# Function Point Modeler Workbench

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# Function Point Modeler Workbench

## Introduction

**Function Point Modeler** is a new generation tool for Function Point Analysis to measure Software. It is a *IFPUG CPM* conform tool, designed by Certified Function Point Specialists to meet all requirements in our daily work as Function Point Specialists. It is the first product to combine Function Point Models with other Models and exchanges Models over XMI-API (UseCase Model, Business Object Class Model and Data Model).

The Function Point Modeler is based on the most popular open source Eclipse platform. It can be run both as stand-alone Application and as Plugin/Feature in Eclipse to interact with both the Eclipse platform and other UML-Modeling Tools.

It supports the life-cycle of elementary processes and application systems and tracks its functional changes. Function Point Modeler supports UML-Like Syntax, Different PDF reports and a lot of other features...

See the **Function Point Modeler** web site at *www.functionpointmodeler.com* for additional information.

## Getting started

### Function Point Analysis

Function point analysis is a standard method for measuring software development from the user's point of view. Function point analysis measures software by quantifying the functionality the software provides to the user based primarily on logical design.

Refer to *IFPUG* document Function Point Counting Practices Manual for additional information about the function point analysis, or see the *IFPUG* web site at *http://www.ifpug.org* for additional information.

#### Introduction to Function Point Analysis

A function point is a unit of measurement to express the amount of business functionality an information system provides to a user. The cost (in dollars or hours) of a single unit is calculated from past projects. Function points are the units of measure used by the *IFPUG* Functional Size Measurement Method. The *IFPUG FSM* Method is an ISO recognized software metric to size an information system based on the functionality that is perceived by the user of the information system, independent of the technology used to implement the information system. The *IFPUG FSM* Method (ISO/IEC 20926 Software Engineering - Function Point Counting Practices Manual) is one of five currently recognized ISO standards for functionally sizing software.

Function points were defined in 1979 in A New Way of Looking at Tools by *Allan Albrecht* at IBM. The functional user requirements of the software are identified and each one is categorized into one of five types: outputs, inquiries, inputs, internal files, and external interfaces. Once the function is identified and categorized into a type, it is then assessed for complexity and assigned a number of function points. Each of these functional user requirements maps to an end-user business function, such as a data entry for an Input or a user query for an Inquiry. This distinction is important because it tends to make the functions measured in function points map easily into user-oriented requirements, but it also tends to hide internal functions (e.g. algorithms), which also require resources to implement. Over the years there have been different approaches proposed to deal with this perceived weakness, however there is no ISO recognized FSM Method that includes algorithmic complexity in the sizing result. The variations of the Albrecht based *IFPUG* method designed to make up for this (and other weaknesses) include:

- Early and easy function points. Adjusts for problem and data complexity with two questions that yield a somewhat subjective complexity measurement; simplifies measurement by eliminating the need to count data elements.

- Engineering function points. Elements (variable names) and operators (e.g., arithmetic, equality/inequality, Boolean) are counted. This variation highlights computational function.The intent is similar to that of the operator/ operand-based Halstead Complexity Measures.
- Bang measure - Defines a function metric based on twelve primitive (simple) counts that affect or show Bang, defined as "the measure of true function to be delivered as perceived by the user." Bang measure may be helpful in evaluating a software unit's value in terms of how much useful function it provides, although there is little evidence in the literature of such application. The use of Bang measure could apply when re-engineering (either complete or piecewise) is being considered, as discussed in Maintenance of Operational Systems -An Overview.
- Feature points. Adds changes to improve applicability to systems with significant internal processing (e.g., operating systems, communications systems). This allows accounting for functions not readily perceivable by the user, but essential for proper operation.

### Objectives of Function Point Analysis

Most practitioners of Function Point Analysis (FPA) will probably agree that there are three main objectives within the process of FPA:

- Measure software by quantifying the functionality requested by and provided to the customer.
- Measure software development and maintenance independently of technology used for implementation.
- Measure software development and maintenance consistently across all projects and organizations.

In working towards objectives 2 and 3 above, several organizations have created large repositories of FP counts that cross projects, technologies, and organizations. These repositories can be an invaluable tool for your first estimation efforts, because it lets you compare your project to similar projects that have been developed by other organizations around the world.

### What is a "Function Point"

One of the first questions we are always asked is a logical one: *"What is a function point?"* . Simply stated, function points are a standard unit of measure that represent the functional size of a software application.

In the same way that a house is measured by the square feet it provides, the size of an application can be measured by the number of function points it delivers to the users of the application. A good example is when we had build our house two years ago. We worked with a very straightforward home builder and he basically said "You have two choices here. First, how many square feet do you want to build? Second, what quality of materials do you want to use?" He continued "Let's say that you want to build a house that is 2,000 square feet. If you want to use cheap materials we can build it for $80 per square feet. That's $160,000. If you want to go top of the line then you're looking at more like $110 per square foot, and that's $220,000. What would you like?"

Don't read into this example that building a software application is like building a house. We all know that there are a lot of other variables, and it's not quite this simple. But function points do get you a lot closer. For example, although it's not like building a house, We're currently working on a Java software development project where we are building a Swing-based application that runs on Windows and Mac computer platforms. We're building this application on a fixed-price basis, at a rate of approximately $250/FP. So, is it like building a house? No. But can we bid projects on a fixed-price basis now? Yes, we can. And we couldn't do that 18 months ago.

### Important introductory FPA notes

There are several other important notes about the FPA process that need to be introduced at this time, so we're including them here:

### Measured from the user's perspective

The size of the application being measured is based on the user's view of the system. It is based on what the user asked for, not what is delivered. It's based on the way the user interacts with the system, including the screens that the user uses to enter input, and the reports the users receive as output. Finally, it's also based on their understanding of the data that needs to be stored and processed by the system.

### Technology-independent

As mentioned in the objectives section, FPA is also technology-neutral. As a Certified Function Point Specialist (CFPS) it does not matter to me what technology you are using to implement your application. It doesn't matter if it's a Web application written in Java, PHP, ColdFusion, or .Net; or a client-server app written in Java, Delphi, VB; or even an AS/400 RPG application. Just show me your screens and your data tables and I'll derive "number of function points" from there.

### Low cost

Adding FPA to your software development portfolio is also very easy. Historically, adding the process of counting FPs to your development process results in a cost increase of only 1%.

### Repeatable Studies

have shown that multiple function point counters can independently count the same application to within 10% accuracy of each other. Repeatability is very important, because without it we could not begin to trust the data from the hundreds of applications that are stored in repositories around the world.

### Work well with use cases

This process works extremely well with use cases, and can even work with the concept of "stories" in Extreme Programming.

### Other useful information

Before we get into the practice of counting FPs, there are a few other background points you should also know:

### Large user group

A large user group known as *IFPUG* ( *http://www.ifpug.org* ) is responsible for carrying the FP torch. *IFPUG* is a non-profit, member-governed organization, consisting of over 1,200 members in 30 countries around the world. As the time of this writing version 4.2 of the *IFPUG* specifications for counting FPs (referred to as the Counting Practices Manual) has just been released.

### ISO Standard

The "Unadjusted FP Count" of *IFPUG* v4.1 is now an ISO standard. In this paper you'll learn some of the basics of performing an Unadjusted FP Count.

### De-facto standard

In addition to being an ISO standard, FPs are used as the de facto standard for cost estimating applications like Cocomo II, Construx Estimate, and other estimating packages.

### Certified Function Point Specialist, or CFPS

A CFPS is a person who has passed the official *IFPUG* certification test. The CFPS designation must be renewed every three years.

### Counting Practices Manual, or CPM

The CPM is the official manual created and distributed by *IFPUG* . It details the official counting rules used by CFPS practitioners. These rules help to keep counts consistent from one CFPS to another. Version 4.1 of this manual is over 300 pages in length.

### FP data repositories

Because many companies have been using FP information for quite some time, there are several large repositories of project data, where companies have combined FP counts along with other information, such as tools used, man hours, and overall project cost. With accurate counts and other accurate data, you don't have to feel so along when making those all-important project estimates.

### A brief history

The following table shows a brief history of function points, beginning with the introduction of the concept by *Alan Albrecht* in 1979.

- 1979 FPs introduced by *Alan Albrecht*
- 1984 First FP guidelines
- 1986 First *IFPUG* Board of Directors
- 1994 CPM Release 4.0
- 2003 ISO standard

### The benefits of Function Point Analysis

Now that you have a little understanding of what FPA is, we can discuss the important things that they bring to your overall software development process.

From our experience, we've found that with a small amount of experience, understanding the functional size of your applications leads to a gold mine of other information that will help you run a successful software development business, including:

- The ability to accurately estimate:
  - project cost
  - project duration
  - project staffing size
- An understanding of other important metrics, such as:
  - Project defect rate
  - Cost per FP
  - FP's per hour (what I refer to as "velocity")
  - The productivity benefits of using new or different tools

As an example of what FPs can do for you, our company can now tackle projects on a fixed-price basis, whereas in the last five years we've had only one other fixed price effort. This gives us a significant competitive advantage against our competition, because most people think it's impossible to develop software on a fixed price basis.

## Function Point Analysis Overview

In this section we'll provide a brief overview of the FP counting process, and then we'll dig more into the nitty-gritty details of the process.

### A simple five step counting process

To start at a high level, there are five steps in the process of counting FPs. They are:

- Determine the type of count.
- Identify the scope and boundary of the count.
- Determine the unadjusted FP count.
- Determine the Value Adjustment Factor.
- Calculate the Adjusted FP Count.

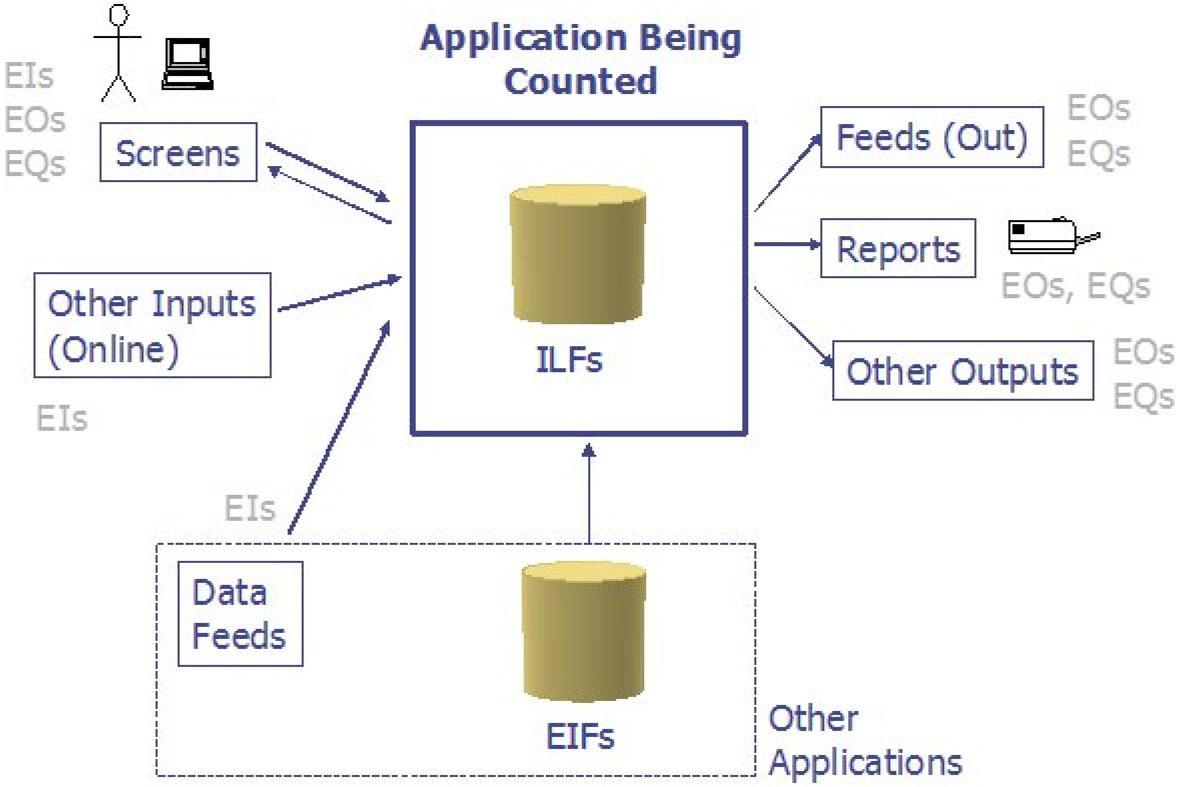
We'll introduce steps 1, 2, 4, and 5 during our sample count, because they are most easily introduced by using an example. At this point we'll get into the heart of step 3 in our process, because this is where the actual FP counting takes place. At this point FP practitioners look at a software application in terms of five standard functions.

### Five standard "functions"

In counting FPs there are five standard *"functions"* that you count. The first two of these are called Data Functions, and last three are called Transaction Functions. The names of these functions are listed below.

- Data Functions:
  - Internal logical files
  - External interface files
- Transactional Functions:
  - External Inputs
  - External Outputs
  - External Inquiries

Using this terminology, when a person that counts FPs looks at a software system, they see something like this:



These five functions will be discussed in greater depth in the sections that follow.

### Details on the Five Data and Transactional Functions

This section provides more detailed information and definitions on the five Data and Transactional Functions. Before getting into the details of the five functions there are several terms that you need to understand, because they'll be used in each of the subsequent definitions. These are taken directly from the CPM.

### Important terms and definitions used in describing the five functions

**User identifiable**

This term refers to defined requirements for processes and/or groups of data that are agreed upon, and understood by, both the users and software developers.

**Control information**

This is data that influences and elementary process of the application being counted. It specifies what, when, or how data is to be processed.

**Elementary process**

An elementary process is the smallest unit of activity that is meaningful to the user. An elementary process must be self-contained and leave the business of the application being counted in a consistent state.

**Data Element Type, or DET**

A data element type is a unique, user recognizable, non-repeated field. This definition applies to both analyses of data functions and transactional functions.

**Record Element Type, or RET**

A record element type is a user recognizable subgroup of data elements within an Internal Logical File or External Interface File.

### Data Functions - Internal Logical Files (ILFs)

ILF stands for *"Internal Logical File"* . In our words, ILFs represent data that is stored and maintained within the boundary of the application you are counting. When counting ILFs you are basically counting the data functions that your application is being built to maintain.

The more precise *IFPUG* definition of an ILF is:

"An ILF is a user-identifiable group of logically related data or control information maintained within the boundary of the application. The primary intent of an ILF is to hold data maintained through one or more elementary processes of the application being counted."

Furthermore, for data or control information to be counted as an ILF, both of the following *IFPUG* counting rules must also apply:

- The group of data or control information is logical and user identifiable.
- The group of data is maintained through an elementary process within the application boundary being counted.

Examples of ILFs Samples of things that *can* be ILFs include:

- Tables in a relational database.
- Flat files.
- Application control information, perhaps things like user preferences that are stored by the application.
- LDAP data stores.

This isn't to say that all these things are ILFs, just that they can be.

### Function point counts resulting from ILFs

When you're counting ILFs you will constantly be referring to the two tables that follow. The purpose of the first table is to help you determine whether the ILF you're currently looking at has a complexity level of Low (L), Average (A), or High (H). You do this by going into the table knowing the number of DETs and number of RETs you have counted in the ILF, and then finding the resulting Low, Average, or High value.

For instance, suppose I counted 5 DETs and 1 RET; that would be a Low complexity table. Conversely, if I had a table with 21 DETs and 2 RETs, that would be an Average complexity table.

| RETS | Data Element Types (DETs) | | |
|---|---|---|---|
| | 1-19 | 20-50 | 51+ |
| 1 | L | L | A |
| 2 to 5 | L | A | H |
| 6 or more | A | H | H |

Now that you know whether the ILF under consideration has a complexity of Low, Average, or High, you'll come to this next table and determine the number of FPs that should be counted for this ILF. A Low complexity ILF is worth 7 points, an Average ILF is worth 10 points, and a High is worth 15.

| Complexity | Points |
|---|---|
| Low | 7 |
| Average | 10 |
| High | 15 |

### Data Functions - External Interface Files (EIFs)

EIF stands for *"External Interface File"* . In our words, EIFs represent the data that your application will use/ reference, but data that is not maintained by your application.

The official *IFPUG* definition of an EIF is:

"An external interface file (EIF) is a user identifiable group of logically related data or control information referenced by the application, but maintained within the boundary of another application. The primary intent of an EIF is to hold data referenced through one or more elementary processes within the boundary of the application counted. This means an EIF counted for an application must be in an ILF in another application."

Again, think of this as data that your application needs and uses, but does not maintain.

Examples of things that can be EIFs are identical to the list for ILFs, but again, the big difference here is that EIFs are not maintained by the application under consideration, but ILFs are.

### Function point counts resulting from EIFs

Assigning an FP value to an EIF is the same as assigning one to an ILF. First, determine the number of DETs and RETs in the EIF, then do a lookup in the following table to determine whether the EIF has a complexity of Low, Average, or High.

| | Data Element Types (DETs) | | |
|---|---|---|---|
| **RETS** | **1-19** | **20-50** | **51+** |
| 1 | L | L | A |
| 2 to 5 | L | A | H |
| 6 or more | A | H | H |

Then, once you know whether the EIF is considered Low, Average, or High, look in the following table for the number of FPs to count for this particular EIF.

| Value | No. or Function Points |
|---|---|
| Low | 5 |
| Average | 7 |
| High | 10 |

You'll notice that the first two lookup tables are identical, but that more FPs are assigned to ILFs than EIFs. Here's some homework for you: Can you guess why?

### Transaction Functions - External Inputs (EI's)

EI stands for *"External Input"* . Here the official *IFPUG* definition of an EI is as follows:

An external input (EI) is an elementary process that processes data or control information that comes from outside the application boundary. The primary intent of an EI is to maintain one or more ILFs and/or to alter the behavior of the system.

Examples of EIs include:

- Data entry by users.
- Data or file feeds by external applications.

### Function point counts resulting from EI's

Allocating FPs to EIs is similar to the process we covered for ILFs and EIFs. However, in this case, instead of doing a lookup based on DET's and RET's to determine a Low/Average/High complexity, the lookup is performed using DET and FTR values. As you'll recall from the earlier definition, an FTR is a "file type referenced", so it can be either an ILF or an EIF.

As an example, suppose that you have a process that has 5 DET's, and during the processing it references an EIF named Users and an ILF named Process. You would go into the following table looking for the complexity of an EI that has 5 DET's and 2 FTR's. As you'll see from the table below, this EI is considered an "Average" complexity EI.

| **FTR's** | **Data Element Types (DET's)** | | |
|---|---|---|---|
| | **1-4** | **5-15** | **16+** |
| 0-1 | L | L | A |
| 2 | L | A | H |
| 3 or more | A | H | H |

To carry our example forward, as you can see from the following table, an Average complexity EI is worth 4 FPs.

| **Complexity** | **Points/Weight** |
|---|---|
| Low | 3 |
| Average | 4 |
| High | 6 |

### Transaction Functions - External Outputs (EO's)

External Outputs are referred to as EO's. The *IFPUG* definition of an EO is as follows:

An external output (EO) is an elementary process that sends data or control information outside the application boundary. The primary intent of an external output is to present information to a user through processing logic other than, or in addition to, the retrieval of data or control information . The processing logic must contain at least one mathematical formula or calculation, create derived data maintain one or more ILFs or alter the behavior of the system.

EO examples include:

- Reports created by the application being counted, where the reports include derived information.

### Function point counts resulting from EO's

Allocating FP's to EO's is very similar to the process for EI's. Again, you perform your lookup using DET's and FTR's, with a resulting Low/Average/High complexity.

As an example, suppose that you have a process that you've identified as being an EO, and it has 10 DET's and references two FTR's. You would go into the following table looking for the complexity of an EI that has 10 DET's and 2 FTR's. As you'll see from the table below, this EO is considered an "Average" complexity EO.

| **FTR** | **Data Element Types (DET)** | | |
|---|---|---|---|
| | 1-5 | 6-19 | 20+ |
| 0-1 | L | L | A |
| 2-3 | L | A | H |

| FTR | Data Element Types (DET) | | |
|---|---|---|---|
| 4 or more | A | H | H |

To carry our example forward, using the table that follows, you'll see that an Average complexity EO has a value of 5 FPs.

| Complexity | Points/Weight |
|---|---|
| Low | 4 |
| Average | 5 |
| High | 7 |

### Transaction Functions - External Inquiries (EQ's)

The last transactional function is referred to as an EQ, or External Inquiry. The *IFPUG* definition of an EQ is as follows:

An external inquiry (EQ) is an elementary process that sends data or control information outside the application boundary. The primary intent of an external inquiry is to present information to a user through the retrieval of data or control information from an ILF of EIF. The processing logic contains no mathematical formulas or calculations, and creates no derived data. No ILF is maintained during the processing, nor is the behavior of the system altered.

Examples of EQs include:

- Reports created by the application being counted, where the report does not include any derived data.
- Other things known as "implied inquiries", which unfortunately, are a little out of scope for this paper.

### Function point counts resulting from EQ's

Allocating an FP count to EQs is very similar to the process for EIs and EOs. Again, you perform your lookup using DETs and FTRs, with a resulting Low/Average/High complexity.

As an example, suppose that you have a process that you've identified as being an EQ, and it has 20 DETs and references 4 FTRs. You would go into the following table looking for the complexity of an EI that has 20 DETs and 4 FTRs. As you'll see from the table below, this EQ is considered a "High" complexity EQ.

| FTRs | Data Element Types (DETs) | | |
|---|---|---|---|
| | 1-5 | 6-19 | 20+ |
| 0-1 | L | L | A |
| 2-3 | L | A | H |
| 4 or more | A | H | H |

Carrying our EQ example forward, you'll find from the table below that a High complexity EQ is worth 6 FPs.

| Complexity | Points/Weight |
|---|---|
| Low | 3 |
| Average | 4 |
| High | 6 |

### Summary of Functions

Taken together, these two data functions (ILFs and EIFs) and three transactional functions (EIs, EOs, EQs) represent the five functions that are counted in a FP count.

### A sample count

We will now explain the previously described theory using a practical example.

#### An introduction to our example

Okay, we've given you some background information and theory. The best thing to do now is to jump into the process of counting a sample application.

To demonstrate how the FP process works, we're going to use a sample application that we will create. The application is named "FPTracker", and as its name implies, it's a tool that you can use when you perform FP counts on other applications. Of course this is an example application. We encourage you to use a major tool like "Function Point Modeler" for your daily work. As output, it provides some convenient reports and an analysis of the data to help keep you from making errors in your counts.

The FPTracker application consists of the following primary process areas:

- Project management, including creating, editing, and deleting projects.
- Entity management, including creating, editing, and deleting ILFs and EIFs.
- Process management, including creating, editing, and deleting EIs, EOs, and EQs.
- Process group management, which is a mechanism for grouping processes.
- Reporting, which includes several useful FP reports.

For the purposes of our example, we're only going to cover a subset of the application. In a few moments you'll learn more about the FPTracker application by seeing the data it stores, the screens it offers, and two output reports it provides.

#### The counting process

As a quick review, the five steps in the process of counting FPs are as follows:

- Determine the type of count.
- Identify the scope and boundary of the count.
- Determine the unadjusted FP count.
- Determine the Value Adjustment Factor.
- Calculate the Adjusted FP Count.

In our example we're going to follow these steps precisely.

#### Step 1: The type of count

The first step in our FPA process is determining the type of count for the application at hand. Function point counts can be one of three different types:

| Name | Definition |
|---|---|
| Development Project FP Count | Measures the functions provided to the users with the first installation of the software being delivered. |
| Enhancement Project FP Count | Measures the modifications to an existing application. |
| Application FP Count | Measures the functionality provided to users in an existing application. |

Because our FPTracker application already exists and is in production, the type of our count is an "Application FP Count".

That's all we have to do for Step 1. Note that this does not have anything to do with assigning points at this time. We are simply recording what type of project we are counting, because there are different summation rules at the end of the count, and they vary depending on the type of count you are performing.

#### Step 2: Identify the scope and boundary of the count

The second step of the FPA process is identifying the scope and boundary of our count.

The scope of this count will be defined by the data, screens, and reports that we're about to show you. You should not make any assumptions about any behavior that may appear to be missing.

Regarding the boundary of this application, for our purposes FPTracker should be thought of as a simple, standalone software application. Unlike a suite of applications like Microsoft Office, or a combination of applications that can be found on an Intranet or Extranet site, the FPTracker is not tied to any other applications in any way.

It's also worth noting that the purpose of this particular count is to serve as a sample count for this paper. In the real world the purpose of our counts vary, but typical examples include:

- Serving as the basis to determine the cost of this software application.
- Helping to determine the productivity rate of the development team on this project.
- Helping to determine the retail value of this software asset to the company.

Of course there could be any number of other reasons for pursuing a count like this, but this is a good list of the typical reasons.

### Step 3: Determine the unadjusted function point count

Although the first two steps are very important in setting the groundwork for your count, and specifying the scope of your count, they are usually performed very quickly, and it is the third step that really takes the majority of the FPA time, and is the heart of the count.

In this step we'll be counting the data functions and transactional functions that yield the unadjusted FP count. As you've seen, to this point we haven't been dealing with any numbers, but we're now ready to start adding them up.

#### *Step 3a: Determine the count resulting from ILF's*

In the FPTracker application the data is stored in a series of relational database tables, so we'll use those as the basis of our analysis. The following is a list of the database table names used in the FPTracker application:

1. Project
2. Entity
3. Process Group
4. Process
5. ProcessDETs
6. ProcessEntities

The full listing of the fields stored in each table are shown in the following tables. These tables provide each field name, a field description, and indicator as to whether the field should be counted as a DET, and other notes/comments regarding each field. The last row of each table provides a count of the total number of DETs in the corresponding database table.

The "Project" database table

| **Field** | **Description** | **Count as a DET?** | **Notes** |
|---|---|---|---|
| project_id | Sequential id, system-assigned. | No | This is a technical artifact. It is not user-recognizable, and therefore not counted. |
| project_name | The name a user assigns to a given project. | Yes | |
| project_type | The type of project count. | Yes | |
| description | A description of the project. | Yes | |
| Total DETs: | 3 | | |

The "Entity" database table

| Field | Description | Count as a DET? | Notes |
|---|---|---|---|
| entity_id | Sequential id, system-assigned. | No | System-generated sequence number. Not user-recognizable. |
| project_id | Foreign key. | Yes | Do count a DET for pieces of data that are required by the user to establish a relationship with another ILF or EIF. Foreign keys usually fit this definition. |
| name | Name of the entity. | Yes | |
| type | Type of entity (ILF or EIF). | Yes | |
| no. RETs | Number of RETs in the entity. | Yes | |
| no. DETs | Number of DETs in the entity. | Yes | |
| complexity | Calculated complexity (Low, Average, or High). | Yes | |
| Total DETs: | 6 | | |

The "Process" database table

| Field | Description | Count as a DET? | Notes |
|---|---|---|---|
| process_id | Sequential id, system-assigned. | No | System-generated sequence number. Not user-recognizable. |
| pg_id | Foreign key. | Yes | |
| name | Name of the process. | Yes | |
| type | Type of process (EI, EO, or EQ). | Yes | |
| sort_order | Order of appearance when displayed. | Yes | |
| no. FTRs | Number of FTRs. | Yes | |
| no. DETs | Number of DETs. | Yes | |
| complexity | Low, Average, or High. | Yes | |
| description | Description of the process. | Yes | |
| Total DETs: | 8 | | |

The "Process Group" database table

| Field | Description | Count as a DET? | Notes |
|---|---|---|---|
| process group id | Sequential id, system-assigned. | No | System-generated sequence number. Not user-recognizable. |
| project id | Foreign key. | Yes | |

| Field | Description | Count as a DET? | Notes |
|---|---|---|---|
| name | Name of the process group. | Yes | |
| Total DETs: | 2 | | |

The "ProcessDETs" database table

| Field | Description | Count as a DET? | Notes |
|---|---|---|---|
| id | Sequential id, system-assigned. | No | System-generated sequence number. Not user-recognizable. |
| process_id | Foreign key. | Yes | |
| sequence | Sort order, for display purposes. | Yes | |
| description | User-supplied description. | Yes | |
| Total DETs: | 4 | | |

The "ProcessEntities" database table

| Field | Description | Count as a DET? | Notes |
|---|---|---|---|
| id | Sequential id, system-assigned. | No | System-generated sequence number. Not user-recognizable. |
| process_id | Foreign key. | Yes | |
| entity_id | Foreign key. | Yes | |
| sequence | Sort order, for display purposes. | Yes | |
| Total DETs: | 3 | | |

We won't keep you guessing about these tables; the data they represent are all ILFs (and not EIFs) because they are maintained within the boundary of the FPTracker application. That being said, you're about to see some of the complexity of FP counting.

In this particular application there is not a one-to-one relationship between the database tables and the way a user would logically view this data being stored. As an FP counter, and also the primary user of this application :), we think of the data logically being stored like this:

1. Project
2. Entity
3. Process Group
4. Process
    a. ProcessDETs
    b. ProcessEntities

In this case what I'm saying is that, as the user of this application, we think of the Process DETs and the Process Entities as being logical subgroups of the overall Process data. Okay, you say, but what does that matter to me as an FP counter? Let's look at how our counts would differ if we count the tables first as being separate, then second as being logically merged.

First, if we think of the these six tables as separate ILFs, because of the number of DETs they contain, each table would be considered to be a "Low" complexity table. Because each Low table is worth 7 FPs, the FP count for these six tables would be 42 FPs (6x7=42).

However, if we look at the tables from a "logical" perspective instead of the physical RDBMS layout, what we really have are four logical groups. Because of their DET and RET counts, all four of the groups are considered "Low" in complexity. So, in this case, the total count is 28 FPs (4x7=28).

Therefore, had we counted the physical implementation of the tables as opposed to a logical grouping, we would have over-counted this portion of the application by 14 FPs, or 50%. This is a good example of where a physical implementation differs from a correct, logical grouping for an FP count.

### Total Count Due to ILFs

To tally up the FP count due to ILFs, I've identified four ILFs, with the number of RETs and number of DETs as shown in the table below. The first three ILFs are very straightforward, and as discussed above, I believe that we have one Process ILF with three RETs: (1) Process, (2) Process DETs, and (3) Process Entities. Using the ILF lookup table shown earlier in Table 2, we see that each ILF is considered "Low" in complexity. Looking up Low Complexity ILFs in Table 3, we see that a Low Complexity table is counted as seven FPs. This gives me the total of 28 FPs as a result of ILFs.

| ILF | No. RETs | No. DETs | Complexity | Function Points |
|---|---|---|---|---|
| Project | 1 | 3 | Low | 7 |
| Entity | 1 | 6 | Low | 7 |
| Process Group | 1 | 2 | Low | 7 |
| Process | 3 | 13 | Low | 7 |
| Total: | 28 | | | |

#### *Step 3b: Determine the count resulting from EIF's*

In this particular application there are no EIFs, so EIFs contribute zero FPs to the overall FP count.

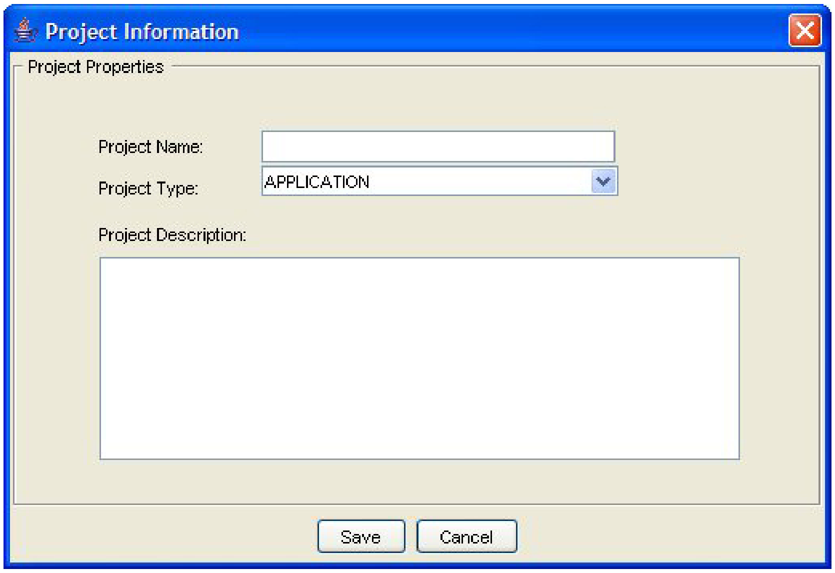
However, in many applications there definitely are EIFs. Suppose, for example, that this application required the use of a file named Users, and this file was maintained by another application, but was accessed by our application. In this case the file would be counted as an EIF, using the EIF rules discussed earlier.

At this point we've finished counting data functions, and it's time to move on to transaction functions.

#### *Step 3c: Determine the count resulting from EI's*

To begin counting the transactional functions we first need to look at the user interface screens in the application. Let's look at all of these screens first, then determine which of these are EI's, which are EO's, and finally which are EQ's.

### Screen shots from the application

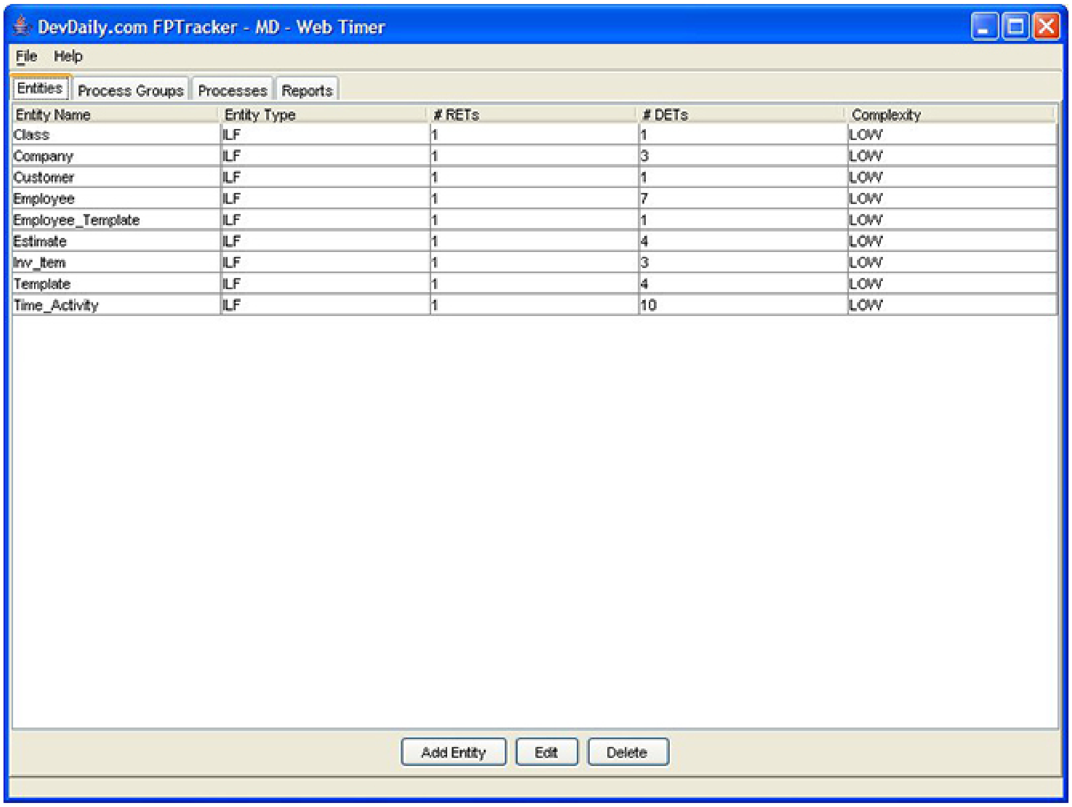


Project Name:

Project Type: APPLICATION

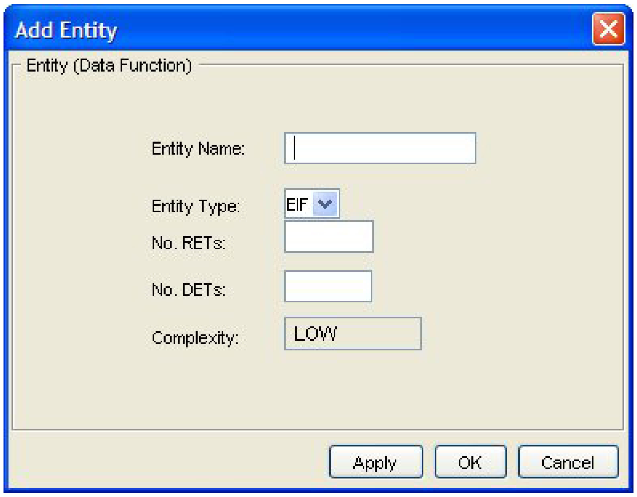
Project Description:

Figure 1: The "New Project" screen lets users create a new project.



| Entity Name | Entity Type | # RETs | # DETs | Complexity |
|---|---|---|---|---|
| Class | ILF | 1 | 1 | LOW |
| Company | ILF | 1 | 3 | LOW |
| Customer | ILF | 1 | 1 | LOW |
| Employee | ILF | 1 | 7 | LOW |
| Employee_Template | ILF | 1 | 1 | LOW |
| Estimate | ILF | 1 | 4 | LOW |
| Inv_Item | ILF | 1 | 3 | LOW |
| Template | ILF | 1 | 4 | LOW |
| Time_Activity | ILF | 1 | 10 | LOW |

Figure 2: This screen shows the Entities tab. From this location users can View, Add, Edit, and Delete entities.



Add Entity

Entity (Data Function)

Entity Name:

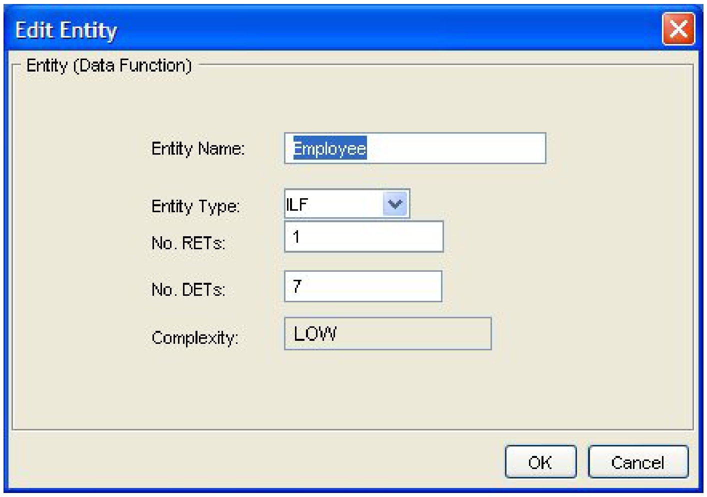
Entity Type: EIF

No. RETs:

No. DETs:

Complexity: LOW

Figure 3: The "Add Entity" screen lets the user add new entities (ILFs and EIFs) to the project.



Edit Entity

Entity (Data Function)

Entity Name: Employee

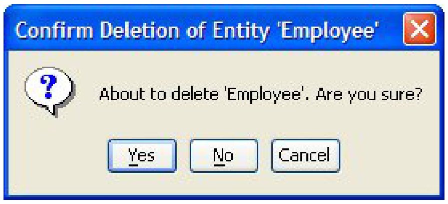
Entity Type: ILF

No. RETs: 1

No. DETs: 7

Complexity: LOW

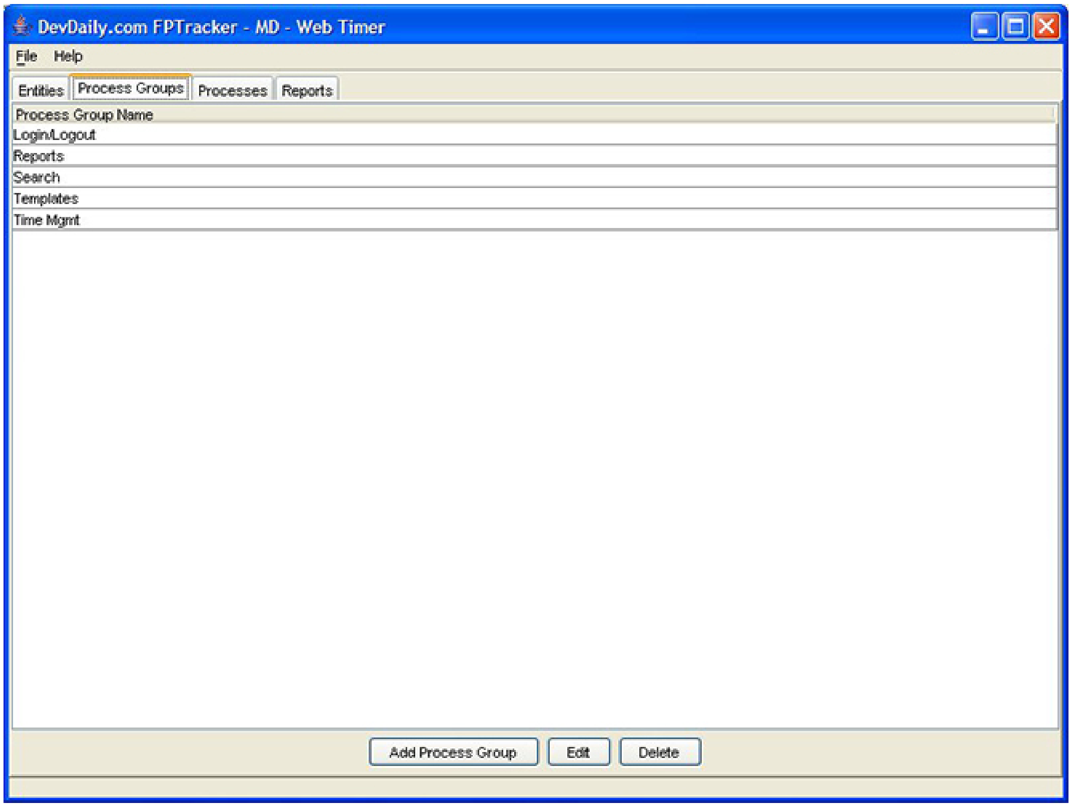
Figure 4: The "Edit Entity" screen lets the user edit entities in the project.



Confirm Deletion of Entity 'Employee'

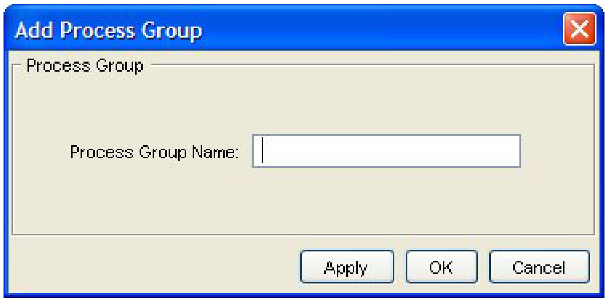
About to delete 'Employee'. Are you sure?

Figure 5: The "Delete Entity" screen asks the users to confirm their attempt to delete an entity in the application.



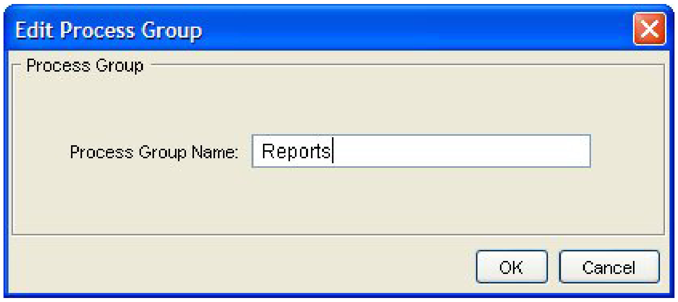
| Process Group Name |
|---|
| Login/Logout |
| Reports |
| Search |
| Templates |
| Time Mgmt |

Figure 6: This screen shows the Process Groups tab. From this screen users can Add, Edit, and Delete Process Groups.



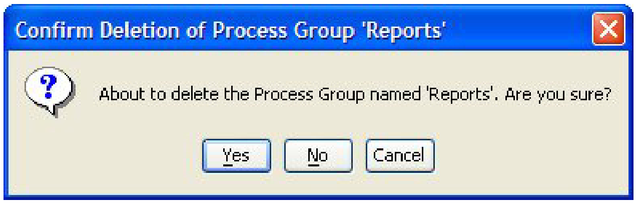
Process Group Name:

Figure 7: The "Add Process Group" screen lets the user add new process groups to the application.



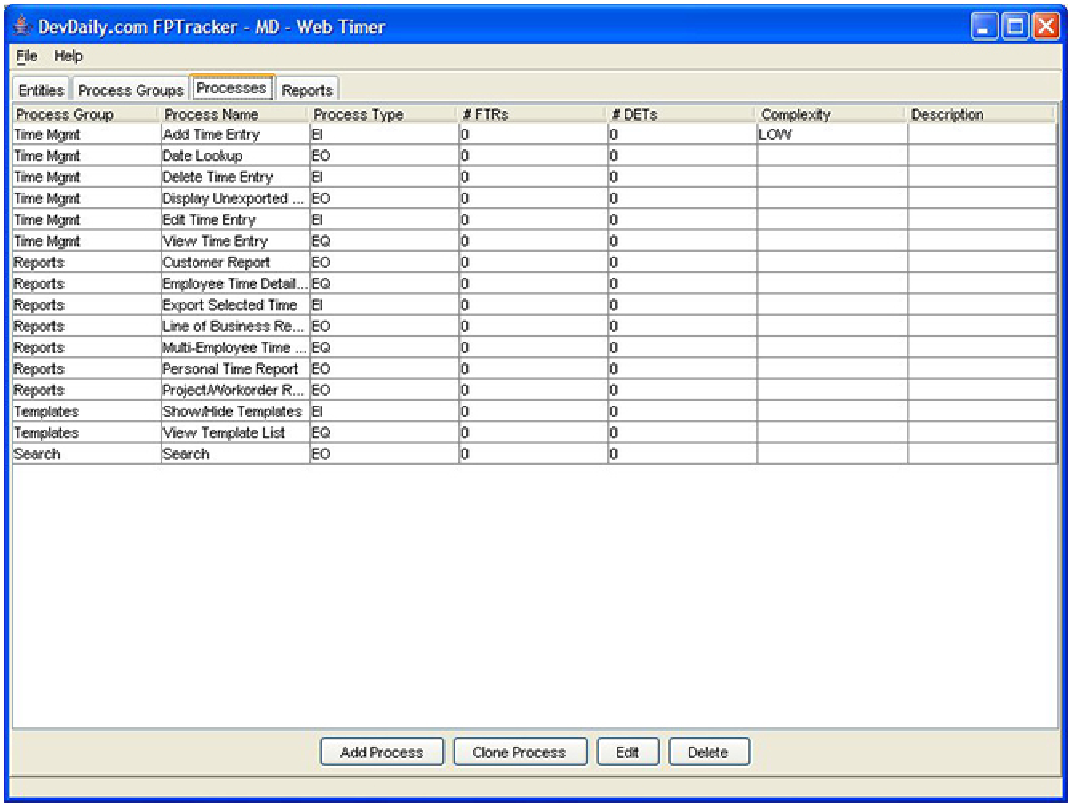
Process Group Name: Reports

Figure 8: The "Edit Process Group" lets the user assign a new name to a process group.



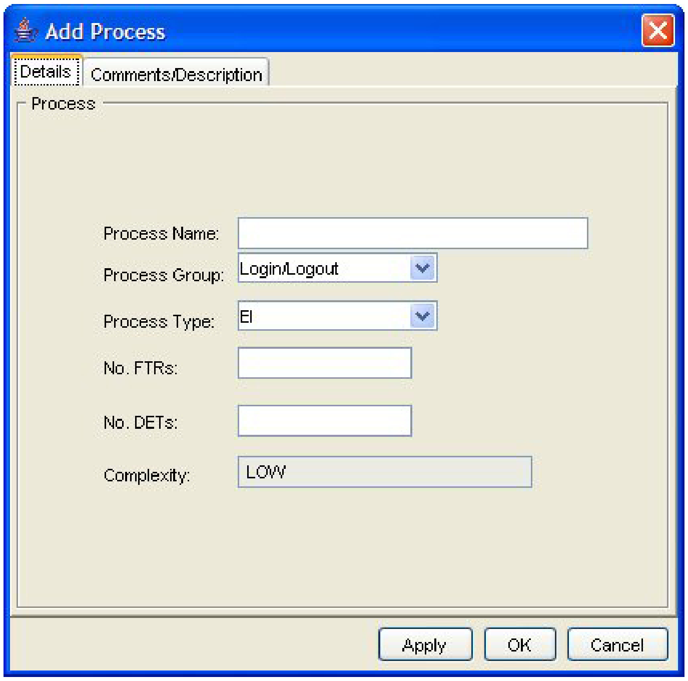
About to delete the Process Group named 'Reports'. Are you sure?

Figure 9: This screen lets the user delete a selected process group.



| Process Group | Process Name | Process Type | # FTRs | # DETs | Complexity | Description |
|---|---|---|---|---|---|---|
| Time Mgmt | Add Time Entry | EI | 0 | 0 | LOW | |
| Time Mgmt | Date Lookup | EO | 0 | 0 | | |
| Time Mgmt | Delete Time Entry | EI | 0 | 0 | | |
| Time Mgmt | Display Unexported ... | EO | 0 | 0 | | |
| Time Mgmt | Edit Time Entry | EI | 0 | 0 | | |
| Time Mgmt | View Time Entry | EQ | 0 | 0 | | |
| Reports | Customer Report | EO | 0 | 0 | | |
| Reports | Employee Time Detail... | EQ | 0 | 0 | | |
| Reports | Export Selected Time | EI | 0 | 0 | | |
| Reports | Line of Business Re... | EO | 0 | 0 | | |
| Reports | Multi-Employee Time ... | EQ | 0 | 0 | | |
| Reports | Personal Time Report | EO | 0 | 0 | | |
| Reports | Project/Workorder R... | EO | 0 | 0 | | |
| Templates | Show/Hide Templates | EI | 0 | 0 | | |
| Templates | View Template List | EQ | 0 | 0 | | |
| Search | Search | EO | 0 | 0 | | |

Figure 10: This figure shows the Processes tab. From this location users can Add, Clone, Edit, and Delete processes.



Process Name:

Process Group: Login/Logout

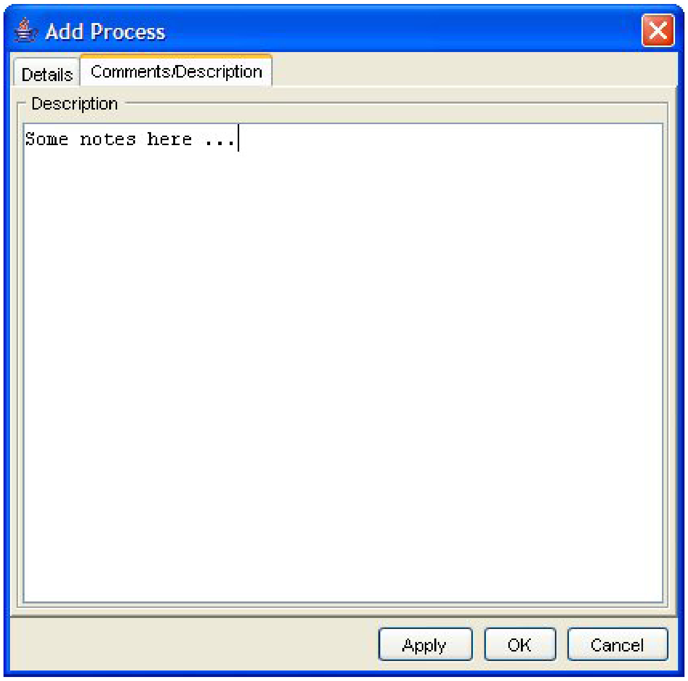
Process Type: EI

No. FTRs:

No. DETs:

Complexity: LOW

Figure 11: This screen lets the user define a new process. Note the "Description" tab.



```
Some notes here ...
```

Figure 12: This screen shows the details of the Comments/Description tab. Users can optionally enter information here when creating a new Process.

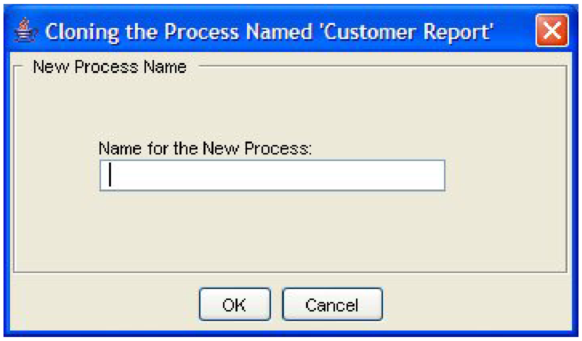
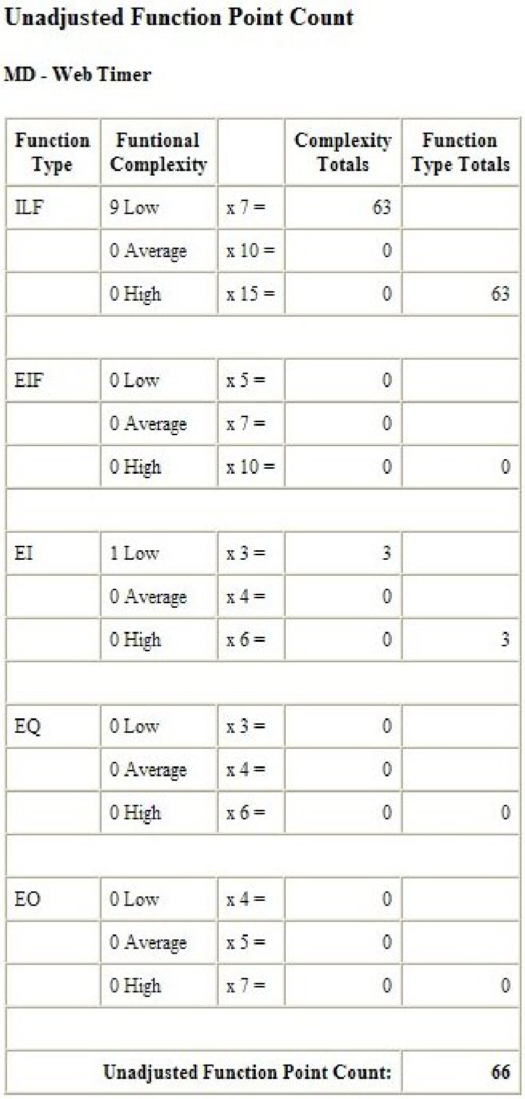

Cloning the Process Named 'Customer Report'
New Process Name
Name for the New Process:
OK
Cancel

Figure 13: Users can use this screen to clone a Process in the application. They simply select an existing Process, then select a Clone option that leads to this screen.

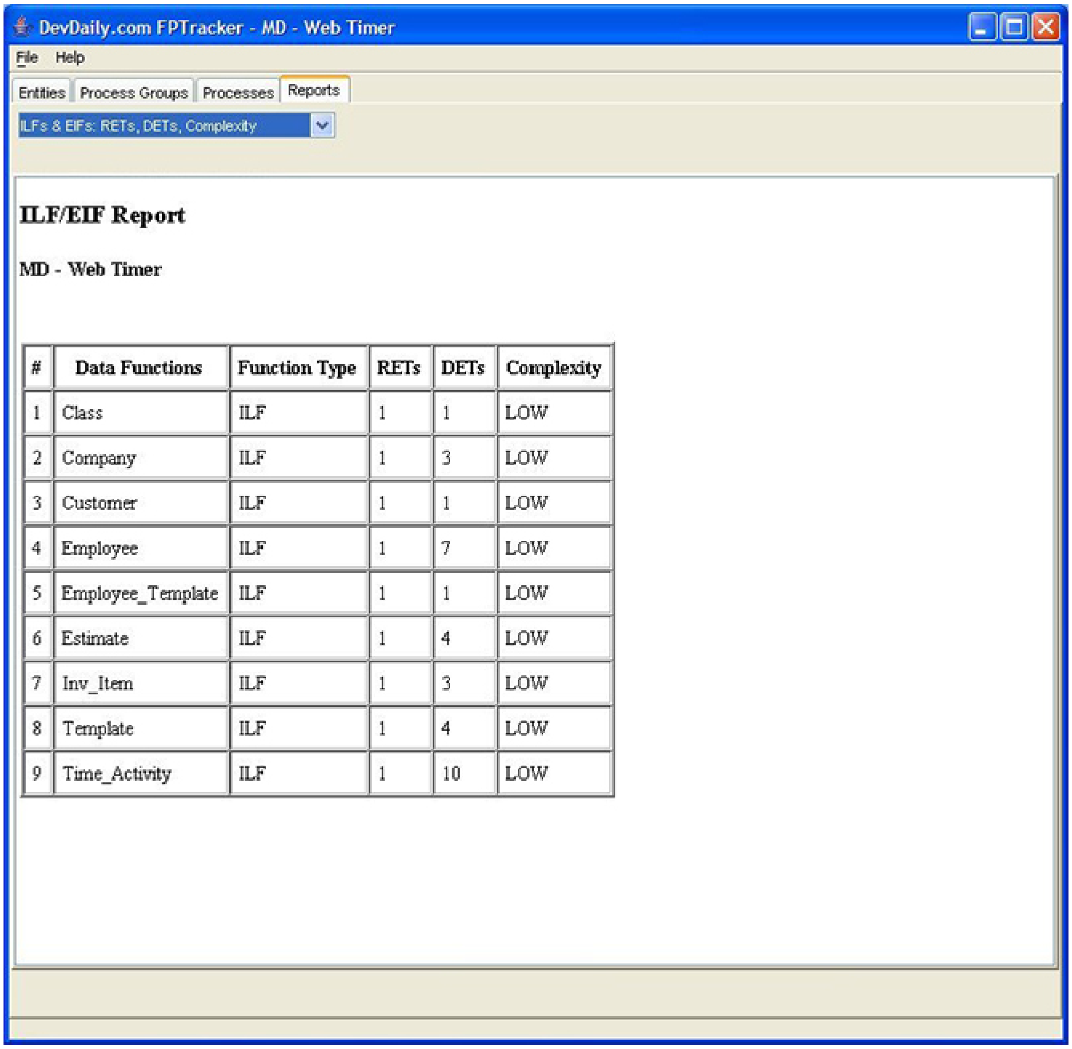


**Unadjusted Function Point Count**

**MD - Web Timer**

| Function Type | Funtional Complexity | | Complexity Totals | Function Type Totals |
|---|---|---|---|---|
| ILF | 9 Low | x 7 = | 63 | |
| | 0 Average | x 10 = | 0 | |
| | 0 High | x 15 = | 0 | 63 |
| | | | | |
| EIF | 0 Low | x 5 = | 0 | |
| | 0 Average | x 7 = | 0 | |
| | 0 High | x 10 = | 0 | 0 |
| | | | | |
| EI | 1 Low | x 3 = | 3 | |
| | 0 Average | x 4 = | 0 | |
| | 0 High | x 6 = | 0 | 3 |
| | | | | |
| EQ | 0 Low | x 3 = | 0 | |
| | 0 Average | x 4 = | 0 | |
| | 0 High | x 6 = | 0 | 0 |
| | | | | |
| EO | 0 Low | x 4 = | 0 | |
| | 0 Average | x 5 = | 0 | |
| | 0 High | x 7 = | 0 | 0 |
| | | | | |
| **Unadjusted Function Point Count:** | | | | **66** |

Figure 14: This screen shows a basic Unadjusted Function Point Count report.


DevDaily.com FPTracker - MD - Web Timer
File
Help
Entities
Process Groups
Processes
Reports
ILFs & EIFs: RETs, DETs, Complexity

ILF/EIF Report

MD - Web Timer

| # | Data Functions | Function Type | RETs | DETs | Complexity |
|---|---|---|---|---|---|
| 1 | Class | ILF | 1 | 1 | LOW |
| 2 | Company | ILF | 1 | 3 | LOW |
| 3 | Customer | ILF | 1 | 1 | LOW |
| 4 | Employee | ILF | 1 | 7 | LOW |
| 5 | Employee_Template | ILF | 1 | 1 | LOW |
| 6 | Estimate | ILF | 1 | 4 | LOW |
| 7 | Inv_Item | ILF | 1 | 3 | LOW |
| 8 | Template | ILF | 1 | 4 | LOW |
| 9 | Time_Activity | ILF | 1 | 10 | LOW |

Figure 15: This figure shows a report provided by the application called the "ILF/EIF Report".

Now that we've seen the screens in the application we have to determine which of these correspond to EI's, which are EO's, and which are EQ's. We'll do that in the next sections.

### Brief process descriptions

Because you haven't seen this application before, it may be hard to understand the processes in this application. Therefore, I'll provide a brief name and description of each process in this application.

| Process Name | Process Description |
|---|---|
| Create a Project | This screen is displayed in Figure 1. This lets the user create a new project. Note that for the purposes of this paper we are skipping other project-related processes, including the ability to list, edit, delete, and clone projects. |
| Display Entity List | The list is displayed in Figure 2. This is a list of every Entity that the user has identified for the application they are counting. |
| Add Entity | Shown in Figure 3, this dialog lets the user add a new Entity. |
| Edit Entity | Shown in Figure 4, this dialog lets the user edit an existing Entity. This dialog appears when the user highlights a row in the Entity List, then selects the Edit button. Alternatively, they can double-click on the desired row. |

| Process Name | Process Description |
|---|---|
| Delete Entity | Shown in Figure 5, this confirmation dialog is displayed when a user selects a row, then presses the Delete button. |
| Display Process Group List | This list is shown in Figure 6. This is a list of every Process Group the user has identified. |
| Add Process Group | Shown in Figure 7, this dialog lets the user define a new Process Group. |
| Edit Process Group | Shown in Figure 8, this dialog lets the user edit an existing Process Group. |
| Delete Process Group | Shown in Figure 9, this confirmation dialog is displayed when a user selects a row in the Process Group table, then presses the Delete button. |
| Display Process List | The list is displayed in Figure 10. This is a list of every Process that the user has identified for the application they are counting. |
| Add Process | Shown in Figures 11 and 12, this dialog lets the user define a new Process. |
| Edit Process | Although not shown, this dialog is identical to screens shown in Figures 11 and 12, other than the title of the dialog. These screens let the user edit an existing Process. |
| Delete Process | Although not shown, this confirmation dialog is displayed when a user selects a row, then presses the Delete button. For the sake of our count, assume that it is a simple confirmation dialog, similar to the dialog for deleting a Process Group. |
| Clone Process | Shown in Figure 13, this dialog lets the user make a duplicate copy of a Process. This makes it easy to create new processes which are very similar to an existing process. |
| Display UFPC Report | Shown in Figure 14, this is a typical report that totals up the number of FPs in the application you are recording. The report is displayed after the user selects the report type from a drop-down list of reports in the Reports tab. The list of data shown in the drop-down list is hard-coded into the application. |
| Display ILF/EIF Report | Shown in Figure 15, this report shows the ILFs and EIFs (i.e., all the FTRs) in the application, along with their associated number of DETs and RETs, as well as their complexity level. It is selected from the same drop-down list as the UFPC Report. |

There is a little more to this application than what is shown in these figures, but for the purposes of this paper, these screens and descriptions define the application under consideration.

For our counting purposes, we will also assume that each data-entry screen can also result in one or more error screens. For example, when a user is creating a new project, the system will display an error dialog if they do not provide a project name, because this is a required field.

In the next section we'll classify each of these processes as an EI, EO, or EQ, and determine the FPs associated with each process.

### Function points resulting from EI's

The table below lists the External Inputs in the application. It also lists the number of DETs and FTRs for each process, and the complexity that results from the number of DETs and FTRs.

| Process | # DETs | FTR Names | # FTRs | Resulting Complexity | # FPs |
|---|---|---|---|---|---|
| Create Project | 5 | Project | 1 | Low | 3 |
| Add Entity | 7 | Project, Entity | 2 | Average | 4 |
| Edit Entity | 7 | Project, Entity | 2 | Average | 4 |
| Delete Entity | 4 | Project, Entity | 2 | Low | 3 |
| Add Process Group | 3 | Project, ProcessGroup | 2 | Low | 3 |
| Edit Process Group | 3 | Project, ProcessGroup | 2 | Low | 3 |

| Process | # DETs | FTR Names | # FTRs | Resulting Complexity | # FPs |
|---|---|---|---|---|---|
| Delete Process Group | 4 | Project, ProcessGroup | 2 | Low | 3 |
| Add Process | 9 | Project, Process, ProcessGroup | 3 | High | 6 |
| Edit Process | 9 | Project, Process, ProcessGroup | 3 | High | 6 |
| Delete Process | 5 | Project, Process, ProcessGroup | 3 | High | 6 |
| Clone Process | 3 | Project, Process, ProcessGroup | 3 | Average | 4 |
|  |  |  |  | Total: | 45 |

*Step 3d: Determine the count resulting from EO's*

According to the rules, we have only one EO, and that is the UFPC Report. This report is considered an EO, and specifically not an EQ, because it contains derived data. More specifically, the complexity total column and the total UFPC count at the bottom of the table are derived fields, and EQs specifically cannot contain derived fields like this.

This report is actually a very difficult report for me to get right, and that's exactly why I've included it here. It's hard for me because of the rules surrounding duplicated fields in reports. Unfortunately, rather than get into all the complexity of these rules, I'm just going to state that there are at least seven DETs in this report, and they are:

1. Title
2. Function type
3. Functional complexity
4. The complexity totals
5. The function type totals
6. The Unadjusted FP Count
7. A DET that is counted for the menu option to choose this report

| Process | DETs | FTRs | Resulting Complexity | # FPs |
|---|---|---|---|---|
| UFPC Report | 7 | 3 | Average | 5 |
|  |  |  | Total: | 5 |

Because of the repeating fields this is a very difficult report for me. Fortunately, when we double-checked with a colleague we both came up with an Average score for this EO, even though we differed on the fields slightly. That's one of the nice things about using ranges like this; very rarely does a disagreement about the detailed rules actually affect a count.

*Step 3e: Determine the count resulting from EQ's*

The table below lists the External Inquiries in the application. It also lists counts of the number of DETs and FTRs for each process, and the complexity that results from the number of DETs and FTRs.

We begin with the ILF/EIF Report. Fortunately, it's a lot easier that the UFPC Report. It contains six DETs, including the title, data function names, function type, number of RETs, number of DETs, and complexity. Looking at the report, you can also see that it retrieves information from the Project and Entity ILFs, so there are two ILFs.

### Implied Inquiries

The rest of the EQs in the table below are probably quite a surprise. We haven't introduced them yet, primarily because they add a little complexity to the mix. Each of the last four processes in this table are referred to as "implied inquiries". They are the almost hidden processes in an application that are easy to overlook. For instance, if you look back at Figures 3, 7, and 11, you'll see that the application has built-in lists of Entities, Process Groups, and Processes.

These are the tables (JTable's to be more specific) that are contain in the Entity, Process Group, and Process tabs, respectively. Some type of query had to be performed to generate these lists, and those types of queries that result in this "view list" operation often qualify as "implied inquiries".

The Process Group drop-down list on the Add/Edit Process dialog is another implied inquiry. It took some type of query to generate that list, and again it is considered an implied inquiry.

While I'm covering this important topic rather quickly, it's important to note that other drop-down lists and tables may not qualify as implied inquiries, especially when the data they contain is hard-coded in the application. You also might not count the listing as an implied inquiry if the data **could have been** hard-coded. This is an introductory tutorial, so that's all I'm going to say about this topic for now, other than the fact that we will refer you to the CPM for more specific rules.

| **Process** | **DETs** | **FTRs** | **Resulting Complexity** | **# FPs** |
|---|---|---|---|---|
| ILF/EIF Report | 6 | 2 | Average | 4 |
| Display List of Entities | 5 | 2 | Low | 3 |
| Display List of Process Groups | 2 | 2 | Low | 3 |
| Display List of Processes | 7 | 3 | Average | 4 |
| Implied Inquiry - Process Group ComboBox on the Add/Edit Process Dialog | 1 | 2 | Low | 3 |
| | | | Total: | 17 |

Now that we've finished counting the ILFs, EIFs, EIs, EOs, and EQs in the application, we add up each of the individual counts to get a total unadjusted function point count for the application. This is shown in the table that follows.

| **Function Type** | **Complexity** | **Multiplier** | **Line Item Sub-Total** | **Section Total** |
|---|---|---|---|---|
| ILF | 4 Low | x 7 = | 28 | |
| | 0 Average | x 10 = | 0 | |
| | 0 High | x 15 = | 0 | 28 |
| | | | | |
| EIF | 0 Low | x 5 = | 0 | |
| | 0 Average | x 7 = | 0 | |
| | 0 High | x 10 = | 0 | 0 |
| | | | | |
| EI | 5 Low | x 3 = | 15 | |
| | 3 Average | x 4 = | 12 | |
| | 3 High | x 6 = | 18 | 45 |
| | | | | |
| EQ | 0 Low | x 4 = | 0 | |
| | 1 Average | x 5 = | 5 | |
| | 0 High | x 7 = | 0 | 5 |
| | | | | |
| EO | 3 Low | x 3 = | 9 | |

| **Function Type** | **Complexity** | **Multiplier** | **Line Item Sub-Total** | **Section Total** |
|---|---|---|---|---|
| | 2 Average | x 4 = | 8 | |
| | 0 High | x 6 = | 0 | 17 |
| | | | | |
| | | | **Unadjusted Function Point Count:** | **95** |

### Step 4: Determine the Value Adjustment Factor (VAF)

In this step we'll look at something named the "Value Adjustment Factor", or VAF. But first, a warning about the VAF.

### A warning about the VAF

Before we tell you what the VAF is, let us first give you a warning about it: To the best of our knowledge, most users don't use it.

We can't tell you much about the history of the VAF, but what we can tell from the conversations we've had with many other users is that they don't use the VAF. This stems from at least two reasons that we can determine:

- Most users count function points to derive a number that they can plug into another piece of software to determine a cost estimate. Those other software applications usually have their own equivalent of the VAF, and in fact, instruct you to supply the "raw FP count". So, in this case, the VAF competes against these vendor tools.
- Some users don't feel that the GSCs are flexible enough. I tend to agree, and I think it's an easy argument. When you look at the math below, you'll see that for two applications under consideration, if both start with the same function point count - let's say 1,000 FPs - after adjustments the hardest application in the world would be rated at 1,350 FPs, and the easiest possible application would be rated at 650 FPs when adjusted. Let's say the hardest application in the world had to run on 10 different operating systems in 15 languages and be distributed electronically to 1 million users, and the easiest would be written in Microsoft Access, run on Windows, and be used by only one user, the author of the program. Do you really think the first application is only about twice as hard to deliver as the second? No, I certainly don't, and this is why I don't use the VAF.

All that being said, we'll give you the quick VAF introduction so you can make a decision on your own. If nothing else, we find it nice that someone has taken the time to come up with these 14 categories. It helps our thinking in other areas.

### VAF Introduction

Here are a few facts and definitions to get the ball rolling:

- The Value Adjustment Factor (VAF) consists of 14 "General System Characteristics", or GSCs.
- These GSCs represent characteristics of the application under consideration. Each is weighted on a scale from 0 (low) to 5 (high).
- When you sum up the values of these 14 GSCs you get a value named "Total Degree of Influence", or TDI. As you can see from the math the TDI can vary from 0 (when all GSCs are low) to 35 (when all GSCs are high).

Before getting into the VAF formula, let us quickly list the 14 GSCs:

- Data Communication
- Distributed data processing
- Performance
- Heavily used configuration
- Transaction rate
- Online data entry
- End user efficiency

- Online update
- Complex processing
- Reusability
- Installation ease
- Operational ease
- Multiple sites
- Facilitate change

Given this background information, you can see with the following formula:

```
VAF = (TDI*0.01) + 0.65
```

that the VAF can vary in range from 0.65 (when all GSCs are low) to 1.35 (when all GSCs are high). In the next section you'll see that the VAF is applied directly to the FP count to determine the "Adjusted Function Point Count".

### Step 5: Calculate the Adjusted Function Point Count

The final step in our five-step process is to determine the Adjusted Function Point Count. For initial application counts such as ours, this is easily determined with the following equation:

```
Adjusted FP Count = Unadjusted FP Count * VAF
```

As you saw in the previous section, the VAF can vary from 0.65 to 1.35, so the VAF exerts an influence of +/- 35% on the final Adjusted FP Count.

Since we're not going to come up with a value for the VAF in this paper, we also will not have a number for the Adjusted FP Count. As you can see, however, this is very easy and straightforward.

### The Value of Counting Function Points

Okay, we showed you the "how" of FP counting, but we'd like to return to the "why" of FP counting, because we think motivation is a very important driver here. You need to asking yourself "Why should you add as much as 1% to your overall software development effort?"

Our experience with FP counting has shown all of the benefits we mentioned earlier in this document. Once you have a history of developing applications and you also have FP counts for all those applications, you can now add to your software development arsenal these capabilities:

- The ability to accurately estimate:
  - project cost
  - project duration
  - optimum project staffing size
- The ability to determine other important metrics, such as:
  - Project defect rate
  - Cost per FP
  - FP's per hour (a productivity rate; We tend to refer to it as "Velocity", a term I like from Extreme Programming)
  - The productivity benefits of using new or different tools

So, the question to you is "What are these abilities worth to you?"

For us, the biggest benefit of FP counting means that a company can get into fixed-price software development projects. When a prospect says "Can you do this project for $100,000?" we can run around the corner, scratch some numbers on the back of an envelope, and give them a Yes or No answer. And while doing this we can be pretty well assured that the company won't go bankrupt on this project.

Why is this important? Because we've never met a developer that likes to estimate programming work, and the bigger the work, the worse is gets. we don't blame them; estimating is very hard, especially on larger projects. We've met a lot of developers, and some always estimate low, some always estimate high, and others go both high and low. As a manager, We'd much rather have some cold statistics that we can rely on in times like this, even if it's just as a point of comparison.

### An example of how this works

As an example of how this works, we're going to walk through the process that we followed recently. This involves two small phases of development on one project. On this project, the developers, project managers, users, technology, and application all remained constant. We also followed a relatively formal process, beginning with a requirements phase, which led into development, testing, and final delivery of a portion of an application.

### A first measurement

In our case we were able to start with one project that we were already developing. The project itself was small, but it was a distributed Java Swing application with an embedded database that runs on Windows, Mac, and Linux platforms, so even though the application itself was small, the degree of complexity here was very high.

The first thing we did was to finish the requirements documentation and initial prototypes for our application. Once we had this information, which included a simple, logical view of the database requirements, we were able to count the function points for this small project. We created what we thought was a fairly detailed requirements document, and the count at this time was 400 FPs.

Skipping a few details here, let's just say that the next thing we did was to develop this project. When we called the development "complete", we counted the number of FPs that were actually delivered to the users. This was 440 FPs, or a growth from the requirements stage of 11%.

At this point we also had development time information. Two developers worked on this project for a total of 540 man-hours. This comes out to be 0.815 FPs/hour (440 FPs divided by 540 man-hours). Had our customer kept a good record of time that users spent testing the application they also could have determined a metric of "Number of testing hours per FP", but they did not. IMHO, we think this would benefit them in the future, but in our role, application testing is not our responsibility, so we did not pursue this.

Although we spent 540 hours on this project, the real "calendar time" for delivery of the application was 10 weeks. This was because of several periods of down time during the development process. Therefore this project was delivered at the rate of 44 FPs per calendar week.

Depending on how you track cost information, you can also determine "Cost per FP". As we stated earlier, as an independent software development firm, we now develop complex applications like this for about $250/FP.

### Your second measurement

Because this is an ongoing project, we basically repeated the same steps on the next phase of our project. For summary purposes, here are the steps we followed:

- Develop the requirements, including an understanding of the necessary data stores and screens to be developed.
- Count the FPs.
- Supplied an estimate of the project cost, assuming another 11% gain in functionality (scope creep) during development.
- Develop the code.
- Track the amount of time people spend on the project during development and testing.
- Count the FPs again.
- Deliver useful project metrics, including:
    - Number of developer hours.
    - Number of testing hours.
    - Average number of hours per FP.
    - Elapsed calendar time, which yields something like "Number of calendar days per FP" or the converse of "Number of FPs per calendar day". This occurs when there is down time in a project, or when your development resources are not fully dedicated to the project at hand.
    - Development cost per FP.
    - Testing cost per FP.
    - Overall cost per FP (including other time for management, documentation, etc.).
    - The ratio of Requirements time to Development time, and other similar ratios.

Note that Step 3 in this example is "estimate the project cost". Because we have the same developers, users, and managers working on a different part of the same project, isn't it reasonable to assume that the project velocity for earlier phases will be the same for this new phase? For us, this is at the heart of estimating new development work with FPs. Given this scenario of having the same developers, users, and managers, and working with the same technology on the same application, We're glad to take our chances estimating with FPs

Now, if you suddenly change any of these factors, you can use this same information for your estimates, but you're estimate will probably vary somewhat. For instance, with our company, we've found that we can develop web applications much, much faster than we can develop Swing applications. Of course this is an over-simplification, but in general a simple web application conforming to HTML 3.2 specifications is much easier for us to develop, and hence our cost estimate and delivery times will be scaled down for this environment.

Another factor you'll be able to measure is the impact of new technology and tools on your development costs. As we mentioned, we deliver Web applications much faster than Swing applications, so a 500 FP Web application will be developed faster than a 500 FP Swing application. Although the size (amount) of functionality we're delivering to the customer is equivalent, the technology that we're using to deliver the applications is different, and for us, web applications are much less expensive.

That being said, we've found that other factors, including project managers and customers can also be a major influence on the overall development time and cost. For instance, when it comes to customers, it's much easier to work with a small team of customers that agree on what they want an application to deliver, versus a large committee with different opinions. The large committee is going to take more time during the requirements process, and IMHO is going to be subject to a larger scope creep during development.

In summary, given a little bit of time and statistics, your organization can rapidly begin applying FPs to use these same metrics. Over time, your cost and time estimates will get much more accurate. And, as you bring new technologies into your portfolio, you'll be able to look at these metrics and see the positive (or negative) correlation of new technology.

### Bonus

In the last section we started getting into the real usefulness of FP counting - it leads to many different metrics that you can use to measure and improve your software development process. Assuming that you take this to heart, and become really proficient at FP counting, let us show you a few magic formulas that people in the cost estimating and metrics world use.

### Three magic formulas

The last thing we're going to share here are three things we refer to as "magic formulas", mostly because we don't know how the authors of these formulas arrived at them. We'll have to assume that they had some data at their disposal, and came up with these formulas to match their data.

### Project Duration

The first formula is credited to Barry Boehm. The formula states that the duration of a project is equal to 2.5 times the cube root of the work months, or:

```
Project Duration = 2.5 * (Cube Root of Work Months)
```

where Work Months is defined as `Work Months = (Project Work Effort (Hours)) / (Hours per Month)` . So, if a project is estimated to take 27 work months, then the project duration can be expected to be

```
Project Duration = 2.5 * (3)
```

or 7.5 months.

### Optimum Staffing Size

The origin of this formula is currently unknown, but it goes like this: `Optimum Staffing Size = Square Root of Work Months` . Here, the square root of 27 is 5.2.

### Minimum Duration

The last magic formula states that the minimum duration of a software project is:

```
Project Duration = 0.75 * (Cube Root of Work Months)
```

In our example, this yields 0.75 * 3, or 2.25 months.

### Summary

How does this compare to what we've measured? In our earlier example we stated that we worked 540 man-hours 10 weeks. At 160 man-hours per month, this is 3.375 months. Applying the three magic formulas we would arrive at these numbers:

- Minimum Duration = 0.75*1.5 = 1.12 month. We didn't make it in this short time frame, but assuming 540 total hours of development time, we could have finished in seven weeks instead of 10. (We essentially lost three development weeks due to other issues.)
- Project Duration = 2.5*1.5 = 3.75 months. This is 15 weeks. We took 10.
- Optimum Staffing Size = 1.84 developers. We used two developers here, and I did not want any more or less on this effort, so this correlation seems good.

Before using any of these "magic formulas" in practice, you might try reverse-engineering them like this against your own projects, and see if they work for you.

### Function Point Analysis Summary

The concept of Function Points was invented by Alan Albrecht 25 years ago, yet they remain a mystery to most developers today. That's unfortunate, because once you know the functional size of an application, you've opens a new door to accurate project cost estimation and other useful metrics.

A recap of the process of Function Point Analysis shows that Function Points:

- Are measured from the user's perspective (not a developer's perspective).
- Are independent of the technology used to develop the application.
- Are low cost, adding less than a 1% overhead to your process.
- Are repeatable, as studies have shown that certified function point counters can come within 10% of each other.
- Are "use case friendly", because counting function points typically corresponds to processes defined in use cases.

Using Function Point Analysis helps you more accurately estimate:

- Project cost
- Project duration
- Optimum project staffing size

An accurate counting of function points leads to a wealth of valuable statistics that can be used to improve the development process, including:

- Number of developer hours per FP.
- Number of total hours per FP.
- Cost per FP.
- Number of FPs per month/week/day.
- Number of bugs/defects per FP.
- Number of bug/defect hours per FP.
- Productivity increases (or decreases) due to technology changes.

These metrics, and others like them, can be used as part of the feedback loop to improve your software development lifecycle.

For more information, visit *http://www.ifpug.org* .

## A walk-through example

In the following chapters we provide an insight into the power and functionality of the Function Point Modeler.

### Introduction to our example

In the previous chapters we have given an overview of the Function Point Analysis. We now want to deepen this overview with a concrete example, by demonstrating the basic capabilities of the Function Point Modeler. To keep it simple, we use the well-known example from the previous chapters. Step by step we will show you how to use the Function Point Modeler in dealing with Function Point Analysis. You will see, Function Point Aalysis has never been so easy.

### Measure a new Application

Let's consider again our example application. We assume that the FPTracker will be a new product we will create. For this reason, we give you an introduction to the first approach for a new application.

### Perform the counting process

The following sections will guide you step by step through the procedure for the measurement of a new application.

#### *How to determine the type of count*

The first step in our FPA process is determining the type of count for the application at hand. Remember, Function Point Counts can be one of three different types:

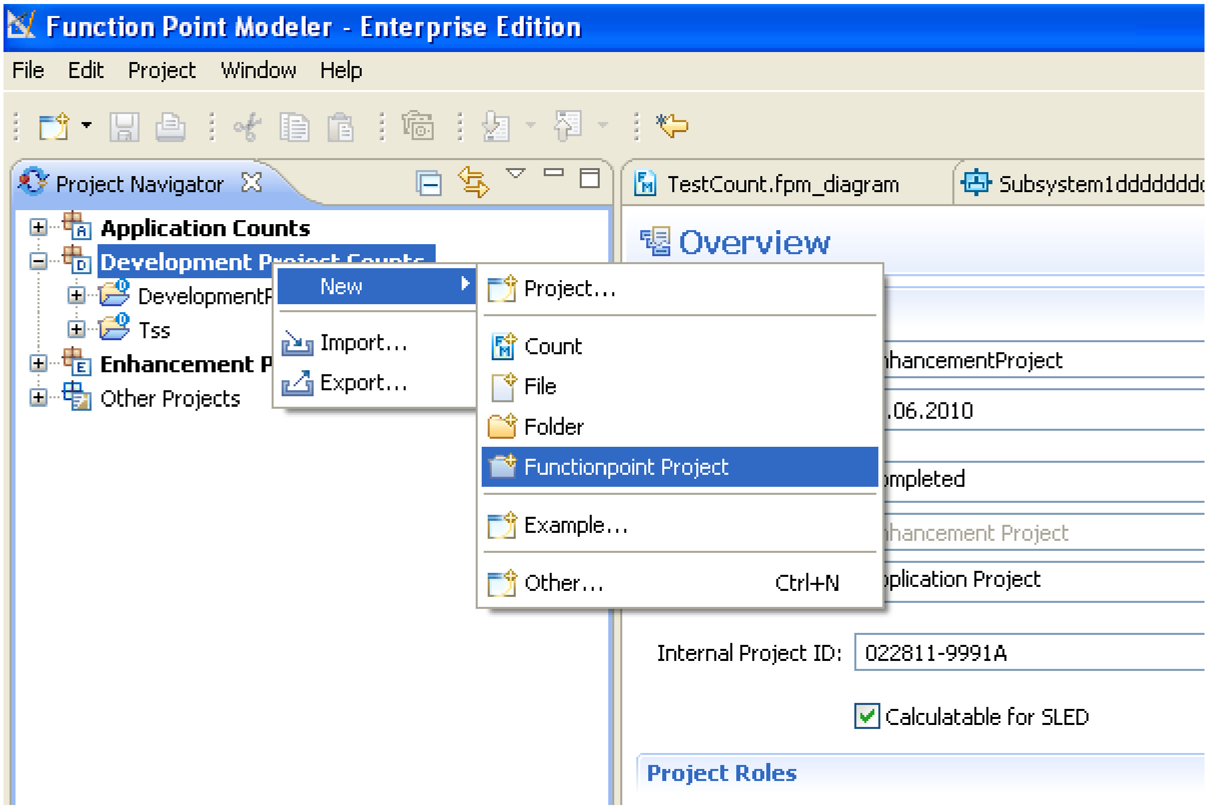
| Name | Definition |
|---|---|
| Development Project FP Count | Measures the functions provided to the users with the first installation of the software being delivered. |
| Enhancement Project FP Count | Measures the modifications to an existing application. |
| Application FP Count | Measures the functionality provided to users in an existing application. |

Because we assume our FPTracker application will be a new product, the type of our count is a "Development Project FP Count".

Create a Development Project

Perform this task before creating a ***Development Project Count***

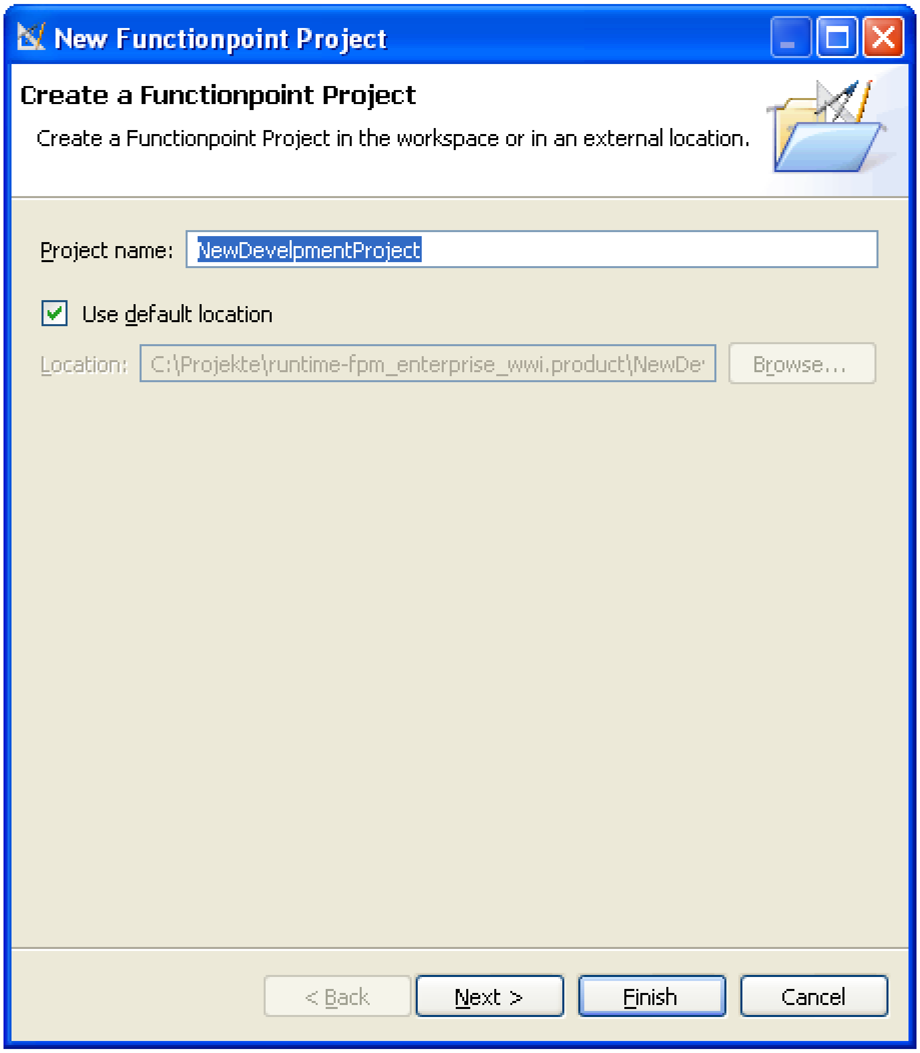
**1.** From the main menu bar, select ***File >New > Functionpoint Project***



Internal Project ID: 022811-9991A

☑ Calculatable for SLED

2. The following wizard dialog will be showed.
   - Enter the project name **NewDevelopmentProject**
   - And click the button **Next**



Create a Functionpoint Project

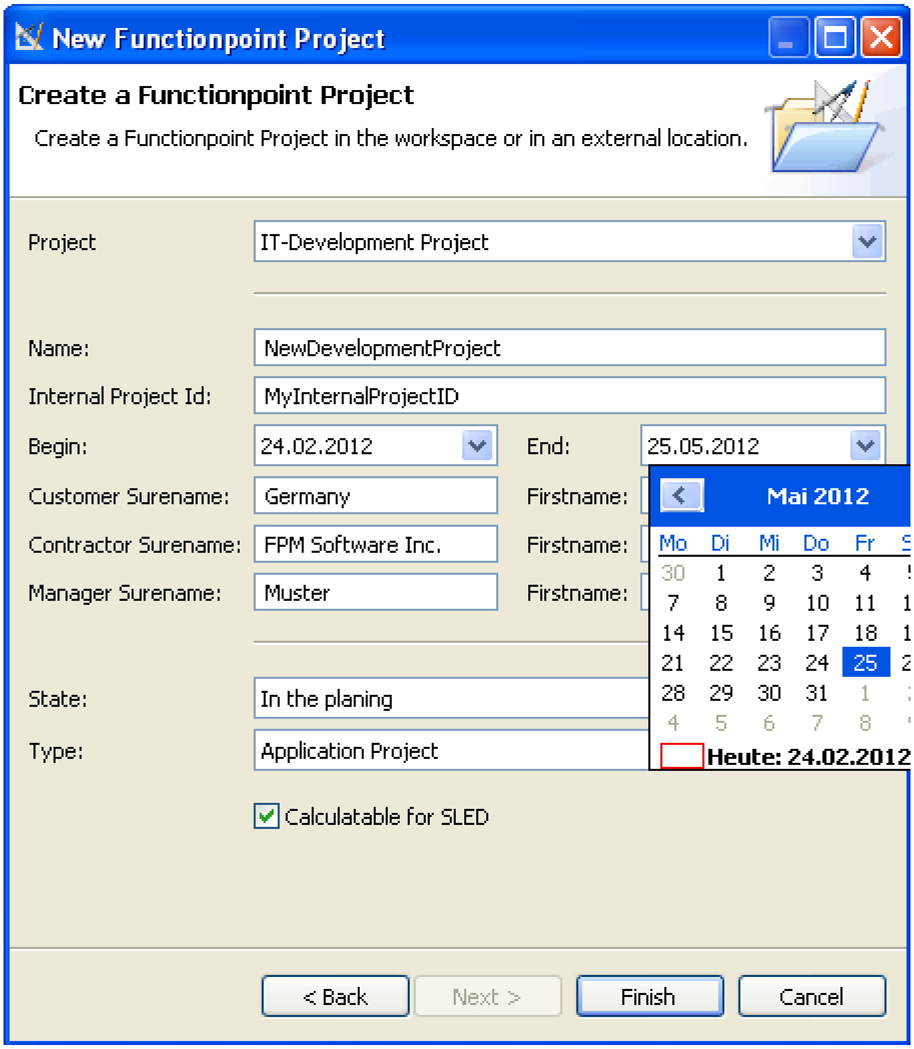
Create a Functionpoint Project in the workspace or in an external location.

Project name: NewDevelpmentProject

☑ Use default location

Location: C:\Projekte\runtime-fpm_enterprise_wwi.product\NewDe

**3.** The following wizard dialog will be showed.



**Create a Functionpoint Project**

Create a Functionpoint Project in the workspace or in an external location.

| | | | |
|---|---|---|---|
| Project | IT-Development Project | | |
| Name: | NewDevelopmentProject | | |
| Internal Project Id: | MyInternalProjectID | | |
| Begin: | 24.02.2012 | End: | 25.05.2012 |
| Customer Surename: | Germany | Firstname: | |
| Contractor Surename: | FPM Software Inc. | Firstname: | |
| Manager Surename: | Muster | Firstname: | |
| State: | In the planing | | |
| Type: | Application Project | | |

☑ Calculatable for SLED

Mai 2012

| Mo | Di | Mi | Do | Fr | S |
|---|---|---|---|---|---|
| 30 | 1 | 2 | 3 | 4 | |
| 7 | 8 | 9 | 10 | 11 | 1 |
| 14 | 15 | 16 | 17 | 18 | 1 |
| 21 | 22 | 23 | 24 | 25 | 2 |
| 28 | 29 | 30 | 31 | 1 | |
| 4 | 5 | 6 | 7 | 8 | |

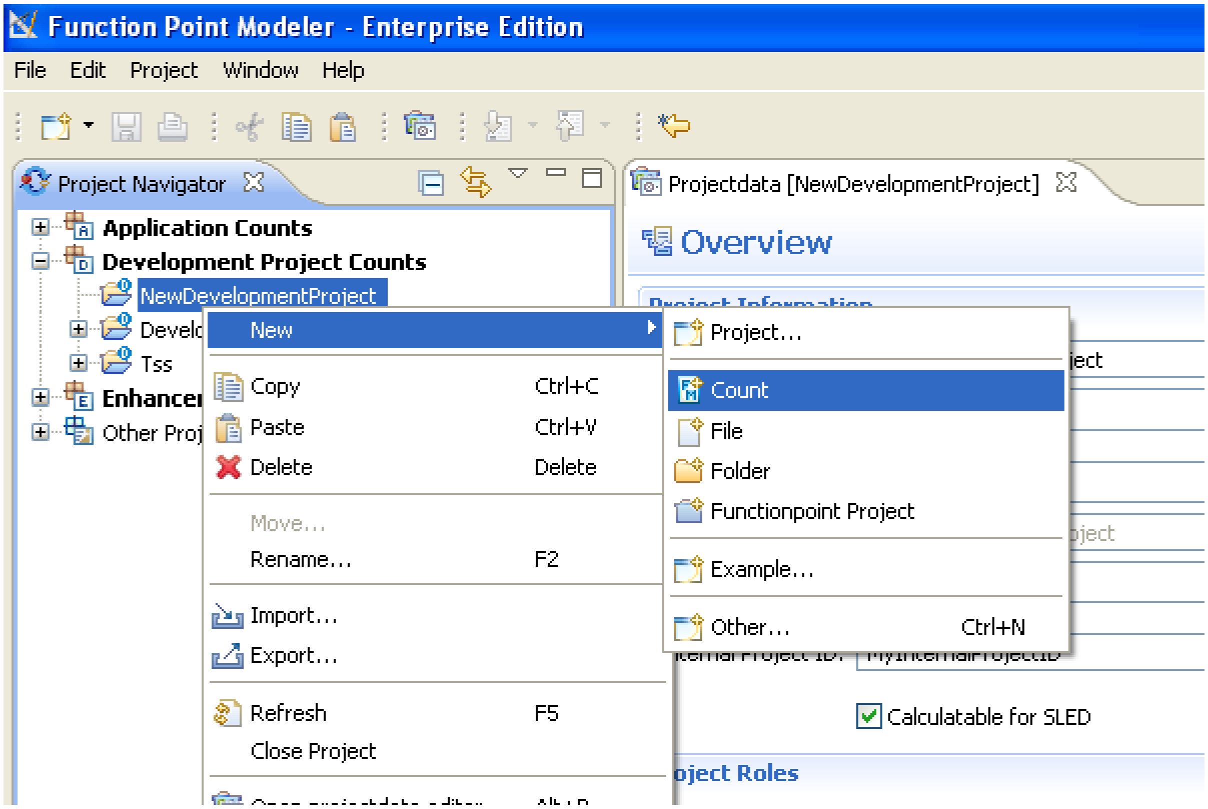
Heute: 24.02.2012

- Select the **IT-Development Project**
- Enter the Internal Project Id as **MyInternalProjectID**
- Select the begin and end date
- Enter the customer, contractor and manager names
- Select the project state **In the planing**
- Select the type **Application Project**
- And click the button **Finish**

Create a Development Project Count

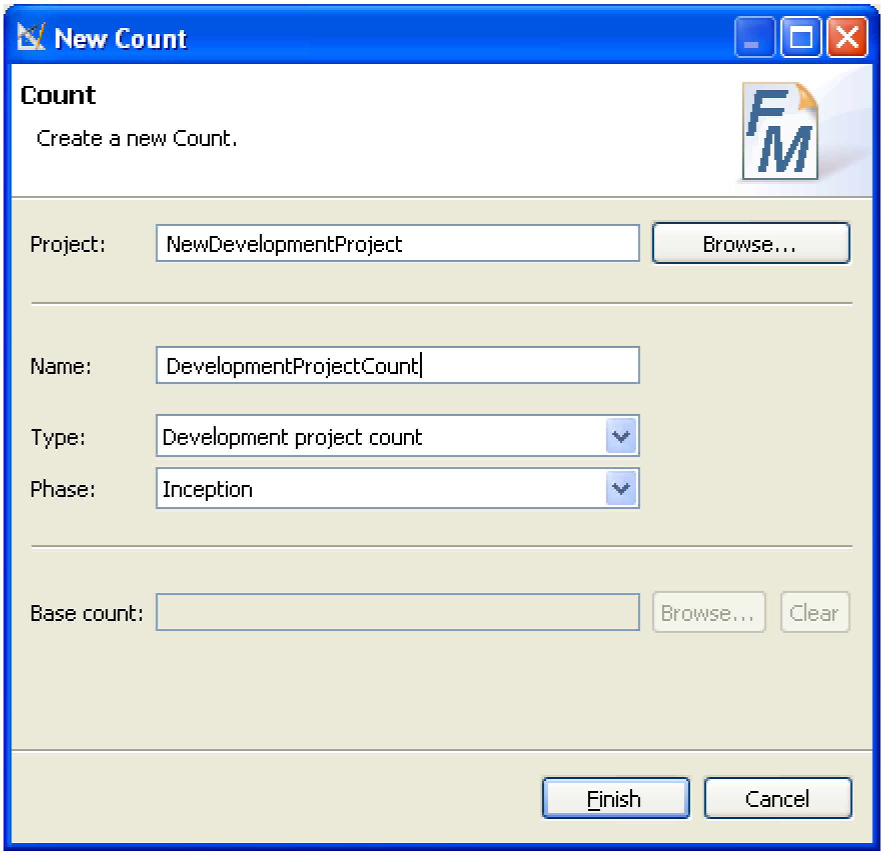
Perform the task ***Create a Development Project*** before creating this task.

1. From the main menu bar, select ***File >New > Functionpoint Project***



2. The following wizard dialog will be showed.

- Click the button **Browse...** and select the **NewDevelopmentProject**
- Enter the count name **DevelopmentProjectCount**
- Select the type **Development project count**
- Select the phase **Inception**
- And click the button **Finish**



Count

Create a new Count.

Project: NewDevelopmentProject

Name: DevelopmentProjectCount

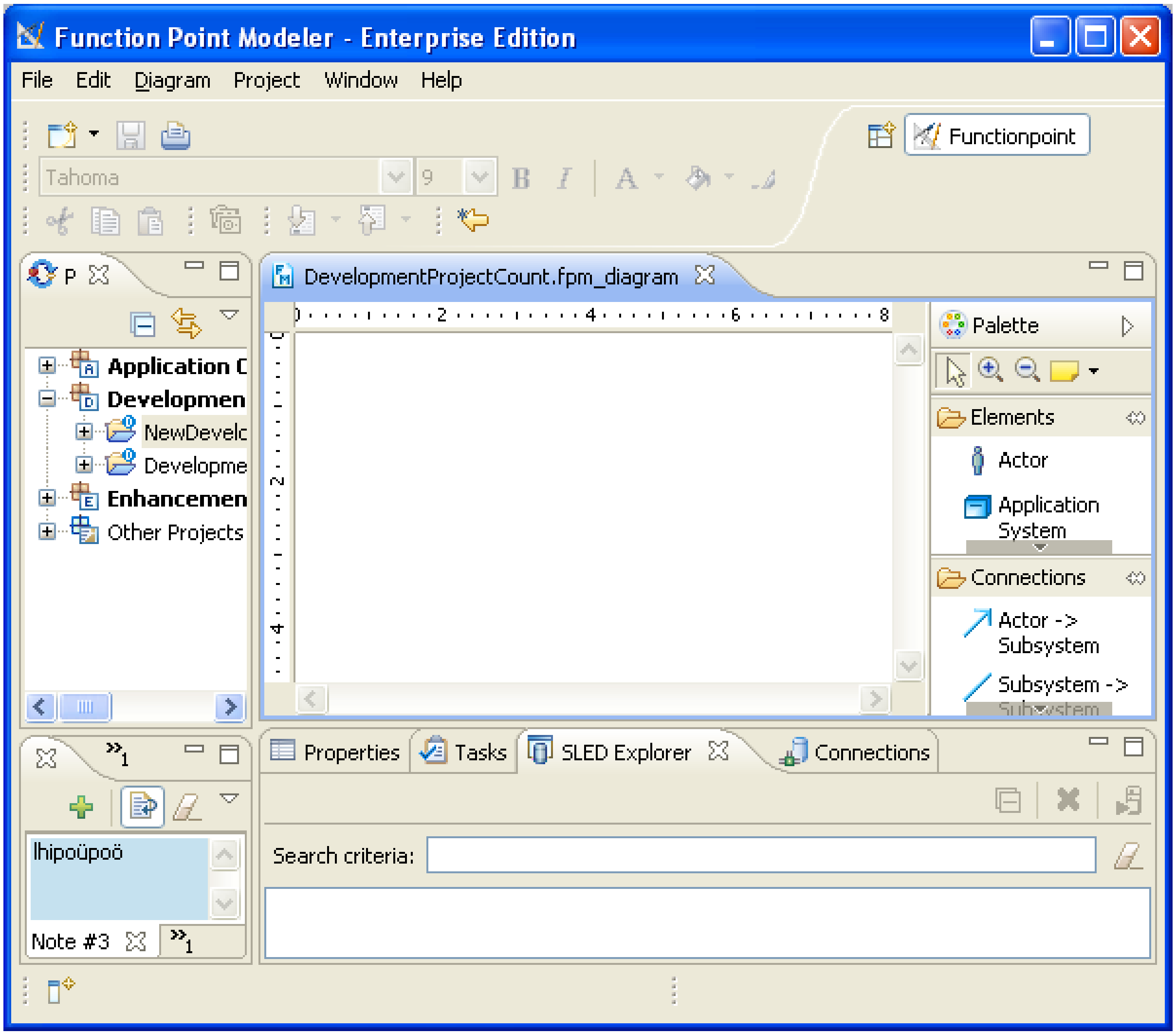
Type: Development project count

Phase: Inception

Base count:

*Identify the scope and boundary of the count*

Once you have created ***Development Project Count*** the **Function Point Modeler Diagram Editor** will be launched.



Before we go further with the count, we have to know the scope and boundary of the count. Function Point Modeler distinguish between **Application System** and **Sub System**

| Name | Definition |
|---|---|
| Application System | The **Application System** indicates the software being measured. An **Application System** includes one ore more **Sub System** You can add to an **Application Count** only one **Application System** . But **Development Project Count** or **Enhancement Project Count** may contain more than an **Application System** . It is recommended is general one **Application System** per **Function Point Count** |
| Sub System | **Sub System** are a type of stereotyped component that represent independent, behavioral units in a system. **Sub System** are used to represent large-scale components in the system that you are modeling. You can model an entire **Application System** as a hierarchy of **Sub System** . |

Create an Application System

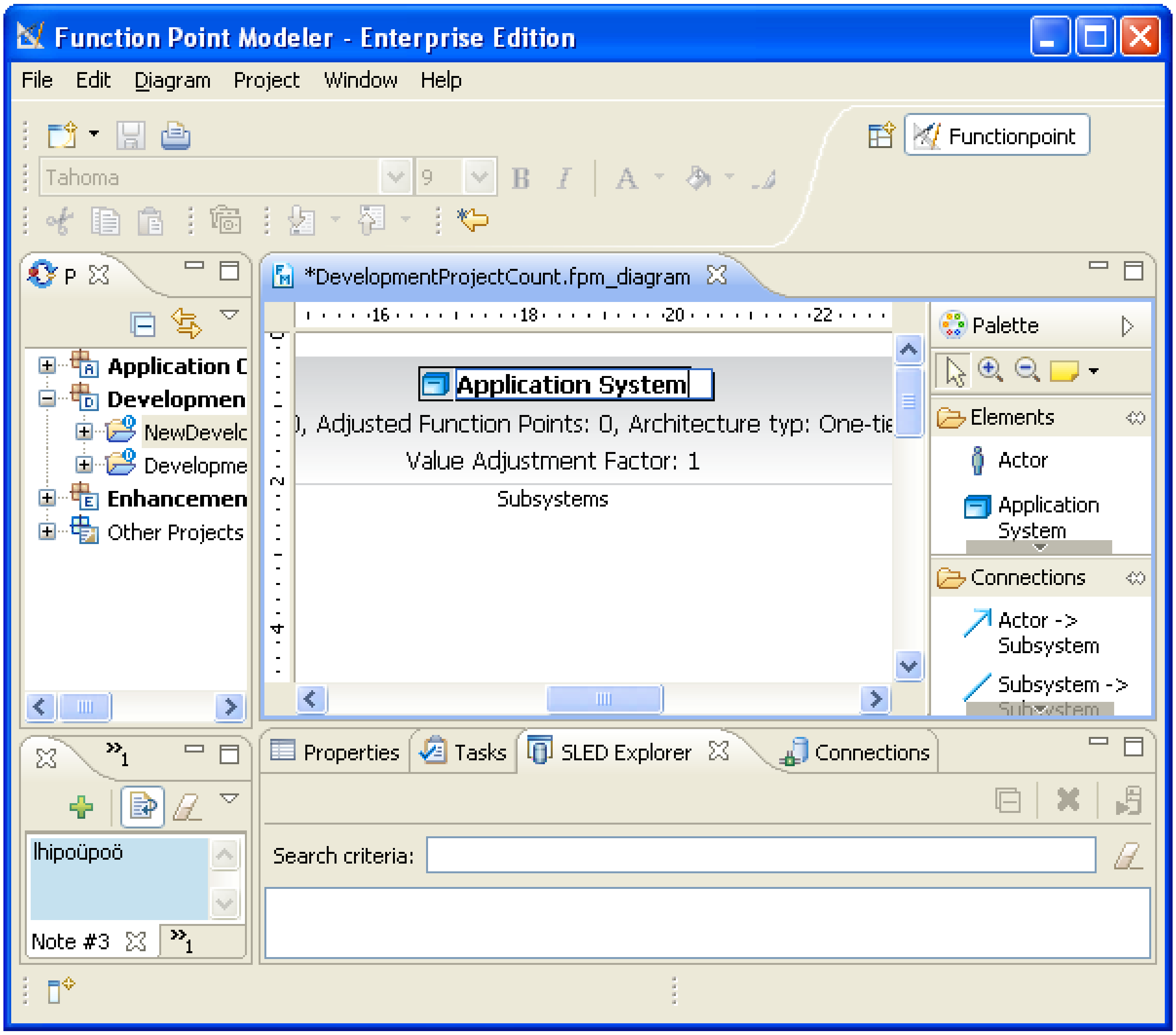
You can use Function Point Modeler to create an ***Application System*** to visually system boundary defined by **IFPUG-CPM** .

You must have a Function Point Modeler diagram open. By default, the Palette view opens when you are editing Function Point Modeler Diagram file in Function Point Modeler. The Palette provides quick access to Function point Modeler toolkit.

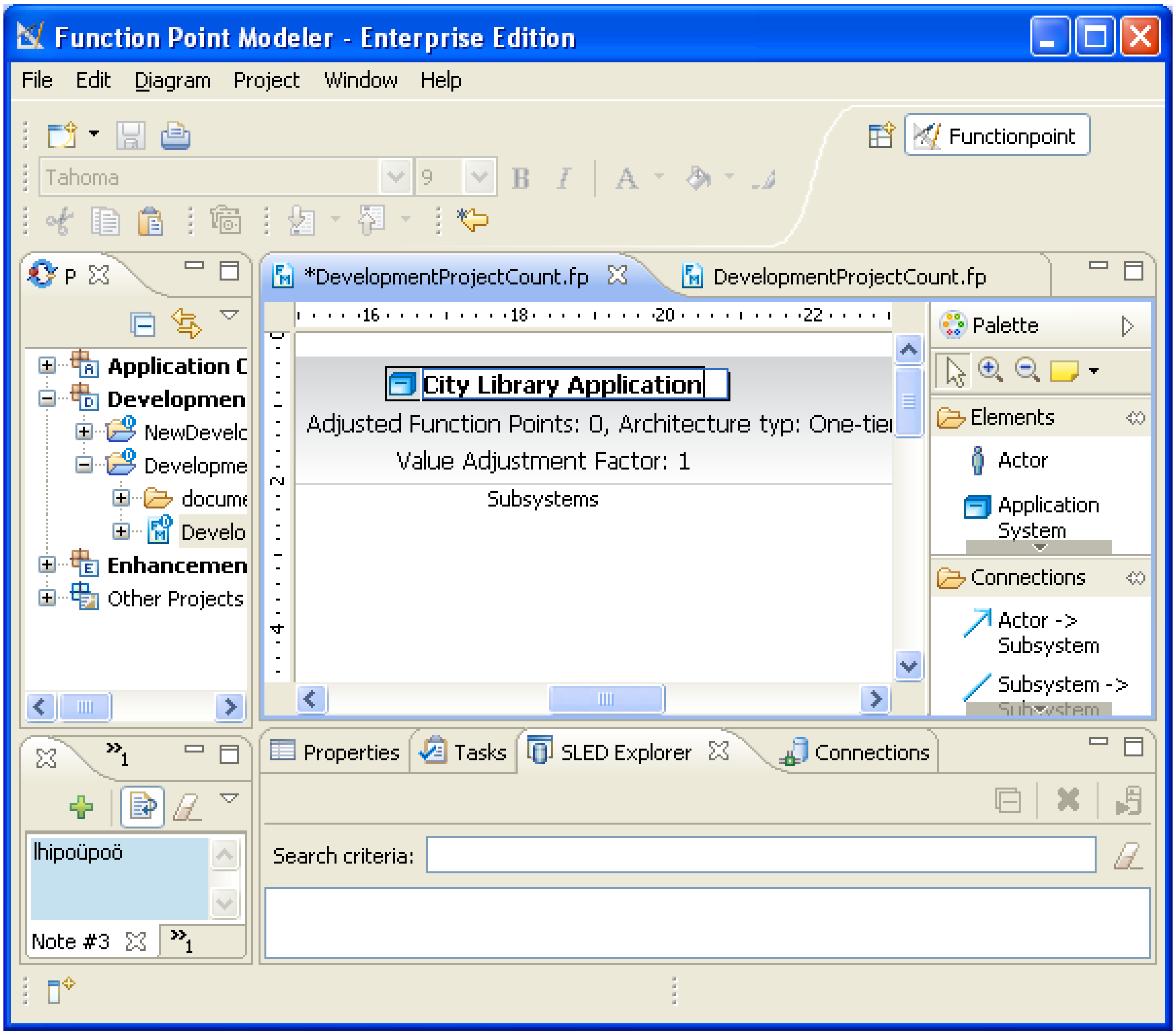
To create an **Application System** :

1. Click FPM Notes drawer in the Palette view. The drawer expands and displays a list of following items:
   - **Application System**
   - **Sub System**
   - **Transactional Function**
   - **Data Function**

   You can drag and drop it onto the Function Point Modeler Diagram Editor.
2. Drag an **Application System** item from a drawer to the desired place ( an empty space inside the Function Point Modeler diagram editor). You can also click a location on the page, and then click on an item in the drawer. Make sure that you drag and drop appropriate items onto a diagram. For example, you can not drop **Sub System** item onto the diagram first without an **Application System** .
3. A new **Application System** is created and displayed in the diagram with the name *Application system*
4. Once the **Application System** appears on the diagram, you can usually set some attributes for it in the Properties view or you can click the attribute of the **Application System** to set its value. Type a desired name for the **Application System** and press Enter.



**5.** Enter the name **City Library Application** and press Enter.



Create a Sub System

You can use Function Point Modeler to create an ***Sub System*** to decompose a large **Application System** in to **Sub System** . This structure of **Sub System** could be a business driven decomposition or technical decomposition.

E.g. grouping of the report functionalities in a sub system with the name *Report* other functionalities in a other sub system with the name *Order* . Technical decomposition would be e.g. a sub system of an application system with the name *J2EE* other sub system of the same application system could be *Cobol*

You must have a Function Point Modeler diagram open. By default, the Palette view opens when you are editing Function Point Modeler Diagram file in Function Point Modeler. The Palette provides quick access to Function point Modeler toolkit.

To create a **Sub System** :

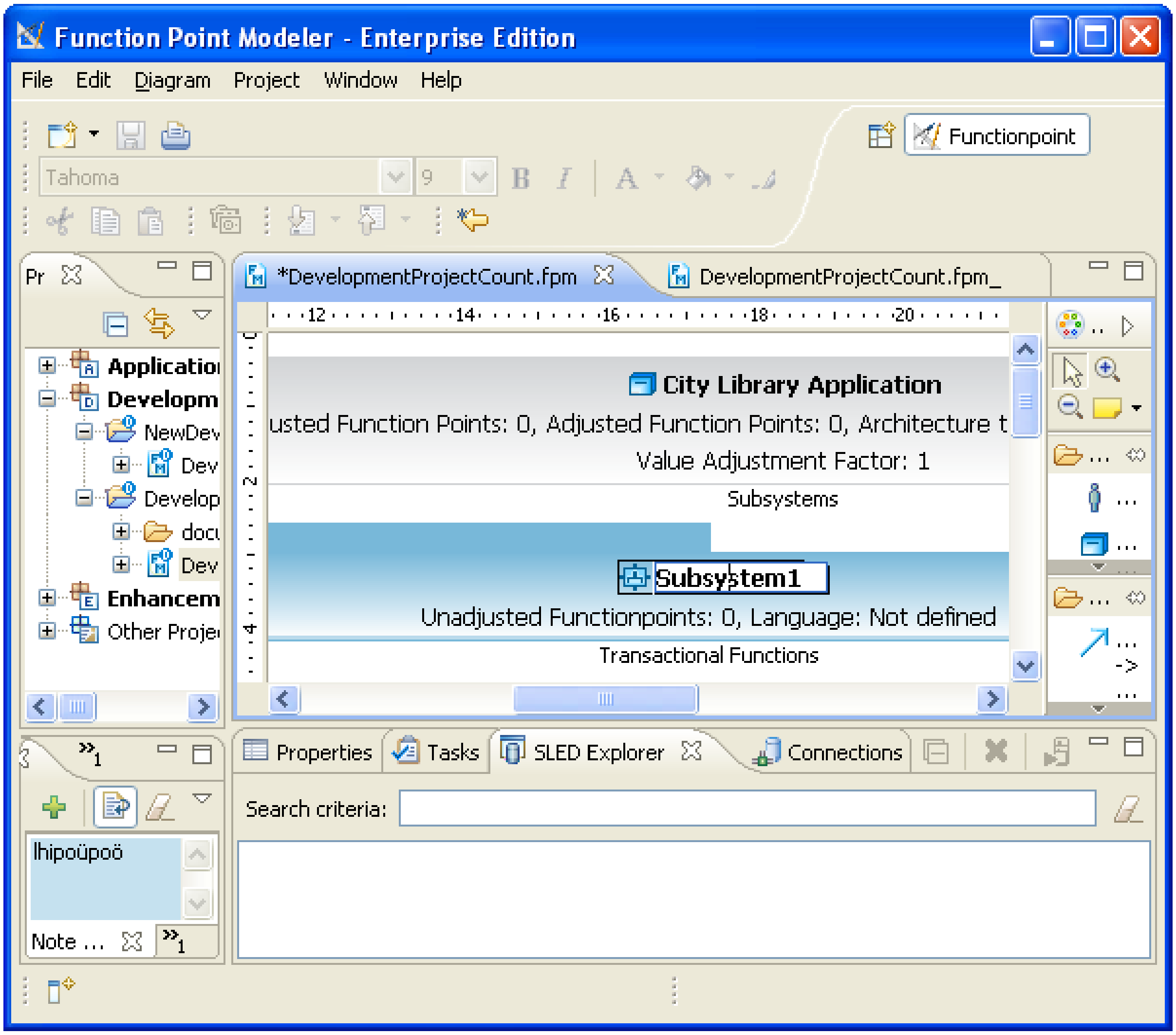
**1.** Click FPM Notes drawer in the Palette view. The drawer expands and displays a list of following items:

- **Application System**
- **Sub System**
- **Transactional Function**

- **Data Function**

  You can drag and drop it onto the Function Point Modeler Diagram Editor.

2. Drag an **Sub System** item from a drawer to the desired place inside of the **Application System** . You can also click a location on the page, and then click on an item in the drawer. Make sure that you drag and drop appropriate items onto a diagram. For example, you can not drop **Sub System** item onto outside of the **Application System** .
3. A new **Sub System** is created and displayed in the diagram with the name *Sub system*
4. Once the **Sub System** appears on the diagram inside of the **Application System** , you can usually set some attributes for it in the Properties view or you can click the attribute of the **Sub System** to set its value. Type a desired name for the **Application System** and press Enter.


Function Point Modeler - Enterprise Edition
File Edit Diagram Project Window Help
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9
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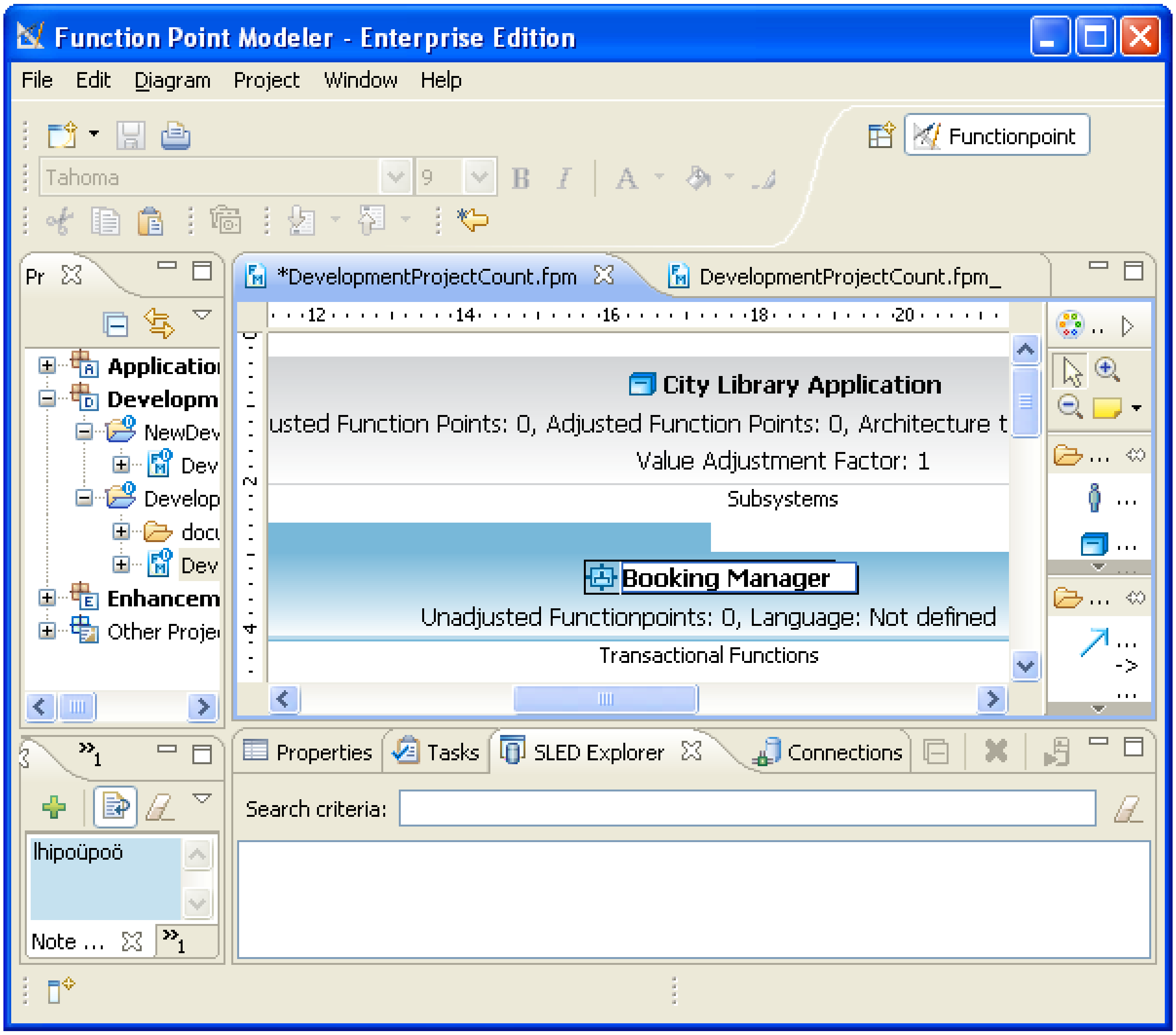
Other Proje
*DevelopmentProjectCount.fpm
DevelopmentProjectCount.fpm_
City Library Application
usted Function Points: 0, Adjusted Function Points: 0, Architecture t
Value Adjustment Factor: 1
Subsystems
Subsystem1
Unadjusted Functionpoints: 0, Language: Not defined
Transactional Functions
Properties
Tasks
SLED Explorer
Connections
Search criteria:
Ihipoüpoö
Note ...

5. Enter the name **Booking Manager** and press Enter.



## *Determine the unadjusted FP count*

Once you have created a ***Transactional Function*** or ***Data Functions*** Function point Modeler calculates the unadjusted function points.

## Create Transactional Functions

Once you have created the Sub System a **Transactional Function** and a **Data Function** can be created.

You must have a Function Point Modeler diagram open. By default, the Palette view opens when you are editing Function Point Modeler Diagram file in Function Point Modeler.

To create a **Transactional Function** :

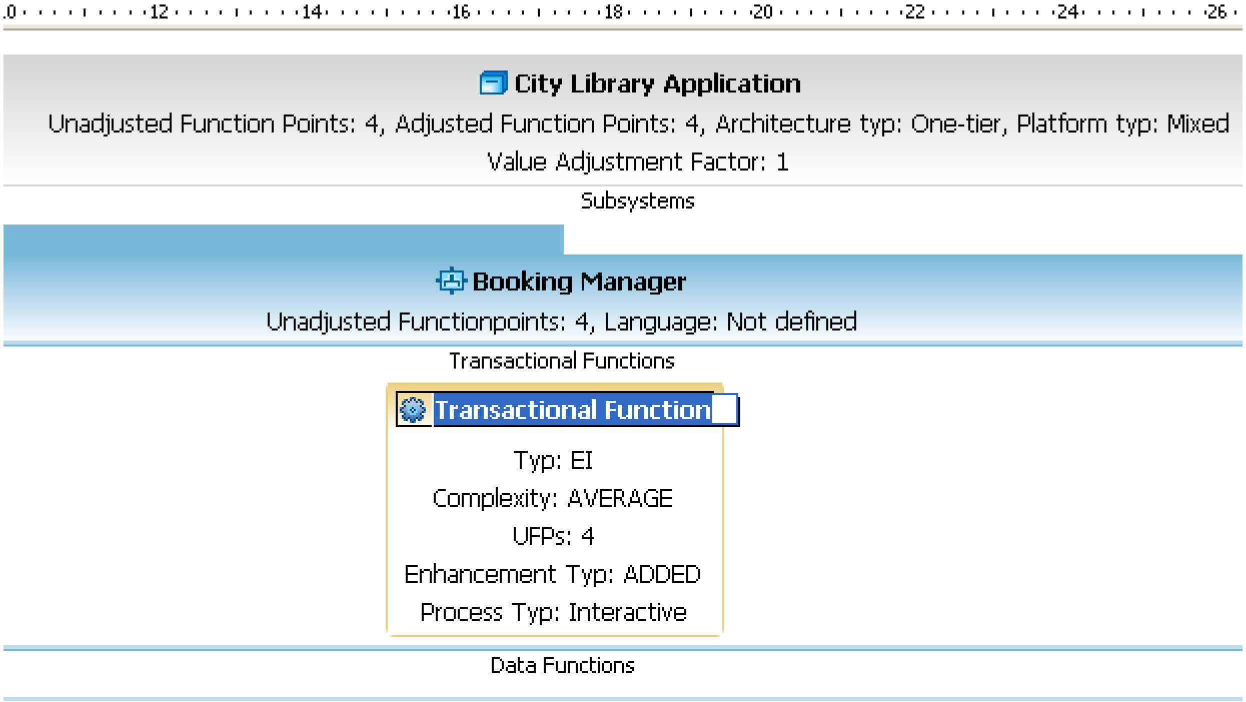
1. Click FPM Notes drawer in the Palette view. The drawer expands and displays a list of following items:

   - **Application System**
   - **Sub System**
   - **Transactional Function**
   - **Data Function**

   You can drag and drop it onto the Function Point Modeler Diagram Editor.
2. Drag an **Transactional Function** item from a drawer to the desired place inside of the **Transactional Functions** section the **Sub System** . You can also click a location **Transactional Functions** section, and then click on an

item in the drawer. Make sure that you drag and drop appropriate items **Transactional Functions** section. For example, you can not drop **Transactional Function**  item onto **Data Functions** section of **Sub System** .

3. A new **Transactional Function** is created and displayed in the diagram with the name *Transactional Function1*
4. Once the **Transactional Function** appears on the diagram inside of the **Sub System** , you can usually set some attributes for it in the Properties view or you can click the attribute of the **Transactional Function** to set its value. Type a desired name for the **Transactional Function** and press Enter.



City Library Application

Unadjusted Function Points: 4, Adjusted Function Points: 4, Architecture typ: One-tier, Platform typ: Mixed

Value Adjustment Factor: 1

Subsystems

Booking Manager

Unadjusted Functionpoints: 4, Language: Not defined

Transactional Functions

Transactional Function

Typ: EI

Complexity: AVERAGE

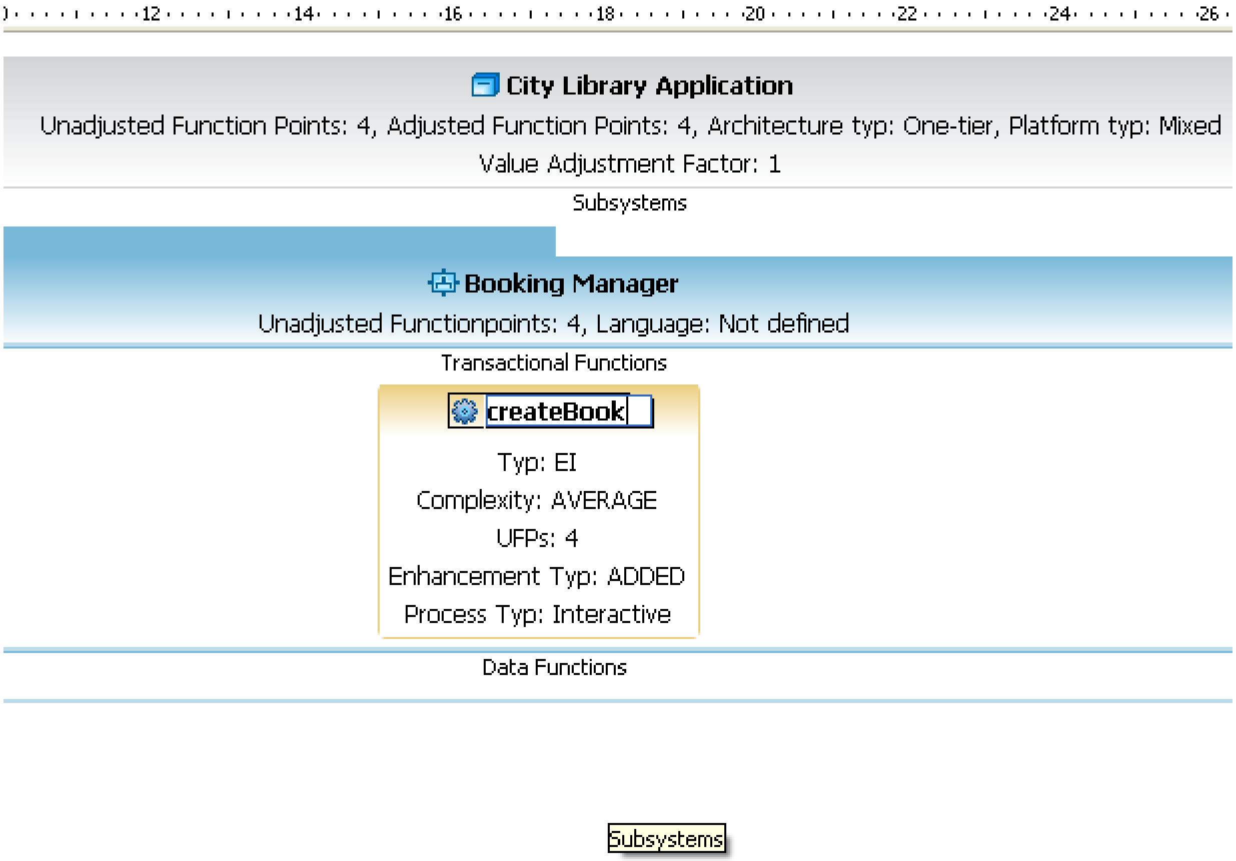
UFPs: 4

Enhancement Typ: ADDED

Process Typ: Interactive

Data Functions

5. Enter the name **createBook** and press Enter.



City Library Application

Unadjusted Function Points: 4, Adjusted Function Points: 4, Architecture typ: One-tier, Platform typ: Mixed

Value Adjustment Factor: 1

Booking Manager

Unadjusted Functionpoints: 4, Language: Not defined

createBook

Typ: EI

Complexity: AVERAGE

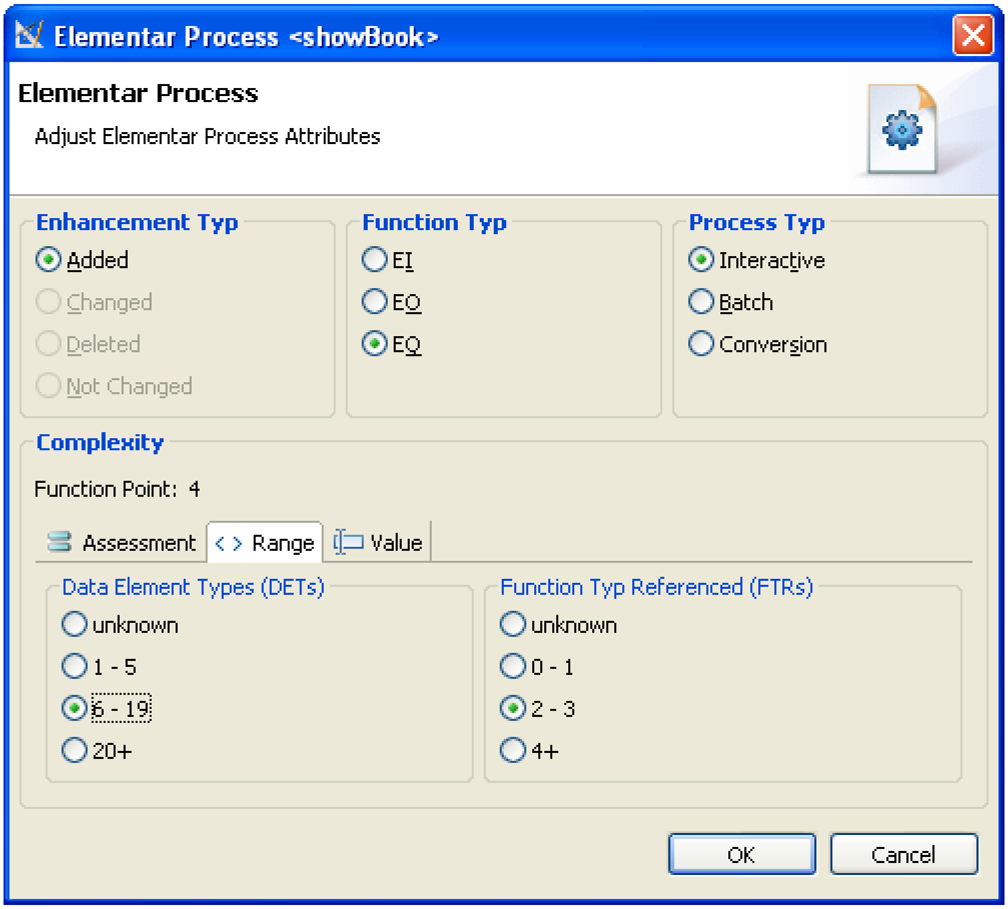
UFPs: 4

Enhancement Typ: ADDED

Process Typ: Interactive

6. Add a second **Transactional Function** as described above, enter the name **deleteBook** and press Enter.
7. Add a third **Transactional Function** as described above, enter the name **showBook** and press Enter.
8. Move mouse over the **showBook Transactional Function** and the text will be highlighted. Double click on this highlighted text. The following property dialog will be showed.

   Change the **Function Typ** of **showBook** as **EQ** and click the button **Ok** .



Elementar Process <showBook>

**Elementar Process**

Adjust Elementar Process Attributes

**Enhancement Typ**

● Added<br>
○ Changed<br>
○ Deleted<br>
○ Not Changed

**Function Typ**

○ EI<br>
○ EQ<br>
● EQ

**Process Typ**

● Interactive<br>
○ Batch<br>
○ Conversion

**Complexity**

Function Point: 4

Data Element Types (DETs)

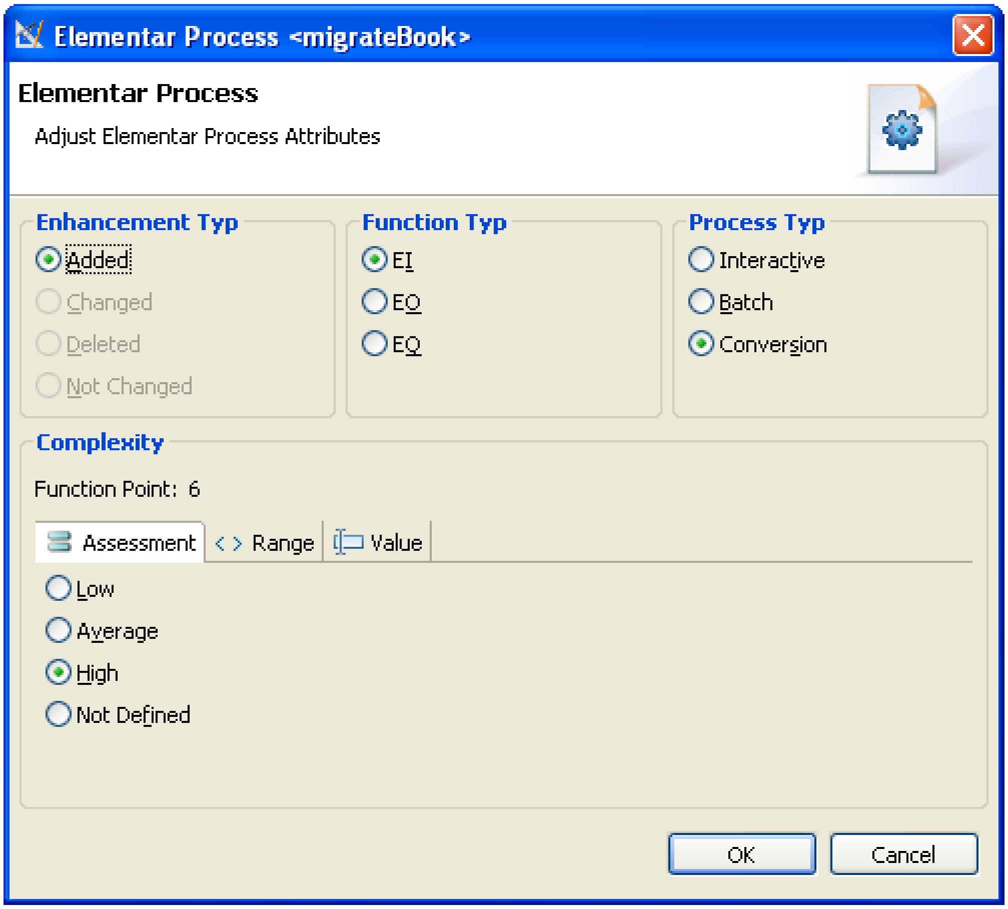
○ unknown<br>
○ 1 - 5<br>
● 6 - 19<br>
○ 20+

Function Typ Referenced (FTRs)

○ unknown<br>
○ 0 - 1<br>
● 2 - 3<br>
○ 4+

9. Add a fourth **Transactional Function** as described above, enter the name **migrateBook** and press Enter.
10. Move mouse over the **migrateBook Transactional Function** and the text will be highlighted. Double click on this highlighted text. The following property dialog will be showed.

    Change the **Process Typ** of **migrateBook** as **Conversion** and click the button **Ok** .



Elementar Process <migrateBook>

Elementar Process

Adjust Elementar Process Attributes

Enhancement Typ
- ● Added
- ○ Changed
- ○ Deleted
- ○ Not Changed

Function Typ
- ● EI
- ○ EO
- ○ EQ

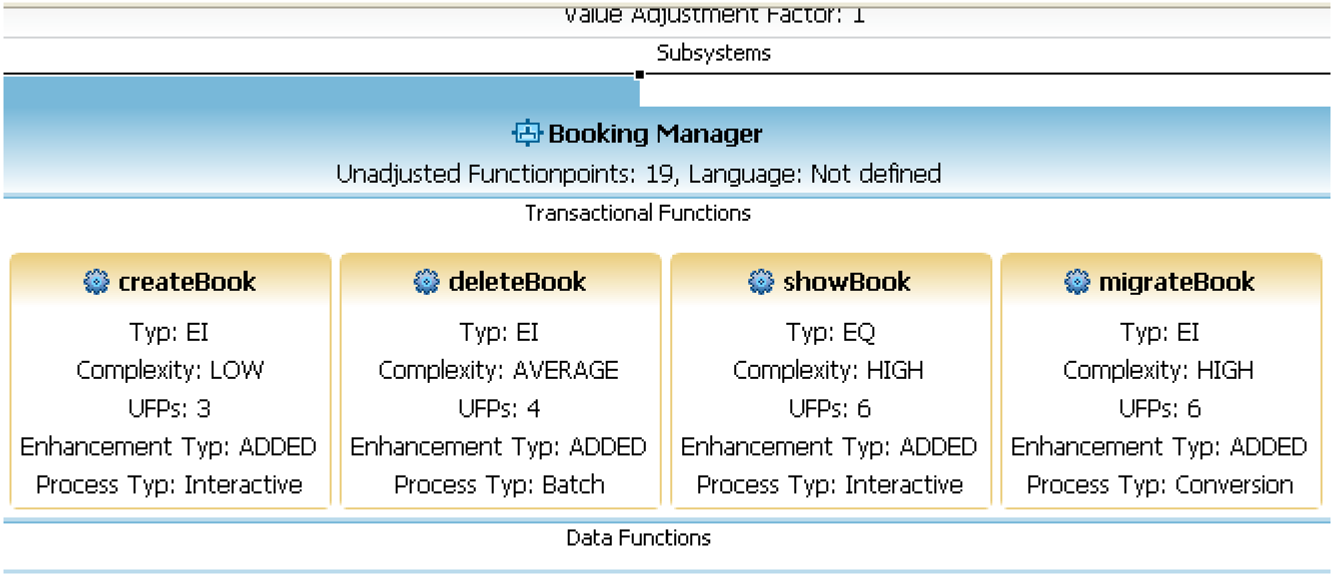
Process Typ
- ○ Interactive
- ○ Batch
- ● Conversion

Complexity

Function Point: 6

- ○ Low
- ○ Average
- ● High
- ○ Not Defined

**11.** All added **Transactional Functions** are showed in the following picture.



Value Adjustment Factor: 1

Subsystems

Booking Manager

Unadjusted Functionpoints: 19, Language: Not defined

Transactional Functions

createBook
Typ: EI
Complexity: LOW
UFPs: 3
Enhancement Typ: ADDED
Process Typ: Interactive

deleteBook
Typ: EI
Complexity: AVERAGE
UFPs: 4
Enhancement Typ: ADDED
Process Typ: Batch

showBook
Typ: EQ
Complexity: HIGH
UFPs: 6
Enhancement Typ: ADDED
Process Typ: Interactive

migrateBook
Typ: EI
Complexity: HIGH
UFPs: 6
Enhancement Typ: ADDED
Process Typ: Conversion

Data Functions

## Create Data Functions

Once you have created the Sub System a **Transactional Function** and a **Data Function** can be created.

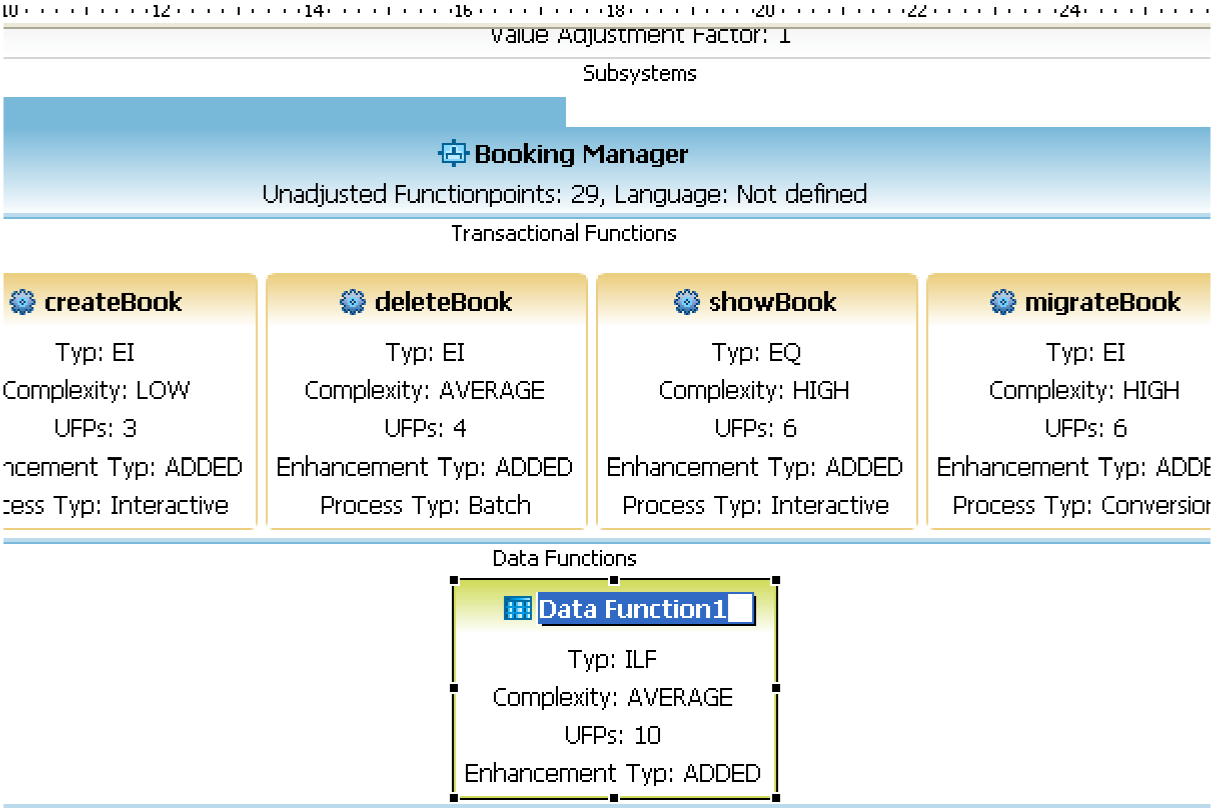
You must have a Function Point Modeler diagram open. By default, the Palette view opens when you are editing Function Point Modeler Diagram file in Function Point Modeler.

To create a **Data Function** :

1. Click FPM Notes drawer in the Palette view. The drawer expands and displays a list of following items:

   - **Application System**
   - **Sub System**
   - **Transactional Function**
   - **Data Function**

   You can drag and drop it onto the Function Point Modeler Diagram Editor.
2. Drag a **Data Function** item from a drawer to the desired place inside of the **Data Functions** section the **Sub System** . You can also click a location **Data Functions** section, and then click on an item in the drawer. Make sure that you drag and drop appropriate items **Data Functions** section. For example, you can not drop **Data Function** item onto **Transactional Functions** section of **Sub System** .
3. A new **Data Function** is created and displayed in the diagram with the name *Data Function1*
4. Once the **Data Function** appears on the diagram inside of the **Sub System** , you can usually set some attributes for it in the Properties view or you can click the attribute of the **Data Function** to set its value. Type a desired name for the **Data Function** and press Enter.



Value Adjustment Factor: 1

Subsystems

Booking Manager

Unadjusted Functionpoints: 29, Language: Not defined

Transactional Functions

createBook
Typ: EI
Complexity: LOW
UFPs: 3
ncement Typ: ADDED
cess Typ: Interactive

deleteBook
Typ: EI
Complexity: AVERAGE
UFPs: 4
Enhancement Typ: ADDED
Process Typ: Batch

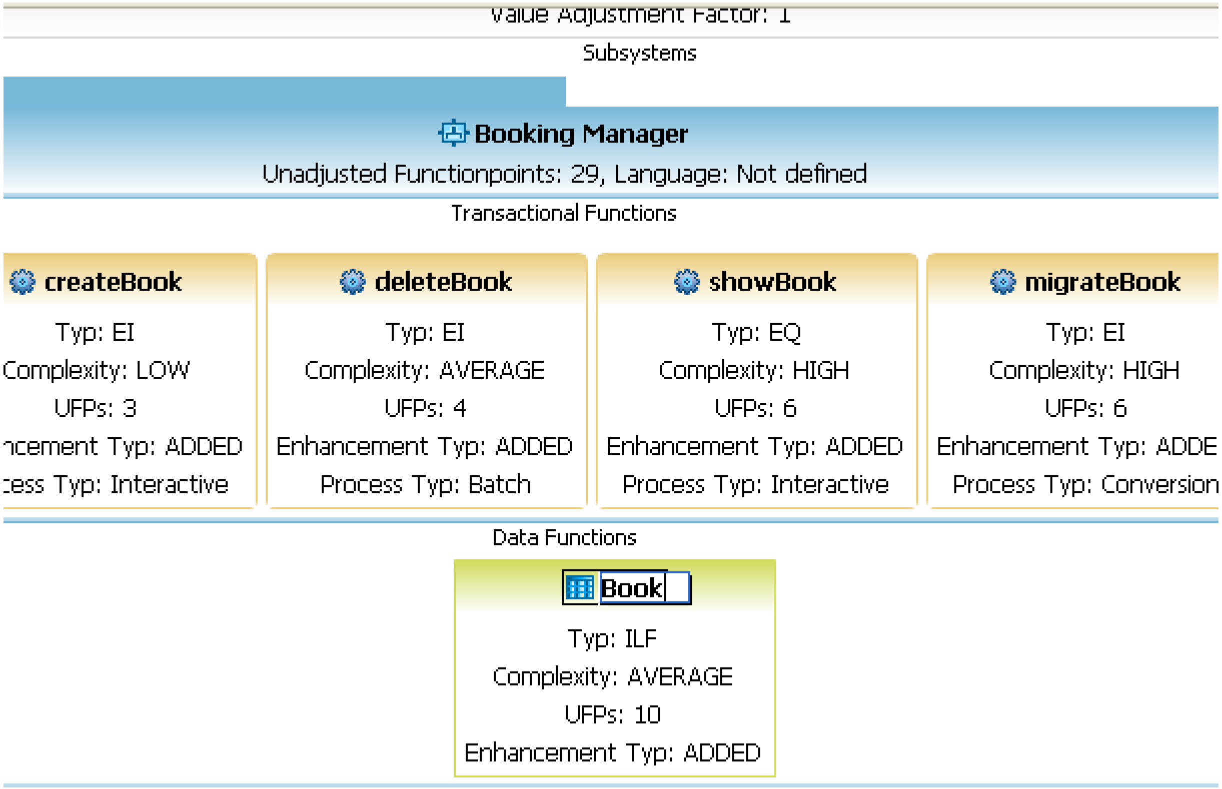
showBook
Typ: EQ
Complexity: HIGH
UFPs: 6
Enhancement Typ: ADDED
Process Typ: Interactive

migrateBook
Typ: EI
Complexity: HIGH
UFPs: 6
Enhancement Typ: ADDE
Process Typ: Conversio

Data Functions

Data Function1
Typ: ILF
Complexity: AVERAGE
UFPs: 10
Enhancement Typ: ADDED

**5.** Enter the name **Book** and press Enter.



Value Adjustment Factor: 1

Subsystems

Booking Manager

Unadjusted Functionpoints: 29, Language: Not defined

Transactional Functions

createBook
Typ: EI
Complexity: LOW
UFPs: 3
ncement Typ: ADDED
cess Typ: Interactive

deleteBook
Typ: EI
Complexity: AVERAGE
UFPs: 4
Enhancement Typ: ADDED
Process Typ: Batch

showBook
Typ: EQ
Complexity: HIGH
UFPs: 6
Enhancement Typ: ADDED
Process Typ: Interactive

migrateBook
Typ: EI
Complexity: HIGH
UFPs: 6
Enhancement Typ: ADDE
Process Typ: Conversion

Data Functions

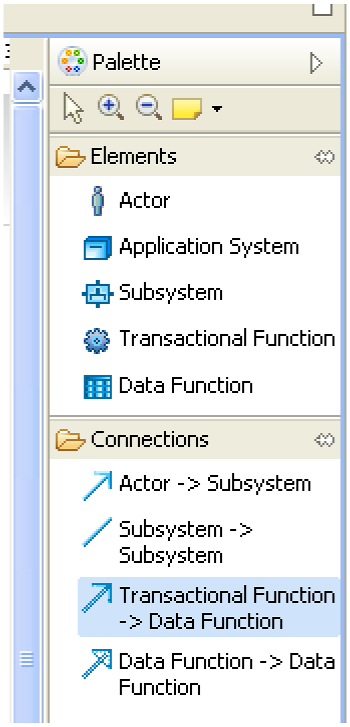
Book
Typ: ILF
Complexity: AVERAGE
UFPs: 10
Enhancement Typ: ADDED

*Creating connection between transactional function and data function*

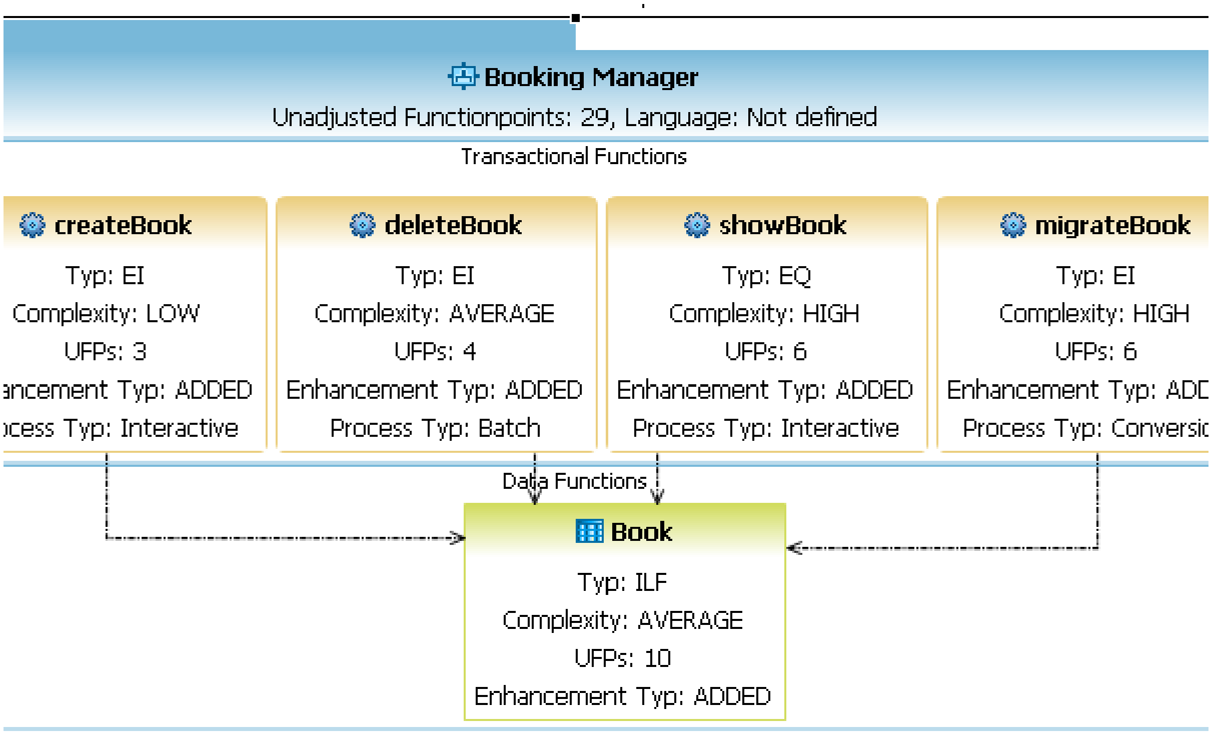
You must have a Function Point Modeler diagram open. By default, the Palette view opens when you are editing Function Point Modeler Diagram file in Function Point Modeler.

To create connection between **Transactional Function** and **Data Function** :

1. In the diagram editor, in the Palette, click a FPM Connections.



2. Click on the **Transactional Function** -> **Data Function** .
3. Move the mouse to target a **Data Function** in the diagram
4. Release the mouse button.

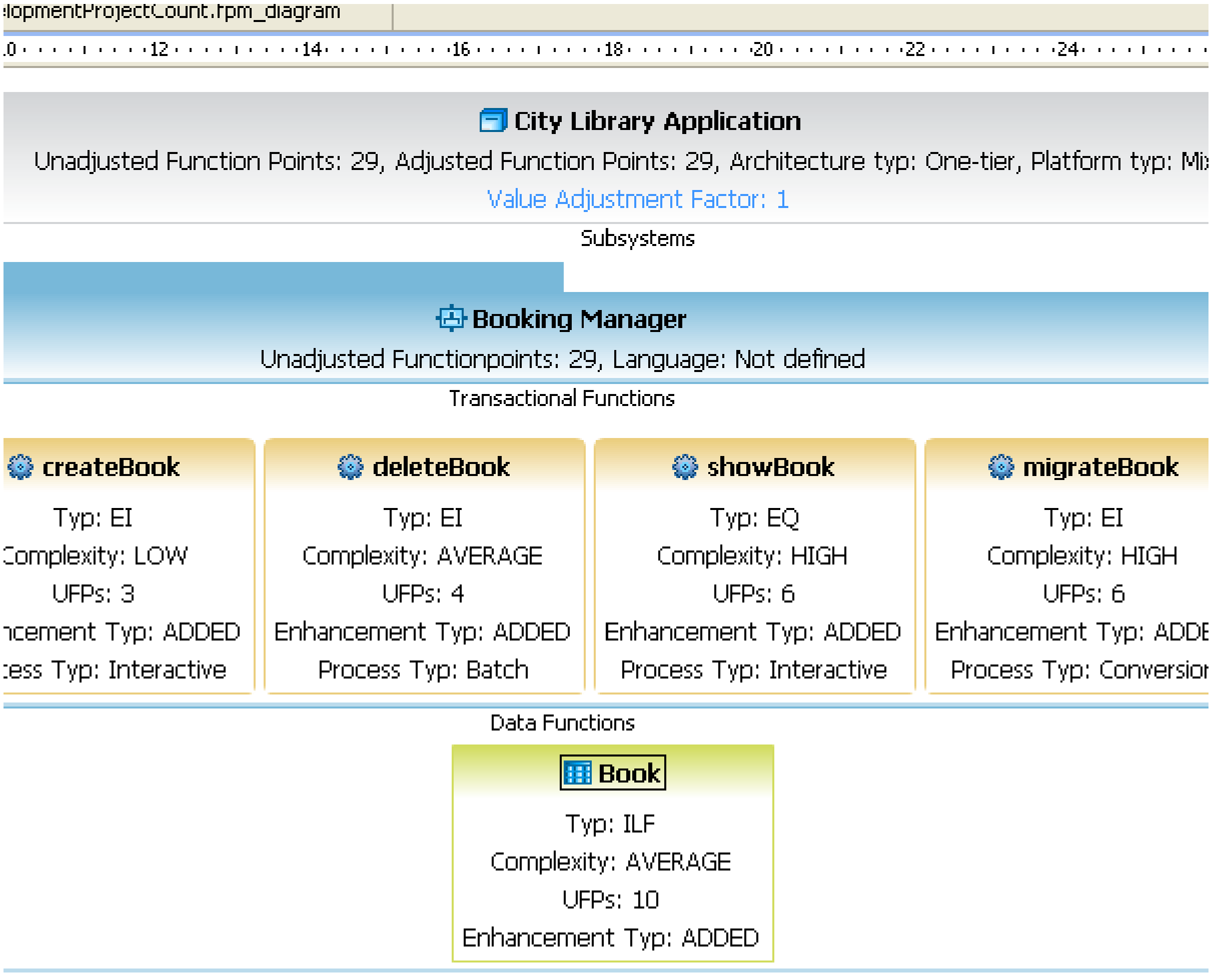


### *Determine the Value Adjustment Factor*

Once you have created an **Application System** the default Value Adjustment Factor **(VAF)** for the **Application System** is set 1.0.

You may change the **(VAF)** as following:

1. By moving the mouse over an **Application System** the color of the attribute *Value Adjustment Factor* becomes **blue** .



lopmentProjectCount.fpm_diagram

**City Library Application**

Unadjusted Function Points: 29, Adjusted Function Points: 29, Architecture typ: One-tier, Platform typ: Mi

Value Adjustment Factor: 1

Subsystems

**Booking Manager**

Unadjusted Functionpoints: 29, Language: Not defined

Transactional Functions

**createBook**

Typ: EI
Complexity: LOW
UFPs: 3
ncement Typ: ADDED
cess Typ: Interactive

**deleteBook**

Typ: EI
Complexity: AVERAGE
UFPs: 4
Enhancement Typ: ADDED
Process Typ: Batch

**showBook**

Typ: EQ
Complexity: HIGH
UFPs: 6
Enhancement Typ: ADDED
Process Typ: Interactive

**migrateBook**

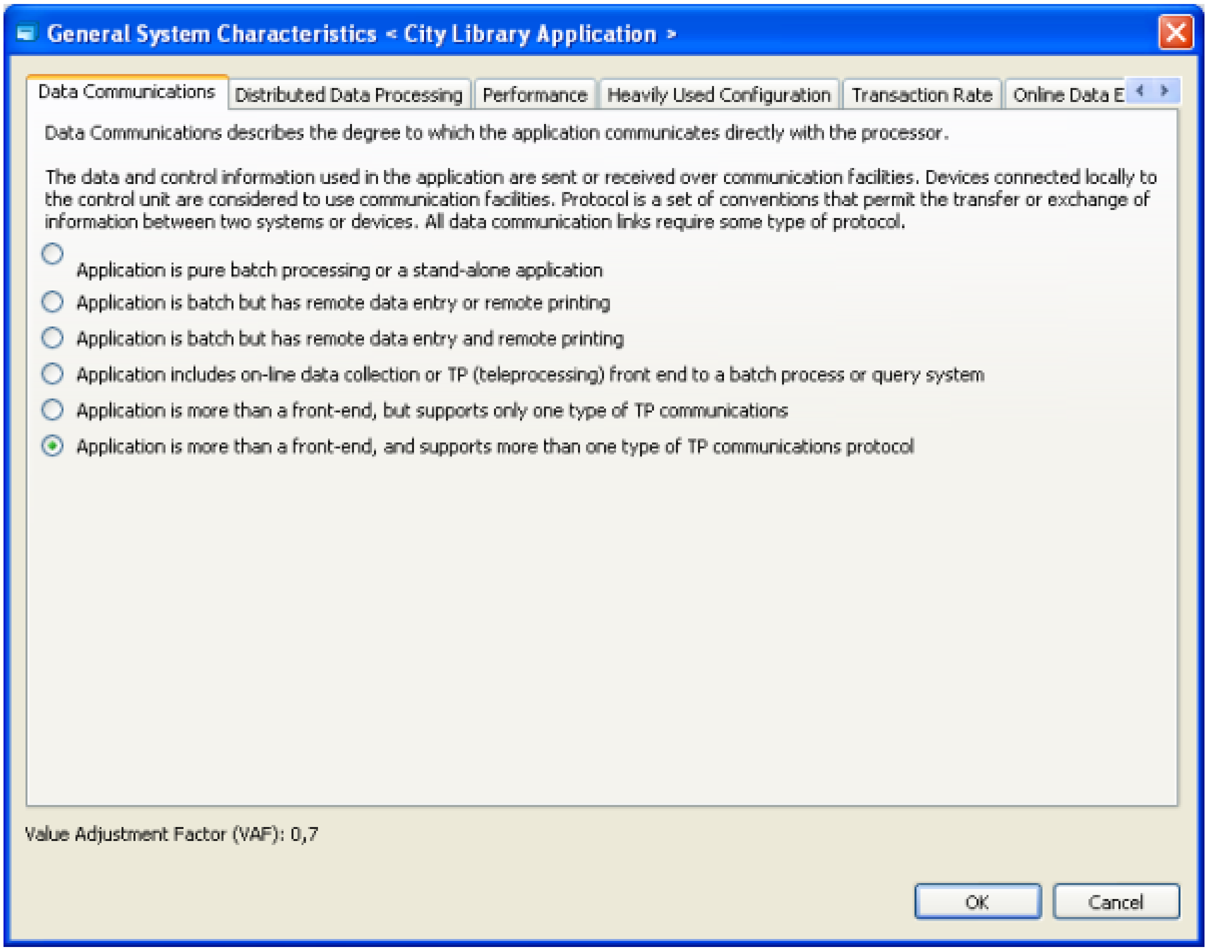
Typ: EI
Complexity: HIGH
UFPs: 6
Enhancement Typ: ADDE
Process Typ: Conversio

Data Functions

**Book**

Typ: ILF
Complexity: AVERAGE
UFPs: 10
Enhancement Typ: ADDED

2. Double click on the *Value Adjustment Factor* of the **Application System**
3. The following General System Characteristics **(GSC)** dialog will be showed in the Workbench.


General System Characteristics < City Library Application >
Data Communications
Distributed Data Processing
Performance
Heavily Used Configuration
Transaction Rate
Online Data E
OK
Cancel

Data Communications describes the degree to which the application communicates directly with the processor.

The data and control information used in the application are sent or received over communication facilities. Devices connected locally to the control unit are considered to use communication facilities. Protocol is a set of conventions that permit the transfer or exchange of information between two systems or devices. All data communication links require some type of protocol.

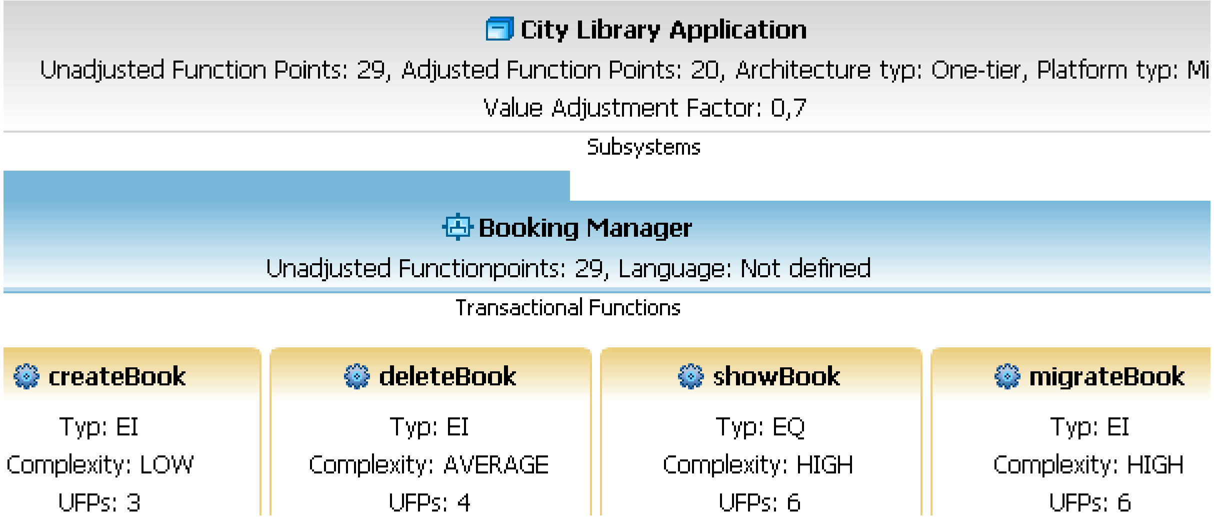
○ Application is pure batch processing or a stand-alone application
○ Application is batch but has remote data entry or remote printing
○ Application is batch but has remote data entry and remote printing
○ Application includes on-line data collection or TP (teleprocessing) front end to a batch process or query system
○ Application is more than a front-end, but supports only one type of TP communications
● Application is more than a front-end, and supports more than one type of TP communications protocol

Value Adjustment Factor (VAF): 0,7

4. Select the **Data Communications** tab. and select the last options *Application is more than a front-end, and support more than one type of TP communication protocol*
5. The **(GSC)** has been changed and is now **0.7**
6. Click the button **Ok** .

### *Calculate the Adjusted FP Count*

Once you have adjusted the default Value Adjustment Factor **(VAF)** the new adjusted function points will be calculated.



City Library Application

Unadjusted Function Points: 29, Adjusted Function Points: 20, Architecture typ: One-tier, Platform typ: Mi

Value Adjustment Factor: 0,7

Subsystems

Booking Manager

Unadjusted Functionpoints: 29, Language: Not defined

Transactional Functions

| createBook | deleteBook | showBook | migrateBook |
|---|---|---|---|
| Typ: EI | Typ: EI | Typ: EQ | Typ: EI |
| Complexity: LOW | Complexity: AVERAGE | Complexity: HIGH | Complexity: HIGH |
| UFPs: 3 | UFPs: 4 | UFPs: 6 | UFPs: 6 |

## Calculate Estimation

Once you have created a **ProjectPlanData** you can calculate **ProjectEstimation.** See more ***Plandata and Estimation Overview***

### *Review the Project Data*

Project data called **ProjectPlanData** includes all project relevant information. You can create more than one **ProjectPlanData** for a **Project** . Each of this **ProjectPlanData** represents a project plan scenario for the current project.

For example one of the project plan scenario would be for the Rational Unified Process **(RUP)** and other for **waterfall** or for the software development process specified for your company. A **ProjectPlanData** can include one or more **ProjectEstimation** . Each **ProjectEstimation** of this estimations represents an estimation scenario for the project. For example one of the **ProjectEstimation** may be with an expert team and other with a mixed team. One of this **ProjectEstimation** has to be set as *default* for the project. It means, that the *default* **ProjectEstimation** is the **valid** estimation for the project.

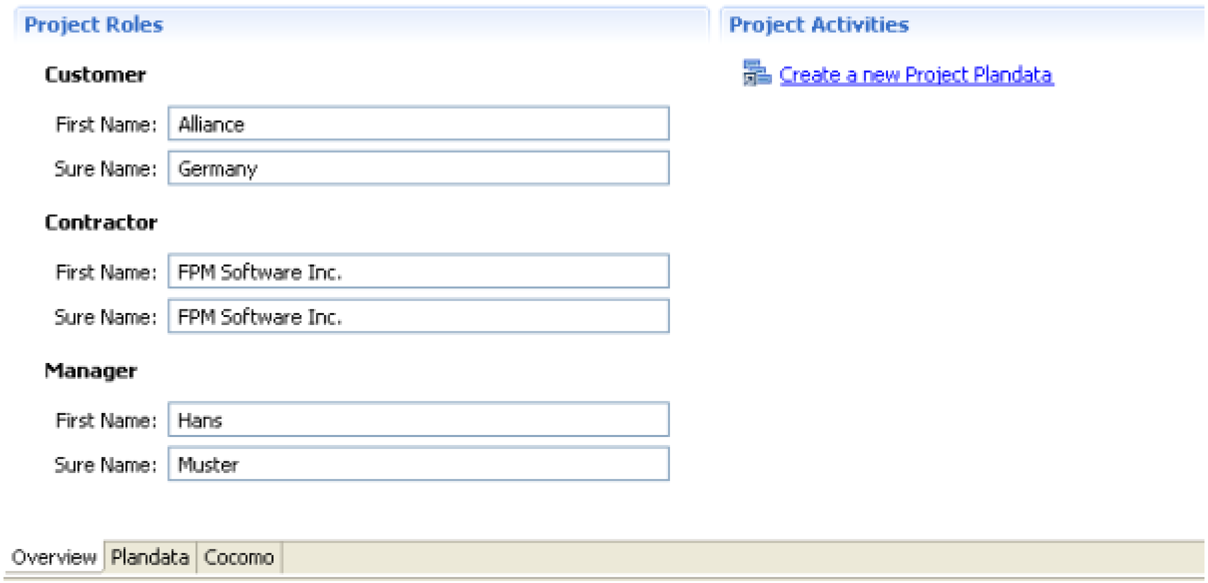
### *Introduction to Project Plandata*

In the following section you will see how to create **ProjectPlanData** and we will also show you how to add **Count** and **ProjectEstimation** .

Create a new Project Plandata

You can add a **ProjectPlanData** as following.:

1. Open **Project Editor**
2. Click on **Create a new Project Plandata**



Project Roles

Customer

First Name: Alliance

Sure Name: Germany

Contractor

First Name: FPM Software Inc.

Sure Name: FPM Software Inc.

Manager

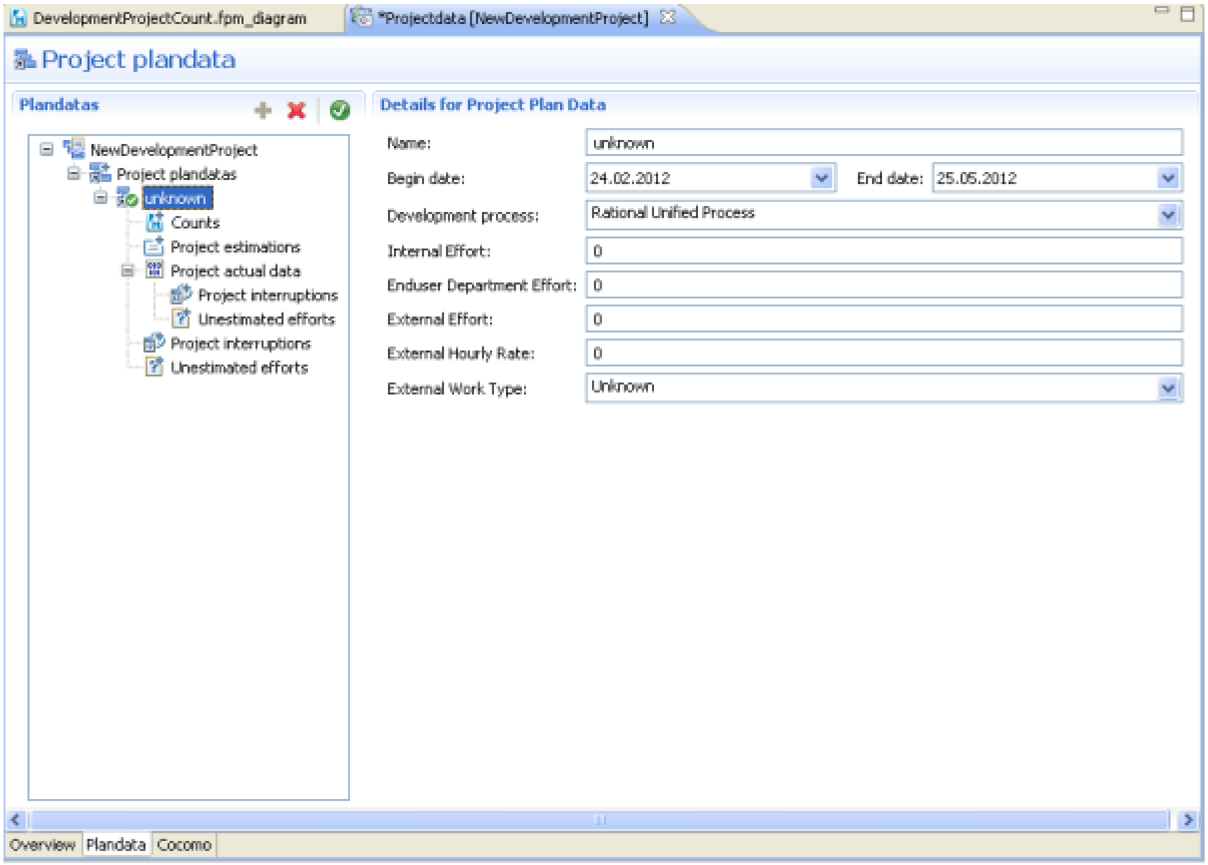
First Name: Hans

Sure Name: Muster

Project Activities

Create a new Project Plandata

3. The following object structure will have been created.



Details for Project Plan Data

Name: unknown

Begin date: 24.02.2012 End date: 25.05.2012

Development process: Rational Unified Process

Internal Effort: 0

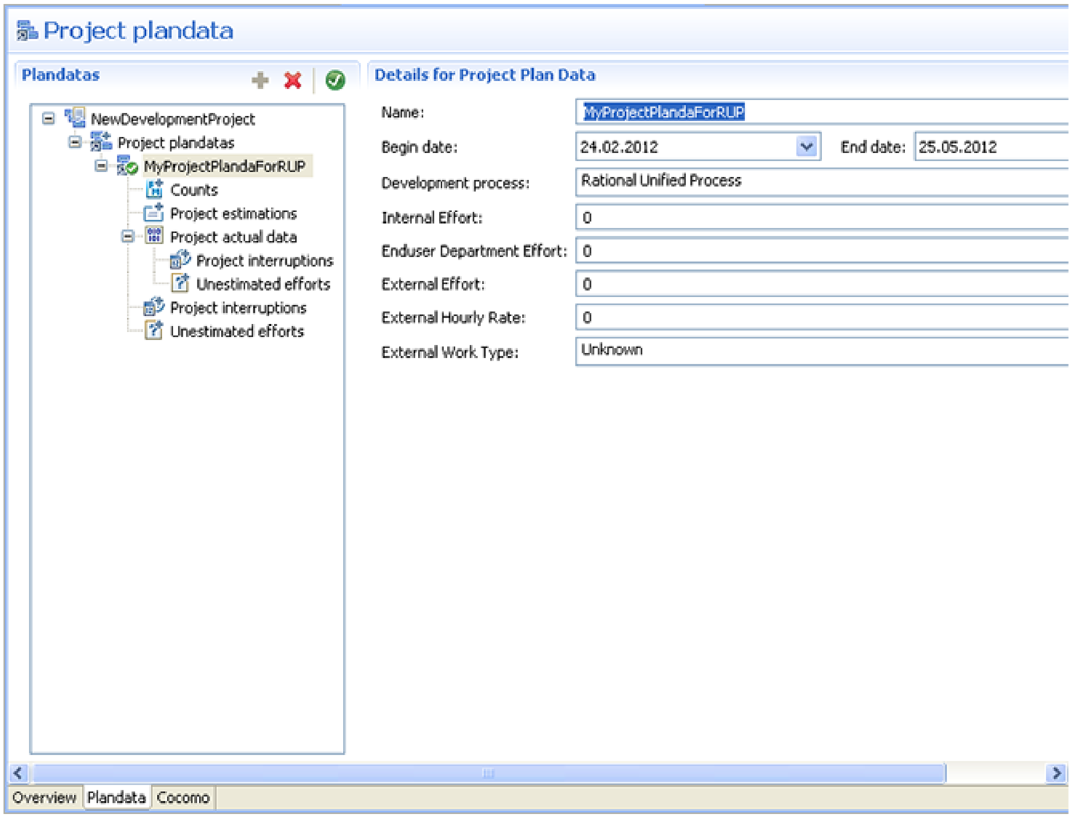
Enduser Department Effort: 0

External Effort: 0

External Hourly Rate: 0

External Work Type: Unknown

4. Select **Rational Unified Process** from the *Development process* combobox.
5. Enter the name **MyProjectPlandaForRUP** and save the **ProjectPlanData** .



Name: MyProjectPlandaForRUP

Begin date: 24.02.2012 End date: 25.05.2012

Development process: Rational Unified Process

Internal Effort: 0

Enduser Department Effort: 0

External Effort: 0

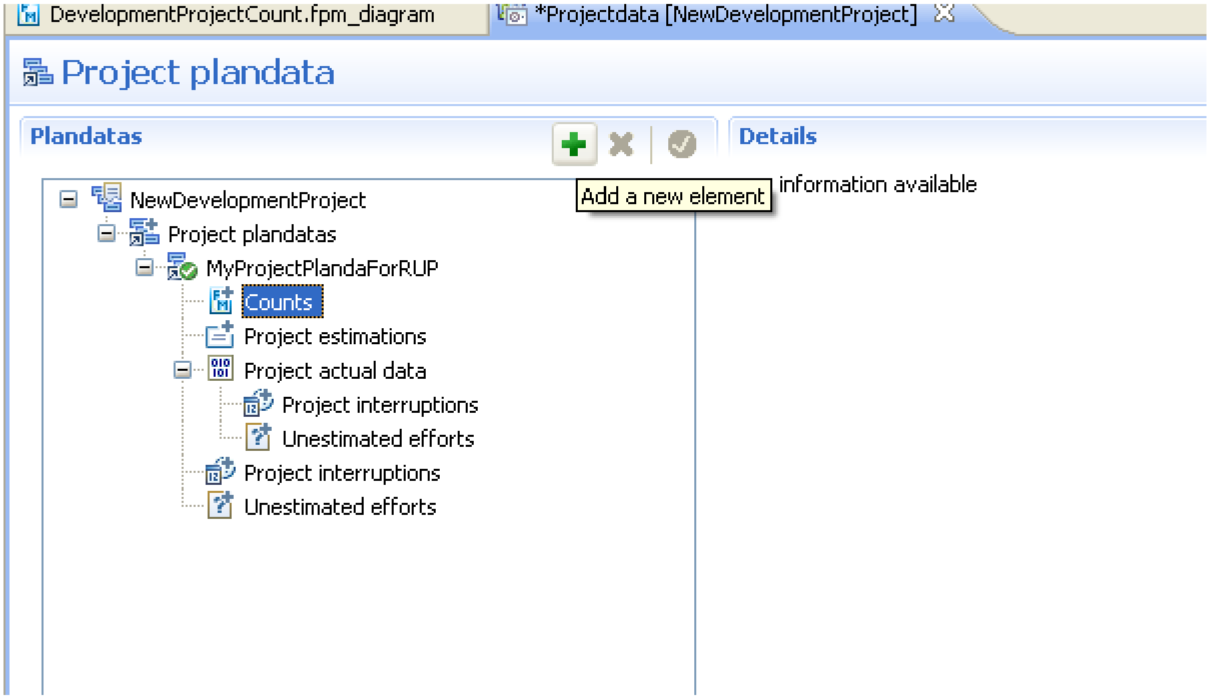
External Hourly Rate: 0

External Work Type: Unknown

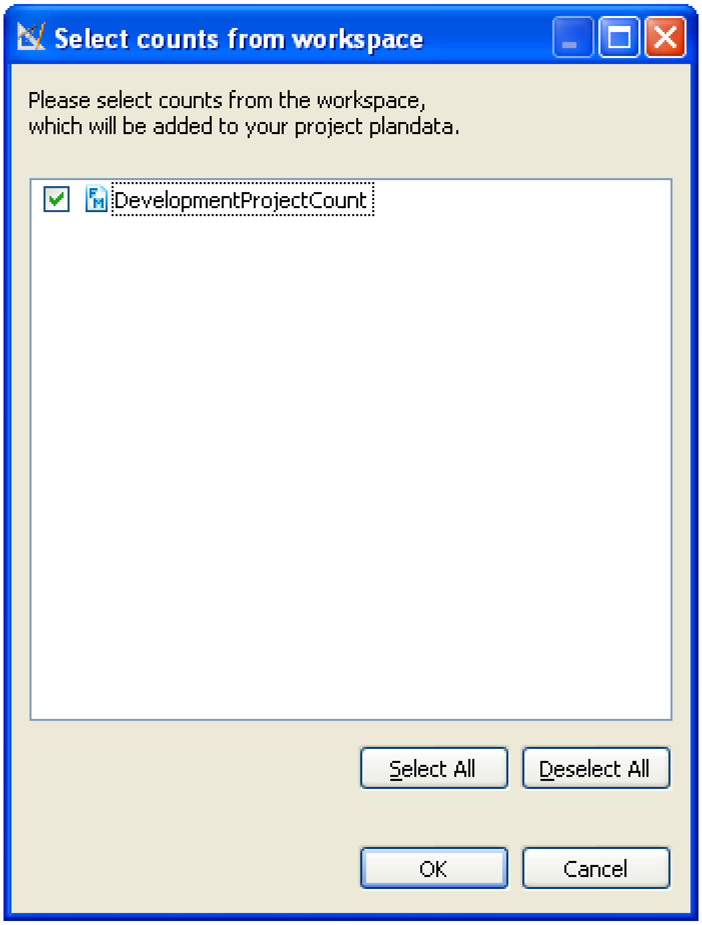
Add a Count to the Plandata

You can add a **Count** to a **ProjectPlanData** as following.:

1. Select the **Counts** in the tree.
2. Click on the button **Add a new element**



3. Select the counts from the following dialog.

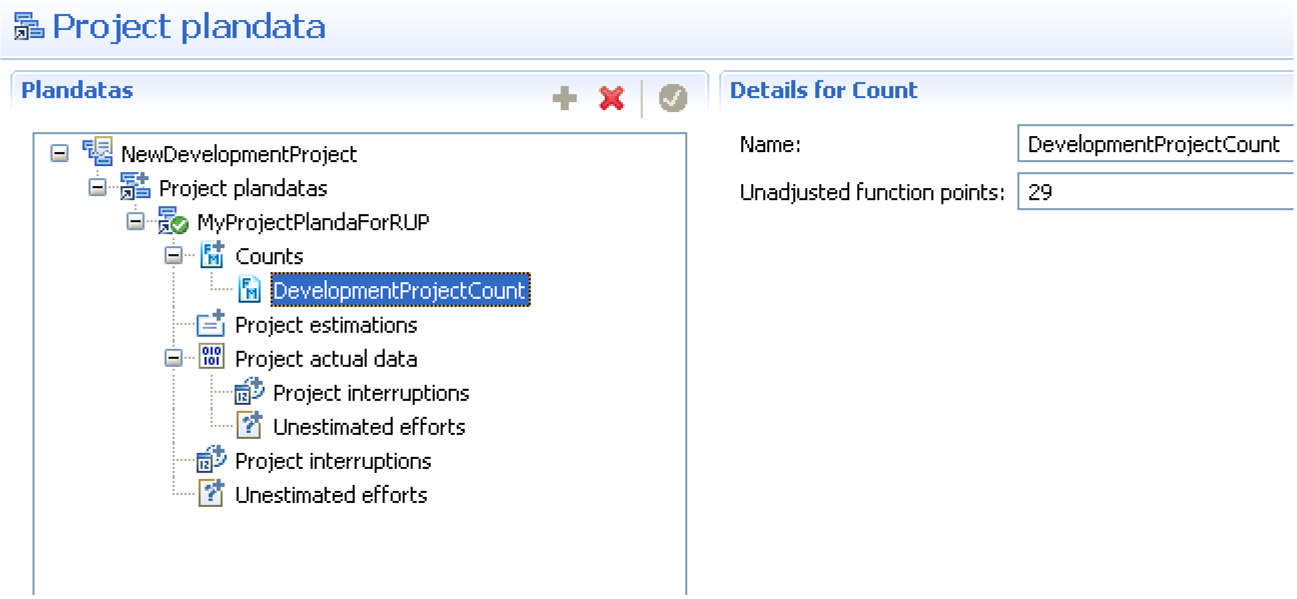


Select counts from workspace

Please select counts from the workspace, which will be added to your project plandata.

☑ DevelopmentProjectCount

4. The selected count will be added to the **ProjectPlanData** and save the **ProjectPlanData**



Project plandata

Plandatas

Details for Count

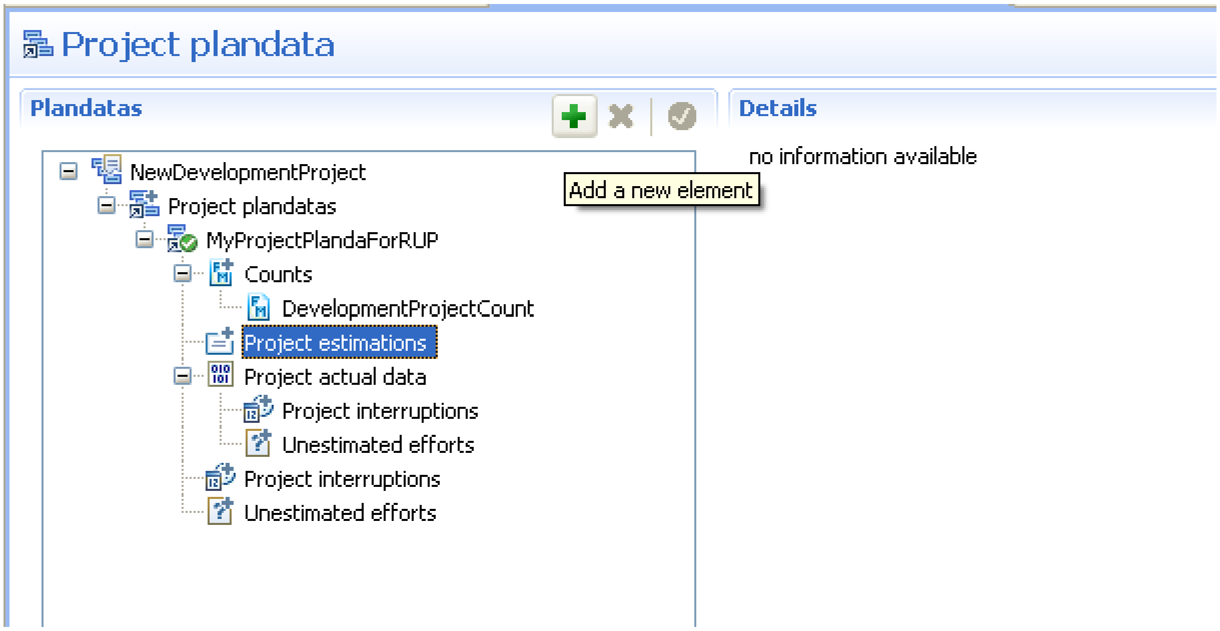
Name: DevelopmentProjectCount

Unadjusted function points: 29

Create a new Project Estimation

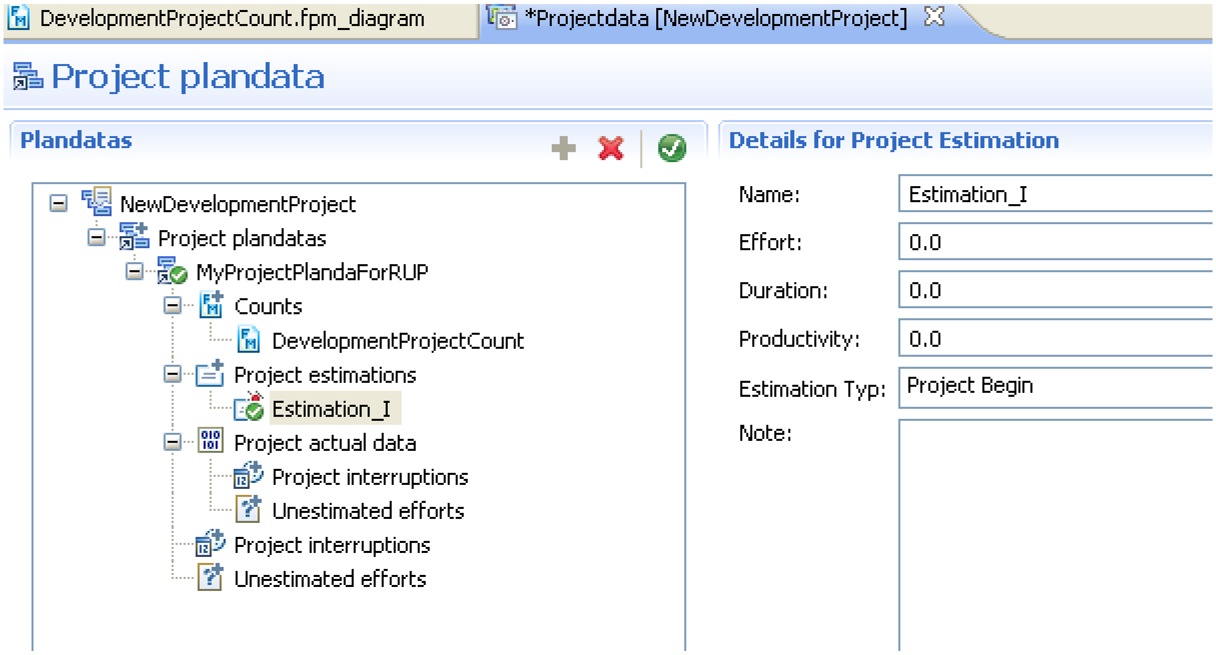
You can add a **ProjectEstimation** to a **ProjectPlanData** as following.:

1. Select the **Project estimations** in the tree.
2. Click on the button **Add a new element**



no information available

3. Enter the name **Estimation_I** and save the **ProjectPlanData**



Name: Estimation_I

Effort: 0.0

Duration: 0.0

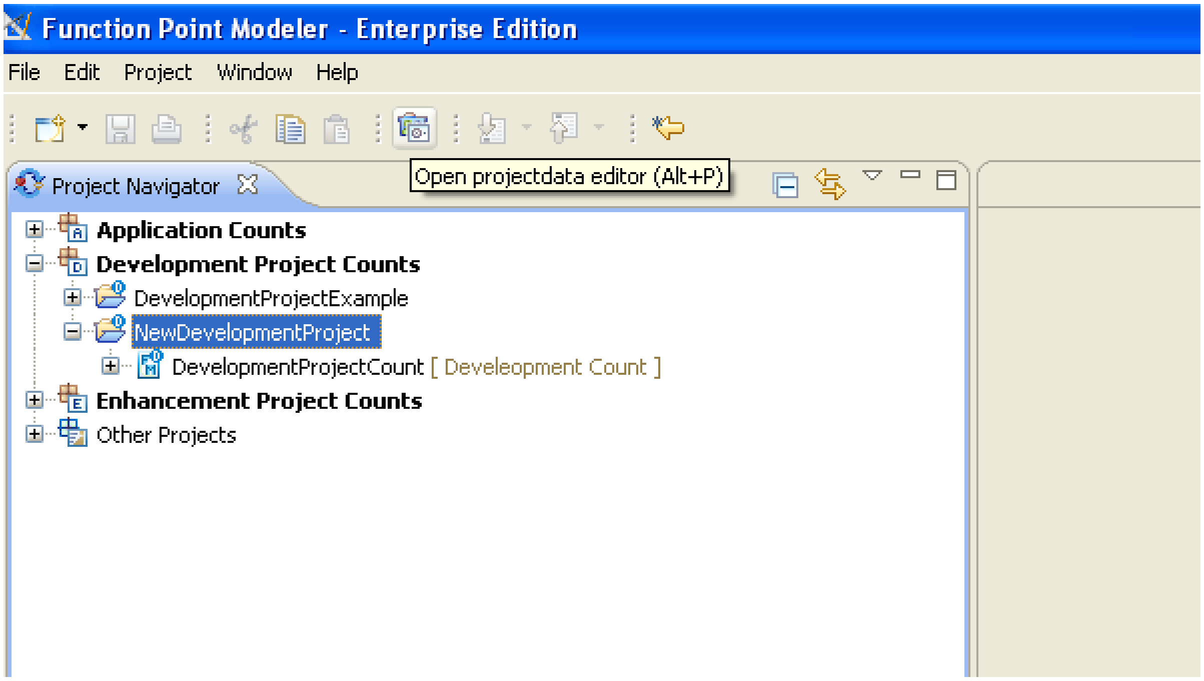
Productivity: 0.0

Estimation Typ: Project Begin

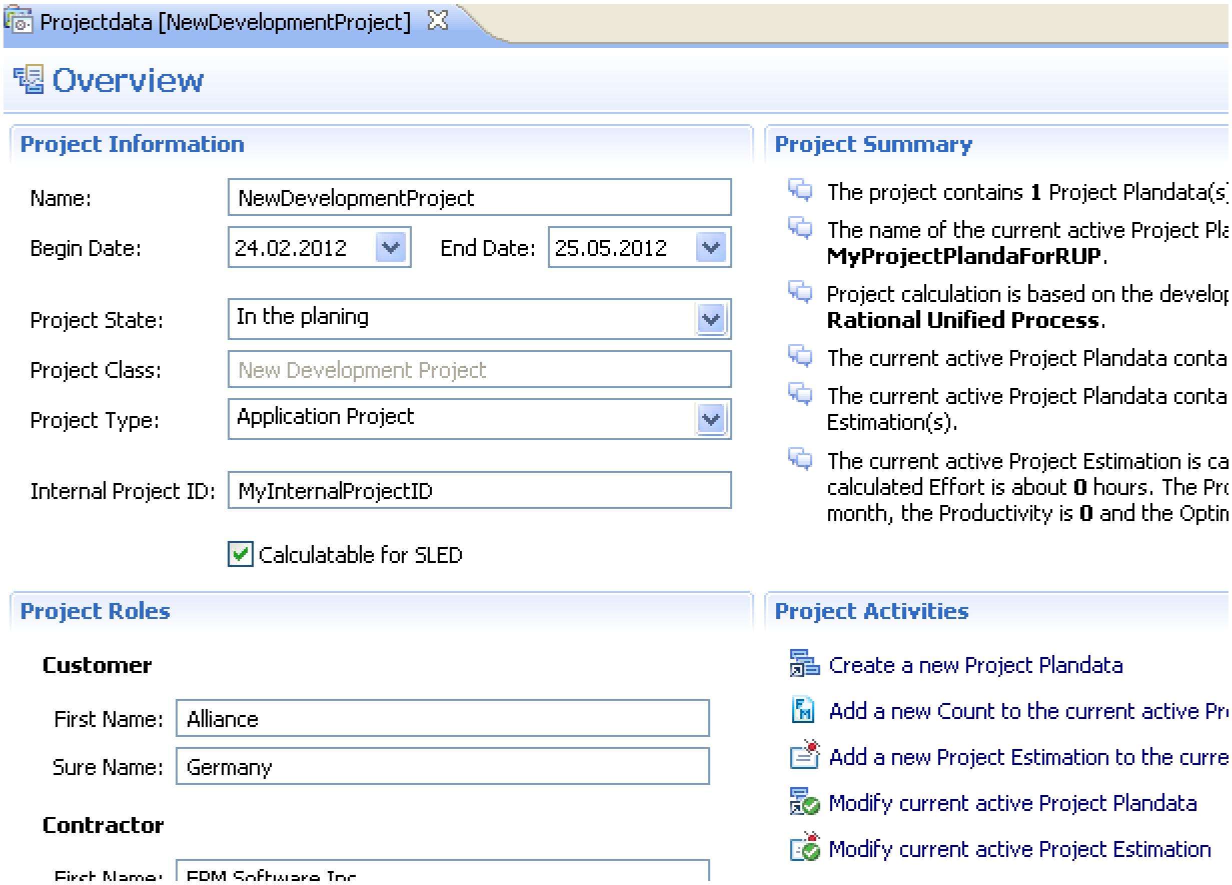
Note:

*Calculate COCOMO effort*

1. Select the project and click the menu **Project** > **Open project data editor**> .


Function Point Modeler - Enterprise Edition
File Edit Project Window Help
Open projectdata editor (Alt+P)
Project Navigator
Application Counts
Development Project Counts
DevelopmentProjectExample
NewDevelopmentProject
DevelopmentProjectCount [ Develeopment Count ]
Enhancement Project Counts
Other Projects

2. The projectdata editor will be showed.



Project Information

Name: NewDevelopmentProject

Begin Date: 24.02.2012 End Date: 25.05.2012

Project State: In the planing

Project Class: New Development Project

Project Type: Application Project

Internal Project ID: MyInternalProjectID

☑ Calculatable for SLED

Project Summary

The project contains **1** Project Plandata(s

The name of the current active Project Pla **MyProjectPlandaForRUP**.

Project calculation is based on the develop **Rational Unified Process**.

The current active Project Plandata conta

The current active Project Plandata conta Estimation(s).

The current active Project Estimation is ca calculated Effort is about **0** hours. The Pro month, the Productivity is **0** and the Optin

Project Roles

**Customer**

First Name: Alliance

Sure Name: Germany

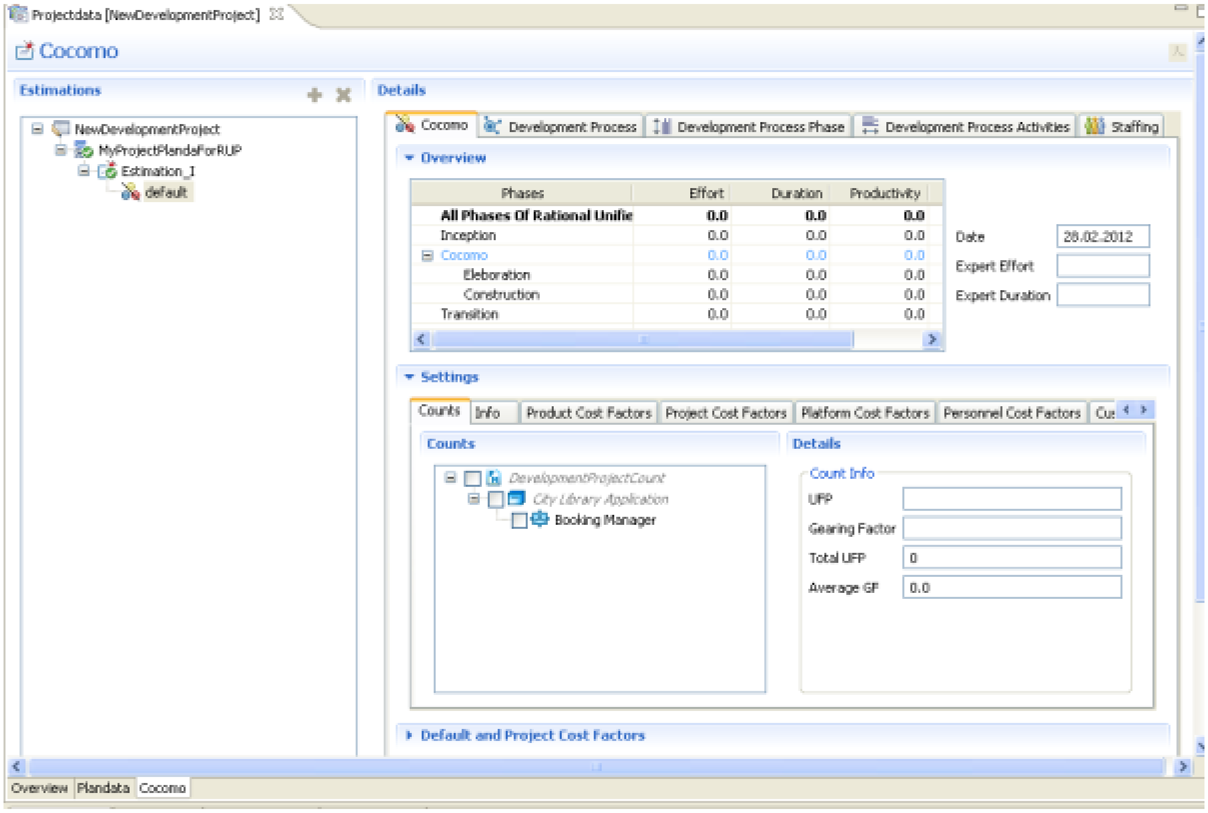
**Contractor**

First Name: FPM Software Inc

Project Activities

Create a new Project Plandata
Add a new Count to the current active Pr
Add a new Project Estimation to the curre
Modify current active Project Plandata
Modify current active Project Estimation

3. Click on the **COCOMO** tab. It will show the Cocomo editor of the project editor.

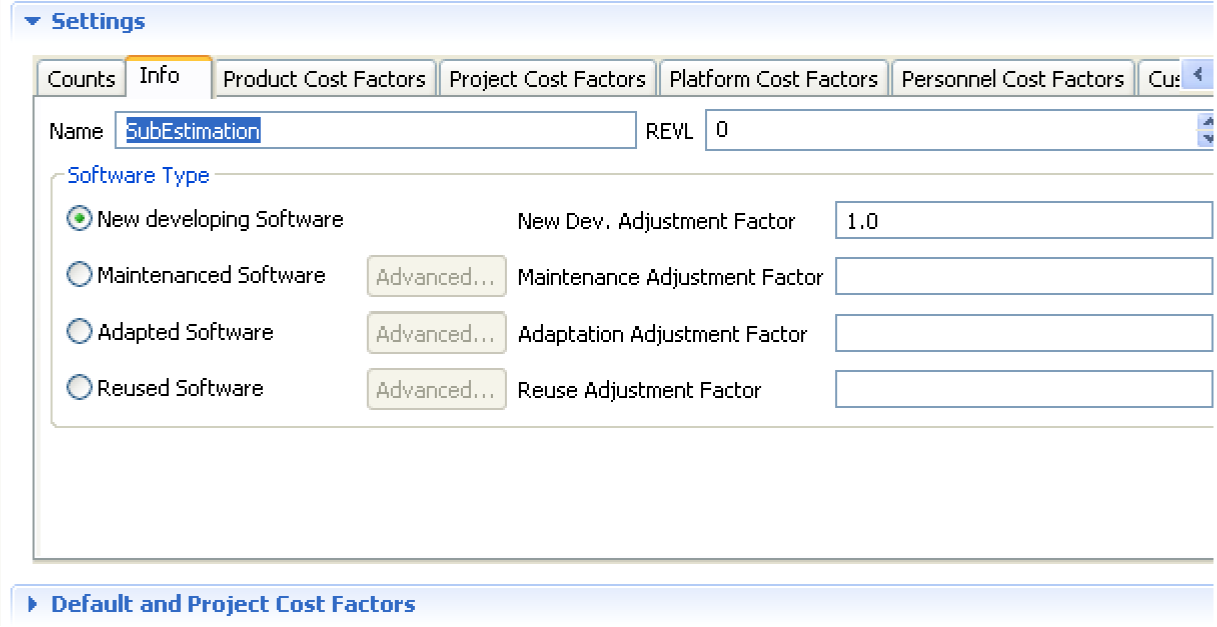


| Phases | Effort | Duration | Productivity |
|---|---|---|---|
| **All Phases Of Rational Unifie** | **0.0** | **0.0** | **0.0** |
| Inception | 0.0 | 0.0 | 0.0 |
| ⊟ Cocomo | 0.0 | 0.0 | 0.0 |
| Eleboration | 0.0 | 0.0 | 0.0 |
| Construction | 0.0 | 0.0 | 0.0 |
| Transition | 0.0 | 0.0 | 0.0 |

Date 28.02.2012
Expert Effort
Expert Duration

Count Info
UFP
Gearing Factor
Total UFP 0
Average GF 0.0

4. Select the **default** sub estimation. Click on the tab **Info** in the **Setting** section . Change the name as **SubEstimation** .



Name SubEstimation
REVL 0

Software Type

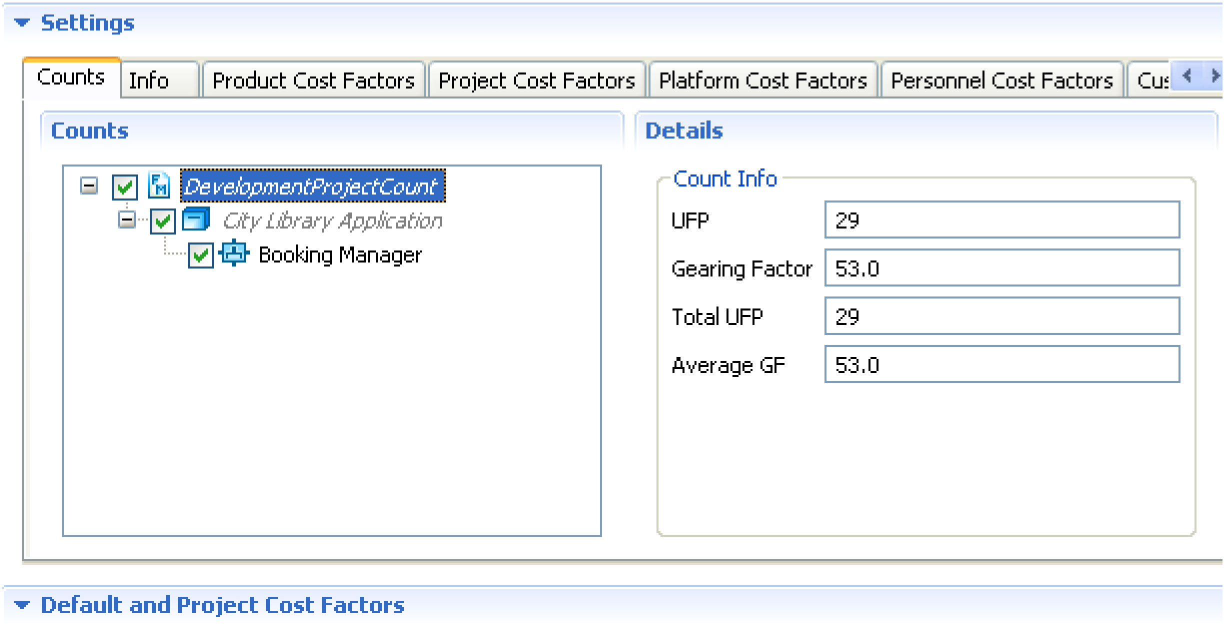
● New developing Software
New Dev. Adjustment Factor 1.0

○ Maintenanced Software
Maintenance Adjustment Factor

○ Adapted Software
Adaptation Adjustment Factor

○ Reused Software
Reuse Adjustment Factor

5. Select the **SubEstimation** and select the count **Booking Manager** .



**Settings**

Counts | Info | Product Cost Factors | Project Cost Factors | Platform Cost Factors | Personnel Cost Factors | Cus

**Counts**

- ☑ DevelopmentProjectCount
  - ☑ City Library Application
    - ☑ Booking Manager

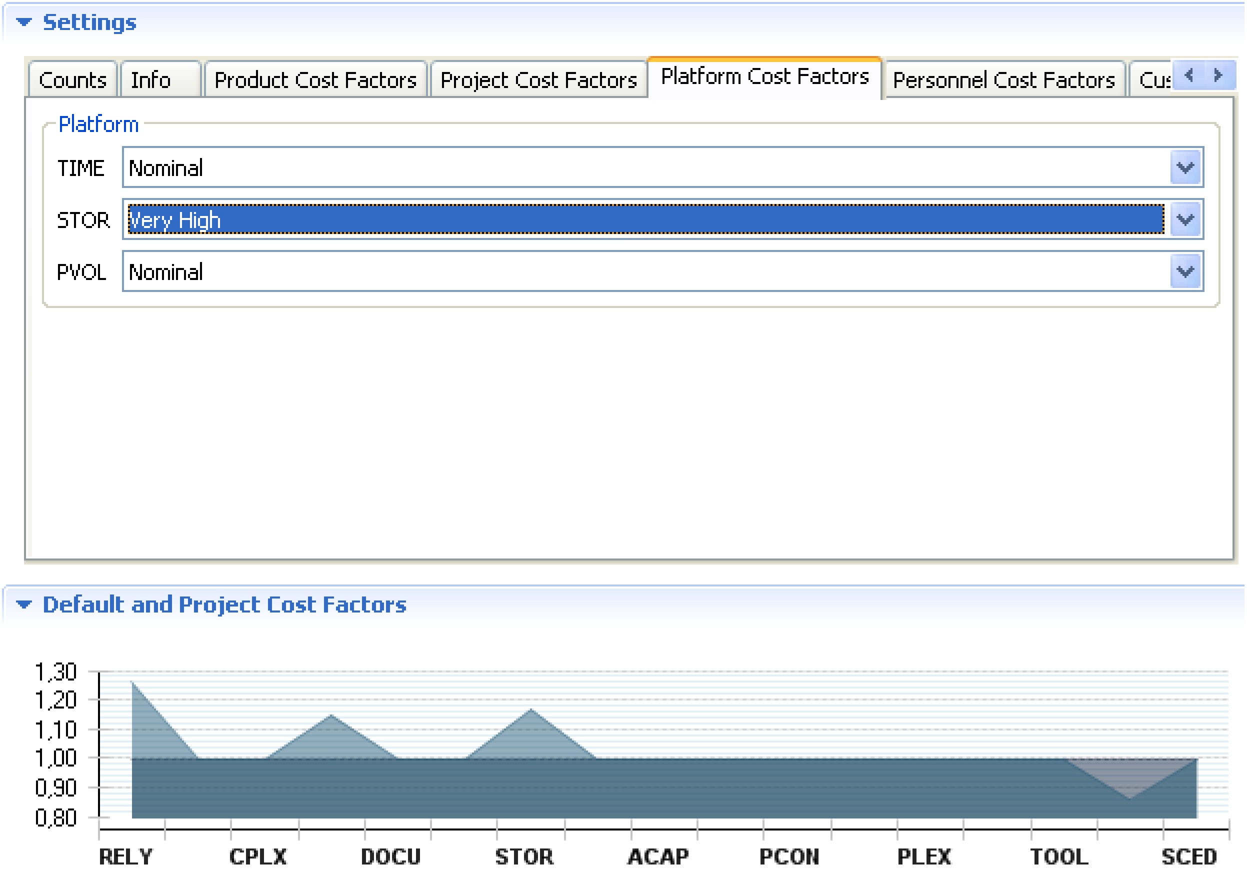
**Details**

Count Info

| | |
|---|---|
| UFP | 29 |
| Gearing Factor | 53.0 |
| Total UFP | 29 |
| Average GF | 53.0 |

**Default and Project Cost Factors**

**6.** Set the complexity of some **cost factors** .



**Settings**

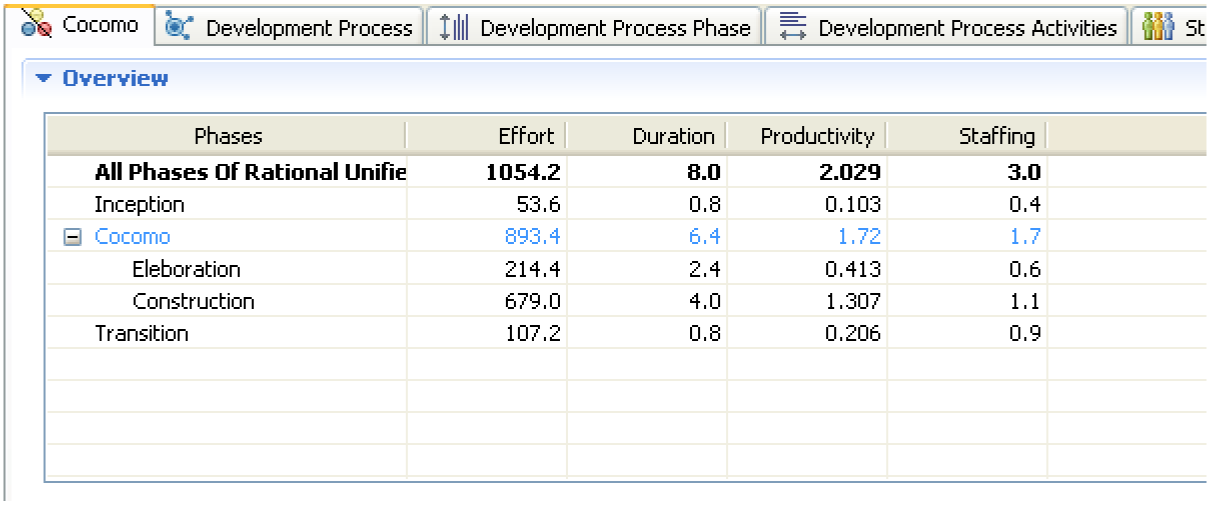
Counts | Info | Product Cost Factors | Project Cost Factors | Platform Cost Factors | Personnel Cost Factors | Cus

Platform

| | |
|---|---|
| TIME | Nominal |
| STOR | Very High |
| PVOL | Nominal |

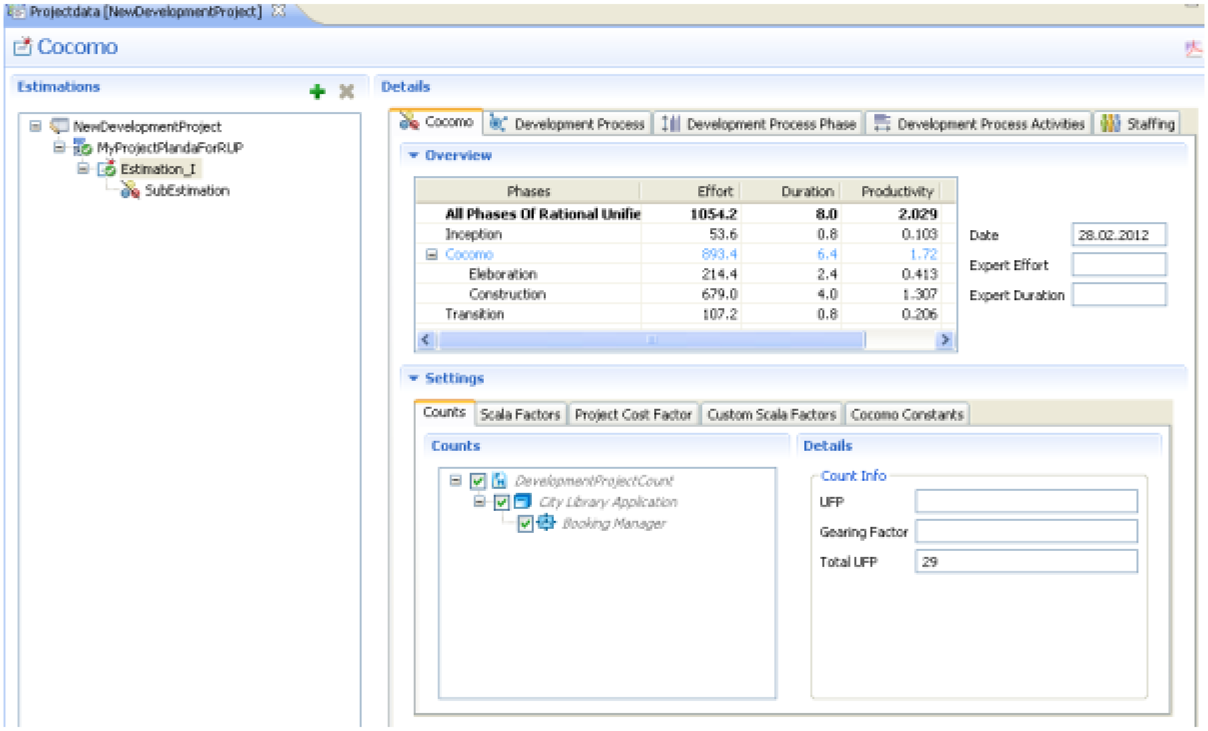
**Default and Project Cost Factors**

**7.** The estimation for this count will be calculated.



| Phases | Effort | Duration | Productivity | Staffing |
|---|---|---|---|---|
| **All Phases Of Rational Unifie** | **1054.2** | **8.0** | **2.029** | **3.0** |
| Inception | 53.6 | 0.8 | 0.103 | 0.4 |
| ⊟ Cocomo | 893.4 | 6.4 | 1.72 | 1.7 |
| Eleboration | 214.4 | 2.4 | 0.413 | 0.6 |
| Construction | 679.0 | 4.0 | 1.307 | 1.1 |
| Transition | 107.2 | 0.8 | 0.206 | 0.9 |

**8.** Select the base estimation **Estimation_I**



- NewDevelopmentProject
  - MyProjectPlandaForRUP
    - Estimation_I
      - SubEstimation

| Phases | Effort | Duration | Productivity |
|---|---|---|---|
| **All Phases Of Rational Unifie** | **1054.2** | **8.0** | **2.029** |
| Inception | 53.6 | 0.8 | 0.103 |
| ⊟ Cocomo | 893.4 | 6.4 | 1.72 |
| Eleboration | 214.4 | 2.4 | 0.413 |
| Construction | 679.0 | 4.0 | 1.307 |
| Transition | 107.2 | 0.8 | 0.206 |

Date 28.02.2012

Expert Effort

Expert Duration

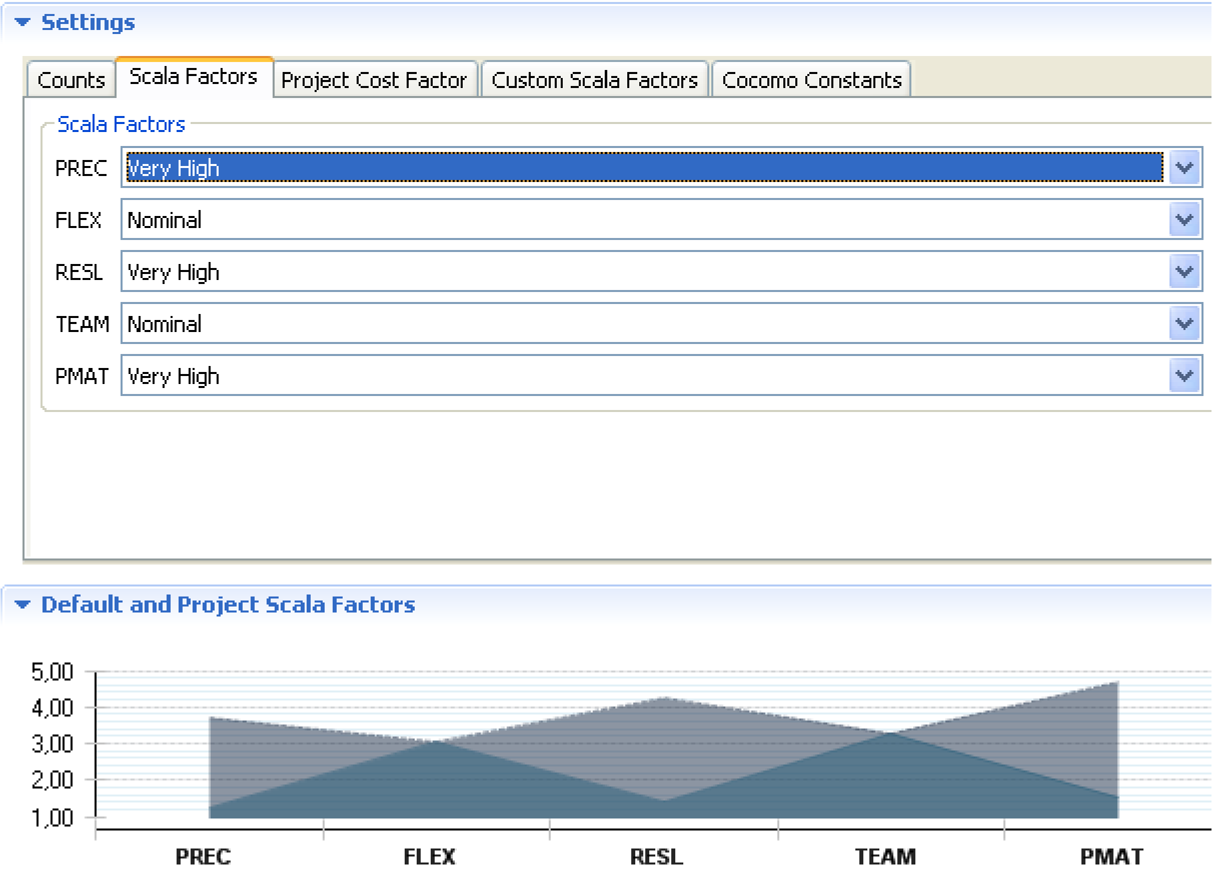
- ☑ DevelopmentProjectCount
  - ☑ City Library Application
    - ☑ Booking Manager

UFP

Gearing Factor

Total UFP 29

**9.** Set the complexity of some **scale factors** .



Scala Factors

PREC Very High

FLEX Nominal

RESL Very High

TEAM Nominal

PMAT Very High

### Calculate the Baseline

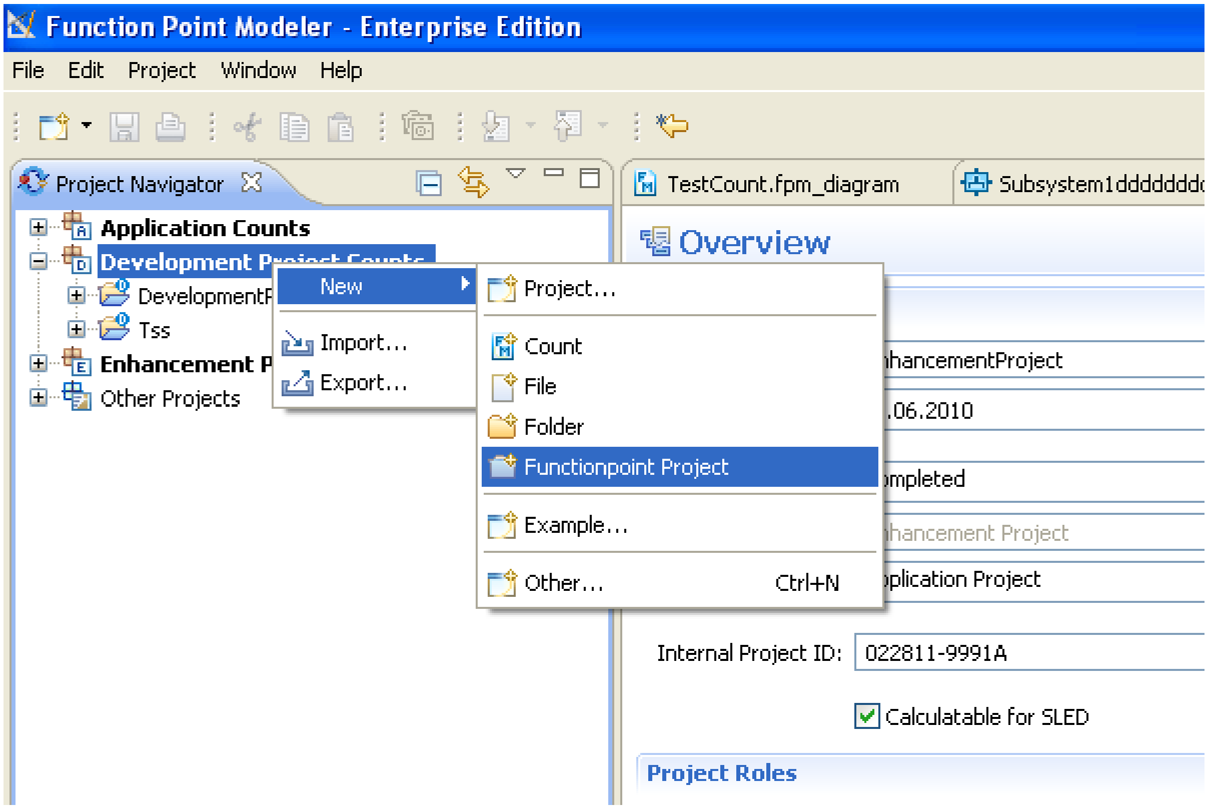
We will now create an **Application Count** from the previously **Development Project Count** as following.

### Determine the type of count

The type of count is an **Application Count** .

*Create a Application Project*

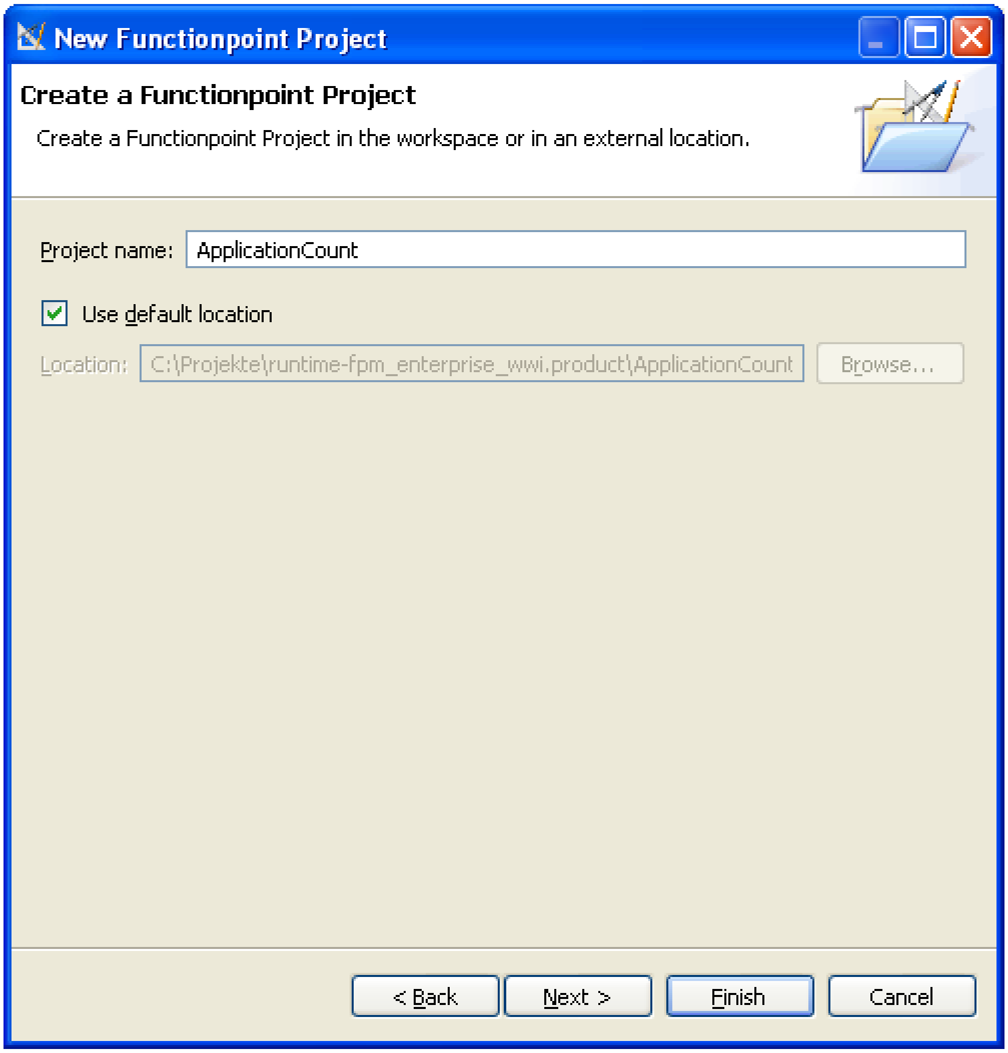
1. From the main menu bar, select ***File >New > Functionpoint Project***



Internal Project ID: 022811-9991A

☑ Calculatable for SLED

2. The following wizard dialog will be showed.
   - Enter the project name **ApplicationCount**
   - And click the button **Next**



**Create a Functionpoint Project**

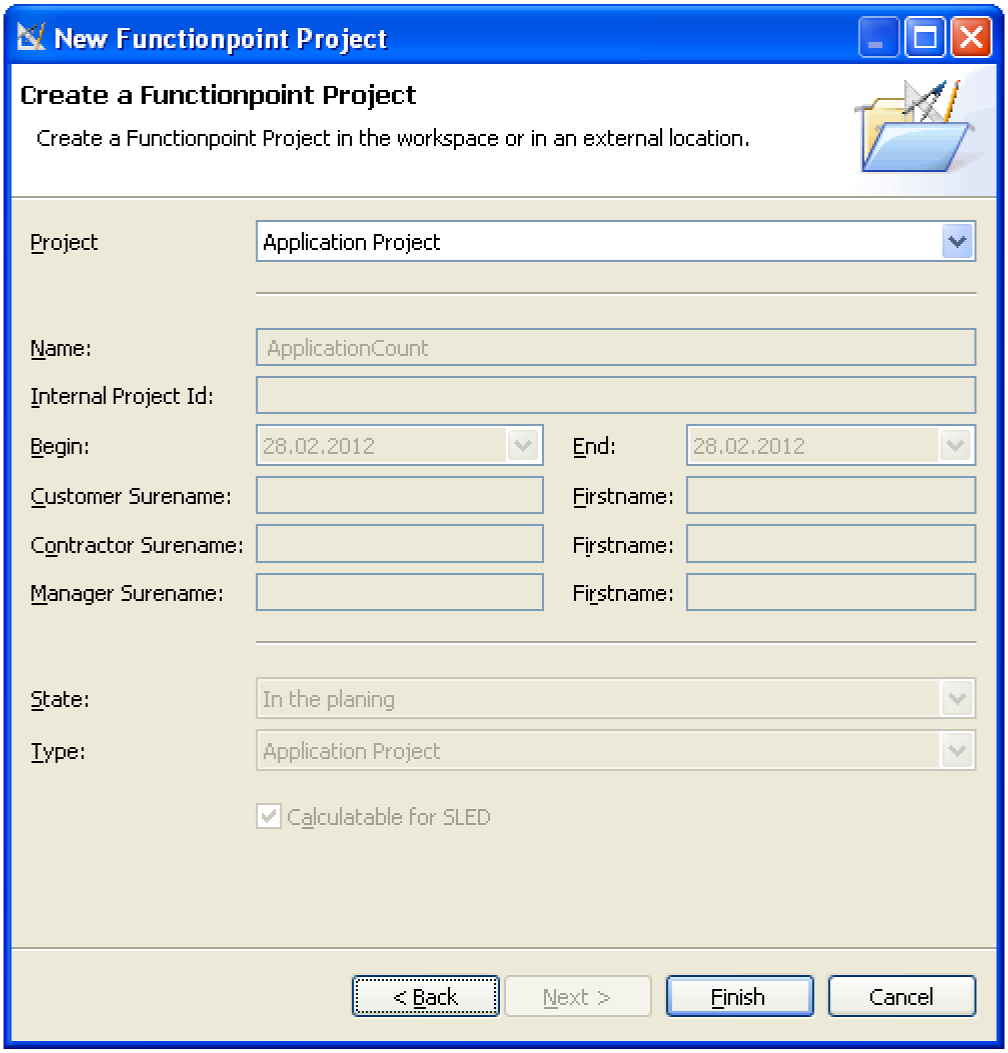
Create a Functionpoint Project in the workspace or in an external location.

Project name: ApplicationCount

☑ Use default location

Location: C:\Projekte\runtime-fpm_enterprise_wwi.product\ApplicationCount

**3.** The following wizard dialog will be showed.



Create a Functionpoint Project

Create a Functionpoint Project in the workspace or in an external location.

Project: Application Project

Name: ApplicationCount

Internal Project Id:

Begin: 28.02.2012 End: 28.02.2012

Customer Surename: Firstname:

Contractor Surename: Firstname:

Manager Surename: Firstname:

State: In the planing

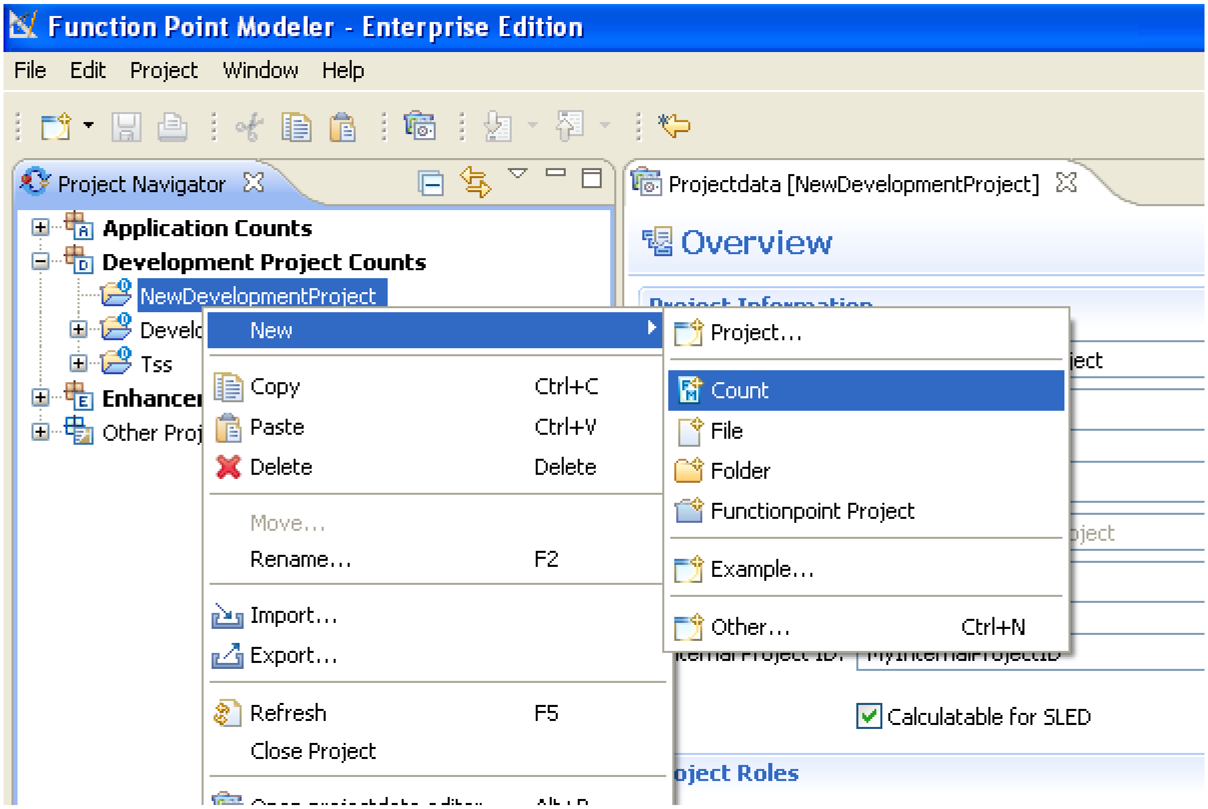
Type: Application Project

☑ Calculatable for SLED

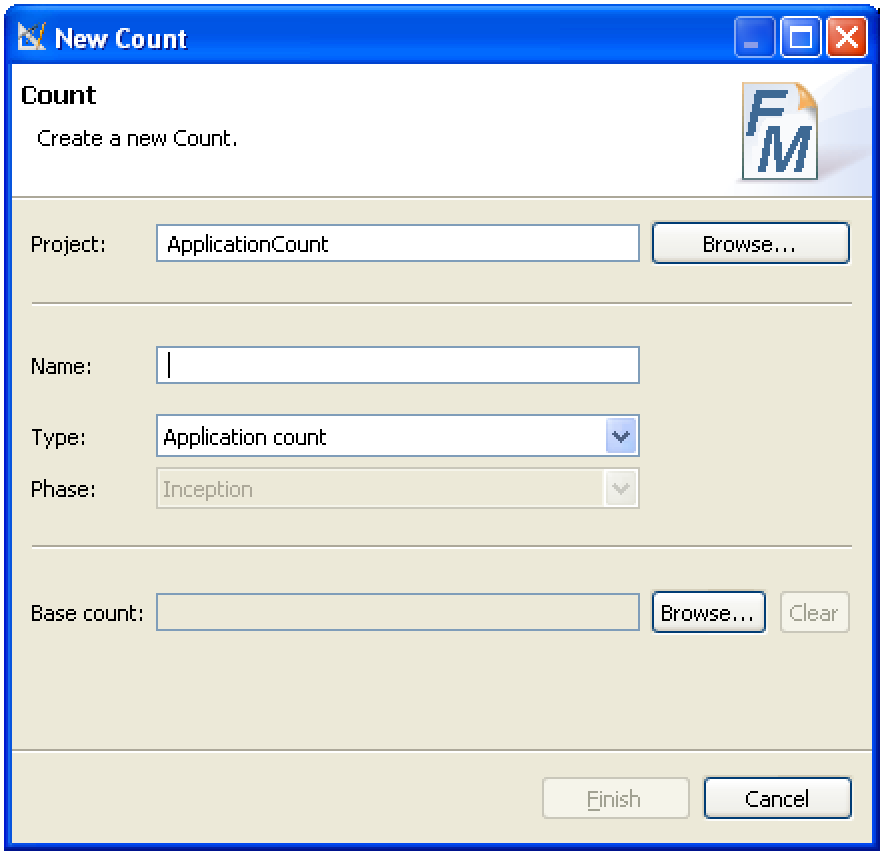
- Select the **Application Project**
- And click the button **Finish**

*Create a Application Count*

1. From the main menu bar, select ***File >New > Functionpoint Project***



2. The following wizard dialog will be showed.



**Count**

Create a new Count.

Project: ApplicationCount

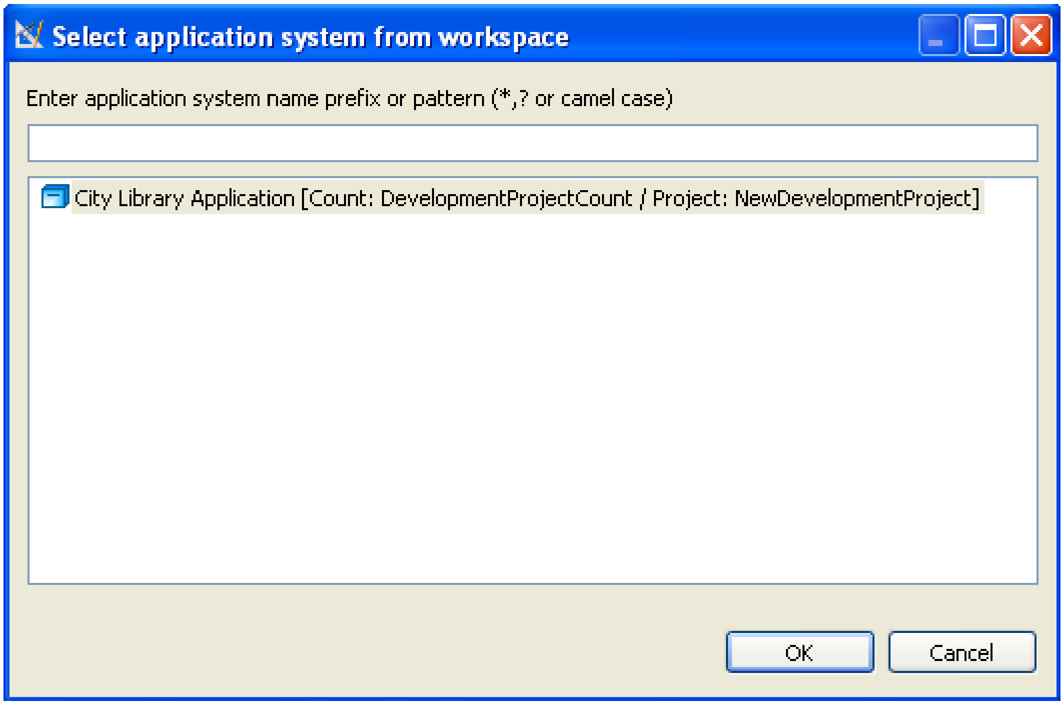
Name:

Type: Application count

Phase: Inception

Base count:

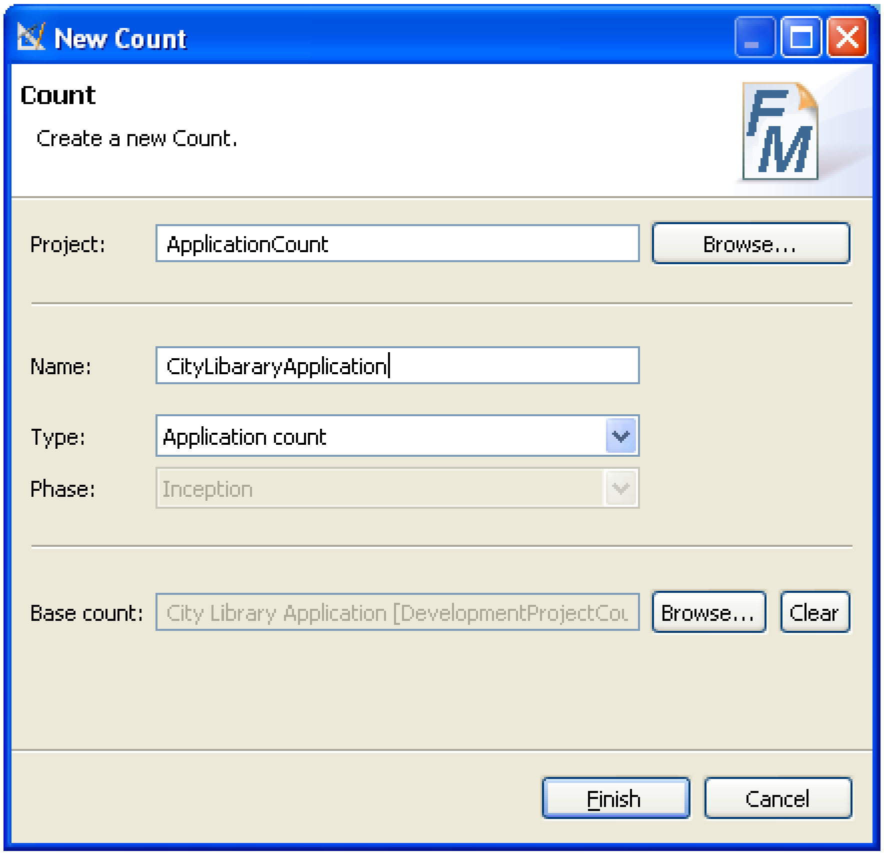
- Click the button **Browse...** and select the **City Library Application**



Enter application system name prefix or pattern (*,? or camel case)

City Library Application [Count: DevelopmentProjectCount / Project: NewDevelopmentProject]

- Enter the count name **CityLibraryApplication**



Count

Create a new Count.

Project: ApplicationCount

Name: CityLibararyApplication

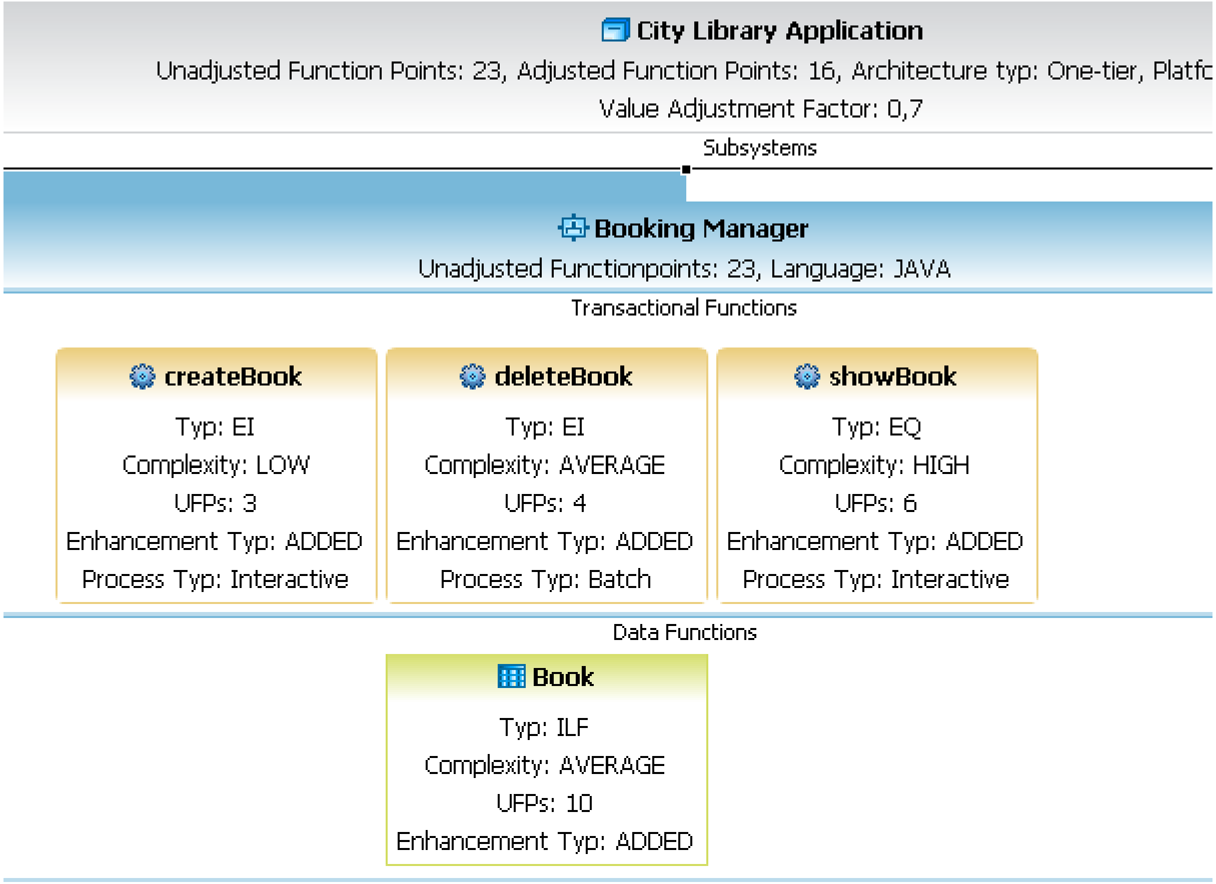
Type: Application count

Phase: Inception

Base count: City Library Application [DevelopmentProjectCou

- And click the button **Finish**

A new **Application Count** will be created from **Development Project Count** . The **migrateBook** will be deleted from the **Application Count** because its **Process Type** conversion.



City Library Application

Unadjusted Function Points: 23, Adjusted Function Points: 16, Architecture typ: One-tier, Platfc

Value Adjustment Factor: 0,7

Subsystems

Booking Manager

Unadjusted Functionpoints: 23, Language: JAVA

Transactional Functions

createBook

Typ: EI

Complexity: LOW

UFPs: 3

Enhancement Typ: ADDED

Process Typ: Interactive

deleteBook

Typ: EI

Complexity: AVERAGE

UFPs: 4

Enhancement Typ: ADDED

Process Typ: Batch

showBook

Typ: EQ

Complexity: HIGH

UFPs: 6

Enhancement Typ: ADDED

Process Typ: Interactive

Data Functions

Book

Typ: ILF

Complexity: AVERAGE

UFPs: 10

Enhancement Typ: ADDED

### Add, change and delete functionaliy

The next step is to add, change and delete the functionalities of the application system **City Library Application** .

### The counting process

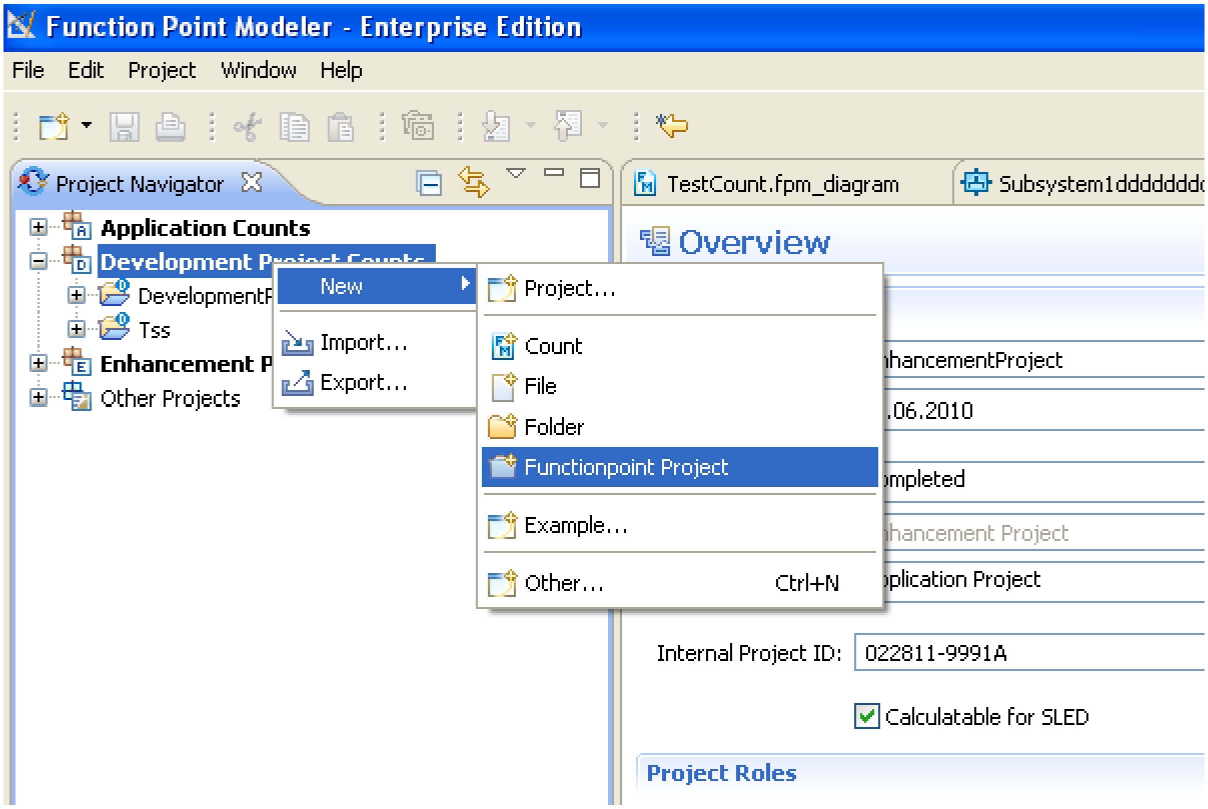
We will follow the counting process:

*Determine the type of count*

The type of count is an **Enhancement Project Count** .

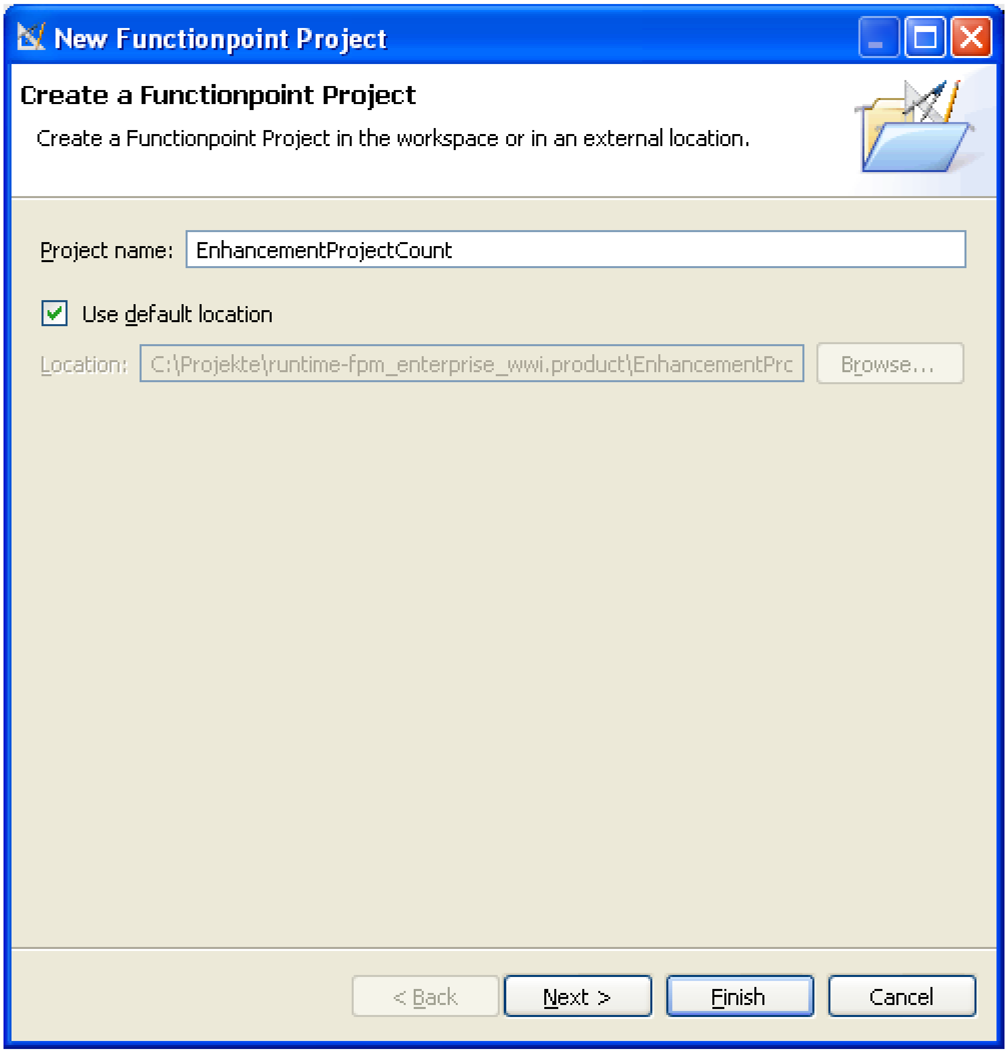
Create a Enhancement Project

1. From the main menu bar, select ***File >New > Functionpoint Project***



2. The following wizard dialog will be showed.

- Enter the project name **EnhancementProjectCount**
- And click the button **Next**



Create a Functionpoint Project

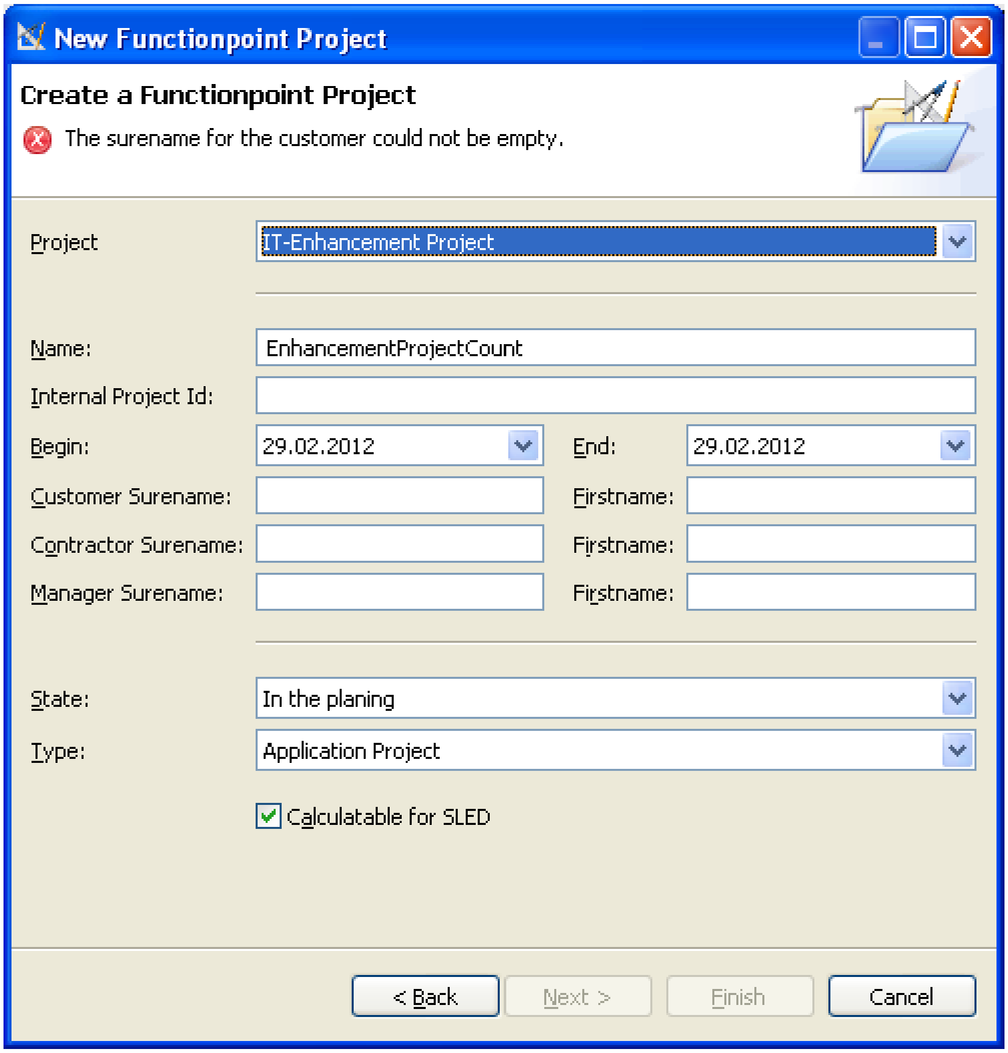
Create a Functionpoint Project in the workspace or in an external location.

Project name: EnhancementProjectCount

☑ Use default location

Location: C:\Projekte\runtime-fpm_enterprise_wwi.product\EnhancementPrc

**3.** The following wizard dialog will be showed.



New Functionpoint Project

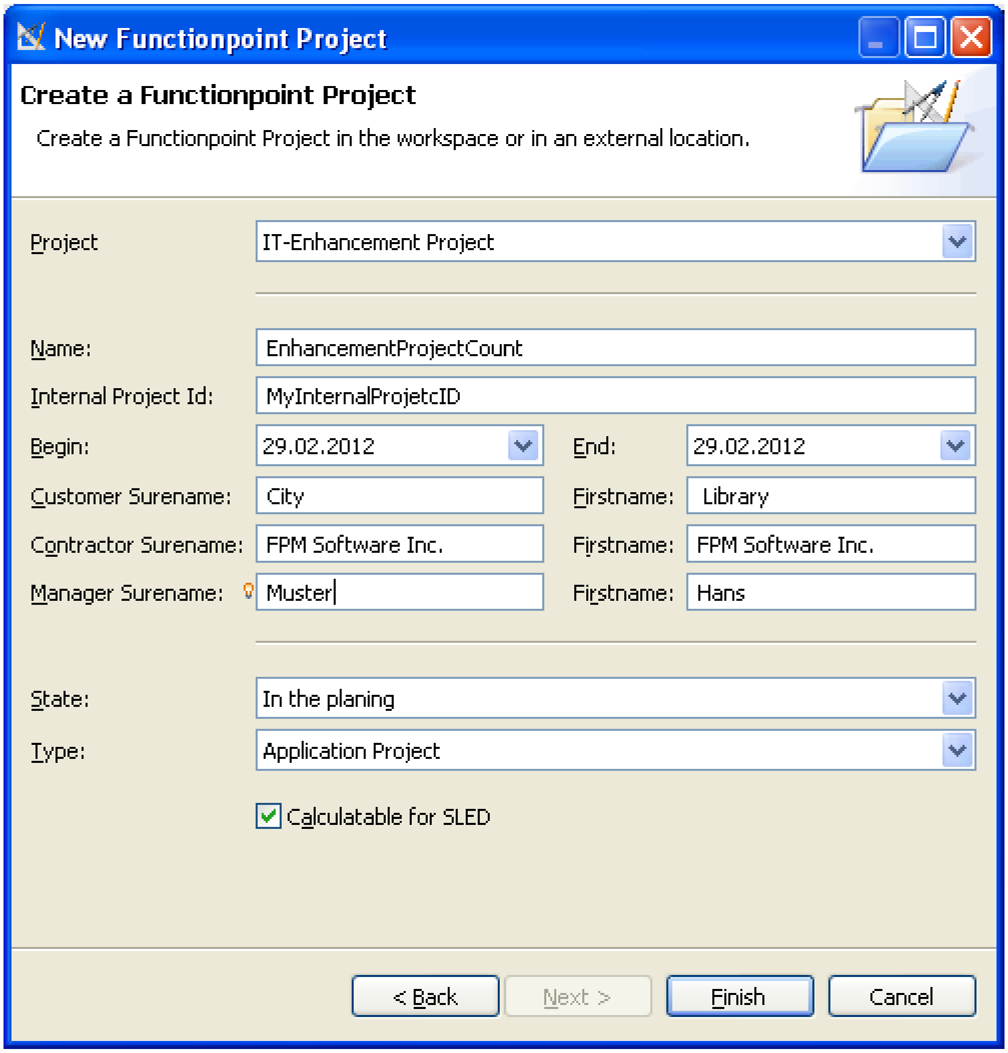
Create a Functionpoint Project

The surename for the customer could not be empty.

| | | | |
|---|---|---|---|
| Project | IT-Enhancement Project | | |
| Name: | EnhancementProjectCount | | |
| Internal Project Id: | | | |
| Begin: | 29.02.2012 | End: | 29.02.2012 |
| Customer Surename: | | Firstname: | |
| Contractor Surename: | | Firstname: | |
| Manager Surename: | | Firstname: | |
| State: | In the planing | | |
| Type: | Application Project | | |

☑ Calculatable for SLED

**4.** The following wizard dialog will be showed. Set the value of the fields.



**Create a Functionpoint Project**

Create a Functionpoint Project in the workspace or in an external location.

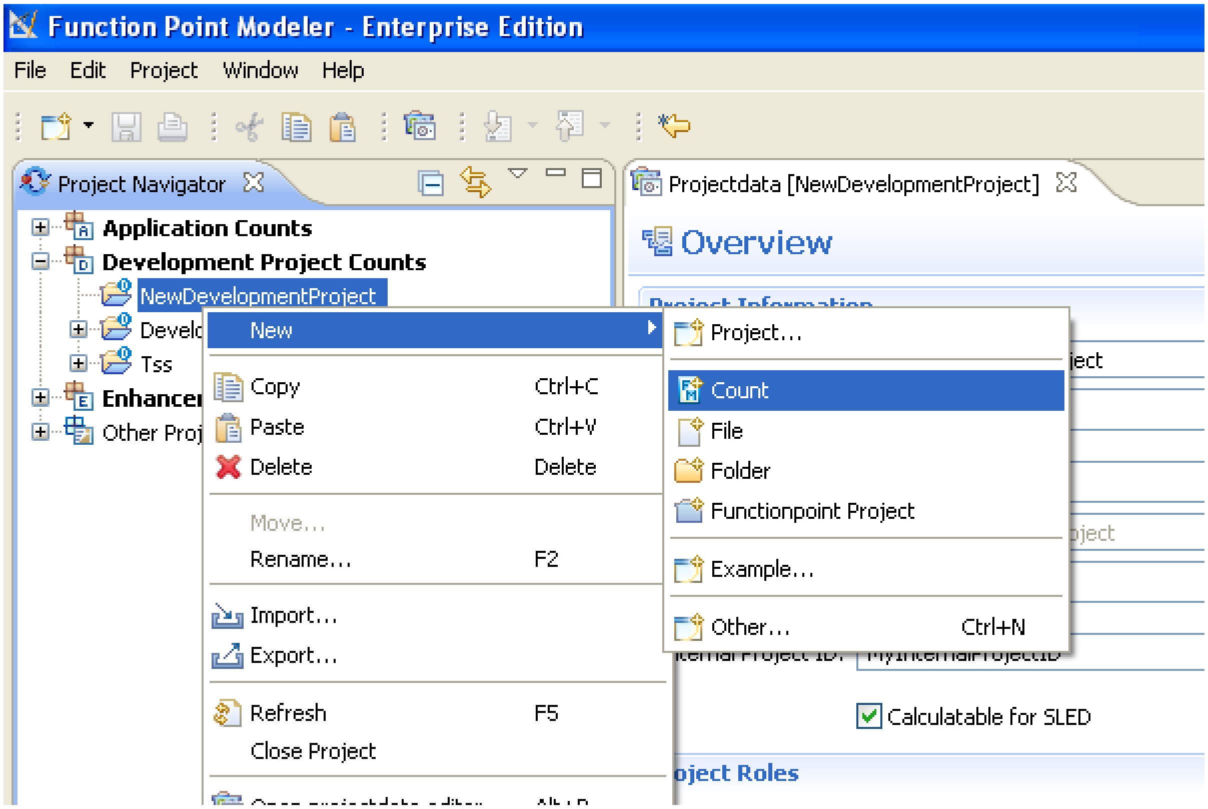
| | | | |
|---|---|---|---|
| Project | IT-Enhancement Project | | |
| Name: | EnhancementProjectCount | | |
| Internal Project Id: | MyInternalProjetcID | | |
| Begin: | 29.02.2012 | End: | 29.02.2012 |
| Customer Surename: | City | Firstname: | Library |
| Contractor Surename: | FPM Software Inc. | Firstname: | FPM Software Inc. |
| Manager Surename: | Muster | Firstname: | Hans |
| State: | In the planing | | |
| Type: | Application Project | | |

☑ Calculatable for SLED

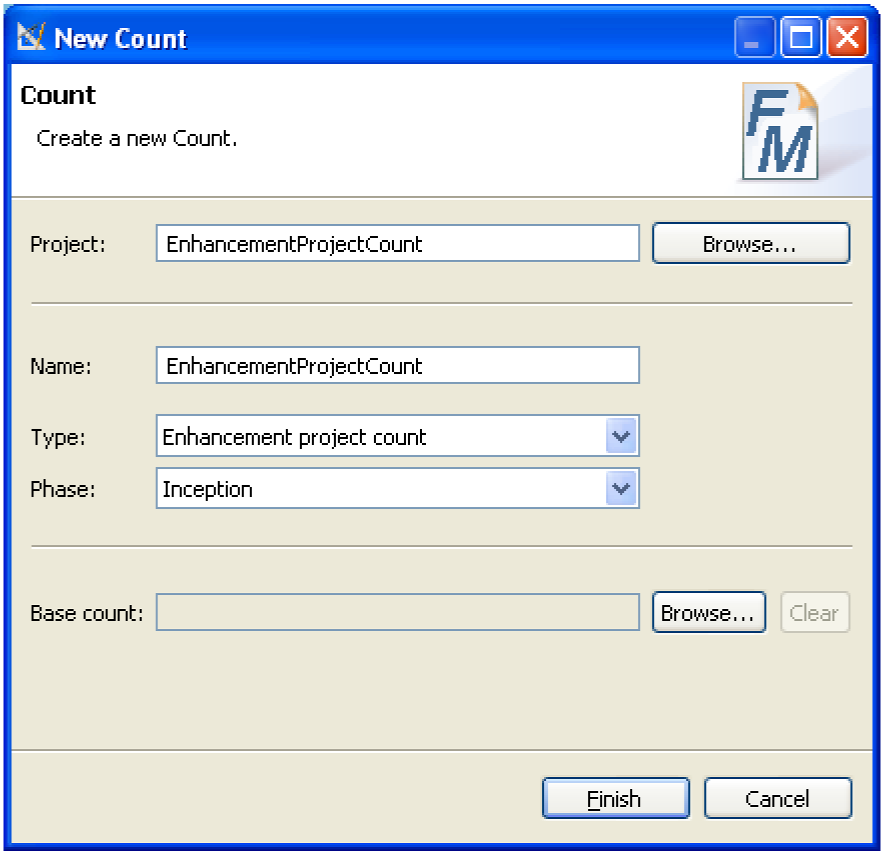
And click the button **Finish**

Create a enhancement count

1. From the main menu bar, select ***File >New > Functionpoint Project***



2. The following wizard dialog will be showed. Enter **EnhancementProjectCount** as name.



Project: EnhancementProjectCount

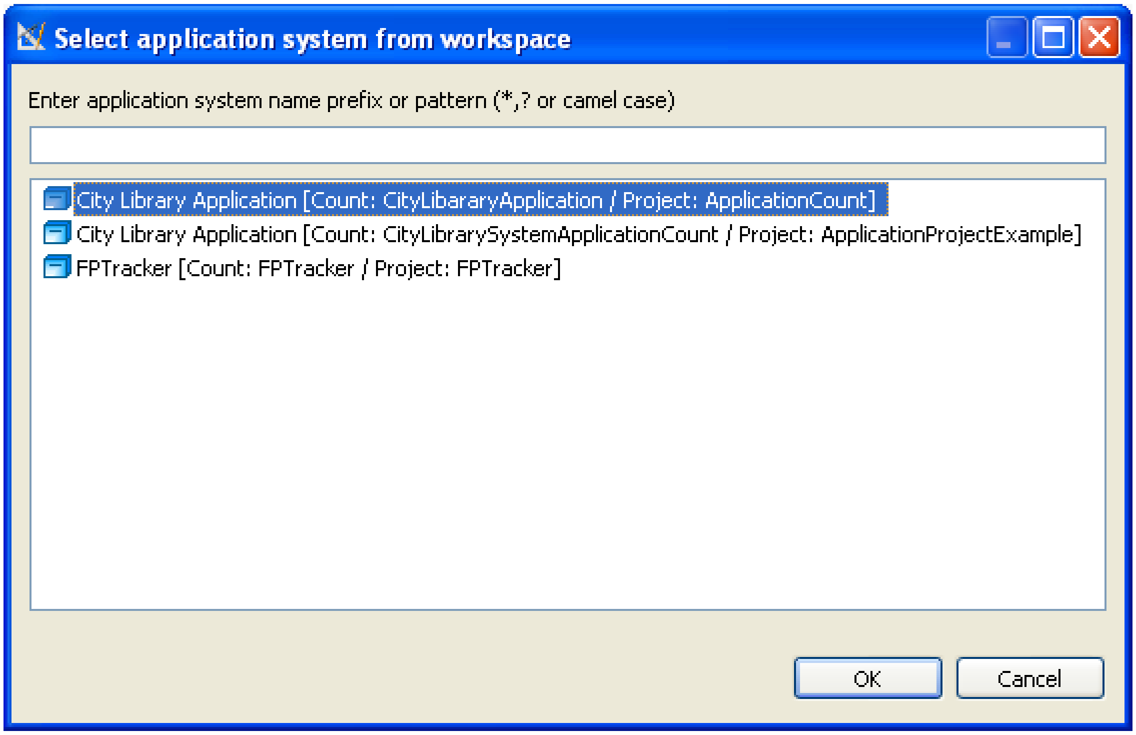
Name: EnhancementProjectCount

Type: Enhancement project count

Phase: Inception

Base count:

- Click the button **Browse...** and select the **City Library Application**



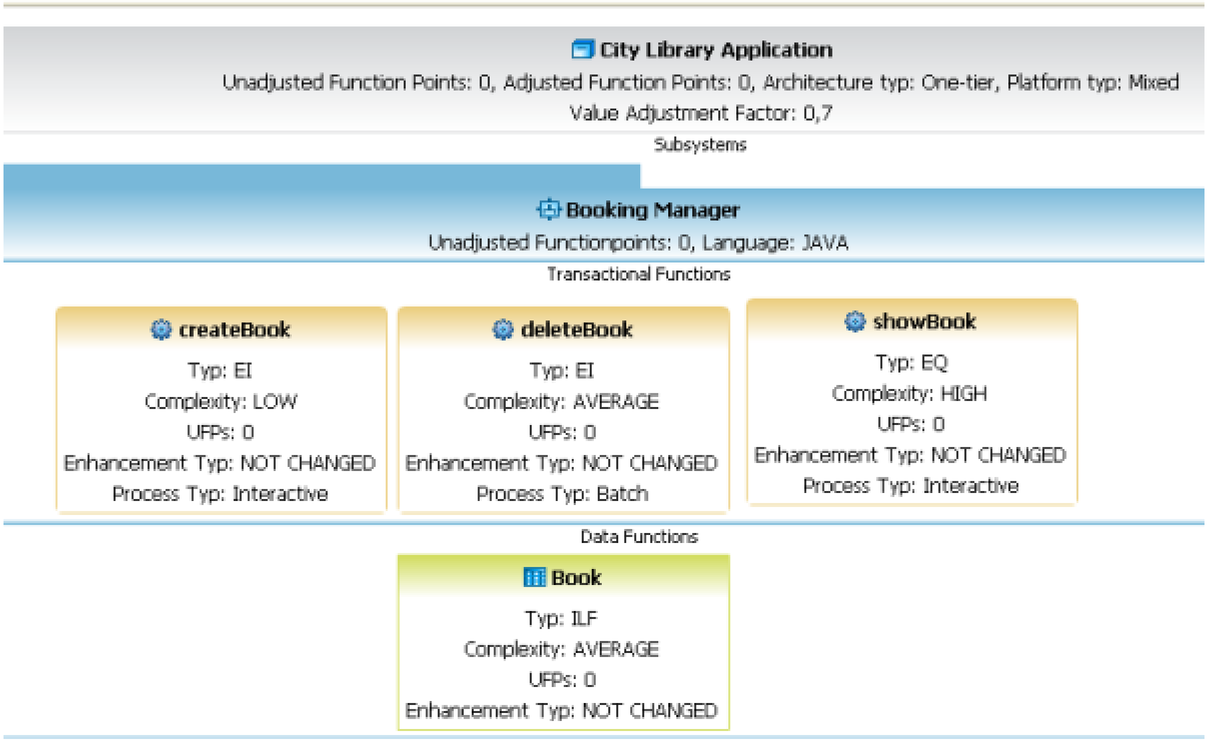
Select application system from workspace

Enter application system name prefix or pattern (*,? or camel case)

City Library Application [Count: CityLibararyApplication / Project: ApplicationCount]
City Library Application [Count: CityLibrarySystemApplicationCount / Project: ApplicationProjectExample]
FPTracker [Count: FPTracker / Project: FPTracker]

- And click the button **Finish**

A new **Enhancement Project Count** will be created from **Application Count** . The **Enhancement Type** of all elementary process and data function will be set **NOT CHANGED** . It means, that they have null function points. If you change **Enhancement Type** as **CHANGED** or **DELETED** , the function points will be calculated for the current elementary process or data function. You can also add new elementary process or data function in the current **Enhancement Project Count** .



**City Library Application**

Unadjusted Function Points: 0, Adjusted Function Points: 0, Architecture typ: One-tier, Platform typ: Mixed

Value Adjustment Factor: 0,7

Subsystems

**Booking Manager**

Unadjusted Functionpoints: 0, Language: JAVA

Transactional Functions

**createBook**

Typ: EI

Complexity: LOW

UFPs: 0

Enhancement Typ: NOT CHANGED

Process Typ: Interactive

**deleteBook**

Typ: EI

Complexity: AVERAGE

UFPs: 0

Enhancement Typ: NOT CHANGED

Process Typ: Batch

**showBook**

Typ: EQ

Complexity: HIGH

UFPs: 0

Enhancement Typ: NOT CHANGED

Process Typ: Interactive

Data Functions

**Book**

Typ: ILF

Complexity: AVERAGE

UFPs: 0

Enhancement Typ: NOT CHANGED

### *Determine the unadjusted FP count*

Once you have created a ***Transactional Function*** or ***Data Functions*** Function point Modeler calculates the unadjusted function points.

## Add, change and delete Transactional Functions

Once you have created the Sub System a **Transactional Function** and a **Data Function** can be created.

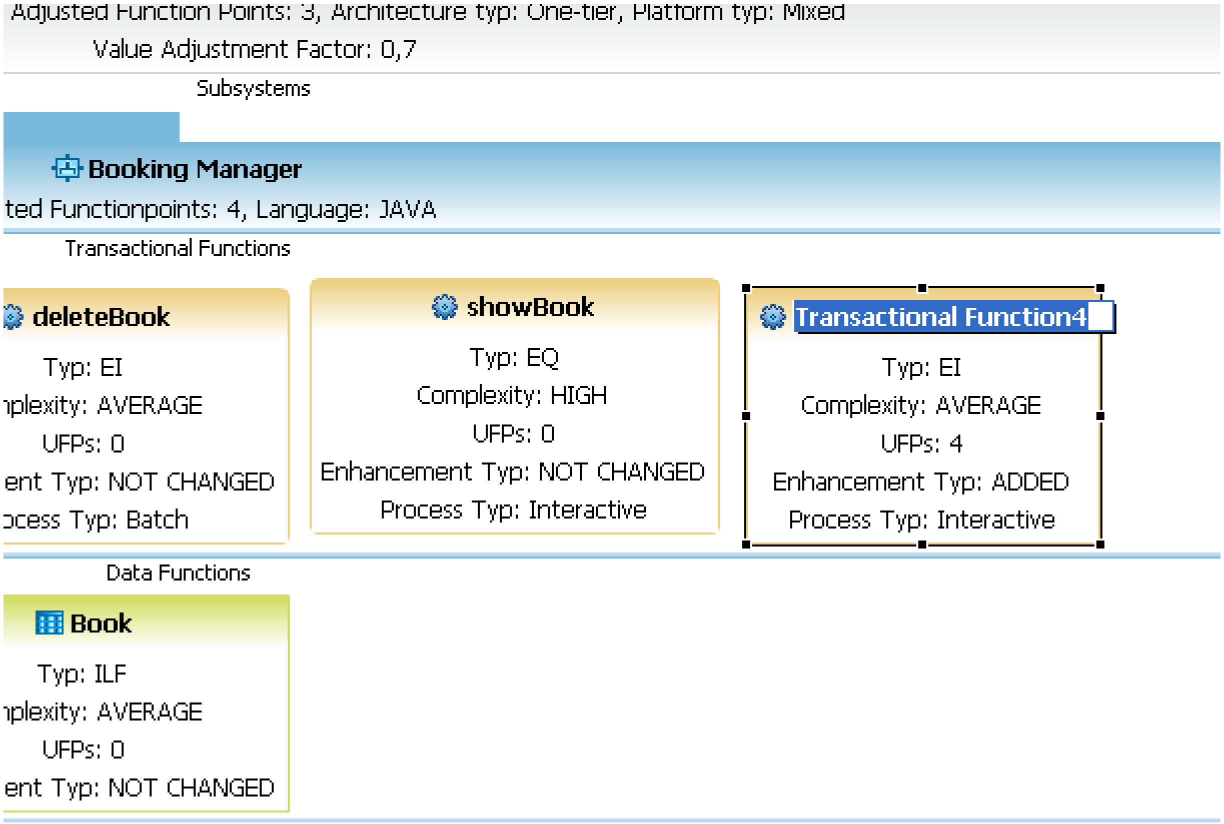
You must have a Function Point Modeler diagram open. By default, the Palette view opens when you are editing Function Point Modeler Diagram file in Function Point Modeler.

To create a **Transactional Function** :

1. Click FPM Notes drawer in the Palette view. The drawer expands and displays a list of following items:

   - **Application System**
   - **Sub System**
   - **Transactional Function**
   - **Data Function**

   You can drag and drop it onto the Function Point Modeler Diagram Editor.
2. Drag an **Transactional Function** item from a drawer to the desired place inside of the **Transactional Functions** section the **Sub System** . You can also click a location **Transactional Functions** section, and then click on an item in the drawer. Make sure that you drag and drop appropriate items **Transactional Functions** section. For example, you can not drop **Transactional Function** item onto **Data Functions** section of **Sub System** .
3. A new **Transactional Function** is created and displayed in the diagram with the name *Transactional Function1*
4. Once the **Transactional Function** appears on the diagram inside of the **Sub System** , you can usually set some attributes for it in the Properties view or you can click the attribute of the **Transactional Function** to set its value. Type a desired name for the **Transactional Function** and press Enter.



Adjusted Function Points: 3, Architecture typ: One-tier, Platform typ: Mixed
Value Adjustment Factor: 0,7

Subsystems

Booking Manager
ted Functionpoints: 4, Language: JAVA

Transactional Functions

deleteBook
Typ: EI
nplexity: AVERAGE
UFPs: 0
ent Typ: NOT CHANGED
ocess Typ: Batch

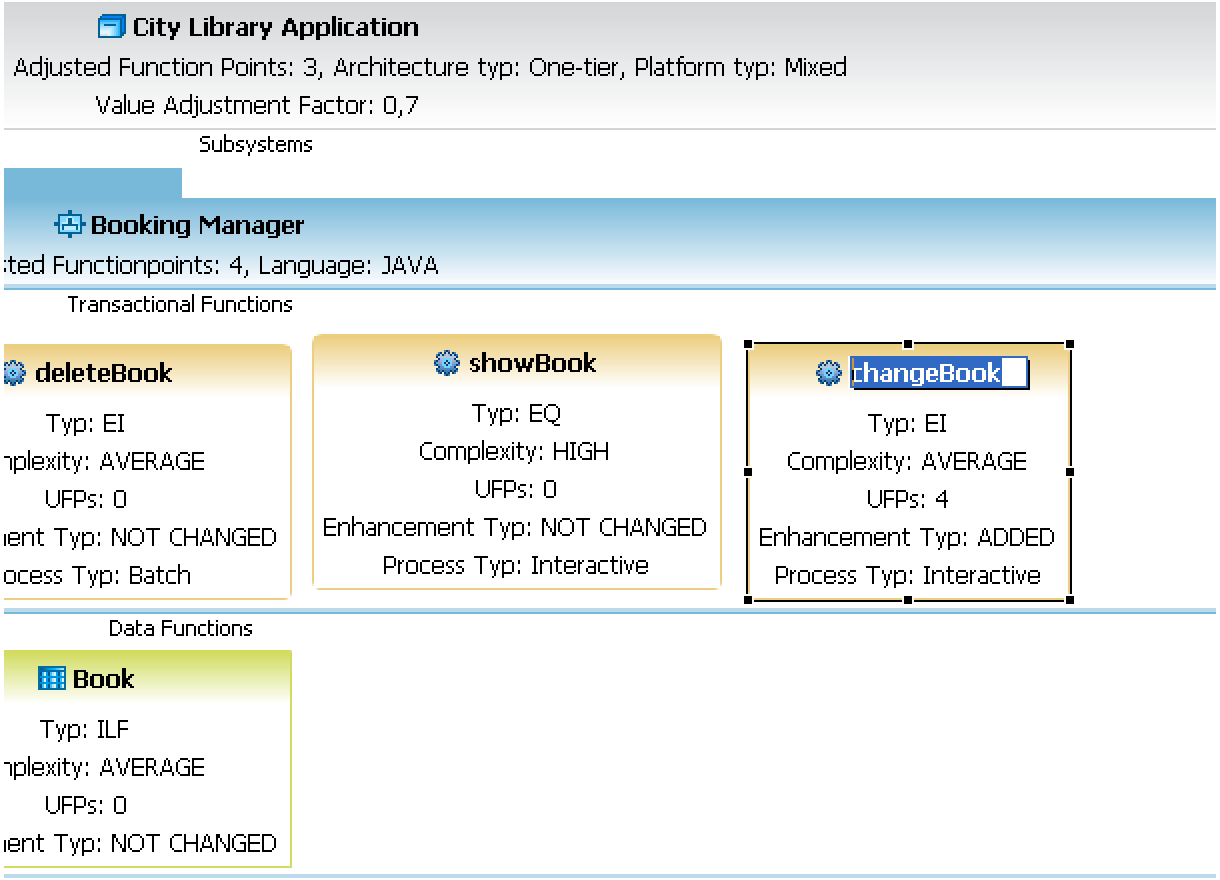
showBook
Typ: EQ
Complexity: HIGH
UFPs: 0
Enhancement Typ: NOT CHANGED
Process Typ: Interactive

Transactional Function4
Typ: EI
Complexity: AVERAGE
UFPs: 4
Enhancement Typ: ADDED
Process Typ: Interactive

Data Functions

Book
Typ: ILF
nplexity: AVERAGE
UFPs: 0
ent Typ: NOT CHANGED

**5.** Enter the name **changeBook** and press Enter.



City Library Application

Adjusted Function Points: 3, Architecture typ: One-tier, Platform typ: Mixed

Value Adjustment Factor: 0,7

Subsystems

Booking Manager

ted Functionpoints: 4, Language: JAVA

Transactional Functions

deleteBook

Typ: EI

nplexity: AVERAGE

UFPs: 0

nent Typ: NOT CHANGED

ocess Typ: Batch

showBook

Typ: EQ

Complexity: HIGH

UFPs: 0

Enhancement Typ: NOT CHANGED

Process Typ: Interactive

changeBook

Typ: EI

Complexity: AVERAGE

UFPs: 4

Enhancement Typ: ADDED

Process Typ: Interactive

Data Functions

Book

Typ: ILF

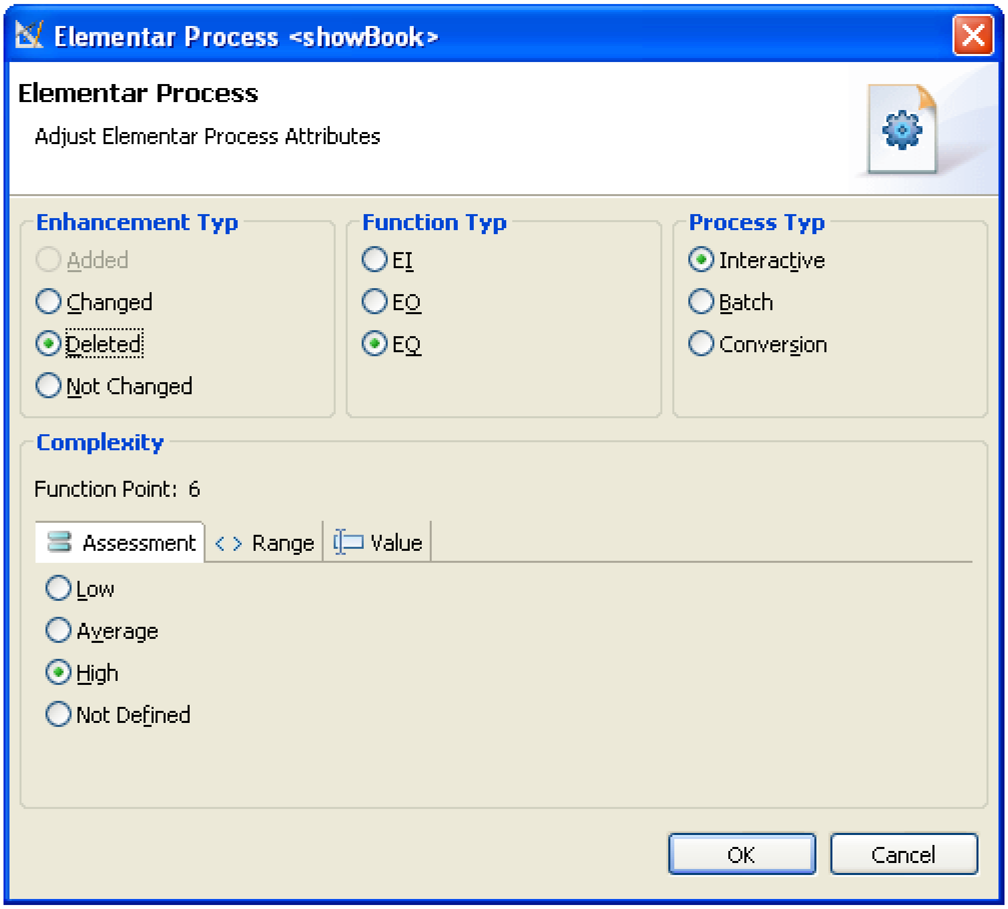
nplexity: AVERAGE

UFPs: 0

nent Typ: NOT CHANGED

6. Move mouse over the **showBook Transactional Function** and the text will be highlighted. Double click on this highlighted text. The following property dialog will be showed.

   Double click the **Transactional Function showBook** , and change enter the name **Enhancement Type** *Deleted* .



Elementar Process <showBook>

Elementar Process

Adjust Elementar Process Attributes

Enhancement Typ

○ Added
○ Changed
● Deleted
○ Not Changed

Function Typ

○ EI
○ EO
● EQ

Process Typ

● Interactive
○ Batch
○ Conversion

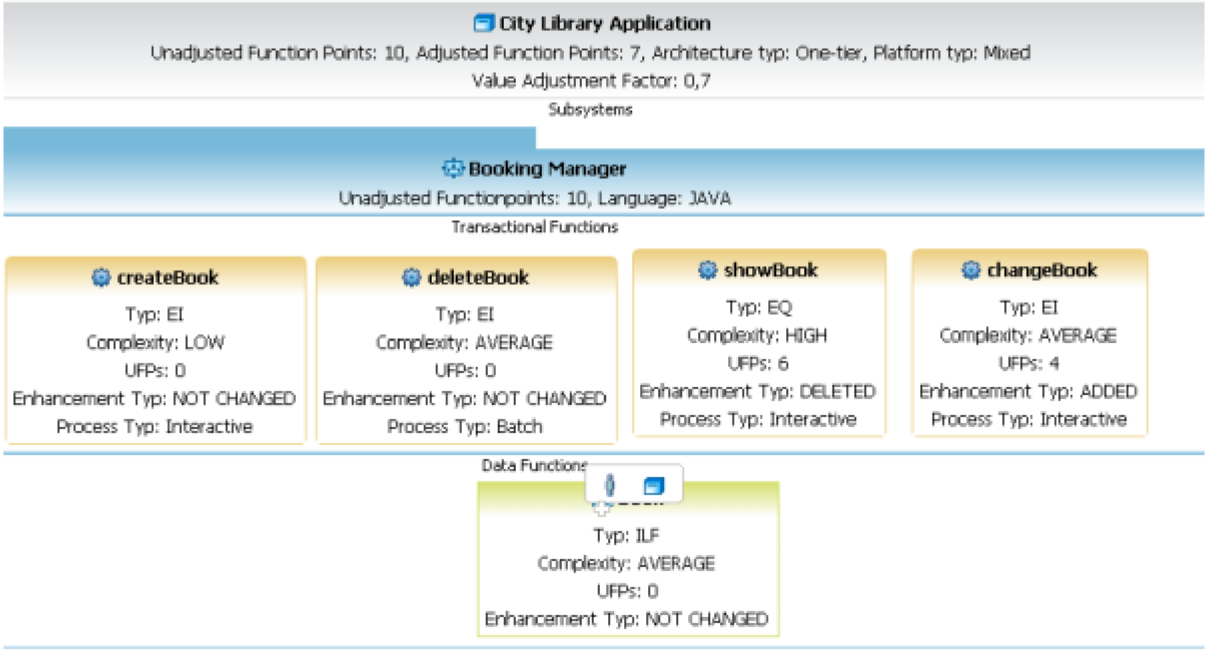
Complexity

Function Point: 6

○ Low
○ Average
● High
○ Not Defined

7. Click the button **Ok** .
8. Move mouse over the **deleteBook Transactional Function** and the text will be highlighted. Double click on this highlighted text. The following property dialog will be showed.

   Double click the **Transactional Function deleteBook** , and change enter the name **Enhancement Type** *Changed* .
9. Your **Enhancement Project Count** will look like as following,



City Library Application
Unadjusted Function Points: 10, Adjusted Function Points: 7, Architecture typ: One-tier, Platform typ: Mixed
Value Adjustment Factor: 0,7
Subsystems

Booking Manager
Unadjusted Functionpoints: 10, Language: JAVA
Transactional Functions

createBook
Typ: EI
Complexity: LOW
UFPs: 0
Enhancement Typ: NOT CHANGED
Process Typ: Interactive

deleteBook
Typ: EI
Complexity: AVERAGE
UFPs: 0
Enhancement Typ: NOT CHANGED
Process Typ: Batch

showBook
Typ: EQ
Complexity: HIGH
UFPs: 6
Enhancement Typ: DELETED
Process Typ: Interactive

changeBook
Typ: EI
Complexity: AVERAGE
UFPs: 4
Enhancement Typ: ADDED
Process Typ: Interactive

Data Functions

Typ: ILF
Complexity: AVERAGE
UFPs: 0
Enhancement Typ: NOT CHANGED

Add, change and delete Data Functions

Once you have created the Sub System a **Transactional Function** and a **Data Function** can be created.

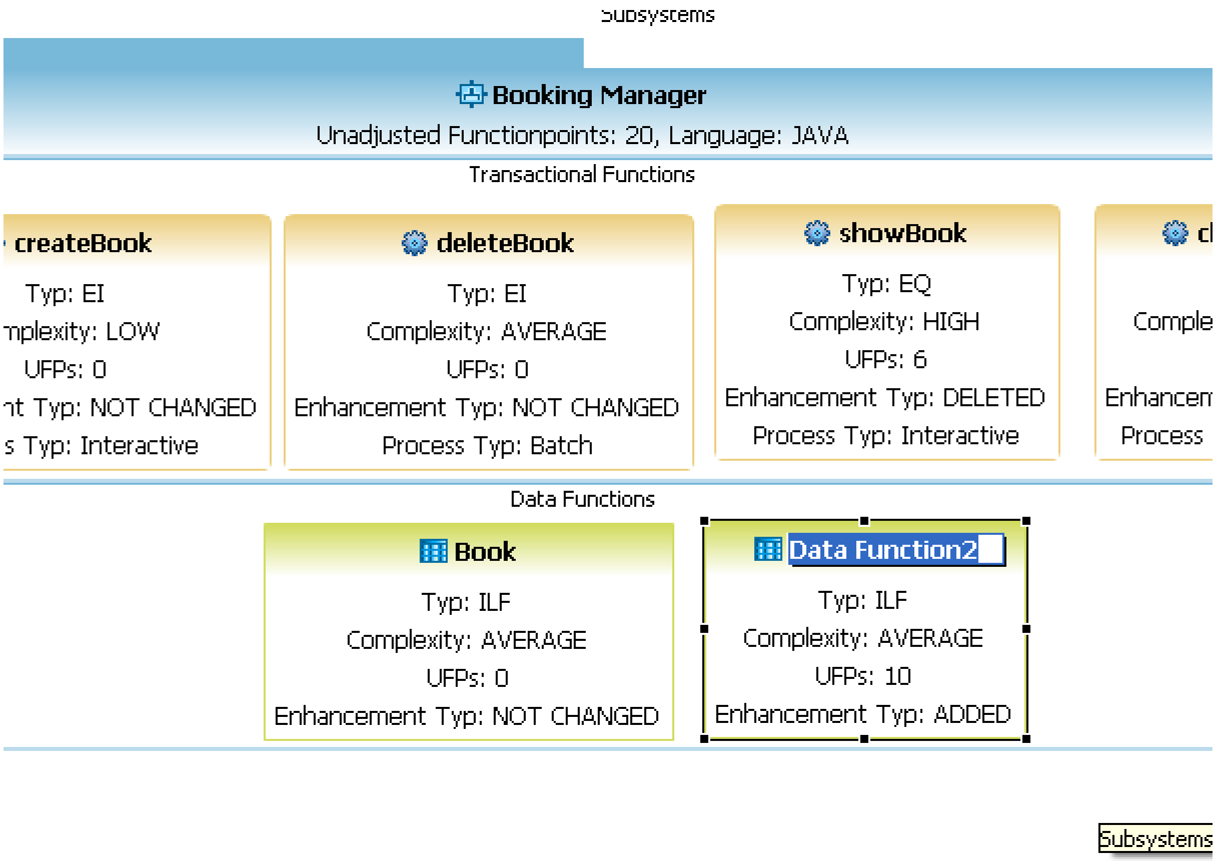
You must have a Function Point Modeler diagram open. By default, the Palette view opens when you are editing Function Point Modeler Diagram file in Function Point Modeler.

To create a **Data Function** :

1. Click FPM Notes drawer in the Palette view. The drawer expands and displays a list of following items:

   - **Application System**
   - **Sub System**
   - **Transactional Function**
   - **Data Function**

   You can drag and drop it onto the Function Point Modeler Diagram Editor.
2. Drag a **Data Function** item from a drawer to the desired place inside of the **Data Functions** section the **Sub System** . You can also click a location **Data Functions** section, and then click on an item in the drawer. Make sure that you drag and drop appropriate items **Data Functions** section. For example, you can not drop **Data Function** item onto **Transactional Functions** section of **Sub System** .
3. A new **Data Function** is created and displayed in the diagram with the name *Data Function1*
4. Once the **Data Function** appears on the diagram inside of the **Sub System** , you can usually set some attributes for it in the Properties view or you can click the attribute of the **Data Function** to set its value. Type a desired name for the **Data Function** and press Enter.



Booking Manager

Unadjusted Functionpoints: 20, Language: JAVA

createBook
Typ: EI
mplexity: LOW
UFPs: 0
nt Typ: NOT CHANGED
s Typ: Interactive

deleteBook
Typ: EI
Complexity: AVERAGE
UFPs: 0
Enhancement Typ: NOT CHANGED
Process Typ: Batch

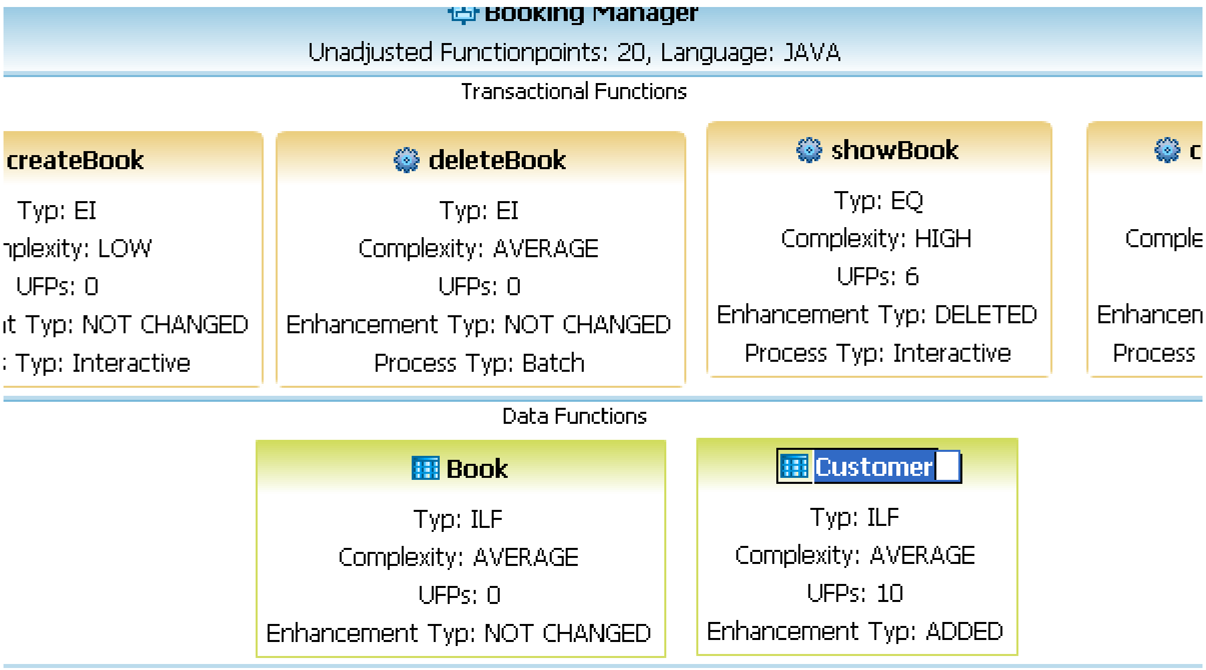
showBook
Typ: EQ
Complexity: HIGH
UFPs: 6
Enhancement Typ: DELETED
Process Typ: Interactive

cl
Comple
Enhancem
Process

Book
Typ: ILF
Complexity: AVERAGE
UFPs: 0
Enhancement Typ: NOT CHANGED

Data Function2
Typ: ILF
Complexity: AVERAGE
UFPs: 10
Enhancement Typ: ADDED

**5.** Enter the name **Customer** and press Enter.



Booking Manager

Unadjusted Functionpoints: 20, Language: JAVA

createBook
Typ: EI
nplexity: LOW
UFPs: 0
nt Typ: NOT CHANGED
: Typ: Interactive

deleteBook
Typ: EI
Complexity: AVERAGE
UFPs: 0
Enhancement Typ: NOT CHANGED
Process Typ: Batch

showBook
Typ: EQ
Complexity: HIGH
UFPs: 6
Enhancement Typ: DELETED
Process Typ: Interactive

c
Comple
Enhancen
Process

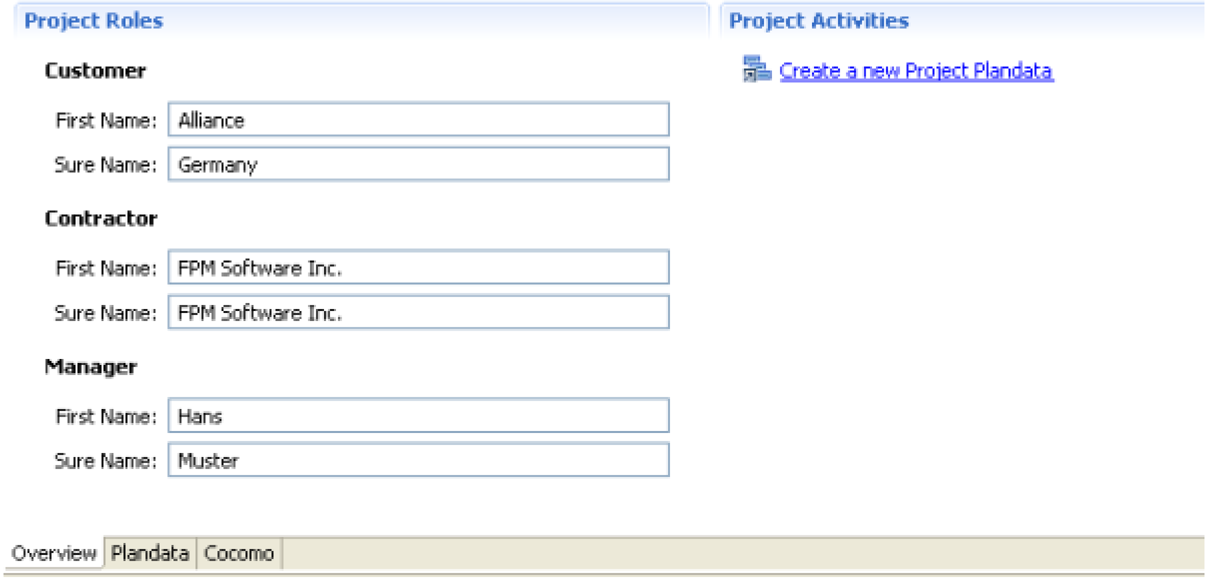
Book
Typ: ILF
Complexity: AVERAGE
UFPs: 0
Enhancement Typ: NOT CHANGED

Customer
Typ: ILF
Complexity: AVERAGE
UFPs: 10
Enhancement Typ: ADDED

### Calculate Estimation

You can add a **ProjectPlanData** as following.:

1. Select the project **EnhancementProjectCount** and open **Project Editor** for the current selected project.
2. Click on **Create a new Project Plandata**



Project Roles

Customer

First Name: Alliance

Sure Name: Germany

Contractor

First Name: FPM Software Inc.

Sure Name: FPM Software Inc.

Manager

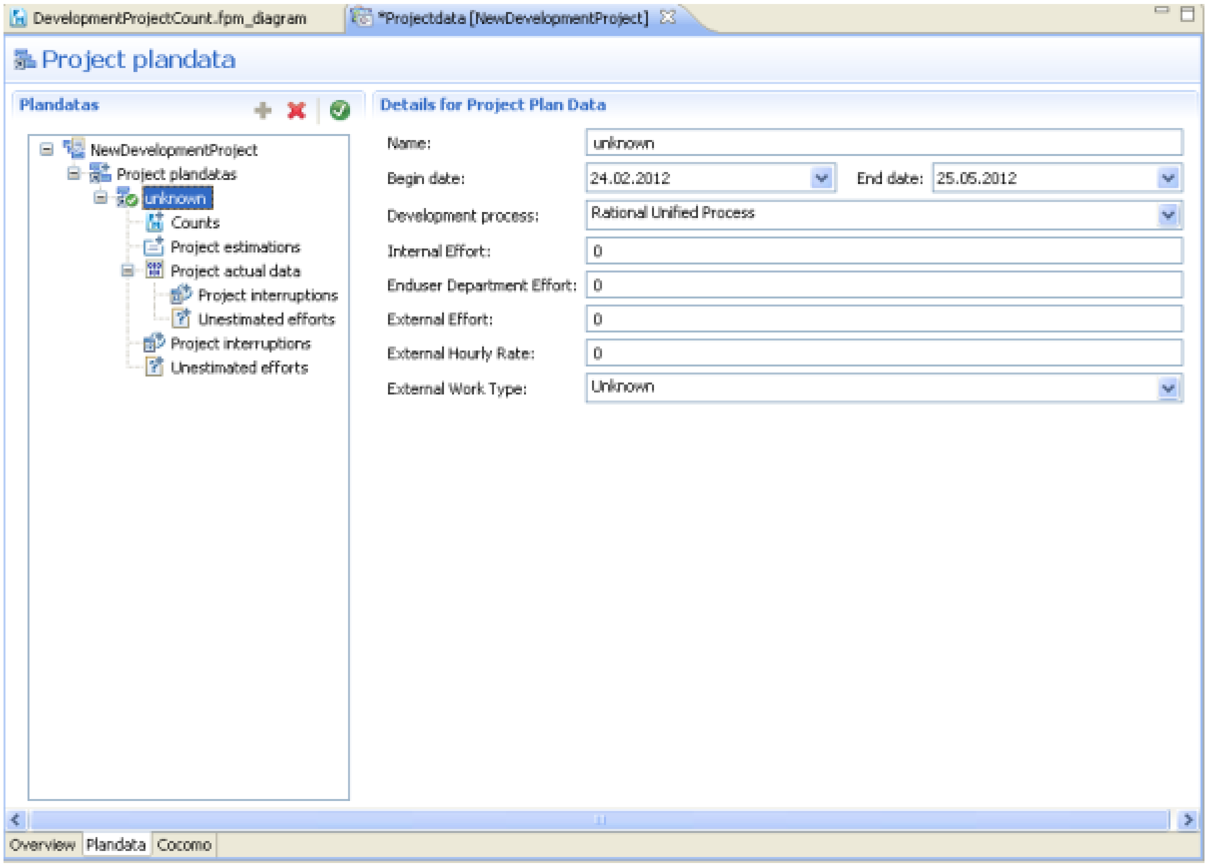
First Name: Hans

Sure Name: Muster

Project Activities

Create a new Project Plandata

3. The following object structure will have been created.



Name: unknown

Begin date: 24.02.2012 End date: 25.05.2012

Development process: Rational Unified Process

Internal Effort: 0

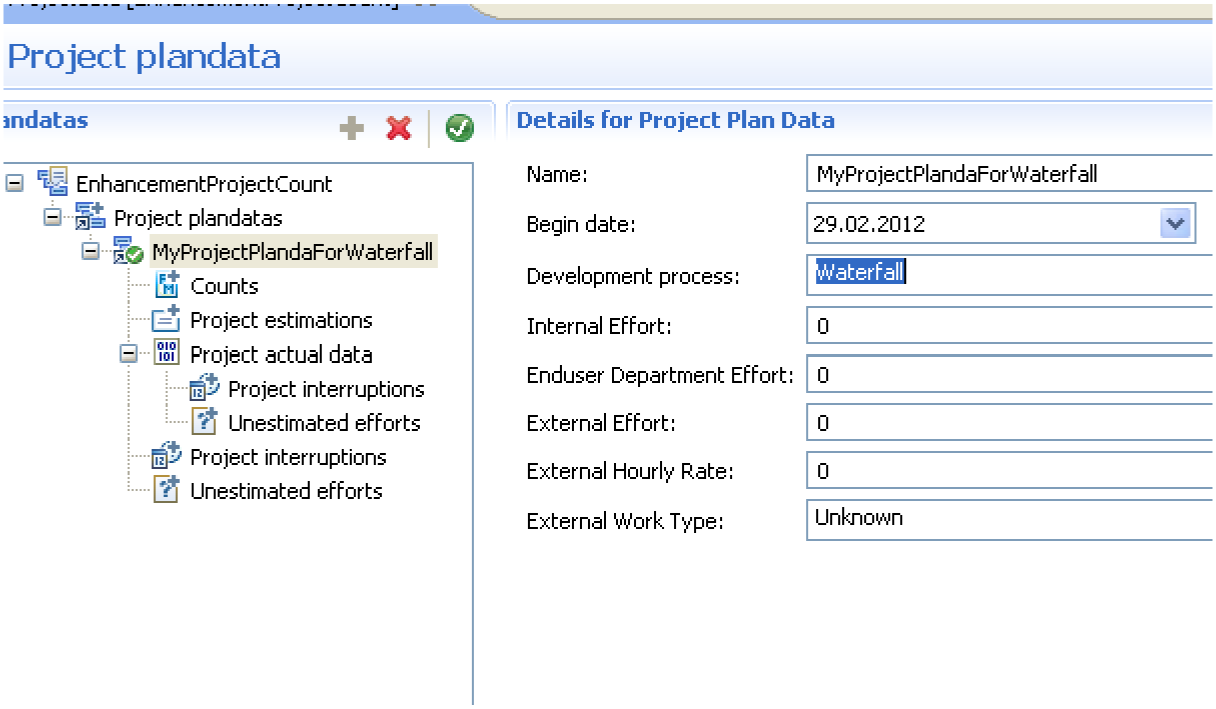
Enduser Department Effort: 0

External Effort: 0

External Hourly Rate: 0

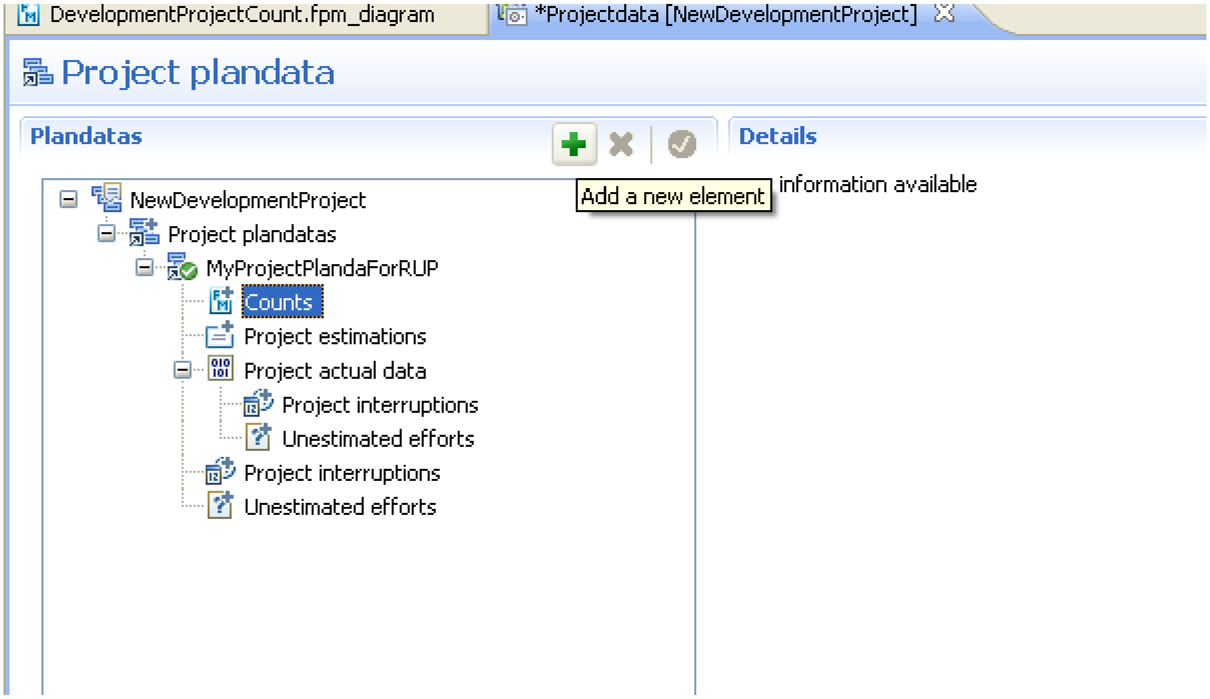
External Work Type: Unknown

4. Select **Waterfall** from the *Development process* combobox.
5. Enter the name **MyProjectPlandaForWaterfall** and save the **ProjectPlanData** .



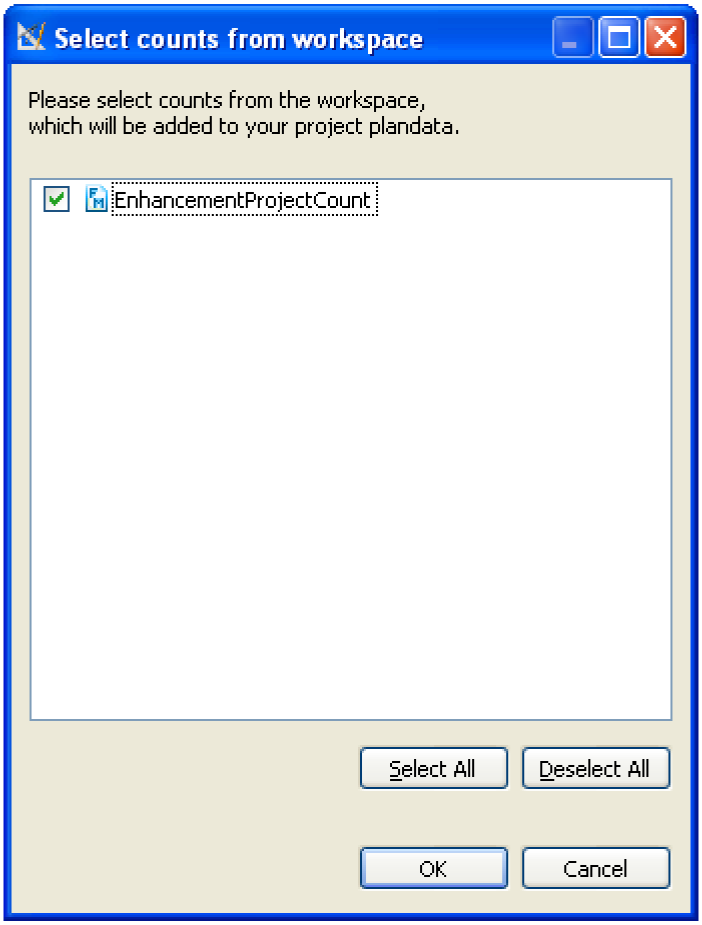
Name: MyProjectPlandaForWaterfall
Begin date: 29.02.2012
Development process: Waterfall
Internal Effort: 0
Enduser Department Effort: 0
External Effort: 0
External Hourly Rate: 0
External Work Type: Unknown

6. Select the **Counts** in the tree.
7. Click on the button **Add a new element**



information available

8. Select the counts from the following dialog.

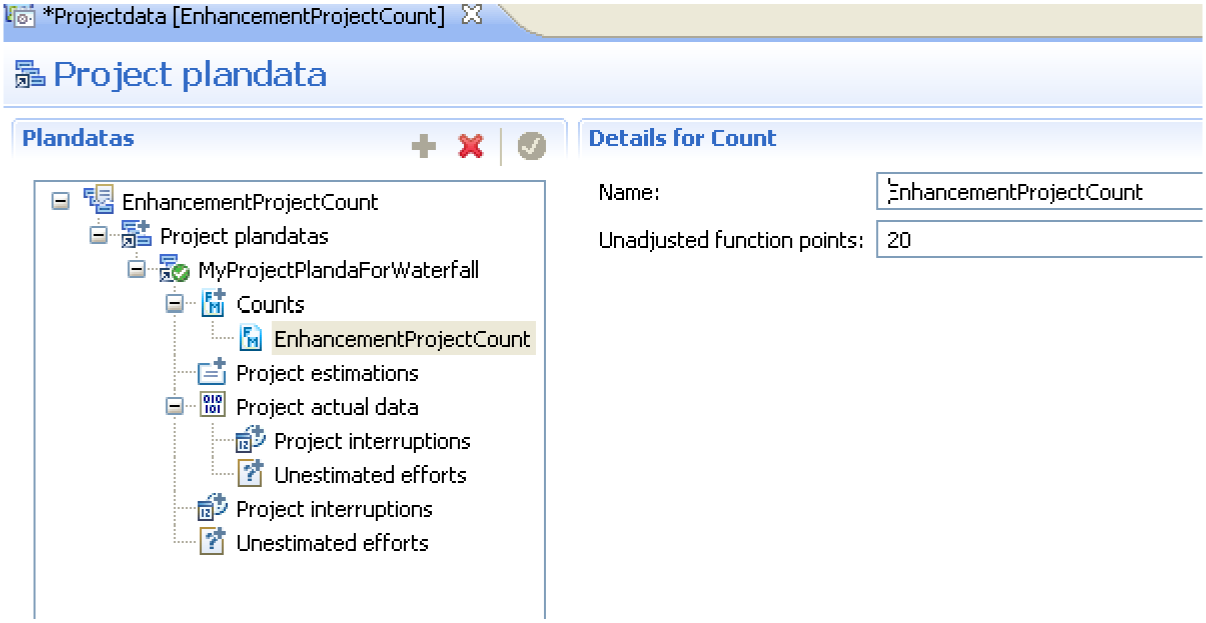


Select counts from workspace

Please select counts from the workspace, which will be added to your project plandata.

☑ EnhancementProjectCount

9. The selected count will be added to the **ProjectPlanData** and save the **ProjectPlanData**



*Projectdata [EnhancementProjectCount]

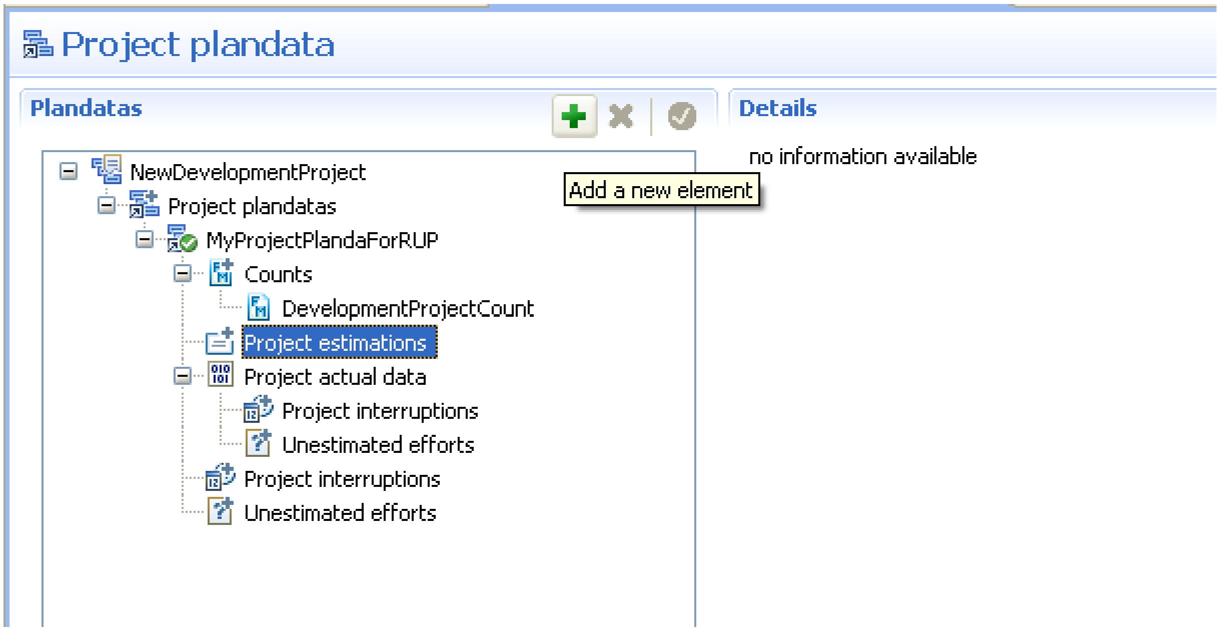
Project plandata

Name: EnhancementProjectCount

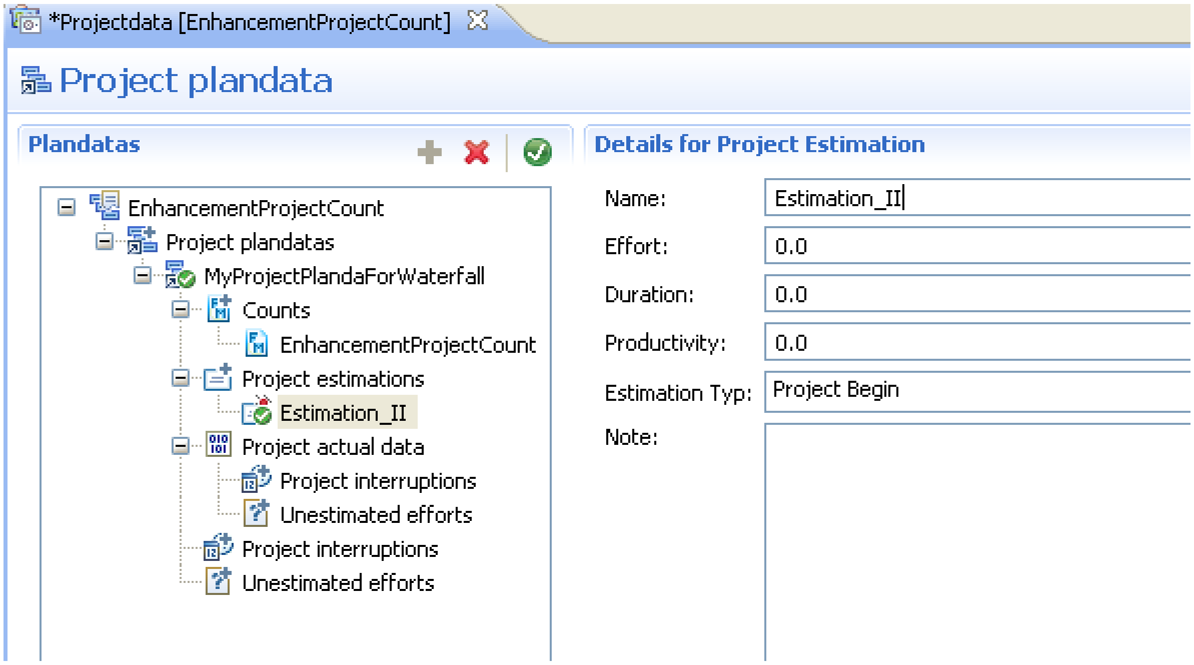
Unadjusted function points: 20

10. Select the **Project estimations** in the tree.

**11.** Click on the button **Add a new element**

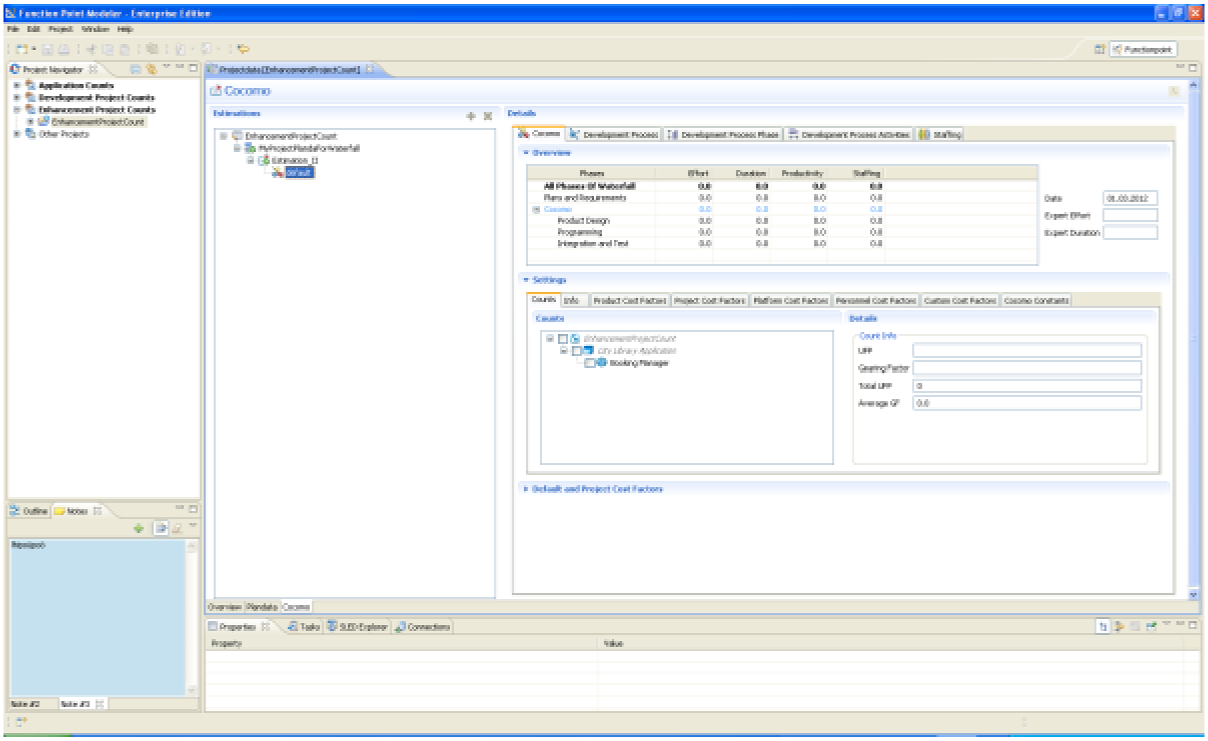


**12.** Enter the name **Estimation_II** and save the **ProjectPlanData**

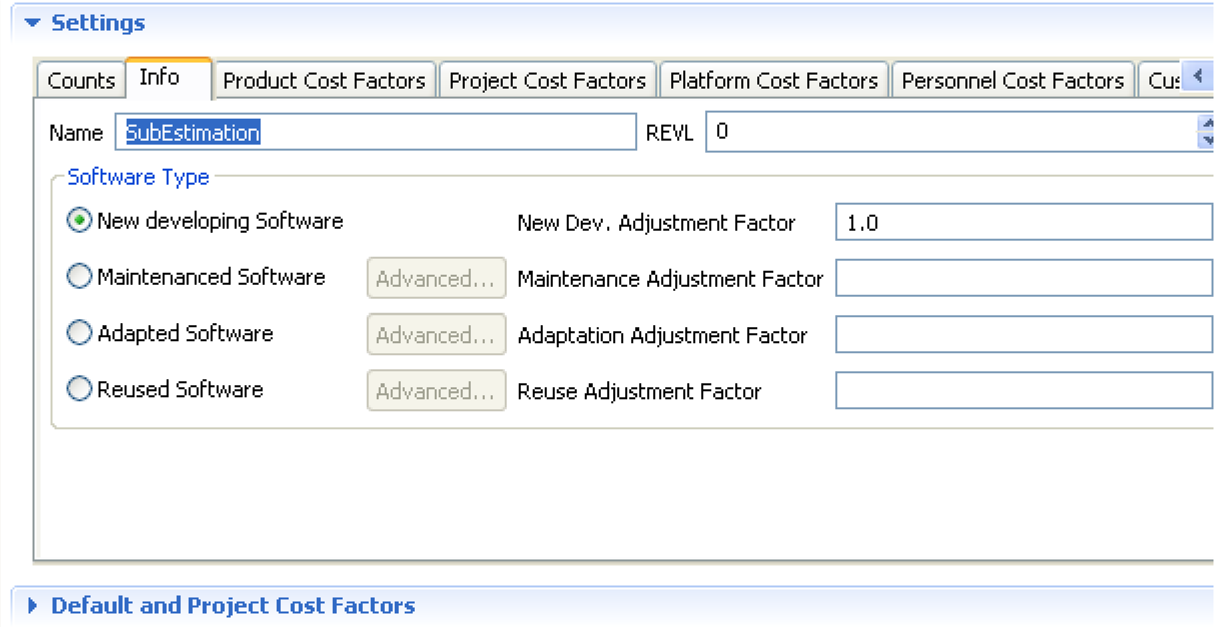


Name: Estimation_II
Effort: 0.0
Duration: 0.0
Productivity: 0.0
Estimation Typ: Project Begin
Note:

**13.** Click on the **COCOMO** tab. It will show the Cocomo editor of the project editor.



**14.** Select the **default** sub estimation. Click on the tab **Info** in the **Setting** section . Change the name as **SubEstimation** .

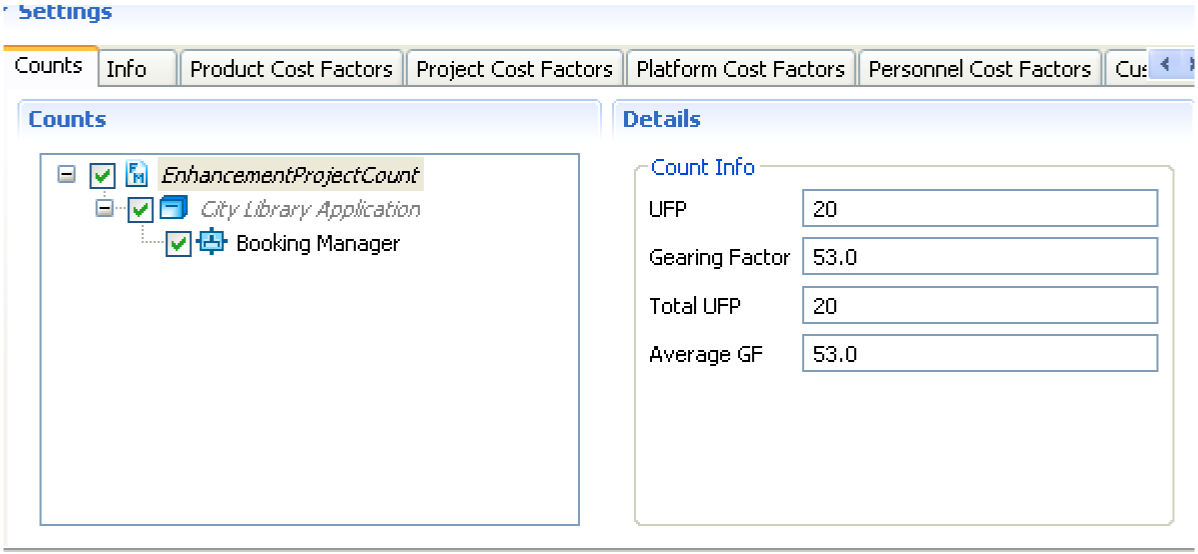


Name SubEstimation REVL 0

Software Type

- ● New developing Software — New Dev. Adjustment Factor 1.0
- ○ Maintenanced Software — Maintenance Adjustment Factor
- ○ Adapted Software — Adaptation Adjustment Factor
- ○ Reused Software — Reuse Adjustment Factor

**15.** Select the **SubEstimation** and select the count **Booking Manager** .



EnhancementProjectCount
City Library Application
Booking Manager

Count Info

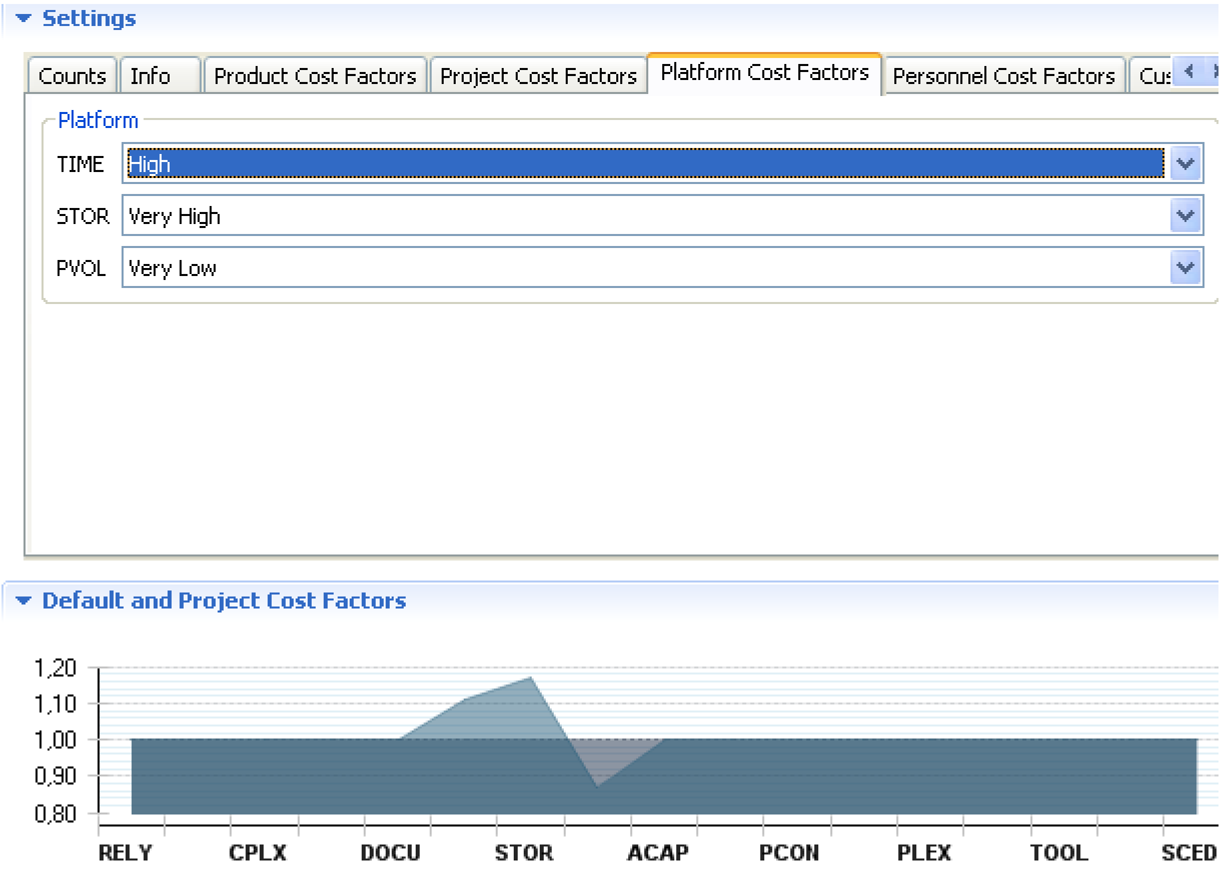
UFP 20

Gearing Factor 53.0

Total UFP 20

Average GF 53.0

**16.** Set the complexity of some **cost factors** .

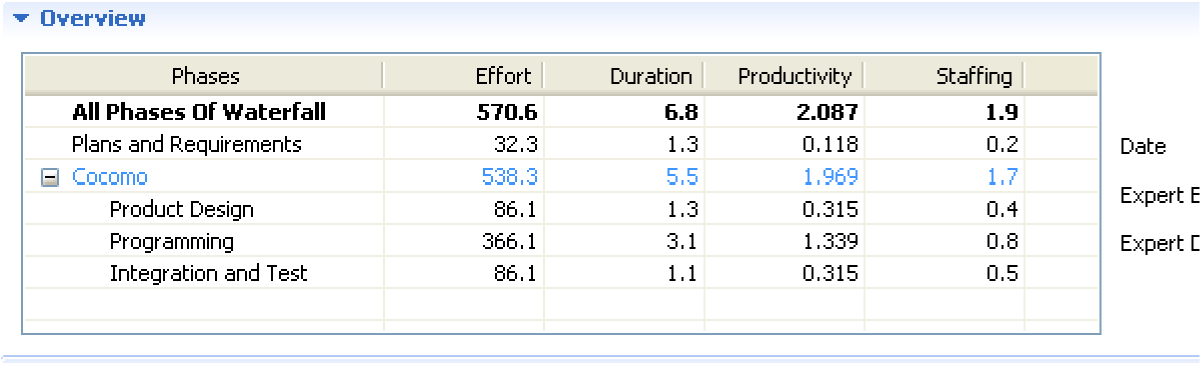


TIME High

STOR Very High

PVOL Very Low

**17.** The estimation for this count will be calculated.



Overview

| Phases | Effort | Duration | Productivity | Staffing |
|---|---|---|---|---|
| **All Phases Of Waterfall** | **570.6** | **6.8** | **2.087** | **1.9** |
| Plans and Requirements | 32.3 | 1.3 | 0.118 | 0.2 |
| Cocomo | 538.3 | 5.5 | 1.969 | 1.7 |
| Product Design | 86.1 | 1.3 | 0.315 | 0.4 |
| Programming | 366.1 | 3.1 | 1.339 | 0.8 |
| Integration and Test | 86.1 | 1.1 | 0.315 | 0.5 |

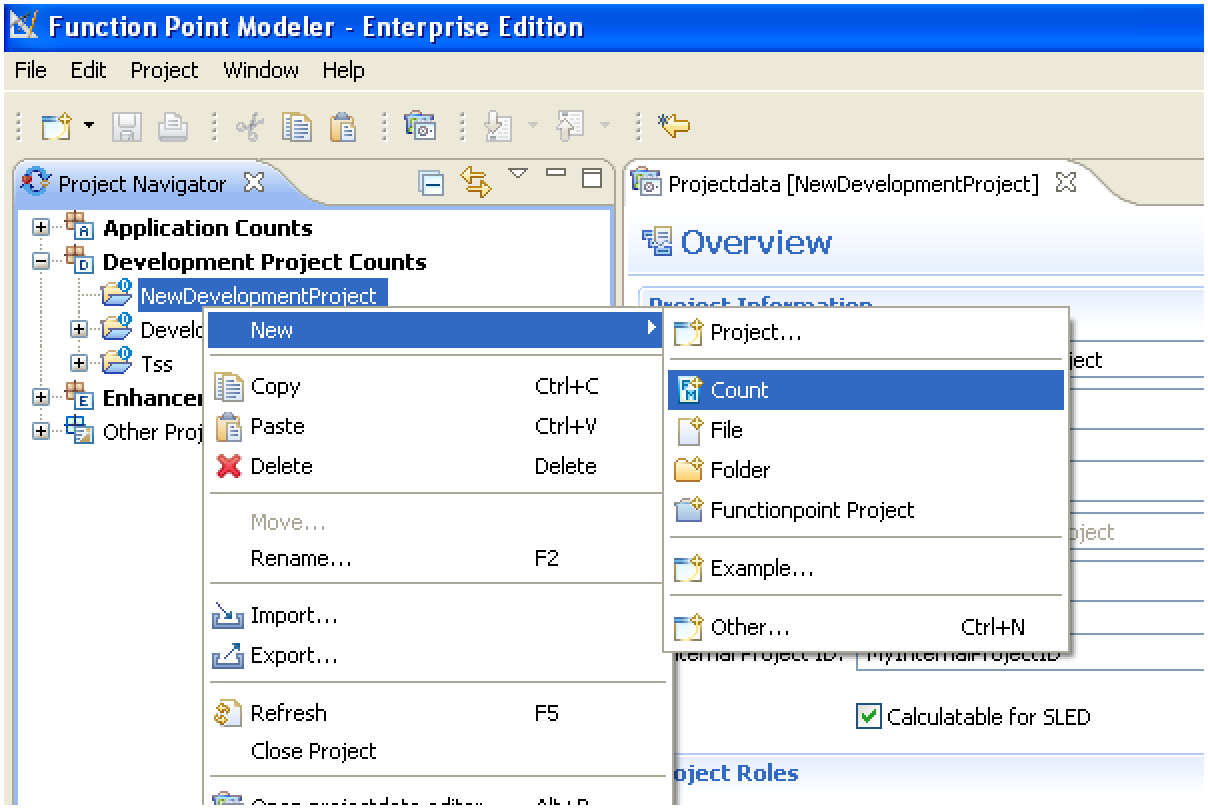
### Re-Calculate the Baseline

We will now create an **Application Count** from the previously **Enhancement Project Count** as following.

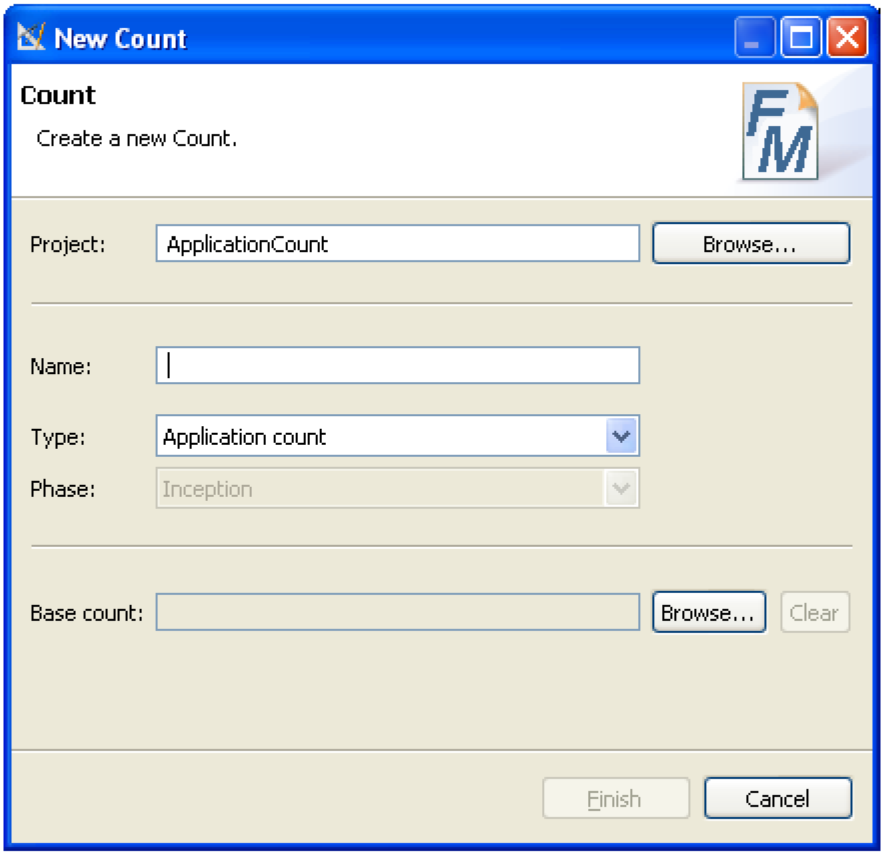
### Update an existing Application Count

Once you have created an **Enhancement Project Count** you have to update the **Application Count** for the current application.

**1.** From the main menu bar, select ***File >New > Functionpoint Project***



**2.** The following wizard dialog will be showed.



New Count

Count

Create a new Count.

Project: ApplicationCount

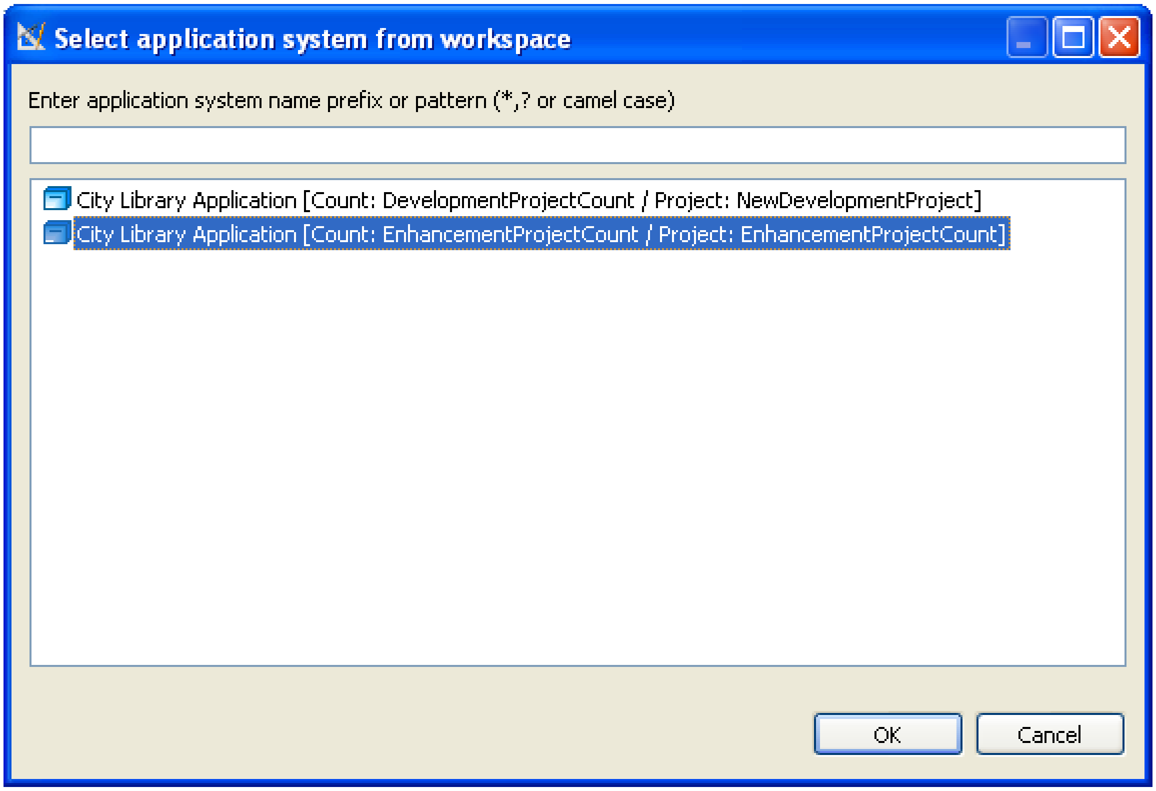
Name:

Type: Application count

Phase: Inception

Base count:

- Click the button **Browse...** and select the **City Library Application** with **Enhancement Project Count**



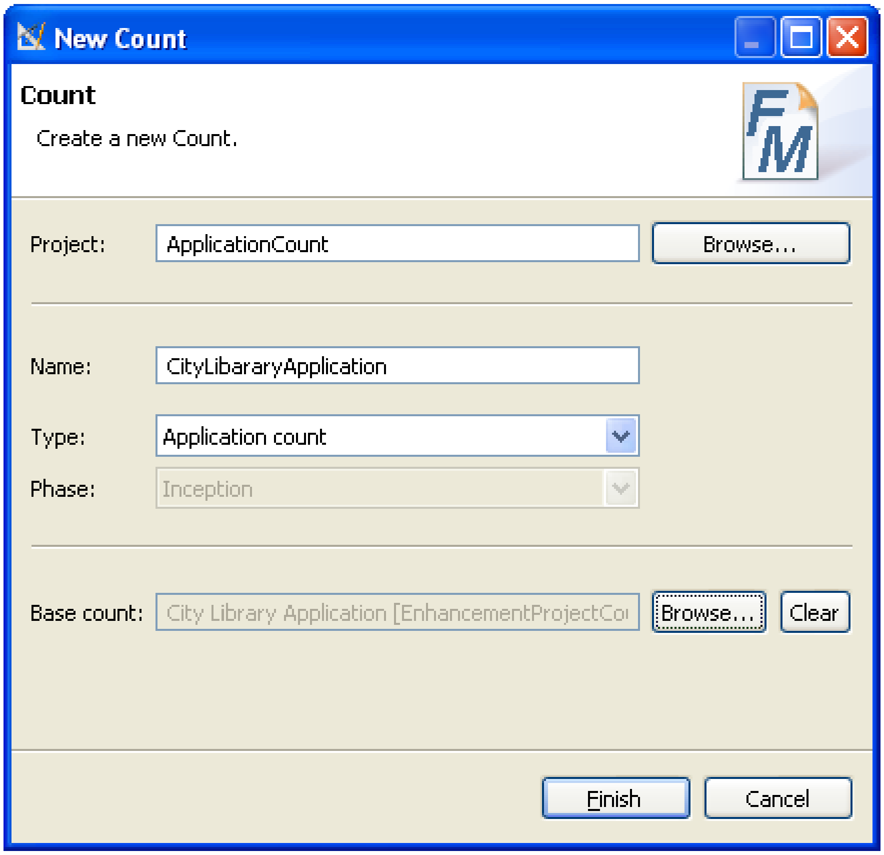
Select application system from workspace

Enter application system name prefix or pattern (*,? or camel case)

City Library Application [Count: DevelopmentProjectCount / Project: NewDevelopmentProject]

City Library Application [Count: EnhancementProjectCount / Project: EnhancementProjectCount]

- The following dialog will be showed.



New Count

Count

Create a new Count.

Project: ApplicationCount

Name: CityLibararyApplication

Type: Application count

Phase: Inception

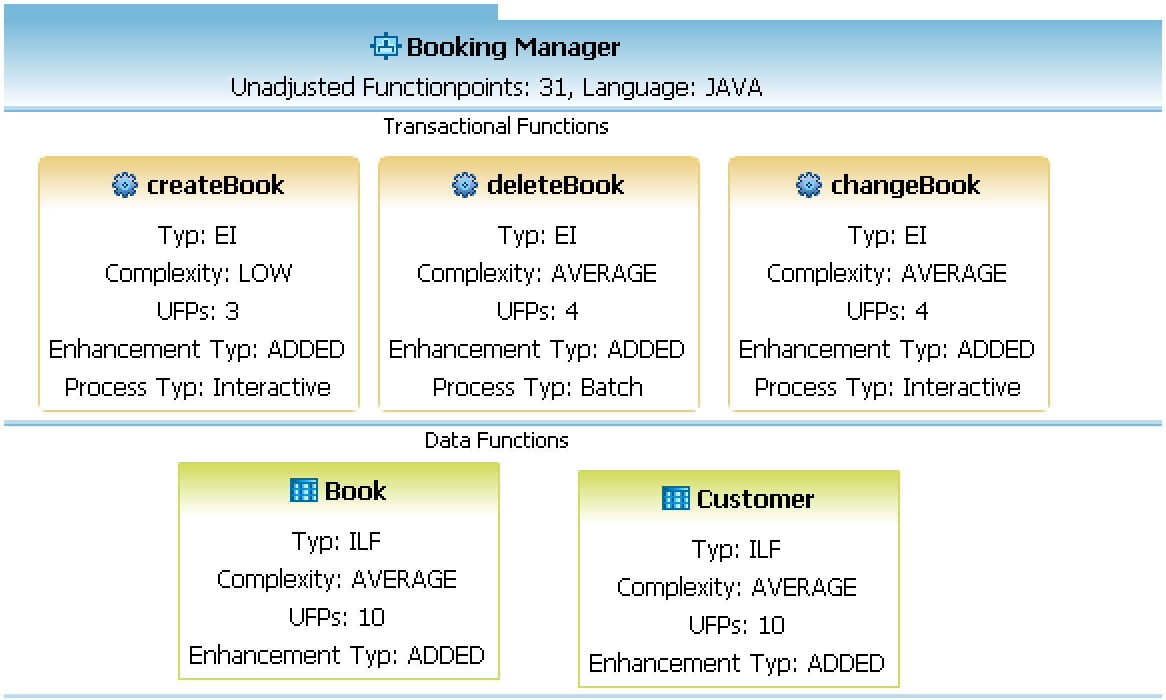
Base count: City Library Application [EnhancementProjectCo

- And click the button **Finish**

The **Application Count** will be updated from **Enhancement Project Count** . The **showBook** will be deleted from the **Application Count** because its **Enhancement Type** is set as **DELTED** in the **Enhancement Project Count** .

The transactional function **changeBook** and data function **Customer** will be added to the **Application Count**

The new updated **Application Count** looks like as following



Booking Manager

Unadjusted Functionpoints: 31, Language: JAVA

Transactional Functions

createBook

Typ: EI

Complexity: LOW

UFPs: 3

Enhancement Typ: ADDED

Process Typ: Interactive

deleteBook

Typ: EI

Complexity: AVERAGE

UFPs: 4

Enhancement Typ: ADDED

Process Typ: Batch

changeBook

Typ: EI

Complexity: AVERAGE

UFPs: 4

Enhancement Typ: ADDED

Process Typ: Interactive

Data Functions

Book

Typ: ILF

Complexity: AVERAGE

UFPs: 10

Enhancement Typ: ADDED

Customer

Typ: ILF

Complexity: AVERAGE

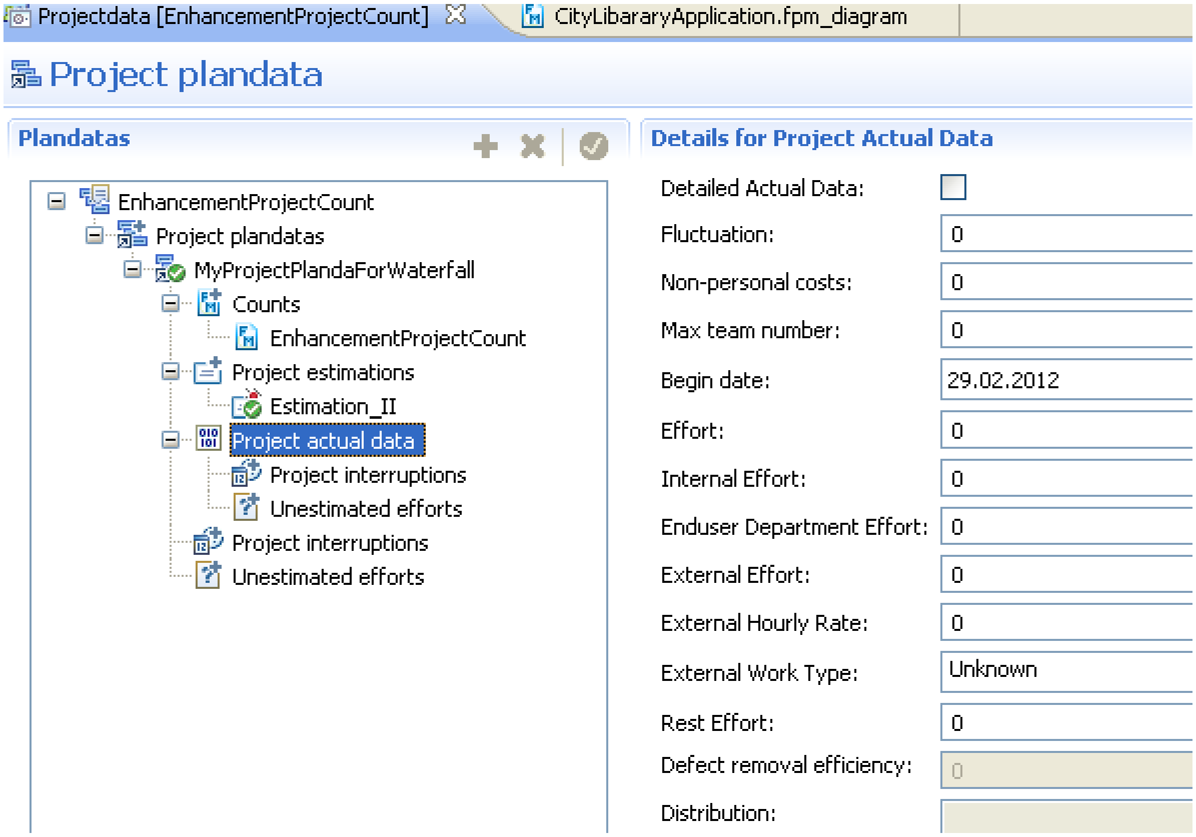
UFPs: 10

Enhancement Typ: ADDED

### Create a project actual data

Once you have completed your project you can begin to gather **Project Actual Data** .

1. Select the **Project actual datas** in the tree. You will see the following dialog. This is the default level without any detail of the used software development process phases. **Project Actual Data** without detail means, that you can gather project actual data for whole project without phases of of the used software development process.



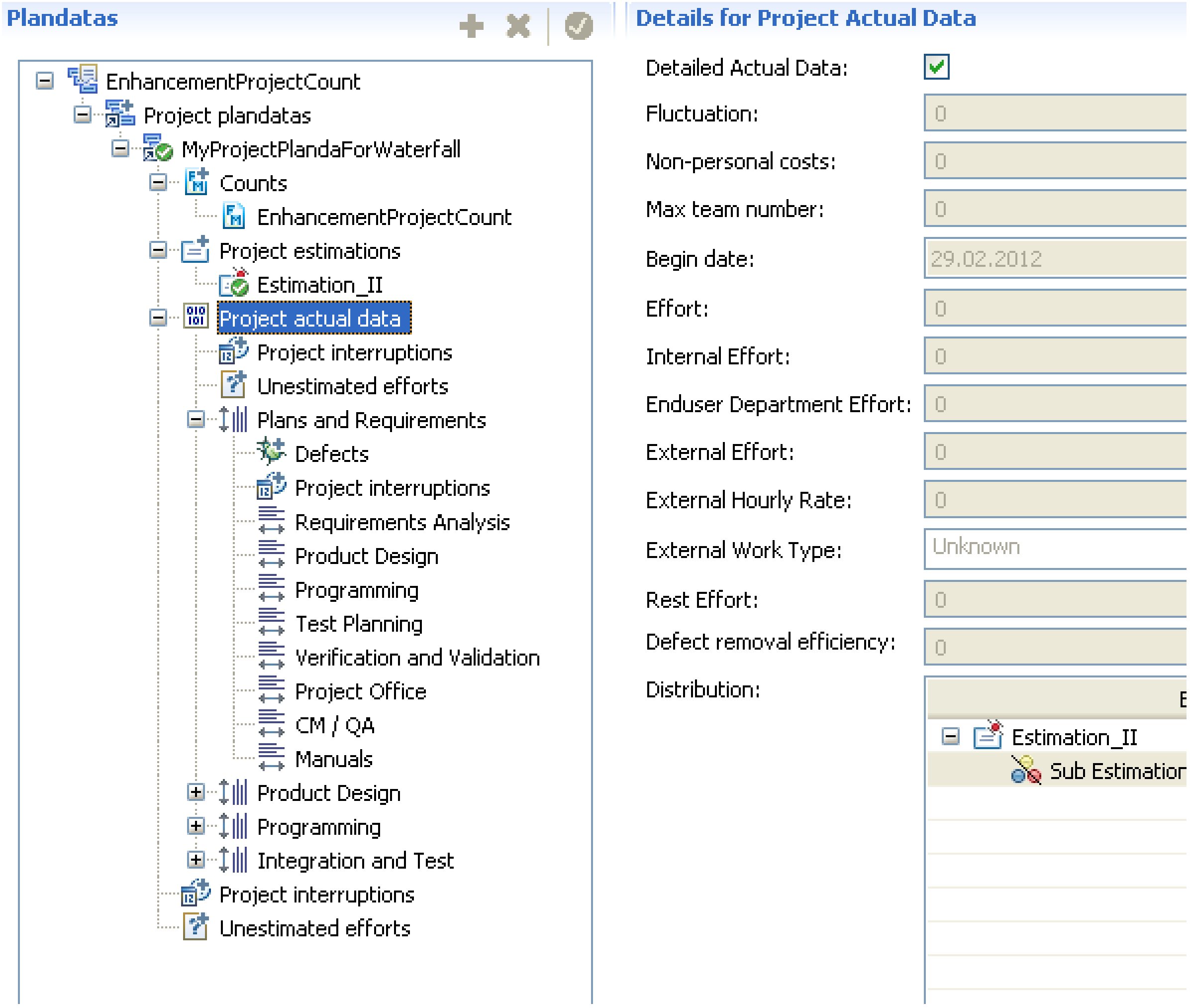
Project plandata

Details for Project Actual Data

| | |
|---|---|
| Detailed Actual Data: | □ |
| Fluctuation: | 0 |
| Non-personal costs: | 0 |
| Max team number: | 0 |
| Begin date: | 29.02.2012 |
| Effort: | 0 |
| Internal Effort: | 0 |
| Enduser Department Effort: | 0 |
| External Effort: | 0 |
| External Hourly Rate: | 0 |
| External Work Type: | Unknown |
| Rest Effort: | 0 |
| Defect removal efficiency: | 0 |
| Distribution: | |

**2.** If you click on the check box **Detailed Actual Data** in the editor. You will see in this case a detailed structure of the used software development process with its phase. **Project Actual Data** with detail means, that you can gather project actual data for each phases of the used software development process.

If you click on the check box **Detailed Actual Data** of a phase in the editor. You can also specify, whether you want to specify for each activity of any phase. In this case you can gather project actual data for each activity of each phases of of the used software development process.



Plandatas

- EnhancementProjectCount
  - Project plandatas
    - MyProjectPlandaForWaterfall
      - Counts
        - EnhancementProjectCount
      - Project estimations
        - Estimation_II
      - Project actual data
        - Project interruptions
        - Unestimated efforts
        - Plans and Requirements
          - Defects
          - Project interruptions
          - Requirements Analysis
          - Product Design
          - Programming
          - Test Planning
          - Verification and Validation
          - Project Office
          - CM / QA
          - Manuals
        - Product Design
        - Programming
        - Integration and Test
      - Project interruptions
      - Unestimated efforts

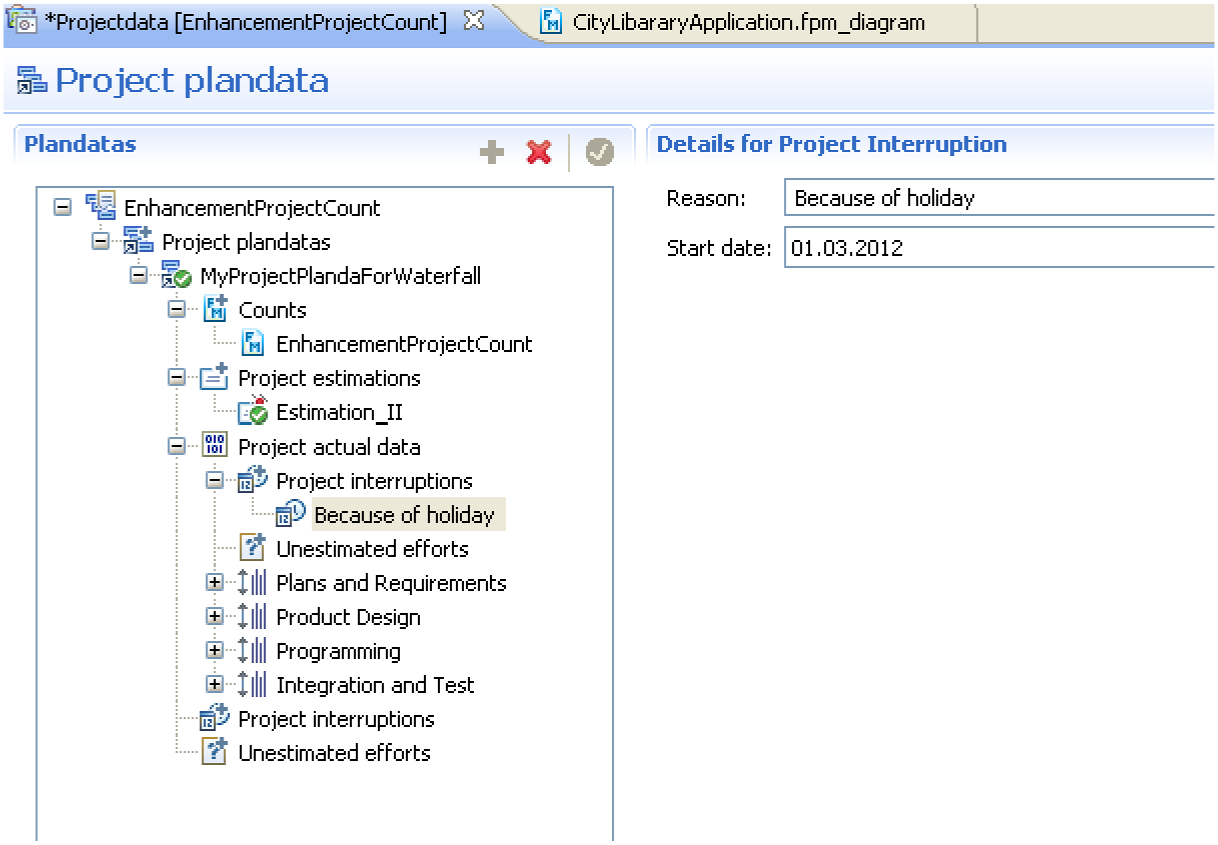
Details for Project Actual Data

| | |
|---|---|
| Detailed Actual Data: | ☑ |
| Fluctuation: | 0 |
| Non-personal costs: | 0 |
| Max team number: | 0 |
| Begin date: | 29.02.2012 |
| Effort: | 0 |
| Internal Effort: | 0 |
| Enduser Department Effort: | 0 |
| External Effort: | 0 |
| External Hourly Rate: | 0 |
| External Work Type: | Unknown |
| Rest Effort: | 0 |
| Defect removal efficiency: | 0 |
| Distribution: | E<br>Estimation_II<br>Sub Estimatior |

## Add a project interruption

You can add a **Project Interruption** as following.:

1. Click on **Project interruptions** and click on the button **Add a new element**
2. Enter the name as **Because of holiday**
3. Set the **Start date** and **End date** of the current **Project Interruption**



*Projectdata [EnhancementProjectCount]

CityLibararyApplication.fpm_diagram

Project plandata

Plandatas

- EnhancementProjectCount
  - Project plandatas
    - MyProjectPlandaForWaterfall
      - Counts
        - EnhancementProjectCount
      - Project estimations
        - Estimation_II
      - Project actual data
        - Project interruptions
          - Because of holiday
        - Unestimated efforts
        - Plans and Requirements
        - Product Design
        - Programming
        - Integration and Test
      - Project interruptions
      - Unestimated efforts

Details for Project Interruption

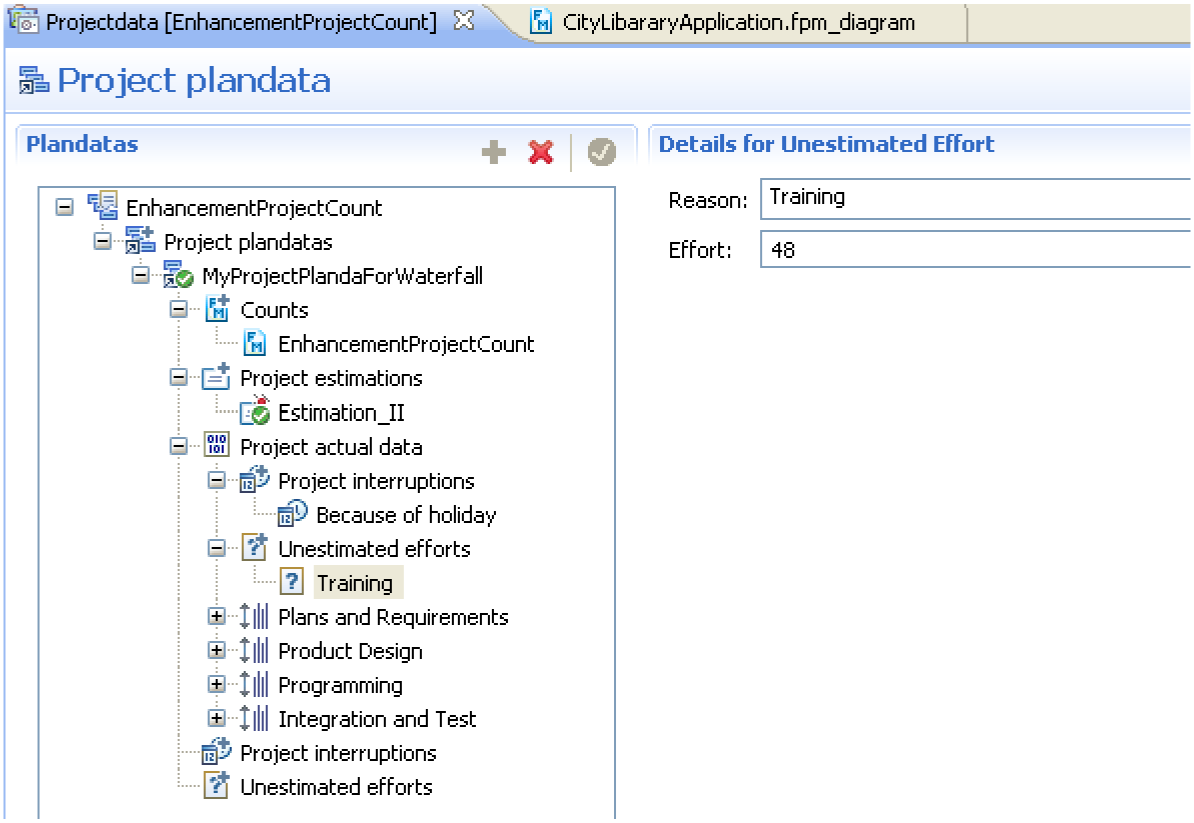
Reason: Because of holiday

Start date: 01.03.2012

## Add an unestimated project effort

You can add an **Unestimated Project Effort** as following.:

1. Click on **Unestimated efforts** and click on the button **Add a new element**
2. Select the **Training** from the combo box.
3. Set the **Effort** of this **Unestimated Project Effort** as 48 hours.



Reason: Training

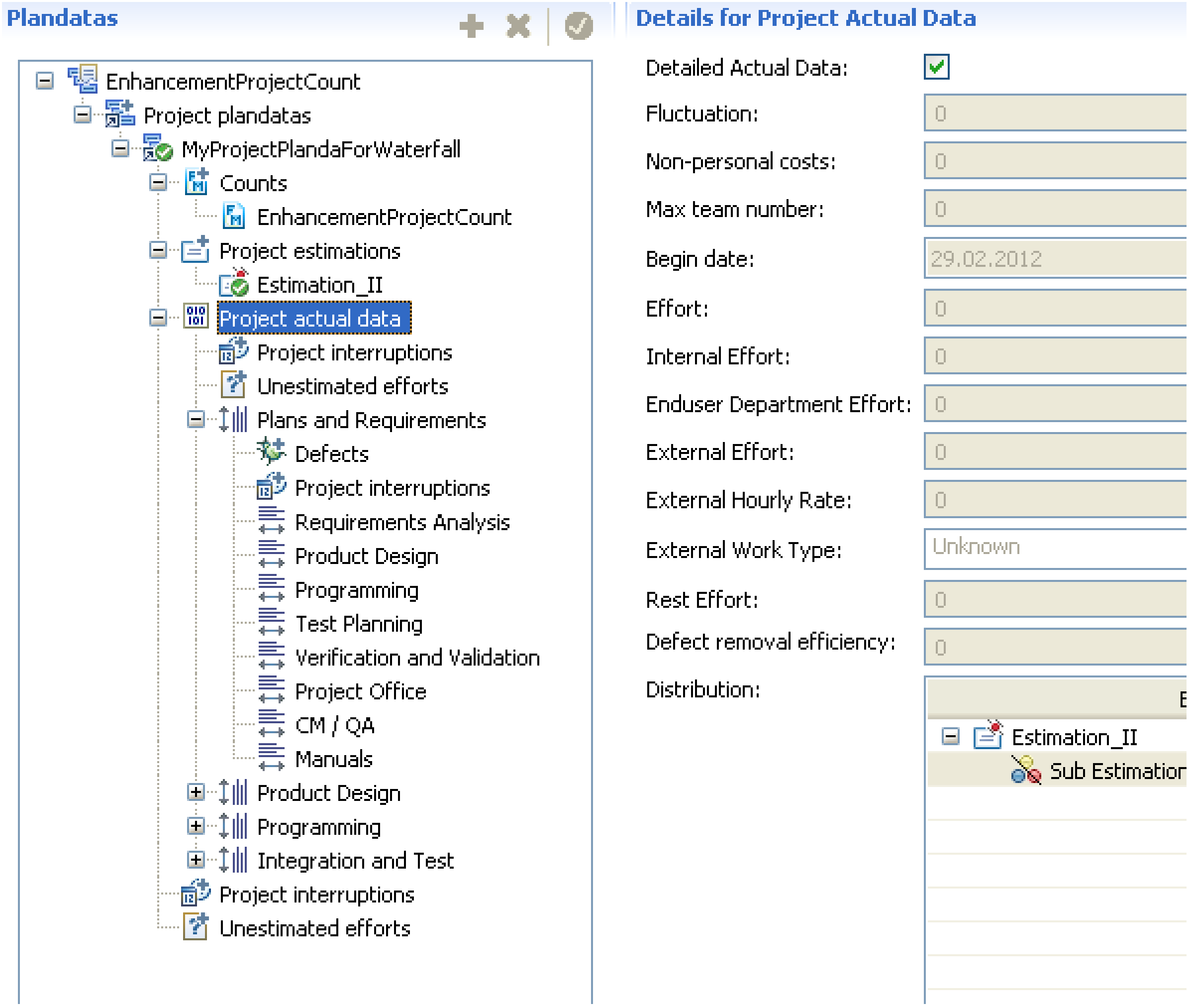
Effort: 48

## Detailed actual data with phases

Once you have completed your project you can begin to gather **Project Actual Data** .

1. If you click on the check box **Detailed Actual Data** of any phase in the editor. You will see in this case a detailed structure of the used software development process with its phase and activities. **Project Actual Data** with detail means, that you can gather project actual data for each activity of any phases.

   If you click on the check box **Detailed Actual Data** of a phase in the editor. You can also specify, whether you want to specify for each activity of any phase. In this case you can gather project actual data for each activity of each phases of of the used software development process.



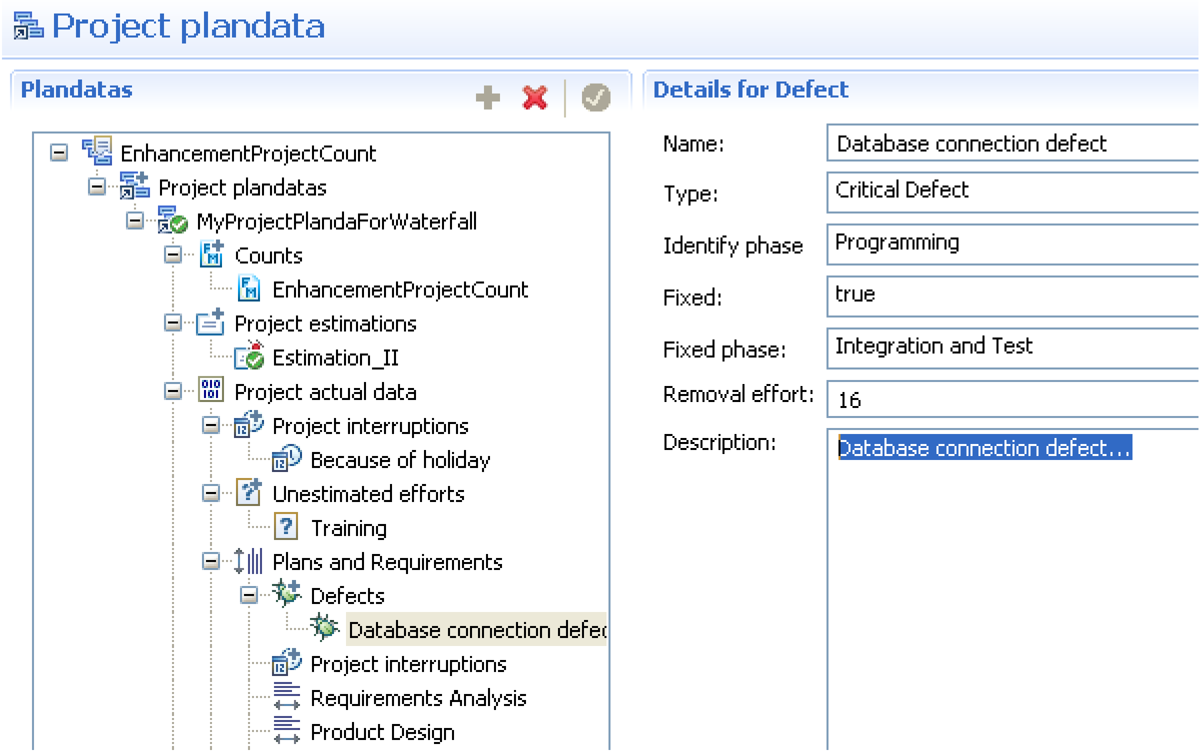
Details for Project Actual Data

Detailed Actual Data: ☑
Fluctuation: 0
Non-personal costs: 0
Max team number: 0
Begin date: 29.02.2012
Effort: 0
Internal Effort: 0
Enduser Department Effort: 0
External Effort: 0
External Hourly Rate: 0
External Work Type: Unknown
Rest Effort: 0
Defect removal efficiency: 0
Distribution:

*Add defect*

You can add a **Defect** as following.:

1. Click on **Defects** of any **Phase** and click on the button **Add a new element**
2. Enter the name as *Database connection defect*
3. Select the **Type** as *Critical Defect*
4. Select the **Identify Phase** as *Programming*
5. Select the **Fixed** as *true*
6. Select the **Fixed Phase** as *Integration Test*
7. Enter the **Removal effort Phase** as *16*
8. Enter the **Description** as *Database connection defect...*
9. Save the project
10.



Project plandata

Plandatas

- EnhancementProjectCount
  - Project plandatas
    - MyProjectPlandaForWaterfall
      - Counts
        - EnhancementProjectCount
      - Project estimations
        - Estimation_II
      - Project actual data
        - Project interruptions
          - Because of holiday
        - Unestimated efforts
          - Training
        - Plans and Requirements
          - Defects
            - Database connection defec
          - Project interruptions
          - Requirements Analysis
          - Product Design

Details for Defect

Name: Database connection defect

Type: Critical Defect

Identify phase Programming

Fixed: true

Fixed phase: Integration and Test

Removal effort: 16

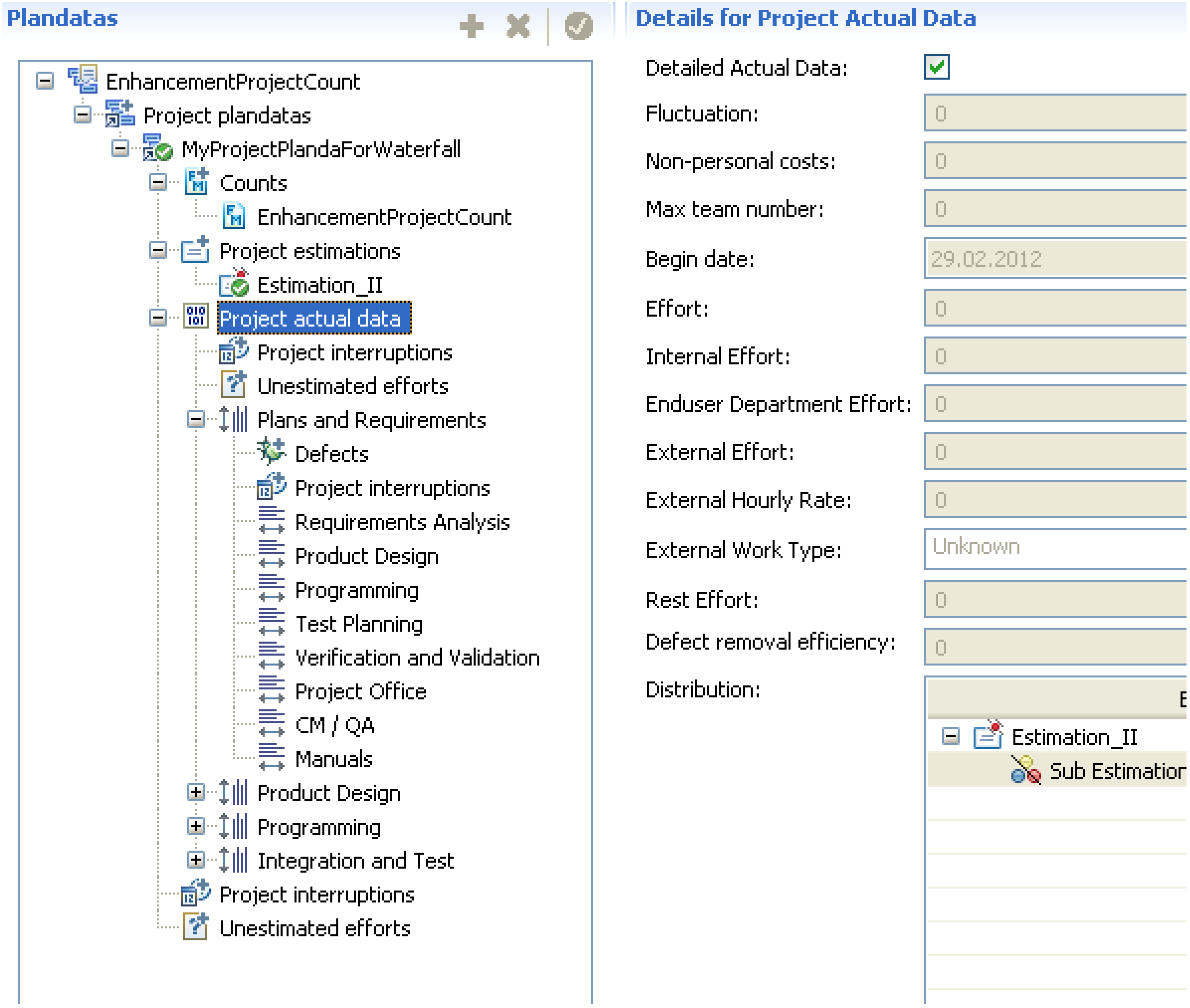
Description: Database connection defect...

### *Detailed actual data with activities*

Once you have completed your project you can begin to gather **Project Actual Data** .

1. If you click on the check box **Detailed Actual Data** of any phase in the editor. You will see in this case a detailed structure of the used software development process with its phase and activities. **Project Actual Data** with detail means, that you can gather project actual data for each activity of any phases.

   If you click on the check box **Detailed Actual Data** of a phase in the editor. You can also specify, whether you want to specify for each activity of any phase. In this case you can gather project actual data for each activity of each phases of of the used software development process.



Details for Project Actual Data

Detailed Actual Data: ☑

Fluctuation: 0

Non-personal costs: 0

Max team number: 0

Begin date: 29.02.2012

Effort: 0

Internal Effort: 0

Enduser Department Effort: 0

External Effort: 0

External Hourly Rate: 0

External Work Type: Unknown

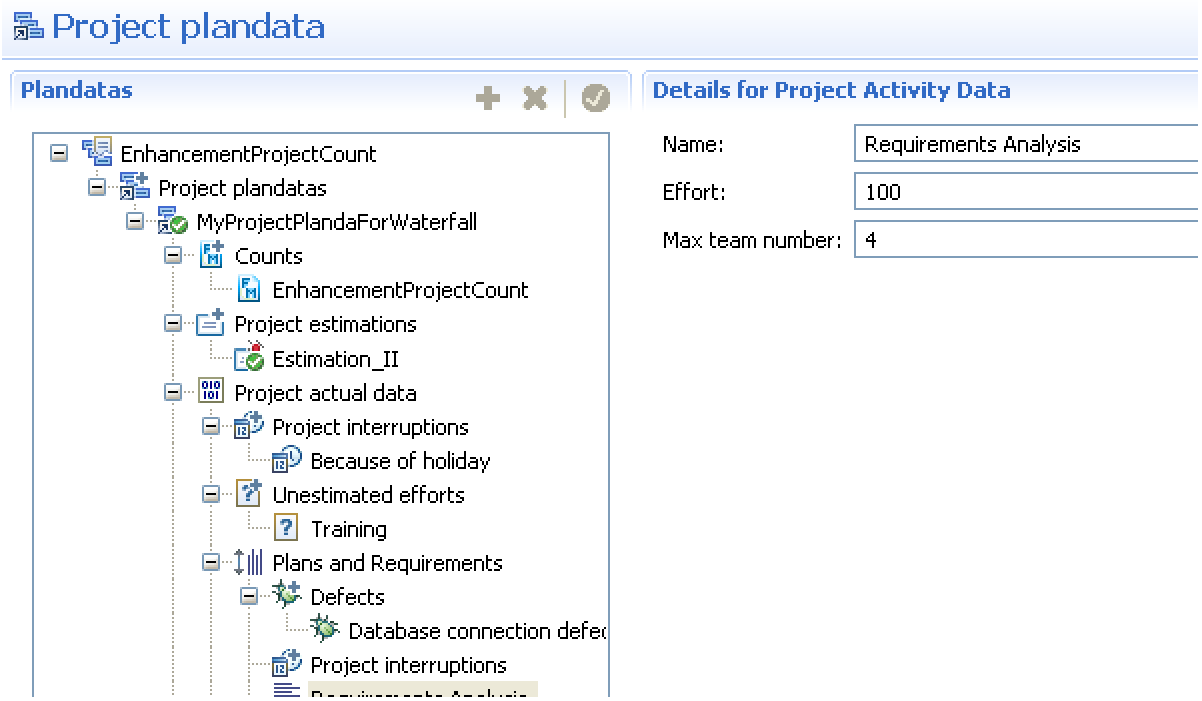
Rest Effort: 0

Defect removal efficiency: 0

Distribution:

2. Click the activity **Requirement Analysis** of phase **Plan and Requirements**

   Enter **Effort** as *100* and **Max Team Number** as *4*



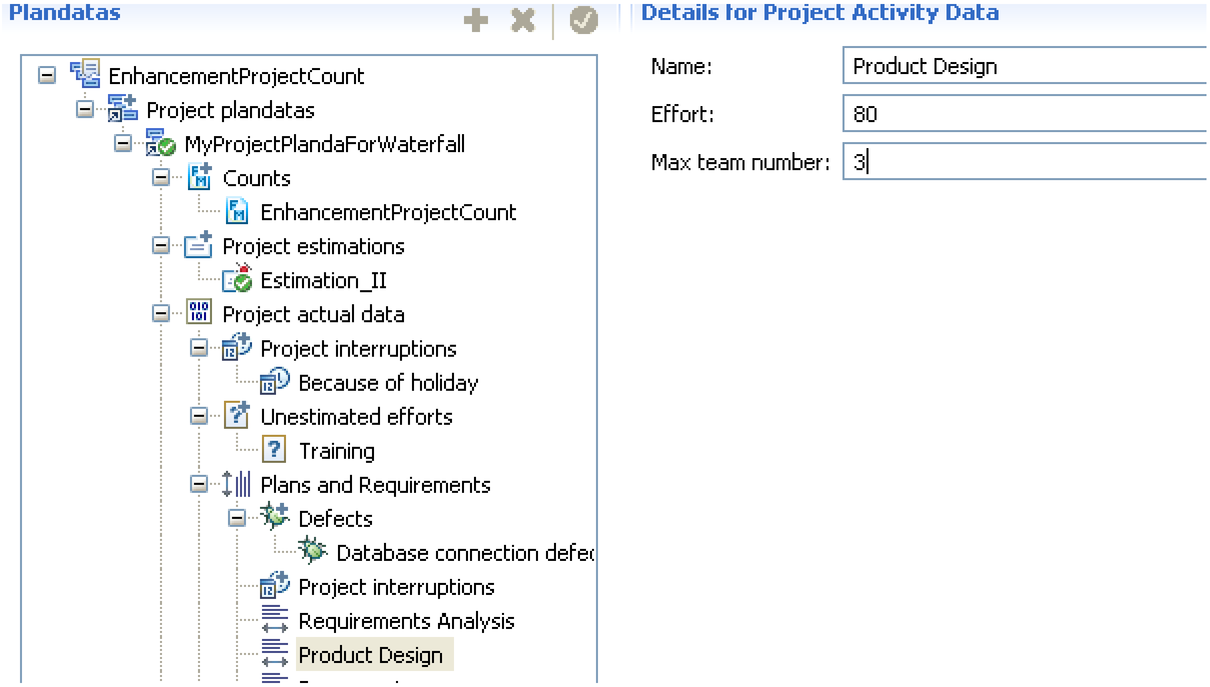
Name: Requirements Analysis

Effort: 100

Max team number: 4

**3.** Click the activity **Product Design** of phase **Plan and Requirements**

Enter **Effort** as *80* and **Max Team Number** as *3*



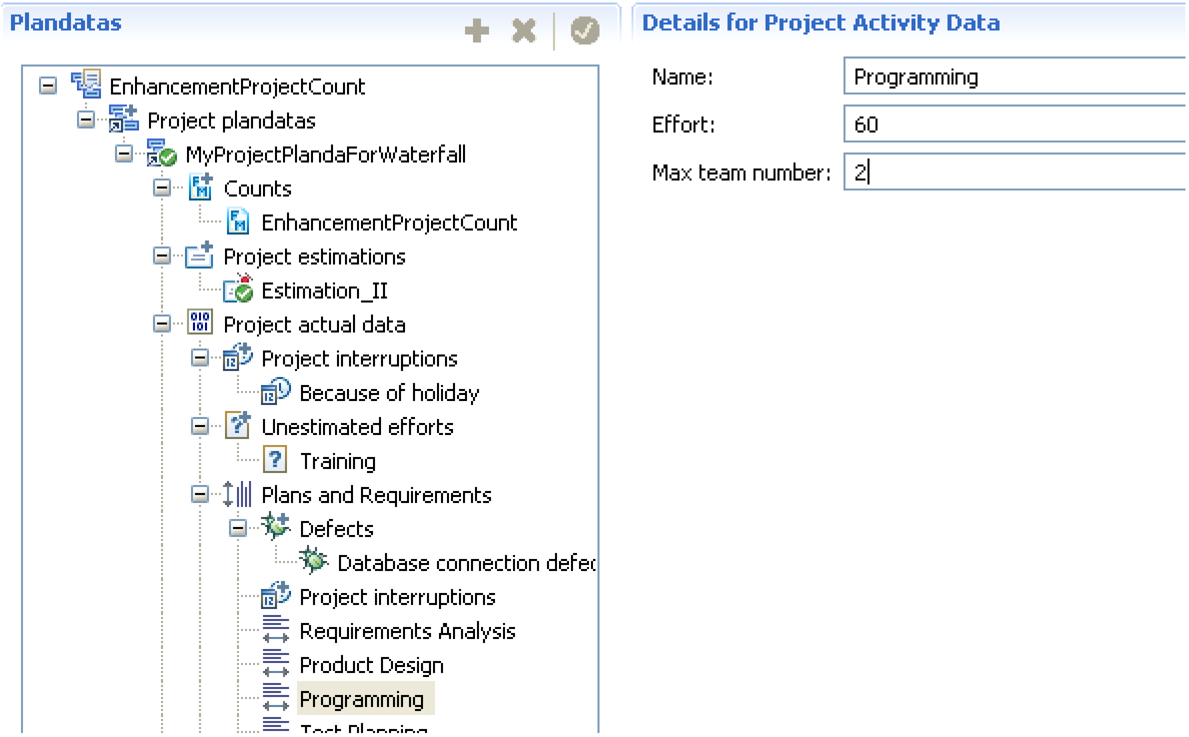
Name: Product Design

Effort: 80

Max team number: 3

**4.** Click the activity **Programming** of phase **Plan and Requirements**

Enter **Effort** as *60* and **Max Team Number** as *2*



Details for Project Activity Data

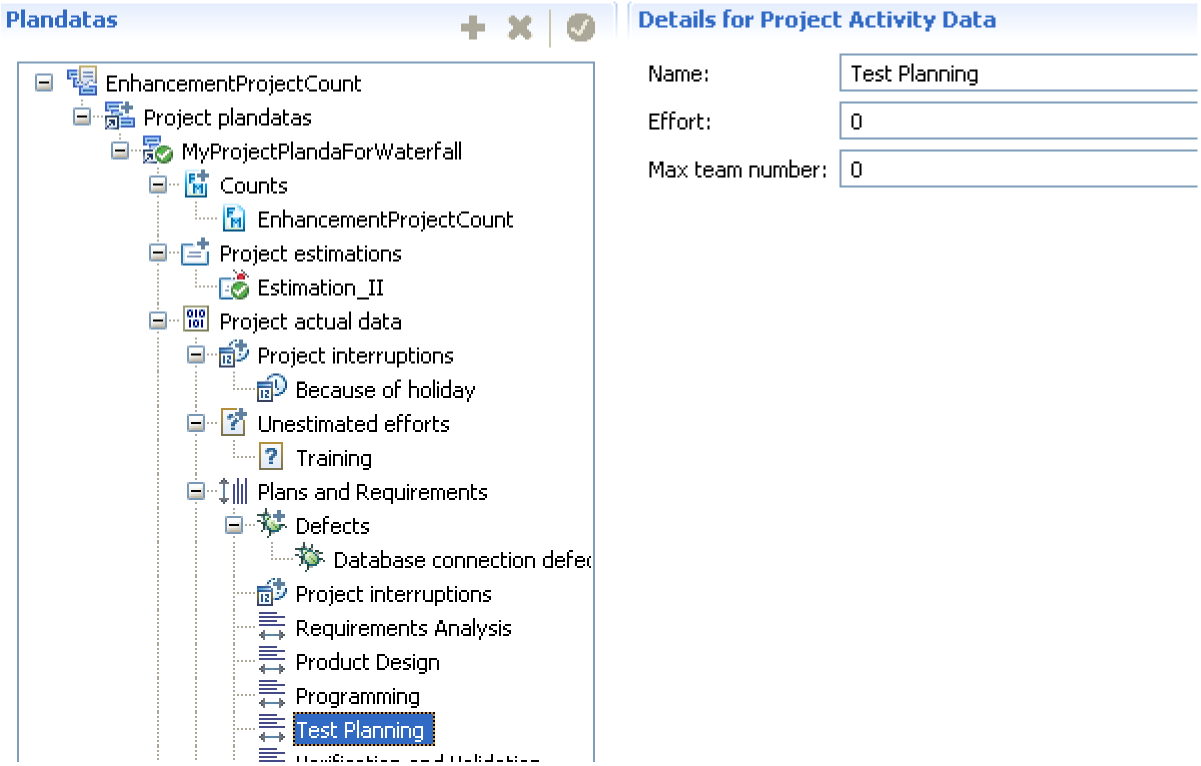
Name: Programming

Effort: 60

Max team number: 2

5. Click the activity **Test Planning** of phase **Plan and Requirements**

   Enter **Effort** as *30* and **Max Team Number** as *1*



Details for Project Activity Data

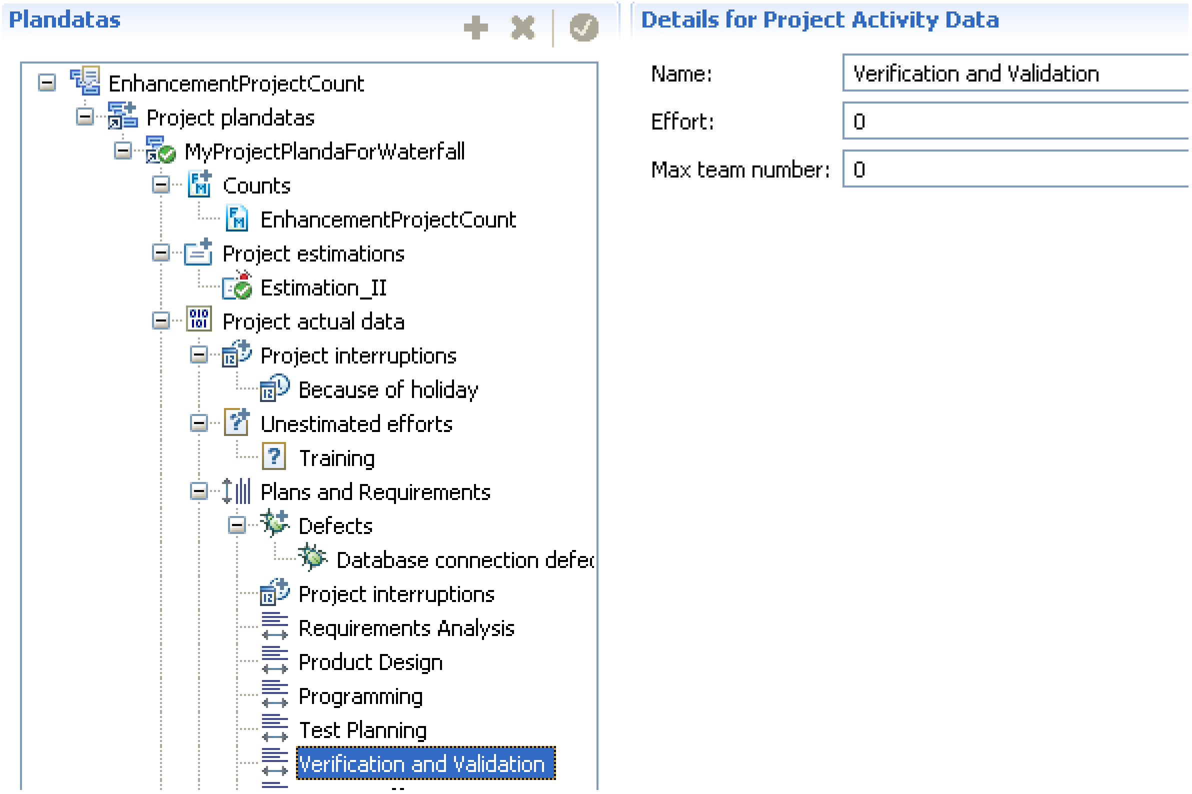
Name: Test Planning

Effort: 0

Max team number: 0

6. Click the activity **Verification and Validation** of phase **Plan and Requirements**

   Enter **Effort** as *20* and **Max Team Number** as *1*



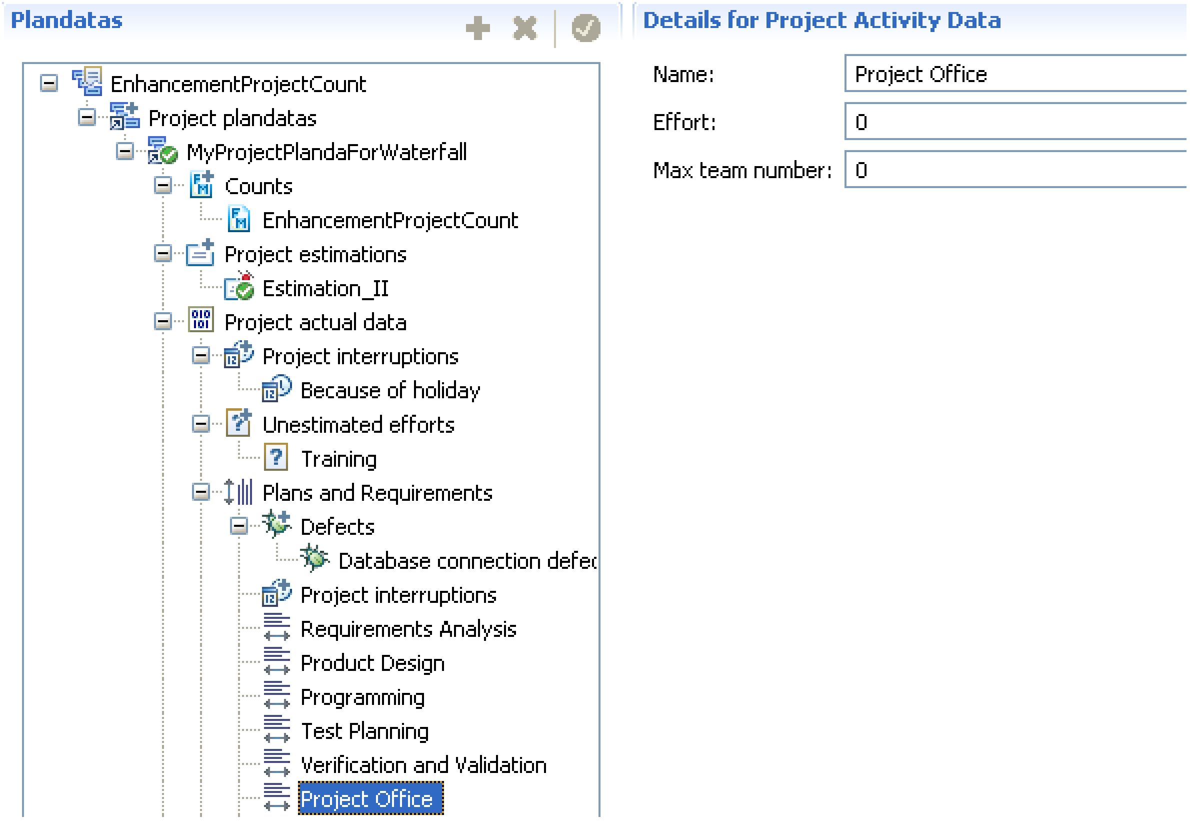
Name: Verification and Validation

Effort: 0

Max team number: 0

**7.** Click the activity **Project Office** of phase **Plan and Requirements**

Enter **Effort** as *20* and **Max Team Number** as *1*



Details for Project Activity Data

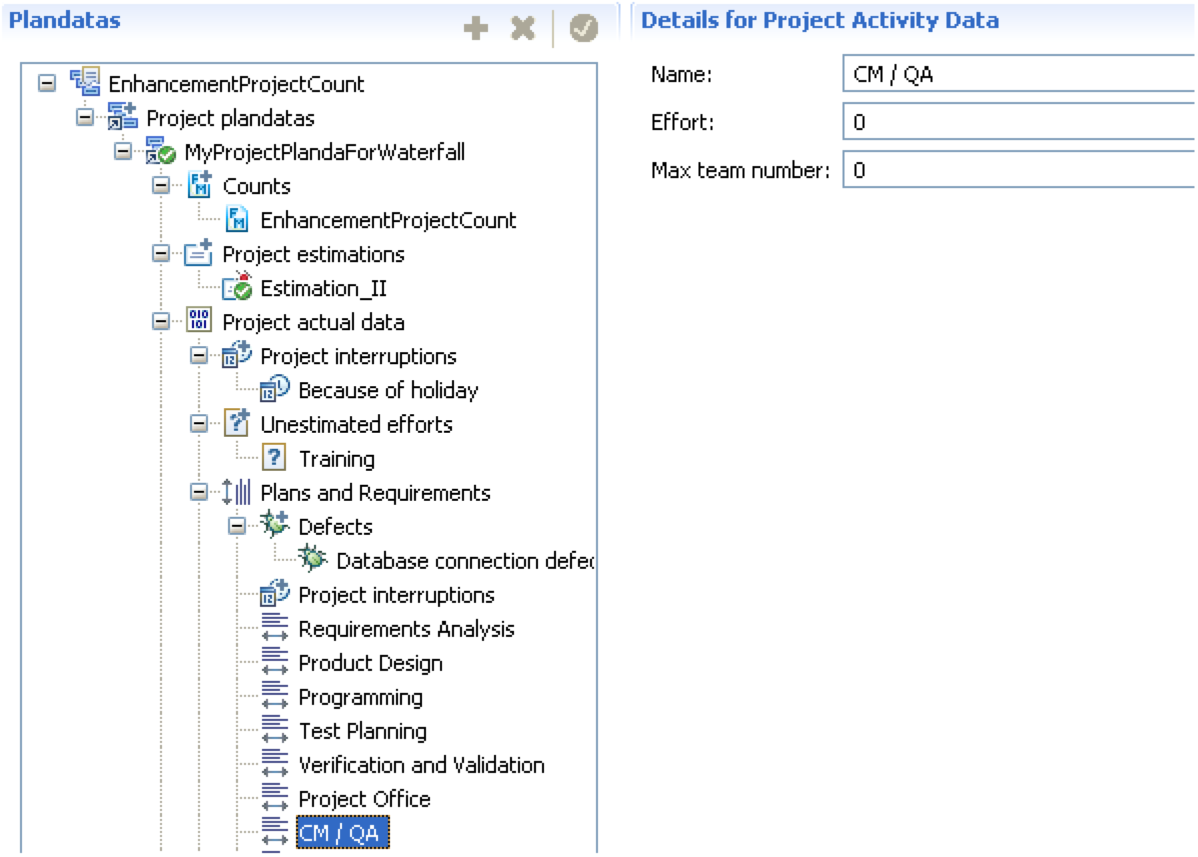
Name: Project Office

Effort: 0

Max team number: 0

**8.** Click the activity **CM / QA** of phase **Plan and Requirements**

Enter **Effort** as *0* and **Max Team Number** as *0*



Plandatas

- EnhancementProjectCount
  - Project plandatas
    - MyProjectPlandaForWaterfall
      - Counts
        - EnhancementProjectCount
      - Project estimations
        - Estimation_II
      - Project actual data
        - Project interruptions
          - Because of holiday
        - Unestimated efforts
          - Training
        - Plans and Requirements
          - Defects
            - Database connection defec
          - Project interruptions
          - Requirements Analysis
          - Product Design
          - Programming
          - Test Planning
          - Verification and Validation
          - Project Office
          - CM / QA

Details for Project Activity Data

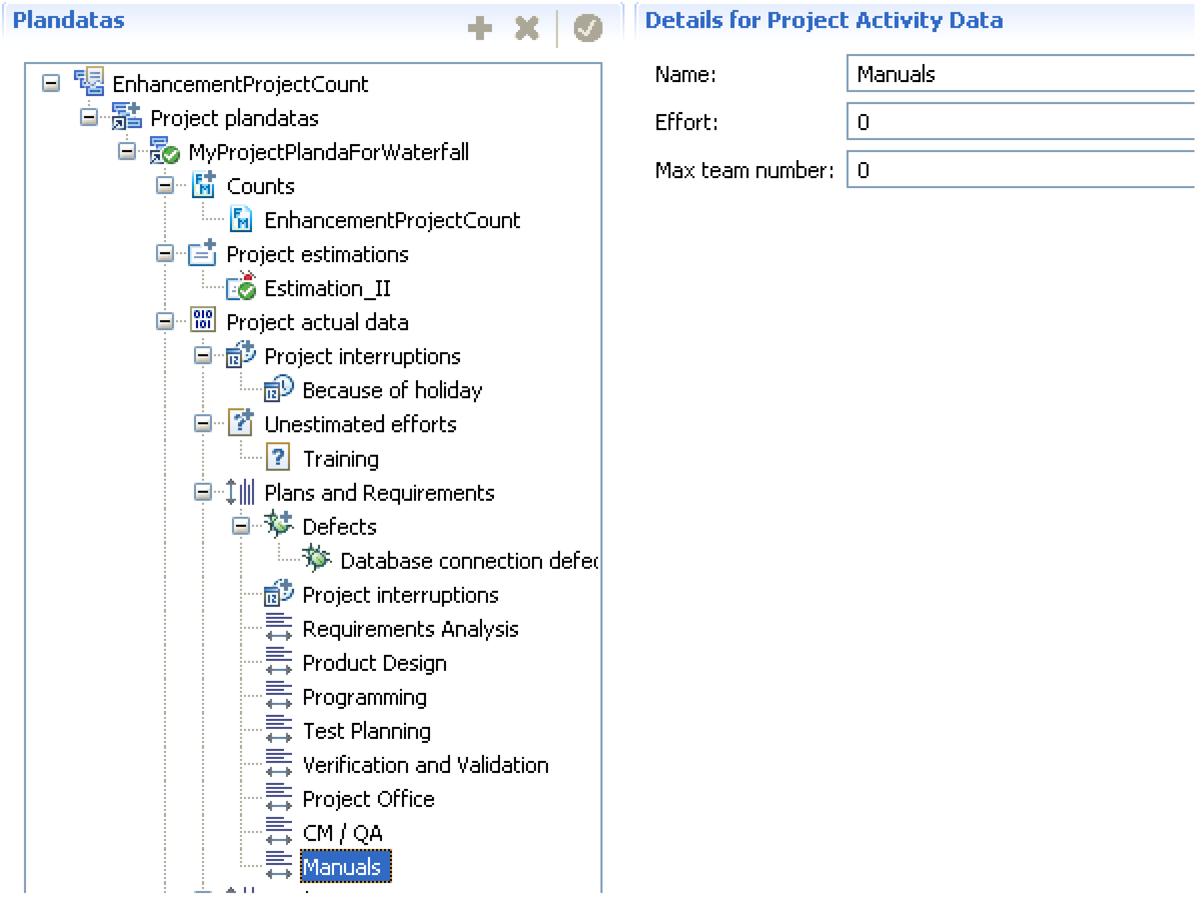
Name: CM / QA

Effort: 0

Max team number: 0

**9.** Click the activity **Manuals** of phase **Plan and Requirements**

Enter **Effort** as *0* and **Max Team Number** as *0*



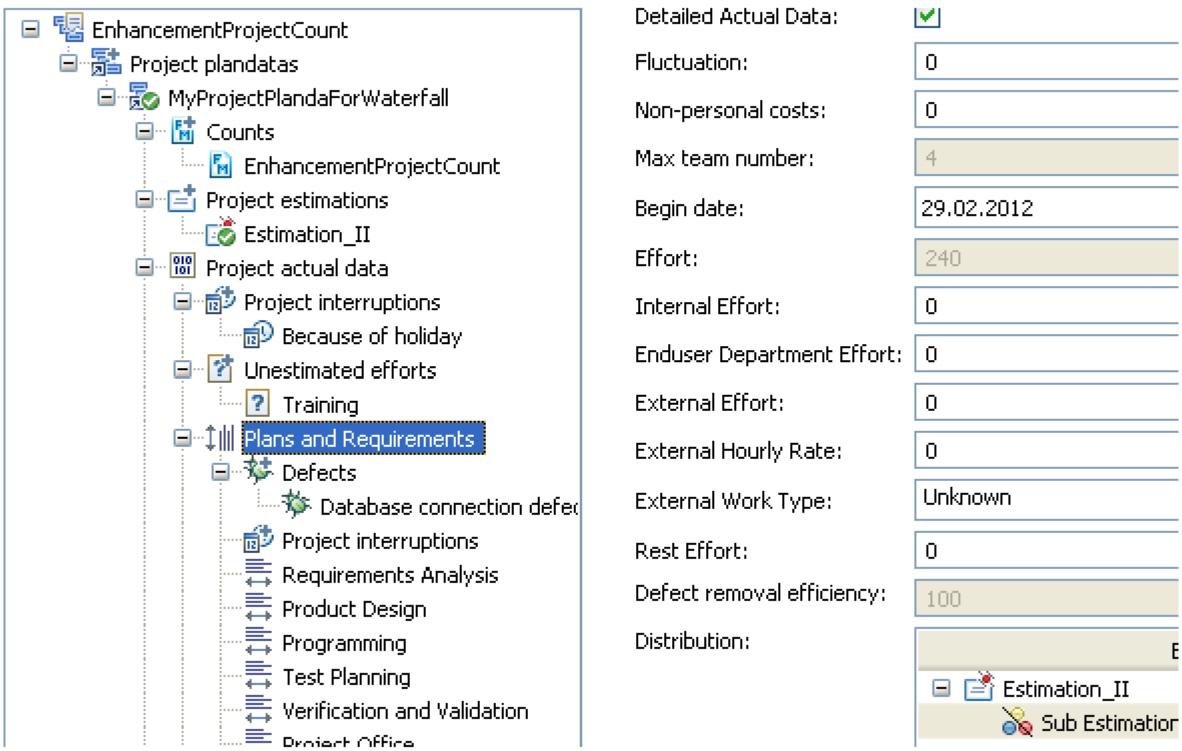
Plandatas

EnhancementProjectCount
Project plandatas
MyProjectPlandaForWaterfall
Counts
EnhancementProjectCount
Project estimations
Estimation_II
Project actual data
Project interruptions
Because of holiday
Unestimated efforts
Training
Plans and Requirements
Defects
Database connection defec
Project interruptions
Requirements Analysis
Product Design
Programming
Test Planning
Verification and Validation
Project Office
CM / QA
Manuals

Details for Project Activity Data

Name: Manuals
Effort: 0
Max team number: 0

**10.** Click the phase **Plan and Requirements** . You will see **Effort** as *240* and **Max Team Number** as *4* for the phase **Plan and Requirements** calculated from the sum of the activities.



EnhancementProjectCount
Project plandatas
MyProjectPlandaForWaterfall
Counts
EnhancementProjectCount
Project estimations
Estimation_II
Project actual data
Project interruptions
Because of holiday
Unestimated efforts
Training
Plans and Requirements
Defects
Database connection defec
Project interruptions
Requirements Analysis
Product Design
Programming
Test Planning
Verification and Validation
Project Office

Detailed Actual Data: ☑
Fluctuation: 0
Non-personal costs: 0
Max team number: 4
Begin date: 29.02.2012
Effort: 240
Internal Effort: 0
Enduser Department Effort: 0
External Effort: 0
External Hourly Rate: 0
External Work Type: Unknown
Rest Effort: 0
Defect removal efficiency: 100
Distribution:
Estimation_II
Sub Estimatior

## Visualize the Application Lifecycle

The Software Life Cycle Management System of **Function Point Modeler** is described in the following section.

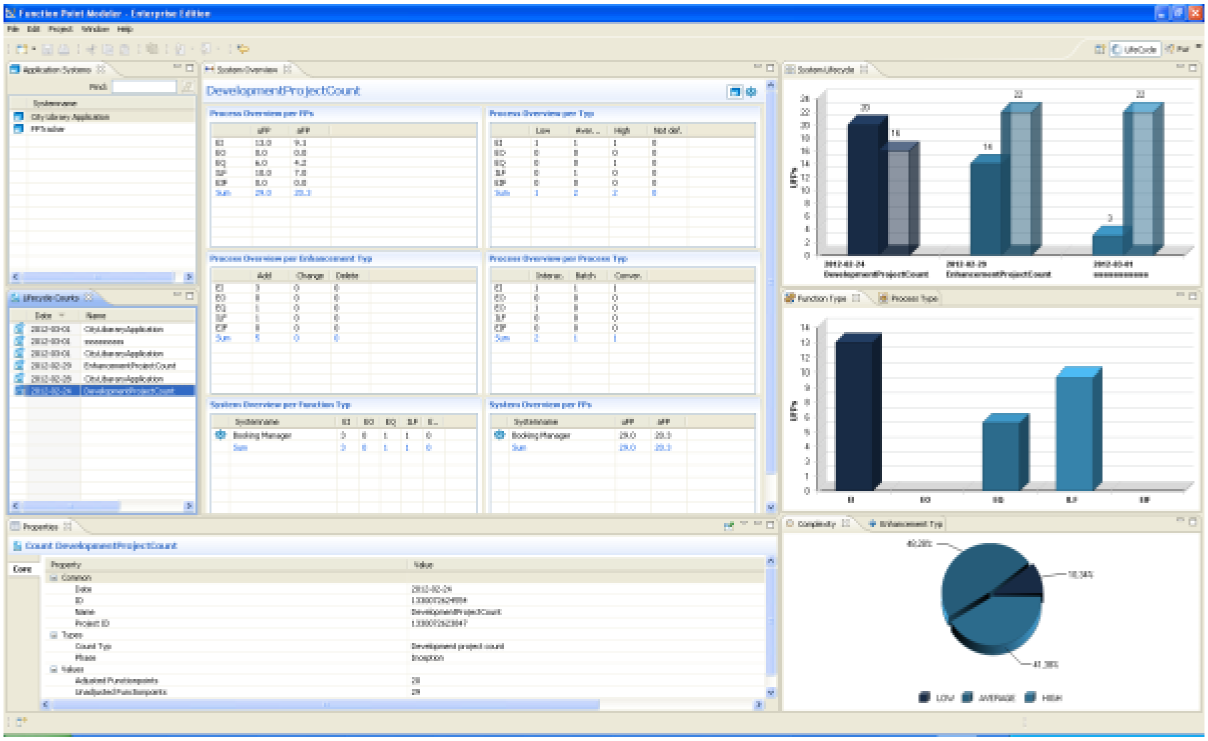
### Introduction to Lifecycle

**Function Point Modeler** provides you a **Software Life Cycle Management System** . This key feature of **Function Point Modeler** enables you to track the functional evolution of an application system from the begin.

A application system is born with a **Development Project Count** . If you have completed your development project, you have to create a new **Application Count** for this current application system. All **Process Type** of *Conversion* will be deleted in the new **Application Count** . The new **Application Count** will include only the real user functions from the previously **Development Project Count** .

You create a **Enhancement Project Count** from the **Application Count** of your application system. In this case all **Enhancement Type** of the transactional functions and data funtions will be set as *Not Changed* . If some of them has to change during enhancement project, you have to set **Enhancement Type** as *Changed* . You can also add new transactional functions and data functions to your **Enhancement Project Count** .

If you have completed your **Enhancement Project Count** you have to update the **Application Count** of your application system from the latest **Enhancement Project Count** , so that the **Application Count** of your application system has current user functions. This is repeatable till to the end of the application system life. It is called **Software Life Cycle Management System** .



| Systemname |
|---|
| City Library Application |
| FPTrainer |

| Date | Name |
|---|---|
| 2012-03-01 | CityLibraryApplication |
| 2012-03-01 | xxxxxxxxxx |
| 2012-03-01 | CityLibraryApplication |
| 2012-02-29 | EnhancementProjectCount |
| 2012-02-29 | CityLibraryApplication |
| 2012-02-24 | DevelopmentProjectCount |

DevelopmentProjectCount

Process Overview per FPs

| | uFP | aFP |
|---|---|---|
| EI | 13.0 | 9.1 |
| EO | 0.0 | 0.0 |
| EQ | 6.0 | 4.2 |
| ILF | 10.0 | 7.0 |
| EIF | 0.0 | 0.0 |
| Sum | 29.0 | 20.3 |

Process Overview per Typ

| | Low | Aver... | High | Not def. |
|---|---|---|---|---|
| EI | 1 | 1 | 1 | 0 |
| EO | 0 | 0 | 0 | 0 |
| EQ | 0 | 0 | 1 | 0 |
| ILF | 0 | 1 | 0 | 0 |
| EIF | 0 | 0 | 0 | 0 |
| Sum | 1 | 2 | 2 | 0 |

Process Overview per Enhancement Typ

| | Add | Change | Delete |
|---|---|---|---|
| EI | 3 | 0 | 0 |
| EO | 0 | 0 | 0 |
| EQ | 1 | 0 | 0 |
| ILF | 1 | 0 | 0 |
| EIF | 0 | 0 | 0 |
| Sum | 5 | 0 | 0 |

Process Overview per Process Typ

| | Interac. | Batch | Conver. |
|---|---|---|---|
| EI | 1 | 1 | 1 |
| EO | 0 | 0 | 0 |
| EQ | 1 | 0 | 0 |
| ILF | 0 | 0 | 0 |
| EIF | 0 | 0 | 0 |
| Sum | 2 | 1 | 1 |

System Overview per Function Typ

| Systemname | EI | EO | EQ | ILF | E... |
|---|---|---|---|---|---|
| Booking Manager | 3 | 0 | 1 | 1 | 0 |
| Sum | 3 | 0 | 1 | 1 | 0 |

System Overview per FPs

| Systemname | uFP | aFP |
|---|---|---|
| Booking Manager | 29.0 | 20.3 |
| Sum | 29.0 | 20.3 |

Count DevelopmentProjectCount

| Property | Value |
|---|---|
| Common | |
| Date | 2012-02-24 |
| ID | 1330072624884 |
| Name | DevelopmentProjectCount |
| Project ID | 1330072623847 |
| Types | |
| Count Typ | Development project count |
| Phase | Inception |
| Values | |
| Adjusted Functionpoints | 20 |
| UnadjustedFunctionpoints | 29 |

### Specify selection criterias

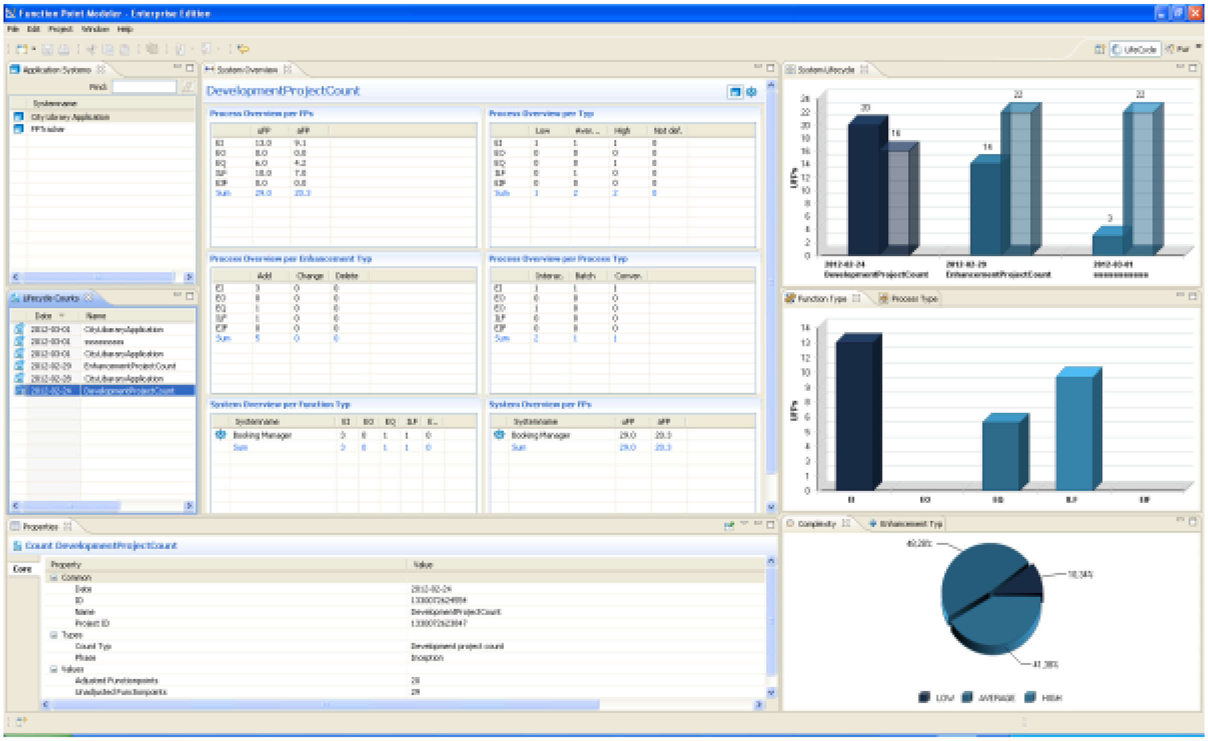
The **Software Life Cycle Management System** enables you to look at each application system and the counts o this application system.

#### *Select a Application System*

Perspectives provide combinations of views and editors that are suited to performing a particular set of tasks.

To open the **LifeCycle Perspective** perspective:

1. Click the **Open Perspective** button on the shortcut bar on the left side of the Workbench window. (This provides the same function as the **Window > Open Perspective** menu on the menu bar.)
2. Select the perspective **LifeCycle Perspective** .
3. When the perspective opens, the title bar of the window it is in changes to display the name of the perspective. In addition, an icon is added to the shortcut bar, allowing you to quickly switch back to that perspective from other perspectives in the same window.



| Systemname |
|---|
| City Library Application |
| FPTrainer |

Lifecycle Counts

| Date | Name |
|---|---|
| 2012-03-01 | CityLibraryApplication |
| 2012-03-01 | ========== |
| 2012-03-01 | CityLibraryApplication |
| 2012-02-29 | EnhancementProjectCount |
| 2012-02-29 | CityLibraryApplication |
| 2012-02-24 | DevelopmentProjectCount |

DevelopmentProjectCount

Process Overview per FPs

| | uFP | aFP |
|---|---|---|
| EI | 13.0 | 9.1 |
| EO | 8.0 | 0.0 |
| EQ | 6.0 | 4.2 |
| ILF | 18.0 | 7.0 |
| EIF | 8.0 | 0.0 |
| Sum | 29.0 | 20.3 |

Process Overview per Typ

| | Low | Aver... | High | Not def. |
|---|---|---|---|---|
| EI | 1 | 1 | 1 | 0 |
| EO | 0 | 0 | 0 | 0 |
| EQ | 0 | 0 | 1 | 0 |
| ILF | 0 | 1 | 0 | 0 |
| EIF | 0 | 0 | 0 | 0 |
| Sum | 1 | 2 | 2 | 0 |

Process Overview per Enhancement Typ

| | Add | Change | Delete |
|---|---|---|---|
| EI | 3 | 0 | 0 |
| EO | 0 | 0 | 0 |
| EQ | 1 | 0 | 0 |
| ILF | 1 | 0 | 0 |
| EIF | 0 | 0 | 0 |
| Sum | 5 | 0 | 0 |

Process Overview per Process Typ

| | Interac. | Batch | Conver. |
|---|---|---|---|
| EI | 1 | 1 | 1 |
| EO | 0 | 0 | 0 |
| EQ | 1 | 0 | 0 |
| ILF | 0 | 0 | 0 |
| EIF | 0 | 0 | 0 |
| Sum | 2 | 1 | 1 |

Systems Overview per Function Typ

| Systemname | EI | EO | EQ | ILF | E... |
|---|---|---|---|---|---|
| Booking Manager | 3 | 0 | 1 | 1 | 0 |
| Sum | 3 | 0 | 1 | 1 | 0 |

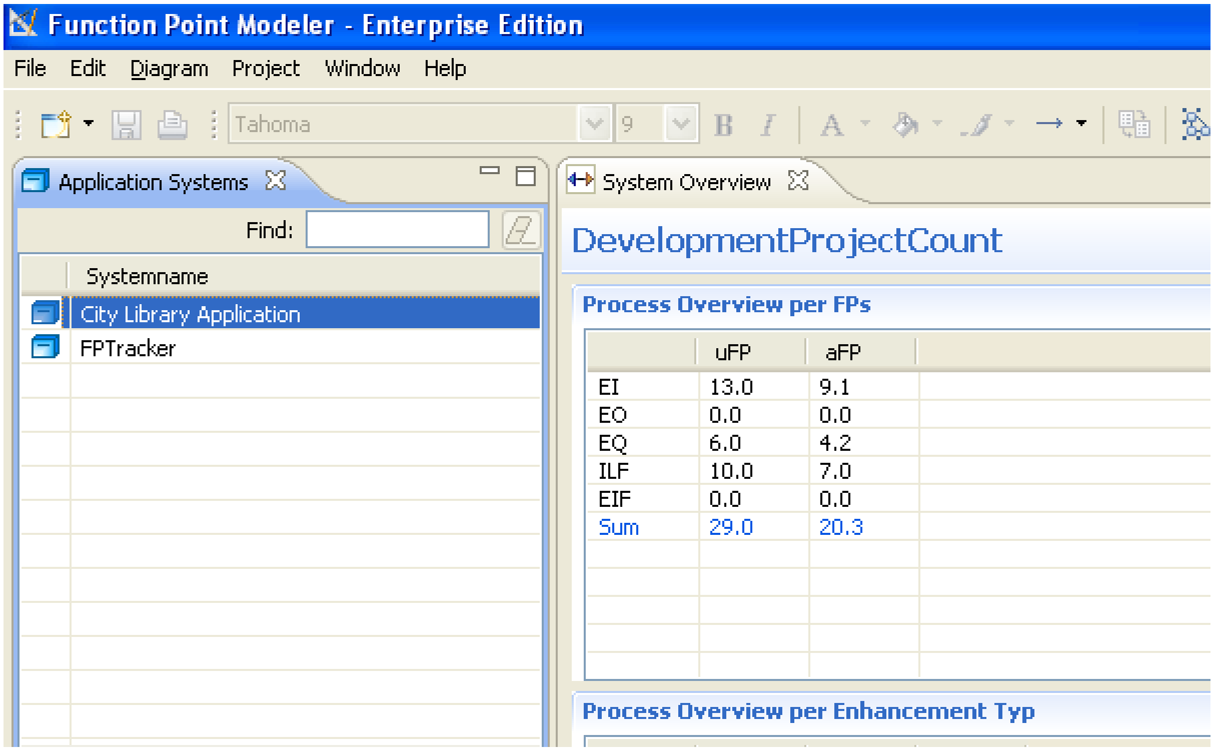
Systems Overview per FPs

| Systemname | uFP | aFP |
|---|---|---|
| Booking Manager | 29.0 | 20.3 |
| Sum | 29.0 | 20.3 |

Count DevelopmentProjectCount

| Property | Value |
|---|---|
| Common | |
| Date | 2012-02-24 |
| ID | 1330072624884 |
| Name | DevelopmentProjectCount |
| Project ID | 1330072623847 |
| Types | |
| Count Typ | Development project count |
| Phase | Inception |
| Values | |
| Adjusted Functionpoints | 20 |
| UnadjustedFunctionpoints | 29 |

4. Select the *City Library Application* in the view



| Systemname |
|---|
| City Library Application |
| FPTracker |

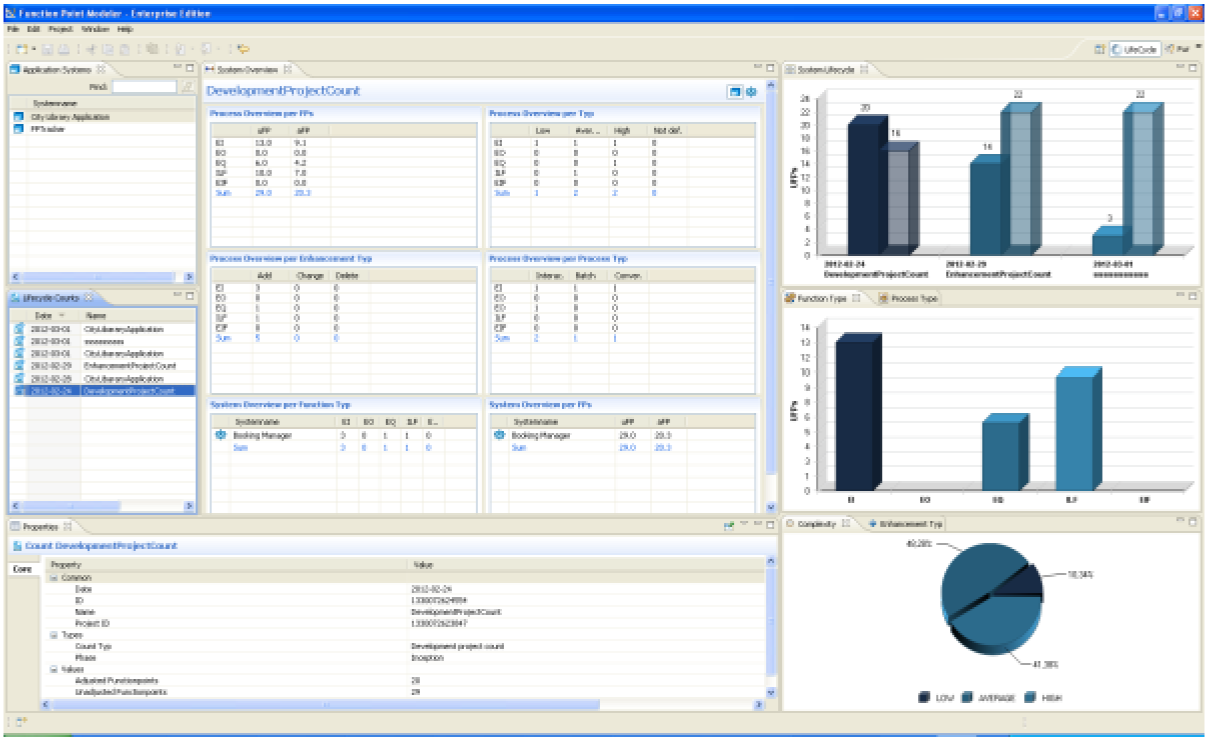
DevelopmentProjectCount

Process Overview per FPs

| | uFP | aFP |
|---|---|---|
| EI | 13.0 | 9.1 |
| EO | 0.0 | 0.0 |
| EQ | 6.0 | 4.2 |
| ILF | 10.0 | 7.0 |
| EIF | 0.0 | 0.0 |
| Sum | 29.0 | 20.3 |

Process Overview per Enhancement Typ

**5.** You will see all counts for the current selected application system *City Library Application* .



| Systemname |
|---|
| City Library Application |
| FPTracker |

Lifecycle Counts

| Date | Name |
|---|---|
| 2012-03-01 | CityLibraryApplication |
| 2012-03-01 | xxxxxxxxx |
| 2012-03-01 | CityLibraryApplication |
| 2012-02-29 | EnhancementProjectCount |
| 2012-02-29 | CityLibraryApplication |
| 2012-02-24 | DevelopmentProjectCount |

DevelopmentProjectCount

Process Overview per FPs

| | uFP | aFP |
|---|---|---|
| EI | 13.0 | 9.1 |
| EO | 0.0 | 0.0 |
| EQ | 6.0 | 4.2 |
| ILF | 10.0 | 7.0 |
| EIF | 0.0 | 0.0 |
| Sum | 29.0 | 20.3 |

Process Overview per Typ

| | Low | Aver... | High | Not def. |
|---|---|---|---|---|
| EI | 1 | 1 | 1 | 0 |
| EO | 0 | 0 | 0 | 0 |
| EQ | 0 | 0 | 1 | 0 |
| ILF | 0 | 1 | 0 | 0 |
| EIF | 0 | 0 | 0 | 0 |
| Sum | 1 | 2 | 2 | 0 |

Process Overview per Enhancement Typ

| | Add | Change | Delete |
|---|---|---|---|
| EI | 3 | 0 | 0 |
| EO | 0 | 0 | 0 |
| EQ | 1 | 0 | 0 |
| ILF | 1 | 0 | 0 |
| EIF | 0 | 0 | 0 |
| Sum | 5 | 0 | 0 |

Process Overview per Process Typ

| | Interac. | Batch | Conver. |
|---|---|---|---|
| EI | 1 | 1 | 1 |
| EO | 0 | 0 | 0 |
| EQ | 1 | 0 | 0 |
| ILF | 0 | 0 | 0 |
| EIF | 0 | 0 | 0 |
| Sum | 2 | 1 | 1 |

System Overview per Function Typ

| Systemname | EI | EO | EQ | ILF | E... |
|---|---|---|---|---|---|
| Booking Manager | 3 | 0 | 1 | 1 | 0 |
| Sum | 3 | 0 | 1 | 1 | 0 |

System Overview per FPs

| Systemname | uFP | aFP |
|---|---|---|
| Booking Manager | 29.0 | 20.3 |
| Sum | 29.0 | 20.3 |

Count DevelopmentProjectCount

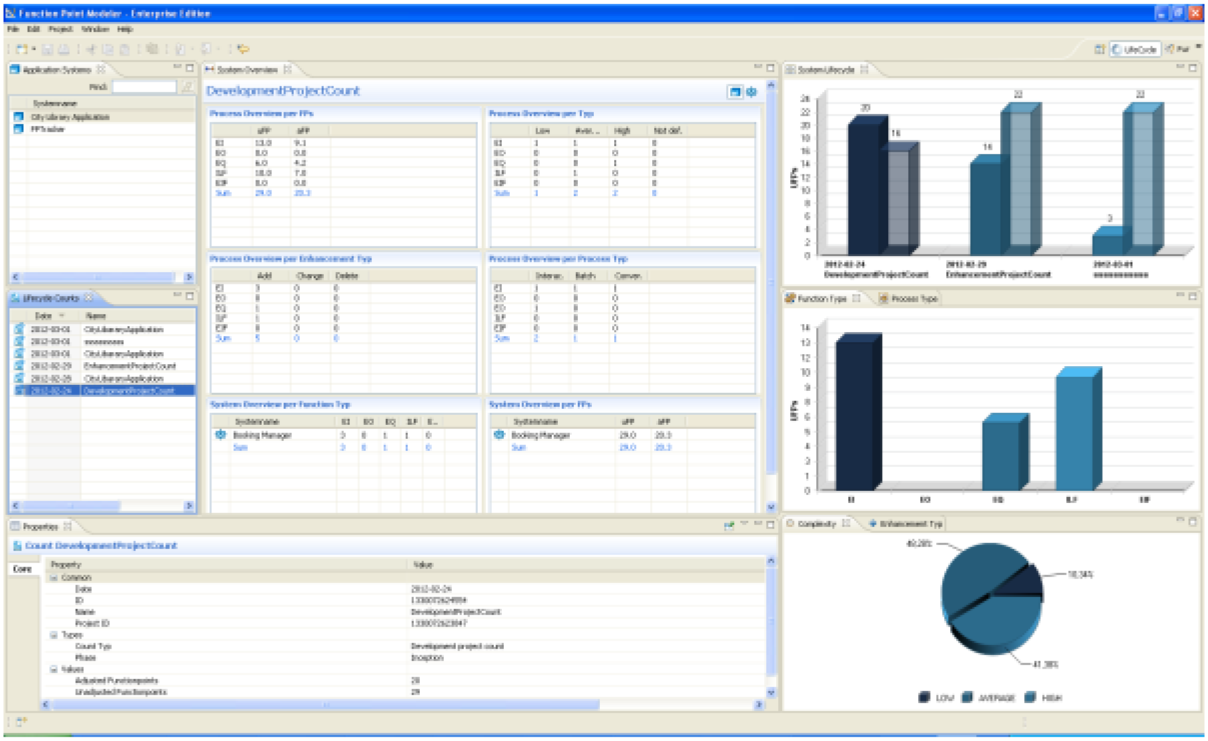
| Property | Value |
|---|---|
| Common | |
| Date | 2012-02-24 |
| ID | 1330072624984 |
| Name | DevelopmentProjectCount |
| Project ID | 1330072623847 |
| Types | |
| Count Typ | Development project count |
| Phase | Inception |
| Values | |
| Adjusted Functionpoints | 20 |
| Unadjusted Functionpoints | 29 |

## *Select a Count*

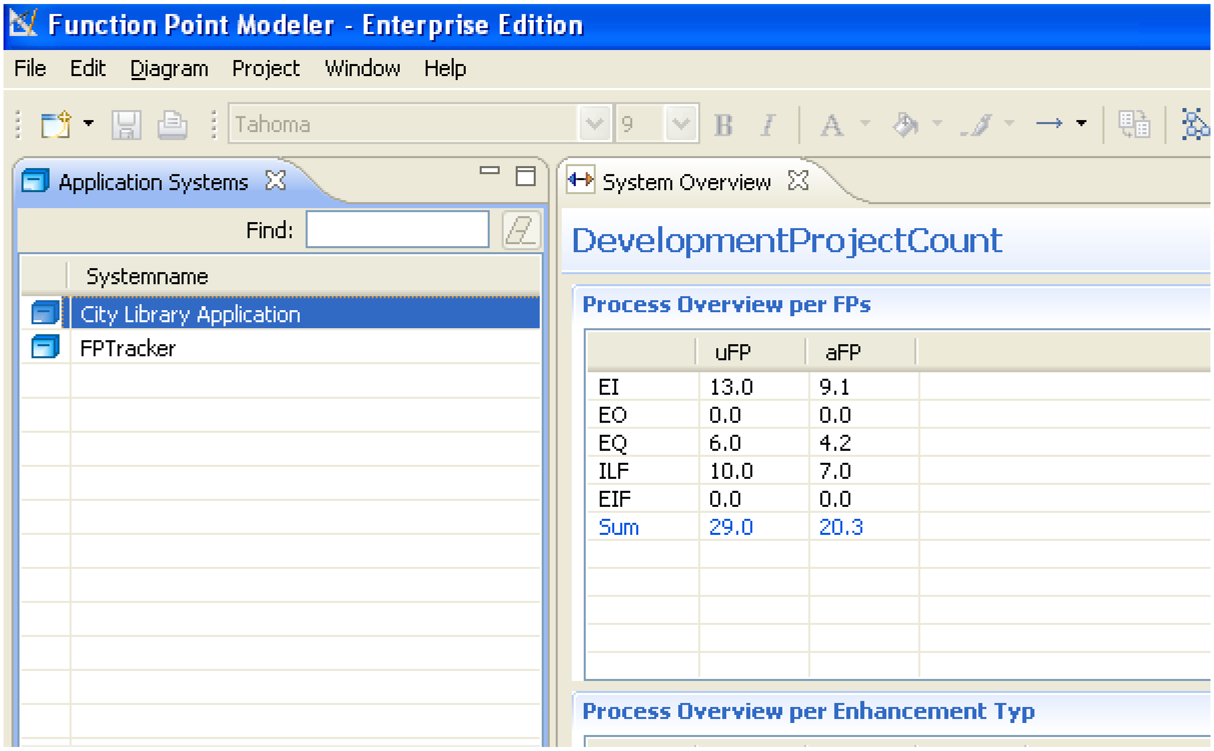
Perspectives provide combinations of views and editors that are suited to performing a particular set of tasks.

To open the **LifeCycle Perspective** perspective:

1. Click the **Open Perspective** button on the shortcut bar on the left side of the Workbench window. (This provides the same function as the **Window** > **Open Perspective** menu on the menu bar.)
2. Select the perspective **LifeCycle Perspective** .
3. When the perspective opens, the title bar of the window it is in changes to display the name of the perspective. In addition, an icon is added to the shortcut bar, allowing you to quickly switch back to that perspective from other perspectives in the same window.



4. Select the *City Library Application* in the view


Function Point Modeler - Enterprise Edition
File Edit Diagram Project Window Help
Tahoma
9
Application Systems
Find:
System Overview

| Systemname |
|---|
| City Library Application |
| FPTracker |

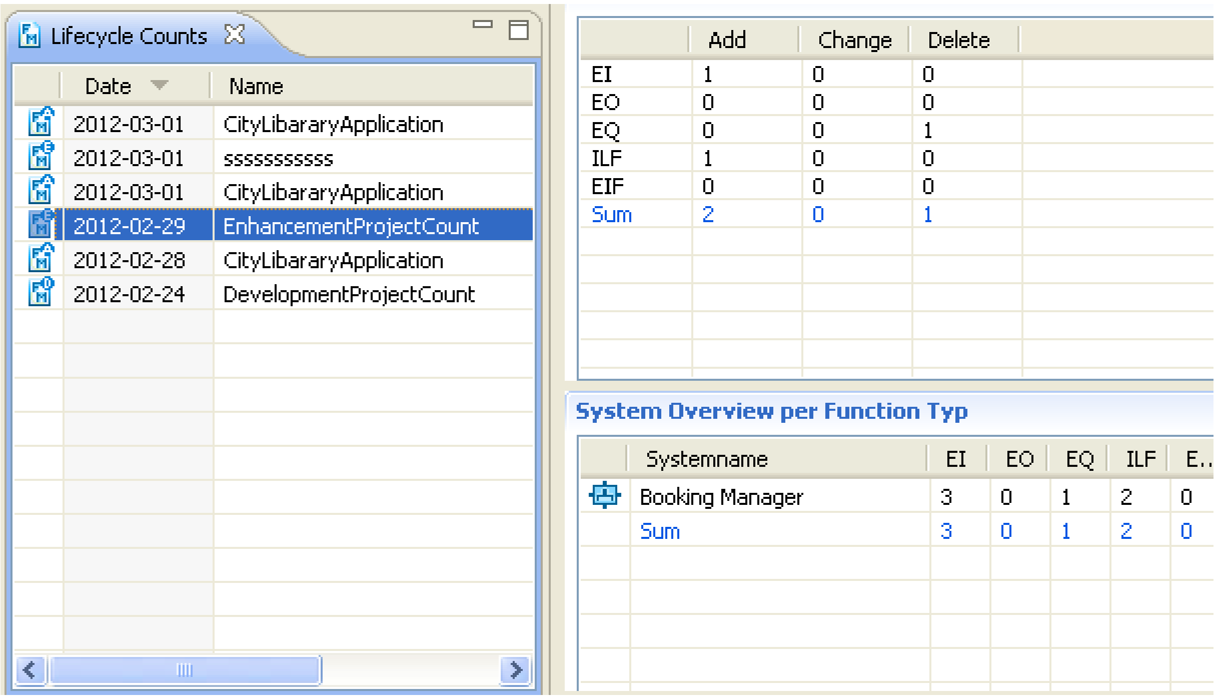
## DevelopmentProjectCount

### Process Overview per FPs

| | uFP | aFP |
|---|---|---|
| EI | 13.0 | 9.1 |
| EO | 0.0 | 0.0 |
| EQ | 6.0 | 4.2 |
| ILF | 10.0 | 7.0 |
| EIF | 0.0 | 0.0 |
| Sum | 29.0 | 20.3 |

### Process Overview per Enhancement Typ

5. Select the *EnhancementProjectCount* in the view



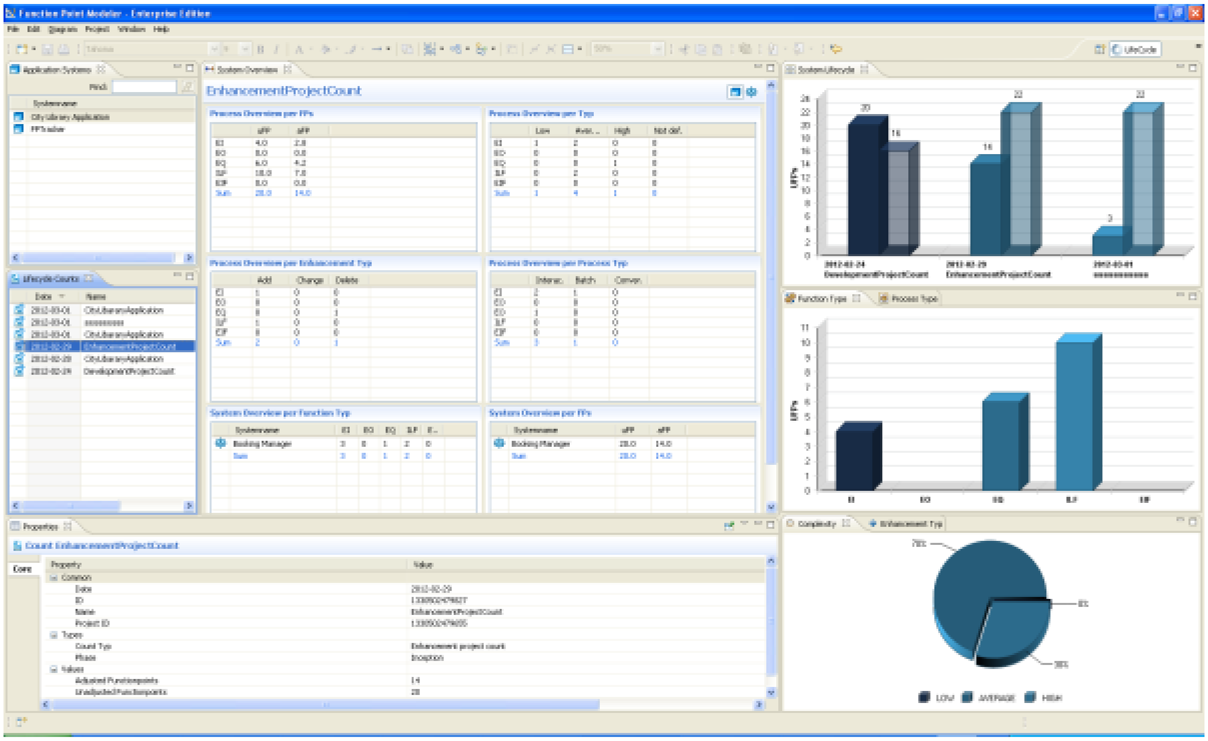
| Date | Name |
|---|---|
| 2012-03-01 | CityLibararyApplication |
| 2012-03-01 | sssssssssss |
| 2012-03-01 | CityLibararyApplication |
| 2012-02-29 | EnhancementProjectCount |
| 2012-02-28 | CityLibararyApplication |
| 2012-02-24 | DevelopmentProjectCount |

| | Add | Change | Delete |
|---|---|---|---|
| EI | 1 | 0 | 0 |
| EO | 0 | 0 | 0 |
| EQ | 0 | 0 | 1 |
| ILF | 1 | 0 | 0 |
| EIF | 0 | 0 | 0 |
| Sum | 2 | 0 | 1 |

### System Overview per Function Typ

| Systemname | EI | EO | EQ | ILF | E.. |
|---|---|---|---|---|---|
| Booking Manager | 3 | 0 | 1 | 2 | 0 |
| Sum | 3 | 0 | 1 | 2 | 0 |

6. You will see all detail metrics of the current selected count *EnhancementProjectCount* .



| Systemname |
|---|
| City Library Application |
| FPTrainer |

| Date | Name |
|---|---|
| 2012-03-01 | CityLibraryApplication |
| 2012-03-01 | xxxxxxxxxx |
| 2012-03-01 | CityLibraryApplication |
| 2012-02-29 | EnhancementProjectCount |
| 2012-02-28 | CityLibraryApplication |
| 2012-02-24 | DevelopmentProjectCount |

EnhancementProjectCount

Process Overview per FPs

| | uFP | aFP |
|---|---|---|
| EI | 4.0 | 2.8 |
| EO | 0.0 | 0.0 |
| EQ | 6.0 | 4.2 |
| ILF | 18.0 | 7.0 |
| EIF | 0.0 | 0.0 |
| Sum | 28.0 | 14.0 |

Process Overview per Typ

| | Low | Aver... | High | Not def. |
|---|---|---|---|---|
| EI | 1 | 2 | 0 | 0 |
| EO | 0 | 0 | 0 | 0 |
| EQ | 0 | 0 | 1 | 0 |
| ILF | 0 | 2 | 0 | 0 |
| EIF | 0 | 0 | 0 | 0 |
| Sum | 1 | 4 | 1 | 0 |

Process Overview per Enhancement Typ

| | Add | Change | Delete |
|---|---|---|---|
| EI | 1 | 0 | 0 |
| EO | 0 | 0 | 0 |
| EQ | 0 | 0 | 1 |
| ILF | 1 | 0 | 0 |
| EIF | 0 | 0 | 0 |
| Sum | 2 | 0 | 1 |

Process Overview per Process Typ

| | Interac. | Batch | Conver. |
|---|---|---|---|
| EI | 2 | 1 | 0 |
| EO | 0 | 0 | 0 |
| EQ | 1 | 0 | 0 |
| ILF | 0 | 0 | 0 |
| EIF | 0 | 0 | 0 |
| Sum | 3 | 1 | 0 |

System Overview per Function Typ

| Systemname | EI | EO | EQ | ILF | E... |
|---|---|---|---|---|---|
| Booking Manager | 3 | 0 | 1 | 2 | 0 |
| Sum | 3 | 0 | 1 | 2 | 0 |

System Overview per FPs

| Systemname | uFP | aFP |
|---|---|---|
| Booking Manager | 28.0 | 14.0 |
| Sum | 28.0 | 14.0 |

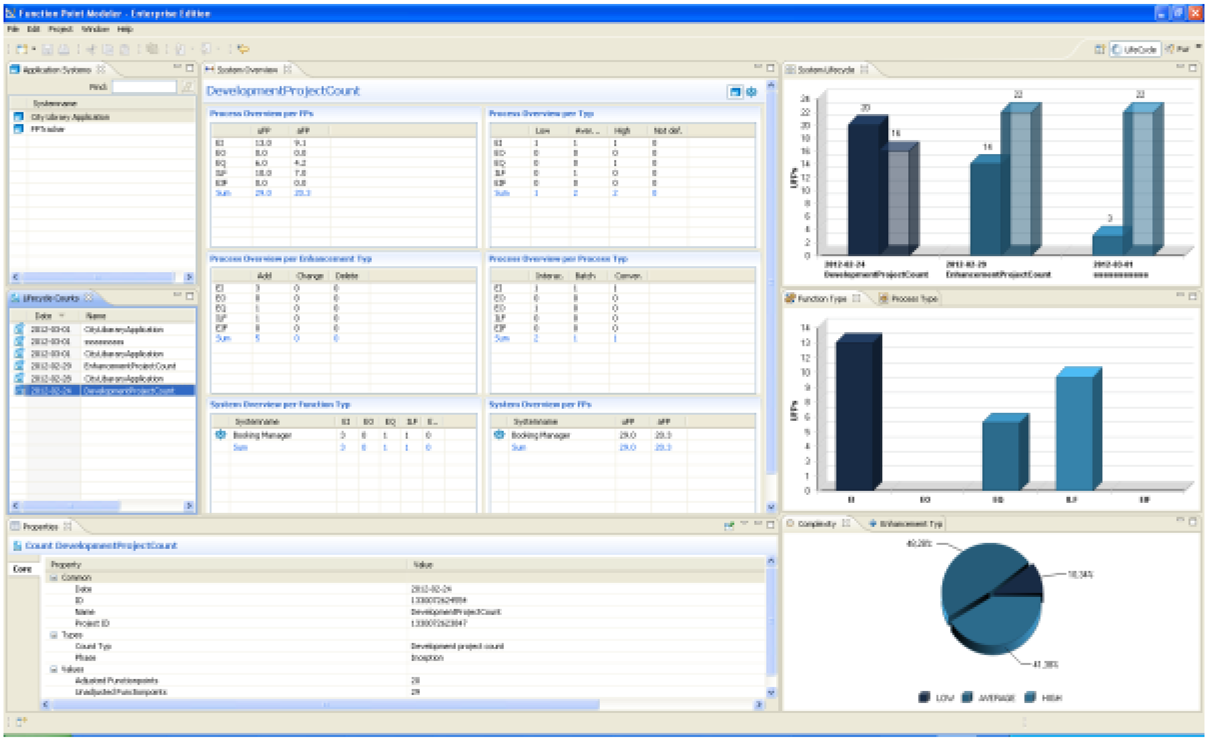
Count EnhancementProjectCount

| Property | Value |
|---|---|
| Common | |
| Date | 2012-02-29 |
| ID | 1330502479827 |
| Name | EnhancementProjectCount |
| Project ID | 1330502479655 |
| Types | |
| Count Typ | Enhancement project count |
| Phase | Inception |
| Values | |
| Adjusted Functionpoints | 14 |
| Unadjusted Functionpoints | 28 |

## Understand the differnt views

To open the **LifeCycle Perspective** perspective:

1. Click the **Open Perspective** button on the shortcut bar on the left side of the Workbench window. (This provides the same function as the **Window > Open Perspective** menu on the menu bar.)
2. Select the perspective **LifeCycle Perspective** .
3. When the perspective opens, the title bar of the window it is in changes to display the name of the perspective. In addition, an icon is added to the shortcut bar, allowing you to quickly switch back to that perspective from other perspectives in the same window.



| Date | Name |
|---|---|
| 2012-03-01 | CityLibraryApplication |
| 2012-03-01 | ========== |
| 2012-03-01 | CityLibraryApplication |
| 2012-02-29 | EnhancementProjectCount |
| 2012-02-29 | CityLibraryApplication |
| 2012-02-24 | DevelopmentProjectCount |

Process Overview per FPs

| | uFP | aFP |
|---|---|---|
| EI | 13.0 | 9.1 |
| EO | 0.0 | 0.0 |
| EQ | 6.0 | 4.2 |
| ILF | 10.0 | 7.0 |
| EIF | 0.0 | 0.0 |
| Sum | 29.0 | 20.3 |

Process Overview per Typ

| | Low | Aver... | High | Not def. |
|---|---|---|---|---|
| EI | 1 | 1 | 1 | 0 |
| EO | 0 | 0 | 0 | 0 |
| EQ | 0 | 0 | 1 | 0 |
| ILF | 0 | 1 | 0 | 0 |
| EIF | 0 | 0 | 0 | 0 |
| Sum | 1 | 2 | 2 | 0 |

Process Overview per Enhancement Typ

| | Add | Change | Delete |
|---|---|---|---|
| EI | 3 | 0 | 0 |
| EO | 0 | 0 | 0 |
| EQ | 1 | 0 | 0 |
| ILF | 1 | 0 | 0 |
| EIF | 0 | 0 | 0 |
| Sum | 5 | 0 | 0 |

Process Overview per Process Typ

| | Interac. | Batch | Conver. |
|---|---|---|---|
| EI | 1 | 1 | 1 |
| EO | 0 | 0 | 0 |
| EQ | 1 | 0 | 0 |
| ILF | 0 | 0 | 0 |
| EIF | 0 | 0 | 0 |
| Sum | 2 | 1 | 1 |

System Overview per Function Typ

| Systemname | EI | EO | EQ | ILF | E... |
|---|---|---|---|---|---|
| Booking Manager | 3 | 0 | 1 | 1 | 0 |
| Sum | 3 | 0 | 1 | 1 | 0 |

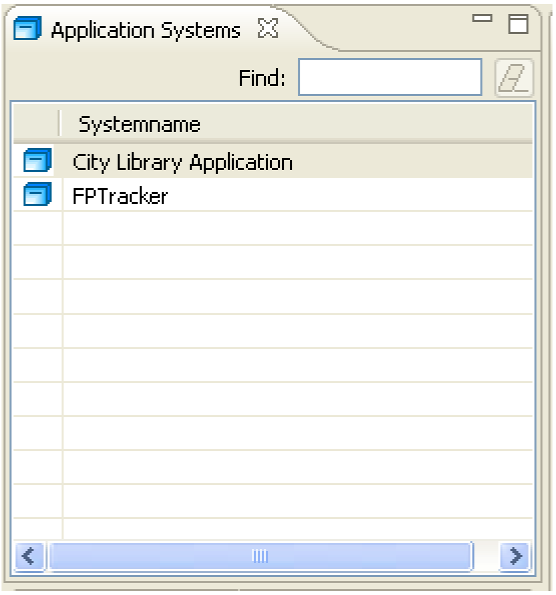
System Overview per FPs

| Systemname | uFP | aFP |
|---|---|---|
| Booking Manager | 29.0 | 20.3 |
| Sum | 29.0 | 20.3 |

Count DevelopmentProjectCount

| Property | Value |
|---|---|
| Common | |
| Date | 2012-02-24 |
| ID | 1330072624954 |
| Name | DevelopmentProjectCount |
| Project ID | 1330072623847 |
| Types | |
| Count Typ | Development project count |
| Phase | Inception |
| Values | |
| Adjusted Functionpoints | 20 |
| Unadjusted Functionpoints | 29 |

4. The *System view* shows all application system in your workspace.

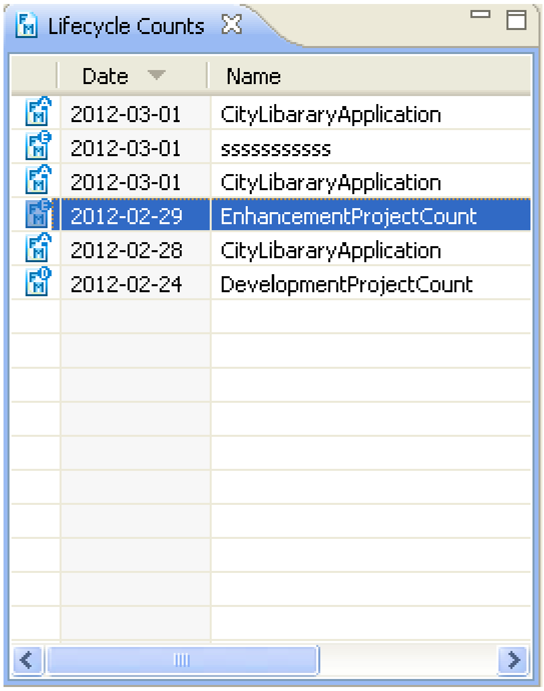


Application Systems

Find:

| Systemname |
|---|
| City Library Application |
| FPTracker |

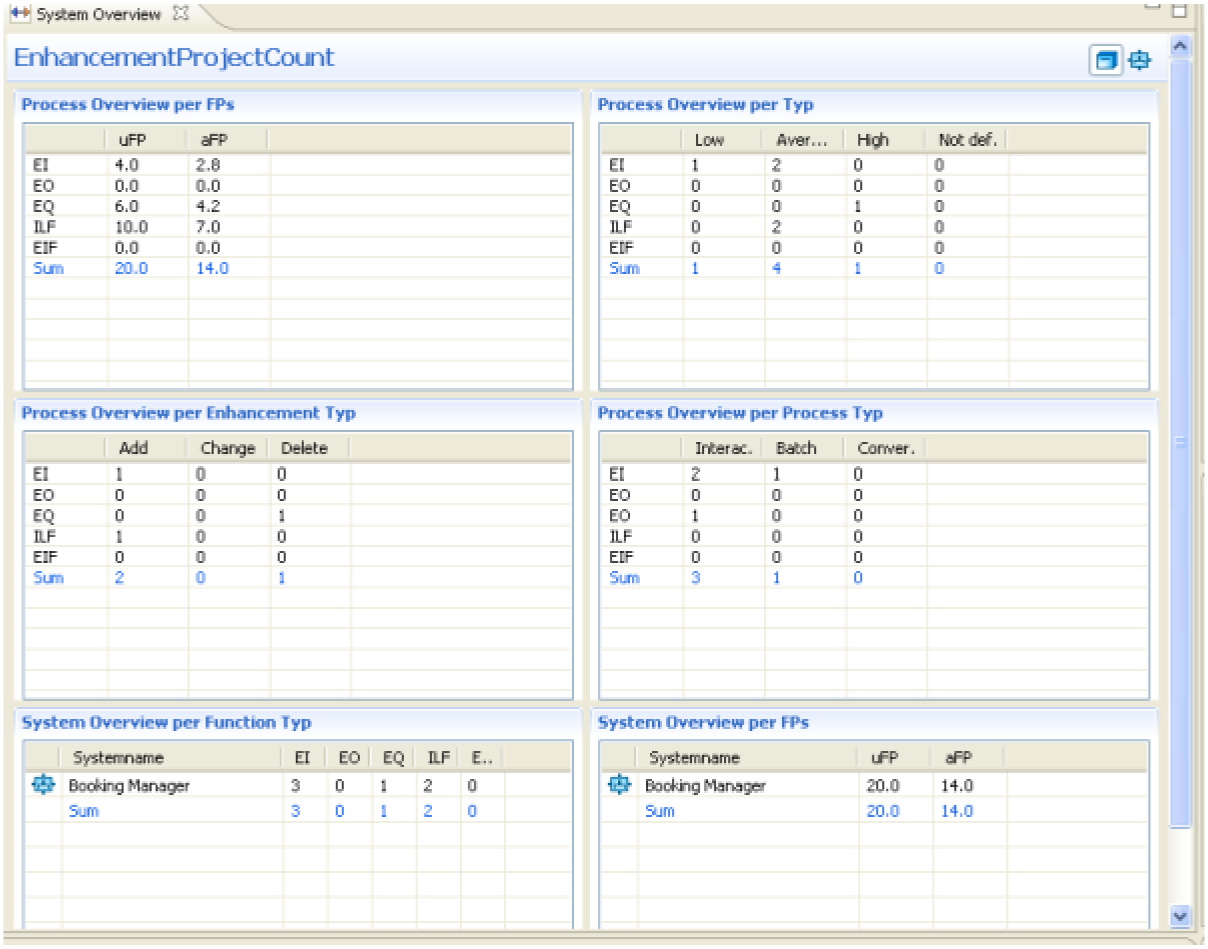
5. The *Counts view* shows all metrics relevant for the current selected count.



Lifecycle Counts

| Date | Name |
|---|---|
| 2012-03-01 | CityLibararyApplication |
| 2012-03-01 | sssssssssss |
| 2012-03-01 | CityLibararyApplication |
| 2012-02-29 | EnhancementProjectCount |
| 2012-02-28 | CityLibararyApplication |
| 2012-02-24 | DevelopmentProjectCount |

6. The *Counts view* shows all metrics relevant for the current selected count.



System Overview

EnhancementProjectCount

Process Overview per FPs

| | uFP | aFP |
|---|---|---|
| EI | 4.0 | 2.8 |
| EO | 0.0 | 0.0 |
| EQ | 6.0 | 4.2 |
| ILF | 10.0 | 7.0 |
| EIF | 0.0 | 0.0 |
| Sum | 20.0 | 14.0 |

Process Overview per Typ

| | Low | Aver… | High | Not def. |
|---|---|---|---|---|
| EI | 1 | 2 | 0 | 0 |
| EO | 0 | 0 | 0 | 0 |
| EQ | 0 | 0 | 1 | 0 |
| ILF | 0 | 2 | 0 | 0 |
| EIF | 0 | 0 | 0 | 0 |
| Sum | 1 | 4 | 1 | 0 |

Process Overview per Enhancement Typ

| | Add | Change | Delete |
|---|---|---|---|
| EI | 1 | 0 | 0 |
| EO | 0 | 0 | 0 |
| EQ | 0 | 0 | 1 |
| ILF | 1 | 0 | 0 |
| EIF | 0 | 0 | 0 |
| Sum | 2 | 0 | 1 |

Process Overview per Process Typ

| | Interac. | Batch | Conver. |
|---|---|---|---|
| EI | 2 | 1 | 0 |
| EO | 0 | 0 | 0 |
| EO | 1 | 0 | 0 |
| ILF | 0 | 0 | 0 |
| EIF | 0 | 0 | 0 |
| Sum | 3 | 1 | 0 |

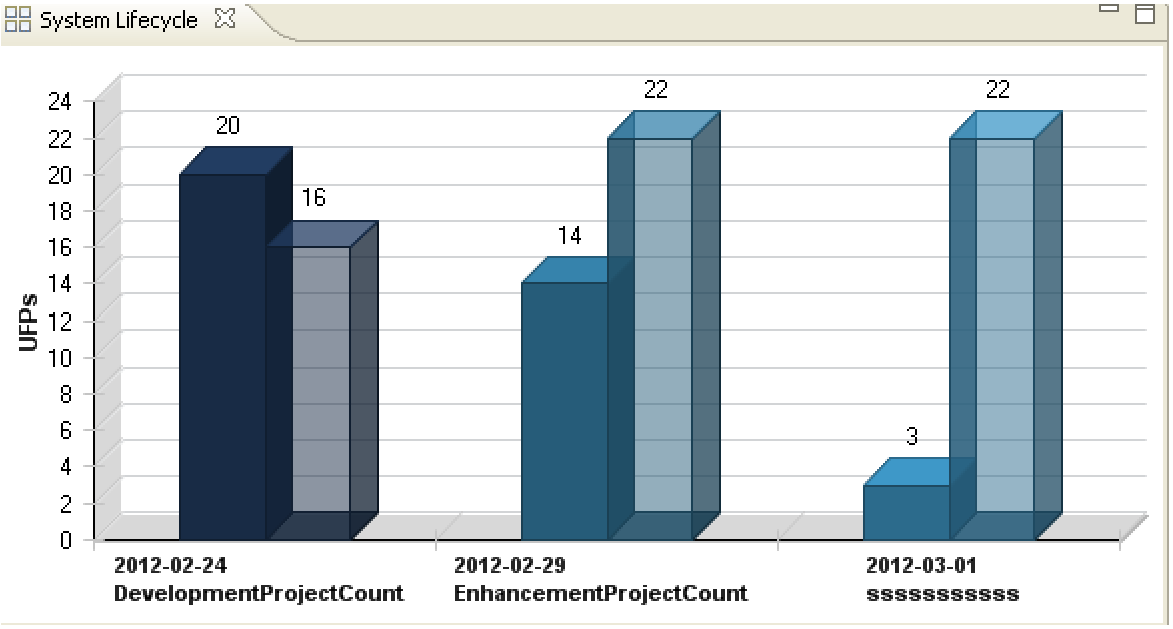
System Overview per Function Typ

| Systemname | EI | EO | EQ | ILF | E.. |
|---|---|---|---|---|---|
| Booking Manager | 3 | 0 | 1 | 2 | 0 |
| Sum | 3 | 0 | 1 | 2 | 0 |

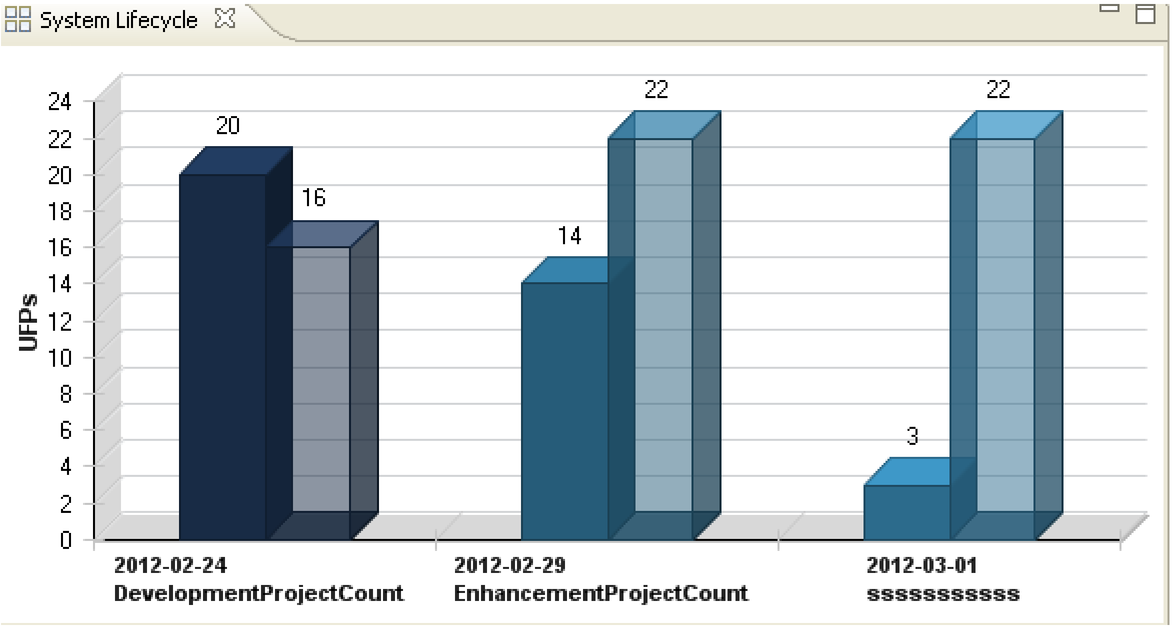
System Overview per FPs

| Systemname | uFP | aFP |
|---|---|---|
| Booking Manager | 20.0 | 14.0 |
| Sum | 20.0 | 14.0 |

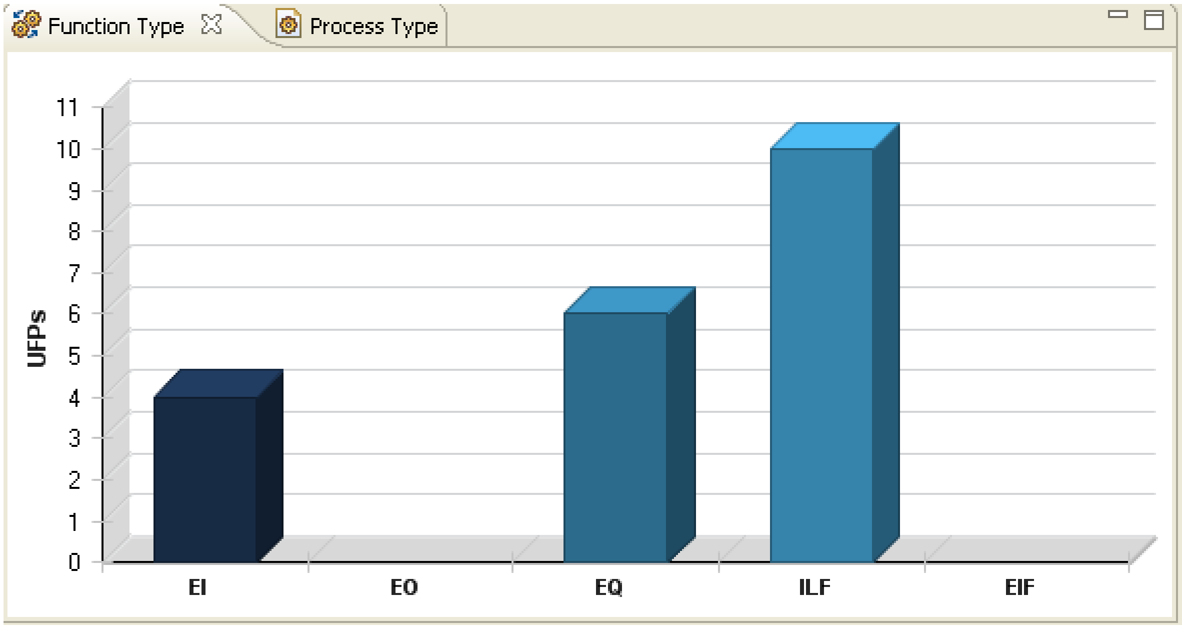
7. The *System Lifecycle view* shows the development of functions of the current selected application system.



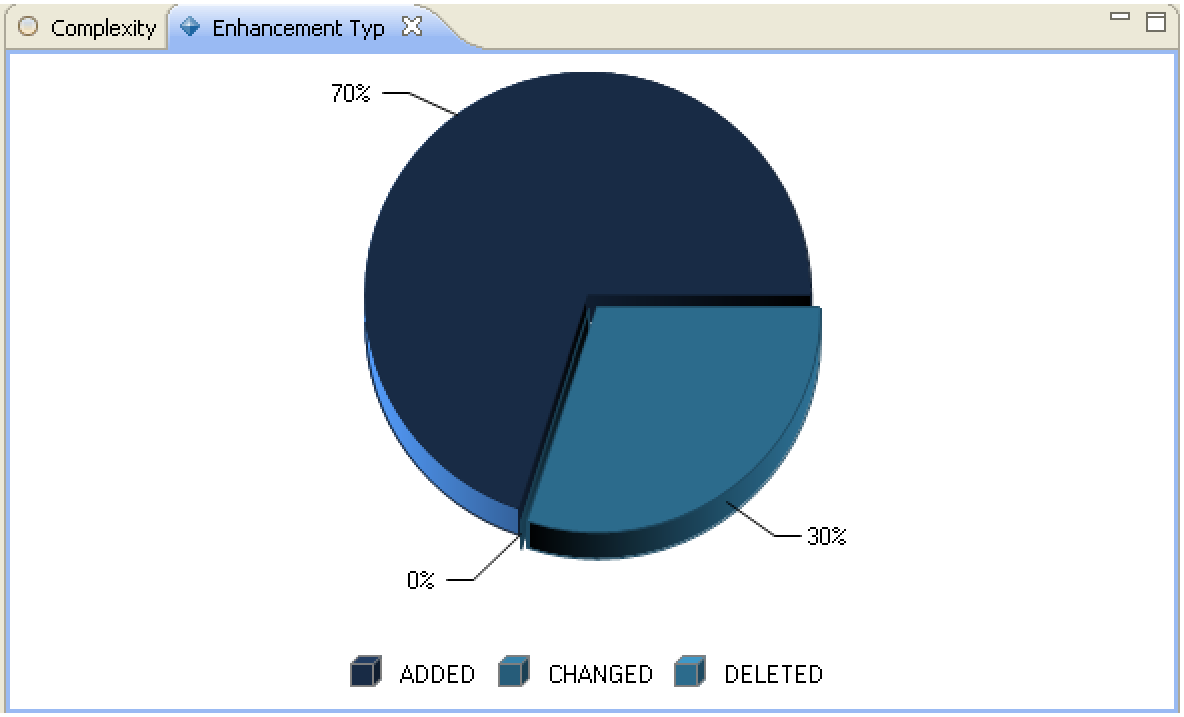
8. The *System Lifecycle view* shows the development of functions of the current selected application system.



9. The *Function Type view* shows the distribution of functions of the current selected count.



**10.** The *Enhancement Type view* shows the distribution of enhancement type of the current selected count.

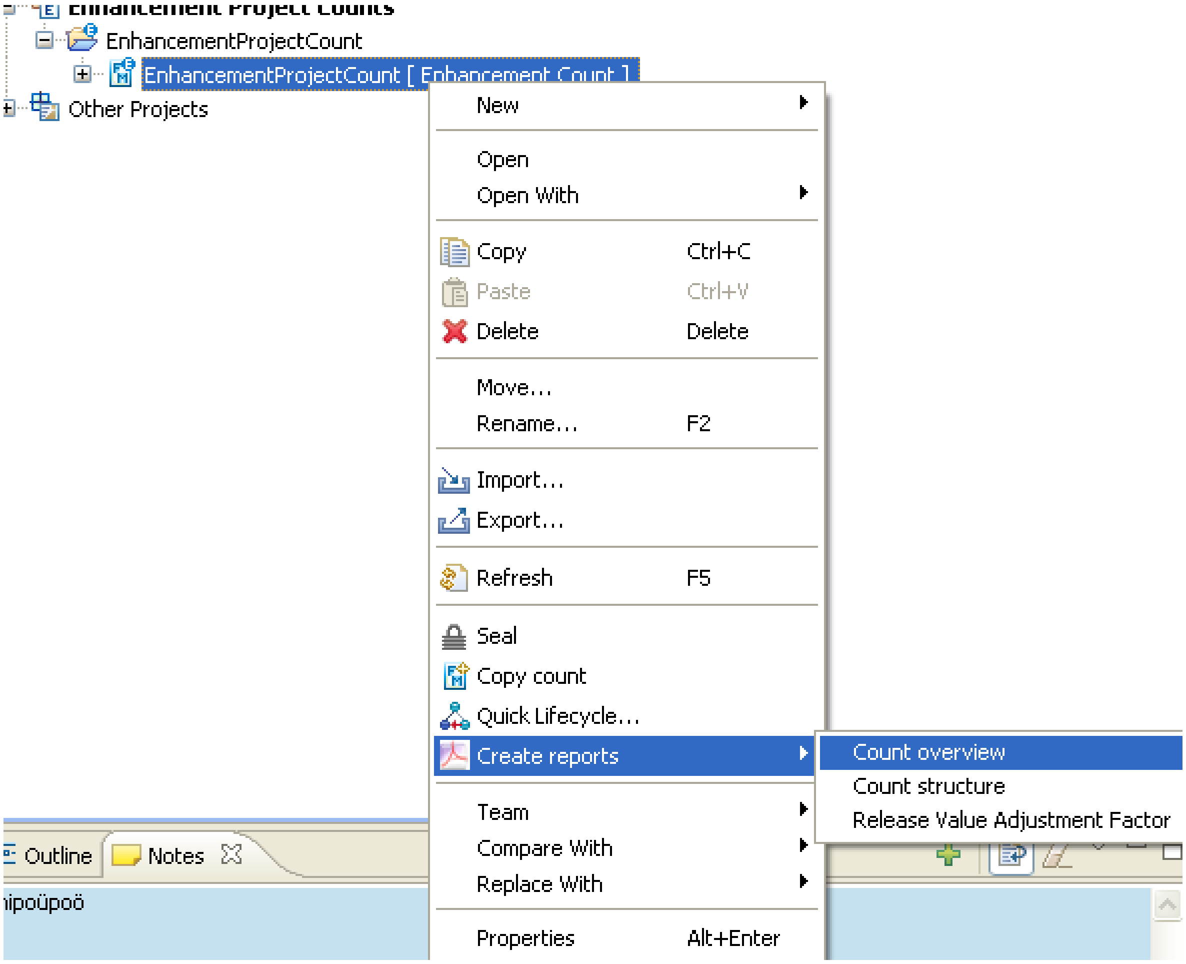


## Standard Reporting

**Function Point Modeler** provides you a some **Standard Reporting** function for counts and estimations for different format e.g PDF, Excel, etc.

## Reporting for Counts

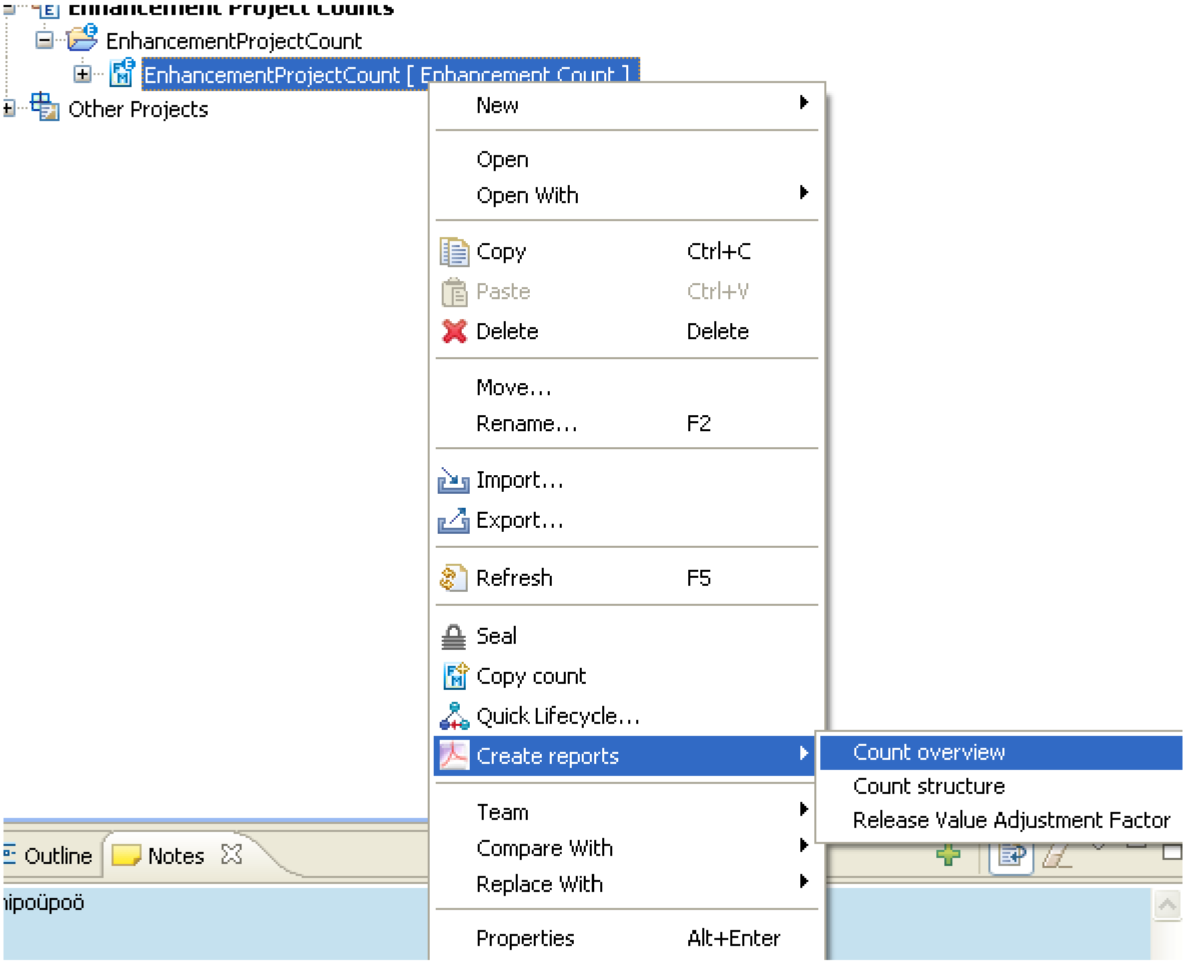
You can create with **Function Point Modeler** the following reports for a count.



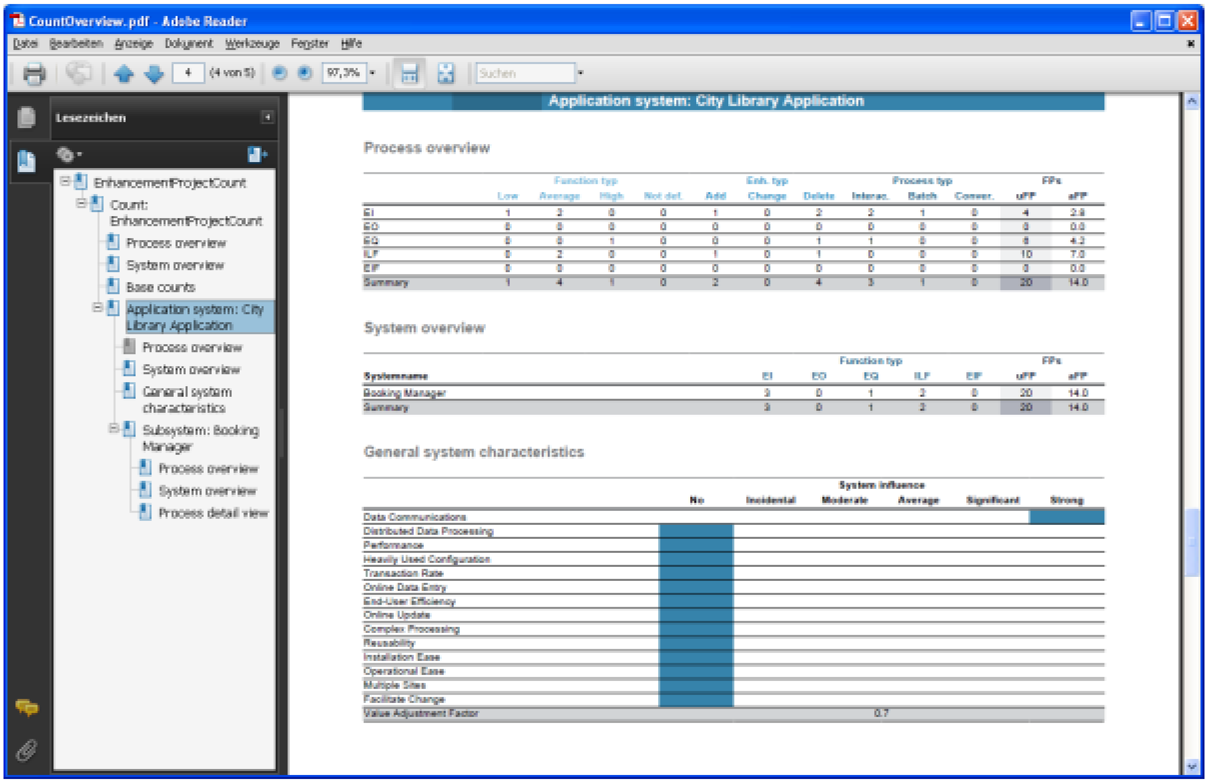
*Count Overview*

To create a **Count Overview** :

1. Click on the right mouse **Create reports** > **Count Overview**



2. Enter **Target file** as *C:\CountOverview.pdf* .
3. Press the button **Ok** .
4. The following **Count Overview** report will be created


CountOverview.pdf - Adobe Reader
Datei Bearbeiten Anzeige Dokument Werkzeuge Fenster Hilfe
4 (4 von 5)
97,3%
Suchen
Lesezeichen
EnhancementProjectCount
Count: EnhancementProjectCount
Process overview
System overview
Base counts
Application system: City Library Application
Process overview
System overview
General system characteristics
Subsystem: Booking Manager
Process overview
System overview
Process detail view

Application system: City Library Application

Process overview

| | Function typ | | | | Enh. typ | | | Process typ | | | FPs | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Low | Average | High | Not def. | Add | Change | Delete | Interac. | Batch | Conver. | uFP | aFP |
| EI | 1 | 2 | 0 | 0 | 1 | 0 | 2 | 2 | 1 | 0 | 4 | 2.8 |
| EO | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| EQ | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 6 | 4.2 |
| ILF | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 10 | 7.0 |
| EIF | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Summary | 1 | 4 | 1 | 0 | 2 | 0 | 4 | 3 | 1 | 0 | 20 | 14.0 |

System overview

| | Function typ | | | | | FPs | |
|---|---|---|---|---|---|---|---|
| Systemname | EI | EO | EQ | ILF | EIF | uFP | aFP |
| Booking Manager | 3 | 0 | 1 | 2 | 0 | 20 | 14.0 |
| Summary | 3 | 0 | 1 | 2 | 0 | 20 | 14.0 |

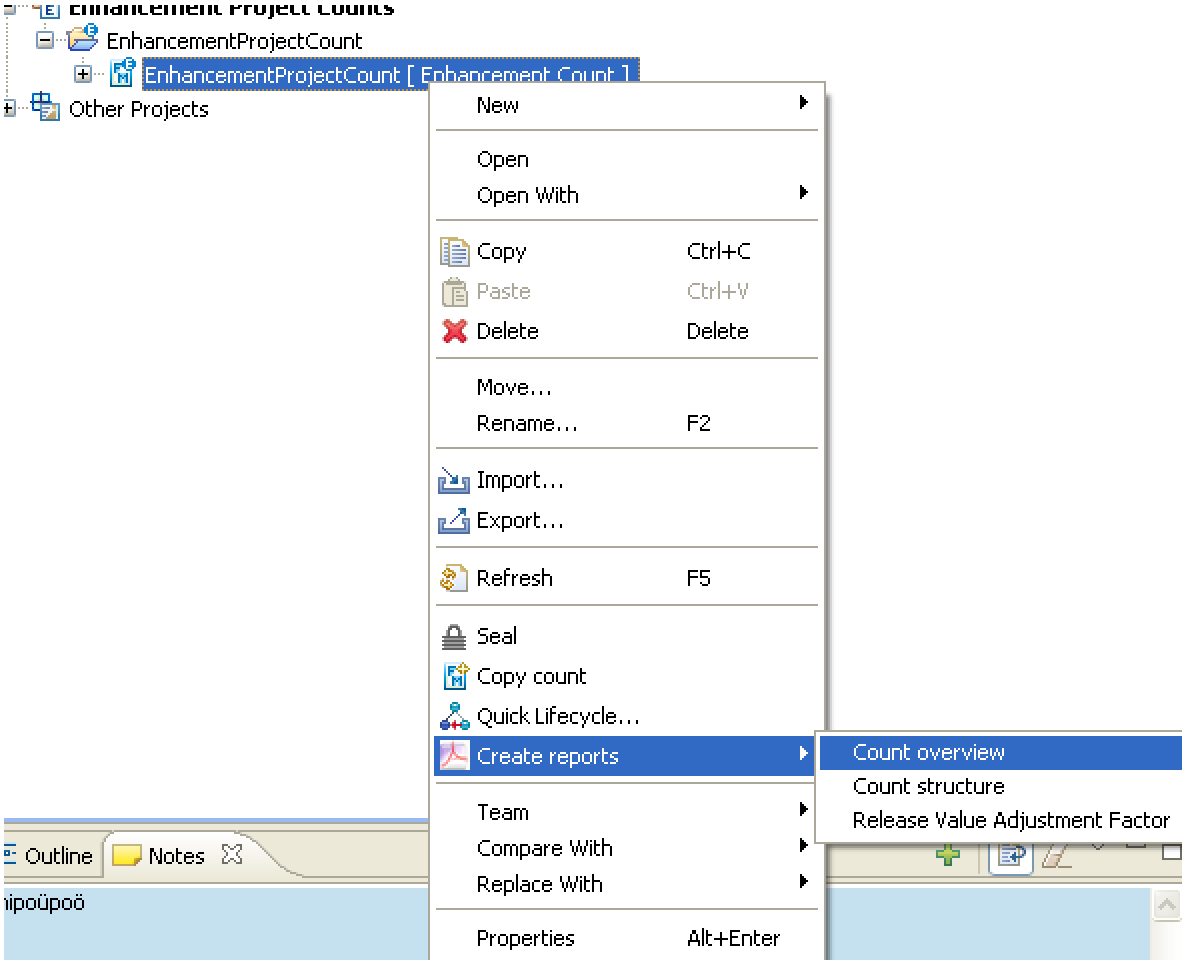
General system characteristics

| | System influence | | | | | |
|---|---|---|---|---|---|---|
| | No | Incidental | Moderate | Average | Significant | Strong |
| Data Communications | | | | | | ■ |
| Distributed Data Processing | ■ | | | | | |
| Performance | ■ | | | | | |
| Heavily Used Configuration | ■ | | | | | |
| Transaction Rate | ■ | | | | | |
| Online Data Entry | ■ | | | | | |
| End-User Efficiency | ■ | | | | | |
| Online Update | ■ | | | | | |
| Complex Processing | ■ | | | | | |
| Reusability | ■ | | | | | |
| Installation Ease | ■ | | | | | |
| Operational Ease | ■ | | | | | |
| Multiple Sites | ■ | | | | | |
| Facilitate Change | ■ | | | | | |
| Value Adjustment Factor | | | 0.7 | | | |

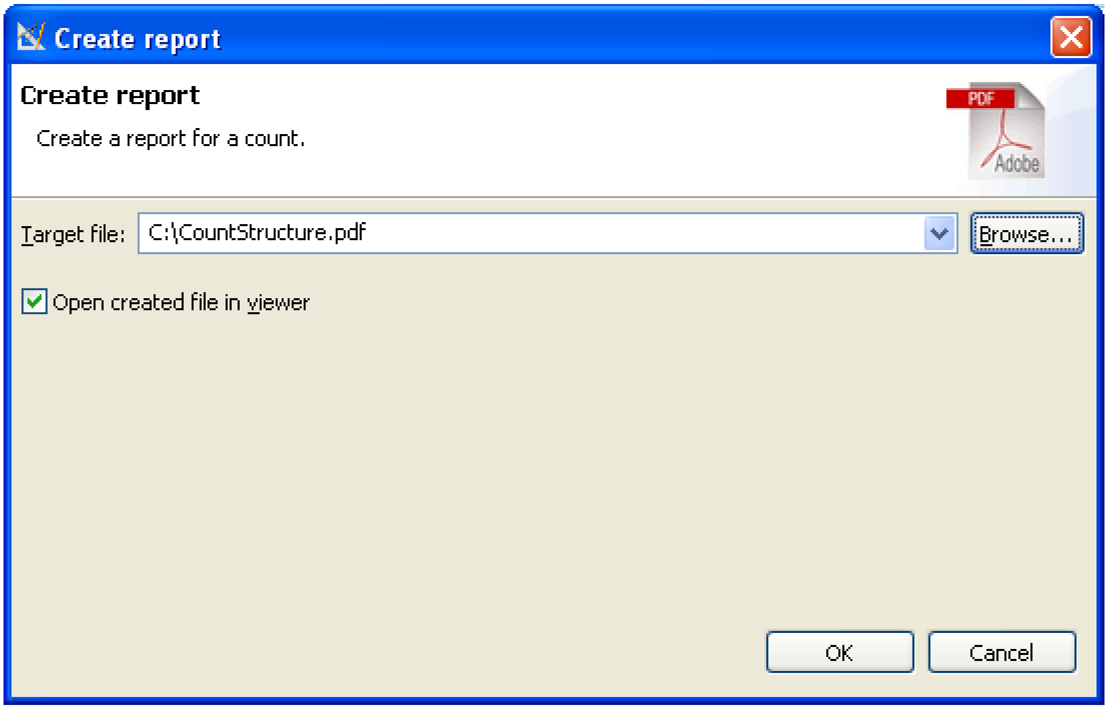
### *Count Structure*

To create a **Count Structure** :

1. Click on the right mouse **Create reports** > **Count Structure**



2. Enter **Target file** as *C:\CountStructure.pdf* .


Create report

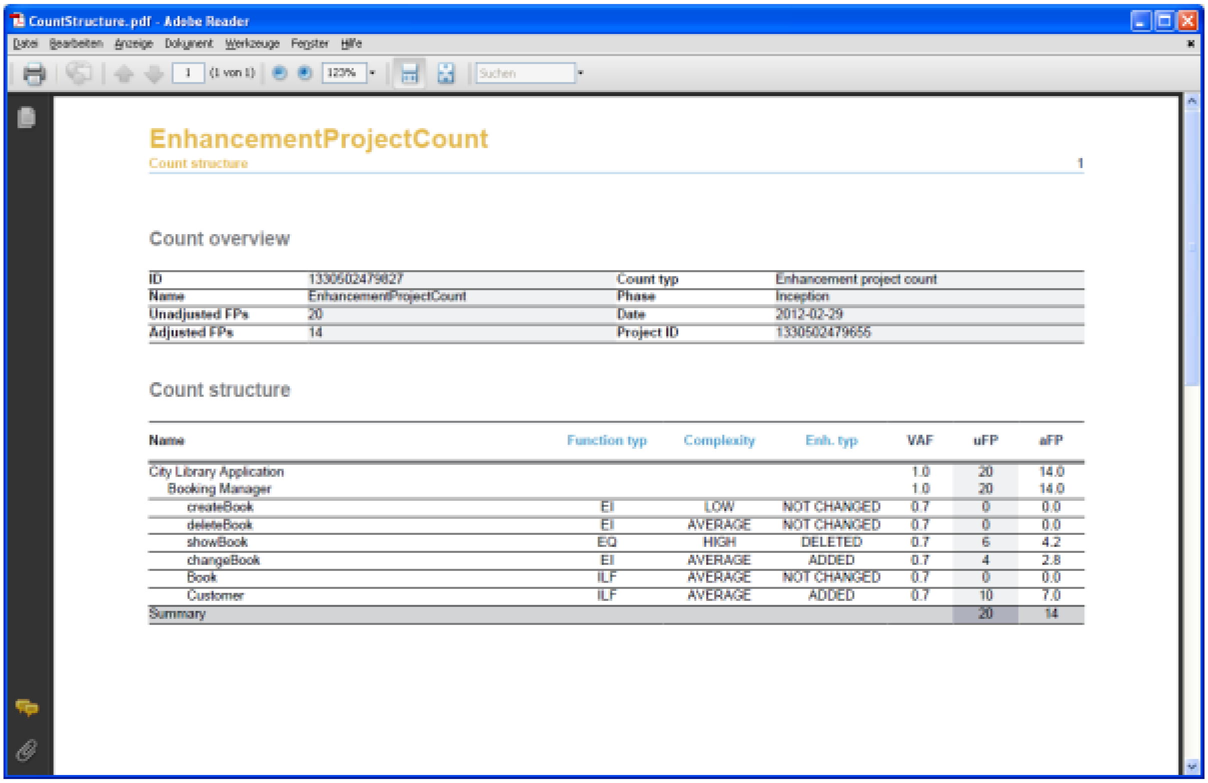
Create report

Create a report for a count.

Target file: C:\CountStructure.pdf

☑ Open created file in viewer

3. Press the button **Ok** .
4. The following **Count Structure** report will be created


CountStructure.pdf - Adobe Reader
Datei Bearbeiten Anzeige Dokument Werkzeuge Fenster Hilfe
1 (1 von 1)
123%
Suchen

EnhancementProjectCount

Count structure 1

Count overview

| | | | |
|---|---|---|---|
| ID | 1330502479827 | Count typ | Enhancement project count |
| Name | EnhancementProjectCount | Phase | Inception |
| Unadjusted FPs | 20 | Date | 2012-02-29 |
| Adjusted FPs | 14 | Project ID | 1330502479655 |

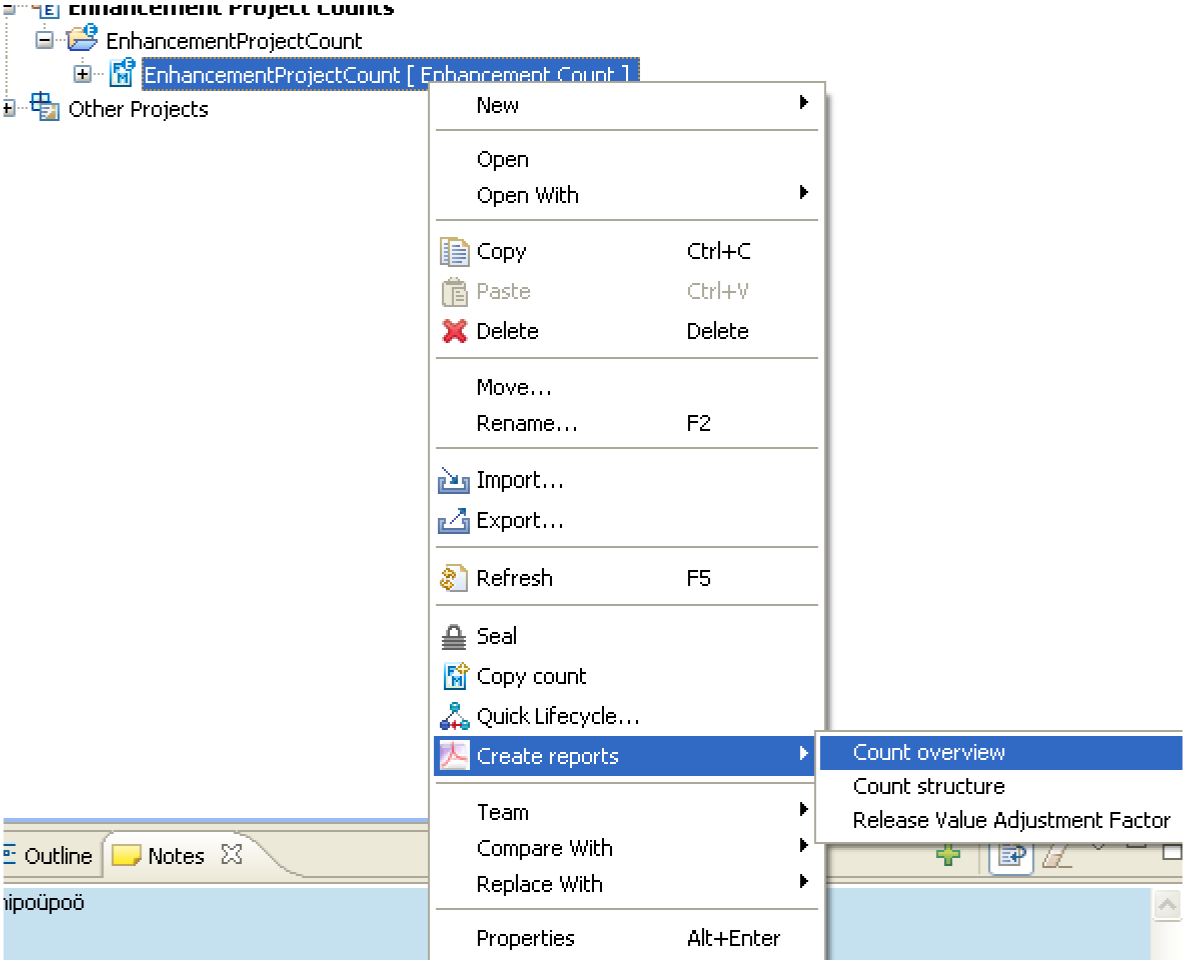
Count structure

| Name | Function typ | Complexity | Enh. typ | VAF | uFP | aFP |
|---|---|---|---|---|---|---|
| City Library Application | | | | 1.0 | 20 | 14.0 |
| Booking Manager | | | | 1.0 | 20 | 14.0 |
| createBook | EI | LOW | NOT CHANGED | 0.7 | 0 | 0.0 |
| deleteBook | EI | AVERAGE | NOT CHANGED | 0.7 | 0 | 0.0 |
| showBook | EQ | HIGH | DELETED | 0.7 | 6 | 4.2 |
| changeBook | EI | AVERAGE | ADDED | 0.7 | 4 | 2.8 |
| Book | ILF | AVERAGE | NOT CHANGED | 0.7 | 0 | 0.0 |
| Customer | ILF | AVERAGE | ADDED | 0.7 | 10 | 7.0 |
| Summary | | | | | 20 | 14 |

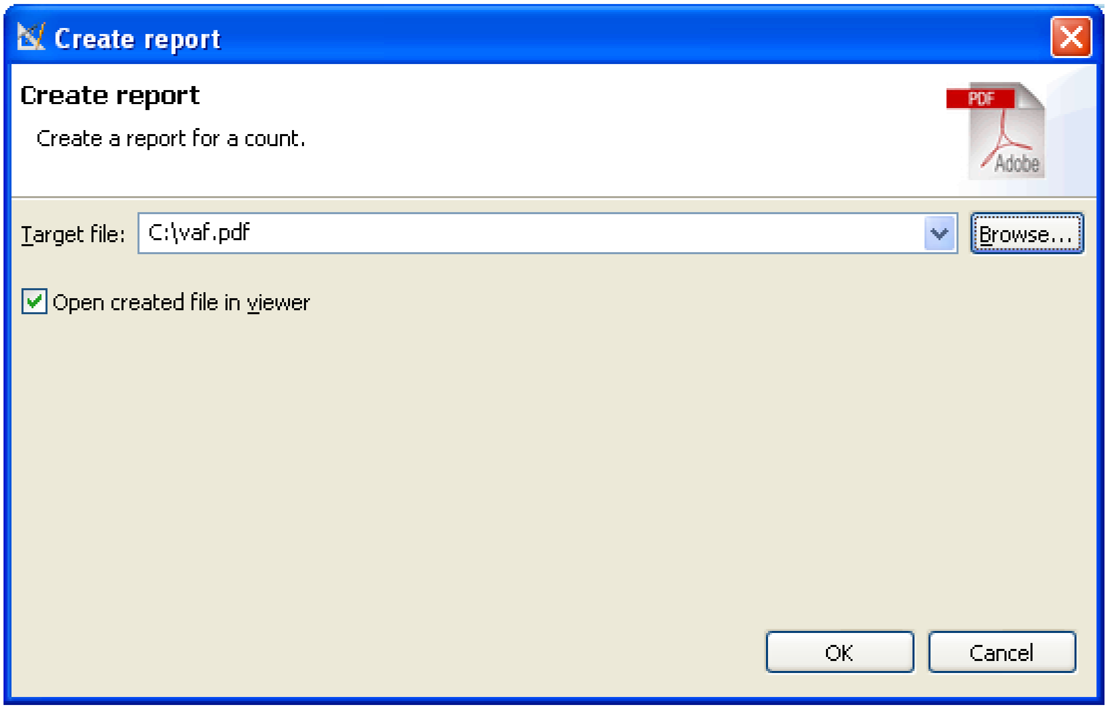
*Release Value Adjustment Factor*

To create a **Release Value Adjustment Factor** :

1. Click on the right mouse **Create reports > Count Structure**



2. Enter **Target file** as *C:\vaf.pdf* .



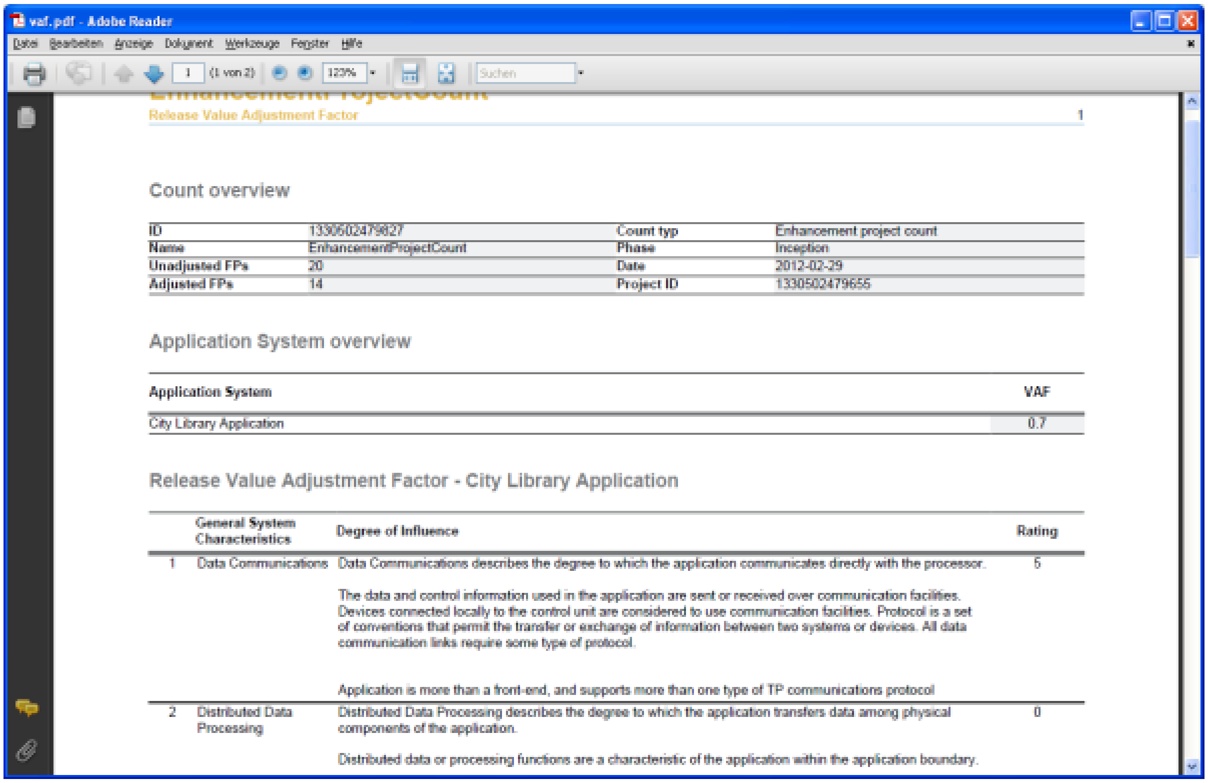
Create report

Create a report for a count.

Target file: C:\vaf.pdf

☑ Open created file in viewer

3. Press the button **Ok** .
4. The following **Release Value Adjustment Factor** report will be created



Release Value Adjustment Factor 1

Count overview

| | | | |
|---|---|---|---|
| ID | 1330502479827 | Count typ | Enhancement project count |
| Name | EnhancementProjectCount | Phase | Inception |
| Unadjusted FPs | 20 | Date | 2012-02-29 |
| Adjusted FPs | 14 | Project ID | 1330502479655 |

Application System overview

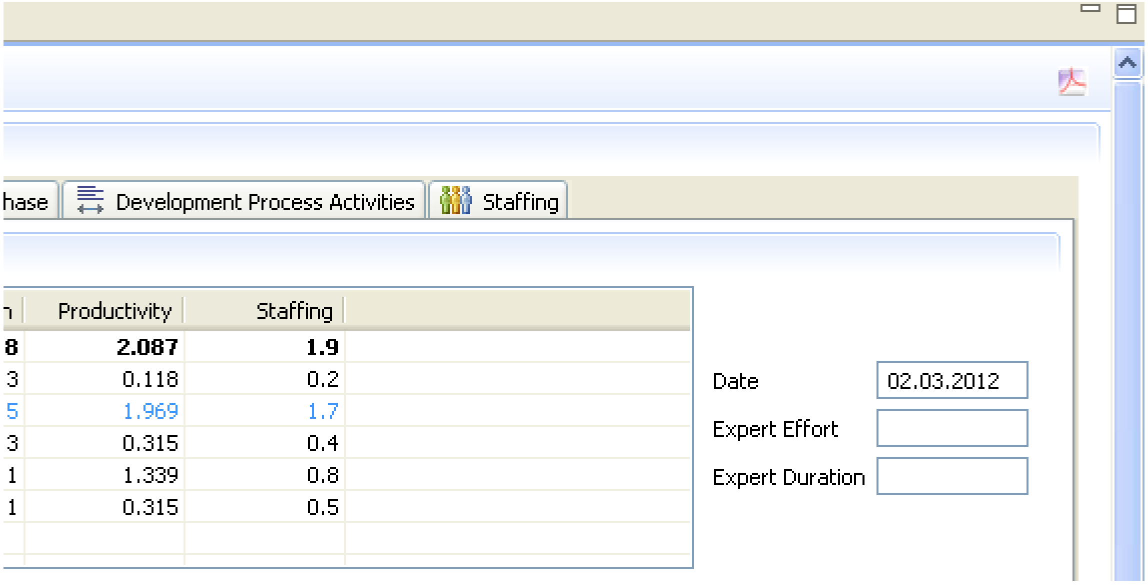
| Application System | VAF |
|---|---|
| City Library Application | 0.7 |

Release Value Adjustment Factor - City Library Application

| | General System Characteristics | Degree of Influence | Rating |
|---|---|---|---|
| 1 | Data Communications | Data Communications describes the degree to which the application communicates directly with the processor.<br>The data and control information used in the application are sent or received over communication facilities. Devices connected locally to the control unit are considered to use communication facilities. Protocol is a set of conventions that permit the transfer or exchange of information between two systems or devices. All data communication links require some type of protocol.<br>Application is more than a front-end, and supports more than one type of TP communications protocol | 5 |
| 2 | Distributed Data Processing | Distributed Data Processing describes the degree to which the application transfers data among physical components of the application.<br>Distributed data or processing functions are a characteristic of the application within the application boundary. | 0 |

## Reporting for Estimations

You can create with **Function Point Modeler** the following reports for a an estimation.



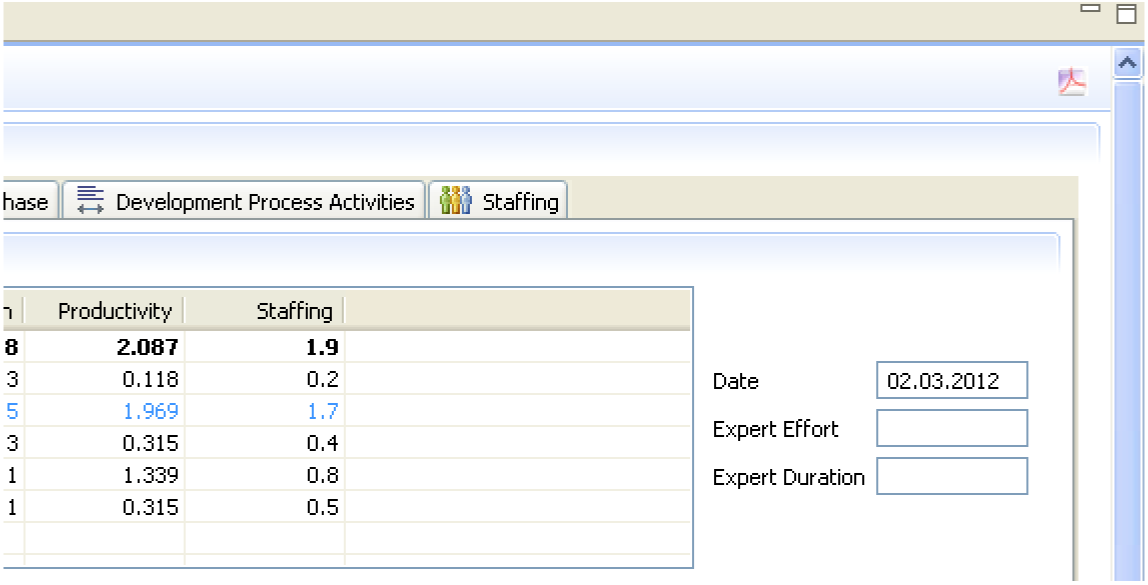
| n | Productivity | Staffing |
|---|---|---|
| 8 | 2.087 | 1.9 |
| 3 | 0.118 | 0.2 |
| 5 | 1.969 | 1.7 |
| 3 | 0.315 | 0.4 |
| 1 | 1.339 | 0.8 |
| 1 | 0.315 | 0.5 |

| | |
|---|---|
| Date | 02.03.2012 |
| Expert Effort | |
| Expert Duration | |

*Estimation Overview*

To create a **Estimation Overview** :

1. Click on the **PDF** icon.



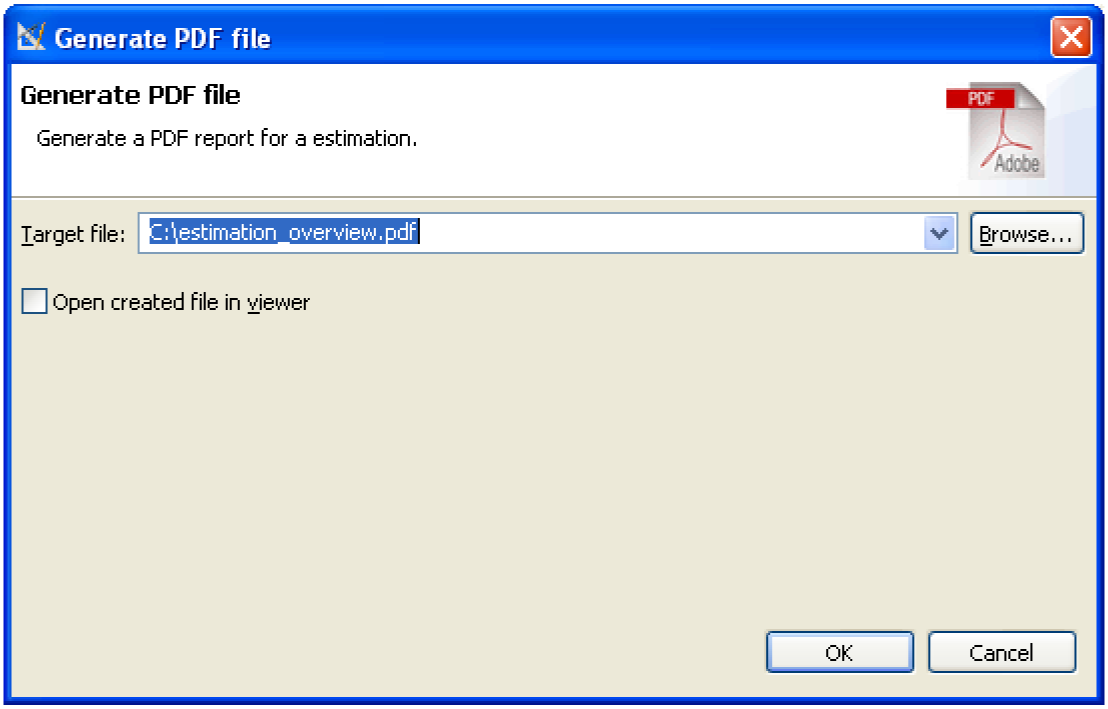
| n | Productivity | Staffing |
|---|---|---|
| 8 | 2.087 | 1.9 |
| 3 | 0.118 | 0.2 |
| 5 | 1.969 | 1.7 |
| 3 | 0.315 | 0.4 |
| 1 | 1.339 | 0.8 |
| 1 | 0.315 | 0.5 |

Date 02.03.2012

Expert Effort

Expert Duration

2. Enter **Target file** as *C:\estimation_overview.pdf* .



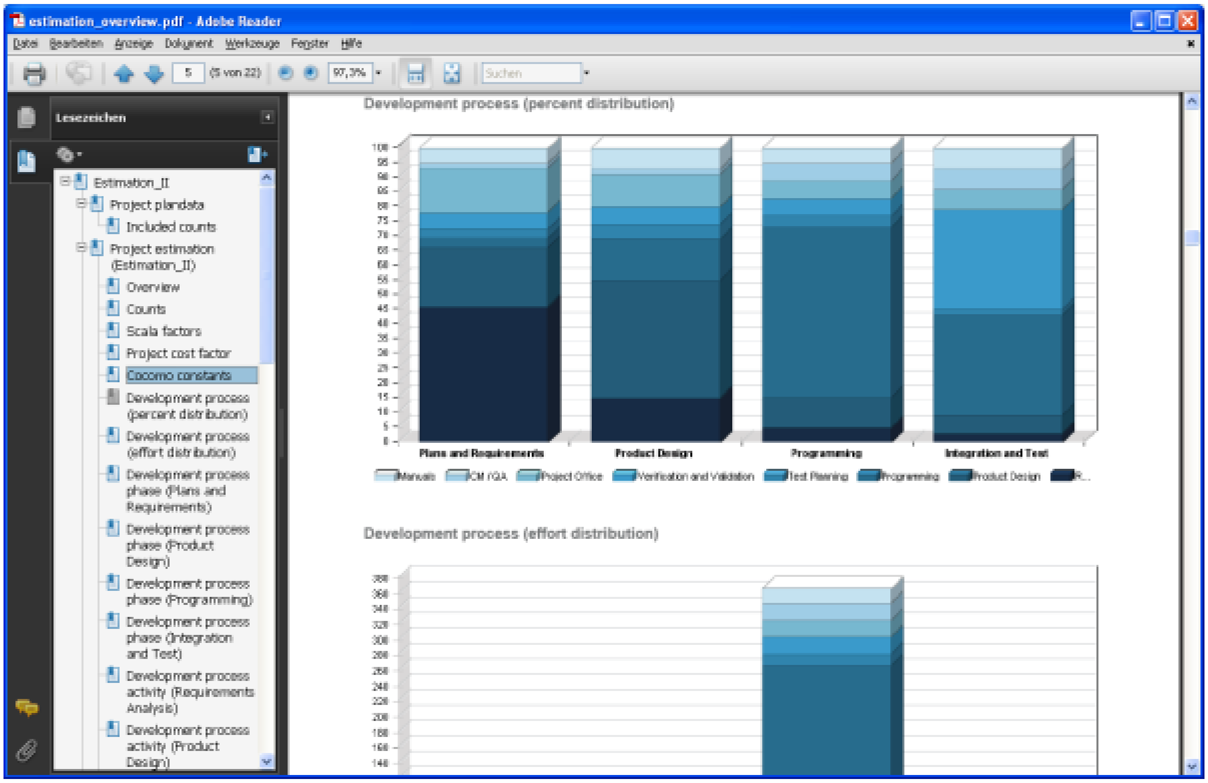
Generate PDF file

Generate a PDF report for a estimation.

Target file: C:\estimation_overview.pdf

□ Open created file in viewer

3. Press the button **Ok** .
4. The following **Estimation Overview** report will be created


estimation_overview.pdf - Adobe Reader
Datei Bearbeiten Anzeige Dokument Werkzeuge Fenster Hilfe
5 (5 von 22) 97,3% Suchen
Lesezeichen
Estimation_II
Project plandata
Included counts
Project estimation (Estimation_II)
Overview
Counts
Scala factors
Project cost factor
Cocomo constants
Development process (percent distribution)
Development process (effort distribution)
Development process phase (Plans and Requirements)
Development process phase (Product Design)
Development process phase (Programming)
Development process phase (Integration and Test)
Development process activity (Requirements Analysis)
Development process activity (Product Design)
Development process (percent distribution)
100 95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0
Plans and Requirements
Product Design
Programming
Integration and Test
Manuals
CM / QA
Project Office
Verification and Validation
Test Planning
Programming
Product Design
R...
Development process (effort distribution)
380 360 340 320 300 280 260 240 220 200 180 160 140

# Concepts

## Function Points Analysis

The following sections will introduce the basic concepts of Function Point Analysis and introduce and reinforce unit cost estimating.

### Introduction

Systems continue to grow in size and complexity, becoming increasingly difficult to understand. As improvements in coding tools allow software developers to produce larger amounts of software to meet ever-expanding user requirements, a method to understand and communicate size must be used. A structured technique of problem solving, function point analysis is a method to break systems into smaller components, so they can be better understood and analyzed. This book describes function point analysis and industry trends using function points.

Human beings solve problems by breaking them into smaller, understandable pieces. Problems that may initially appear to be difficult are found to be simple when dissected into their components, or classes. When the objects to be classified are the contents of software systems, a set of definitions and rules, or a scheme of classification, must be used to place these objects into their appropriate categories. Function point analysis is one such technique: FPA is a method to break systems into smaller components, so they can be better understood and analyzed. It also provides a structured technique for problem solving. Function Point Analysis is a structured method to perform functional decomposition of a software application.

Function points are a unit measure for software much like an hour is to measuring time, miles are to measuring distance or Celsius is to measuring temperature. Function Points are interval measures much like other measures such as kilometers, Fahrenheit, hours, so on and so forth.

Function Points measure software by quantifying its functionality provided to the user based primarily on the logical design. Frequently the term end user or user is used without specifying what is meant. In this case, the user is a sophisticated user. Someone that would understand the system from a functional perspective --- more than likely someone that would provide requirements or does acceptance testing.

There are a variety of different methods used to count function point, but this book is based upon those rules developed by the *Alan Albrecht* and later revised by the International Function Point User Group ( *IFPUG* ). The *IFPUG* rules have much to be desired, so this book attempts to fill in gaps not defined by *IFPUG* .

### What is on the surface?

Remember a tip of an iceberg. The real issue is not the tip, but what is under the surface of the water and can not be seen. The same is true when you design a software application.

One of the largest misconceptions of function points is understanding what functionality is being exposed to an end user versus the delivered functionality. One trend happening in software development today is self service applications like most major airlines are using.

If you visit American Airlines Website and/or Expedia, you will see a relatively simple screen exposed to the end user. The end user simply puts in their departure and destinations and the dates of travel. This appears on the surface to be a simple inquiry, but this is extremely complex. The process actually includes 1,000’s of elementary processes, but the end user is only exposed to a very simple process. All possible routes are calculated, city names are converted to their international three characters, interfaces are sent to all the airline carriers (each one being unique), this is an extremely complex and robust process! When we size software applications we want to understand what is exposed and what is under the surface.

### Elementary Process:

A software application is in essence a defined set of elementary processes. When these elementary processes are combined they interact to form what we call a software system or software application. An elementary process is not totally independent existing alone, but the elementary processes are woven together becoming interdependent. There are two basic types of elementary processes (data in motion and data at rest) in a software application. Data in motion has the characteristic of moving data inside to outside the application boundary or outside to inside the application boundary. An elementary process is similar to an acceptance test case.

### Definition

On a conceptual level, function point analysis helps define two abstract levels of data - data at rest and data in motion.

### Data in motion

Data in motion is handled via transactional function types or simple transactions. All software applications will have numerous elementary processes or independent processes to move data. Transactions (or elementary processes) that bring data from outside the application domain (or application boundary) to inside that application boundary are referred to as external inputs.

Transactions (or elementary processes) that take data from a resting position (normally on a file) to outside the application domain (or application boundary) are referred as either an external outputs or external inquiries (these will be defined later in this book).

### Data at rest

Data at rest that is maintained by the application in question is classified as internal logical files. Data at rest that is maintained by another application in question is classified as external interface files.

### Benefits and Uses

A function point count has many uses.

- Function Points can be used to communicate more effectively with business user groups.
- Function Points can be used to reduce overtime.
- Function points can be used to establish an inventory of all transactions and files of a current project or application. This inventory can be used as a means of financial evaluation of an application. If an inventory is conducted for a development project or enhancement project, then this same inventory could be used to help

maintain scope creep and to help control project growth. Even more important this inventory helps understand the magnitude of the problem

- Function Points can be used to size software applications. Sizing is an important component in determining productivity (outputs/inputs), predicting effort, understanding unit cost, so on and so forth.
- Unlike some other software metrics, different people can count function points at different times, to obtain the same measure within a reasonable margin of error. That is, the same conclusion will be drawn from the results.
- FPA can help organizations understand the unit cost of a software application or project. Once unit cost is understood tools, languages, platforms can be compared quantitatively instead of subjectively. This type of analysis is much easier to understand than technical information. That is, a non-technical user can easily understand Function Points.

There are several other uses of function points. The following list are some practical applications of Function Points and FPA.

- Defining When and What to Re-Engineer
- Estimating Test Cases
- Understanding Wide Productivity Ranges
- Understanding Scope Creep
- Calculating the True Cost of Software
- Estimating Overall Project Costs, Schedule and Effort
- Understanding Maintenance Costs
- Help with contract negotiations
- Understanding the appropriate set of metrics

### When Not to Use Function Points

Function points are not a very good measure when sizing maintenance efforts (fixing problems) or when trying to understand performance issues. Much of the effort associated with fixing problems (production fixes) is due to trying to resolve and understand the problem (detective work). Another inherent problem with measuring maintenance work is that much of maintenance programming is done by one or two individuals. Individual skill sets become a major factor when measuring this type of work. The productivity of individual maintenance programmers can vary as much as 1,000 percent.

Performance tuning may or may not have anything to do with functionality. Performance tuning is more a result of trying to understand application throughput and processing time. There are better metrics to utilize when measuring this type of work.

### Types of Function Point Counts

Function point counts can be associated with either projects or applications. There are three major types of software projects (Development, Enhancements and Maintenance). In accordance with these types of function points there are three different types of function point counts (Development, Enhancement and Application).

### Development Project Function Point Count

Function Points can be counted at all phases of a development project from requirements up to and including implementation. This type of count is associated with new development work. Scope creep can be tracked and monitored by understanding the functional size at all phase of a project. Frequently, this type of count is called a baseline function point count.

### Enhancement Project Function Point Count

It is common to enhance software after it has been placed into production. This type of function point count tries to size enhancement projects. All production applications evolve over time. By tracking enhancement size and associated costs a historical database for your organization can be built. Additionally, it is important to understand how a development project has changed over time.

### Application Function Point Count

Application counts are done on existing production applications. This “baseline count” can be used with overall application metrics like total maintenance hours. This metric can be used to track maintenance hours per function point. This is an example of a normalized metric. It is not enough to examine only maintenance, but one must examine the ratio of maintenance hours to size of the application to get a true picture.

Additionally, application counts can assist organizations in understanding the size of the entire corporate portfolio (or inventory). This type of count is analogous to taking an inventory for a store. Like inventory, a dollar value can be associated with any application function point count and for the entire organization portfolio.

### What about Lines of Code (LOC)

There are several problems with using LOC as a unit of measure for software. Imagine two applications that provide the same exact functionality (screens, reports, databases). One of the applications is written in C++ and the other application written a language like Clarion (a very visual language). The number of function points would be exactly the same, but aspects of the application would be different. The lines of code needed to develop the application would not be the same. The amount of effort required to develop the application would be different (hours per function point). We are able to compare the productivity of the languages. Unlike Lines of Code, the number of function points will remain constant (should remain constant).

With this in mind:

- The number of lines of code delivered is dependent upon the skill level of the programmer. In fact, the higher skill level of the programmer the fewer lines of code they will develop to perform the same function.
- Higher-level languages such as Delphi, Progress 4GL, Forte, Dynasty, VB, Java Script, or other visual languages require far fewer lines of code than Assembler, COBOL, or C to perform the same functionality. That is, there is an inverse relationship between level of language and work output (when work output is LOC).
- The actual number of LOC is not known until the project is almost completed. Therefore, LOC cannot be used to estimate the effort or schedule of a project. Function Points can be derived from requirements and analysis documents that are available early in a project life cycle.
- There is no agreed upon method to count lines of code. The statement and type of statements used in Visual C ++, Assembler, COBOL, SQL are completely different. It is common for applications to have a combination of different languages being utilized.

### Understanding Productivity

The standard economic definition of productivity is “Goods or services per unit of labor or expenses” until 1979, when *A.J. Albrecht* of IBM published a paper about Function Points, there was no definition of what “goods or services” were the output of software project. The good or service of software is the business functionality provided.

While software productivity is a relatively new subject “industrial productivity” has been a subject of interest for many years. One of the first individuals to study productivity was *Frederick Taylor* (1856-1912). Taylor’s major concern throughout most of his life was to increase efficiency in production. Taylor decided that the problem of productivity was a matter of ignorance on the part of management. Taylor believed that application of scientific methods, instead of customs and rules of thumb could yield higher productivity. A century after *Frederick Taylor* most software managers use rules of thumb instead of systematic study.

Several scientists undertook the famous experiments at the Hawthorne plant of the Western Electric Company in 1927 and 1932. They began a study to determine the effect of illumination on workers and their productivity. They found that productivity improved when illumination was either increased or decreased for a test group. They found that when people felt they were being noticed then their productivity increased. They also found that the improvement in productivity was due to such social factors as morale, satisfactory interrelationships and effective management. They also found that the best managers were those that managed via counseling, leading, and communicating. The phenomenon, arising basically from people being “noticed,” has been known as the Hawthorne effect.

### Productivity

The definition of productivity is the output-input ratio within a time period with due consideration for quality.

```
Productivity = outputs/inputs (within a time period, quality considered)
```

The formula indicates that productivity can be improved by (1) by increasing outputs with the same inputs, (2) by decreasing inputs but maintaining the same outputs, or (3) by increasing outputs and decreasing inputs change the ratio favorably.

```
Software Productivity = Function Points / Inputs
```

### Effectiveness v. Efficiency:

Productivity implies effectiveness and efficiency in individual and organizational performance. Effectiveness is the achievement of objectives. Efficiency is the achievement of the ends with least amount of resources.

### Understanding Software Productivity

Software productivity is defined as hours/function points or function points/hours. This is the average cost to develop software or the unit cost of software. One thing to keep in mind is the unit cost of software is not fixed with size. What industry data shows is the unit cost of software goes up with size.

### How does size impact productivity

As the size of software development project becomes larger the cost per function point actually rises. As can be seen from the graph and data, the effort per unit does not remain constant as the size of the software project increases. This is self-evident because the tasks are not the same for software projects as the size increases.

### What is Marginal Cost?

As some of you remember Marginal Cost is an economic term and is different from average cost.

Average cost is the total cost of producing a particular quantity of output divided by that quantity. In this case to Total Cost/Function Points.

Marginal cost is the change in total cost attributable to a one-unit change in output. In our case, how does per unit cost change as the software project size change? How does the cost of software change as the product becomes larger and larger?

Imagine the average cost per square foot of a one-story building compared to the cost per square foot of a 100-story building. No doubt the construction costs (per unit cost) for the 100-story building are much higher than a one-story building. This same concept is true for a software project.

Besides size there are several other factors, which impact the cost of construction

- Where the building is located
- Who is the general contractor?
- Who does the actual labor?

### Why increasing Marginal Costs for Software Development?

There are a variety of reasons why marginal costs for software increase as size increases. The following is a list of some of the reasons

- As size becomes larger complexity increases.
- As size becomes larger a greater number of tasks need to be completed.
- As size becomes larger there is a greater number of staff members and they become more difficult to manage.
- A the numbers of individuals in a project increases the number of communication paths increase also. Communication in large projects can be very difficult.
- Since fixed costs for software projects is minimal. There are little if any economies of scale for software projects.

Function Points are the output of the software development process. Function points are the unit of software. It is very important to understand that Function Points remain constant regardless who develops the software or what language the software is develop in. Unit costs need to be examined very closely. To calculate average unit cost all items (units) are combined and divided by the total cost. On the other hand, to estimate the total cost each item is examined.

For example, assume you are going to manufacture a computer mousepad. The total Cost to manufacture 1,000 mousepad is $2,660. The unit cost is $2.66 (per pad). The cost break down is:

- Artwork is a fixed cost at $500 (or .50 per unit)
- Set Up costs are $250 (or .25 per unit)
- Shipping costs are $10 (or .01 per unit)
- Papers for production will cost $1.50 per unit.
- Rubber Pads are $ .15 per unit.
- Application of paper to pad cost is $.25 per unit

Notice the variation in the unit cost for each item. One of the biggest problems with estimating software projects is understanding unit cost. Software managers fail to break down items into similar components or like areas. They assume all units cost the same.

There are different costs for each of the function point components. The unit cost for external inputs is not the same as the unit cost of external outputs for example. The online external inputs and the batch external inputs do not have the same unit cost (or cost per function point). The cost per unit to build and implement internal logical files is not the same per unit cost as the building and implementing of online reports.

To accurately estimate the cost of an application each component cost needs to be estimated. The same is true for the mousepad problem above.

### Function Point Counting Process

Even though there have been attempts by the National Bureau of Standards *(NBS)* and *IEEE* to standardize terms and definitions, there are no industry wide practiced terms and definitions related to software development. *IFPUG* has developed some standard terms and definitions related to function points, but these terms and definitions need to be applied to a variety of different software environments.

Clients who have standardized their terminology within their own environments have seen significant jumps in productivity. That is, they have reduced the number of verbs used to describe transactions and other events.

Imagine if we compared a blue print document used for construction purposes with a typical software design document. While the blue print uses standard terminology the software design document uses a variety of different terminology to describe the same exact thing.

### Definition

The overall objective is to determine adjusted function point count. There are several steps necessary to accomplish this. While you may not understand the mechanics of the following steps, they will be discussed in great detail in the remainder of the book. The actual sequence or order of steps is not necessary. Many counters will complete step 5 through out the entire count – gathering information as they go:

- Determine type of function point count
- Determine the application boundary
- Identify and rate transactional function types to determine their contribution to the unadjusted function point count.
- Identify and rate data function types to determine their contribution to the unadjusted function point count.
- Determine the value adjustment factor (VAF)
- Calculate the adjusted function point count.

The unadjusted function point (UFP) count is determined in steps 3 & 4. Steps 3 & 4 are discussed later in this chapter and discussed in detail later in the book. It is not important if step 3 or step 4 is completed first. In GUI and OO type applications it is easy to begin with step 3.

The final function point count (adjusted function point count) is a combination of both unadjusted function point count (UFP) and the general system characteristics (GSCs).

### Types of Function Point Counts

Function point counts can be associated with either projects or applications. There are three types of function point counts.

- Development project function point count
- Enhancement project function point count
- Application function point count

### High Level Steps:

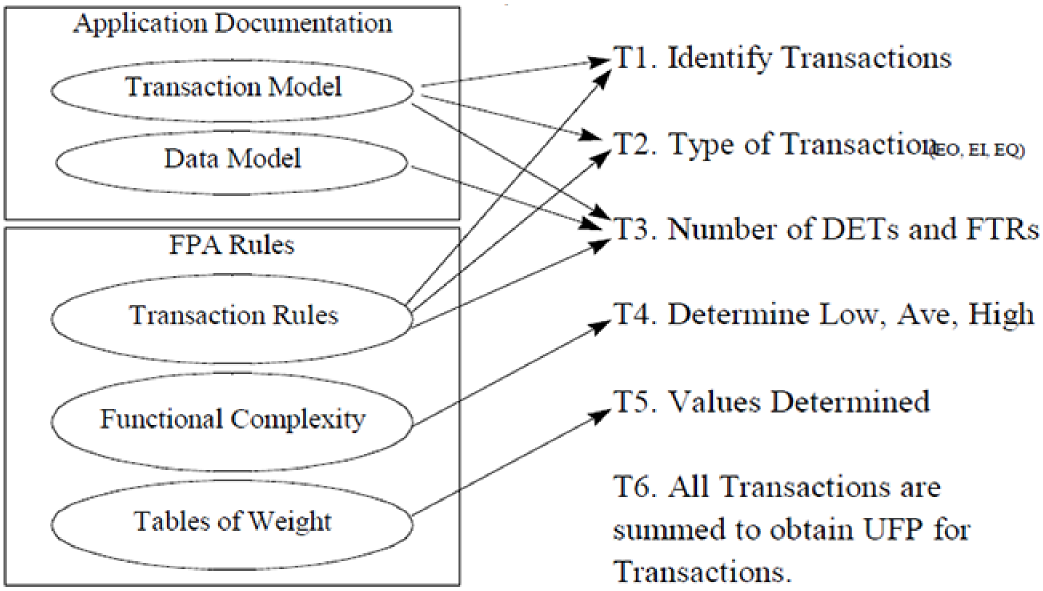
- To complete a function point count knowledge of function point rules and application documentation is needed. Access to an application expert can improve the quality of the count also.
- Once the application boundary has been established, FPA can be broken into three major parts (FPA for transactional function types, FPA for data function types and FPA for GSCs).

### Independence and Dependence:

Since the rating of transactions is dependent on both information contained in the transactions and the number of files referenced, it is recommended that transactions are counted first. At the same time the transactions are counted a tally should be kept of all FTR's (file types referenced) that the transactions reference. It will be made clear in later chapters that every FTR must have at least one or more transactions.

### FPA Steps for Transactional Function Types

Later in this document external inputs, external outputs and external inquiries are discussed in detail. Each transaction must be an elementary process. An elementary process is the smallest unit of activity that is meaningful to the end user in the business. It must be self-contained and leave the business in consistent state.


Application Documentation
Transaction Model
Data Model
FPA Rules
Transaction Rules
Functional Complexity
Tables of Weight
T1. Identify Transactions
T2. Type of Transaction (EO, EI, EQ)
T3. Number of DETs and FTRs
T4. Determine Low, Ave, High
T5. Values Determined
T6. All Transactions are summed to obtain UFP for Transactions.

**T1.** Application documentation and transaction rules are used to identify transactions.

**T2.** The application documentation and transaction rules are used to determine type of transaction (external input, external output, or external inquiry).

**T3.** With the help of application documentation (data model and transaction model) and transaction rules the number data elements and file type referenced are determined.

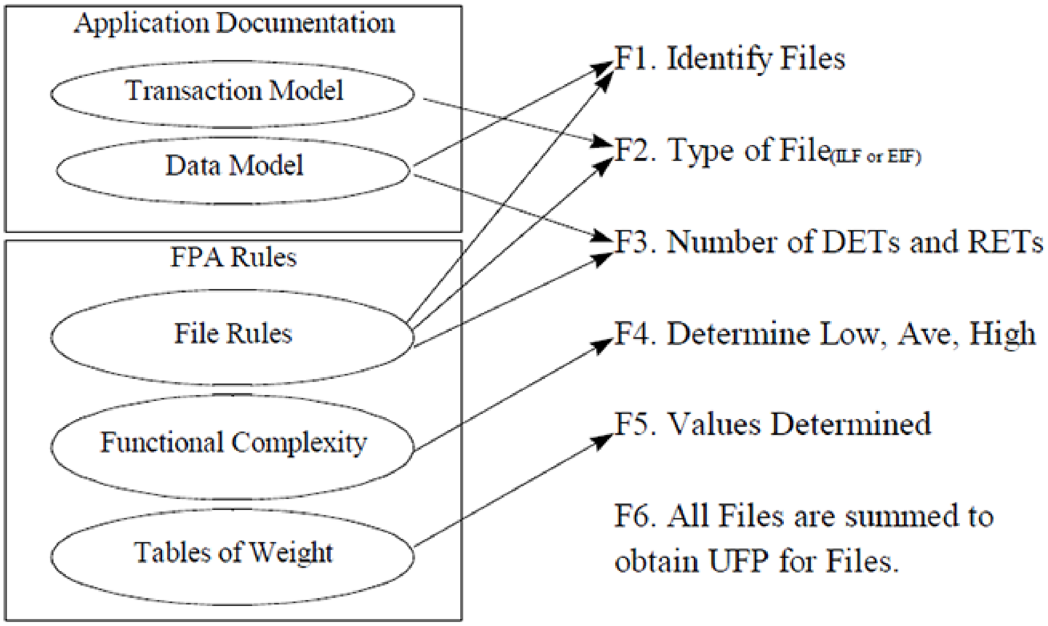
**T4.** Each identified transaction is assigned a value of low, average or high based upon type, data elements, and files referenced.

**T5.** A distinct numerical value is assigned based upon type and value (low, average, or high).

**T6.** All transactions are summed to create a transaction unadjusted function point count.

### FPA Steps for Files

Later in this document internal logical files and external interface files are discussed in detail.


Application Documentation
Transaction Model
Data Model
FPA Rules
File Rules
Functional Complexity
Tables of Weight
F1. Identify Files
F2. Type of File(ILF or EIF)
F3. Number of DETs and RETs
F4. Determine Low, Ave, High
F5. Values Determined
F6. All Files are summed to obtain UFP for Files.

**F1.** Application documentation and file rules are used to identify files.

**F2.** The application documentation (transaction model and data model) is used to determine type of file (either external interface file or internal logical file).

**F3.** With the help of application documentation (data model) and file rules the number data elements and record element types are determined.

**F4.** Each identified file is assigned a value of low, average or high based upon type, data elements and record types.

**F5.** A distinct numerical value is assigned based upon type and value (low, average, or high).

**F6.** All files are summed to create a file unadjusted function point count.

### Establishing the Boundary

Since it is common for computer systems to interact with other computer systems and/or human beings, a boundary must be drawn around each system to be measured prior to classifying components. This boundary must be drawn according to the sophisticated user’s point of view. In short, the boundary indicates the border between the project or application being measured and the external applications or user domain. Once the border has been established, components can be classified, ranked and tallied.

One of the benefits of function point is analysis is creating ratios with other metrics such hours, cost, headcount, duration, and other application metrics. It is important the function point boundary be consistent with other metrics that are being gathered for the application and project.

### Identify the Boundary

- Review the purpose of the function point count.
- Look at how and which applications maintain data.
- Identify the business areas that support the applications.

The boundary may need to be adjusted once components have been identified. In practice the boundary may need to be revisited, as the overall application is better understood. Function point counts may need to be adjusted as you learn about the application.

### Standard Documentation

- General Specification Documents
- Interface Documents
- Other metric reports

- Interviews with the users
- User Documentation
- Design Documentation
- Requirements
- Data flow diagrams

### Establishing the Boundary early in the Life cycle

Boundaries can be established early in the software life cycle. If the application is a replacement project, then the project boundary should be similar (perhaps identical) to the previous application. If the application is a new application, other applications boundaries should be reviewed to establish the correct boundary.

### Technology Issues

### Internet/Intranet Applications

The boundary for an Internet/Intranet application is defined in a similar way for traditional applications. For traditional applications the boundary is not drawn just around the user interface or a group of screens but around the entire application. Frequently, Internet/Intranet applications are just extensions to current and existing applications. There is a tendency to create a "new" application for the Internet/Intranet extension, but this approach is incorrect.

### Client/Server

The boundaries for client/server applications need to be drawn around both the client and server. The reason is that neither the client nor server supports a users (or sophisticated) view. That is, one alone does not represent a total application. As mentioned early, any complete application needs both data at rest (server) and data in motion (client).

### Tabulating

There is no special tabulating that needs to take place for establishing the boundary, but the boundary can dramatically impact the number of external inputs and external outputs.

### Identifying RETs, DETs, FTRs

**Record Element Type (RET):** A RET is user recognizable sub group of data elements within an ILF or an EIF. It is best to look at logical groupings of data to help identify them. The concept of RET will be discussed in detail in the chapters that discuss internal logical file and external interface files.

**File Type Referenced (FTR):** A FTR is a file type referenced by a transaction. An FTR must also be an internal logical file or external interface file.

**Data Element Type (DET):** A DET is a unique user recognizable, non-recursive (non-repetitive) field. A DET is information that is dynamic and not static. A dynamic field is read from a file or created from DETs contained in a FTR. Additionally, a DET can invoke transactions or can be additional information regarding transactions. If a DET is recursive then only the first occurrence of the DET is considered not every occurrence.

A data element can be either quantitative or qualitative. A quantitative data element is data in numerical form. A qualitative data element is data not in numerical form, but is in the form of text, photographs, sound bytes and so on.

Understanding the FTRs and DETs helped distinguish one transaction from another transactions. This concept will be discussed in detail later in this book.

### Rating

All of the components are rated based upon DET’s, and either RETs or FTRs.

| Component | RETs | FTRs | DETs |
|---|---|---|---|
| External Inputs (EI) | | yes | yes |
| External Outputs (EO) | | yes | yes |
| External Inquiries (EQ) | | yes | yes |

| Component | RETs | FTRs | DETs |
|---|---|---|---|
| External Interface Files (EIF) | yes |  | yes |
| Internal Logical Files (ILF) | yes |  | yes |

### Transaction DETs

- **External Inputs:** Data Input Fields, Error Messages, Calculated Values, Buttons
- **External Outputs:** Data Fields on a Report, Calculated Values, Error Messages, and Column Headings that are read from an ILF. Like an EQ and EO can have an input side and output sides.
- **External Inquiries:** Input Side - field used to search by, the click of the mouse. Output side - displayed fields on a screen.

### Record Element Types (RETs)

Record element types are one of the most difficult concepts in function point analysis. Most record element types are dependent on a parent - child relationship. In this case, the child information is a subset of the parent information. In a parent child relationship there is a one to many relationship. That is, each child piece of information is linked directly to a field on the parent file. More will be discussed about RETs in the internal logical file and external interface file sections.

### Tips to Identify RETs and DETs early in the life cycle

RETs and DETs may be difficult to evaluate early in the software life cycle. Since RETs and DETs are essential to rating components, several techniques can be used to rate components.

- Rate all transactional function types and data function types as Average.
- Determine how are transactional function type and data function types rated in similar type applications. Are the majority of data function types rated as low in similar type applications?

### DETs for GUI

Using the strict definition of a data element provided by IFPUG's Counting Practices Manual. “A data element is a user recognizable, non recursive field.” Unfortunately this does not provide much guidance when counting GUI applications. In fact, the IFPUG Counting Practices manual does not provide much detail on counting, radio buttons, check boxes, pick list, drop downs, look ups, combo boxes, so on and so forth. In GUI applications, a data element is information that is stored on an internal logical file or that is used to invoke a transaction.

### Radio Buttons

Radio Buttons are treated as data element types. Within a group of, a frame, radio buttons the user has the option of selecting only one radio button; so only one data element type is counted for all the radio buttons contained in the frame.

### Check Boxes

Check Boxes differ from radio buttons in that more than one check box can be selected at a time. Each check box, within a frame, that can be selected should be treated as a data element.

### Command Buttons

Command buttons may specify an add, change, delete or inquire action. A button, like OK, may invoke several different types of transactions.

According to IFPUG counting rules each command button would be counted as a data element for the action it invokes. In practice this data element will not impact the rating of the transaction, but it does help understand and dissect a screen full of transactions.

A button like next may actually be the input side of an inquiry or another transaction.

For example, a simple application to track distributors could have fields for Distributor Name, Address, City, State, Zip, Phone Number, and Fax Number. This would represent seven fields or (seven data elements) and the add command button would represent the eighth data element. In short, the “add” external input represent a one external input with eight data elements, the “change” external input represents another external input with eight (seven data elements plus the “change” command button), and the “delete” external input represents the last external input with eight data elements (seven fields plus the “delete” command button).

### Display of Graphical Images or Icons

A display of a graphical image is simply another data element. An inventory application, for example, may contain data about parts. It may contain part name, supplier, size, and weight and include a schematic image of the part. This schematic is treated as a single data element.

### Sound Bytes

Many GUI applications have a sound byte attached. This represents one data element. The number of notes played is simply recursive information. If the length of the sound byte increases, then the data element remains one. For example, you can play the “Star Spangled Banner” for two seconds or four seconds, but you’ll still count the sound bytes as one data element. The longer it is played the more recursive information it has.

### Photographic Images

A photographic image is another data element, and is counted as one. A human resource application may display employee name, start date, etc. and a photograph of the employee. The photograph is treated the same as employee name or employee start date. The photograph is stored and maintained like any other piece of information about the employee.

### Messages

There are three types of messages that are generated in a GUI application: **error messages** , **confirmation messages** and **notification messages** . Error messages and confirmation messages indicate that an error has occurred or that a process will be or have been completed. They are not an elementary or independent process alone, but they are part of another elementary process. A message that would state, "zip code is required" would be an example of an error message. A message that would state, "are you sure you want to delete customer" is an example of a confirmation message. Neither type of message is treated as a unique external output, but each is treated as a data element for the appropriate transaction.

On the other hand, a **notification messages** is a business type message. A notification is an elementary process, has some meaning to the business user and is independent of other elementary processes. It is the basis of processing and a conclusion being drawn. For example, you may try to withdraw from an ATM machine more money than you have in your account and you receive the dreaded message, "You have insufficient funds to cover this transaction." This is the result of information being read from a file regarding your current balance and a conclusion being drawn. A notification message is treated as an External Output.

### DETs For Real Time Systems

Using the strict definition of a data element provided by IFPUG’s Counting Practices Manual. "A data element is a user recognizable, non recursive field." Unfortunately this does not provide much guidance when counting real time or embedded systems. In fact, the IFPUG Counting Practices manual does not provide any detail on counting these types of systems.

Some traditional definitions can be applied directly to real time and embedded systems. The fields on a diagnostics file: time of diagnostics, hardware state during diagnostics, temperature, voltage, so on and so forth would all be examples of data elements.

Real Time Systems may not have any "traditional user interface." That is, the stimulus for the Real Time System may be it's own output – or state. A real time or embedded systems can signal to determine current Hardware State (or location) and determine the appropriate adjustment (input) based on the current state.

### Navigation

Nigation is moving from one transaction to another.

### External Inputs

External Inputs (EI) - is an elementary process in which data crosses the boundary from outside to inside. This data is coming external to the application. The data may come from a data input screen or another application. The data may be used to maintain one or more internal logical files. The data can be either control information or business information. If the data is control information it does not have to maintain an internal logical file.

If an external input adds, changes and deletes (maintains) information on an internal logical file, then this represents three external inputs. External inputs (especially change & delete) may be preceded by an external inquiry (see the section on external inquiries). Hence a full function screen is add, change, delete and inquiry (more will be discussed about inquiries later in the book).

### Rating

Like all components, EI's are rated and scored. The rating is based upon the number of data element types (DET's) and the file types referenced (FTR's). DET's and FTR's are discussed earlier. The table below lists both the level (low, average or high) and appropriate score (3, 4 or 6).

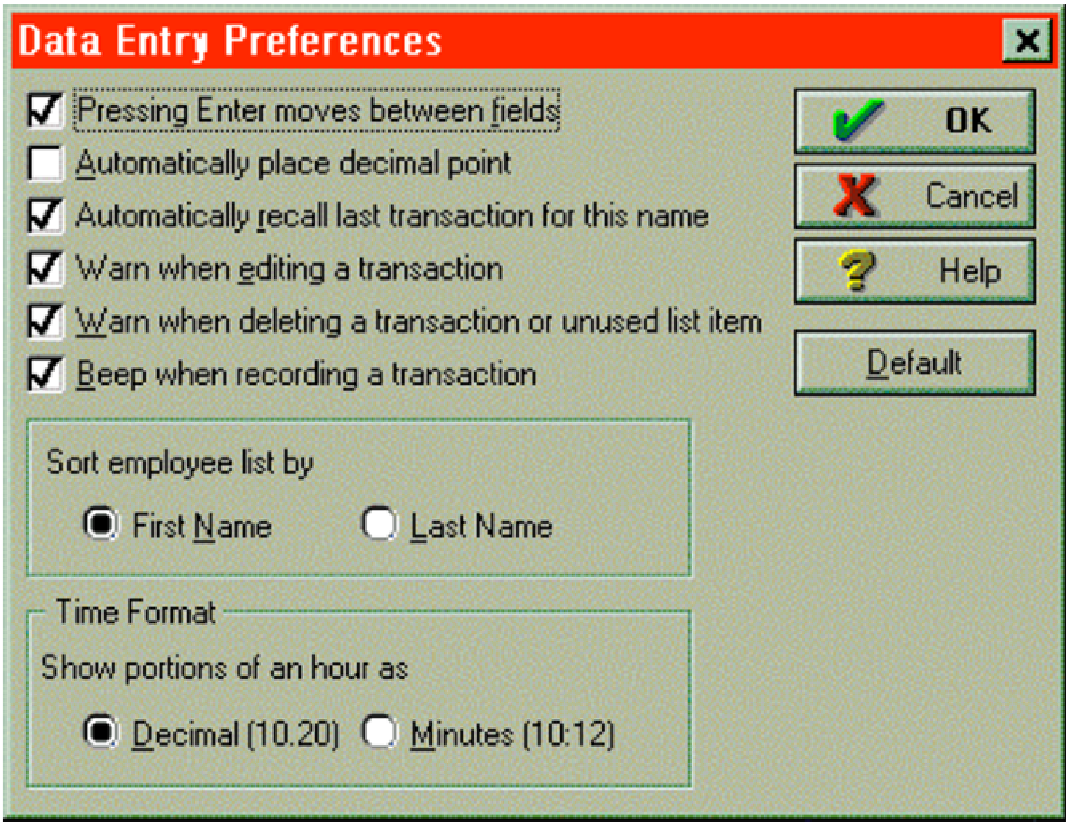
| **Files Type Referenced (FTR)** | **Data Elements (DETs)** | | |
|---|---|---|---|
| | 1-4 | 5-15 | Greater than 15 |
| Less than 2 | Low (3) | Low (3) | Average (4) |
| 2 | Low (3) | Average (4) | High (6) |
| Greater than 2 | Average (4) | High (6) | High (6) |

### Counting Tips

Try to ask the question, do external inputs need more or less than 2 files to be processed? For all the EIs that reference more than 2 FTRs, all that is needed to know is if the EI has more or less than 4 data element types referenced. If the EI has more than 4 DETs the EI will be rated as high; less than 4 DETs the EI will be rated as average. Any EIs that reference less than 2 FTRs should be singled out and counted separately.

### Examples

EIs can be business data, control data and rules based data.



Data Entry Preferences

☑ Pressing Enter moves between fields

□ Automatically place decimal point

☑ Automatically recall last transaction for this name

☑ Warn when editing a transaction

☑ Warn when deleting a transaction or unused list item

☑ Beep when recording a transaction

Sort employee list by

● First Name ○ Last Name

Time Format

Show portions of an hour as

● Decimal (10.20) ○ Minutes (10:12)

**Business Data:** Customer Name, Address, Phone, and so on and so forth.

**Control Data:** The data elements are those that invoke the transaction or change the behavior of the application. Each check box represents a data element. Additionally, the sort employee list radio buttons represents one data element as well as the time format radio buttons.

Control information changes or alters the state (or behavior) of the application. Control information specifies how, what, and when data will be processed.

### Data Elements

Unique sets of data elements help distinguish external input from other external input.

- Data Input Fields
- Calculated Values or Derived Data that are stored
- Error Messages
- Confirmation Messages
- Recursive fields are only counted as one DET.
- Action keys (command buttons such as OK, Next, so on and so forth)
- Multiple Action Keys that perform the same function are counted only as one DET.

### File Types Referenced (FTRs)

Unique FTRs helps distinguish external input from other external input. An FTR must be either an Internal Logical File and/or External Interface File. Each internal logical file that an external input maintains is counted as an FTR. Any internal logical file or external interface file that is referenced by an external input as part of the elementary process of maintaining an internal logical file would be considered an FTR also. For example, an External Input may update an internal logical file, but must also reference a "security file" to make sure that the user has appropriate security levels. This would be an example of two FTRs.

### Uniqueness

A unique set of data elements, and/or a different set of FTRs, and/or a unique set of calculations make one external input unique or different from other external inputs. That is, one of the following must be true:

- Unique or different set of data elements
- Unique or different set of FTRs
- Unique or different calculations

Calculations alone are not an elementary process but part of the elementary process of the external input. A calculation (or derived data) does not make the transaction an external output. External outputs and derived data will be discussed in detail in the external output section of this document.

### Understanding Enhancement Function Points

Modification of any of the items, which make an External Input unique from other external inputs, causes the EI to be "enhanced." If any of the following are true:

- DETs added to an EI
- DETs modified on an EI. The DET was included in the last FP Count.
- A New FTR
- Modifications to a calculation that appears on an EI.

### Technology Issues

### GUI

**Radio Buttons** - each set of radio buttons is counted as one DET. Only one radio button can be selected at a time.

**Pick Lists** - The actual pick list (also known as drop downs, lookups) could be an external inquiry, but the result of the inquiry may be a DET for an external input.

**Check Box** - Each check box that can be simultaneously checked is a unique DET.

**Buttons** - Buttons can be DETs. The OK button above would be a data element. If there was a series of buttons Add, Change and Delete. Each button would be counted as a DET for the associated transaction.

A single GUI "screen" may represent several transactional function types. For example, it is common for a GUI “screen” to have a series of external inquiries followed by an external input.

### Other

**Error Messages** - error messages are counted as data elements (DETs), not unique external inquiries. Count one DET for the entire input screen. Multiple Error Messages are similar to recursive values. An error message is part of another elementary process.

The number of error messages on a GUI screen is less than the number of error messages associated with traditional applications. If used correctly, radio buttons and pick lists can force users to select correct information; therefore, eliminating the need to do editing behind the scenes.

In practice the number of DETs do not make much of a difference in evaluating an EI, understanding error or confirmation messages help in the understanding of uniqueness.

**Real Time and Embedded Systems** - In real time and embedded systems communication between hardware and software is common and should not be overlooked when counting these types of systems. Other types of inputs for real time and embedded systems are: Operator Controls, Volume Controls, Sensor Readings, Radio Frequencies, Standards and Limit Settings (Alarms Settings, so on and so forth.)

### Standard Documentation

A good source of information to determine external inputs is Screen Layouts, Screen Formats & dialogs, and layouts of any input forms. Additional inputs from other applications should be inventoried here. Inputs from other applications must update internal logical files of the application being counted.

- Screen Layouts
- Screen Dialogs
- Design Documentation
- Functional Specifications

- User Requirements
- Any Input Forms
- Context Diagrams
- Data Flow Diagrams

### Tips to Identify External Inputs early in the life cycle

The following types of documentation can be used to assist in counting EIs prior to system implementation.

- Any refined objectives and constraints for the proposed system.
- Collected documentation regarding the current system, if such a system (either automated or manual) exits.
- Documentation of the users' perceived objectives, problems and needs.
- Preliminary Data Flow Diagram.
- Requirements Documentation.

### Typical Vocabulary

The following words are associated with external input or "inputs." While reading textual document or application description look for these type of words, they may indicate an add, change or delete aspect of an external input.

Add, Activate, Amend (change and delete), Cancel, Change, Convert (change), Create (add), Delete, Deassign, Disable, Disconnect (change or delete), Enable, Edit (change), Insert ( add and change), Maintain (add, change, or delete), Memorize (add), Modify (change), Override (change), Post (add, change and delete), Remove (delete), Reactivate (change), Remit, Replace (change), Revise (change and delete), Save (add, change or delete), Store (add), Suspend (change or delete), Submit (add, change or delete), Update (add, change or delete), Voids (change and delete)

### External Outputs

External Outputs (EO) - an elementary process in which derived data passes across the boundary from inside to outside. Additionally, an EO may update an ILF. The data creates reports or output files sent to other applications. These reports and files are created from information contained in one or more internal logical files and external interface files.

Derived Data is data that is processed beyond direct retrieval and editing of information from internal logical files or external interface files. Derived data is usually the result of algorithms, or calculations. Derived data occurs when one or more data elements are combined with a formula to generate or derive an additional data element(s). This derived data does not appear in any FTR (internal logical file or external interface file).

An algorithm is defined as a mechanical procedure for performing a given calculation or solving a problem in a series of steps.

A calculation is defined as an equation that has one or more operators. An operator is a mathematical function such as addition, subtraction, multiplication, and division (+, -,x, /).

Transactions between applications should be referred to as interfaces. You can only have an external output or external inquiry of data external to your application. If you get data from another application and add it to a file in your application, this is a combination get and add (external inquiry and external input).

### Rating

Like all components, EOs are rated and scored. The rating is based upon the number of data elements (DETs) and the file types referenced (FTRs). The rating is based upon the total number of unique (combined unique input and out sides) data elements (DETs) and the file types referenced (FTRs) (combined unique input and output sides). DETs and FTRs were discussed earlier in this section. The table below lists both the level (low, average or high) and appropriate score (4, 5 or 7).

| **File Types Referenced (FTR)** | **Data Elements** | | |
|---|---|---|---|
| | 1-5 | 6-19 | Greater than 19 |
| Less than 2 | Low (4) | Low (4) | Average (5) |

| File Types Referenced (FTR) | Data Elements | | |
|---|---|---|---|
| 2-3 | Low (4) | Average (5) | High (7) |
| Greater than 3 | Average (5) | High (7) | High (7) |

### Counting Tips

You may ask the question, Do external outputs need more or less than 3 files to be processed? For all the EOs that reference more than 3 files, all that is needed to know is if the EO has more or less than 5 data element types. If the EO has more than 5 data element types then the EO will be rated as high, less than 5 the EO will be rated as average. Any EOs that reference less than 3 files should be singled out and counted separately.

### Terminology

The definition states an EO contains information, which derived data passes across the boundary from inside to outside. Some confusion may arise because an EO has an input side. The confusion is the definition reads data passes across the boundary from inside to outside. The input side of an EO is search criteria, parameters, etc does not maintain an ILF. The information that a cross from outside to inside (input side) is not permanent data, but it is transient data. The intent of the information coming from outside the application (input side) is not to maintain an ILF.

### Examples

Unlike other components EO’s almost always contain business data. Rule base data and control based "outputs" are almost always considered External Inquiries. This is true due to the fact that rule data and control type data is not derived (or derivable).

**Notification Messages** are considered EOs. A notification message differs from an error message. A notification message is an elementary process, while an error message (or confirmation message) is part of an elementary process. A notification message is the result of some business logic processing. For example, a trading application may notify a broker that the customer trying to place an order does not have adequate funds in their account.

**Derived Data** displayed in textual fashion (rows and columns) and graphical format is an example of two external outputs.

### Data Elements

Unique sets of data elements help distinguish one external output from another. Keep in mind that a DET is something that is dynamic.

(A DET is a unique user recognizable, non-recursive (non-repetitive) field)

- Error Messages
- Confirmation Messages
- Calculated Values (derived data)
- Values on reports that are read from an internal logical file or external interface file.
- Recursive values or fields (count only once)
- Generally, do not count report headings (literals) as data elements unless they are dynamic. That is, if the report headings are read from files that are maintained they may be DETs also.
- System generated dates that are on the tops or reports or are displayed are normally not counted as DETs. If system generated dates is part of business information of the external output they should be counted as DETs. For example, the date an invoice is printed or the date a check is printed.

### File Types Referenced (FTR)

Unique FTRs help distinguish one external output from another. An FTR must be either an Internal Logical File and/or External Interface File.

The elementary process associated with an external output may update an internal logical file or external interface file. For example, the elementary process that produces as payroll check may include an update to a file to set a flag to indicate that the payroll check was produced. This is not the same as maintaining the file. Maintained is the process of modifying data (adding, changed and deleting) via an elementary process (via an External Input). The primary intent of an EO is not to maintain an ILF.

### Uniqueness

A unique set of data elements, and/or a different set of FTRs, and/or a unique set of calculations makes one external output unique or different from other external outputs. That is, one of the following must be true:

- Unique or different set of data elements
- Unique or different set of FTRs
- Unique or different calculations
- Unique processing logic

### Understanding Enhancement Function Points

Modification of any of the items, which make an External Output unique from other external outputs, causes the EO to be "enhanced." If any of the following are true:

- DETs added to an EO
- DETs modified on an EO. The DET was included in the last FP Count.
- A New FTR
- Modifications to a calculation that appears on an EO.

### Technology Issues

Each media that a report is sent to is counted as a unique EO. If a report were available on line, paper and electronic it would be counted as three EOs. Now some organizations choose to count this as only one EO. Whatever decision is made, the organization needs to stick with it.

**Disk Cache:** Information that is prepared, processed, and derived and put on cache files for another application to utilize should not be overlooked. These cached files may be external outputs or external inquiries.

### Standard Documentation

- Report Layouts
- Design Documentation
- Functional Specifications
- User Requirements
- Database descriptions
- Field Sizes and Formats
- Graphical Report Layouts

### Tips to Identify External Outputs early in the life cycle

The following types of documentation can be used to assist in counting External Outputs prior to system implementation.

- Any refined objectives and constraints for the proposed system.
- Collected documentation regarding the current system, if such a system (either automated or manual) exits.
- Documentation of the users' perceived objectives, problems and needs.
- Preliminary Data Flow Diagrams.

### Typical Vocabulary

The following words are associated with an "external outputs." While reading textual documents or application descriptions look for these types of words. They may indicate an external output. Notice these words are very similar to those words used for an External Inquiry (discussed in the next chapter).

Browse, Display, Get, On-lines, Output, Print, Query, Reports, Request, Retrieve, Seek, Select, View

## Special Issues and Concerns

### When to count DET's for Report Headings

Report headings are counted when they are dynamic. That is, if report headings are being read from an internal logical file they should be counted as DETs.

### Can an External Output have an input side?

Since the input side is not stand-alone (independent or an elementary process) it should be considered as part of the entire external output. The FTRs and DETs used to search should be combined with unique outside DETs and FTRs for at grand total FTRs and DETs for the entire EO. In short, an external output can have an input side.

### Can an External Output Update an Internal Logical File?

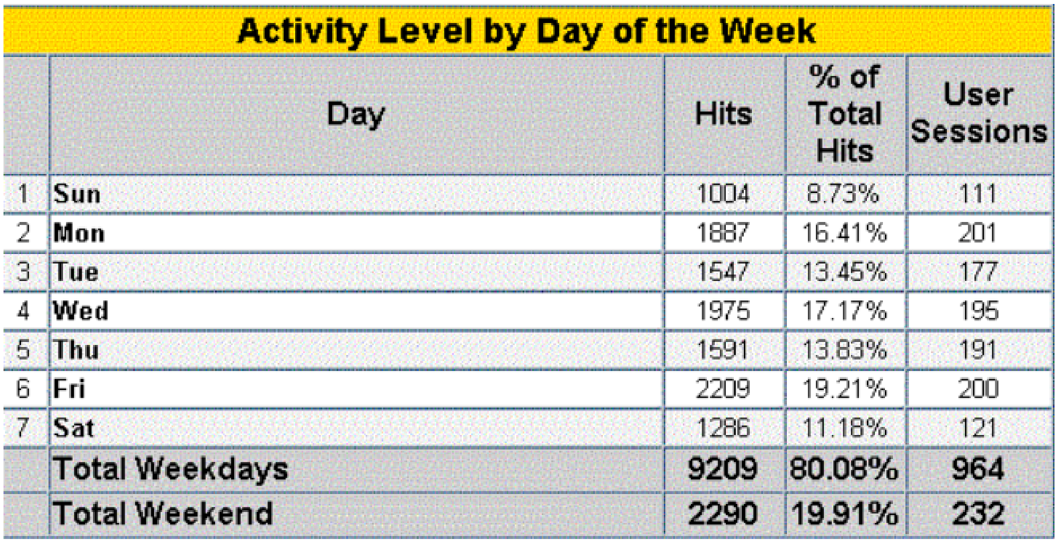
An external output can update an internal logical file, but it is incorrect to say that an external output can maintain an internal logical file. The update is part of the elementary process of the external output. An external input maintains data on and ILF file. The maintain process is an elementary process alone. The definition for maintaining is discussed in the internal logical file and external input sections of this book.

### Graphs

Graphs are counted the same way as the textual EOs. That is, the graph is rated and scored based on the number of DETs and the number of FTRs. In fact, recursive information is easily seen in a graph, but can be more difficult to visualize in a text report.

There are 10 data elements in the following table

1. Days
2. Hits
3. % of Total Hits
4. User Sessions
5. Total Hits (weekday)
6. Total % (weekday)
7. Total User Sessions (weekday)
8. Total Hits (weekend)
9. Total % (weekend)
10. Total User Sessions (weekend)

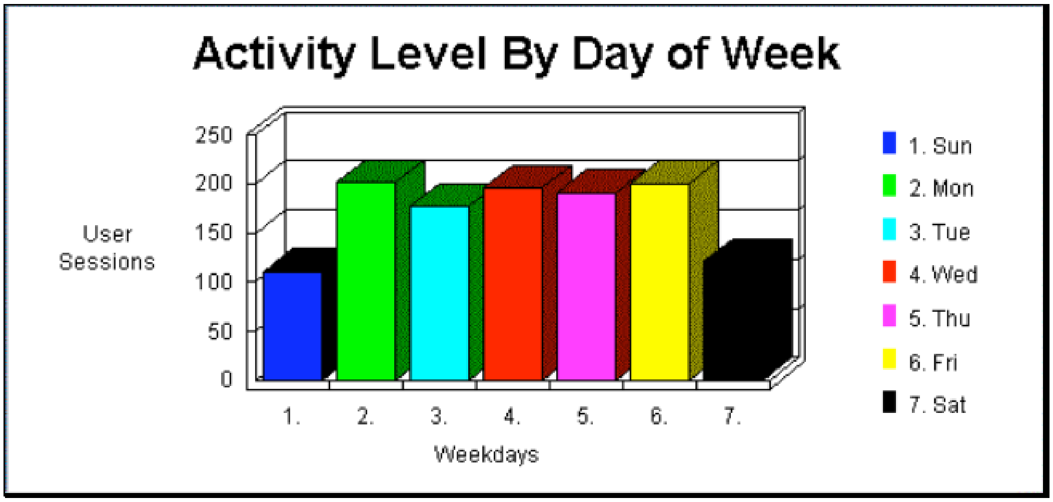


Activity Level by Day of the Week

| | Day | Hits | % of Total Hits | User Sessions |
|---|---|---|---|---|
| 1 | **Sun** | 1004 | 8.73% | 111 |
| 2 | **Mon** | 1887 | 16.41% | 201 |
| 3 | **Tue** | 1547 | 13.45% | 177 |
| 4 | **Wed** | 1975 | 17.17% | 195 |
| 5 | **Thu** | 1591 | 13.83% | 191 |
| 6 | **Fri** | 2209 | 19.21% | 200 |
| 7 | **Sat** | 1286 | 11.18% | 121 |
| | **Total Weekdays** | **9209** | **80.08%** | **964** |
| | **Total Weekend** | **2290** | **19.91%** | **232** |

Days, Hits, % of Total Hits and User Sessions all have recursive data.

The same data could be processed and presented as bar graph. But on the following bar graph there are only two data elements (user session and day of week). The bar graph is a separate external output and is unique from the above table. In short, it provides different business slightly different information than the table.



## External Inquiries

External Inquiry (EQ) - an elementary process with both input and output components that result in data retrieval from one or more internal logical files and external interface files. The input process does not update or maintain any FTRs (Internal Logical Files or External Interface Files) and the output side does not contain derived data.

Transactions between applications should be referred to as interfaces. You can only have an external output or external inquiry of data external to your application. If you get data from another application and add it to a file in your application, this is a combination get and add (external inquiry and external input).

## Rating

Like all components, EQs are rated and scored. Basically, an EQ is rated (Low, Average or High) like an EO, but assigned a value like and EI. The rating is based upon the total number of unique (combined unique input and out sides) data elements (DETs) and the file types referenced (FTRs) (combined unique input and output sides). DETs and FTRs were discussed in an earlier chapter. If the same FTR is used on both the input and output side, then it is counted only one time. If the same DET is used on both the input and output side, then it is only counted one time.

Functional Complexity Matrix (shared table between EO and EQ)

| **File Types Referenced (FTR)** | **Data Elements** | | |
|---|---|---|---|
| | 1-5 | 6-19 | Greater than 19 |
| less than 2 | Low (3) | Low (3) | Average (4) |
| 2 or 3 | Low (3) | Average (4) | High (6) |
| Greater than 3 | Average (4) | High (6) | High (6) |

## Examples

EQs can contain business data, control data and rules based data.

Business Applications: An example of Business data is customer names, addresses, phone number, so on and so forth. An example of Rules Data is a table entry that tells how many days a customer can be late before they are turned over for collection.

Drop Down List (a listing of customers by name) would be an example of an EQ.

A screen full of customer address information would be an example of an EQ.

Reset (or restore) functionality where all the modified fields are reset to their saved values. The key to understanding this an external query is the “reset to their saved values.” Clearly a table is being read.

### Terminology

The definition states that an EO contains information, which derived data passes across the boundary from inside to outside. Some confusion may arise because an EO has an input side. The confusion is the definition reads data passes across the boundary from inside to outside. The input side of an EO is search criteria, parameters, etc does not maintain an ILF. The information that a cross from outside to inside (input side) is not permanent data, but it is transient data. The intent of the information coming from outside the application (input side) is not to maintain an ILF.

### Data Elements

Unique sets of data elements help to distinguish one external inquiry from another external inquiry.

- Input Side
  - Click of a the mouse
  - Search values
  - Action keys (command buttons)
  - Error Messages
  - Confirmation Messages (searching)
  - Clicking on the an action key
  - Scrolling
  - Recursive fields are counted only once.
- Outside
  - Values read from an internal logical file or external interface file
  - Color or Font changes on the screen
  - Error Messages
  - Confirmation Messages
  - Recursive fields are counted only once.
- The combined (unique) total input and outside DETs are used when rating EQs.

Like an EI, action keys that perform the same function but appear multiple times are counted as only one DET.

Error Messages and confirmation messages can and do occur on either the input side and/or output side. If a user initiates a search and a message is displayed, "please wait searching" is an example of a confirmation message on the input side. The message "all fields must be populated" is another example of an error message on the input side. On the other hand, if the message is "customer not found" is an example of an error message on the output side. That is, the input side contained no problems. The database was searched and the "error" has occurred on the output side of the transaction.

### File Type Referenced (FTRs)

Unique FTRs help distinguish one external inquiry from another external inquiry.

Both the input side and output side must be considered when evaluating the FTRs used by an external inquiry. Normally they are the same but there are instances where they may not be the same. The combined total should be used when evaluating an EQ. For example, a security check may be done on the input side of an external inquiry. The security check is done to make sure the user of the application has the appropriate level of authority to view the data.

### Uniqueness

A unique set of data elements, and/or a different set of FTRs make one external inquiry unique or different from other external inquiry. That is, one of the following must be true:

- Unique or different set of data elements
- Unique or different set of FTRs
- Unique processing logic

Sorting does not make on external inquiry unique from another since the data elements and FTR’s are the same.

An external inquiry **cannot have calculated values or derived data** . This characteristic distinguishes an external inquiry from an external output.

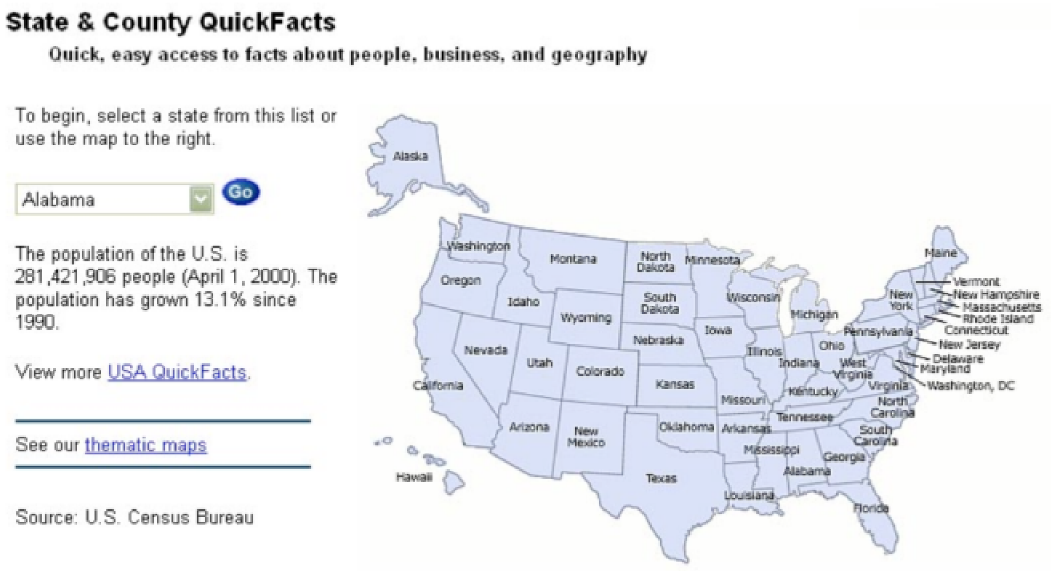
### Understanding Enhancement Function Points

Modification of any of the items, which make an External Inquiry unique from other external inquiries, causes the EQ to be "enhanced." If any of the following are true:

- DETs added to an EQ
- DETs modified on an EQ. The DET was included in the last FP Count.
- A New FTR

### Example of Graphical Data

Imagine the following map. There are two different ways to get the same exact data. One you can click on the specific state or you can use the drop down list. Once you choose a state data is generated and presented to the screen. These two EQ are repetitive and do the same exact thing. We would not consider this as two EQs but only one. You can view this map by visiting *http://quickfacts.census.gov/qfd/index.html*



State & County QuickFacts

Quick, easy access to facts about people, business, and geography

To begin, select a state from this list or use the map to the right.

Alabama Go

The population of the U.S. is 281,421,906 people (April 1, 2000). The population has grown 13.1% since 1990.

View more USA QuickFacts.

See our thematic maps

Source: U.S. Census Bureau

### Technology Issues

- GUI applications are usually rich with EQs (and EOs).
- A dynamic pick list that reads from a file is an example an External Inquiry.
- GUI screens my have a series of EQs prior to an EI.

### Standard Documentation

- Screen Layouts
- Design Documentation
- Functional Specifications
- Table Layouts
- User Requirements
- Database descriptions
- Pick lists
- Field sizes and formats

### Tips to Identify EQs early in the life cycle

The following types of documentation can be used to assist in counting internal logical files prior to system implementation.

- Any refined objectives and constraints for the proposed system.
- Collected documentation regarding the current system, if such a system (either automated or manual) exits.
- Documentation of the users' perceived objectives, problems and needs.
- Preliminary Data Flow Diagrams.

### Typical Vocabulary

The following words are associated with an "external inquiry." While reading textual document or application description look for these type of words. They may indicate an external inquiry. Notice the words are very similar to those related to external outputs.

Browse, Display, Extract, Fetch, Find, Gather, Get, Drop Down, Lists, Look Ups, On-lines, Output, Pick Lists, Print, Query, Scan, Seek, Select, Show, View, Reports

### Special Issues and Concerns

### Can an External Inquiry not have an input side?

Even though it may not be visible all external inquiries have an input side. In cases where the input side is not readily visible is referred to as an implied inquiry.

### Can an External Inquiry Update an Internal Logical File?

Like an external output, an external inquiry may update an internal logical file, but it is incorrect to say that an external inquiry can maintains an internal logical file. The update is part of the elementary process of the external inquiry. The definition for maintaining is discussed in the internal logical file and external input sections of this book. The only component that maintains an internal logical file is an external input.

### Menus (Dynamic Menus)

The menu displayed to the right is a dynamic menu. Word displays the last several files that have been opened. We can easily conclude that this information is being read from some type of internal file. Hence, the information is dynamic. The menu would be counted as an external inquiry.

Even though the IFPUG Manual explicitly states that menus are not counted, in this case it is clear that the menu is dynamic and changes.

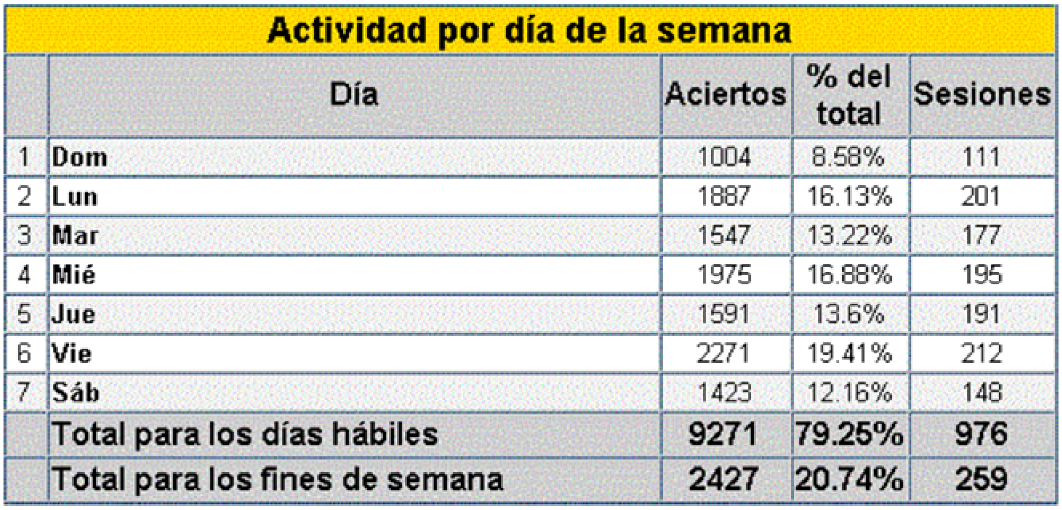
The real distinction is if a menu is dynamic or static. That is, are the contents of the screen or report dynamic (read from some file) or are they static (hard coded).

### Transaction Review

This chapter reviews the three types of transactional function type (external input, external output and external inquiry).

### Multiple Languages

Consider an application that is a single language. More than likely report headings, text descriptions are all "hard coded." That is the user cannot dynamically change the headings or the text. Now consider an application that has been developed with multiple languages in mind. The report headings, text descriptions are all read from files. Compare the following chart in Spanish to the English chart presented earlier. Is this chart a unique external output or the same external output?



| Actividad por día de la semana | | | | |
|---|---|---|---|---|
| | Día | Aciertos | % del total | Sesiones |
| 1 | **Dom** | 1004 | 8.58% | 111 |
| 2 | **Lun** | 1887 | 16.13% | 201 |
| 3 | **Mar** | 1547 | 13.22% | 177 |
| 4 | **Mié** | 1975 | 16.88% | 195 |
| 5 | **Jue** | 1591 | 13.6% | 191 |
| 6 | **Vie** | 2271 | 19.41% | 212 |
| 7 | **Sáb** | 1423 | 12.16% | 148 |
| | Total para los días hábiles | **9271** | **79.25%** | **976** |
| | Total para los fines de semana | **2427** | **20.74%** | **259** |

The Spanish chart is not a unique external output. If external outputs are available in multiple languages then several things need to be considered. First there is probably some control input that allows the user to dynamically select the language. Second, there is an additional FTR referenced that contains the language text. Third, this language internal logical file is maintained by an external input. Fourth, there are more data elements in the report. If an external output is available in more than one language then it is not considered an unique external output, but the external output is more complex (more DETs and more FTRs).

### Display of Graphical Images or Icons

A display of a graphical image is simply another data element. An inventory application may contain data about parts. It may contain part name, supplier, size, and weight and include a schematic image of the part. This schematic is treated as another data element.

Another example would be a map. The map may be "hot." As the mouse pointer is moved over the map different city names are displayed. If the user clicks on a particular hot point details about that city is displayed. The details about each city are contained in an internal logical file or external interface file then the details could be an external inquiry.

The following map of the United States is "hot." If you click on Kansas City, then you get the following information.

Kansas City, Missouri: Population 435,146: Location: 39.1 N, 94.5 W Houston, Texas: Populations 2,231,130: Location: 29.8 N, 95.4 W Chicago, Illinois: Population 2,783,726: Location: 41.8 N, 87.6 W

This would be an example of another inquiry.

Seattle
Minneapolis
Chicago
Akron
New York
Denver
Kansas City
Las Vegas
Lexington
Virginia Beach
Tulsa
Charlotte
Phoenix
Memphis
Atlanta
El Paso
Dallas
Jacksonville
Houston
Tampa
500 mi
©1998 Vicinity Corp, ©1998 Etak Inc

### Messages

There are three types of messages that are generated in a GUI application: Error messages, Confirmation Messages and Notification Messages. An error message and a confirmation message indicate that an error has occurred or that a process will be or have been completed. A message that would state, "Zip code is required" would be an example of an error message. A message that would state, "Are you sure you want to delete the customer?" is an example of a confirmation message. Neither of these types of messages is treated as a unique External Output, but they are treated as data elements for the appropriate transaction.

On the other hand, a notification messages is a business type message. It is the basis of processing and a conclusion being drawn. For example, you may try to withdraw from an ATM machine more money than you have in your account and you receive the dreaded message, "You have insufficient funds to cover this transaction." This is the result of information being read from a file regarding your current balance and a conclusion being drawn. A notification message is treated as an External Output.

Notification Messages may be the result of processing and the actual processing or derived data my not be seen. If a message is created to be sent to a pager (beeper) at a given time. This is much like an alarm. That is current time is compared to set time and they are equal the message is sent. The pager message has one data element the text message.

### Complex Control Inputs

Control inputs change the behavior of an application or the content of a report. In the "Create Report" control screen, the user has the ability to select which reports are going to be produced. This particular screen has several data element types. The check box, graph type, dimensions elements, sub-items and the action keys.

Note that the users can choose each report individually. In fact each report is as an object. The generated report is a combination of several reports (or objects). Each object has several attributes.

### Hyperlinks on WebPages

Many hyperlinks are nothing more than menus. In this case, they are not treated as an EI, EO or EQ.

According to the rules for an external inquiry a request must come from outside the application boundary and information must be displayed from inside to outside the application boundary. A hyperlink is just that – a hyperlink. A hyperlink is navigation to another part of the application or another Internet/Intranet site. No information crosses the boundary.

An external inquiry must reference at least one internal logical file and/or one external interface file. Both an internal logical file and an external interface file must be a logical group of related information. Imagine hyperlinking to another Website -- all the information displayed is not a logical group of information.

On the other hand, a hyperlink that sends a parameter that is used to search could be an example of an external inquiry. That is, the hyperlink follows the rules required for an external inquiry. There is an input side (the parameter) and there is an output side the results of the search. In this case the output side is dynamic and changes. This is in sharp contrast to a static hyperlink that navigates to another part of the Website.

### Internal Logical Files

Internal Logical Files (ILF) - a user identifiable group of logically related data that resides entirely within the application boundary and is maintained through External Inputs. An internal logical file has the inherent meaning it is internally maintained, it has some logical structure and it is stored in a file.

Even though it is not a rule, an ILF should have at least one external output and/or external inquiry. That is, at least one external output and/or external inquiry should include the ILF as an FTR. Simply put, information is stored in an ILF, so it can be used later. The EO or EQ could be from another application. It is worth noting that it is possible that a specific ILF is not referenced by EO or EQ, but it is used by an EI (other than the EI that maintains it).

Again, even though it is not a rule, an ILF should have at least one external input.

### Rating

Like all components, ILFs are rated and scored. The rating is based upon the number of data elements (DETs) and the record types (RETs). DET's and RET's were discussed earlier. The table below lists both the level (low, average or high) and appropriate score (7, 10 or 15).

| Record Element Types (RET) | Data Elements | | |
|---|---|---|---|
| | 1 to 19 | 20 - 50 | 51 or More |
| 1 | Low (7) | Low (7) | Average (10) |
| 2 to 5 | Low (7) | Average (10) | High (15) |
| 6 or More | Average (10) | High (15) | High (15) |

### Counting Tips

Determine the appropriate row first then the column. Ask the question, do all files contain one record type or more than one record type? If all or many of the files only contain one record type, then all that is needed to know if the file contains more or less than 50 data elements types (DETs). If the file contains more than 50 data elements the file will be rated as average, if less than 50 data element types the file will be considered low. Any files that contain more than one record type can be singled out and counted separately.

### Examples

ILFs can contain business data, control data and rules based data. The type of data contained in an ILF is the same type of data an EI to contains and maintains.

It is common for control data to have only one occurrence within an ILF. For example control data file may only contain parameter settings, or a status setting. For example, part of the on board automobile system only contains current information, oil pressure, engine temperature, so on and so forth. This particular process of the on board system does not care about historical data – only the current instance. When the status changes the file is updated with current information and there is no historical information. The on board system may keep track of historical changes in diagnostics files, but this would be a totally separate process. This process is not used to keep the car running, but to help a mechanic understand what has been going on with the engine.

Real Time and Embedded Systems: For example, Telephone Switching is made of all three types, Business Data, Rule Data and Control Data. Business Data is the actual call, Rule Data is how the call should be routed through the network, and Control Data is how the switches communicate with each other. Like control files it is common real time systems will have only one occurrence in an internal logical file.

Business Applications: An example of Business data is customer names, addresses, phone number, so on and so forth. An example of Rules Data is a table entry that tells how many days a customer can be late before they are turned over for collection.

### Record Element Types

The idea behind RETs is to quantify complex data relationships maintained in a single FTR.

Record element types are one of the most difficult concepts in function point analysis. Most record element types are dependent on a parent - child relationship. The child information is a subset of the parent information. In a parent child relationship there is a one to many relationship.

Imagine a customer file that contains Name, Address, so on and so forth. In addition all the credit cards and credit card numbers of the customer are contained in the file. This would be an example of 2 record types. There would be multiple occurrences of credit cards and numbers for each customer. The credit card and numbers are meaningless when not linked to the customer.

### Data Element Types

Count a DET's for each unique user recognizable, nonrecursive field on the ILF or EIF. Fields that are redundant and appear more than one time are only counted one time. Fields that are redundant because of implementation concerns are counted only one time.

Count a DET’s for each piece of data in an ILF or EIF that exists because the user requires a relationship with another ILF to be maintained (key information). If an EIF has multiple key fields only the key fields that relate back to an ILF are counted as data element types.

### Technology Issues

Lotus Notes refers to data stores as "forms." Powerbuilder Applications may store information on the host or client. Count it only one time. COBOL Applications may use a variety of data stores such as IMS, DB2 etc.… It is important to view data from the "logical model."

In Internet applications an html can be a data store if it is maintained.

### Standard Documentation

- Table Layouts
- Database descriptions
- Logical data models
- Field sizes and formats
- Design Documentation
- Functional Specifications
- User Requirements

### Tips to Identify ILFs early in the life cycle

The following types of documentation can be used to assist in counting internal logical files prior to system implementation.

- Any refined objectives and constraints for the proposed system.
- Collected documentation regarding the current system, if such a system (either automated or manual) exits.
- Documentation of the users perceived objectives, problems and needs.
- Preliminary Data Models.

### Other comments

Code maintenance may not be maintained by the application and they may not be maintained by any other application, but they exist. The issue is that these same tables may be used by external inquiries. A strict interpretation of the rules would not allow the inquiries to be counted. It is recommended that this type of tables be treated as external interface file.

### External Interface Files

External Interface Files (EIF) - a user identifiable group of logically related data that is used for reference purposes only. The data resides entirely outside the application boundary and is maintained by another applications external inputs. The external interface file is an internal logical file for another application. An application may count a file as either a EIF or ILF not both. An external interface file has the inherent meaning it is externally maintained (probably by some other application), an interface has to be developed to get the data and it is stored in a file.

Each EIF included in a function point count must have at least one external output or external interface file against it. At least one transaction, external input, external output or external inquiry should include the EIF as a FTR.

Every application, which references the EIF, needs to include it in their FP Count. Some organizations have a pull theory and others have a push theory of data. The pull theory is an external application "reaching into" another applications and retrieving data. Those organizations which have push theory require applications to create interfaces (EO or EQ) which other applications read.

### Rating

Like all components, EIFs are rated and scored. The rating is based upon the number of data elements (DETs) and the record types (RETs). DETs and RETs were discussed earlier in this section. The table below lists both the level (low, average or high) and appropriate score (5, 7 or 10).

| **Record Element Types (RET)** | **Data Elements** | | |
|---|---|---|---|
| | 1 to 19 | 20 - 50 | 51 or More |
| 1 | Low (5) | Low (5) | Average (7) |
| 2 to 5 | Low (5) | Average (7) | High (10) |
| 6 or More | Average (7) | High (10) | High (10) |

### Counting Tips

Only count the part of the file that is used by the application being counted not the entire file. The internal logical file, of another application, that you access may have a large amount of data, but only consider the DETs and/or RETs that are used when rating an EIF.

Determine the appropriate row first then the column. Ask the question, do all files contain one record type or more than one record type? If all or many of the files only contain one record type, then all that is needed to know if the file contains more or less than 50 data elements types (DETs). If the file contains more than 50 data elements the file will be rated as average, if less than 50 data element types the file will be considered low. Any files that contain more than one record type can be singled out and counted separately.

### Examples

EIFs can contain business data, control data and rules based data.

Real Time and Embedded Systems: For example, Telephone Switching is made of all three types, Business Data, Rule Data and Control Data. Business Data is the actual call, Rule Data is how the call should be routed through the network, and Control Data is how the switches communicate with each other.

Business Applications: An example of Business data is customer names, addresses, phone number, so on and so forth. An example of Rules Data is a table entry that tells how many days a customer can be late before they are turned over for collection.

### Technology Issues

Lotus Notes refers to data stores as "forms." Client/Server Applications may store information on the host or client. Count it only one time. COBOL Applications may use a variety of data stores such as IMS, DB2 etc.… It is important to view data from the "logical model."

### Standard Documentation

- Table Layouts
- Interface Diagrams
- Database descriptions
- Logical data models
- Field sizes and formats
- Design Documentation
- Functional Specifications
- User Requirements

### Tips to Identify EIFs early in the life cycle

The following types of documentation can be used to assist in counting external interface files prior to system implementation.

- Any refined objectives and constraints for the proposed system.
- Collected documentation regarding the current system, if such a system (either automated or manual) exits.
- Documentation of the users perceived objectives, problems and needs.
- Preliminary Data Models.

### General System Characteristics

The value adjustment factor (VAF) is based on 14 general system characteristics (GSCs) that rate the general functionality of the application being counted. Each characteristic has associated descriptions to determine the degrees of influence.

### Rating

The degrees of influence range on a scale of zero to five, from no influence to strong influence. Each characteristic is assigned the rating based upon detail descriptions provided by the IFPUG Manual. They ratings are:

- 0 Not present, or no influence
- 1 Incidental influence
- 2 Moderate influence
- 3 Average influence
- 4 Significant influence
- 5 Strong influence throughout

### Standard Documentation

- General Specification Documents
- Interviews with the users

### Rating GSCs early in the life cycle

GSCs can be rated relative early in the software life cycle. In fact, if a user cannot answer these fourteen questions, then the entire project needs to be re-evaluated.

### Tabulating

Once all the 14 GSCs have been answered, they should be tabulated using the IFPUG Value Adjustment Equation (VAF)

$$VAF = 0.65 + [( \sum_{i=1}^{14} Ci) / 100]$$

where: Ci = degree of influence for each General System Characteristic
.i = is from 1 to 14 representing each GSC.
∑ = is summation of all 14 GSC's.

Another way to understand the formula is VAF = (65 + TDI)/100, where TDI is the sum of the results from each question. A Microsoft Excel formula would be: =0.65+SUM(A1:A14)/100 ; assuming that the values for the characteristics were in cells A1 – A14.

### GSCs at a Glance

| | General System Characteristic | Brief Description |
|---|---|---|
| 1. | Data communications | How many communication facilities are there to aid in the transfer or exchange of information with the application or system? |
| 2. | Distributed data processing | How are distributed data and processing functions handled? |
| 3. | Performance | Did the user require response time or throughput? |
| 4. | Heavily used configuration | How heavily used is the current hardware platform where the application will be executed? |
| 5. | Transaction rate | How frequently are transactions executed daily, weekly, monthly, etc.? |
| 6. | On-Line data entry | What percentage of the information is entered On-Line? |
| 7. | End-user efficiency | Was the application designed for end-user efficiency? |
| 8. | On-Line update | How many ILF's are updated by On-Line transaction? |
| 9. | Complex processing | Does the application have extensive logical or mathematical processing? |
| 10. | Reusability | Was the application developed to meet one or many users needs? |

| | General System Characteristic | Brief Description |
|---|---|---|
| 11. | Installation ease | How difficult is conversion and installation? |
| 12. | Operational ease | How effective and/or automated are start-up, back up, and recovery procedures? |
| 13. | Multiple sites | Was the application specifically designed, developed, and supported to be installed at multiple sites for multiple organizations? |
| 14. | Facilitate change | Was the application specifically designed, developed, and supported to facilitate change? |

### Considerations for GUI Applications

GSC items such as Transaction Rates, End User Efficiency, On Line Update, and Reusability usually score higher for GUI applications than on traditional applications. On the other hand, Performance, Heavily used configuration, multiple sites, will score lower for GUI applications than traditional applications.

### Detail GSCs

Each of the following general system characteristic descriptions includes guidelines to determine the degree of influence.

Each guideline contains a definition of the GSC, rules for determining the score, and, in situations where the rule needs further clarification, hints have been provided to help apply the rules consistently across all platforms.

Hints are not intended to cover all situations but are meant to provide additional guidance in determining the appropriate score.

*Data Communications*

### Definition

Data Communications describes the degree to which the application communicates directly with the processor.

The data and control information used in the application are sent or received over communication facilities. Devices connected locally to the control unit are considered to use communication facilities. Protocol is a set of conventions that permit the transfer or exchange of information between two systems or devices. All data communication links require some type of protocol.

### Score

| Score As | Descriptions to Determine Degree of Influence |
|---|---|
| 0 | Application is pure batch processing or a stand-alone application |
| 1 | Application is batch but has remote data entry or remote printing |
| 2 | Application is batch but has remote data entry and remote printing |
| 3 | Application includes on-line data collection or TP (teleprocessing) front end to a batch process or query system |
| 4 | Application is more than a front-end, but supports only one type of TP communications |
| 5 | Application is more than a front-end, and supports more than one type of TP communications protocol |

### Hints

Protocol examples include FTP, dial-up, Token Ring, Ethernet, SNA, TCP/IP, IPX/SPX, HTTP, XML, WAP, NTP, ICQ, and NETBEUI. This list should not be considered exhaustive.

### Hints to Rules 1 and 2

- Remote devices might include a 3270 terminal connected to a mainframe computer that allows only simple edits (numeric vs. alpha), or printers connected via parallel port (the user can specify where to direct the output).
- The entry of data does not involve reading or writing directly to an ILF. Data are entered on-line, but the transactions are stored in a temporary file for batch update of ILF(s) at a later time.
- The entry of data does not involve reading or writing directly to an ILF.

### Hints to Rule 3

- Simple business rules and minimal edits (e.g., alpha/numeric, range check, required data, etc.) may be performed. When this data is eventually processed by the application, additional edits are performed.
- The entry of data does not involve reading or writing directly to an ILF. Data are entered on-line, but the transactions are stored in a temporary file for batch update of ILF(s) at a later time.

### Hints to Rule 4

- Data for the application is collected and may directly update ILF(s) or be stored for future processing using an input device, which performs edits based on business rules.
- Only one communication protocol is used. Typically, when this data is processed by the application, no further edits are required.
- The entry of data involves reading or writing to an ILF.
- For example, client-server data entry or Internet data entry, but not both.

### Hints to Rule 5

- Same as 4, however, data collection is performed using multiple telecommunication protocols.
- For example, client-server data entry and Internet data entry of the same transaction.

### Typically

- Batch applications receive a score of 0 to 3
- On-line applications receive a score of 4
- Web-based applications receive a score of 4 or 5
- Real-time, telecommunication, or process control systems receive a score of 4 or 5

*Distributed Data Processing*

### Definition

Distributed Data Processing describes the degree to which the application transfers data among physical components of the application.

Distributed data or processing functions are a characteristic of the application within the application boundary.

### Score

| Score As | Descriptions To Determine Degree of Influence |
|---|---|
| 0 | Data is not transferred or processed on another component of the system. |
| 1 | Data is prepared for transfer, then is transferred and processed on another component of the system, for user processing. |
| 2 | Data is prepared for transfer, then is transferred and processed on another component of the system ,not for user processing. |
| 3 | Distributed processing and data transfer are on-line and in one direction only. |
| 4 | Distributed processing and data transfer are on-line and in both directions |

| Score As | Descriptions To Determine Degree of Influence |
|---|---|
| 5 | Distributed processing and data transfer are on-line and are dynamically performed on the most appropriate component of the system. |

### Hints

Distributed data processing by definition is not an application that is contained on a central processor, which sends data to other applications. In a distributed environment, the application is viewed as requiring multiple components (hardware) on which certain processing or data resides. A knowledgeable user would usually recognize this configuration.

### Hints to Rule 0

- Presentation, processing, and I/O components are all in the same place (i.e., stand-alone applications).

### Hints to Rule 1

- Application downloads data to a user's client machine, so the user can use Excel or other reporting tools to prepare graphs and perform other analysis.
- Process that transfers data from mainframe to an external component for user processing. This transfer is performed using a simple protocol such as FTP.
- Transferred to a user for processing.

### Hints to Rule 2

- Process that transfers data from mainframe to mid-tier. For example;, processing with SAS-PC.
- Application sends data to client or server. This data is then processed or used to produce reports, etc. No data or confirmation is sent back to the client or server.
- Transferred to a component for processing.

### Hints to Rule 3

- Data is sent between client and server in one direction only. This data is then processed or used to produce reports, etc. by the receiving application. This data typically includes transactions that update an ILF on the client or server.
- For example – client-server or web-enabled applications.

### Hints to Rule 4

- Data is sent between client and server in either direction. This data is then processed or used to produce reports, etc. by the receiving application. This data typically includes transactions that update an ILF on the client or server.
- For example - client-server or web-enabled applications.
- The application runs under an operating system that automatically handles the allocation between components, however, the use of the operating system did not influence the design and implementation of the application.

### Hints to Rule 5

- The developer must consider special application software that looks at multiple processors and runs the application on a specific type of processor. This is invisible to the user.
- The application runs under an operating system that automatically handles the dynamic allocation between components, and the use of the operating system specifically influenced the design and implementation of the application.

### Typically

- Many applications, including legacy applications, receive a score of 0
- Primitive distributed applications that include batch applications in which data is not transferred online on-line receive a score of 1 to 2
- Client-server or web-based applications receive a score of 3 to 4
- It is uncommon to score 5
- There must be multiple servers or processors, each of which would be selected dynamically on the basis of its real-time availability to score 5

*Performance*

### Definition

Performance describes the degree to which response time and throughput performance considerations influenced the application development.

Application performance objectives, stated or approved (or implied) by the user, in either response or throughput, influence (or will influence) the design, development, installation, and support of the application.

### Score

| Score As | Descriptions To Determine Degree of Influence |
|---|---|
| 0 | No special performance requirements were stated by the user. |
| 1 | Performance and design requirements were stated and reviewed but no special actions were required. |
| 2 | Response time or throughput is critical during peak hours. No special design for CPU utilization was required. Processing deadline is for the next business cycle. |
| 3 | Response time or throughput is critical during all business hours. No special design for CPU utilization was required. Processing deadline requirements with interfacing systems are constraining. |
| 4 | In addition, stated user performance requirements are stringent enough to require performance analysis tasks in the design phase. |
| 5 | In addition, performance analysis tools were used in the design, development, and/or implementation phases to meet the stated user performance requirements. |

### Hints

- GSCs 3, 4 and 5 are somewhat related. For this GSC, think in terms of "How fast can we make the application go and how much did/does that impact the design, development, and/or implementation?"
- The users may require real time access to their data, stating or implying standards for response time and throughput capacity.
- Response time typically relates to interactive processing; throughput relates to batch processing.

### Typically

- Batch applications receive a score of 0 to 4
- On-line (including interactive client-server or web-enabled) applications receive a score of 0 to 4
- Web-based applications receive a score of 4 or 5
- Most MIS on-line systems receive a score of 2
- Real-time, telecommunication, or process control systems receive a score of 0 to 5
- A score of 5 requires the use of performance analysis tools

### *Heavily Used Configuration*

#### Definition

Heavily Used Configuration describes the degree to which computer resource restrictions influenced the development of the application.

A heavily used operational configuration may require special considerations when designing the application. For example, the user wants to run the application on existing or committed equipment that will be heavily used.

#### Score

| Score As | Descriptions To Determine Degree of Influence |
|---|---|
| 0 | No explicit or implicit operational restrictions are included. |
| 1 | Operational restrictions do exist, but are less restrictive than a typical application. No special effort is needed to meet the restrictions. |
| 2 | Stated operational restrictions require special constraints on one piece of the application in the central processor or a dedicated processor. |
| 3 | Stated operational restrictions require special constraints on one piece of the application in the central processor or a dedicated processor. |
| 4 | Stated operational restrictions require special constraints on the entire application in the central processor or a dedicated processor. |
| 5 | In addition, there are special constraints on the application in the distributed components of the system. |

#### Hints

- GSCs 3, 4 and 5 are somewhat related.
- For this GSC think in terms of "How much does the infrastructure influence the design?"

#### Examples

Examples of operational restrictions may include the following (not an exhaustive list):

- This question indicates that the application must run on a computer that is under- powered and can not adequately handle the new or changed functionality and that somehow the developers can overcome this by developing the application differently.
- More than one application accessing the same data can create operational restrictions.
- Application competing for the same resource and technologies with the potential deadlocks must be tuned and constrained to avoid performance degradation.

#### Typically

- Most applications receive a score of 2
- Client-server, web-enabled, real-time, telecommunication or process control systems receive a score of 3 to 5, but then you would need either a dedicated processor or multiple processors processing the same transactions and searching for the most expeditious means of processing.

### *Transaction Rate*

#### Definition

Transaction Rate describes the degree to which the rate of business transactions influenced the development of the application.

The transaction rate is high, and it influences the design, development, installation, and support of the application. Users may require what they regard as normal response time even during times of peak volume.

### Score

| Score As | Descriptions To Determine Degree of Influence |
|---|---|
| 0 | No peak transaction period is anticipated. |
| 1 | Low transaction rates have minimal effect on the design, development, and installation phases. |
| 2 | Average transaction rates have some effect on the design, development, and installation phases. |
| 3 | High transaction rates affect the design, development, and/or installation phases. |
| 4 | High transaction rate(s) stated by the user in the application requirements or service level agreements are high enough to require performance analysis tasks in the design, development, and/or installation phases. |
| 5 | High transaction rate(s) stated by the user in the application requirements or service level agreements are high enough to require performance analysis tasks and, in addition, require the use of performance analysis tools in the design, development, and/or installation phases. |

### Hints

- GSCs 3, 4 and 5 are somewhat related. For this GSC think in terms of "How many transactions can be processed by the application in a given period of time?"
- Often this score is the same as the score for GSC 3 because transaction rates often influence performance requirements.

### Typically

- Batch applications receive a score of 0 to 3
- On-line (including interactive client-server or web-enabled) applications receive a score of 0 to 4
- Real-time, telecommunication, or process control systems receive a score of 0 to 5
- A score of 5 requires the use of performance analysis tools

*Online Data Entry*

### Definition

Online Data Entry describes the degree to which data is entered or retrieved through interactive transactions.

On-line User Interface for data entry, control functions, reports, and queries are provided in the application.

### Score

| Score As | Descriptions To Determine Degree of Influence |
|---|---|
| 0 | All transactions are processed in batch mode. |
| 1 | 1% to 7% of transactions are interactive. |
| 2 | 8% to 15% of transactions are interactive. |
| 3 | 16% to 23% of transactions are interactive. |
| 4 | 24% to 30% of transactions are interactive. |
| 5 | More than 30% of transactions are interactive. |

### Hints

- This refers to types of transactions not volumes.
- For example, if an application has 45 EIs, EOs, and EQs, what percent of the EIs, EOs, and EQs are accomplished via on-line transactions.

### Typically

- Batch applications receive a score of 0 to 1
- On-line, real-time, telecommunication, or process control systems receive a score of 5
- Most contemporary on-line (including interactive client-server or web-enabled) applications receive a score of 5
- Batch systems with on-line features may have a lot of batch transactions, but there must be at least 71 percent batch to receive a score of less than 5.

*End-User Efficiency*

### Definition

End-User Efficiency describes the degree of consideration for human factors and ease of use for the user of the application measured.

The on-line functions provided emphasize a design for user efficiency (human factor/user friendliness). The design includes:

- Navigational aids (e.g., function keys, jumps, dynamically generated menus, hyper-links)
- Menus
- On-line help and documents
- Automated cursor movement
- Scrolling
- Remote printing (via on-line transmissions)
- Pre-assigned function keys (e.g., clear screen, request help, clone screen)
- Batch jobs submitted from on-line transactions
- Drop down List box
- Heavy use of reverse video, highlighting, colors, underlining, and other indicators
- Hard-copy documentation of on-line transactions (e.g., screen print)
- Mouse interface
- Pop-up windows
- Templates and/or defaults
- Bilingual support (supports two languages: count as four items)
- Multi-lingual support (supports more than two languages: count as six items) January

### Score

| **Score As** | **Descriptions To Determine Degree of Influence** |
|---|---|
| 0 | None of the above. |
| 1 | One to three of the above. |
| 2 | Four to five of the above. |
| 3 | Six or more of the above, but there are no specific user requirements related to efficiency. |
| 4 | Six or more of the above, and stated requirements for user efficiency are strong enough to require design tasks for human factors to be included. |
| 5 | Six or more of the above, and stated requirements for user efficiency are strong enough to require use of special tools and processes in order to demonstrate that the objectives have been achieved. |

### Hints

- Use a convention of a score of 4 whenever the application is deployed in a GUI environment (unless it scores 5).
- Usually only software environments that prepare applications for mass-market or non-technical users score 5, and only if they have ergonomics specialists and/or usability studies as part of their process.

### Typically

- Pure batch applications receive a score of 0
- Character mode user interface receive a score of 1 or possibly a 2
- GUI user interface to be used for low volume transactions receive a score of 3
- GUI user interface to be used for high volume transactions and most Web Intranet user interfaces receive a score of 4 (requires design tasks for human factors)
- Web Internet user interfaces receive a score of 5 (requires special tools and processes to demonstrate that the objectives have been achieved)

*Online Update*

### Definition

On-line Update describes the degree to which internal logical files are updated on-line.

The application provides on-line update for the internal logical files.

### Score

| Score As | Descriptions To Determine Degree of Influence |
|---|---|
| 0 | None. |
| 1 | On-line update of one to three control files is included. Volume of updating is low and recovery is easy. |
| 2 | On-line update of four or more control files is included. Volume of updating is low and recovery is easy. |
| 3 | On-line update of major internal logical files is included. |
| 4 | In addition, protection against data loss is essential and has been specially designed and programmed in the system. |
| 5 | In addition, high volumes bring cost considerations into the recovery process. Highly automated recovery procedures with minimum human intervention are included. |

### Hints

- On-line update usually requires a keyed file or database.
- Automatic recovery provided by the operating system counts if it impacts the application.

### Typically

- Pure batch applications receive a score of 0.
- On-line updates of files that modify the way an application processes or validates data receive a score of 1 or 2.
- On-line updates of user persistent data receive a score of 3.
- MIS applications receive a score of 3 or less.
- Most GUI type applications receive a score of 3 or above.
- Applications which use programmed recovery such as SQL roll back and commit receive a score of 4. Operational/routine backup is not considered protection against data loss.

- Applications required to recover data, reboot, or perform other self-contained functions in the event of a system error receive a score of 5. Recovery may require a human to press enter or perform some other minimal function to initiate this process.

*Complex Processing*

### Definition

Complex processing describes the degree to which processing logic influenced the development of the application. The following components are present:

- Sensitive control and/or application-specific security processing.
- Extensive logical processing
- Extensive mathematical processing
- Much exception processing, resulting in incomplete transactions that must be processed again.
- Complex processing to handle multiple input/output possibilities.

### Score

| Score As | Descriptions To Determine Degree of Influence |
|---|---|
| 0 | None of the above. |
| 1 | Any one of the above. |
| 2 | Any two of the above. |
| 3 | Any three of the above. |
| 4 | Any four of the above. |
| 5 | All five of the above. |

### Hints

- Sensitive control or security process (e.g., individual users would have different access authority to screens where they could view and/or change data) may include special audit processing (audit data would be captured whenever data was viewed and/or changed and reported).
- Application-specific security processing may include internally developed security processing or use of purchased security packages.
- **Extensive logical** processing is Boolean logic (use of ‘AND’, ‘OR’) of greater than average difficulty or a minimum of 4 nested conditional (IF, CASE) statements. Extensive logical processing does not occur in most MIS applications.
- **Extensive mathematical** processing is arithmetic that is beyond the capability of a 4-function calculator (add, subtract, multiply, divide). This is usually not present in most MIS applications. However, an engineering application may qualify.
- Exception processing includes incomplete ATM transactions caused by TP interruption, missing data values, failed validations, or cycle redundancy checks which can be used to recreate lost pieces of data
- Multiple input/output possibilities include multi-media, device independence, voice, OCR reading, barcode reading, retinal scanning, and Breathalyzer analysis.

### Typically

Scoring is not platform dependent.

*Reusability*

### Definition

Reusability describes the degree to which the application and the code in the application have been specifically designed, developed, and supported to be usable in other applications.

### Score

| Score As | Descriptions To Determine Degree of Influence |
|---|---|
| 0 | No reusable code. |
| 1 | Reusable code is used within the application. |
| 2 | Less than 10% of the application code developed is intended for use in more than one application. |
| 3 | Ten percent (10%) or more of the application code developed is intended for use in more than one application. |
| 4 | The application was specifically packaged and/or documented to ease reuse, and the application is customized at the source code level. |
| 5 | The application was specifically packaged and/or documented to ease reuse, and the application is customized for use by means of user parameter maintenance. |

### Hints

### Hints for Rule 1

- A score of 1 is awarded for reusing code regardless of where it was developed.
- Code developed specifically for reuse within the application and used more than once within the application counts as well as code retrieved from a central library and available for general use

### Hints for Rule 2

- To score 2 or more, the code must be developed for use in more then one application, stored and managed in a central library and be available for general use. Code from one application that is cut and pasted into another application is not considered reuse.
- The reusable code would be supported by documentation that enables and eases the reuse.

### Hints for Rule 5

- Examples of applications customized through use of parameters include PeopleSoft and SAP and would generally receive a score of 5.
- Reused code may be slightly modified in the receiving application.
- Examples of reuse include objects or other static code maintained in an object/code library.

### Typically

Scoring is not platform dependent.

*Installation Ease*

### Definition

Installation Ease describes the degree to which conversion from previous environments influenced the development of the application.

Conversion and installation ease are characteristics of the application. A conversion and installation plan and/or conversion tools were provided and tested during the system test phase.

### Score

| Score As | Descriptions To Determine Degree of Influence |
|---|---|
| 0 | No special considerations were stated by the user, and no special setup is required for installation. |
| 1 | No special considerations were stated by the user, but special setup is required for installation. |
| 2 | Conversion and installation requirements were stated by the user, and conversion and installation guides were provided and tested. The impact of conversion on the project is not considered to be important. |
| 3 | Conversion and installation requirements were stated by the user, and conversion and installation guides were provided and tested. The impact of conversion on the project is considered to be important. |
| 4 | In addition to 2 above, automated conversion and installation tools were provided and tested. |
| 5 | In addition to 3 above, automated conversion and installation tools were provided and tested. |

### Hints

- Conversion and installation includes converting pre-existing data into new data files, loading files with actual data, or developing special installation software, such as porting.
- Purchased or developed software must be used in order to take credit for installation and conversion.

### Hint for Rule 1

- Most business applications require some special setup to install the application and receive a score of 1.

### Hint for Rule 2

- If the application has conversion and installation requirements and installation guides were provided, and providing these functions and guides were not on the critical path of the project, score a 2.

### Hint for Rule 3

- If the application has conversion and installation requirements and installation guides were provided, and providing these functions and guides were on the critical path of the project, score a 3.

### Hint for Rules 4 and 5

- If the application has conversion and installation requirements and can be installed with no external intervention, score a 4 or 5, depending on the other requirements for the scoring of 2 and 3

### Typically

Scoring is not platform dependent.

*Operational Ease*

### Definition

Operational Ease describes the degree to which the application attends to operational aspects, such as start-up, back-up, and recovery processes.

Operational ease is a characteristic of the application. The application minimizes the need for manual activities, such as tape mounts, paper handling, and direct on-location manual intervention.

### Score

| Score As | Descriptions To Determine Degree of Influence |
|---|---|
| 0 | No special operational considerations other than the normal back-up procedures were stated by the user. |
| 1 - 4 | One, some, or all of the following items apply to the application. Select all that apply. Each item has a point value of one, except as noted otherwise.<br>• Start-up, back-up, and recovery processes were provided, but human intervention is required.<br>• Start-up, back-up, and recovery processes were provided, but no human intervention is required (count as two items)<br>• The application minimizes the need for tape mounts and/or remote data access requiring human intervention<br>• The application minimizes the need for paper handling. |
| 5 | The application is designed for unattended operation. Unattended operation means no human intervention is required to operate the system other than to start up or shut down the application. Automatic error recovery is a feature of the application. |

### Hints

#### Hint to Rule 1-4a

- Application has the ability to perform start-up, back-up, and recovery; however, human response is required to initiate the function.

#### Hint to Rule 1-4b

- Application has the ability to perform start-up, back-up, and recovery; and no human response is required to initiate the function.

#### Hint to Rule 1-4c

- If the application has conversion and installation requirements and installation guides were provided, and providing these functions and guides were on the critical path of the project, score a 3.

#### Hint for Rules 4 and 5

- The application minimizes the need to access data that is not immediately available.
- This may include importing data from a distributed processor to the local processor prior to execution to eliminate access delays.

#### Hint to Rule 1-4d

- The application has been designed to provide the user with data in a condensed format or via a media other than paper.
- This could include elimination of detailed printed information or access to on-line reports, inquiries, microfiche, CD, or other such media.

#### Hint to Rule 5

- A score of 5 is assigned to an application that runs and recovers automatically from errors, on its own – an unattended operation.
- Unattended operation may include unmanned satellite, nuclear reactor, or air traffic control.

### Typically

Scoring is not platform dependent.

*Multiple Sites*

### Definition

Multiple Sites describes the degree to which the application has been developed for different hardware and software environments.

### Score

| **Score As** | **Descriptions To Determine Degree of Influence** |
|---|---|
| 0 | The needs of only one installation site were considered in the design. |
| 1 | The needs of more than one installation site were considered in the design, and the application is designed to operate only under identical hardware and software environments. |
| 2 | The needs of more than one installation site were considered in the design, and the application is designed to operate only under similar hardware and/or software environments. |
| 3 | The needs of more than one installation site were considered in the design, and the application is designed to operate under different hardware and/or software environments |
| 4 | Documentation and support plan are provided and tested to support the application at multiple installation sites and the application is as described by 2. |
| 5 | Documentation and support plan are provided and tested to support the application at multiple installation sites and the application is as described by 3. |

### Hints

The term multiple sites is a logical term and is not necessarily physical. There can be multiple sites within the same physical location. The determining factor is based upon the needs of the various installations.

### Hints for Rule 0

- Most mainframe applications would probably score 0.
- However, if an application is installed on multiple mainframe computers with significantly different configurations or different operating systems, it would receive a score of greater than 0.

### Hints for Rule 1

- For example, Windows NT on hardware with exactly the same configuration.

### Hints for Rule 2

- For example, Windows 95, 98 and NT on hardware with a similar configuration.
- Variations could include different memory sizes, various storage capability, different processor speeds, and different printer types.

### Hints for Rule 3

- For example, Windows, OS X, UNIX, Linux, and VOS3 on different types of hardware.
- Differences could include Intel based PC, MAC, Tandem, Sun, and AS400.

### Typically

Scoring is dependent on the number of different platforms.

### *Facilitate Change*

#### Definition

Facilitate Change describes the degree to which the application has been developed for easy modification of processing logic or data structure.

The following characteristics can apply for the application:

- Flexible Query
  1. Flexible query and report facility is provided that can handle simple requests. (count as 1 item)
  2. Flexible query and report facility is provided that can handle requests of average complexity. (count as 2 items)
  3. Flexible query and report facility is provided that can handle complex requests. (count as 3 items)
- Business Control Data
  1. Business control data is kept in tables that are maintained by the user with on-line interactive processes, but changes take effect only on the next business cycle. (count as 1 item)
  2. Business control data is kept in tables that are maintained by the user with on-line interactive processes, and the changes take effect immediately. (count as 2 items)

#### Score

| **Score As** | **Descriptions To Determine Degree of Influence** |
|---|---|
| 0 | None of the above. |
| 1 | A total of one item from above. |
| 2 | A total of two items from above. |
| 3 | A total of three items from above. |
| 4 | A total of four items from above. |
| 5 | A total of five items from above. |

#### Hints

#### Flexible Query and Reporting:

- A flexible query and reporting facility means more than a list of choices in a "canned" query or report.
- It is the ability of the user to control the data, data source, sequence and format of their query or report request.
- It means freedom to design screen layout, horizontal and vertical sorting, data item display formats, selection criteria for both files and data items.
- It includes true user programming for inquiries and is sometimes referred to as ad hoc query or reporting
- Using filters which control the amount of data viewed or printed in a fixed format is not considered to be a flexible query and report facility.
- Query and/or report writer capability is often provided by languages such as SQL or Focus or by some of the more dynamic ad hoc reporting tools (e.g., Crystal Reports).

#### Hint for Rule A1

- Simple requests may include and/or logic applied to only one internal logical file.

#### Hint for Rule A2

- Requests of average complexity may include and/or logic applied to more than one internal logical file.

### Hint for Rule A3

- Complex requests may include and/or logic combinations on one or more internal logic files.

### Business Control Data:

- Business Control Data (Reference Data) is stored to support the business rules for the maintenance of the Business Data; e.g., in a payroll application it would be the data stored on the government tax rates for each wage scale and the date the tax rate became effective.
- See Part 2, Code Data for additional information.

### Typically

Scoring is not platform dependent.

### History and IFPUG

This chapter provides a brief history of Function Points and describe IFPUG.

### Brief History

Function Point Analysis was developed first by Allan J. Albrecht in the mid 1970s. It was an attempt to overcome difficulties associated with lines of code as a measure of software size, and to assist in developing a mechanism to predict effort associated with software development. The method was first published in 1979, then later in 1983. In 1984 Albrecht refined the method and since 1986, when the International Function Point User Group (IFPUG) was set up, several versions of the Function Point Counting Practices Manual have been published by IFPUG.

### Growth and Acceptance of Function Point Analysis

The acceptance of Function Point Analysis continues to grow. This is indicated by the growth of the International Function Point User Group (IFPUG). Since 1987 membership in IFPUG has grown from 100 members to nearly 600 members in 1997. Additionally, in less than six years conference attendance has grown from 125 in 1988 to over 300 by 1997. Examination of IFPUG clearly indicates that the majority of its is members are from North America, but Function Point analysis growth outside North America is strong. This is evident by the growing number of function point organizations worldwide. There are numerous affiliate organizations of IFPUG. There are affiliate organizations in Italy, France, Germany, Austria, India, The Netherlands, Australia, Japan, and several other countries.

The exercises at the end of the section help the student demonstrate that they have gained the basic knowledge required.

### More Information about IFPUG

More information about joining IFPUG, conferences, committees can be obtained by contacting the IFPUG.

Website: *http://www.IFPUG.org*

### Calculating Adjusted Function Point

Describe the calculations necessary for determining the final Function Point Counts. The exercises at the end of the section help the student demonstrate that they have gained the basic knowledge required.

### Understanding the Equations

There are three sets of equations new projects (Development), existing projects (Baseline or Application) and for enhancement projects. There are two equations for the enhancement projects. The first equation accounts for size of the enhancement project while the second equation adjusts the size of the Application.

### Forget About the Equations for a Minute

The equations can be very cumbersome and there are many variables. Forget about the exact equations for a moment.

When you develop a new application you need to know the entire size of the project. This means you would want to include the number of function points of the application plus any other function points that need to be developed. For example, you may need to develop a mini (temporary) application to assist with conversion efforts. So in the end, you would have the number of function points for the application to be installed plus any other functions you needed to develop.

When you have an enhancement project and you are going to modify an existing production application, you are concerned about two things. The first thing is the size of the actual enhancement project. How many function points is this project? The size of this project includes any added functionality, any changed functionality, and any deleted functionality. Also in an enhancement project you may have other functionality needed that is not directly part of the enhancement project.

Normally an enhancement project is the size of any (added functionality plus any changed functionality) x the value adjustment factor. The value adjustment factor normally does not change; there is normally no conversion effort, so on and so forth.

The second concern is how did the enhancement project change the actual production application. Is the existing production application larger than before? And if it is larger by how much? This would be any added functionality. Also you would want to know of any functionality that exist before and is larger after the enhancement.

In practice the size of the existing production application will be impacted by added functionality more. Many organizations learn that existing application size does not change much, but they are changing existing functionality.

### Definition

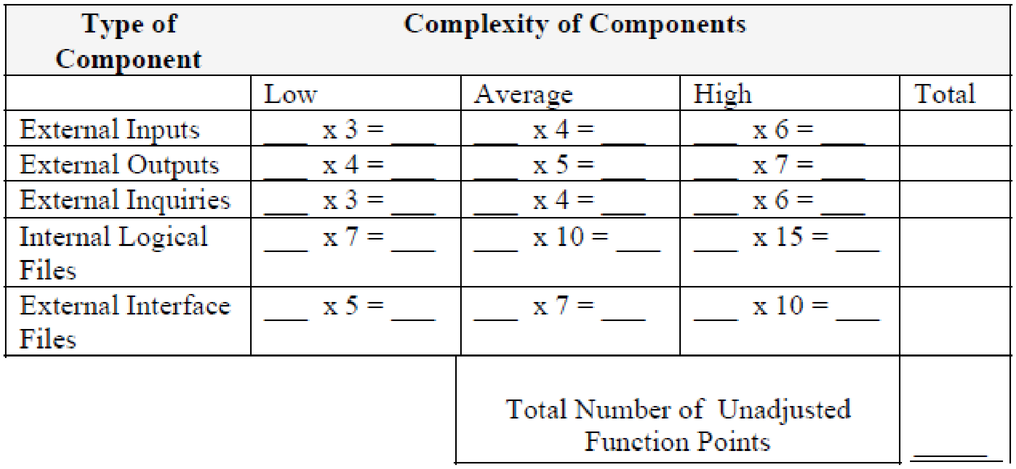
The final Function Point Count is obtained by multiplying the VAF times the Unadjusted Function Point (UAF). The standard function point equation is:

**FP = UAF * VAF**

Where:

- UAF = Unadjusted Function Points
- VAF = Value Adjustment Factor

### Unadjusted Function Point



| Type of Component | Complexity of Components | | | |
|---|---|---|---|---|
| | Low | Average | High | Total |
| External Inputs | ___ x 3 = ___ | ___ x 4 = ___ | ___ x 6 = ___ | |
| External Outputs | ___ x 4 = ___ | ___ x 5 = ___ | ___ x 7 = ___ | |
| External Inquiries | ___ x 3 = ___ | ___ x 4 = ___ | ___ x 6 = ___ | |
| Internal Logical Files | ___ x 7 = ___ | ___ x 10 = ___ | ___ x 15 = ___ | |
| External Interface Files | ___ x 5 = ___ | ___ x 7 = ___ | ___ x 10 = ___ | |
| | | Total Number of Unadjusted Function Points | | ______ |

### Development Project Function Point Calculation

Use the following formula to calculate the development project function point count. Notice there is an additional term CFP which is conversion function points. Often when a new application is replacing an old application, the data must be converted. Sometimes a "mini application" needs to be developed to assist in the conversion. This mini application does not exist after the new application is up and running. This is why development function point calculation is different the application function point count (see next below).

**DFP = (UFP + CFP) * VAF**

Where:

- DFP is the development project function point count
- UFP is the unadjusted function point count

- CFP is the function points added by the conversion unadjusted function point count
- VAF is the value adjustment factor

### Application Function Point Count (Baseline)

Use the following formula to establish the initial function point count for an existing application. The user is receiving functionality. There are no changes to the existing functionality or deletions of unneeded functionality. The application function point count does not include conversion requirements.

**AFP = ADD * VAF**

Additionally, this equation is used to establish the function point count for an application at any point in time.

- AFP is the initial application function point count.
- ADD is the unadjusted function point count of those functions that were installed by the development project. Since many enhancement projects (that were not counted) have been installed in the application, the ADD in this case represents all functionality that exists within the application boundary at a particular point in time.
- VAF is the value adjustment factor of the application.

### Enhancement Project Function Point Calculation

Use the following formula to calculating the size for enhancement projects.

**EFP = [(ADD + CHGA + CFP) * VAFA] + (DEL* VAFB)**

Where:

- EFP is the enhancement project function point count.
- ADD is the unadjusted function point count of those functions that were added by the enhancement project.
- CHGA is the unadjusted function point count of those functions that were modified by the enhancement project. This number reflects the functions after the modifications.
- CFP is the function point count added by the conversion.
- VAFA is the value adjustment factor of the application after the enhancement project.
- DEL is the unadjusted function point count of those functions that were deleted by the enhancement project. It is important to consider the absolute value of the DEL not the negative value.
- VAFB is the value adjustment factor of the application before the enhancement project.

In practice:

EFP = [(ADD + CHGA + CFP) * VAFA] + (DEL* VAFB)

In practice VAFA = VAFB = VAF, so the equation becomes

EFP = (ADD + CHGA + CFP+ DEL)* VAF)

Also normally CFP = 0, so the equation simplifies further

EFP = ((ADD + CHGA + DEL)* VAF)

### Simplification of the equation

To examine the equation in detail let’s assume that VAFA = VAFB = 1 and CFP = 0. Hence EFP = (ADD + CHGA + DEL). That is, the size of an enhancement project is a summation of all added functionality, changed functionality and any deleted functionality.

In theory and in practice, each piece of the formula must be adjusted by the appropriate Value Adjustment factor. Assume now that VAFA <> VAFB. The added and changed after is adjusted by the VAFA, but the deleted is adjusted by the VAFB. Additionally, if CFP <> 0 then it should be adjusted by VAFA.

### Application After Enhancement Project

**AFP = [(UFPB + ADD + CHGA) - (CHGB + DEL)] * VAFA**

Where:

- UFPB = Unadjusted Function Point Count Before Enhancement.

- AFP = Application Function Point Count
- DEL = is the number of function points deleted (the negative value).
- All other acronyms are the same as before.

Of course, an enhancement calculation can add and/or Delete functionality from the UFPB. Added functionality can be due to new components or added functionality can be due to increase in size of existing components. For example, an existing external input could go from a low to an average – valued at 3 to 4.

In Practice

Normally VAFA = VAFB = VAF, so the equation can be re-arranged

AFP = (UFPB+ADD + CHGA-CHGB – DEL)* VAF

Lets assume that CHGA = CHGB and DEL = 0.

Then AFP= (UFPB + ADD) * VAFA

### NESMA Impacted Enhancement Function Points

The Netherlands Software Metrics Association (NESMA) has published guidelines on counting enhancement projects that supplement the IFPUG guidelines. Full details of the NESMA Method can be found in FUNCTION POINT ANALYSIS FOR SOFTWARE ENHANCEMENT GUIDELINES Version 2.2.1. The NESMA Method considers the application of FPA to software enhancement from the perspective of the standard function point analysis method. The result of this work, embodied in these guidelines, is a method applicable to software enhancement and testing that is strongly related to the standard FPA method. The term Enhancement Function Point Analysis (EFPA) is used to differentiate the method from the standard function point analysis method.

### Methodology

Six steps are necessary for determining the size of the enhancement expressed in enhancement function points:

- Identify the transactional and data functions within the scope of the enhancement project and determine their functional size.
- Determine which transactional and data functions are to be added.
- Determine which transactional and data functions are to be deleted.
- Determine which data functions are to be changed and determine the impact factor.
- Determine which transactional functions are to be changed and determine the impact factor.
- Calculate the number of Enhancement Function Points.

The analysis is primarily concerned with determining the FPA user functions which are added, modified or deleted. For this part of the analysis Function Point Analysis (FPA) is used. The result is a summary of the impacted FPA user functions with their functional size.

During enhancement, user transactions and logical data files can be added, modified or deleted. With regard to deleted user transactions and logical data files, the number of function points before deletion is decisive; for added and modified user transactions and logical data files, the number of function points after modification is decisive. The impact of an enhancement may go beyond what is initially apparent from the enhancement proposal. For example, the change of a logical file or transaction may impact other transactions or logical files.

After this, every impacted function needs to be carefully assessed to identify the extent of the impact of enhancement on the function. The impact factor reflects the degree of change of each identified (data and transactional) function.

Finally, the enhancement size of each affected transactional and data function is calculated by multiplying its base size by its impact factor. The enhancement size is measured in “Enhancement Function Points” (EFP), not standard function points, which is a different measure. It is imperative to maintain the distinction between the standard function point unit used to express the size of software (FP) and the unit used to express the size of an enhancement (EFP). In the following chapters, the relationship between the original and the new unit of measure will be described.

### Identify the functions within the scope of the enhancement project

The enhancement proposal, the functional documentation of the current system and the function point analysis of the existing system are used to identify the transactional and data functions within the scope of the enhancement project.

A function point analysis of the existing system is an essential prerequisite because all existing functions that are affected either directly or indirectly by the enhancement contribute to the function point size of the enhancement. If, for any reason, a function point analysis of the existing system is not available, one must be undertaken to identify, as a minimum, the functions affected by the enhancement.

The size of the existing system, or that part impacted by the enhancement project, is expressed in standard function points.

### Determine which transactional and data functions will be added

The enhancement proposal should specify the transactional and data functions to be added to the application. From the proposal it should be possible to calculate the size of the functions added by applying the standard FPA methodology. The impact factor for added functions is 1.00.

Hence, the number of enhancement function points for a single added function is determined as follows:

$\text{EFP}_{\text{ADDED}} = \text{FP}_{\text{ADDED}}$

This means, for example, that 3 function points added will result in 3 enhancement function points.

### Determine which transactional and data functions will be deleted

The (data and transactional) functions that will be deleted from the existing system are identified from the enhancement proposal and the number of function points they represent is determined. For deleted functions an impact factor of 0.40 is used. The number of enhancement function points for a single deleted function is determined as follows:

$\text{EFP}_{\text{DELETED}} = \text{FP}_{\text{DELETED}} \text{ x } 0.40$

This means, for example, that 6 function points deleted will result in 6 x 0.40 = 2.4 enhancement function points.

### Determine which data functions will be modified and determine the impact factor

A data function can be either an internal logical file (ILF) or an external interface file (EIF). Each type of data function is assessed to identify:

- data functions that change internally: DETs added, deleted or changed; and
- data functions that change type but do not change internally (that is, an EIF is changed into an ILF or vice versa).

Determine which data functions will change and how many function points each data function represents after the change, applying the standard FPA rules.

For data functions that change internally an impact factor is calculated from the percentage of DETs changed. The percentage change is defined as the ratio of DETs changed divided by the original number of DETs.

Percentage change = Number of DETs added/changed/deleted / Number of DETs in original data function * 100

The impact factor is taken from the table below using the percentage change in the number of DETs.

| **Percentage DETs** | **<= 33.3%** | **<= 66.6%** | **<= 100.0%** | **> 100.0%** |
|---|---|---|---|---|
| Impact Factor | 0.25 | 0.50 | 0.75 | 1.00 |

If a data function changes type (for example, an external interface file becomes an internal logical file), a value of 0.40 is used for the impact factor. However, in case of a change of type one needs to check if there is also an internal change of the Logical File (change of DETs). If the number of DETs changes as well as the type, the impact factor due to the change in the number of DETs must be determined. The value of the impact factor due to the change in type is compared with that due to the change in the number of DETs and the higher value is used in the calculation of the enhancement function point size.

The number of enhancement function points for a single changed data function is determined as follows:

$\text{EFP}_{\text{CHANGED}} = \text{FP}_{\text{CHANGED}} \text{ x I}_{\text{CHANGED}}$

The number of enhancement function points arising from a change in data functions therefore depends on the extent of the change in the data function.

If an EIF or an ILF is split into two (or more) data functions, one deleted data function and two (or more) added data functions are counted.

If an EIF and an ILF are combined, two deleted data functions and one added data function are counted.

### Determine which transactional functions will be modified and determine the impact factor

The transactional functions that change are identified and the size of each transaction after the change (the enhancement) is determined.

A transactional function is considered changed if it is altered in some way but retains the same name and purpose after enhancement as before enhancement. To determine the functional size of a transactional function after the change the same counting guidelines are used as for new-built systems, applying the standard FPA rules. A transactional function may be affected by changes to data functions. All transactional functions specified in the enhancement proposal and those affected by changes to data functions are included in the scope of the analysis.

This means that a transaction is counted when at least one of the following conditions is satisfied:

- the transaction is identified in the enhancement proposal; or;
- the transaction undergoes a function change as a consequence of other changes defined in the enhancement proposal.

In general, a transaction must be counted if the user can identify that the transaction has changed. This means that at least one of the following criteria is met:

- a transaction is affected by a DET that is added, changed or deleted;
- a transaction is affected by a Logical Data File (ILF or EIF) that is added, changed or deleted;
- the user interface is functionally changed (for example, the composition of a screen or a report);
- the business logic supporting a transaction is changed (for example, edit rules or calculations performed on the transaction data);
- a cosmetic change visible in the user interface is made, for example:
  - static data is changed or moved in a report or other media,
  - a heading is replaced or changed in a report or on a screen

A change to the name of a DET is not regarded as a change in a transaction. The nature of the DET does not change if the name only is changed.

There are four steps to calculating the enhancement function point size of a change to a transaction:

1. Identify the DETs and FTRs used by the transaction.
2. Determine the percentages of DETs and FTRs changed as a result of the enhancement.
3. Determine the impact factor for the transaction.
4. Calculate the number of enhancement function points.

#### *Identify the DETs and FTRs used by the transaction*

The enhancement function point size of a changed transactional function is calculated from the function point size of the function after the change and the change impact factor. The impact factor is determined by the percentage changes in the numbers of DETs and FTRs used by the transaction.

If the change is cosmetic only, the number of changed DETs and FTRs is nil. The impact of such a change is considered minimal and the value of the impact factor (0.25) reflects a relatively low impact. However, the change will be included in the scope of the enhancement project.

#### *Determine the percentage of DETs and FTRs changed as a result of the enhancement*

The impact factor is determined by the percentage changes to the numbers of DETs and FTRs used by the transaction compared with the original numbers of DETs and FTRs.

Percentage DETs = Number of DETs added/changed/deleted / Number of DETs in original transaction * 100

Percentage FTRs = Number of FTRs added/changed/deleted / Number of FTRs in original transaction * 100

Changes in excess of 100% are possible when DETs and FTRs are added to a transaction.

### *Calculate the enhancement function point size*

The enhancement function point size of a single transactional function is calculated as follows:

$EFP_{CHANGED} = FP_{CHANGED} \times I_{CHANGED}$

### Calculate the size of the enhancement project

The size of the enhancement project is the sum of the number of enhancement function points for all the affected transactional and data functions.

$EFP_{TOTAL} = \# EFP_{ADDED} + \# EFP_{DELETED} + \# EFP_{CHANGED}$

### Calculate the size of the system after enhancement

The functional size of a system may change as a result of the enhancement. The size after enhancement can be calculated by analysing the whole application anew or by taking account of the changes from the original FPA analysis. Steps to take are:

1. Calculate the function point size of the application prior to the change ($FP_{BASE}$) using the standard FPA method.
2. Identify the transactional and data functions deleted from the existing application and determine their function point size ($\# FP_{DELETED}$).
3. Determine the transactional and data functions changed. Calculate the number of function points these represent before and after the enhancement ($\# FP_{AFTER}$ and $\# FP_{BEFORE}$), using the standard FPA method.
4. Determine the transactional and data functions added to the system and calculate how many function points these represent ($\# FP_{ADDED}$).
5. Calculate the size of the system after enhancement ($FP_{NEW}$).

$FP_{NEW} = FP_{BASE} + (\# FP_{ADDED}) + (\# FP_{AFTER-CHANGE} - \# FP_{BEFORE-CHANGE}) - (\# FP_{DELETED})$

Note: the Impact Factor does not play when determining the size of the system after enhancement.

## Function Point Modeler Diagram Elements

### Actor

An actor represents a role of a user that interacts with the system that you are modeling. The user can be a human user, an organization, a machine, or another external system.

### Application System

The Application System indicates the software being measured.

### Subsystem

Subsystems are a type of stereotyped component that represent independent, behavioral units in a system. Subsystems are used to represent large-scale components in the system that you are modeling. You can model an entire application system as a hierarchy of subsystems.

### Transactional Functions

Transactional functions represent the functionality provided to the user to process data. Transactional functions are either external inputs, external outputs, or external inquiries.

- An **external input (EI)** is an elementary process that processes data or control information that comes from outside the applications boundary. The primary intent of an **EI** is to maintain one or more **ILF** s and/or to alter the behavior of the system.
- An **external output (EO)** is an elementary process that sends data or control information outside the applications boundary. The primary intent of an external output is to present information to a user through processing logic other than or in addition to the retrieval of data or control information. The processing logic must contain at least one mathematical formula or calculation, or create derived data. An external output may also maintain one or more **ILF** s and/or alter the behavior of the system.

- An **external inquiry (EQ)** is an elementary process that sends data or control information outside the application boundary. The primary intent of an external inquiry is to present information to a user through the retrieval of data or control information. The processing logic contains no mathematical formula or calculation, and creates no derived data. No **ILF** is maintained during the processing, nor is the behavior of the system altered.

Source: **Function Point Counting Practices Manual** , see the IFPUG web site at *http://www.ifpug.org* for additional information.

### Data Functions

Data functions represent the functionality provided to the user to meet internal and external data requirements. Data functions are either internal logical files or external interface files.

- An **internal logical file (ILF)** is a user identifiable group of logically related data or control information maintained within the boundary of the application. The primary intent of an **ILF** is to hold data maintained through one or more elementary processes of the application being counted.
- An **external interface file (EIF)** is a user identifiable group of logically related data or control information referenced by the application, but maintained within the boundary of another application. The primary intent of an **EIF** is to hold data referenced through one or more elementary processes within the boundary of the application counted. This means an **EIF** counted for an application must be in an **ILF** in another application.

Source: **Function Point Counting Practices Manual** , see the IFPUG web site at *http://www.ifpug.org* for additional information.

### Relations

A relationship is a connection between model elements. A Function Point Model relationship is a type of model element that adds semantics to a Function Point Model by defining the structure and behavior between the model elements.

#### Relation between Actor and Subsystem

A relationship between Actor and Subsystem is a type of model element that adds semantics to a Function Point Model by defining the structure and behavior between a model element Actor and a model element Subsystem.

#### Relation between Subsystem and Subsystem

A relationship between Subsystem and Subsystem is a type of model element that adds semantics to a Function Point Model by defining the structure and behavior between two model elements of the type Subsystem.

#### Relation between Transactional Function and Data Function

A relationship between Transactional Function and Data Function is a type of model element that adds semantics to a Function Point Model by defining the structure and behavior between model elements Transactional Function and Data Function.

#### Relation between Data Function and Data Function

A relationship between Data Function and Data Function is a type of model element that adds semantics to a Function Point Model by defining the structure and behavior between two model elements of Type Data Function.

### Note

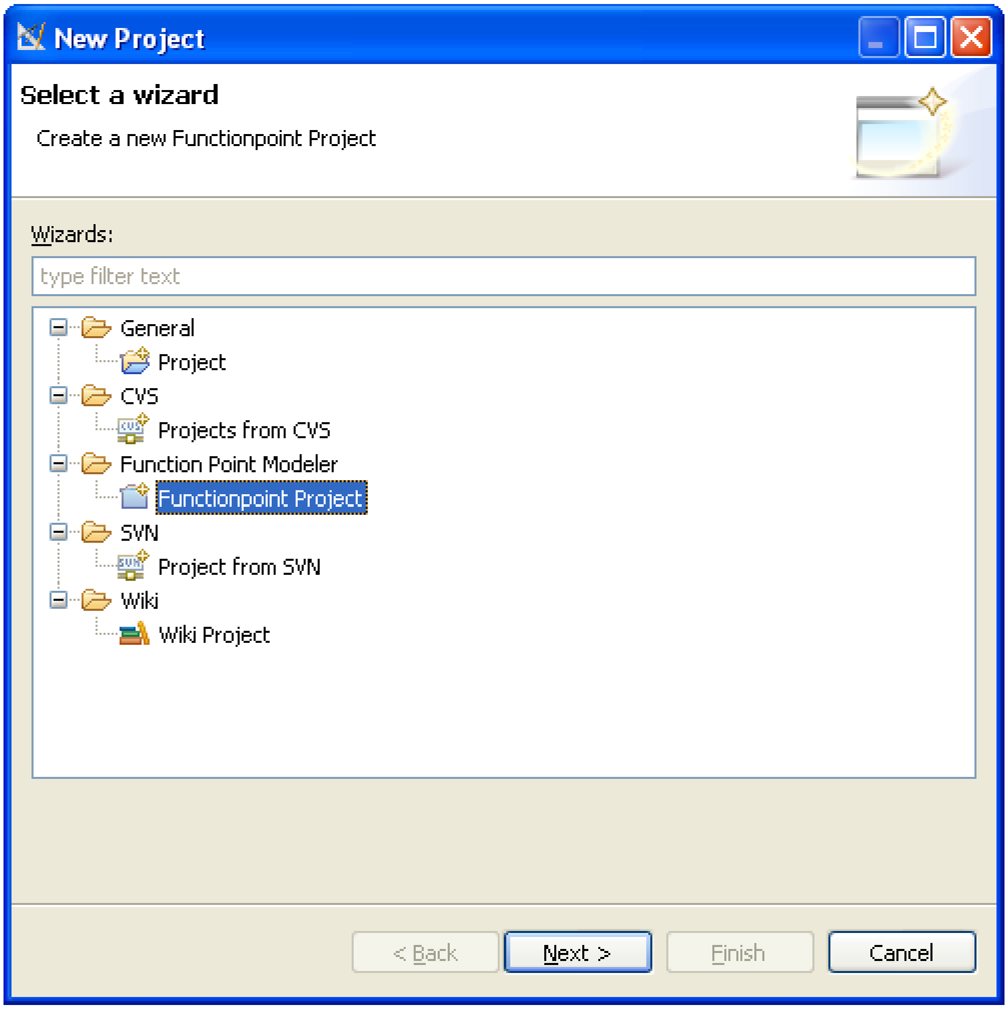
A note is a non-FPM diagram element, which contains comments or textual information.

Notes can be added to indicate comments, observations or explanations on a particular diagram element. When required, a single note can be added to multiple diagram elements.

## Modeling with Function Point Modeler

### Function Point Modeler Projects

You can create different project type with **Function Point Modeler** . This wizard helps you create a new project in the **Function Point Modeler** .



Select a wizard

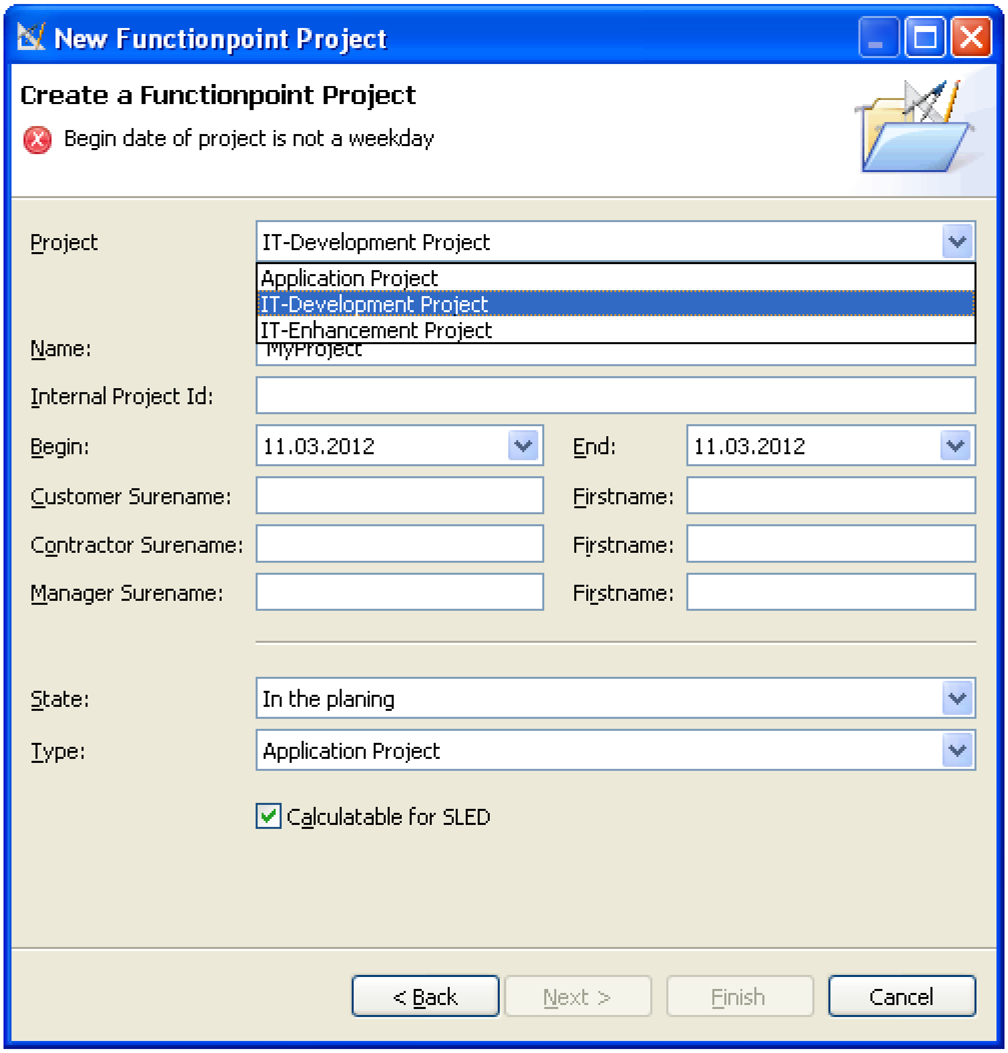
Create a new Functionpoint Project

Wizards:

type filter text

- General
  - Project
- CVS
  - Projects from CVS
- Function Point Modeler
  - Functionpoint Project
- SVN
  - Project from SVN
- Wiki
  - Wiki Project

The most important of them for you is the **Functionpoint Project** . The **Functionpoint Project** contains three types of projects.



New Functionpoint Project

Create a Functionpoint Project

Begin date of project is not a weekday

Project: IT-Development Project

Application Project
IT-Development Project
IT-Enhancement Project

Name: MyProject

Internal Project Id:

Begin: 11.03.2012

End: 11.03.2012

Customer Surename:

Firstname:

Contractor Surename:

Firstname:

Manager Surename:

Firstname:

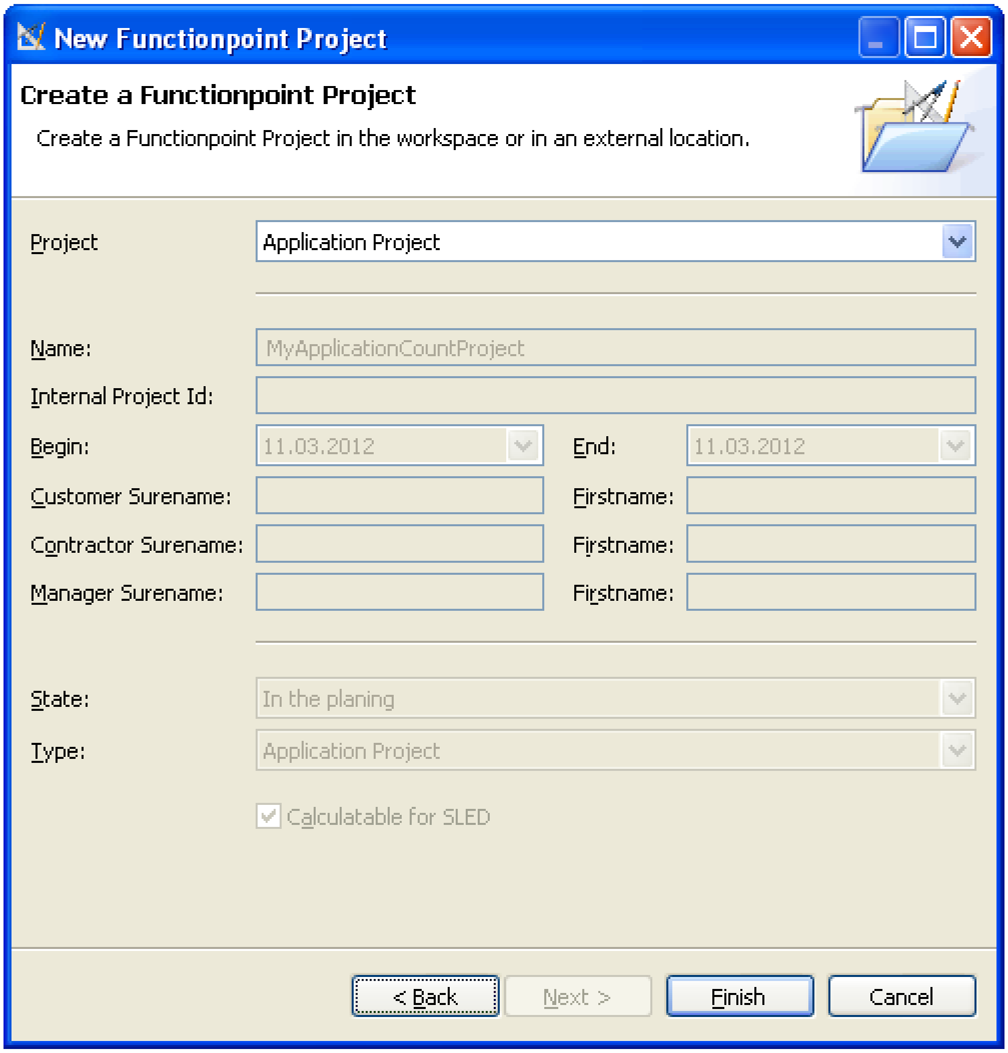
State: In the planing

Type: Application Project

☑ Calculatable for SLED

1. The **Application Project** is like a container for the **Application Counts** . This kind of project does not include any project information except *Project Name* . You may create one **Application Project** for each **Application System** one **Application Project** for an application domain that contains all **Application Systems** in this domain.

   You can not make an estimation for the **Application Project** , becaus eit is nat real it-project.



New Functionpoint Project

Create a Functionpoint Project

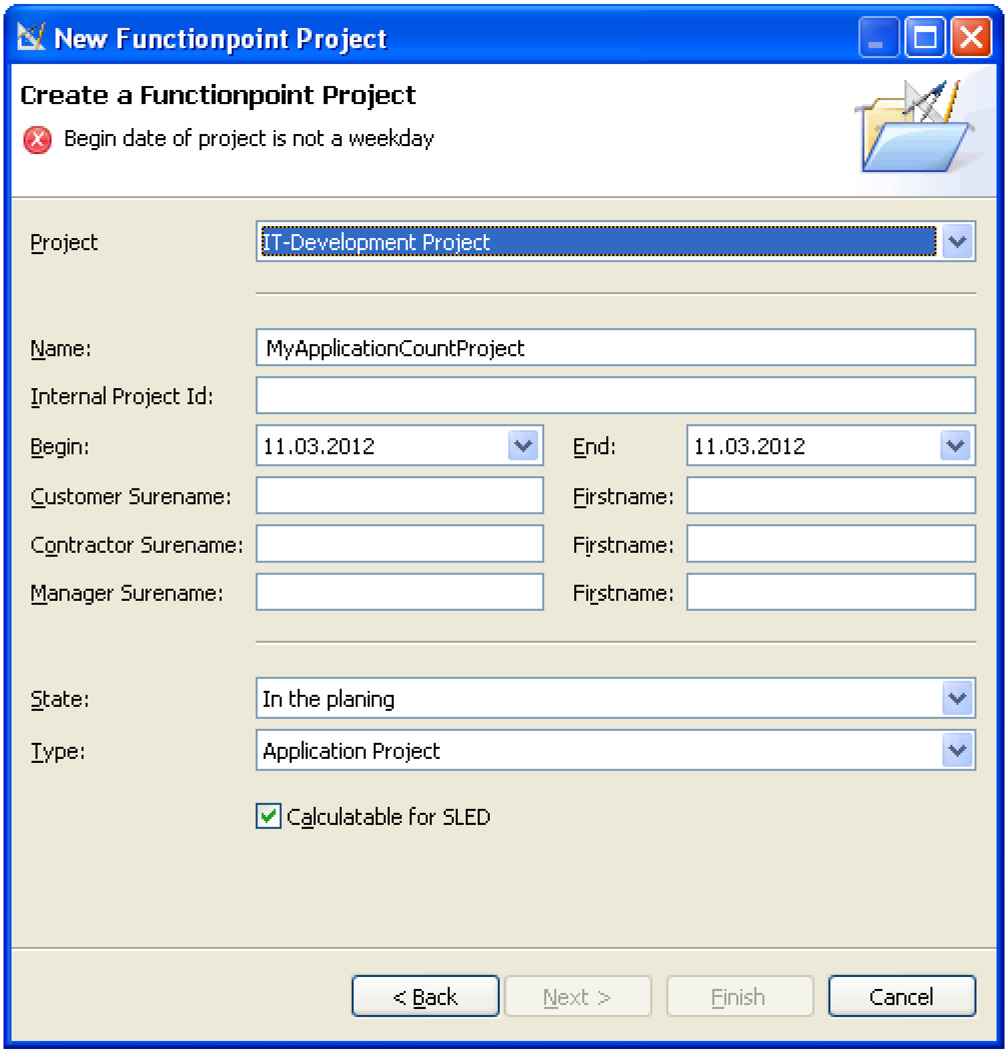
Create a Functionpoint Project in the workspace or in an external location.

| | | | |
|---|---|---|---|
| Project | Application Project | | |
| Name: | MyApplicationCountProject | | |
| Internal Project Id: | | | |
| Begin: | 11.03.2012 | End: | 11.03.2012 |
| Customer Surename: | | Firstname: | |
| Contractor Surename: | | Firstname: | |
| Manager Surename: | | Firstname: | |
| State: | In the planing | | |
| Type: | Application Project | | |

☑ Calculatable for SLED

2. The second **Functionpoint Project** type is the **IT-Development Project** . Create **IT-Development Project** if you have to count a **New Development Project Count** according **IFPUG-CPM** rules.

   The **IT-Development Project** is a real it-project that contains all project relevant metrics. At the and of your counting process you may estimate an **IT-Development Project** .



Create a Functionpoint Project

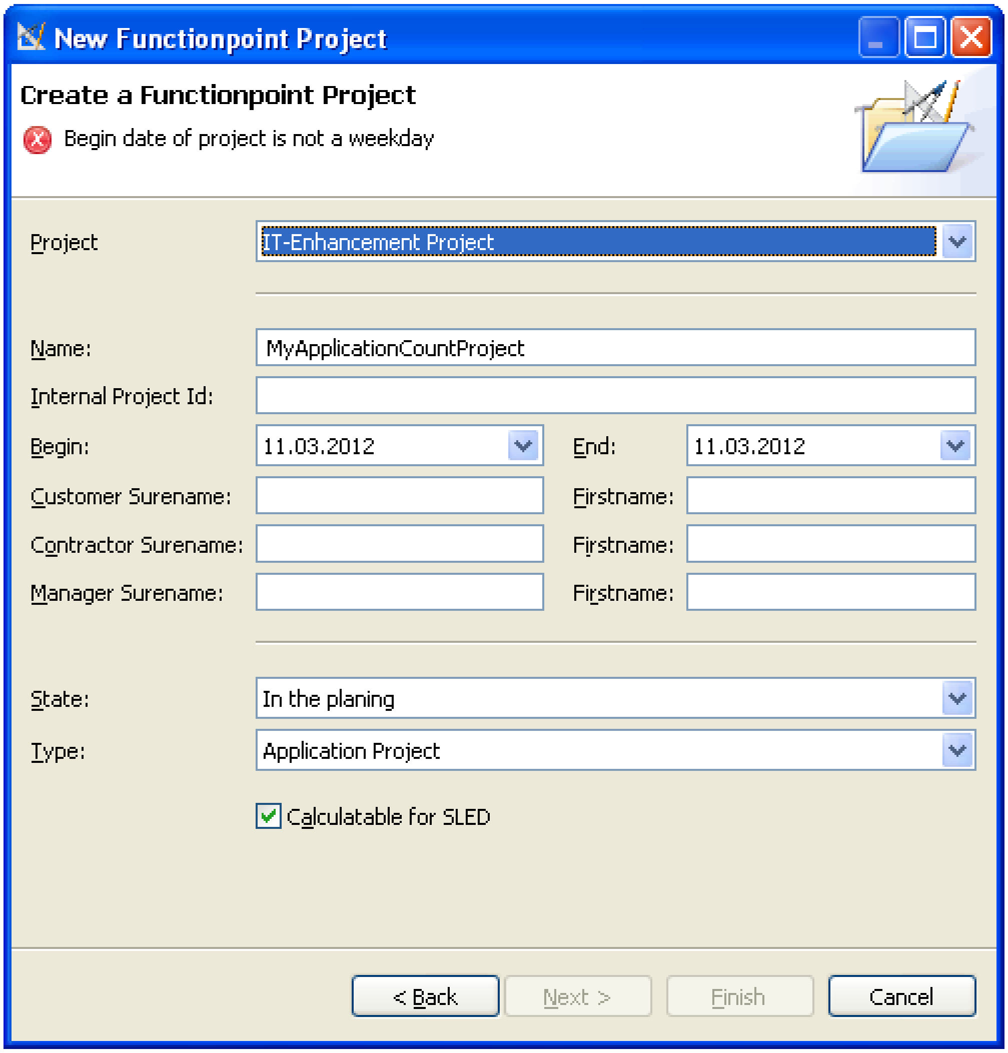
Begin date of project is not a weekday

|  |  |  |  |
|---|---|---|---|
| Project | IT-Development Project |  |  |
| Name: | MyApplicationCountProject |  |  |
| Internal Project Id: |  |  |  |
| Begin: | 11.03.2012 | End: | 11.03.2012 |
| Customer Surename: |  | Firstname: |  |
| Contractor Surename: |  | Firstname: |  |
| Manager Surename: |  | Firstname: |  |
| State: | In the planing |  |  |
| Type: | Application Project |  |  |

☑ Calculatable for SLED

3. The last **Functionpoint Project** type is the **IT-Enhancement Project** . Create **IT-Enhancement Project** if you have to count a **Enhancement Project Count** according **IFPUG-CPM** rules.

   The **IT-Enhancement Project** is also a real it-project that contains all project relevant metrics. At the and of your counting process you may estimate an **IT-Enhancement Project** .



Create a Functionpoint Project

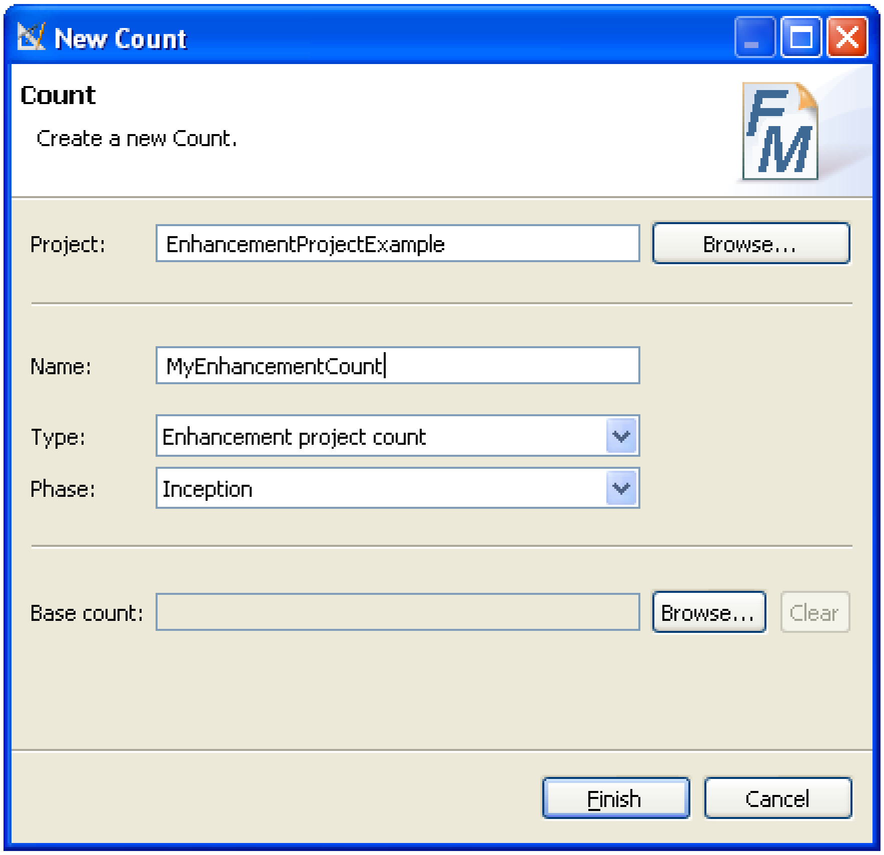
Begin date of project is not a weekday

| | | | |
|---|---|---|---|
| Project | IT-Enhancement Project | | |
| Name: | MyApplicationCountProject | | |
| Internal Project Id: | | | |
| Begin: | 11.03.2012 | End: | 11.03.2012 |
| Customer Surename: | | Firstname: | |
| Contractor Surename: | | Firstname: | |
| Manager Surename: | | Firstname: | |
| State: | In the planing | | |
| Type: | Application Project | | |

☑ Calculatable for SLED

### Function Point Modeler Counts

You can create **Application Count** , **Development Project Count** or **Enhancement Project Count** with **Function Point Modeler** . This tree types of counts are defined **IFPU-CPM** and are the **IFPU-conform** .



Count

Create a new Count.

Project: EnhancementProjectExample

Name: MyEnhancementCount

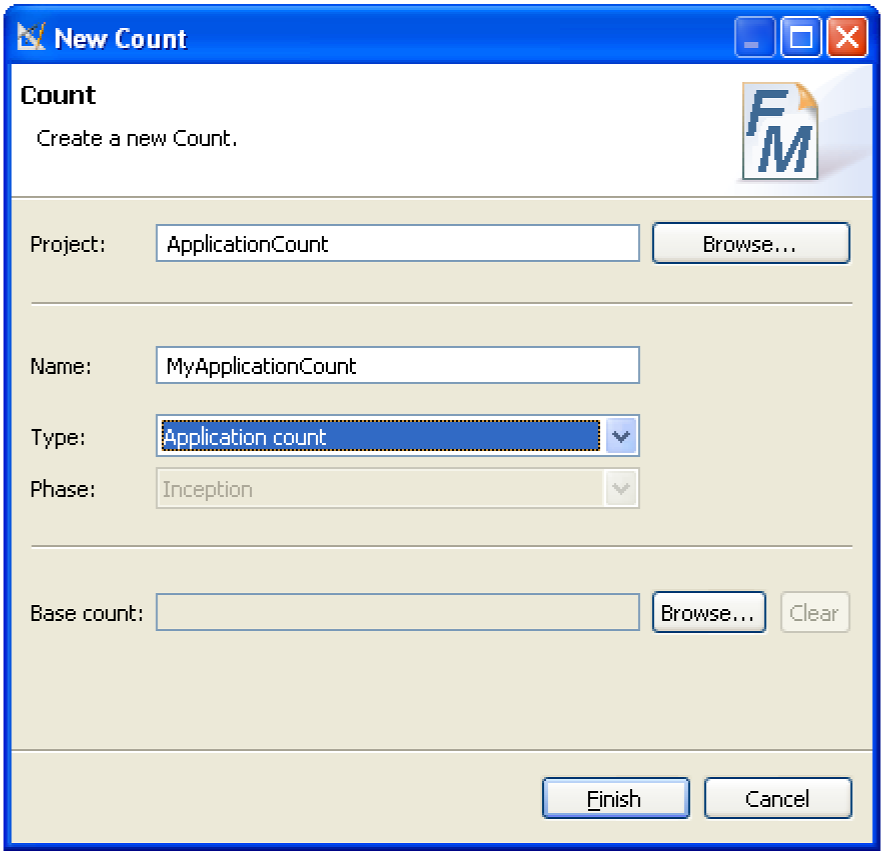
Type: Enhancement project count

Phase: Inception

Base count:

1. You can create an **Application Count** without any real it-project. It is recommended that you can start with **Application Count** to size all existing **Application Systems** in your company. Create an **Application Project** before you create an **Application Count** .

   Based on this **Application Counts** you can create the further **Enhancement Project Count** .



Count

Create a new Count.

Project: ApplicationCount

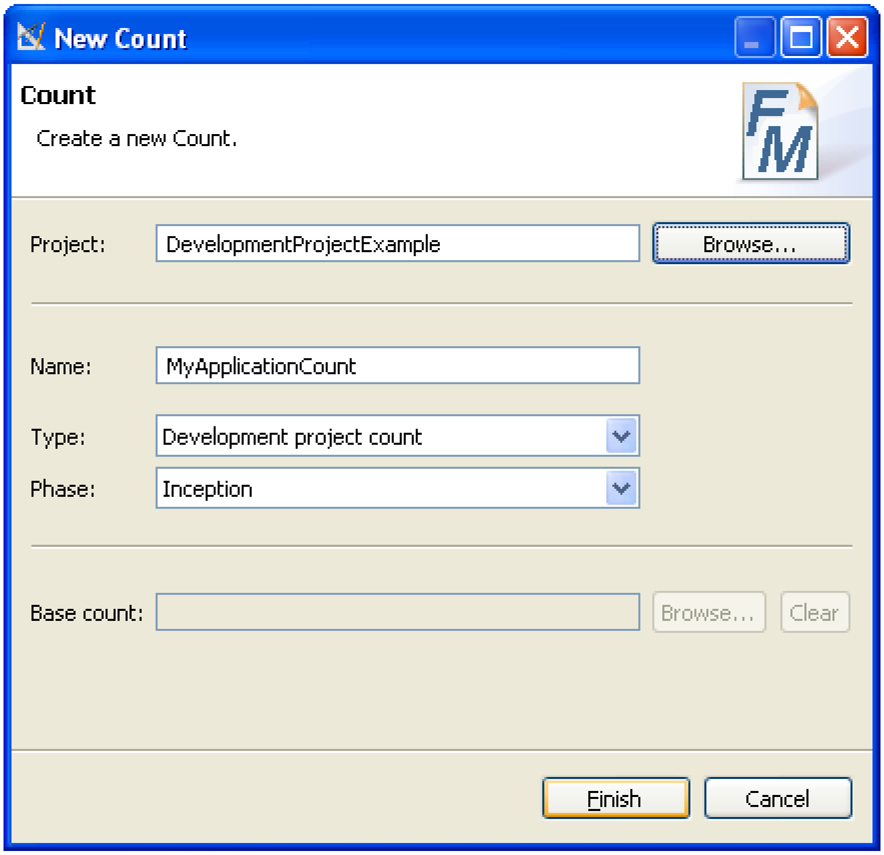
Name: MyApplicationCount

Type: Application count

Phase: Inception

Base count:

2. The second count type is the **Development Project Count** . Create an **IT-Development Project** before you create an **Development Project Count** .



**Count**

Create a new Count.

Project: DevelopmentProjectExample

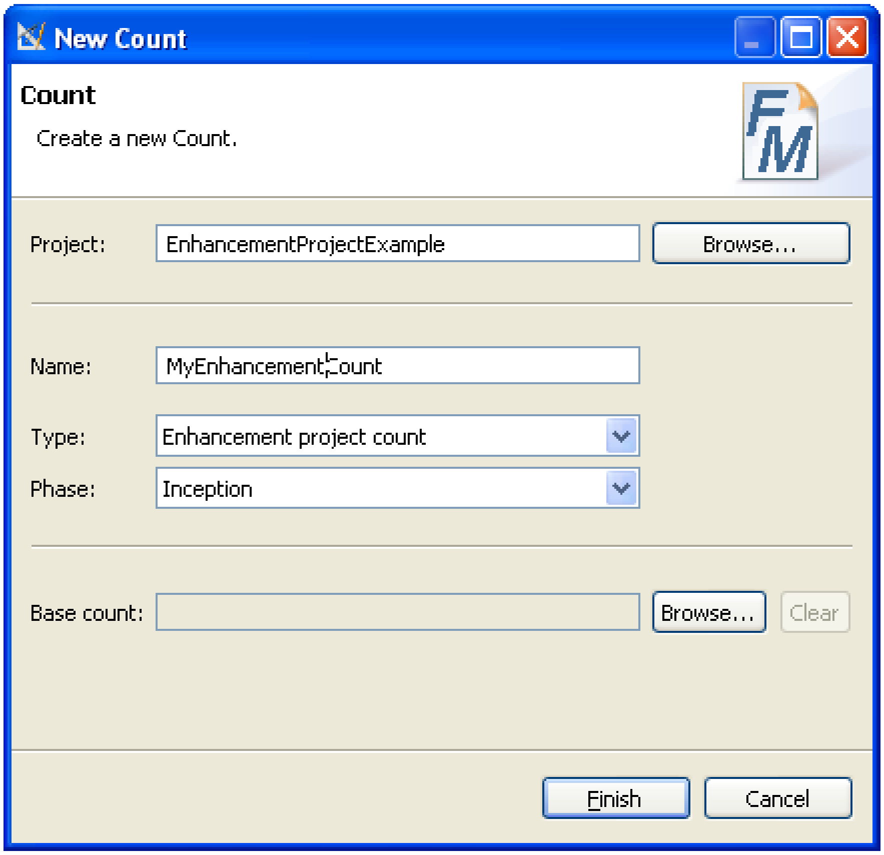
Name: MyApplicationCount

Type: Development project count

Phase: Inception

Base count:

3. The last count type is the **Enhancement Project Count** . Create an **IT-Development Project** before you create an **Development Project Count** .



Count

Create a new Count.

Project: EnhancementProjectExample

Name: MyEnhancementCount

Type: Enhancement project count

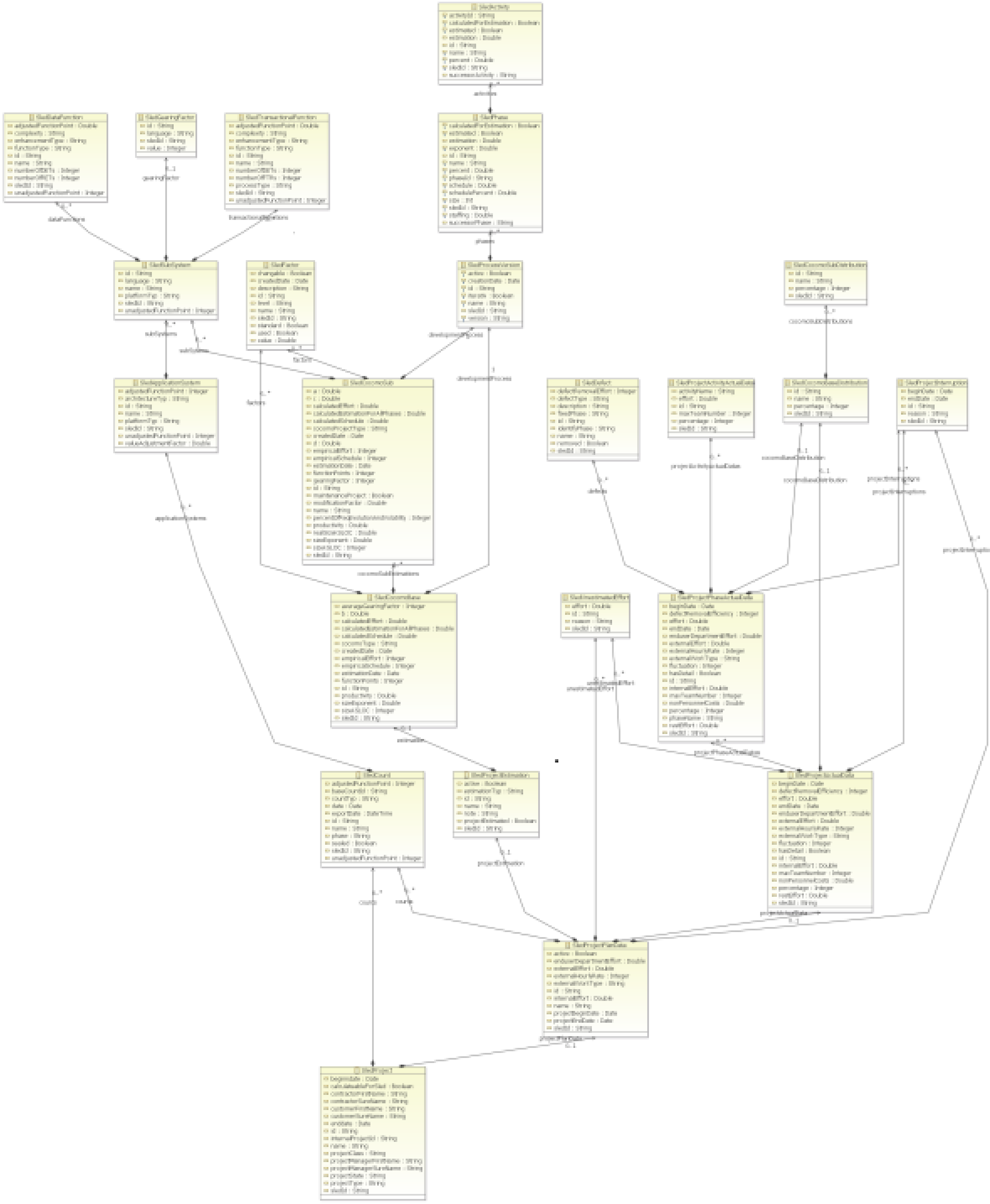
Phase: Inception

Base count:

## Projectdata and Cocomo Estimation

Function Point Modeler gives you insight into the key process, project and product metrics within your company. The **Software Life Cycle Experience Database (SLED)** is designed to meet the needs of a wide range of product, process and project metrics. It delivers significant metrics about product, process, project and estimation (see the following picture).

The **SLED** model is easy to extend for customer requirements and contains the core business objects like Project, **ProjectPlanData** , **ApplicationSystem** , **Count** and **Estimation** . You can read more about each of this objects in the following chapters.



*Software Life Cycle Experience Database (SLED)*

### Plandata and Estimation Overview

Project data called **ProjectPlanData** includes all project relevant information. You can create more than one **ProjectPlanData** for a **Project** . Each of this **ProjectPlanData** represents a project plan scenario for the project.

For example one of the project plan scenario would be for the **Rational Unified Process (RUP)** and other for waterfall or for the software development process specified for your company. A **ProjectPlanData** can include one or more **ProjectEstimation** . Each **ProjectEstimation** represents an estimation scenario for the project. For example one of the **ProjectEstimation** may be with an expert team and other with a mixed team. One of this **ProjectEstimation** has to be set as **default** for the project. It means, that the default **ProjectEstimation** is valid estimation for the project.

One of this **ProjectPlanData** also has to be set as **default** . It means, that the default **ProjectPlanData** is valid for the project. Only the default **ProjectPlanData** of the completed projects in **Software Life Cycle Experience Database (SLED)** are used for the calibration and other metrics reports.

### Plandata

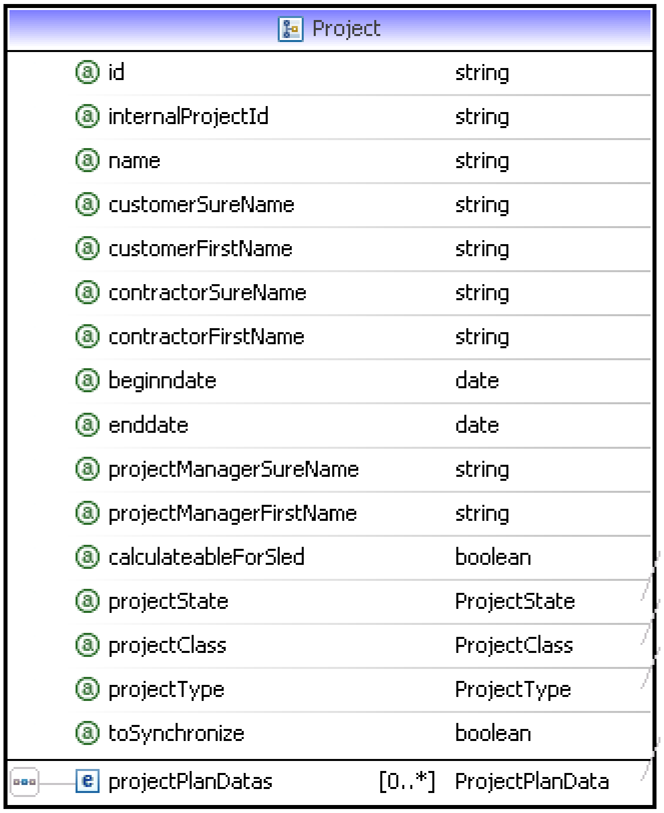
You can create more than one **ProjectPlanData** for a **Project** . Each of this **ProjectPlanData** represents a project plan scenario for the project. **ProjectPlanData** includes beside project relevant metrics the **Counts** , **ProjectEstimations** , **ProcessVersions** , **ProjectActualData** , **ProjectInterruptions** and **UnestimatedEfforts** .

One of this **ProjectPlanData** has to be set as default. It means, that the default Project Plan Data is valid for the project. Only the default **ProjectPlanData** of the completed projects in **Software Life Cycle Experience Database (SLED)** are used for the calibration and other metrics reports.

### Project Plandata Element

You can create more than one **ProjectPlanData** for a **Project** . Each of this **ProjectPlanData** represents a project plan scenario for the project. **ProjectPlanData** includes beside project relevant metrics the **Counts** , **ProjectEstimations** , **ProcessVersion** , **ProjectActualData** , **ProjectInterruptions** and **Unestimated Efforts** .

One of this **ProjectPlanData** has to be set as **default** . It means, that the default **ProjectPlanData** is the valid for the project. Only the default **ProjectPlanData** of the completed projects in **Software Life Cycle Experience Database (SLED)** are used for the calibration and other metrics reports.



| Project | | |
|---|---|---|
| id | | string |
| internalProjectId | | string |
| name | | string |
| customerSureName | | string |
| customerFirstName | | string |
| contractorSureName | | string |
| contractorFirstName | | string |
| beginndate | | date |
| enddate | | date |
| projectManagerSureName | | string |
| projectManagerFirstName | | string |
| calculateableForSled | | boolean |
| projectState | | ProjectState |
| projectClass | | ProjectClass |
| projectType | | ProjectType |
| toSynchronize | | boolean |
| projectPlanDatas | [0..*] | ProjectPlanData |

*Project*

### Referenced Counts

A project can contain one or more Counts, which exists in the current project. You can add one or more Count to a **ProjectPlanData** . Only the added counts can be considered for an estimation in this Project Plan Data.

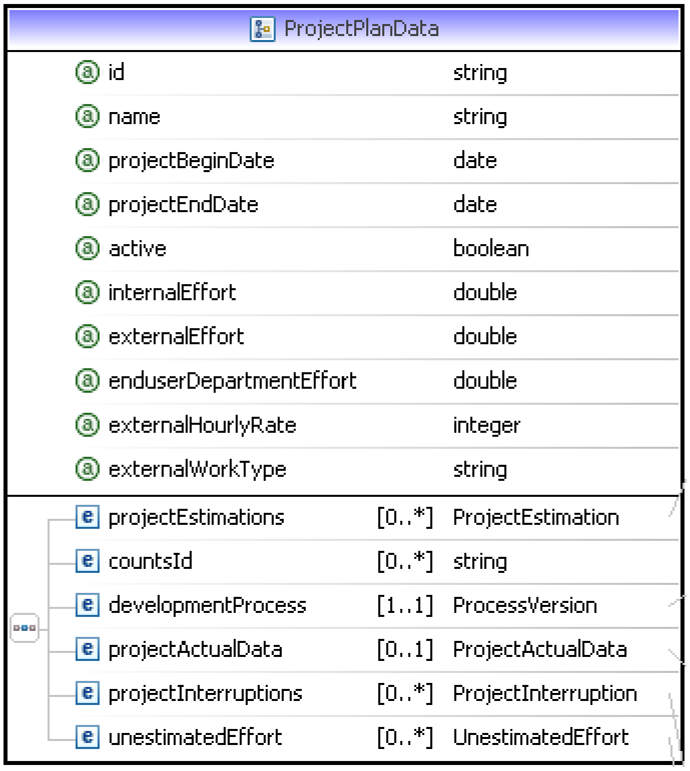
### Project Estimation

A **ProjectPlanData** can include one or more **ProjectEstimation** . Each of this **ProjectEstimation** represents different estimation scenario for the project. For example one of the Project Estimation may be with an expert team and other with a mixed team etc..

One of this **ProjectEstimation** has to be set as **default** for the project. It means, that the default **ProjectEstimation** is the valid estimation for the project. An **ProjectEstimation** can contains one **CocomoBase** and one ore more **CocomoSub** . The **CocomoBase** is the the sum of Sub Estimation, which also means total estimation of the project. The Sub Estimation enable you to estimate each logical or technical sub systems of the counted application or application of a project separately.

You can specify the Scale Factors in the Base Estimation for the whole project/application. You can also specify the Cost Factors for each Sub System or Application in the Sub Estimation separately. This feature enables you to estimate each sub system of an application or each application of the project precise and correctly.

**For example:** There are application A and application B to be developed in your project. Each of this application will be developed by different team on the different platform with different language in the same project. There some factor like scale factors has to be set for whole project. You can adjust this scale factors in the Base Estimation for the whole project. You can also create two Sub Estimations for the application A and application B. In this two Sub Estimation you can adjust the Cost Factors for each application system separately. Finally you have two separated sub estimation for each application and a Base Estimation for whole project (application A + application B)



ProjectPlanData

| | | |
|---|---|---|
| ⓐ id | | string |
| ⓐ name | | string |
| ⓐ projectBeginDate | | date |
| ⓐ projectEndDate | | date |
| ⓐ active | | boolean |
| ⓐ internalEffort | | double |
| ⓐ externalEffort | | double |
| ⓐ enduserDepartmentEffort | | double |
| ⓐ externalHourlyRate | | integer |
| ⓐ externalWorkType | | string |
| e projectEstimations | [0..*] | ProjectEstimation |
| e countsId | [0..*] | string |
| e developmentProcess | [1..1] | ProcessVersion |
| e projectActualData | [0..1] | ProjectActualData |
| e projectInterruptions | [0..*] | ProjectInterruption |
| e unestimatedEffort | [0..*] | UnestimatedEffort |

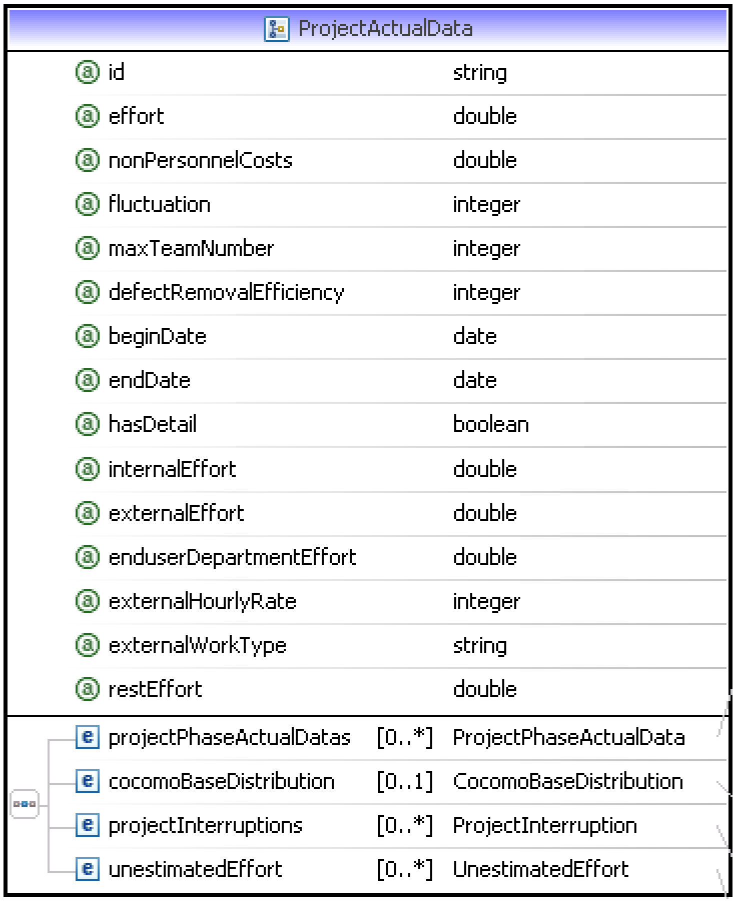
*Project Plan Data*

## Project Actual Data

A **ProjectPlanData** contain one **ProjectActualData** . The **ProjectActualData** contains the **ProjectPhaseActualData** , **ProjectInterruption** and **UnestimatedEffort** some project relevant information like *fluctuation* , *endDate* and etc. (see in the following picture).

The attribute *hasDetail* indicates whether the detailed **ProjectActualData** exist. If this attribute is set **false** , you can record Project Actual Data for entirety project without any **ProjectPhaseActualData** (see in the following chapter).

**ProjectActualData** also contains **ProjectInterruption** and **UnestimatedEffort** (see in the following chapter).



ProjectActualData

| | | |
|---|---|---|
| id | | string |
| effort | | double |
| nonPersonnelCosts | | double |
| fluctuation | | integer |
| maxTeamNumber | | integer |
| defectRemovalEfficiency | | integer |
| beginDate | | date |
| endDate | | date |
| hasDetail | | boolean |
| internalEffort | | double |
| externalEffort | | double |
| enduserDepartmentEffort | | double |
| externalHourlyRate | | integer |
| externalWorkType | | string |
| restEffort | | double |
| projectPhaseActualDatas | [0..*] | ProjectPhaseActualData |
| cocomoBaseDistribution | [0..1] | CocomoBaseDistribution |
| projectInterruptions | [0..*] | ProjectInterruption |
| unestimatedEffort | [0..*] | UnestimatedEffort |

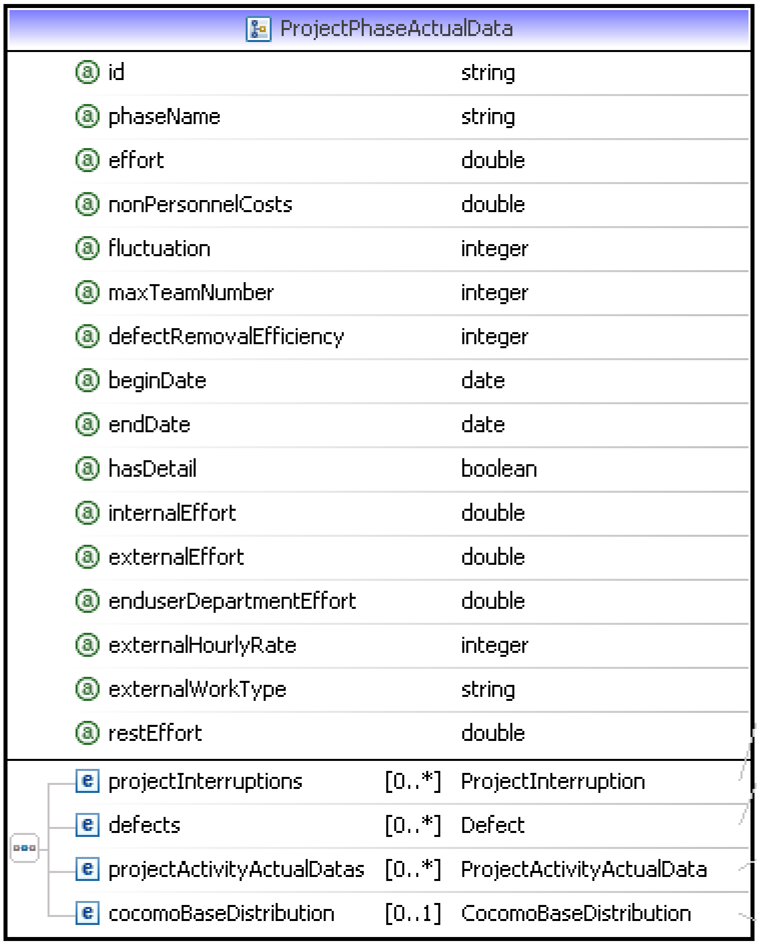
*Project Actual Data*

## Project Phase Data

A **ProjectPhaseActualData** represents all project relevant information of a phase of the used Software Development Process. A **ProjectActualData** contain depend on the used Software Development Process several **ProjectPhaseActualData** . A **ProjectPhaseActualData** contains one or more **ProjectActivityActualData** and some project relevant information like *fluctuation* and *endDate* , etc. (see in the following picture).

The attribute *hasDetail* indicates whether the detailed **ProjectActivityActualData** exist. If this attribute is set false, you can record **ProjectPhaseActualData** for current phase without any **ProjectActivityActualData** (see in the following chapter).

**ProjectPhaseActualData** also contains **ProjectInterruption** and **Defect** (see in the following chapter).



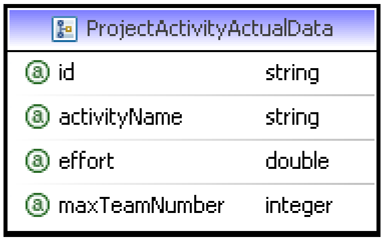
| ProjectPhaseActualData | | |
|---|---|---|
| ⓐ id | | string |
| ⓐ phaseName | | string |
| ⓐ effort | | double |
| ⓐ nonPersonnelCosts | | double |
| ⓐ fluctuation | | integer |
| ⓐ maxTeamNumber | | integer |
| ⓐ defectRemovalEfficiency | | integer |
| ⓐ beginDate | | date |
| ⓐ endDate | | date |
| ⓐ hasDetail | | boolean |
| ⓐ internalEffort | | double |
| ⓐ externalEffort | | double |
| ⓐ enduserDepartmentEffort | | double |
| ⓐ externalHourlyRate | | integer |
| ⓐ externalWorkType | | string |
| ⓐ restEffort | | double |
| ⓔ projectInterruptions | [0..*] | ProjectInterruption |
| ⓔ defects | [0..*] | Defect |
| ⓔ projectActivityActualDatas | [0..*] | ProjectActivityActualData |
| ⓔ cocomoBaseDistribution | [0..1] | CocomoBaseDistribution |

*Project Phase Actual Data*

### Project Activity Data

A **ProjectActivityActualData** represents all project relevant information of an activity in the specified phase of the used Software Development Process. A **ProjectPhaseActualData** contain depend on the used Software Development Process several **ProjectActivityActualData** .

The **ProjectActivityActualData** contains the attribute *effort* and *maxTeamNumber* . (see in the following picture) is the last leaf of Project Actual Data. .



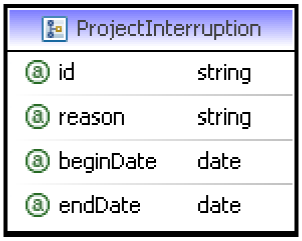
| ProjectActivityActualData | |
|---|---|
| ⓐ id | string |
| ⓐ activityName | string |
| ⓐ effort | double |
| ⓐ maxTeamNumber | integer |

*Project Activity Actual Data*

### Project Interruption

A **ProjectInterruption** represents the interruptions during the project. The **ProjectPlanData** , **ProjectActualData** and **ProjectPhaseActualData** can contain one or more **ProjectInterruption** .

The **ProjectInterruption** contains the attribute *reason* , *beginDate* and *endDate* (see in the following picture).



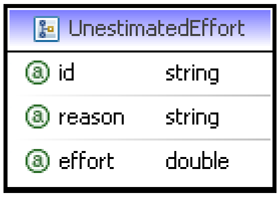
| ProjectInterruption | |
|---|---|
| id | string |
| reason | string |
| beginDate | date |
| endDate | date |

*Project Interruption*

### Unestimated Effort

An **UnestimatedEffort** represents the unestimated efforts in the project. The **ProjectPlanData** and **ProjectActualData** can contain one or more **UnestimatedEffort** .

The **UnestimatedEffort** contains the attribute *reason* and *effort* (see in the following picture).



| UnestimatedEffort | |
|---|---|
| id | string |
| reason | string |
| effort | double |

*Unestimated Effort*

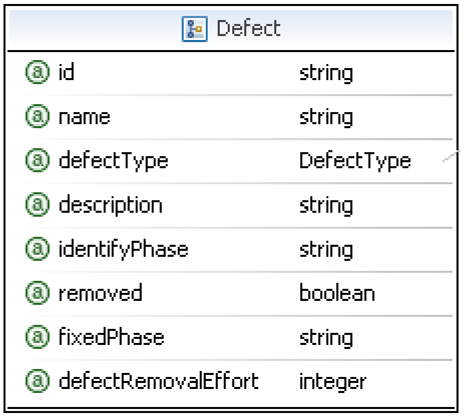
### Defect

A **Defect** represents the defects occured in the project. There are tree types of defect:

- Critical Defect
- Major Defect
- Minor Defect

The **ProjectPhaseActualData** can contain one or more **Defect** . This is the phase which caused the defect. We also need the phases, in which the defect is identified and fixed phases for defect. This informations are very important to improve the Software Development Process in your company

The **Defect** also contains the attribute *defectRemovalEffort* , etc. (see in the following picture).



| Defect | |
|---|---|
| id | string |
| name | string |
| defectType | DefectType |
| description | string |
| identifyPhase | string |
| removed | boolean |
| fixedPhase | string |
| defectRemovalEffort | integer |

*Defect*

### Cocomo

The **CO** nstructive **CO** st **MO** del **COCOMO** cost estimation model is used by thousands of software project managers, and is based on a study of hundreds of software projects. Unlike other cost estimation models, **COCOMO** is an open model, so all of the details are published, including:

- The underlying cost estimation equations
- Every assumption made in the model (e.g. "the project will enjoy good management")
- Every definition (e.g. the precise definition of the Product Design phase of a project)
- The costs included in an estimate are explicitly stated (e.g. project managers are included, secretaries aren't)

**COCOMO II** is the latest major extension to the original **COCOMO (COCOMO 81)** model published in 1981. **COCOMO** consists of three submodels, each one offering increased fidelity the further along one is in the project planning and design process. Listed in increasing fidelity, these submodels are called the Applications Composition, Early Design, and Post-architecture models.

### Introduction to the COCOMO Model:

The most fundamental calculation in the **COCOMO** model is the use of the Effort Equation to estimate the number of Person-Months required to develop a project. Most of the other **COCOMO** results, including the estimates for Requirements and Maintenance, are derived from this quantity.

### Source Lines of Code:

The **COCOMO** calculations are based on your estimates of a project's size in Source Lines of Code **(SLOC)** . **SLOC** is defined such that:

- Only Source lines that are **DELIVERED** as part of the product are included -- test drivers and other support software is excluded
- SOURCE lines are created by the project staff -- code created by applications generators is excluded
- One SLOC is one logical line of code
- Declarations are counted as **SLOC**
- Comments are not counted as **SLOC**

The major difference between **DSI** and **SLOC** is that a single Source Line of Code may be several physical lines. For example, an "if-then-else" statement would be counted as one SLOC, but might be counted as several **DSI** . The original **COCOMO 81** model was defined in terms of Delivered Source Instructions, which are very similar to **SLOC** .

### The Scale Drivers:

In the **COCOMO II** model, some of the most important factors contributing to a project's duration and cost are the Scale Drivers. You set each Scale Driver to describe your project; these Scale Drivers determine the exponent used in the Effort Equation.

**The 5 Scale Drivers are:**

- Precedentedness
- Development Flexibility
- Architecture / Risk Resolution
- Team Cohesion
- Process Maturity

Note that the Scale Drivers have replaced the Development Mode of **COCOMO 81** . The first two Scale Drivers, Precedentedness and Development Flexibility actually describe much the same influences that the original Development Mode did.

### Cost Drivers:

**COCOMO II** has 17 cost drivers and you assess your project, development environment, and team to set each cost driver. The cost drivers are multiplicative factors that determine the effort required to complete your software project. For example, if your project will develop software that controls an airplane's flight, you would set the Required Software Reliability **(RELY)** cost driver to Very High. That rating corresponds to an effort multiplier of 1.26, meaning that your project will require 26% more effort than a typical software project. **COCOMO II** defines each of the cost drivers, and the Effort Multiplier associated with each rating.

**Personnel Factors:**

- Analyst Capability
- Applications Experience
- Programmer Capability
- Personnel Continuity
- Platform Experience
- Language and Tool Experience

**Product Factors:**

- Required Software Reliability
- Database Size
- Software Product Complexity
- Required Reusability
- Documentation Match to Life-Cycle Needs

**Platform Factors:**

- Execution Time Constraint
- Main Storage Constraint
- Platform Volatility

**Project Factors:**

- Use of Software Tools
- Required Development Schedule
- Multisite Development

### COCOMO II Effort Equation:

The **COCOMO II** model makes its estimates of required effort (measured in Person-Months **PM** ) based primarily on your estimate of software project's size (as measured in thousands of **SLOC, KSLOC** )):

$\text{Effort} = 2.94 * \text{EAF} * (\text{KSLOC})^{E}$

Where:

- EAF Is the Effort Adjustment Factor derived from the Cost Drivers
- E Is an exponent derived from the five Scale Drivers

As an example, a project with all Nominal Cost Drivers and Scale Drivers would have an **EAF** of 1.00 and exponent, E, of 1.0997. Assuming that the project is projected to consist of 8,000 source lines of code, **COCOMO II** estimates that 28.9 Person-Months of effort is required to complete it:

$\text{Effort} = 2.94 * (1.0) * (8)^{1.0997} = 28.9$ Person-Months

### Effort Adjustment Factor:

The Effort Adjustment Factor in the effort equation is simply the product of the effort multipliers corresponding to each of the cost drivers for your project.

For example, if your project is rated Very High for Complexity (effort multiplier of 1.34), and Low for Language And Tools Experience (effort multiplier of 1.09), and all of the other cost drivers are rated to be Nominal (effort multiplier of 1.00), the **EAF** is the product of 1.34 and 1.09.

Effort Adjustment Factor = EAF = 1.34 * 1.09 = 1.46

Effort = 2.94 * (1.46) * $(8)^{1.0997}$ = 42.3 Person-Months

### COCOMO II Schedule Equation:

The **COCOMO II** schedule equation predicts the number of months required to complete your software project. The duration of a project is based on the effort predicted by the effort equation:

Duration = 3.67 * $(\text{Effort})^{SE}$

Where:

- Effort Is the effort from the COCOMO II effort equation
- SE Is the schedule equation exponent derived from the five Scale Drivers

Continuing the example, and substituting the exponent of 0.3179 that is calculated from the scale drivers, yields an estimate of just over a year, and an average staffing of between 3 and 4 people:

Duration = 3.67 * $(42.3)^{0.3179}$ = 12.1 months

Average staffing = (42.3 Person-Months) / (12.1 Months) = 3.5 people

### The SCED Cost Driver:

The **COCOMO** cost driver for Required Development Schedule **(SCED)** is unique, and requires a special explanation.

The **SCED** cost driver is used to account for the observation that a project developed on an accelerated schedule will require more effort than a project developed on its optimum schedule. A **SCED** rating of Very Low corresponds to an Effort Multiplier of 1.43 (in the **COCOMO II.2000** model) and means that you intend to finish your project in 75% of the optimum schedule (as determined by a previous **COCOMO** estimate). Continuing the example used earlier, but assuming that **SCED** has a rating of Very Low, **COCOMO** produces these estimates:

Duration = 75% * 12.1 Months = 9.1 Months

Effort Adjustment Factor = EAF = 1.34 * 1.09 * 1.43 = 2.09

Effort = 2.94 * (2.09) * $(8)^{1.0997}$ = 60.4 Person-Months

Average staffing = (60.4 Person-Months) / (9.1 Months) = 6.7 people

Notice that the calculation of duration isn't based directly on the effort (number of Person-Months) instead it's based on the schedule that would have been required for the project assuming it had been developed on the nominal schedule. Remember that the **SCED** cost driver means "accelerated from the nominal schedule".

### Function Point Modeler And COCOMO:

Because **COCOMO** is well defined, and because it doesn't rely upon proprietary estimation algorithms, **Function Point Modeler** supports **COCOMO II Post Architecture** and offers these advantages to its users :

- COCOMO estimates are more objective and repeatable than estimates made by methods relying on proprietary models
- COCOMO can be calibrated to reflect your software development environment, and to produce more accurate estimates

Function Point Modeler is a faithful implementation of the **COCOMO** model that is easy to use on small projects, and yet powerful enough to plan and control very large projects.

Typically, you'll start with only a rough description of the software system that you'll be developing, and you'll use Function point Modeler to give you early estimates about the proper schedule and staffing levels. As you refine your knowledge of the problem, and as you design more of the system, you can use **Function Point Modeler** to produce more and more refined estimates.

**Function Point Modeler** allows you to define a software structure to meet your needs. Your initial estimate might be made on the basis of a system containing 3,000 lines of code. Your second estimate might be more refined so that you now understand that your system will consist of two subsystems (and you'll have a more accurate idea about how many lines of code will be in each of the subsystems). Your next estimate will continue the process -- you can use **Function Point Modeler** to define the sub estimation of each subsystem. **Function Point Modeler** permits you to continue this process until you arrive at the level of detail that suits your needs.

## Multiple Module Effort Estimation

**Function Point Modeler** allows you to define a software structure to meet your needs. Your project might consist of several application systems with different platform or language or of one application system with several sub systems (different platform or language). You want to estimate each application system or sub system separately.

Your initial estimate might be made on the basis of a application system. Your second estimate might made on the basis of several application system system which will consist of several subsystems, etc. You can use **Function Point Modeler** to define the sub estimation of each subsystem. **Function Point Modeler** permits you to continue this process until you arrive at the level of detail that suits your needs.

You can use **Function Point Modeler** to define the sub estimation of each subsystem and to quantify each subsystem separately by using **COCOMO** cost factor. You can also use **Function Point Modeler** to define some factors for whole project by using **COCOMO** scale factor. Your project might contain two application systems, one of them is system A based on the **J2EE** and other is system B based **SAP** . You have to estimate your project as a whole. You can define the **COCOMO** cost factor in the CocomoBase estimation for whole project. You might create two CocomoSub estimation for the system A and system B.

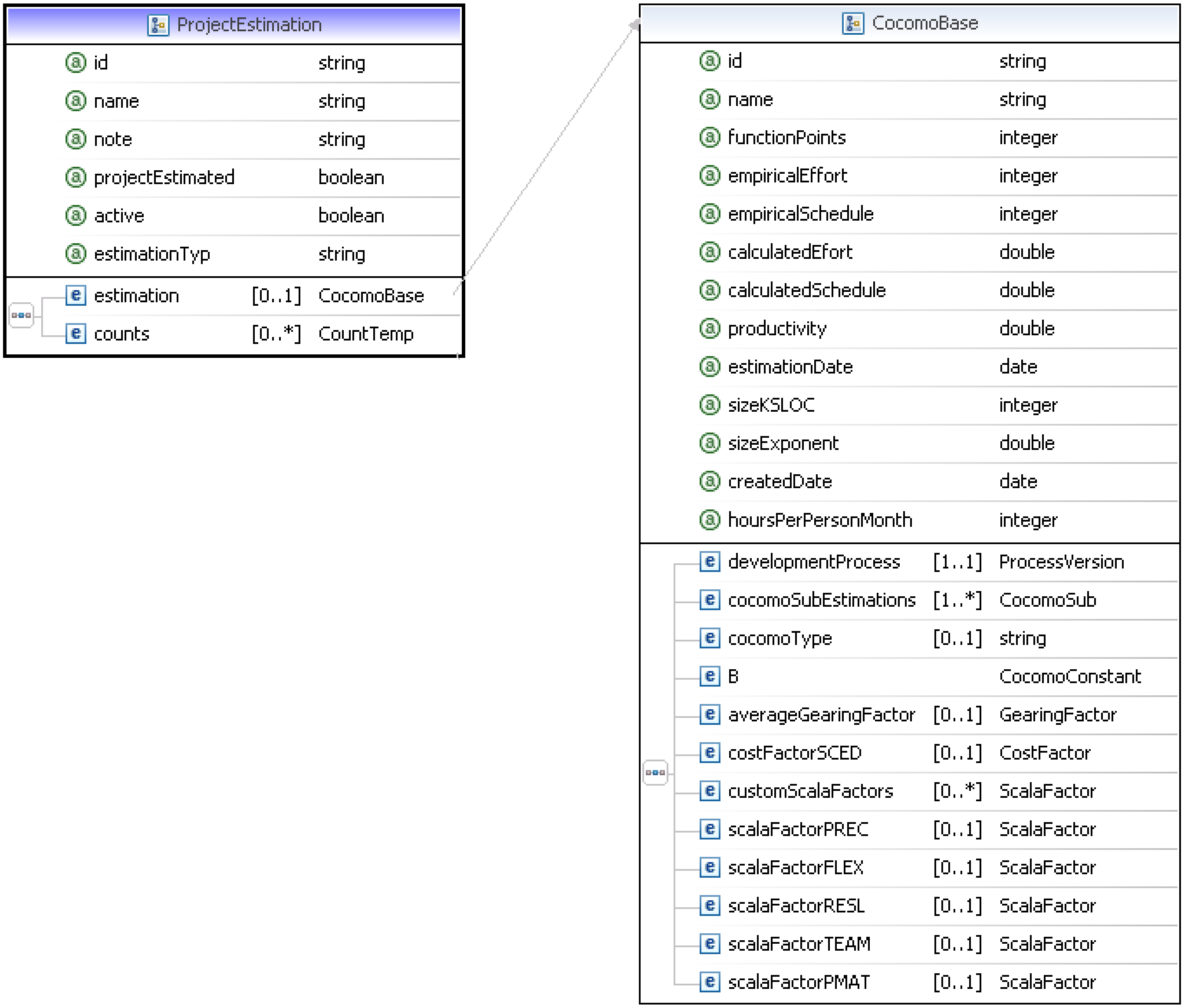
You'll define sub estimations, assign **COCOMO** cost factor values of each sub estimation, etc. The sum of the CocomoSub estimations is the total project estimation.

### *Base Estimation*

**Function Point Modeler** allows you to define several sub estimations for large a project. Your project might consist of several application systems with different platform or language or of one application system with several sub systems (different platform or language). You want to estimate each application system or sub system separately.

Base Estimation Overview

You might create **ProjectEstimation** which contains one **ProjectEstimation** . A **ProjectEstimation** contains only one **CocomoBase** . You can also use **CocomoBase** to adjust some factors scale factor and the cost factor **SCED** for whole project. A **CocomoBase** includes at least one or more **CocomoSub** estimation (see in the following picture).



| ProjectEstimation | | |
|---|---|---|
| id | | string |
| name | | string |
| note | | string |
| projectEstimated | | boolean |
| active | | boolean |
| estimationTyp | | string |
| estimation | [0..1] | CocomoBase |
| counts | [0..*] | CountTemp |

| CocomoBase | | |
|---|---|---|
| id | | string |
| name | | string |
| functionPoints | | integer |
| empiricalEffort | | integer |
| empiricalSchedule | | integer |
| calculatedEffort | | double |
| calculatedSchedule | | double |
| productivity | | double |
| estimationDate | | date |
| sizeKSLOC | | integer |
| sizeExponent | | double |
| createdDate | | date |
| hoursPerPersonMonth | | integer |
| developmentProcess | [1..1] | ProcessVersion |
| cocomoSubEstimations | [1..*] | CocomoSub |
| cocomoType | [0..1] | string |
| B | | CocomoConstant |
| averageGearingFactor | [0..1] | GearingFactor |
| costFactorSCED | [0..1] | CostFactor |
| customScalaFactors | [0..*] | ScalaFactor |
| scalaFactorPREC | [0..1] | ScalaFactor |
| scalaFactorFLEX | [0..1] | ScalaFactor |
| scalaFactorRESL | [0..1] | ScalaFactor |
| scalaFactorTEAM | [0..1] | ScalaFactor |
| scalaFactorPMAT | [0..1] | ScalaFactor |

*CocomoBase*

Settings

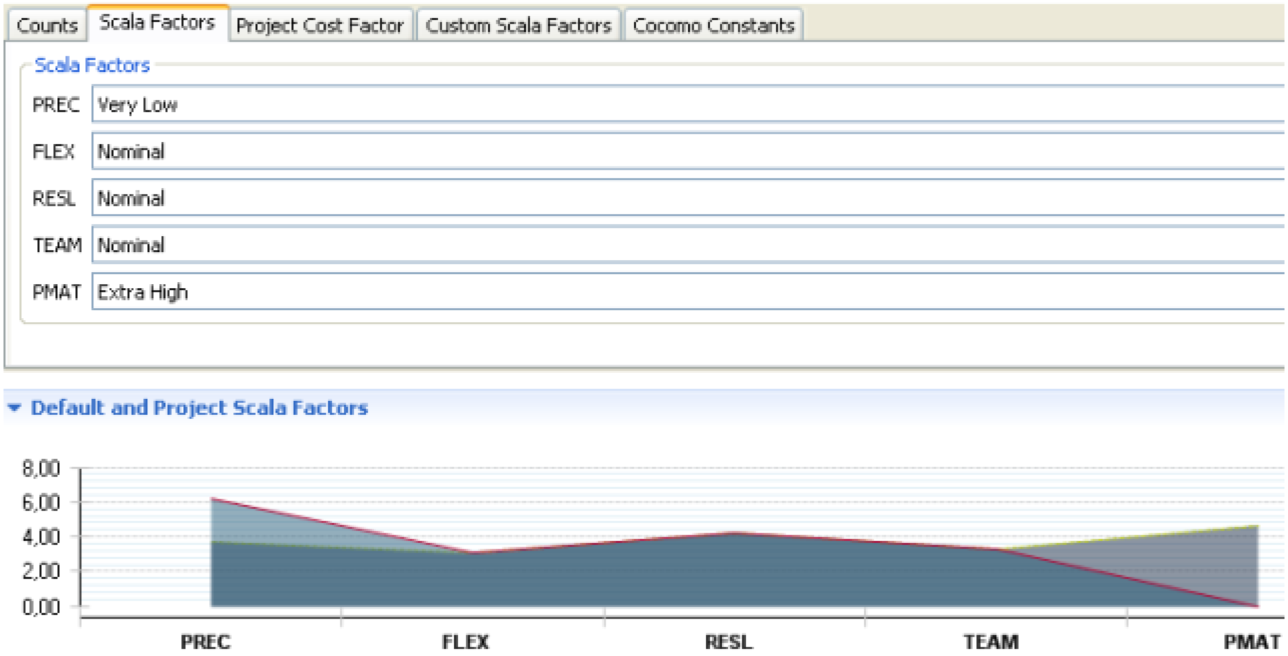
You might adjust the following scale factors and cost factor.

**Scale Factors adjusted for CocomoBase:**

- PREC
- FLEX
- RESL
- TEAM
- PMAT

**Cost Factor adjusted for CocomoBase:**

- SCED



Scala Factors

PREC Very Low

FLEX Nominal

RESL Nominal

TEAM Nominal

PMAT Extra High

*CocomoBase Editor*

Counts

You might assign **Count** to a **CocomoSub** but not to **CocomoBase** .

Scala Factors

The application size exponent is aggregated of five scale factors (SF) that describe relative economies or diseconomies of scale that are encountered for software projects of dissimilar magnitude. A project exhibits economies of scale if the exponent is less than one i.e. effort is non-linearly reduced. Economies and diseconomies of scale are in balance should the exponent hold a value of one. A project exhibits diseconomies of scale if the exponent is more than one i.e. effort is non-linearly increased.

Scala Factor PREC

If a product is similar to several previously developed projects, then the precedentedness is high.

| **Feature** | **Very Low** | **Nominal/High** | **Extra High** |
|---|---|---|---|
| Organizational understanding of product objectives | General | Considerable | Thorough |
| Experience in working with related software systems | Moderate | Considerable | Extensive |
| Concurrent development of associated new hardware and operational procedures | Extensive | Moderate | Some |
| Need for innovative data processing architectures, algorithms | Considerable | Some | Minimal |

Scale Factors for COCOMO.II Early Design and Post-Architecture Models

| **PREC Descriptors** | **thoroughly unprecedented** | **largely unprecedented** | **somewhat unprecedented** | **generally familiar** | **largely familiar** | **thoroughly familiar** |
|---|---|---|---|---|---|---|
| Rating Levels | Very Low | Low | Nominal | High | Very High | Extra High |
| Value | 6.20 | 4.96 | 3.72 | 2.48 | 1.24 | 0.00 |

Scala Factor FLEX

| **Feature** | **Very Low** | **Nominal/High** | **Extra High** |
|---|---|---|---|
| Need for software conformance with preestablished requirements | Full | Considerable | Basic |
| Need for software conformance with external interface specifications | Full | Considerable | Basic |
| Combination of inflexibilities above with premium on early completion | High | Medium | Low |

Scale Factors for COCOMO.II Early Design and Post-Architecture Models

| **FLEX Descriptors** | **rigorous** | **occasional relaxation** | **some relaxation** | **general conformity** | **some conformity** | **general goals** |
|---|---|---|---|---|---|---|
| Rating Levels | Very Low | Low | Nominal | High | Very High | Extra High |
| Value | 5.07 | 4.05 | 3.04 | 2.03 | 1.01 | 0.00 |

Scala Factor RESL

RESL combines two scale factors; "Design Thoroughness by Product Design Review (PDR)" and "Risk Elimination by PDR". The next table combines these ratings factors to form a more comprehensive characterization for the COCOMO II RESL ranking. It moreover narrates the ranking levels to the MBASE/RUP Life Cycle Architecture (LCA) milestone above and beyond the waterfall PDR milestone. RESL ranking should be subjectively weighted in order to average the outlined distinctiveness.

| **Feature** | **Very Low** | **Low** | **Nominal** | **High** | **Very High** | **Extra High** |
|---|---|---|---|---|---|---|
| Risk Management Plan identifies all critical risk items, establishes milestones for resolving them by PDR or LCA. | None | Little | Some | Generally | Mostly | Fully |
| Schedule, budget, and internal milestones through PDR or LCA compatible with Risk Management Plan. | None | Little | Some | Generally | Mostly | Fully |

| Feature | Very Low | Low | Nominal | High | Very High | Extra High |
|---|---|---|---|---|---|---|
| Percent of development schedule devoted to establishing architecture, given general product objectives. | 5 | 10 | 17 | 25 | 33 | 40 |
| Percent of required top software architects available to project. | 20 | 40 | 60 | 80 | 100 | 120 |
| Tool support available for resolving risk items, developing and verifying architectural specs. | None | Little | Some | Good | Strong | Full |
| Level of uncertainty in key architecture drivers: mission, user interface, COTS, hardware, technology, performance. | Extreme | Significant | Considerable | Some | Little | Very Little |
| Number and criticality of risk items. | > 10 Critical | 5-10 Critical | 2-4 Critical | 1 Critical | > 5 Non-Critical | < 5 Non-Critical |

Scale Factors for COCOMO.II Early Design and Post-Architecture Models

| RESL Descriptors | little (20%) | some (40%) | often (60%) | generally (75%) | mostly (90%) | full (100%) |
|---|---|---|---|---|---|---|
| Rating Levels | Very Low | Low | Nominal | High | Very High | Extra High |
| Value | 7.07 | 5.65 | 4.24 | 2.83 | 1.41 | 0.00 |

Scala Factor TEAM

The scale factor for team cohesion accounts for sources of project instability and entropy for the reason that of intricacy in synchronizing stakeholders of a project. Endusers, customers, developers, maintainers, interfacers, and such are included in this category. Boehm construes that "these difficulties may arise from differences in stakeholder objectives and cultures; difficulties in reconciling objectives; and stakeholders’ lack of experience and familiarity in operating as a team". The following table outlines definitions for TEAM rating levels. TEAM ranking should be subjectively weighted in order to average the outlined distinctiveness.

| Characteristic | Very Low | Low | Nominal | High | Very High | Extra High |
|---|---|---|---|---|---|---|
| Consistency of stakeholder objectives and cultures | Little | Some | Basic | Considerable | Strong | Full |
| Ability, willingness of stakeholders to accommodate other stakeholders' objectives | Little | Some | Basic | Considerable | Strong | Full |
| Experience of stakeholders in operating as a team | None | Little | Little | Basic | Considerable | Extensive |
| Stakeholder teambuilding to achieve shared vision and commitments | None | Little | Little | Basic | Considerable | Extensive |

Scale Factors for COCOMO.II Early Design and Post-Architecture Models

| TEAM Descriptors | very difficult interactions | some difficult interactions | basically cooperative interactions | largely cooperative | highly cooperative | seamless interactions |
|---|---|---|---|---|---|---|
| Rating Levels | Very Low | Low | Nominal | High | Very High | Extra High |
| Value | 5.48 | 4.38 | 3.29 | 2.19 | 1.10 | 0.00 |

Scala Factor PMAT

The procedure for determining PMAT is organized around the Software Engineering Institute's Capability Maturity Model (CMM). The time period for rating Process Maturity is the time the project starts. There are two ways of rating Process Maturity. The first captures the result of an organized evaluation based on the CMM.

Overall Maturity Level:

- CMM Level 1 (lower half)
- CMM Level 1 (upper half)
- CMM Level 2
- CMM Level 3
- CMM Level 4
- CMM Level 5

Scale Factors for COCOMO.II Early Design and Post-Architecture Models

| PMAT Descriptors | CMM Level 1 (lower half) | CMM Level 1 (upper half) | CMM Level 2 | CMM Level 3 | CMM Level 4 | CMM Level 5 |
|---|---|---|---|---|---|---|
| Rating Levels | Very Low | Low | Nominal | High | Very High | Extra High |
| Value | 7.80 | 6.24 | 4.68 | 3.12 | 1.56 | 0.00 |

Project Cost Factor

Project factors account for influences on the estimated effort such as use of modern software tools, location of the development team, and compression of the project schedule.

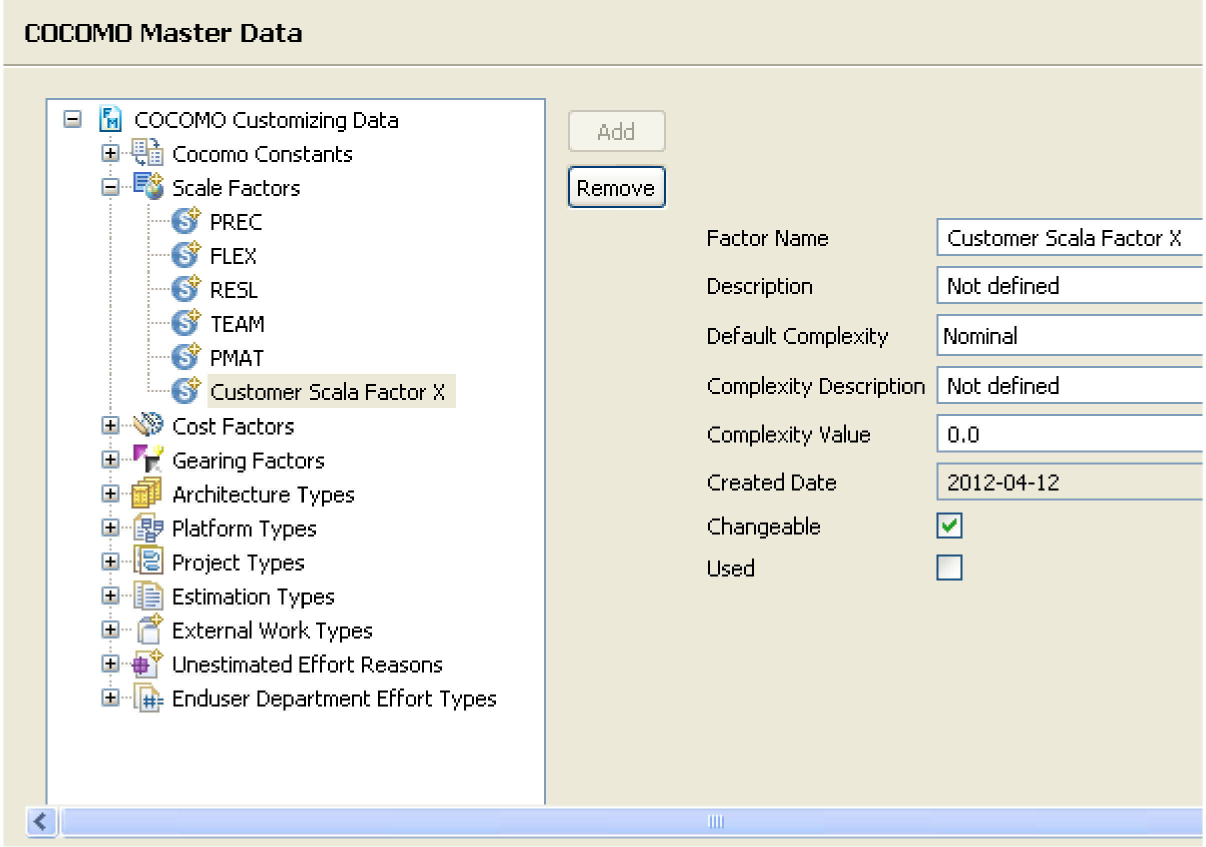
Project Cost Factor SCED

The rating for SCED is defined in terms of the percentage of schedule stretch-out or acceleration with respect to a nominal schedule for a project requiring a given amount of effort. The following table delineates that accelerated schedules produces more effort in initializing phases in order to eliminate risks and refine the architecture, but more effort in concluding processes to achieve more system tests and documentation. Stretch-outs in schedule are not considered as adding to or decreasing the effort in developing software.

| **SCED Descriptors** | **75% of nominal** | **85% of nominal** | **100% of nominal** | **130% of nominal** | **160% of nominal** | |
|---|---|---|---|---|---|---|
| Rating Levels | Very Low | Low | Nominal | High | Very High | Extra High |
| Value | 1.43 | 1.14 | 1.00 | 1.00 | 1.00 | n/a |

Custom Scale Factors

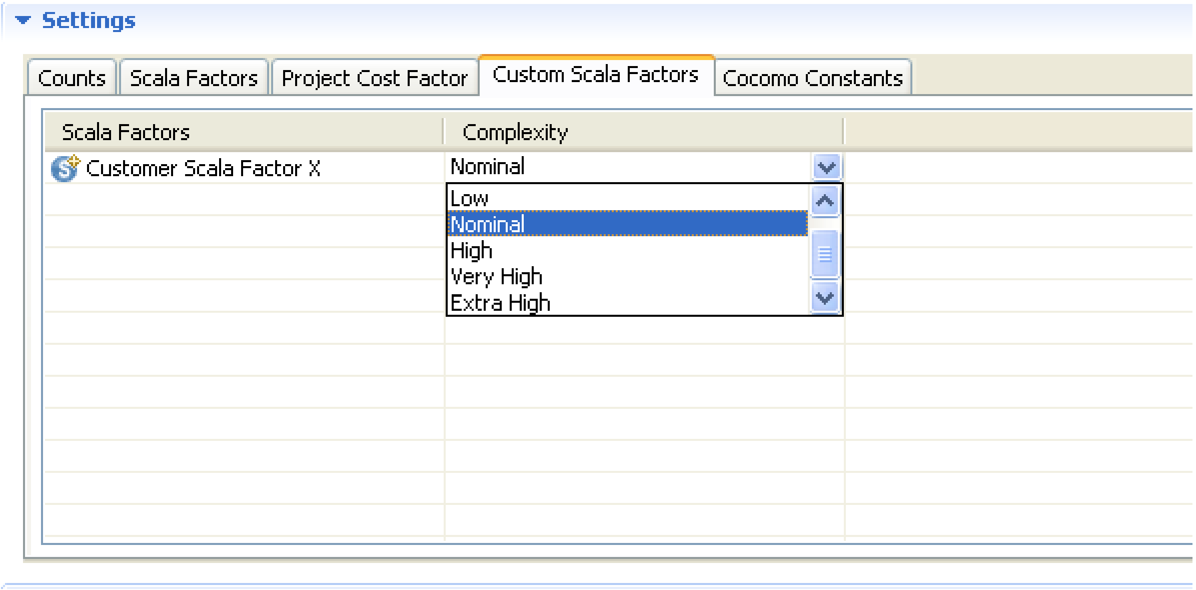
You may want to extend **Scale Factors** by defining your own custom scale factors.



| | |
|---|---|
| Factor Name | Customer Scala Factor X |
| Description | Not defined |
| Default Complexity | Nominal |
| Complexity Description | Not defined |
| Complexity Value | 0.0 |
| Created Date | 2012-04-12 |
| Changeable | ☑ |
| Used | □ |

*Create Customer Scale Factor*

Once you've created your own custom scale factor you can use it for your estimation.



| Scala Factors | Complexity |
|---|---|
| Customer Scala Factor X | Nominal |

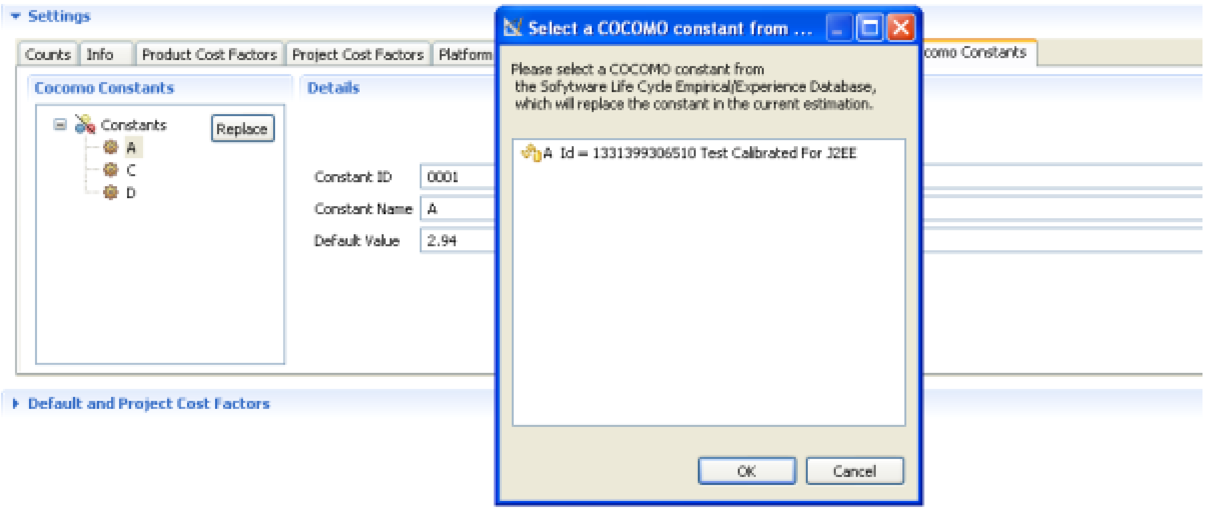
*Use Customer Scale Factor*

## Cocomo Constants

To estimate the effort and development time, COCOMO use the equations with constants called coefficients **(a, b, c, d)** .

You can calibrate this coefficients for different kind of project, domain or platform in your company. You may you this calibrated coefficients for appropriate project.

**Function Point Modeler** enables you to use this calibrated coefficients for the estimation.



Constant ID: 0001
Constant Name: A
Default Value: 2.94

Please select a COCOMO constant from
the Sofytware Life Cycle Empirical/Experience Database,
which will replace the constant in the current estimation.

A Id = 1331399306510 Test Calibrated For J2EE

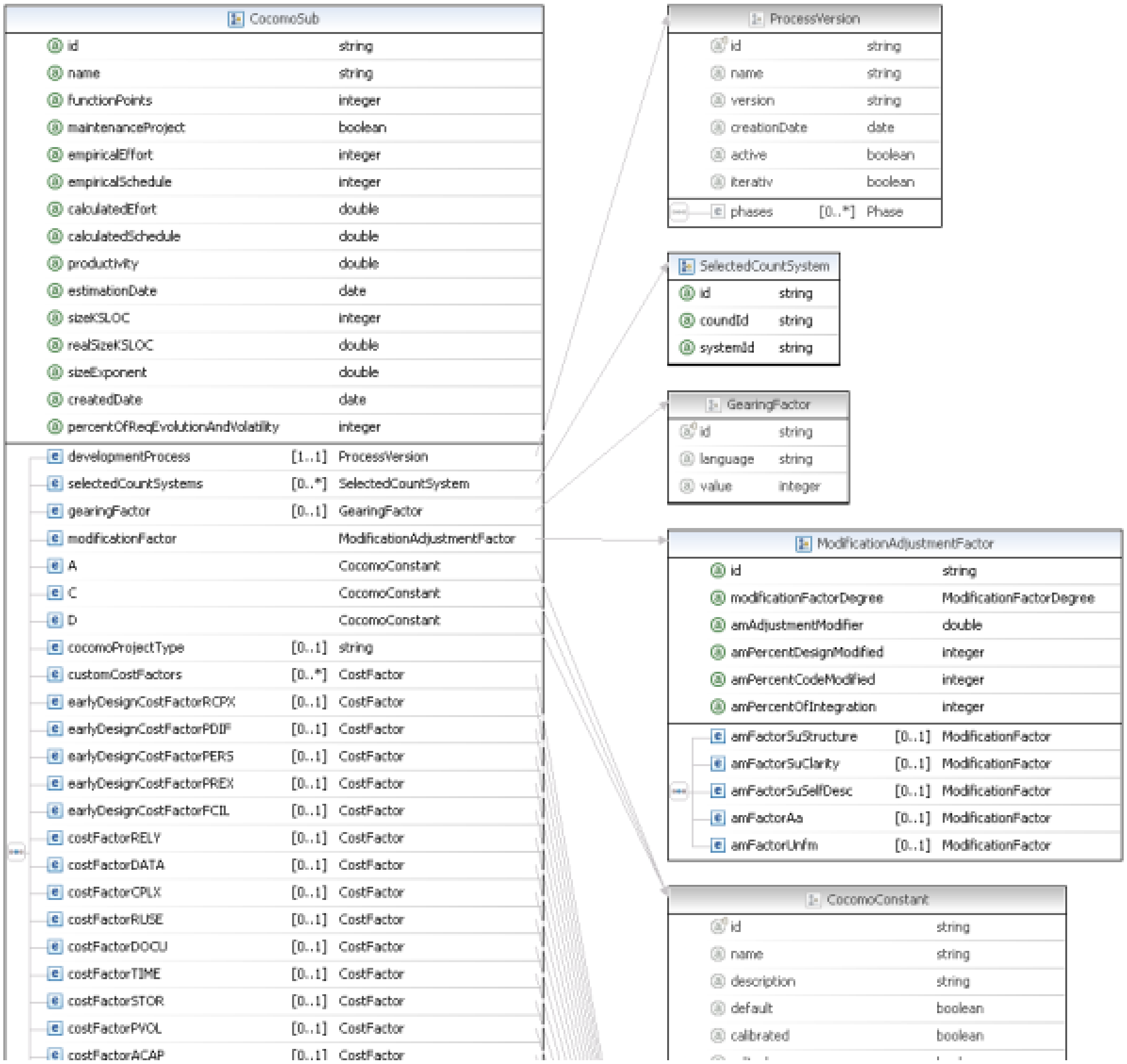
### *Sub Estimation*

You can use **Function Point Modeler** to define the sub estimation of each subsystem and to quantify each subsystem separately by using **COCOMO** cost factor. You can also use **Function Point Modeler** to define some factors for whole project by using **COCOMO** scale factor. Your project might contain two application systems, one of them is system A based on the **J2EE** and other is system B based **SAP** . You have to estimate your project as a whole. You can define the **COCOMO** cost factor in the CocomoBase estimation for whole project. You might create two CocomoSub estimation for the system A and system B.

Sub Estimation Overview

You can use **Function Point Modeler** to define the sub estimation of each subsystem and to quantify each subsystem separately by using **COCOMO** cost factor. You can also use **Function Point Modeler** to define some factors for whole project by using **COCOMO** scale factor. Your project might contain two application systems, one of them is system A based on the **J2EE** and other is system B based **SAP** . You have to estimate your project as a whole. You can define the **COCOMO** cost factor in the CocomoBase estimation for whole project. You might create two CocomoSub estimation for the system A and system B.

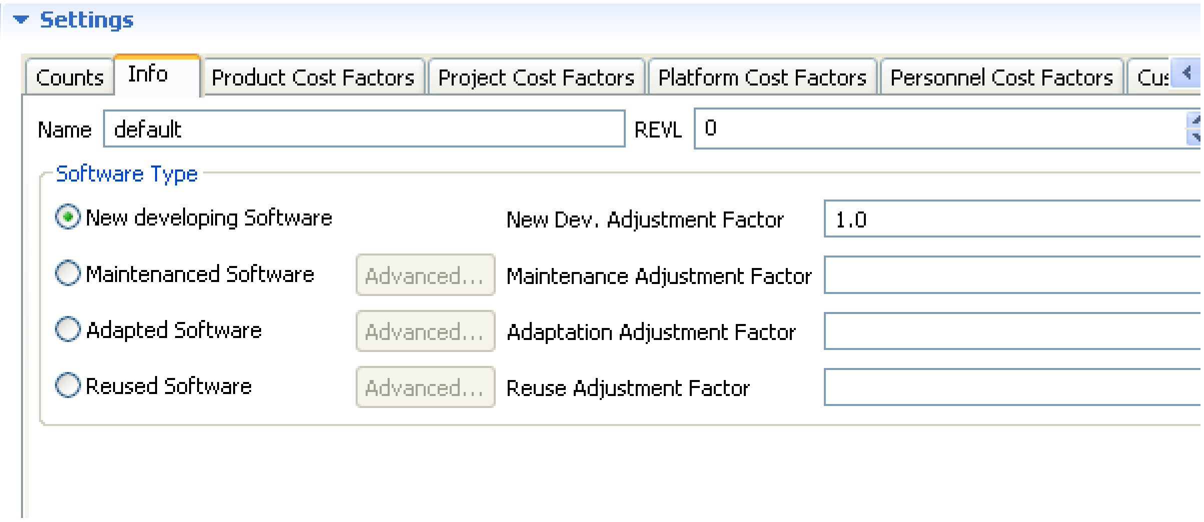
You'll define sub estimations, assign **COCOMO** cost factor values of each sub estimation, etc. The sum of the CocomoSub estimations is the total project estimation.


CocomoSub
id string
name string
functionPoints integer
maintenanceProject boolean
empiricalEffort integer
empiricalSchedule integer
calculatedEfort double
calculatedSchedule double
productivity double
estimationDate date
sizeKSLOC integer
realSizeKSLOC double
sizeExponent double
createdDate date
percentOfReqEvolutionAndVolatility integer
developmentProcess [1..1] ProcessVersion
selectedCountSystems [0..*] SelectedCountSystem
gearingFactor [0..1] GearingFactor
modificationFactor ModificationAdjustmentFactor
A CocomoConstant
C CocomoConstant
D CocomoConstant
cocomoProjectType [0..1] string
customCostFactors [0..*] CostFactor
earlyDesignCostFactorRCPX [0..1] CostFactor
earlyDesignCostFactorPDIF [0..1] CostFactor
earlyDesignCostFactorPERS [0..1] CostFactor
earlyDesignCostFactorPREX [0..1] CostFactor
earlyDesignCostFactorFCIL [0..1] CostFactor
costFactorRELY [0..1] CostFactor
costFactorDATA [0..1] CostFactor
costFactorCPLX [0..1] CostFactor
costFactorRUSE [0..1] CostFactor
costFactorDOCU [0..1] CostFactor
costFactorTIME [0..1] CostFactor
costFactorSTOR [0..1] CostFactor
costFactorPVOL [0..1] CostFactor
costFactorACAP [0..1] CostFactor
ProcessVersion
id string
name string
version string
creationDate date
active boolean
iterativ boolean
phases [0..*] Phase
SelectedCountSystem
id string
coundId string
systemId string
GearingFactor
id string
language string
value integer
ModificationAdjustmentFactor
id string
modificationFactorDegree ModificationFactorDegree
amAdjustmentModifier double
amPercentDesignModified integer
amPercentCodeModified integer
amPercentOfIntegration integer
amFactorSuStructure [0..1] ModificationFactor
amFactorSuClarity [0..1] ModificationFactor
amFactorSuSelfDesc [0..1] ModificationFactor
amFactorAa [0..1] ModificationFactor
amFactorUnfm [0..1] ModificationFactor
CocomoConstant
id string
name string
description string
default boolean
calibrated boolean

*CocomoBase*

Settings

The Setting Section allows you to set counts, COCOMO cost factors and COCOMO constants.



**Settings**

Name: default

REVL: 0

Software Type

● New developing Software — New Dev. Adjustment Factor: 1.0

○ Maintenanced Software — Advanced... — Maintenance Adjustment Factor:

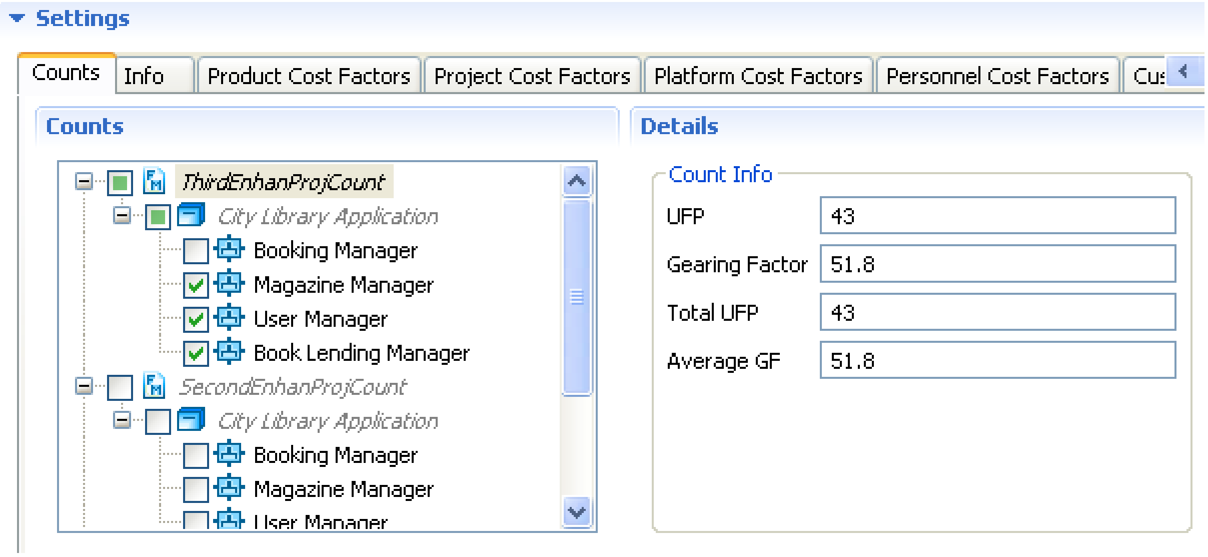
○ Adapted Software — Advanced... — Adaptation Adjustment Factor:

○ Reused Software — Advanced... — Reuse Adjustment Factor:

*COCOMO settings section*

Counts

You can select sub systems of a count for an sub estimation via the counts tree. You will see all counts added to the current project plan data. You can not select a sub system twice in an estimation.



**Settings**

**Counts**

- ■ ThirdEnhanProjCount
  - ■ City Library Application
    - □ Booking Manager
    - ☑ Magazine Manager
    - ☑ User Manager
    - ☑ Book Lending Manager
- □ SecondEnhanProjCount
  - □ City Library Application
    - □ Booking Manager
    - □ Magazine Manager
    - □ User Manager

**Details**

Count Info

UFP: 43

Gearing Factor: 51.8

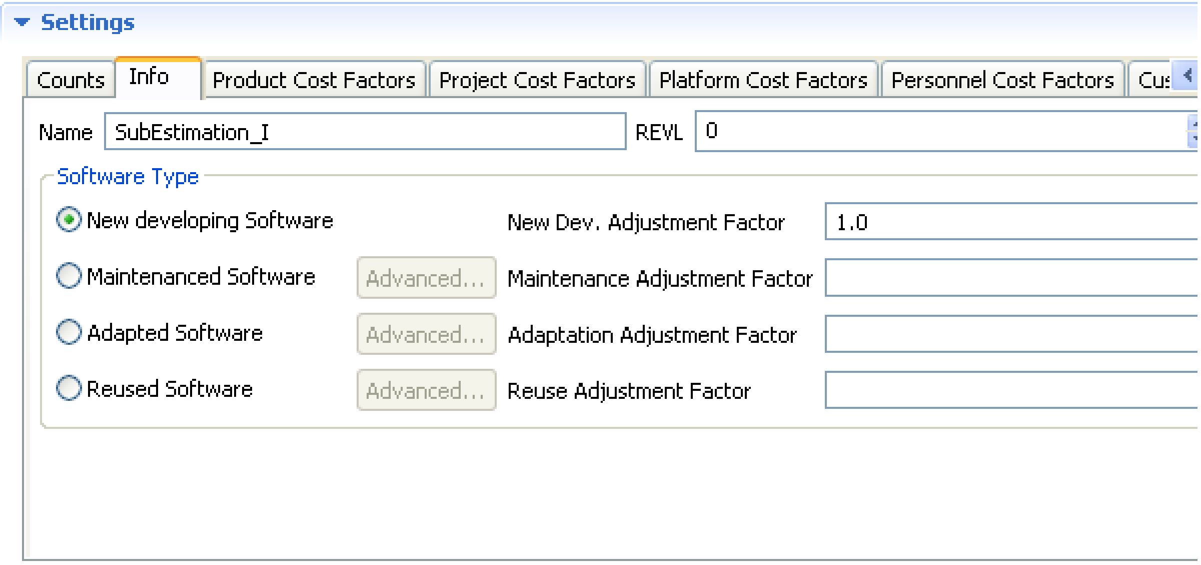
Total UFP: 43

Average GF: 51.8

*Counts tree*

Info

You can edit the name of a sub estimation in the **Info** tab. You may also set Requirements Evolution and Volatility **REVL** for this estimation. **COCOMO II** uses a factor called **REVL** , to adjust the effective size of the product caused by requirements evolution and volatility, by such factors as mission or user interface evolution, technology upgrades or **COTS** volatility. It is the percentage of code discarded due to requirements evolution.



Name SubEstimation_I
REVL 0

Software Type

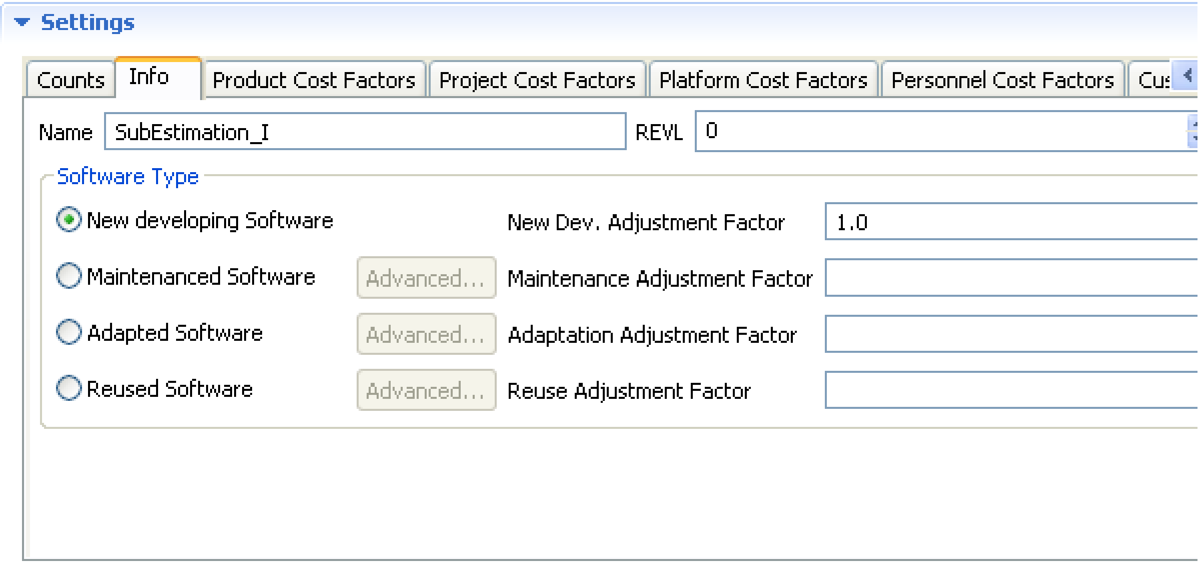
- ● New developing Software — New Dev. Adjustment Factor 1.0
- ○ Maintenanced Software — Maintenance Adjustment Factor
- ○ Adapted Software — Adaptation Adjustment Factor
- ○ Reused Software — Reuse Adjustment Factor

*COCOMO info*

You can also set the software type produced or maintenanced in this project. Default is the **New Development Software** see in following section.

New developing software

The **New developing software** means that the software is implemented implemented from scratch. The **New Development Adjustment Factor** is 1.0 in this case.



Name SubEstimation_I
REVL 0

Software Type

- ● New developing Software — New Dev. Adjustment Factor 1.0
- ○ Maintenanced Software — Maintenance Adjustment Factor
- ○ Adapted Software — Adaptation Adjustment Factor
- ○ Reused Software — Reuse Adjustment Factor

*New developing software*

Maintenanced software

The **New developing software** means the changes that have to be made to computer programs after they have been delivered to the customer or user. It includes adding new capabilities and fixing or adapting existing capabilities.

**Effective Maintenance Size = (Size Added + Size Modified) * MAF**

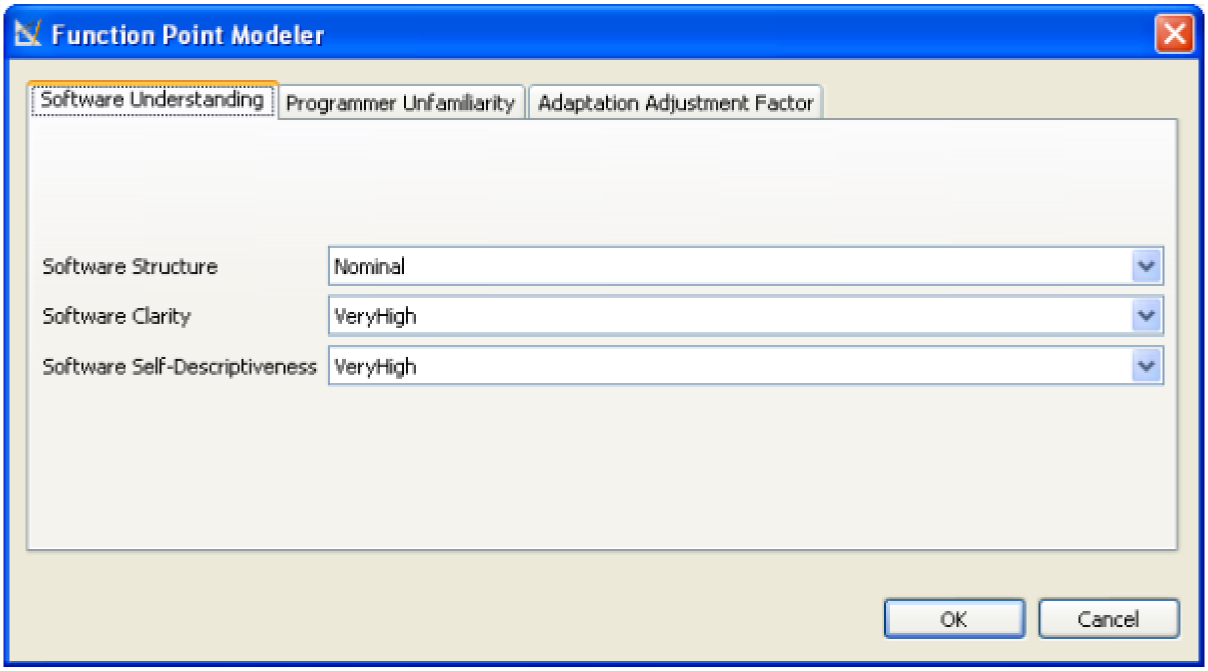
Where:

- Size Added The new functionalities added to software
- Size Modified The modified functionalities of software
- MAF Maintenance Adjustement Factor **MAF** is used to adjust the effective maintenance size to account for software understanding and unfamiliarity effect, as with reuse

**MAF = AAF (1+ (SU * UNFM)) / 100**

Where:

- MAF Maintenance Adjustement Factor
- AAF Adaption Adjustment Factor
- SU Software Understanding
- UNFM Programmer Unfamiliarity



Software Structure: Nominal
Software Clarity: VeryHigh
Software Self-Descriptiveness: VeryHigh

*Maintenanced software dialog*

Adapted software

The existing code is treated as a white box and is modified for use with the product is called **adapted software code** .

Adapted code is preexisting code that has some changes to it, while reused code has no changes to the preexisting code.

**AAF = (0.4 * DM)+ (0,3 * CM)) + (0,3 * IM))**

Where:

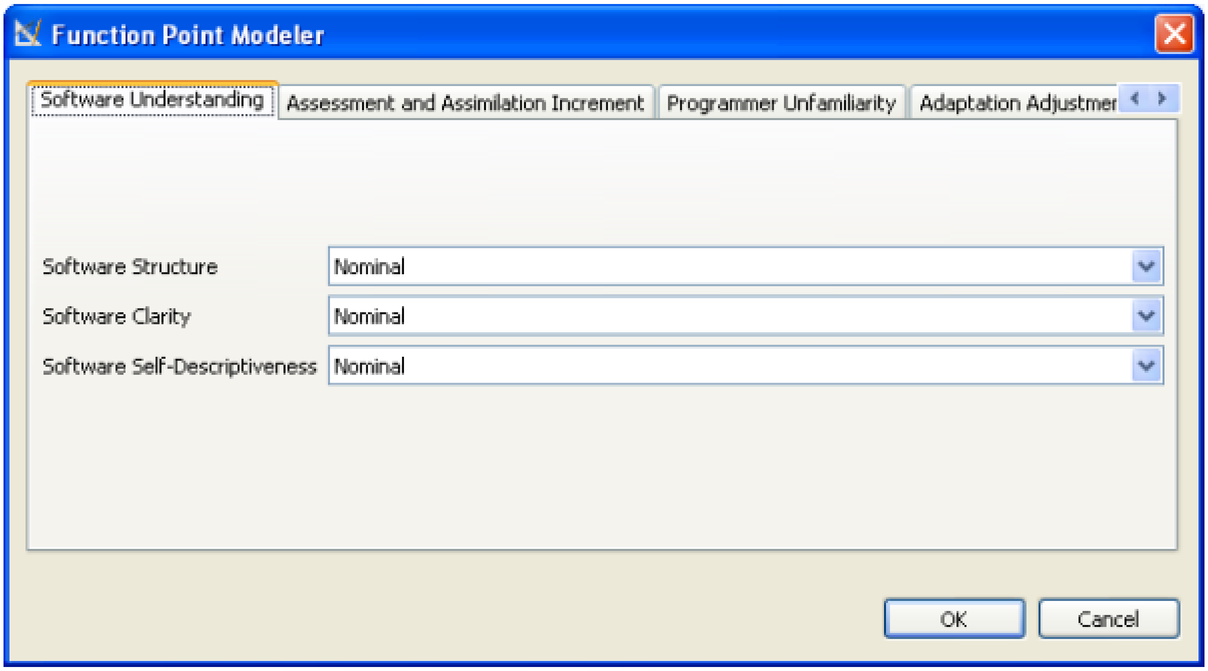
- AAF Adaption Adjustment factor
- DM Percentage of Design Modified
- CM Percentage of Code Modified
- IM Percentage of Integration Required for Adapted Software

**AAM = (AA + AAF + (SU * UNFM))) / 100**

Where:

- AAM Adaption Adjustment Modifier
- AA Assessment and Assimilation

- AAF Adaption Adjustment factor
- SU Software Understanding
- UNFM Programmer Unfamiliarity



Software Structure: Nominal

Software Clarity: Nominal

Software Self-Descriptiveness: Nominal

*Adapted software dialog*

Reused software

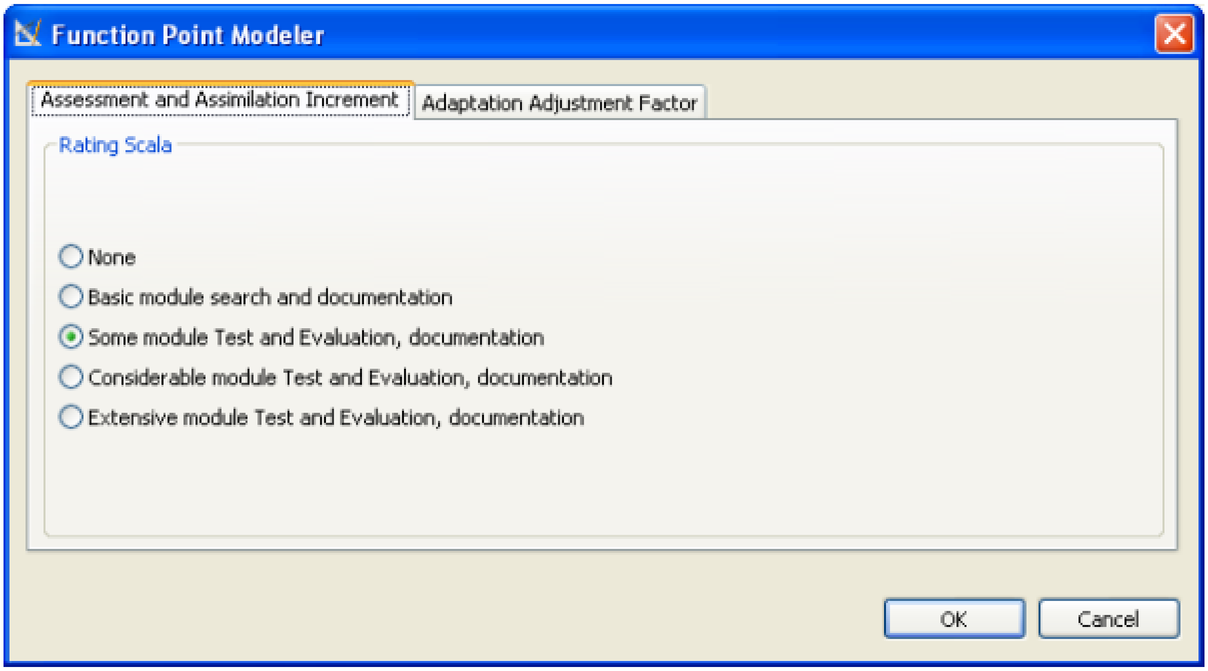
The existing code is treated as a black box and is not modified for use with the product is called **reused software code** .

Adapted code is preexisting code that has some changes to it, while reused code has no changes to the preexisting code.

**AAM = (AA + (0,3 * IM))/100**

Where:

- AAM Adaption Adjustment Modifier
- AA Assessment and Assimilation
- IM Percentage of Integration Required for Adapted Software


Function Point Modeler
Assessment and Assimilation Increment
Adaptation Adjustment Factor
OK
Cancel

Rating Scala

○ None
○ Basic module search and documentation
● Some module Test and Evaluation, documentation
○ Considerable module Test and Evaluation, documentation
○ Extensive module Test and Evaluation, documentation

*Reused software dialog*

Product Cost Factors

Product factors account for variation in the effort required to develop software caused by characteristics of the product under development.

COCOMO II presupposes that a product that is complex also has high reliability requirements, or incorporates the use of an outsized testing database and thus requires additional time for completion.

Product Cost Factor RELY

RELY is a measure to which degree the application must perform its projected function over a certain period of time. Its rating schemes are explicated in the following table.

| **RELY Descriptors** | **slight inconvenience** | **low, easily recoverable losses** | **moderate, easily recoverable losses** | **high financial loss** | **risk to human life** | |
|---|---|---|---|---|---|---|
| Rating Levels | Very Low | Low | Nominal | High | Very High | Extra High |
| Effort Multipliers | 0.82 | 0.92 | 1.00 | 1.10 | 1.26 | n/a |

Product Cost Factor DATA

The DATA cost driver delineated in the following table captures the influence test data requirements have on program development. Its rating is assessed by calculating the ratio of bytes in the testing database to SLOC in the program. The basis for this cost driver is that database size is important for the reason that of the resources required for generating test data.

| **DATA Descriptors** | | **Testing DB bytes/Pgm SLOC < 10** | **10 = D/P < 100** | **100 = D/P < 1000** | **D/P = 1000** | |
|---|---|---|---|---|---|---|
| Rating Levels | Very Low | Low | Nominal | High | Very High | Extra High |
| Effort Multipliers | n/a | 0.90 | 1.00 | 1.14 | 1.28 | n/a |

Product Cost Factor CPLX

The Table (found at the end of this section) provides the new COCOMO II CPLX rating scale. Complexity is divided into five areas: control operations, computational operations, device-dependent operations, data management operations, and user interface management operations. Select the area or combination of areas that characterize the product or a sub-system of the product.

| Rating Levels | Very Low | Low | Nominal | High | Very High | Extra High |
|---|---|---|---|---|---|---|
| Effort Multipliers | 0.73 | 0.87 | 1.00 | 1.17 | 1.34 | 1.74 |

The complexity rating is the subjective weighted average of the following areas.

| | Control Operations | Computational Operations | Device-dependent Operations | Data Management Operations | User Interface Management Operations |
|---|---|---|---|---|---|
| Very Low | Straight-line code with a few non-nested structured programming operators: DOs, CASEs, IFTHENELSEs. Simple module composition via procedure calls or simple scripts. | Evaluation of simple expressions: e.g., A=B+C*(D-E) | Simple read, write statements with simple formats. | Simple arrays in main memory. Simple COTS-DB queries, updates. | Simple input forms, report generators. |
| Low | Straightforward nesting of structured programming operators. Mostly simple predicates | Evaluation of moderate-level expressions: e.g., D=SQRT(B**2-4.*A*C) | No cognizance needed of particular processor or I/O device characteristics. I/O done at GET/PUT level. | Single file subsetting with no data structure changes, no edits, no intermediate files. Moderately complex COTS-DB queries, updates. | Use of simple graphic user interface (GUI) builders. |
| Nominal | Mostly simple nesting. Some intermodule control. Decision tables. Simple callbacks or message passing, including middleware-supported distributed processing | Use of standard math and statistical routines. Basic matrix/vector operations. | I/O processing includes device selection, status checking and error processing. | Multi-file input and single file output. Simple structural changes, simple edits. Complex COTS-DB queries, updates. | Simple use of widget set. |
| High | Highly nested structured programming operators with many compound predicates. Queue and stack control. | Basic numerical analysis: multivariate interpolation, ordinary differential equations. Basic | Operations at physical I/O level (physical storage address translations; seeks, reads, etc.). | Simple triggers activated by data stream contents. Complex data restructuring. | Widget set development and extension. Simple voice I/O, multimedia. |

| | Control Operations | Computational Operations | Device-dependent Operations | Data Management Operations | User Interface Management Operations |
|---|---|---|---|---|---|
| | Homogeneous, distributed processing. Single processor soft real-time control. | truncation, roundoff concerns. | Optimized I/O overlap. | | |
| Very High | Reentrant and recursive coding. Fixed-priority interrupt handling. Task synchronization, complex callbacks, heterogeneous distributed processing. Single-processor hard real-time control. | Difficult but structured numerical analysis: near-singular matrix equations, partial differential equations. Simple parallelization. | Routines for interrupt diagnosis, servicing, masking. Communication line handling. Performance-intensive embedded systems. | Distributed database coordination. Complex triggers. Search optimization. | Moderately complex 2D/3D, dynamic graphics, multimedia. |
| Extra High | Multiple resource scheduling with dynamically changing priorities. Microcode-level control. Distributed hard real-time control. | Difficult and unstructured numerical analysis: highly accurate analysis of noisy, stochastic data. Complex parallelization. | Device timing-dependent coding, micro-programmed operations. Performance-critical embedded systems. | Highly coupled, dynamic relational and object structures. Natural language data management. | Complex multimedia, virtual reality. |

Product Cost Factor RUSE

This cost driver accounts for the additional effort needed to construct components intended for reuse on current or future projects.

- across project applies across the modules in a single financial applications project
- across project applies across the modules in a single financial applications project
- across program applies across multiple financial applications for one organization
- across product line applies across multiple organizations
- across multiple product lines applies across financial and marketing product lines

| RUSE Descriptors | | none | across project | across program | across product line | across multiple product lines |
|---|---|---|---|---|---|---|
| Rating Levels | Very Low | Low | Nominal | High | Very High | Extra High |
| Effort Multipliers | n/a | 0.95 | 1.00 | 1.07 | 1.15 | 1.24 |

Product Cost Factor DOCU

COCOMO II specifies the rating scale for DOCU in the following table as evaluation in terms of the suitability of the project’s documentation to its life-cycle needs.

| **DOCU Descriptors** | **Many lifecycle needs uncovered** | **Some lifecycle needs uncovered** | **Rightsized to life-cycle needs** | **Excessive for lifecycle needs** | **Very excessive for lifecycle needs** | |
|---|---|---|---|---|---|---|
| Rating Levels | Very Low | Low | Nominal | High | Very High | Extra High |
| Effort Multipliers | 0.81 | 0.91 | 1.00 | 1.11 | 1.23 | n/a |

Project Cost Factors

Project factors account for influences on the estimated effort such as use of modern software tools, location of the development team, and compression of the project schedule.

Project Cost Factor TOOL

TOOL incorporates the process of using CASE tools support for the development which reflects upon the capability, maturity, and integration of them, see the following table.

| **TOOL Descriptors** | **edit, code, debug** | **simple, frontend, backend CASE, little integration** | **basic lifecycle tools, moderately integrated** | **strong, mature lifecycle tools, moderately integrated** | **strong, mature, proactive life-cycle tools, well integrated with processes, methods, reuse** | |
|---|---|---|---|---|---|---|
| Rating Levels | Very Low | Low | Nominal | High | Very High | Extra High |
| Value | 1.17 | 1.09 | 1.00 | 0.90 | 0.78 | n/a |

Project Cost Factor SITE

Determining the SITE cost driver rating involves the assessment and judgementbased averaging of site collocation and communication support as described in the following table.

| **Collocation Descriptors** | **International** | **Multicity and Multicompany** | **Multicity or Multicompany** | **Same city or metro.area** | **Same building or complex** | **Fully collocated** |
|---|---|---|---|---|---|---|
| **Communications Descriptors** | **Some phone, mail** | **Individual phone, FAX** | **Narrow band email** | **Wideband electronic communication** | **Wideband elect. comm., occasional video conf.** | **Interactive multimedia** |
| Rating Levels | Very Low | Low | Nominal | High | Very High | Extra High |
| Value | 1.22 | 1.09 | 1.00 | 0.93 | 0.86 | 0.80 |

Platform Cost Factors

The platform refers to the target-machine complexity of hardware and infrastructure software. Boehm considers additional platform factors, e.g. distribution, parallelism, embeddedness, and real-time operations.

Platform Cost Factor TIME

The rating in the following table is expressed in terms of the percentage of available execution time expected to be used by the system or subsystem consuming the execution time resource.

| TIME Descriptors | | | = 50% use of available execution time | 70% use of available execution time | 85% use of available execution time | 95% use of available execution time |
|---|---|---|---|---|---|---|
| Rating Levels | Very Low | Low | Nominal | High | Very High | Extra High |
| Value | n/a | n/a | 1.00 | 1.11 | 1.29 | 1.63 |

### Platform Cost Factor STOR

The following table specifies a rating that represents the degree of main storage constraint imposed on a software system or subsystem.

| STOR Descriptors | | | = 50% use of available storage | 70% use of available storage | 85% use of available storage | 95% use of available storage |
|---|---|---|---|---|---|---|
| Rating Levels | Very Low | Low | Nominal | High | Very High | Extra High |
| Value | n/a | n/a | 1.00 | 1.05 | 1.17 | 1.46 |

### Platform Cost Factor PVOL

PVOL implies the complexity of hardware and software products calls on to perform its tasks. The platform includes any compilers or assemblers supporting the development of the software system. Development of e.g. software as OS formulates the platform as the computer hardware. Development of e.g. database management system originates the platform as hardware and OS. Network text browser development specifies the platform as the network, computer hardware, the operating system, and the distributed information repositories.

| PVOL Descriptors | | Major change every 12 mo.; Minor change every 1 mo. | Major: 6 mo.; Minor: 2 wk. | Major: 2 mo.; Minor: 1 wk. | Major: 2 wk.; Minor: 2 days | |
|---|---|---|---|---|---|---|
| Rating Levels | Very Low | Low | Nominal | High | Very High | Extra High |
| Value | n/a | 0.87 | 1.00 | 1.15 | 1.30 | n/a |

### Personnel Cost Factors

Personnel factors have the strongest affect on effort required to develop software compared to other cost drivers. These ratings are most likely to change during the course of a project reflecting the gaining of experience or the rotation of people onto and off the project. Personnel factors rank the development team’s capability and experience but exclude the individual aspect.

### Personnel Cost Factor ACAP

ACAP considers personnel who work on requirements, high-level design and detailed design hence, accompanying attributes are analysis and design ability, efficiency and thoroughness, and the ability to communicate and cooperate. The following table does not reflect on the level of experience of the analyst. APEX, LTEX, and PLEX are used in the rating of this attribute.

| ACAP Descriptors | 5th percentile | 35th percentile | 55th percentile | 75th percentile | 90th percentile | |
|---|---|---|---|---|---|---|
| Rating Levels | Very Low | Low | Nominal | High | Very High | Extra High |
| Value | 1.42 | 1.19 | 1.00 | 0.85 | 0.71 | n/a |

### Personnel Cost Factor PCAP

Evaluating PCAP should be founded on the capability of the programmers as a team rather than as individuals hence, associated factors ought to be ability, efficiency and thoroughness, and the ability to communicate and cooperate. The following table does not reflect on the level of experience of the programmer. APEX, LTEX, and PLEX are used in the rating of this attribute.

| **PCAP Descriptors** | **5th percentile** | **35th percentile** | **55th percentile** | **75th percentile** | **90th percentile** | |
|---|---|---|---|---|---|---|
| Rating Levels | Very Low | Low | Nominal | High | Very High | Extra High |
| Value | 1.34 | 1.15 | 1.00 | 0.88 | 0.76 | n/a |

Personnel Cost Factor PCON

The rating scale for PCON depicted in the following table is in terms of the project’s annual personnel turnover. Three percent (very high continuity) to 48 percent (very low continuity) are the limits for this cost driver.

| **PCON Descriptors** | **48% / year** | **24% / year** | **12% / year** | **6% / year** | **3% / year** | |
|---|---|---|---|---|---|---|
| Rating Levels | Very Low | Low | Nominal | High | Very High | Extra High |
| Value | 1.29 | 1.12 | 1.00 | 0.90 | 0.81 | n/a |

Personnel Cost Factor APEX

Ranking APEX is coupled with the level of applications experience of the project team developing the software system or subsystem. The ratings in the following table are characterized in terms of the project team’s equivalent level of experience with this kind of software system

| **APEX Descriptors** | **<= 2 months** | **6 months** | **1 year** | **3 years** | **6 years** | |
|---|---|---|---|---|---|---|
| Rating Levels | Very Low | Low | Nominal | High | Very High | Extra High |
| Value | 1.22 | 1.10 | 1.00 | 0.88 | 0.81 | n/a |

Personnel Cost Factor PLEX

PLEX recognizes the importance of understanding the utilization of more powerful platforms, including more graphic user interface, database, networking, and distributed middleware capabilities.

| **PLEX Descriptors** | **<= 2 months** | **6 months** | **1 year** | **3 years** | **6 years** | |
|---|---|---|---|---|---|---|
| Rating Levels | Very Low | Low | Nominal | High | Very High | Extra High |
| Value | 1.19 | 1.09 | 1.00 | 0.91 | 0.85 | n/a |

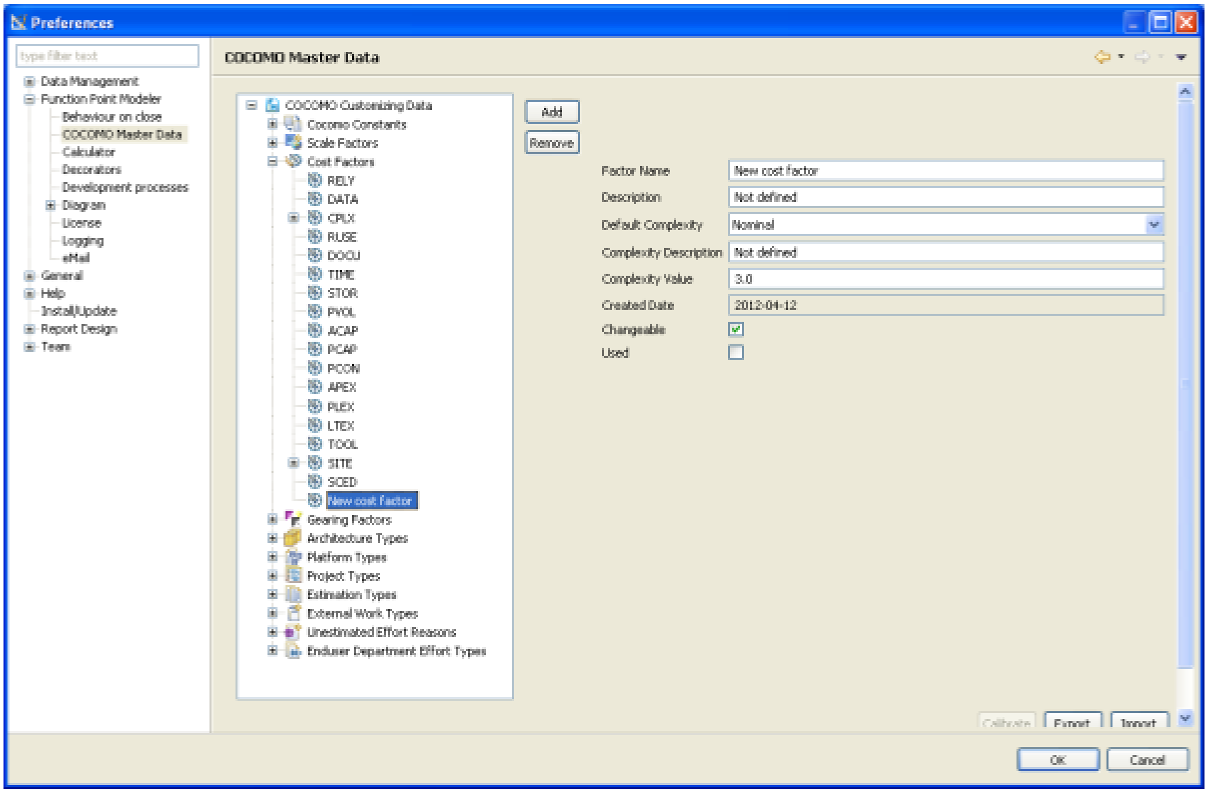
Personnel Cost Factor LTEX

LTEX reflects upon software development that includes the utilization of CASE tools which perform requirements and design representation and analysis, configuration management, document extraction, library management, program style and formatting, consistency checking, planning and control.

| **PLEX Descriptors** | **<= 2 months** | **6 months** | **1 year** | **3 years** | **6 years** | |
|---|---|---|---|---|---|---|
| Rating Levels | Very Low | Low | Nominal | High | Very High | Extra High |
| Value | 1.20 | 1.09 | 1.00 | 0.91 | 0.84 | n/a |

Custom Cost Factors

You may want to extend **Cost Factors** by defining your own custom cost factors.



Factor Name: New cost factor

Description: Not defined

Default Complexity: Nominal

Complexity Description: Not defined

Complexity Value: 3.0

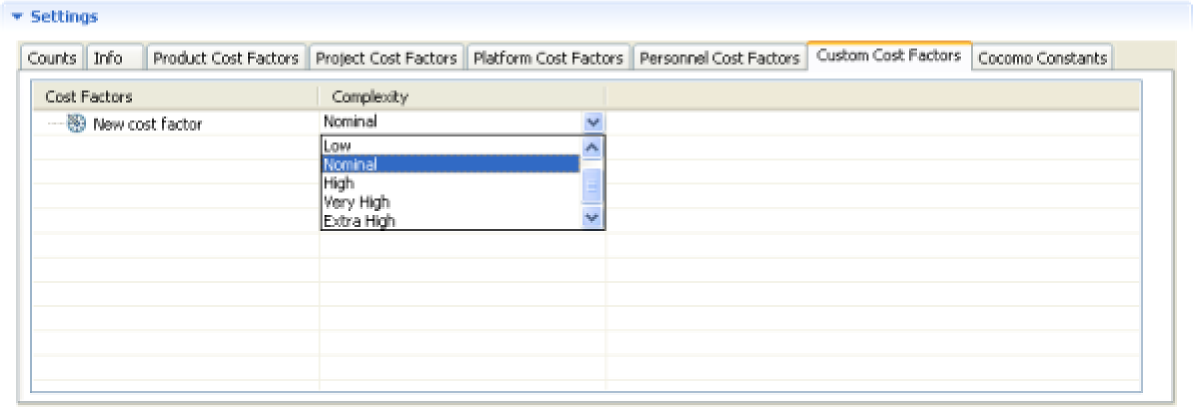
Created Date: 2012-04-12

Changeable ☑

Used ☐

*Create Customer Cost Factor*

Once you've created your own custom cost factor you can use it for your estimation.



| Cost Factors | Complexity |
|---|---|
| New cost factor | Nominal |

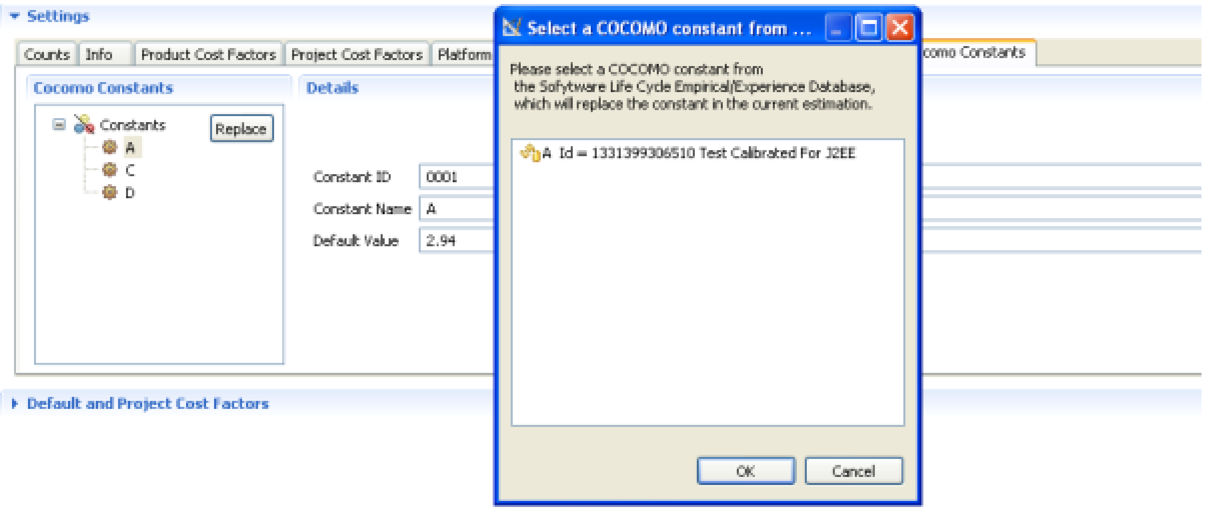
*Use Customer Cost Factor*

## Cocomo Constants

To estimate the effort and development time, COCOMO use the equations with constants called coefficients **(a, b, c, d)** .

You can calibrate this coefficients for different kind of project, domain or platform in your company. You may you this calibrated coefficients for appropriate project.

**Function Point Modeler** enables you to use this calibrated coefficients for the estimation.



Constant ID: 0001
Constant Name: A
Default Value: 2.94

Please select a COCOMO constant from
the Sofytware Life Cycle Empirical/Experience Database,
which will replace the constant in the current estimation.

A Id = 1331399306510 Test Calibrated For J2EE

## Reporting and Statistics

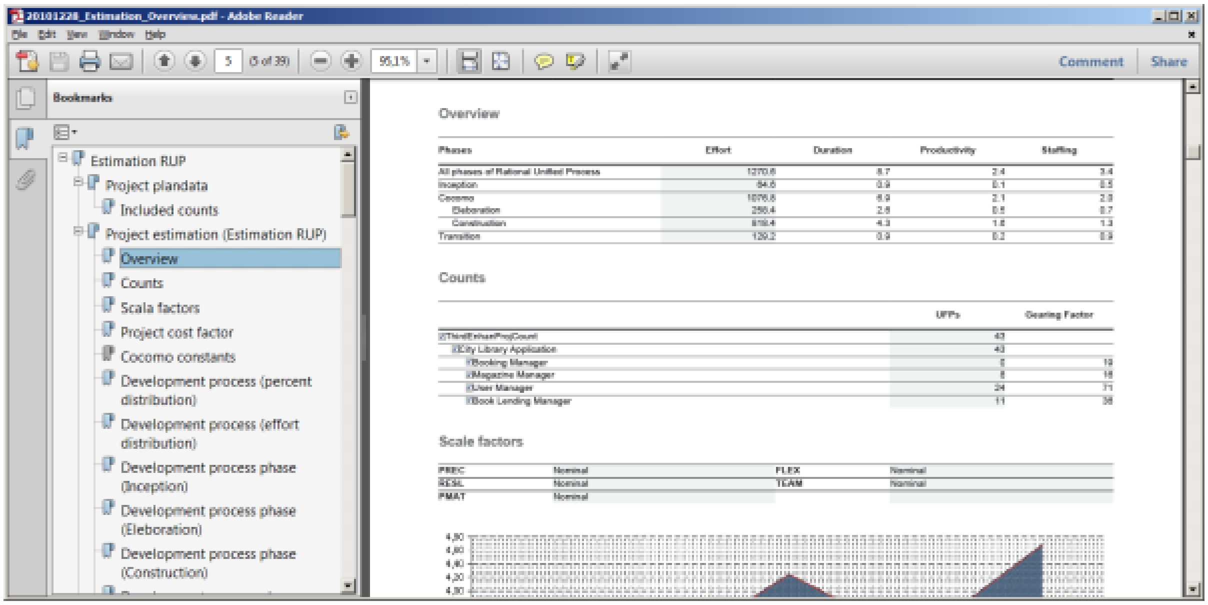
**Function Point Modeler** provides you some standard reports and statistics beside **Function Point Modeler Report Designer**

*Project Estimation Report*

You can create a **project estimation report** as **PDF** file. This report contains all relevant informations and settings of the current estimation.

You can quickly navigate you estimation structure in the three on the left side to see selected information.

This estimation report is suitable for the project manager.


20101228_Estimation_Overview.pdf - Adobe Reader
File
Edit
View
Window
Help
5
(5 of 39)
95.1%
Comment
Share
Bookmarks
Estimation RUP
Project plandata
Included counts
Project estimation (Estimation RUP)
Overview
Counts
Scala factors
Project cost factor
Cocomo constants
Development process (percent distribution)
Development process (effort distribution)
Development process phase (Inception)
Development process phase (Eleboration)
Development process phase (Construction)
4,80
4,60
4,40
4,20
4,00

Overview

| Phases | Effort | Duration | Productivity | Staffing |
|---|---|---|---|---|
| All phases of Rational Unified Process | 1270.8 | 8.7 | 2.4 | 3.4 |
| Inception | 84.6 | 0.9 | 0.1 | 0.5 |
| Cocomo | 1076.8 | 6.9 | 2.1 | 2.9 |
| Elaboration | 258.4 | 2.6 | 0.5 | 0.7 |
| Construction | 818.4 | 4.3 | 1.6 | 1.3 |
| Transition | 129.2 | 0.9 | 0.2 | 0.9 |

Counts

| | UFPs | Gearing Factor |
|---|---|---|
| ThirdEnhanProjCount | 43 | |
| City Library Application | 43 | |
| Booking Manager | 0 | 19 |
| Magazine Manager | 8 | 16 |
| User Manager | 24 | 71 |
| Book Lending Manager | 11 | 38 |

Scale factors

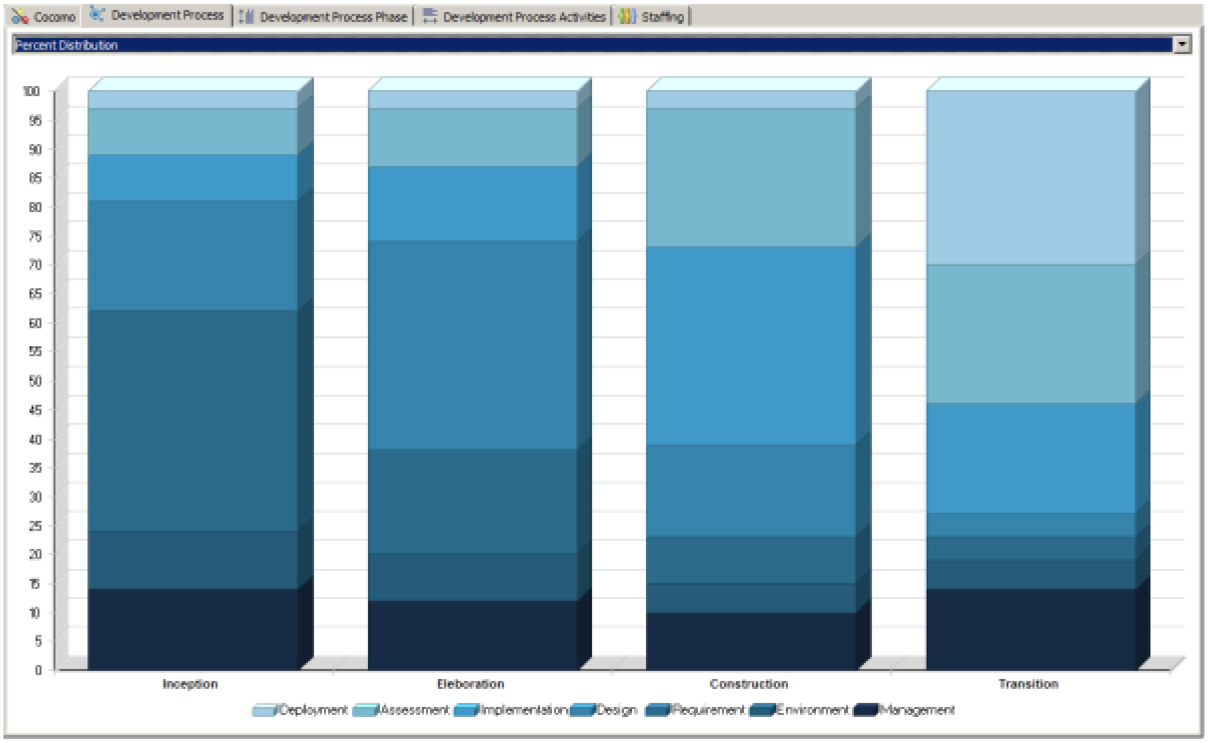
| | | | |
|---|---|---|---|
| PREC | Nominal | FLEX | Nominal |
| RESL | Nominal | TEAM | Nominal |
| PMAT | Nominal | | |

### *Development Process Statistic*

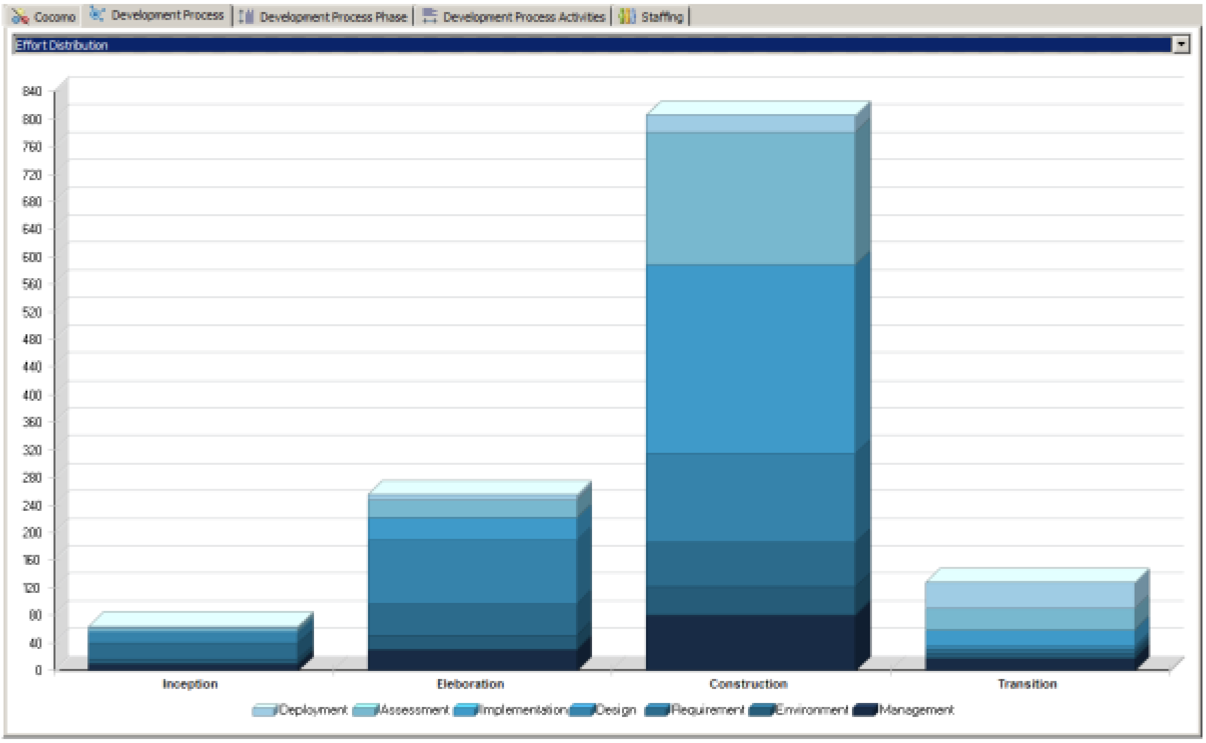
**Function Point Modeler** provides you detail standard reports and statistics about the effort distributions regarding selected **Software Development Process** .

**Development Process Statistic** shows you the effort distributions of each phase of selected **Software Development Process** and the effort distributions of activities of each phase of selected **Software Development Process**

In the following you see the so called *percent distribution* :



In the next picture you see the so called *effort distribution* of the same estimation above:

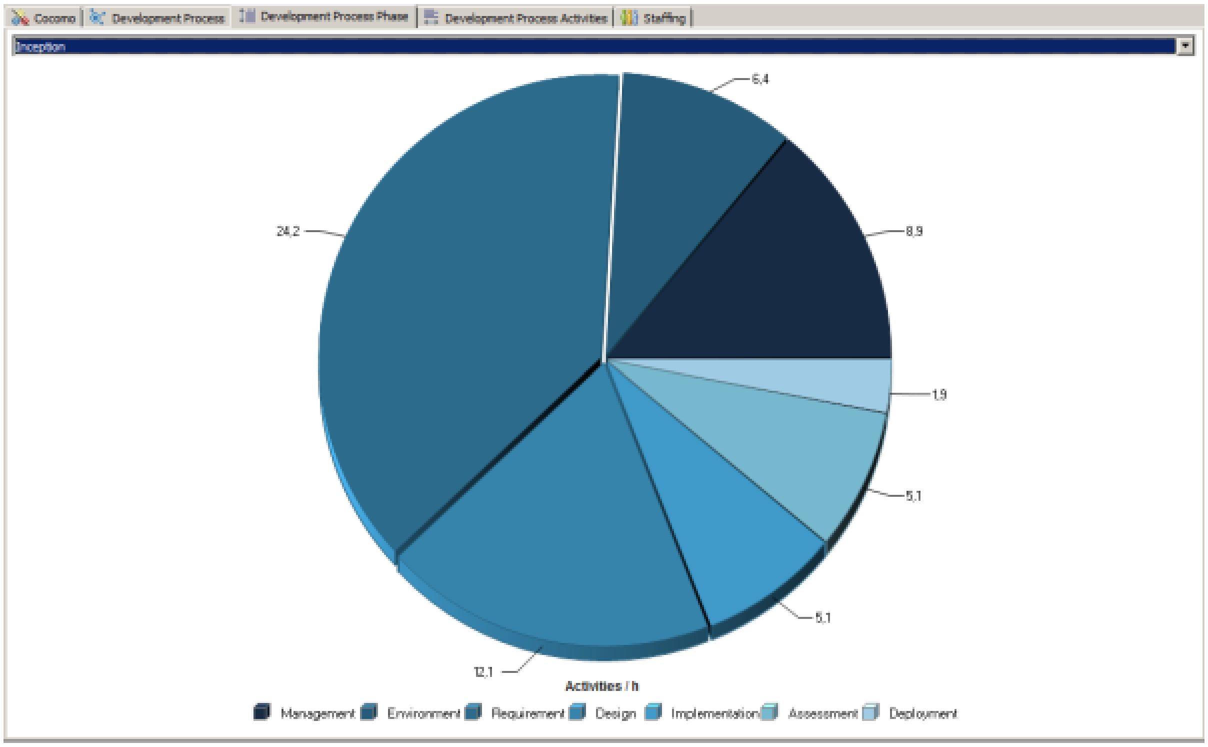


*Development Process Phase Statistic*

**Function Point Modeler** provides you detail standard reports and statistics about the effort distributions of each phase of the selected **Software Development Process** .

**Development Process Phase Statistic** shows you the effort distributions of each phase of selected **Software Development Process** .

In the following you see the *activity distributions* of the *inception* phase :

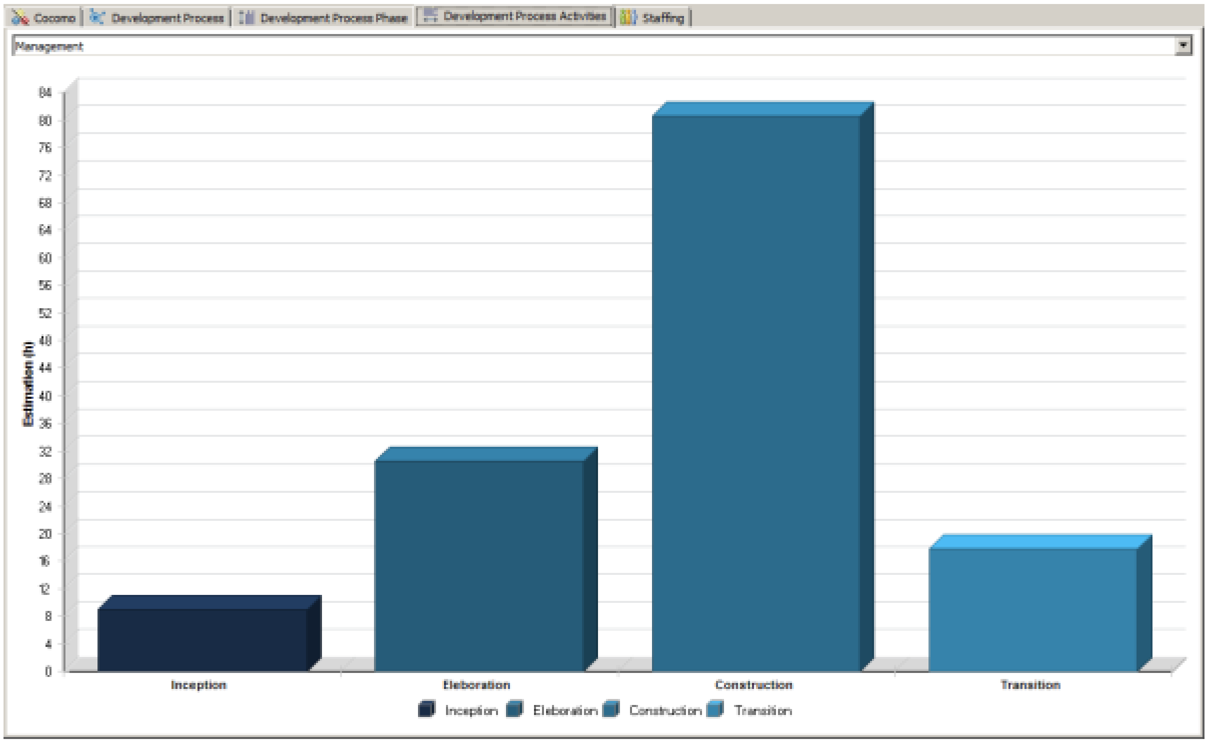


### *Development Process Activity Statistic*

**Function Point Modeler** provides you detail standard reports and statistics about the effort distributions of each phase of the selected **Software Development Process** .

**Development Process Activity Statistic** shows you the effort distributions of each activity for the phases of selected **Software Development Process** .

In the following you see the activity effort distributions of the *Management* activity for all phases :



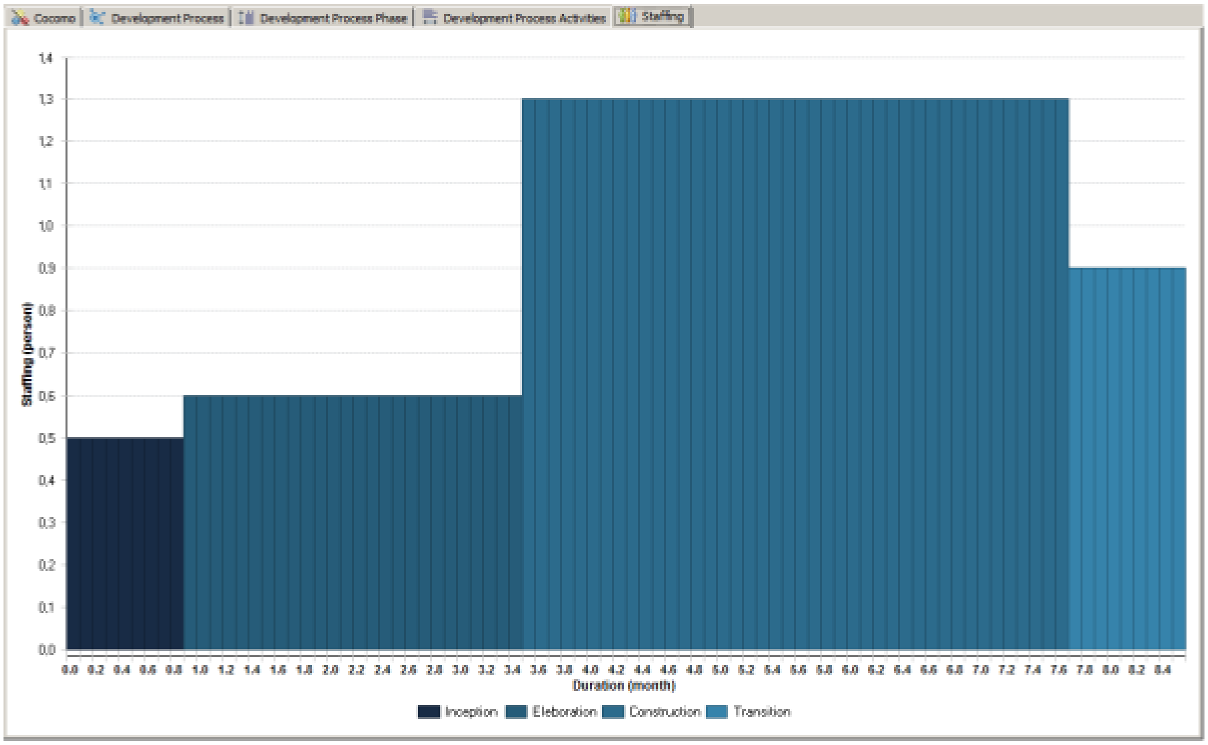
Management

*Staffing Statistic*

**Function Point Modeler** provides you detail standard reports and statistics about the effort distributions of each phase of the selected **Software Development Process** .

**Staffing Statistic** shows you the staffing distributions of each phase of selected **Software Development Process** .

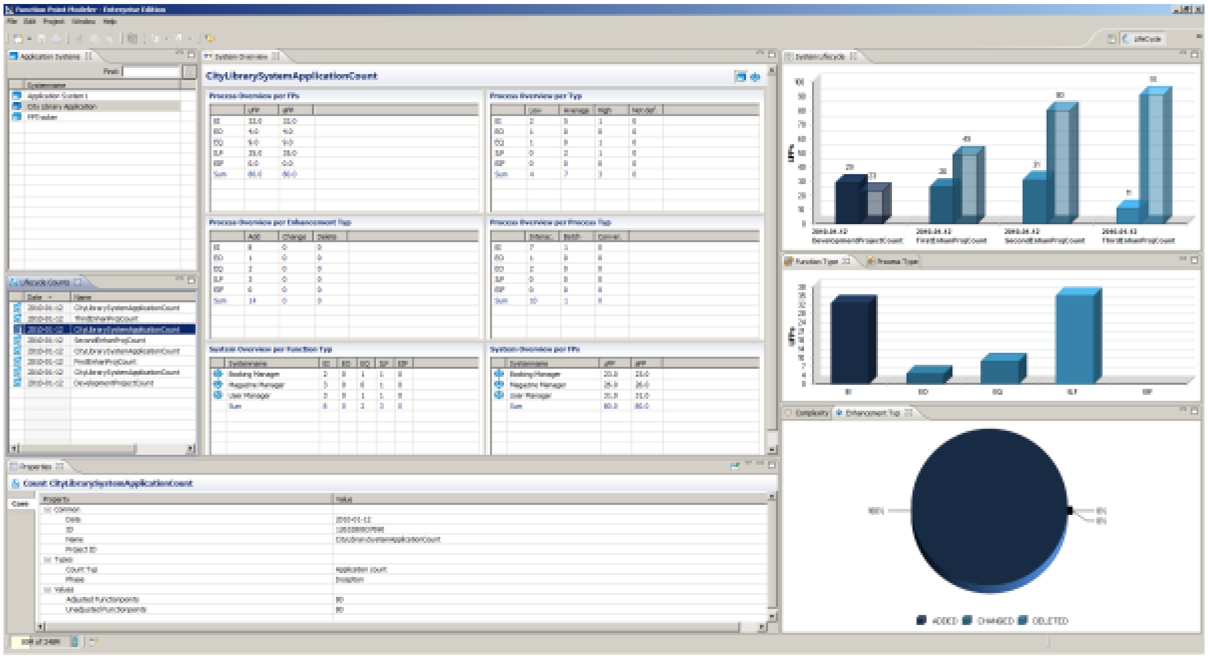
In the following you see the staffing distributions for all phases :



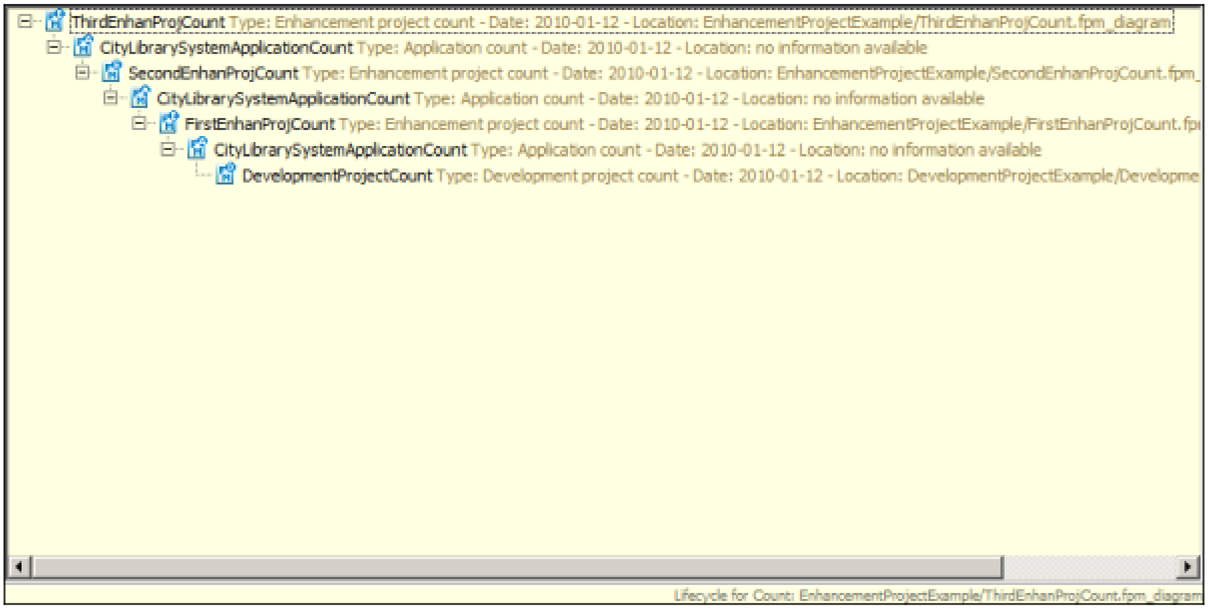
## Application System Lifecycle

**Function Point Modeler** also manages the *lifecycle* of the Elementary Processes, Logical Files, Sub Systems and Application Systems. Each of this has its unique key. This unique key enables us to track the *lifecycle* of this components from the beginning (creation or development time ) to the end (deletion or end-of-life ). You are able to track the functional growing of your application system as well as its cost during its life.

In the following you see detail *lifecycle* of a selected **Application System** :


Function Point Modeler - Enterprise Edition
File Edit Project Window Help
Application Systems
System Overview
CityLibrarySystemApplicationCount
Process Overview per FPs
Process Overview per Typ
Process Overview per Enhancement Typ
Process Overview per Process Typ
System Overview per Function Typ
System Overview per FPs
Lifecycle Counts
Properties
Count CityLibrarySystemApplicationCount
System Lifecycle
Function Type
Process Type
Complexity
Enhancement Typ
ADDED
CHANGED
DELETED

In the following you see quick *lifecycle* of a selected **Application System** :



```
⊟ ThirdEnhanProjCount Type: Enhancement project count - Date: 2010-01-12 - Location: EnhancementProjectExample/ThirdEnhanProjCount.fpm_diagram
   ⊟ CityLibrarySystemApplicationCount Type: Application count - Date: 2010-01-12 - Location: no information available
      ⊟ SecondEnhanProjCount Type: Enhancement project count - Date: 2010-01-12 - Location: EnhancementProjectExample/SecondEnhanProjCount.fpm_
         ⊟ CityLibrarySystemApplicationCount Type: Application count - Date: 2010-01-12 - Location: no information available
            ⊟ FirstEnhanProjCount Type: Enhancement project count - Date: 2010-01-12 - Location: EnhancementProjectExample/FirstEnhanProjCount.fp
               ⊟ CityLibrarySystemApplicationCount Type: Application count - Date: 2010-01-12 - Location: no information available
                  DevelopmentProjectCount Type: Development project count - Date: 2010-01-12 - Location: DevelopmentProjectExample/Developme
```

Lifecycle for Count: EnhancementProjectExample/ThirdEnhanProjCount.fpm_diagram

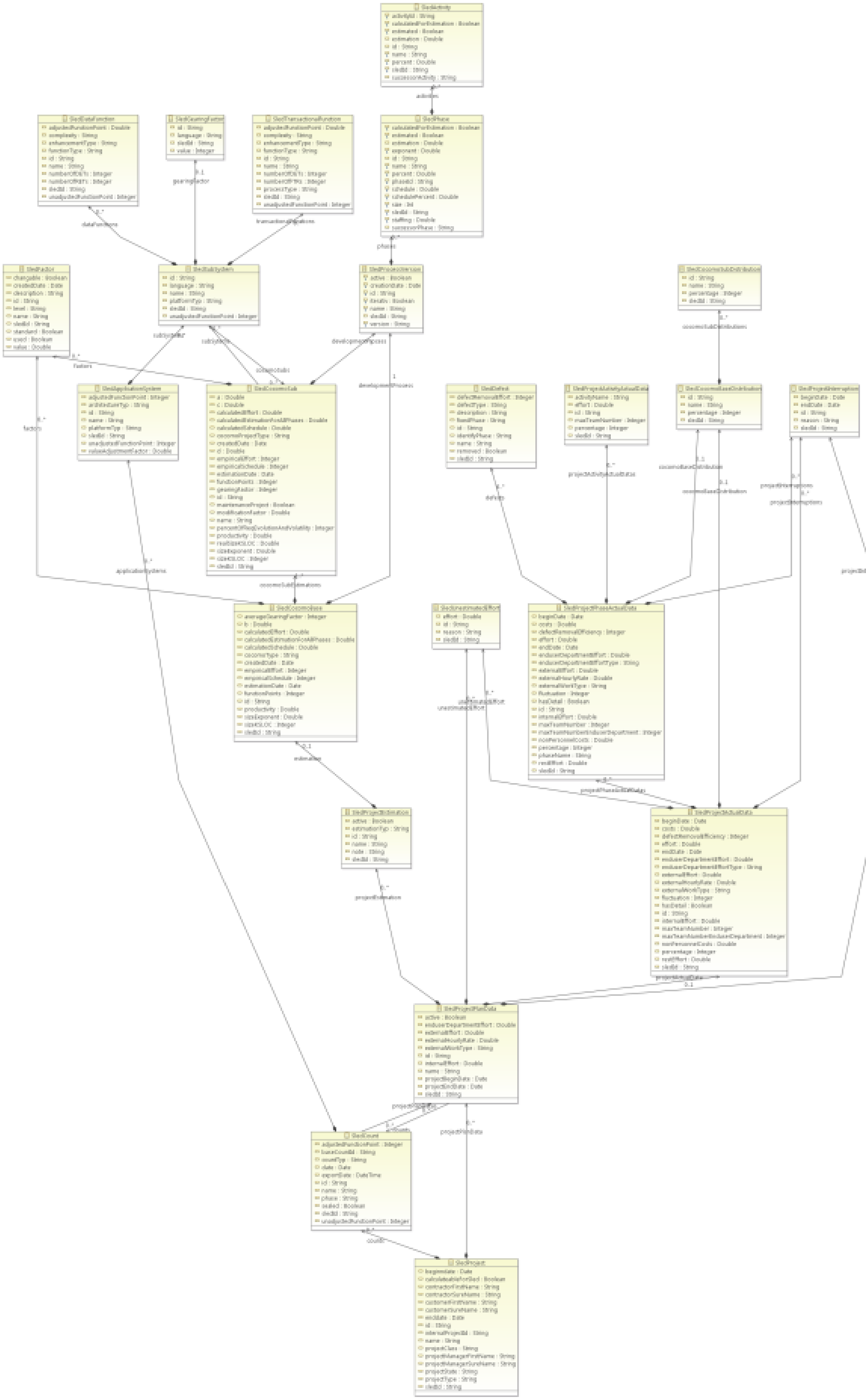
## Software Lifecycle Empirical / Experience Database

**Function Point Modeler Enterprise** enables you to set up a Software Life Cycle Experience Database **(SLED)** in your company without any effort, since the data model of the SLED is the same model of the objects in the Function Point Modeler.

**SLED** enables you insight into the key process, project and product metrics within your company. The Metrics Database **SLED** is designed to meet the needs of a wide range of product, process and project metrics. It delivers significant metrics about product, process and project.

data model does not meet the requirements in your company or you have other metrics in your company. **Function Point Modeler** architecture will make it easy for you to customize you company data to the Metrics Database **SLED** .

In the following you see **SLED** data model :


SledActivity
activityId : String
calculatedForEstimation : Boolean
estimated : Boolean
estimation : Double
id : String
name : String
percent : Double
sledId : String
successorActivity : String
activities
0..*
SledDataFunction
adjustedFunctionPoint : Double
complexity : String
enhancementType : String
functionType : String
id : String
name : String
numberOfDETs : Integer
numberOfRETs : Integer
sledId : String
unadjustedFunctionPoint : Integer
SledGearingFactor
id : String
language : String
sledId : String
value : Integer
SledTransactionalFunction
adjustedFunctionPoint : Double
complexity : String
enhancementType : String
functionType : String
id : String
name : String
numberOfDETs : Integer
numberOfFTRs : Integer
processType : String
sledId : String
unadjustedFunctionPoint : Integer
SledPhase
calculatedForEstimation : Boolean
estimated : Boolean
estimation : Double
exponent : Double
id : String
name : String
percent : Double
phaseId : String
schedule : Double
schedulePercent : Double
size : Int
sledId : String
staffing : Double
successorPhase : String
dataFunctions
0..*
0..1
gearingFactor
transactionalFunctions
phases
0..*
SledFactor
changable : Boolean
createdDate : Date
description : String
id : String
level : String
name : String
sledId : String
standard : Boolean
used : Boolean
value : Double
SledSubSystem
id : String
language : String
name : String
platformTyp : String
sledId : String
unadjustedFunctionPoint : Integer
SledProcessVersion
active : Boolean
creationDate : Date
id : String
iterativ : Boolean
name : String
sledId : String
version : String
SledCocomoSubDistribution
id : String
name : String
percentage : Integer
sledId : String
cocomoSubDistributions
0..*
subSystems
subSystem
cocomoSubs
developmentProcess
factors
0..*
1
developmentProcess
SledApplicationSystem
adjustedFunctionPoint : Integer
architectureTyp : String
id : String
name : String
platformTyp : String
sledId : String
unadjustedFunctionPoint : Integer
valueAdjustmentFactor : Double
SledCocomoSub
a : Double
c : Double
calculatedEffort : Double
calculatedEstimationForAllPhases : Double
calculatedSchedule : Double
cocomoProjectType : String
createdDate : Date
d : Double
empiricalEffort : Integer
empiricalSchedule : Integer
estimationDate : Date
functionPoints : Integer
gearingFactor : Integer
id : String
maintenanceProject : Boolean
modificationFactor : Double
name : String
percentOfReqEvolutionAndVolatility : Integer
productivity : Double
realSizeKSLOC : Double
sizeExponent : Double
sizeKSLOC : Integer
sledId : String
SledDefect
defectRemovalEffort : Integer
defectType : String
description : String
fixedPhase : String
id : String
identifyPhase : String
name : String
removed : Boolean
sledId : String
SledProjectActivityActualData
activityName : String
effort : Double
id : String
maxTeamNumber : Integer
percentage : Integer
sledId : String
SledCocomoBaseDistribution
id : String
name : String
percentage : Integer
sledId : String
SledProjectInterruption
beginDate : Date
endDate : Date
id : String
reason : String
sledId : String
factors
0..*
applicationSystems
0..*
cocomoSubEstimations
0..*
defects
0..*
projectActivityActualData
0..*
cocomoBaseDistribution
0..1
cocomoBaseDistribution
0..1
projectInterruptions
0..*
projectInterruptions
0..*
projectInterruptions
0..*
SledCocomoBase
averageGearingFactor : Integer
b : Double
calculatedEffort : Double
calculatedEstimationForAllPhases : Double
calculatedSchedule : Double
cocomoType : String
createdDate : Date
empiricalEffort : Integer
empiricalSchedule : Integer
estimationDate : Date
functionPoints : Integer
id : String
productivity : Double
sizeExponent : Double
sizeKSLOC : Integer
sledId : String
SledUnestimatedEffort
effort : Double
id : String
reason : String
sledId : String
SledProjectPhaseActualData
beginDate : Date
costs : Double
defectRemovalEfficiency : Integer
effort : Double
endDate : Date
enduserDepartmentEffort : Double
enduserDepartmentEffortType : String
externalEffort : Double
externalHourlyRate : Double
externalWorkType : String
fluctuation : Integer
hasDetail : Boolean
id : String
internalEffort : Double
maxTeamNumber : Integer
maxTeamNumberEnduserDepartment : Integer
nonPersonnelCosts : Double
percentage : Integer
phaseName : String
restEffort : Double
sledId : String
unestimatedEffort
unestimatedEffort
0..*
0..*
estimation
0..1
projectPhaseActualData
0..*
SledProjectEstimation
active : Boolean
estimationTyp : String
id : String
name : String
note : String
sledId : String
SledProjectActualData
beginDate : Date
costs : Double
defectRemovalEfficiency : Integer
effort : Double
endDate : Date
enduserDepartmentEffort : Double
enduserDepartmentEffortType : String
externalEffort : Double
externalHourlyRate : Double
externalWorkType : String
fluctuation : Integer
hasDetail : Boolean
id : String
internalEffort : Double
maxTeamNumber : Integer
maxTeamNumberEnduserDepartment : Integer
nonPersonnelCosts : Double
percentage : Integer
restEffort : Double
sledId : String
projectEstimation
0..*
projectActualData
0..1
SledProjectPlanData
active : Boolean
enduserDepartmentEffort : Double
externalEffort : Double
externalHourlyRate : Double
externalWorkType : String
id : String
internalEffort : Double
name : String
projectBeginDate : Date
projectEndDate : Date
sledId : String
projectPlanData
0..*
counts
0..*
projectPlanData
0..*
SledCount
adjustedFunctionPoint : Integer
baseCountId : String
countTyp : String
date : Date
exportDate : DateTime
id : String
name : String
phase : String
sealed : Boolean
sledId : String
unadjustedFunctionPoint : Integer
counts
0..*
SledProject
beginnDate : Date
calculateableForSled : Boolean
contractorFirstName : String
contractorSureName : String
customerFirstName : String
customerSureName : String
endDate : Date
id : String
internalProjectId : String
name : String
projectClass : String
projectManagerFirstName : String
projectManagerSureName : String
projectState : String
projectType : String
sledId : String

## Sharing Projects in Teams

**Function Point Modeler** allows synchronization of workspace resources with a versioning and configuration management repository (e.g. CVS, SVN). The **CVS** and **SVN** are known as centralised version control systems **(CVCS)** .

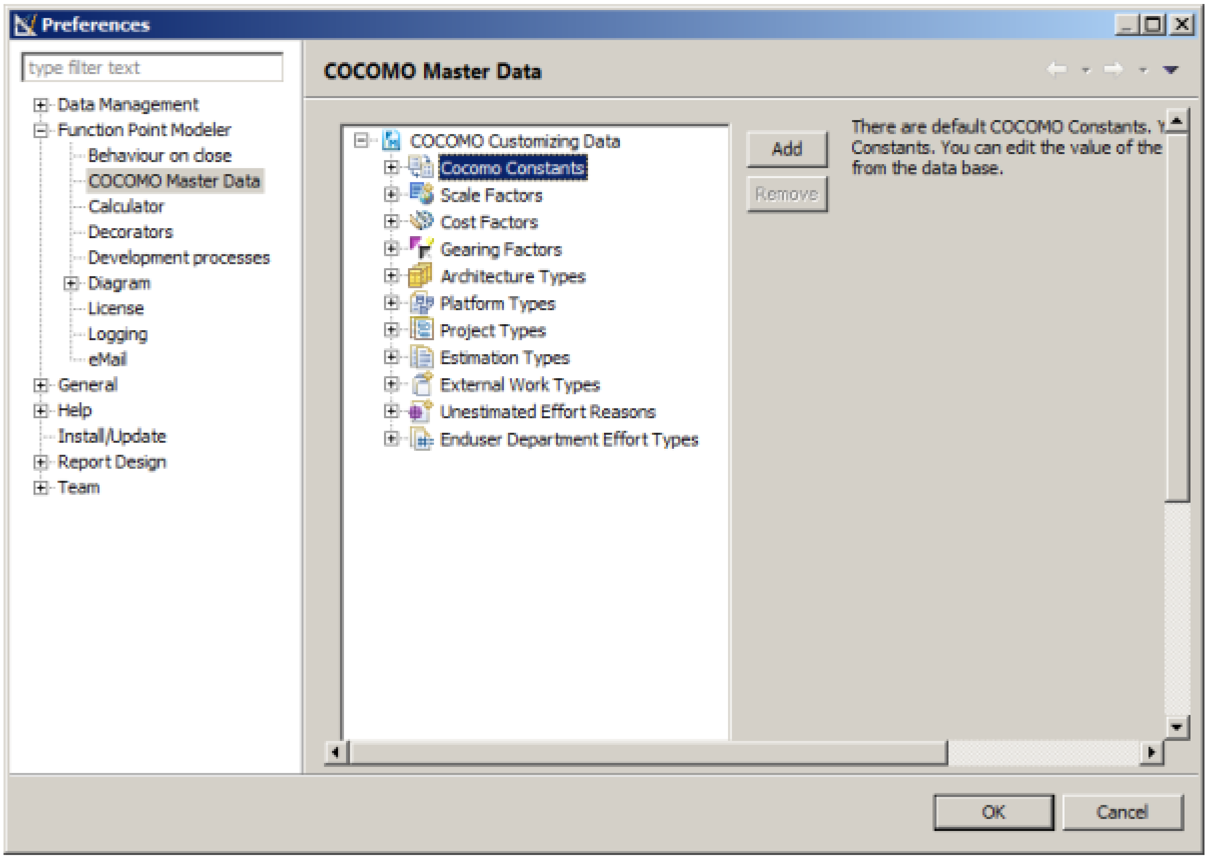
A versioning and configuration management repository allows synchronization of workspace resources with a remote location to share projects file in your counting team. At a minimum it allows pushing resources in the workspace to a remote location and pulling resources from a remote location into the workspace.

## Standard Reporting

## Cocomo Masterdata

**Function Point Modeler** allows you to customize the following **Cocomo** settings.

In the following you see the **Cocomo Masterdata** :



There are default COCOMO Constants. Y
Constants. You can edit the value of the
from the data base.

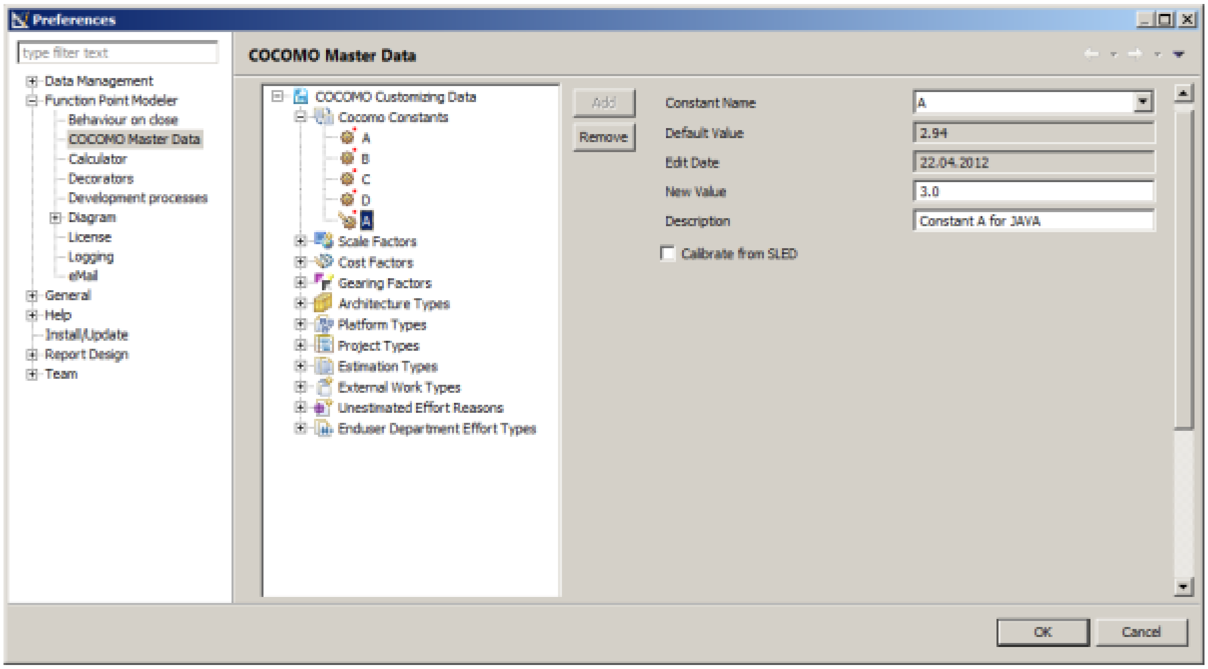
### Cocomo Constant

**Function Point Modeler** allows you to customize or calibrate the **Cocomo** constants **A** and **B** that are used for the calculation of the estimation

You may use this customized or calibrated constants in any **Cocomo** estimation.

You may set the constants **A** and **B** yourself without any calibration process. In this case you have to deselect check button **calibrate from SLED** .

In the following you see the **Cocomo Constant** setting dialog :



Constant Name: A

Default Value: 2.94

Edit Date: 22.04.2012

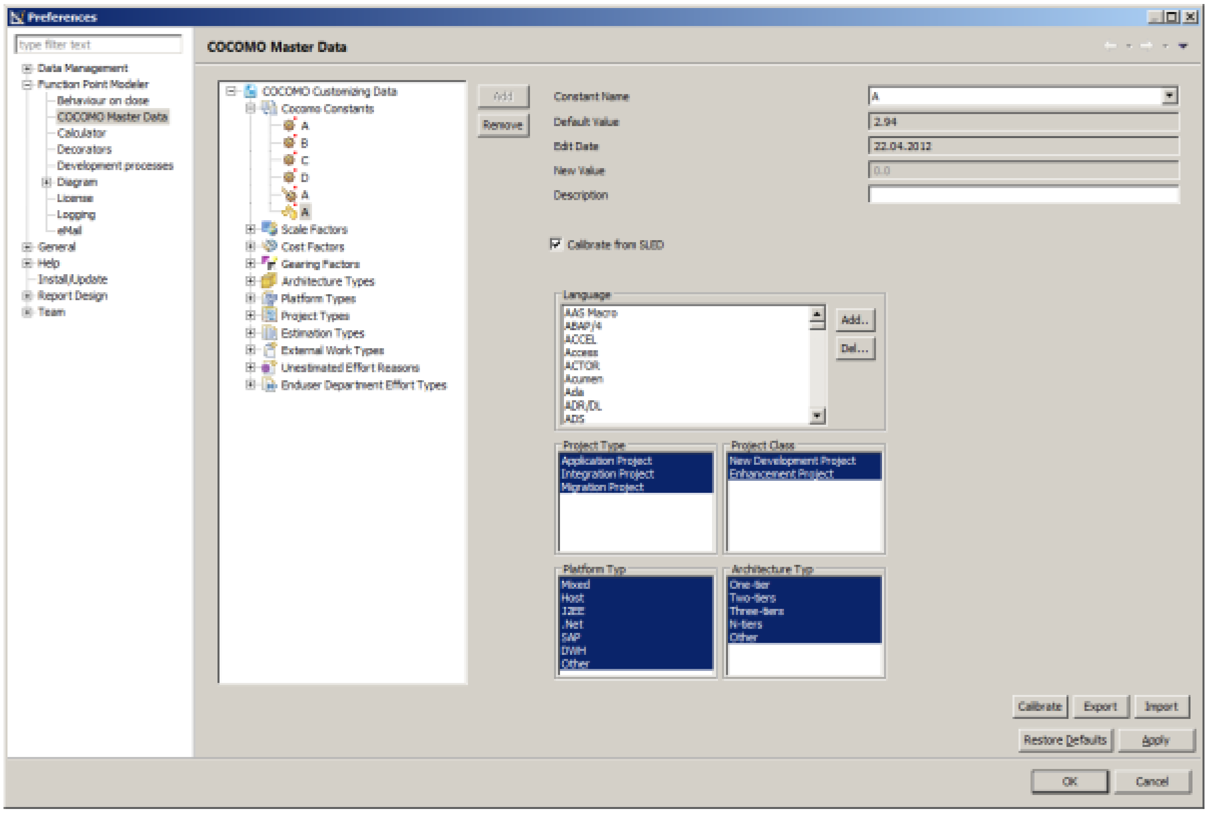
New Value: 3.0

Description: Constant A for JAVA

☐ Calibrate from SLED

You may also set the constants **A** and **B** from the result of a calibration process.

In the following you see the **Cocomo Constant** setting dialog with a calibration :



Constant Name: A

Default Value: 2.94

Edit Date: 22.04.2012

New Value: 0.0

Description:

☑ Calibrate from SLED

Language: AAS Macro, ABAP/4, ACCEL, Access, ACTOR, Acumen, Ada, ADR/DL, ADS

Project Type: Application Project, Integration Project, Migration Project

Project Class: New Development Project, Enhancement Project

Platform Typ: Mixed, Host, J2EE, .Net, SAP, DWH, Other

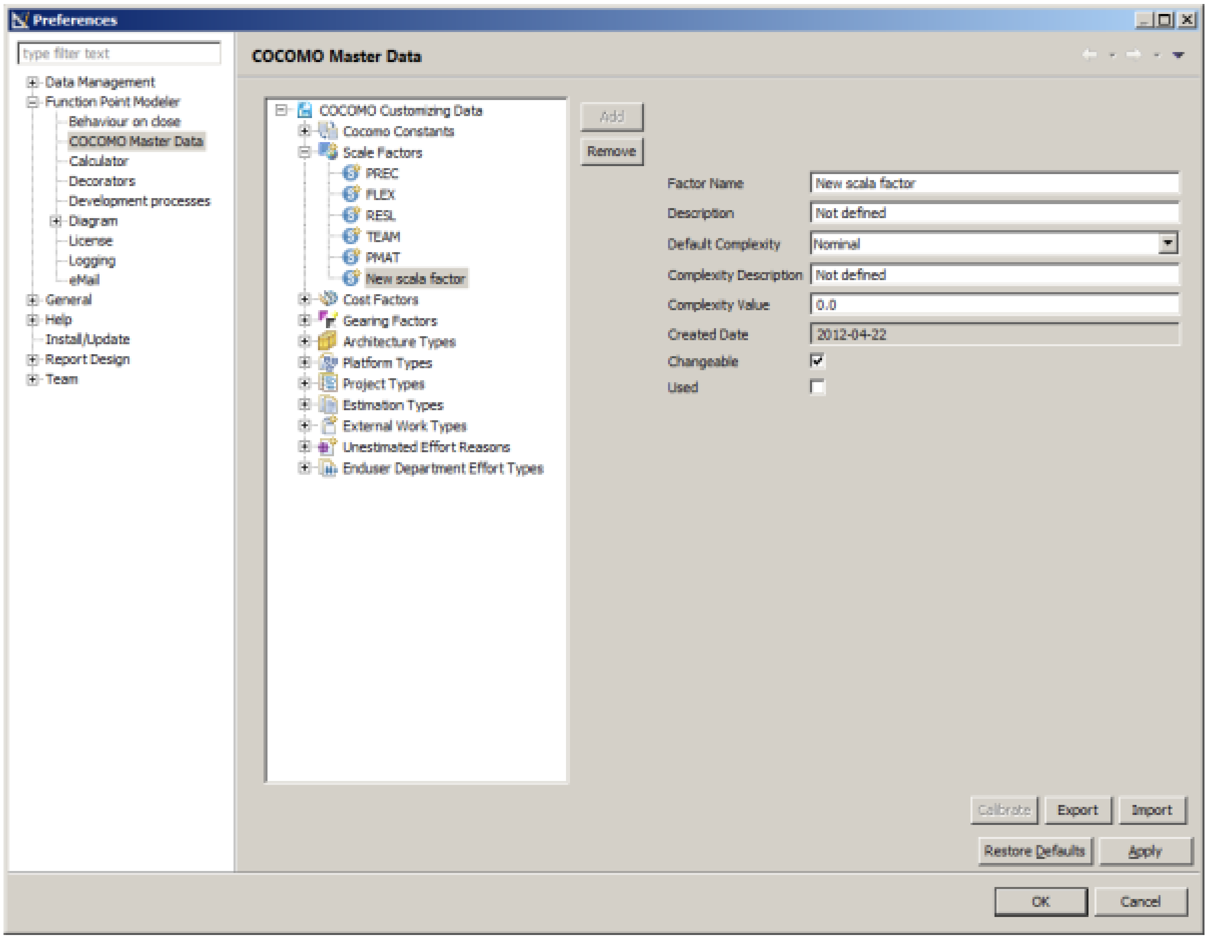
Architecture Typ: One-tier, Two-tiers, Three-tiers, N-tiers, Other

### Scale Factor

**Function Point Modeler** allows you to customize the **Scale Factors** . The attribute **Used** means whether it is used for the Cocomo calculation or not.

It is recommended that first of all you collect the complexities of your customized **Scale Factors** before you use it in the Cocomo calculation.

In the following you see the **Scale Factor** setting dialog :



Factor Name: New scala factor
Description: Not defined
Default Complexity: Nominal
Complexity Description: Not defined
Complexity Value: 0.0
Created Date: 2012-04-22
Changeable: ☑
Used: □

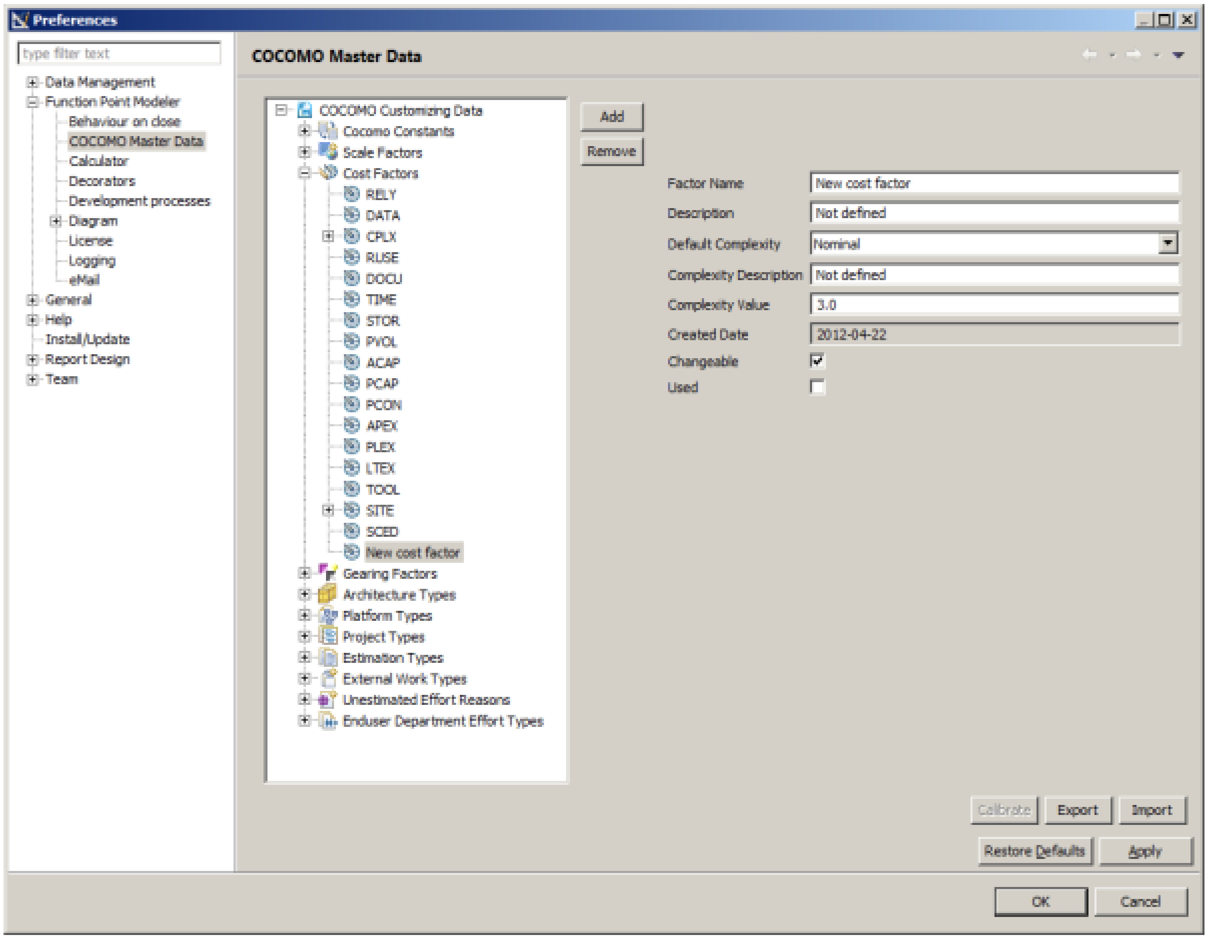
### Cost Factor

**Function Point Modeler** allows you to customize the **Cost Factors** . The attribute **Used** means whether it is used for the Cocomo calculation or not.

A **Cost Factors** can also consist of so called **Sub Cost Factors** . The sum of settings of **Sub Cost Factors** will be used for the parent **Cost Factors** .

It is recommended that first of all you collect the complexities of your customized **Cost Factors** before you use it in the Cocomo calculation.

In the following you see the **Cost Factor** setting dialog :



Factor Name: New cost factor

Description: Not defined

Default Complexity: Nominal

Complexity Description: Not defined

Complexity Value: 3.0

Created Date: 2012-04-22

Changeable ☑

Used □

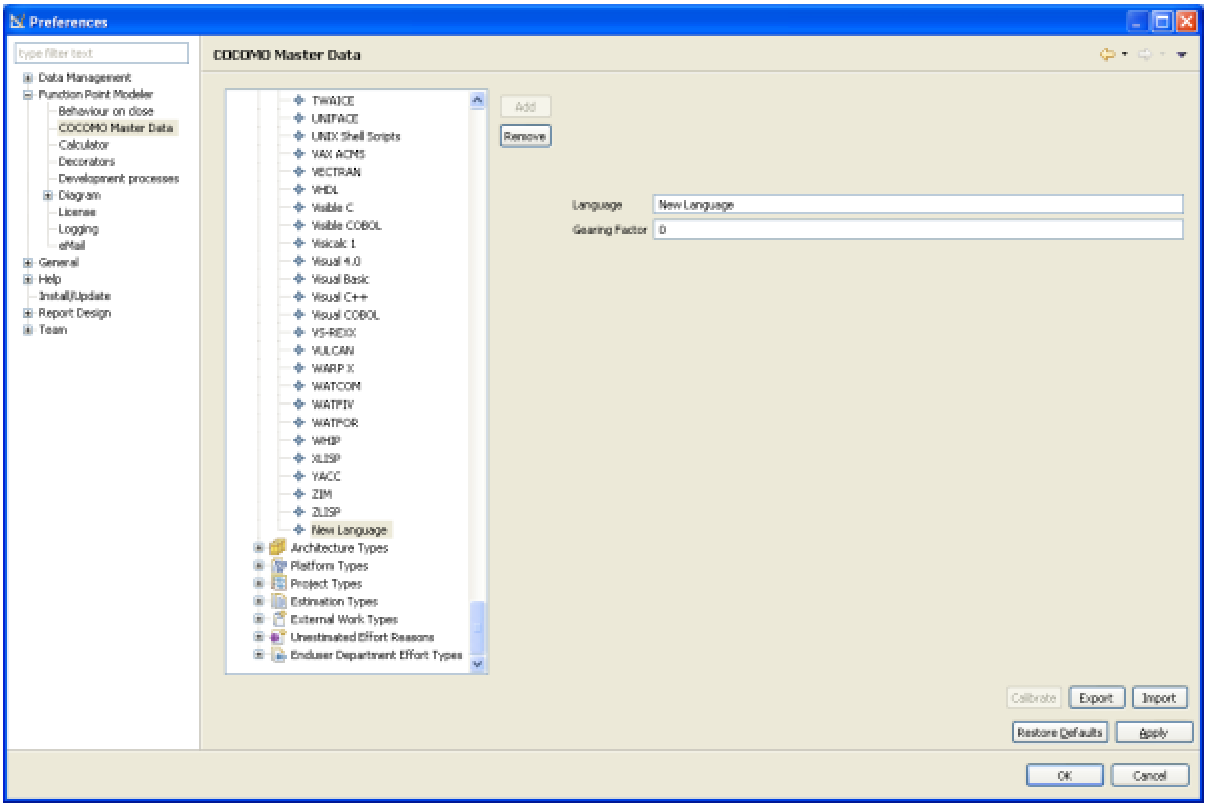
## Gearing Factor

**Function Point Modeler** allows you to customize the **Gearing Factors** for the languages.

**What is a gearing factor?**

The gearing factor is simply the average number of Source Lines of Code **(SLOC)** per function point in the completed project. It is calculated by dividing the final code count for a completed project by the final function point count. **(SLOC)** counts are logical, not physical line counts.

In the following you see the **Gearing Factor** setting dialog :



Language: New Language

Gearing Factor: 0

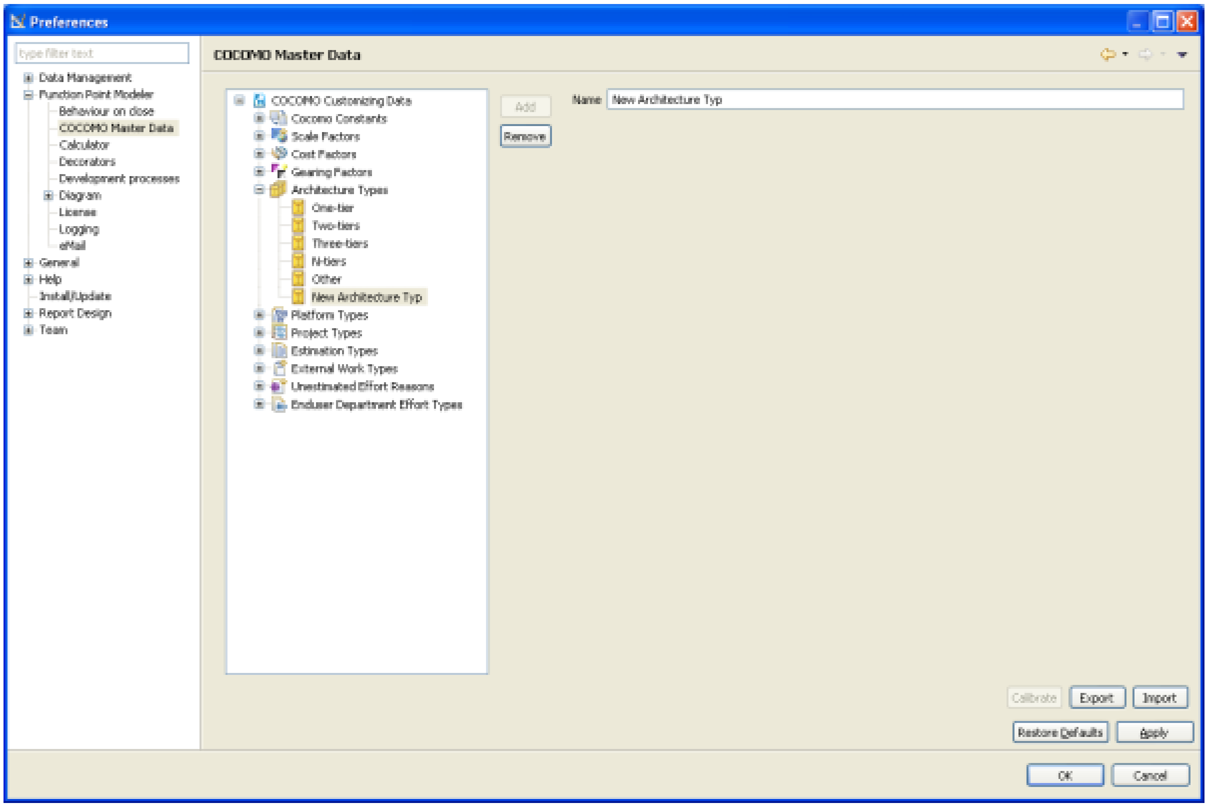
## Architecture Type

**Function Point Modeler** allows you to customize the **Architecture Type** .

The following default **Architecture Types** are defined:

- One-tier
- Two-tiers
- Three-tiers
- N-tiers
- Other

In the following you see the **Architecture Type** setting dialog :



Name: New Architecture Typ

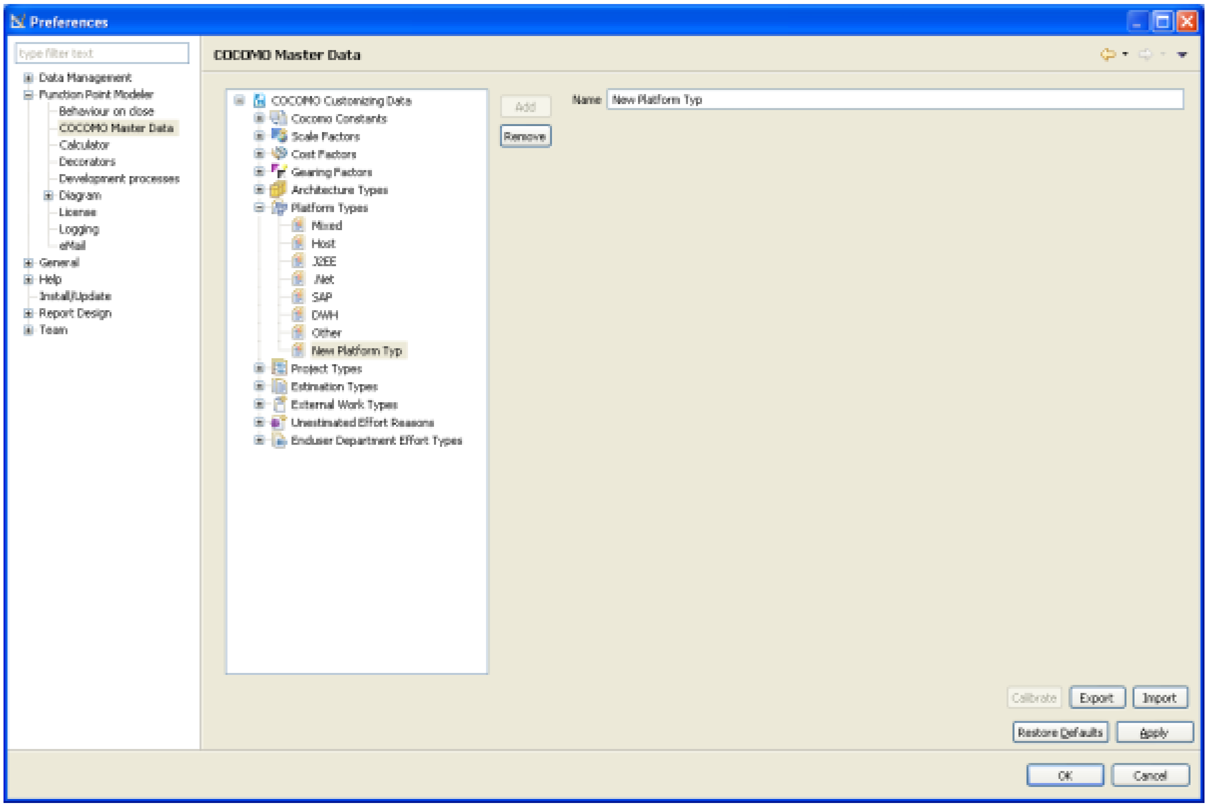
## Platform Type

**Function Point Modeler** allows you to customize the **Platform Type** .

The following default **Platform Types** are defined:

- Mixed
- Host
- J2EE
- .Net
- SAP
- DWH
- Other

In the following you see the **Platform Type** setting dialog :



Name: New Platform Typ

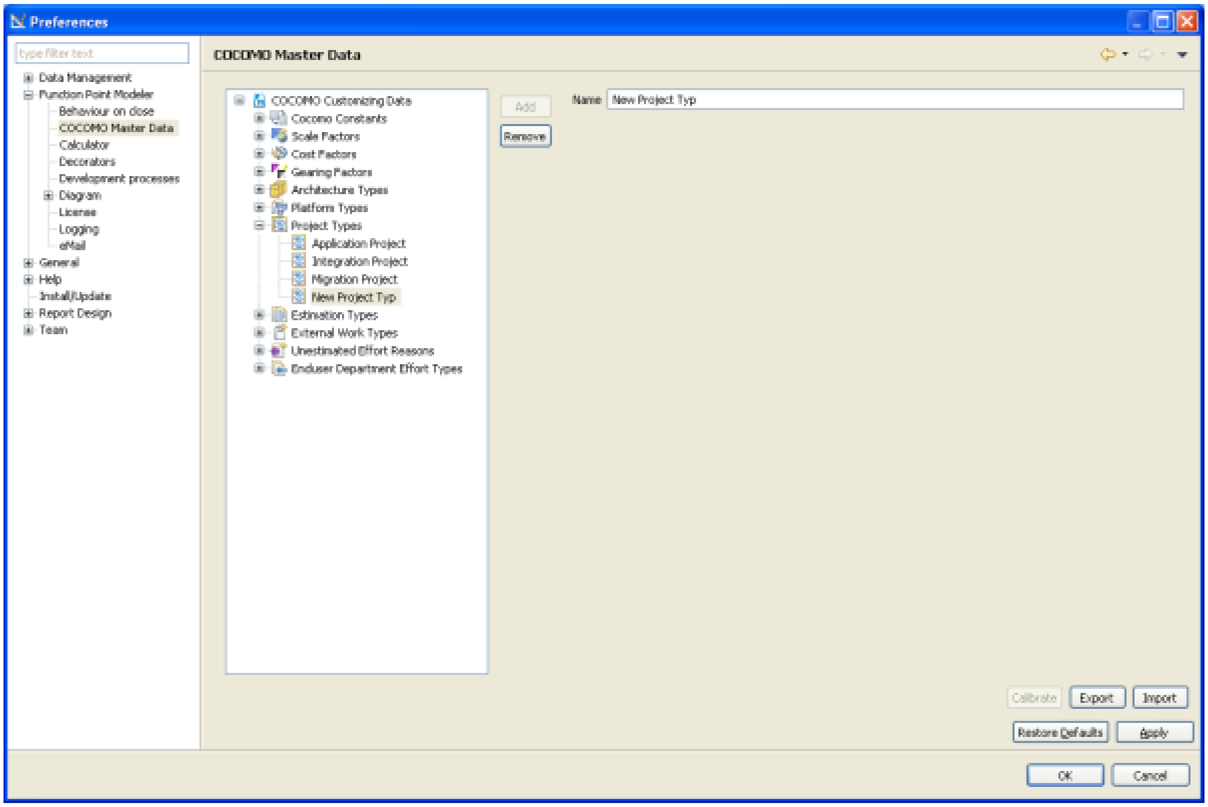
## Project Type

**Function Point Modeler** allows you to customize the **Project Type** .

The following default **Project Types** are defined:

- Application Project
- Integration Project
- Migration Project

In the following you see the **Project Type** setting dialog :



Name: New Project Typ

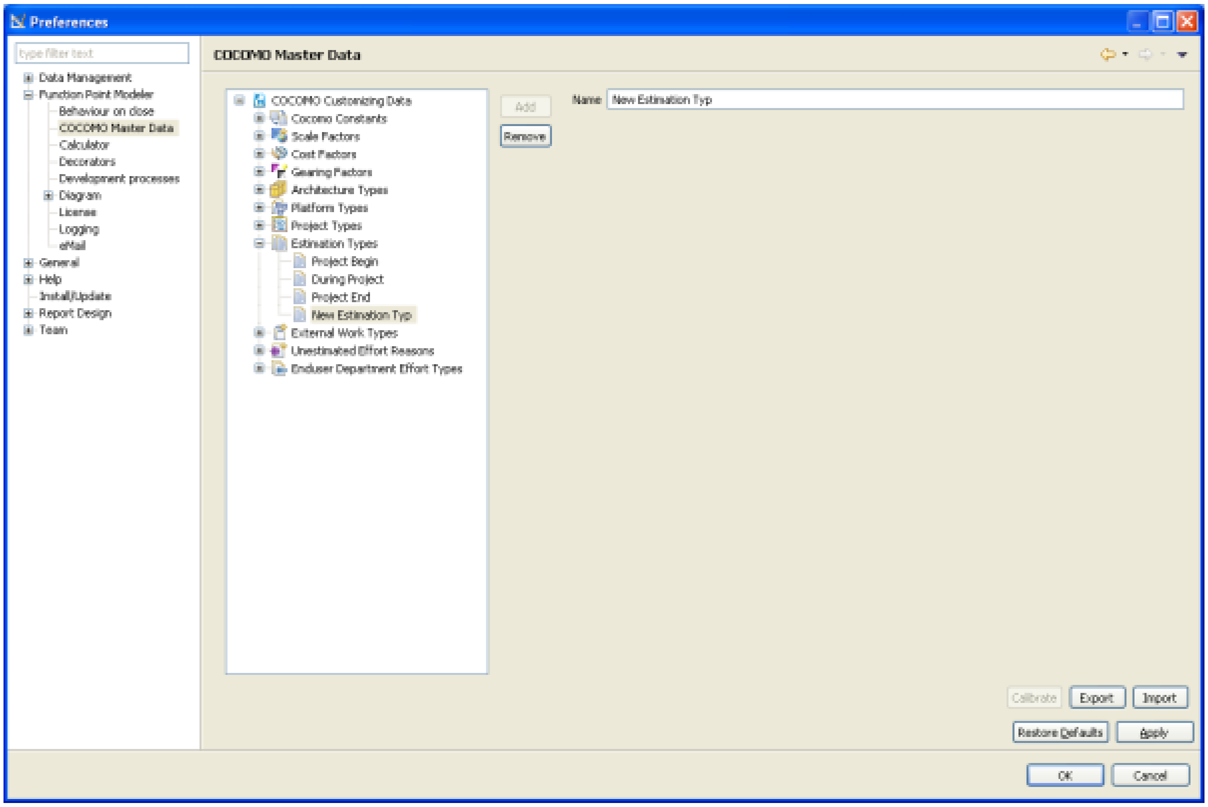
## Estimation Type

**Function Point Modeler** allows you to customize the **Estimation Type** .

The following default **Estimation Types** are defined:

- Project Begin
- During Project
- Project End

In the following you see the **Estimation Type** setting dialog :



Name: New Estimation Typ

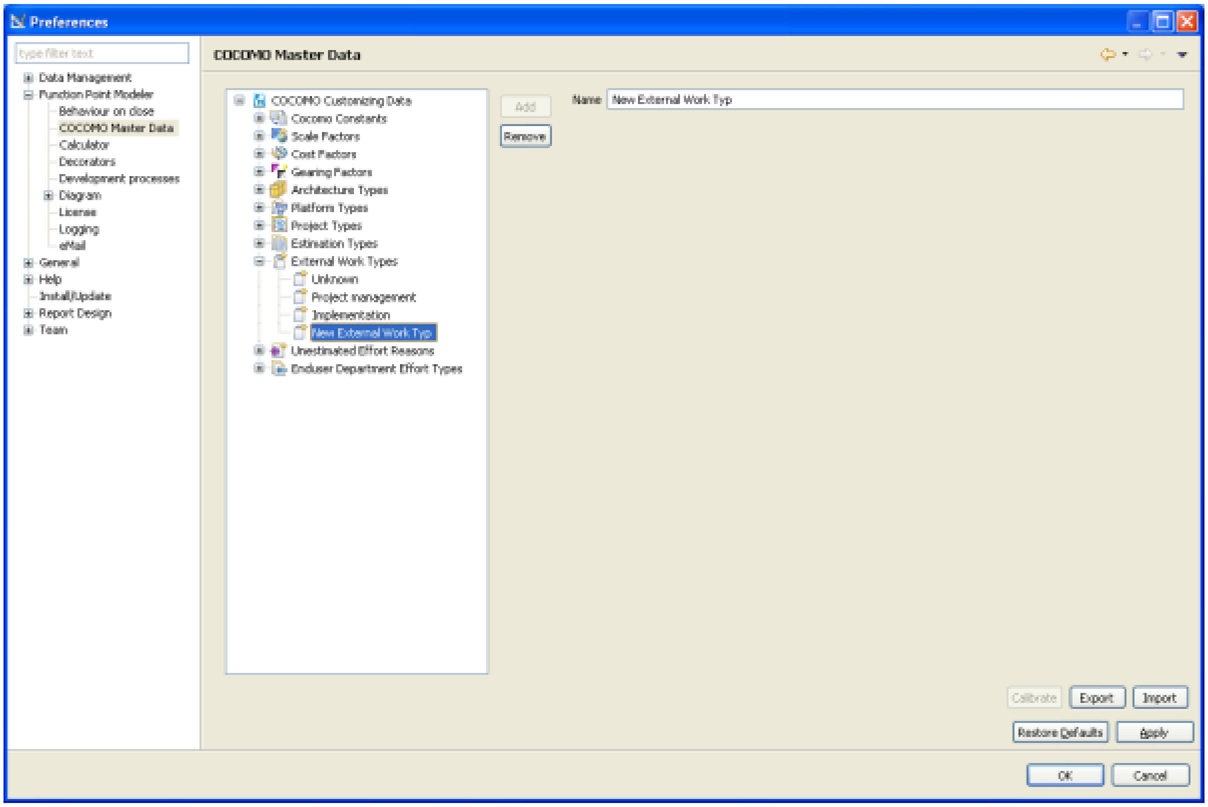
## External Work Type

**Function Point Modeler** allows you to customize the **External Work Type** .

The following default **External Work Types** are defined:

- Unknown
- Project management
- Implementation

In the following you see the **External Work Type** setting dialog :



Name: New External Work Typ

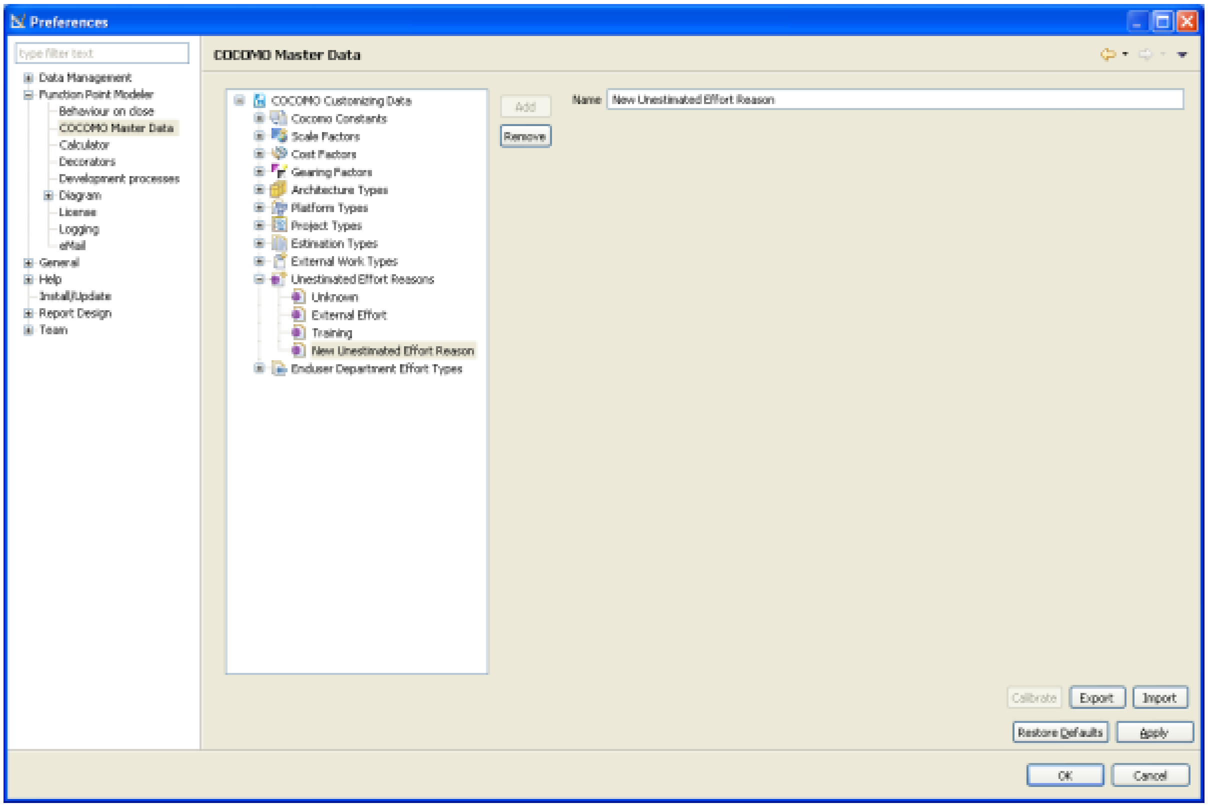
## Unestimated Effort Reason

**Function Point Modeler** allows you to customize the **Unestimated Effort Reason** .

The following default **Unestimated Effort Reason** are defined:

- Unknown
- External Effort
- Training

In the following you see the **Unestimated Effort Reason** setting dialog :

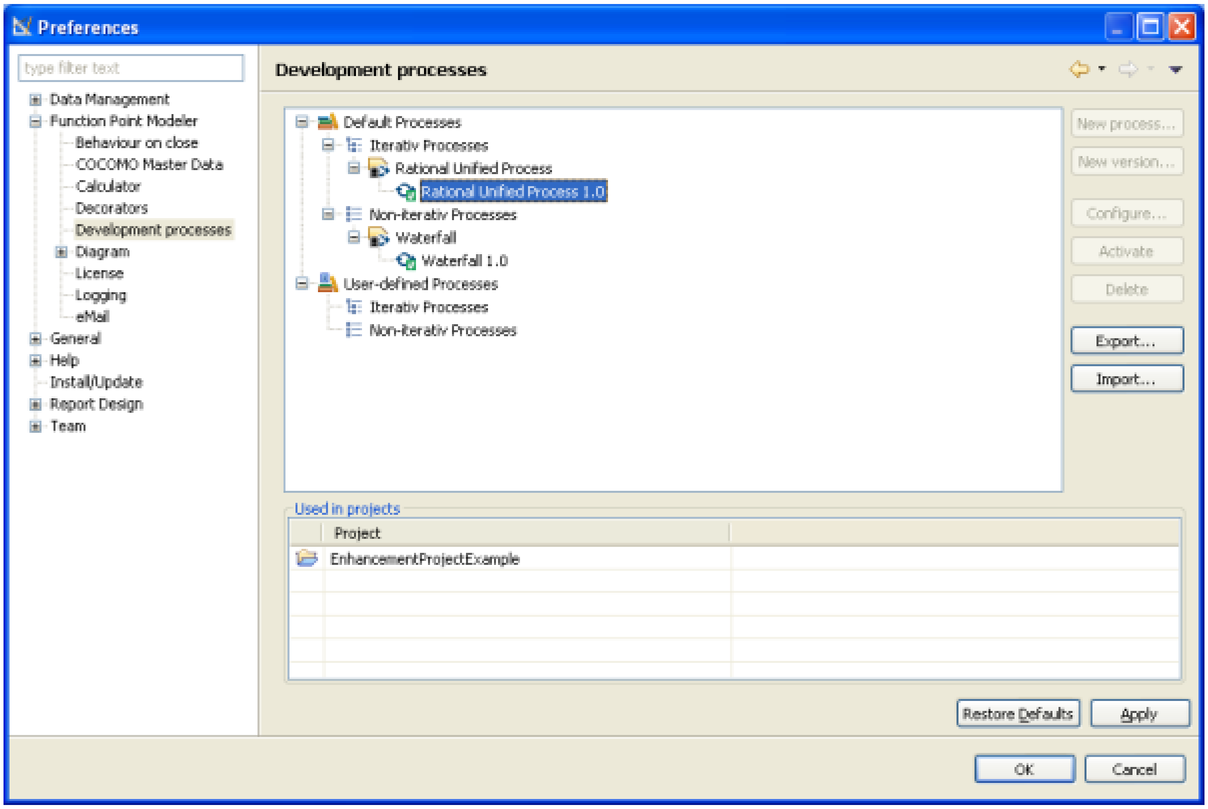


Name: New Unestimated Effort Reason

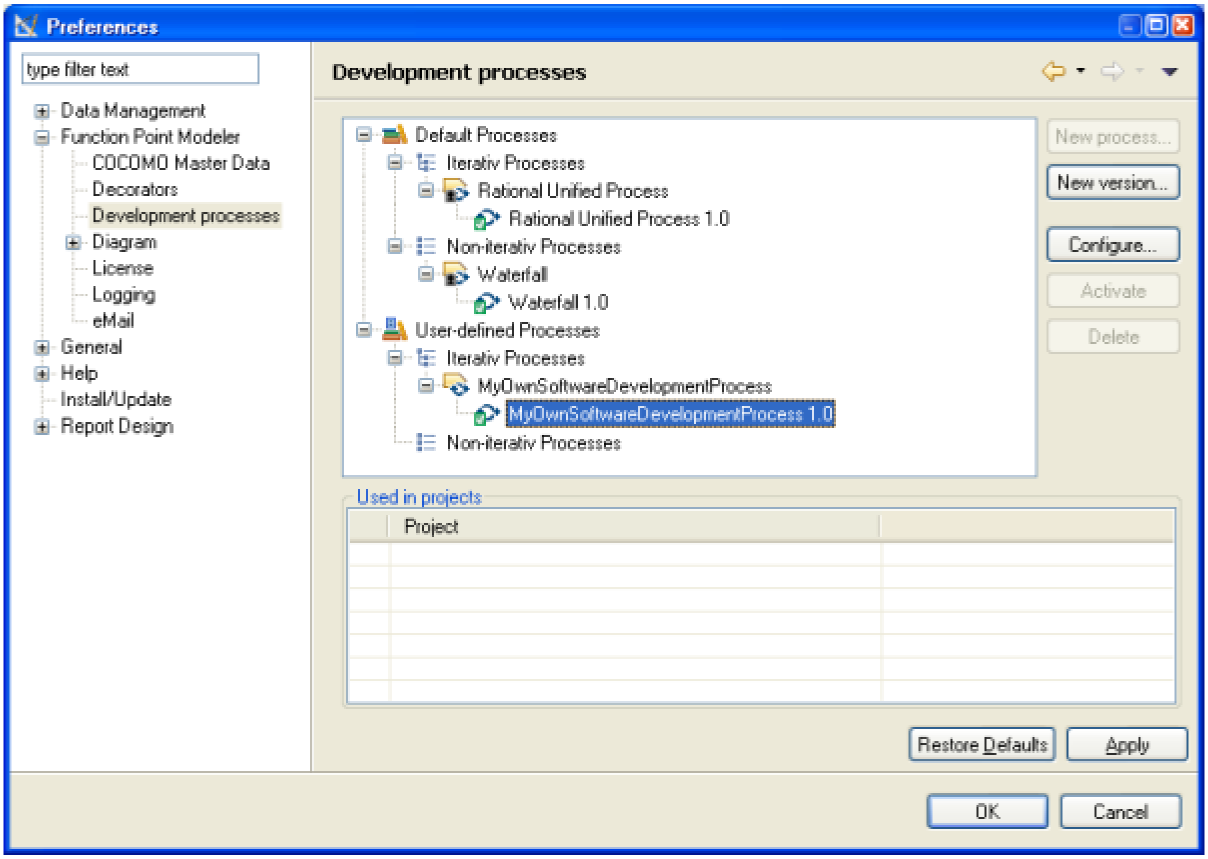
## Development Process

**Function Point Modeler Enterprise Edition** allows you to manage the software development process in your company.

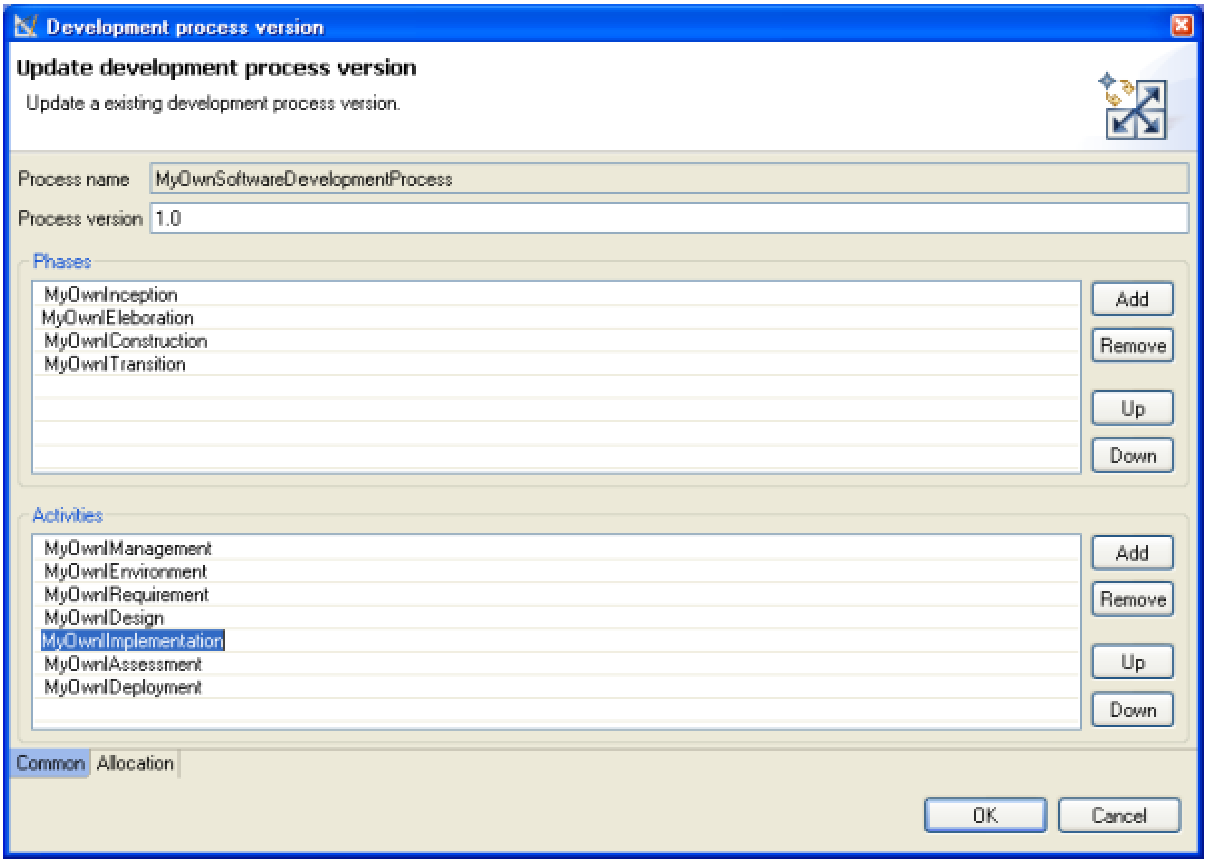
**Function Point Modeler Enterprise Edition** provides default Rational Unified Process **(RUP)** and Waterfall.



You may also create your own software development process specified for your company. The new created software development process must extend either the Rational Unified Process or Waterfall.



You can also define the phases and activities of this new software development process.



Update development process version

Update a existing development process version.

Process name MyOwnSoftwareDevelopmentProcess

Process version 1.0

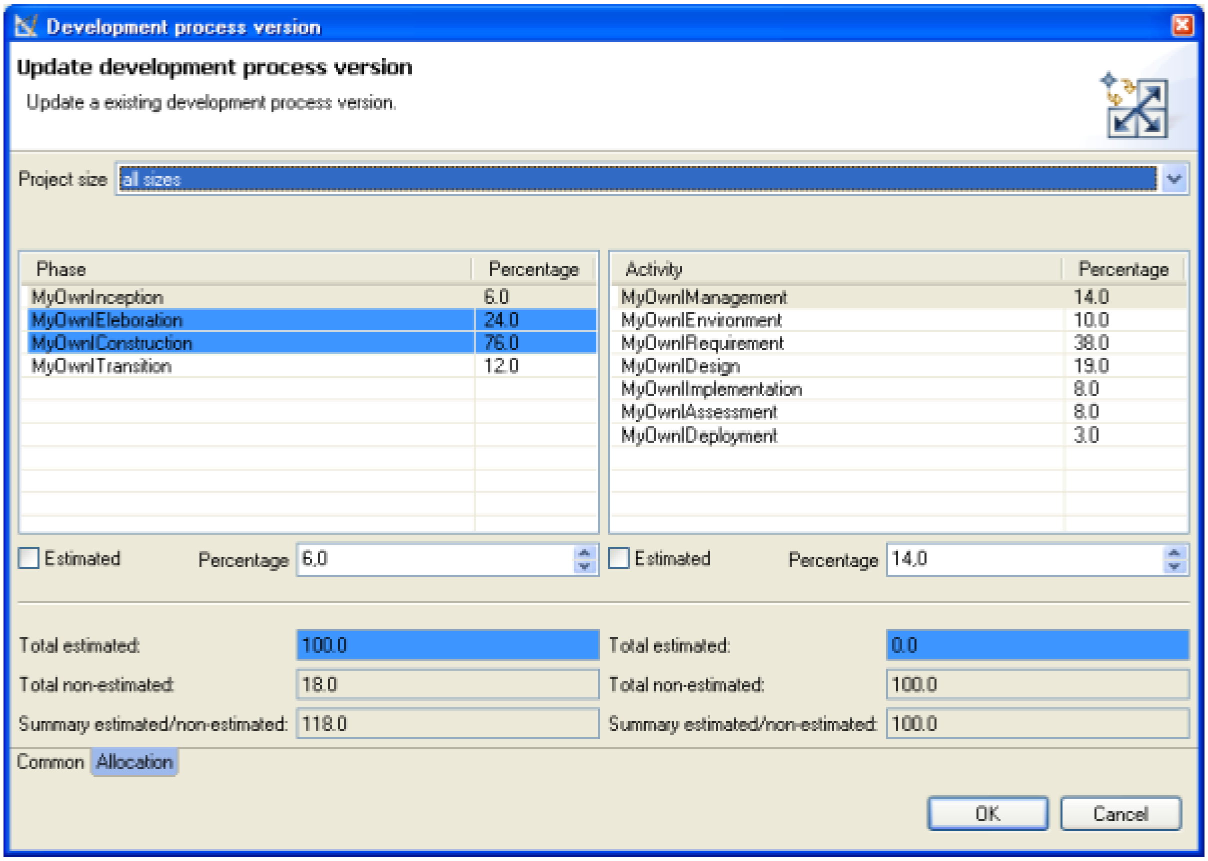
Phases

- MyOwnInception
- MyOwnEleboration
- MyOwnConstruction
- MyOwnTransition

Activities

- MyOwnManagement
- MyOwnEnvironment
- MyOwnRequirement
- MyOwnDesign
- MyOwnImplementation
- MyOwnAssessment
- MyOwnDeployment

You can also change the estimation distribution for each phase or activity.



Development process version

**Update development process version**

Update a existing development process version.

Project size: all sizes

| Phase | Percentage |
|---|---|
| MyOwnInception | 6.0 |
| MyOwnEleboration | 24.0 |
| MyOwnConstruction | 76.0 |
| MyOwnTransition | 12.0 |

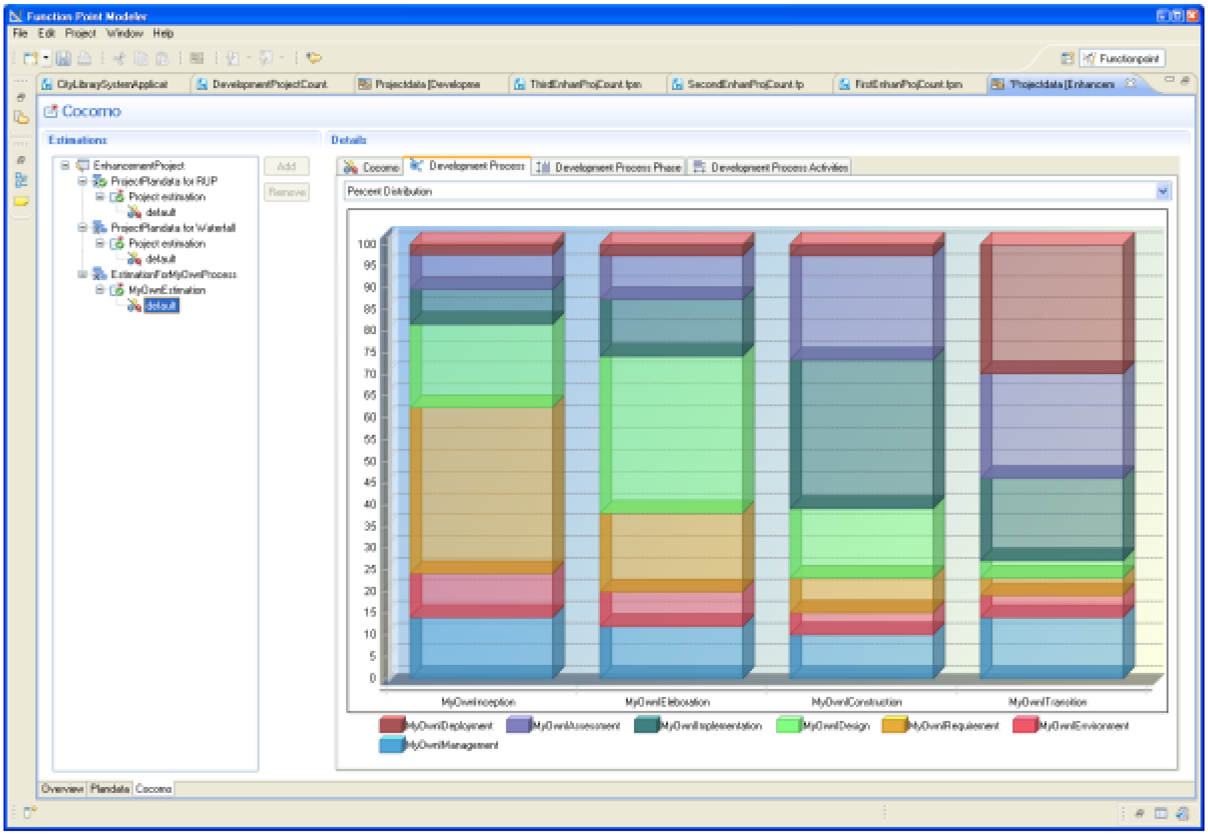
| Activity | Percentage |
|---|---|
| MyOwnManagement | 14.0 |
| MyOwnEnvironment | 10.0 |
| MyOwnRequirement | 38.0 |
| MyOwnDesign | 19.0 |
| MyOwnImplementation | 8.0 |
| MyOwnAssessment | 8.0 |
| MyOwnDeployment | 3.0 |

□ Estimated Percentage 6,0

□ Estimated Percentage 14,0

| | | | |
|---|---|---|---|
| Total estimated: | 100.0 | Total estimated: | 0.0 |
| Total non-estimated: | 18.0 | Total non-estimated: | 100.0 |
| Summary estimated/non-estimated: | 118.0 | Summary estimated/non-estimated: | 100.0 |

The estimation is now distributed based on the new defined software development process.



## Diagram Customization

**Function Point Modeler** allows you to customize the appearance and behavior of digrams in many ways. It is possible, to set the following settings to your own needs and desires:

- Global Settings
- Diagram Appearance
- Connection Styles
- Copy/Paste Behaviour
- Diagram Layout Style
- Diagram Pathmaps
- Diagram Printing Options
- Rulers and Grid Settings

For some of these settings, it is necessary to close an already opened diagram editor and reopen it. An example are the setting for the layout style. This works only if an editor is reopened.

## Product License

**Function Point Modeler** is available in two different versions.

The Standard Edition of **Function Point Modeler** ist free, i.e. it can be used for all personal and business purposes without restrictions. This version enables accurate development project counting, enhancement project counting and application counting using IFPUG 4.2 and 4.3 function point analysis. The Enterprise Edition differs from Standard Edition in that it includes a Software Life Cycle Experience Database (SLED) and supports UML Export / Import and many other useful features.

To get the full extent of the Enterprise Edition a registration is required, see also *www.functionpointmodeler.com* .

After successful registration you will receive a license key, with which you can unlock the full range of features in Enterprise Edition.

## Understand Project Logging

**Function Point Modeler** offers a special view, which allows you to analyze and to consider the internal workings of the application. Internally, **the Function Point Modeler** makes use of the famous logging framework *Log4J* . You can analyze the messages, which will be created by this framework, in a simple manner with the help of the provided view.

# Tasks

## Working with Diagram Elements

You can perform the following tasks to use **Working with Diagram Elements** .

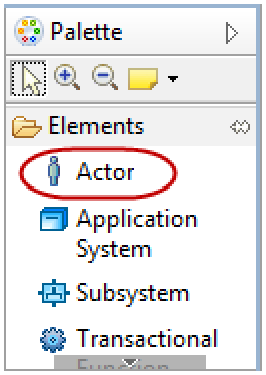
### Actor

You can perform the following tasks to use **Actor** .

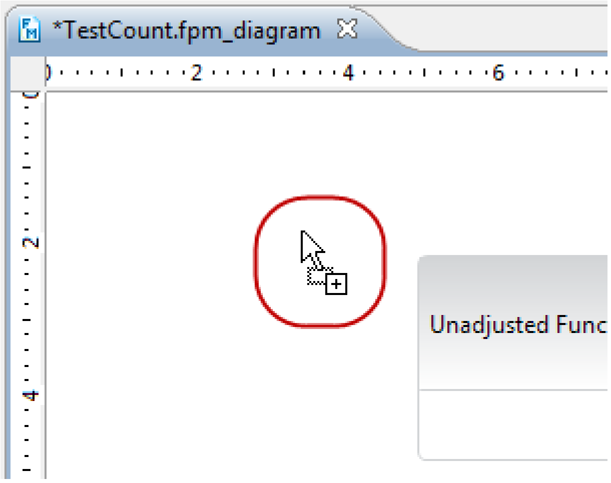
### Create a new Actor

To create a new **Actor** in a Count, perform the following steps.

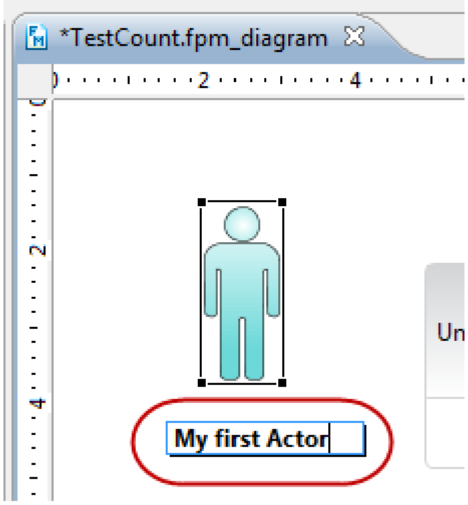
1. Click on the **Actor** entry in the editor palette.



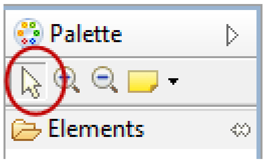
2. Move your mouse pointer to a free area in the editor and perform a mouse click. Please keep in mind, you can not place an **Actor** element as part of another diagram element. The mouse pointer will show you, if an insert action on the given diagram position is possible.



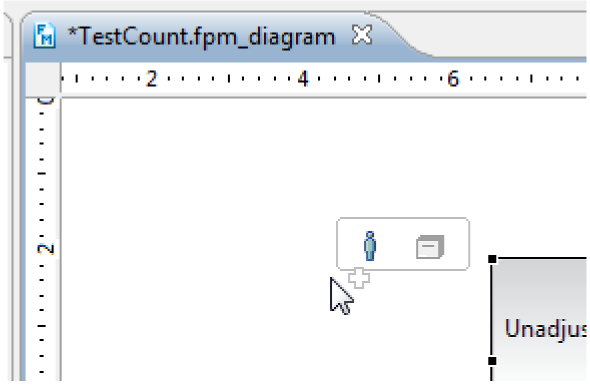
3. Enter a name for your new **Actor** element.



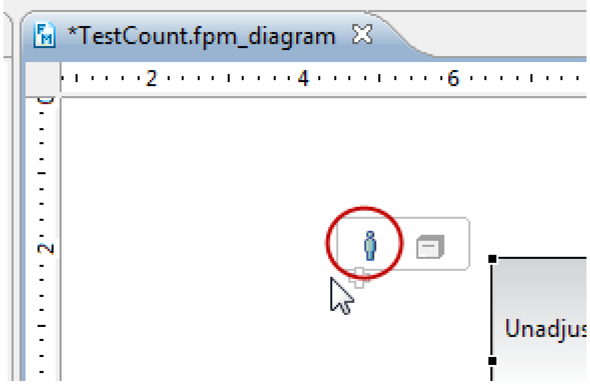
4. An alternative way to create a new **Actor** features the diagram editor select mode.



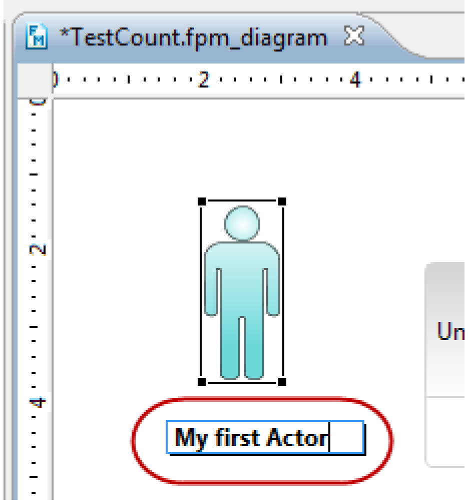
5. Move your mouse pointer to a free area in the editor. Please keep in mind, you can not place an **Actor** element as part of another diagram element. A popup window will be displayed.



6. Click on the **Actor** element



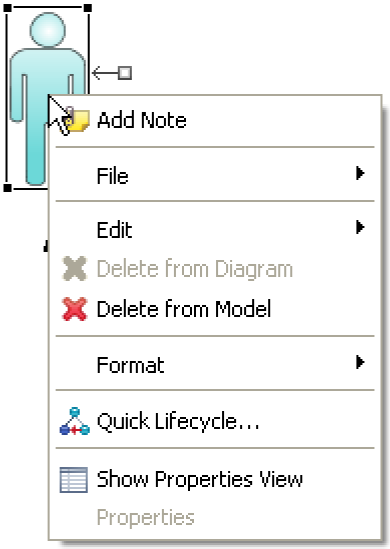
7. Enter a name for your new **Actor** element.



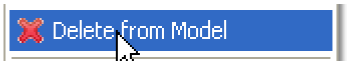
### Delete an existing Actor

To delete an existing **Actor** in a Count, perform the following steps.

1. Move your mouse pointer to an **Actor** element in the editor area and perform a right mouse click.

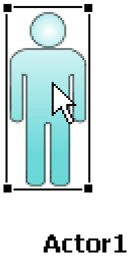


**2.** Select the menu item **Delete from model** .



**3.** An alternative way to delete an existing **Actor** is described in the following steps.

**4.** Move your mouse pointer to an **Actor** element in the diagram editor and perform a mouse click to select this element.



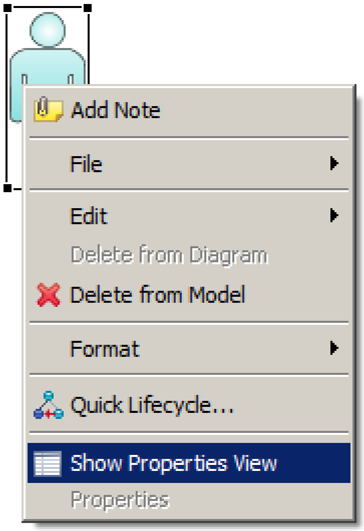
**5.** Press **DEL** on your keyboard.

### Change Actor Properties

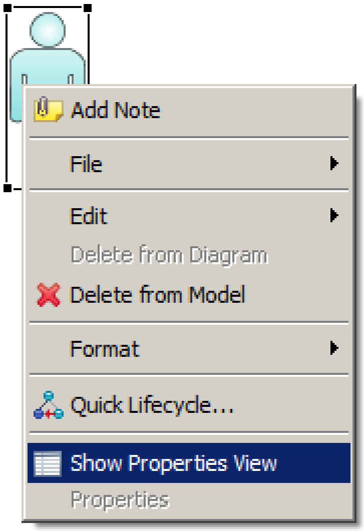
After you create an **Actor** , you can edit its various properties, such as its name, etc.

To change the properties of **Actor** , perform the following steps.

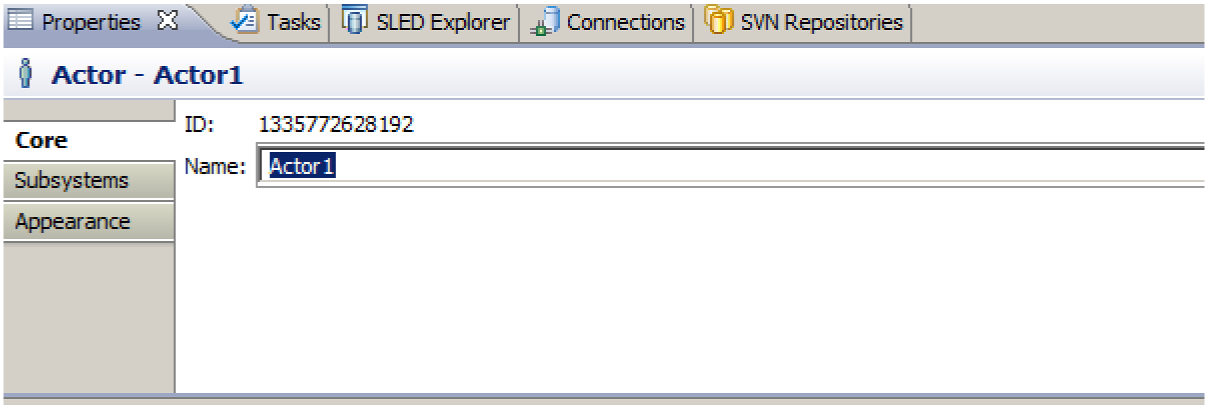
**1.** Move your mouse pointer to an **Actor** element in the editor area and perform a right mouse click.



2. Select the menu item **Show Properties View** .



3. The following **Properties View** will be showed. .

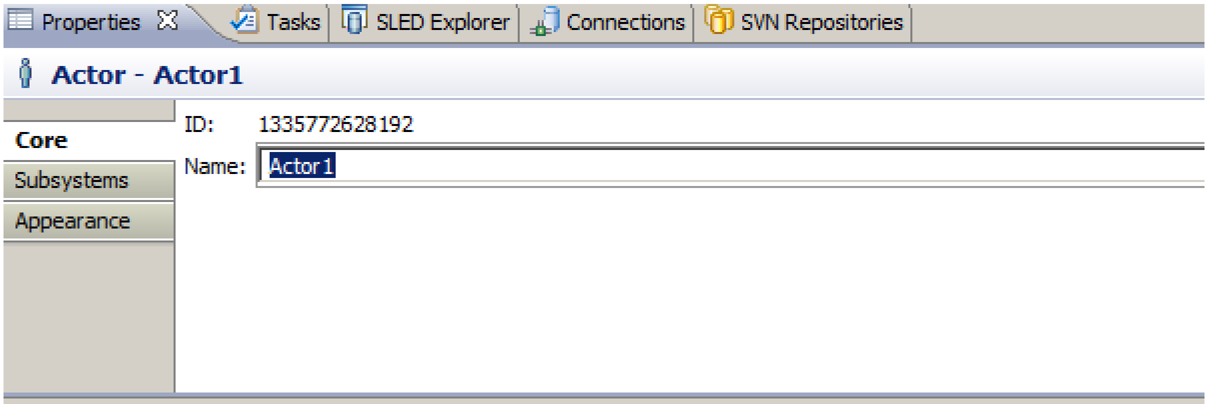


Actor - Actor1

ID: 1335772628192

Name: Actor1

4. Enter a name for your Actor element.

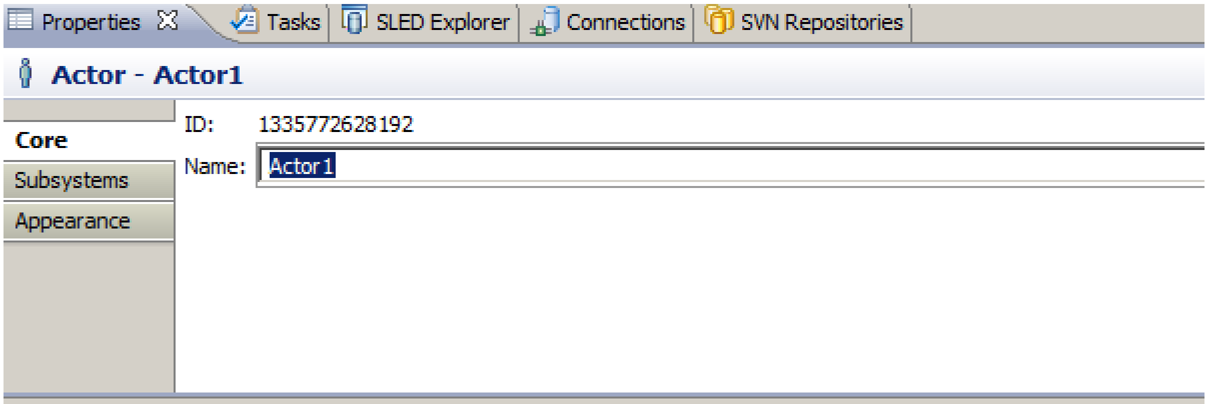


Actor - Actor1

ID: 1335772628192

Name: Actor1

5. Click Enter to change the properties.



Actor - Actor1

ID: 1335772628192

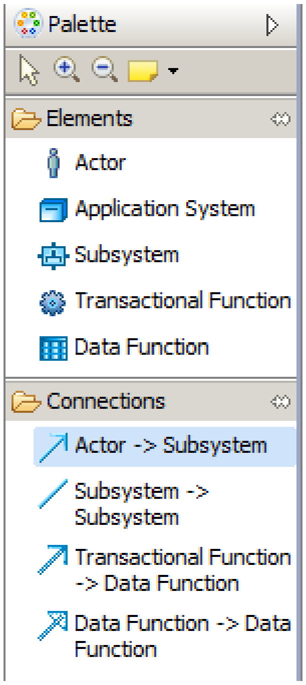
Name: Actor1

### Create or Modify an Actor Relation

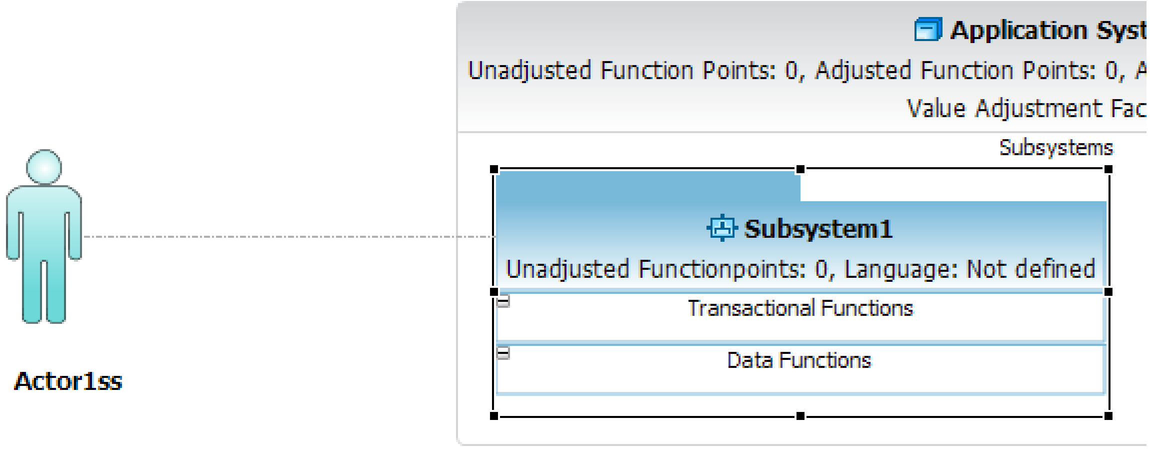
The palette of a graphical editor provides tools to create connections in the diagram. There are different types of connections available in the palette:

This tool lets the user create a connection between Actors and Sub System by starting the connection on a source object (Actor) dropping it on a target object (Sub System)s.

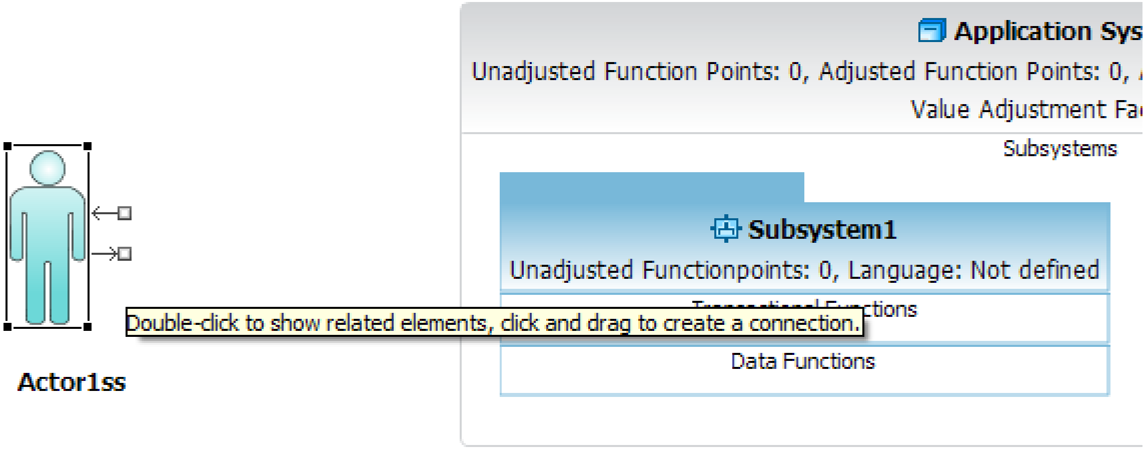
1. Click on the **Actor -> Subsystem** entry in the editor palette.



2. Move your mouse pointer to an **Actor** in the editor and perform a mouse click and drag and drop the connection from the **Actor** to target **Sub System** .


Application Syst
Unadjusted Function Points: 0, Adjusted Function Points: 0, A
Value Adjustment Fac
Subsystems
Subsystem1
Unadjusted Functionpoints: 0, Language: Not defined
Transactional Functions
Data Functions
Actor1ss

3. An alternative way to create a connection is described in the following steps.
4. Move your mouse pointer to an **Actor** in the editor. A popup window will be displayed. Click on the out going arrow and drag and drop the connection from the **Actor** to target **Sub System** .


Application Sys
Unadjusted Function Points: 0, Adjusted Function Points: 0,
Value Adjustment Fa
Subsystems
Subsystem1
Unadjusted Functionpoints: 0, Language: Not defined
Transactional Functions
Data Functions
Double-click to show related elements, click and drag to create a connection.
Actor1ss

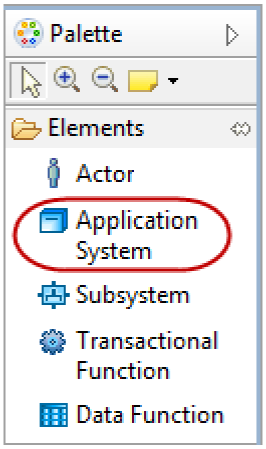
### Application System

You can perform the following tasks to use **Application System** .

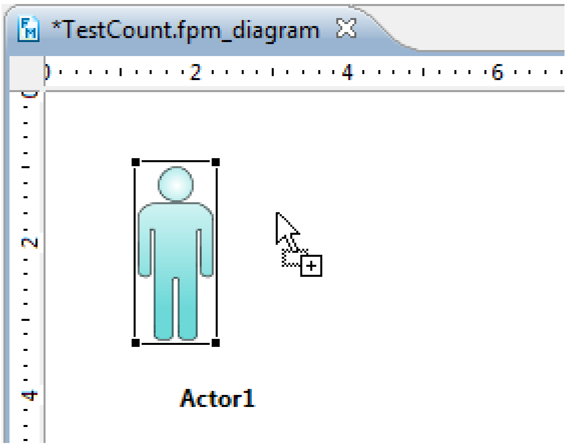
### Create a new Application System

To create a new Application System in a Count, perform the following steps.

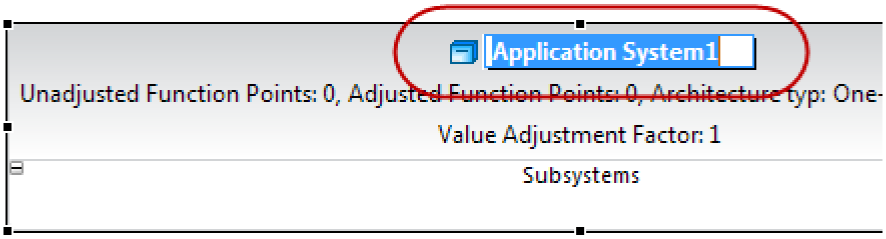
1. Click on the **Application System** entry in the editor palette.



2. Move your mouse pointer to a free area in the editor and perform a mouse click. Please keep in mind, you can not place a Application System element as part of another diagram element. The mouse pointer will show you, if an insert action on the given diagram position is possible.



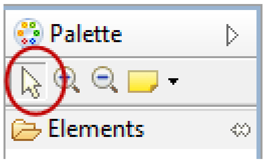
3. Enter a name for your new Application System element.


Application System1

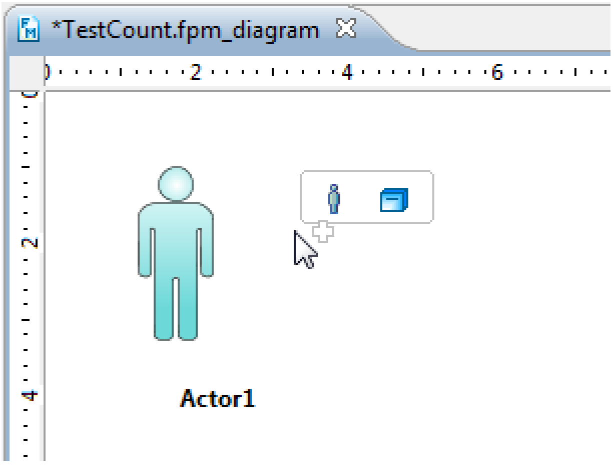
Unadjusted Function Points: 0, Adjusted Function Points: 0, Architecture typ: One-

Value Adjustment Factor: 1

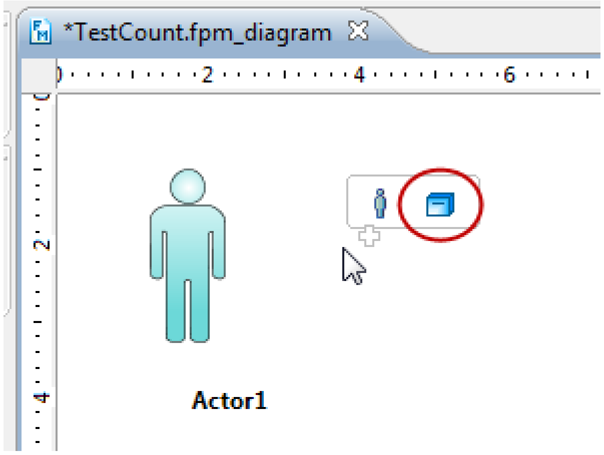
4. An alternative way to create a new Application System features the diagram editor select mode.



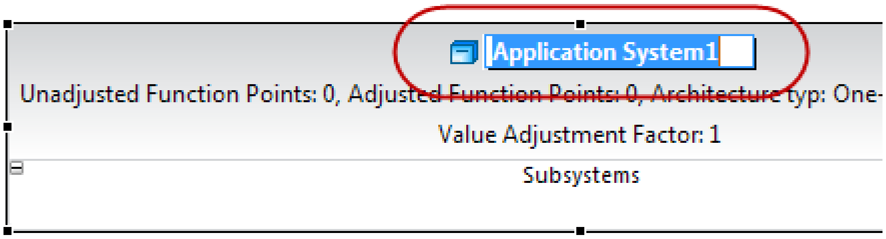
5. Move your mouse pointer to a free area in the editor. Please keep in mind, you can not place a Application System element as part of another diagram element. A popup window will be displayed.



6. Click on the Application System element



7. Enter a name for your new Application System element.


Application System1

Unadjusted Function Points: 0, Adjusted Function Points: 0, Architecture typ: One-

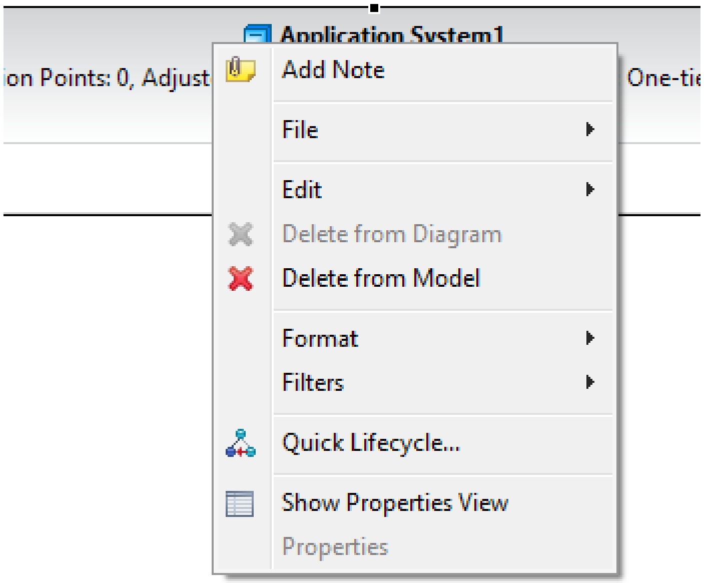
Value Adjustment Factor: 1

Subsystems

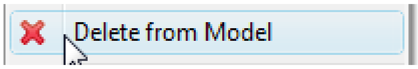
### Delete an existing Application System

To delete an existing **Application System** in a Count, perform the following steps.

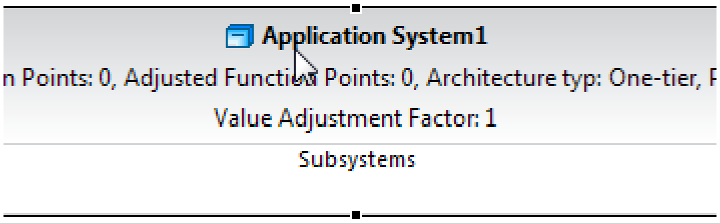
1. Move your mouse pointer to an **Application System** element in the editor area and perform a right mouse click.



2. Select the menu item **Delete from model** .



3. An alternative way to delete an existing **Application System** is described in the following steps.
4. Move your mouse pointer to an **Application System** element in the diagram editor and perform a mouse click to select this element.


Application System1
n Points: 0, Adjusted Function Points: 0, Architecture typ: One-tier, P
Value Adjustment Factor: 1
Subsystems

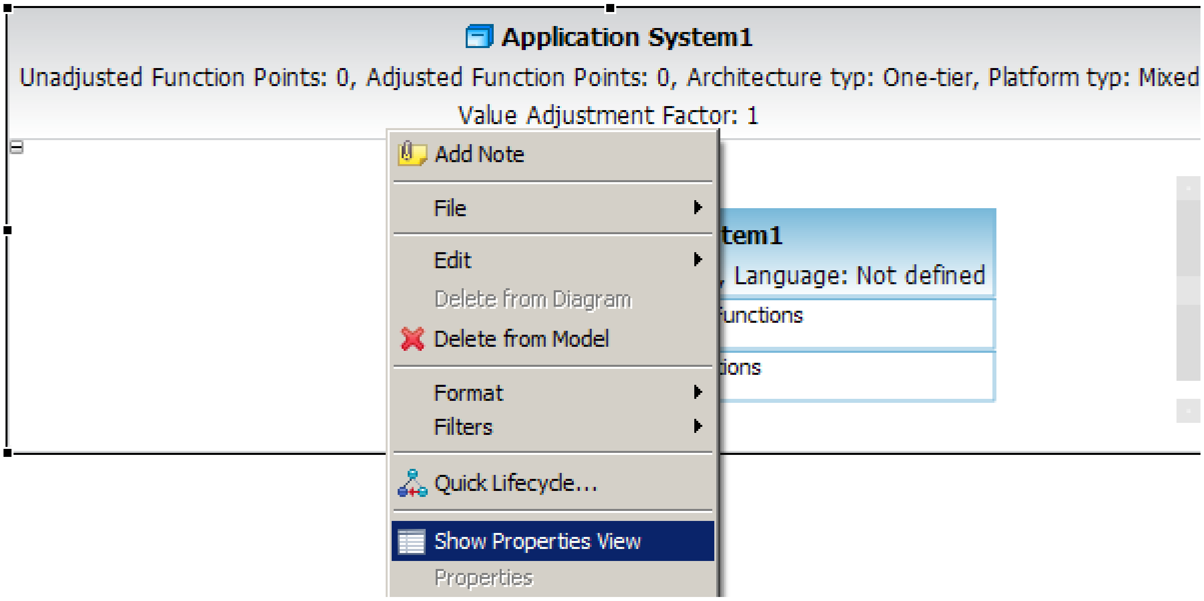
5. Press **DEL** on your keyboard.

### Change Application System Properties

After you create an **Application System** , you can edit its various properties, such as its name, platform type etc.

To change the properties of **Application System** , perform the following steps.

1. Move your mouse pointer to an **Application System** element in the editor area and perform a right mouse click.

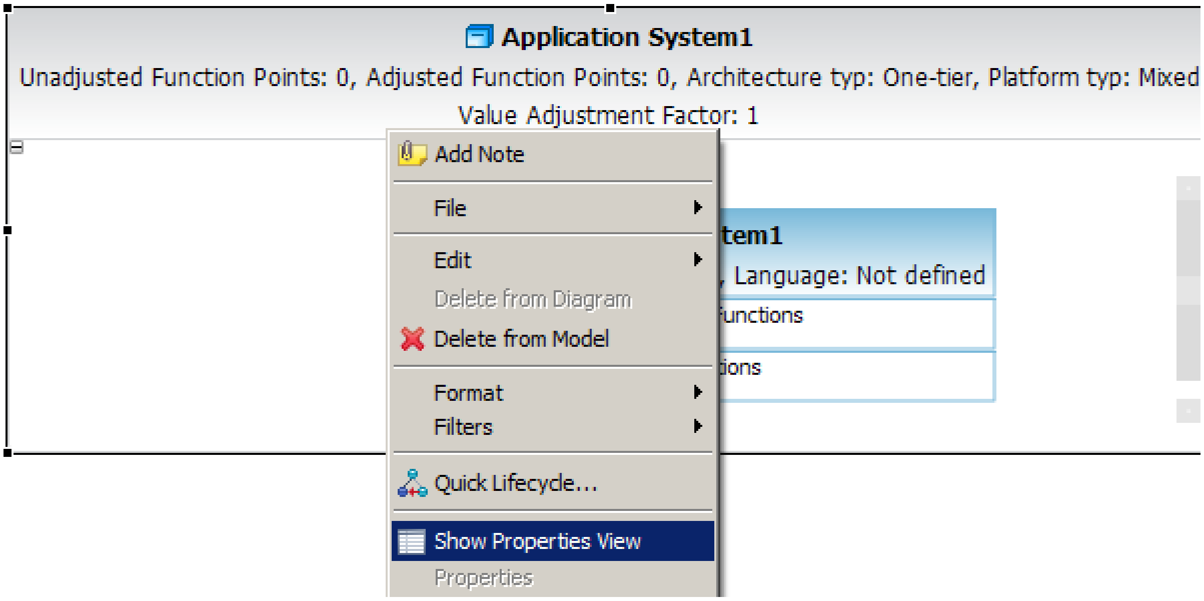


Application System1

Unadjusted Function Points: 0, Adjusted Function Points: 0, Architecture typ: One-tier, Platform typ: Mixed

Value Adjustment Factor: 1

2. Select the menu item **Show Properties View** .

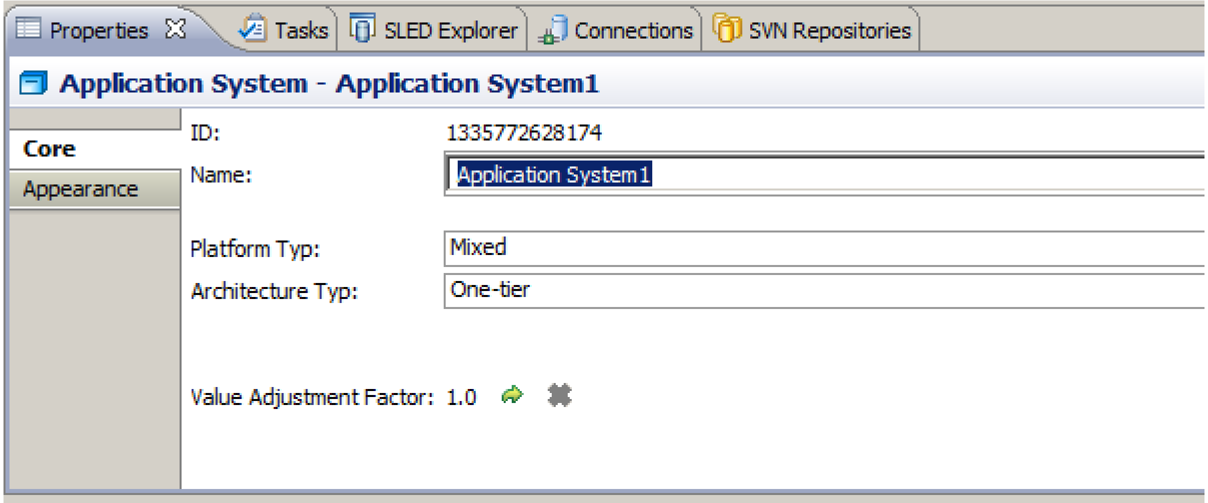


Application System1

Unadjusted Function Points: 0, Adjusted Function Points: 0, Architecture typ: One-tier, Platform typ: Mixed

Value Adjustment Factor: 1

3. The following **Properties View** will be showed. .



Application System - Application System1

ID: 1335772628174

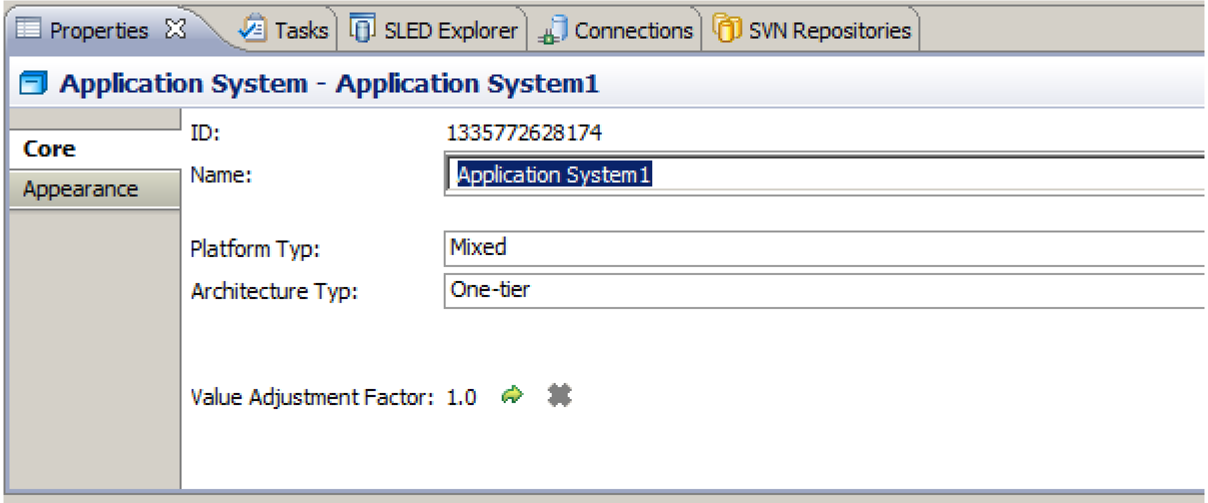
Name: Application System1

Platform Typ: Mixed

Architecture Typ: One-tier

Value Adjustment Factor: 1.0

4. Enter a name for your Application System element.



Application System - Application System1

ID: 1335772628174

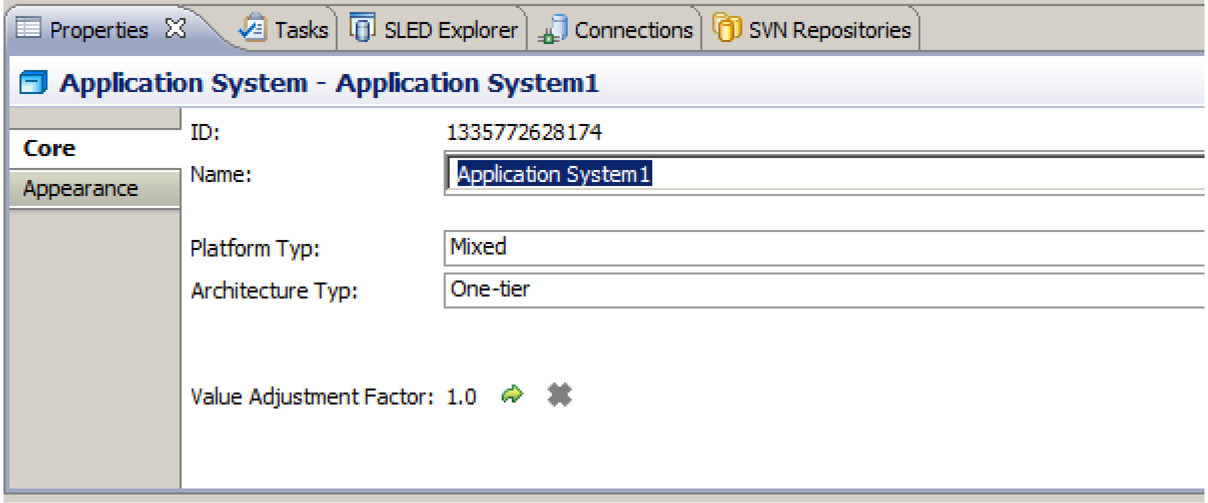
Name: Application System1

Platform Typ: Mixed

Architecture Typ: One-tier

Value Adjustment Factor: 1.0

5. Click Enter to change the properties.



Application System - Application System1

ID: 1335772628174

Name: Application System1

Platform Typ: Mixed

Architecture Typ: One-tier

Value Adjustment Factor: 1.0

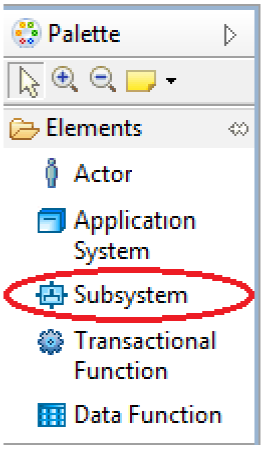
### Subsystem

You can perform the following tasks to use **Subsystem** .

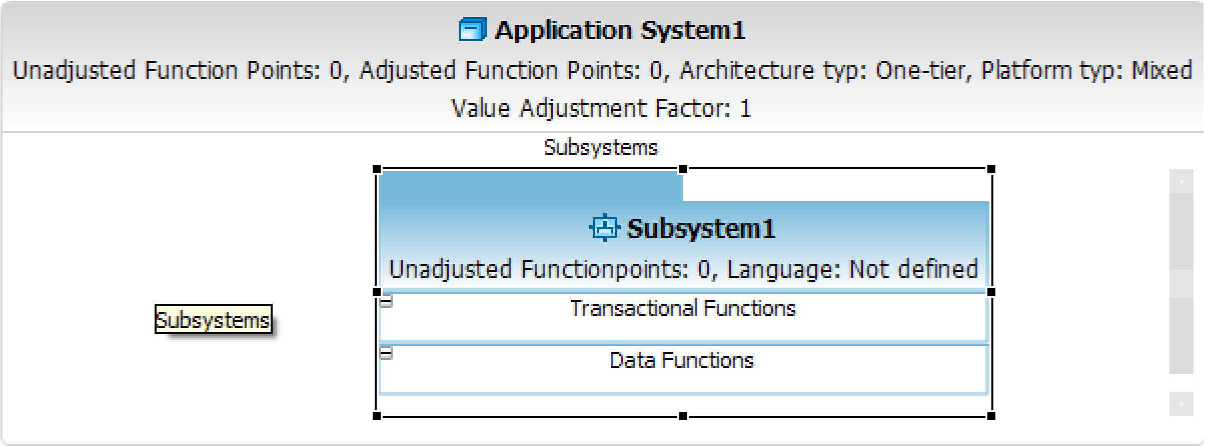
### Create a new Subsystem

To create a new Sub System in a Count, perform the following steps.

1. Click on the **Sub System** entry in the editor palette.



2. Move your mouse pointer to the Subsystem section of an Application System in the editor and perform a mouse click. Please keep in mind, you can place a Sub System element as part of Application System diagram element. The mouse pointer will show you, if an insert action on the given diagram position is possible.



Application System1

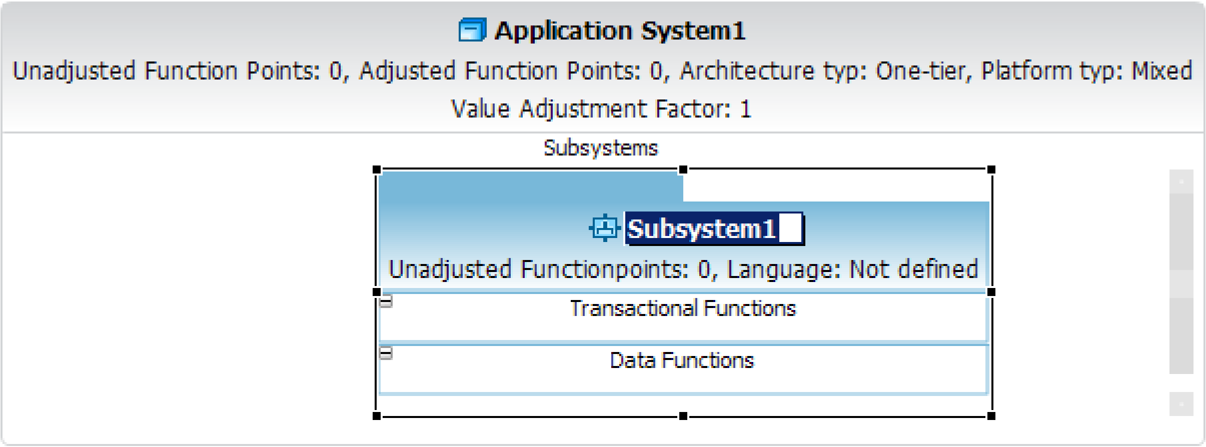
Unadjusted Function Points: 0, Adjusted Function Points: 0, Architecture typ: One-tier, Platform typ: Mixed

Value Adjustment Factor: 1

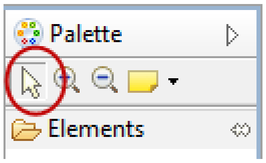
Subsystem1

Unadjusted Functionpoints: 0, Language: Not defined

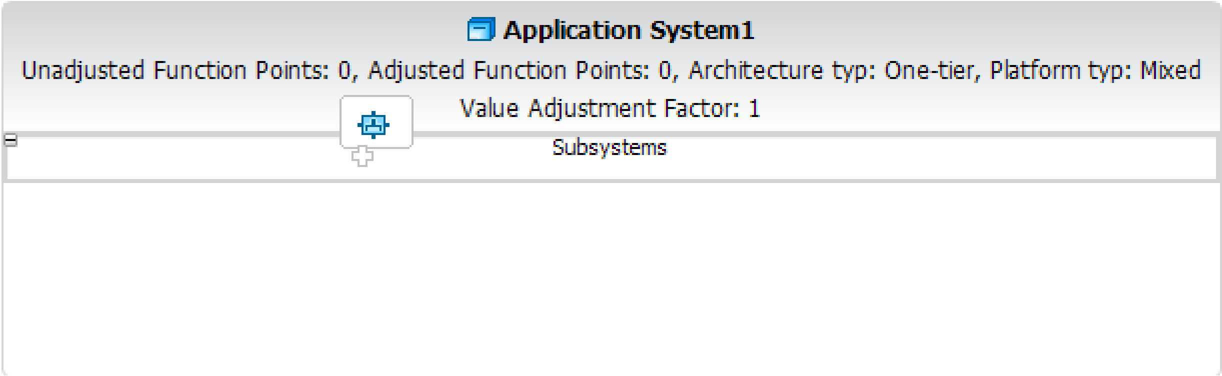
3. Enter a name for your new Sub System element.


Application System1
Unadjusted Function Points: 0, Adjusted Function Points: 0, Architecture typ: One-tier, Platform typ: Mixed
Value Adjustment Factor: 1
Subsystems
Subsystem1
Unadjusted Functionpoints: 0, Language: Not defined
Transactional Functions
Data Functions

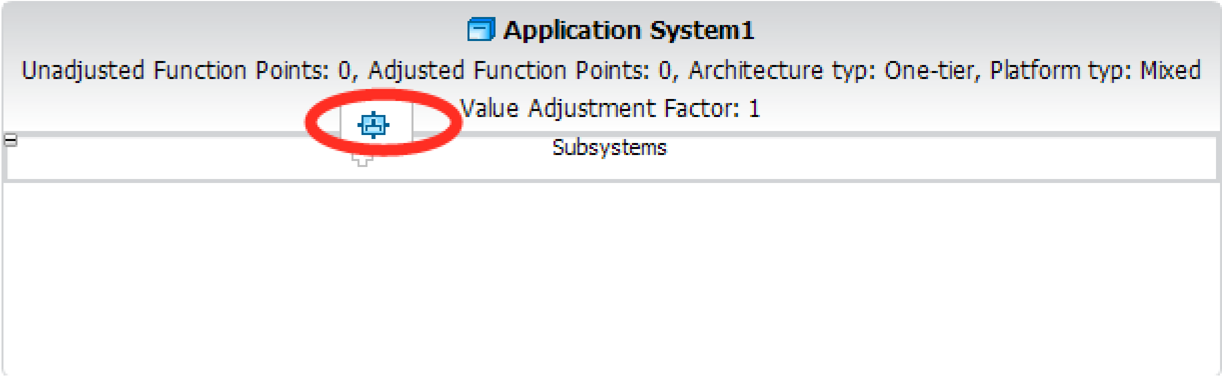
4. An alternative way to create a new Sub System features the diagram editor select mode.



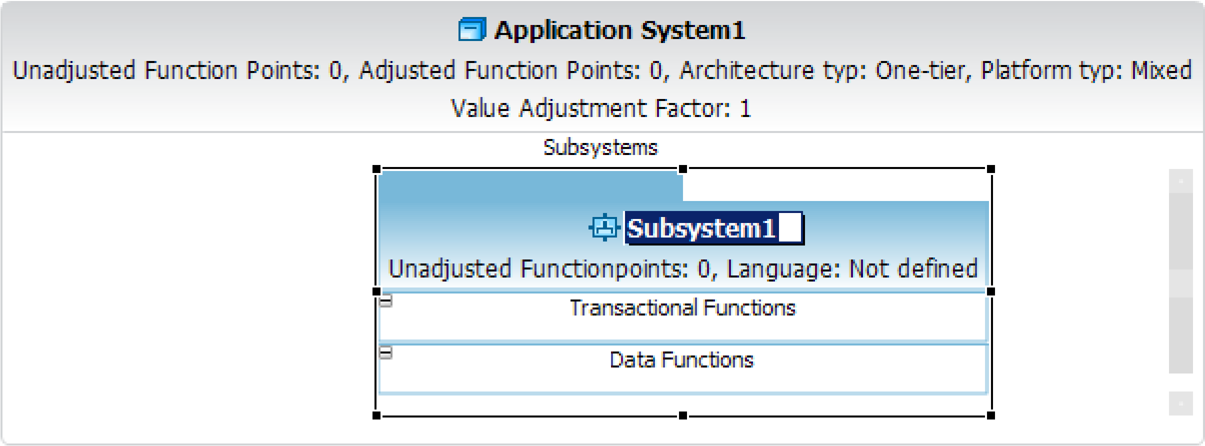
5. Move your mouse pointer to the Subsystem section of an Application System in the editor. Please keep in mind, you can place a Sub System element as part of Application System diagram element. A popup window will be displayed.


Application System1
Unadjusted Function Points: 0, Adjusted Function Points: 0, Architecture typ: One-tier, Platform typ: Mixed
Value Adjustment Factor: 1
Subsystems

6. Click on the Application System element


Application System1
Unadjusted Function Points: 0, Adjusted Function Points: 0, Architecture typ: One-tier, Platform typ: Mixed
Value Adjustment Factor: 1
Subsystems

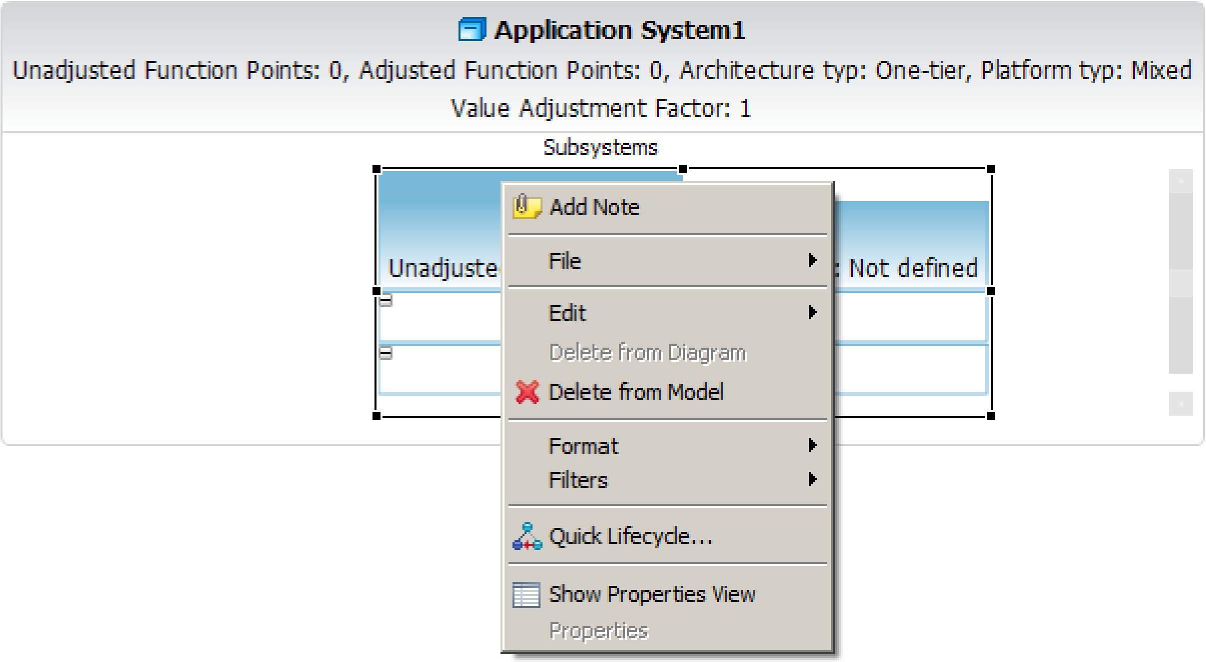
7. Enter a name for your new Sub System element.


Application System1
Unadjusted Function Points: 0, Adjusted Function Points: 0, Architecture typ: One-tier, Platform typ: Mixed
Value Adjustment Factor: 1
Subsystems
Subsystem1
Unadjusted Functionpoints: 0, Language: Not defined
Transactional Functions
Data Functions

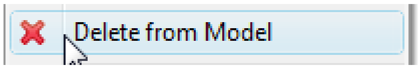
### Delete an existing Subsystem

To delete an existing **Sub System** in a Count, perform the following steps.

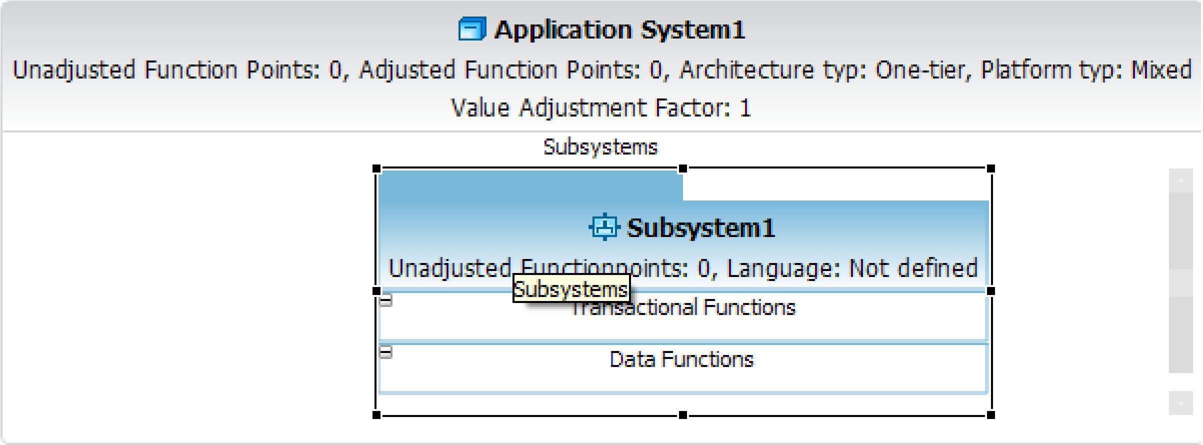
1. Move your mouse pointer to a **Sub System** element in the editor area and perform a right mouse click.



2. Select the menu item **Delete from model** .



3. An alternative way to delete an existing **Sub System** is described in the following steps.
4. Move your mouse pointer to a **Sub System** element in the diagram editor and perform a mouse click to select this element.


Application System1
Unadjusted Function Points: 0, Adjusted Function Points: 0, Architecture typ: One-tier, Platform typ: Mixed
Value Adjustment Factor: 1
Subsystems
Subsystem1
Unadjusted Functionpoints: 0, Language: Not defined
Subsystems
Transactional Functions
Data Functions

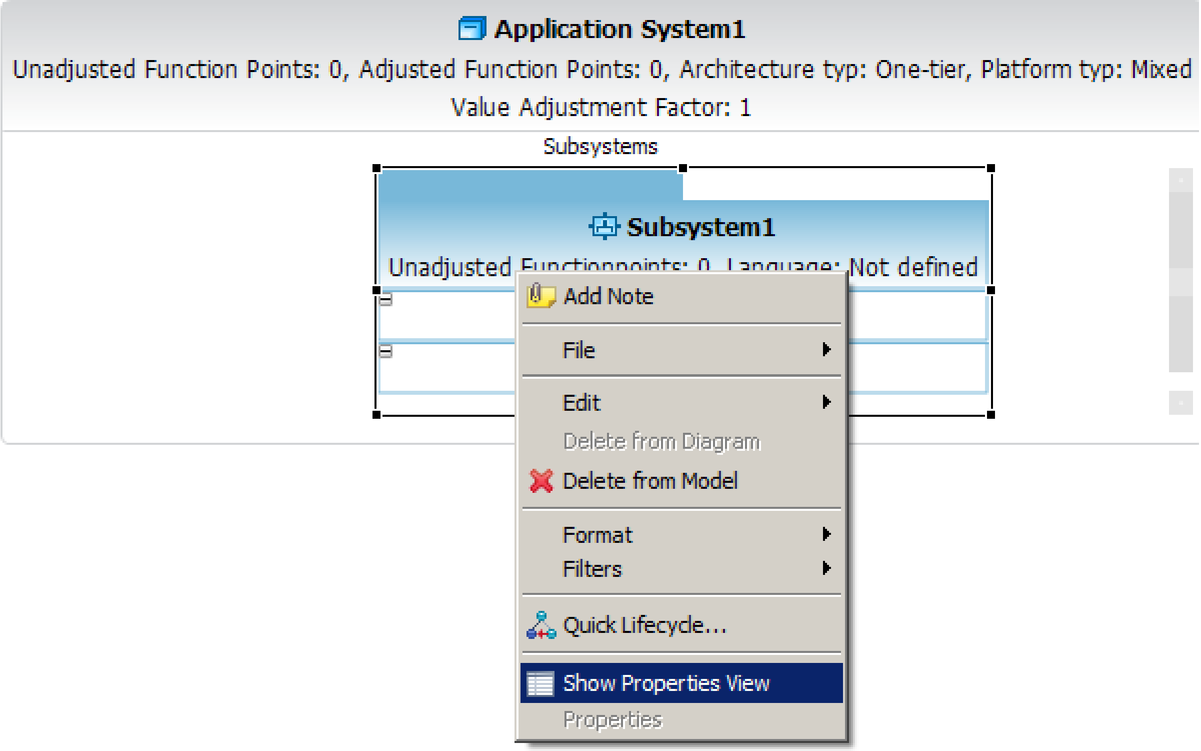
5. Press **DEL** on your keyboard.

### Change Subsystem Properties

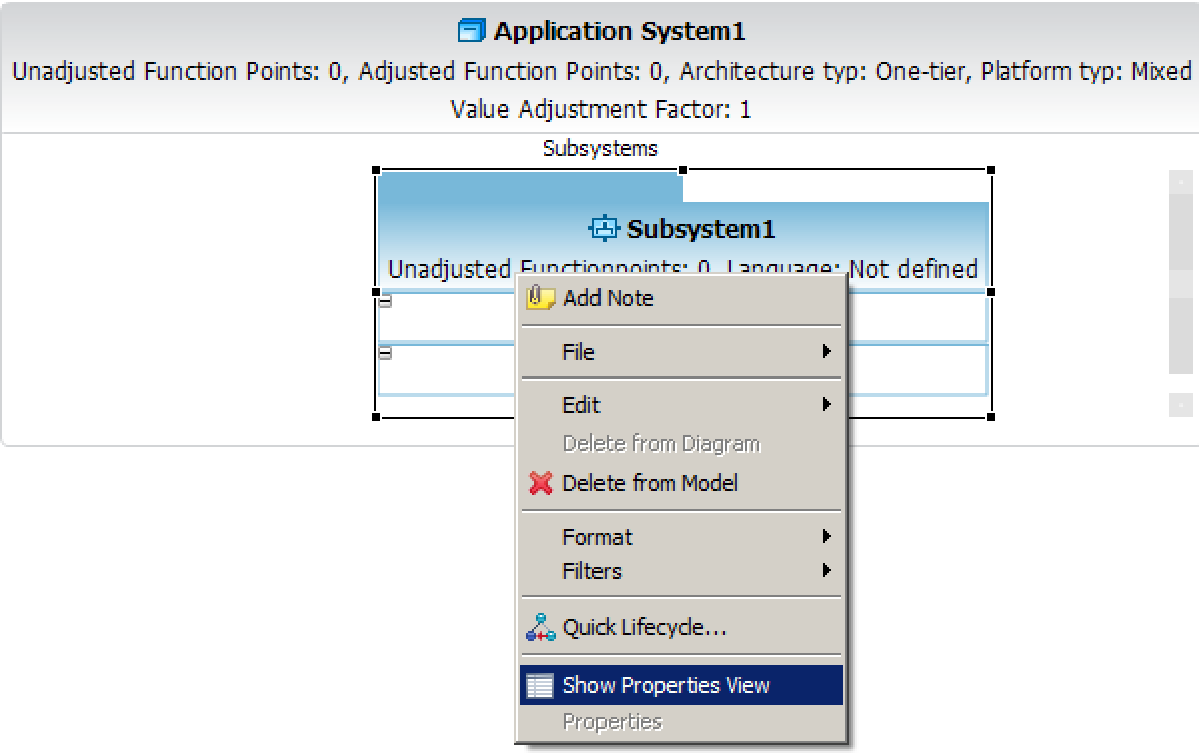
After you create a **Subsystem System** , you can edit its various properties, such as its name, platform type etc.

To change the properties of **Subsystem System** , perform the following steps.

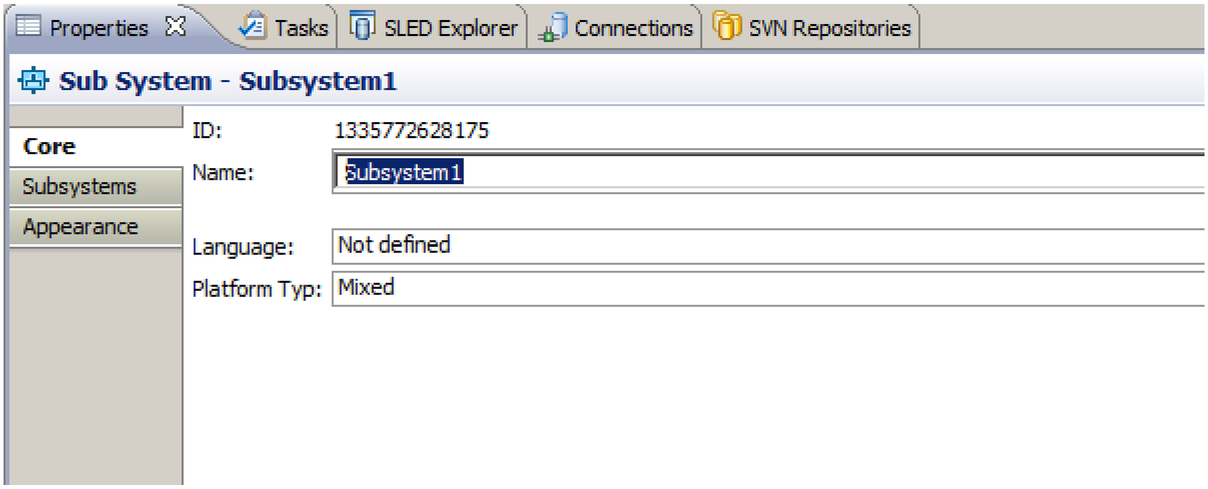
1. Move your mouse pointer to an **Subsystem System** element in the editor area and perform a right mouse click.


Application System1
Unadjusted Function Points: 0, Adjusted Function Points: 0, Architecture typ: One-tier, Platform typ: Mixed
Value Adjustment Factor: 1
Subsystems
Subsystem1
Unadjusted Functionpoints: 0, Language: Not defined
Add Note
File
Edit
Delete from Diagram
Delete from Model
Format
Filters
Quick Lifecycle...
Show Properties View
Properties

2. Select the menu item **Show Properties View** .


Application System1
Unadjusted Function Points: 0, Adjusted Function Points: 0, Architecture typ: One-tier, Platform typ: Mixed
Value Adjustment Factor: 1
Subsystems
Subsystem1
Unadjusted Functionpoints: 0, Language: Not defined
Add Note
File
Edit
Delete from Diagram
Delete from Model
Format
Filters
Quick Lifecycle...
Show Properties View
Properties

3. The following **Properties View** will be showed.



Sub System - Subsystem1

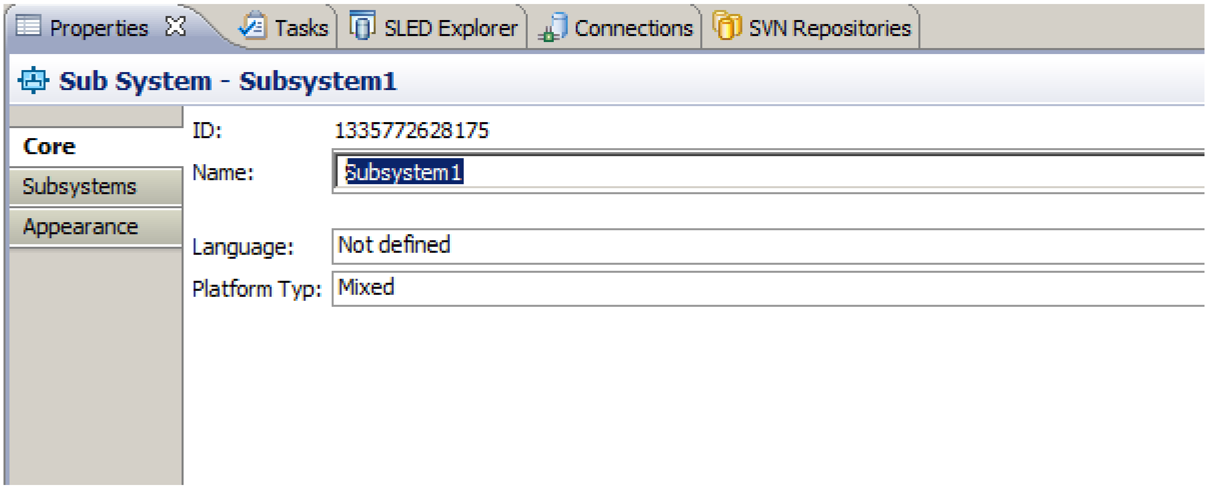
ID: 1335772628175

Name: Subsystem1

Language: Not defined

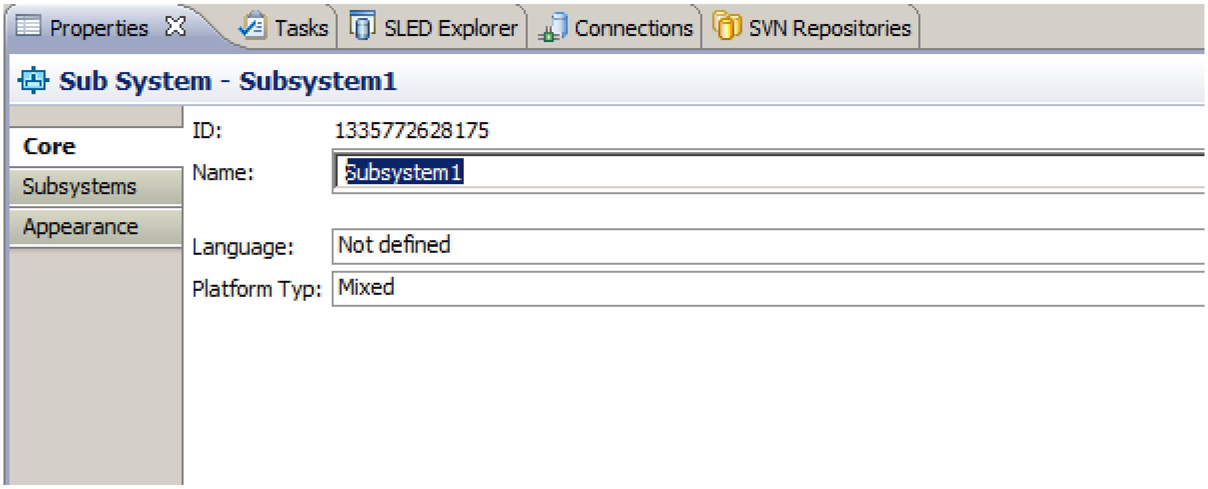
Platform Typ: Mixed

4. Enter a name for your Sub System element.



ID: 1335772628175
Name: Subsystem1
Language: Not defined
Platform Typ: Mixed

5. Click Enter to change the properties.



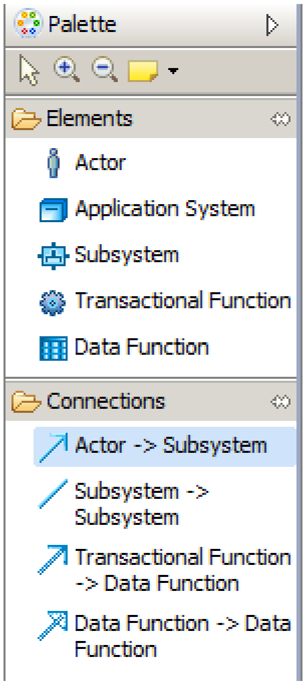
ID: 1335772628175
Name: Subsystem1
Language: Not defined
Platform Typ: Mixed

### Create or Modify a Subsystem Relation

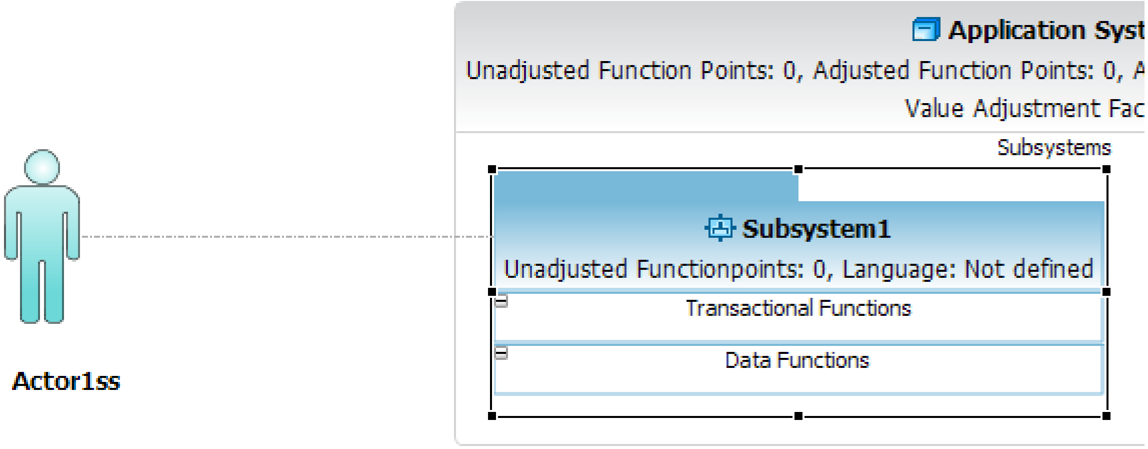
The palette of a graphical editor provides tools to create connections in the diagram. There are different types of connections available in the palette:

This tool lets the user create a connection between Actors and Sub System by starting the connection on a source object (Actor) dropping it on a target object (Sub System).

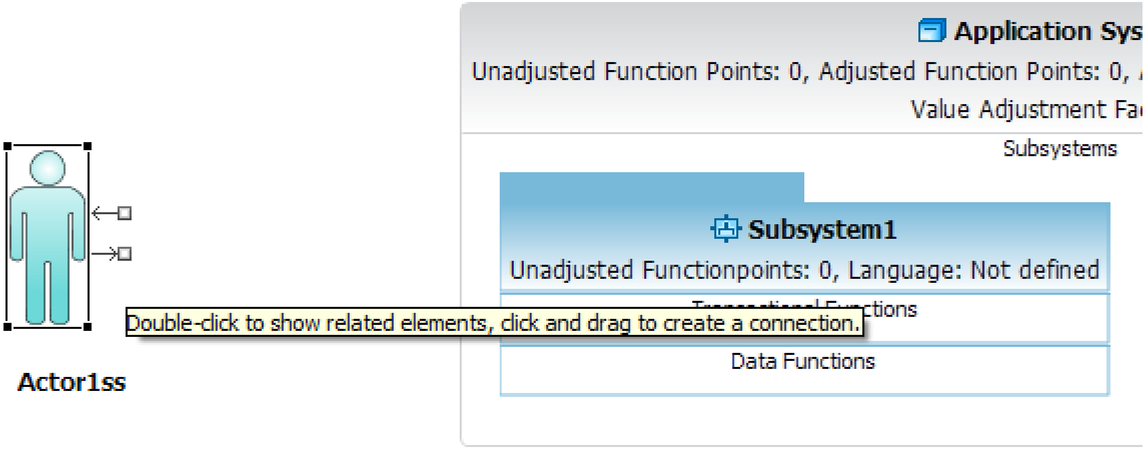
1. Click on the **Actor -> Subsystem** entry in the editor palette.



2. Move your mouse pointer to an **Actor** in the editor and perform a mouse click and drag and drop the connection from the **Actor** to target **Sub System** .


Application Syst
Unadjusted Function Points: 0, Adjusted Function Points: 0, A
Value Adjustment Fac
Subsystems
Subsystem1
Unadjusted Functionpoints: 0, Language: Not defined
Transactional Functions
Data Functions
Actor1ss

3. An alternative way to create a connection is described in the following steps.
4. Move your mouse pointer to an **Actor** in the editor. A popup window will be displayed. Click on the out going arrow and drag and drop the connection from the **Actor** to target **Sub System** .



Unadjusted Function Points: 0, Adjusted Function Points: 0, /

Value Adjustment Fa

Unadjusted Functionpoints: 0, Language: Not defined

Double-click to show related elements, click and drag to create a connection.

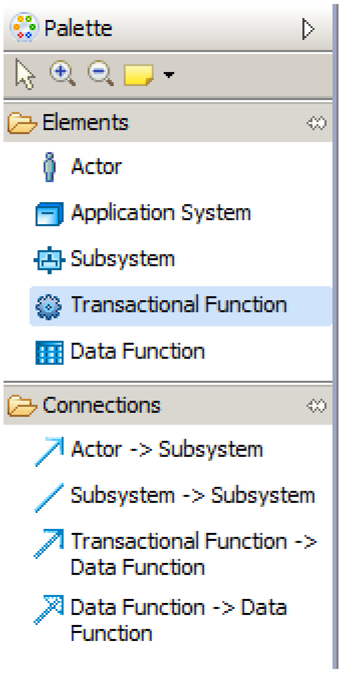
### Transactional Function

You can perform the following tasks to use **Transactional Function** .

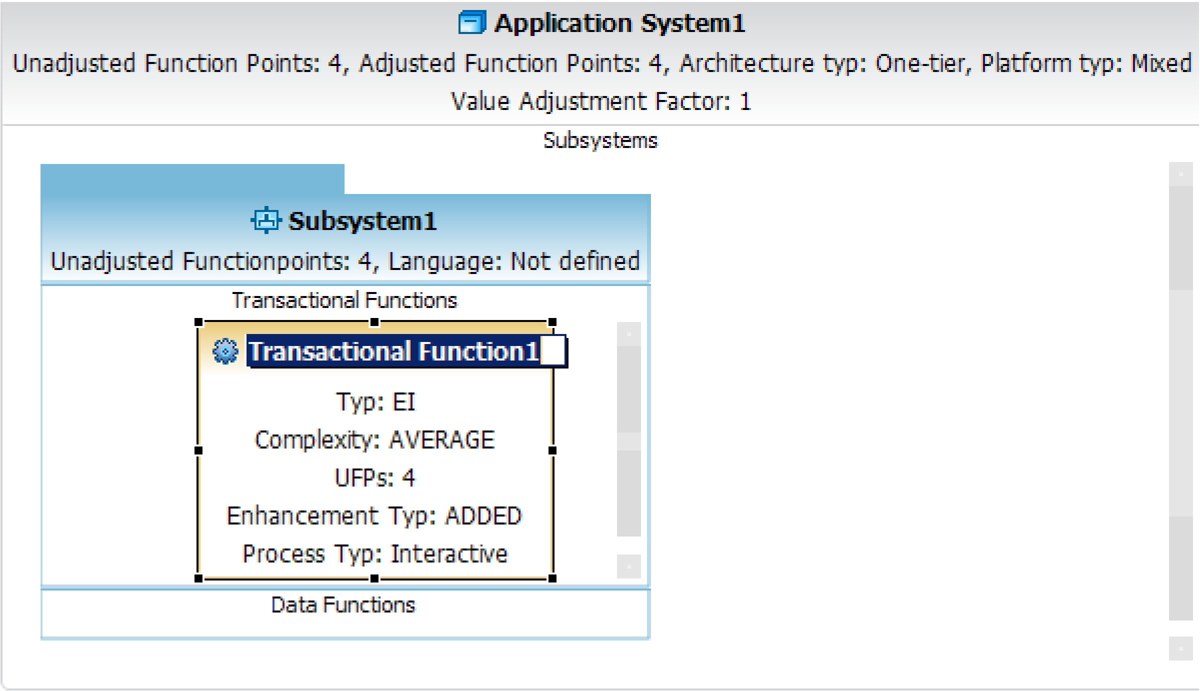
### Create a new Transactional Function

To create a new Transactional Function in a Count, perform the following steps.

1. Click on the **Transactional Function** entry in the editor palette.



2. Move your mouse pointer to the Transactional Functions section of an Sub System in the editor and perform a mouse click. The mouse pointer will show you, if an insert action on the given diagram position is possible.



Application System1

Unadjusted Function Points: 4, Adjusted Function Points: 4, Architecture typ: One-tier, Platform typ: Mixed

Value Adjustment Factor: 1

Subsystems

Subsystem1

Unadjusted Functionpoints: 4, Language: Not defined

Transactional Functions

Transactional Function1

Typ: EI

Complexity: AVERAGE

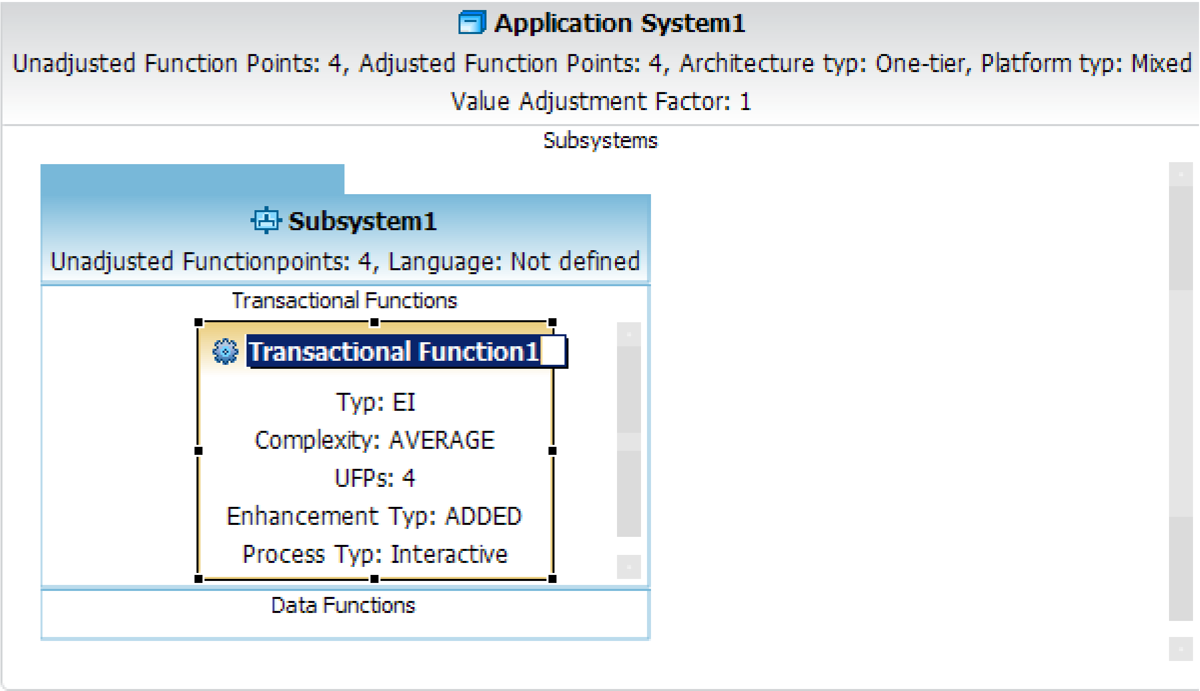
UFPs: 4

Enhancement Typ: ADDED

Process Typ: Interactive

Data Functions

**3.** Enter a name for your new Transactional Function element.



Application System1

Unadjusted Function Points: 4, Adjusted Function Points: 4, Architecture typ: One-tier, Platform typ: Mixed

Value Adjustment Factor: 1

Subsystems

Subsystem1

Unadjusted Functionpoints: 4, Language: Not defined

Transactional Functions

Transactional Function1

Typ: EI

Complexity: AVERAGE

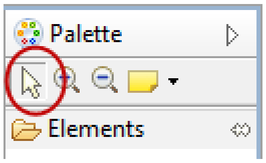
UFPs: 4

Enhancement Typ: ADDED

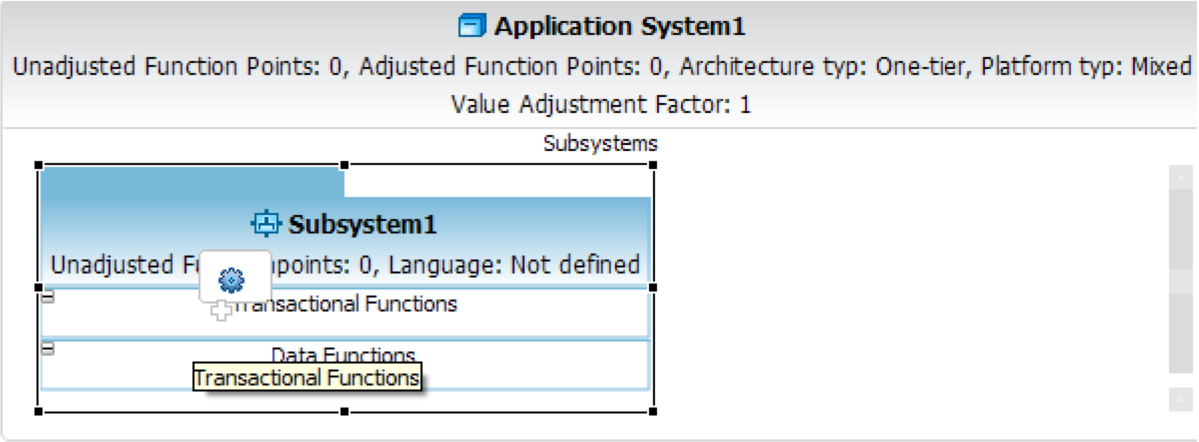
Process Typ: Interactive

Data Functions

**4.** An alternative way to create a new Transactional Functions features the diagram editor select mode.



5. Move your mouse pointer to the Transactional Functions section of an Sub System in the editor. A popup window will be displayed.



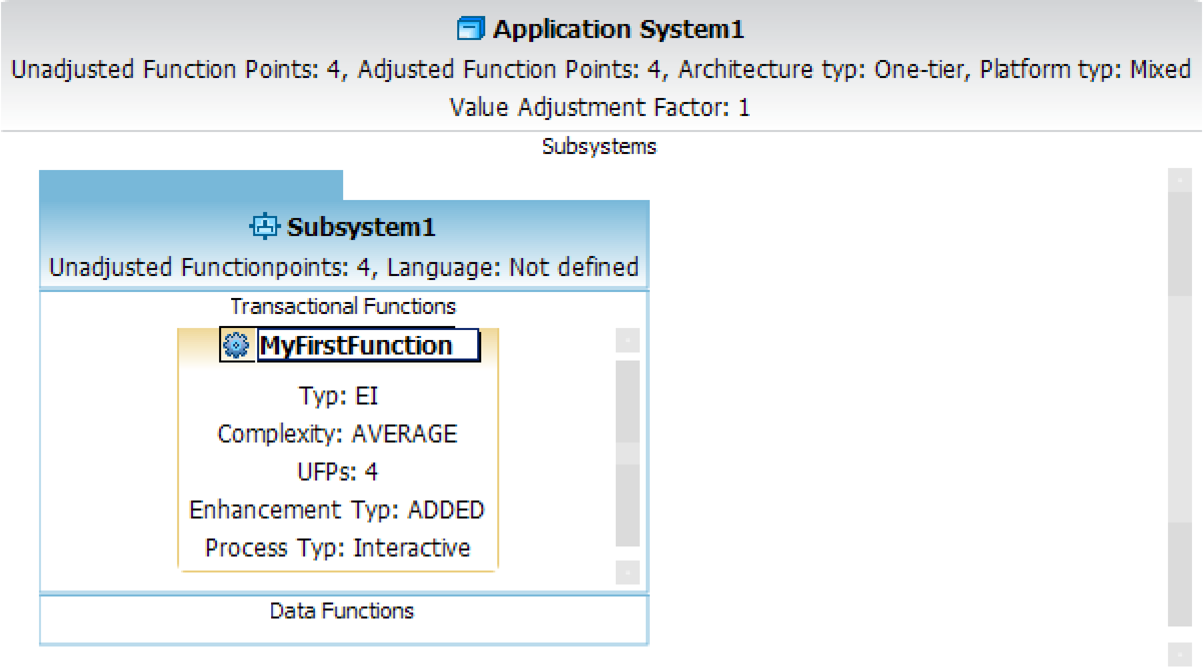
Application System1

Unadjusted Function Points: 0, Adjusted Function Points: 0, Architecture typ: One-tier, Platform typ: Mixed

Value Adjustment Factor: 1

Unadjusted F ipoints: 0, Language: Not defined

6. Enter a name for your new Transactional Functions element.



Application System1

Unadjusted Function Points: 4, Adjusted Function Points: 4, Architecture typ: One-tier, Platform typ: Mixed

Value Adjustment Factor: 1

Unadjusted Functionpoints: 4, Language: Not defined

MyFirstFunction

Typ: EI

Complexity: AVERAGE

UFPs: 4

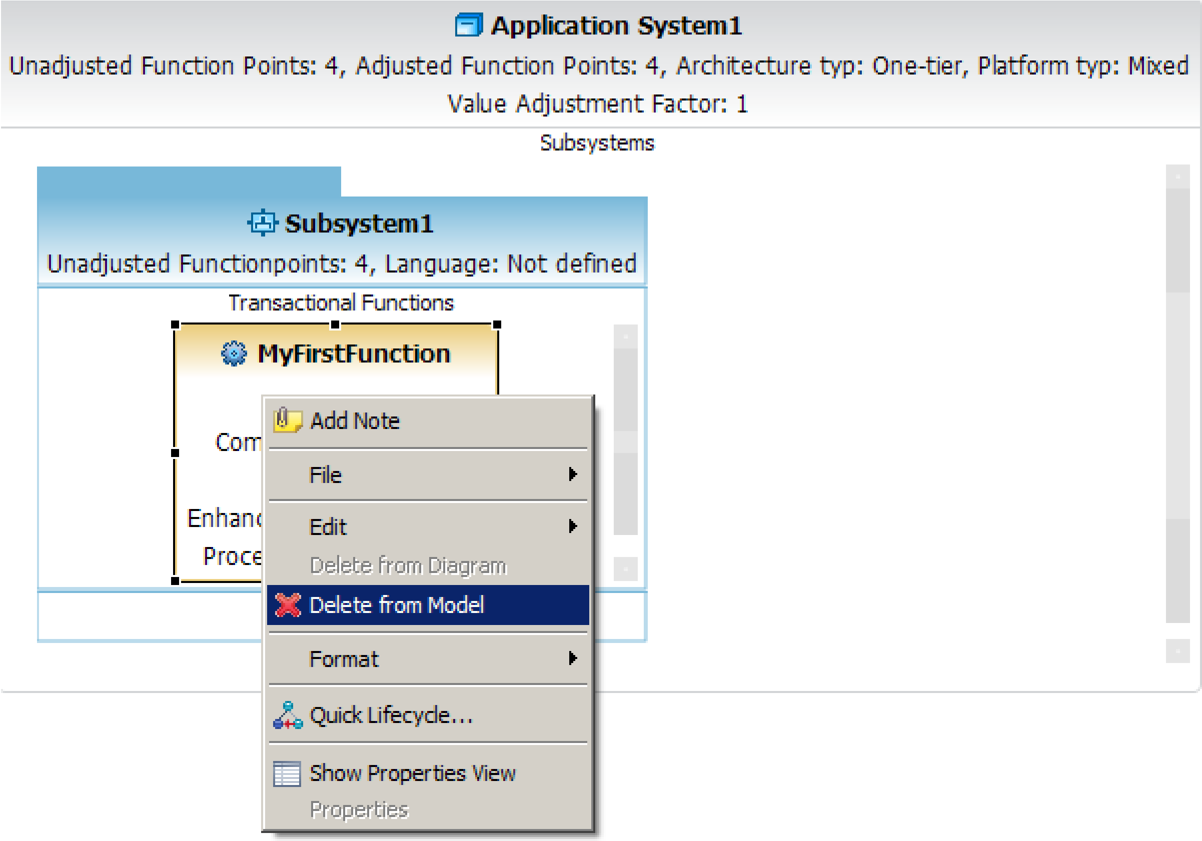
Enhancement Typ: ADDED

Process Typ: Interactive

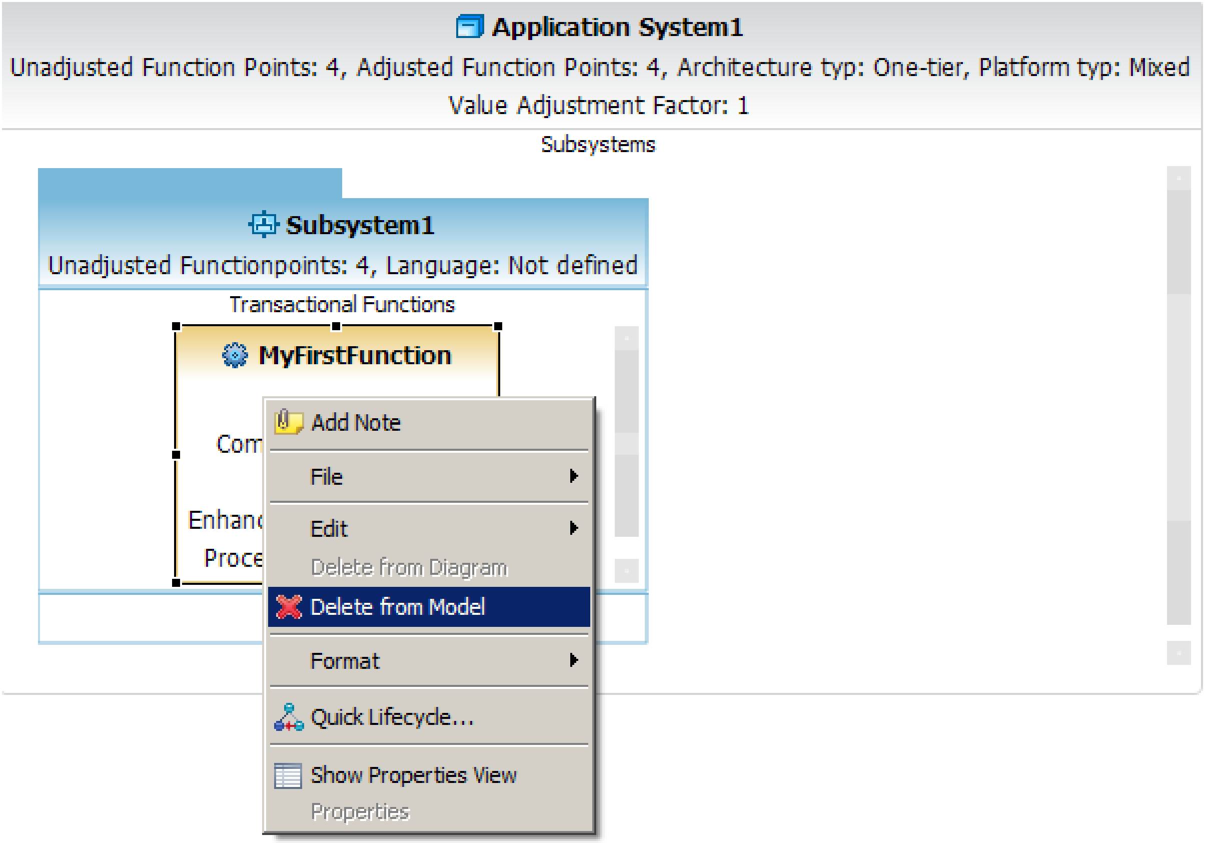
### Delete an existing Transactional Function

To delete an existing **Transactional Function** in a Count, perform the following steps.

1. Move your mouse pointer to a **Transactional Function** element in the editor area and perform a right mouse click.



2. Select the menu item **Delete from model** .



Application System1

Unadjusted Function Points: 4, Adjusted Function Points: 4, Architecture typ: One-tier, Platform typ: Mixed

Value Adjustment Factor: 1

Subsystems

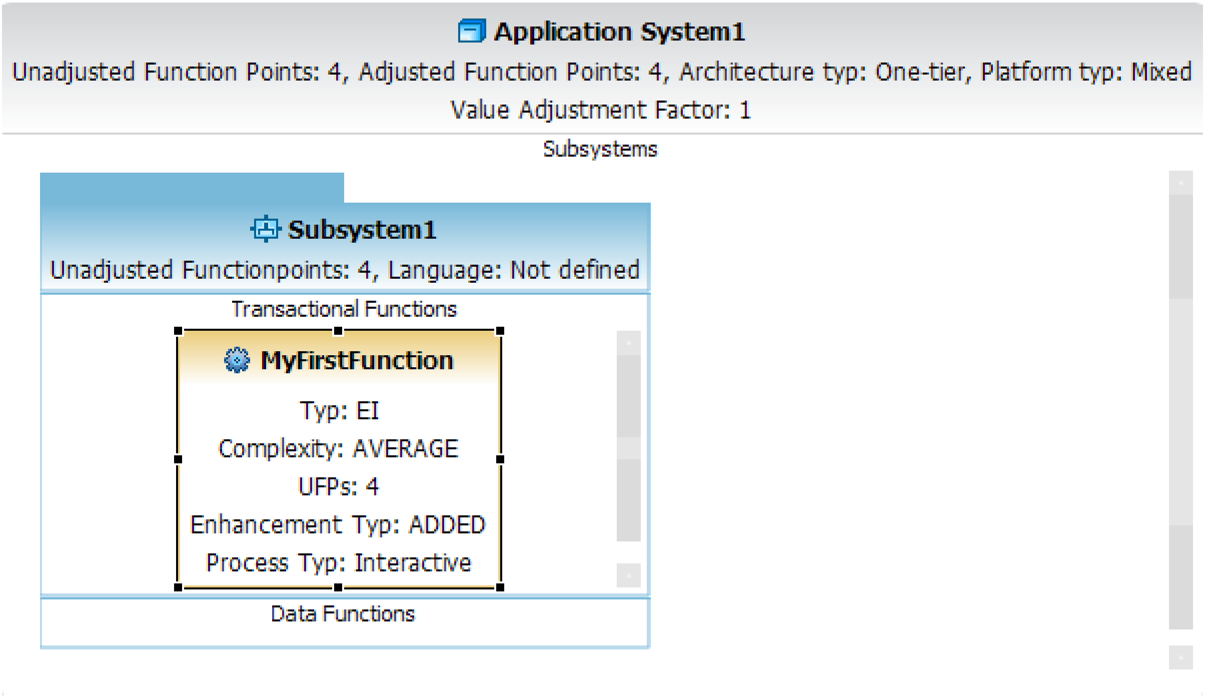
Subsystem1

Unadjusted Functionpoints: 4, Language: Not defined

Transactional Functions

MyFirstFunction

3. An alternative way to delete an existing **Transactional Function** is described in the following steps.
4. Move your mouse pointer to a **Transactional Function** element in the diagram editor and perform a mouse click to select this element.



Application System1

Unadjusted Function Points: 4, Adjusted Function Points: 4, Architecture typ: One-tier, Platform typ: Mixed

Value Adjustment Factor: 1

Subsystems

Subsystem1

Unadjusted Functionpoints: 4, Language: Not defined

Transactional Functions

MyFirstFunction

Typ: EI

Complexity: AVERAGE

UFPs: 4

Enhancement Typ: ADDED

Process Typ: Interactive

Data Functions

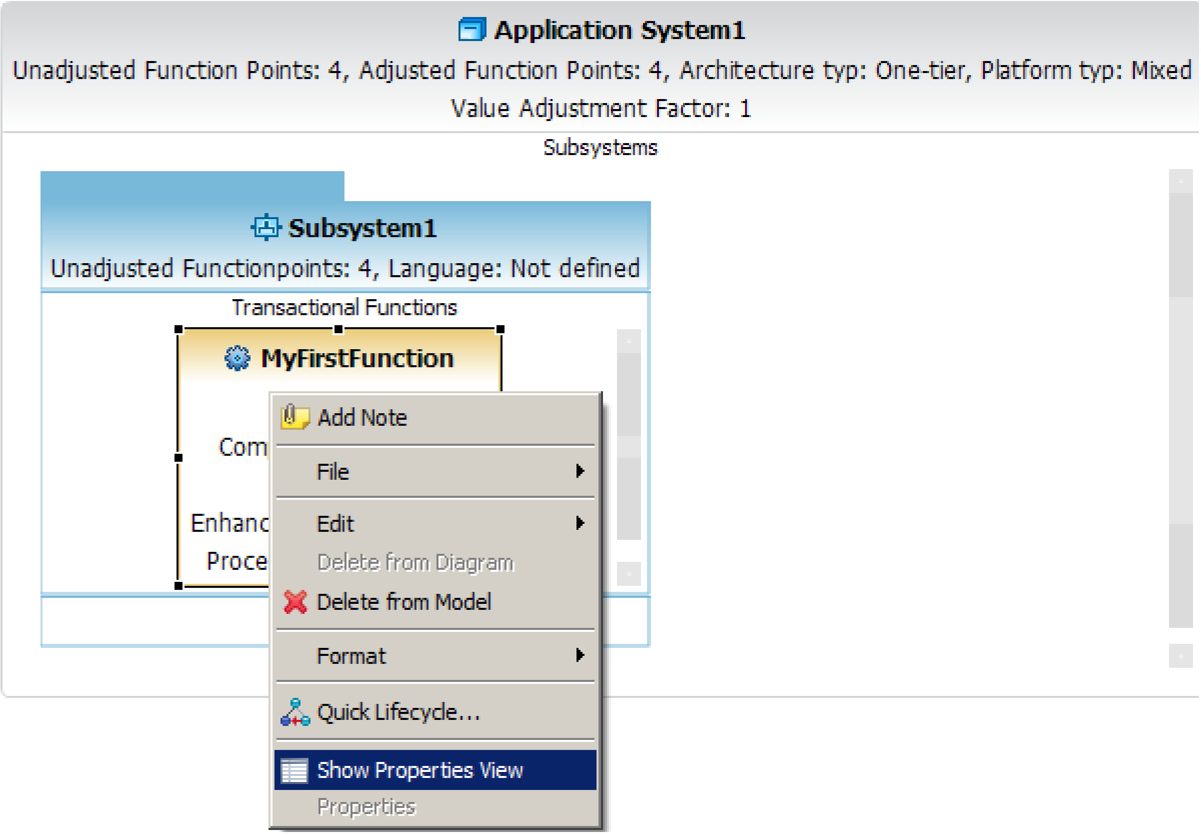
5. Press **DEL** on your keyboard.

### Change Transactional Function Properties

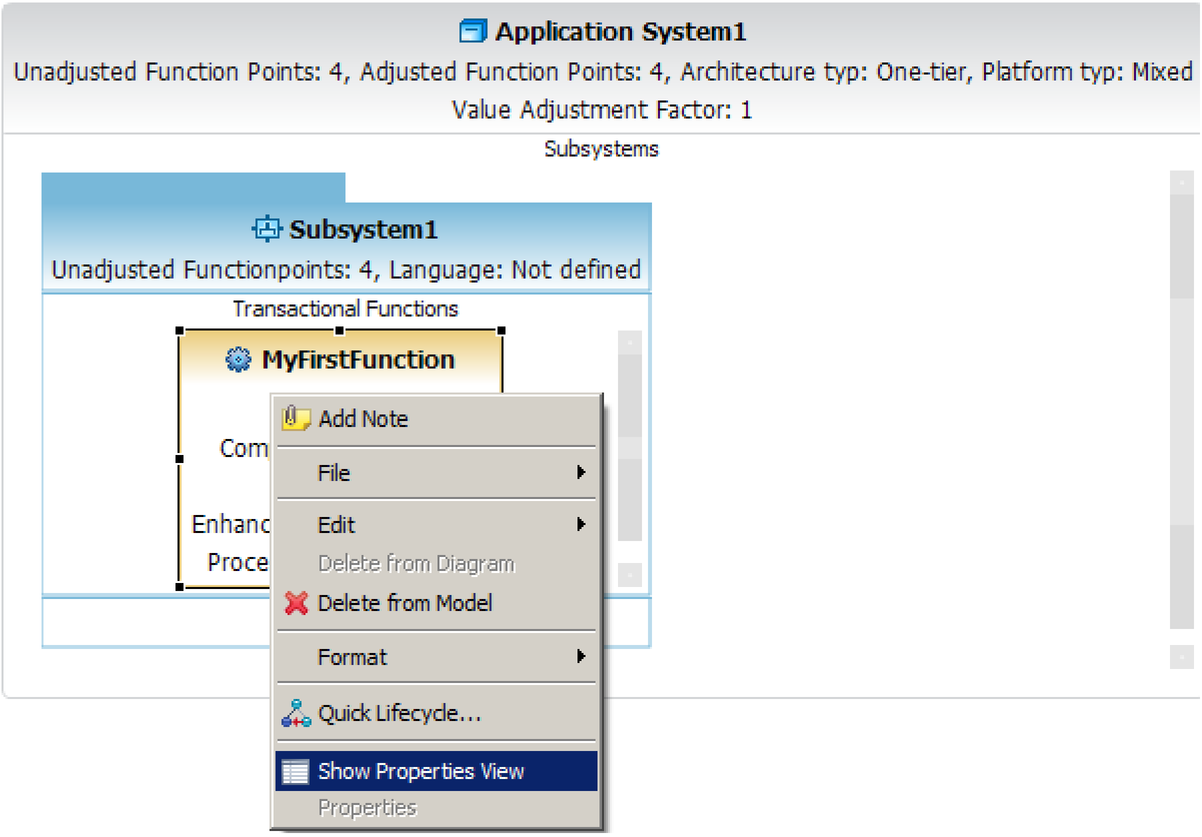
After you create a **Transactional Function** , you can edit its various properties, such as its enhancement type, process type etc.

To change the properties of **Transactional Function** , perform the following steps.

1. Move your mouse pointer to an **Transactional Function** element in the editor area and perform a right mouse click.



2. Select the menu item **Show Properties View** .



Application System1

Unadjusted Function Points: 4, Adjusted Function Points: 4, Architecture typ: One-tier, Platform typ: Mixed

Value Adjustment Factor: 1

Subsystems

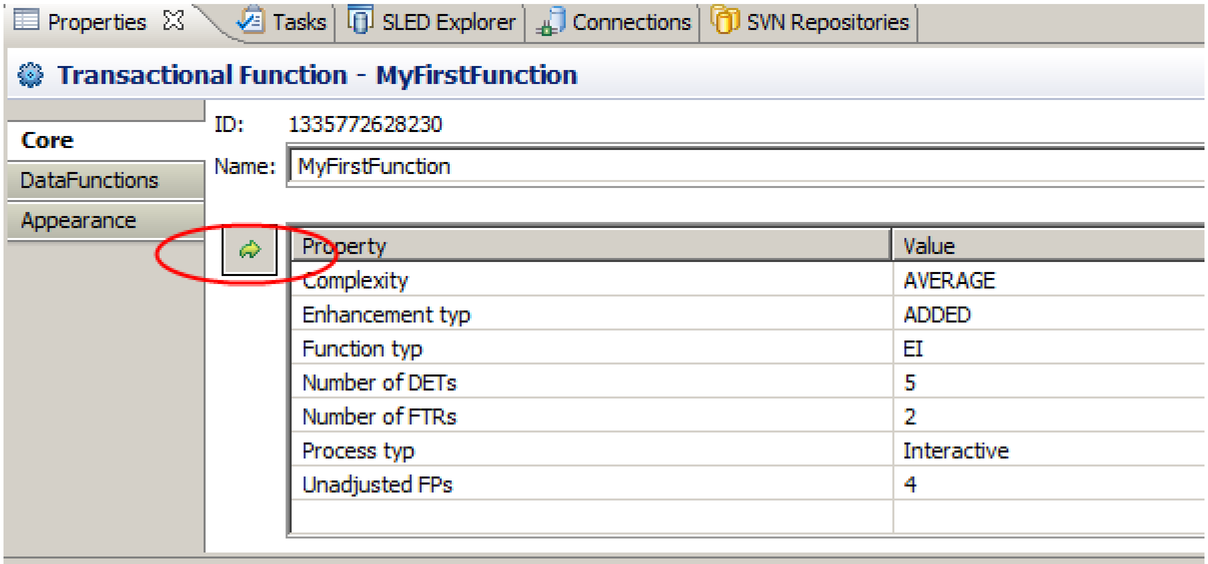
Subsystem1

Unadjusted Functionpoints: 4, Language: Not defined

Transactional Functions

MyFirstFunction

3. The following **Properties View** will be showed. Click on the green arrow button.



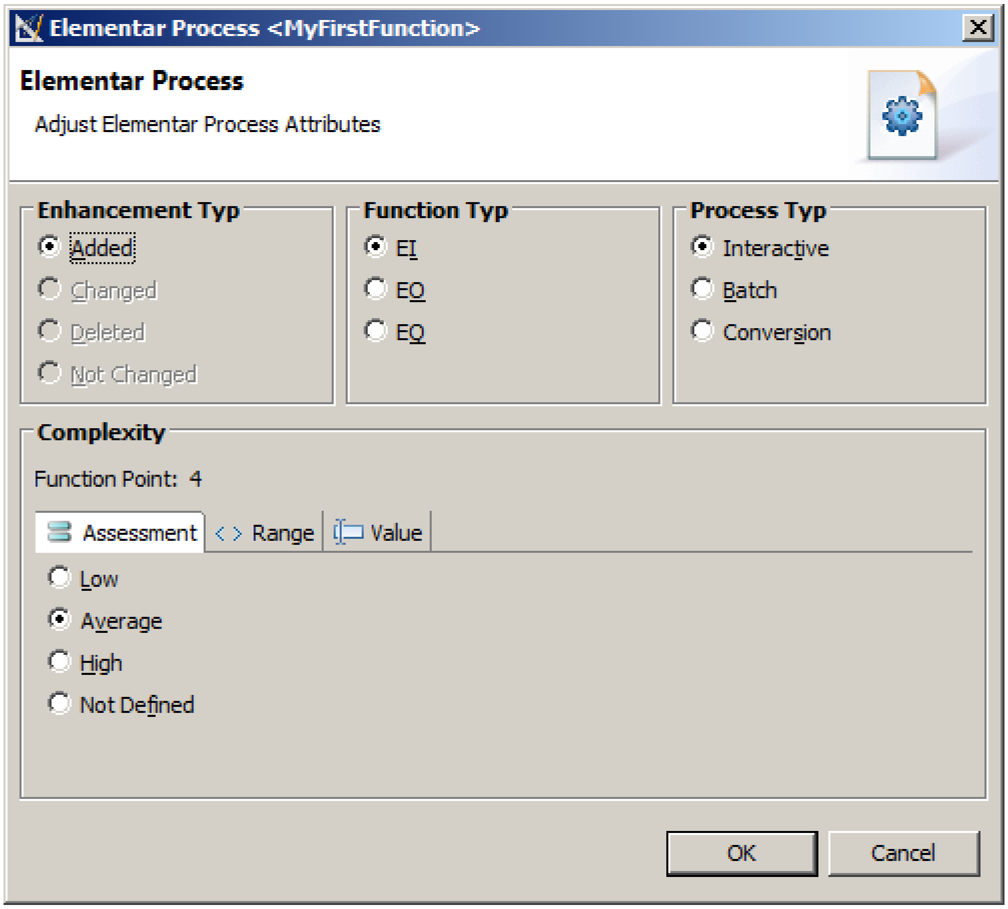
Transactional Function - MyFirstFunction

ID: 1335772628230

Name: MyFirstFunction

| Property | Value |
|---|---|
| Complexity | AVERAGE |
| Enhancement typ | ADDED |
| Function typ | EI |
| Number of DETs | 5 |
| Number of FTRs | 2 |
| Process typ | Interactive |
| Unadjusted FPs | 4 |

4. The following **Properties Dialog** will be showed. Once you have changed the properties click on the button **Ok**



Elementar Process <MyFirstFunction>

Elementar Process

Adjust Elementar Process Attributes

Enhancement Typ

● Added
○ Changed
○ Deleted
○ Not Changed

Function Typ

● EI
○ EO
○ EQ

Process Typ

● Interactive
○ Batch
○ Conversion

Complexity

Function Point: 4

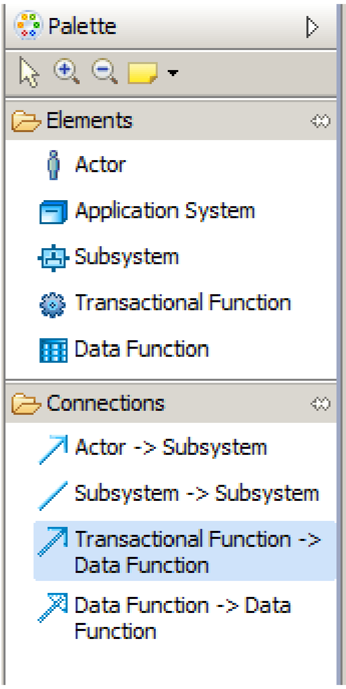
○ Low
● Average
○ High
○ Not Defined

### Create or Modify a Transactional Function Relation

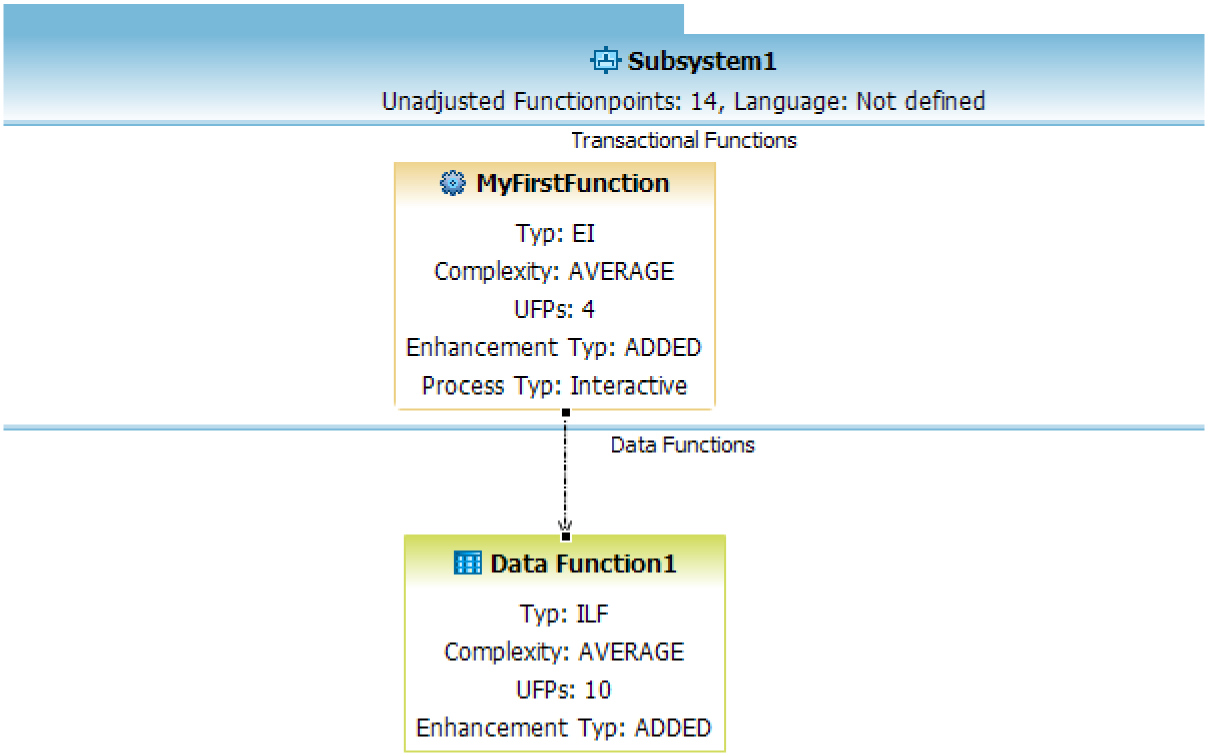
The palette of a graphical editor provides tools to create connections in the diagram. There are different types of connections available in the palette:

This tool also lets the user create a connection between **Transactional Function** and **Data Function** by starting the connection on a source object (Transactional Function) dropping it on a target object (Data Function).

1. Click on the **Transactional Function -> Data Function** entry in the editor palette.



2. Move your mouse pointer to an **Transactional Function** in the editor and perform a mouse click and drag and drop the connection from the **Transactional Function** to target **Data Function** .


Subsystem1

Unadjusted Functionpoints: 14, Language: Not defined

Transactional Functions

MyFirstFunction

Typ: EI

Complexity: AVERAGE

UFPs: 4

Enhancement Typ: ADDED

Process Typ: Interactive

Data Functions

Data Function1

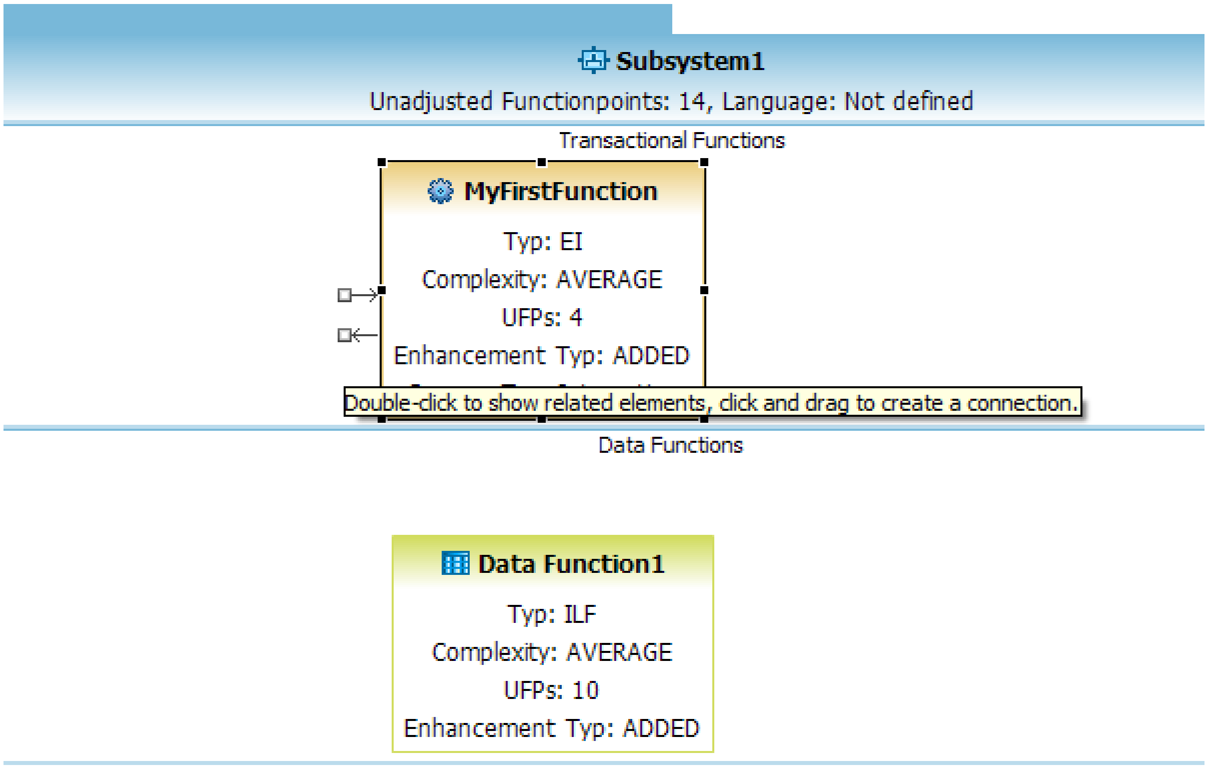
Typ: ILF

Complexity: AVERAGE

UFPs: 10

Enhancement Typ: ADDED

3. An alternative way to create a connection is described in the following steps.
4. Move your mouse pointer to an **Transactional Function** in the editor. A popup window will be displayed. Click on the out going arrow and drag and drop the connection from the **Transactional Function** to target **Data Function** .



Subsystem1

Unadjusted Functionpoints: 14, Language: Not defined

Transactional Functions

MyFirstFunction

Typ: EI

Complexity: AVERAGE

UFPs: 4

Enhancement Typ: ADDED

Double-click to show related elements, click and drag to create a connection.

Data Functions

Data Function1

Typ: ILF

Complexity: AVERAGE

UFPs: 10

Enhancement Typ: ADDED

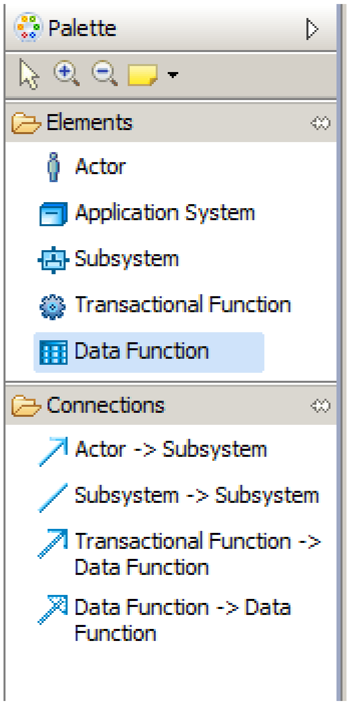
### Data Function

You can perform the following tasks to use **Data Function** .

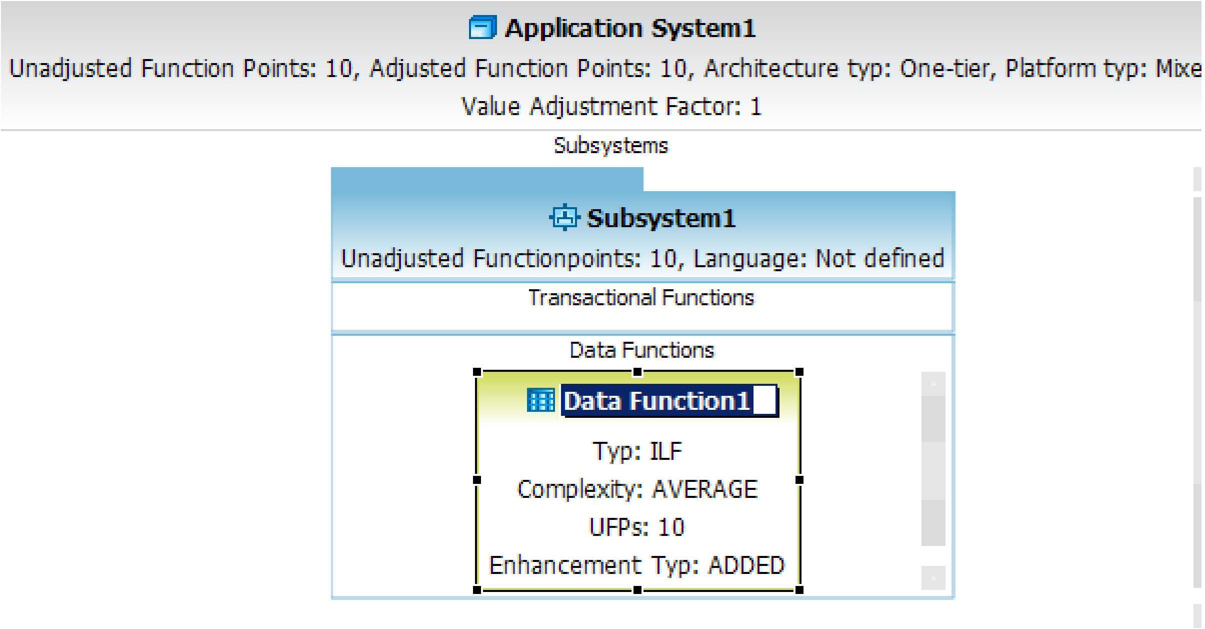
### Create a new Data Function

To create a new Data Function in a Count, perform the following steps.

1. Click on the **Data Function** entry in the editor palette.



2. Move your mouse pointer to the Data Functions section of an Sub System in the editor and perform a mouse click. The mouse pointer will show you, if an insert action on the given diagram position is possible.



Application System1

Unadjusted Function Points: 10, Adjusted Function Points: 10, Architecture typ: One-tier, Platform typ: Mixe

Value Adjustment Factor: 1

Subsystem1

Unadjusted Functionpoints: 10, Language: Not defined

Data Function1

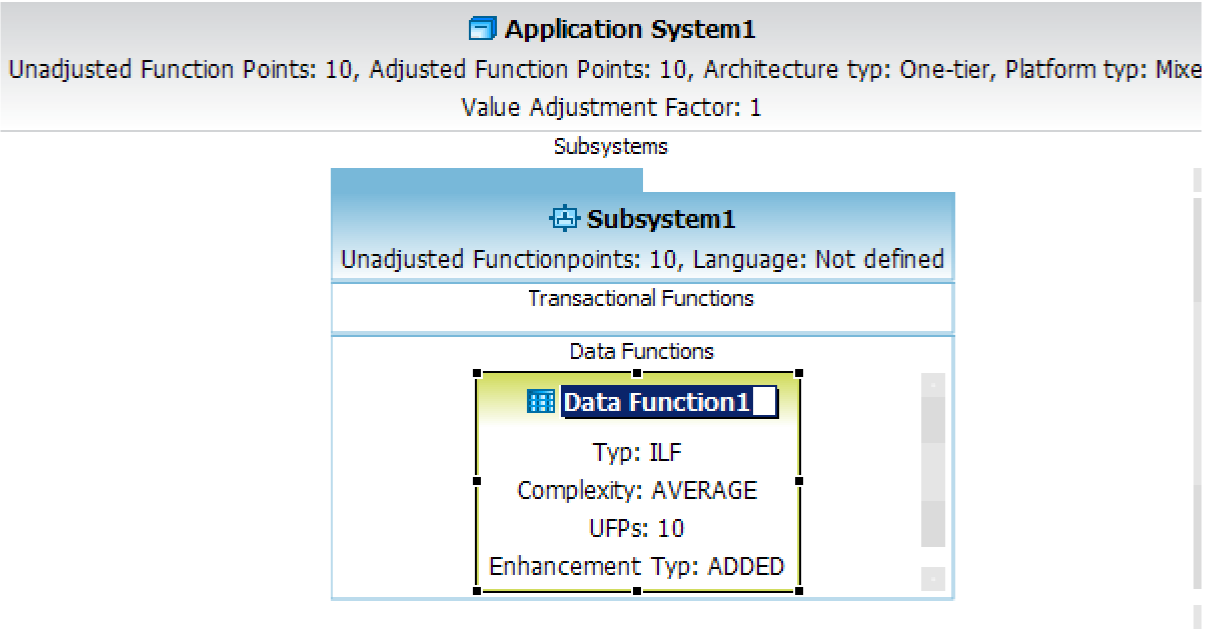
Typ: ILF

Complexity: AVERAGE

UFPs: 10

Enhancement Typ: ADDED

3. Enter a name for your new Data Function element.



Application System1

Unadjusted Function Points: 10, Adjusted Function Points: 10, Architecture typ: One-tier, Platform typ: Mixe

Value Adjustment Factor: 1

Subsystems

Subsystem1

Unadjusted Functionpoints: 10, Language: Not defined

Transactional Functions

Data Functions

Data Function1

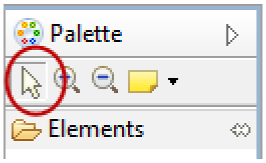
Typ: ILF

Complexity: AVERAGE

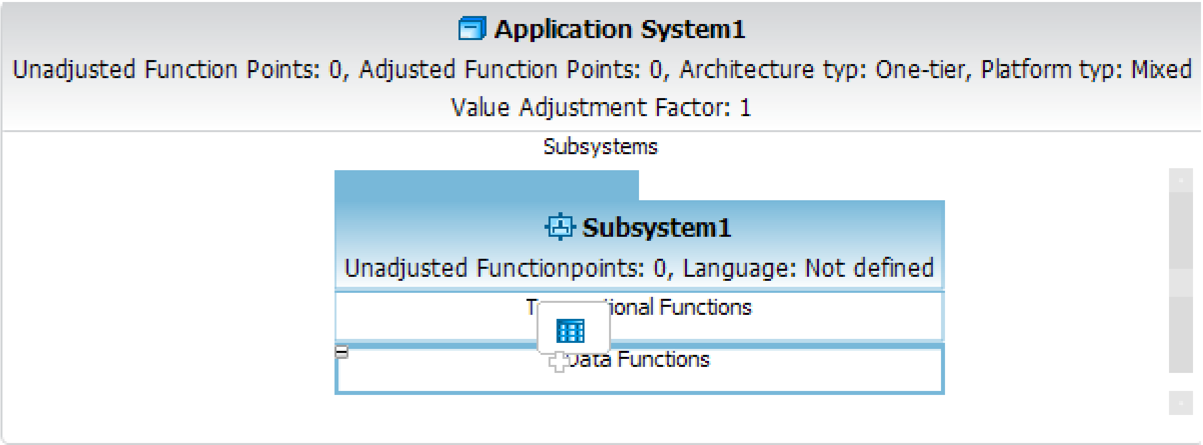
UFPs: 10

Enhancement Typ: ADDED

**4.** An alternative way to create a new Data System features the diagram editor select mode.



**5.** Move your mouse pointer to the Data Functions section of an Sub System in the editor. A popup window will be displayed.



Application System1

Unadjusted Function Points: 0, Adjusted Function Points: 0, Architecture typ: One-tier, Platform typ: Mixed

Value Adjustment Factor: 1

Subsystems

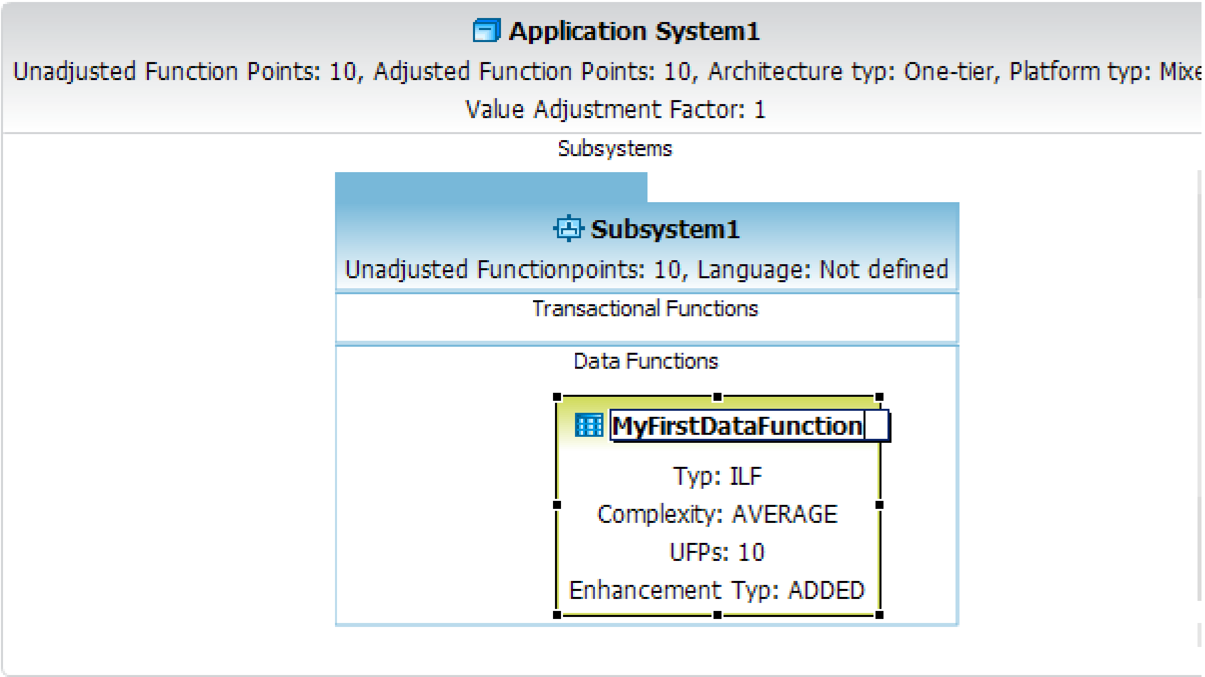
Subsystem1

Unadjusted Functionpoints: 0, Language: Not defined

T ional Functions

Data Functions

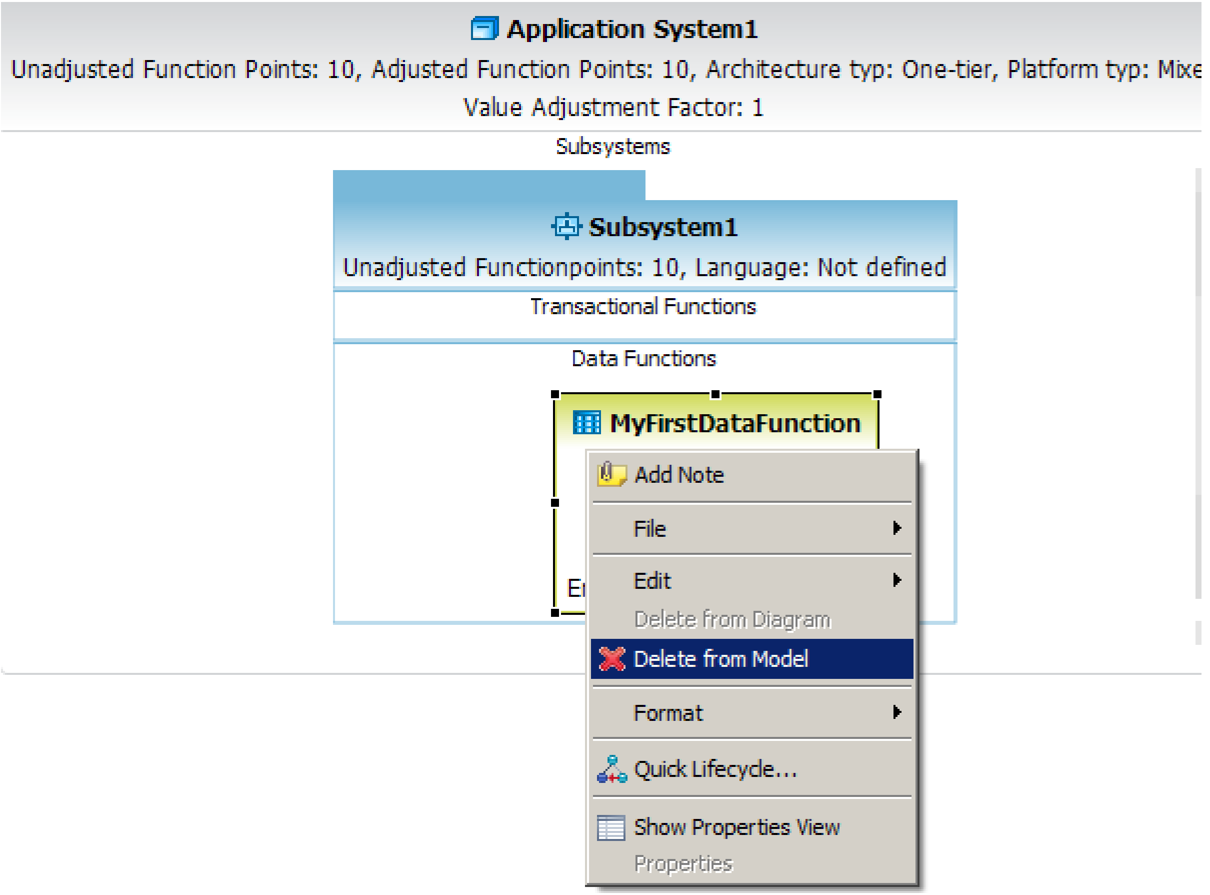
**6.** Enter a name for your new Data Functions element.


Application System1
Unadjusted Function Points: 10, Adjusted Function Points: 10, Architecture typ: One-tier, Platform typ: Mixe
Value Adjustment Factor: 1
Subsystems
Subsystem1
Unadjusted Functionpoints: 10, Language: Not defined
Transactional Functions
Data Functions
MyFirstDataFunction
Typ: ILF
Complexity: AVERAGE
UFPs: 10
Enhancement Typ: ADDED

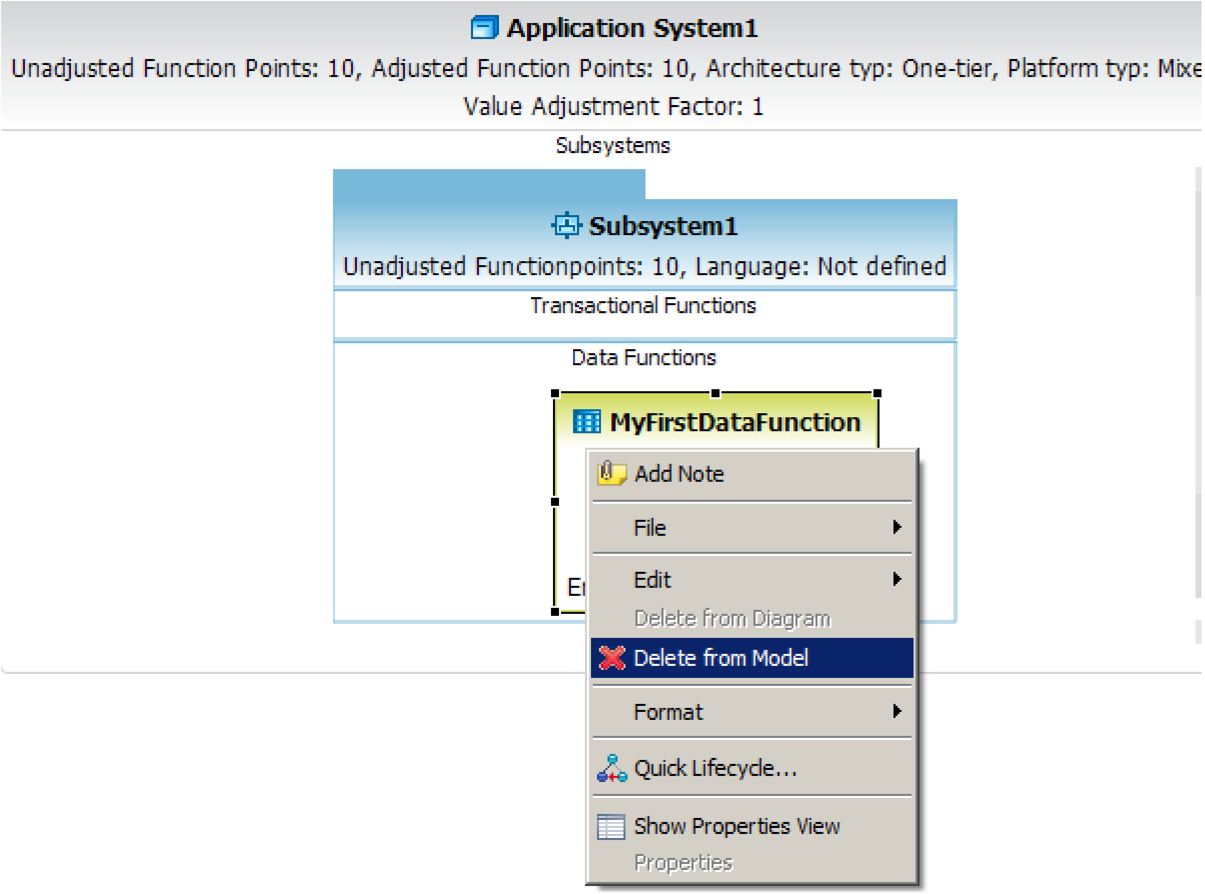
### Delete an existing Data Function

To delete an existing **Data Function** in a Count, perform the following steps.

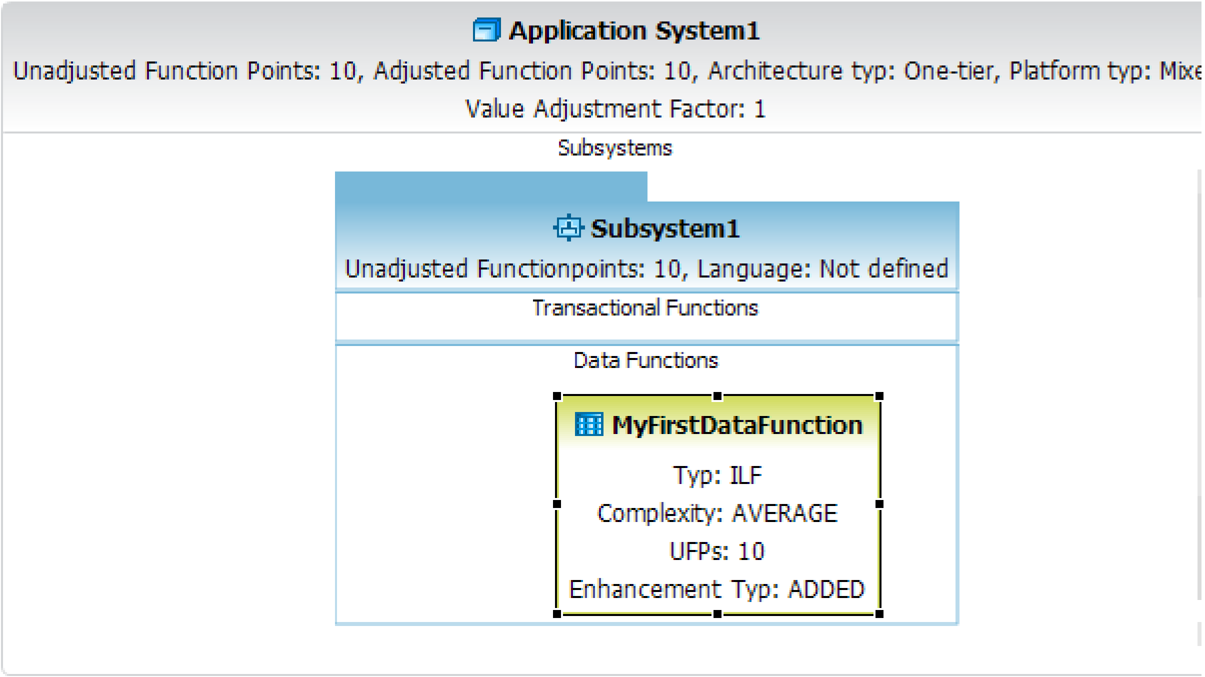
1. Move your mouse pointer to a **Data Function** element in the editor area and perform a right mouse click.



2. Select the menu item **Delete from model** .



3. An alternative way to delete an existing **Data Function** is described in the following steps.
4. Move your mouse pointer to a **Data Function** element in the diagram editor and perform a mouse click to select this element.



Application System1

Unadjusted Function Points: 10, Adjusted Function Points: 10, Architecture typ: One-tier, Platform typ: Mixe

Value Adjustment Factor: 1

Subsystems

Subsystem1

Unadjusted Functionpoints: 10, Language: Not defined

Transactional Functions

Data Functions

MyFirstDataFunction

Typ: ILF

Complexity: AVERAGE

UFPs: 10

Enhancement Typ: ADDED

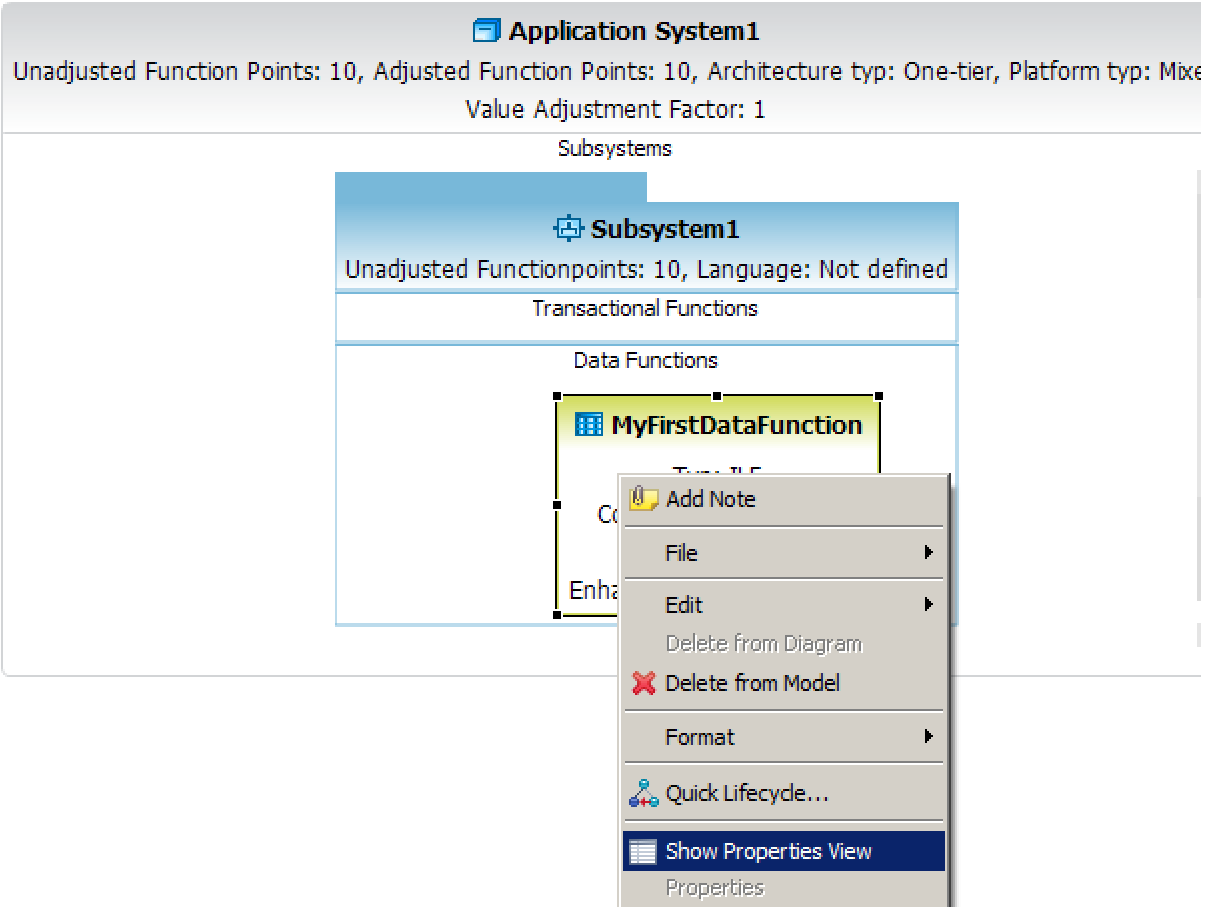
5. Press **DEL** on your keyboard.

### Change Data Function Properties

After you create a **Data Function** , you can edit its various properties, such as its enhancement type, process type etc.

To change the properties of **Data Function** , perform the following steps.

1. Move your mouse pointer to an **Data Function** element in the editor area and perform a right mouse click.

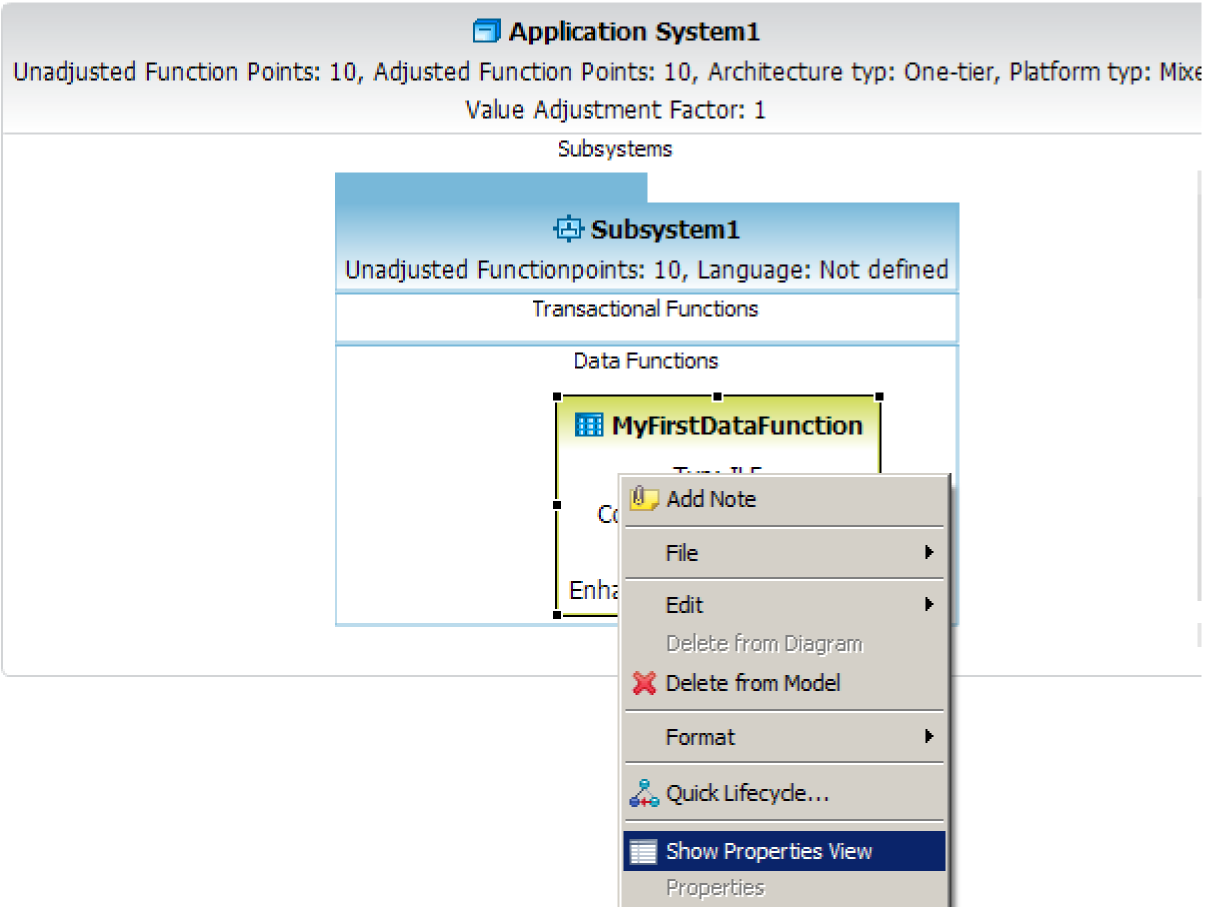


Unadjusted Function Points: 10, Adjusted Function Points: 10, Architecture typ: One-tier, Platform typ: Mixe

Value Adjustment Factor: 1

Unadjusted Functionpoints: 10, Language: Not defined

2. Select the menu item **Show Properties View** .



Application System1

Unadjusted Function Points: 10, Adjusted Function Points: 10, Architecture typ: One-tier, Platform typ: Mixe

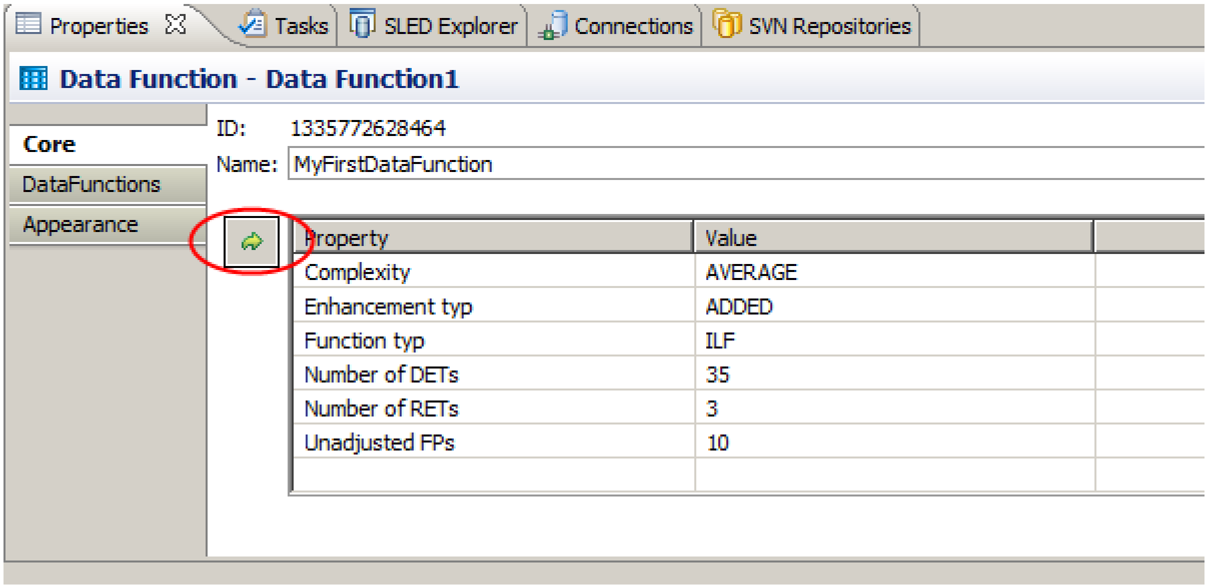
Value Adjustment Factor: 1

Subsystem1

Unadjusted Functionpoints: 10, Language: Not defined

MyFirstDataFunction

3. The following **Properties View** will be showed. Click on the green arrow button.



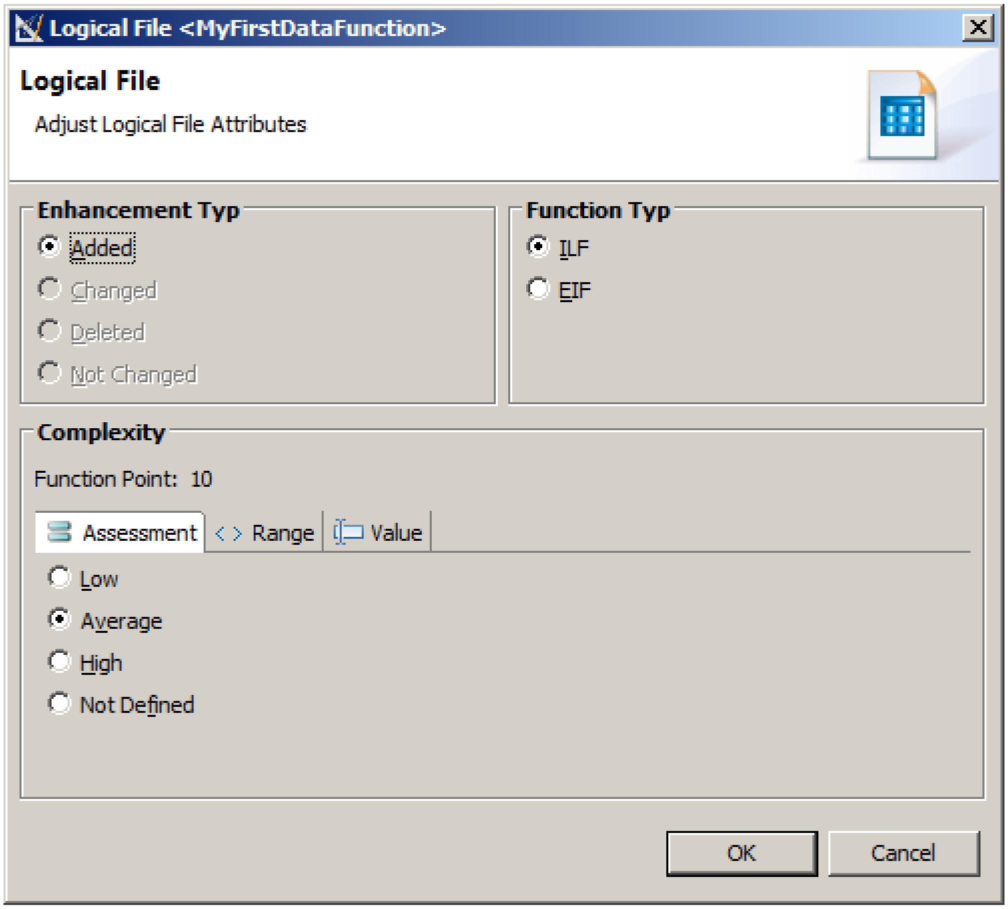
Data Function - Data Function1

ID: 1335772628464

Name: MyFirstDataFunction

| Property | Value |
|---|---|
| Complexity | AVERAGE |
| Enhancement typ | ADDED |
| Function typ | ILF |
| Number of DETs | 35 |
| Number of RETs | 3 |
| Unadjusted FPs | 10 |

4. The following **Properties Dialog** will be showed. Once you have changed the properties click on the button **Ok**



Logical File <MyFirstDataFunction>

Logical File

Adjust Logical File Attributes

Enhancement Typ

● Added
○ Changed
○ Deleted
○ Not Changed

Function Typ

● ILF
○ EIF

Complexity

Function Point: 10

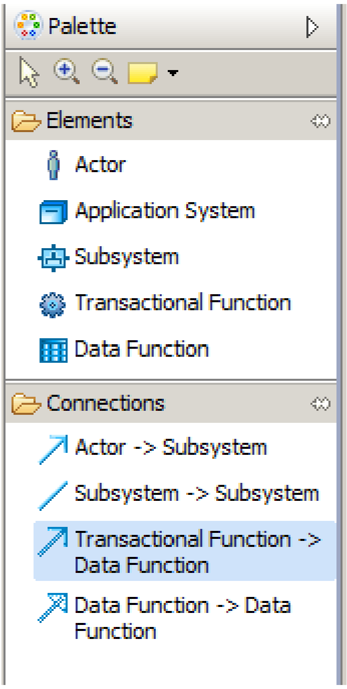
○ Low
● Average
○ High
○ Not Defined

### Create or Modify a Data Function Relation

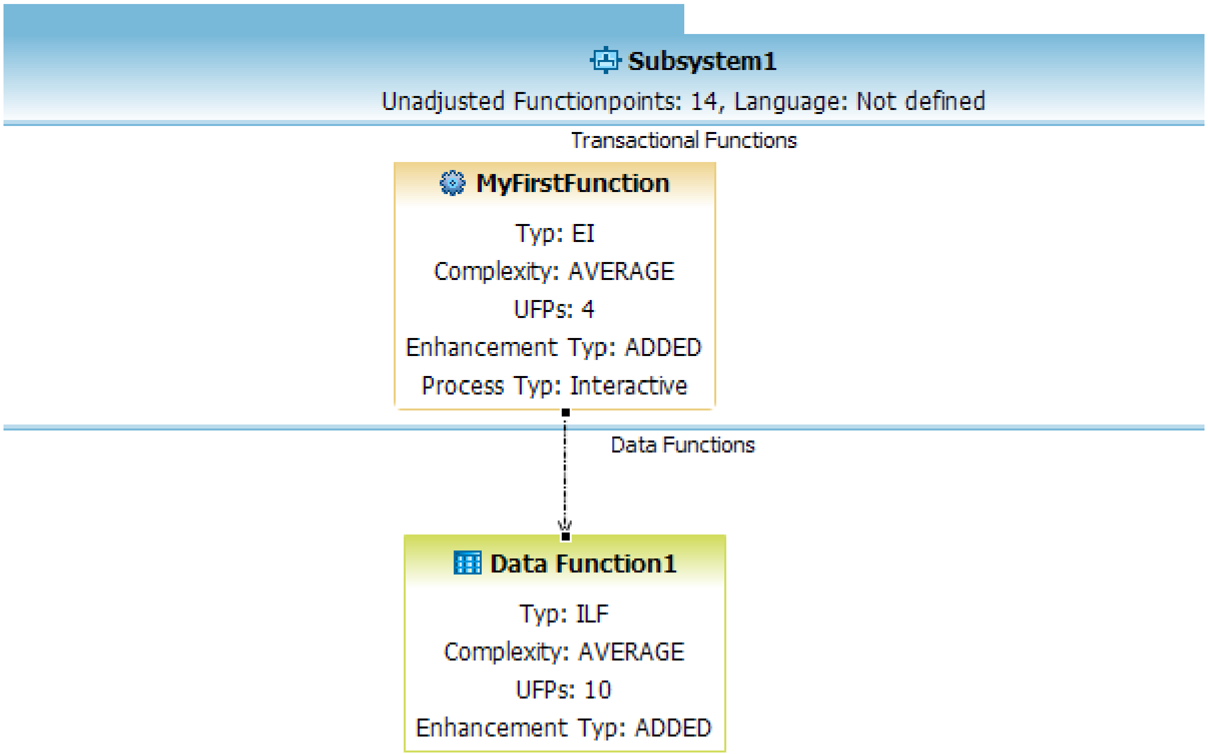
The palette of a graphical editor provides tools to create connections in the diagram. There are different types of connections available in the palette:

This tool also lets the user create a connection between **Transactional Function** and **Data Function** by starting the connection on a source object (Transactional Function) dropping it on a target object (Data Function).

1. Click on the **Transactional Function -> Data Function** entry in the editor palette.



2. Move your mouse pointer to an **Transactional Function** in the editor and perform a mouse click and drag and drop the connection from the **Transactional Function** to target **Data Function** .



Subsystem1

Unadjusted Functionpoints: 14, Language: Not defined

Transactional Functions

MyFirstFunction

Typ: EI

Complexity: AVERAGE

UFPs: 4

Enhancement Typ: ADDED

Process Typ: Interactive

Data Functions

Data Function1

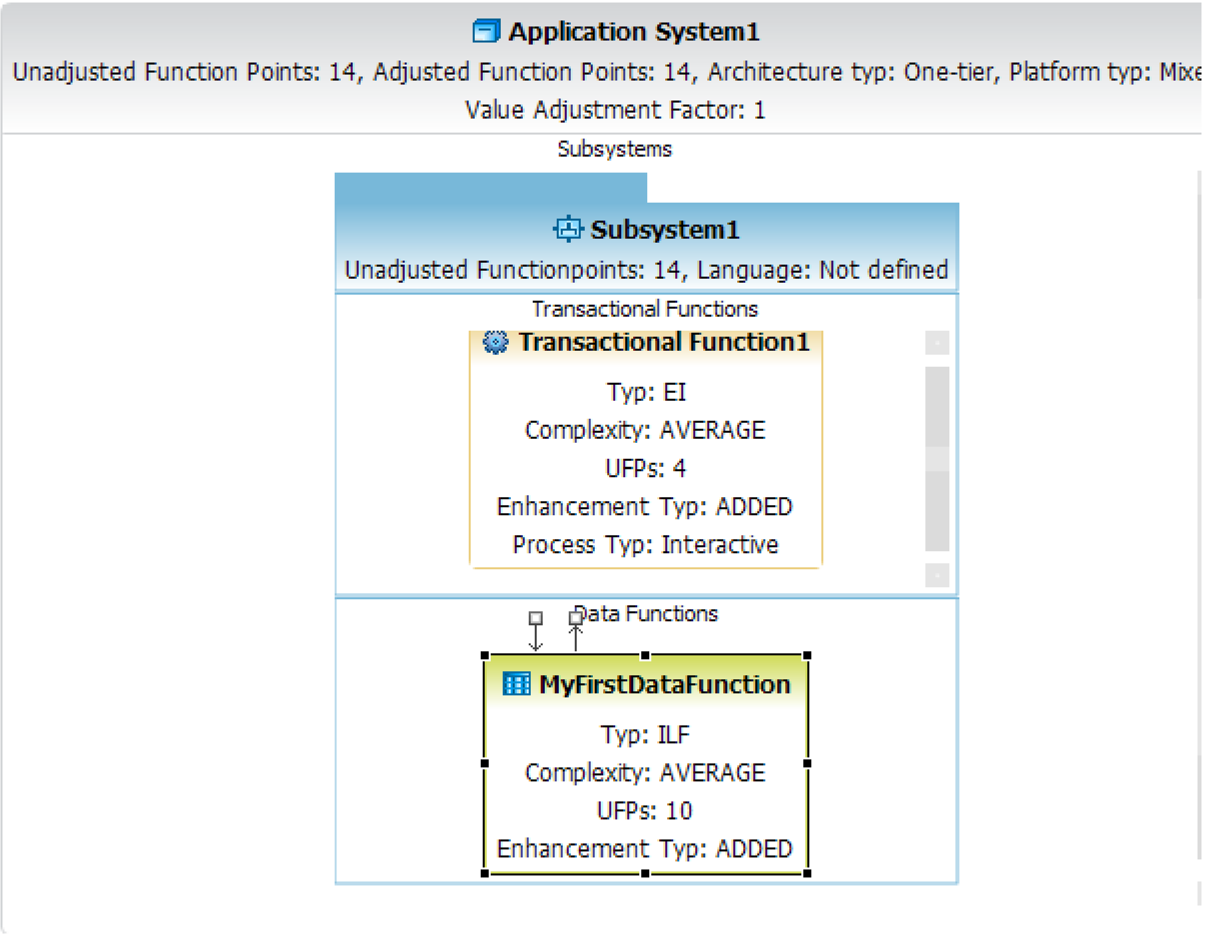
Typ: ILF

Complexity: AVERAGE

UFPs: 10

Enhancement Typ: ADDED

3. An alternative way to create a connection is described in the following steps.
4. Move your mouse pointer to an **Data Function** in the editor. A popup window will be displayed. Click on the in going arrow and drag and drop the connection from the **Data Function** to target **Transactional Function** .



Application System1

Unadjusted Function Points: 14, Adjusted Function Points: 14, Architecture typ: One-tier, Platform typ: Mixe

Value Adjustment Factor: 1

Subsystems

Subsystem1

Unadjusted Functionpoints: 14, Language: Not defined

Transactional Functions

Transactional Function1

Typ: EI

Complexity: AVERAGE

UFPs: 4

Enhancement Typ: ADDED

Process Typ: Interactive

Data Functions

MyFirstDataFunction

Typ: ILF

Complexity: AVERAGE

UFPs: 10

Enhancement Typ: ADDED

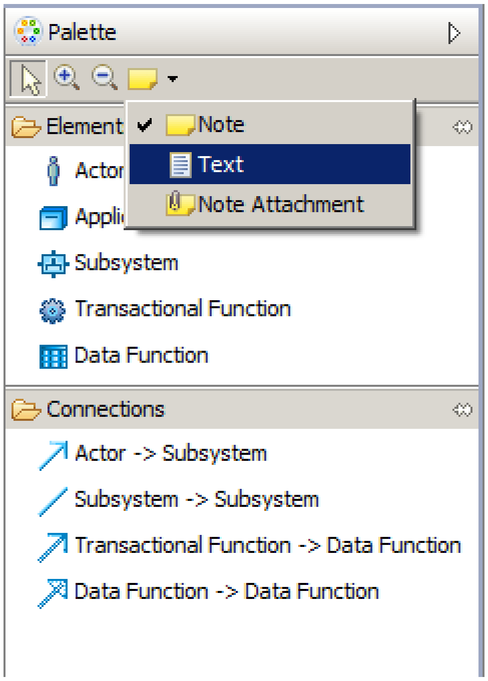
### Adding notes to units

You can add a note to a unit to comment on it or describe it. The note does not affect the function of the topology elements.

To create a note, click **Note** or **Text** in the Palette and use the mouse to drag a rectangle that represents the note on the diagram. For attached notes, click **Note Attachment** and then click the unit or link to which the note will be attached. Then, type the text for the note.

You can add three types of notes to a diagram:

1. **Unattached notes:** Unattached notes are displayed as colored text boxes on the diagram into which you can type text.
2. **Note attachments :** Note attachments are linked to one or more units or links. Like the notes, these links have no meaning in the topology except to indicate to which unit or link the note text applies.
3. **Text boxes :** Text boxes are similar to unattached notes, but they have no background color.

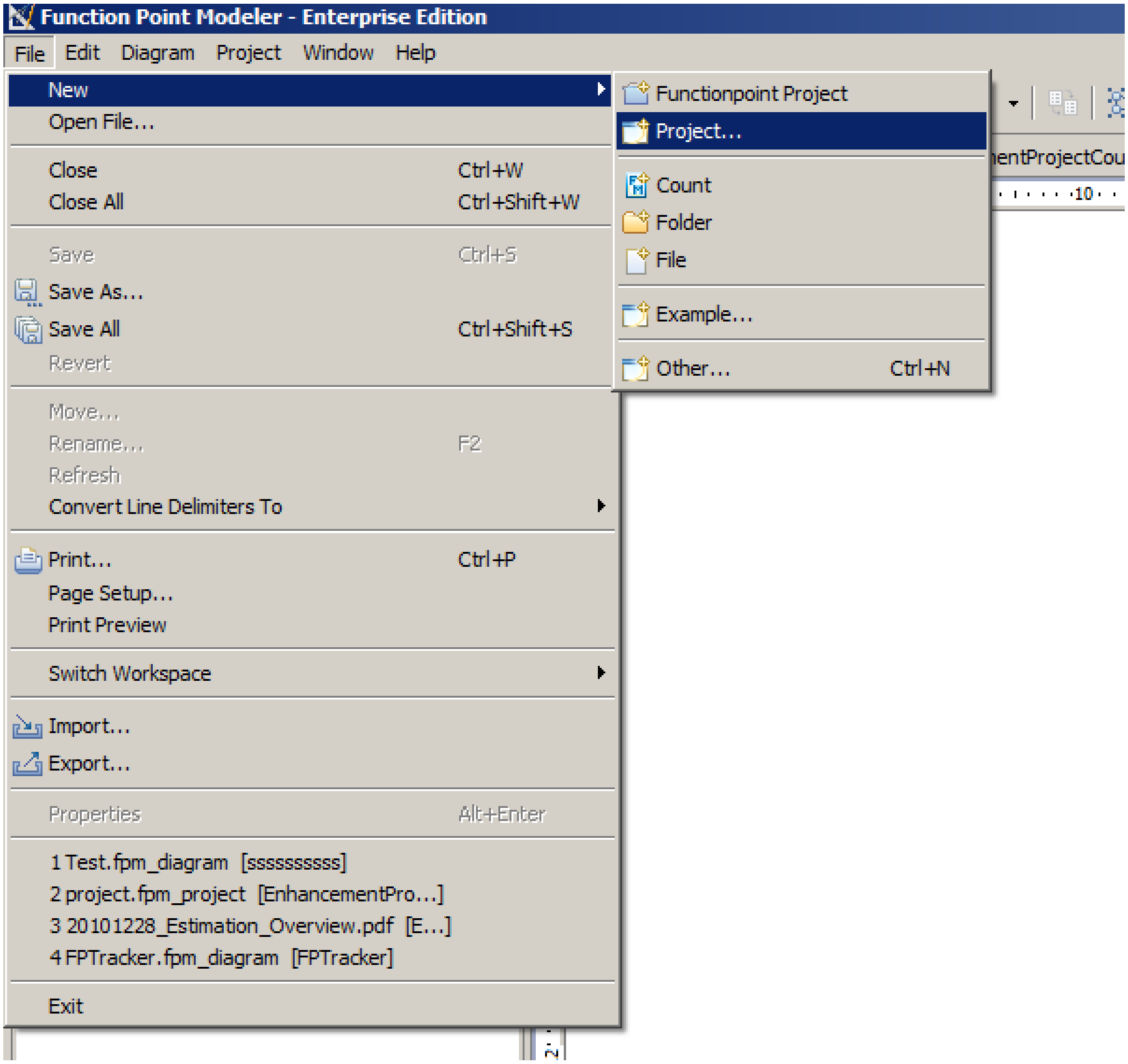


# Working with Projects and Counts

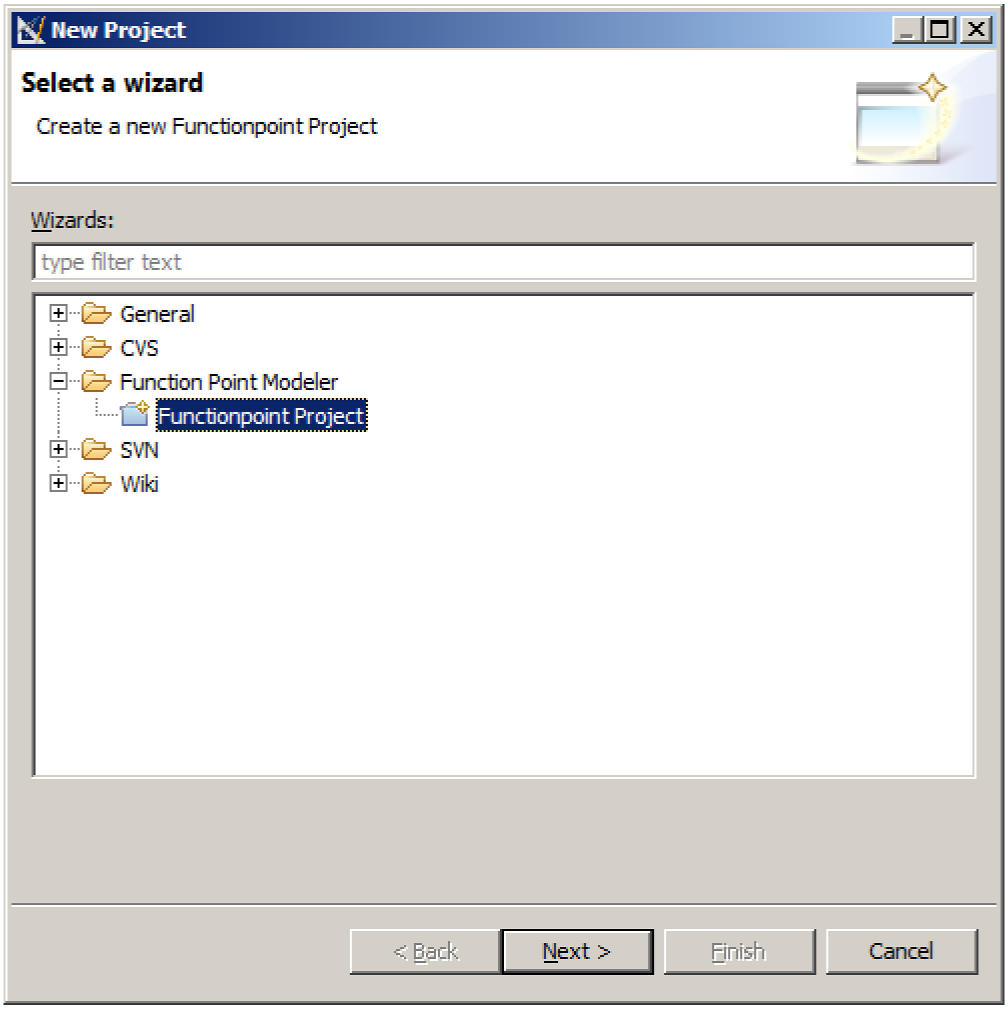
## Create a Application Project

To create a new **Application Project** , perform the following steps.

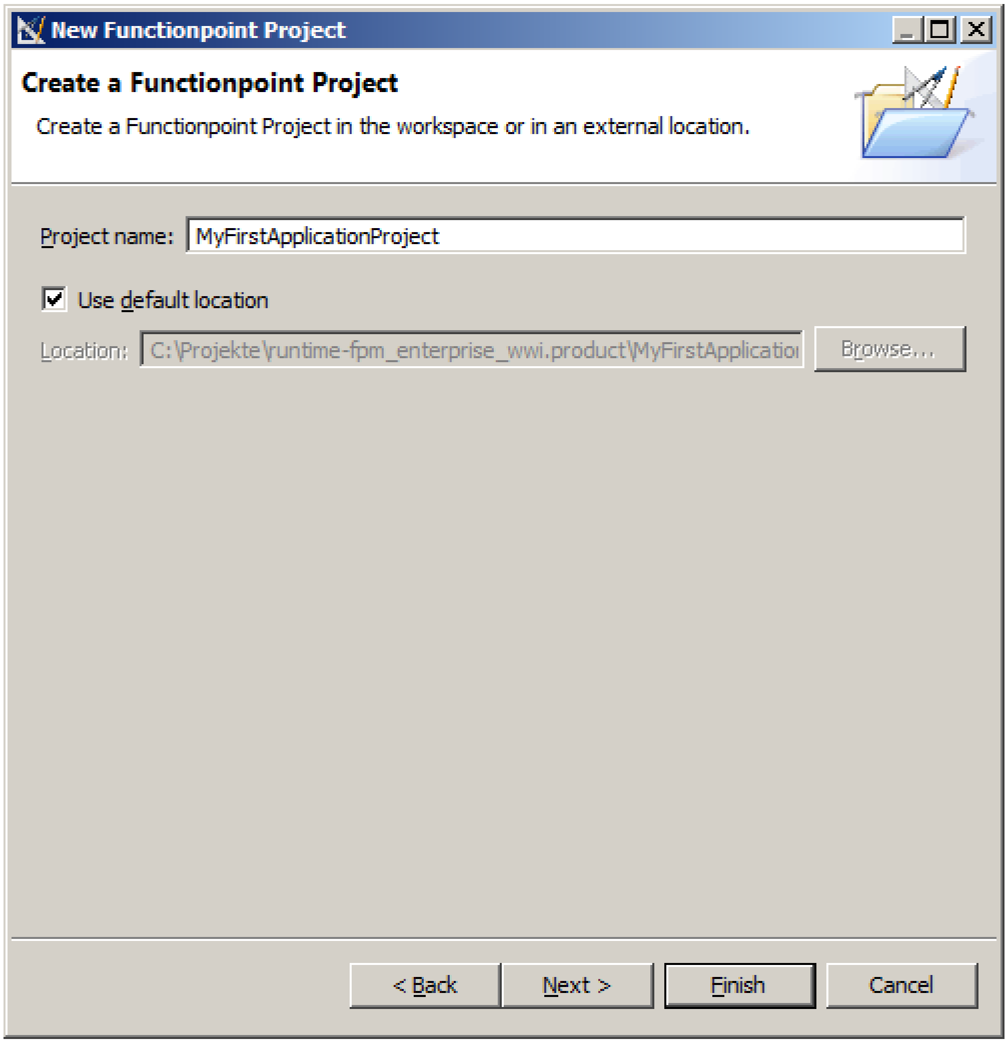
1. From the main menu bar, select **File** > **New** > **Project** .



2. The following **Creat wizard** will be displayed



3. Select the **Function Point Modeler > Functionpoint Project** and click **Next** .
4. Enter a project name and click **Next** .



New Functionpoint Project

Create a Functionpoint Project

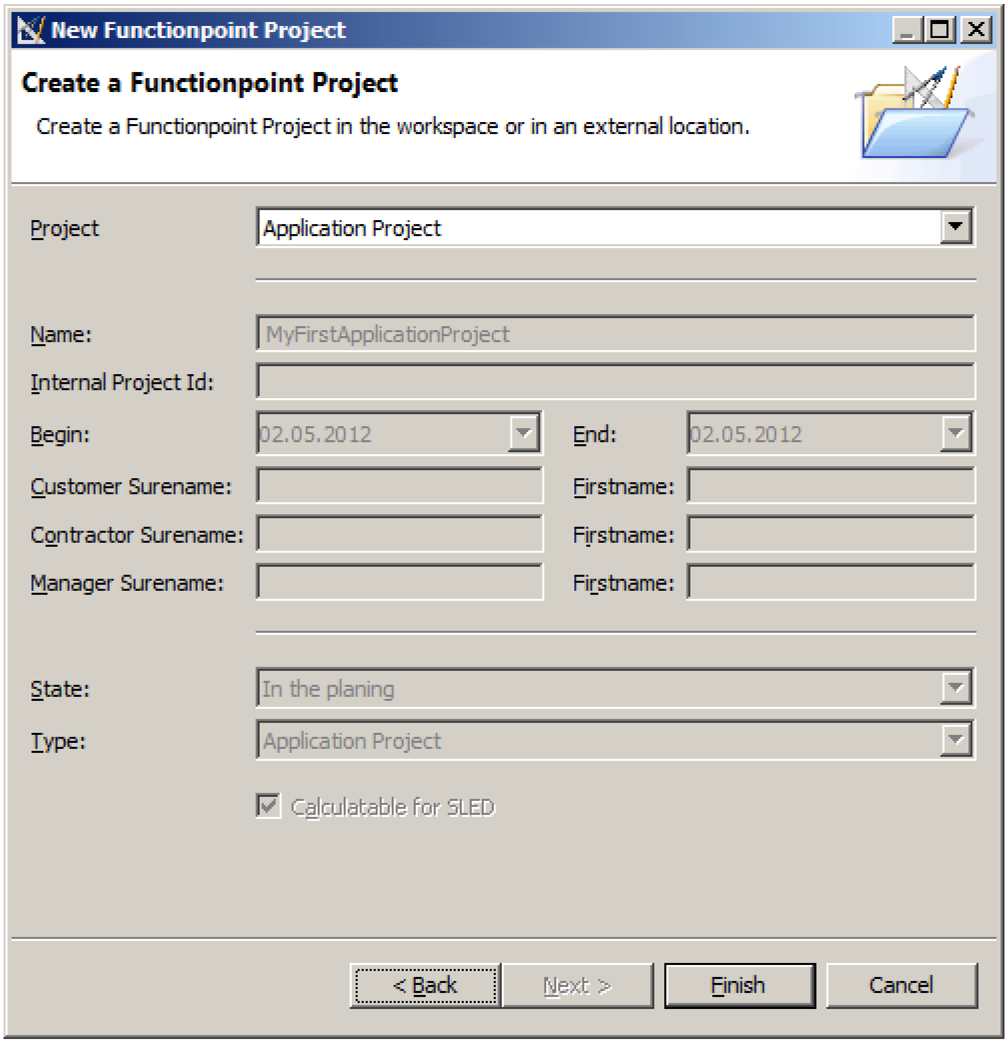
Create a Functionpoint Project in the workspace or in an external location.

Project name: MyFirstApplicationProject

☑ Use default location

Location: C:\Projekte\runtime-fpm_enterprise_wwi.product\MyFirstApplicatio

5. Click **Finish** .



New Functionpoint Project

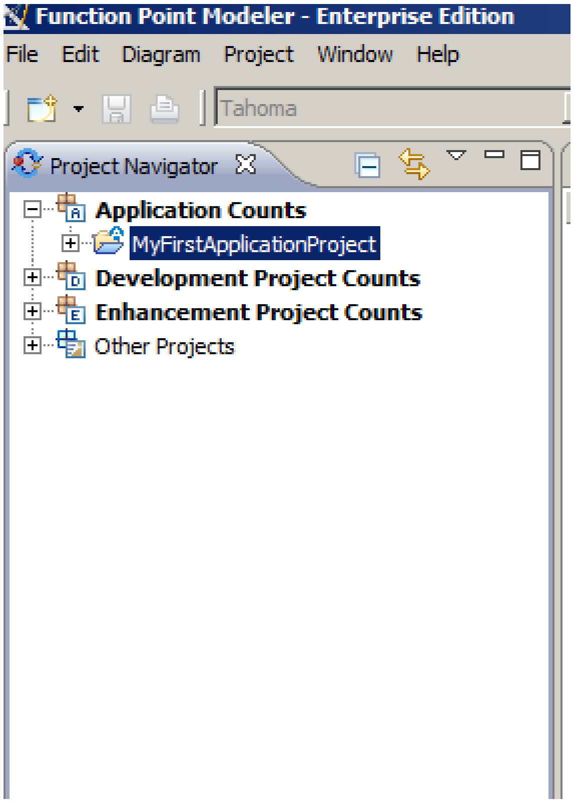
Create a Functionpoint Project

Create a Functionpoint Project in the workspace or in an external location.

| | | | |
|---|---|---|---|
| Project | Application Project | | |
| Name: | MyFirstApplicationProject | | |
| Internal Project Id: | | | |
| Begin: | 02.05.2012 | End: | 02.05.2012 |
| Customer Surename: | | Firstname: | |
| Contractor Surename: | | Firstname: | |
| Manager Surename: | | Firstname: | |
| State: | In the planing | | |
| Type: | Application Project | | |

☑ Calculatable for SLED

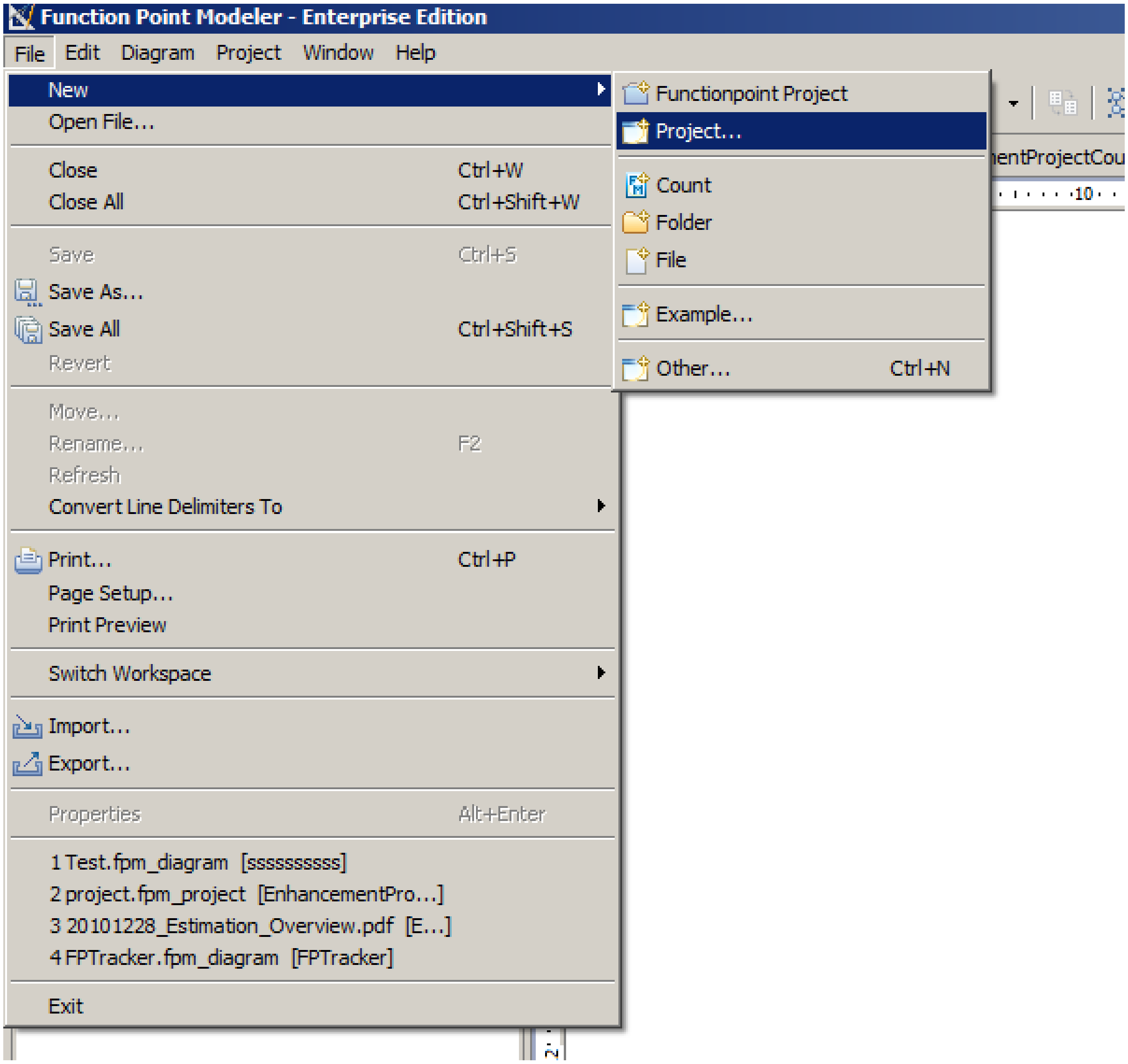
The new created **Application Project** will be displayed in the project explorer


Function Point Modeler - Enterprise Edition
File
Edit
Diagram
Project
Window
Help
Tahoma
Project Navigator
Application Counts
MyFirstApplicationProject
Development Project Counts
Enhancement Project Counts
Other Projects

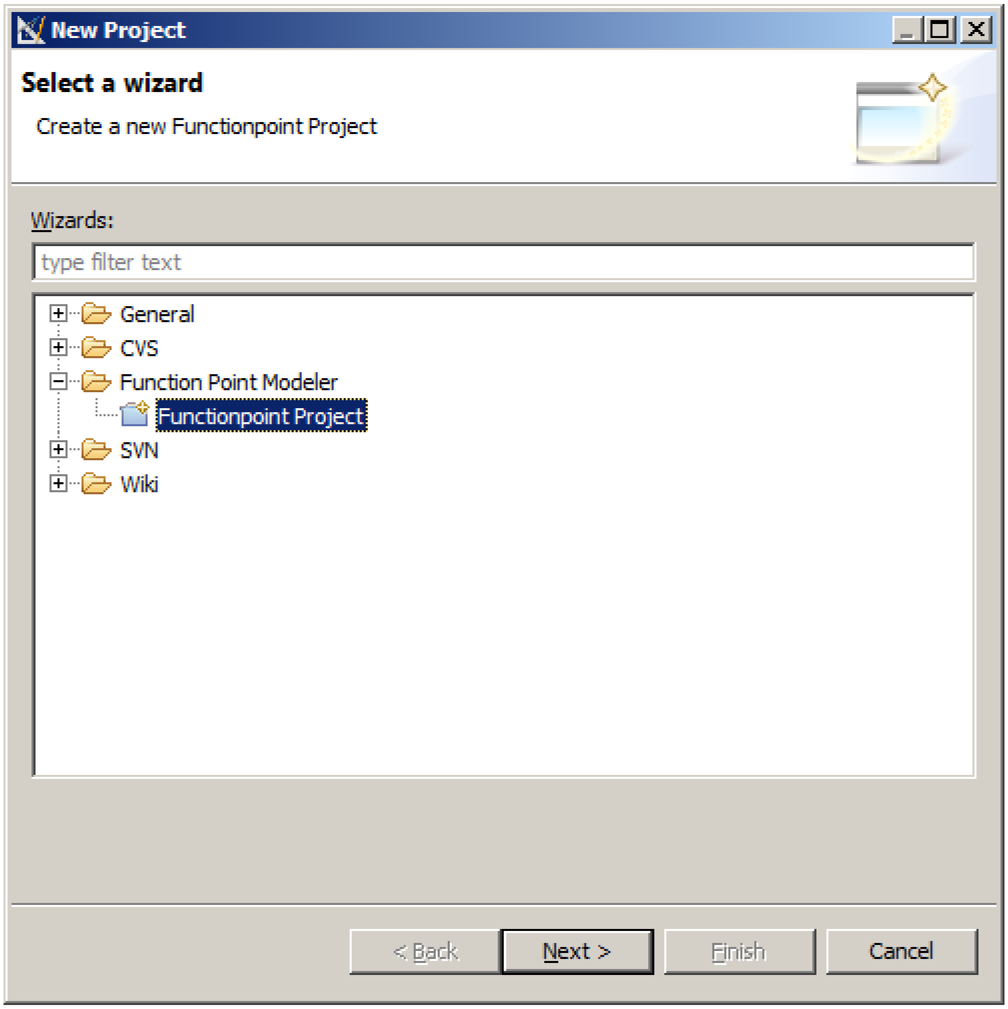
### Create a Development Project

To create a new **Development Project** , perform the following steps.

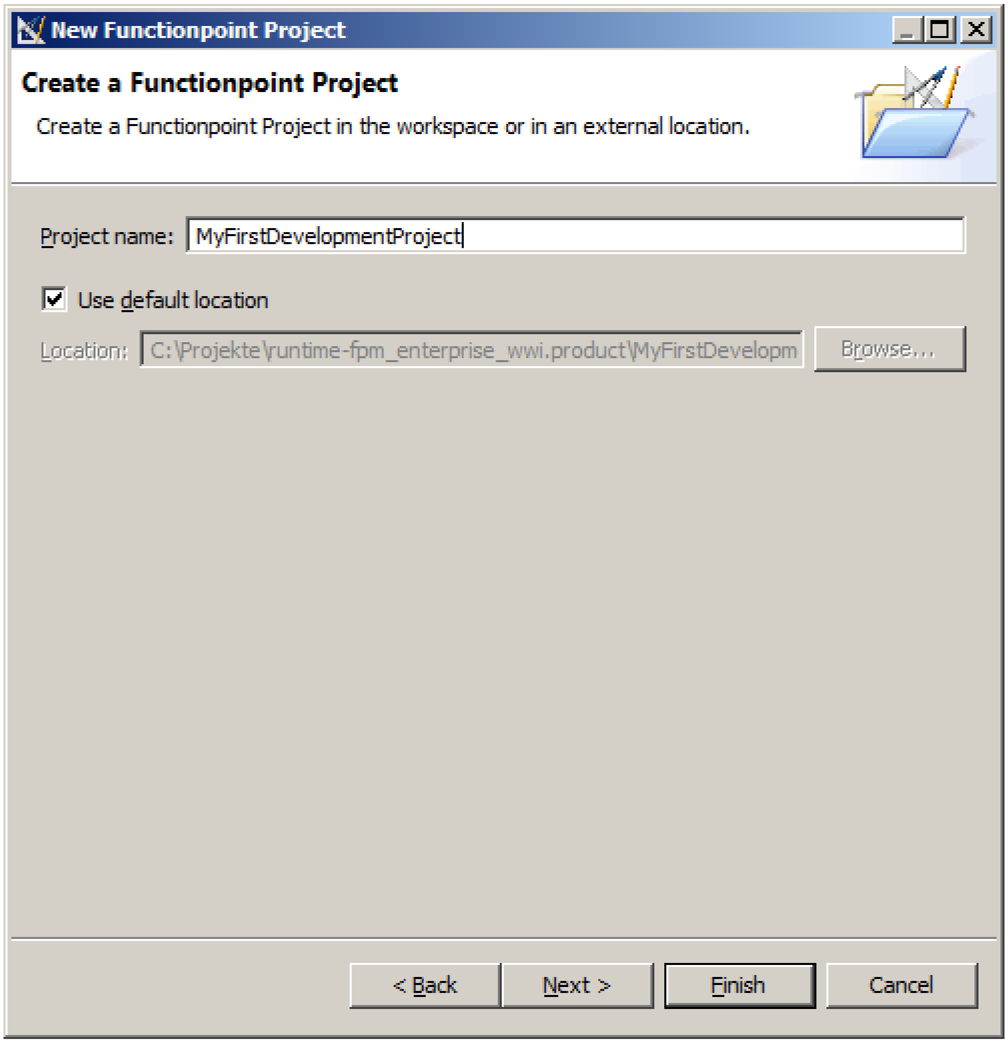
1. From the main menu bar, select **File** > **New** > **Project** .



2. The following **Creat wizard** will be displayed



3. Select the **Function Point Modeler > Functionpoint Project** and click **Next** .
4. Enter a project name and click **Next** .



New Functionpoint Project

Create a Functionpoint Project

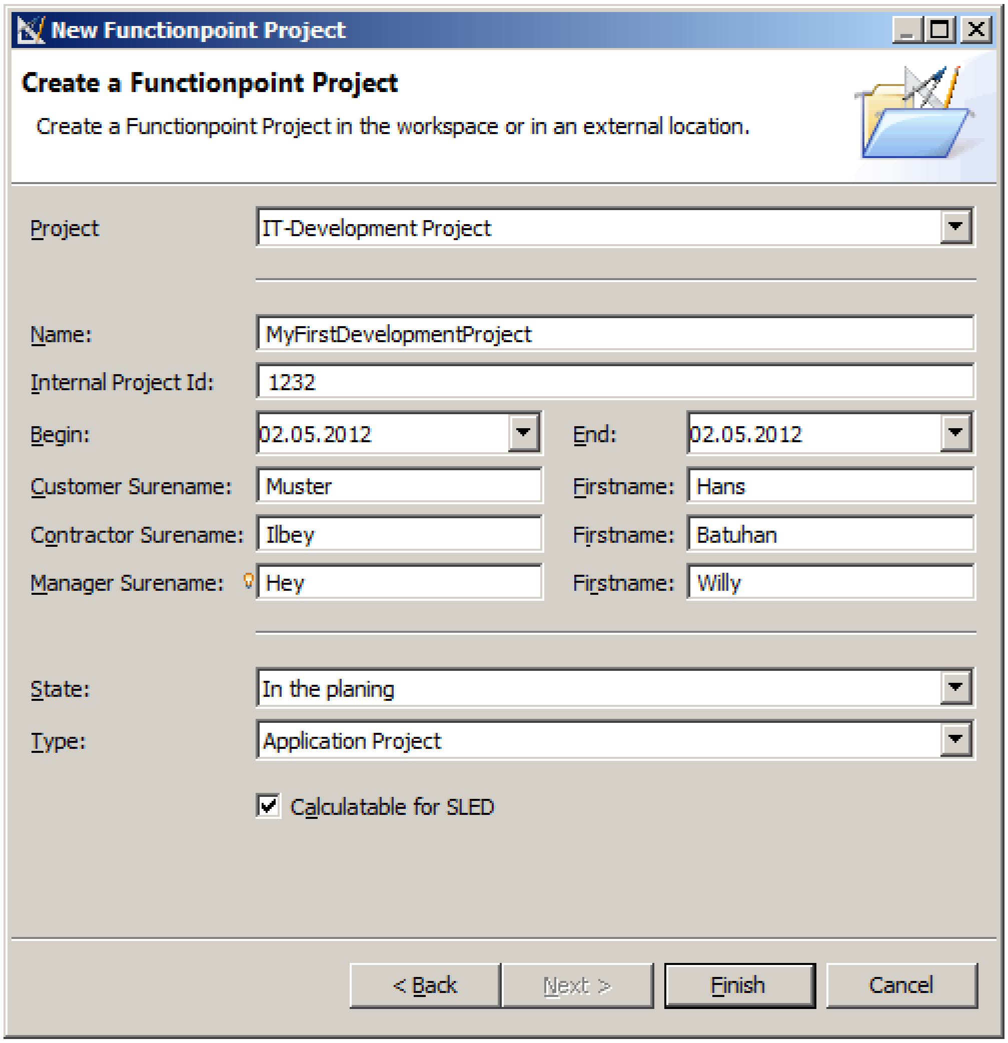
Create a Functionpoint Project in the workspace or in an external location.

Project name: MyFirstDevelopmentProject

☑ Use default location

Location: C:\Projekte\runtime-fpm_enterprise_wwi.product\MyFirstDevelopm

5. Enter the required field and click **Finish** .



New Functionpoint Project

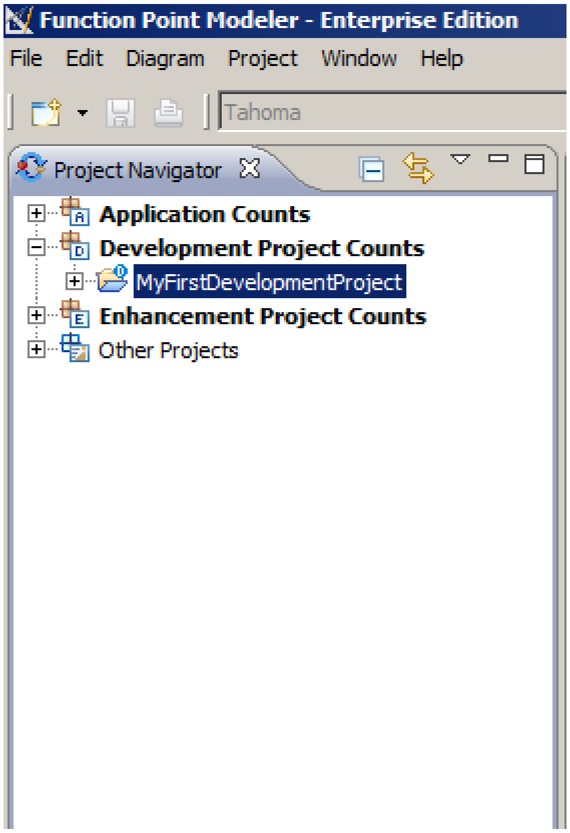
**Create a Functionpoint Project**

Create a Functionpoint Project in the workspace or in an external location.

| | | | |
|---|---|---|---|
| Project | IT-Development Project | | |
| Name: | MyFirstDevelopmentProject | | |
| Internal Project Id: | 1232 | | |
| Begin: | 02.05.2012 | End: | 02.05.2012 |
| Customer Surename: | Muster | Firstname: | Hans |
| Contractor Surename: | Ilbey | Firstname: | Batuhan |
| Manager Surename: | Hey | Firstname: | Willy |
| State: | In the planing | | |
| Type: | Application Project | | |

☑ Calculatable for SLED

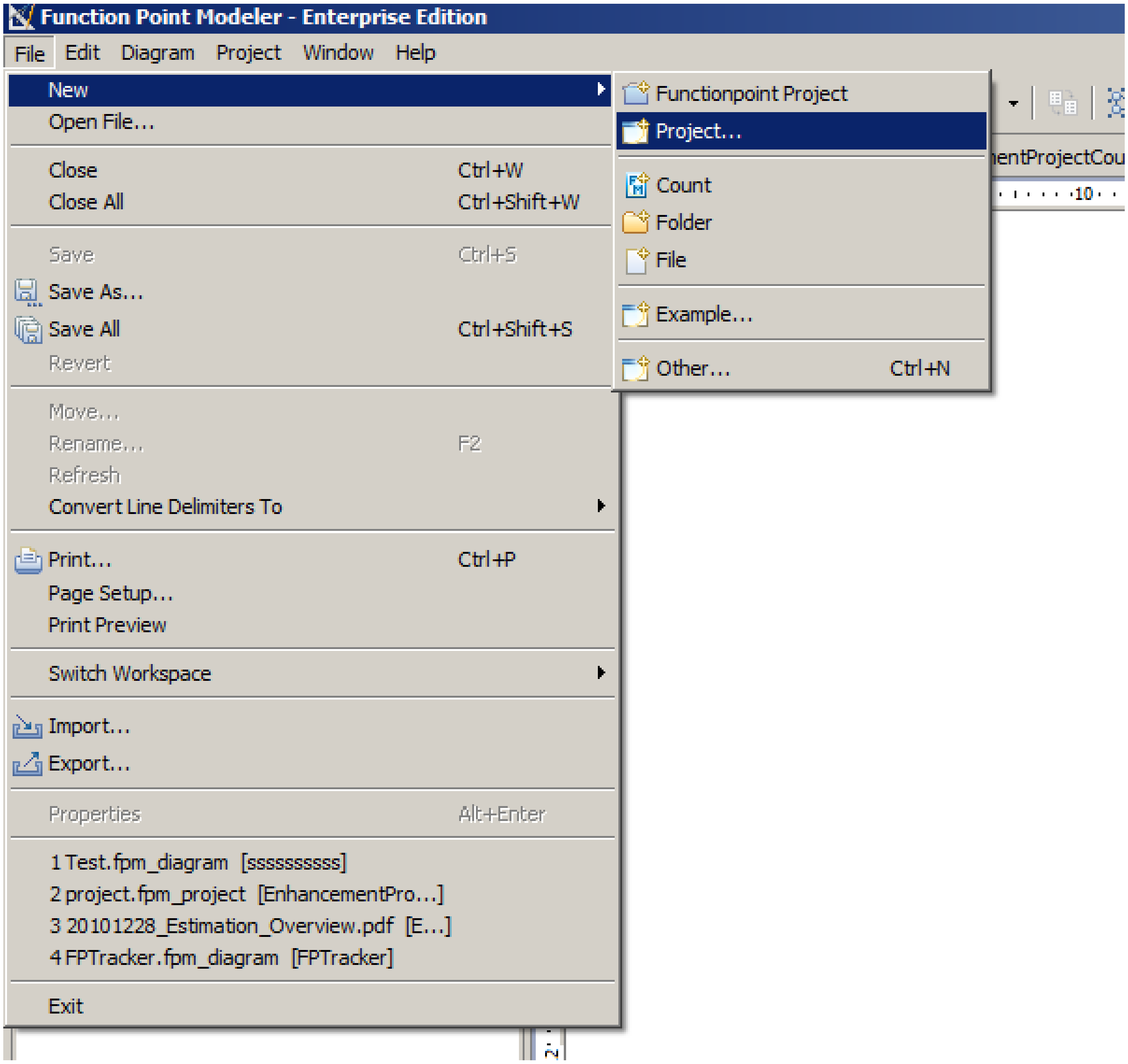
The new created **Development Project** will be displayed in the project explorer


Function Point Modeler - Enterprise Edition
File
Edit
Diagram
Project
Window
Help
Tahoma
Project Navigator
Application Counts
Development Project Counts
MyFirstDevelopmentProject
Enhancement Project Counts
Other Projects

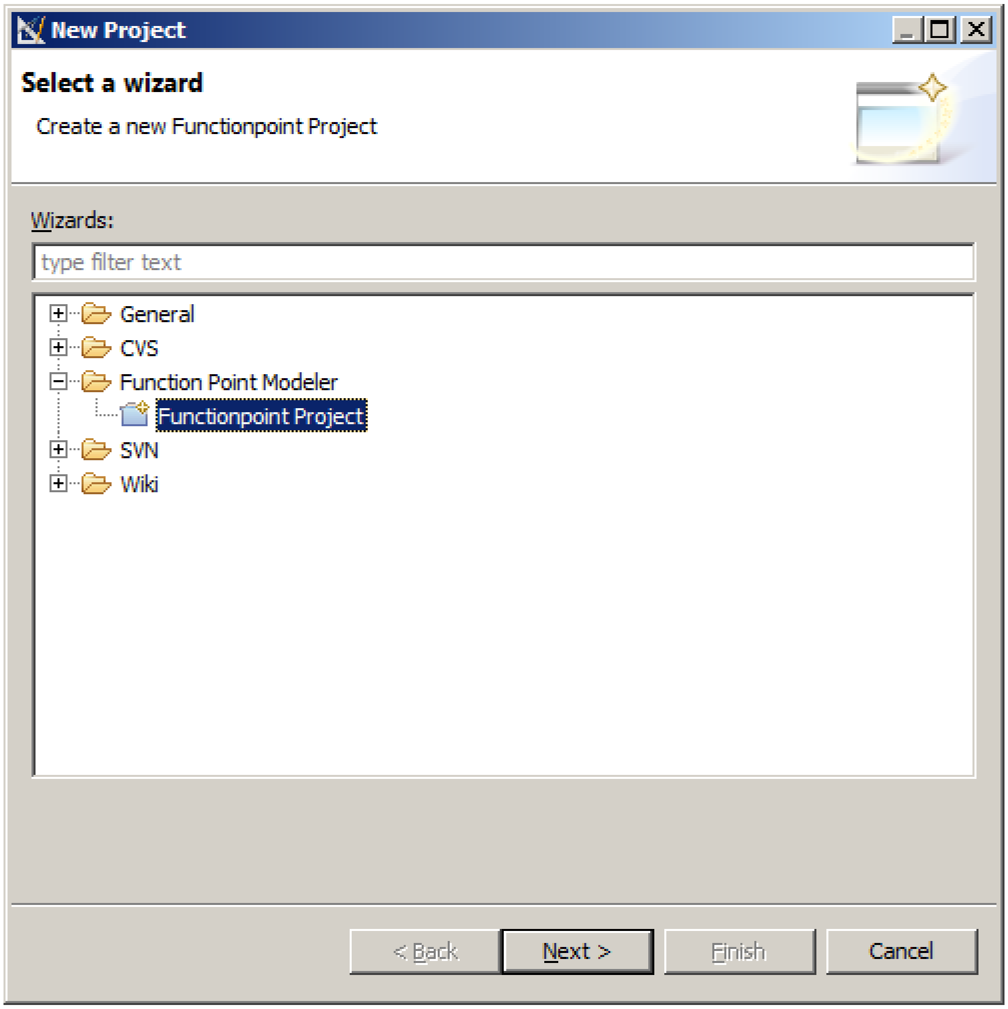
### Create a Enhancement Project

To create a new **Enhancement Project** , perform the following steps.

1. From the main menu bar, select **File** > **New** > **Project** .

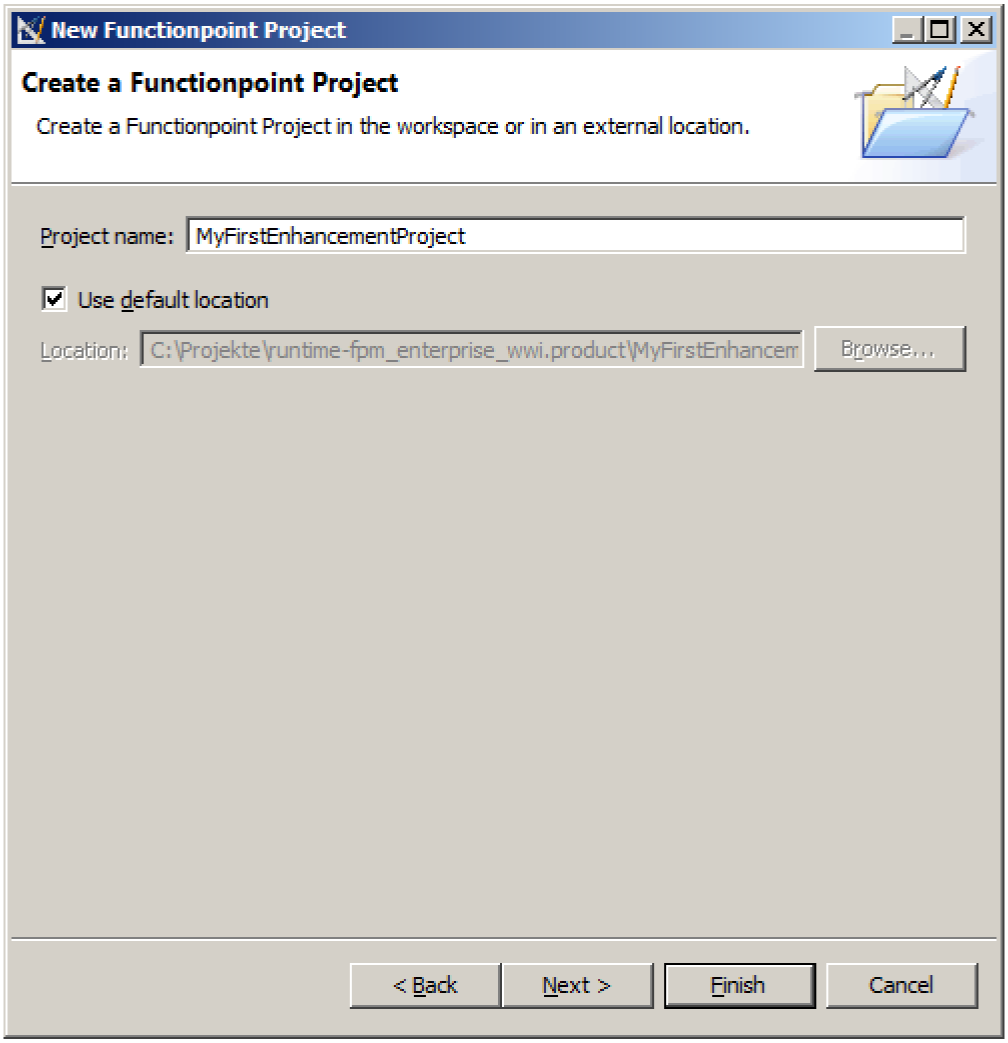


2. The following **Create wizard** will be displayed



**3.** Select the **Function Point Modeler > Functionpoint Project** and click **Next** .

**4.** Enter a project name and click **Next** .



New Functionpoint Project

Create a Functionpoint Project

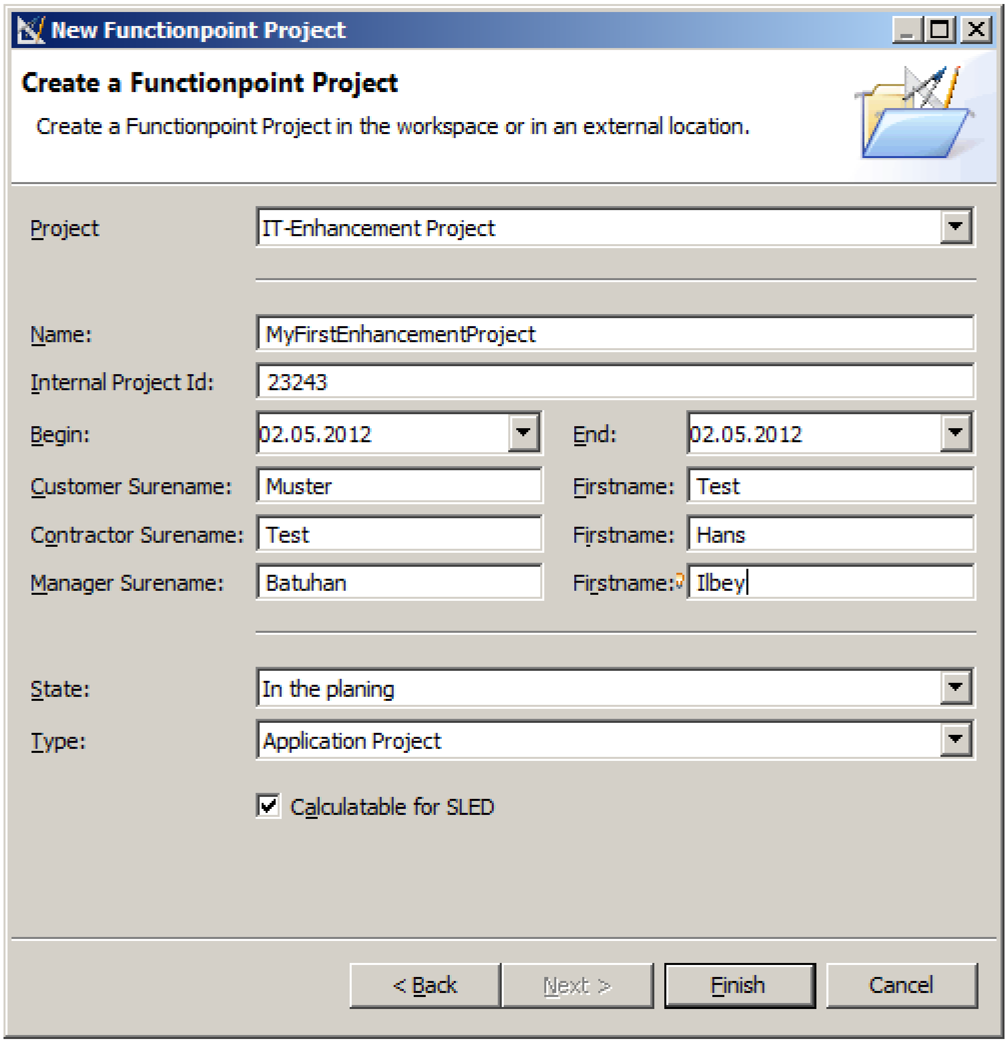
Create a Functionpoint Project in the workspace or in an external location.

Project name: MyFirstEnhancementProject

☑ Use default location

Location: C:\Projekte\runtime-fpm_enterprise_wwi.product\MyFirstEnhancem

**5.** Enter the required field and click **Finish** .



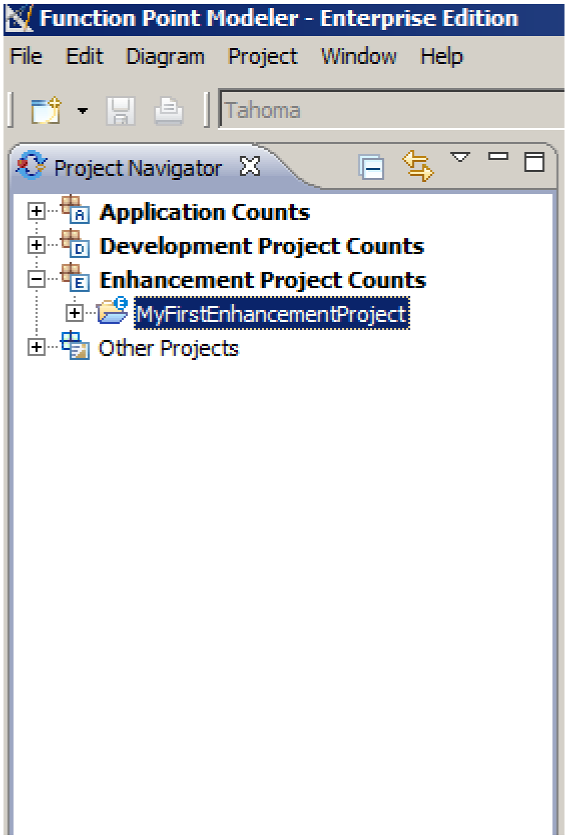
**Create a Functionpoint Project**

Create a Functionpoint Project in the workspace or in an external location.

| | | | |
|---|---|---|---|
| Project | IT-Enhancement Project | | |
| Name: | MyFirstEnhancementProject | | |
| Internal Project Id: | 23243 | | |
| Begin: | 02.05.2012 | End: | 02.05.2012 |
| Customer Surename: | Muster | Firstname: | Test |
| Contractor Surename: | Test | Firstname: | Hans |
| Manager Surename: | Batuhan | Firstname: | Ilbey |
| State: | In the planing | | |
| Type: | Application Project | | |

☑ Calculatable for SLED

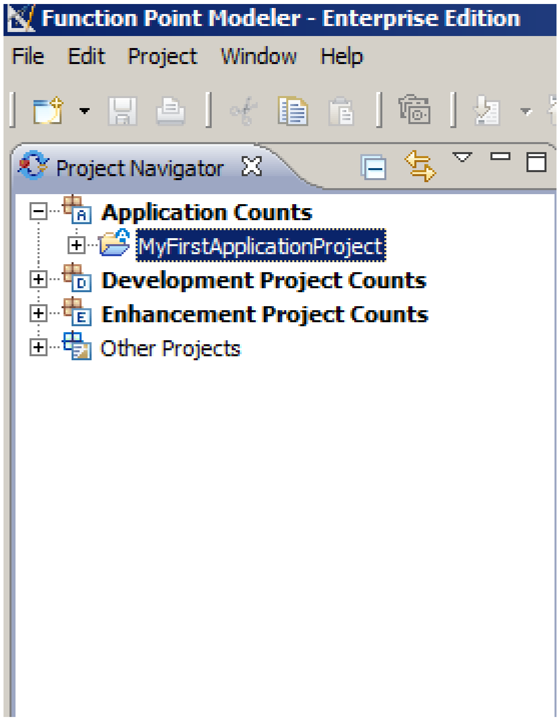
The new created **Enhancement Project** will be displayed in the project explorer


Function Point Modeler - Enterprise Edition
File Edit Diagram Project Window Help
Tahoma
Project Navigator
Application Counts
Development Project Counts
Enhancement Project Counts
MyFirstEnhancementProject
Other Projects

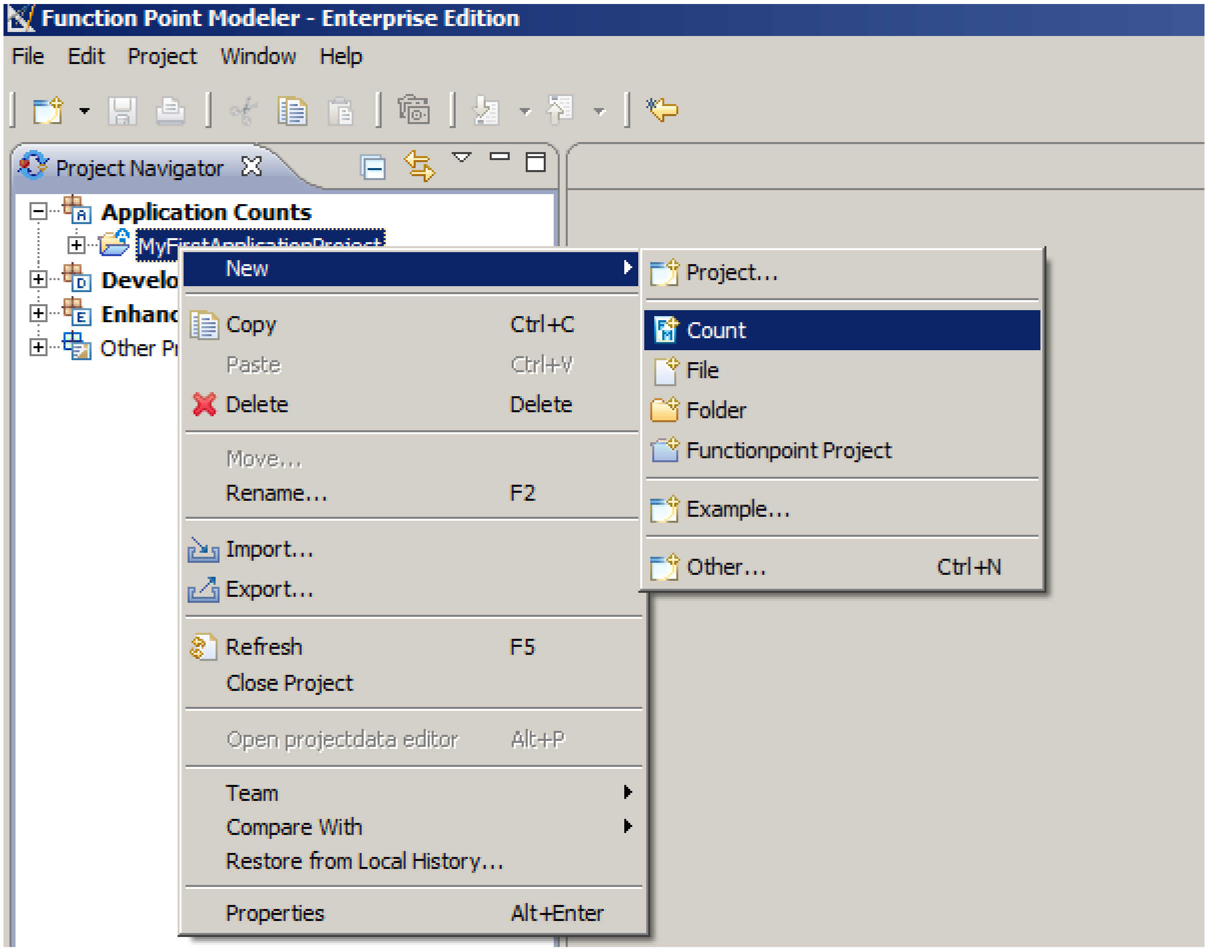
### Create a Application Count

To create a new **Application Count** , perform the following steps.

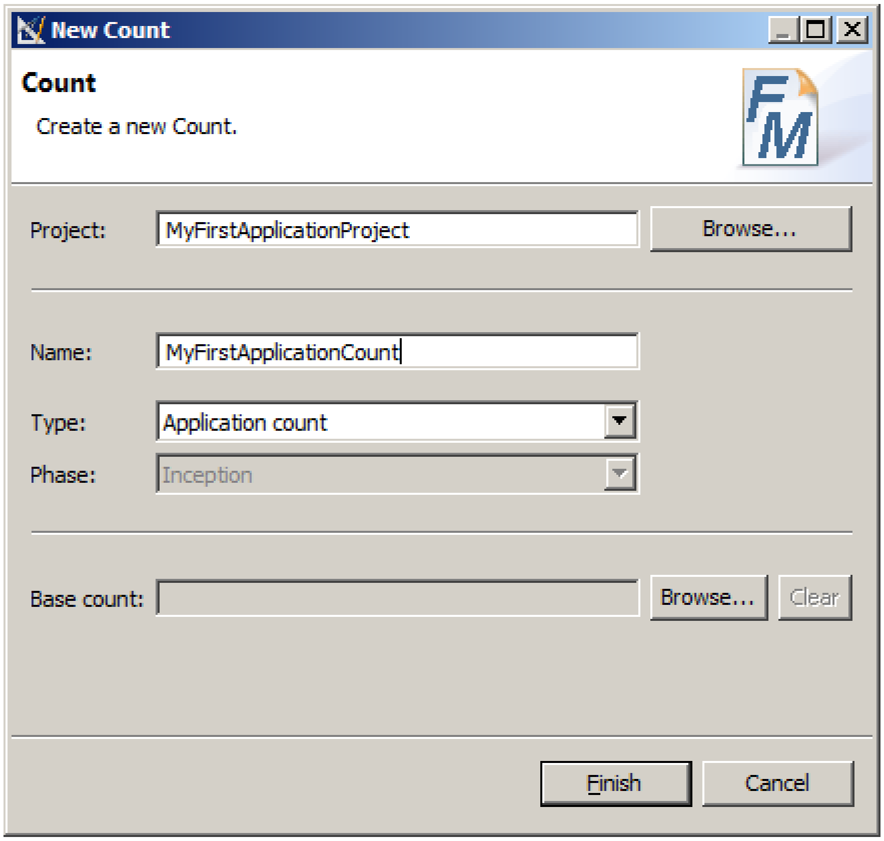
1. Select an **Application Project** in the Project Explorer.


Function Point Modeler - Enterprise Edition
File Edit Project Window Help
Project Navigator
Application Counts
MyFirstApplicationProject
Development Project Counts
Enhancement Project Counts
Other Projects

2. From the main menu bar, select **File** > **New** > **Count** .



3. The following **Create wizard** will be displayed



New Count

**Count**

Create a new Count.

Project: MyFirstApplicationProject

Name: MyFirstApplicationCount

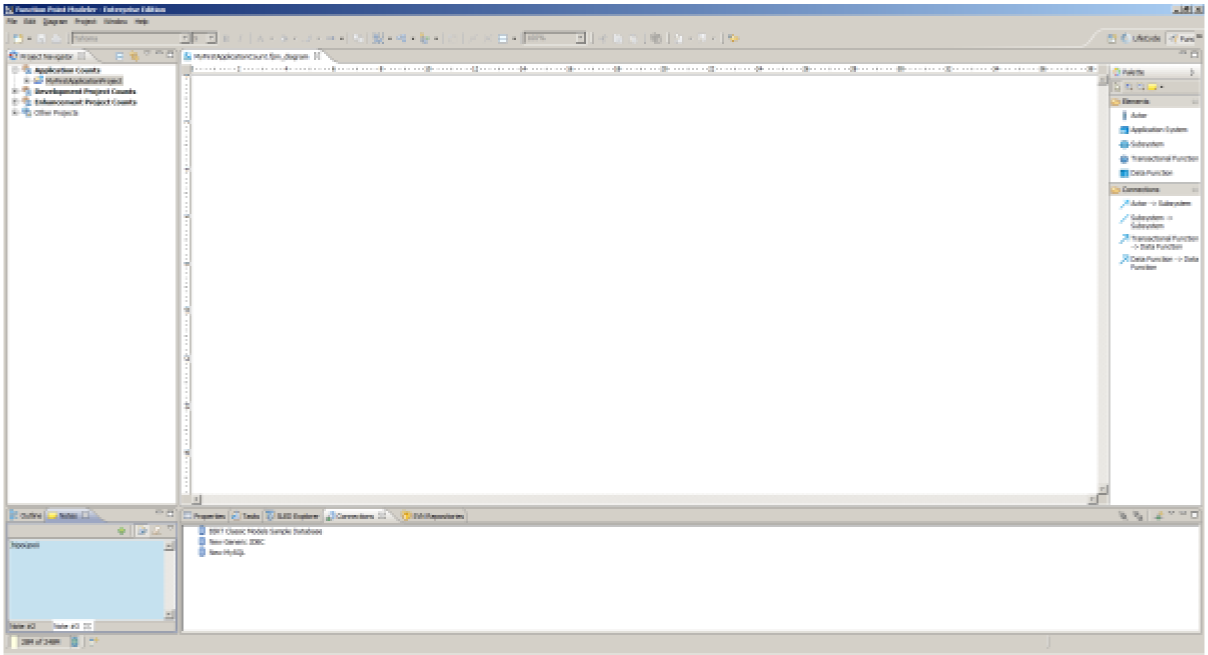
Type: Application count

Phase: Inception

Base count:

4. Enter the count name and click **Finish** .

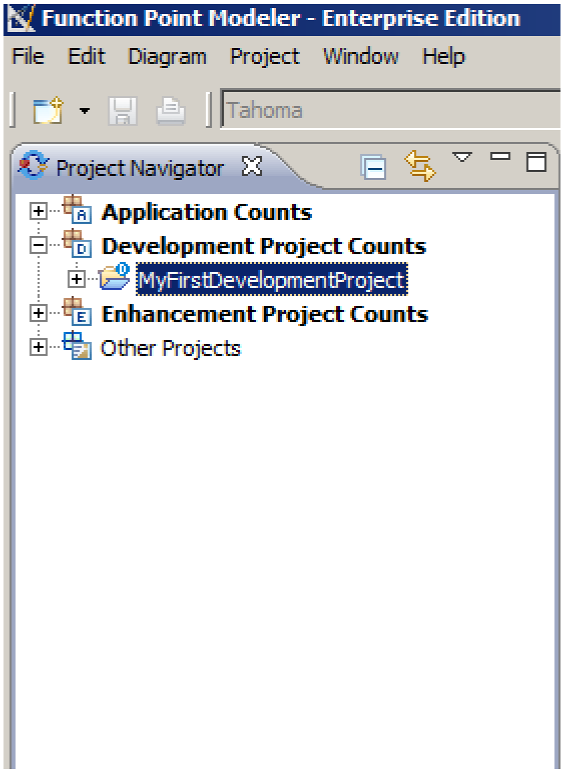
The new created empty **Application Count** will be displayed in the **Function Point Modeler** workbench. You may continue with ***Create a new Application System*** .



### Create a Development Project Count

To create a new **Development Project Count** , perform the following steps.

1. Select an **Development Project** in the Project Explorer.



Function Point Modeler - Enterprise Edition
File
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Diagram
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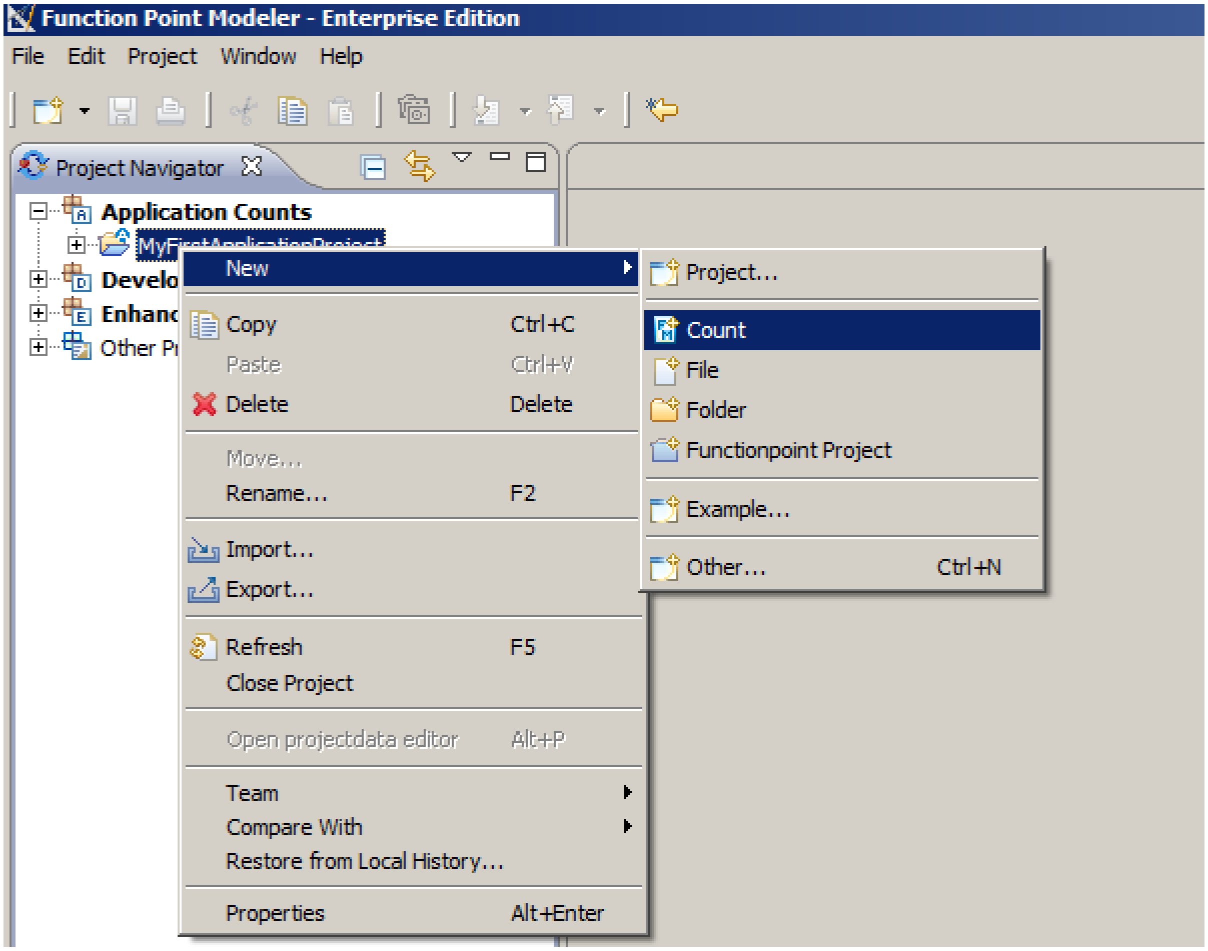
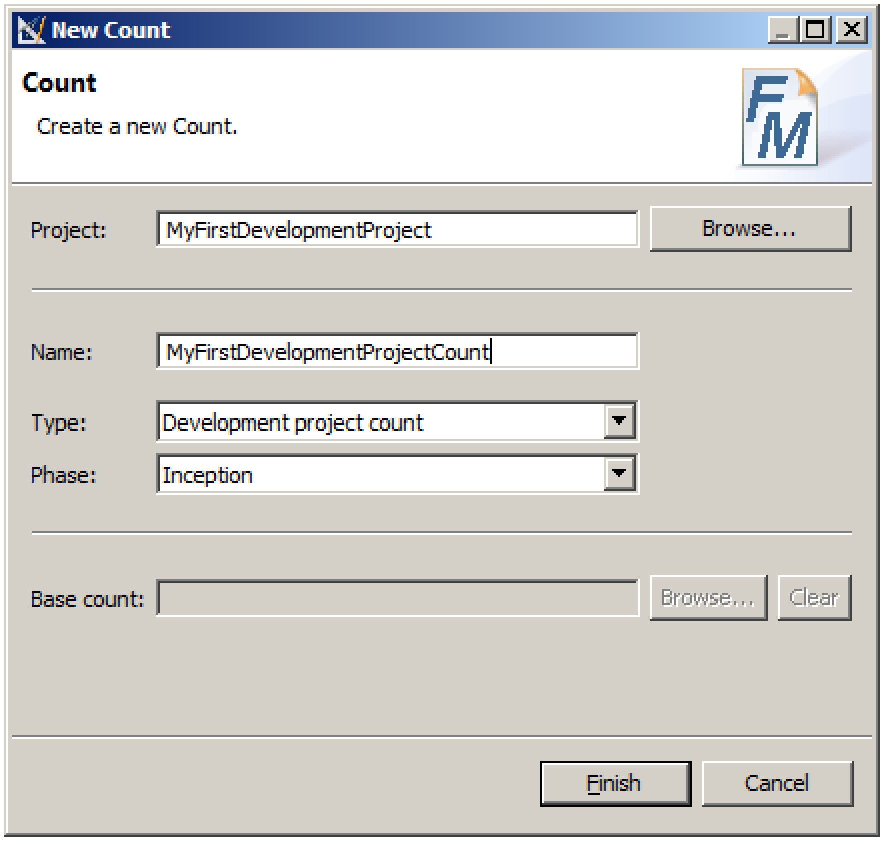
Window
Help
Tahoma
Project Navigator
Application Counts
Development Project Counts
MyFirstDevelopmentProject
Enhancement Project Counts
Other Projects

2. From the main menu bar, select **File** > **New** > **Count** .



3. The following **Create wizard** will be displayed



**Count**

Create a new Count.

Project: MyFirstDevelopmentProject

Name: MyFirstDevelopmentProjectCount

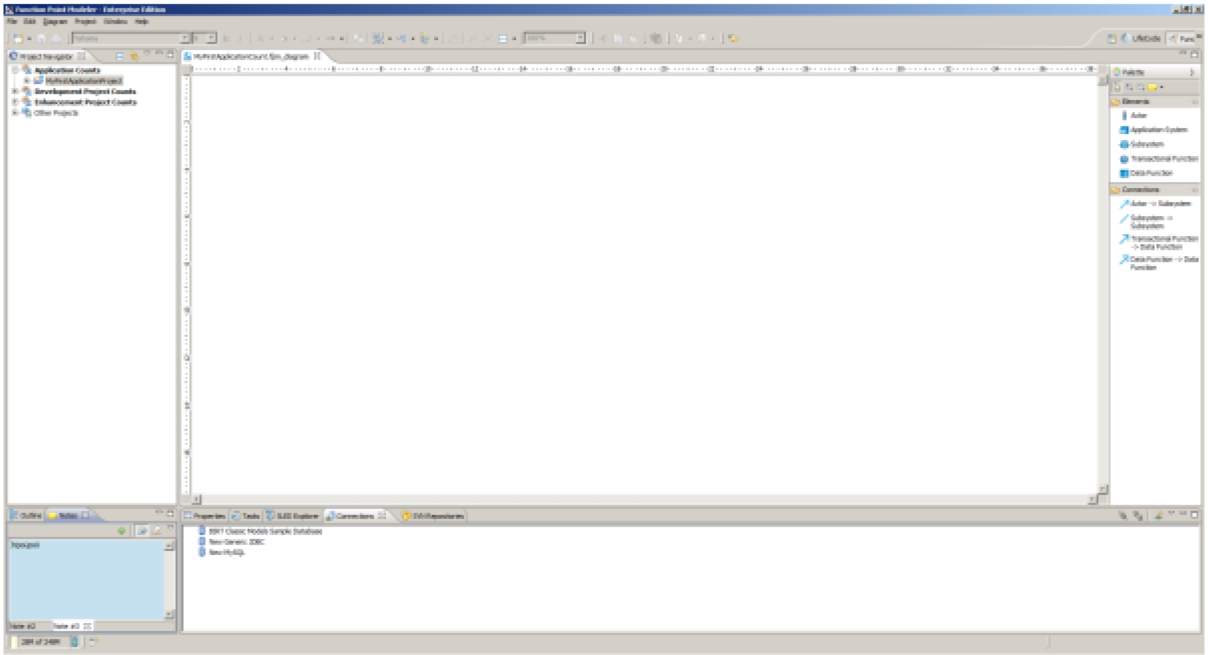
Type: Development project count

Phase: Inception

Base count:

**4.** Enter the count name and click **Finish** .

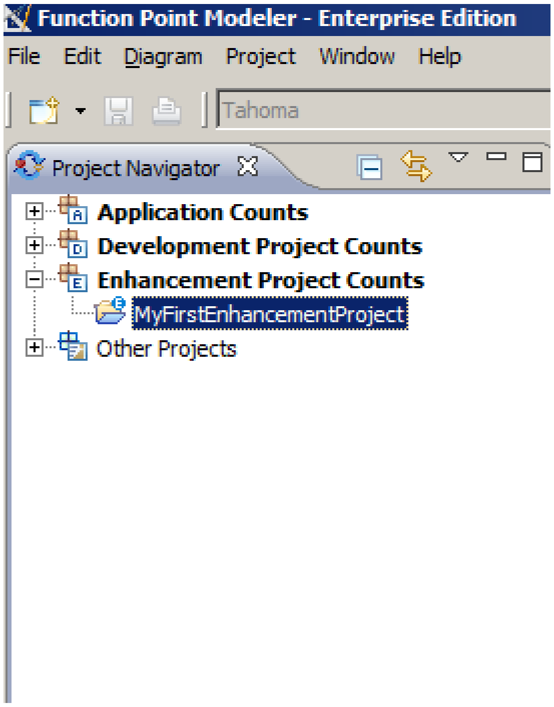
The new created empty **Development Project Count** will be displayed in the **Function Point Modeler** workbench. You may continue with ***Create a new Application System*** .



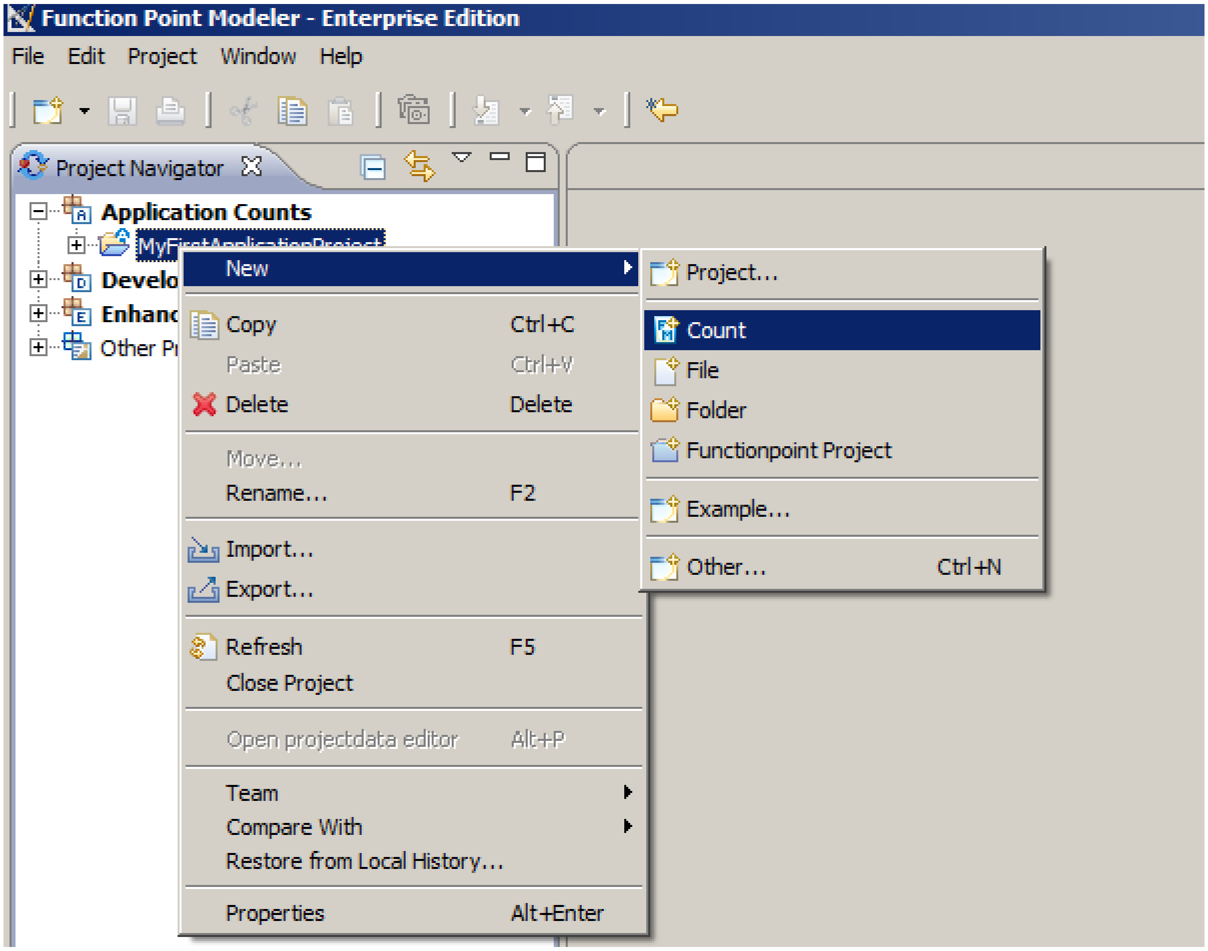
### Create a Enhancement Project Count

To create a new **Enhancement Project Count** , perform the following steps.

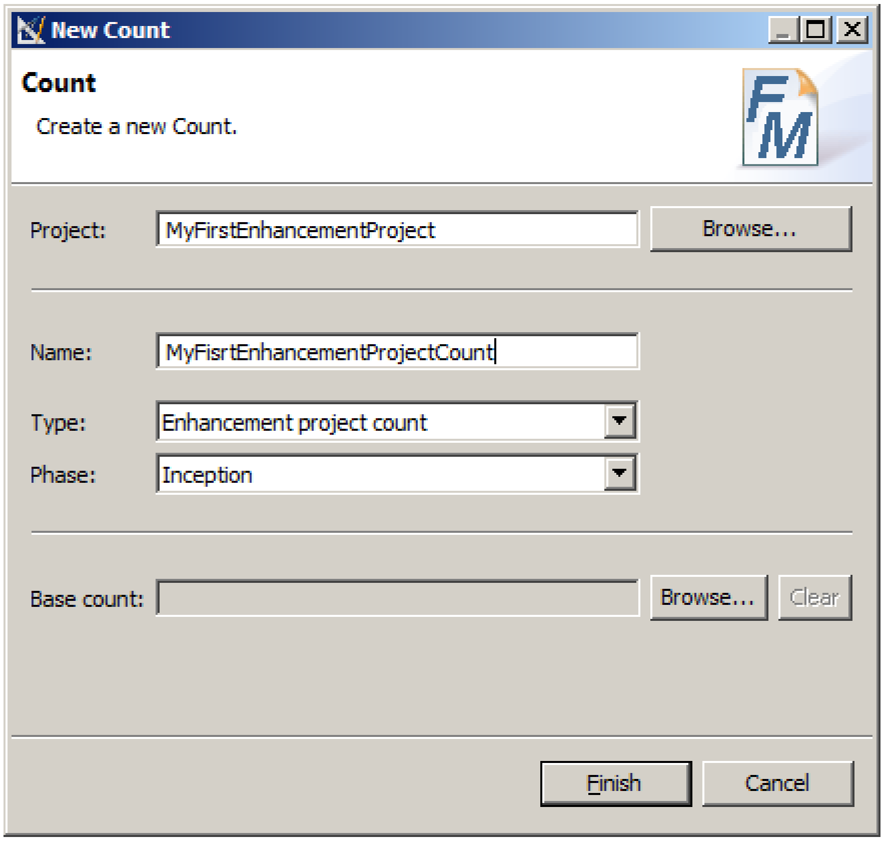
1. Select an **Enhancement Project** in the Project Explorer.


Function Point Modeler - Enterprise Edition
File
Edit
Diagram
Project
Window
Help
Tahoma
Project Navigator
Application Counts
Development Project Counts
Enhancement Project Counts
MyFirstEnhancementProject
Other Projects

2. From the main menu bar, select **File** > **New** > **Count** .



**3.** The following **Create wizard** will be displayed



**Count**

Create a new Count.

Project: MyFirstEnhancementProject

Name: MyFisrtEnhancementProjectCount

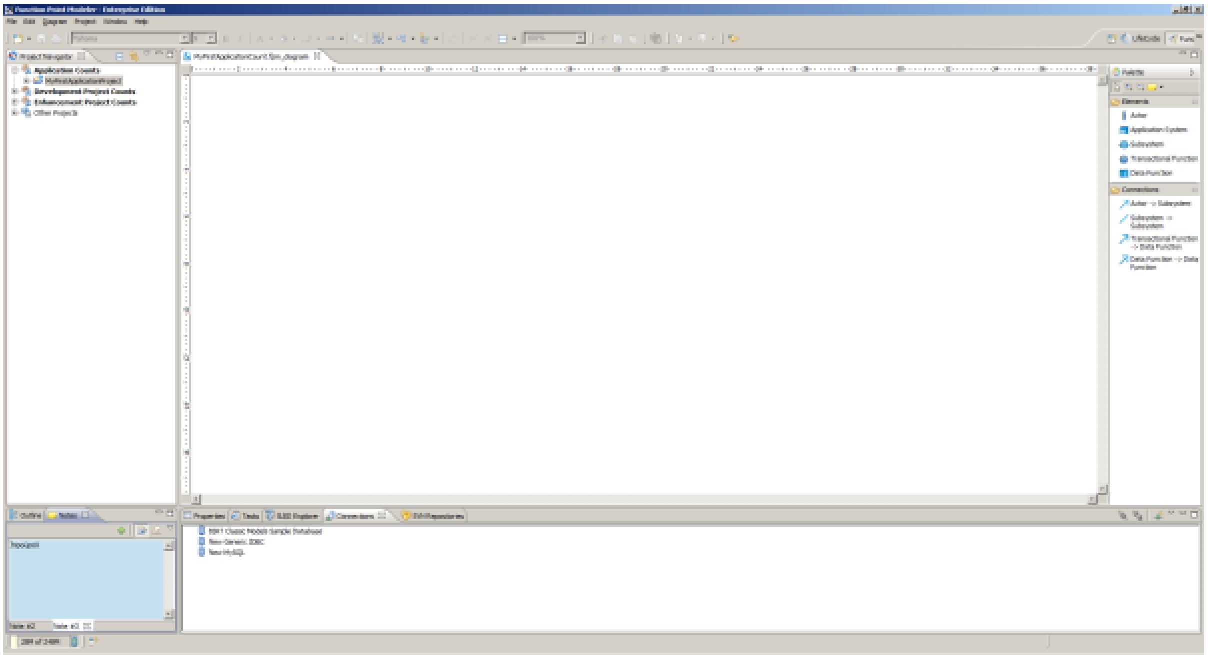
Type: Enhancement project count

Phase: Inception

Base count:

**4.** Enter the count name and click **Finish** .

The new created empty **Enhancement Project Count** will be displayed in the **Function Point Modeler** workbench. You may continue with ***Create a new Application System*** .

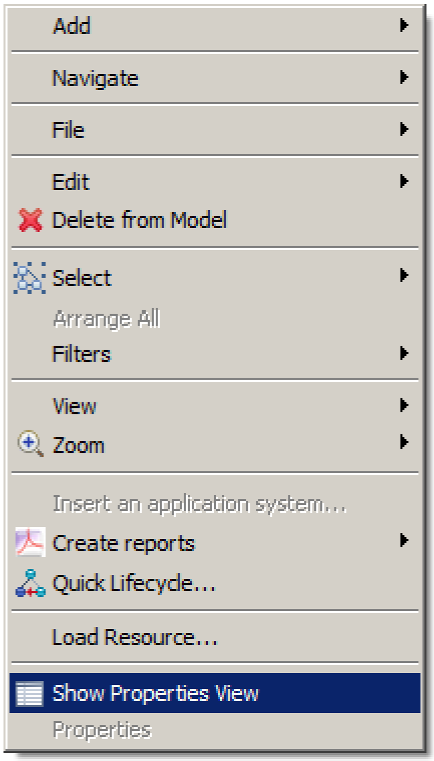


### Change Count Properties

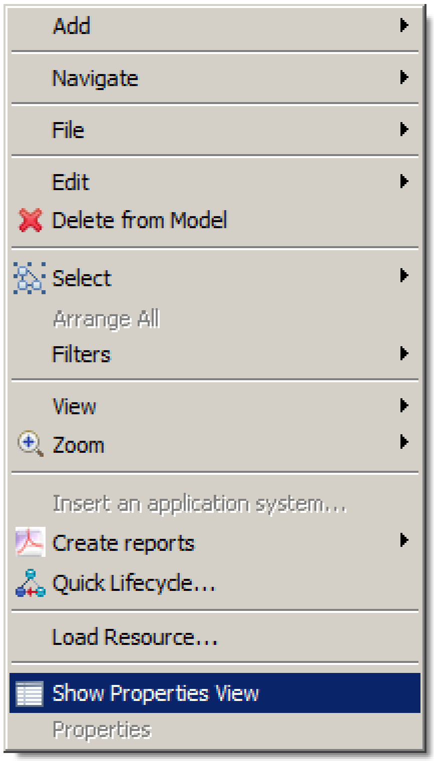
After you create a **Count** , you can edit its various properties, such as its name, phase etc.

To change the properties of **Count** , perform the following steps.

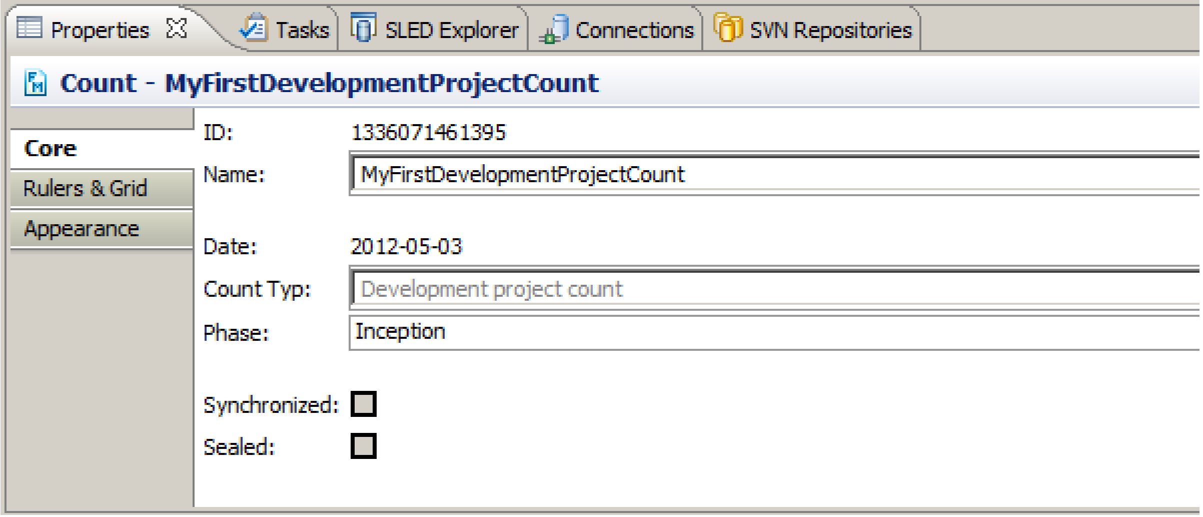
1. Move your mouse pointer to a **Count** on the workbench element in the editor area and perform a right mouse click.



2. Select the menu item **Show Properties View** .



3. The following **Properties View** will be showed.



Count - MyFirstDevelopmentProjectCount

ID: 1336071461395

Name: MyFirstDevelopmentProjectCount

Date: 2012-05-03

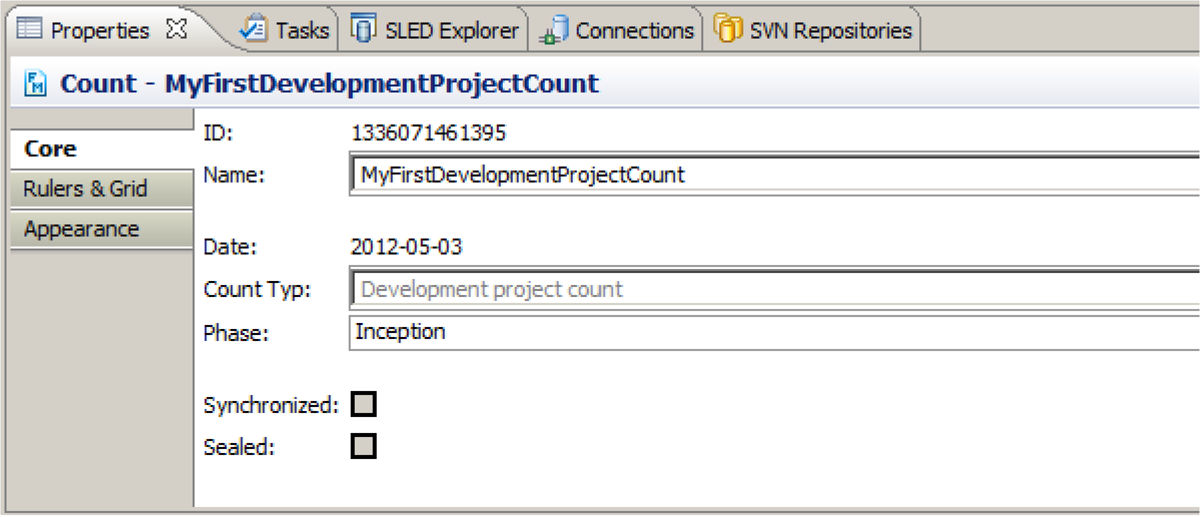
Count Typ: Development project count

Phase: Inception

Synchronized: □

Sealed: □

4. Enter a name for your Count.



Count - MyFirstDevelopmentProjectCount

ID: 1336071461395

Name: MyFirstDevelopmentProjectCount

Date: 2012-05-03

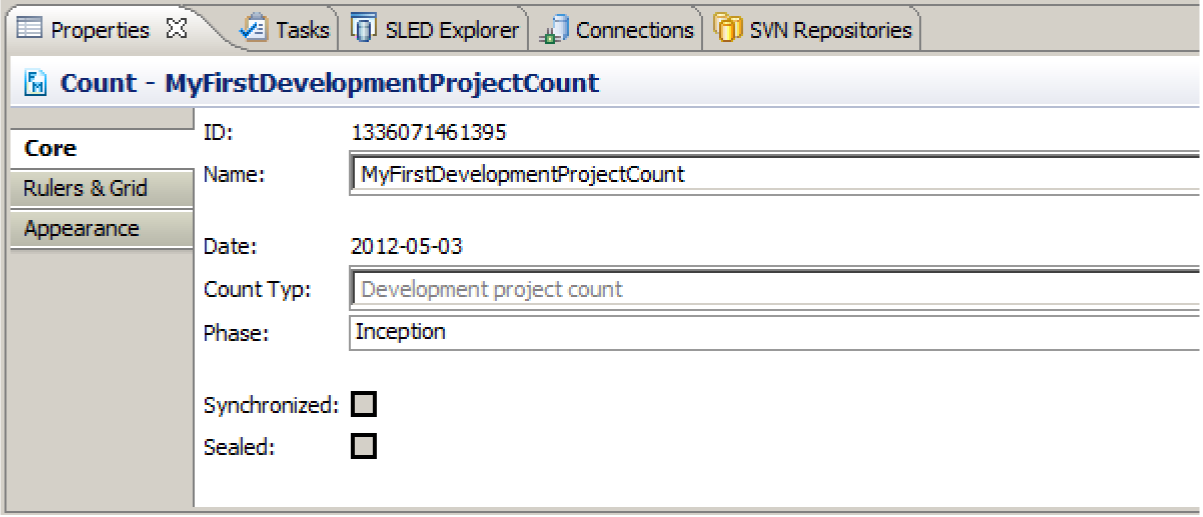
Count Typ: Development project count

Phase: Inception

Synchronized: □

Sealed: □

5. Click Enter to change the properties.



Count - MyFirstDevelopmentProjectCount

ID: 1336071461395

Name: MyFirstDevelopmentProjectCount

Date: 2012-05-03

Count Typ: Development project count

Phase: Inception

Synchronized: □

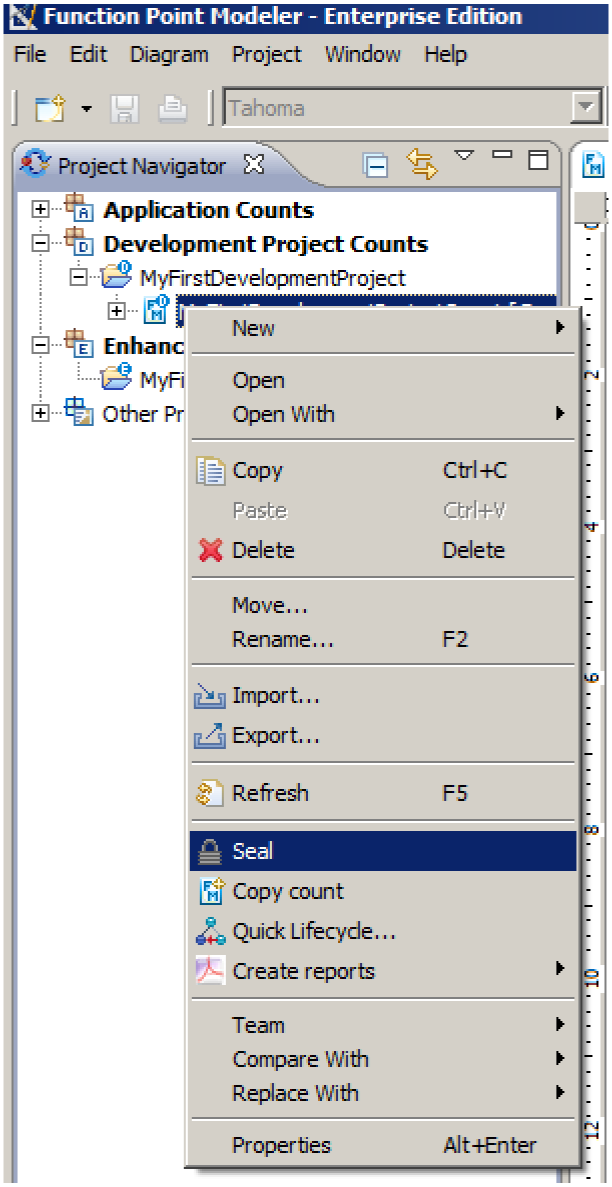
Sealed: □

### Seal a Count

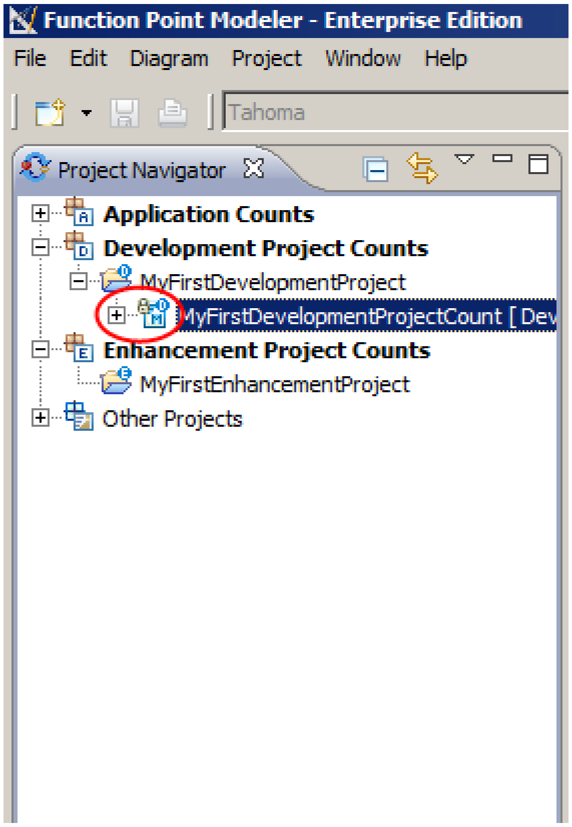
Once you have finished with a count you may seal this **Count** .

The sealing of a count means that you can not change the count any more.

Select a count from the **Project Explorer** and select **Seal** from the popup menu.



Once you have sealed a count, the count will be displayed with lock in the tree.


Function Point Modeler - Enterprise Edition
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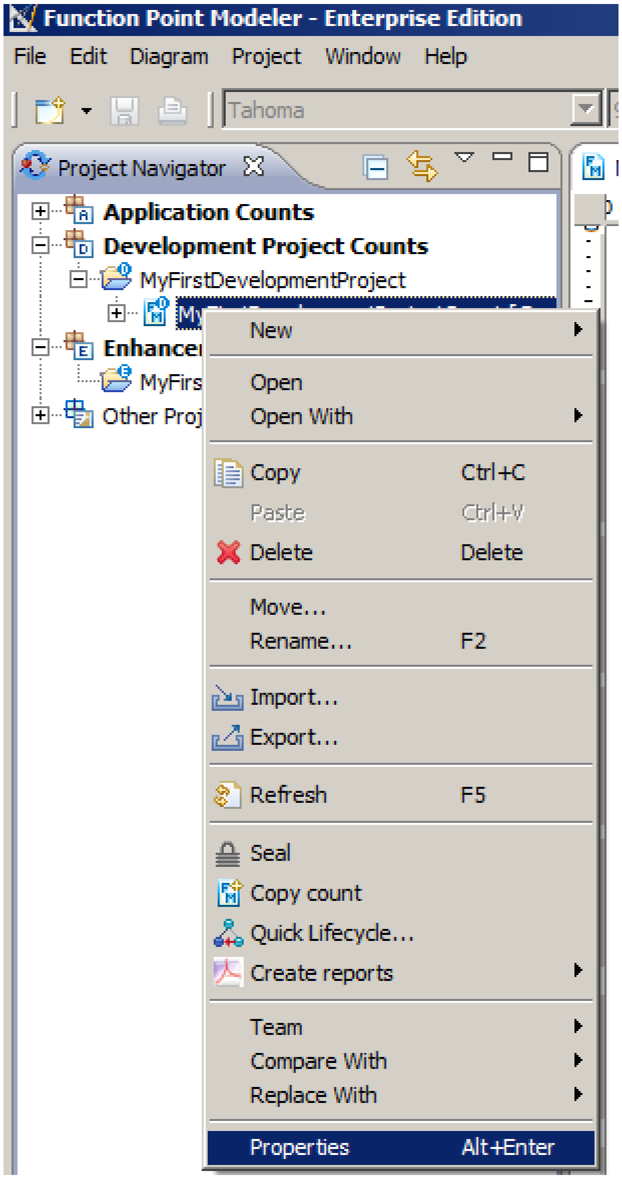
Project Navigator
Application Counts
Development Project Counts
MyFirstDevelopmentProject
MyFirstDevelopmentProjectCount [ Dev
Enhancement Project Counts
MyFirstEnhancementProject
Other Projects

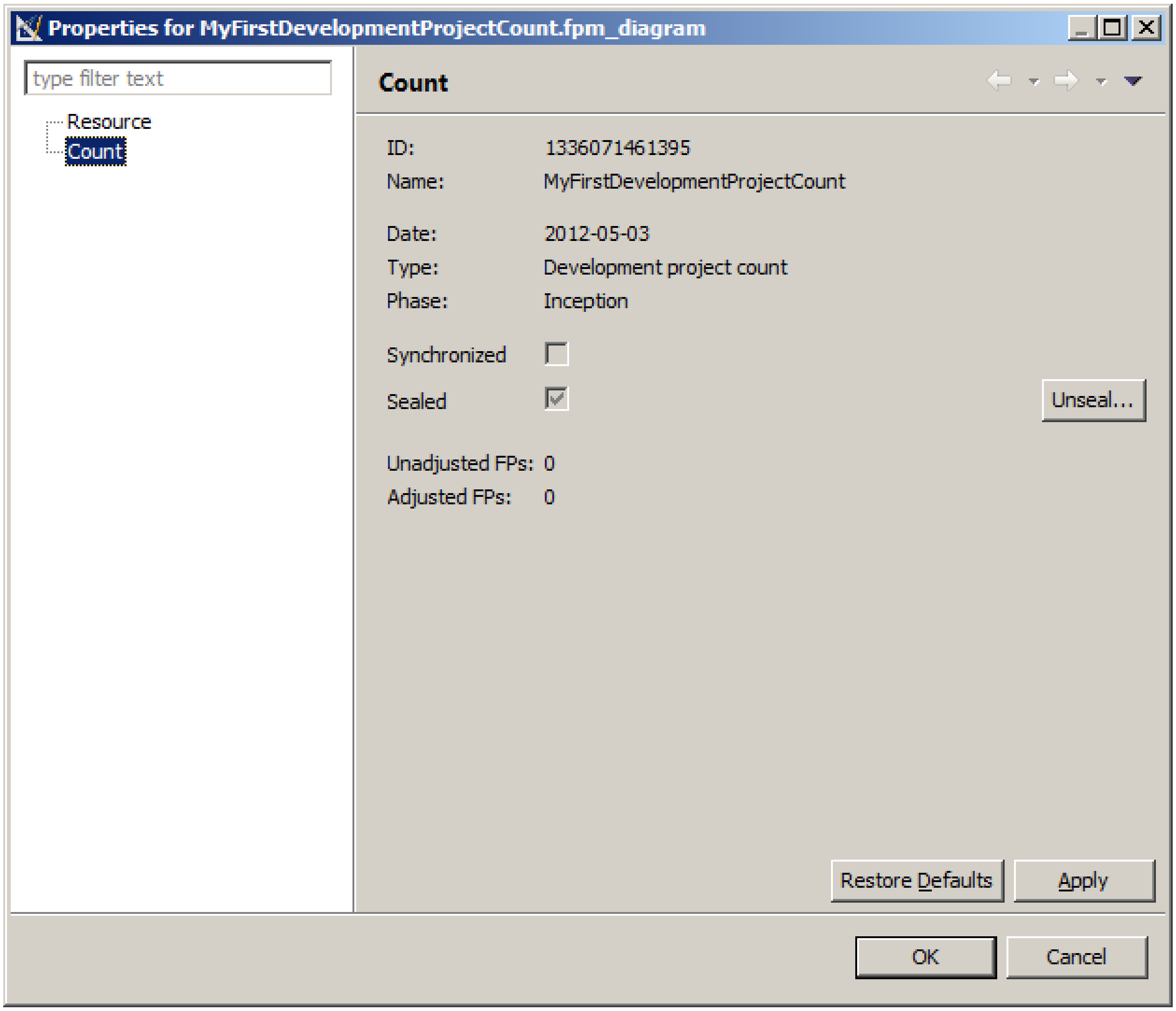
## Unseal a Count

You may also unseal a count which is already sealed. But it is not recommended!

1. Select a count from the **Project Explorer** and select **Properties** from the popup menu.

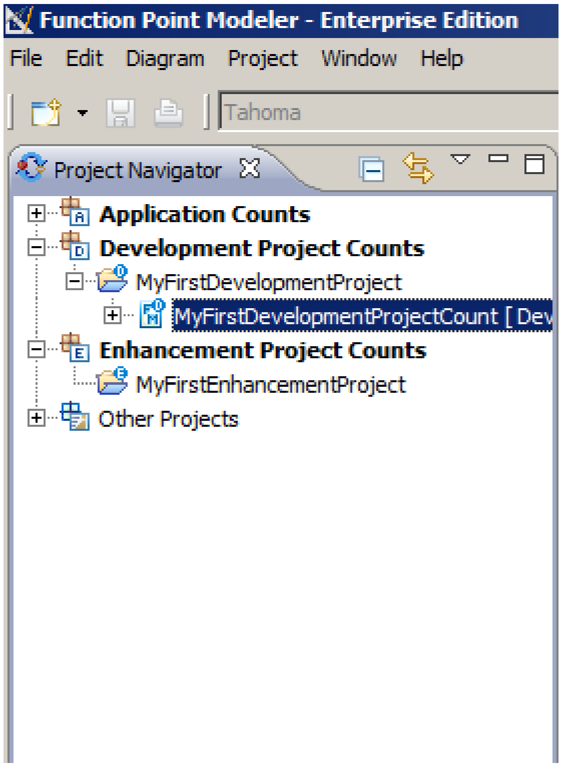


2. The following dialog will be showed.Click **Unseal...** button on the dialog.



ID: 1336071461395
Name: MyFirstDevelopmentProjectCount
Date: 2012-05-03
Type: Development project count
Phase: Inception
Synchronized ☐
Sealed ☑
Unadjusted FPs: 0
Adjusted FPs: 0

Once you have unsealed a count, the lock on the count will be disappear in the tree.


Function Point Modeler - Enterprise Edition
File Edit Diagram Project Window Help
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Project Navigator
Application Counts
Development Project Counts
MyFirstDevelopmentProject
MyFirstDevelopmentProjectCount [ Dev
Enhancement Project Counts
MyFirstEnhancementProject
Other Projects

## Working with Projectdata and Cocomo Estimation

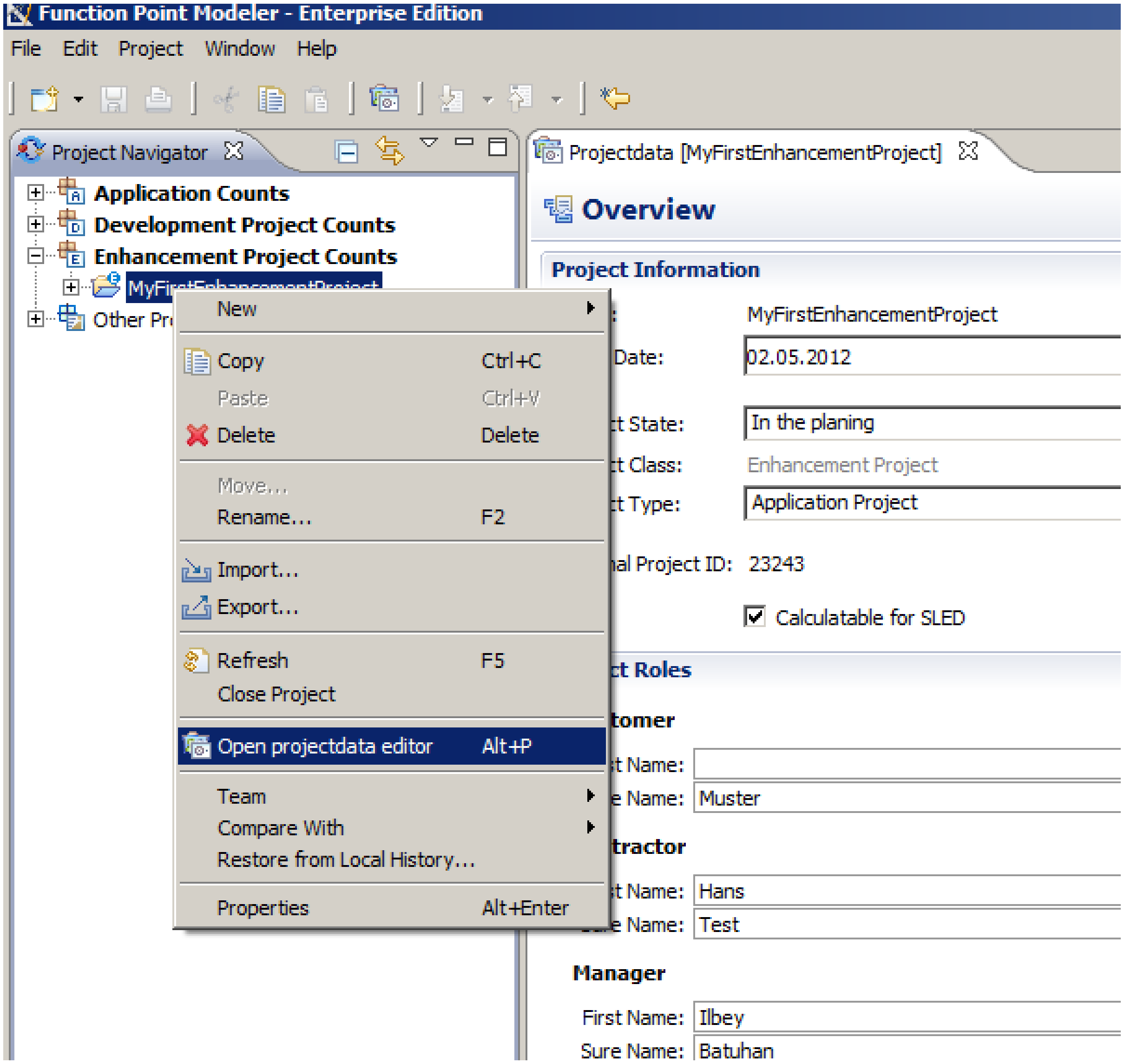
Enterprise Edition

### Create or Modify Project Plandata

Enterprise Edition

To create a new **Project Plandata** , perform the following steps.

1. Select **Open projectdata editor** from the popup menu in the **Project Explorer** .



: MyFirstEnhancementProject

Date: 02.05.2012

t State: In the planing

t Class: Enhancement Project

t Type: Application Project

al Project ID: 23243

☑ Calculatable for SLED

t Roles

tomer

t Name:

e Name: Muster

tractor

t Name: Hans

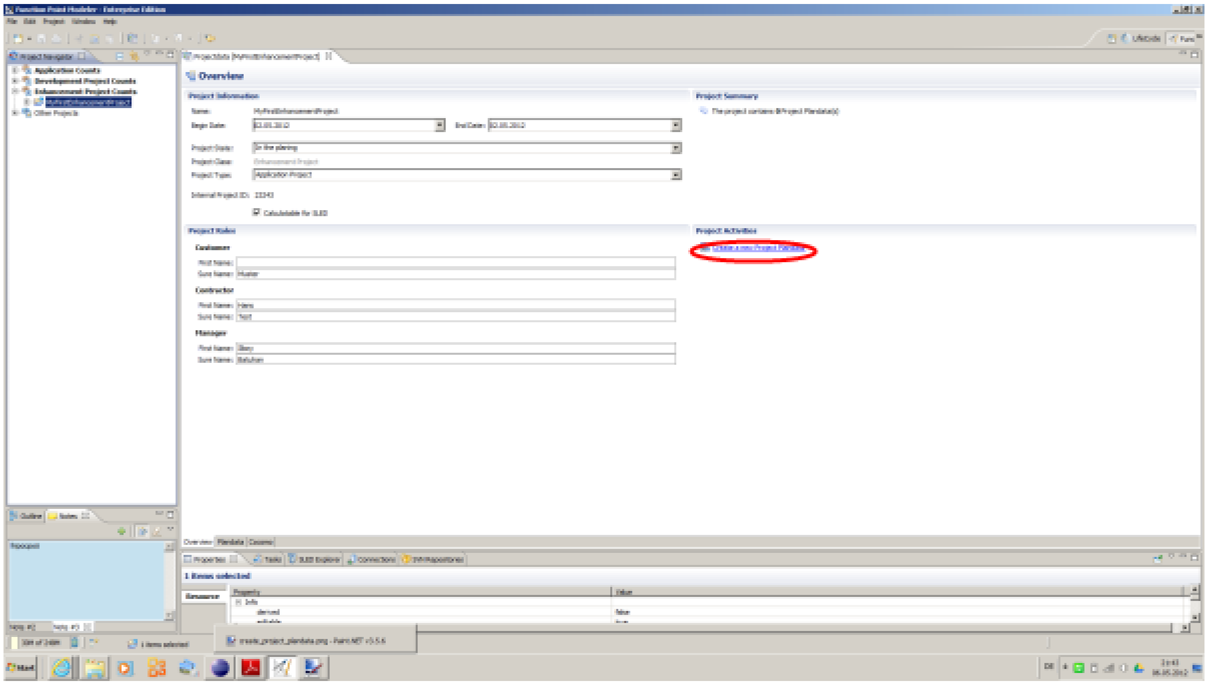
e Name: Test

Manager

First Name: Ilbey

Sure Name: Batuhan

2. The following **Projectdata Editor** will be displayed in the **Function Point Modeler** workbench. Click o the **Create a new Project Plandata** .


Overview

Project Information

Name: MyFirstEnhancementProject

Begin Date: 02.05.2012 End Date: 02.05.2012

Project State: In the planing

Project Class: Enhancement Project

Project Type: Application Project

Internal Project ID: 23343

☑ Calculable for SLED

Project Summary

The project contains 0 Project Plandata(s)

Project Roles

Customer

First Name:

Sure Name: Muster

Contractor

First Name: Hans

Sure Name: Test

Manager

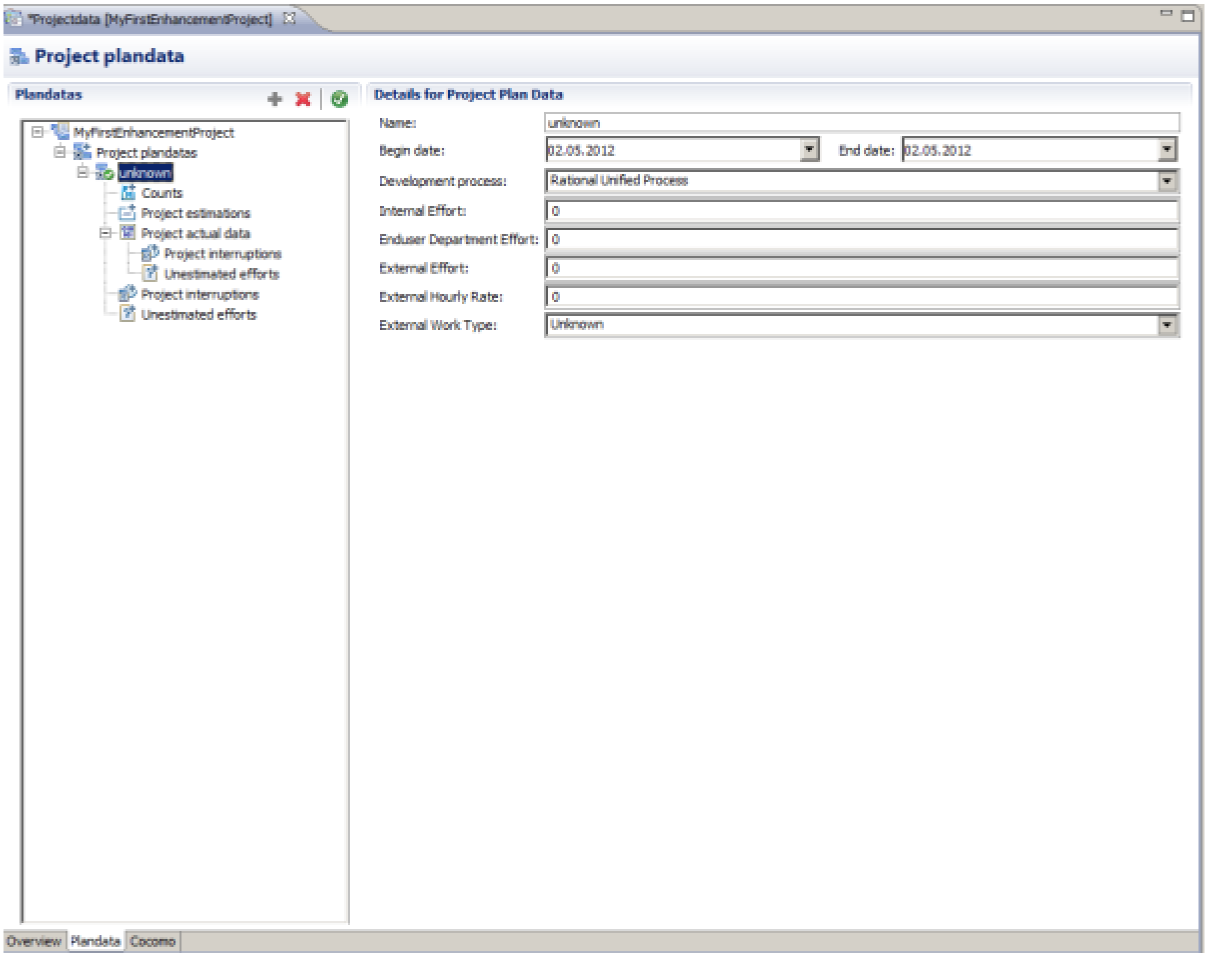
First Name: Sbey

Sure Name: Bafufun

Project Activities

Create a new Project Plandata

The new created **Development Project** will be displayed in the Projectdata Editor.



Project plandata

Plandatas

- MyFirstEnhancementProject
  - Project plandatas
    - unknown
      - Counts
      - Project estimations
      - Project actual data
        - Project interruptions
        - Unestimated efforts
      - Project interruptions
      - Unestimated efforts

Details for Project Plan Data

Name: unknown

Begin date: 02.05.2012 End date: 02.05.2012

Development process: Rational Unified Process

Internal Effort: 0

Enduser Department Effort: 0

External Effort: 0

External Hourly Rate: 0

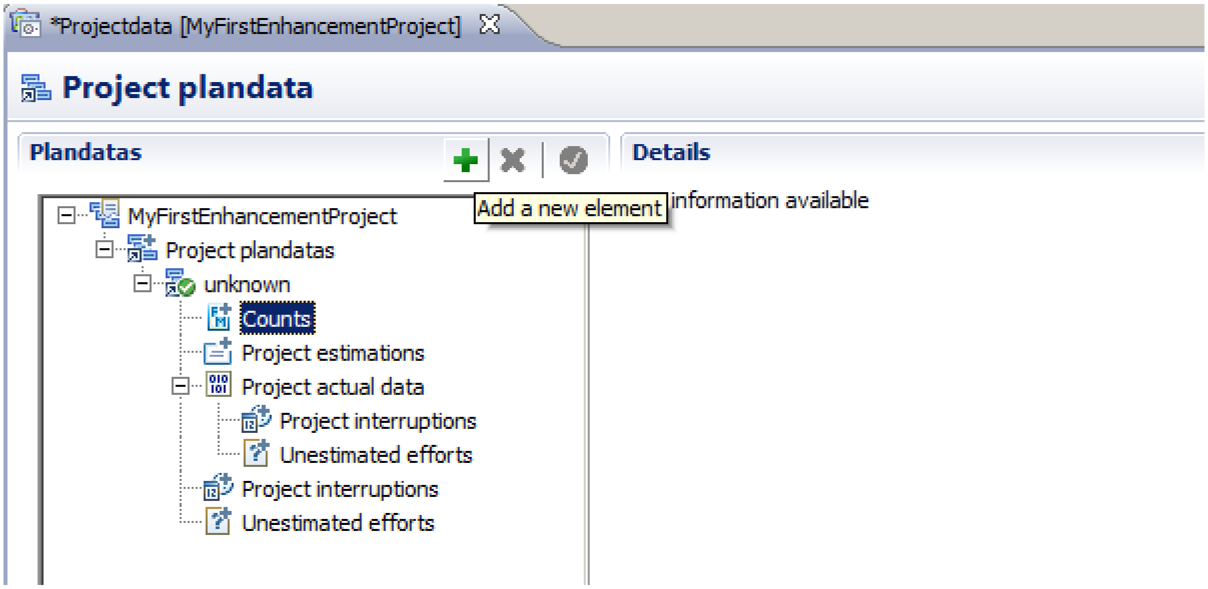
External Work Type: Unknown

### Add or Modify Referenced Counts

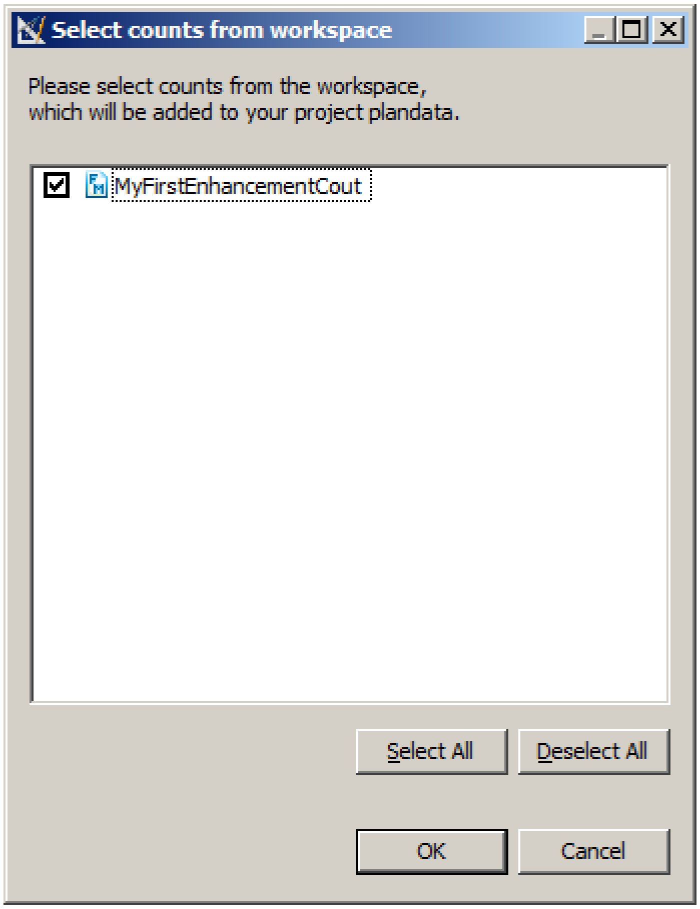
Enterprise Edition

To add a new **Count** to a **Project Plandata** , perform the following steps.

1. Select **Counts** in the tree of a **Project Plandata** and click on the **Add a new element** .



2. The following **Counts Selection Dialog** will be displayed in the **Function Point Modeler** workbench. Select a **count** and click on the **Ok** button .

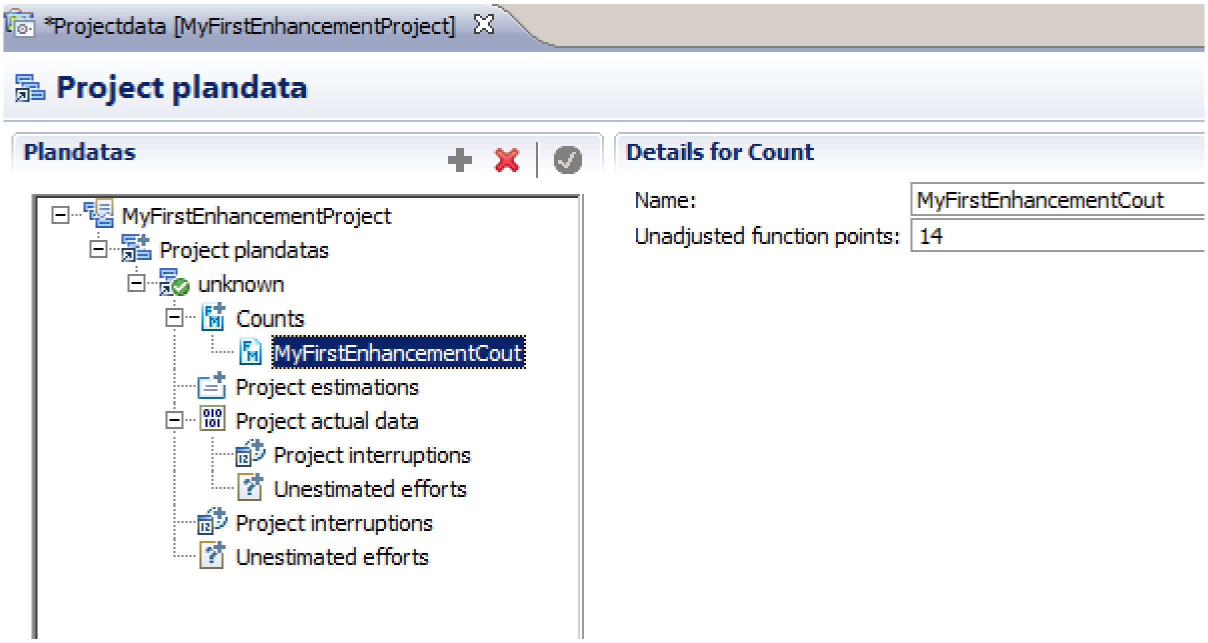


Select counts from workspace

Please select counts from the workspace,
which will be added to your project plandata.

☑ MyFirstEnhancementCout

The new added **count** will be displayed in the tree of **Project Plandata** .



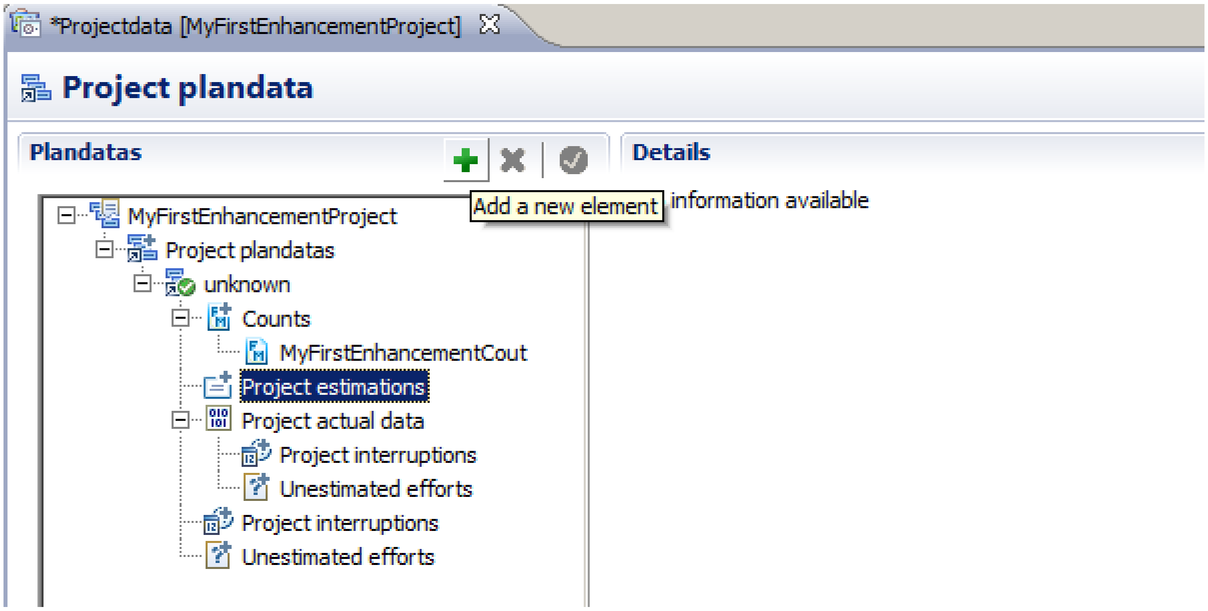
Name: MyFirstEnhancementCout
Unadjusted function points: 14

### Add or Modify Project Estimations

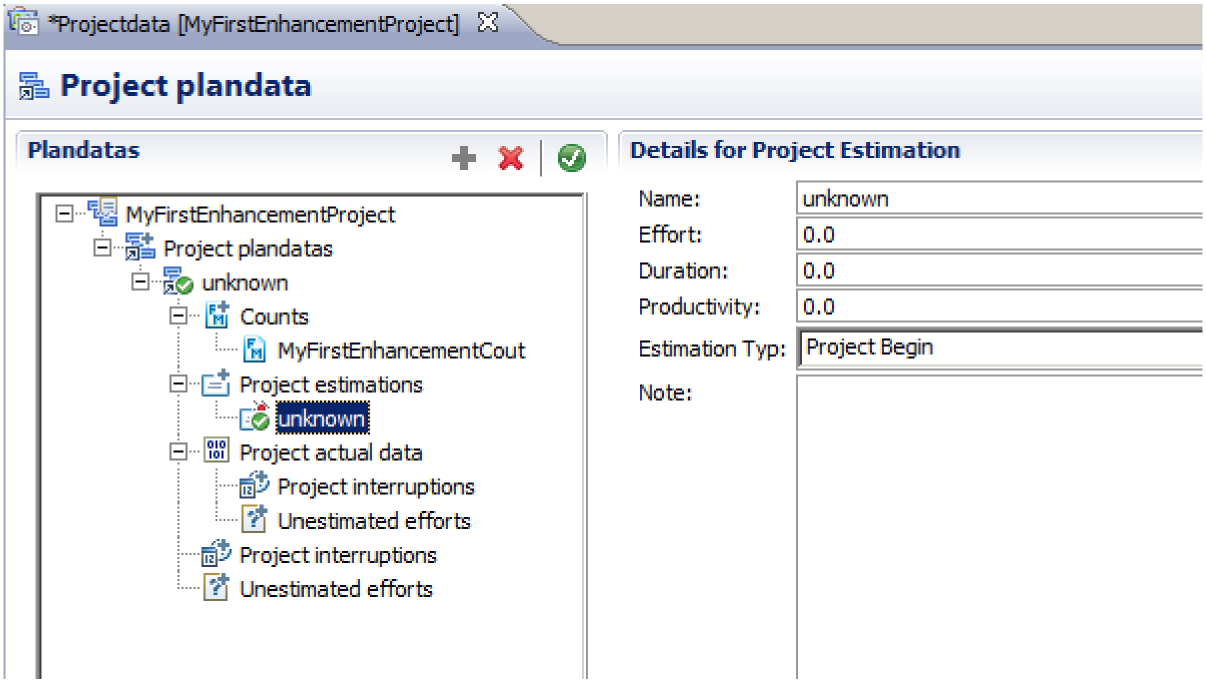
Enterprise Edition

To add a new **Estimations** to a **Project Plandata** , perform the following steps.

Select **Project estimations** in the tree of a **Project Plandata** and click on the **Add a new element** .



The new added **Project estimation** will be displayed in the tree of **Project Plandata** .



Details for Project Estimation

Name: unknown

Effort: 0.0

Duration: 0.0

Productivity: 0.0

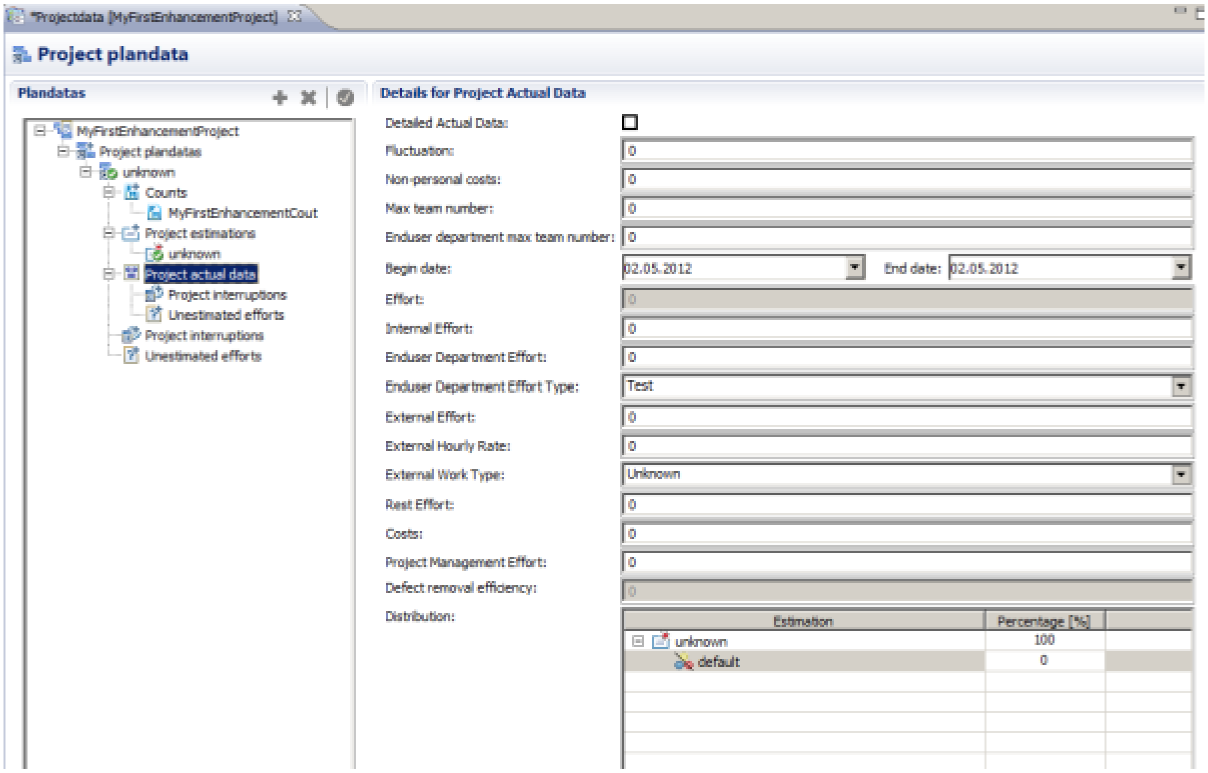
Estimation Typ: Project Begin

Note:

## Create or Modify Project Actual Data

Enterprise Edition

Once you have created a **Project Plandata** , a **Project Actual Data** has been created with it automatically. The new created **Project Actual Data** is showed below.



Details for Project Actual Data

| | |
|---|---|
| Detailed Actual Data: | □ |
| Fluctuation: | 0 |
| Non-personal costs: | 0 |
| Max team number: | 0 |
| Enduser department max team number: | 0 |
| Begin date: | 02.05.2012 |
| End date: | 02.05.2012 |
| Effort: | 0 |
| Internal Effort: | 0 |
| Enduser Department Effort: | 0 |
| Enduser Department Effort Type: | Test |
| External Effort: | 0 |
| External Hourly Rate: | 0 |
| External Work Type: | Unknown |
| Rest Effort: | 0 |
| Costs: | 0 |
| Project Management Effort: | 0 |
| Defect removal efficiency: | 0 |

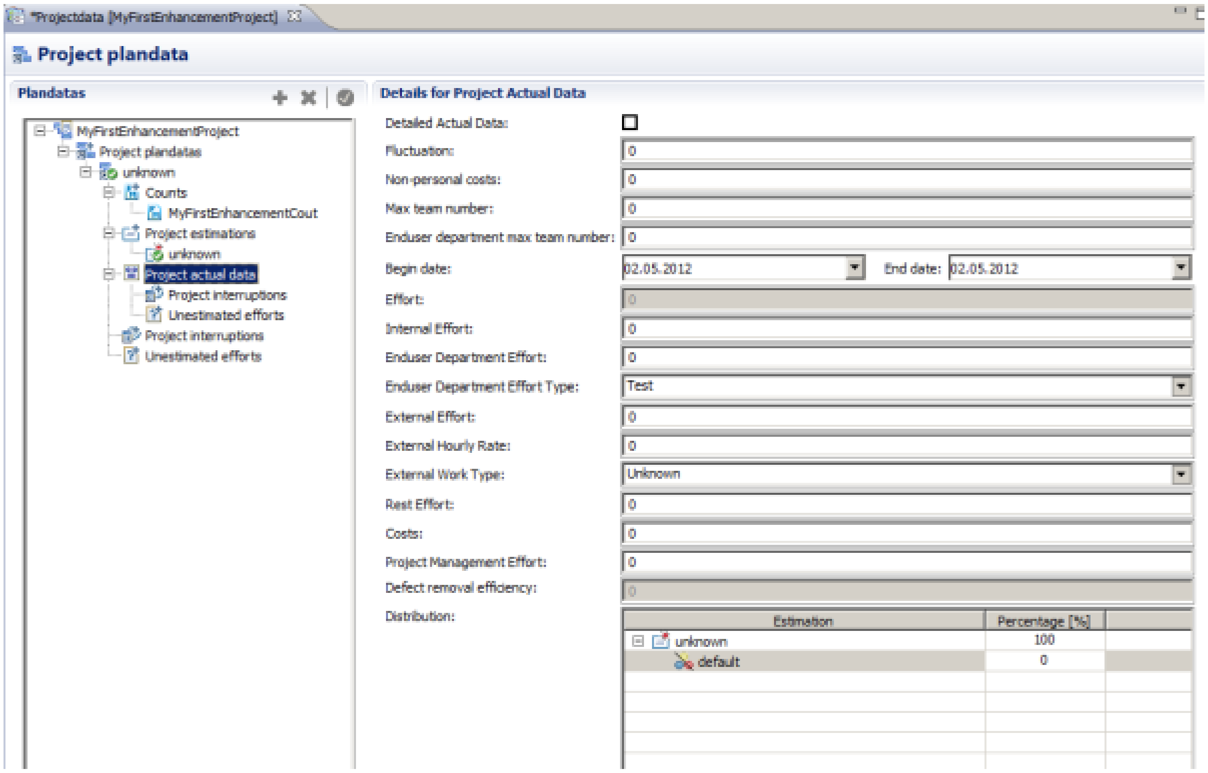
Distribution:

| Estimation | Percentage [%] |
|---|---|
| unknown | 100 |
| default | 0 |

## Create or Modify Project Phase Data

Enterprise Edition

Once you have created a **Project Plandata** , a **Project Actual Data** has been created with it automatically.



**Details for Project Actual Data**

Detailed Actual Data: □

Fluctuation: 0

Non-personal costs: 0

Max team number: 0

Enduser department max team number: 0

Begin date: 02.05.2012 End date: 02.05.2012

Effort: 0

Internal Effort: 0

Enduser Department Effort: 0

Enduser Department Effort Type: Test

External Effort: 0

External Hourly Rate: 0

External Work Type: Unknown

Rest Effort: 0

Costs: 0

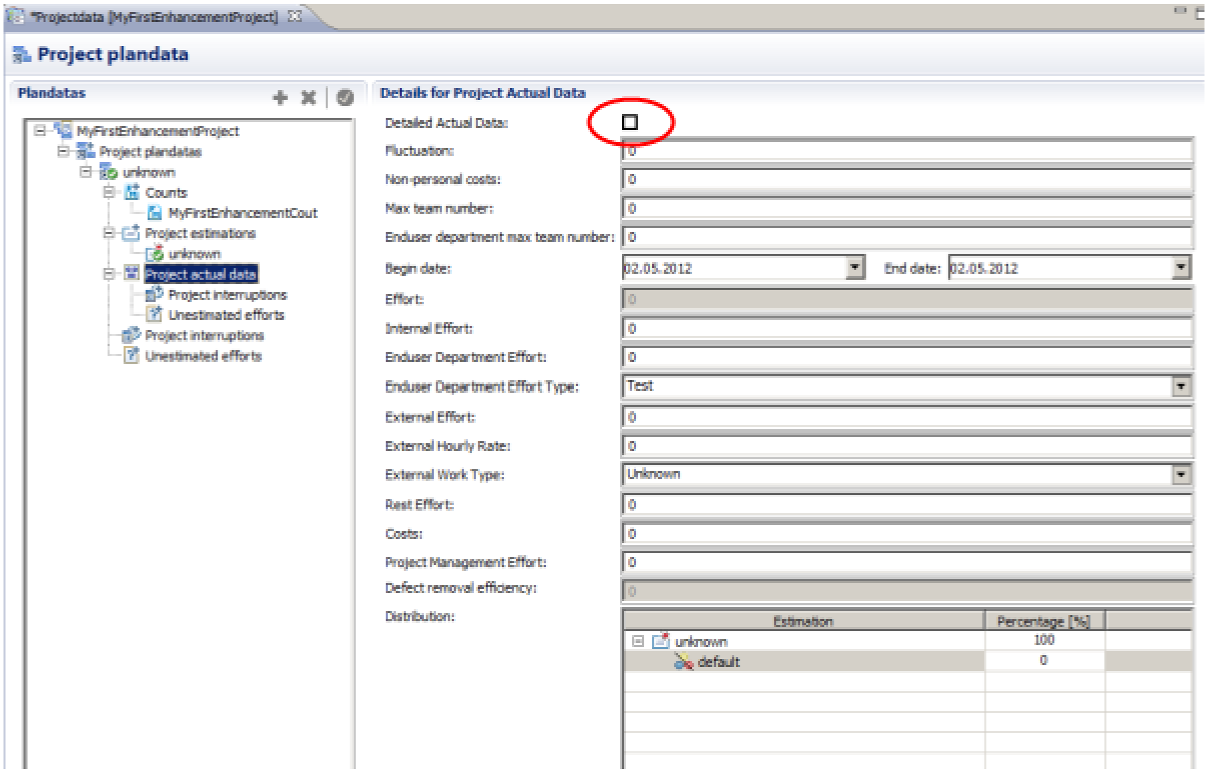
Project Management Effort: 0

Defect removal efficiency: 0

Distribution:

| Estimation | Percentage [%] |
|---|---|
| unknown | 100 |
| default | 0 |

Click **Detailed Actual Data** check box.



**Details for Project Actual Data**

Detailed Actual Data: □

Fluctuation: 0

Non-personal costs: 0

Max team number: 0

Enduser department max team number: 0

Begin date: 02.05.2012 End date: 02.05.2012

Effort: 0

Internal Effort: 0

Enduser Department Effort: 0

Enduser Department Effort Type: Test

External Effort: 0

External Hourly Rate: 0

External Work Type: Unknown

Rest Effort: 0

Costs: 0

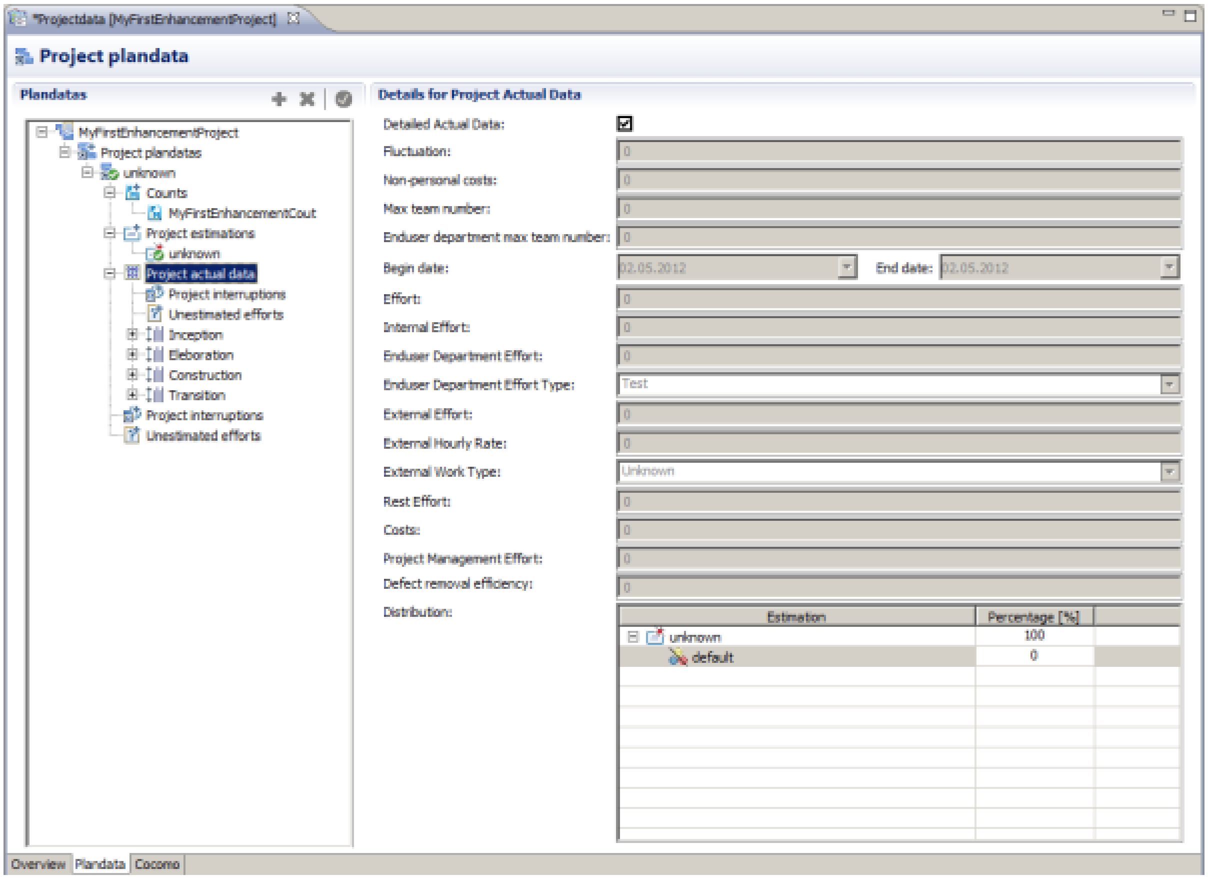
Project Management Effort: 0

Defect removal efficiency: 0

Distribution:

| Estimation | Percentage [%] |
|---|---|
| unknown | 100 |
| default | 0 |

The new created **Project Phase Actual Data** will be displayed in the tree of **Project actual data** .



Details for Project Actual Data

Detailed Actual Data: ☑

Fluctuation: 0

Non-personal costs: 0

Max team number: 0

Enduser department max team number: 0

Begin date: 02.05.2012 End date: 02.05.2012

Effort: 0

Internal Effort: 0

Enduser Department Effort: 0

Enduser Department Effort Type: Test

External Effort: 0

External Hourly Rate: 0

External Work Type: Unknown

Rest Effort: 0

Costs: 0

Project Management Effort: 0

Defect removal efficiency: 0

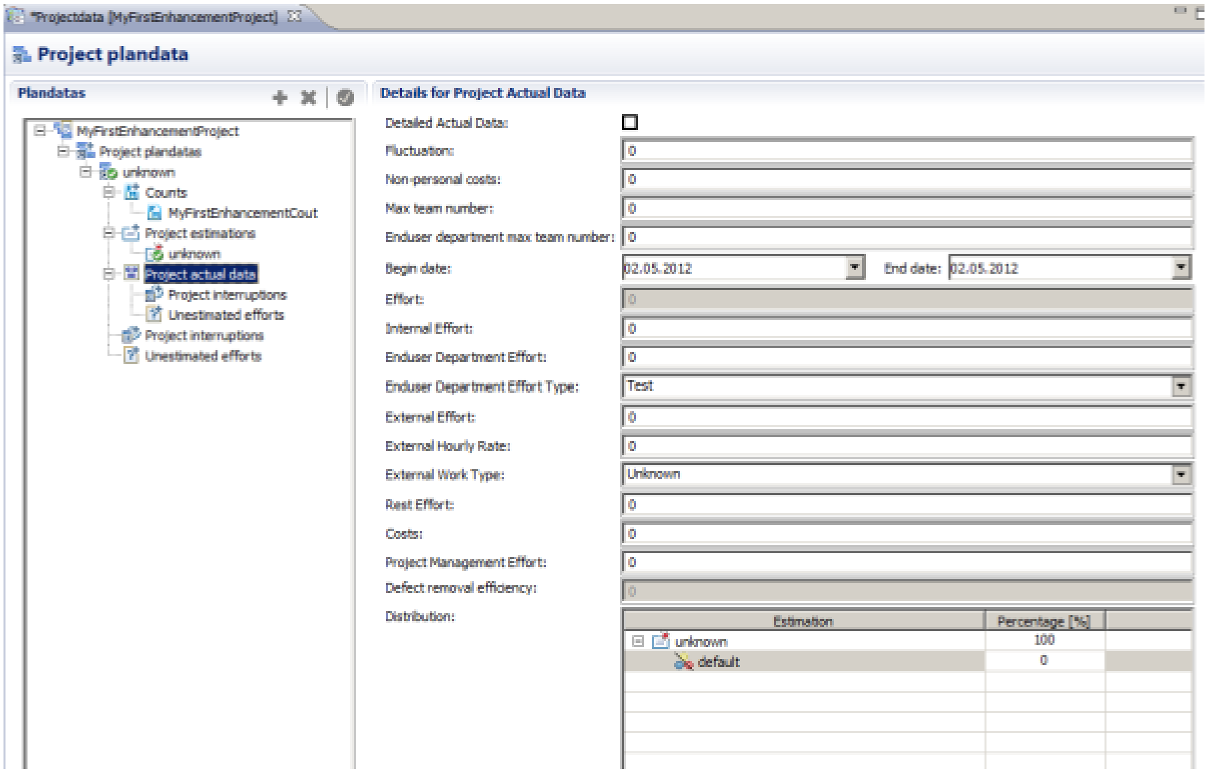
Distribution:

| Estimation | Percentage [%] |
|---|---|
| unknown | 100 |
| default | 0 |

### Create or Modify Project Activity Actual Data

Enterprise Edition

Once you have created a **Project Plandata** , a **Project Actual Data** has been created with it automatically.



*Projectdata [MyFirstEnhancementProject]

Project plandata

Plandatas

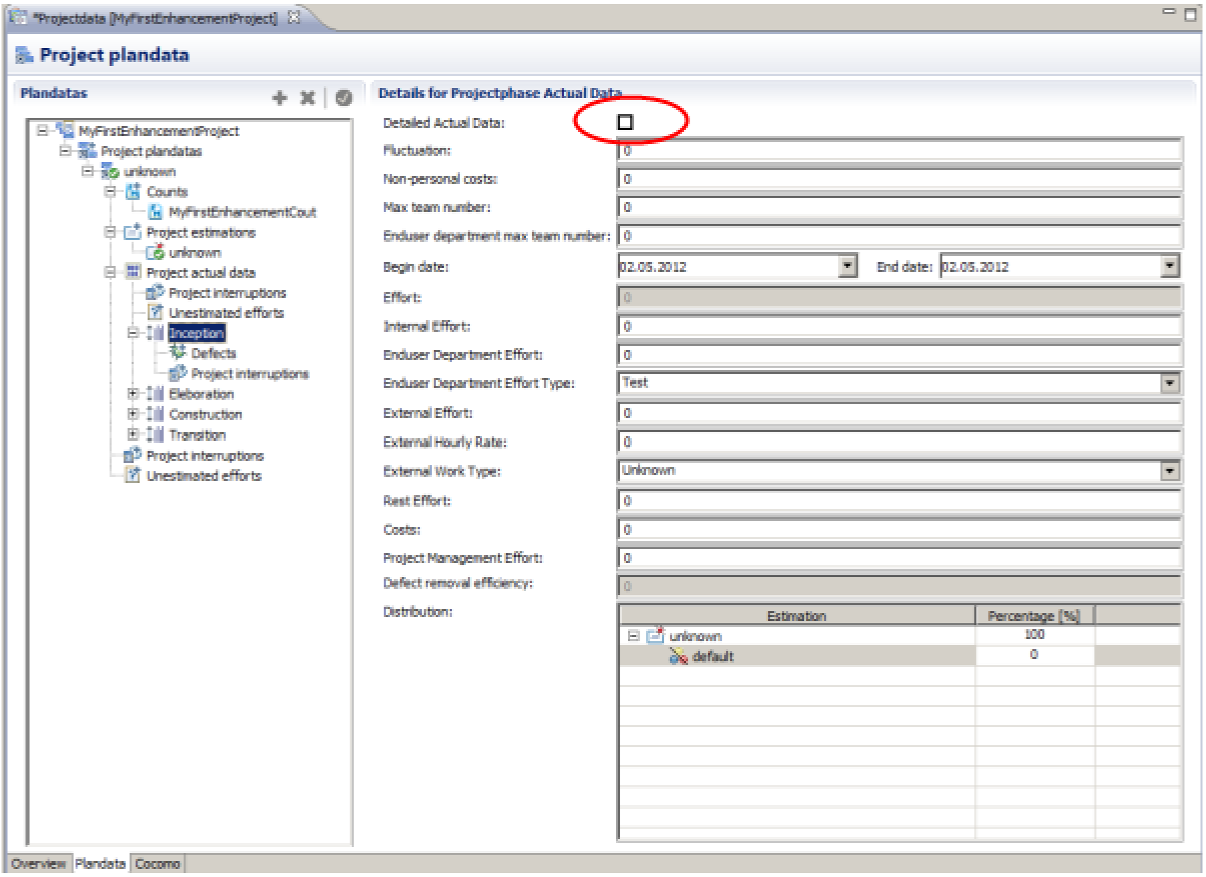
- MyFirstEnhancementProject
  - Project plandatas
    - unknown
      - Counts
        - MyFirstEnhancementCout
      - Project estimations
        - unknown
      - Project actual data
        - Project interruptions
        - Unestimated efforts
      - Project interruptions
      - Unestimated efforts

Details for Project Actual Data

Detailed Actual Data: □
Fluctuation: 0
Non-personal costs: 0
Max team number: 0
Enduser department max team number: 0
Begin date: 02.05.2012 End date: 02.05.2012
Effort: 0
Internal Effort: 0
Enduser Department Effort: 0
Enduser Department Effort Type: Test
External Effort: 0
External Hourly Rate: 0
External Work Type: Unknown
Rest Effort: 0
Costs: 0
Project Management Effort: 0
Defect removal efficiency: 0
Distribution:

| Estimation | Percentage [%] |
|---|---|
| unknown | 100 |
| default | 0 |

Click **Detailed Actual Data** check box.



*Projectdata [MyFirstEnhancementProject]

Project plandata

Plandatas

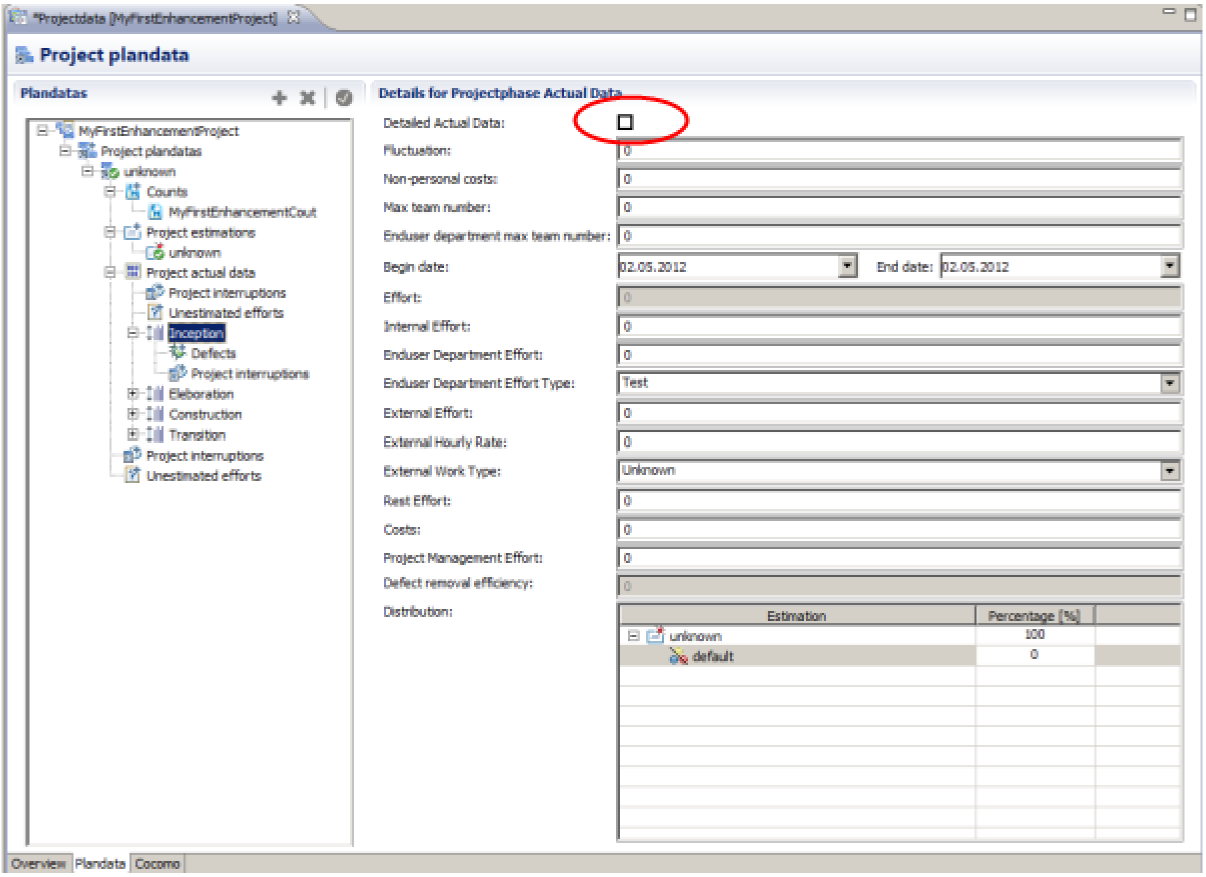
- MyFirstEnhancementProject
  - Project plandatas
    - unknown
      - Counts
        - MyFirstEnhancementCout
      - Project estimations
        - unknown
      - Project actual data
        - Project interruptions
        - Unestimated efforts
        - Inception
          - Defects
          - Project interruptions
        - Elaboration
        - Construction
        - Transition
      - Project interruptions
      - Unestimated efforts

Details for Projectphase Actual Data

Detailed Actual Data: □
Fluctuation: 0
Non-personal costs: 0
Max team number: 0
Enduser department max team number: 0
Begin date: 02.05.2012 End date: 02.05.2012
Effort: 0
Internal Effort: 0
Enduser Department Effort: 0
Enduser Department Effort Type: Test
External Effort: 0
External Hourly Rate: 0
External Work Type: Unknown
Rest Effort: 0
Costs: 0
Project Management Effort: 0
Defect removal efficiency: 0
Distribution:

| Estimation | Percentage [%] |
|---|---|
| unknown | 100 |
| default | 0 |

The new created **Project Activity Actual Data** will be displayed in the tree of **Project Phase Actual Data** .



Details for Projectphase Actual Data

| | |
|---|---|
| Detailed Actual Data: | □ |
| Fluctuation: | 0 |
| Non-personal costs: | 0 |
| Max team number: | 0 |
| Enduser department max team number: | 0 |
| Begin date: | 02.05.2012 End date: 02.05.2012 |
| Effort: | 0 |
| Internal Effort: | 0 |
| Enduser Department Effort: | 0 |
| Enduser Department Effort Type: | Test |
| External Effort: | 0 |
| External Hourly Rate: | 0 |
| External Work Type: | Unknown |
| Rest Effort: | 0 |
| Costs: | 0 |
| Project Management Effort: | 0 |
| Defect removal efficiency: | 0 |
| Distribution: | |

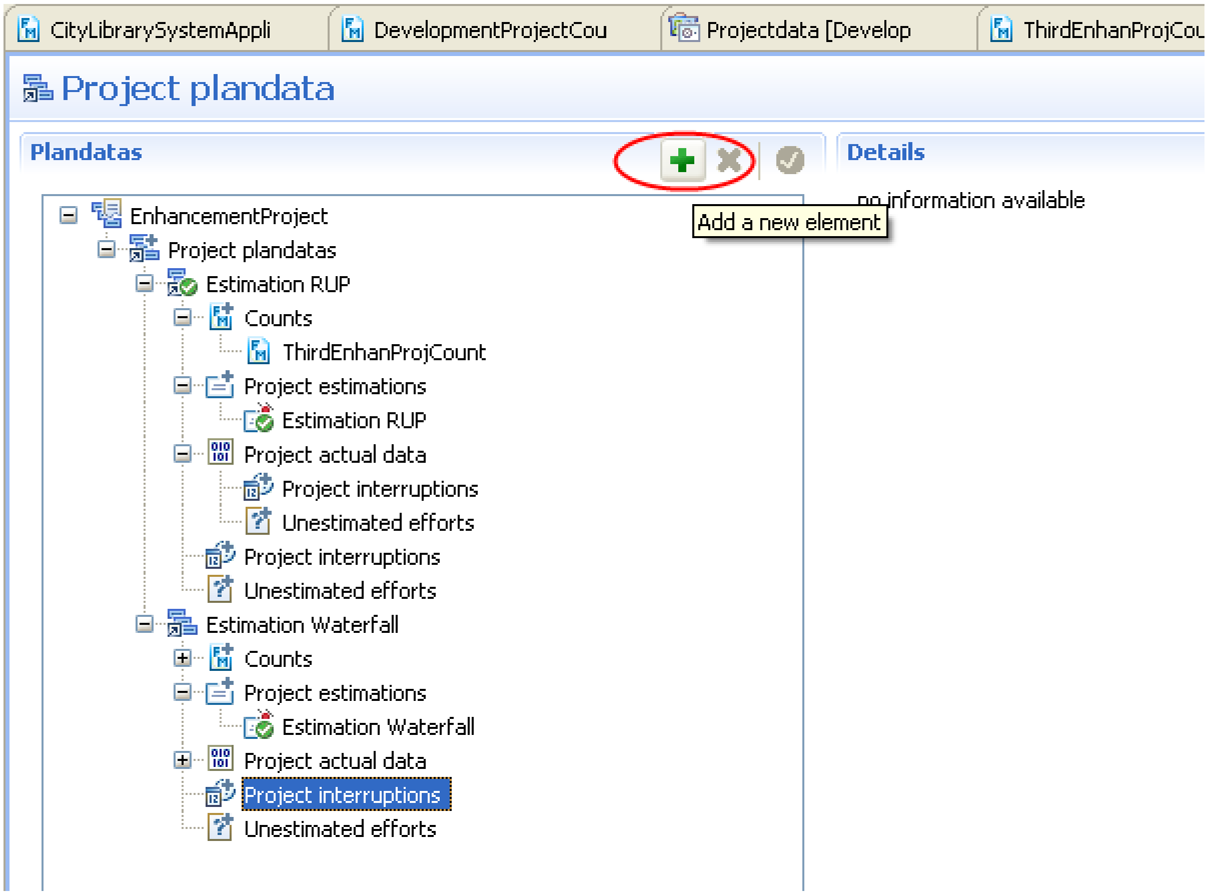
| Estimation | Percentage [%] |
|---|---|
| unknown | 100 |
| default | 0 |

### Add or Modify Project Interruption

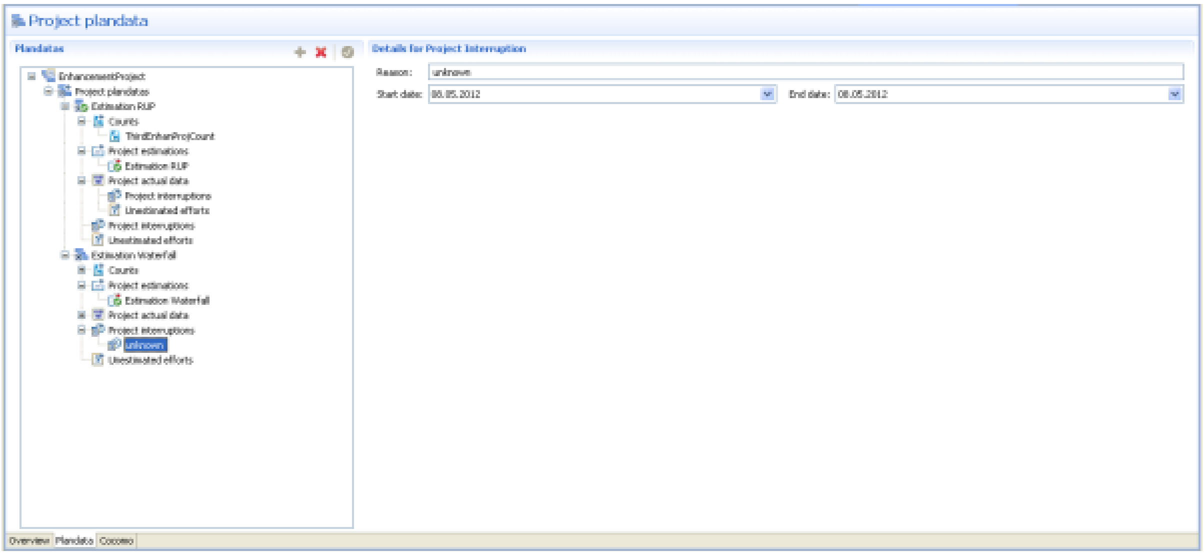
Enterprise Edition

To add a new **Interruption** to a **Project Plandata** , perform the following steps.

Select **Project interruption** in the tree of a **Project Plandata** and click on the **Add a new element** .



The new added **Project interruption** will be displayed in the tree of **Project Plandata** .



Reason: unknown

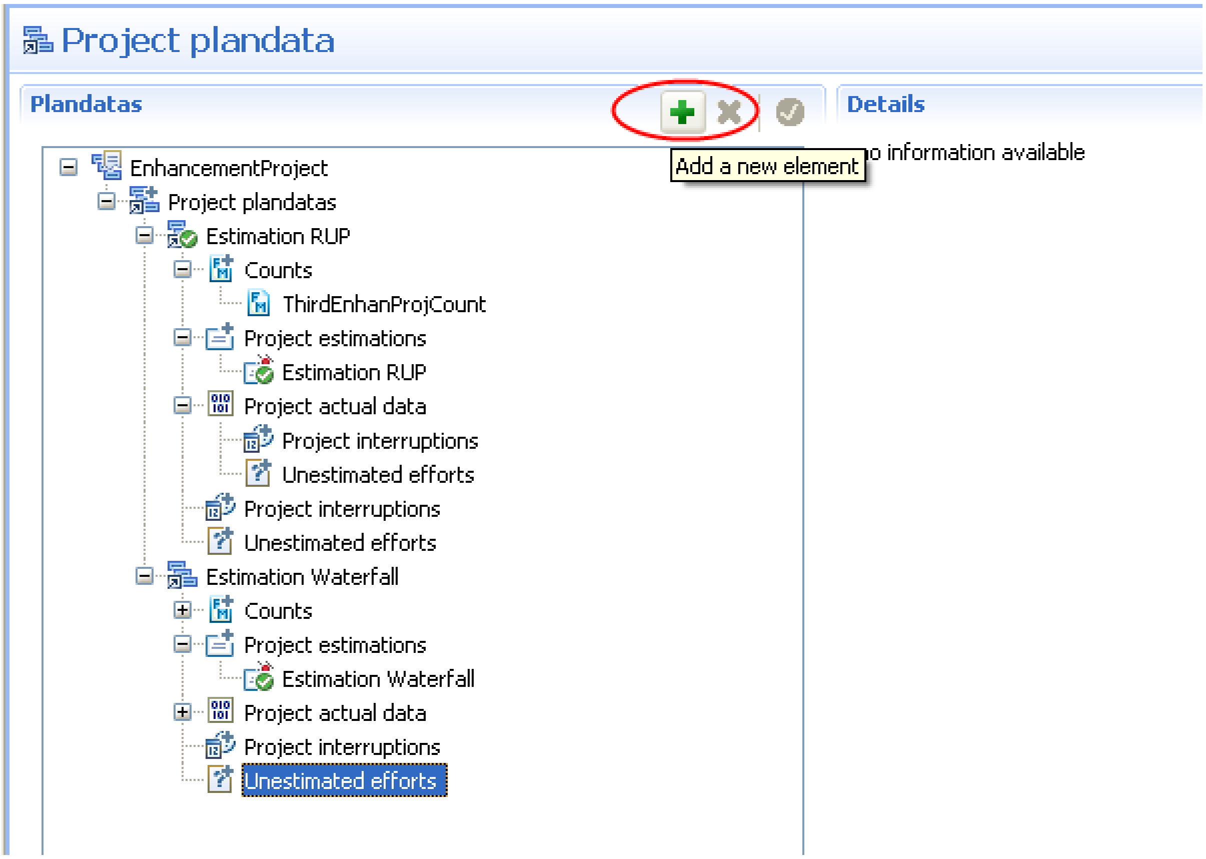
Start date: 08.05.2012 End date: 08.05.2012

### Add or Modify Unestimated Effort

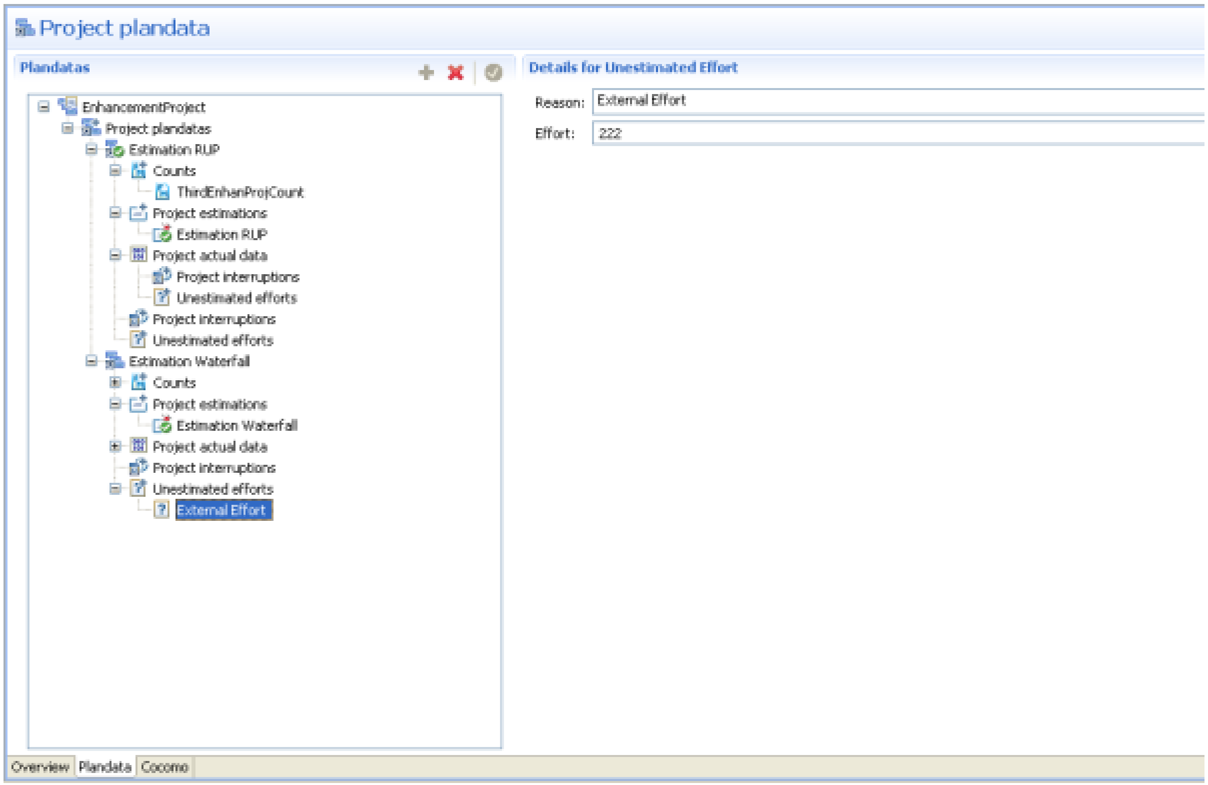
Enterprise Edition

To add a new **Unestimated Effort** to a **Project Plandata** , perform the following steps.

Select **Unestimated efforts** in the tree of a **Project Plandata** and click on the **Add a new element** .



The new added **Unestimated Effort** will be displayed in the tree of **Project Plandata** .



Reason: External Effort

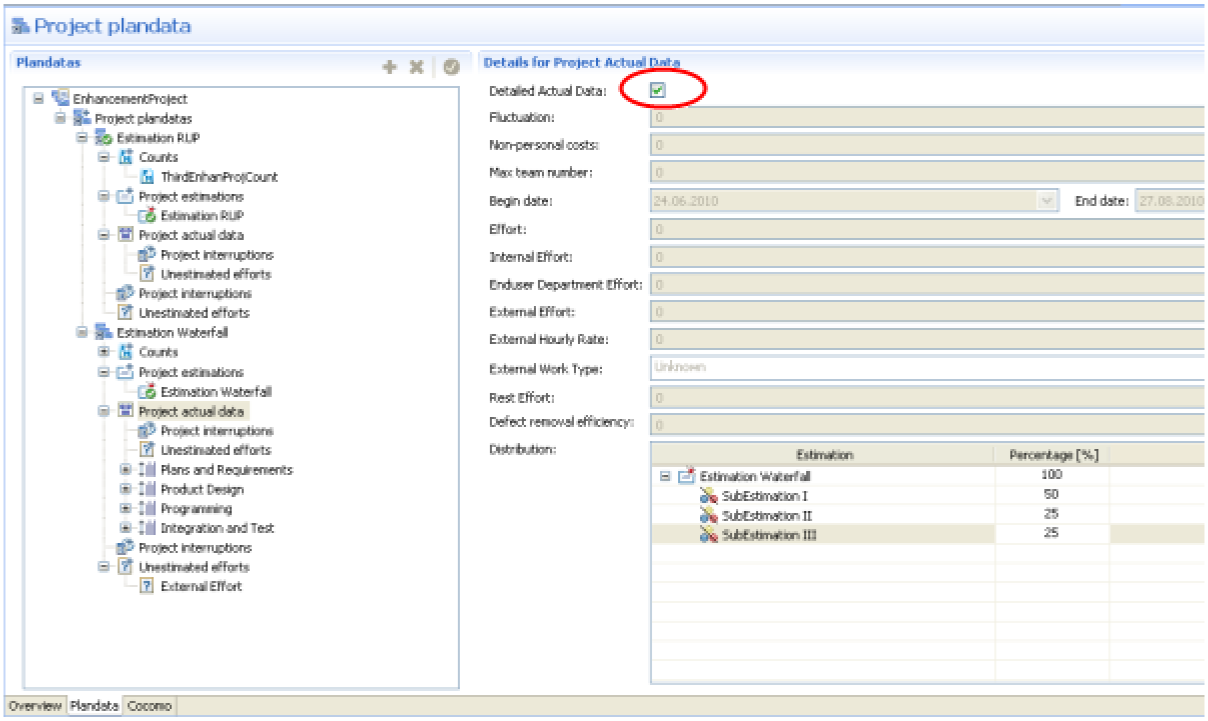
Effort: 222

## Add or Modify Defect

Enterprise Edition

To add a new **Defect** to a **Project Plandata** , perform the following steps.

1. Select the **Project actual data** in the tree of a **Project Plandata** and click **Detailed Actual Data** check box.



Details for Project Actual Data

Detailed Actual Data: ☑

Fluctuation: 0

Non-personal costs: 0

Max team number: 0

Begin date: 24.06.2010 End date: 27.08.2010

Effort: 0

Internal Effort: 0

Enduser Department Effort: 0

External Effort: 0

External Hourly Rate: 0

External Work Type: Unknown

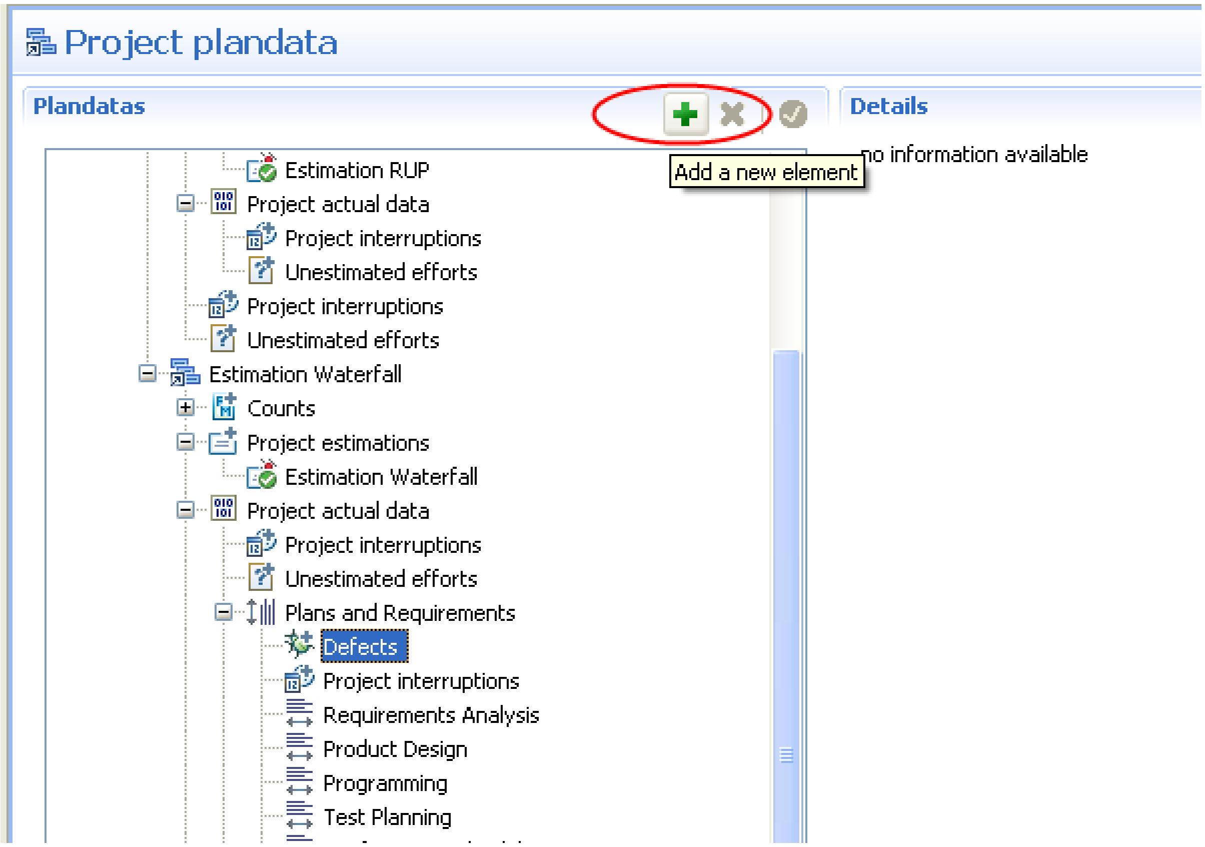
Rest Effort: 0

Defect removal efficiency: 0

Distribution:

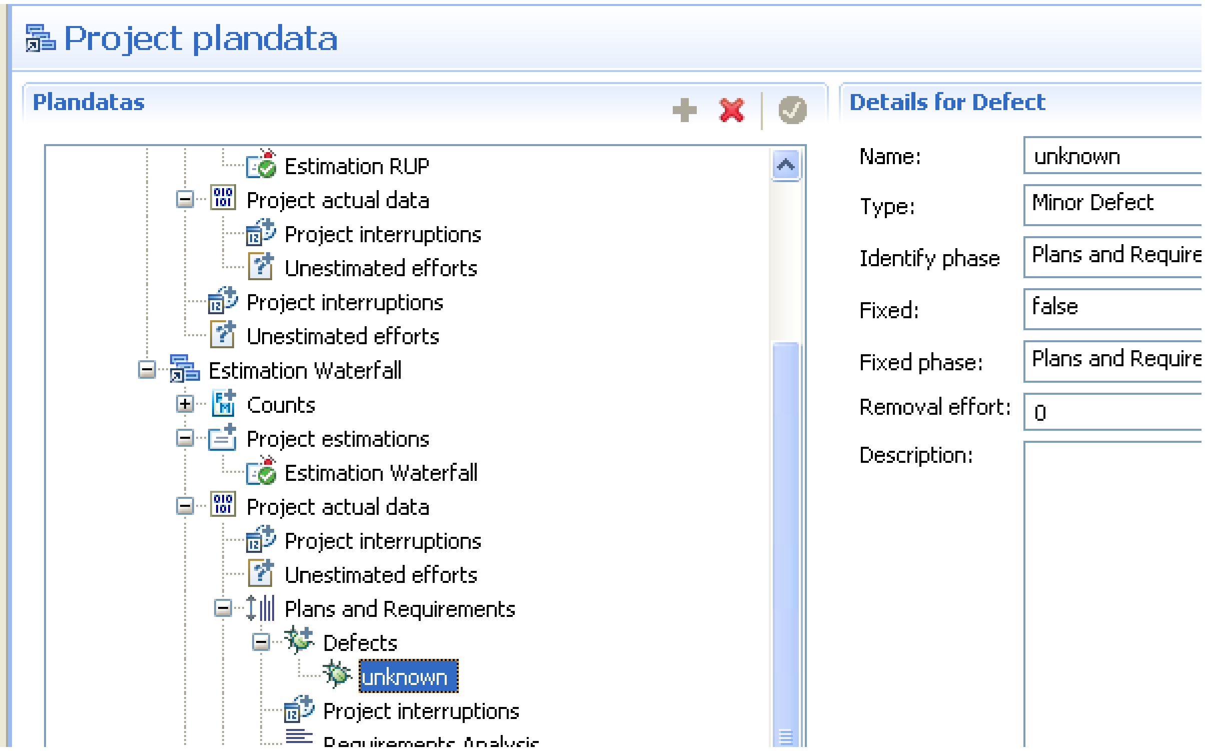
| Estimation | Percentage [%] |
|---|---|
| Estimation Waterfall | 100 |
| SubEstimation I | 50 |
| SubEstimation II | 25 |
| SubEstimation III | 25 |

2. Select the **Defects** in the tree of a **Project Plandata** and click on the **Add a new element** .



no information available

The new added **Deffect** will be displayed in the tree of **Project Plandata** .



Project plandata

Plandatas

```
Estimation RUP
Project actual data
    Project interruptions
    Unestimated efforts
Project interruptions
Unestimated efforts
Estimation Waterfall
    Counts
    Project estimations
        Estimation Waterfall
    Project actual data
        Project interruptions
        Unestimated efforts
        Plans and Requirements
            Defects
                unknown
            Project interruptions
            Requirements Analysis
```

Details for Defect

Name: unknown

Type: Minor Defect

Identify phase Plans and Require

Fixed: false

Fixed phase: Plans and Require

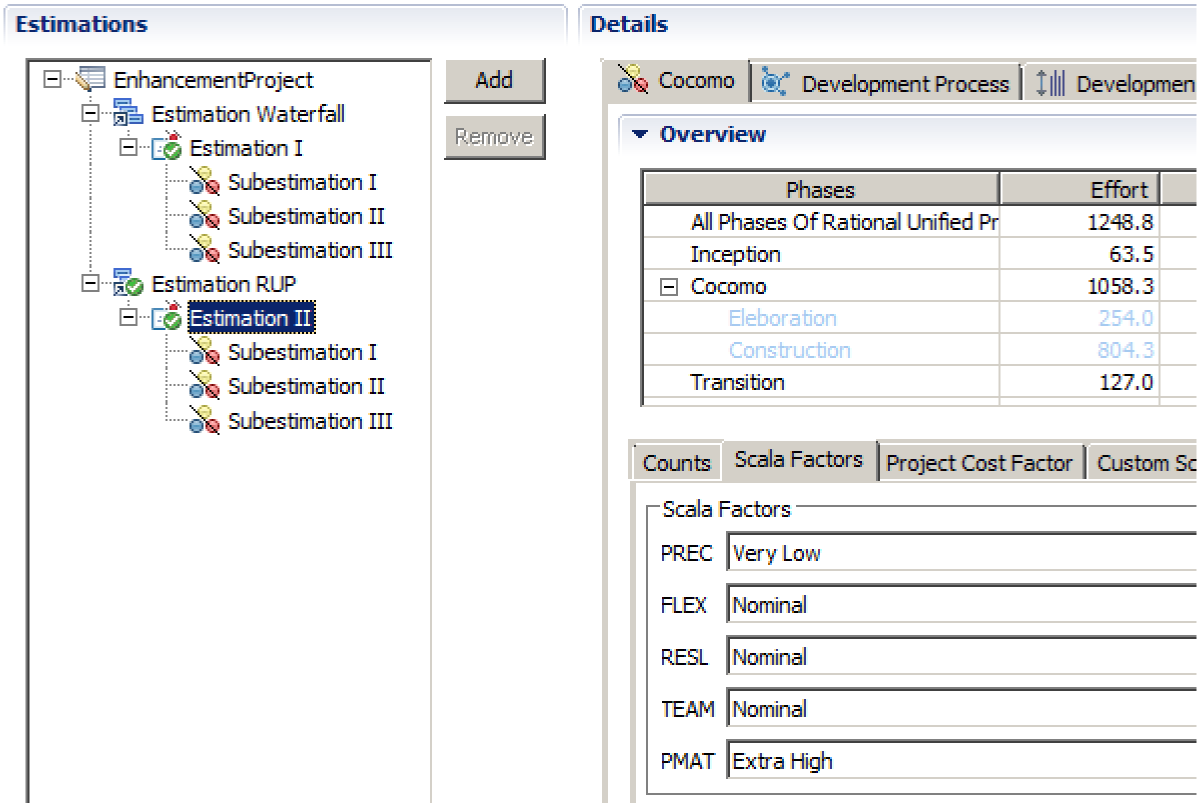
Removal effort: 0

Description:

### Working with Base Estimations

Enterprise Edition

The project-level drivers the scale factors and the cost factor **SCED** are used only for Base Estimation. If you select an **Base Estimation** only the scale factors and the cost factor **SCED** are showed on the right side. This project-level drivers have to be adjusted for whole project.

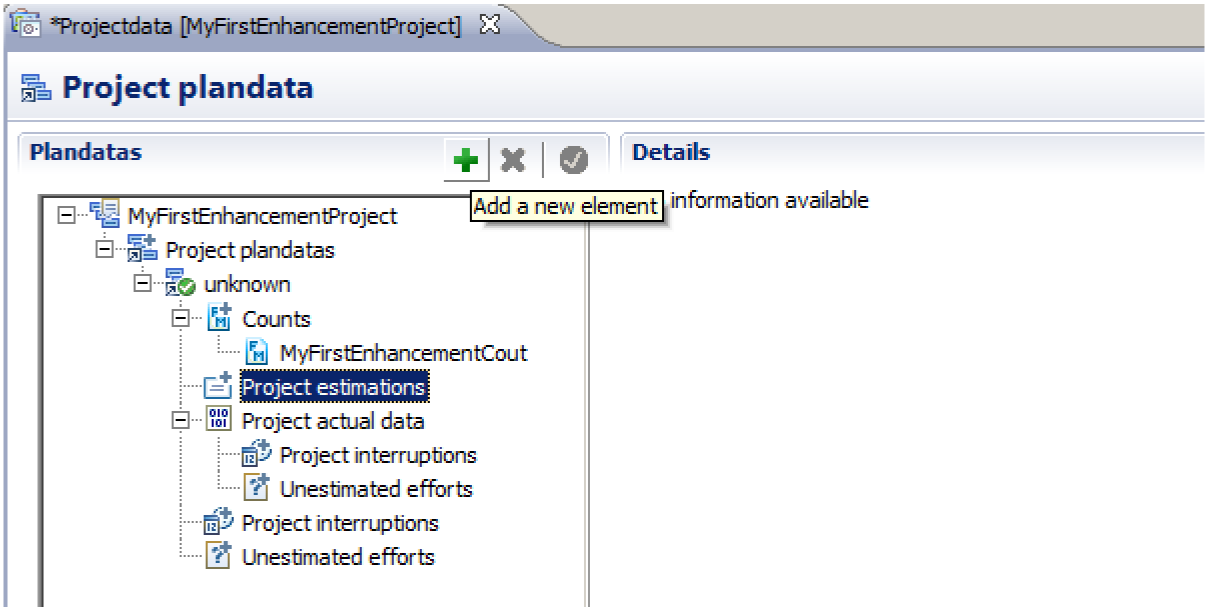


| Phases | Effort |
|---|---|
| All Phases Of Rational Unified Pr | 1248.8 |
| Inception | 63.5 |
| Cocomo | 1058.3 |
| Eleboration | 254.0 |
| Construction | 804.3 |
| Transition | 127.0 |

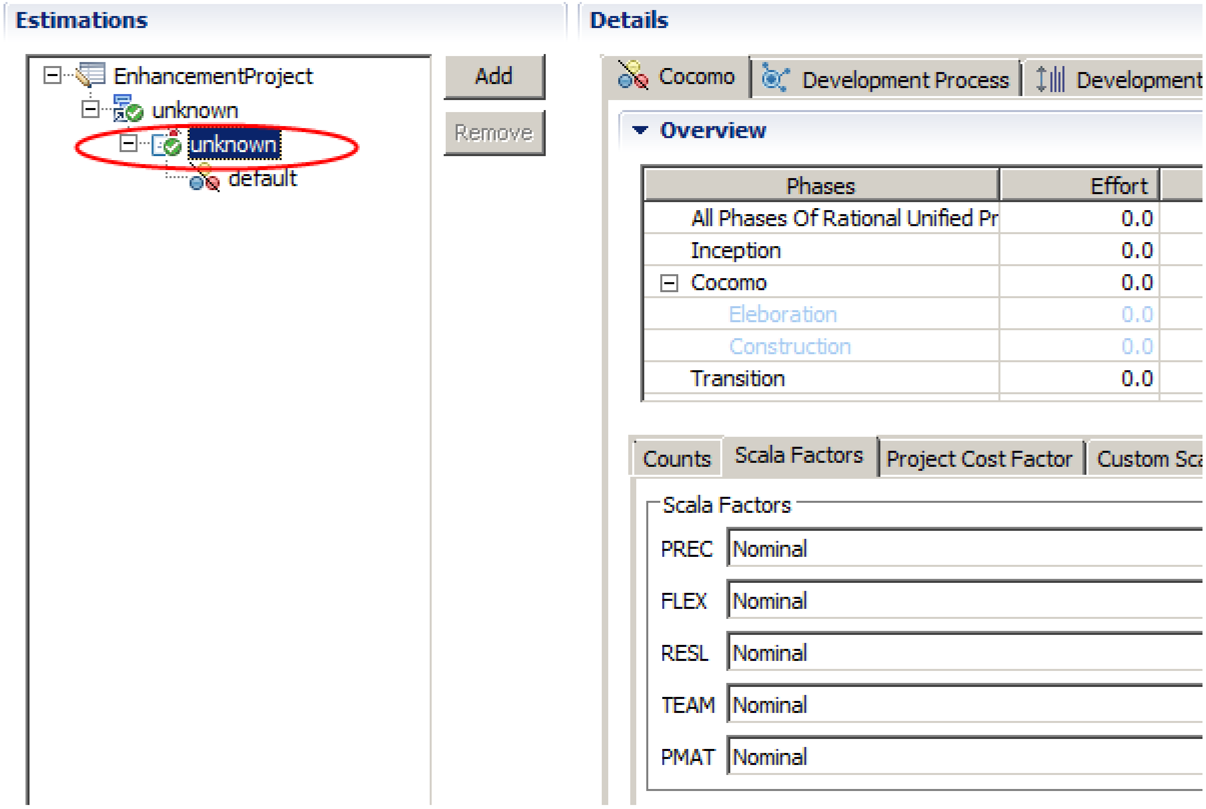
Scala Factors

| | |
|---|---|
| PREC | Very Low |
| FLEX | Nominal |
| RESL | Nominal |
| TEAM | Nominal |
| PMAT | Extra High |

1. Select **Project estimations** in the tree of a **Project Plandata** and click on the **Add a new element** .



2. Click on the **Cocomo** tab on the **Project Plandata** editor. You will see the new added estimation in the **estimation tree** .



| Phases | Effort |
|---|---|
| All Phases Of Rational Unified Pr | 0.0 |
| Inception | 0.0 |
| Cocomo | 0.0 |
| Eleboration | 0.0 |
| Construction | 0.0 |
| Transition | 0.0 |

Scala Factors

PREC Nominal

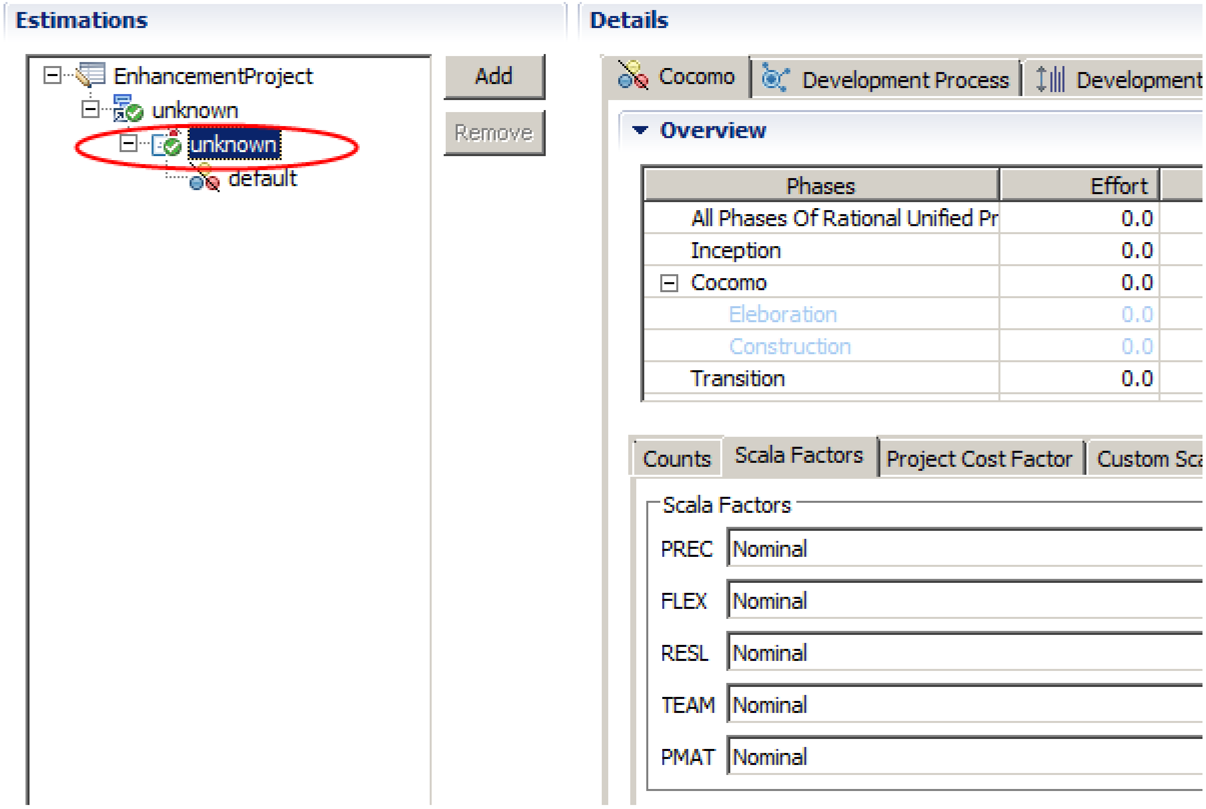
FLEX Nominal

RESL Nominal

TEAM Nominal

PMAT Nominal

3. Select the **Base Estimation** on the **estimation tree** . You will see the the scale factors and the cost factor **SCED** on the left site. You can now adjust this factor for the **Base Estimation** .



| Phases | Effort |
|---|---|
| All Phases Of Rational Unified Pr | 0.0 |
| Inception | 0.0 |
| Cocomo | 0.0 |
| Eleboration | 0.0 |
| Construction | 0.0 |
| Transition | 0.0 |

Scala Factors

PREC Nominal

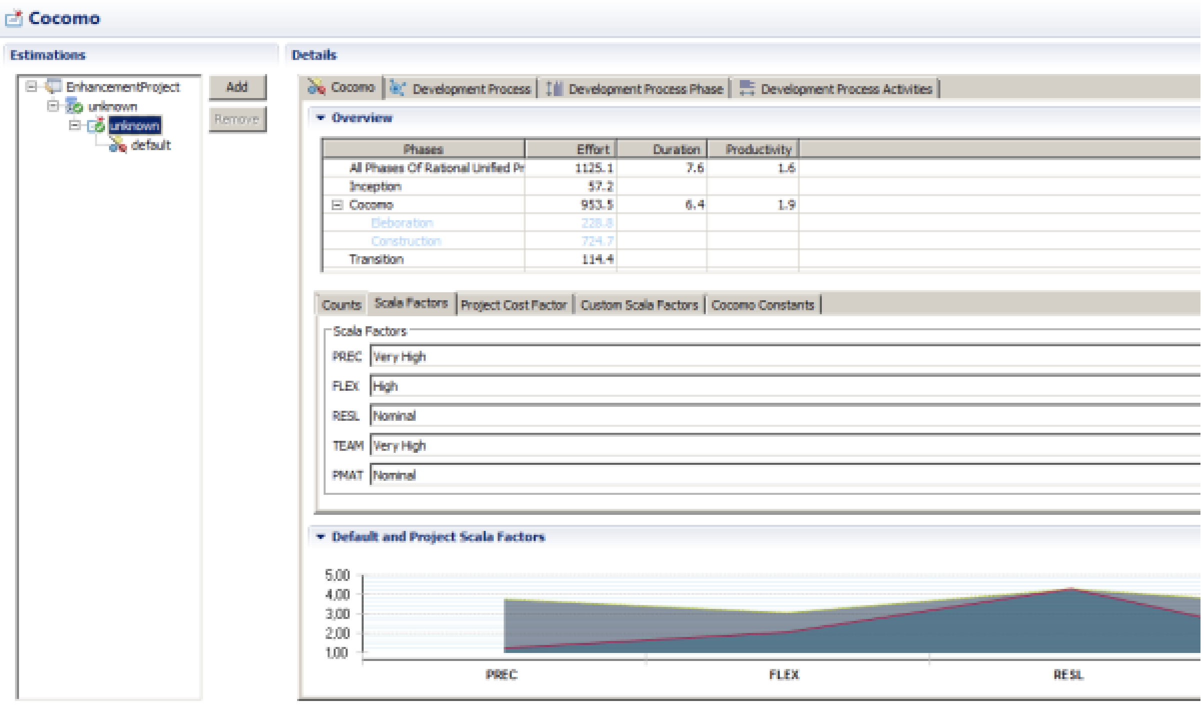
FLEX Nominal

RESL Nominal

TEAM Nominal

PMAT Nominal

The adjusted **scale factors** will be displayed on the chart .



| Phases | Effort | Duration | Productivity |
|---|---|---|---|
| All Phases Of Rational Unified Pr | 1125.1 | 7.6 | 1.6 |
| Inception | 57.2 | | |
| ⊟ Cocomo | 953.5 | 6.4 | 1.9 |
| Eleboration | 228.8 | | |
| Construction | 724.7 | | |
| Transition | 114.4 | | |

Scala Factors

PREC Very High

FLEX High

RESL Nominal

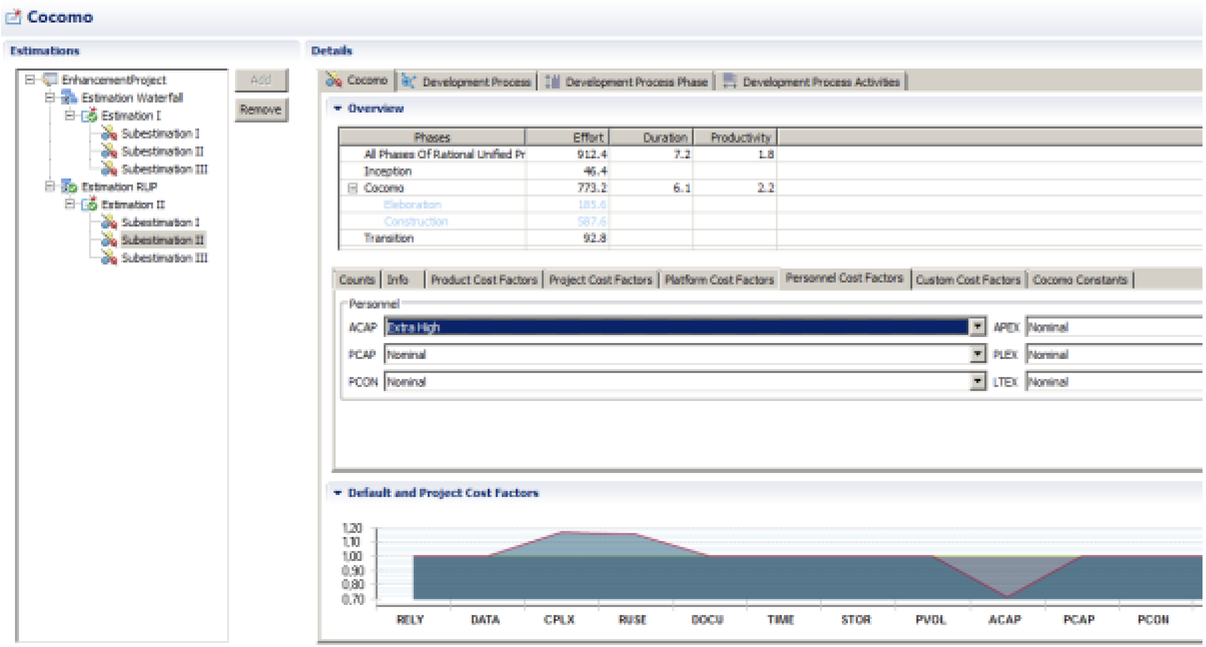
TEAM Very High

PMAT Nominal

## Working with Subestimations

Enterprise Edition

The component-level Cost Drivers are used for each **Sub estimation** . Each **Base estimation** contains 1-n sub estimations. The software systems are comprised of multiple subsystems or components. You can create Sub **Sub estimation** for each subsystem or component. If you select a **Sub estimation** only the whole component-level Cost Drivers are showed on the right side. This component-level **Cost Drivers** have to be adjusted for the current subsystems or components.



| Phases | Effort | Duration | Productivity |
|---|---|---|---|
| All Phases Of Rational Unified Pr | 912.4 | 7.2 | 1.8 |
| Inception | 46.4 | | |
| Cocomo | 773.2 | 6.1 | 2.2 |
| Elaboration | 185.6 | | |
| Construction | 587.6 | | |
| Transition | 92.8 | | |

ACAP Extra High
PCAP Nominal
PCON Nominal
APEX Nominal
PLEX Nominal
LTEX Nominal

Usually software systems are comprised of multiple subsystems or components. It is possible to use **COCOMO II** to estimate effort and schedule for multiple components. The **COCOMO II** method for doing this does not use the sum of the estimate for each components as this would ignore effort due to integration of the component. The **COCOMO II** multiple method for n number of modules has the following steps:

1. Sum the sizes for all of the components, Size1, to yield to aggregate size. **SizeAggregate = # Size**

2. Apply the project-level drivers, the Scale Factors and the SCED Cost Driver to the aggregated size to derive the overall basic effort for the total project, **PMBasic** . **PMBasic = A x (SizeAggregate )E x SCED**

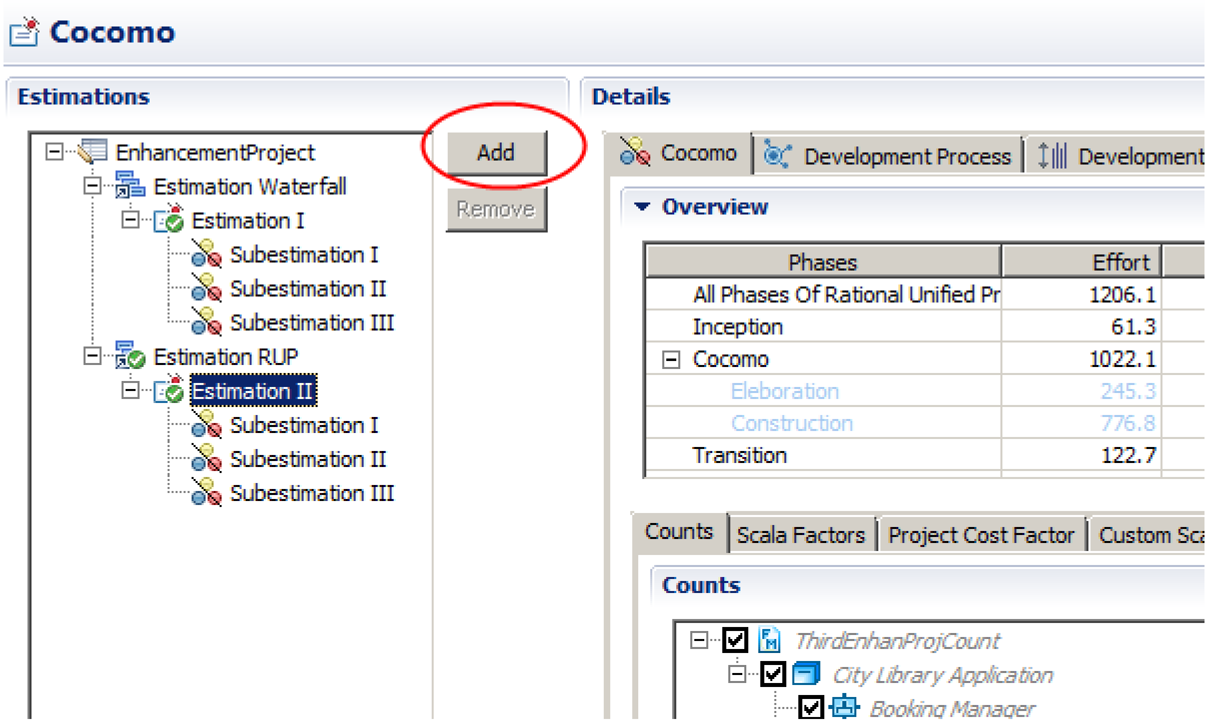
3. Determine each component's basic effort, **PMBasic(i)** , by apportioning the overall basic effort to each component based on its contribution to the aggregate size. **PMBasic(i) = PMBasic x (Size / SizeAggregat )**

4. Apply the component-level Cost Drivers (excluding SCED) to each component's basic effort. **PMi = PMBasic(i) x # EMi (i=1-16)**

5. Sum each component's effort to derive the aggregate effort, **PMAggregate** for the total project. **PMAggregate = # PMi**

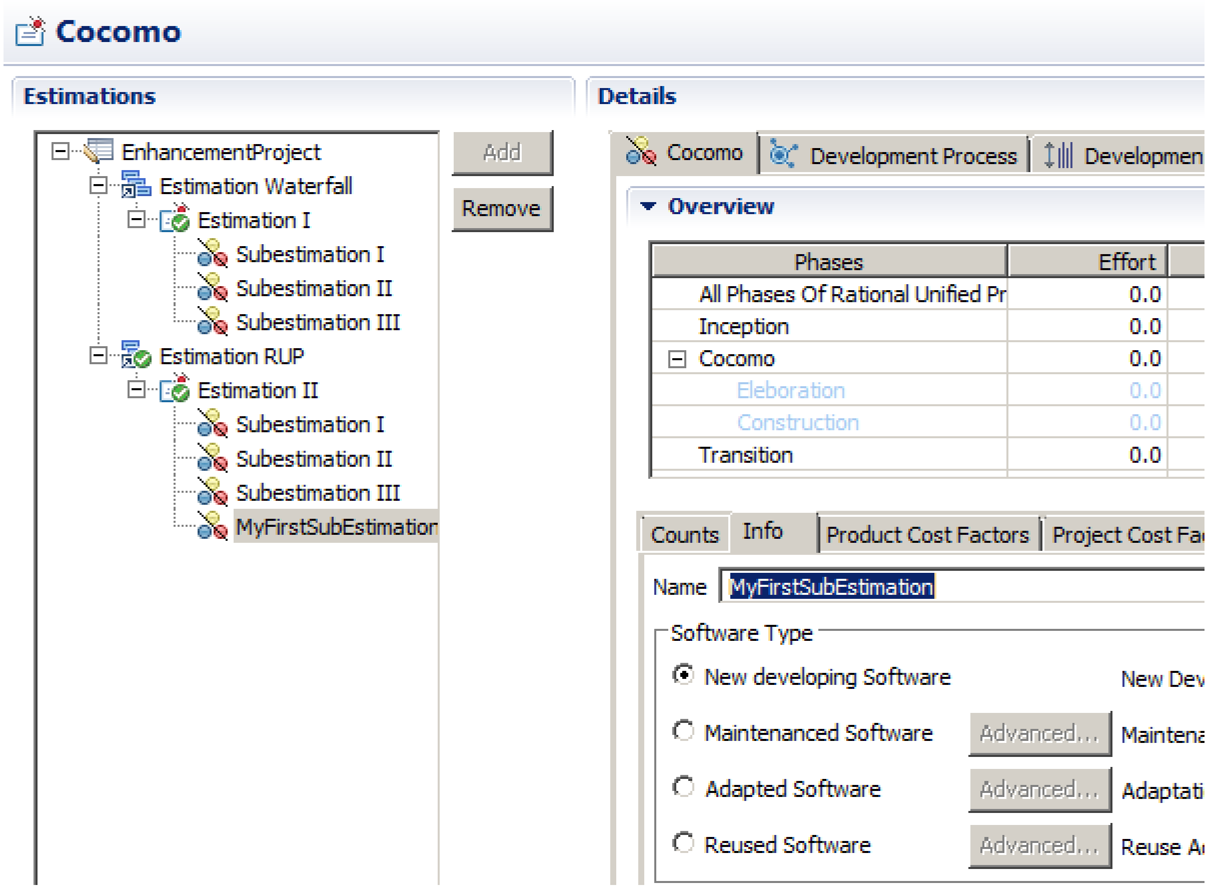
6. The schedule is estimated by repeating steps 2 through 5 without the **SCED** Cost Driver used in step 2.

**1.** Select the Estimation I in the tree and click the Add button



| Phases | Effort |
|---|---|
| All Phases Of Rational Unified Pr | 1206.1 |
| Inception | 61.3 |
| Cocomo | 1022.1 |
| Eleboration | 245.3 |
| Construction | 776.8 |
| Transition | 122.7 |

2. Click on the **Info** tab on the **Project Plandata** editor. You may change the name of **Sub estimation** and the adjust **Cost Drivers**



| Phases | Effort |
|---|---|
| All Phases Of Rational Unified Pr | 0.0 |
| Inception | 0.0 |
| Cocomo | 0.0 |
| Eleboration | 0.0 |
| Construction | 0.0 |
| Transition | 0.0 |

Name MyFirstSubEstimation

Software Type

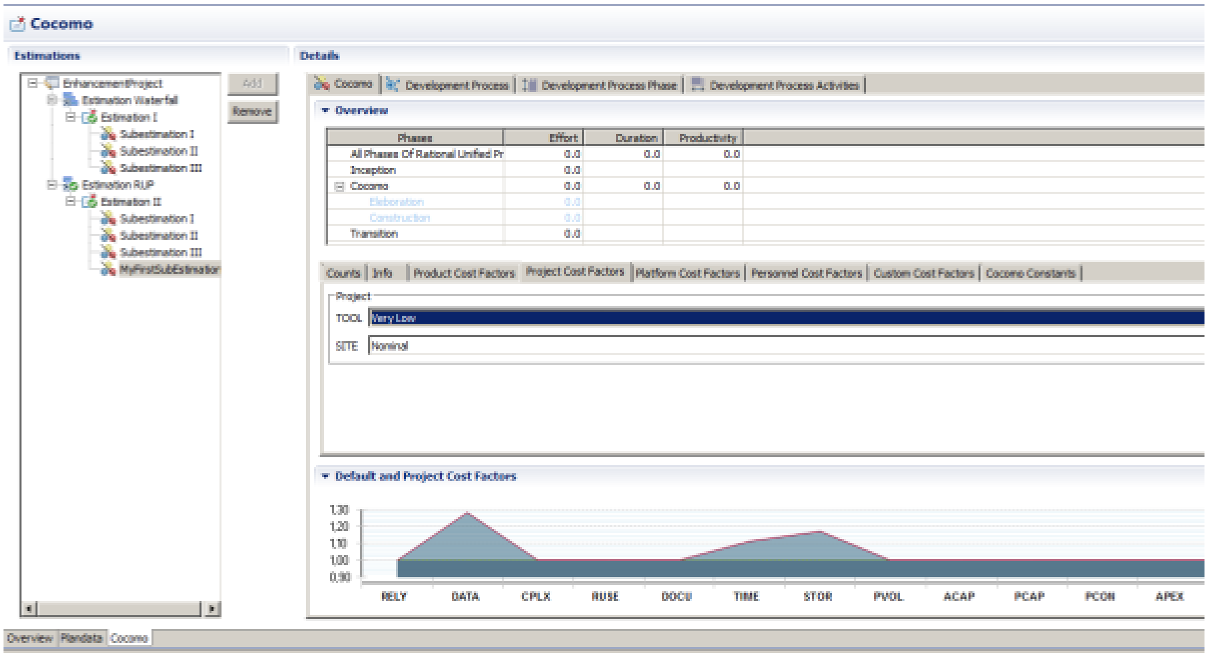
● New developing Software New Dev

○ Maintenanced Software Advanced... Maintena

○ Adapted Software Advanced... Adaptati

○ Reused Software Advanced... Reuse A

The adjusted **cost factors** will be displayed on the chart .



| Phases | Effort | Duration | Productivity |
|---|---|---|---|
| All Phases Of Rational Unified Pr | 0.0 | 0.0 | 0.0 |
| Inception | 0.0 | | |
| Cocomo | 0.0 | 0.0 | 0.0 |
| Elaboration | 0.0 | | |
| Construction | 0.0 | | |
| Transition | 0.0 | | |

Project

TOOL: Very Low

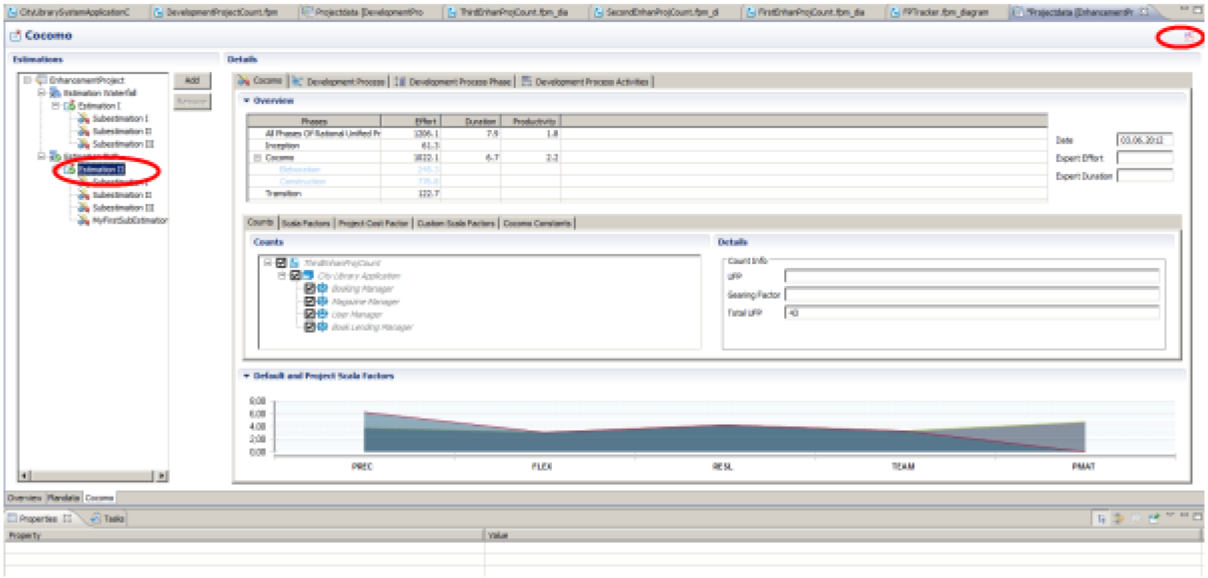
SITE: Nominal

## Create a Project Estimation Report

**Enterprise Edition**

To create an **Estimation Report** , perform the following steps.

1. Select a **Base Estimation** in the tree and click the button **Generate PDF file** right upon.



| Phases | Effort | Duration | Productivity |
|---|---|---|---|
| All Phases Of Rational Unified Pr | 1206.1 | 7.9 | 1.8 |
| Inception | 61.3 | | |
| Cocomo | 1022.1 | 6.7 | 2.2 |
| Elaboration | 245.1 | | |
| Construction | 776.8 | | |
| Transition | 122.7 | | |

Date: 03.06.2012

Expert Effort:

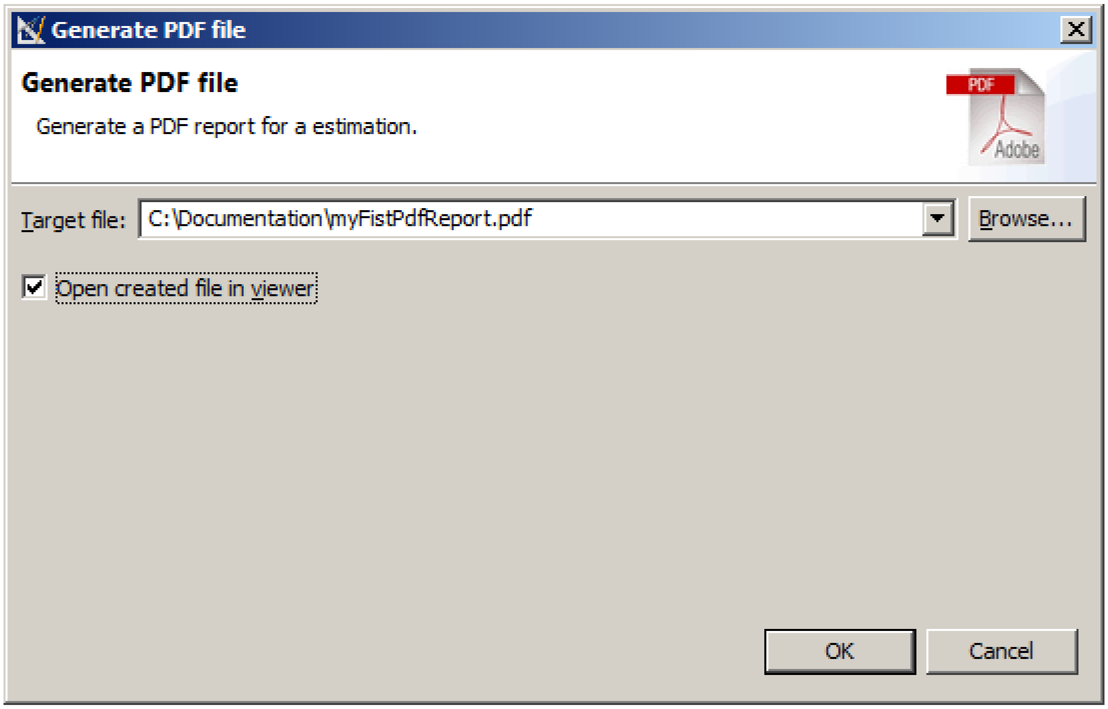
Expert Duration:

UFP:

Gearing Factor:

Total UFP: 40

2. The following dialog will be showed. Enter the file name and click the button **Ok**



Generate PDF file

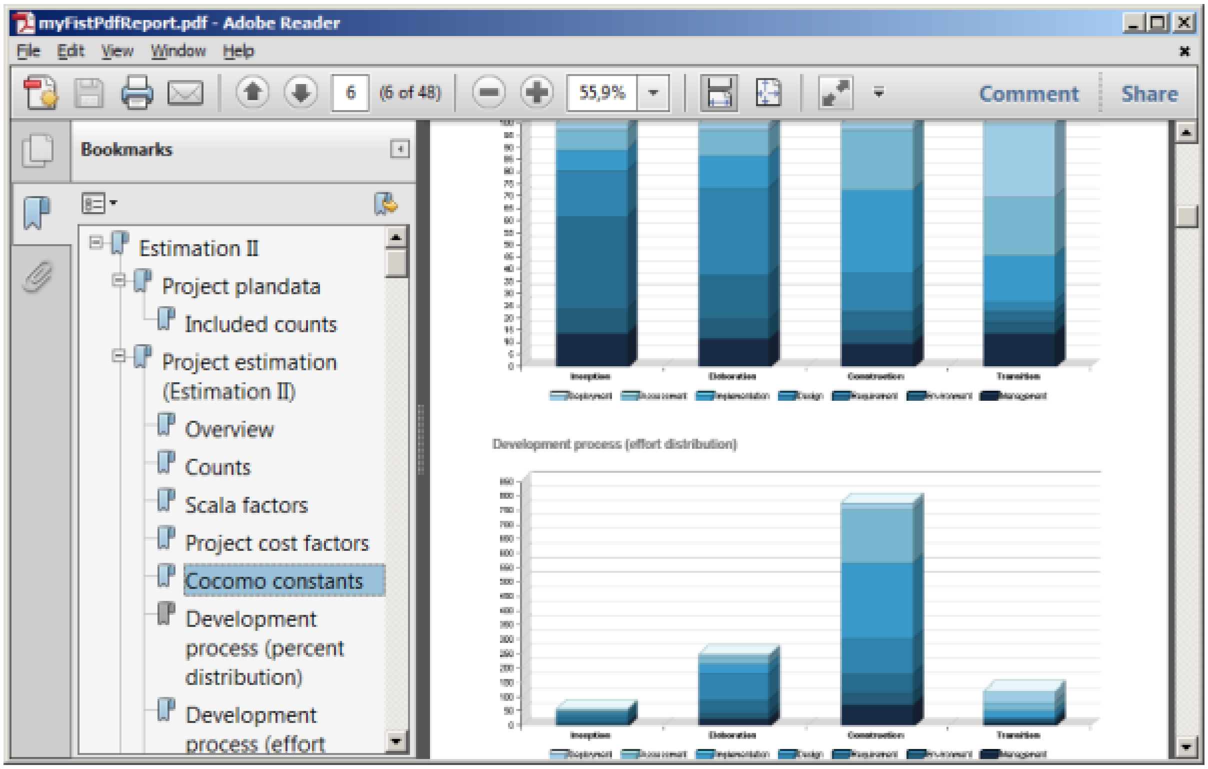
**Generate PDF file**

Generate a PDF report for a estimation.

Target file: C:\Documentation\myFistPdfReport.pdf

☑ Open created file in viewer

The following **PDF** file will be created. .



myFistPdfReport.pdf - Adobe Reader

Bookmarks

- Estimation II
  - Project plandata
    - Included counts
  - Project estimation (Estimation II)
    - Overview
    - Counts
    - Scala factors
    - Project cost factors
    - Cocomo constants
    - Development process (percent distribution)
    - Development process (effort

## Working with Application System Lifecycle

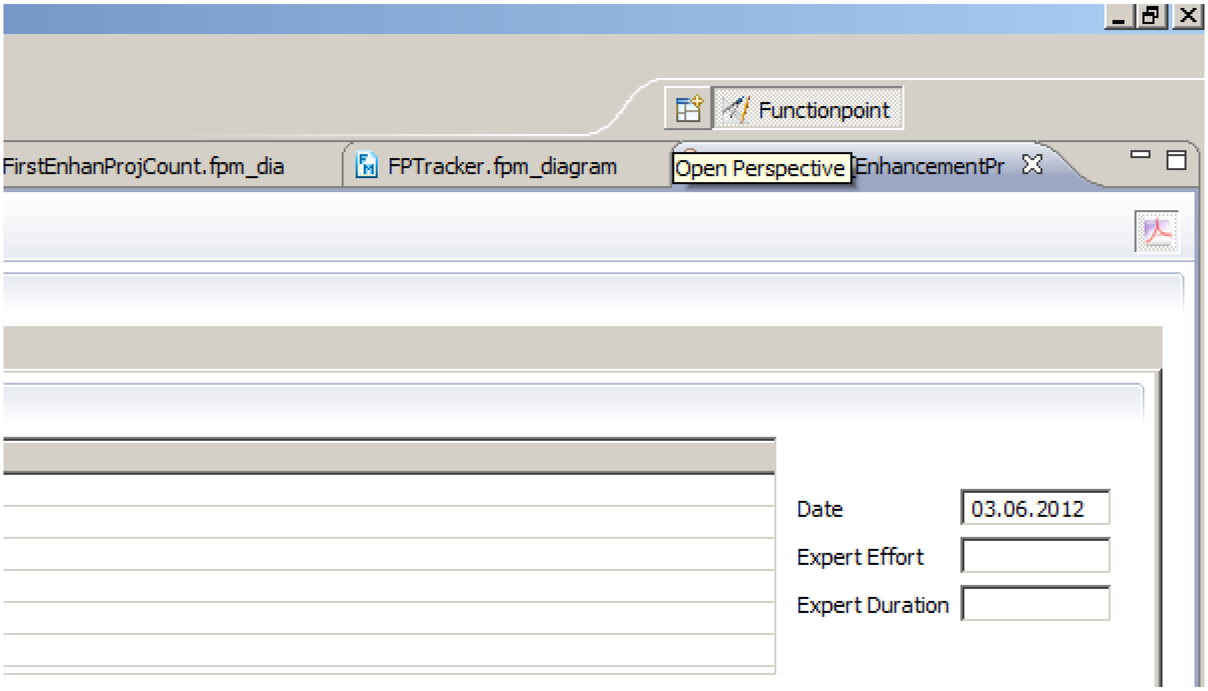
### Navigating Application Systems

Enterprise Edition

**Function Point Modeler** enables you to navigate application system Lifecycle.

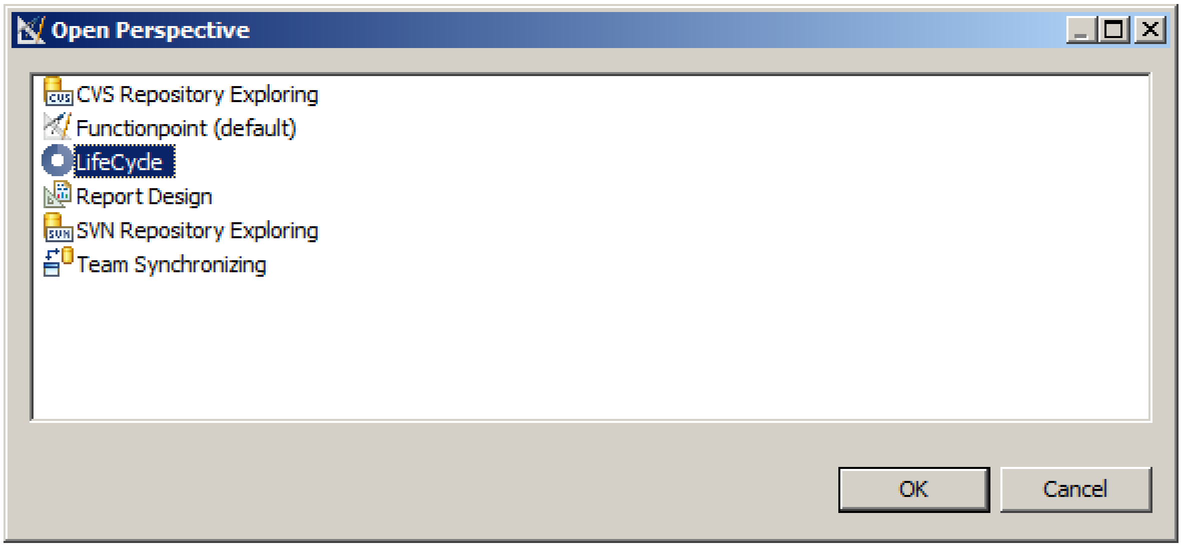
To start a **Life Cycle** perspective , perform the following steps.

1. Click the **Open Perspective** on the right upon of **Function Point Modeler** .

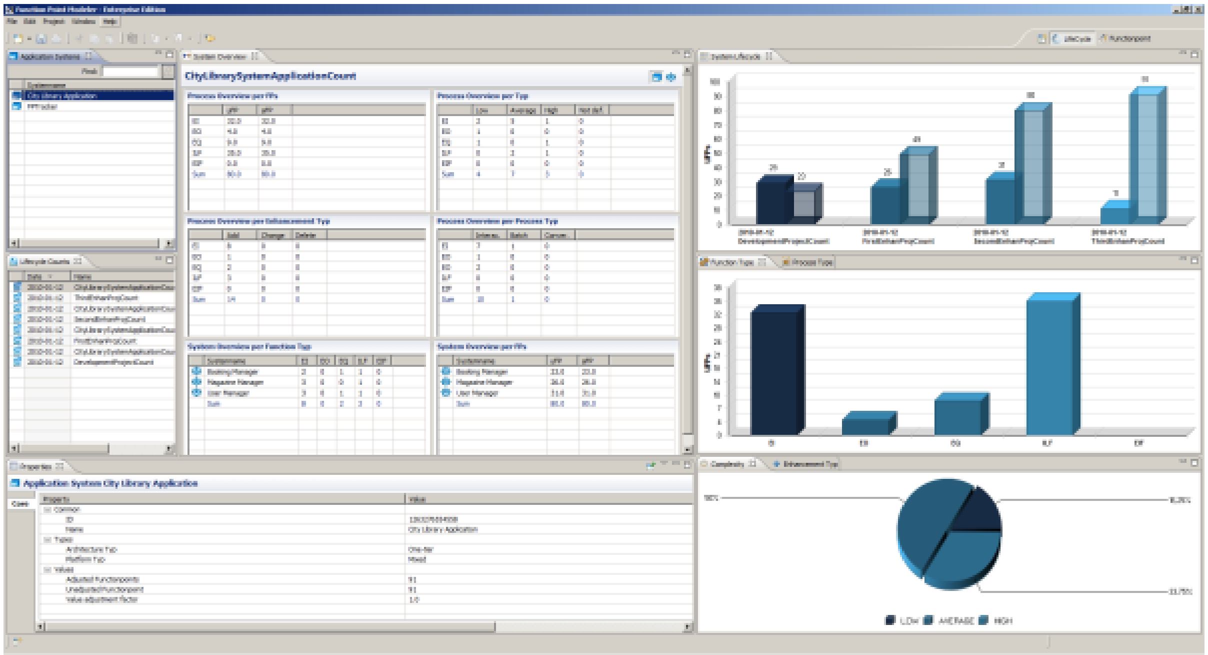


Date 03.06.2012
Expert Effort
Expert Duration

2. The following dialog will be showed. Select the **Life Cycle** and click the button **Ok**



The **Life Cycle** will be showed. Click an desired system and the desired count of the selected system on the **Life Cycle** .


Function Point Modeler - Enterprise Edition
CityLibrarySystemApplicationCount
Application System City Library Application
System Lifecycle
Function Type
Process Type
LOW
AVERAGE
HIGH

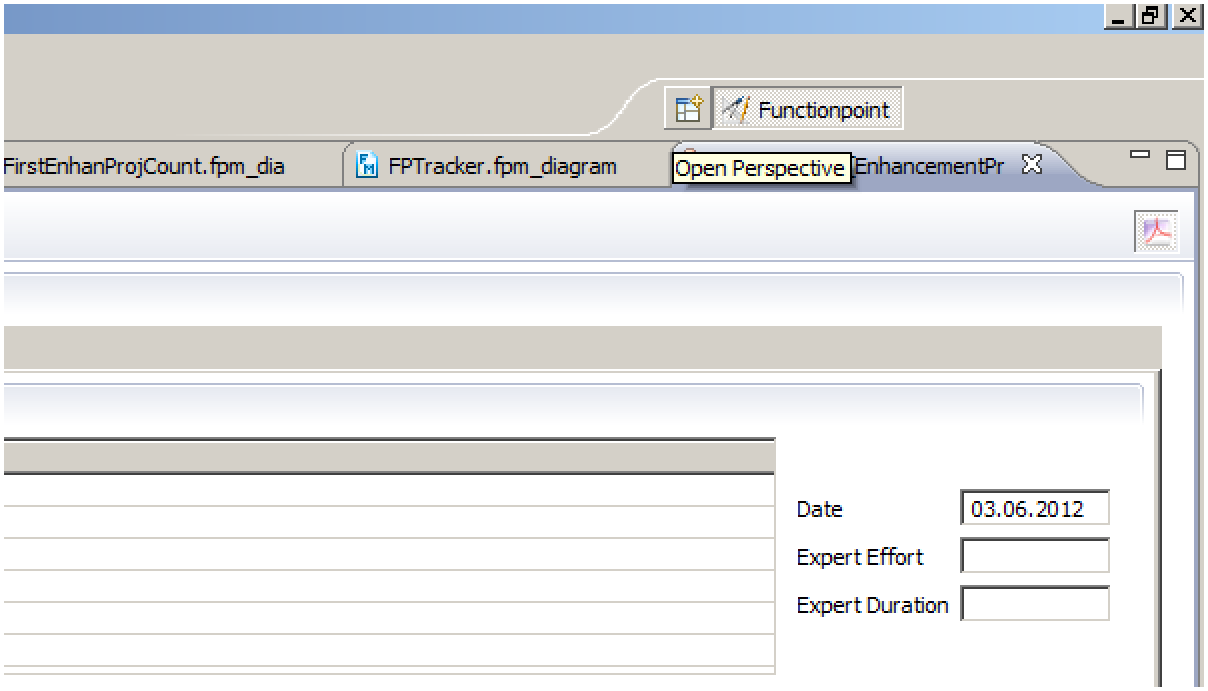
## Navigating Application System Counts

Enterprise Edition

**Function Point Modeler** enables you to navigate application system Lifecycle.

To start a **Life Cycle** perspective , perform the following steps.

1. Click the **Open Perspective** on the right upon of **Function Point Modeler** .

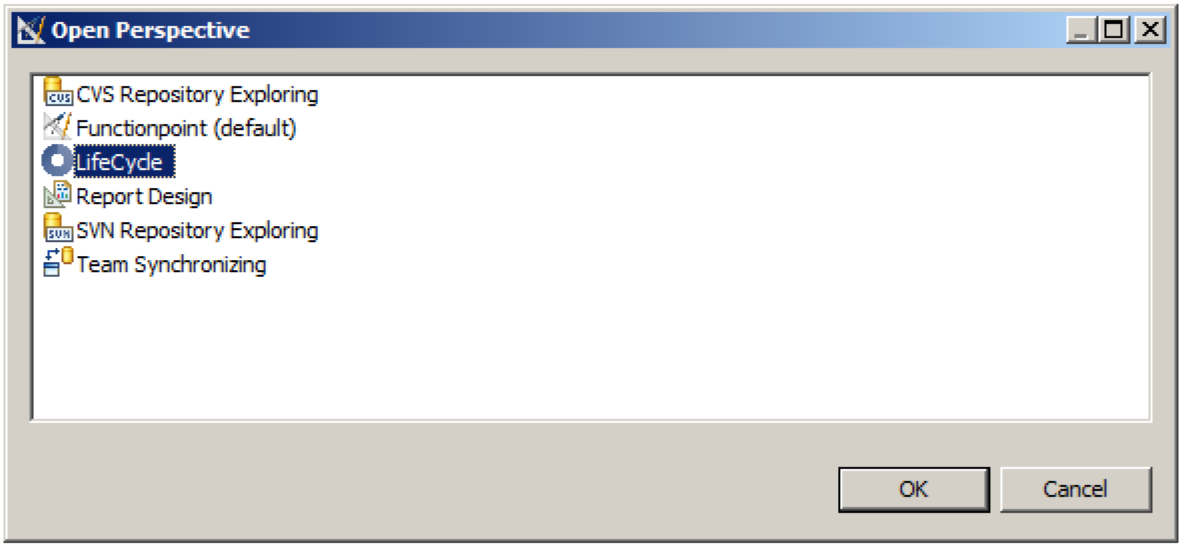


Date 03.06.2012

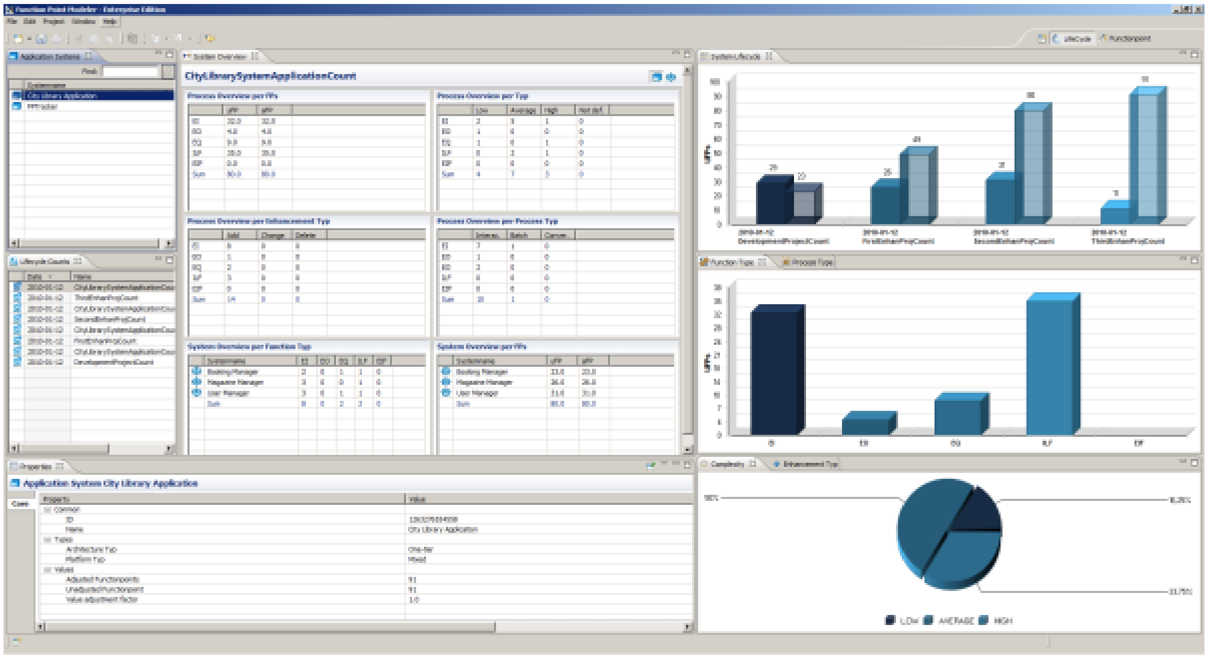
Expert Effort

Expert Duration

2. The following dialog will be showed. Select the **Life Cycle** and click the button **Ok**



The **Life Cycle** will be showed. Click an desired system and the desired count of the selected system on the **Life Cycle** .



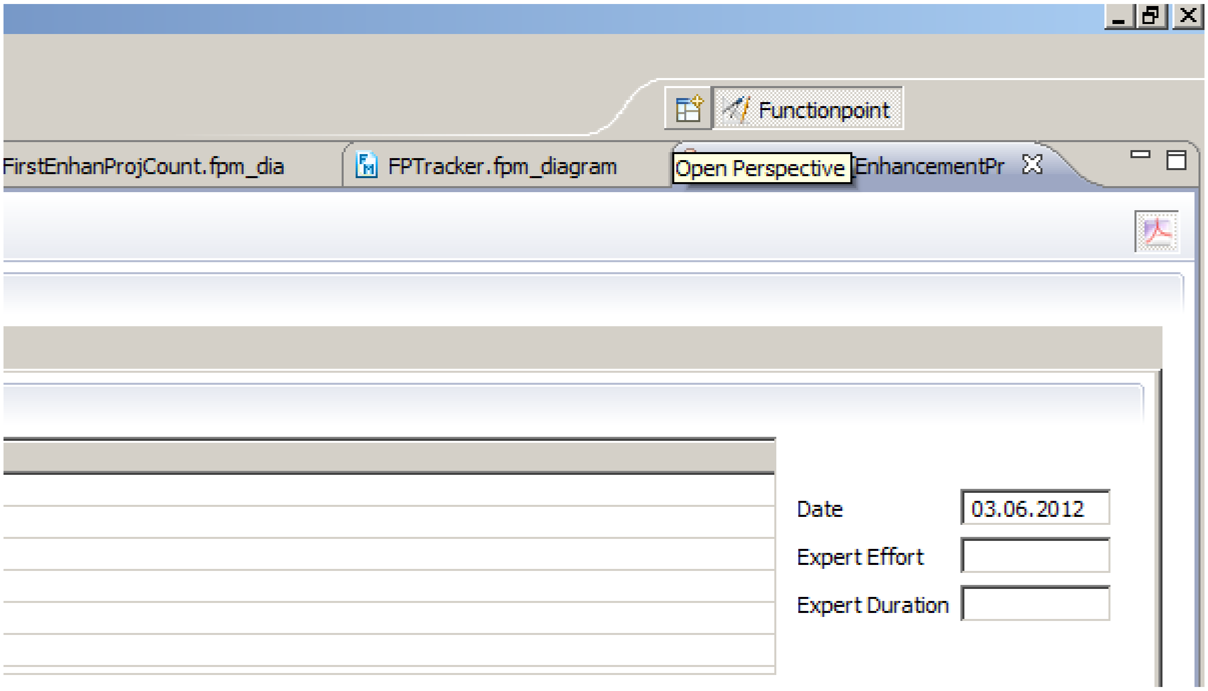
## Analyze Lifecycle Data

**Enterprise Edition**

**Function Point Modeler** enables you to navigate application system Lifecycle.

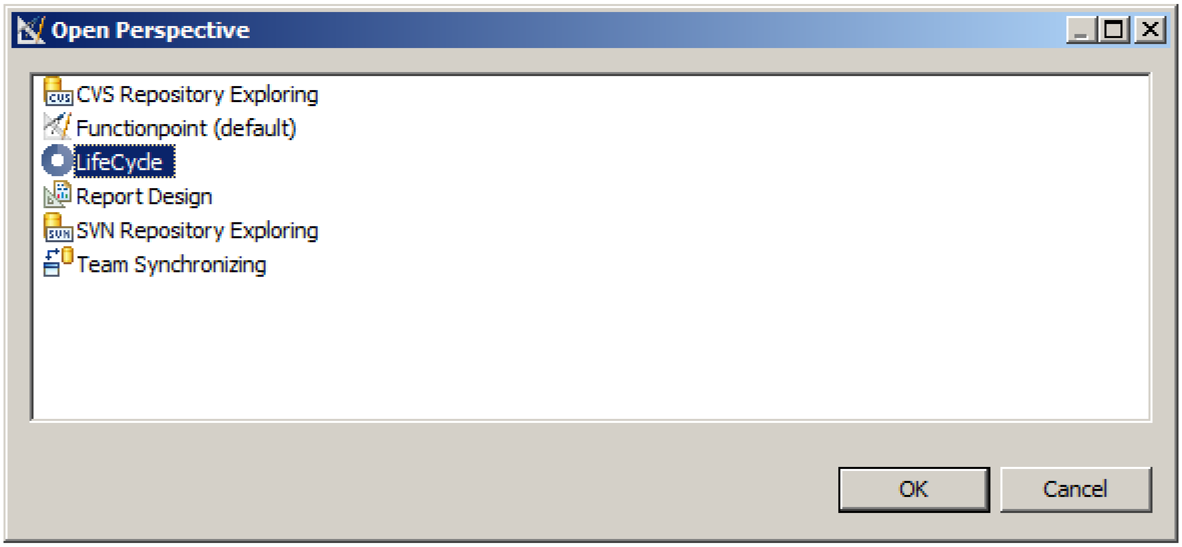
To start a **Life Cycle** perspective , perform the following steps.

1. Click the **Open Perspective** on the right upon of **Function Point Modeler** .



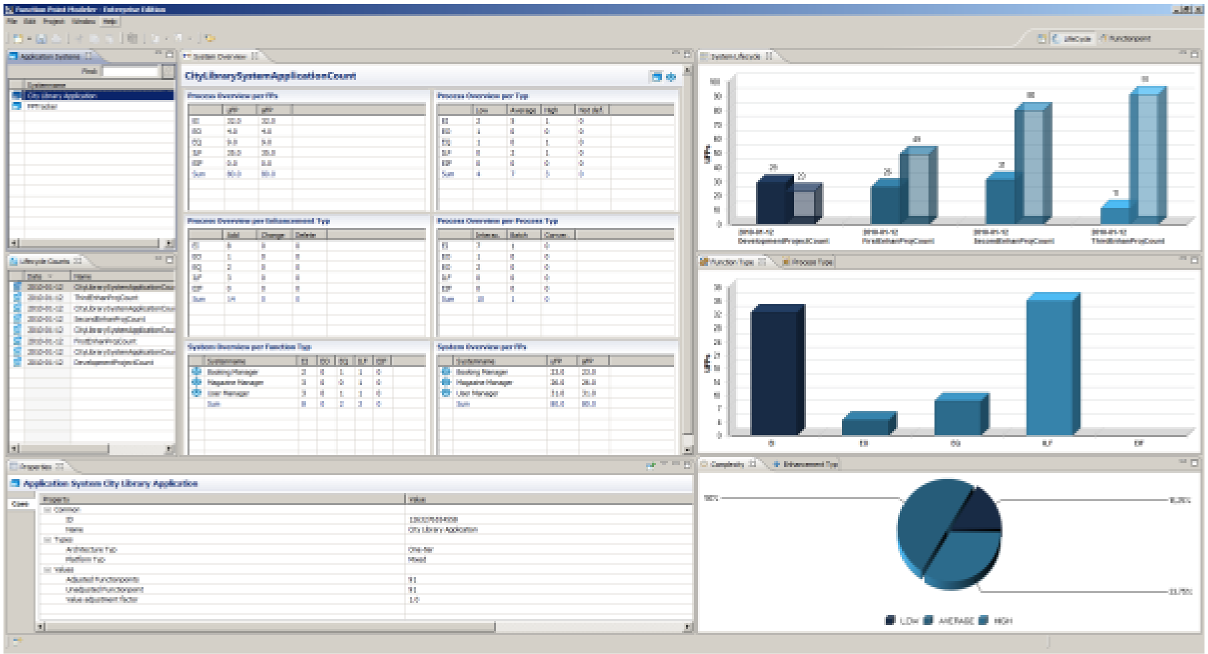
Date 03.06.2012
Expert Effort
Expert Duration

2. The following dialog will be showed. Select the **Life Cycle** and click the button **Ok**



The **Life Cycle** will be showed. Click an desired system and the desired count of the selected system on the **Life Cycle** .

You will see detail information (e.g. Process type, Enhancement type, etc.) of the current selected count


CityLibrarySystemApplicationCount
Process Overview per FPs
Process Overview per Typ
Process Overview per Enhancement Typ
Process Overview per Process Typ
System Overview per Function Typ
System Overview per FPs
Application System City Library Application
LOW
AVERAGE
HIGH

## Working with SLED

Enterprise Edition

### Setup SLED Database

Enterprise Edition

### MS Access

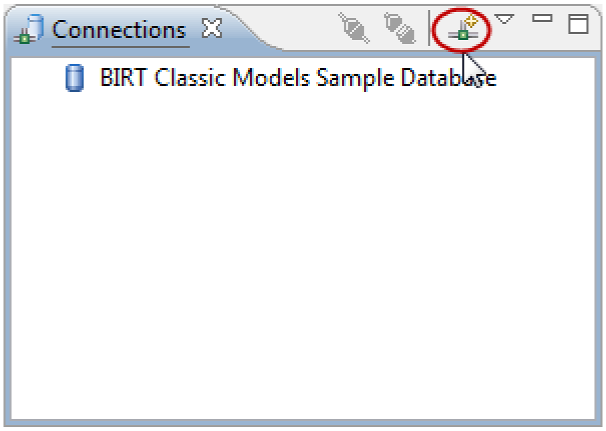
Enterprise Edition

To connect to a MS Access SLED database, perform the following steps.

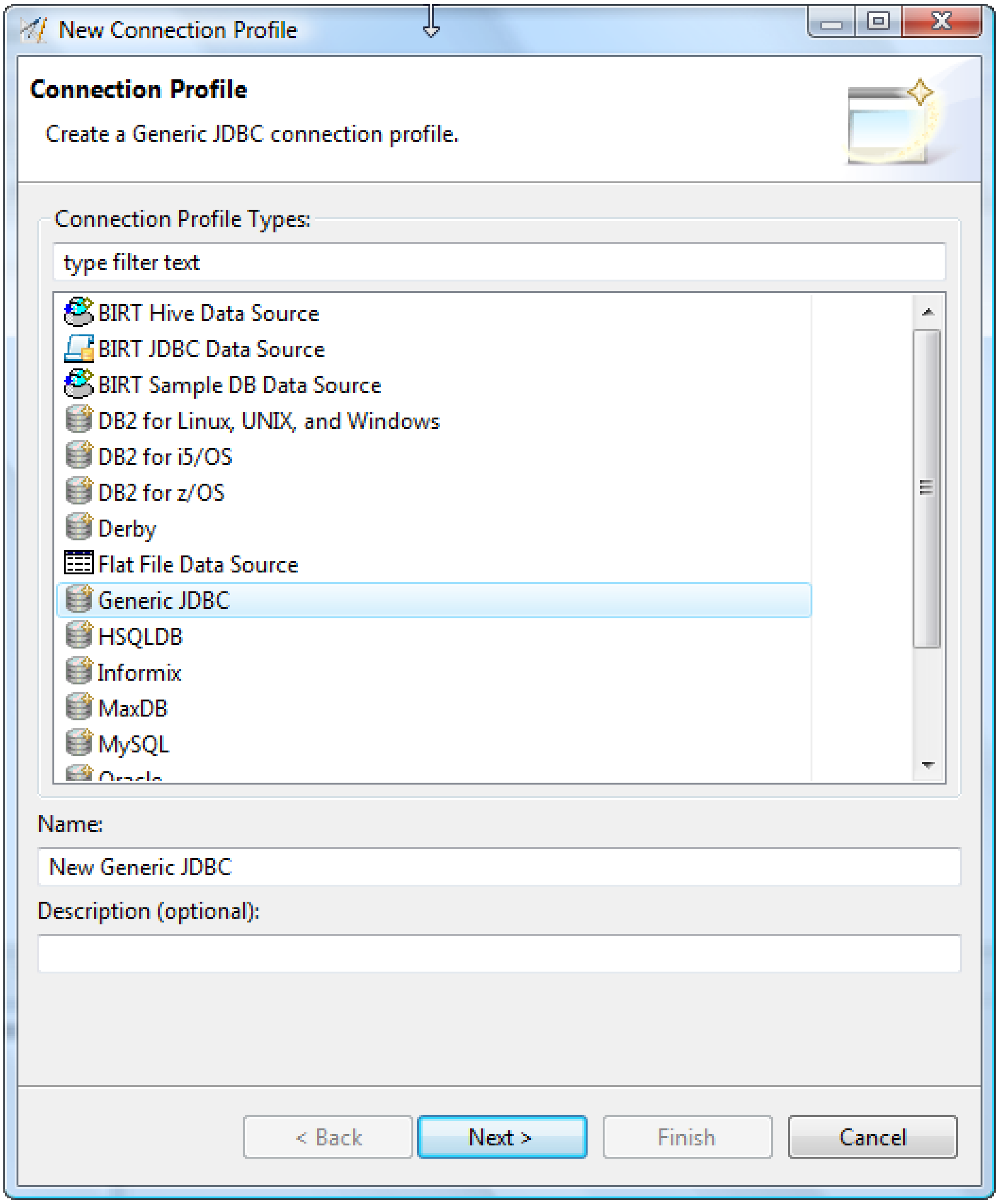
The steps to set up an ODBC connection depends on your operating system. In the following description the procedures in Windows Vista is demonstrated. If you're using a different operating system this steps may vary.

1. Select **Start > Control Panel** in the Windows Task bar.
2. Select **ODBC Datasources** .
3. Switch to the **System-DSN** tab.
4. Press the **Add** button.
5. Select the MS Access driver and press the **Finish** button.
6. Enter a description in the Datasource Name filed, e.g. **FPM** .
7. Press the **Select** button.
8. Switch to your Database location, select the Database file and press the **OK** button.
9. Press the **OK** button in the following to dialog steps.

10. In Function Point Modeler, switch to the **SLED** perspective. To do this, select **Window > Open perspective > Other ... > SLED** from the menu bar.
11. Click on the **New...** button in the toolbar of the **Connections** view.



12. Select entry **Generic JDBC** from the list of availables connection profile types.



New Connection Profile

Connection Profile

Create a Generic JDBC connection profile.

Connection Profile Types:

type filter text

- BIRT Hive Data Source
- BIRT JDBC Data Source
- BIRT Sample DB Data Source
- DB2 for Linux, UNIX, and Windows
- DB2 for i5/OS
- DB2 for z/OS
- Derby
- Flat File Data Source
- Generic JDBC
- HSQLDB
- Informix
- MaxDB
- MySQL
- Oracle

Name:

New Generic JDBC

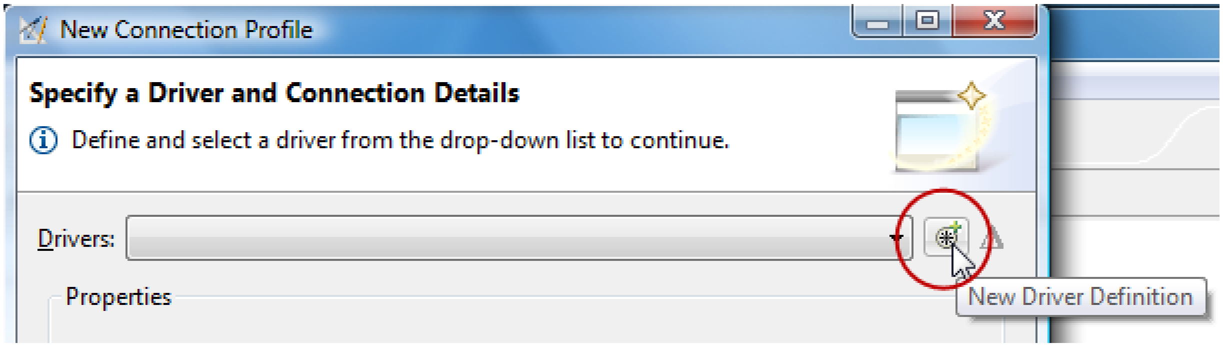
Description (optional):

**13.** Enter a name for your new connection profile e.g. **MS Access** .

**14.** Enter an optional description for your new connection profile e.g. MS Access@localhost.

**15.** Press the **Next** button

**16.** Press the following button to define a new driver definition.

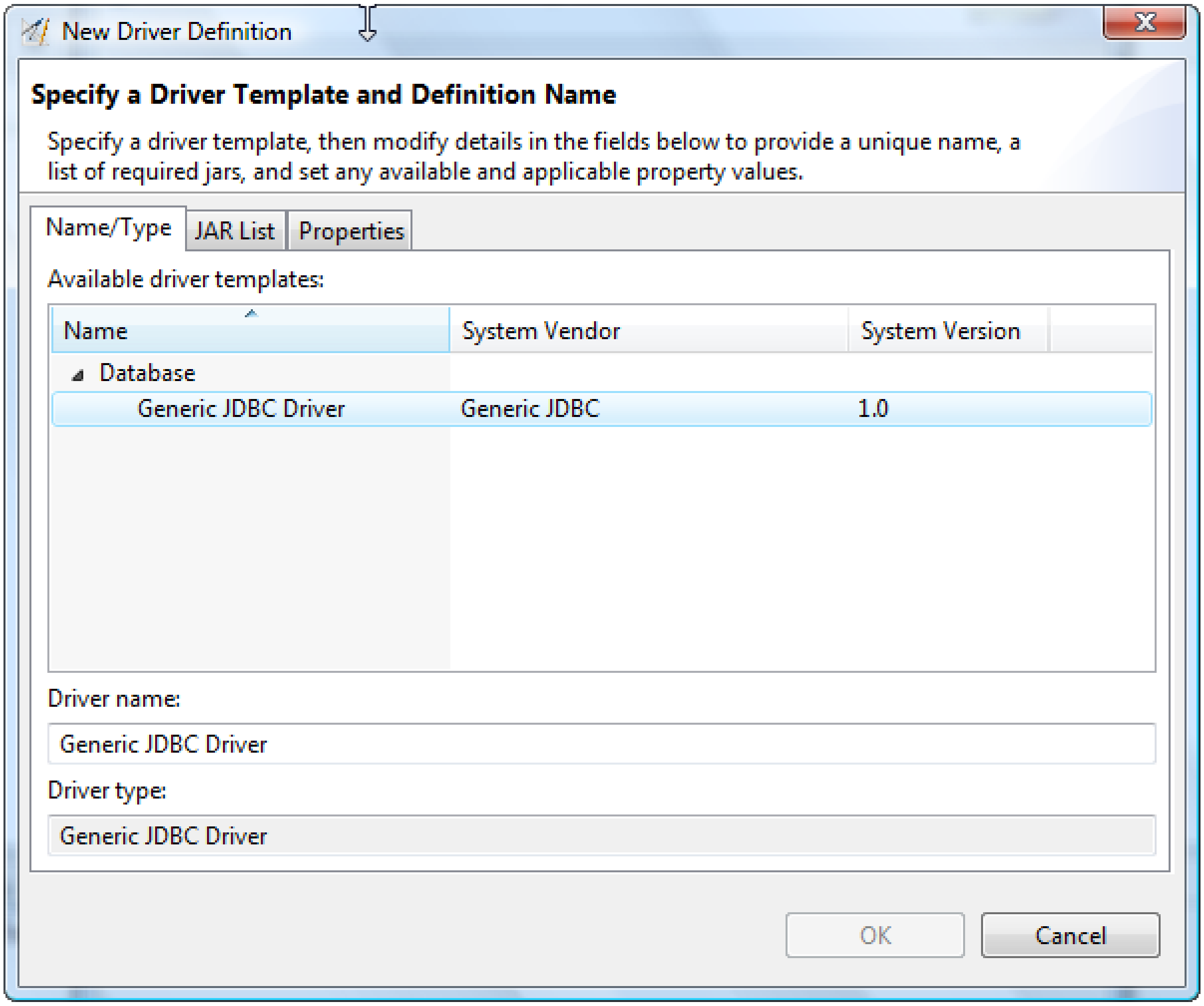


New Connection Profile

**Specify a Driver and Connection Details**

Define and select a driver from the drop-down list to continue.

17. Select the required Generic JDBC driver template from the list of available templates.



New Driver Definition

**Specify a Driver Template and Definition Name**

Specify a driver template, then modify details in the fields below to provide a unique name, a list of required jars, and set any available and applicable property values.

Available driver templates:

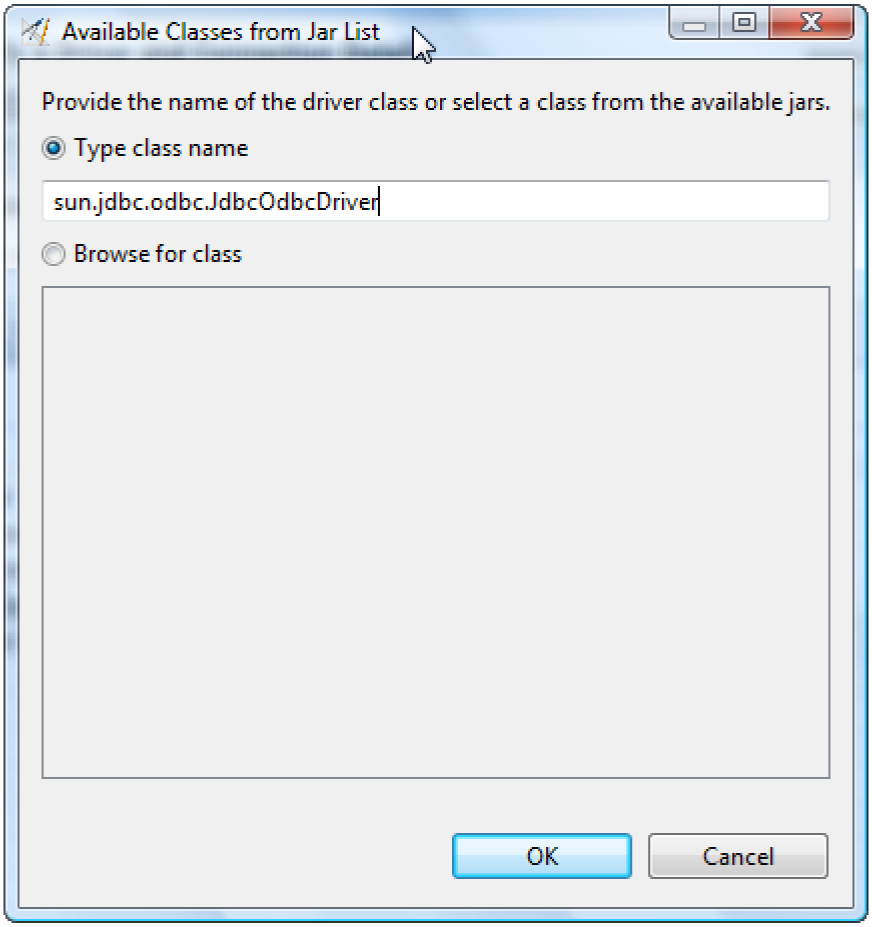
| Name | System Vendor | System Version |
|---|---|---|
| Database | | |
| Generic JDBC Driver | Generic JDBC | 1.0 |

Driver name: Generic JDBC Driver

Driver type: Generic JDBC Driver

18. Switch to the **JAR List** tab.
19. To add a new correct driver, press the button **Add JAR/Zip...** and select a valid Java Runtime Library **rt.jar** .
20. Switch to the **Properties** tab.
21. Correct the entry in the Connection URL, so that it points to your Generic JDBC Database, e.g. **jdbc:odbc:FPM** . The last part of this URL corresponds to your ODBC Definition Name you've created in the previous steps.
22. Correct the entry in the Database name field, e.g. **FPM** .
23. Select Driver Class and press the button at the end of the field.

24. Enter **sun.jdbc.odbc.JdbcOdbcDriver** under Type Class Name and press OK.



Available Classes from Jar List

Provide the name of the driver class or select a class from the available jars.

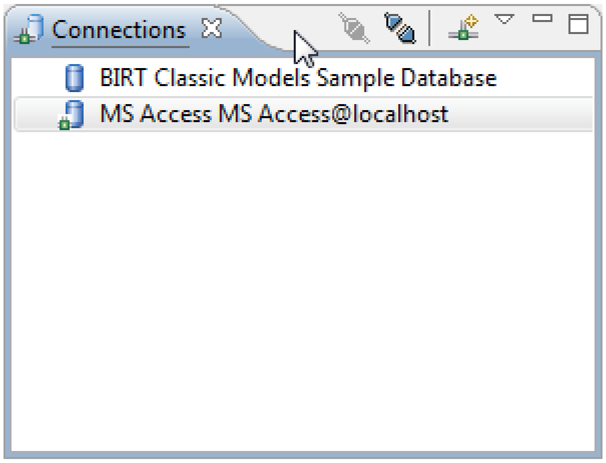
● Type class name

sun.jdbc.odbc.JdbcOdbcDriver

○ Browse for class

25. Enter a valid User ID for your Database.
26. Press the **OK** button.
27. If required, enter a password for your database and press the **Test Connection** button to validate your settings. If you receive a message like **Ping succeeded!** you can press the **Finish** button to confirm your selections.

A new entry with for your SLED MS Access Database will be added to the Connection view.



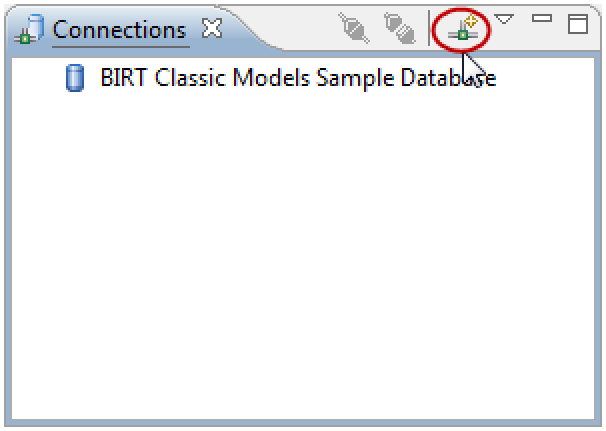
Connections
BIRT Classic Models Sample Database
MS Access MS Access@localhost

### MySQL

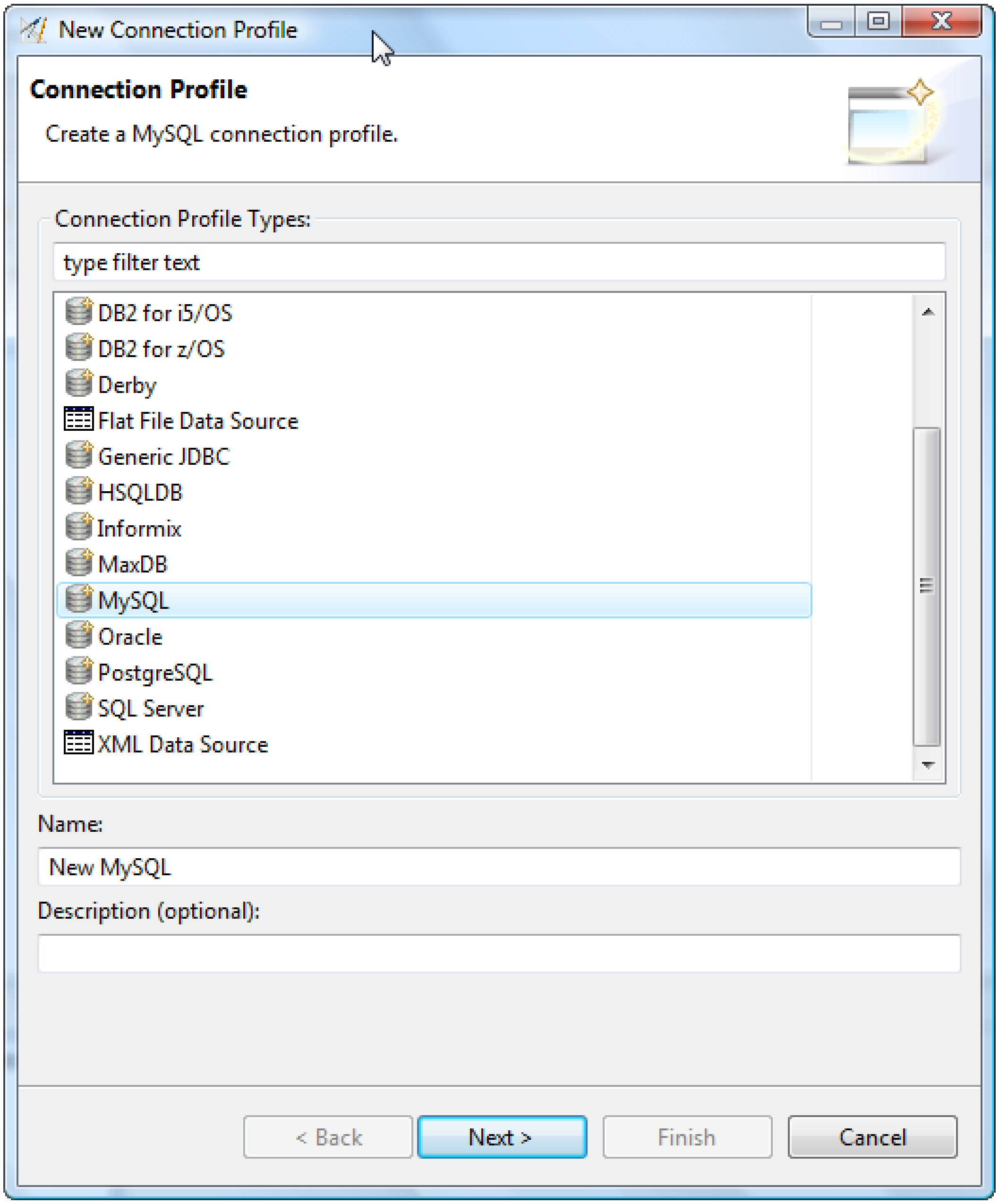
Enterprise Edition

To connect to a MySQL SLED database, perform the following steps.

1. Switch to the **SLED** perspective. To do this, select **Window > Open perspective > Other ... > SLED** from the menu bar.
2. Click on the **New...** button in the toolbar of the **Connections** view.



3. Select entry **MySQL** from the list of availables connection profile types.



New Connection Profile

Connection Profile

Create a MySQL connection profile.

Connection Profile Types:

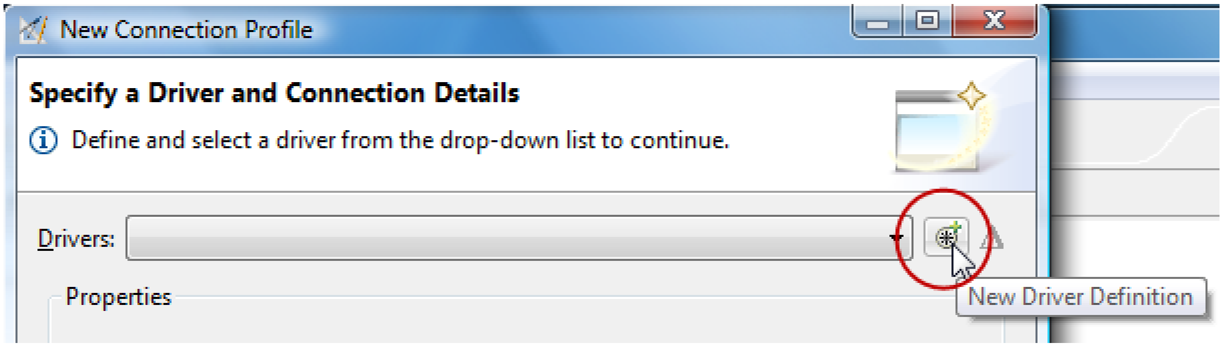
type filter text

- DB2 for i5/OS
- DB2 for z/OS
- Derby
- Flat File Data Source
- Generic JDBC
- HSQLDB
- Informix
- MaxDB
- MySQL
- Oracle
- PostgreSQL
- SQL Server
- XML Data Source

Name: New MySQL

Description (optional):

4. Enter a name for your new connection profile e.g. **MySQL** .
5. Enter an optional description for your new connection profile e.g. MySQL@localhost.
6. Press the **Next** button
7. Press the following button to define a new driver definition.

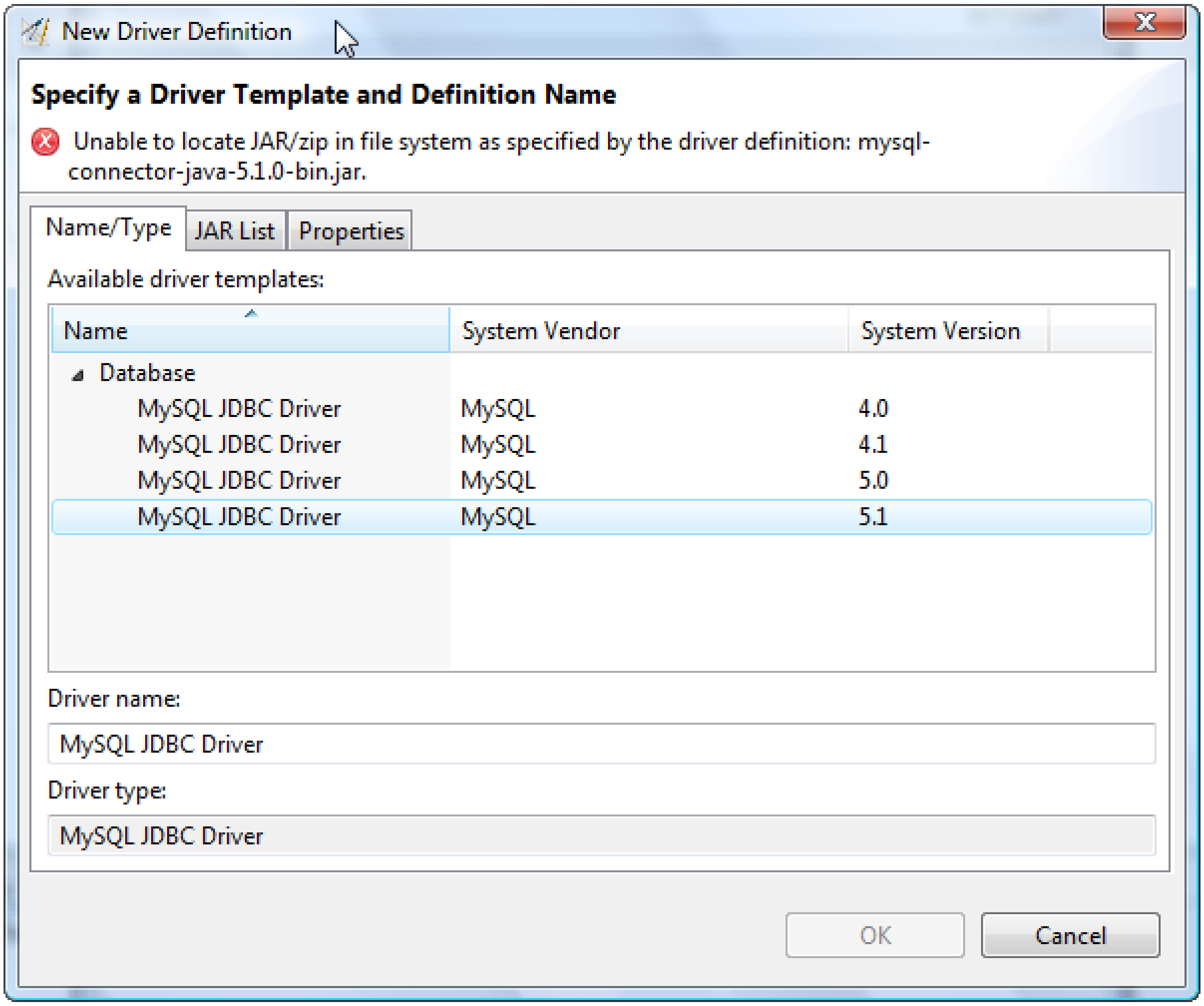


New Connection Profile

**Specify a Driver and Connection Details**

Define and select a driver from the drop-down list to continue.

8. Select the required MySQL driver template from the list of available templates.



New Driver Definition

**Specify a Driver Template and Definition Name**

Unable to locate JAR/zip in file system as specified by the driver definition: mysql-connector-java-5.1.0-bin.jar.

Available driver templates:

| Name | System Vendor | System Version |
|---|---|---|
| Database | | |
| MySQL JDBC Driver | MySQL | 4.0 |
| MySQL JDBC Driver | MySQL | 4.1 |
| MySQL JDBC Driver | MySQL | 5.0 |
| MySQL JDBC Driver | MySQL | 5.1 |

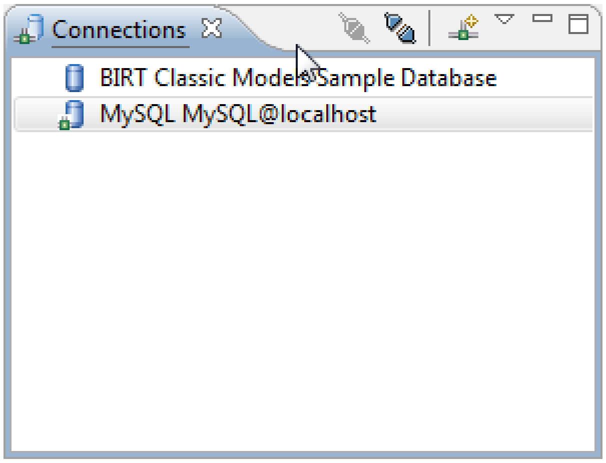
Driver name: MySQL JDBC Driver

Driver type: MySQL JDBC Driver

9. Switch to the **JAR List** tab.
10. Remove the listed driver, if you receive an error message by selecting it and then press the button **Remove JAR/Zip** . To add a new correct driver, press the button **Add JAR/Zip...** and select a valid JAR file which is consistent with the selected MySQL version.
11. Switch to the **Properties** tab.
12. Correct the entry in the Connection URL, so that it points to your MySQL database location, e.g. **jdbc:mysql://localhost:3306/fpm** .
13. Correct the entry in the Database name field, e.g. **fpm** .

14. Enter a valid Password and User ID for your Database.
15. Press the **OK** button.
16. Press the **Test Connection** button to validate your settings. If you receive a message like **Ping succeeded!** you can press the **Finish** button to confirm your selections.

A new entry with for your SLED Derby Database will be added to the Connection view.

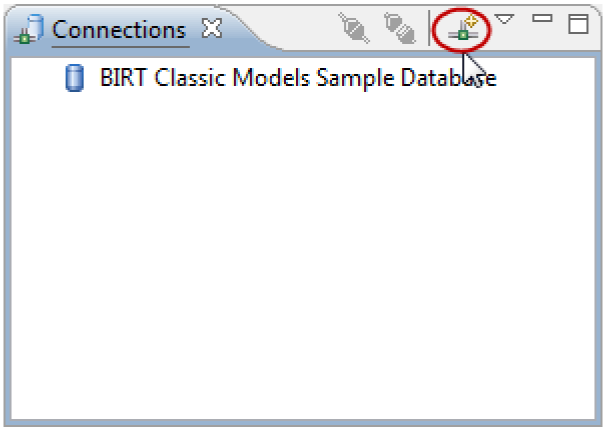


### Derby

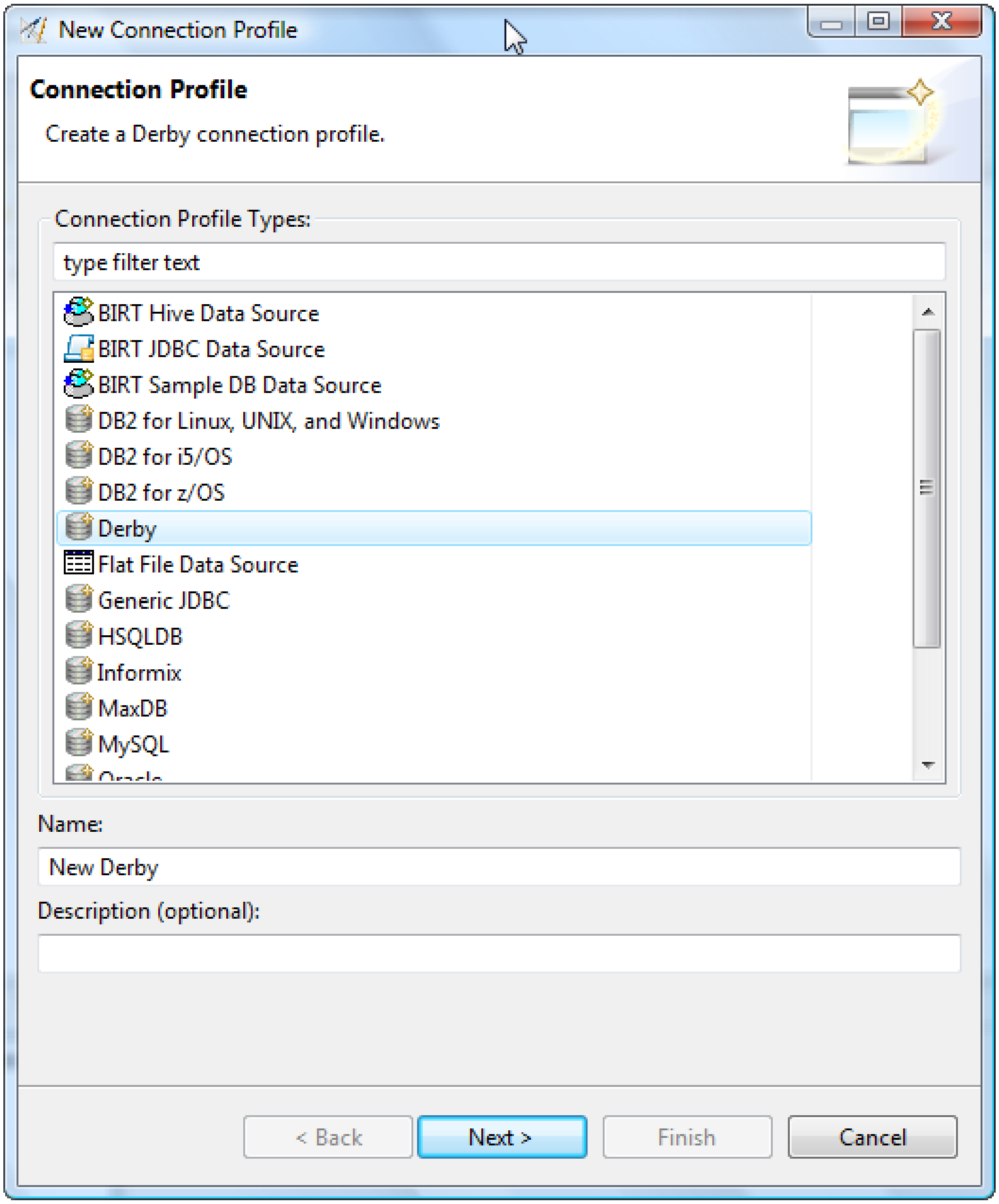
Enterprise Edition

To connect to a Dertby SLED database, perform the following steps.

1. Switch to the **SLED** perspective. To do this, select **Window** > **Open perspective** > **Other ...** > **SLED** from the menu bar.
2. Click on the **New...** button in the toolbar of the **Connections** view.



3. Select entry **Derby** from the list of availables connection profile types.


New Connection Profile

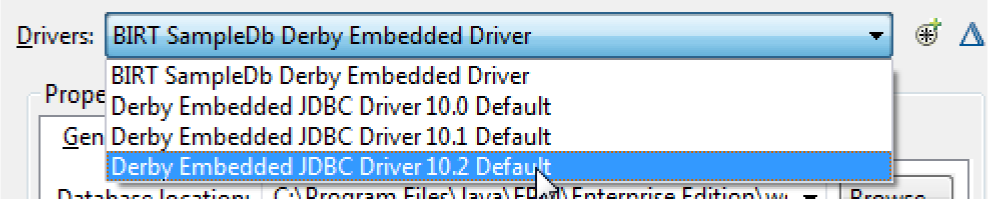
Connection Profile

Create a Derby connection profile.

Name: New Derby

Description (optional):

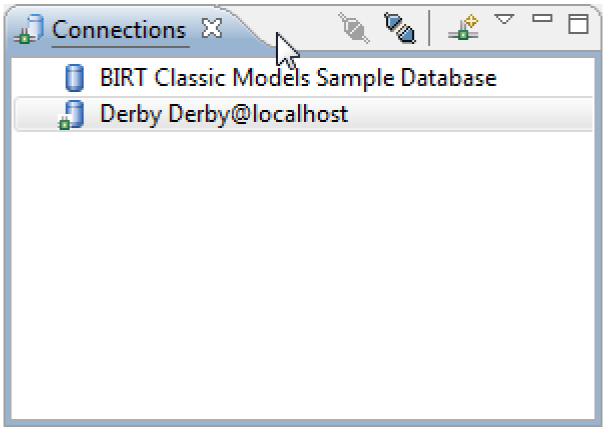
4. Enter a name for your new connection profile e.g. **Derby** .
5. Enter an optional description for your new connection profile e.g. Derby@localhost.
6. Press the **Next** button
7. Select the entry **Derby Embedded JDBC Driver 10.2 Default** from the list of available drivers.


Drivers: BIRT SampleDb Derby Embedded Driver

BIRT SampleDb Derby Embedded Driver
Derby Embedded JDBC Driver 10.0 Default
Derby Embedded JDBC Driver 10.1 Default
Derby Embedded JDBC Driver 10.2 Default
Prope
Gen

8. Enter a location under **Database location** where your Derby Database exists, or where you want to create a new Derby Database e.g. **C:\Temp\MyDerbyDB** .
9. Enter a valid Username and Password for your Database.
10. Select option **Create database** if you want to create a new Database. If you connect to an existing Database, please deselect this option.
11. Press the **Test Connection** button to validate your settings. If you receive a message like **Ping succeeded!** you can press the **Finish** button to confirm your selections.

A new entry with for your SLED Derby Database will be added to the Connection view.

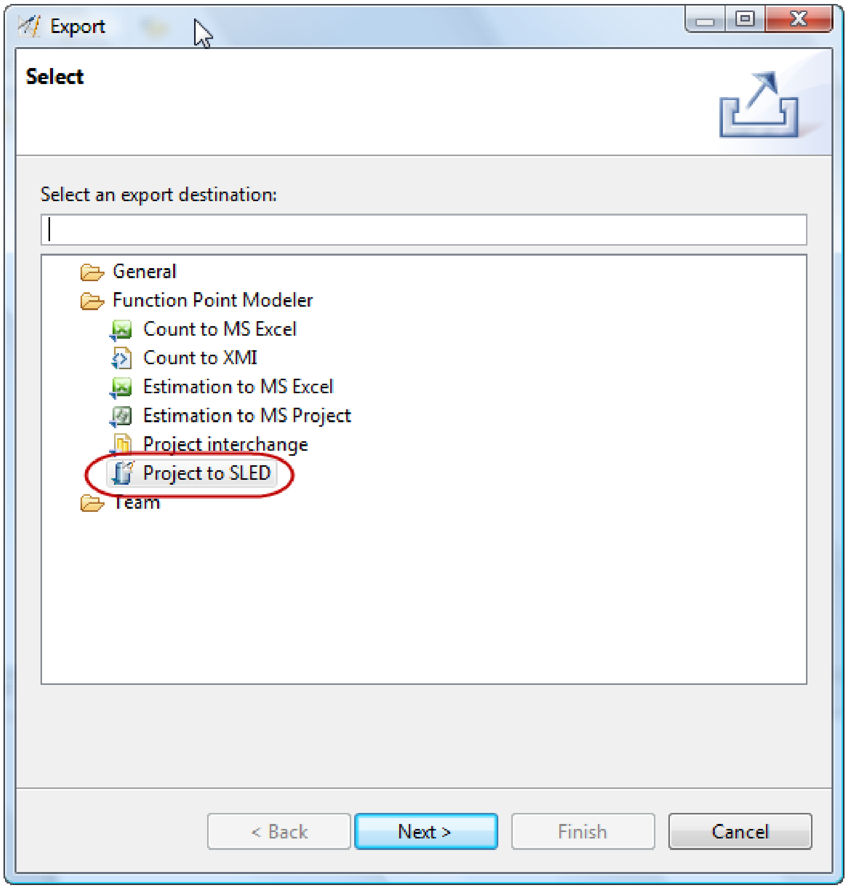


### Export Project to SLED

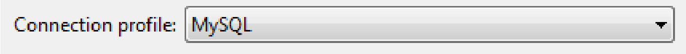
Enterprise Edition

To export Projects to a SLED database, perform the following steps.

1. Right click inside the **Project Navigator** view and select **Export... > Function Point Modeler > Project to SLED** .

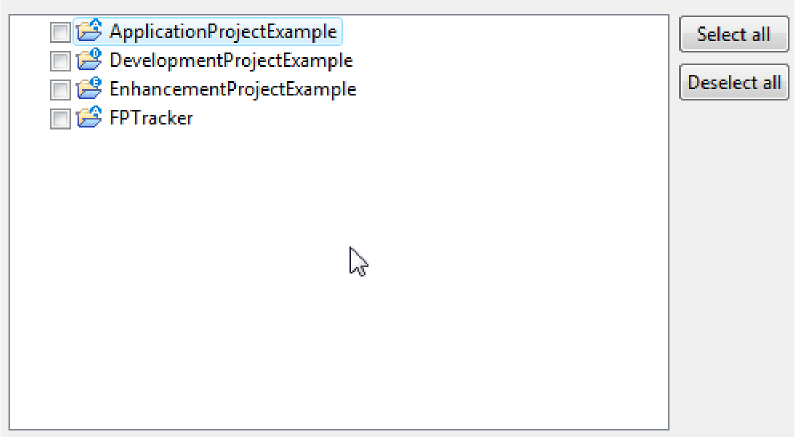


2. Press the **Next** button.
3. Select the connection profile to which you want to export. Keep in mind, only connected profiles are visible.



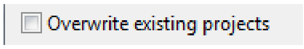
Connection profile: MySQL

4. Select the projects you want to export. It's also possible to select or de-select all projects.



□ ApplicationProjectExample
□ DevelopmentProjectExample
□ EnhancementProjectExample
□ FPTracker

5. Enable the option **Overwrite existing projects** if you want to overwrite by default. If this option is not set, a dialog will be presented if a project already exists in SLED.



□ Overwrite existing projects

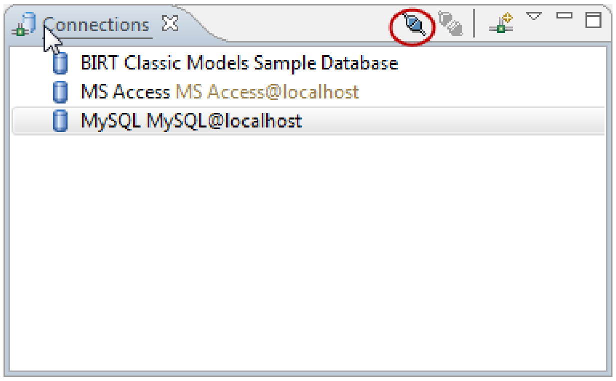
6. Select the **Finish** when you're finished with your selection.

## Analyze SLED Content

Enterprise Edition

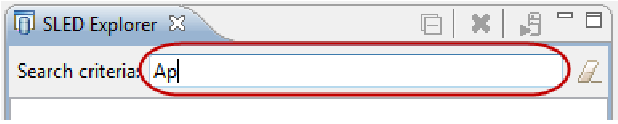
To Analyze SLED Content, perform the following steps.

1. Switch to the **SLED** perspective. To do this, select **Window** > **Open perspective** > **Other ...** > **SLED** from the menu bar.
2. Connect to a SLED database in the **Connections** view, if not already connected.



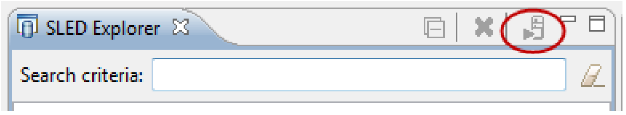
BIRT Classic Models Sample Database
MS Access MS Access@localhost
MySQL MySQL@localhost

3. Enter a search criteria in the **SLED Explorer view** . To analyze the complete SLED content, leave this field empty.



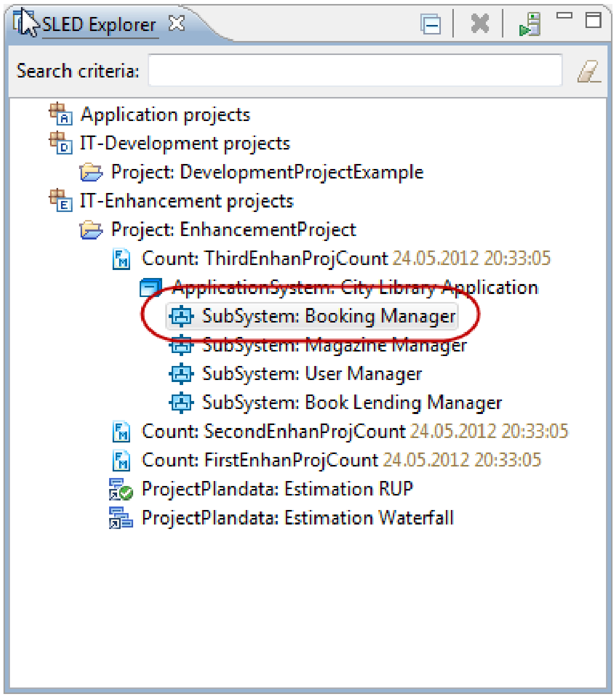
Search criteria: Ap

4. Press the **Reload SLED Content** button in the SLED Explorer view.



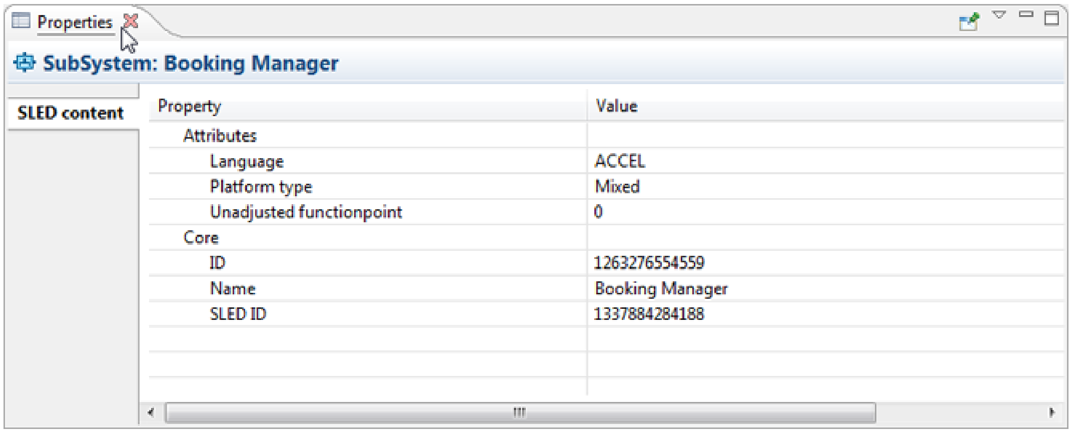
Search criteria:

5. Select the element in the SLED Explorer tree which should be analyzed.



- Application projects
- IT-Development projects
  - Project: DevelopmentProjectExample
- IT-Enhancement projects
  - Project: EnhancementProject
    - Count: ThirdEnhanProjCount 24.05.2012 20:33:05
      - ApplicationSystem: City Library Application
        - SubSystem: Booking Manager
        - SubSystem: Magazine Manager
        - SubSystem: User Manager
        - SubSystem: Book Lending Manager
    - Count: SecondEnhanProjCount 24.05.2012 20:33:05
    - Count: FirstEnhanProjCount 24.05.2012 20:33:05
    - ProjectPlandata: Estimation RUP
    - ProjectPlandata: Estimation Waterfall

View and analyze properties for the selected element.



| Property | Value |
|---|---|
| Attributes | |
| Language | ACCEL |
| Platform type | Mixed |
| Unadjusted functionpoint | 0 |
| Core | |
| ID | 1263276554559 |
| Name | Booking Manager |
| SLED ID | 1337884284188 |

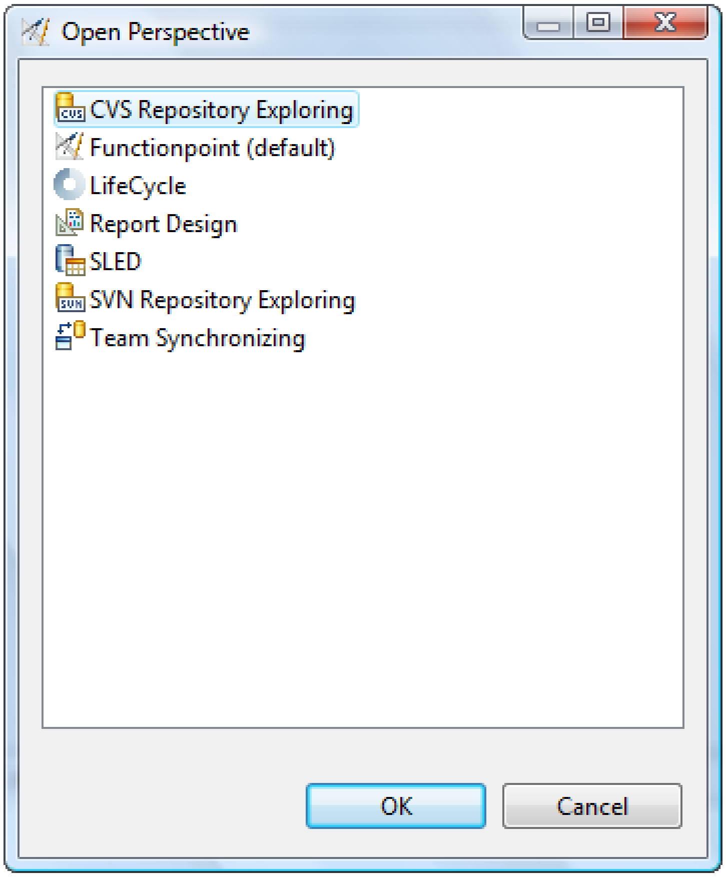
## Working in Teams

### Setup Project Management System

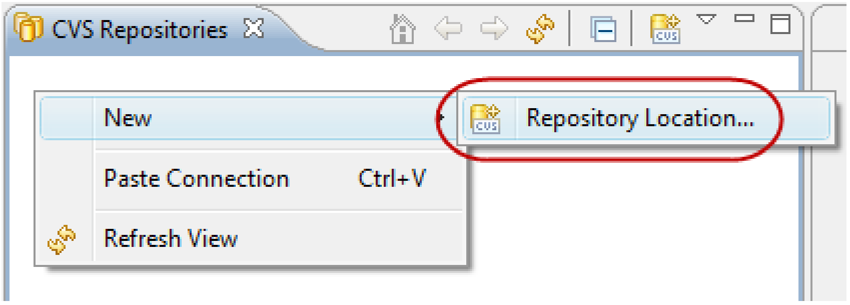
### Setup CVS Project Management System

To connect to a CVS team repository, perform the following steps.

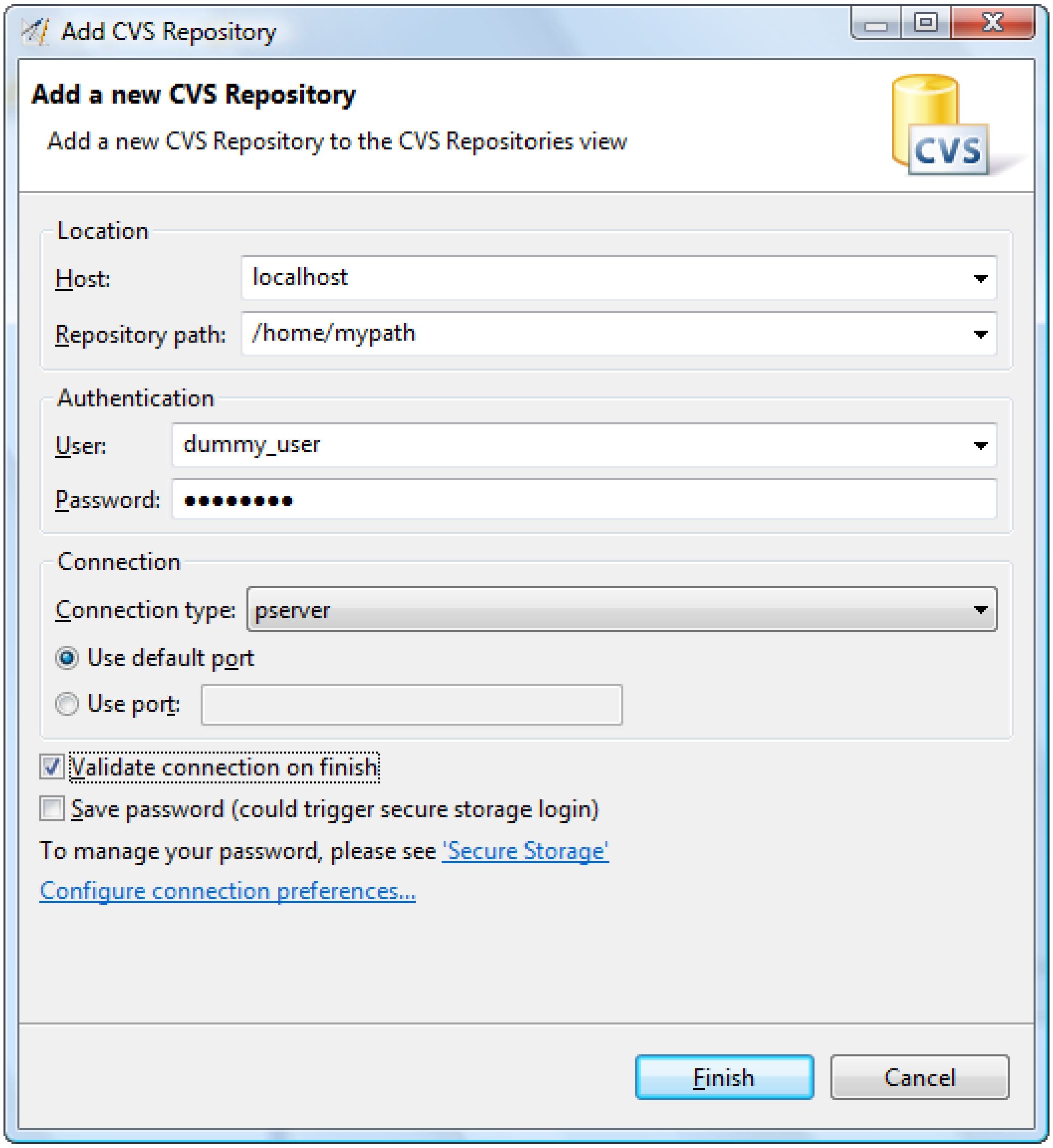
1. Switch to the **CVS Repository Exploring** perspective. To do this, select **Window > Open perspective > Other ... > CVS Repository Exploring** from the menu bar.



2. The relevant perspective will be opened. Select the view **CVS Repositories** . If you now click the right mouse button, a pop-up menu appears. Select the menu item **New > Repository Location...** .



3. In the new pop-up window, you can specify your CVS server, user information and protocol. To get this informations, you may need to contact your administrator.


Add CVS Repository

**Add a new CVS Repository**

Add a new CVS Repository to the CVS Repositories view

Location

Host: localhost

Repository path: /home/mypath

Authentication

User: dummy_user

Password: •••••••••

Connection

Connection type: pserver

● Use default port

○ Use port:

☑ Validate connection on finish

□ Save password (could trigger secure storage login)

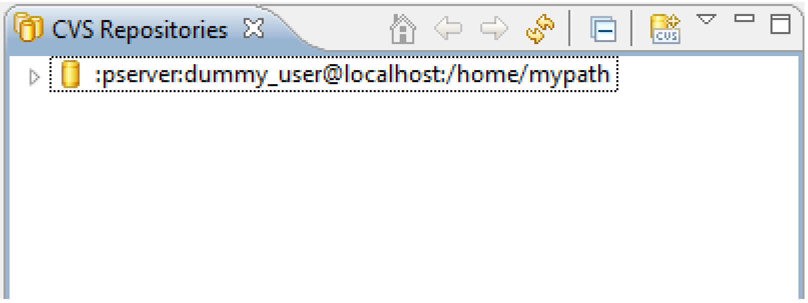
To manage your password, please see 'Secure Storage'

Configure connection preferences...

**4.** Select the option **Validate Connection on Finish** .

**5.** Press the **Finish** button.

If everything is correct, the connection is set up and you can continue to use the team repository.

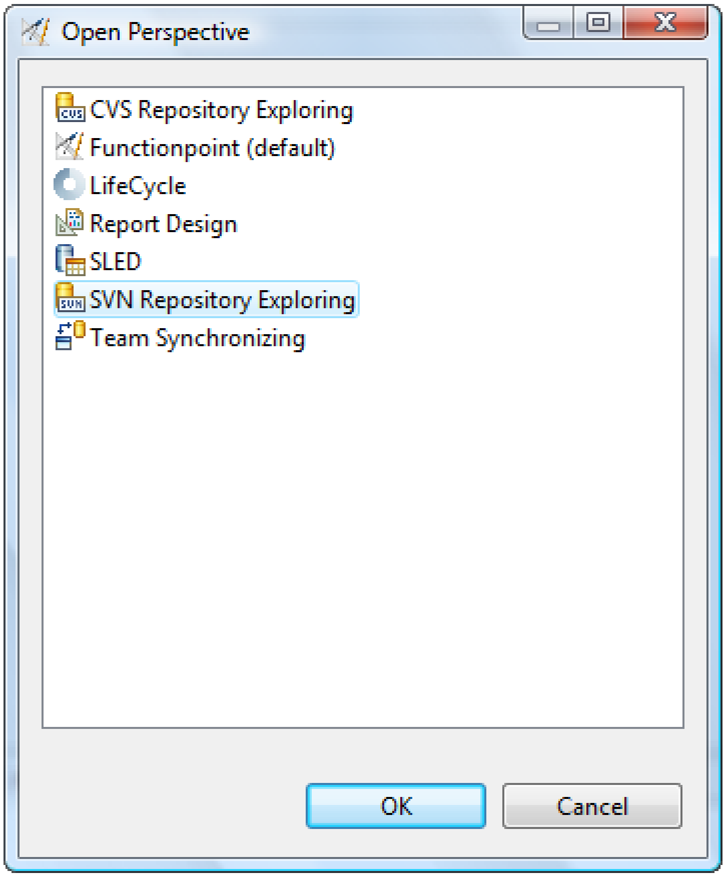

CVS Repositories

:pserver:dummy_user@localhost:/home/mypath

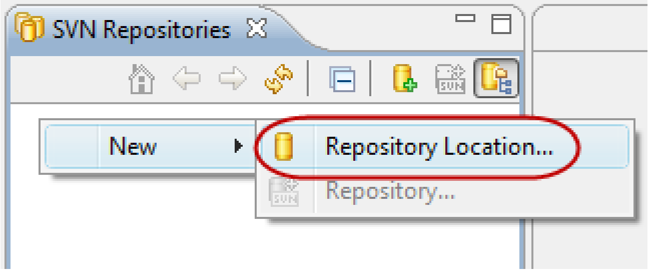
### Setup SVN Project Management System

To connect to a SVN team repository, perform the following steps.

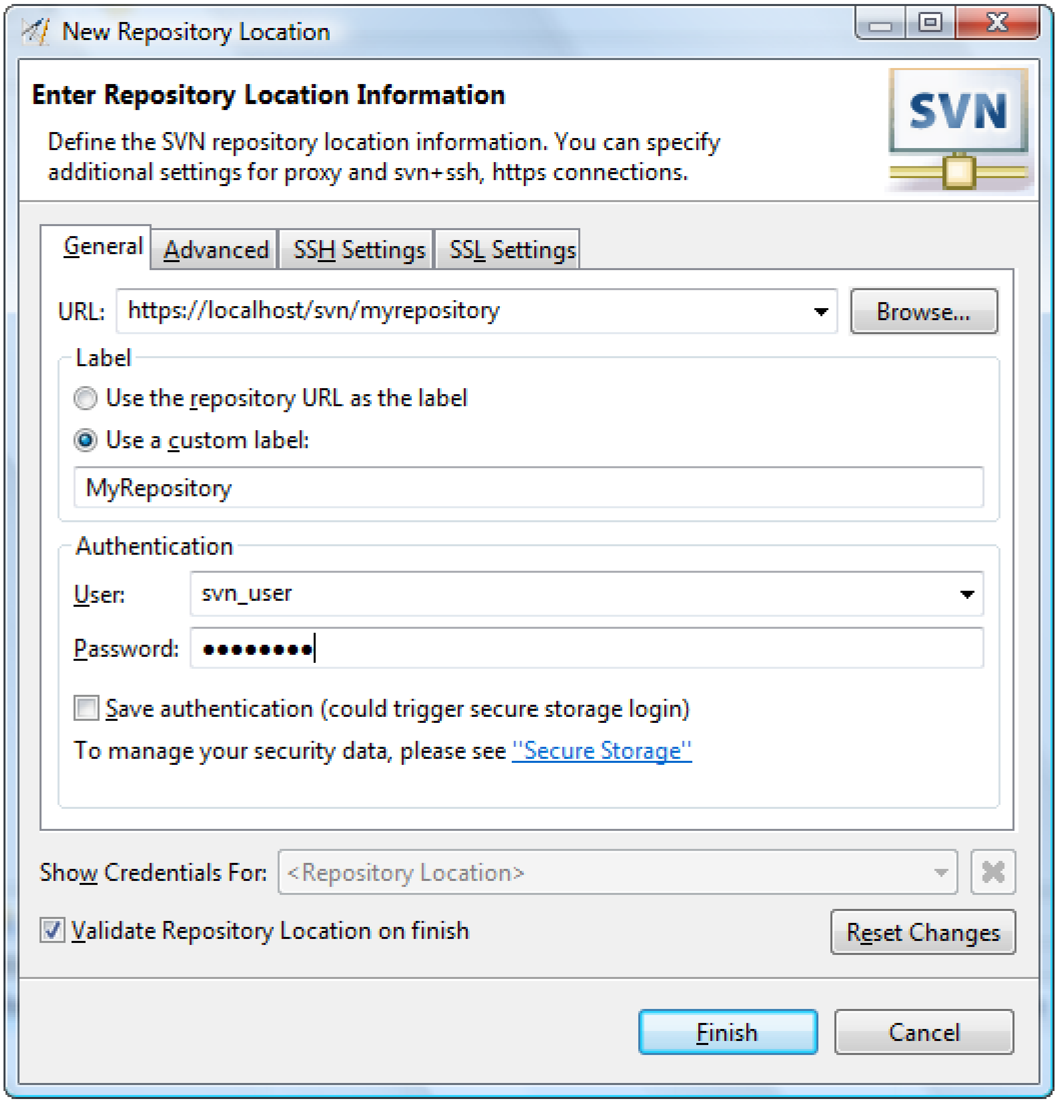
1. Switch to the **SVN Repository Exploring** perspective. To do this, select **Window** > **Open perspective** > **Other ...** > **SVN Repository Exploring** from the menu bar.



2. The relevant perspective will be opened. Select the view **SVN Repositories** . If you now click the right mouse button, a pop-up menu appears. Select the menu item **New** > **Repository Location...** .



3. In the new pop-up window, you can specify your SVN server, user information and password. To get this informations, you may need to contact your administrator.



New Repository Location

**Enter Repository Location Information**

Define the SVN repository location information. You can specify additional settings for proxy and svn+ssh, https connections.

URL: https://localhost/svn/myrepository

Label

○ Use the repository URL as the label

● Use a custom label:

MyRepository

Authentication

User: svn_user

Password: ●●●●●●●●●

□ Save authentication (could trigger secure storage login)

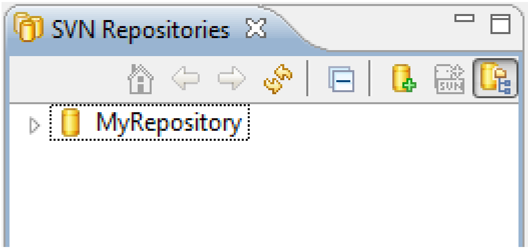
To manage your security data, please see "Secure Storage"

Show Credentials For: <Repository Location>

☑ Validate Repository Location on finish

4. Select the option **Validate Repository Location on finish** .
5. Press the **Finish** button.

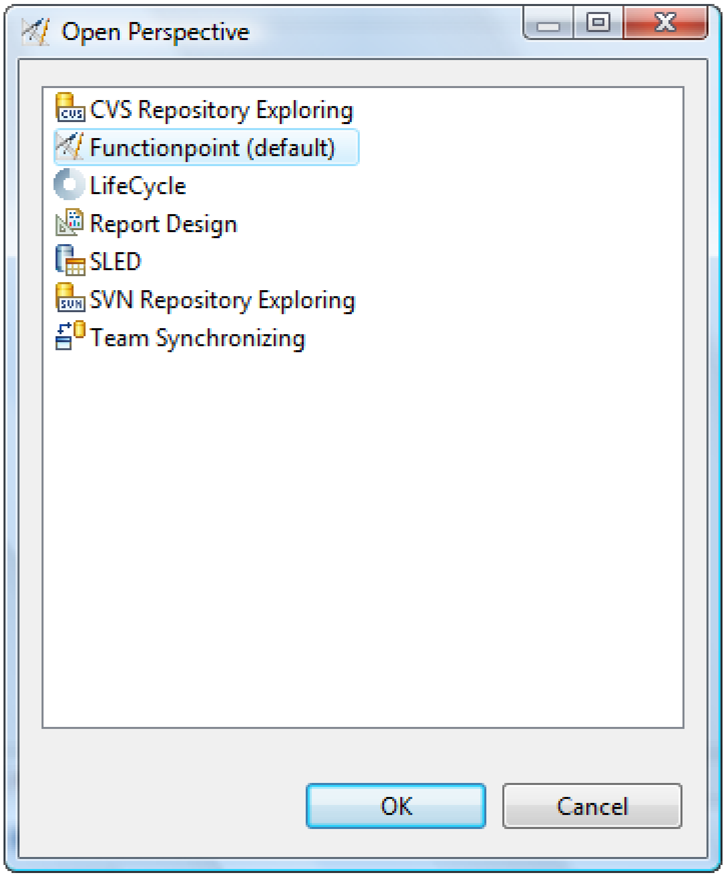
If everything is correct, the connection is set up and you can continue to use the team repository.



## Working with CVS Repositories
## Share Projects in CVS

To share a Project in a CVS team repository, perform the following steps.

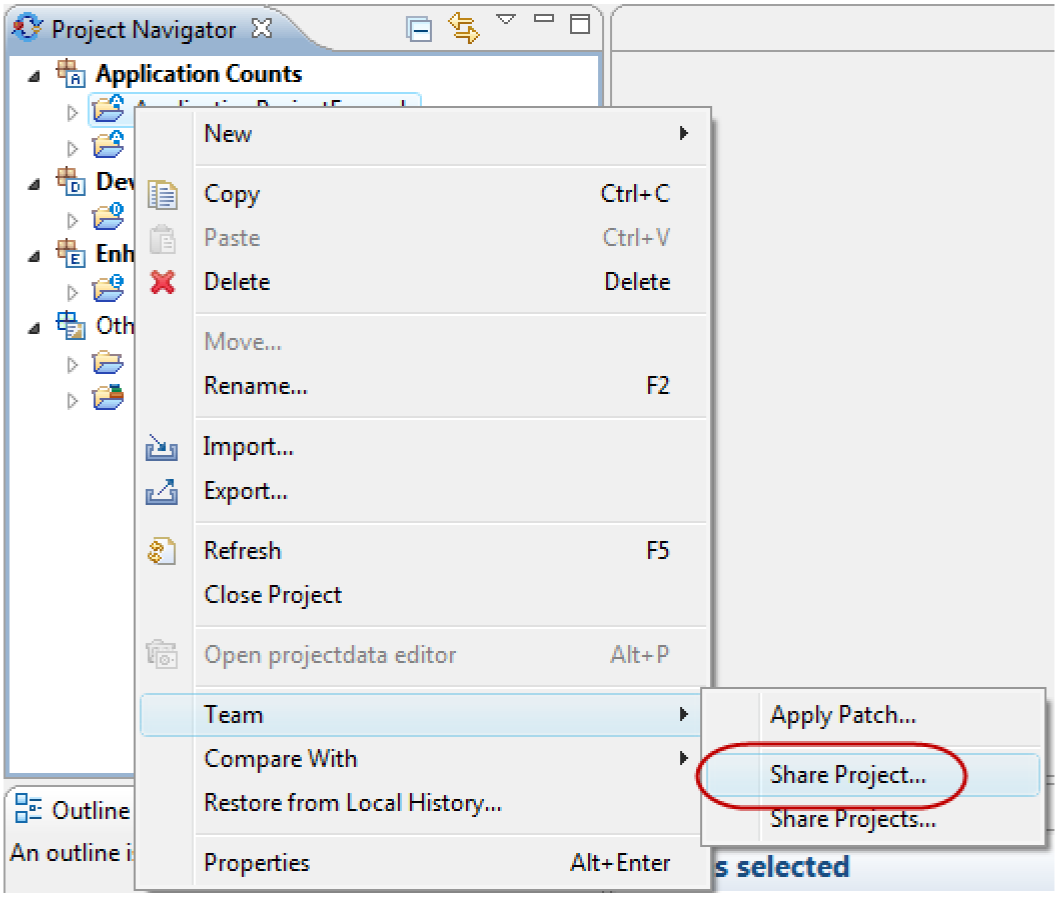
1. Switch to the **Functionpoint** perspective. To do this, select **Window** > **Open perspective** > **Other ...** > **Functionpoint** from the menu bar.



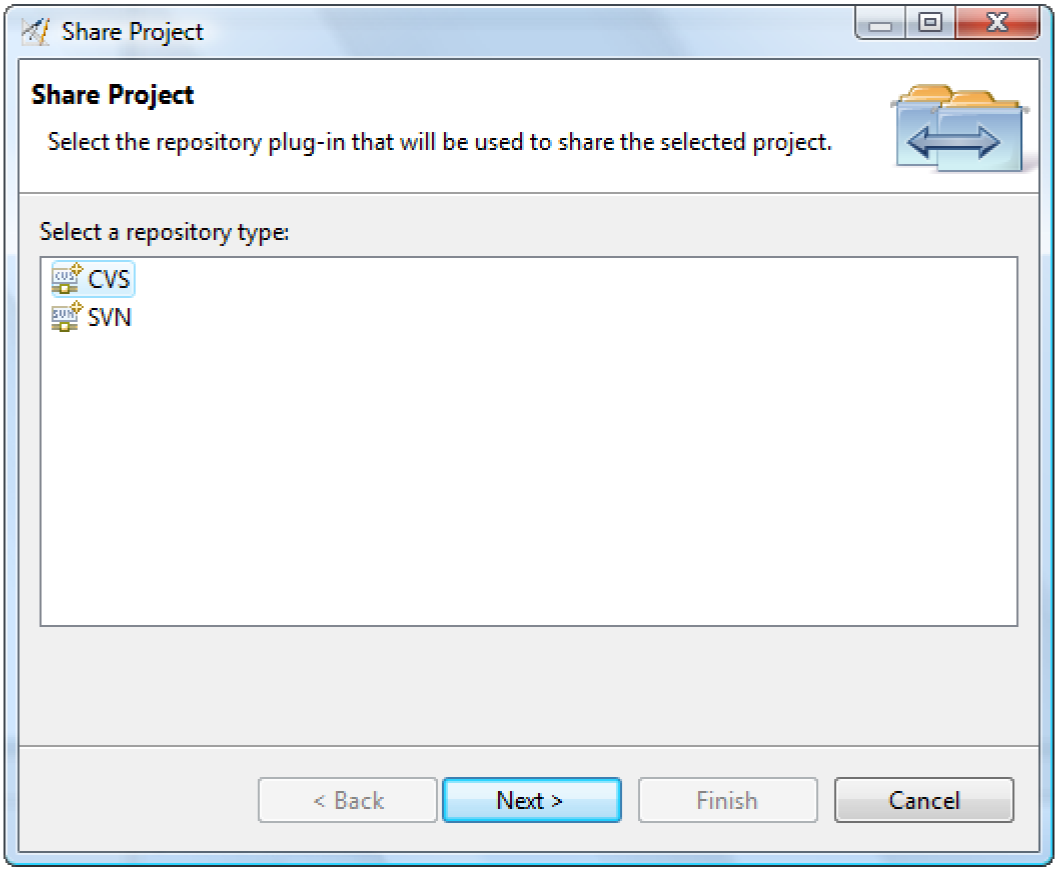
Open Perspective

- CVS Repository Exploring
- Functionpoint (default)
- LifeCycle
- Report Design
- SLED
- SVN Repository Exploring
- Team Synchronizing

2. In the Project Navigator view, select the project you want to share in a team repository and perform a right mouse click. In the following pop-window select the entry **Team > Share project...**



**3.** Select the CVS repository type and click on the **Next** button.



Share Project

**Share Project**

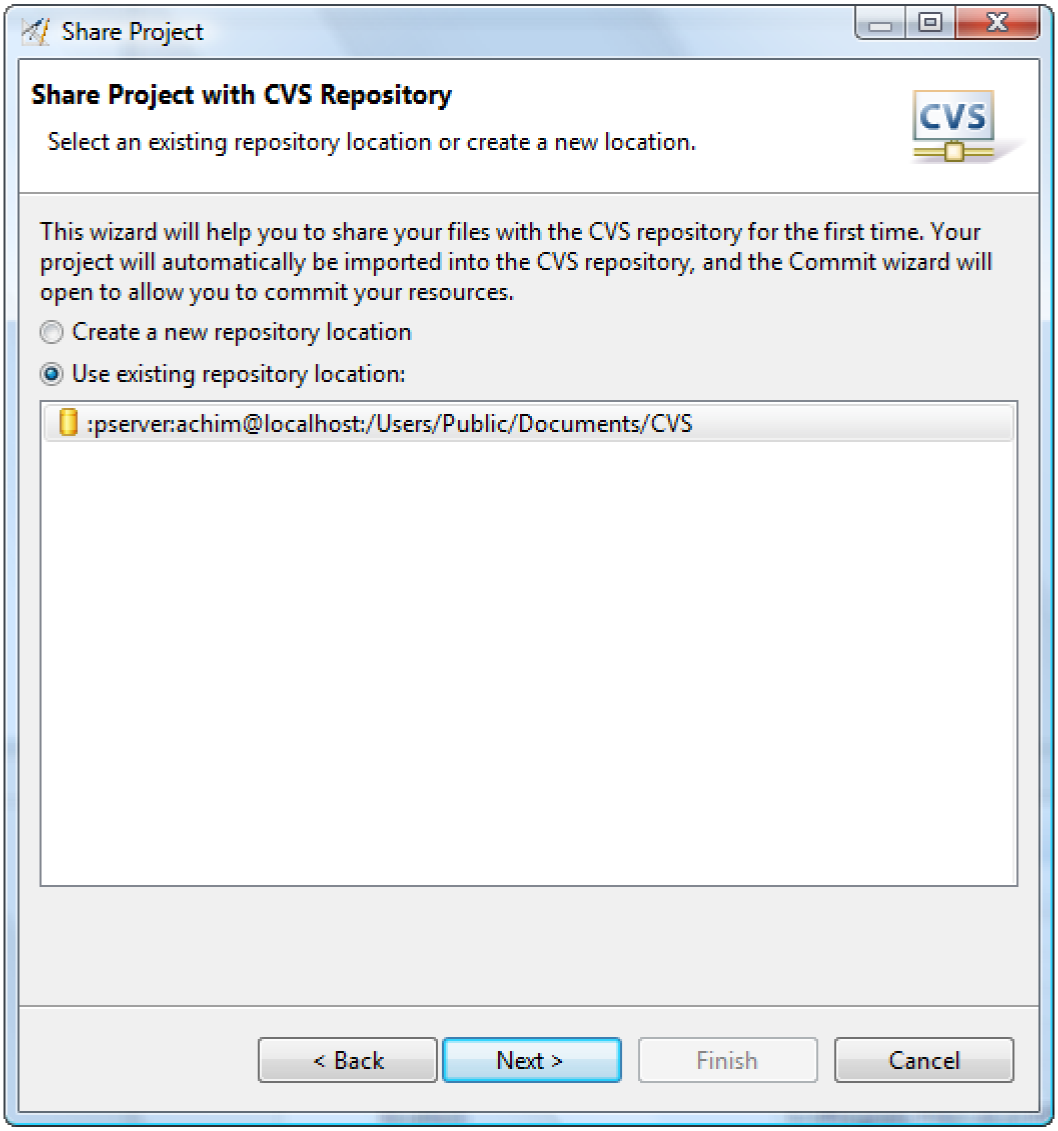
Select the repository plug-in that will be used to share the selected project.

Select a repository type:

CVS

SVN

**4.** Select the team repository where your project should be shared and click on the **Next** button.



**Share Project with CVS Repository**

Select an existing repository location or create a new location.

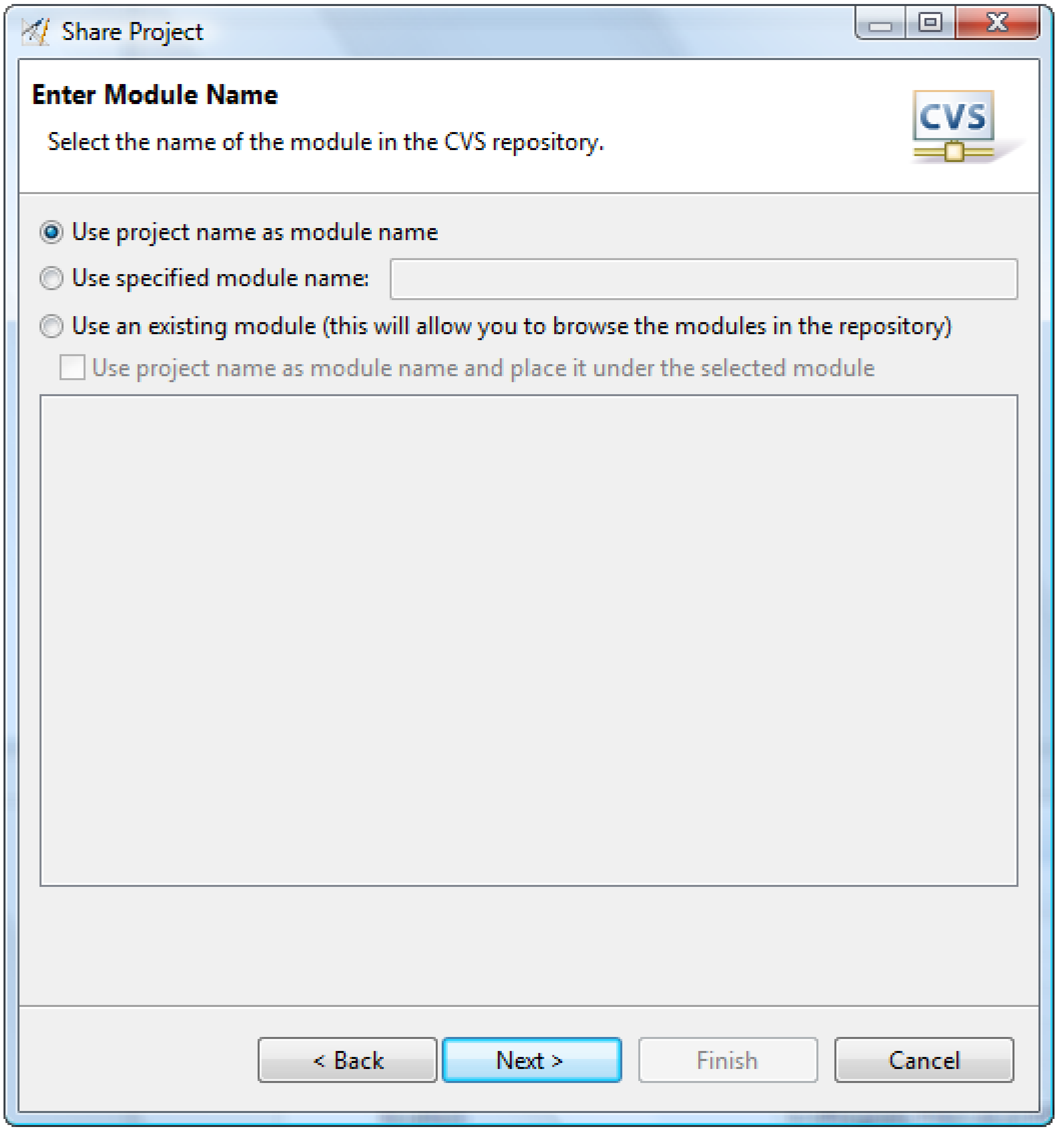
This wizard will help you to share your files with the CVS repository for the first time. Your project will automatically be imported into the CVS repository, and the Commit wizard will open to allow you to commit your resources.

○ Create a new repository location

● Use existing repository location:

:pserver:achim@localhost:/Users/Public/Documents/CVS

5. Select **Use project name as module name** or select **Use specified module name** and enter a name of your choice and press the **Next** button.



Enter Module Name

Select the name of the module in the CVS repository.

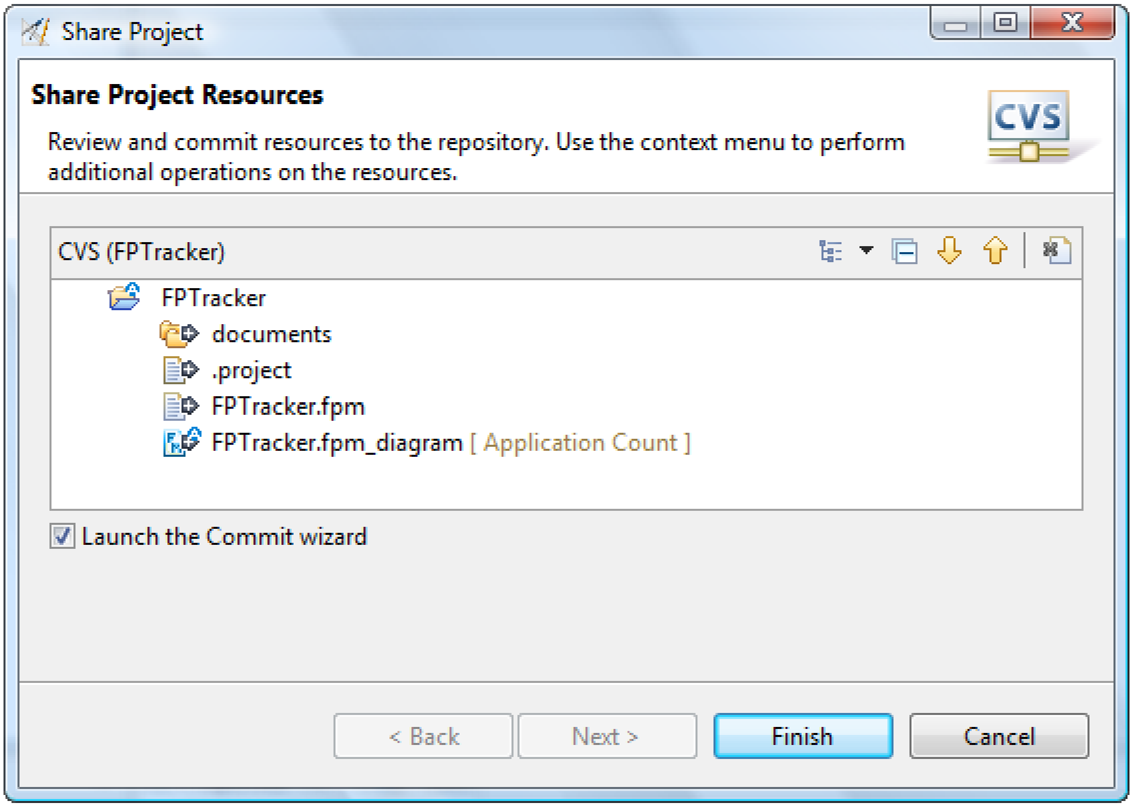
● Use project name as module name

○ Use specified module name:

○ Use an existing module (this will allow you to browse the modules in the repository)

□ Use project name as module name and place it under the selected module

**6.** Select option **Launch the commit wizard** and press the **Finish** button.



Share Project

**Share Project Resources**

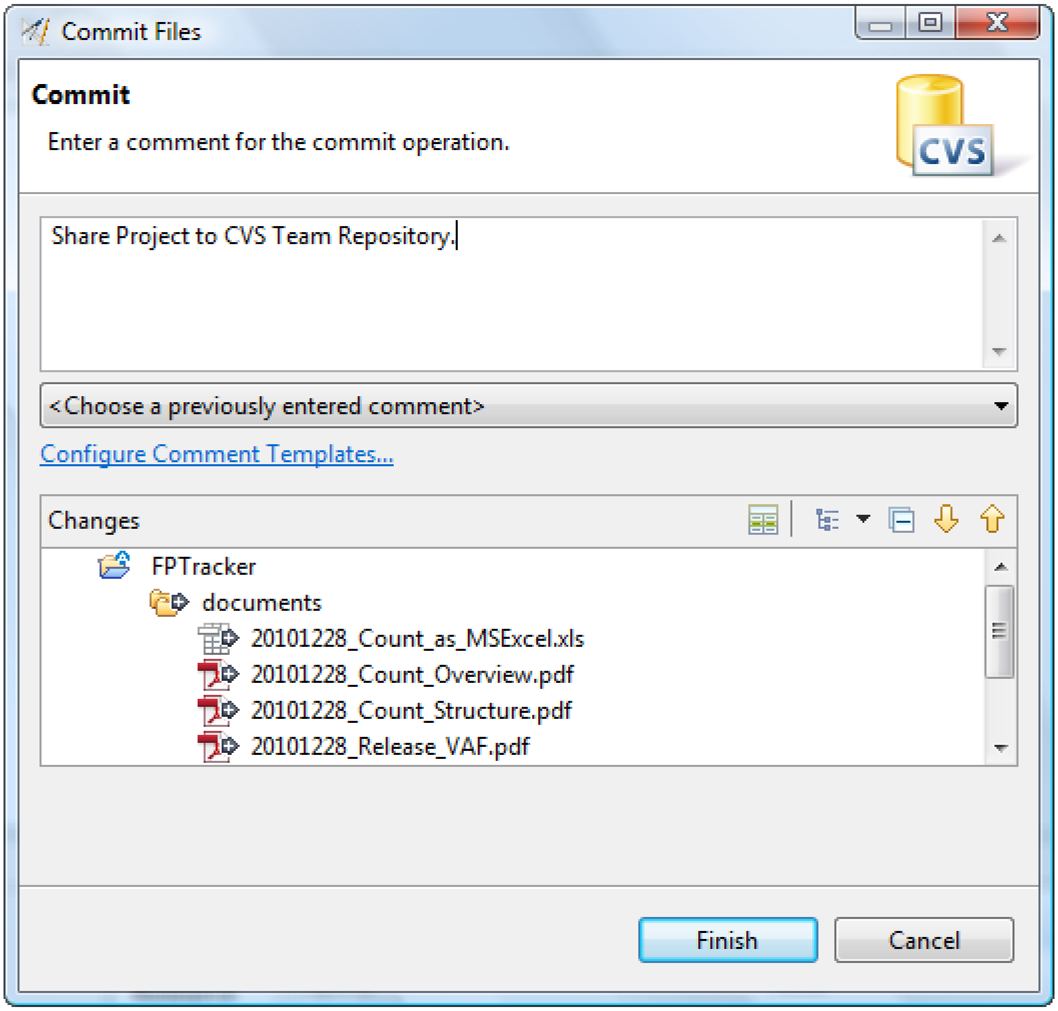
Review and commit resources to the repository. Use the context menu to perform additional operations on the resources.

CVS (FPTracker)

- FPTracker
  - documents
  - .project
  - FPTracker.fpm
  - FPTracker.fpm_diagram [ Application Count ]

☑ Launch the Commit wizard

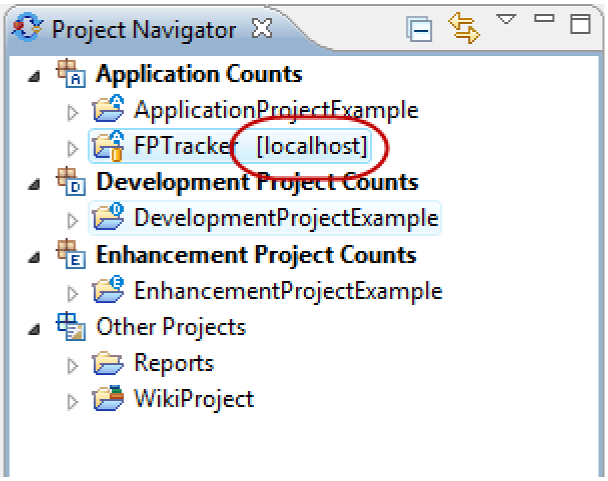
**7.** Enter a comment and press **Finish** .


Commit Files
Commit
Enter a comment for the commit operation.
CVS

Share Project to CVS Team Repository.

<Choose a previously entered comment>
Configure Comment Templates...
Changes
FPTracker
documents
20101228_Count_as_MSExcel.xls
20101228_Count_Overview.pdf
20101228_Count_Structure.pdf
20101228_Release_VAF.pdf
Finish
Cancel

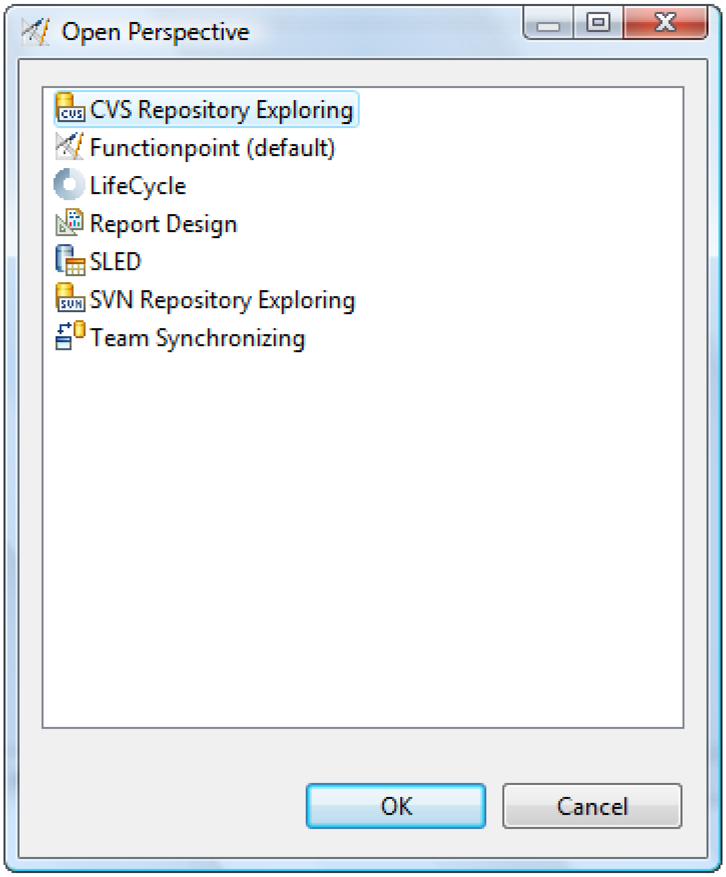
Your local project is now shared in a CVS Team Repository.


Project Navigator
Application Counts
ApplicationProjectExample
FPTracker [localhost]
Development Project Counts
DevelopmentProjectExample
Enhancement Project Counts
EnhancementProjectExample
Other Projects
Reports
WikiProject

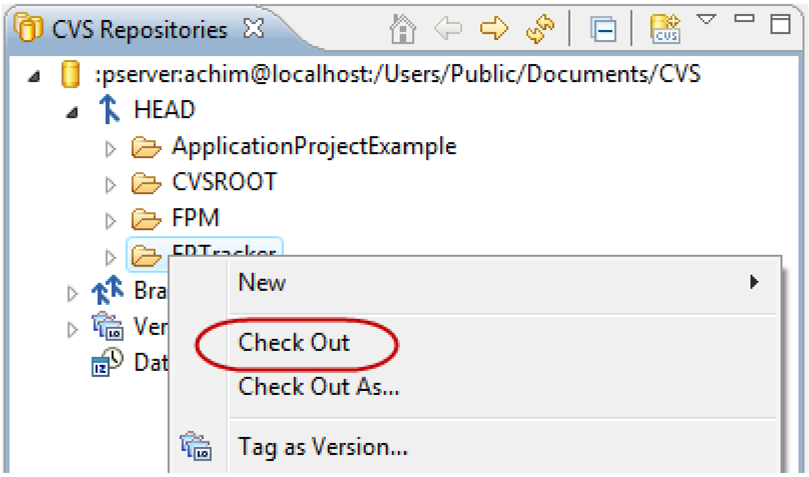
### Checkout Projects from CVS

To checkout a Project from a CVS team repository, perform the following steps.

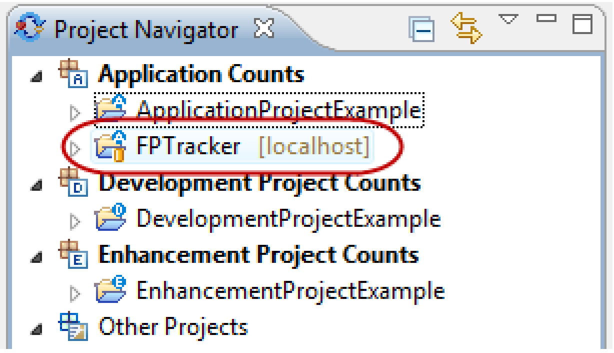
1. Switch to the **CVS Repository Exploring** perspective. To do this, select **Window** > **Open perspective** > **Other ...** > **CVS Repository Exploring** from the menu bar.



2. Select the project you want to check out in the **CVS Repositories** view. If you perform a right mouse click on this project, a pop-up menu appears. Select the menu item **Check Out** .



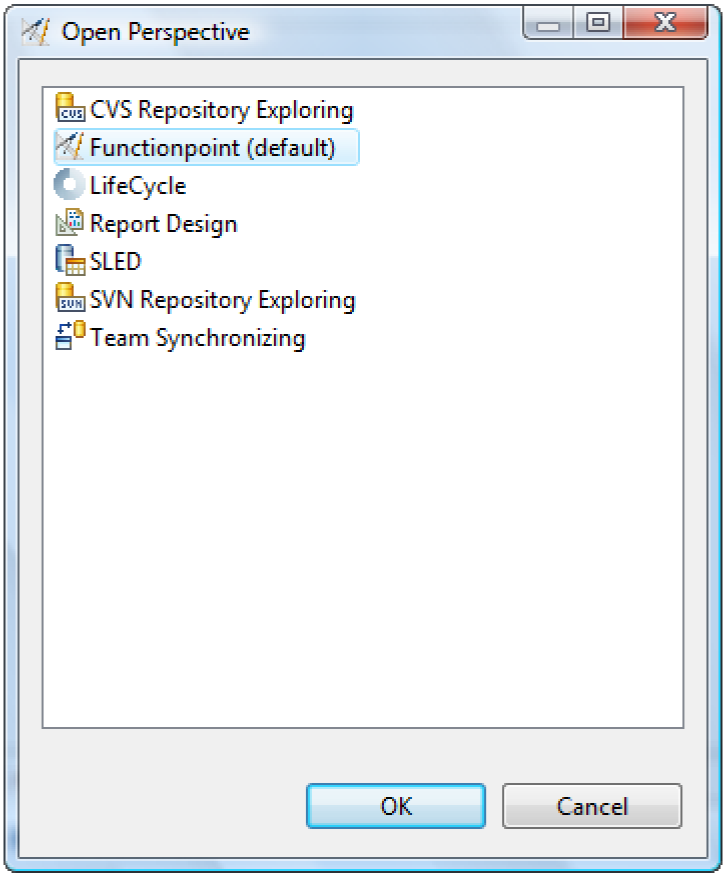
After the checkout operation is completed, you can find the the corresponding project in the **Project Navigator** . The project has been transferred to your local workspace.


Project Navigator
Application Counts
ApplicationProjectExample
FPTracker [localhost]
Development Project Counts
DevelopmentProjectExample
Enhancement Project Counts
EnhancementProjectExample
Other Projects

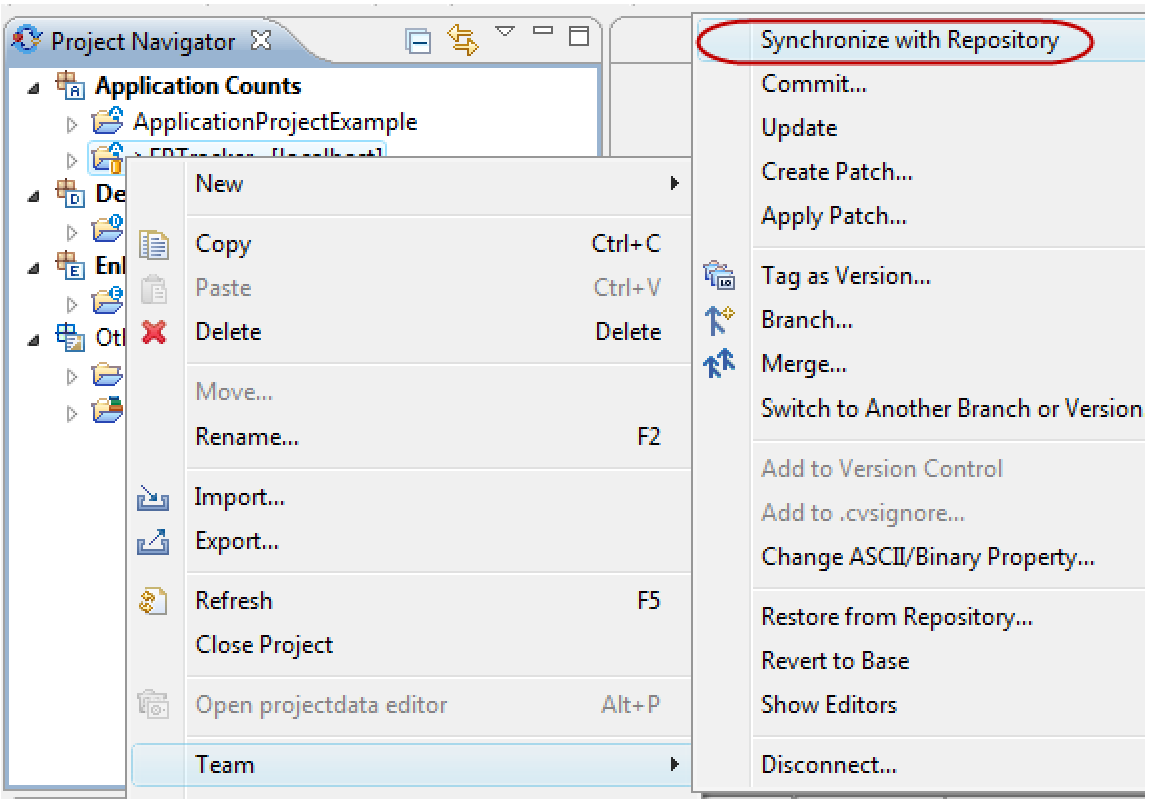
### Synchronize Projects with CVS

To synchronize your local version of a Project with a CVS team repository, perform the following steps.

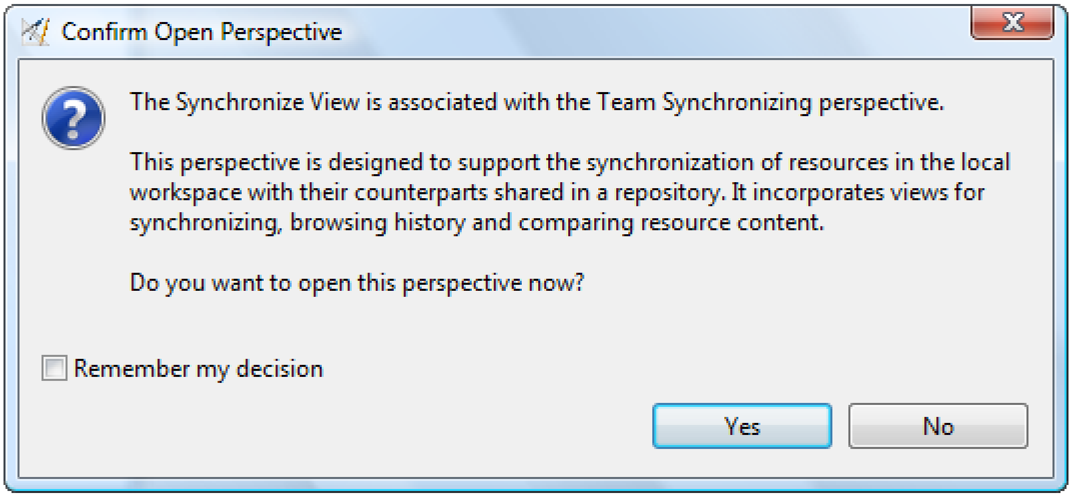
1. Switch to the **Functionpoint** perspective. To do this, select **Window** > **Open perspective** > **Other ...** > **Functionpoint** from the menu bar.



2. Select the project you want to synchronize in the **Project Navigator** view. If you perform a right mouse click on this project, a pop-up menu appears. Select the menu item **Team** > **Synchronize with repository** .



3. If a dialog appears to open a different perspective, please choose **Yes** .


Confirm Open Perspective

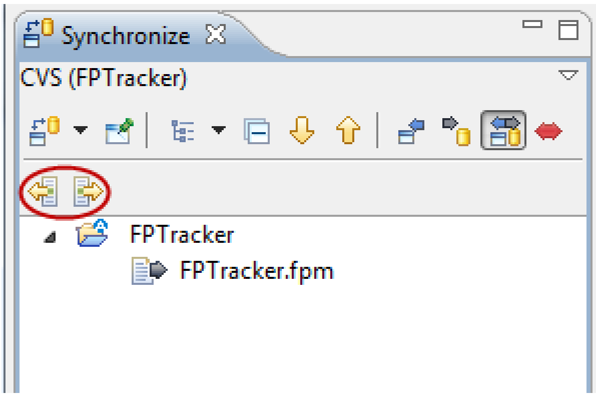
The Synchronize View is associated with the Team Synchronizing perspective.

This perspective is designed to support the synchronization of resources in the local workspace with their counterparts shared in a repository. It incorporates views for synchronizing, browsing history and comparing resource content.

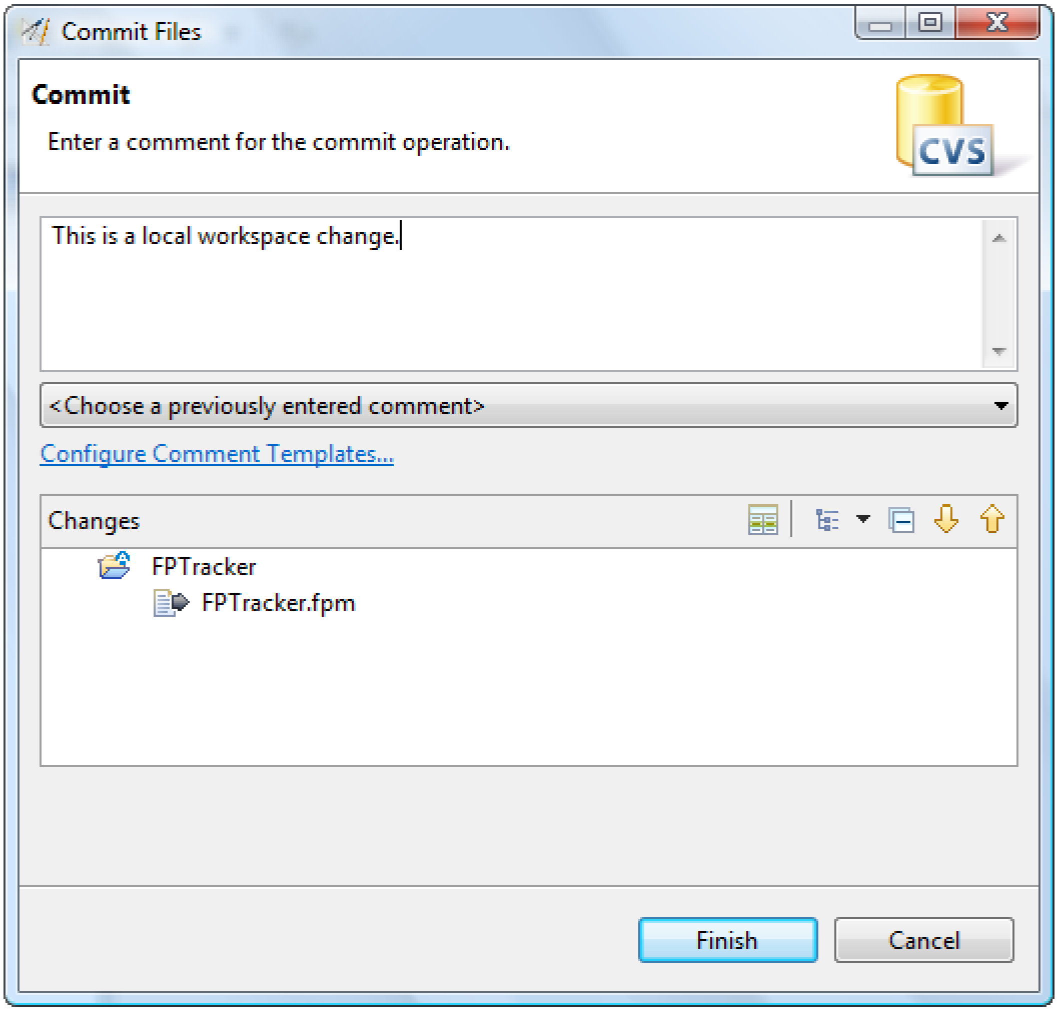
Do you want to open this perspective now?

□ Remember my decision

4. In the **Synchronize** view, select **Update all Incoming Changes...** to update changes from the repository in your local workspace. Select **Commit all Outgoing Changes...** to commit all changes in your local workspace to the repository.



5. Enter a valid comment for a commit operation. This dialog will only be shown if you commit local workspace changes to the repository. For update operations, no dialog will appear. Select **Finish** to start the commit operation.


Commit Files

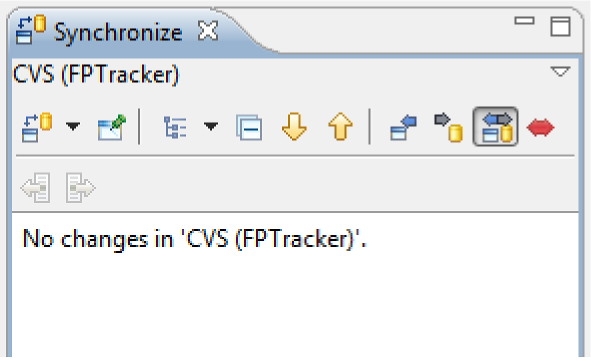
Commit

Enter a comment for the commit operation.

This is a local workspace change.

<Choose a previously entered comment>

After the commit and update operations are completed, the content in the **Synchronize** view will disappear.

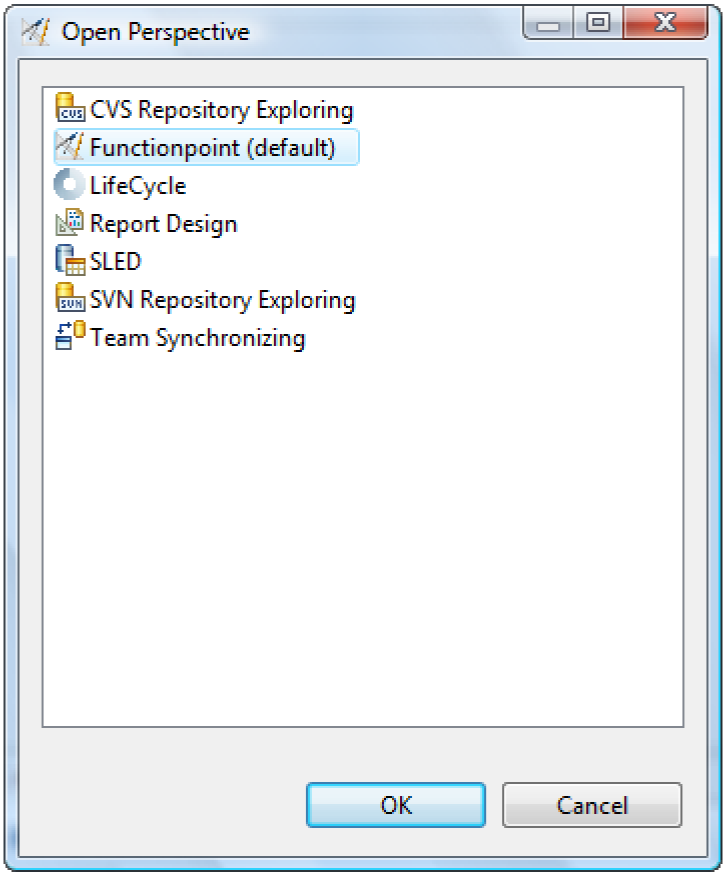


No changes in 'CVS (FPTracker)'.

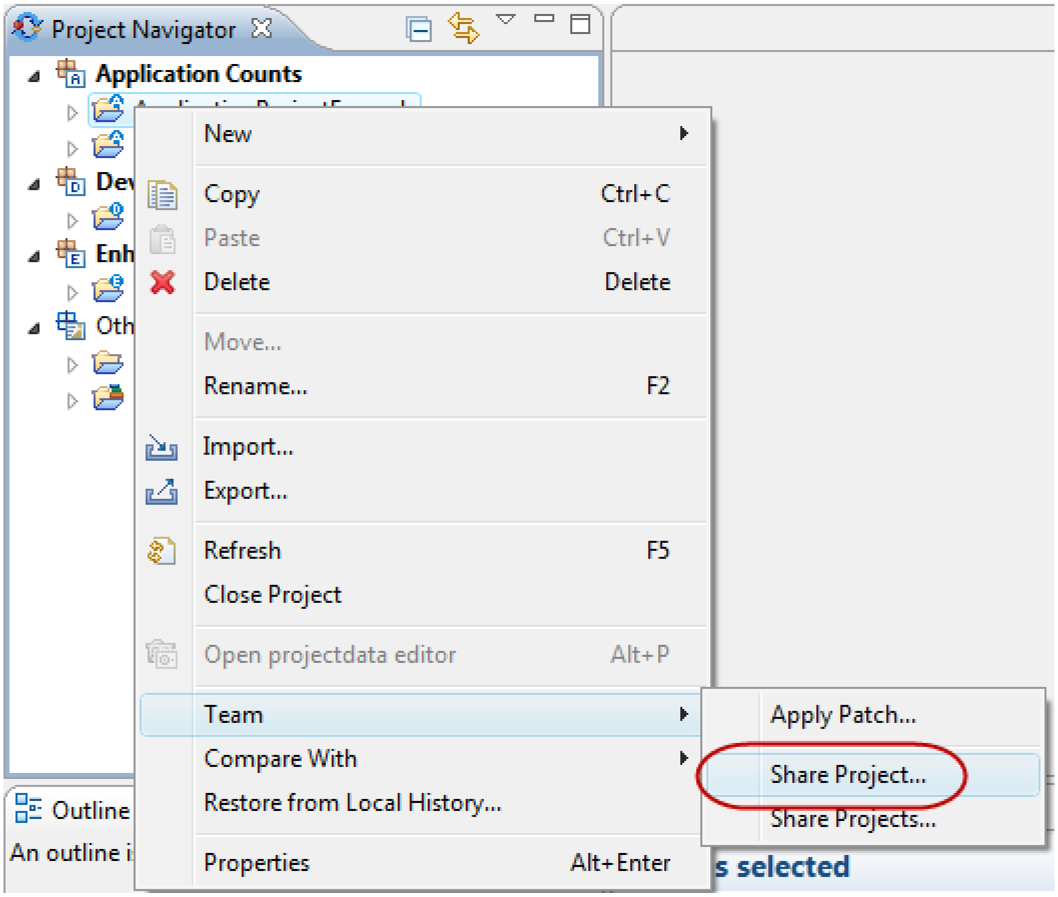
### Working with SVN Repositories
### Share Projects in SVN

To share a Project in a SVN team repository, perform the following steps.

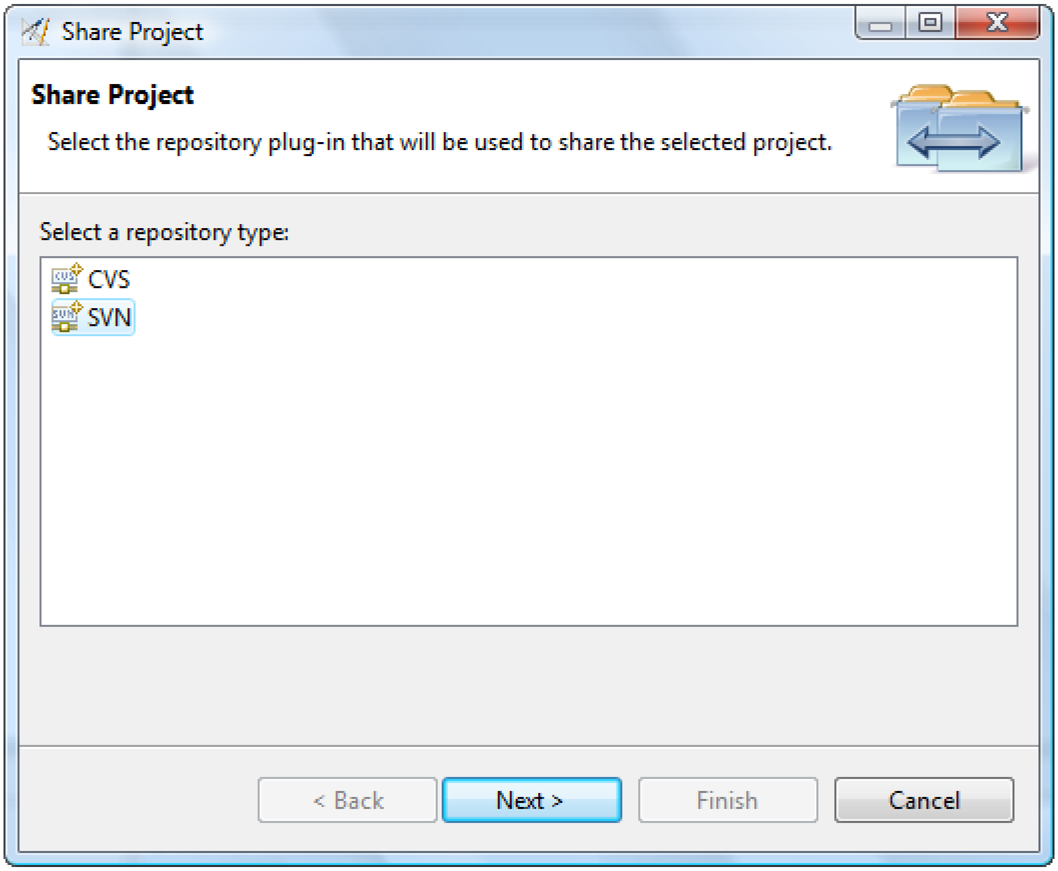
1. Switch to the **Functionpoint** perspective. To do this, select **Window** > **Open perspective** > **Other ...** > **Functionpoint** from the menu bar.



2. In the Project Navigator view, select the project you want to share in a team repository and perform a right mouse click. In the following pop-window select the entry **Team** > **Share project...**



**3.** Select the SVN repository type and click on the **Next** button.



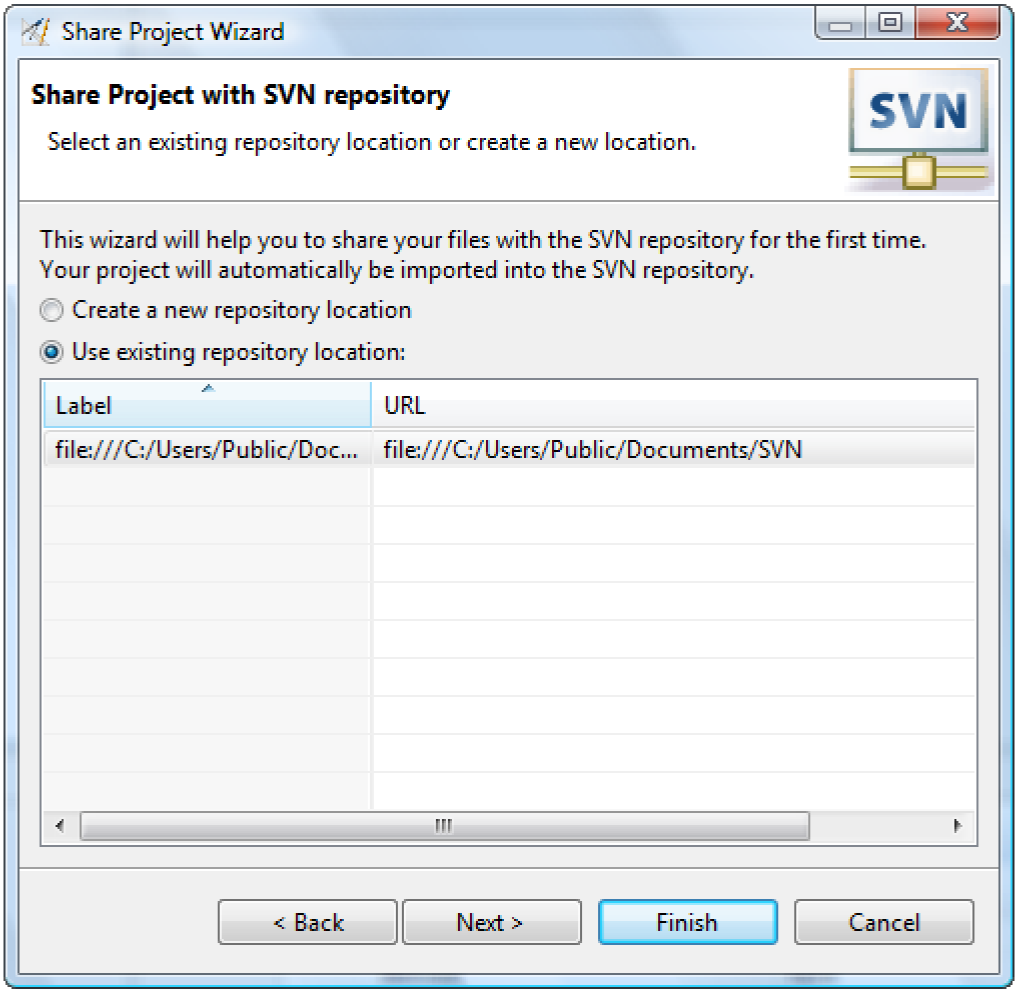
**Share Project**

Select the repository plug-in that will be used to share the selected project.

Select a repository type:

- CVS
- SVN

**4.** Select the team repository where your project should be shared and click on the **Next** button.



Share Project Wizard

**Share Project with SVN repository**

Select an existing repository location or create a new location.

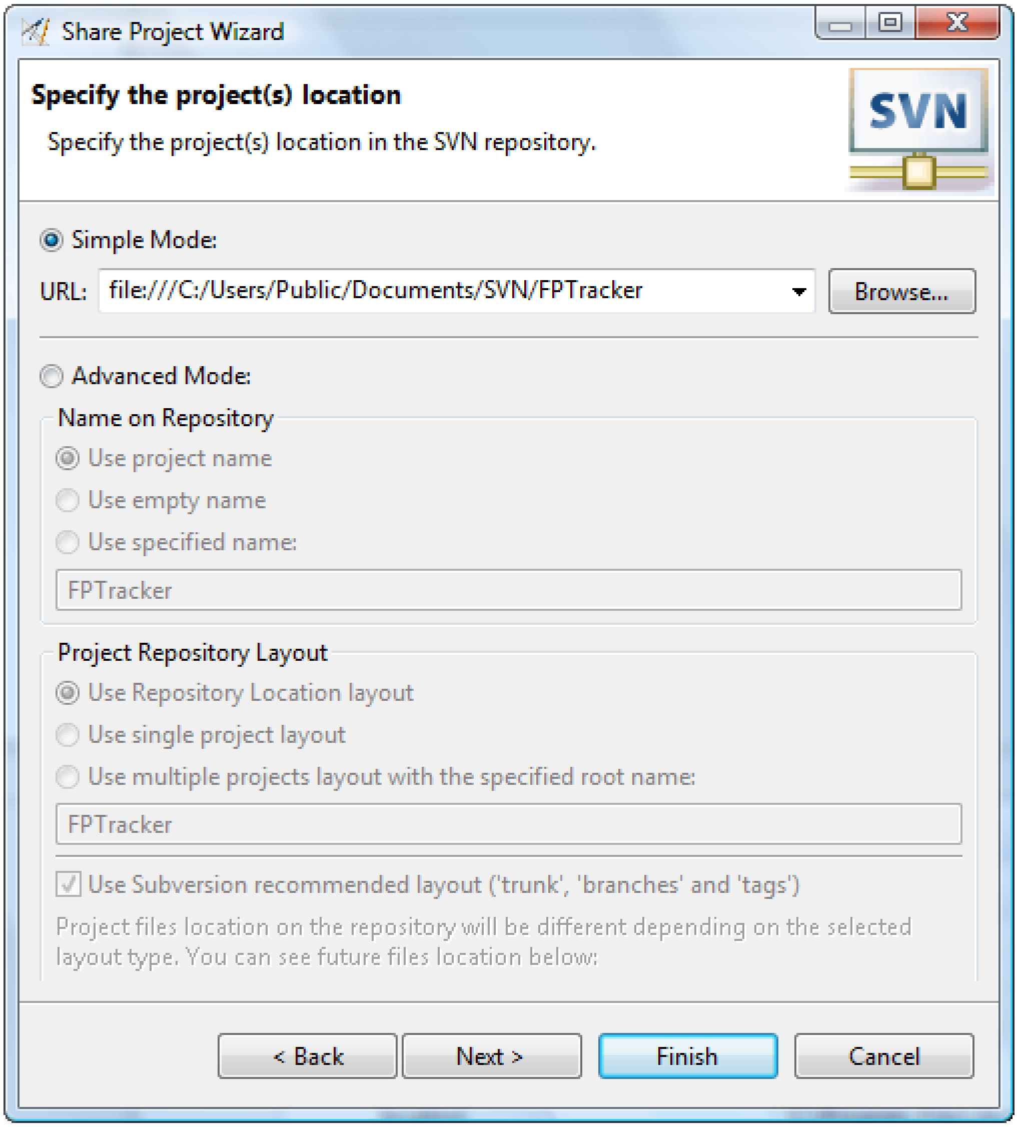
This wizard will help you to share your files with the SVN repository for the first time. Your project will automatically be imported into the SVN repository.

○ Create a new repository location

● Use existing repository location:

| Label | URL |
|---|---|
| file:///C:/Users/Public/Doc... | file:///C:/Users/Public/Documents/SVN |

5. Select **Simple Mode** and press the **Next** button.



**Specify the project(s) location**

Specify the project(s) location in the SVN repository.

● Simple Mode:

URL: file:///C:/Users/Public/Documents/SVN/FPTracker

○ Advanced Mode:

Name on Repository

● Use project name

○ Use empty name

○ Use specified name:

FPTracker

Project Repository Layout

● Use Repository Location layout

○ Use single project layout

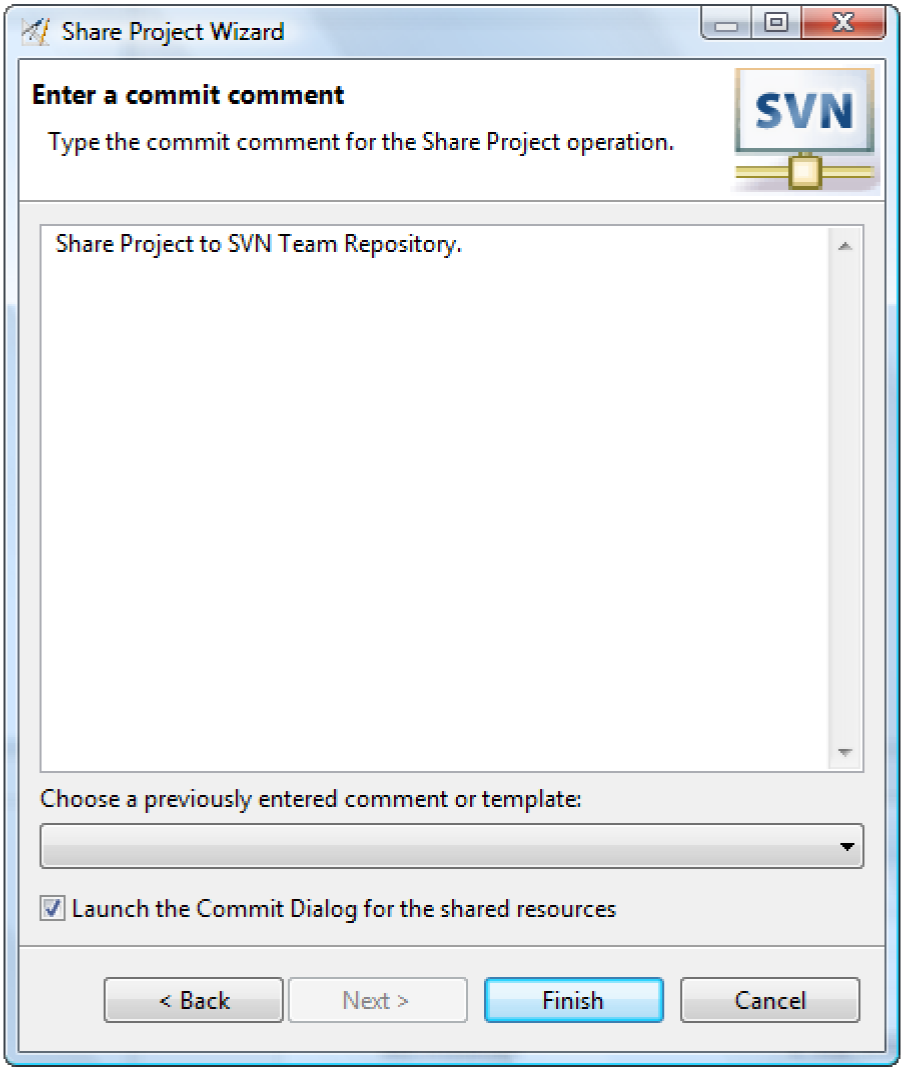
○ Use multiple projects layout with the specified root name:

FPTracker

☑ Use Subversion recommended layout ('trunk', 'branches' and 'tags')

Project files location on the repository will be different depending on the selected layout type. You can see future files location below:

6. Enter a comment, select option **Launch the Commit Dialog for the shared resources** and press the **Finish** button.



Share Project Wizard

Enter a commit comment

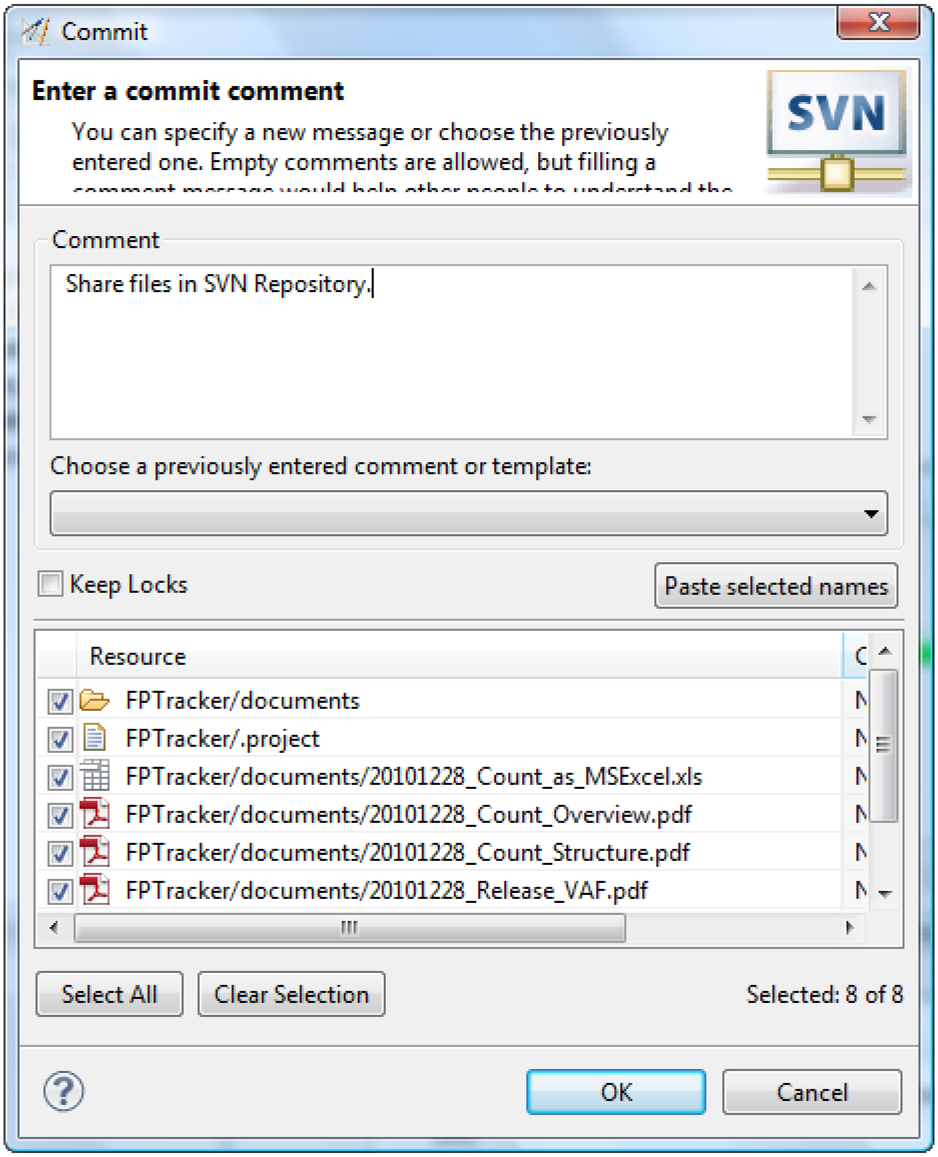
Type the commit comment for the Share Project operation.

Share Project to SVN Team Repository.

Choose a previously entered comment or template:

☑ Launch the Commit Dialog for the shared resources

7. Enter a comment and press **OK** .



Commit

**Enter a commit comment**

You can specify a new message or choose the previously entered one. Empty comments are allowed, but filling a comment message would help other people to understand the

Comment

Share files in SVN Repository.

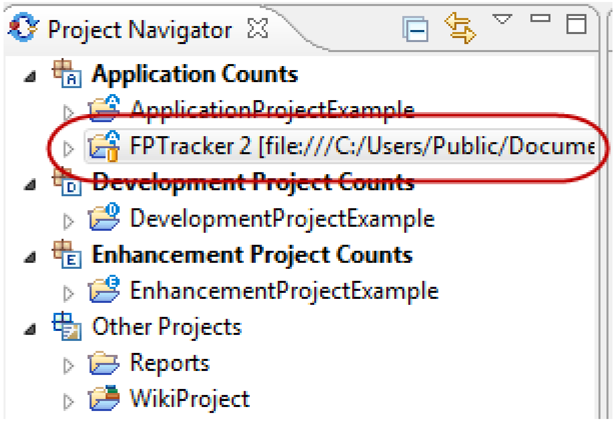
Choose a previously entered comment or template:

□ Keep Locks

| | Resource | C |
|---|---|---|
| ☑ | FPTracker/documents | N |
| ☑ | FPTracker/.project | N |
| ☑ | FPTracker/documents/20101228_Count_as_MSExcel.xls | N |
| ☑ | FPTracker/documents/20101228_Count_Overview.pdf | N |
| ☑ | FPTracker/documents/20101228_Count_Structure.pdf | N |
| ☑ | FPTracker/documents/20101228_Release_VAF.pdf | N |

Selected: 8 of 8

Your local project is now shared in a SVN Team Repository.



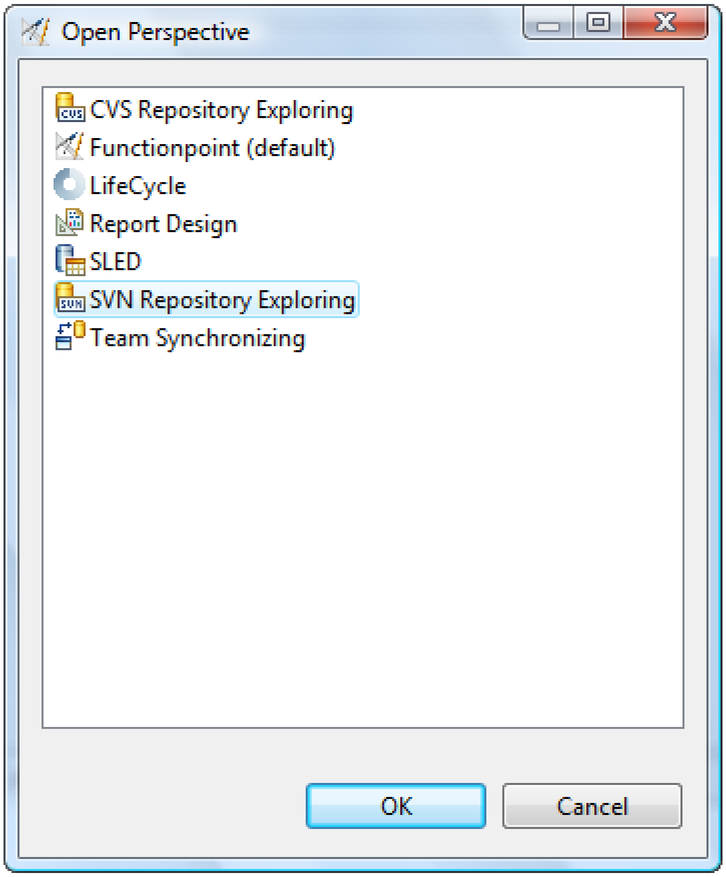
Project Navigator

- Application Counts
  - ApplicationProjectExample
  - FPTracker 2 [file:///C:/Users/Public/Docume
- Development Project Counts
  - DevelopmentProjectExample
- Enhancement Project Counts
  - EnhancementProjectExample
- Other Projects
  - Reports
  - WikiProject

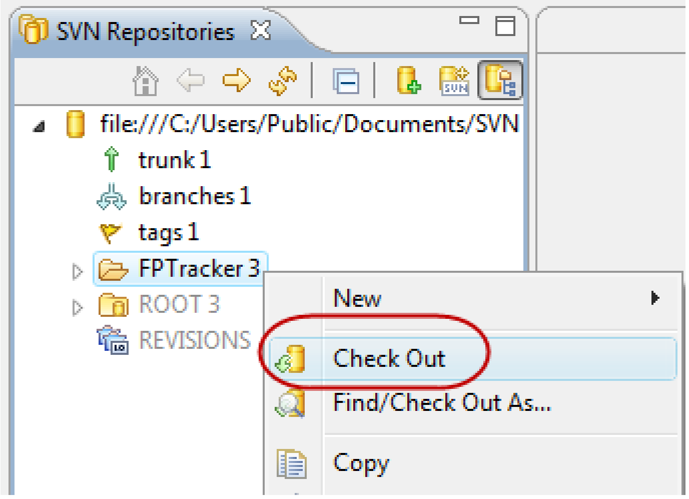
### Checkout Projects from SVN

To checkout a Project from a SVN team repository, perform the following steps.

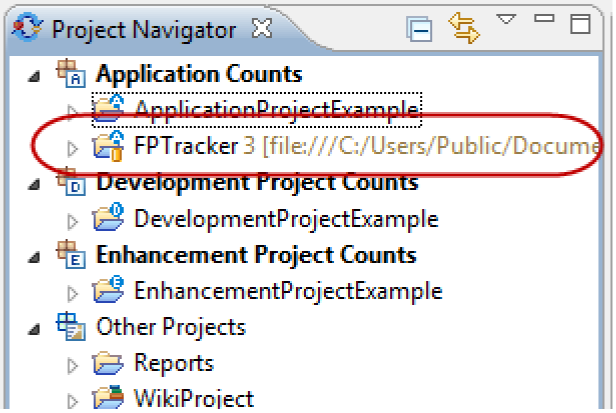
1. Switch to the **SVN Repository Exploring** perspective. To do this, select **Window** > **Open perspective** > **Other ...** > **SVN Repository Exploring** from the menu bar.



2. Select the project you want to check out in the **SVN Repositories** view. If you perform a right mouse click on this project, a pop-up menu appears. Select the menu item **Check Out** .



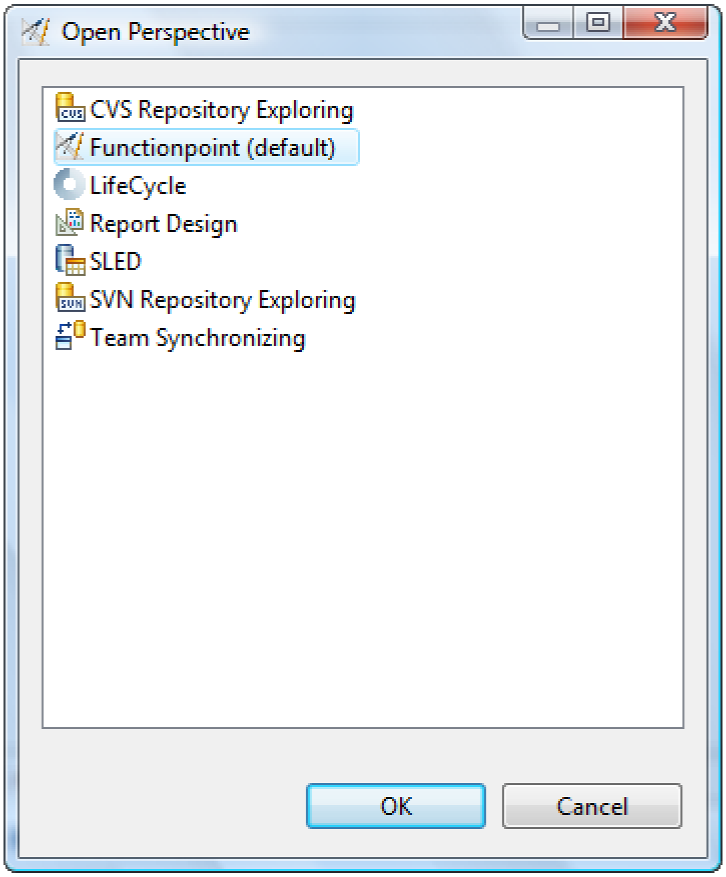
After the checkout operation is completed, you can find the the corresponding project in the **Project Navigator** . The project has been transferred to your local workspace.


Project Navigator
Application Counts
ApplicationProjectExample
FPTracker 3 [file:///C:/Users/Public/Docume
Development Project Counts
DevelopmentProjectExample
Enhancement Project Counts
EnhancementProjectExample
Other Projects
Reports
WikiProject

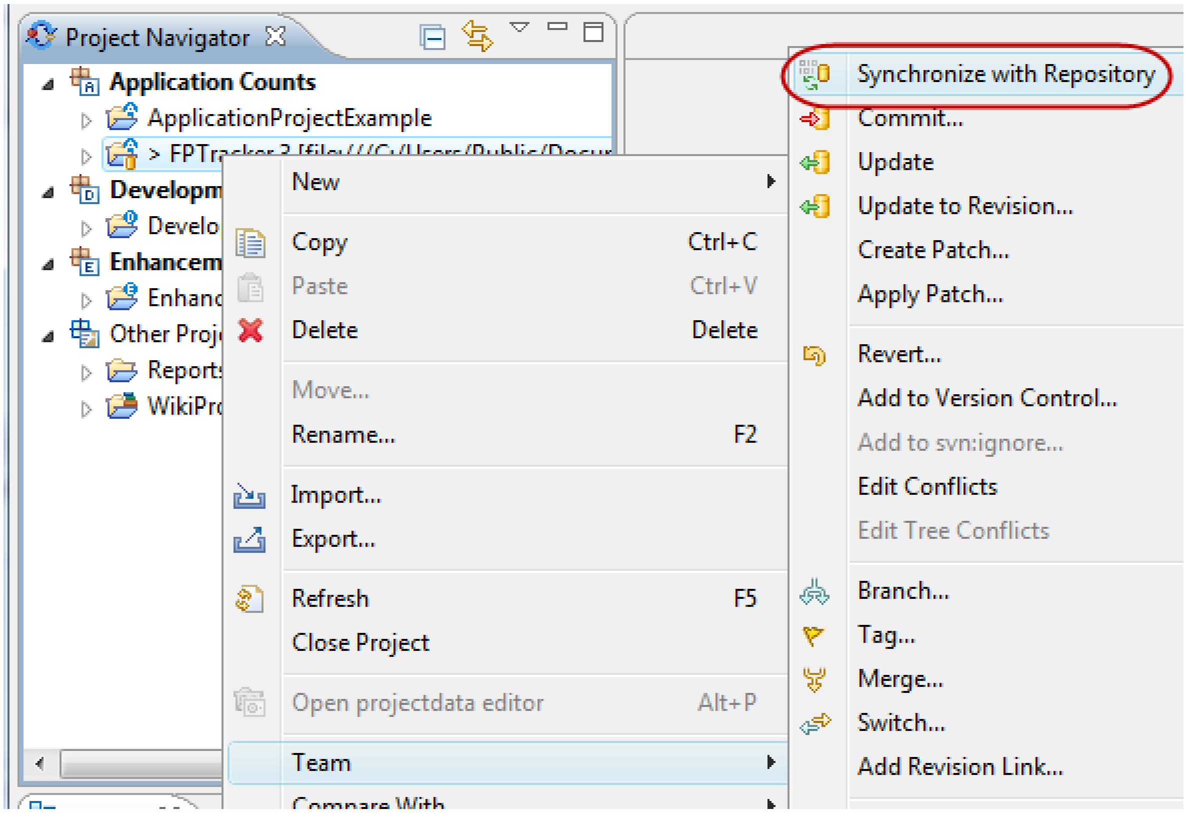
### Synchronize Projects with SVN

To synchronize your local version of a Project with a SVN team repository, perform the following steps.

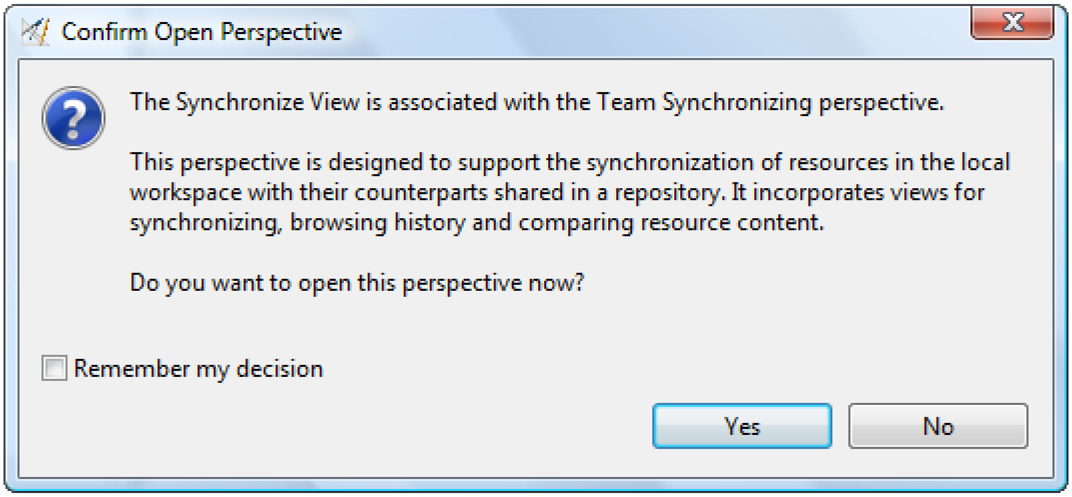
1. Switch to the **Functionpoint** perspective. To do this, select **Window** > **Open perspective** > **Other ...** > **Functionpoint** from the menu bar.



2. Select the project you want to synchronize in the **Project Navigator** view. If you perform a right mouse click on this project, a pop-up menu appears. Select the menu item **Team** > **Synchronize with repository** .



**3.** If a dialog appears to open a different perspective, please choose **Yes** .


Confirm Open Perspective

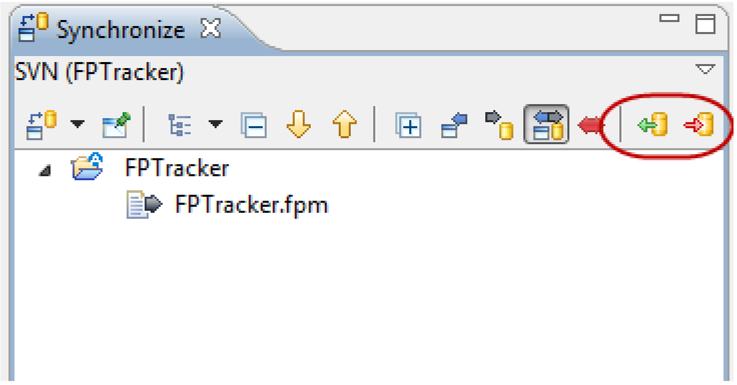
The Synchronize View is associated with the Team Synchronizing perspective.

This perspective is designed to support the synchronization of resources in the local workspace with their counterparts shared in a repository. It incorporates views for synchronizing, browsing history and comparing resource content.

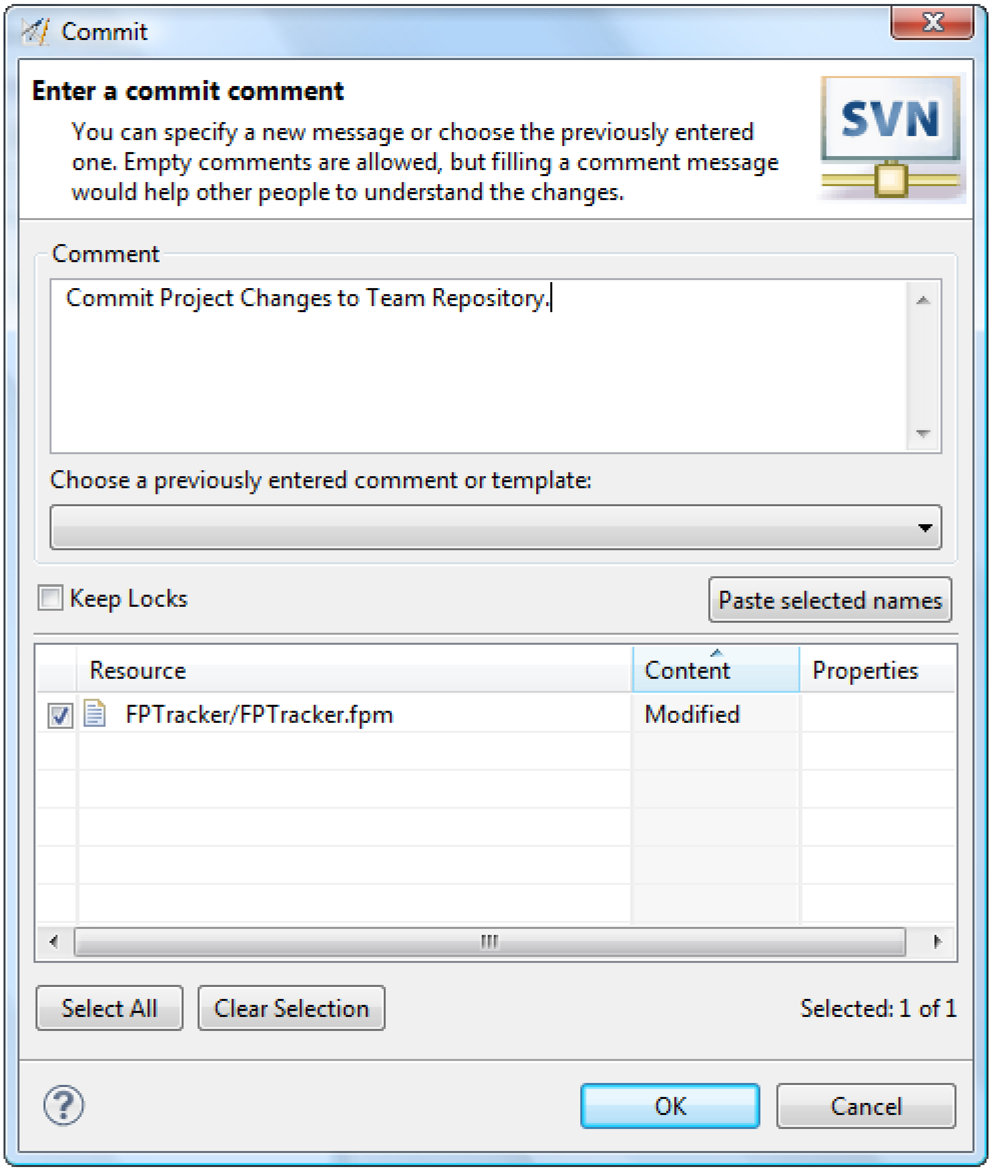
Do you want to open this perspective now?

☐ Remember my decision

**4.** In the **Synchronize** view, select **Update all Incoming Changes...** to update changes from the repository in your local workspace. Select **Commit all Outgoing Changes...** to commit all changes in your local workspace to the repository.



5. Enter a valid comment for a commit operation. This dialog will only be shown if you commit local workspace changes to the repository. For update operations, no dialog will appear. Select **OK** to start the commit operation.



Commit

**Enter a commit comment**

You can specify a new message or choose the previously entered one. Empty comments are allowed, but filling a comment message would help other people to understand the changes.

Comment

Commit Project Changes to Team Repository.

Choose a previously entered comment or template:

□ Keep Locks

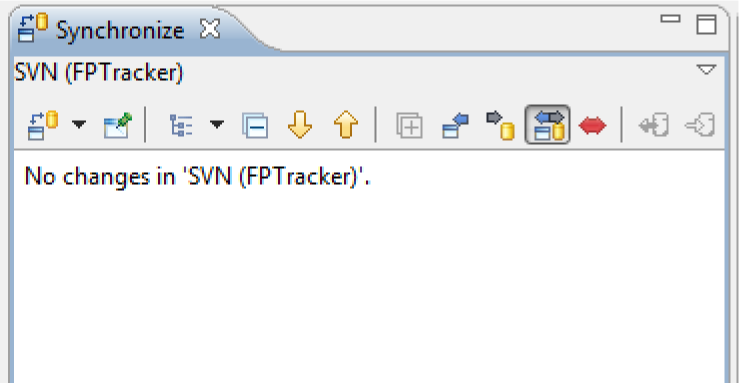
Paste selected names

| | Resource | Content | Properties |
|---|---|---|---|
| ☑ | FPTracker/FPTracker.fpm | Modified | |

Select All | Clear Selection | Selected: 1 of 1

OK | Cancel

After the commit and update operations are completed, the content in the **Synchronize** view will disappear.



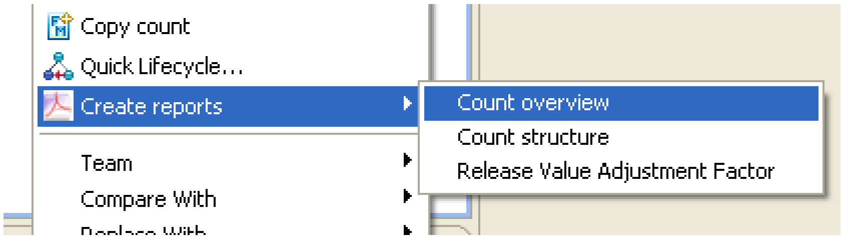
No changes in 'SVN (FPTracker)'.

## Working with Standard Reports

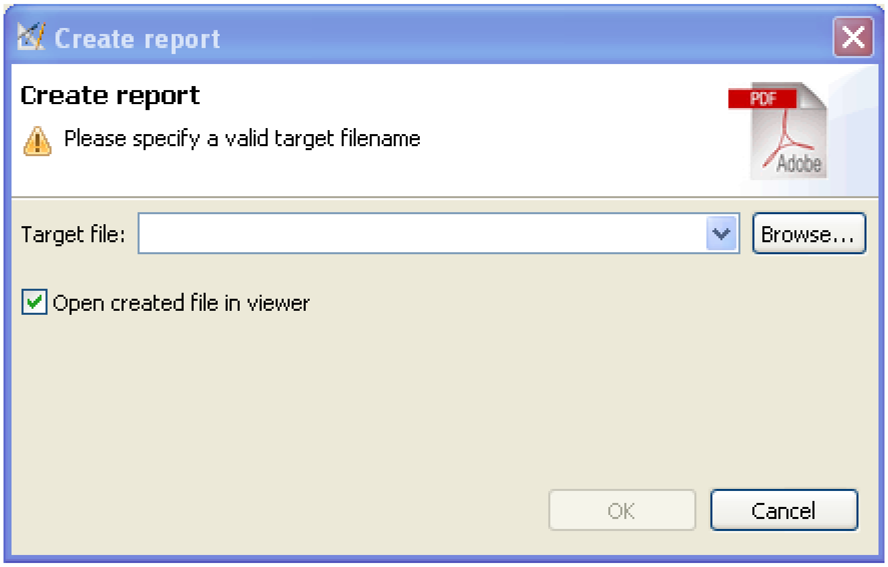
### Create a Count Overview Report

To create a overview report for a count in your workspace, perform the following steps.

1. Select a count in the Project Navigator
2. Right click on the selected element
3. Select entry **Create reports > Count overview**



4. In the dialog, enter a target file or browse for a specific location. The specified filename must end with **.pdf** .



Create report

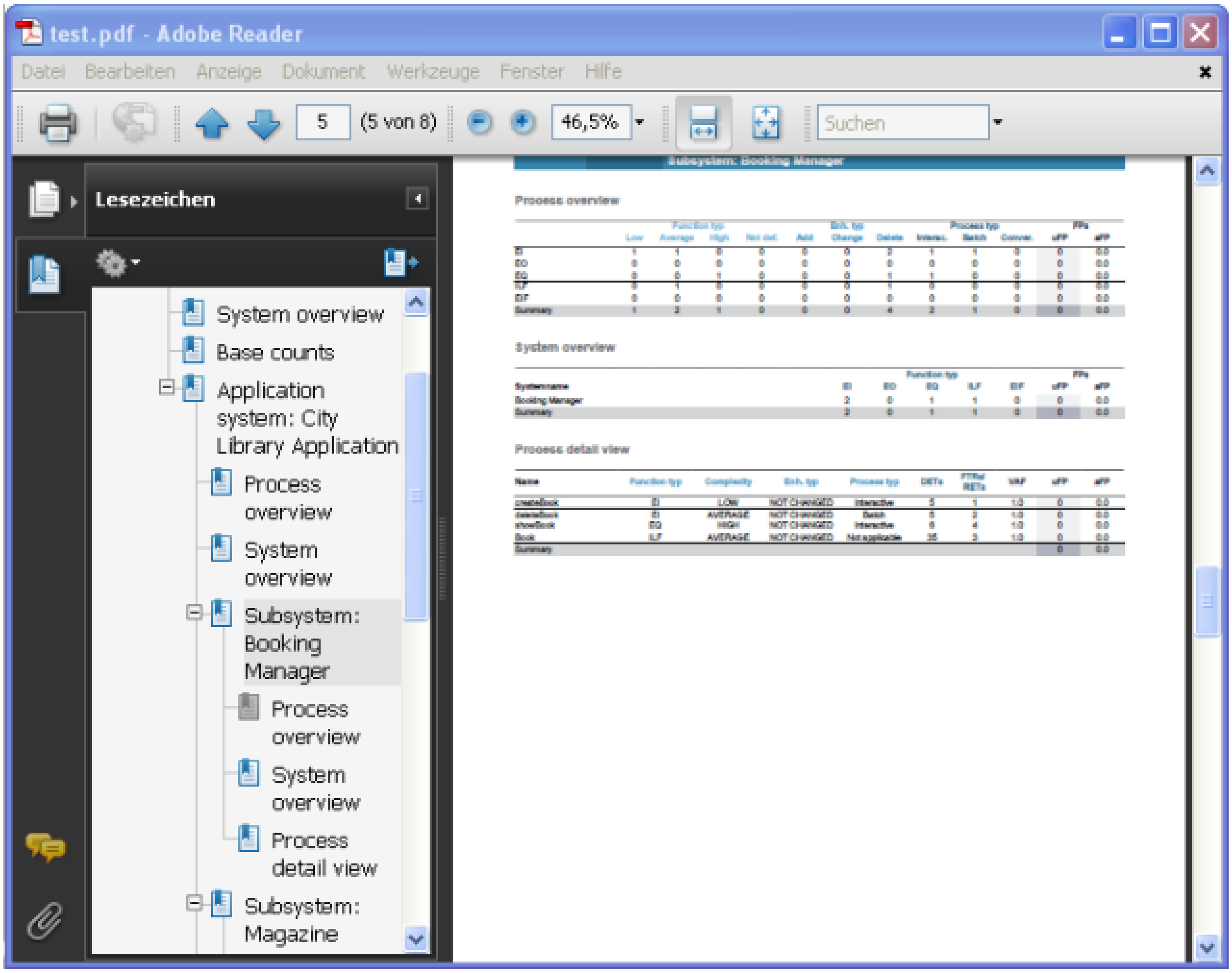
Please specify a valid target filename

Target file:

☑ Open created file in viewer

5. Select **Open created file in viewer** if you want to open the created file in the designated viewer, after the file was created.
6. Perform OK

The following picture shows an open sample report.



Subsystem: Booking Manager

Process overview

| | Function typ | | | | Enh. typ | | | Process typ | | | FPs | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Low | Average | High | Not def. | Add | Change | Delete | Interac. | Batch | Conver. | uFP | aFP |
| EI | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 0 | 0 | 0.0 |
| EO | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| EQ | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0.0 |
| ILF | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.0 |
| EIF | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Summary | 1 | 2 | 1 | 0 | 0 | 0 | 4 | 2 | 1 | 0 | 0 | 0.0 |

System overview

| | Function typ | | | | | FPs | |
|---|---|---|---|---|---|---|---|
| Systemname | EI | EO | EQ | ILF | EIF | uFP | aFP |
| Booking Manager | 2 | 0 | 1 | 1 | 0 | 0 | 0.0 |
| Summary | 2 | 0 | 1 | 1 | 0 | 0 | 0.0 |

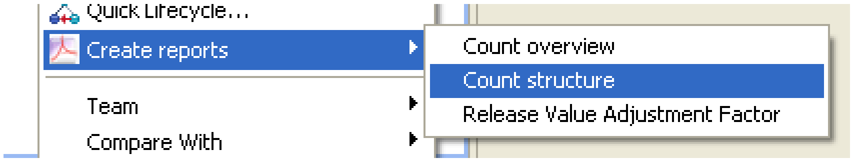
Process detail view

| Name | Function typ | Complexity | Enh. typ | Process typ | DETs | FTRs/ RETs | VAF | uFP | aFP |
|---|---|---|---|---|---|---|---|---|---|
| createBook | EI | LOW | NOT CHANGED | Interactive | 5 | 1 | 1.0 | 0 | 0.0 |
| deleteBook | EI | AVERAGE | NOT CHANGED | Batch | 5 | 2 | 1.0 | 0 | 0.0 |
| showBook | EQ | HIGH | NOT CHANGED | Interactive | 6 | 4 | 1.0 | 0 | 0.0 |
| Book | ILF | AVERAGE | NOT CHANGED | Not applicable | 35 | 3 | 1.0 | 0 | 0.0 |
| Summary | | | | | | | | 0 | 0.0 |

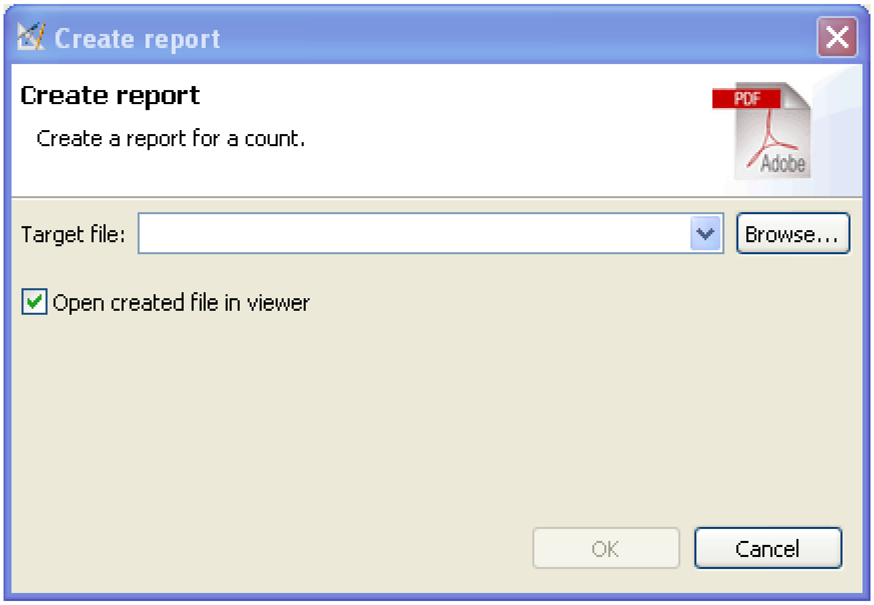
## Create a Count Structure Report

To create a structure report for a count in your workspace, perform the following steps.

1. Select a count in the Project Navigator
2. Right click on the selected element
3. Select entry **Create reports** > **Count structure**



4. In the dialog, enter a target file or browse for a specific location. The specified filename must end with **.pdf** .



Create report

Create report

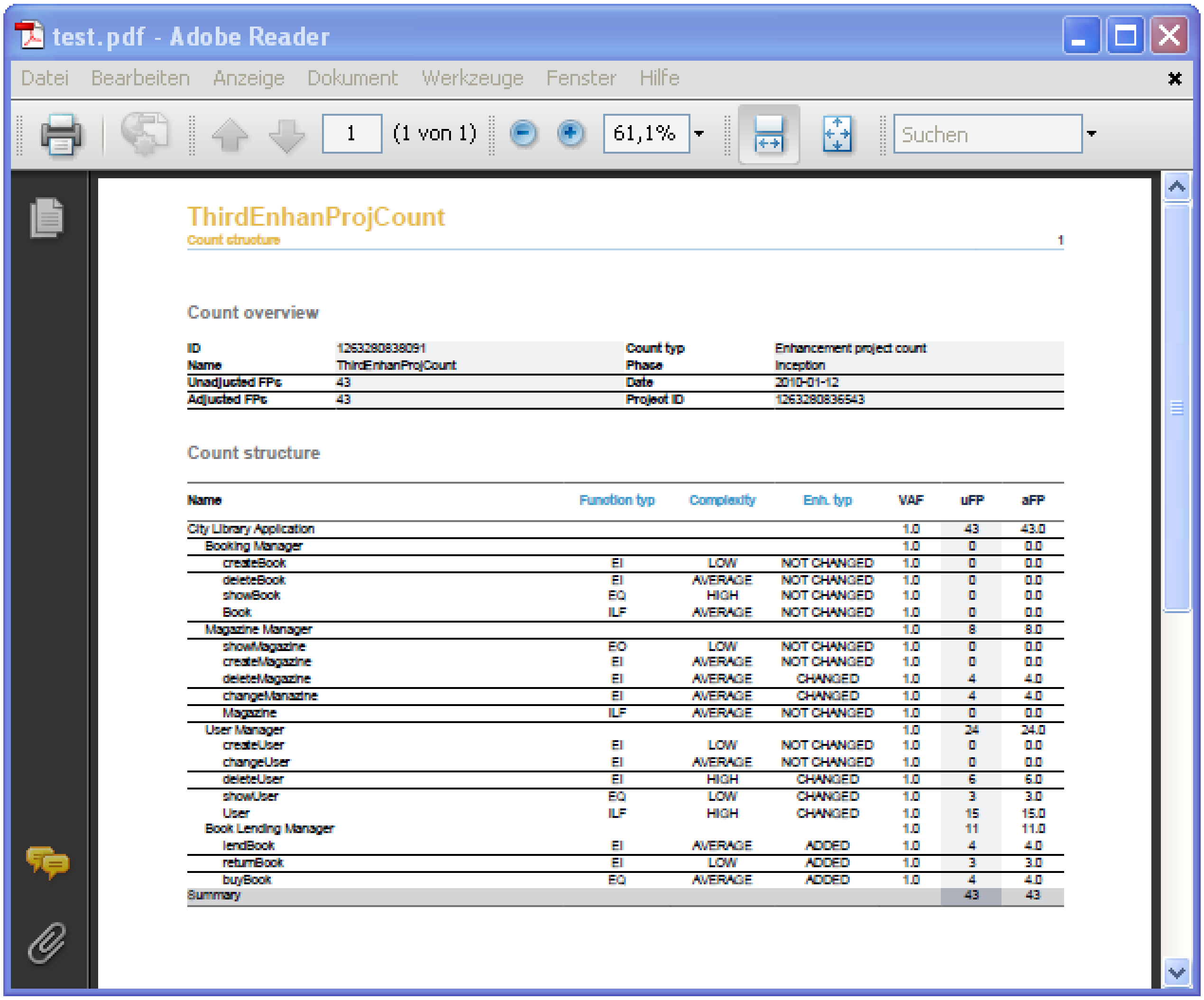
Create a report for a count.

Target file:

☑ Open created file in viewer

5. Select **Open created file in viewer** if you want to open the created file in the designated viewer, after the file was created.
6. Perform OK

The following picture shows an open sample report.



ThirdEnhanProjCount

Count structure 1

Count overview

| | | | |
|---|---|---|---|
| ID | 1263280838091 | Count typ | Enhancement project count |
| Name | ThirdEnhanProjCount | Phase | Inception |
| Unadjusted FPs | 43 | Date | 2010-01-12 |
| Adjusted FPs | 43 | Project ID | 1263280836543 |

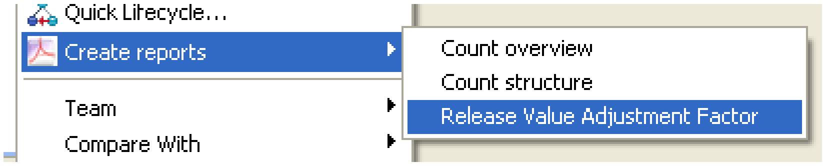
Count structure

| Name | Function typ | Complexity | Enh. typ | VAF | uFP | aFP |
|---|---|---|---|---|---|---|
| City Library Application | | | | 1.0 | 43 | 43.0 |
| Booking Manager | | | | 1.0 | 0 | 0.0 |
| createBook | EI | LOW | NOT CHANGED | 1.0 | 0 | 0.0 |
| deleteBook | EI | AVERAGE | NOT CHANGED | 1.0 | 0 | 0.0 |
| showBook | EQ | HIGH | NOT CHANGED | 1.0 | 0 | 0.0 |
| Book | ILF | AVERAGE | NOT CHANGED | 1.0 | 0 | 0.0 |
| Magazine Manager | | | | 1.0 | 8 | 8.0 |
| showMagazine | EO | LOW | NOT CHANGED | 1.0 | 0 | 0.0 |
| createMagazine | EI | AVERAGE | NOT CHANGED | 1.0 | 0 | 0.0 |
| deleteMagazine | EI | AVERAGE | CHANGED | 1.0 | 4 | 4.0 |
| changeManazine | EI | AVERAGE | CHANGED | 1.0 | 4 | 4.0 |
| Magazine | ILF | AVERAGE | NOT CHANGED | 1.0 | 0 | 0.0 |
| User Manager | | | | 1.0 | 24 | 24.0 |
| createUser | EI | LOW | NOT CHANGED | 1.0 | 0 | 0.0 |
| changeUser | EI | AVERAGE | NOT CHANGED | 1.0 | 0 | 0.0 |
| deleteUser | EI | HIGH | CHANGED | 1.0 | 6 | 6.0 |
| showUser | EQ | LOW | CHANGED | 1.0 | 3 | 3.0 |
| User | ILF | HIGH | CHANGED | 1.0 | 15 | 15.0 |
| Book Lending Manager | | | | 1.0 | 11 | 11.0 |
| lendBook | EI | AVERAGE | ADDED | 1.0 | 4 | 4.0 |
| returnBook | EI | LOW | ADDED | 1.0 | 3 | 3.0 |
| buyBook | EQ | AVERAGE | ADDED | 1.0 | 4 | 4.0 |
| Summary | | | | | 43 | 43 |

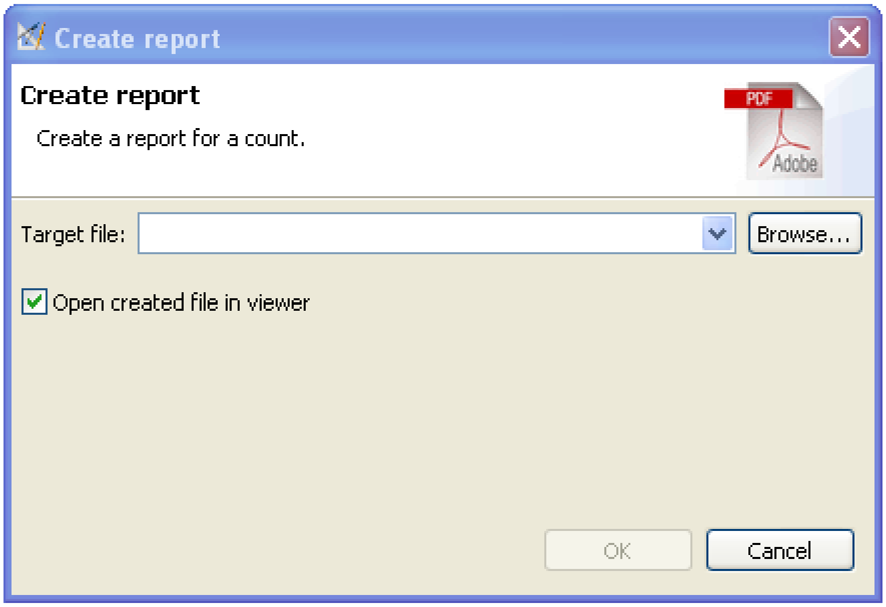
### Create a Release Value Adjustment Factor Report

To create a release value adjustment factor report for a count in your workspace, perform the following steps.

1. Select a count in the Project Navigator
2. Right click on the selected element
3. Select entry **Create reports** > **Release Value Adjustment Factor**



4. In the dialog, enter a target file or browse for a specific location. The specified filename must end with **.pdf** .



Create report

Create report

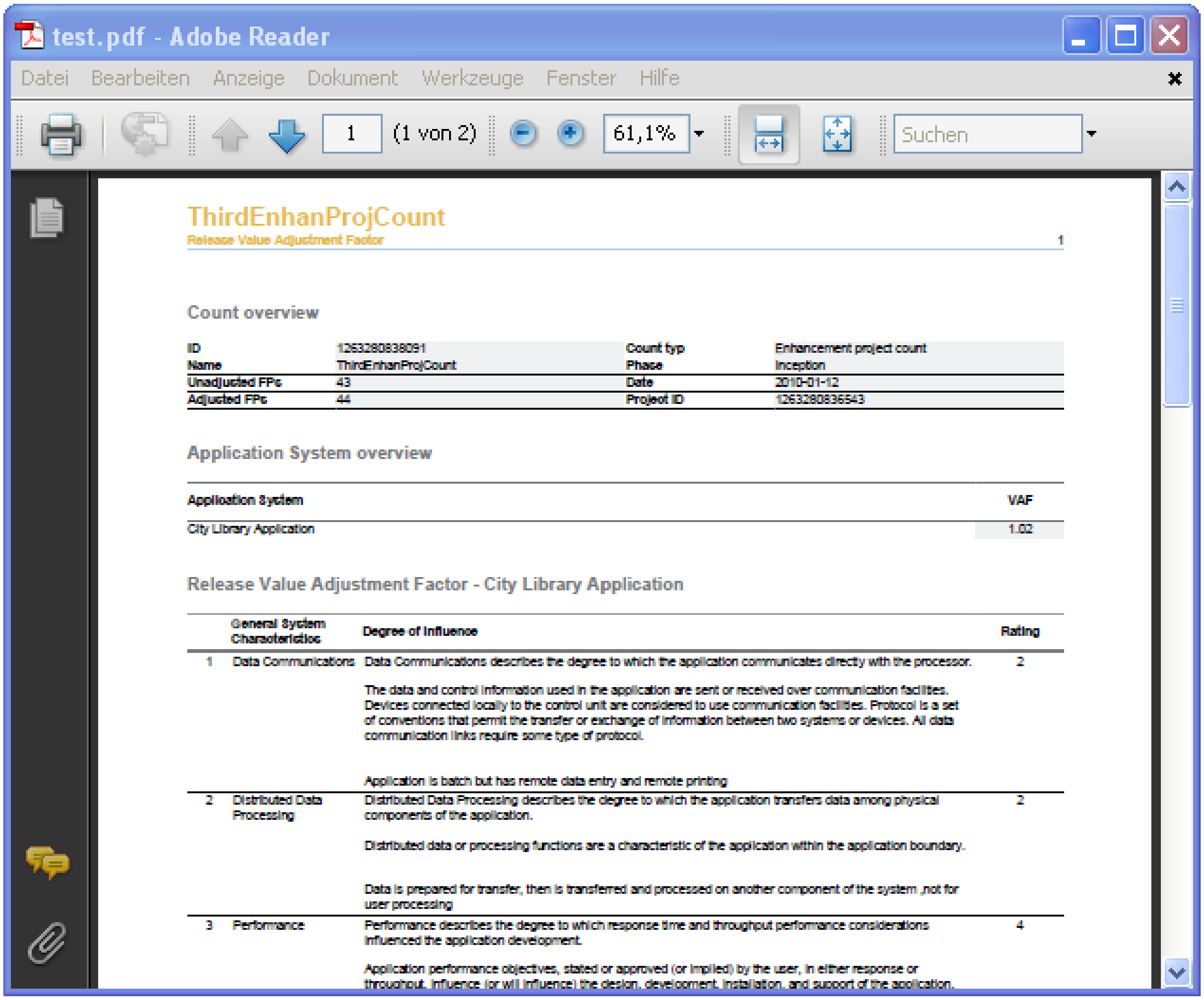
Create a report for a count.

Target file:

☑ Open created file in viewer

5. Select **Open created file in viewer** if you want to open the created file in the designated viewer, after the file was created.
6. Perform OK

The following picture shows an open sample report.



ThirdEnhanProjCount

Release Value Adjustment Factor 1

Count overview

| | | | |
|---|---|---|---|
| **ID** | 1263280838091 | **Count typ** | Enhancement project count |
| **Name** | ThirdEnhanProjCount | **Phase** | Inception |
| **Unadjusted FPs** | 43 | **Date** | 2010-01-12 |
| **Adjusted FPs** | 44 | **Project ID** | 1263280836543 |

Application System overview

| Application System | VAF |
|---|---|
| City Library Application | 1.02 |

Release Value Adjustment Factor - City Library Application

| | General System Characteristics | Degree of Influence | Rating |
|---|---|---|---|
| 1 | Data Communications | Data Communications describes the degree to which the application communicates directly with the processor.<br>The data and control information used in the application are sent or received over communication facilities. Devices connected locally to the control unit are considered to use communication facilities. Protocol is a set of conventions that permit the transfer or exchange of information between two systems or devices. All data communication links require some type of protocol.<br>Application is batch but has remote data entry and remote printing | 2 |
| 2 | Distributed Data Processing | Distributed Data Processing describes the degree to which the application transfers data among physical components of the application.<br>Distributed data or processing functions are a characteristic of the application within the application boundary.<br>Data is prepared for transfer, then is transferred and processed on another component of the system ,not for user processing | 2 |
| 3 | Performance | Performance describes the degree to which response time and throughput performance considerations influenced the application development.<br>Application performance objectives, stated or approved (or implied) by the user, in either response or throughout, influence (or will influence) the design, development, installation, and support of the application. | 4 |

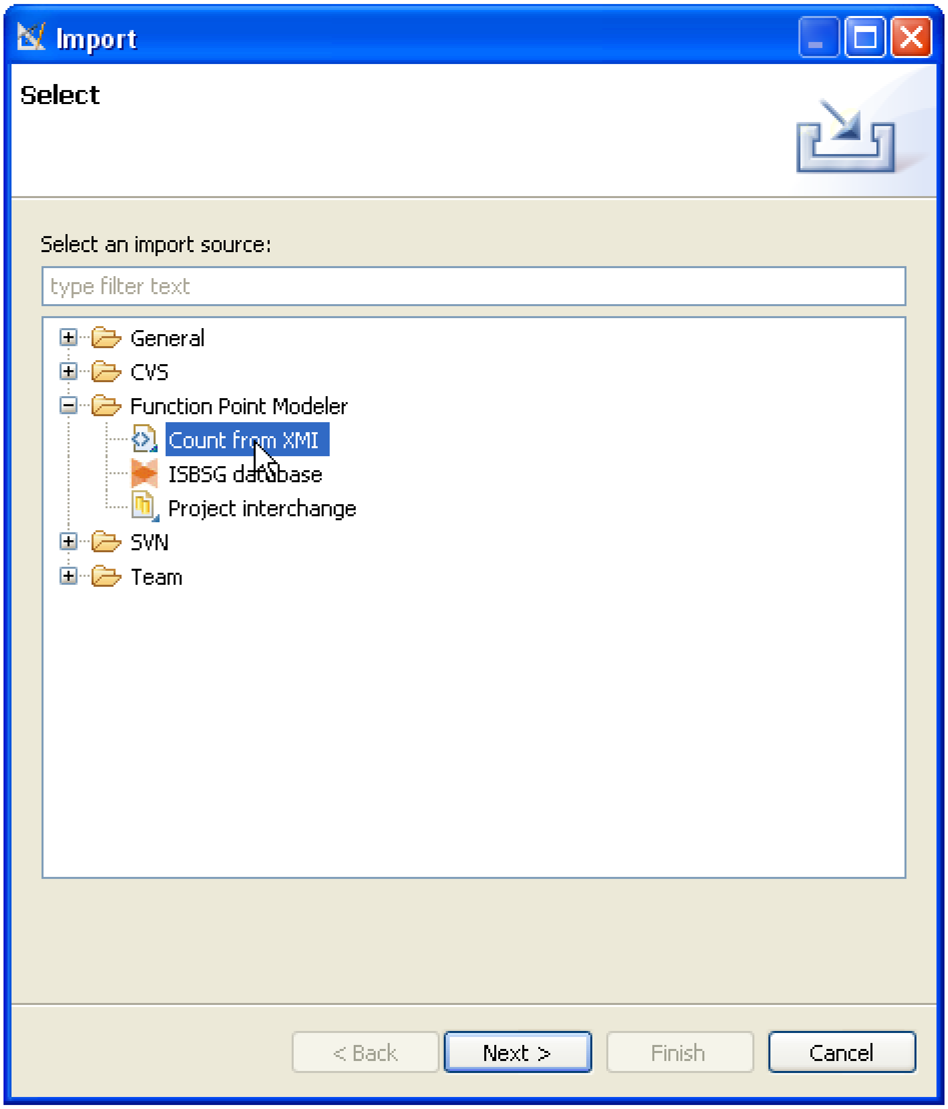
## Importing

### Import Count from XMI

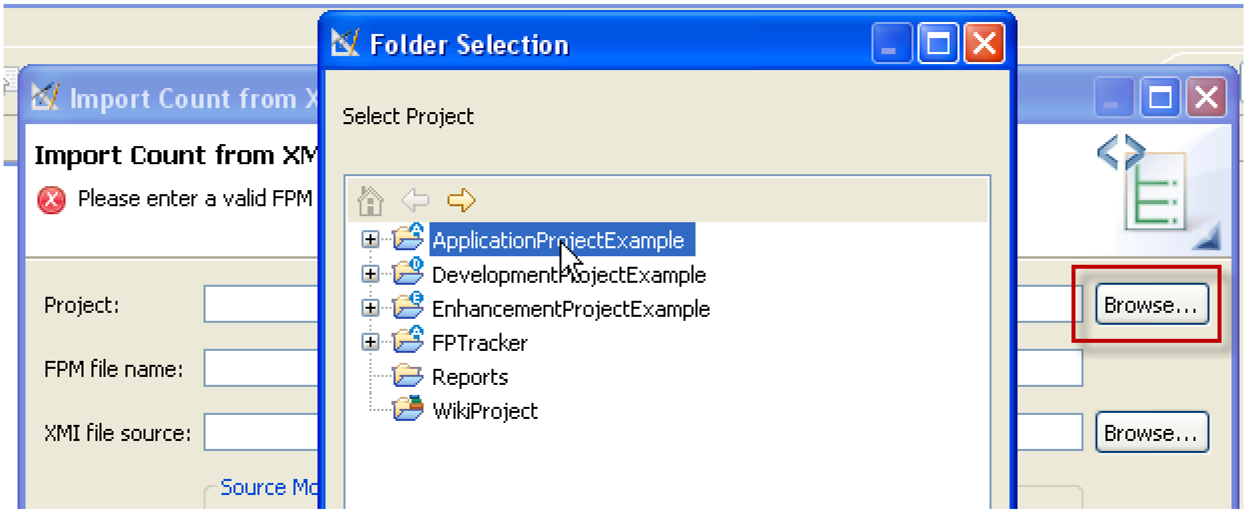
Enterprise Edition

To import a Count from a XMI file, perform the following steps.

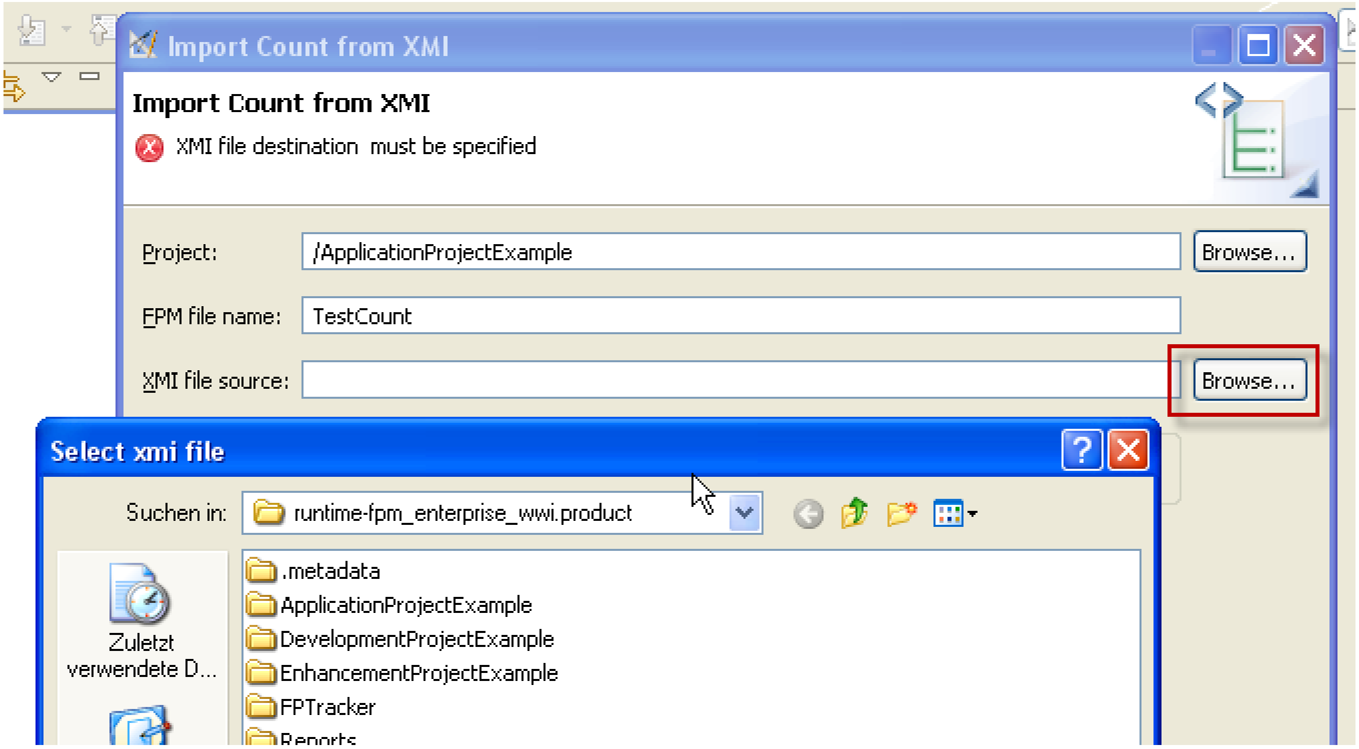
1. Right click inside the **Project Navigator** view and select **Import... > Function Point Modeler > Count from XMI**



2. Press the **Next** button.
3. Enter a valid Project or browse for a project inside your workspace.



4. Enter a valid FPM file name, e.g. **TestCount** .
5. Enter a valid XMI file source or browse for file inside your workspace.



Import Count from XMI

XMI file destination must be specified

Project: /ApplicationProjectExample

FPM file name: TestCount

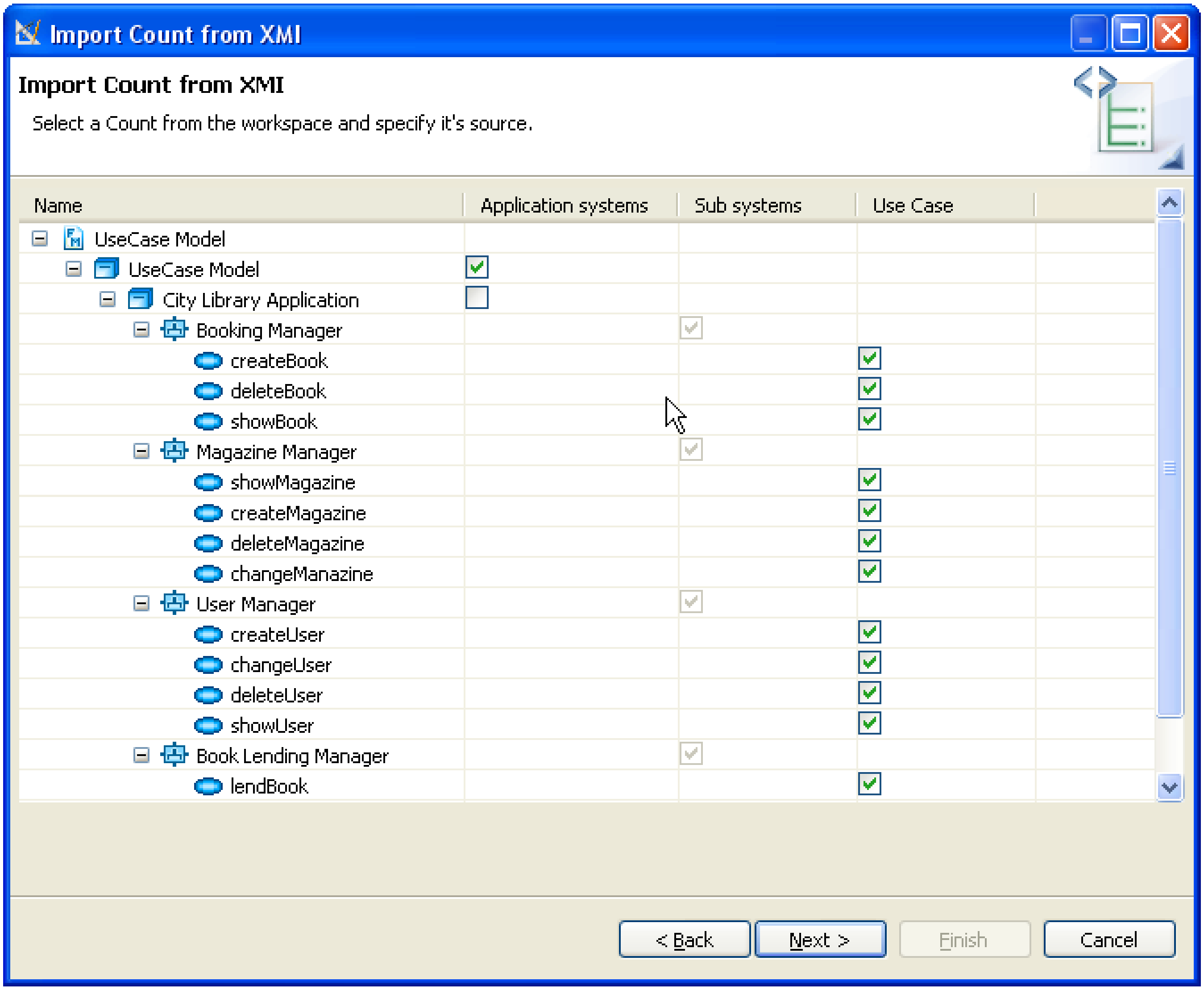
XMI file source:

Select xmi file

Suchen in: runtime-fpm_enterprise_wwi.product

.metadata
ApplicationProjectExample
DevelopmentProjectExample
EnhancementProjectExample
FPTracker
Reports

6. Select the Source Model Typ you wish to import and press **Next** .
7. For Use Case Model import, it's required to select Application Systems, Subsystems and Use Cases. For Class Model import, it's required to select Application Systems, Subsystems, Boundary Classes, Entity Classes and Operations.

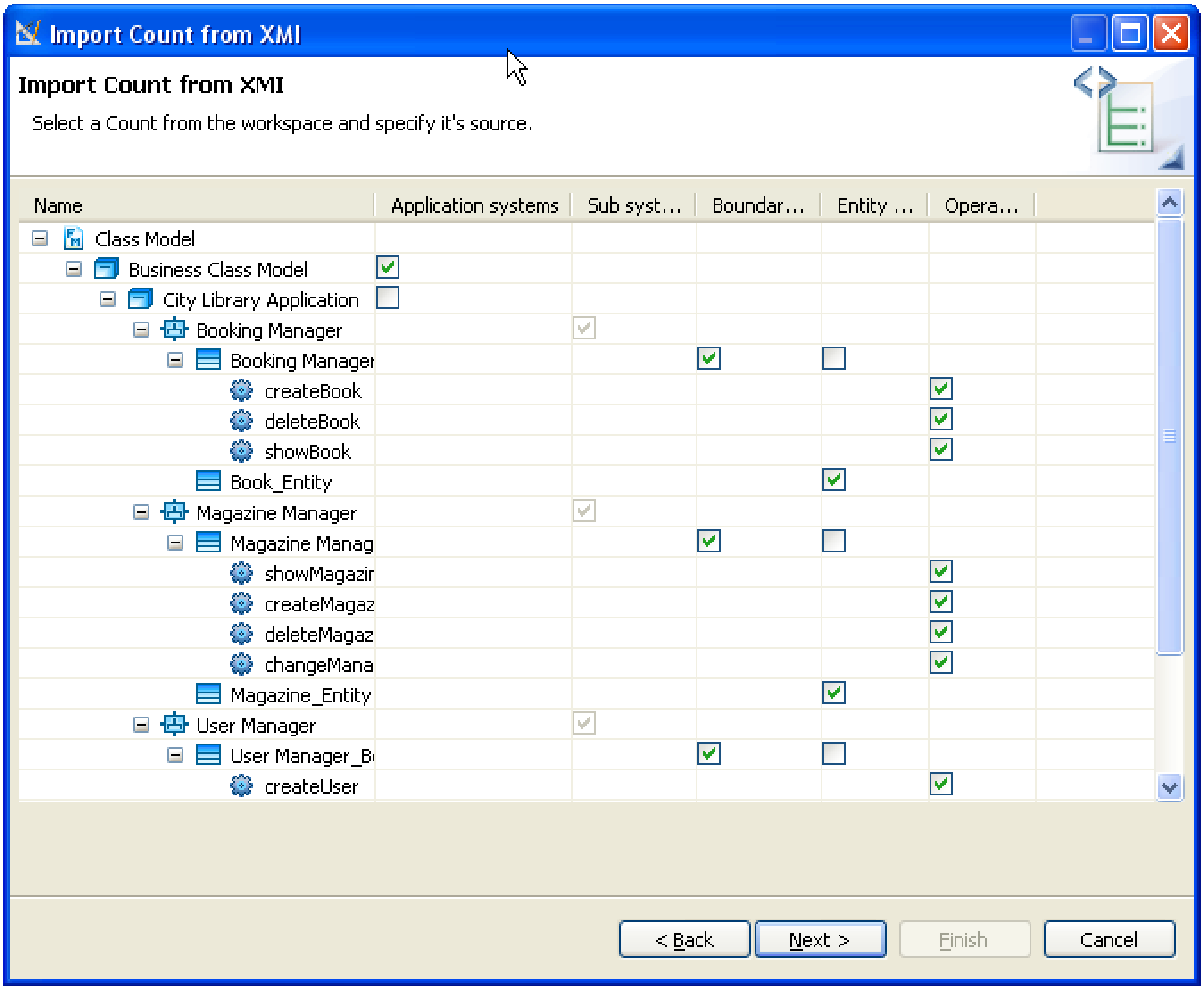


Import Count from XMI

Import Count from XMI

Select a Count from the workspace and specify it's source.

| Name | Application systems | Sub systems | Use Case |
|---|---|---|---|
| ⊟ UseCase Model | | | |
| ⊟ UseCase Model | ☑ | | |
| ⊟ City Library Application | ☐ | | |
| ⊟ Booking Manager | | ☑ | |
| createBook | | | ☑ |
| deleteBook | | | ☑ |
| showBook | | | ☑ |
| ⊟ Magazine Manager | | ☑ | |
| showMagazine | | | ☑ |
| createMagazine | | | ☑ |
| deleteMagazine | | | ☑ |
| changeManazine | | | ☑ |
| ⊟ User Manager | | ☑ | |
| createUser | | | ☑ |
| changeUser | | | ☑ |
| deleteUser | | | ☑ |
| showUser | | | ☑ |
| ⊟ Book Lending Manager | | ☑ | |
| lendBook | | | ☑ |

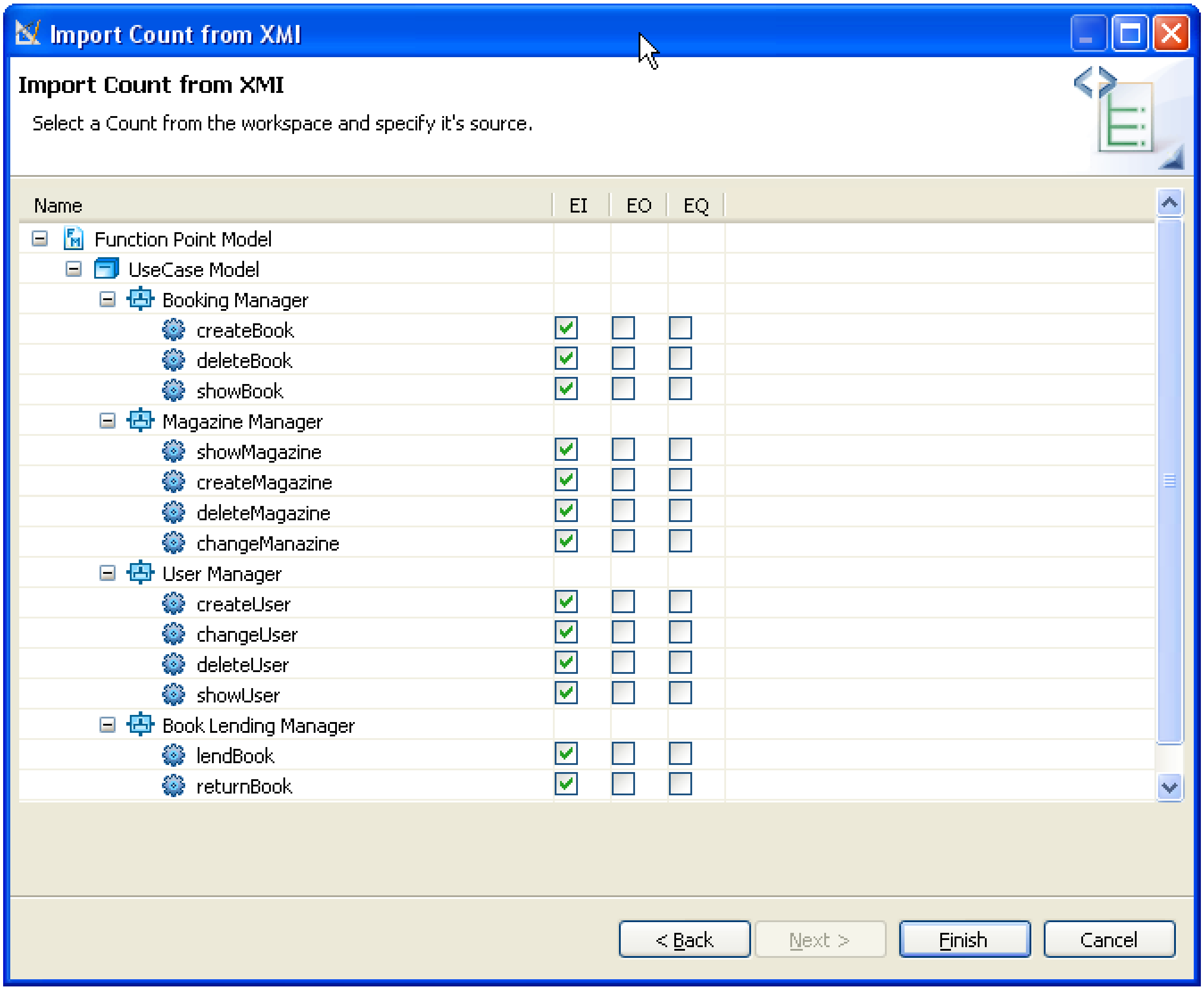


Import Count from XMI

Select a Count from the workspace and specify it's source.

| Name | Application systems | Sub syst… | Boundar… | Entity … | Opera… |
|---|---|---|---|---|---|
| Class Model | | | | | |
| Business Class Model | ☑ | | | | |
| City Library Application | ☐ | | | | |
| Booking Manager | | ☑ | | | |
| Booking Manager | | | ☑ | ☐ | |
| createBook | | | | | ☑ |
| deleteBook | | | | | ☑ |
| showBook | | | | | ☑ |
| Book_Entity | | | | ☑ | |
| Magazine Manager | | ☑ | | | |
| Magazine Manag | | | ☑ | ☐ | |
| showMagazir | | | | | ☑ |
| createMagaz | | | | | ☑ |
| deleteMagaz | | | | | ☑ |
| changeMana | | | | | ☑ |
| Magazine_Entity | | | | ☑ | |
| User Manager | | ☑ | | | |
| User Manager_B( | | | ☑ | ☐ | |
| createUser | | | | | ☑ |

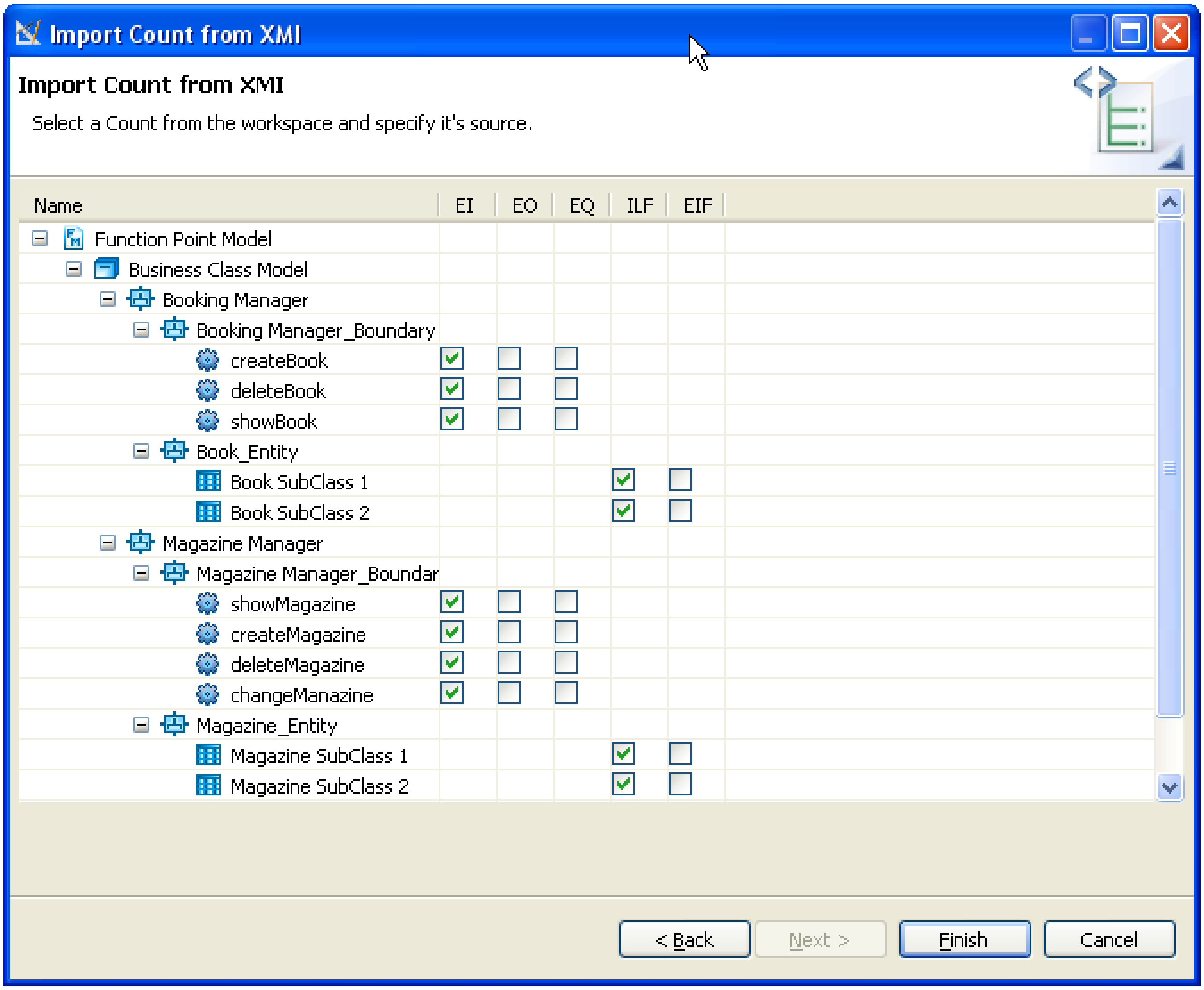
8. Select the **Next** when you're finished with your selection.
9. For Use Case Model import, it's required to select EI, EO and EQ. For Class Model import, it's required to select EI, EO, EQ, ILF and EIF.



**Import Count from XMI**

Select a Count from the workspace and specify it's source.

| Name | EI | EO | EQ |
|---|---|---|---|
| Function Point Model | | | |
| UseCase Model | | | |
| Booking Manager | | | |
| createBook | ☑ | □ | □ |
| deleteBook | ☑ | □ | □ |
| showBook | ☑ | □ | □ |
| Magazine Manager | | | |
| showMagazine | ☑ | □ | □ |
| createMagazine | ☑ | □ | □ |
| deleteMagazine | ☑ | □ | □ |
| changeManazine | ☑ | □ | □ |
| User Manager | | | |
| createUser | ☑ | □ | □ |
| changeUser | ☑ | □ | □ |
| deleteUser | ☑ | □ | □ |
| showUser | ☑ | □ | □ |
| Book Lending Manager | | | |
| lendBook | ☑ | □ | □ |
| returnBook | ☑ | □ | □ |



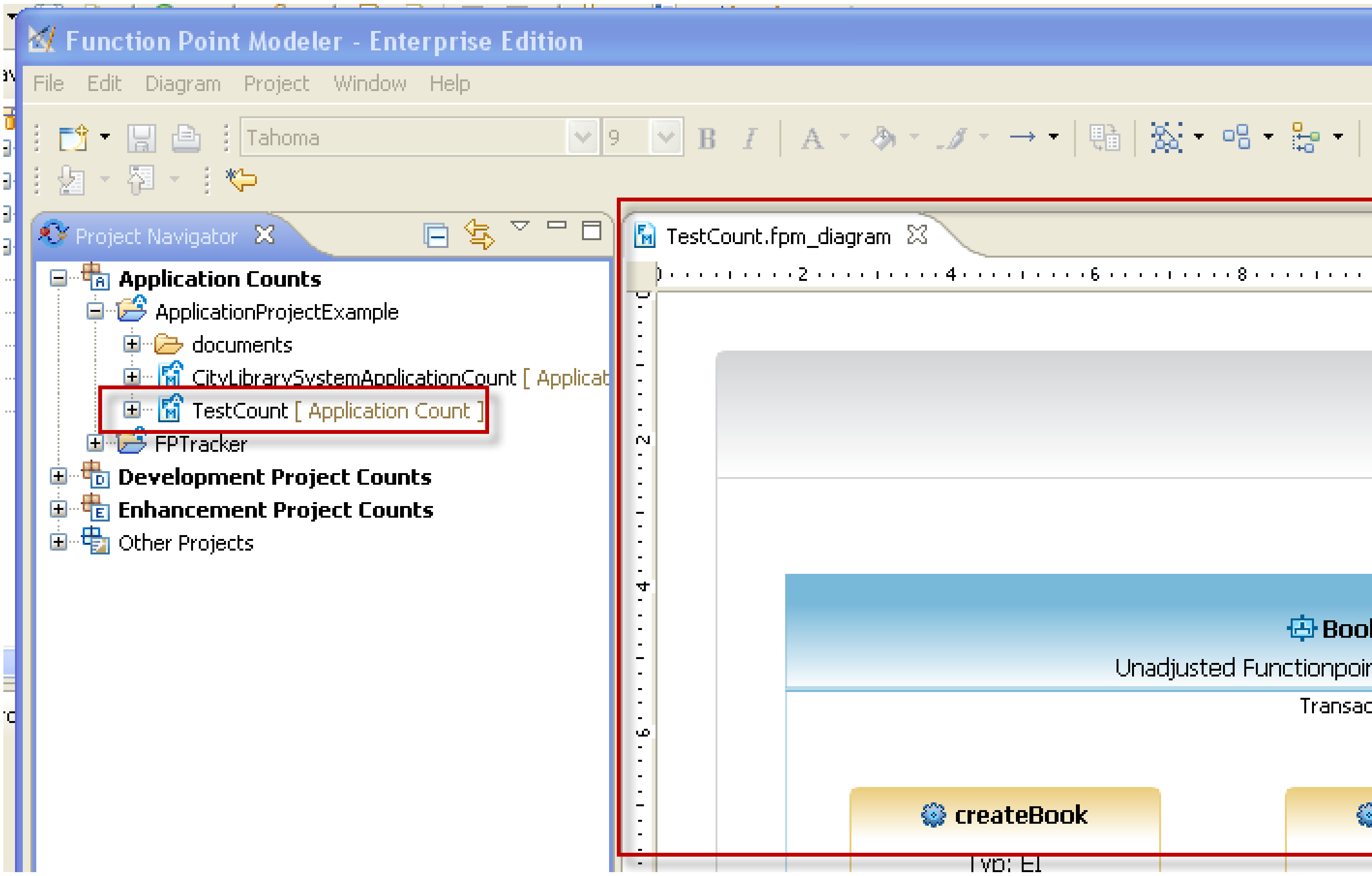
Import Count from XMI

Select a Count from the workspace and specify it's source.

| Name | EI | EO | EQ | ILF | EIF |
|---|---|---|---|---|---|
| ⊟ Function Point Model | | | | | |
| ⊟ Business Class Model | | | | | |
| ⊟ Booking Manager | | | | | |
| ⊟ Booking Manager_Boundary | | | | | |
| createBook | ☑ | □ | □ | | |
| deleteBook | ☑ | □ | □ | | |
| showBook | ☑ | □ | □ | | |
| ⊟ Book_Entity | | | | | |
| Book SubClass 1 | | | | ☑ | □ |
| Book SubClass 2 | | | | ☑ | □ |
| ⊟ Magazine Manager | | | | | |
| ⊟ Magazine Manager_Boundar | | | | | |
| showMagazine | ☑ | □ | □ | | |
| createMagazine | ☑ | □ | □ | | |
| deleteMagazine | ☑ | □ | □ | | |
| changeManazine | ☑ | □ | □ | | |
| ⊟ Magazine_Entity | | | | | |
| Magazine SubClass 1 | | | | ☑ | □ |
| Magazine SubClass 2 | | | | ☑ | □ |

**10.** Select the **Finish** when you're finished with your selection.

A new Count will be added to your workspace.

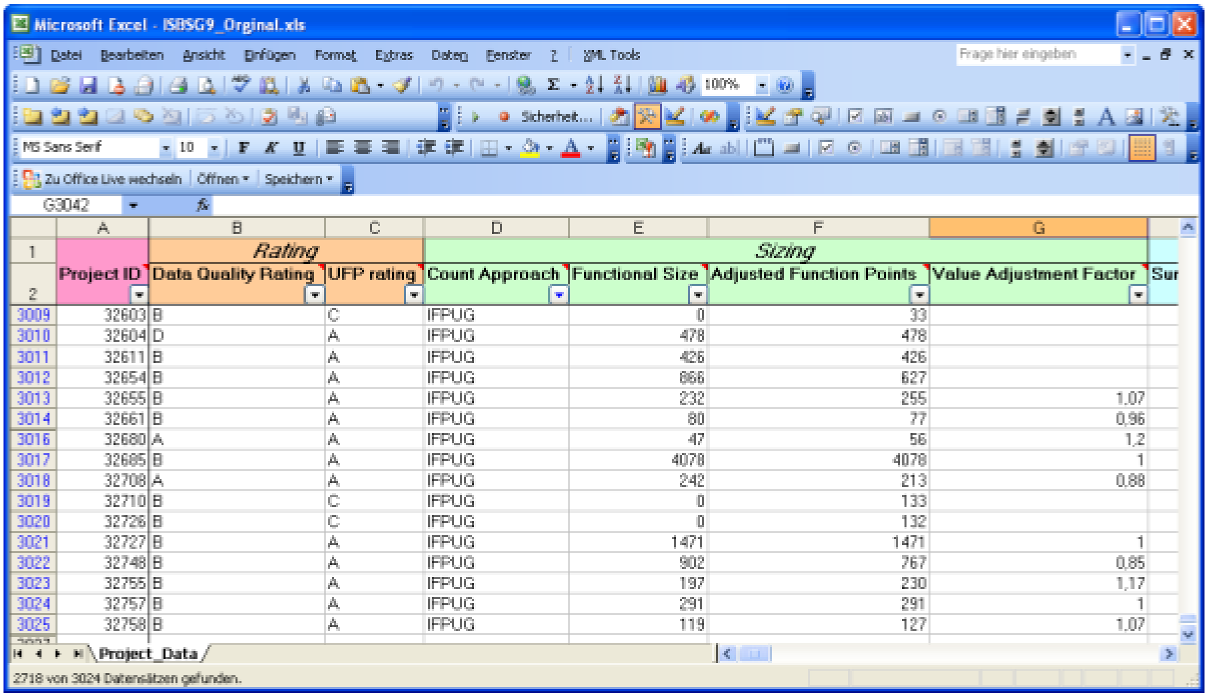

Function Point Modeler - Enterprise Edition
File Edit Diagram Project Window Help
Tahoma
9
Project Navigator
TestCount.fpm_diagram
Application Counts
ApplicationProjectExample
documents
CityLibrarySystemApplicationCount [ Applicat
TestCount [ Application Count ]
FPTracker
Development Project Counts
Enhancement Project Counts
Other Projects
Bool
Unadjusted Functionpoir
Transac
createBook
Typ: EI

### Import Projects from ISBSG Data

Enterprise Edition

**Function Point Modeler** now offers you the opportunity to import **ISBSG** data into the **FPM** in order to calibrate **COCOMO** based on the ISBSG data.

The **ISBSG** delivers a database of software project history data that is used for estimation, benchmarking and project management. The **ISBSG** database has data on over 5000 projects from a wide variety of software domains where the functional size was measured using the **IFPUG** method. **ISBSG** database is delivered in an Excel spreadsheet.

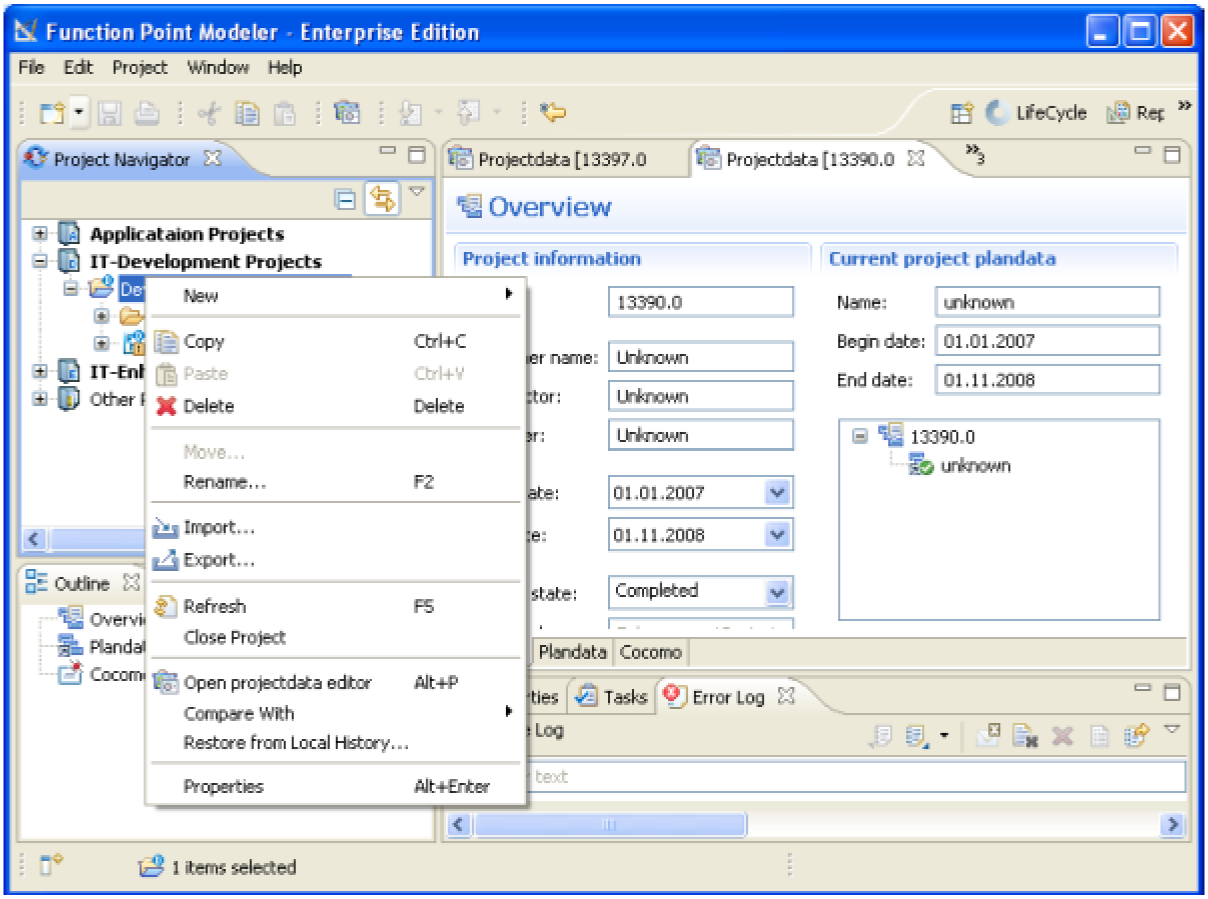


| | A | B | C | D | E | F | G | |
|---|---|---|---|---|---|---|---|---|
| 1 | | Rating | | Sizing | | | | |
| 2 | Project ID | Data Quality Rating | UFP rating | Count Approach | Functional Size | Adjusted Function Points | Value Adjustment Factor | Sur |
| 3009 | 32603 | B | C | IFPUG | 0 | 33 | | |
| 3010 | 32604 | D | A | IFPUG | 478 | 478 | | |
| 3011 | 32611 | B | A | IFPUG | 426 | 426 | | |
| 3012 | 32654 | B | A | IFPUG | 866 | 627 | | |
| 3013 | 32655 | B | A | IFPUG | 232 | 255 | 1,07 | |
| 3014 | 32661 | B | A | IFPUG | 80 | 77 | 0,96 | |
| 3016 | 32680 | A | A | IFPUG | 47 | 56 | 1,2 | |
| 3017 | 32685 | B | A | IFPUG | 4078 | 4078 | 1 | |
| 3018 | 32708 | A | A | IFPUG | 242 | 213 | 0,88 | |
| 3019 | 32710 | B | C | IFPUG | 0 | 133 | | |
| 3020 | 32726 | B | C | IFPUG | 0 | 132 | | |
| 3021 | 32727 | B | A | IFPUG | 1471 | 1471 | 1 | |
| 3022 | 32748 | B | A | IFPUG | 902 | 767 | 0,85 | |
| 3023 | 32755 | B | A | IFPUG | 197 | 230 | 1,17 | |
| 3024 | 32757 | B | A | IFPUG | 291 | 291 | 1 | |
| 3025 | 32758 | B | A | IFPUG | 119 | 127 | 1,07 | |

2718 von 3024 Datensätzen gefunden.

To import a **ISBSG** , perform the following steps.

1. Select **Import** from the pop menu.



13390.0

er name: Unknown

tor: Unknown

r: Unknown

ate: 01.01.2007

e: 01.11.2008

state: Completed

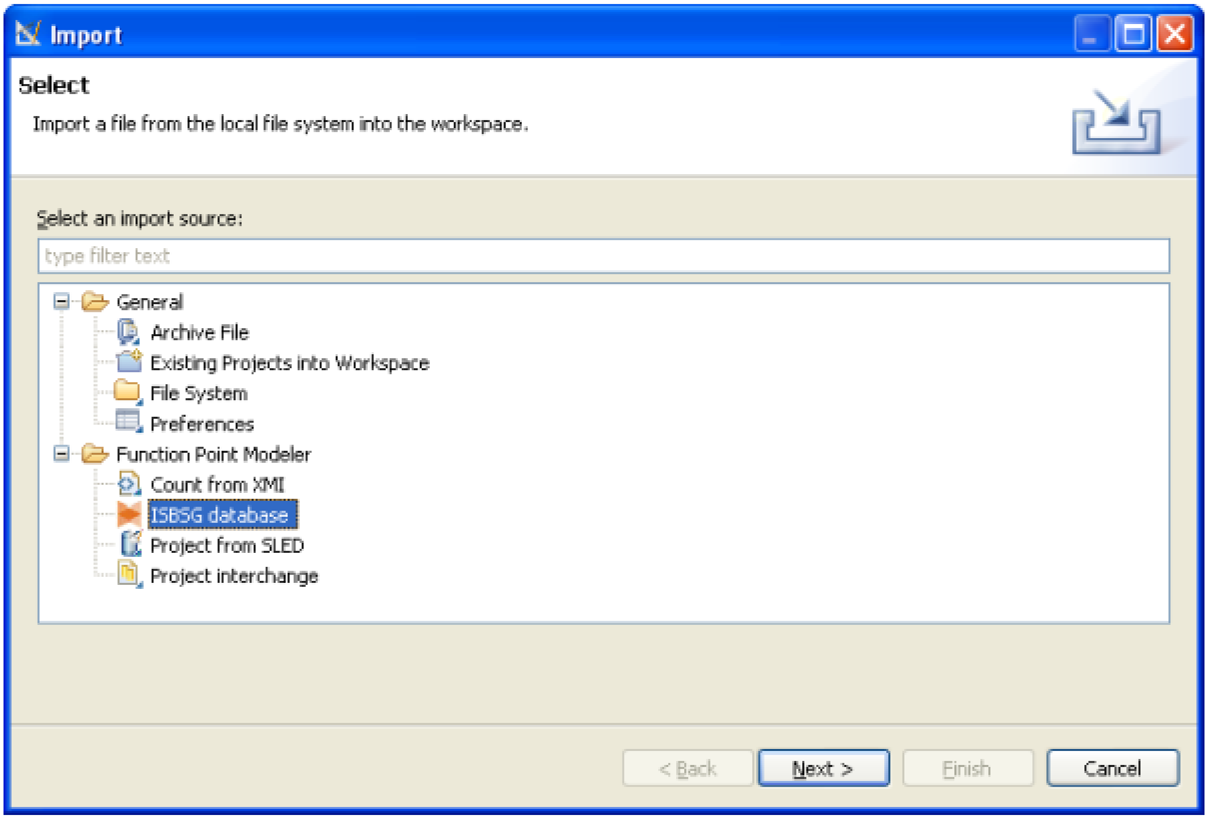
Name: unknown

Begin date: 01.01.2007

End date: 01.11.2008

13390.0
unknown

2. Select **Function Point Modeler > ISBSG database** from the tree.



Import

Select

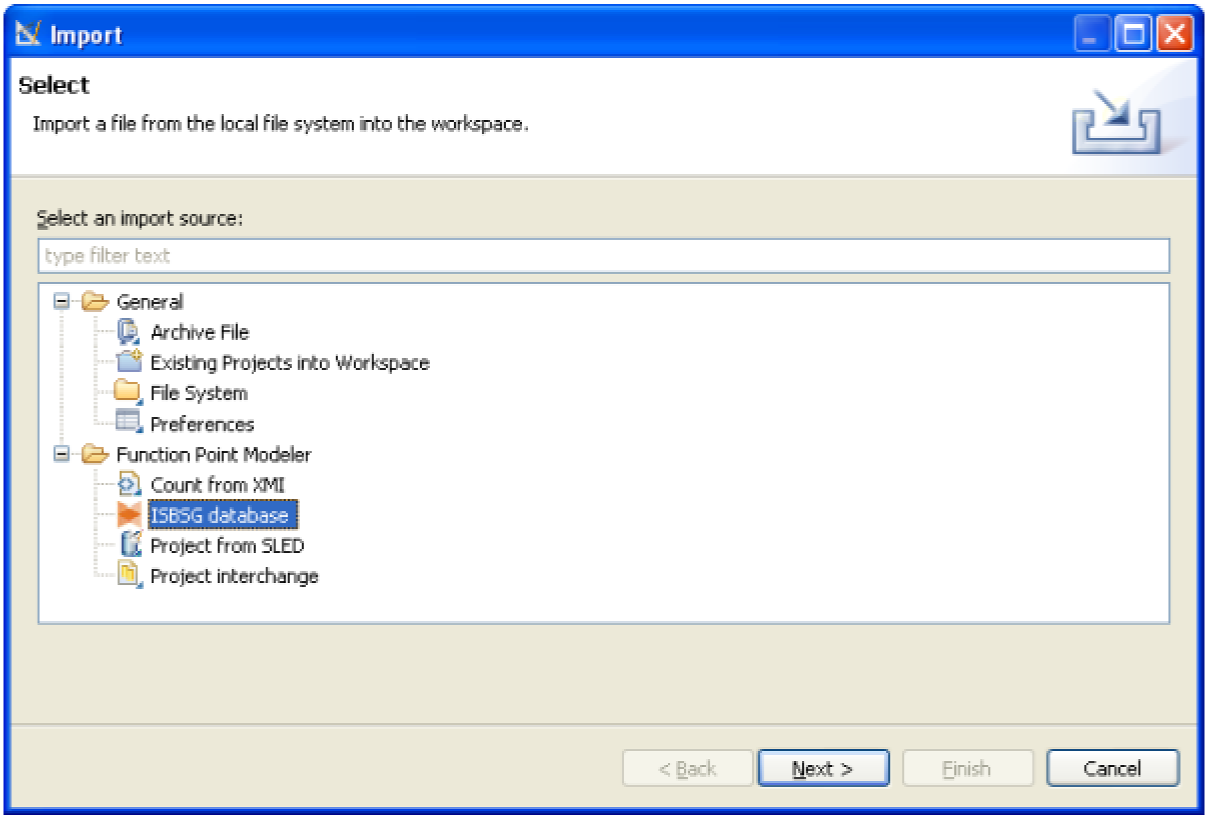
Import a file from the local file system into the workspace.

Select an import source:

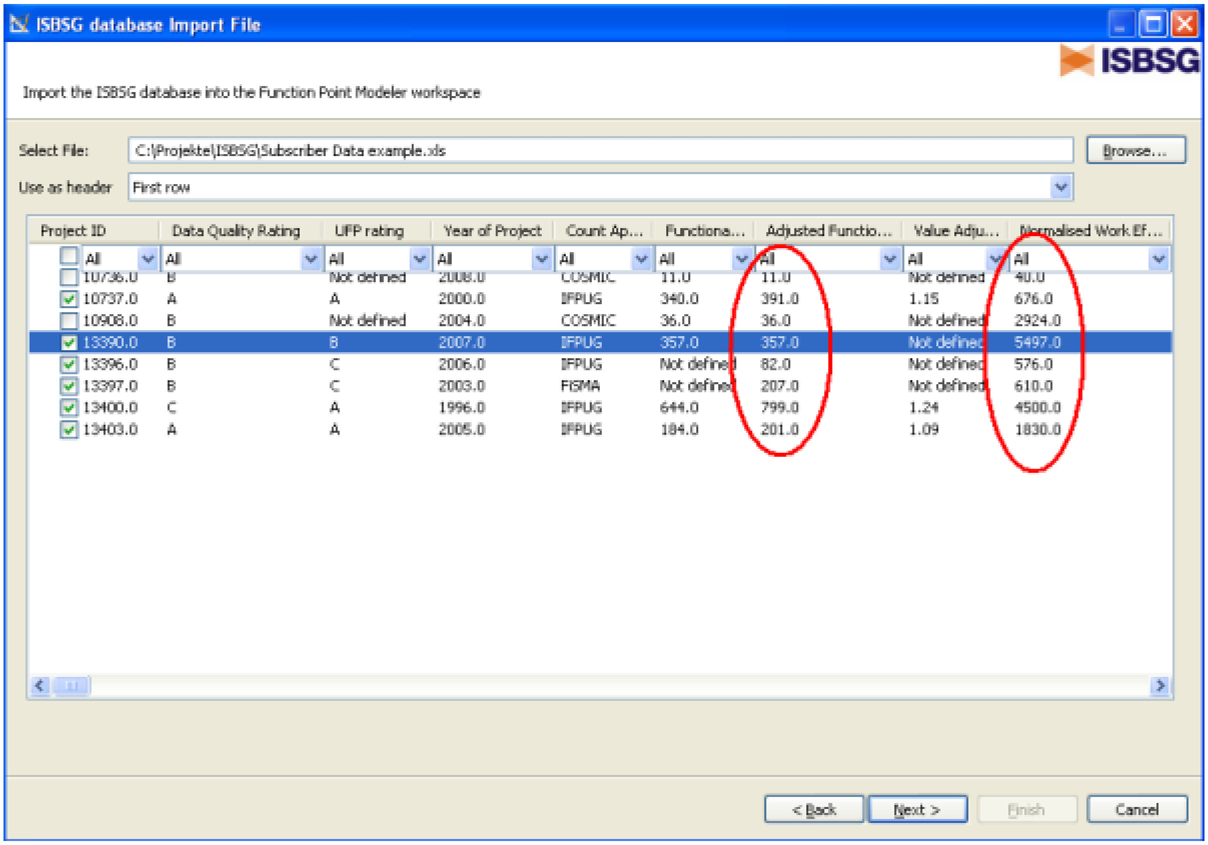
type filter text

- General
  - Archive File
  - Existing Projects into Workspace
  - File System
  - Preferences
- Function Point Modeler
  - Count from XMI
  - ISBSG database
  - Project from SLED
  - Project interchange

3. Select **Function Point Modeler > ISBSG database** from the tree and click the button **Next** .



4. Click on the Browse button … and click the associated Browse to locate the directory or file containing the **ISBSG** excel file. Before you click on the **Browse...** button you have to select the excel spreadsheet row containing the header. The whole **ISBSG** data is now shown in the wizard. You can now specify in the wizard the **ISBSG** data that you want to import into the **Function Point Modeler** . You can see a lot of project metrics like function points and actual effort. It is recommended to deselect all projects that don't have function points and actual effort.



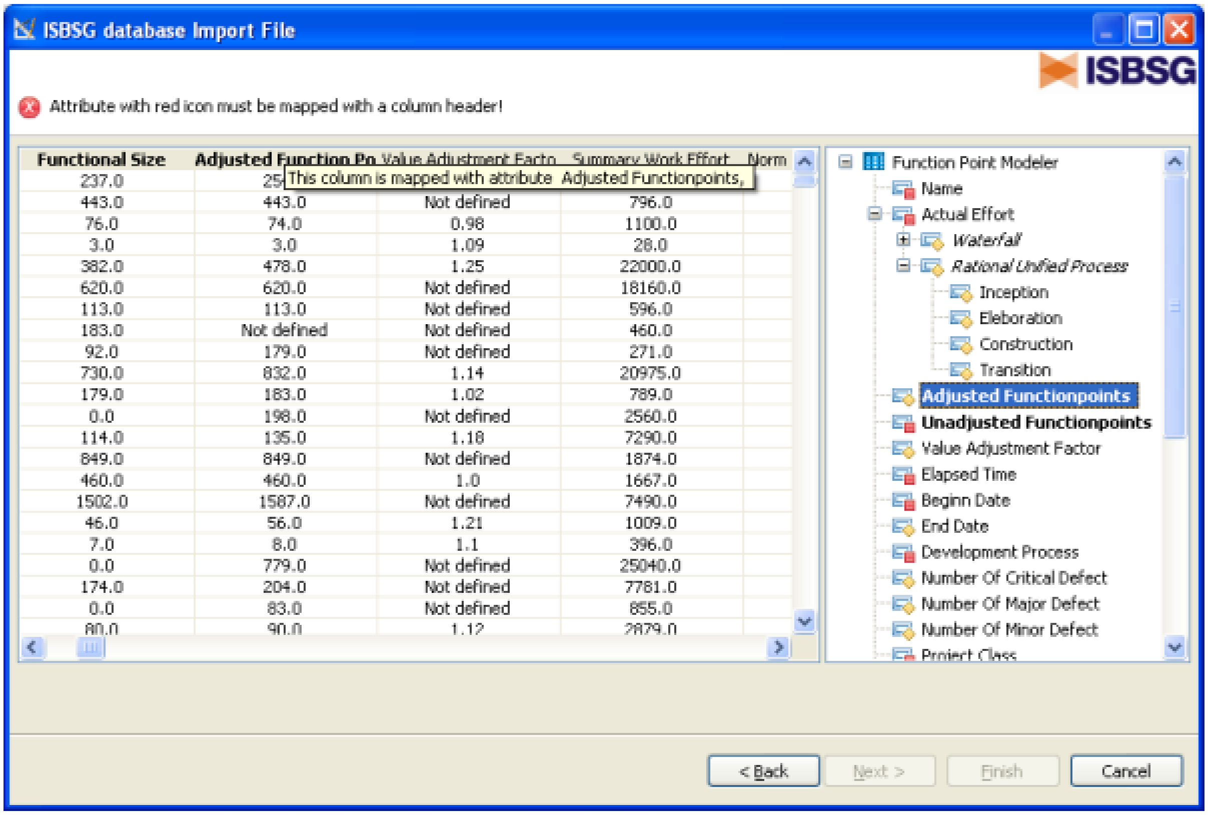
Import the ISBSG database into the Function Point Modeler workspace

Select File: C:\Projekte\ISBSG\Subscriber Data example.xls

Use as header: First row

| | Project ID | Data Quality Rating | UFP rating | Year of Project | Count Ap... | Functiona... | Adjusted Functio... | Value Adju... | Normalised Work Ef... |
|---|---|---|---|---|---|---|---|---|---|
| □ | All | All | All | All | All | All | All | All | All |
| □ | 10736.0 | B | Not defined | 2008.0 | COSMIC | 11.0 | 11.0 | Not defined | 40.0 |
| ☑ | 10737.0 | A | A | 2000.0 | IFPUG | 340.0 | 391.0 | 1.15 | 676.0 |
| □ | 10908.0 | B | Not defined | 2004.0 | COSMIC | 36.0 | 36.0 | Not defined | 2924.0 |
| ☑ | 13390.0 | B | B | 2007.0 | IFPUG | 357.0 | 357.0 | Not definec | 5497.0 |
| ☑ | 13396.0 | B | C | 2006.0 | IFPUG | Not define | 82.0 | Not definec | 576.0 |
| ☑ | 13397.0 | B | C | 2003.0 | FISMA | Not define | 207.0 | Not defined | 610.0 |
| ☑ | 13400.0 | C | A | 1996.0 | IFPUG | 644.0 | 799.0 | 1.24 | 4500.0 |
| ☑ | 13403.0 | A | A | 2005.0 | IFPUG | 184.0 | 201.0 | 1.09 | 1830.0 |

5. After you have specified the **ISBSG** data to be imported you have to map the **Function Point Modeler** data model with the **ISBSG** data model. In the tree on right side you see the **Function Point Modeler** data model. The tree items with red icon are obligatory to map and with yellow icon are optional to map. Click the desired tree item on the tree and drag the item from a tree to the desired row in the **ISBSG** table on left side. The font of the mapped tree items and rows are in **Bold** typeface. To delete mapping, right click on the desired tree item. If you have mapped all obligatory items in the tree, you can click on the **Next>** button.



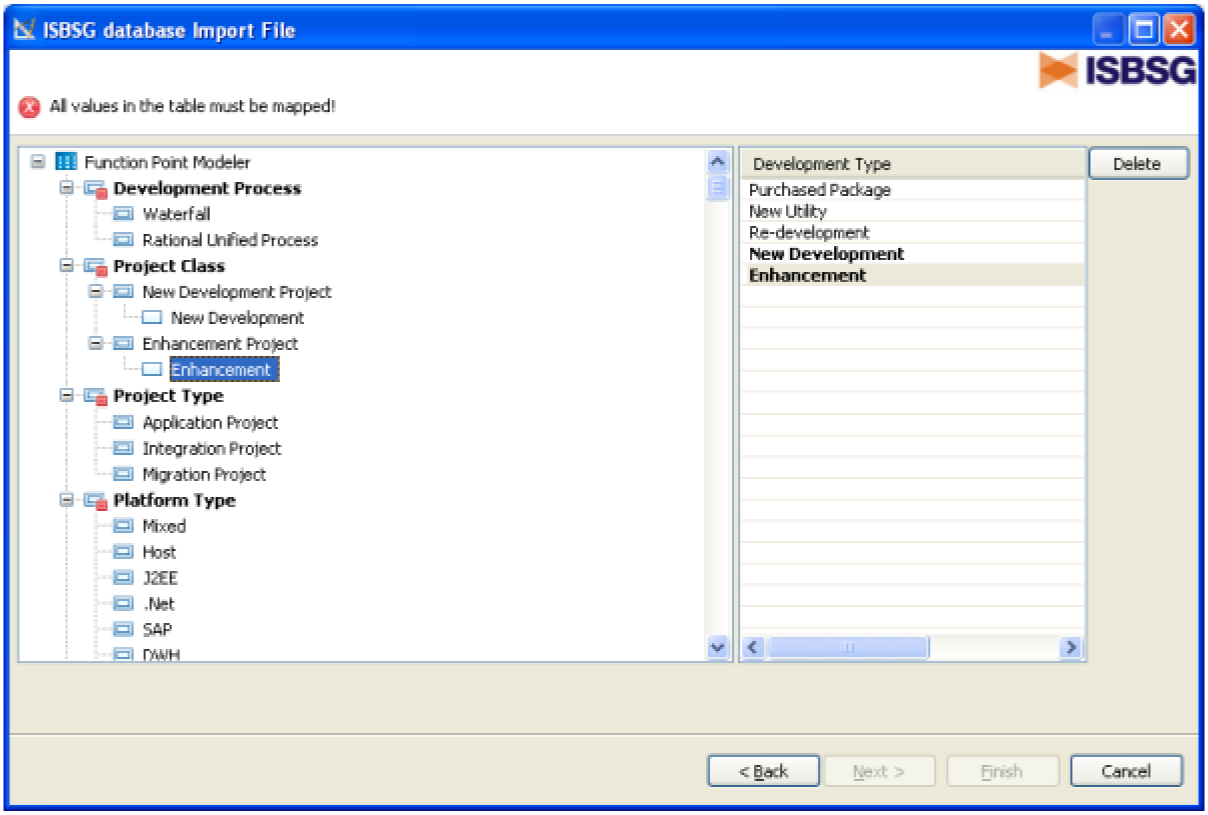
Attribute with red icon must be mapped with a column header!

| Functional Size | Adjusted Function Po | Value Adjustment Facto | Summary Work Effort | Norm |
|---|---|---|---|---|
| 237.0 | 25 | | | |
| 443.0 | 443.0 | Not defined | 796.0 | |
| 76.0 | 74.0 | 0.98 | 1100.0 | |
| 3.0 | 3.0 | 1.09 | 28.0 | |
| 382.0 | 478.0 | 1.25 | 22000.0 | |
| 620.0 | 620.0 | Not defined | 18160.0 | |
| 113.0 | 113.0 | Not defined | 596.0 | |
| 183.0 | Not defined | Not defined | 460.0 | |
| 92.0 | 179.0 | Not defined | 271.0 | |
| 730.0 | 832.0 | 1.14 | 20975.0 | |
| 179.0 | 183.0 | 1.02 | 789.0 | |
| 0.0 | 198.0 | Not defined | 2560.0 | |
| 114.0 | 135.0 | 1.18 | 7290.0 | |
| 849.0 | 849.0 | Not defined | 1874.0 | |
| 460.0 | 460.0 | 1.0 | 1667.0 | |
| 1502.0 | 1587.0 | Not defined | 7490.0 | |
| 46.0 | 56.0 | 1.21 | 1009.0 | |
| 7.0 | 8.0 | 1.1 | 396.0 | |
| 0.0 | 779.0 | Not defined | 25040.0 | |
| 174.0 | 204.0 | Not defined | 7781.0 | |
| 0.0 | 83.0 | Not defined | 855.0 | |
| 80.0 | 90.0 | 1.12 | 2879.0 | |

This column is mapped with attribute  Adjusted Functionpoints,

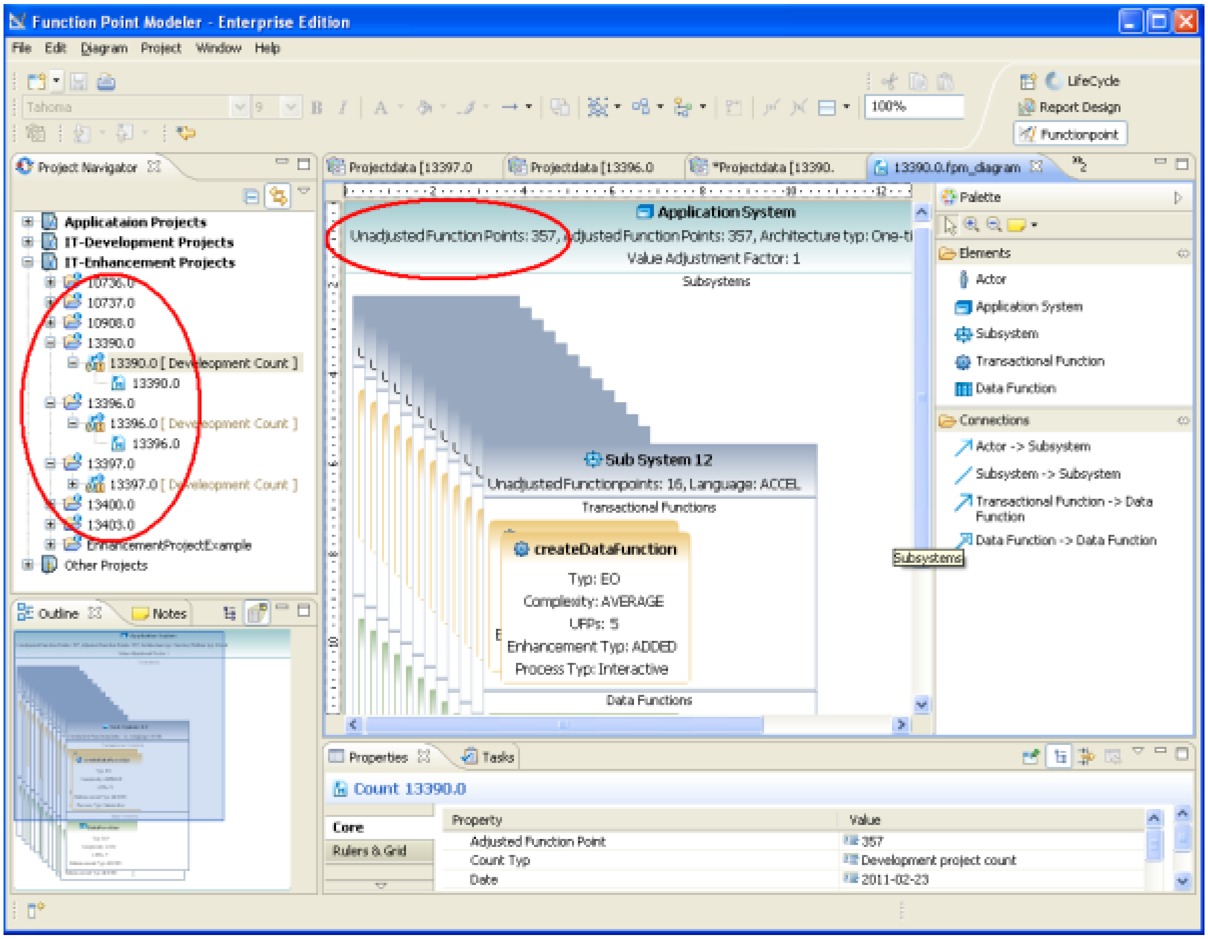
- Function Point Modeler
  - Name
  - Actual Effort
    - *Waterfall*
    - *Rational Unified Process*
      - Inception
      - Eleboration
      - Construction
      - Transition
  - **Adjusted Functionpoints**
  - **Unadjusted Functionpoints**
  - Value Adjustment Factor
  - Elapsed Time
  - Beginn Date
  - End Date
  - Development Process
  - Number Of Critical Defect
  - Number Of Major Defect
  - Number Of Minor Defect
  - Project Class

**6.** This is the last wizard to map the content of some rows of the **ISBSG** data to the content of **Function Point Modeler** data model. In this wizard you see on the left side the tree of **Function Point Modeler** data model and on right side the content of the specified row of the **ISBSG** database. Click the desired table item on the table an drag it from a table to the desired tree item in the tree on left side. The fond of the mapped table items are **Bold** . To delete mapping, click on the desired tree item in the tree. After mapping all table items click on the **Finish** button.



Now you can see the in the **Function Point Modeler** the imported **ISBSG** project and function point size in the **Function Point Modeler** Workspace. All the metrics you have selected and mapped are imported in the **Function Point Modeler** . You can open **Function Point Modeler** Count or Project Editor to show the information.

You will see the imported projects following:

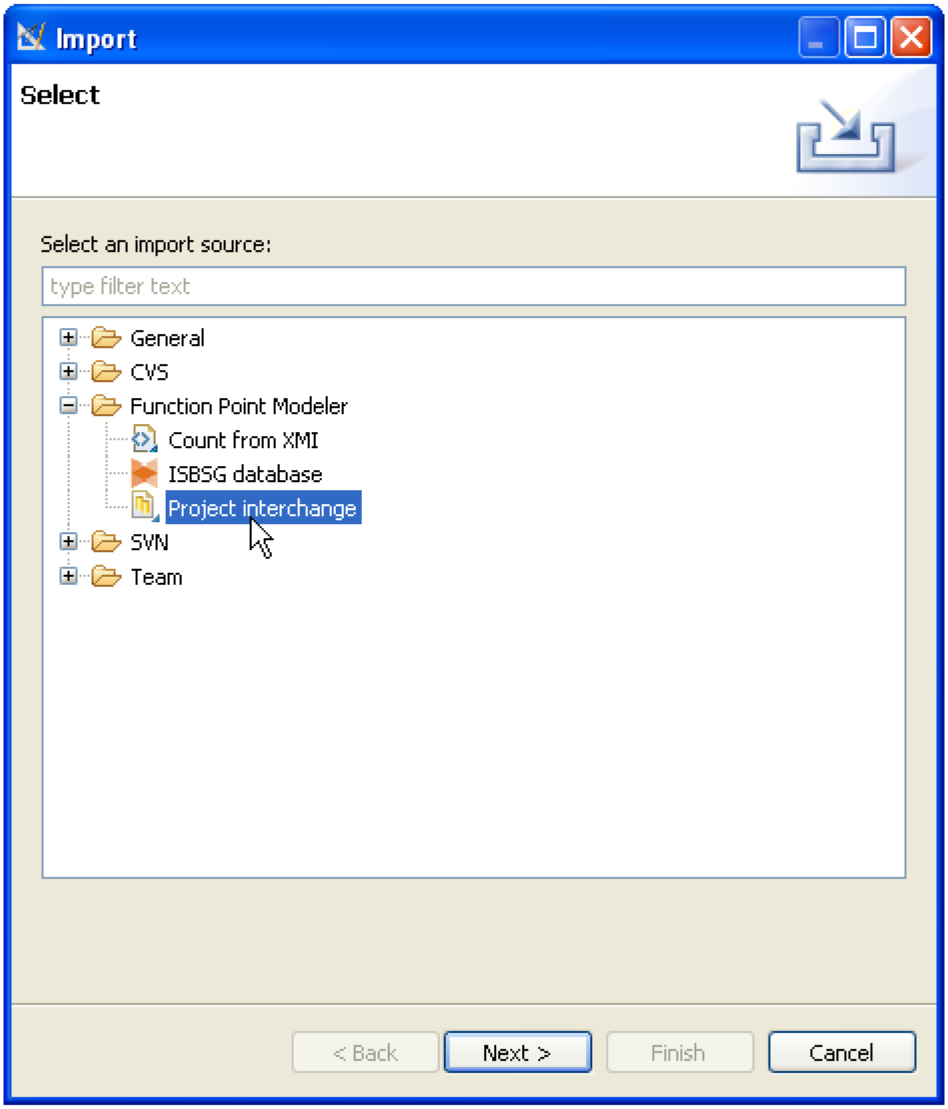


| Property | Value |
|---|---|
| Adjusted Function Point | 357 |
| Count Typ | Development project count |
| Date | 2011-02-23 |

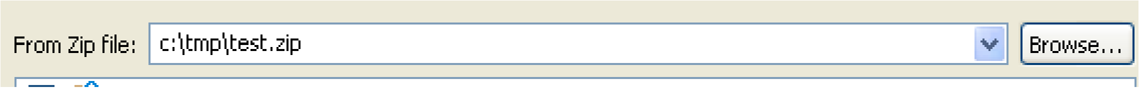
### Import Projects from Project Interchange

To import Projects from Project Interchange format, perform the following steps.

1. Right click inside the **Project Navigator** view and select **Import... > Function Point Modeler > Project Interchange**

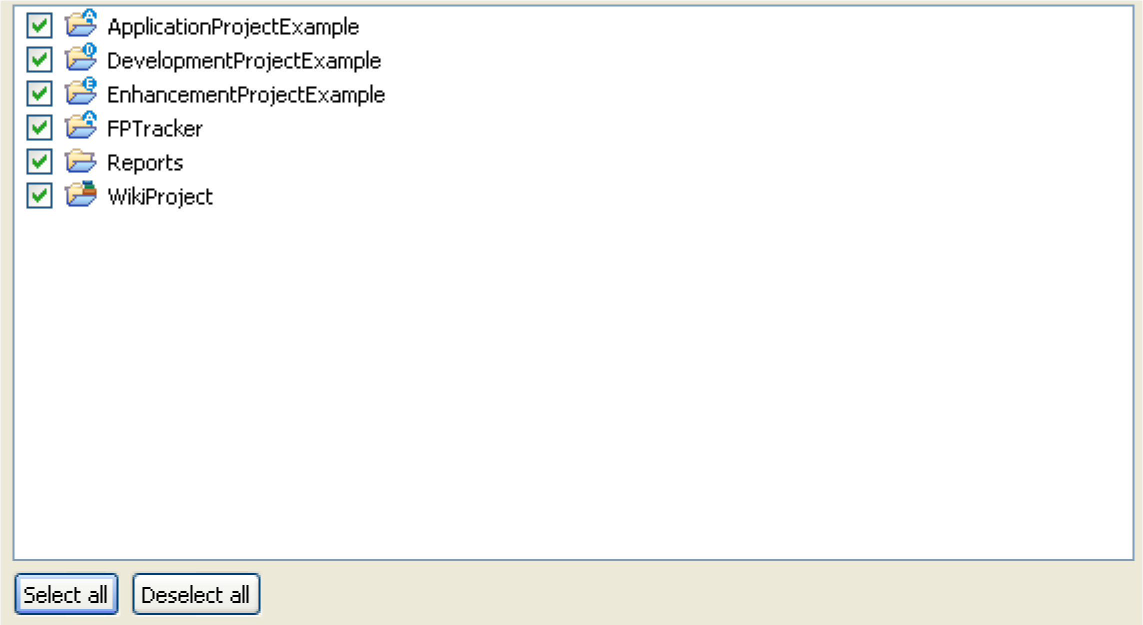


2. Press the **Next** button.
3. Enter a valid Project Interchange file or browse for a location inside your workspace.



From Zip file: c:\tmp\test.zip

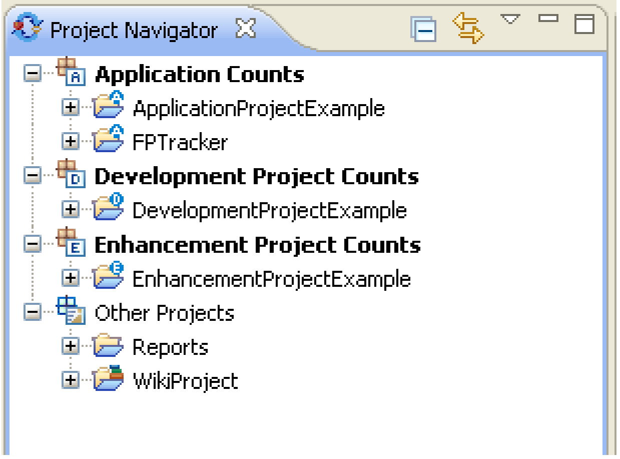
4. Select the projects you want to import. It's also possible to select or de-select all projects.



☑ ApplicationProjectExample
☑ DevelopmentProjectExample
☑ EnhancementProjectExample
☑ FPTracker
☑ Reports
☑ WikiProject

5. Select the **Finish** when you're finished with your selection.

The selected projects will be added to your workspace.



Project Navigator
Application Counts
ApplicationProjectExample
FPTracker
Development Project Counts
DevelopmentProjectExample
Enhancement Project Counts
EnhancementProjectExample
Other Projects
Reports
WikiProject

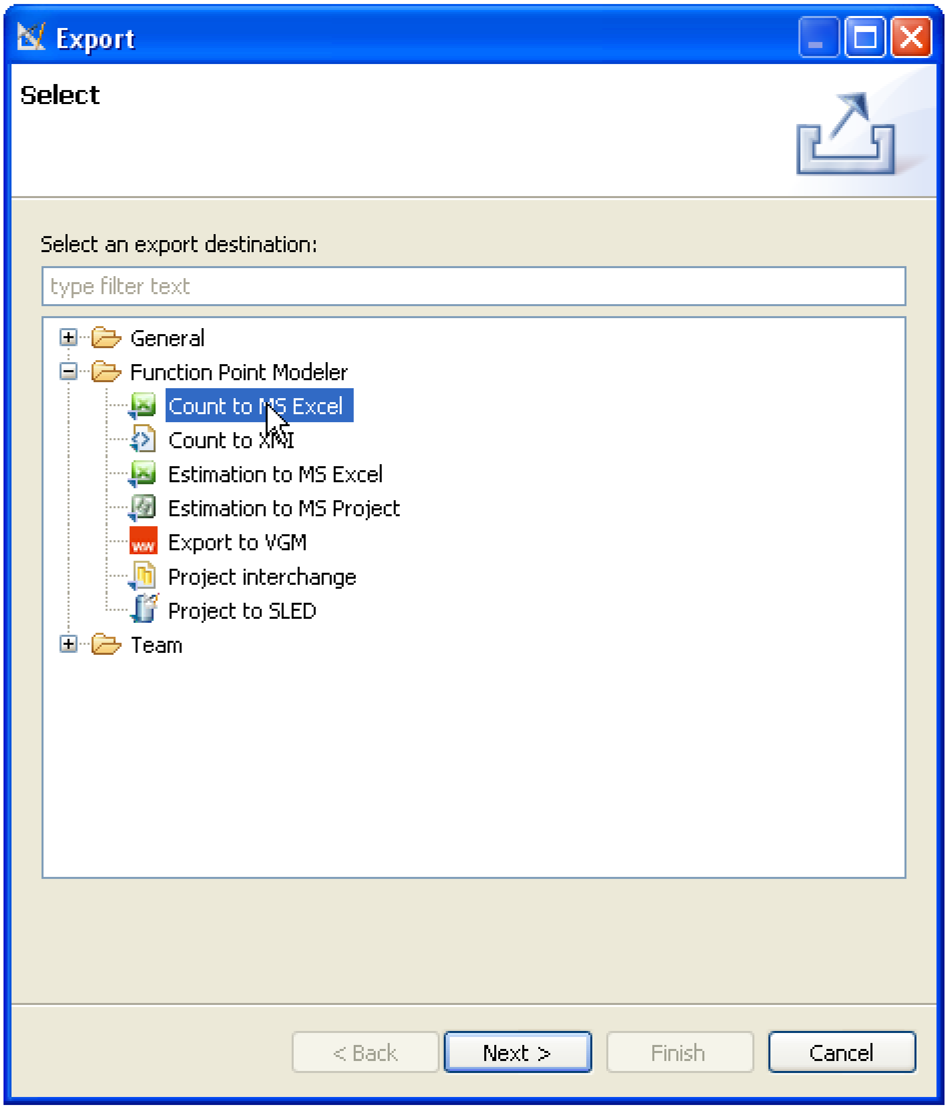
## Exporting

### Export Count to MS Excel

Enterprise Edition

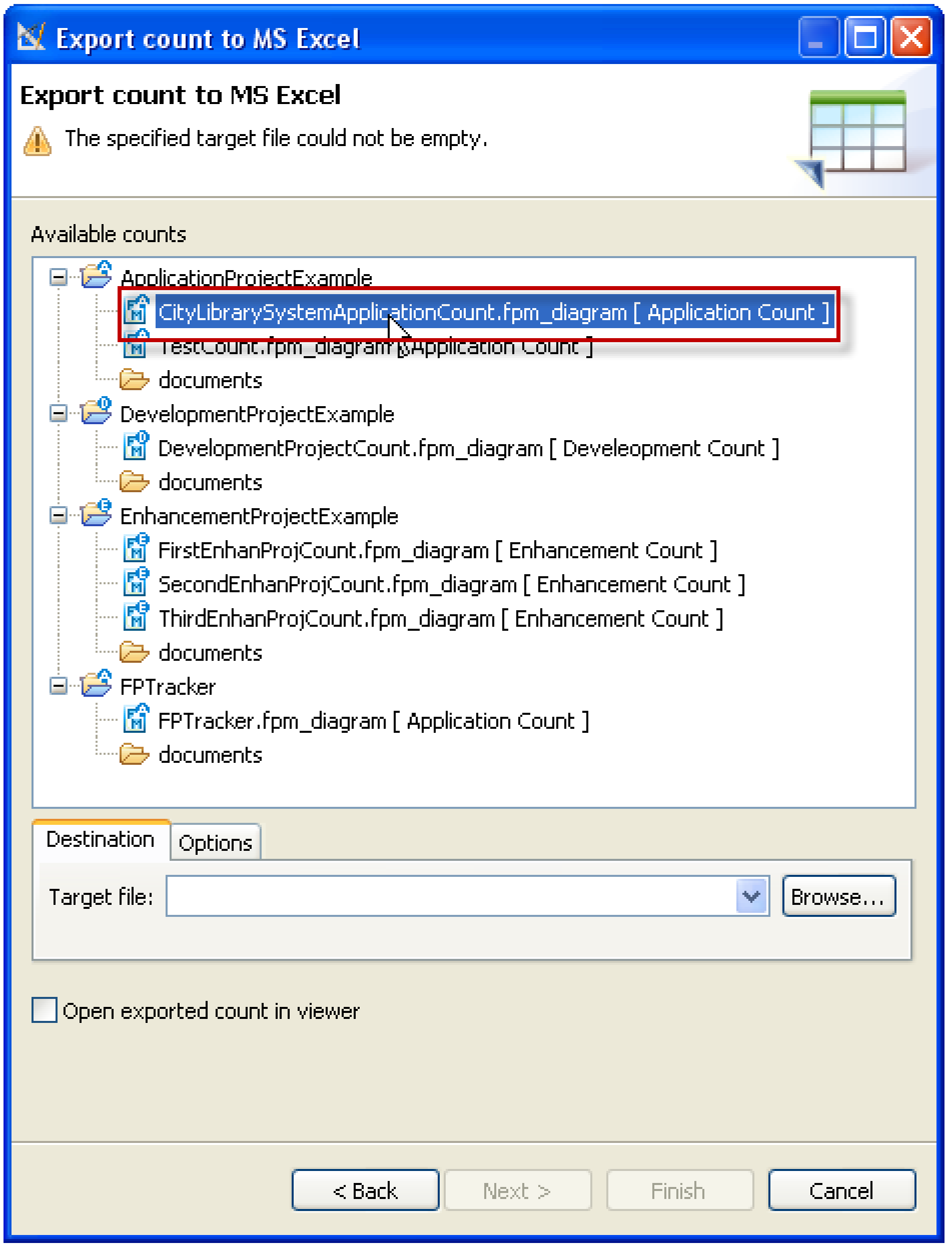
To export a Count to an MS Excel file, perform the following steps.

1. Right click inside the **Project Navigator** view and select **Export... > Function Point Modeler > Count to MS Excel**



**2.** Press the **Next** button.

**3.** Select the Count you want to export from the list of available Counts.



Export count to MS Excel

Export count to MS Excel

The specified target file could not be empty.

Available counts

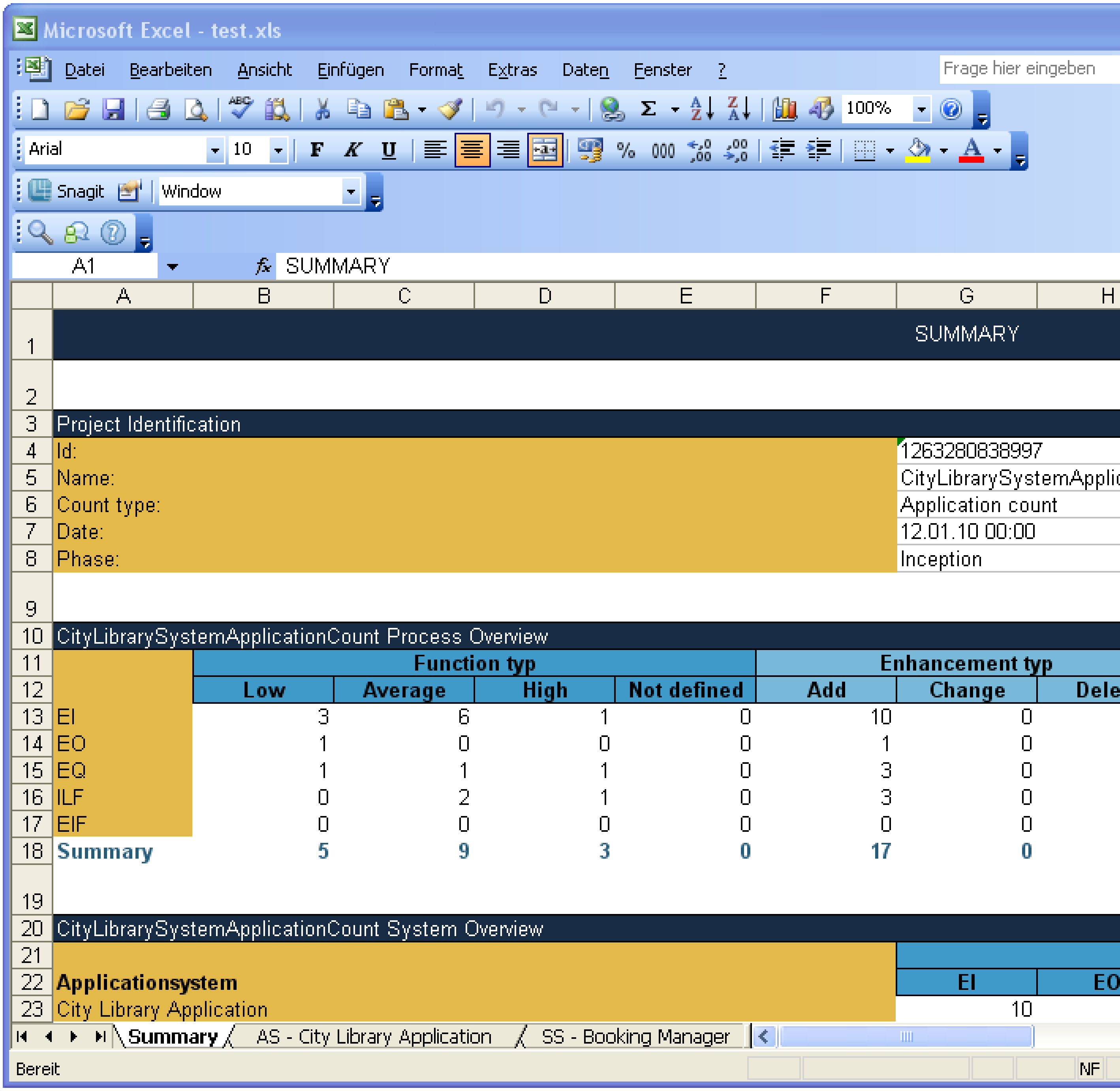
- ApplicationProjectExample
  - CityLibrarySystemApplicationCount.fpm_diagram [ Application Count ]
  - TestCount.fpm_diagram [ Application Count ]
  - documents
- DevelopmentProjectExample
  - DevelopmentProjectCount.fpm_diagram [ Develeopment Count ]
  - documents
- EnhancementProjectExample
  - FirstEnhanProjCount.fpm_diagram [ Enhancement Count ]
  - SecondEnhanProjCount.fpm_diagram [ Enhancement Count ]
  - ThirdEnhanProjCount.fpm_diagram [ Enhancement Count ]
  - documents
- FPTracker
  - FPTracker.fpm_diagram [ Application Count ]
  - documents

Target file:

□ Open exported count in viewer

4. Enter a valid target file e.g. C:\Temp\Test.xls or browse for a file location.
5. Switch to the Options Tab if you want to change your target file version.
6. Select option **Open exported count in viewer** if you want to automatically open the new created file in the designated viewer.
7. Press the **Finish** button

A new MS Excel file will be created.



SUMMARY

Project Identification

| | |
|---|---|
| Id: | 1263280838997 |
| Name: | CityLibrarySystemApplic |
| Count type: | Application count |
| Date: | 12.01.10 00:00 |
| Phase: | Inception |

CityLibrarySystemApplicationCount Process Overview

| | Function typ | | | | Enhancement typ | | |
|---|---|---|---|---|---|---|---|
| | Low | Average | High | Not defined | Add | Change | Dele |
| EI | 3 | 6 | 1 | 0 | 10 | 0 | |
| EO | 1 | 0 | 0 | 0 | 1 | 0 | |
| EQ | 1 | 1 | 1 | 0 | 3 | 0 | |
| ILF | 0 | 2 | 1 | 0 | 3 | 0 | |
| EIF | 0 | 0 | 0 | 0 | 0 | 0 | |
| **Summary** | **5** | **9** | **3** | **0** | **17** | **0** | |

CityLibrarySystemApplicationCount System Overview

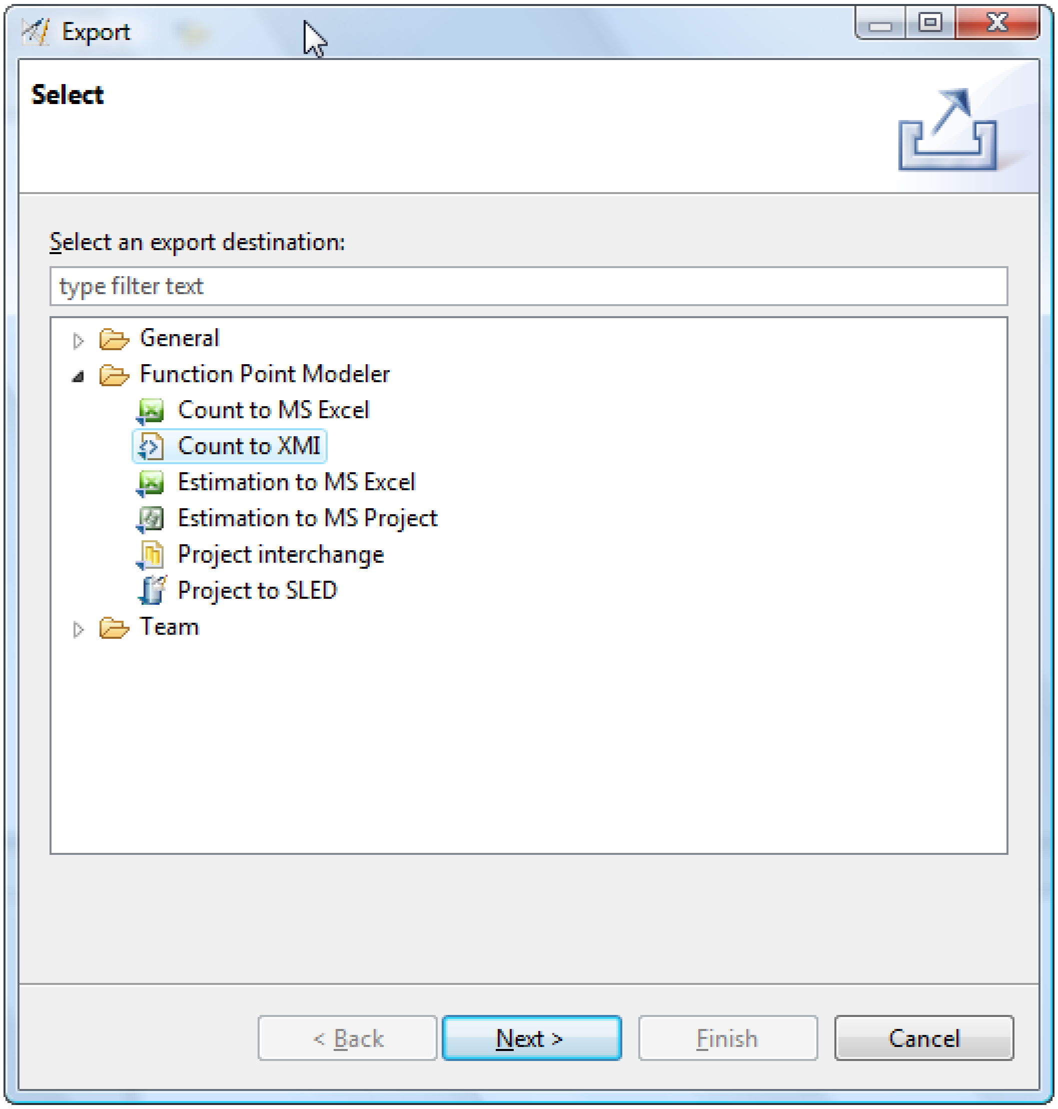
| | | |
|---|---|---|
| **Applicationsystem** | **EI** | **EO** |
| City Library Application | 10 | |

### Export Count to XMI

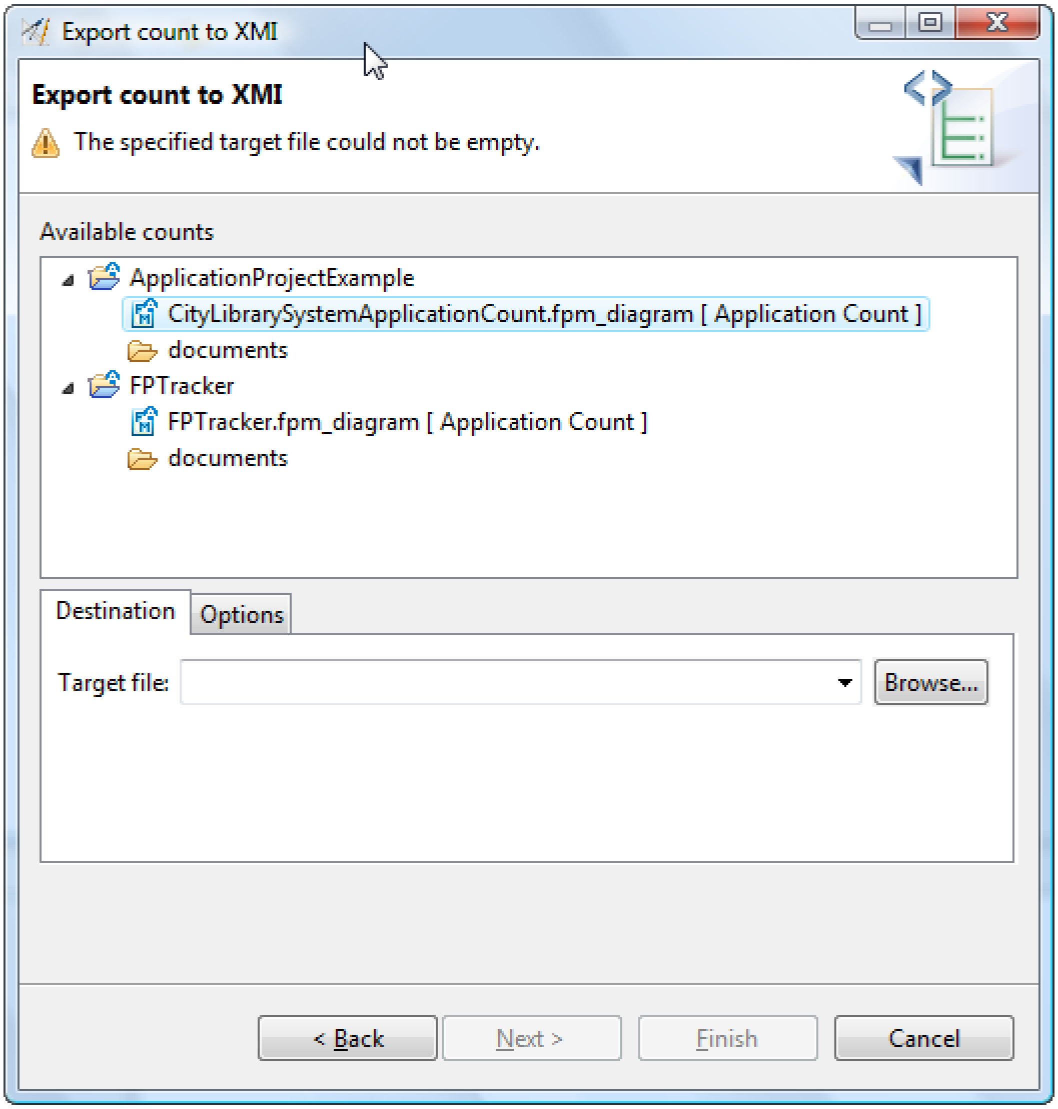
Enterprise Edition

To export a Count to an XMI file, perform the following steps.

1. Right click inside the **Project Navigator** view and select **Export... > Function Point Modeler > Count to XMI**



2. Press the **Next** button.
3. Select the Count you want to export from the list of available Counts.



Export count to XMI

Export count to XMI

The specified target file could not be empty.

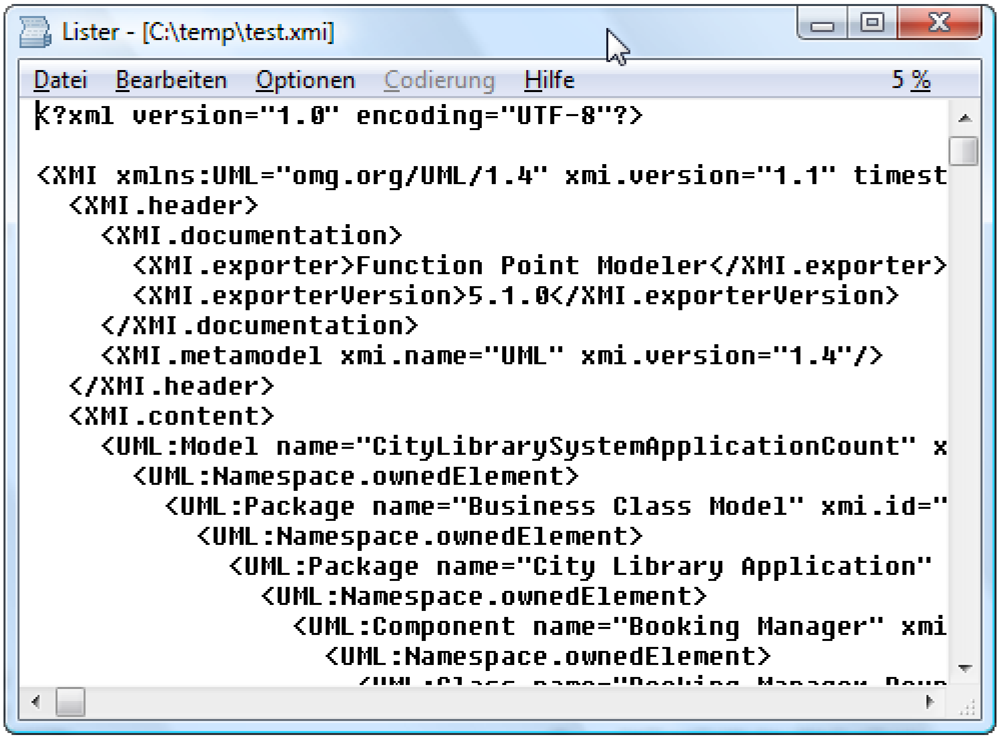
Available counts

- ApplicationProjectExample
  - CityLibrarySystemApplicationCount.fpm_diagram [ Application Count ]
  - documents
- FPTracker
  - FPTracker.fpm_diagram [ Application Count ]
  - documents

Target file:

4. Enter a valid target file e.g. C:\Temp\Test.xmi or browse for a file location.
5. Switch to the Options Tab if you want to change the XMI version version.
6. Select Target Model Typ you wish to export.
7. Press the **Finish** button

A new XMI file will be created.



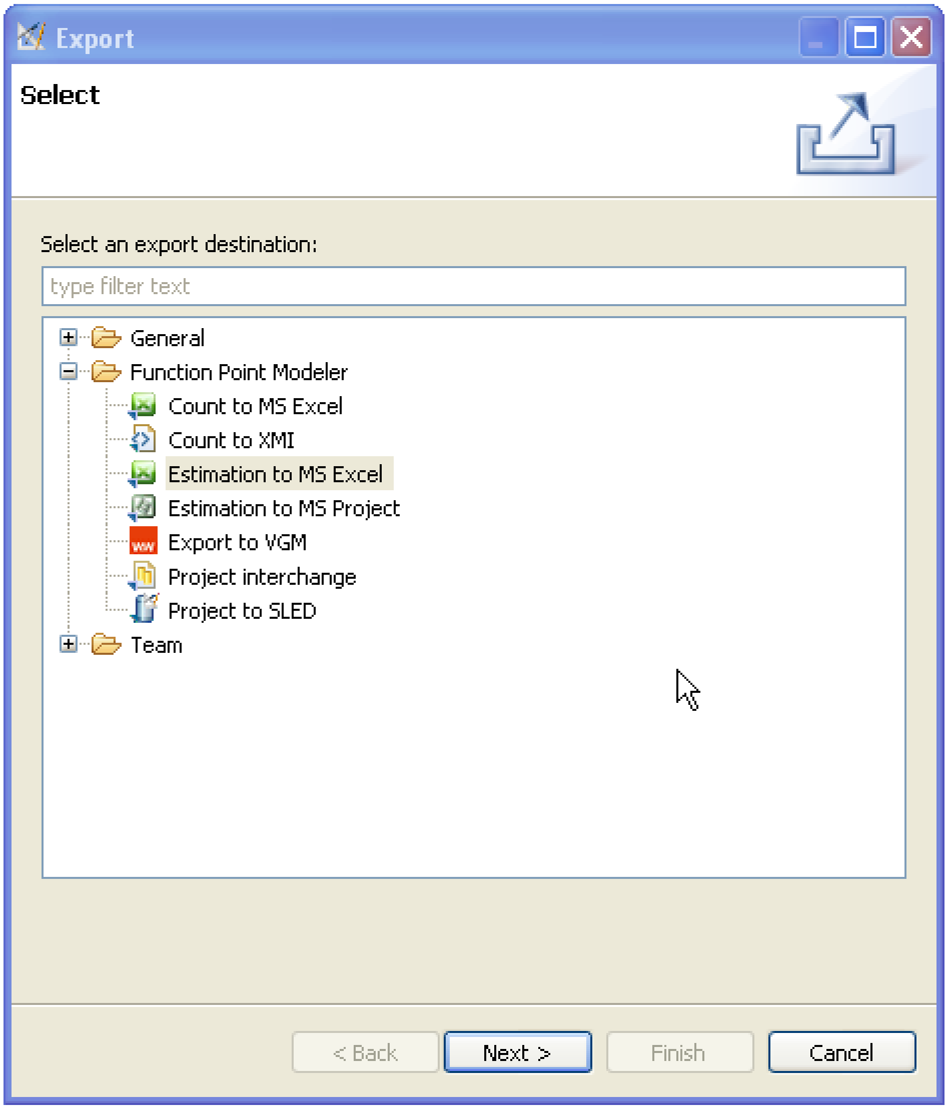
```
<?xml version="1.0" encoding="UTF-8"?>

<XMI xmlns:UML="omg.org/UML/1.4" xmi.version="1.1" timest
  <XMI.header>
    <XMI.documentation>
      <XMI.exporter>Function Point Modeler</XMI.exporter>
      <XMI.exporterVersion>5.1.0</XMI.exporterVersion>
    </XMI.documentation>
    <XMI.metamodel xmi.name="UML" xmi.version="1.4"/>
  </XMI.header>
  <XMI.content>
    <UML:Model name="CityLibrarySystemApplicationCount" x
      <UML:Namespace.ownedElement>
        <UML:Package name="Business Class Model" xmi.id="
          <UML:Namespace.ownedElement>
            <UML:Package name="City Library Application"
              <UML:Namespace.ownedElement>
                <UML:Component name="Booking Manager" xmi
                  <UML:Namespace.ownedElement>
```

### Export Estimation to MS Excel

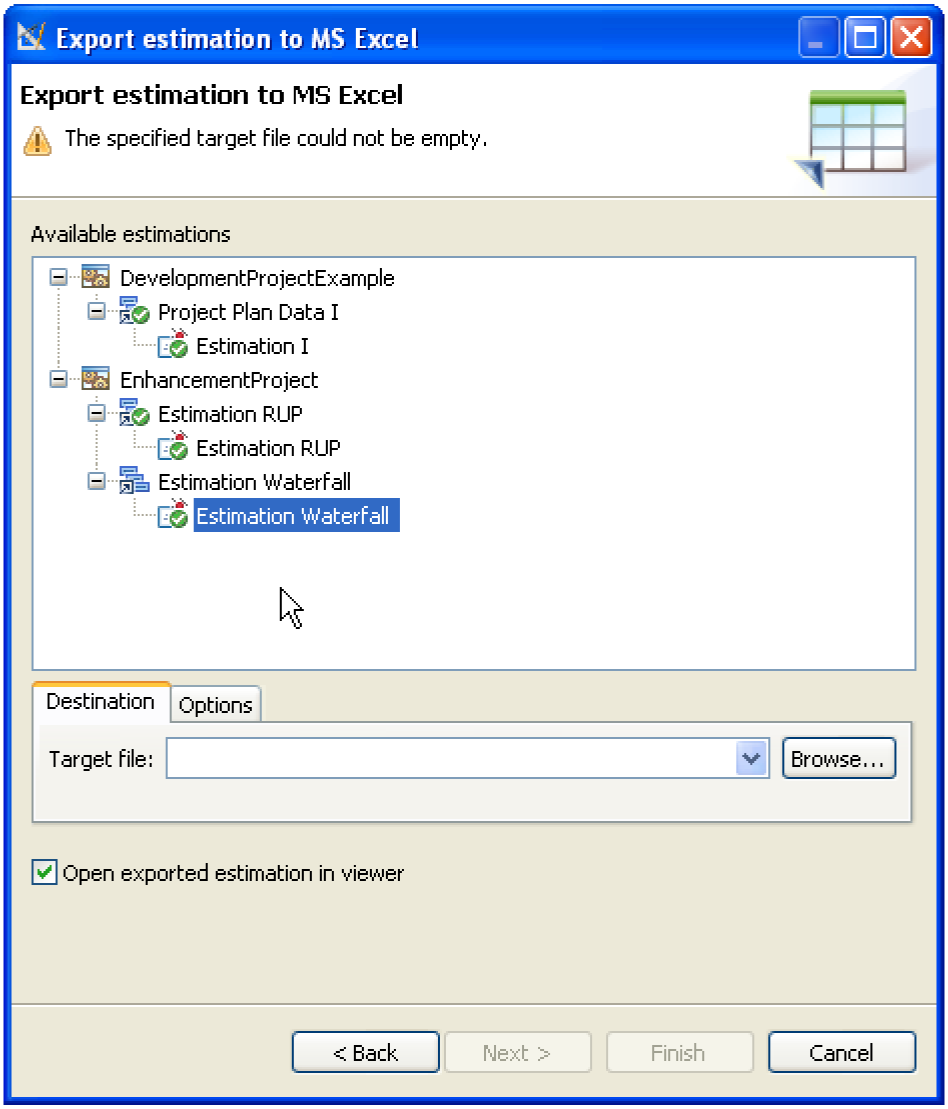
Enterprise Edition

To export a Estimation to an MS Excel file, perform the following steps.

1. Right click inside the **Project Navigator** view and select **Export... > Function Point Modeler > Estimation to MS Excel**



2. Press the **Next** button.
3. Select the Estimation you want to export from the list of available Estimations.



Export estimation to MS Excel

The specified target file could not be empty.

Available estimations

- DevelopmentProjectExample
  - Project Plan Data I
    - Estimation I
- EnhancementProject
  - Estimation RUP
    - Estimation RUP
  - Estimation Waterfall
    - Estimation Waterfall

Target file:

☑ Open exported estimation in viewer

**4.** Enter a valid target file e.g. C:\Temp\Test.xls or browse for a file location.

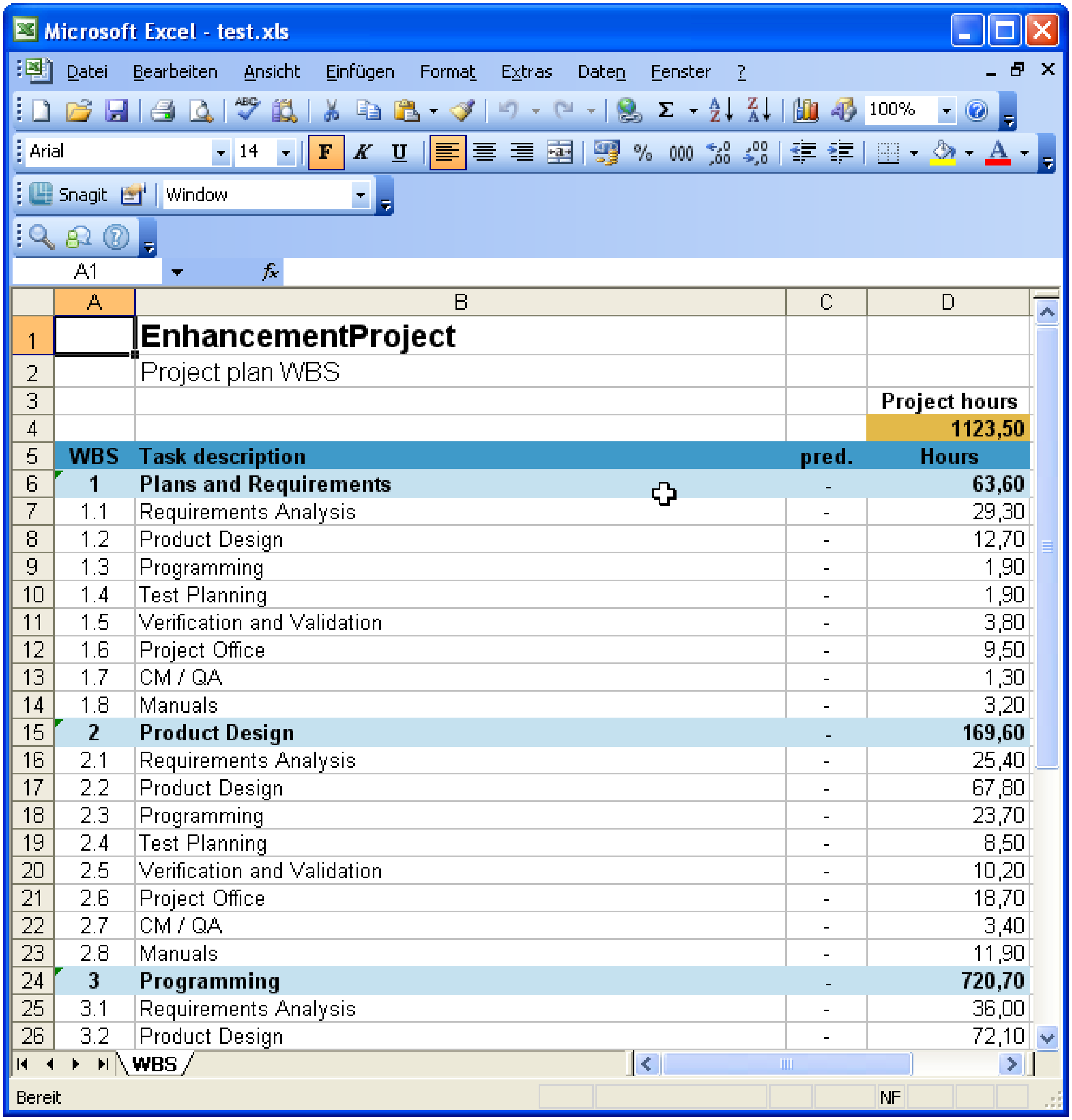
**5.** Switch to the Options Tab if you want to change the Excel version.

**6.** Select Target Model Typ you wish to export.

**7.** Select option **Open exported count in viewer** if you want to automatically open the new created file in the designated viewer.

**8.** Press the **Finish** button

A new MS Excel file will be created.



EnhancementProject

Project plan WBS

Project hours

1123,50

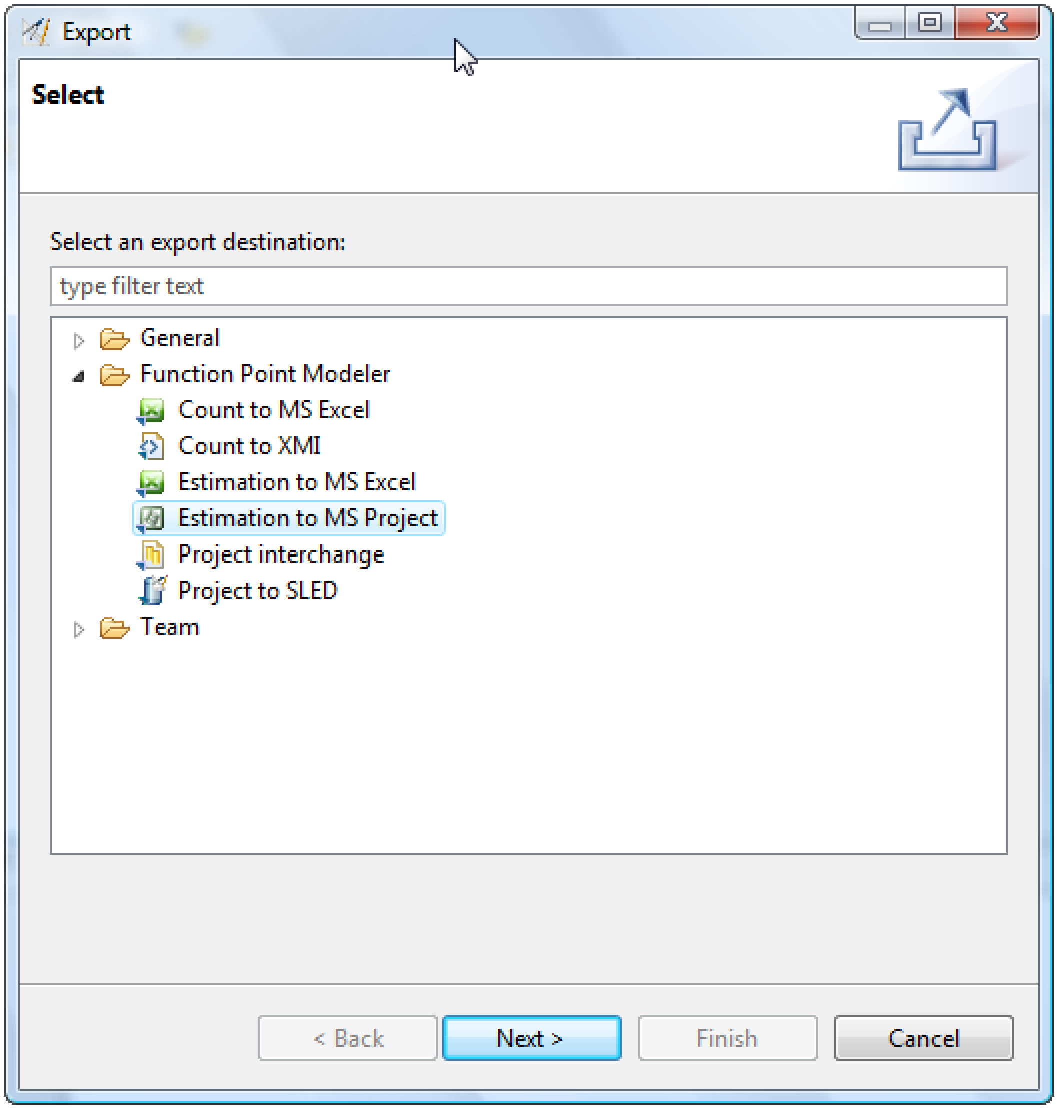
| WBS | Task description | pred. | Hours |
|---|---|---|---|
| 1 | Plans and Requirements | - | 63,60 |
| 1.1 | Requirements Analysis | - | 29,30 |
| 1.2 | Product Design | - | 12,70 |
| 1.3 | Programming | - | 1,90 |
| 1.4 | Test Planning | - | 1,90 |
| 1.5 | Verification and Validation | - | 3,80 |
| 1.6 | Project Office | - | 9,50 |
| 1.7 | CM / QA | - | 1,30 |
| 1.8 | Manuals | - | 3,20 |
| 2 | Product Design | - | 169,60 |
| 2.1 | Requirements Analysis | - | 25,40 |
| 2.2 | Product Design | - | 67,80 |
| 2.3 | Programming | - | 23,70 |
| 2.4 | Test Planning | - | 8,50 |
| 2.5 | Verification and Validation | - | 10,20 |
| 2.6 | Project Office | - | 18,70 |
| 2.7 | CM / QA | - | 3,40 |
| 2.8 | Manuals | - | 11,90 |
| 3 | Programming | - | 720,70 |
| 3.1 | Requirements Analysis | - | 36,00 |
| 3.2 | Product Design | - | 72,10 |

### Export Estimation to MS Project

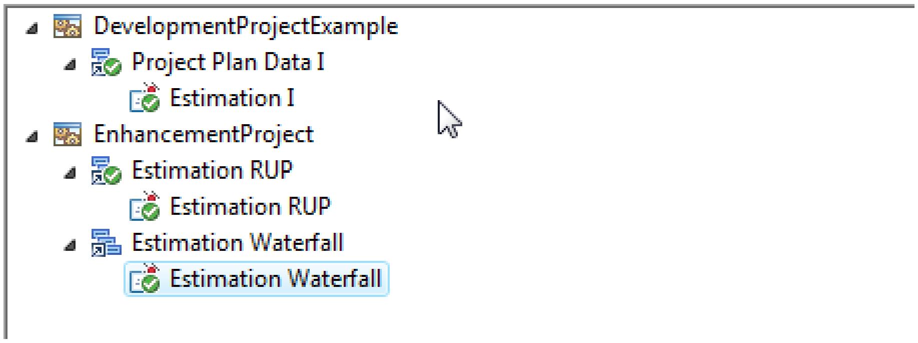
Enterprise Edition

To export a Estimation to an MS Project file, perform the following steps.

1. Right click inside the **Project Navigator** view and select **Export... > Function Point Modeler > Estimation to MS Project**

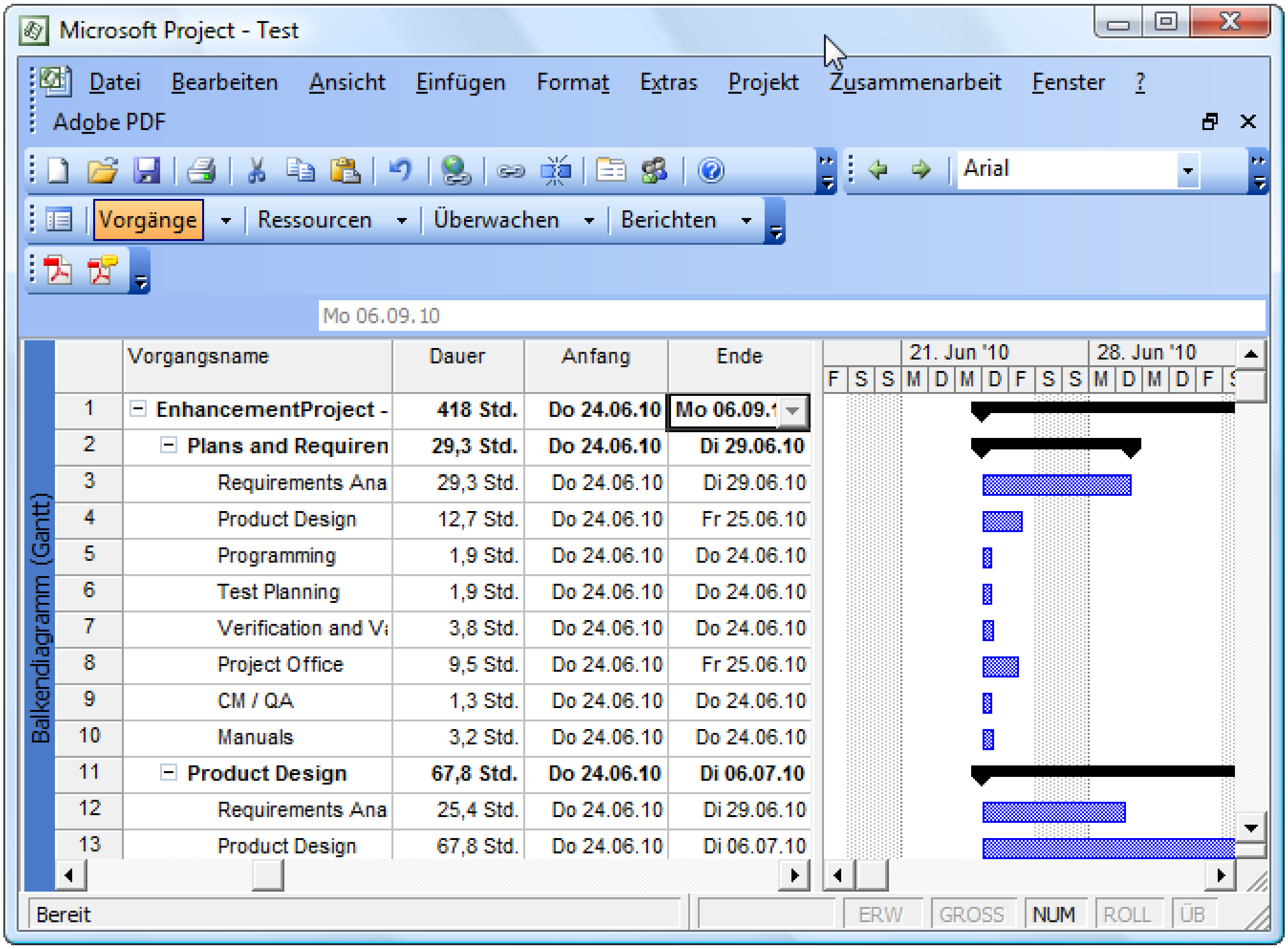


2. Press the **Next** button.
3. Select the Estimation you want to export from the list of available Estimations.



4. Enter a valid target file e.g. C:\Temp\Test.xls or browse for a file location.
5. Switch to the Options Tab if you want to change the MS Project version.
6. Select the Target Model Typ you wish to export.
7. Press the **Finish** button

A new MS Project file will be created.

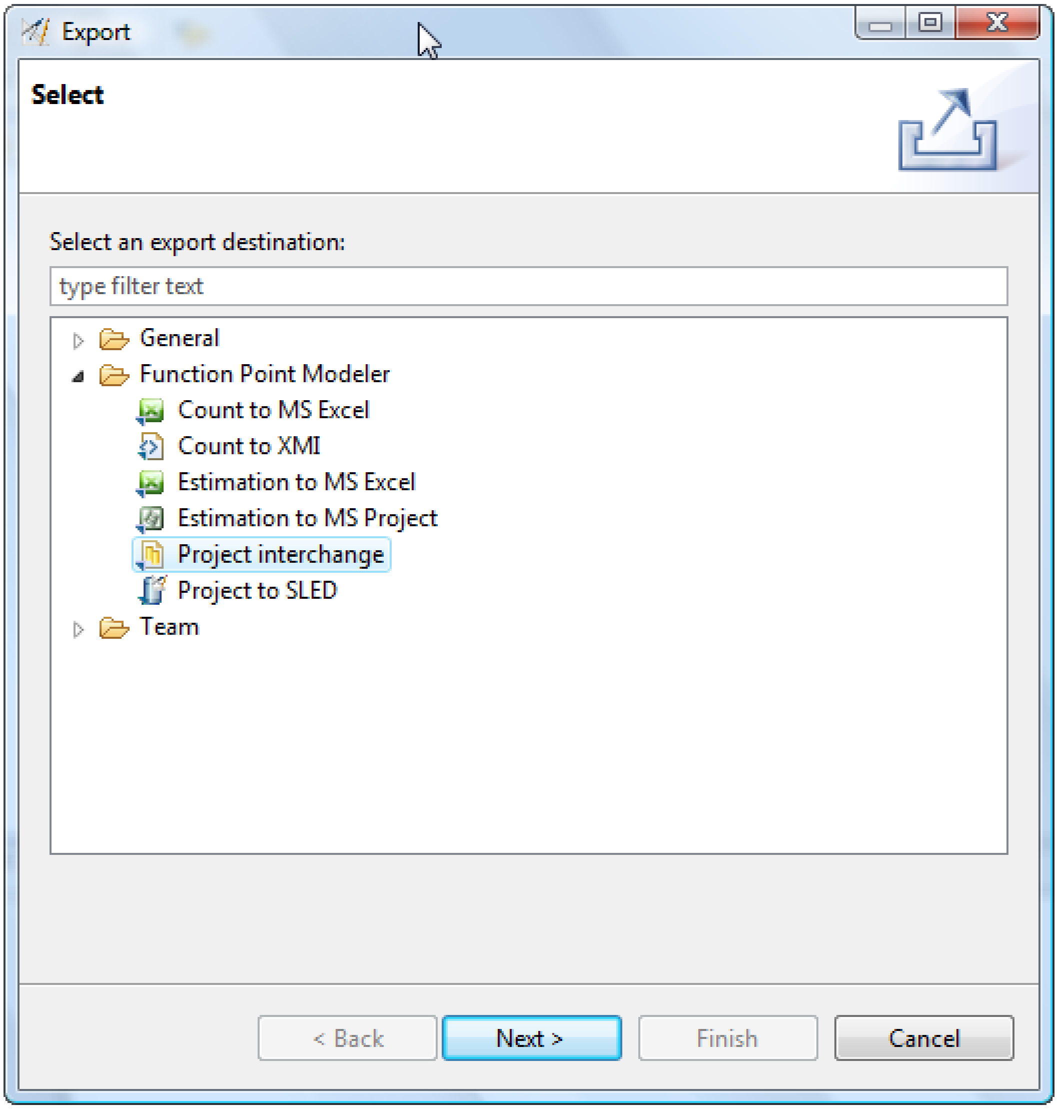


| | Vorgangsname | Dauer | Anfang | Ende |
|---|---|---|---|---|
| 1 | EnhancementProject - | 418 Std. | Do 24.06.10 | Mo 06.09.1 |
| 2 | Plans and Requiren | 29,3 Std. | Do 24.06.10 | Di 29.06.10 |
| 3 | Requirements Ana | 29,3 Std. | Do 24.06.10 | Di 29.06.10 |
| 4 | Product Design | 12,7 Std. | Do 24.06.10 | Fr 25.06.10 |
| 5 | Programming | 1,9 Std. | Do 24.06.10 | Do 24.06.10 |
| 6 | Test Planning | 1,9 Std. | Do 24.06.10 | Do 24.06.10 |
| 7 | Verification and Va | 3,8 Std. | Do 24.06.10 | Do 24.06.10 |
| 8 | Project Office | 9,5 Std. | Do 24.06.10 | Fr 25.06.10 |
| 9 | CM / QA | 1,3 Std. | Do 24.06.10 | Do 24.06.10 |
| 10 | Manuals | 3,2 Std. | Do 24.06.10 | Do 24.06.10 |
| 11 | Product Design | 67,8 Std. | Do 24.06.10 | Di 06.07.10 |
| 12 | Requirements Ana | 25,4 Std. | Do 24.06.10 | Di 29.06.10 |
| 13 | Product Design | 67,8 Std. | Do 24.06.10 | Di 06.07.10 |

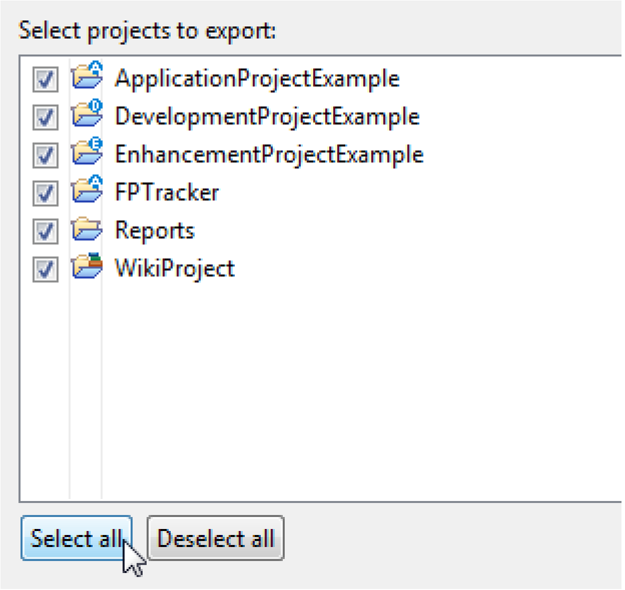
### Export Projects to Project Interchange

To export Projects to Project Interchange format, perform the following steps.

1. Right click inside the **Project Navigator** view and select **Export... > Function Point Modeler > Project Interchange**



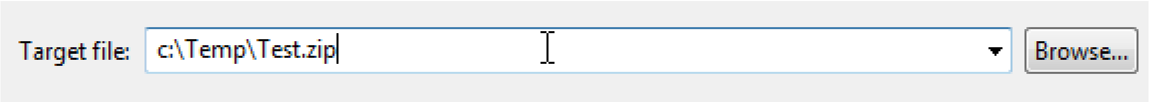
2. Press the **Next** button.
3. Select the projects you want to export. It's also possible to select or de-select all projects.



Select projects to export:

☑ ApplicationProjectExample
☑ DevelopmentProjectExample
☑ EnhancementProjectExample
☑ FPTracker
☑ Reports
☑ WikiProject

4. Enter a valid target file e.g. c:\Temp\Test.zip or browse for a file location.



Target file: c:\Temp\Test.zip

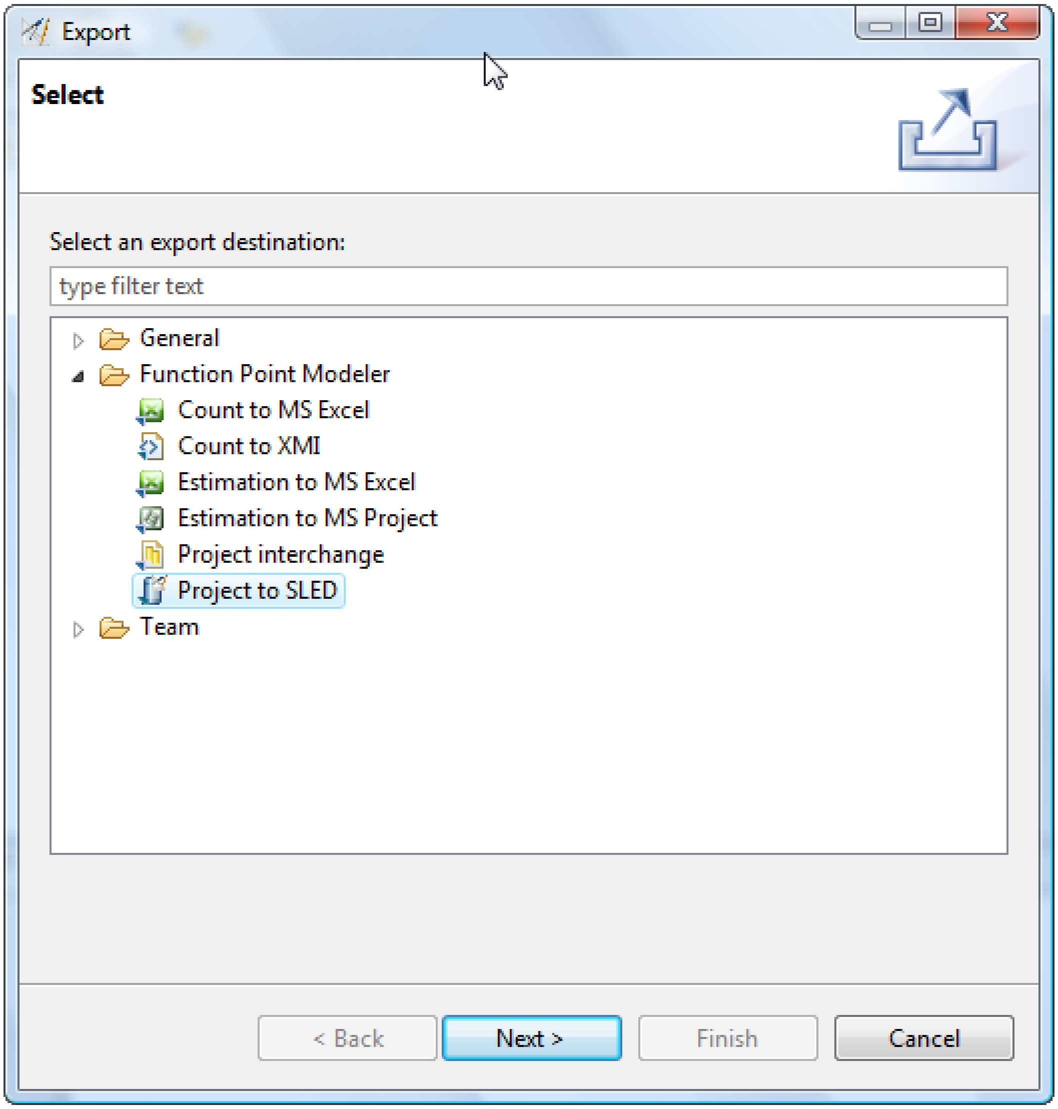
5. Select the **Finish** when you're finished with your selection.

### Export Projects to SLED

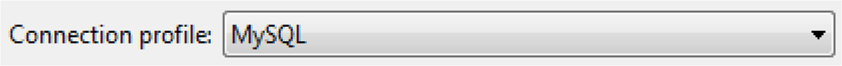
Enterprise Edition

To export Projects to a SLED database, perform the following steps.

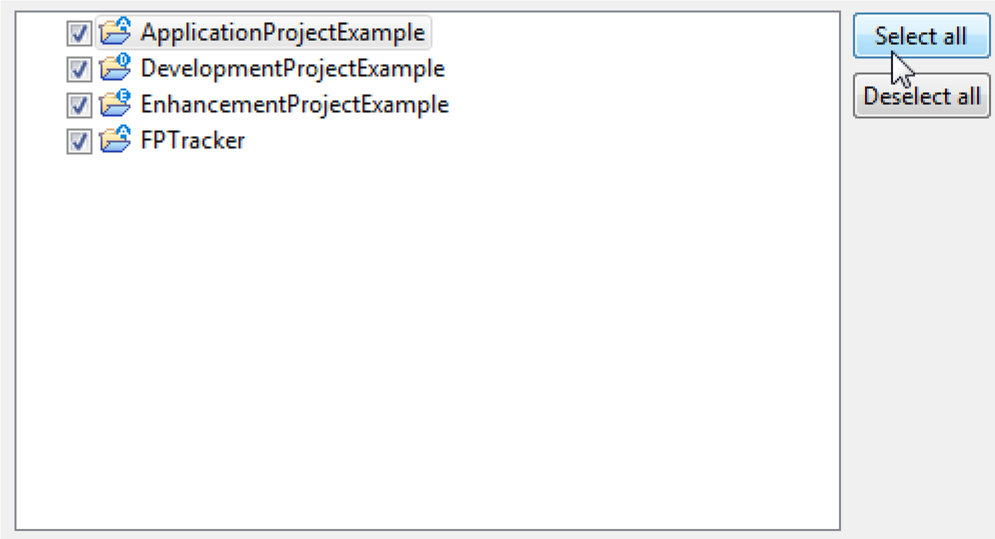
1. Right click inside the **Project Navigator** view and select **Export... > Function Point Modeler > Project to SLED**



2. Press the **Next** button.
3. Select an available SLED connection. Only activated connections are available for selection.

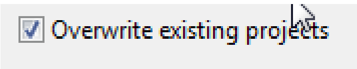

Connection profile: MySQL

4. Select the Projects you want to export from the list of available Projects. It's also possible to select or de-select all Projects at once.



☑ ApplicationProjectExample
☑ DevelopmentProjectExample
☑ EnhancementProjectExample
☑ FPTracker

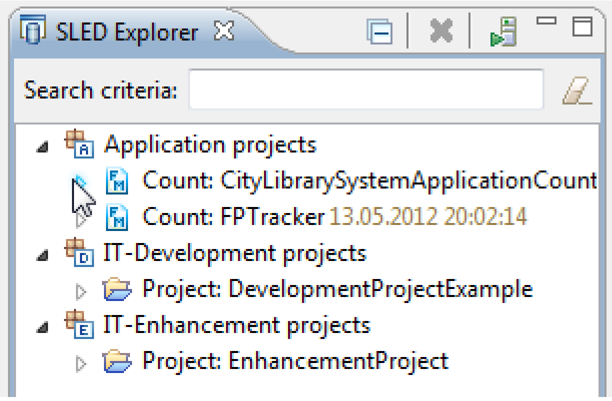
5. Enable checkbox **Overwrite existing projects** if you want to overwrite existing projects in SLED without rückfrage.



☑ Overwrite existing projects

6. Press the **Finish** button

The selected Projects will be exported to the SLED database.



Search criteria:

- Application projects
  - Count: CityLibrarySystemApplicationCount
  - Count: FPTracker 13.05.2012 20:02:14
- IT-Development projects
  - Project: DevelopmentProjectExample
- IT-Enhancement projects
  - Project: EnhancementProject

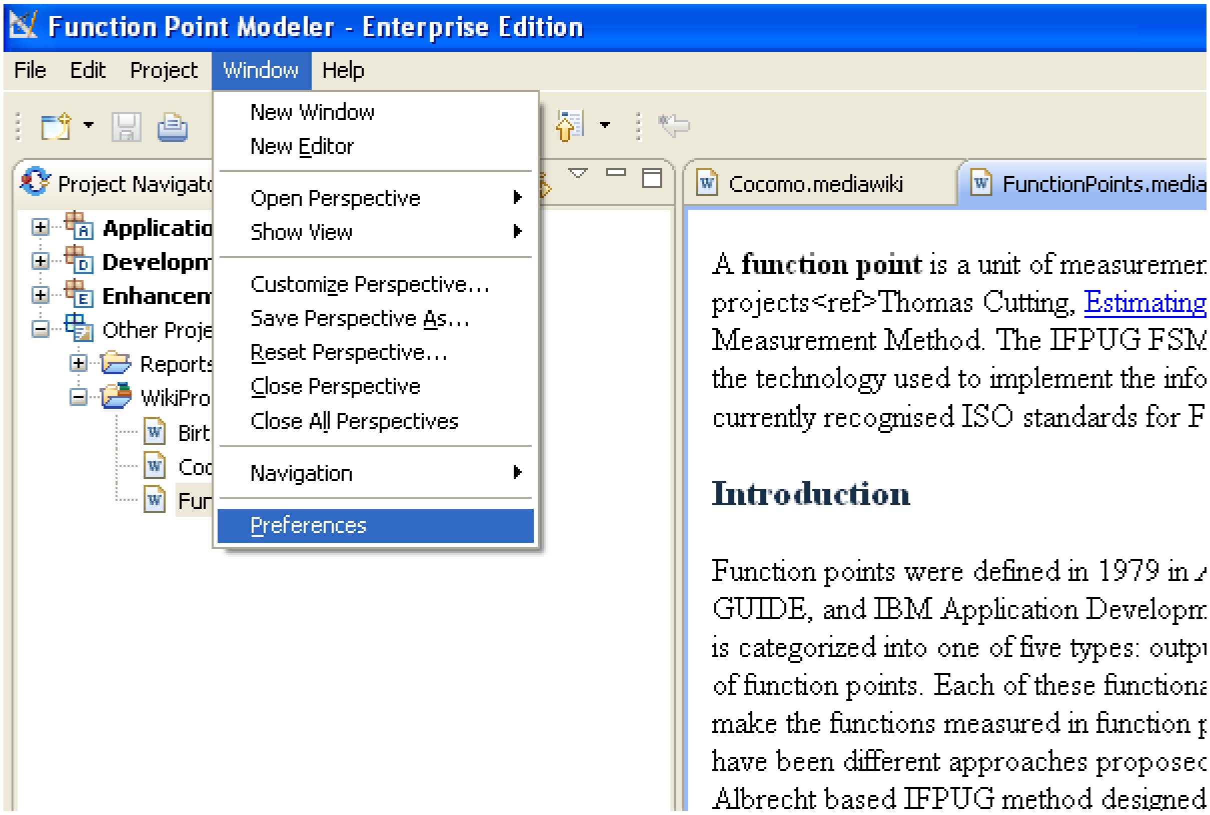
## Working with Cocomo Masterdata

Enterprise Edition

**Function Point Modeler** provides you **COCOMO Masterdata** to customize all parameters of **Function Point Modeler Cocomo Tool**

The default preferences customization is made according to the our advises. But of course each user can change it in the appropriate way to optimize his Cocomo - actually this is the main goal of providing the user such rage of customized preferences.

Select from the menu **Window >Preferences > Function point Modeler > COCOMO Master Data**

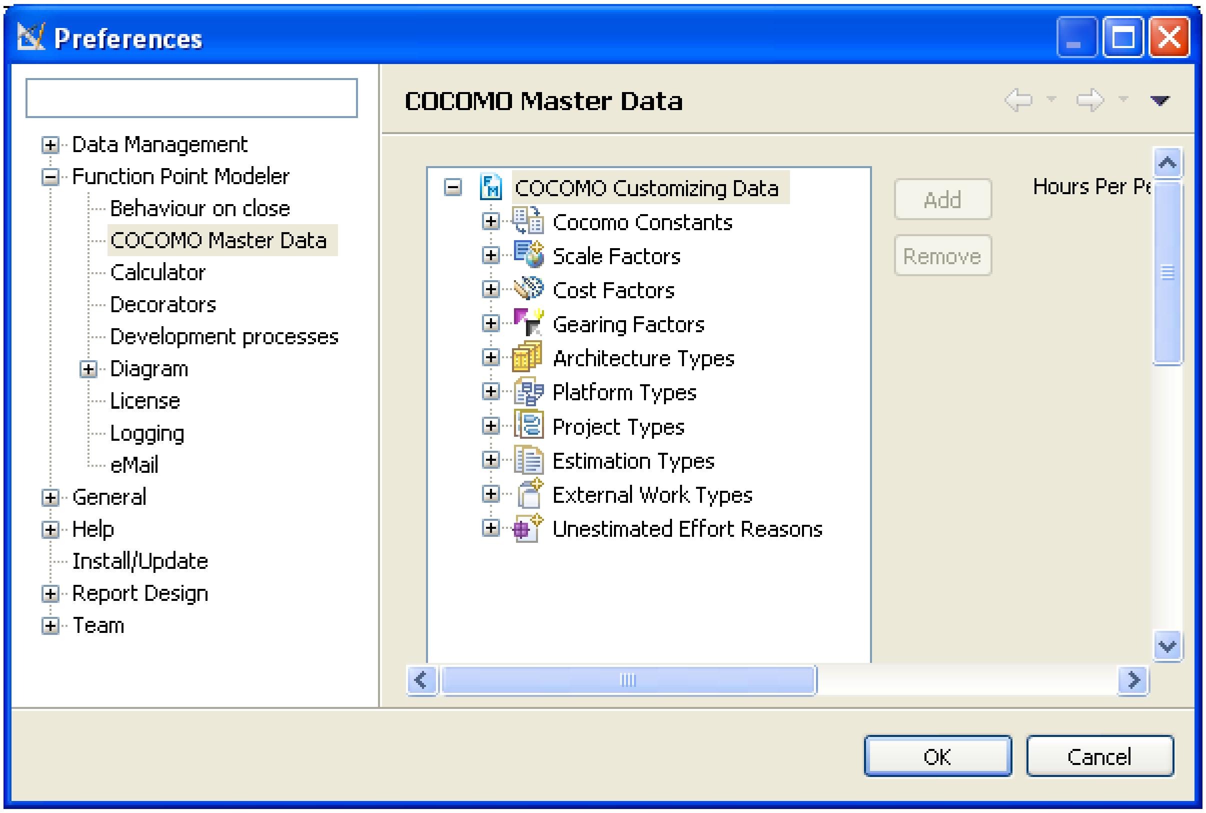


A **function point** is a unit of measuremen
projects<ref>Thomas Cutting, Estimating
Measurement Method. The IFPUG FSM
the technology used to implement the info
currently recognised ISO standards for F

**Introduction**

Function points were defined in 1979 in A
GUIDE, and IBM Application Developm
is categorized into one of five types: outpu
of function points. Each of these function
make the functions measured in function p
have been different approaches proposed
Albrecht based IFPUG method designed

The following dialog will be showed

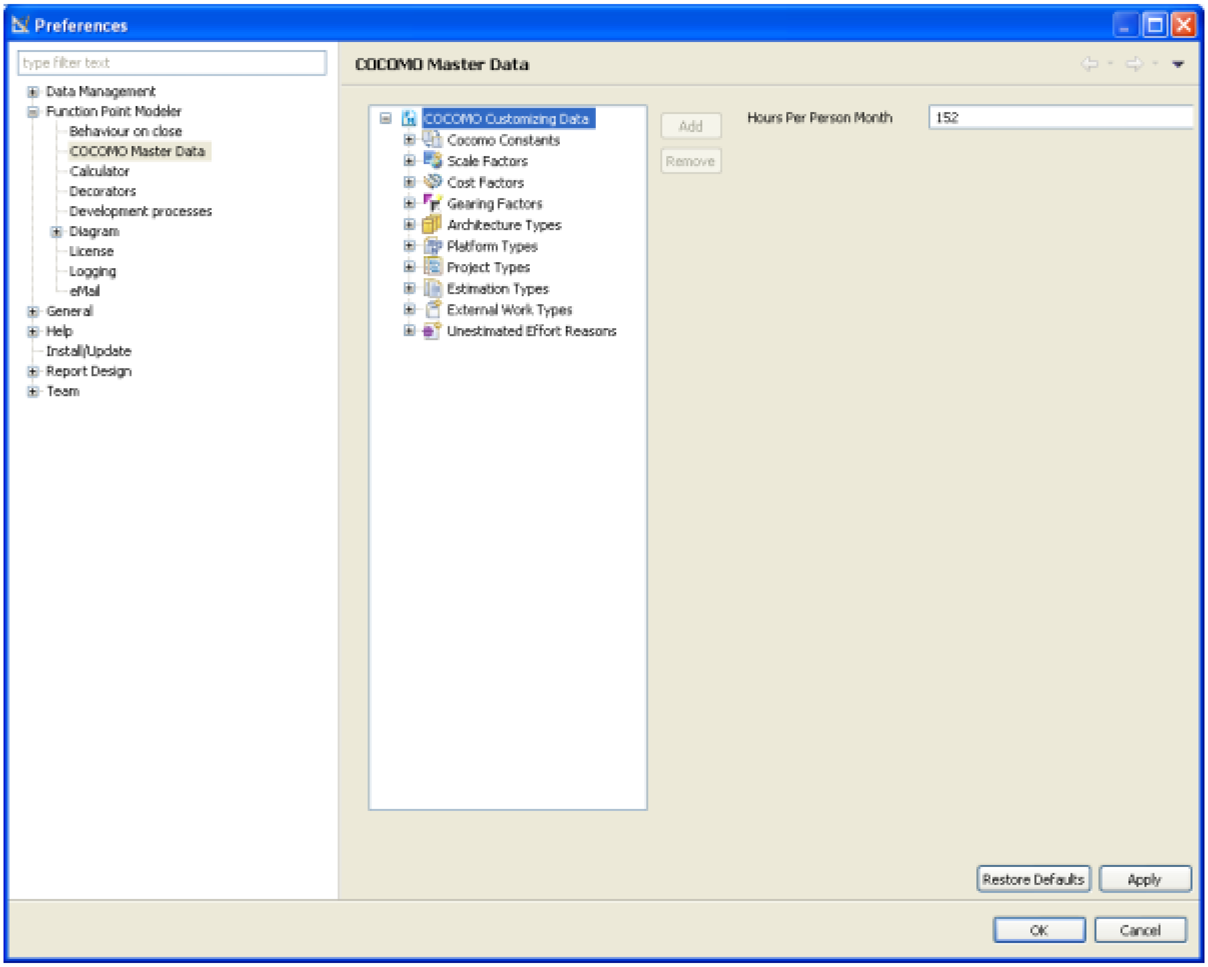


### Change hours/person month

Enterprise Edition

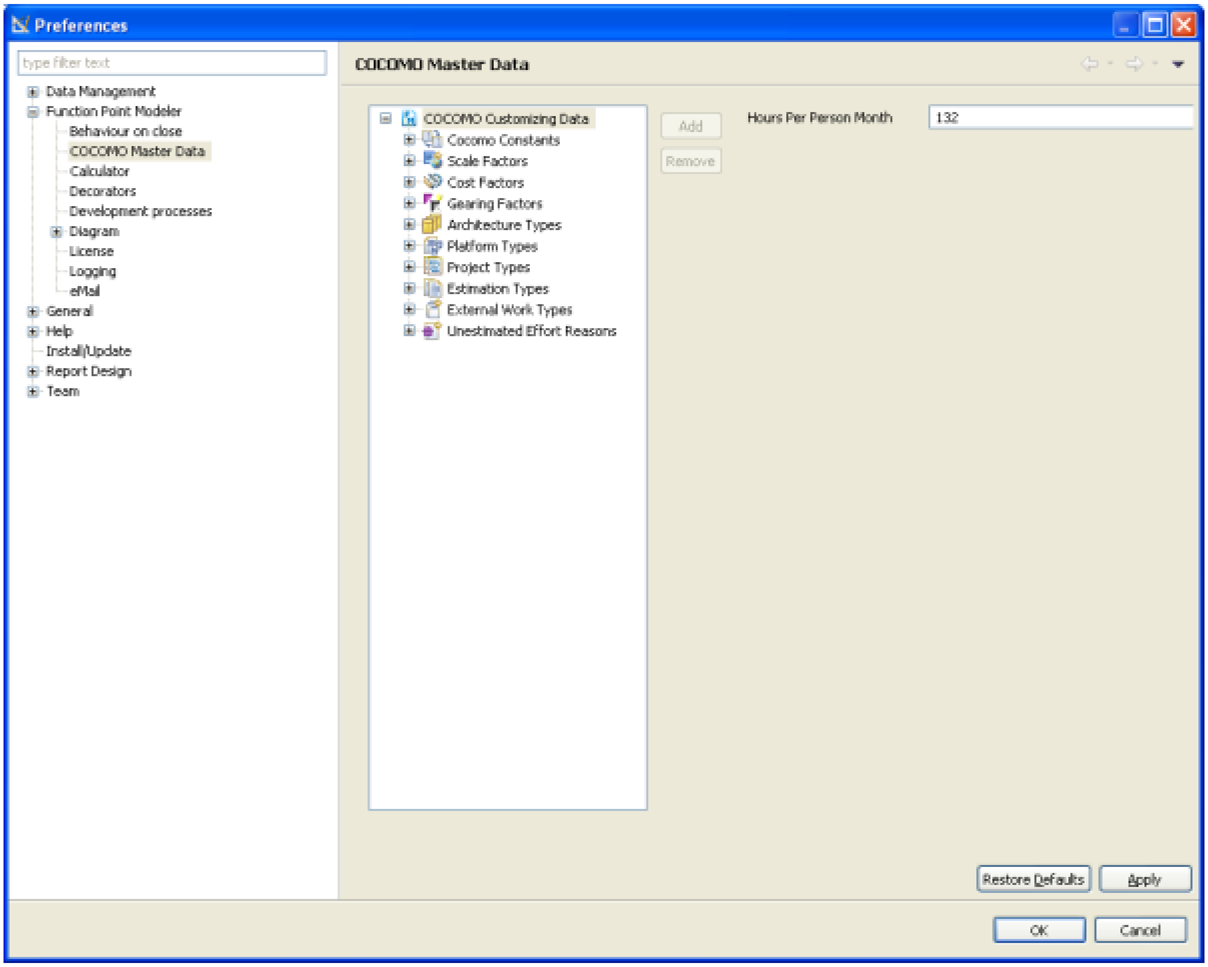
You may change the *hours/person month* specified for your company. The default value of *hours/person month* is **152** hours/month.

1. To change the *hours/person month* click the **COCOMO Customizing Data** leaf of the tree.



Hours Per Person Month: 152

**2.** Enter the *hours/person month* value.



Hours Per Person Month: 132

**3.** To apply the changes click the **Apply** or **Ok** button.

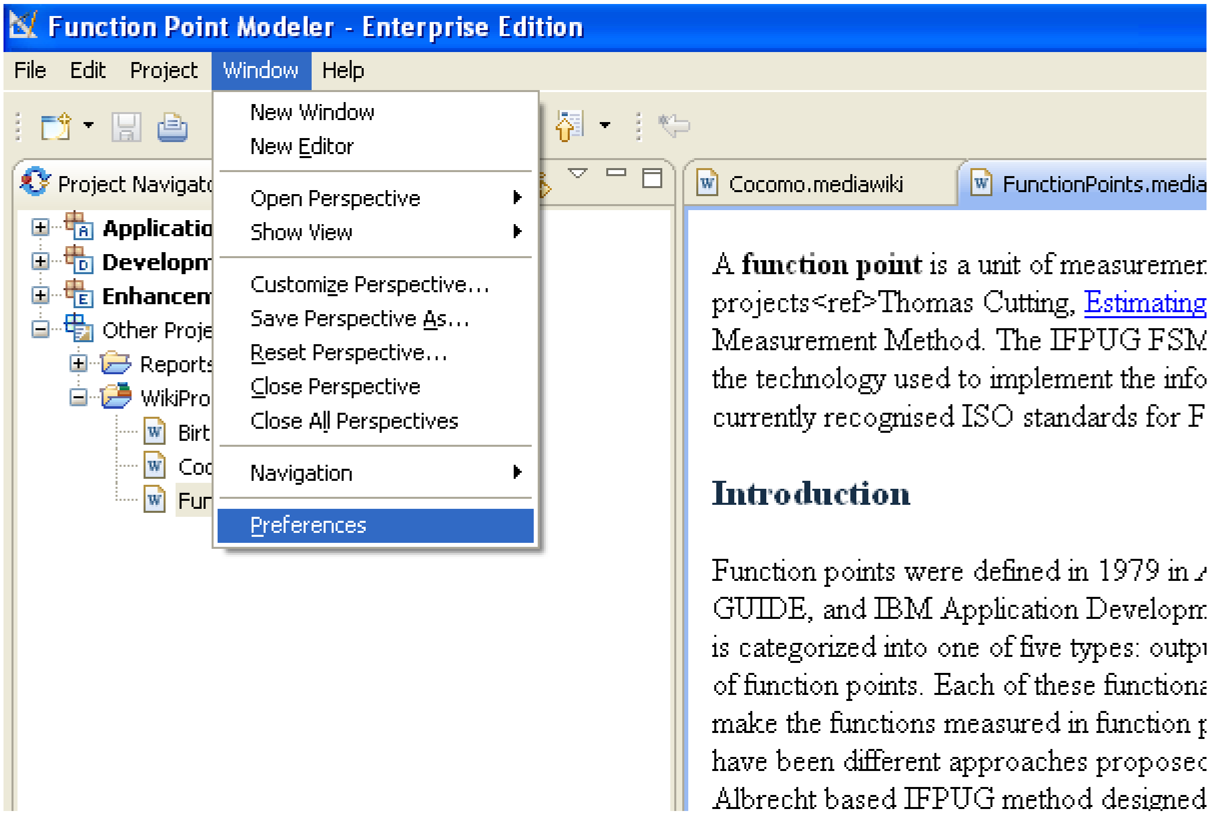
### Create Cocomo Constants

Enterprise Edition

You may create a new *Cocomo Constant* specified for your company.

To create a new **Cocomo Constant** , perform the following steps.

**1.** Select from the menu **Window >Preferences > Function point Modeler > COCOMO Master Data**

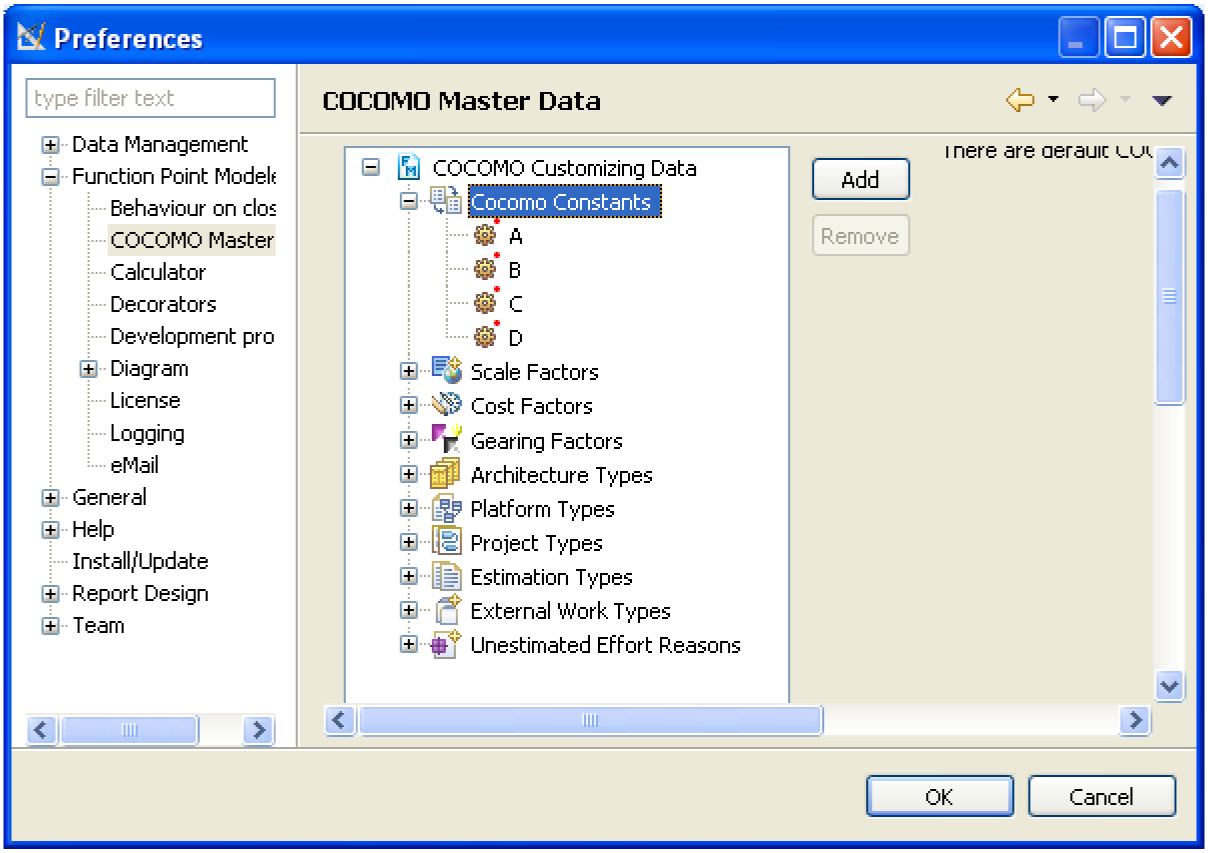


A **function point** is a unit of measuremen projects<ref>Thomas Cutting, Estimating Measurement Method. The IFPUG FSM the technology used to implement the info currently recognised ISO standards for F

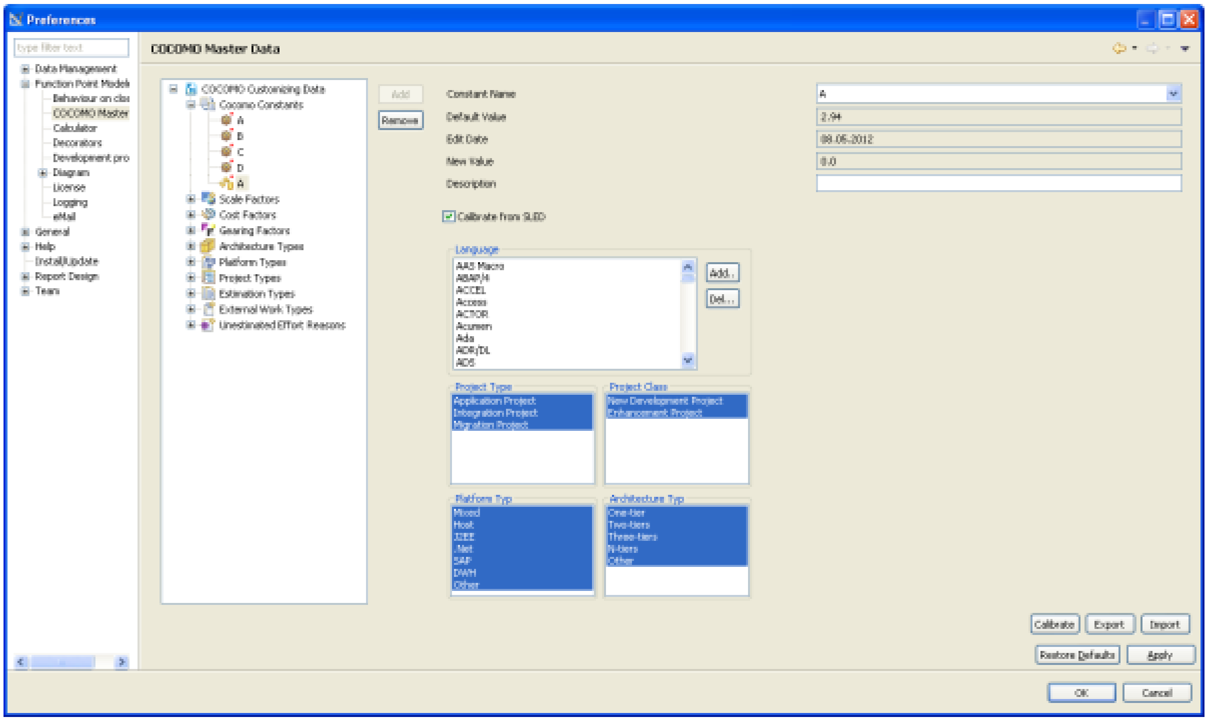
## Introduction

Function points were defined in 1979 in A GUIDE, and IBM Application Developm is categorized into one of five types: outpu of function points. Each of these functiona make the functions measured in function p have been different approaches proposec Albrecht based IFPUG method designed

2. Select the item *Cocomo Constants* in the tree and click the button **Add**



The new added **Cocomo Constant** will be displayed in the tree of **Cocomo Master Data** .



Constant Name: A

Default Value: 2.94

Edit Date: 08.05.2012

New Value: 0.0

Description:

☑ Calibrate from SLED

## Calibrate Cocomo Constants

Enterprise Edition

You may create a new *Cocomo Constant* specified for your company. You may also calibrate a new *Cocomo Constant* from the Software Life Cycle Experience Database **(SLED)** .

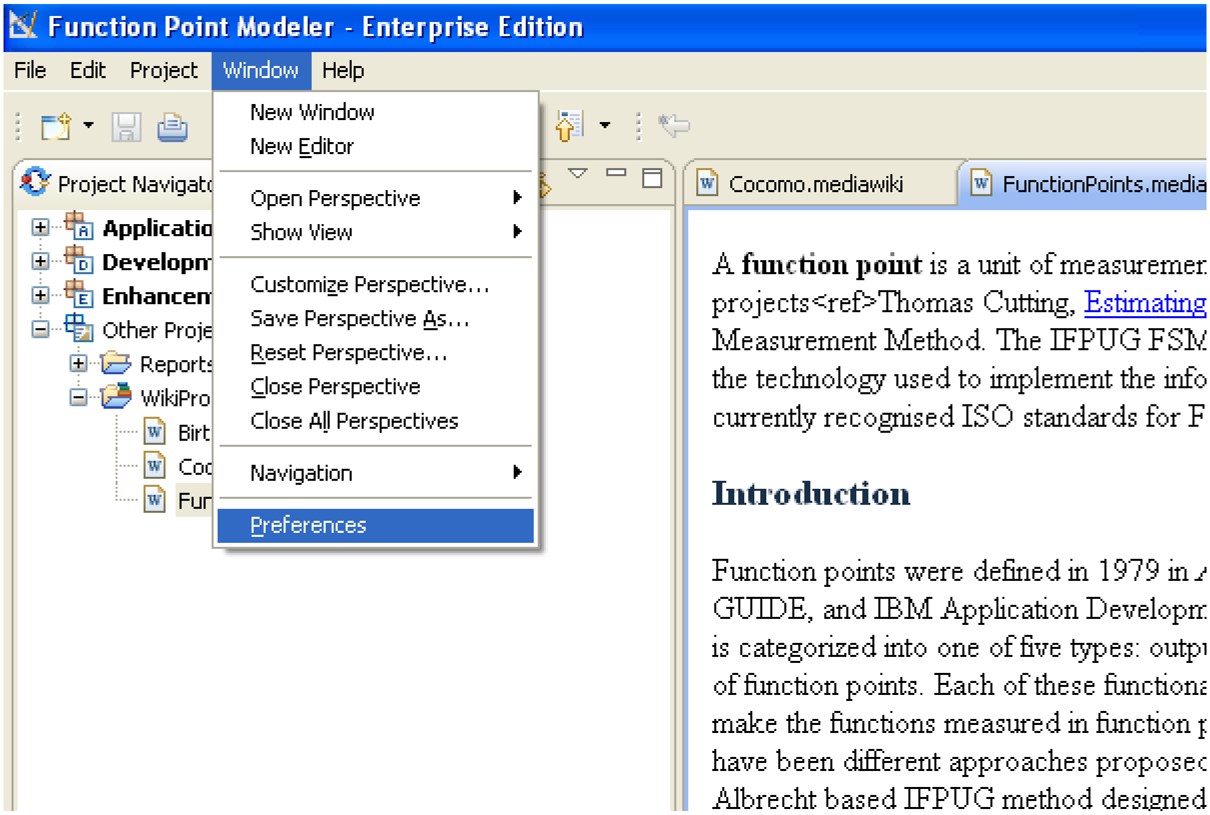
You may calibrate the *Cocomo Constant* both **A** and **B** .

To calibrate a *Cocomo Constant* **A** , you have to have at least 5 completed project for the spezified selection.

To calibrate the *Cocomo Constants* **A** and **A** , you have to have at least 10 completed project for the spezified selection.

To calibrate a new *Cocomo Constant* , perform the following steps.

1. Select from the menu **Window >Preferences > Function point Modeler > COCOMO Master Data**



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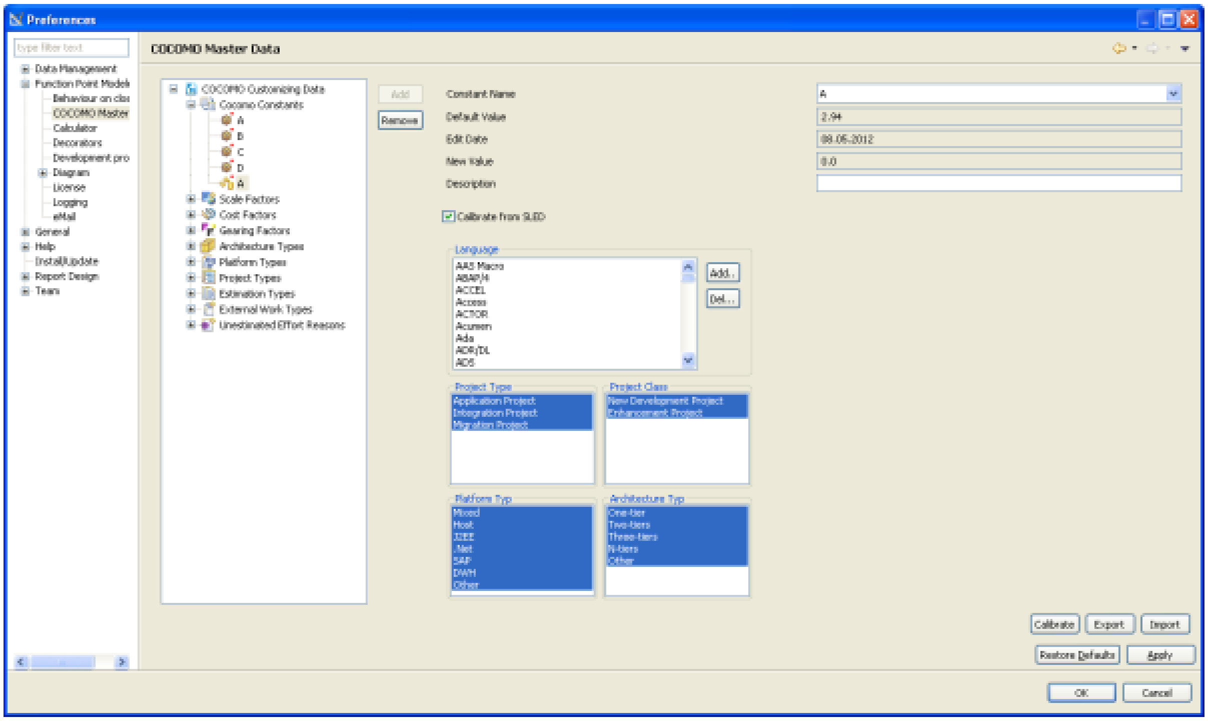
2. Select the item *Cocomo Constants* in the tree and click the button **Add** .



Constant Name: A
Default Value: 2.94
Edit Date: 08.05.2012
New Value: 0.0
Description:

☑ Calibrate from SLED

Language: AAS Macro, ABAP/4, ACCEL, Access, ACTOR, Acumen, Ada, ADR/DL, ADS

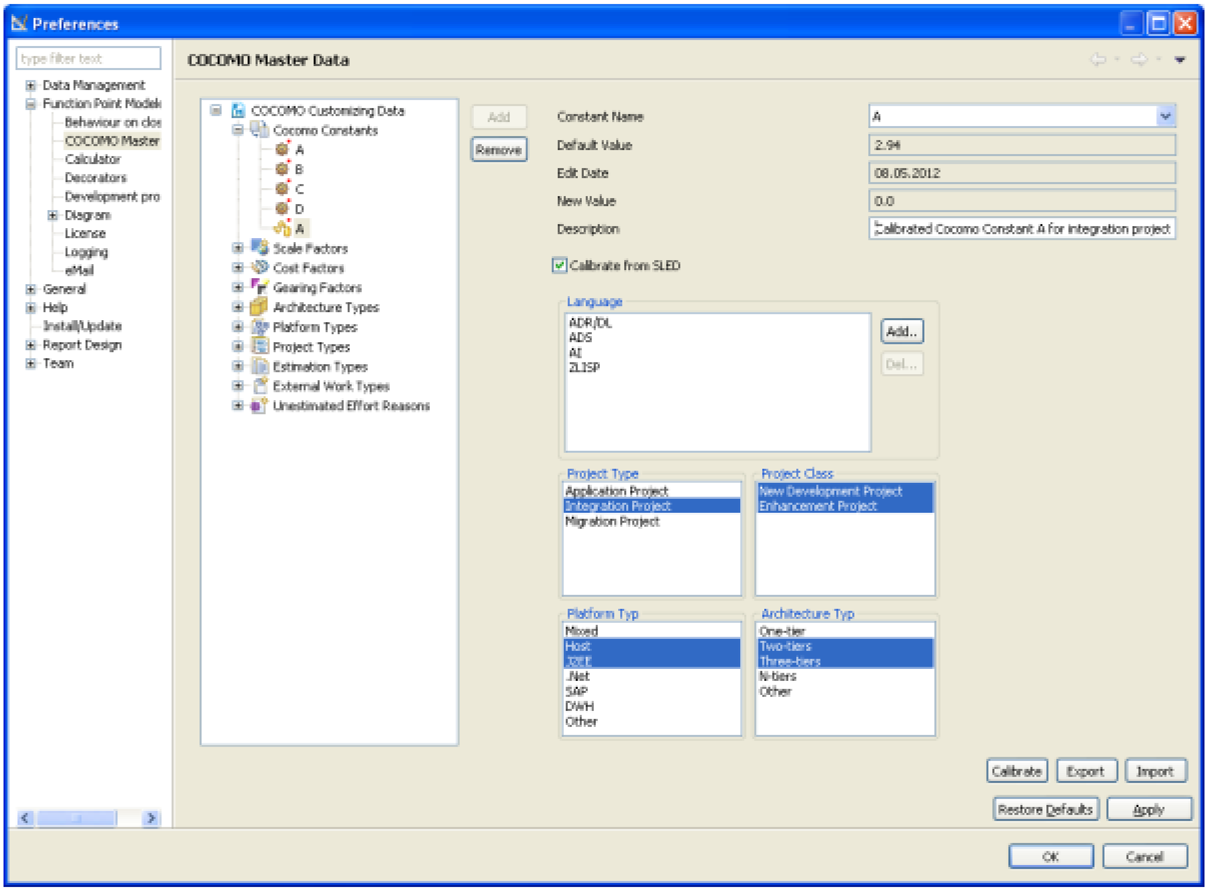
Project Type: Application Project, Integration Project, Migration Project

Project Class: New Development Project, Enhancement Project

Platform Typ: Mixed, Host, J2EE, .Net, SAP, DWH, Other

Architecture Typ: One-tier, Two-tiers, Three-tiers, N-tiers, Other

3. Define the selection criterion for **Language** , **Project Type** , **Project Class** , **Platform Type** and , **Architecture Type**



Constant Name: A

Default Value: 2.94

Edit Date: 08.05.2012

New Value: 0.0

Description: Calibrated Cocomo Constant A for integration project

☑ Calibrate from SLED

Language: ADR/DL, ADS, AI, 2LISP

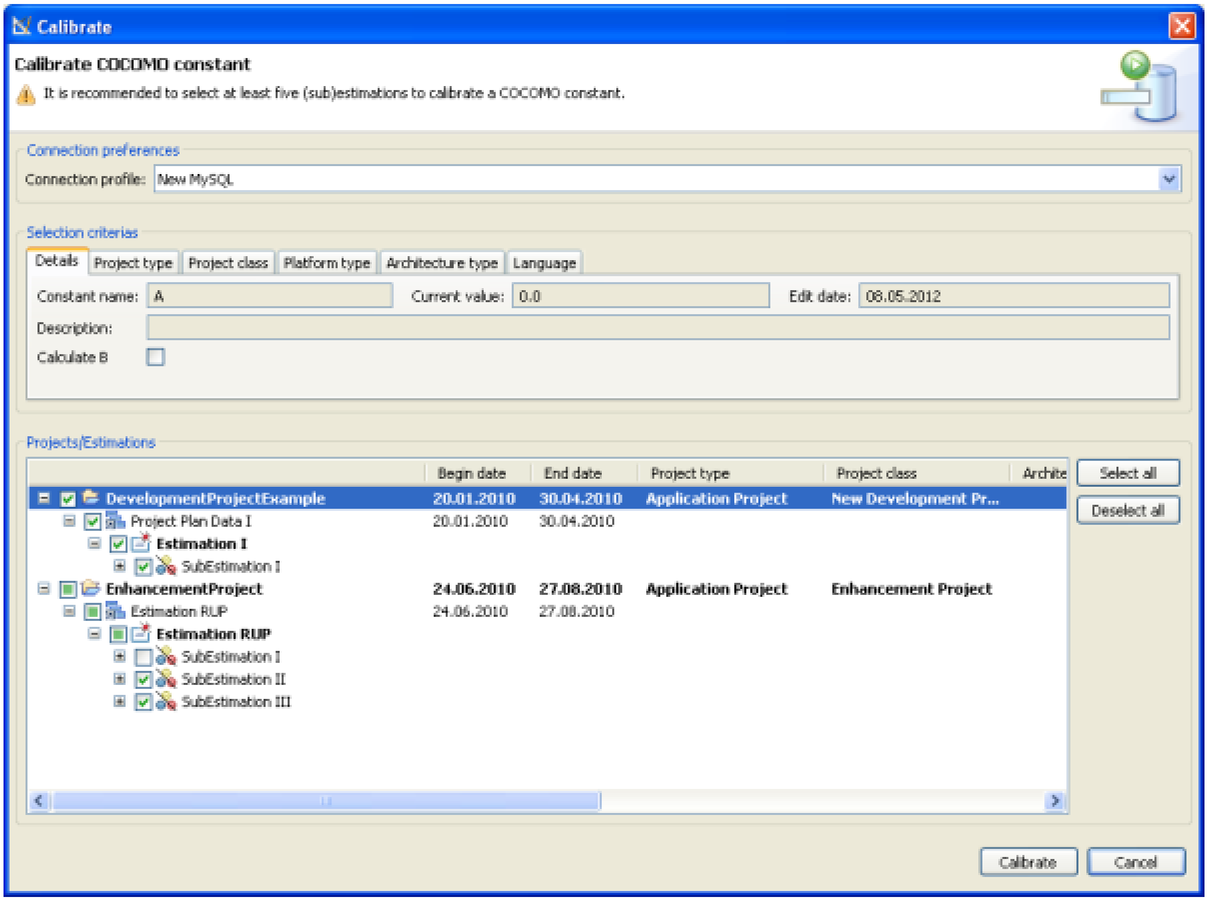
Project Type: Application Project, Integration Project (selected), Migration Project

Project Class: New Development Project (selected), Enhancement Project (selected)

Platform Typ: Mixed, Host (selected), J2EE (selected), .Net, SAP, DWH, Other

Architecture Typ: One-tier, Two-tiers (selected), Three-tiers (selected), N-tiers, Other

4. Click the button **Calibrate** . The following dialog will be showed. Select the required project from the tree and click the button **Calibrate** .



Calibrate

**Calibrate COCOMO constant**

It is recommended to select at least five (sub)estimations to calibrate a COCOMO constant.

Connection preferences

Connection profile: New MySQL

Selection criterias

Constant name: A

Current value: 0.0

Edit date: 08.05.2012

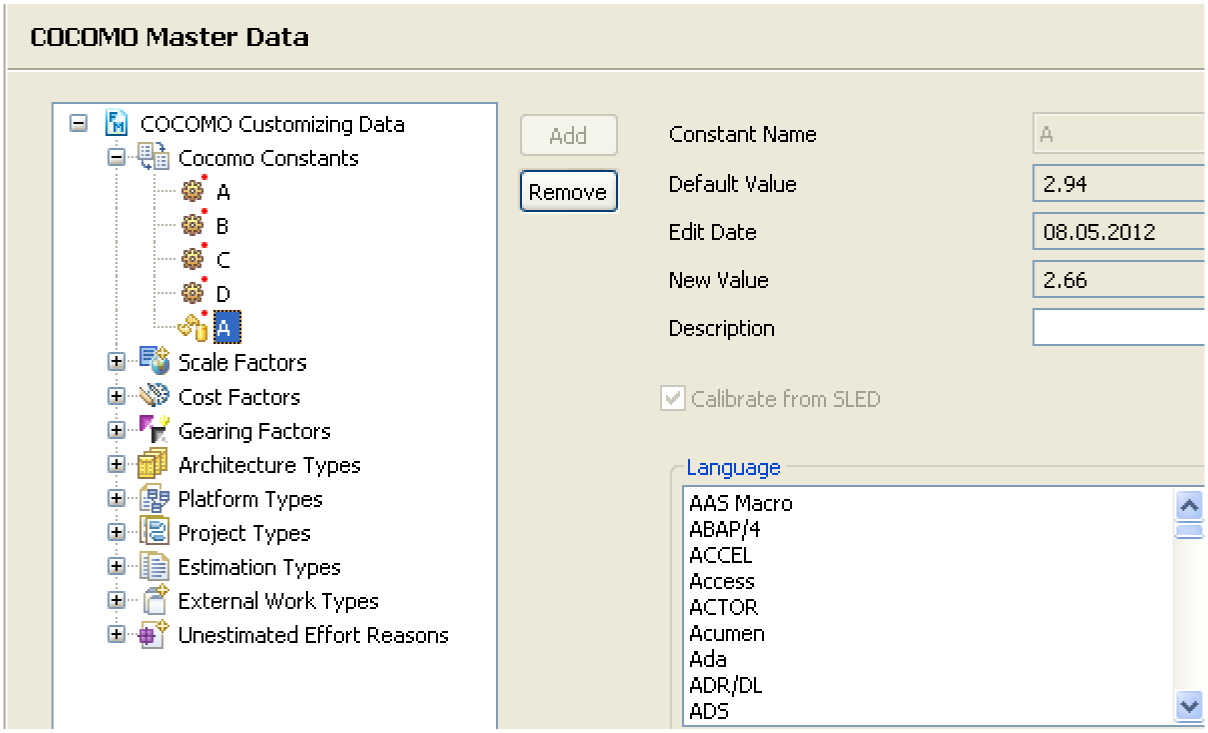
Description:

Calculate B ☐

Projects/Estimations

| | Begin date | End date | Project type | Project class | Archite |
|---|---|---|---|---|---|
| ☑ DevelopmentProjectExample | 20.01.2010 | 30.04.2010 | Application Project | New Development Pr... | |
| ☑ Project Plan Data I | 20.01.2010 | 30.04.2010 | | | |
| ☑ **Estimation I** | | | | | |
| ☑ SubEstimation I | | | | | |
| ▣ **EnhancementProject** | **24.06.2010** | **27.08.2010** | **Application Project** | **Enhancement Project** | |
| ▣ Estimation RUP | 24.06.2010 | 27.08.2010 | | | |
| ▣ **Estimation RUP** | | | | | |
| ☐ SubEstimation I | | | | | |
| ☑ SubEstimation II | | | | | |
| ☑ SubEstimation III | | | | | |

The new calibrated **Cocomo Constant** will be displayed in the tree of **Cocomo Master Data** .



**COCOMO Master Data**

- COCOMO Customizing Data
  - Cocomo Constants
    - A
    - B
    - C
    - D
    - A
  - Scale Factors
  - Cost Factors
  - Gearing Factors
  - Architecture Types
  - Platform Types
  - Project Types
  - Estimation Types
  - External Work Types
  - Unestimated Effort Reasons

Constant Name: A

Default Value: 2.94

Edit Date: 08.05.2012

New Value: 2.66

Description:

☑ Calibrate from SLED

Language

AAS Macro
ABAP/4
ACCEL
Access
ACTOR
Acumen
Ada
ADR/DL
ADS

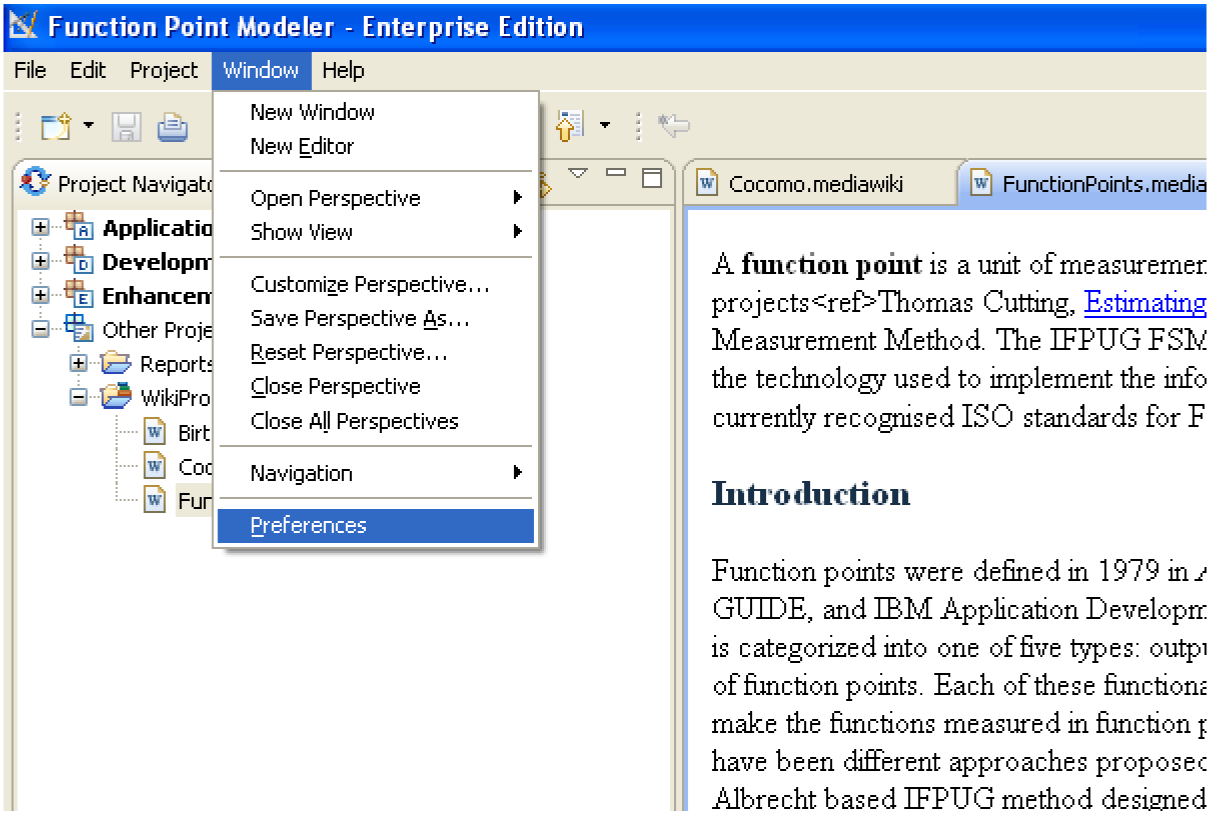
### Add Scale Factors

Enterprise Edition

You may add a new *Scale Factor* specified for your company.

To add a new **Scale Factor** , perform the following steps.

1. Select from the menu **Window >Preferences > Function point Modeler > COCOMO Master Data**



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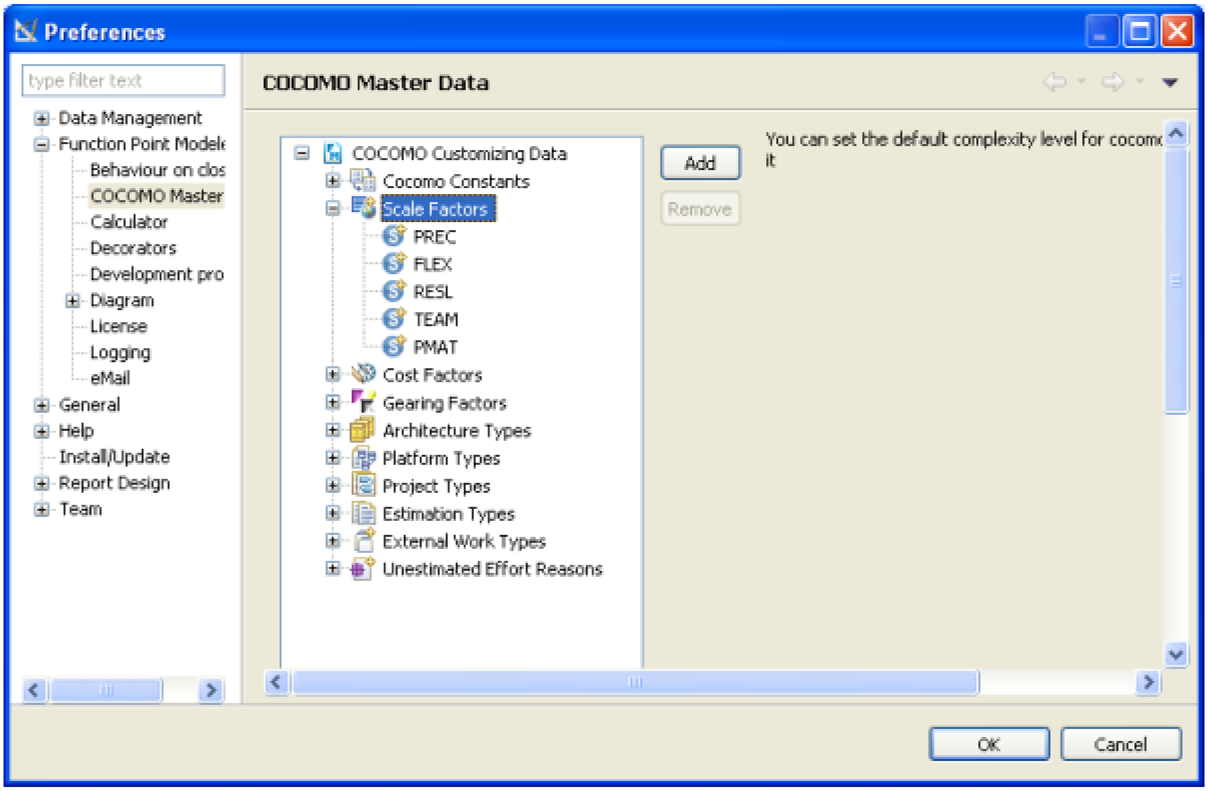
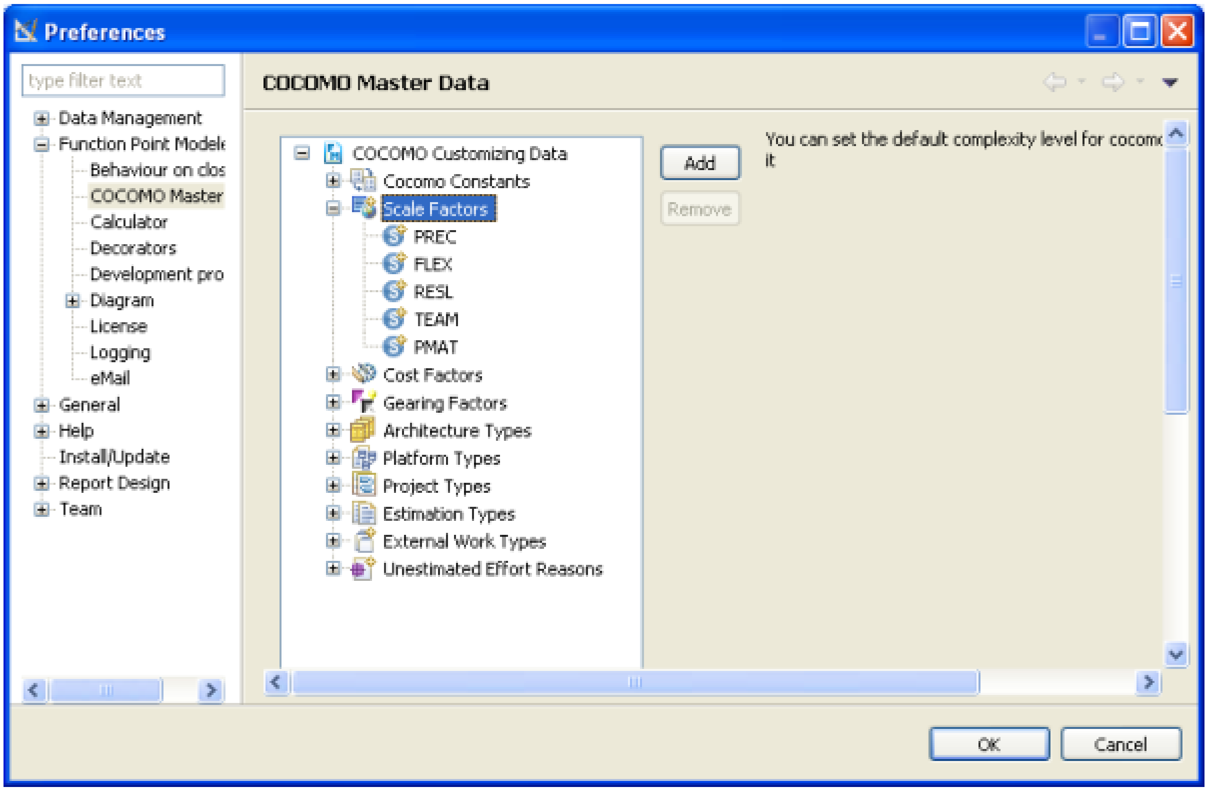
Albrecht based IFPUG method designed

2. Select the item *Scale Factors* in the tree and click the button **Add**



You can set the default complexity level for cocom
it

The new added **Scale Factor** will be displayed in the tree of **Cocomo Master Data** .



You can set the default complexity level for cocom
it

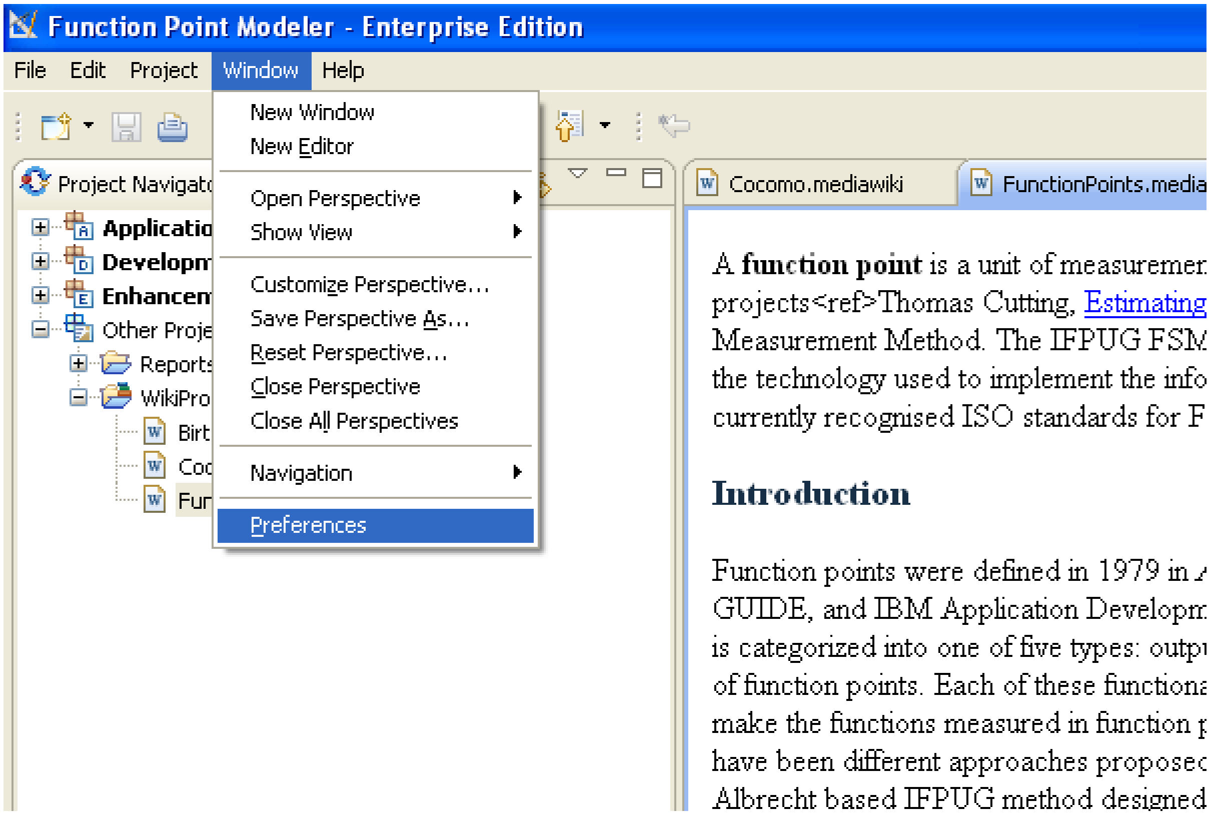
### Add Cost Factors

Enterprise Edition

You may add a new *Cost Factor* specified for your company.

To add a new **Cost Factor** , perform the following steps.

1. Select from the menu **Window >Preferences > Function point Modeler > COCOMO Master Data**



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Measurement Method. The IFPUG FSM
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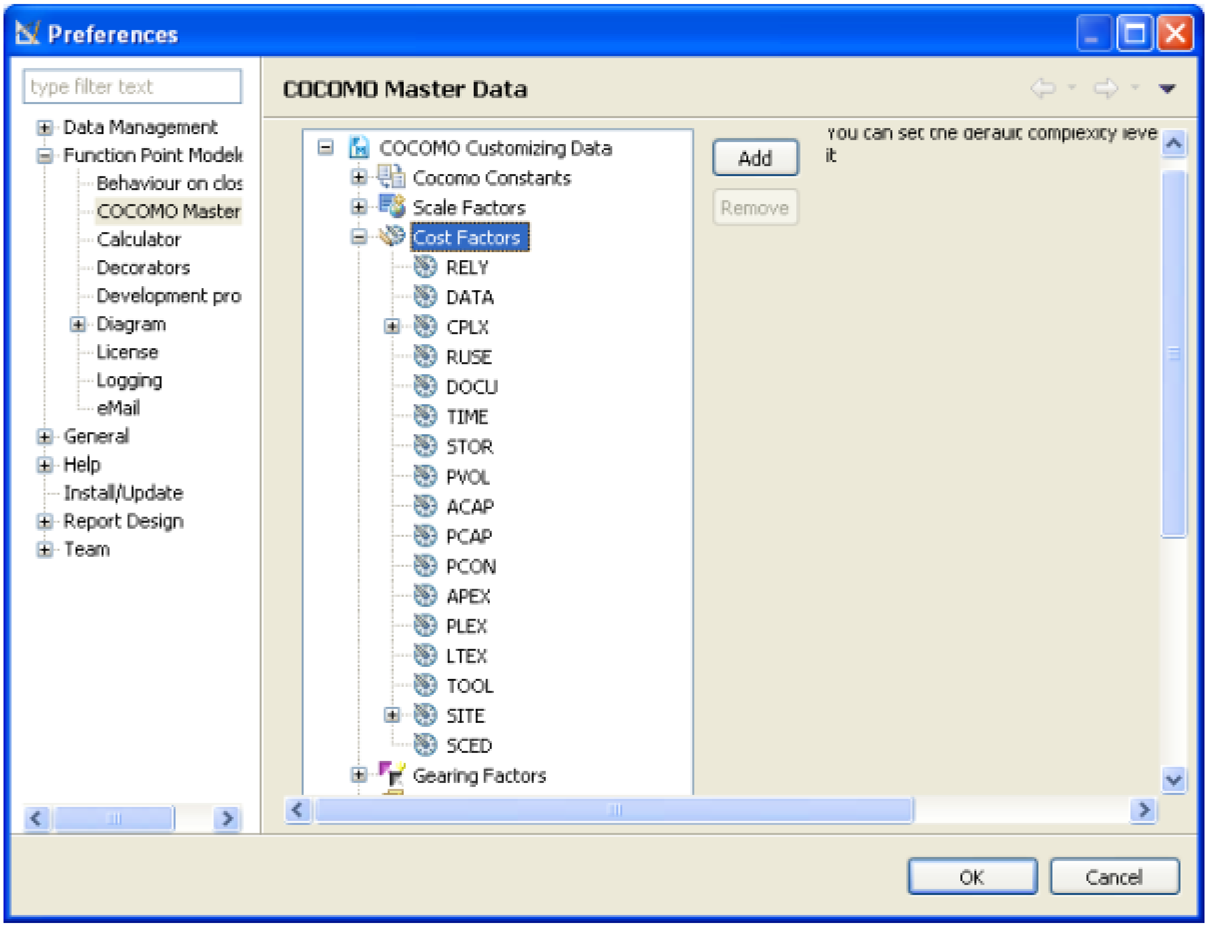
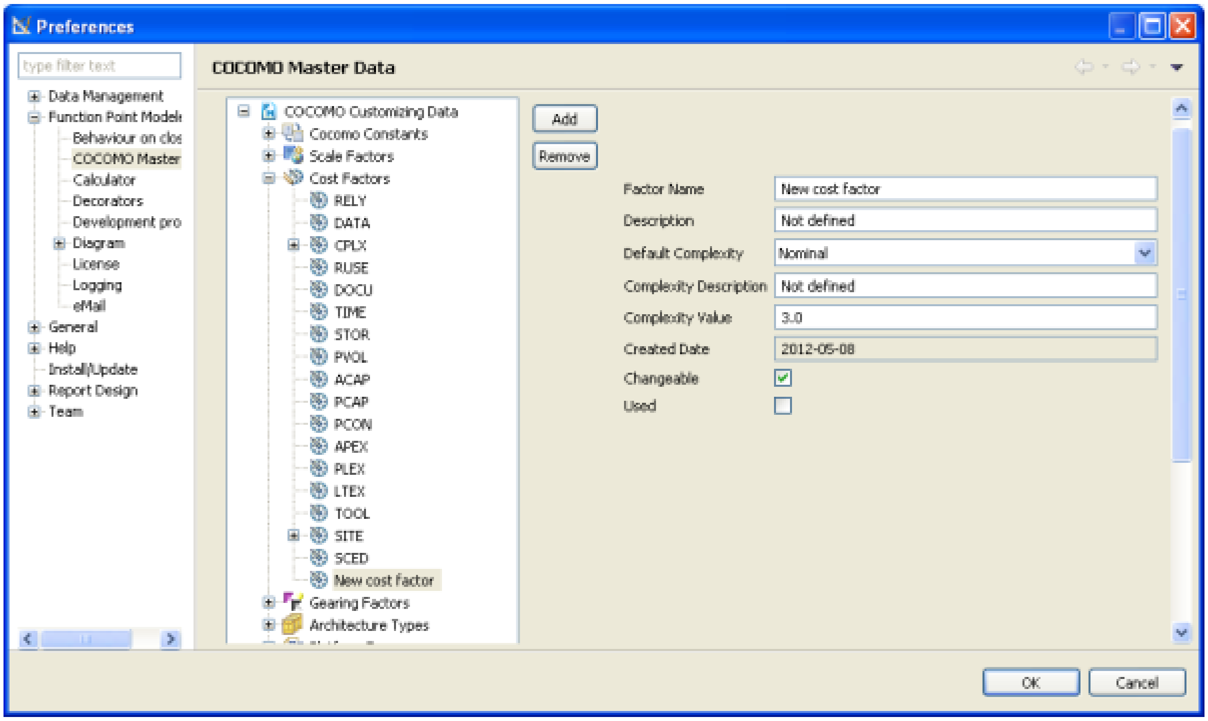
2. Select the item *Cost Factors* in the tree and click the button **Add**



You can set the default complexity leve
it

The new added **Cost Factor** will be displayed in the tree of **Cocomo Master Data** .



| | |
|---|---|
| Factor Name | New cost factor |
| Description | Not defined |
| Default Complexity | Nominal |
| Complexity Description | Not defined |
| Complexity Value | 3.0 |
| Created Date | 2012-05-08 |
| Changeable | ☑ |
| Used | ☐ |

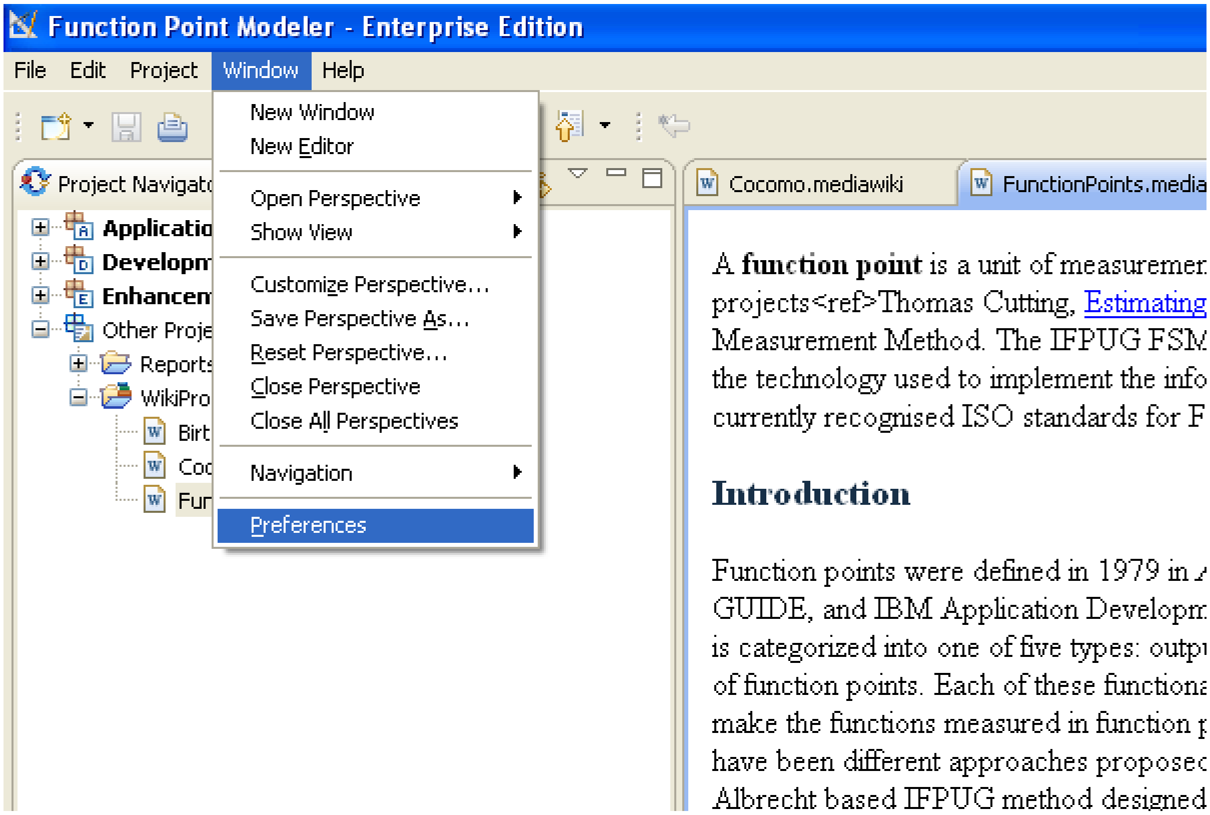
### Add Gearing Factors

Enterprise Edition

You may add a new *Gearing Factor* specified for your company.

To add a new **Gearing Factor** , perform the following steps.

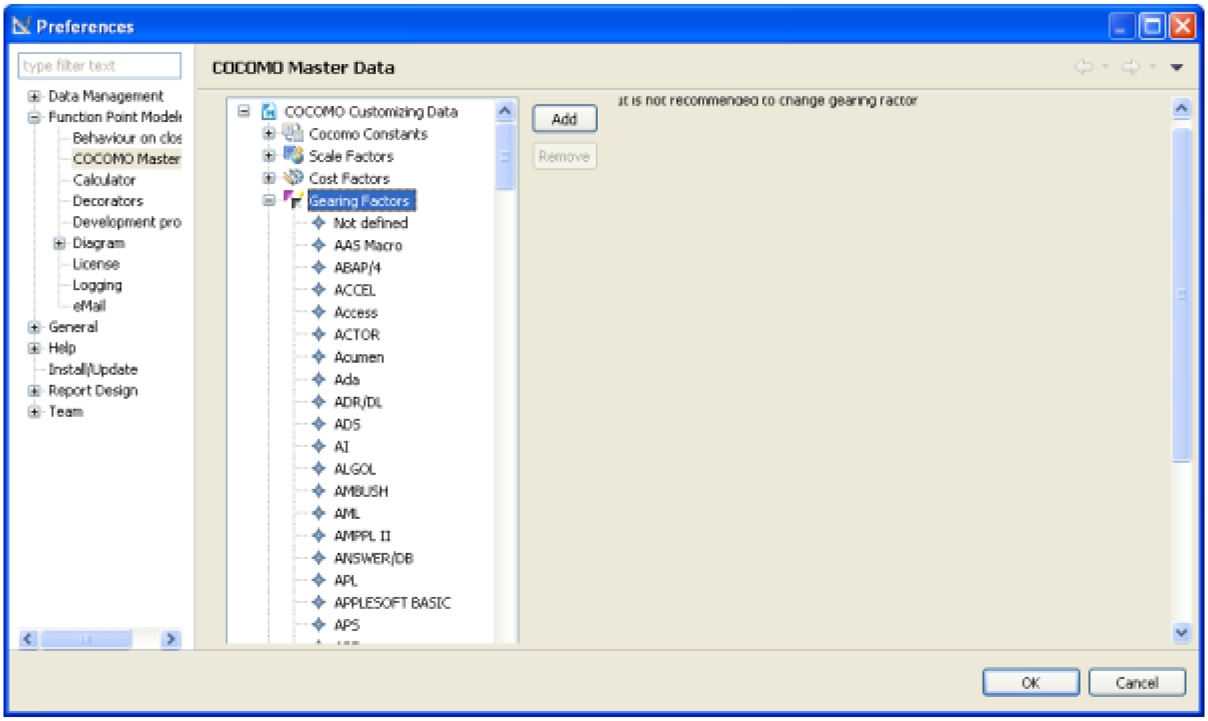
1. Select from the menu **Window >Preferences > Function point Modeler > COCOMO Master Data**



A **function point** is a unit of measuremen projects<ref>Thomas Cutting, Estimating Measurement Method. The IFPUG FSM the technology used to implement the info currently recognised ISO standards for F

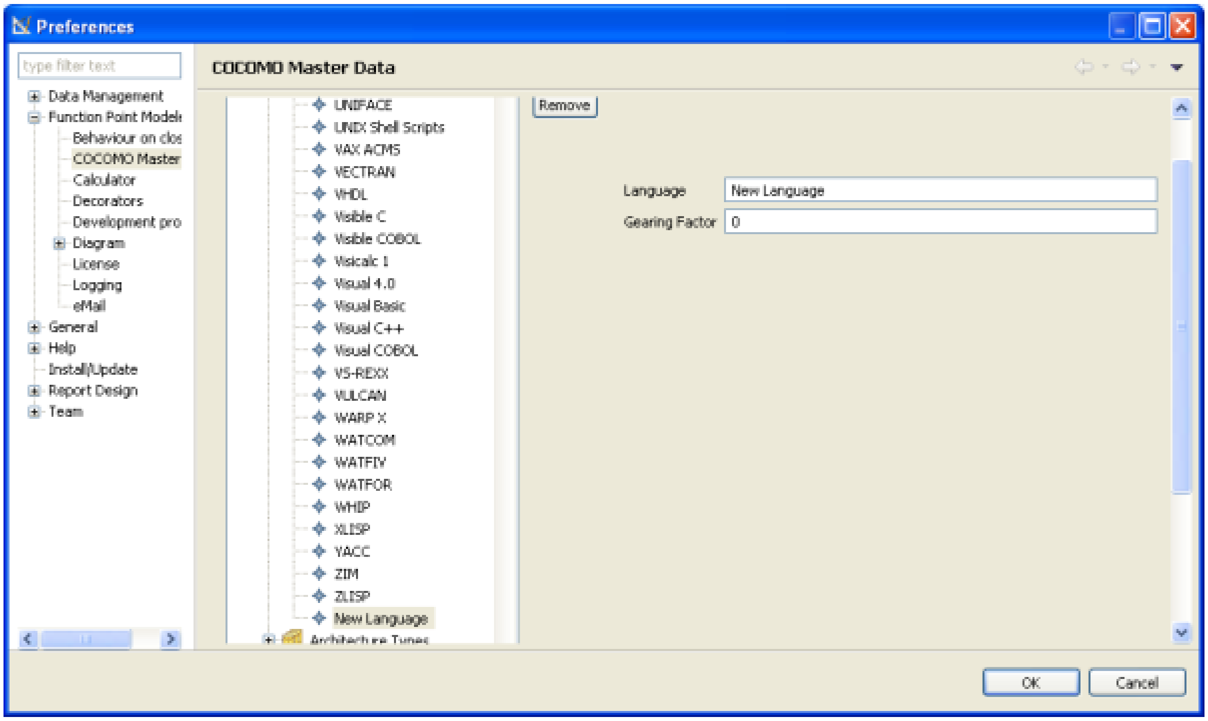
Function points were defined in 1979 in A GUIDE, and IBM Application Developm is categorized into one of five types: outpu of function points. Each of these functiona make the functions measured in function p have been different approaches proposed Albrecht based IFPUG method designed

2. Select the item *Gearing Factors* in the tree and click the button **Add**



It is not recommended to change gearing factor

The new added **Gearing Factor** will be displayed in the tree of **Cocomo Master Data** .



Language: New Language

Gearing Factor: 0

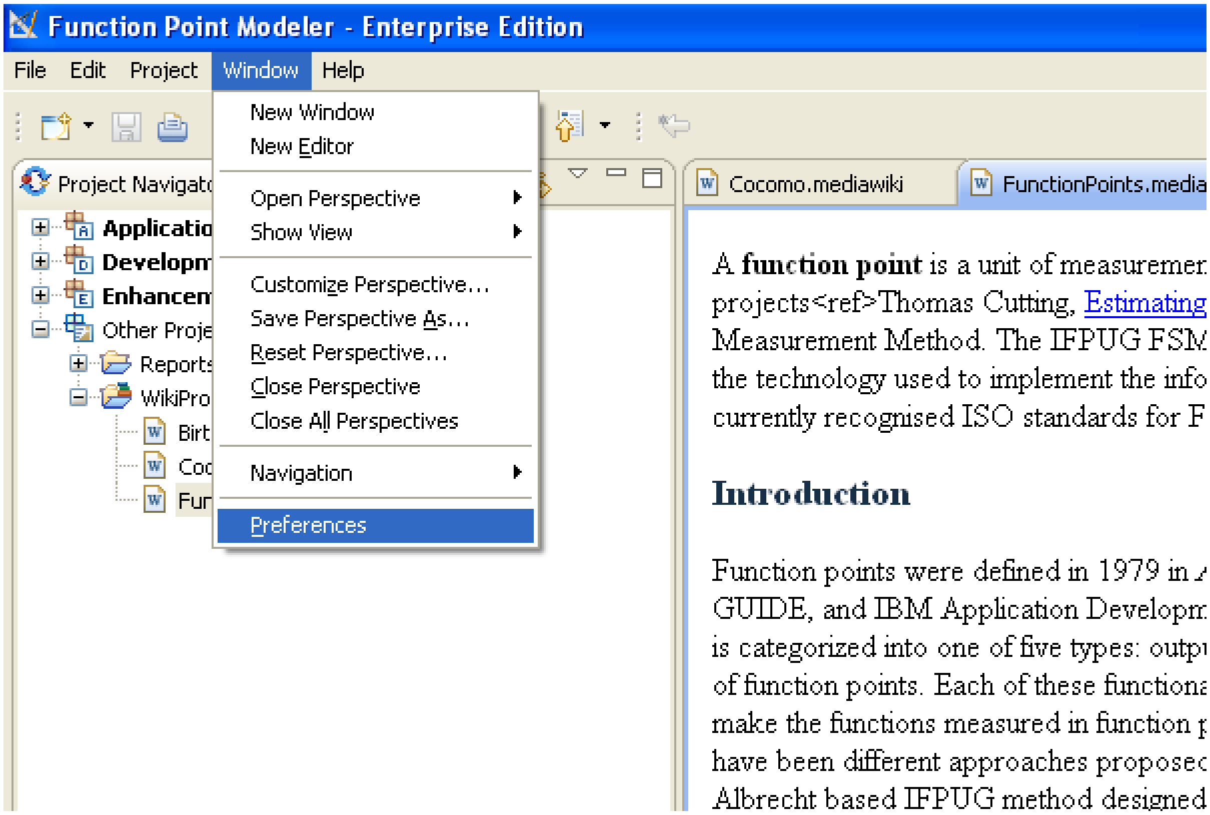
### Add Architecture Types

Enterprise Edition

You may add a new *Architecture Types* specified for your company.

To add a new **Architecture Types** , perform the following steps.

1. Select from the menu **Window >Preferences > Function point Modeler > COCOMO Master Data**

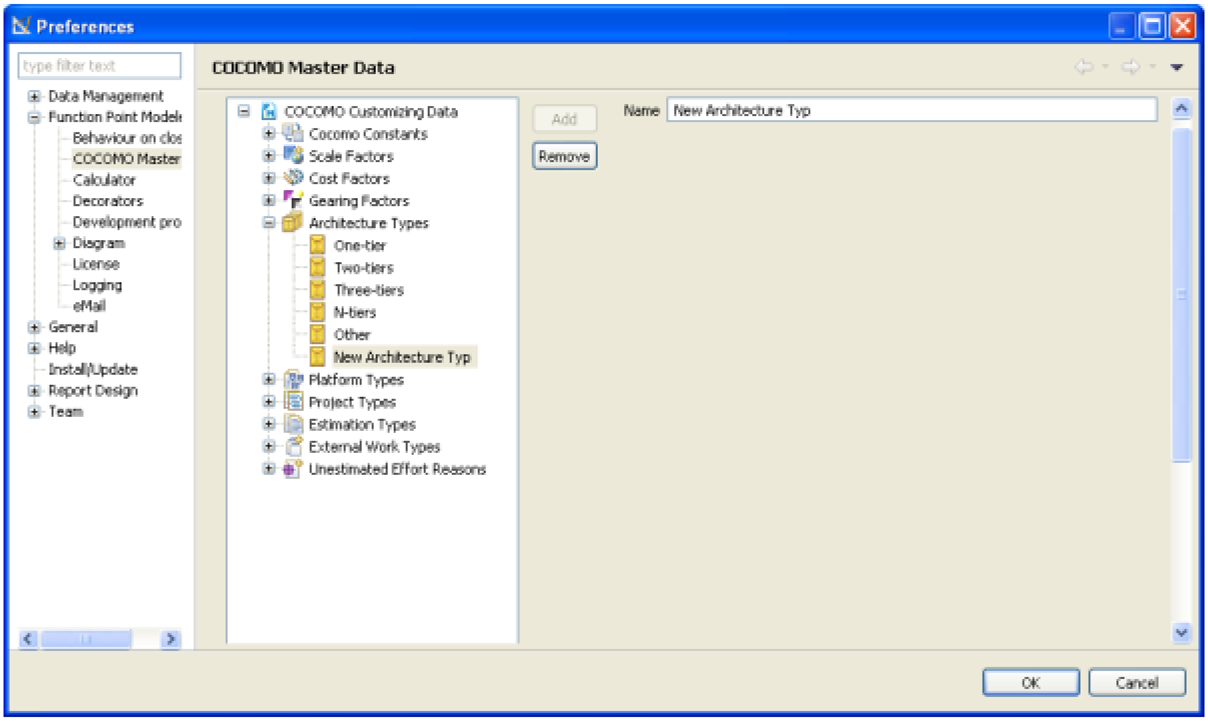


A **function point** is a unit of measuremer
projects<ref>Thomas Cutting, Estimating
Measurement Method. The IFPUG FSM
the technology used to implement the info
currently recognised ISO standards for F

**Introduction**

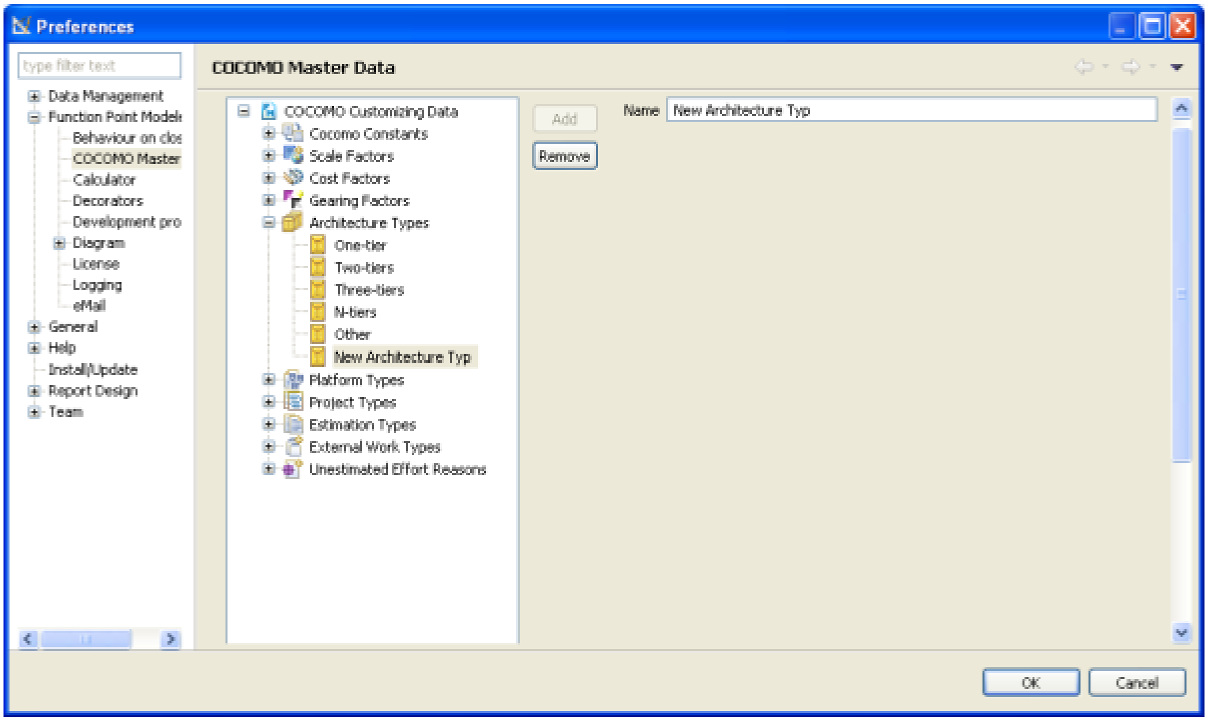
Function points were defined in 1979 in A
GUIDE, and IBM Application Developm
is categorized into one of five types: outpu
of function points. Each of these functiona
make the functions measured in function p
have been different approaches proposed
Albrecht based IFPUG method designed

2. Select the item *Architecture Types* in the tree and click the button **Add**



Name: New Architecture Typ

The new added **Architecture Types** will be displayed in the tree of **Cocomo Master Data** .



Name: New Architecture Typ

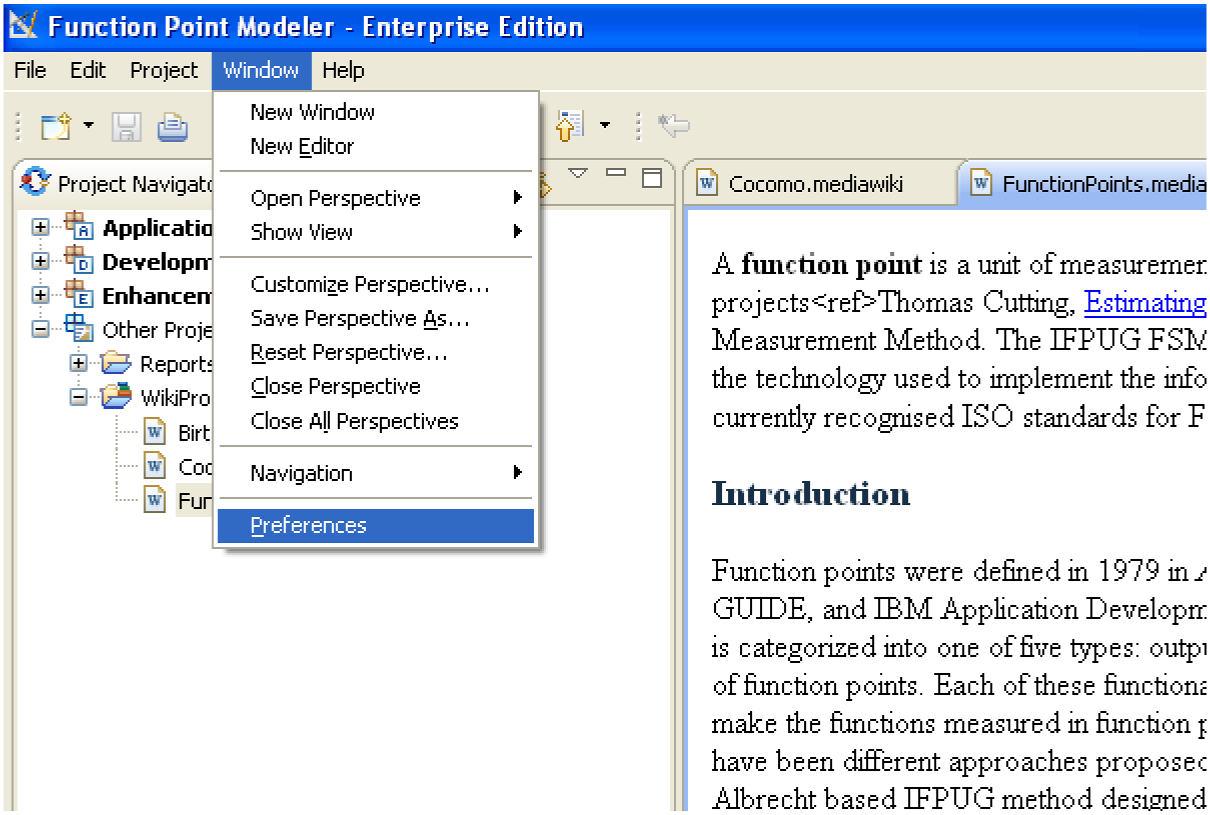
## Add Platform Types

Enterprise Edition

You may add a new *Platform Types* specified for your company.

To add a new **Platform Types** , perform the following steps.

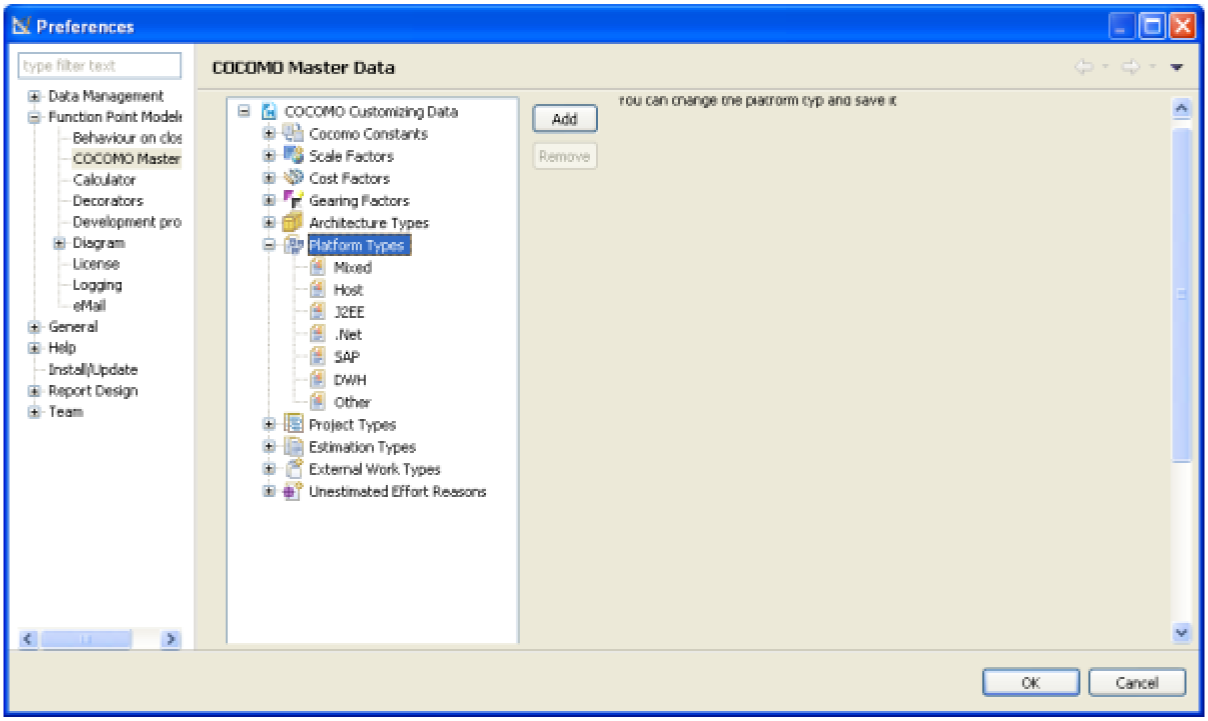
1. Select from the menu **Window >Preferences > Function point Modeler > COCOMO Master Data**



A **function point** is a unit of measuremen
projects<ref>Thomas Cutting, Estimating
Measurement Method. The IFPUG FSM
the technology used to implement the info
currently recognised ISO standards for F

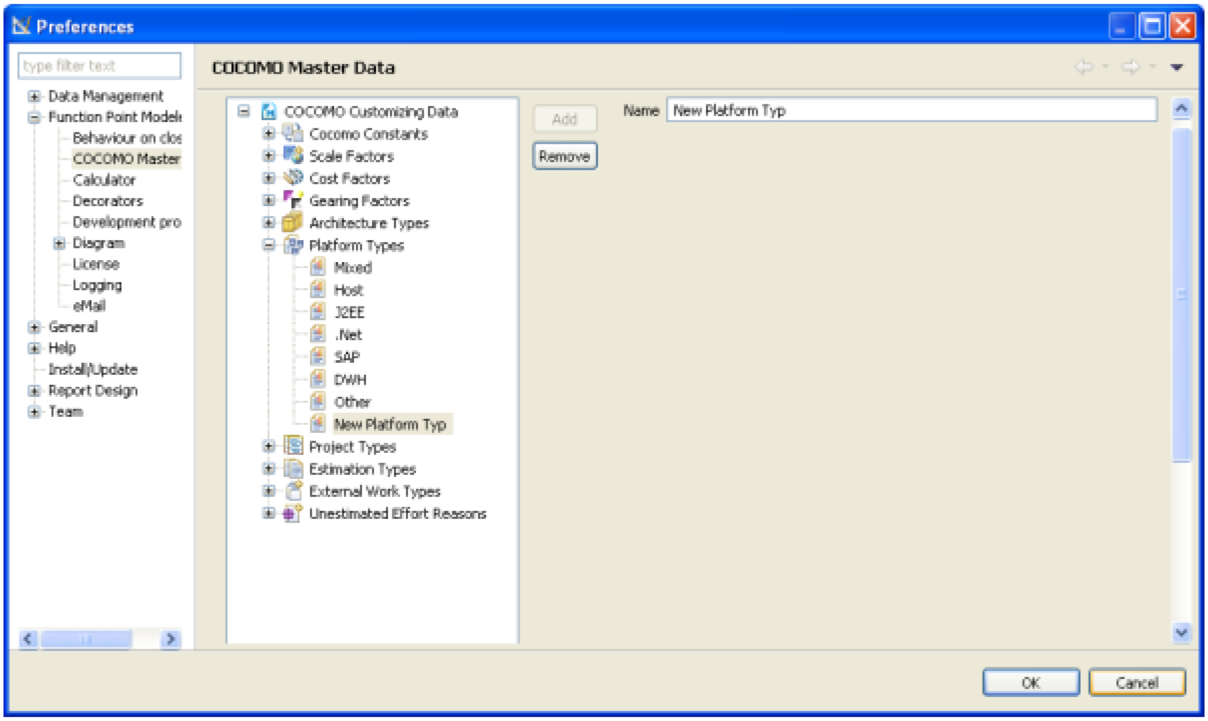
Function points were defined in 1979 in A
GUIDE, and IBM Application Developm
is categorized into one of five types: outpu
of function points. Each of these functiona
make the functions measured in function p
have been different approaches proposed
Albrecht based IFPUG method designed

2. Select the item *Platform Types* in the tree and click the button **Add**



You can change the platform typ and save it

The new added **Platform Types** will be displayed in the tree of **Cocomo Master Data** .



Name: New Platform Typ

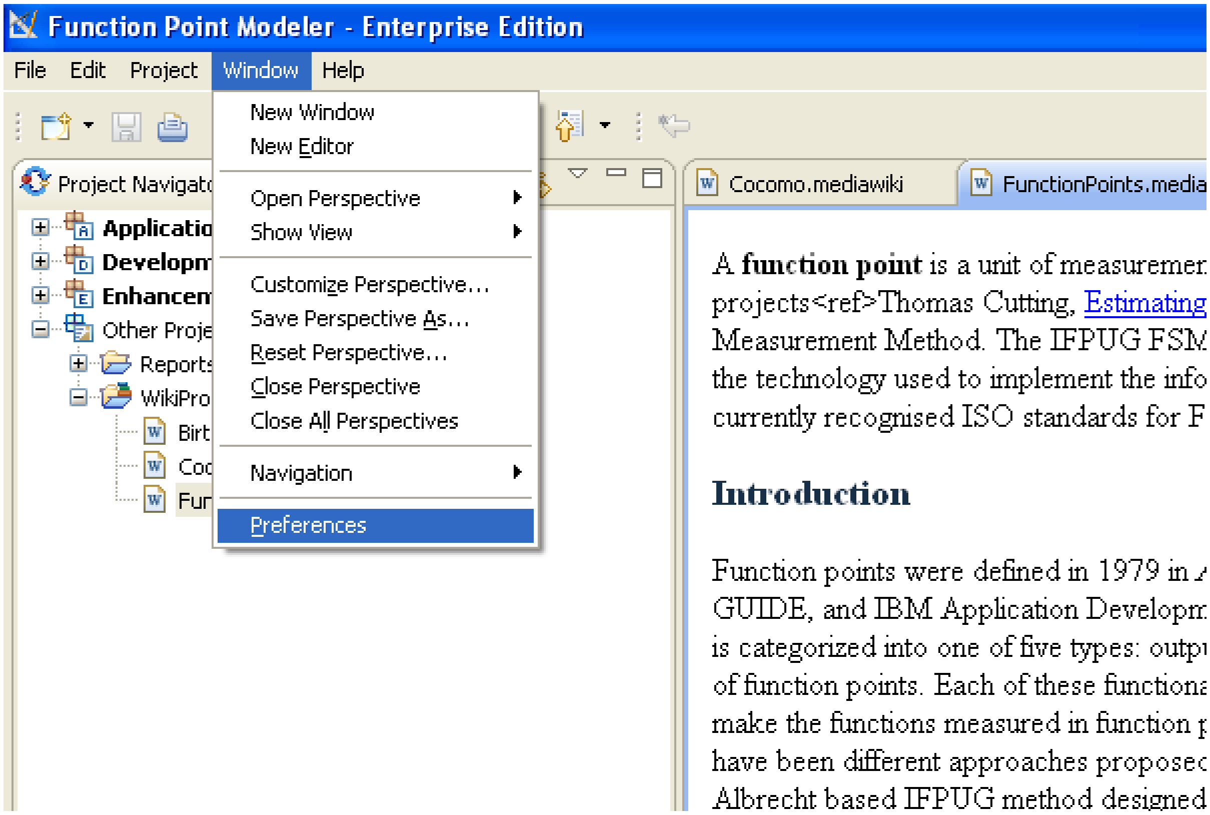
## Add Project Types

Enterprise Edition

You may add a new *Project Types* specified for your company.

To add a new **Project Types** , perform the following steps.

1. Select from the menu **Window >Preferences > Function point Modeler > COCOMO Master Data**

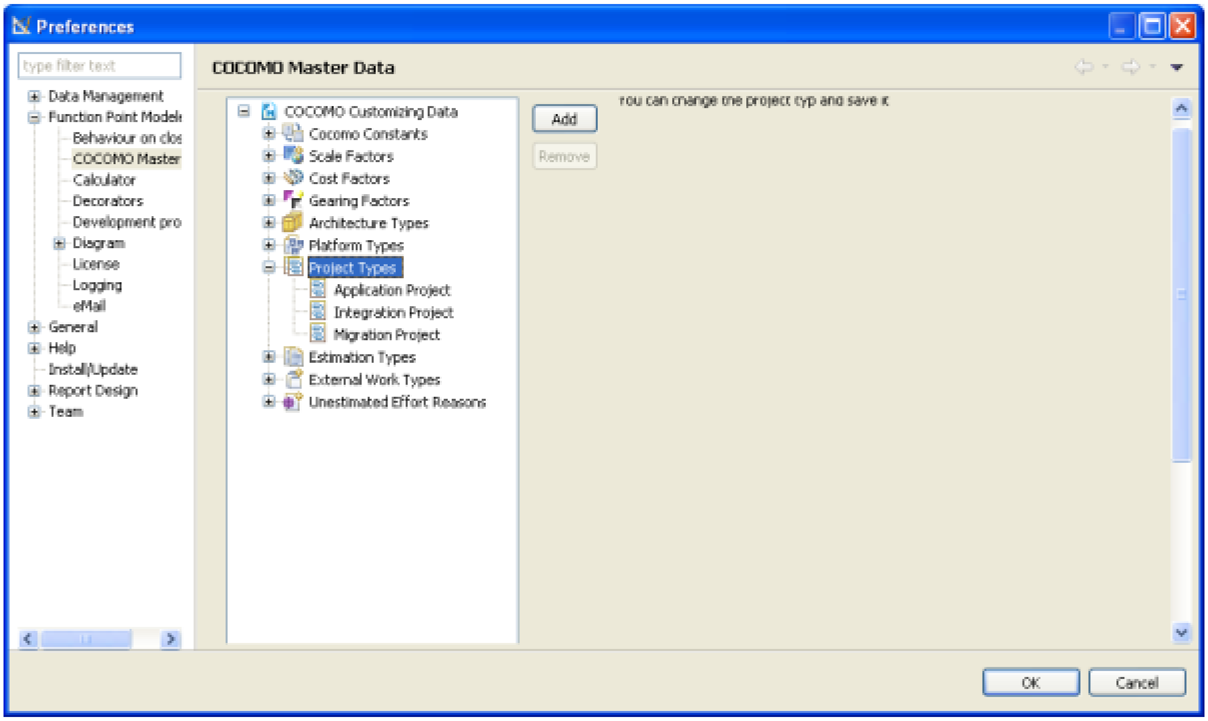


A **function point** is a unit of measuremen
projects<ref>Thomas Cutting, Estimating
Measurement Method. The IFPUG FSM
the technology used to implement the info
currently recognised ISO standards for F

**Introduction**

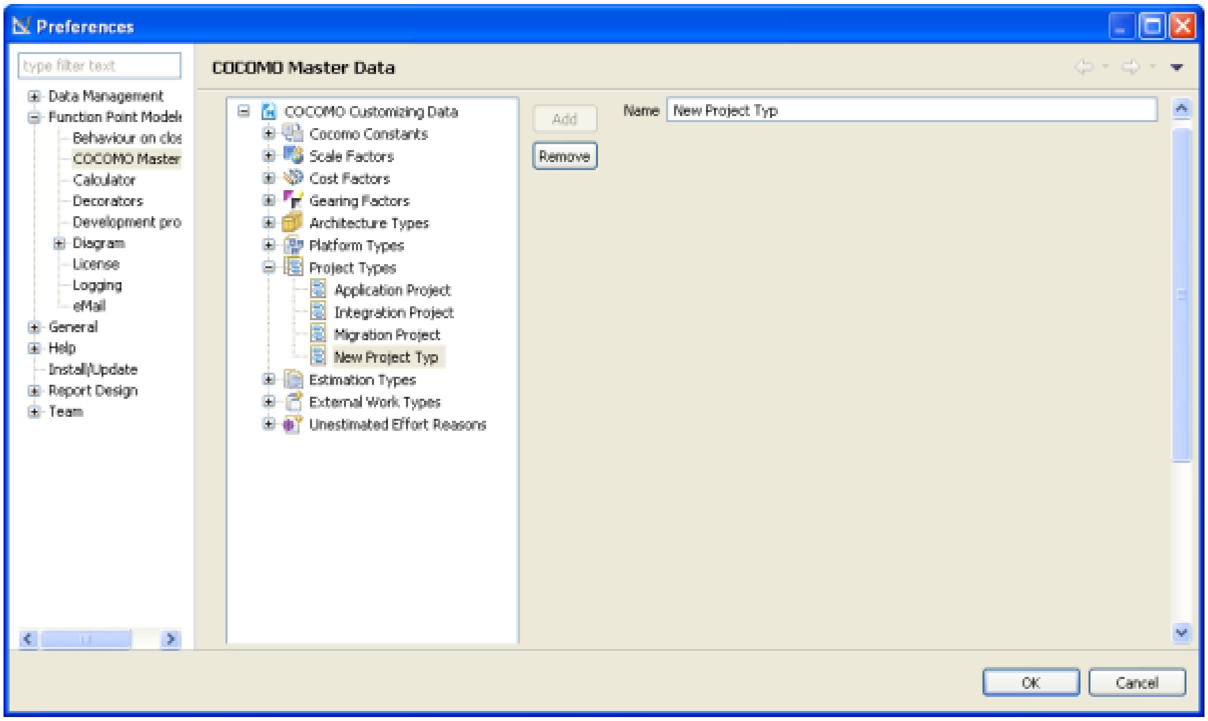
Function points were defined in 1979 in
GUIDE, and IBM Application Developm
is categorized into one of five types: outpu
of function points. Each of these functiona
make the functions measured in function p
have been different approaches proposec
Albrecht based IFPUG method designed

2. Select the item *Project Types* in the tree and click the button **Add**



You can change the project typ and save it

The new added **Project Types** will be displayed in the tree of **Cocomo Master Data** .



Name: New Project Typ

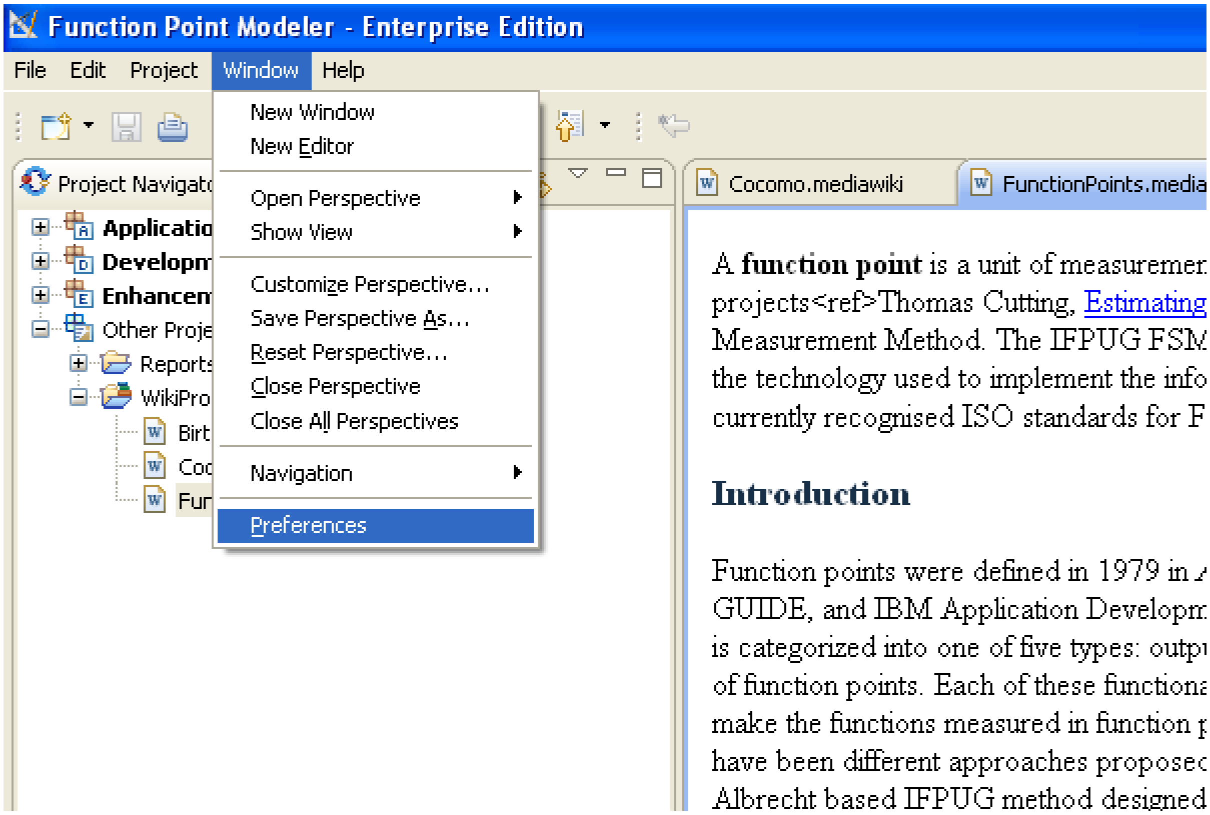
## Add Estimation Types

Enterprise Edition

You may add a new *Estimation Types* specified for your company.

To add a new **Estimation Types** , perform the following steps.

1. Select from the menu **Window >Preferences > Function point Modeler > COCOMO Master Data**

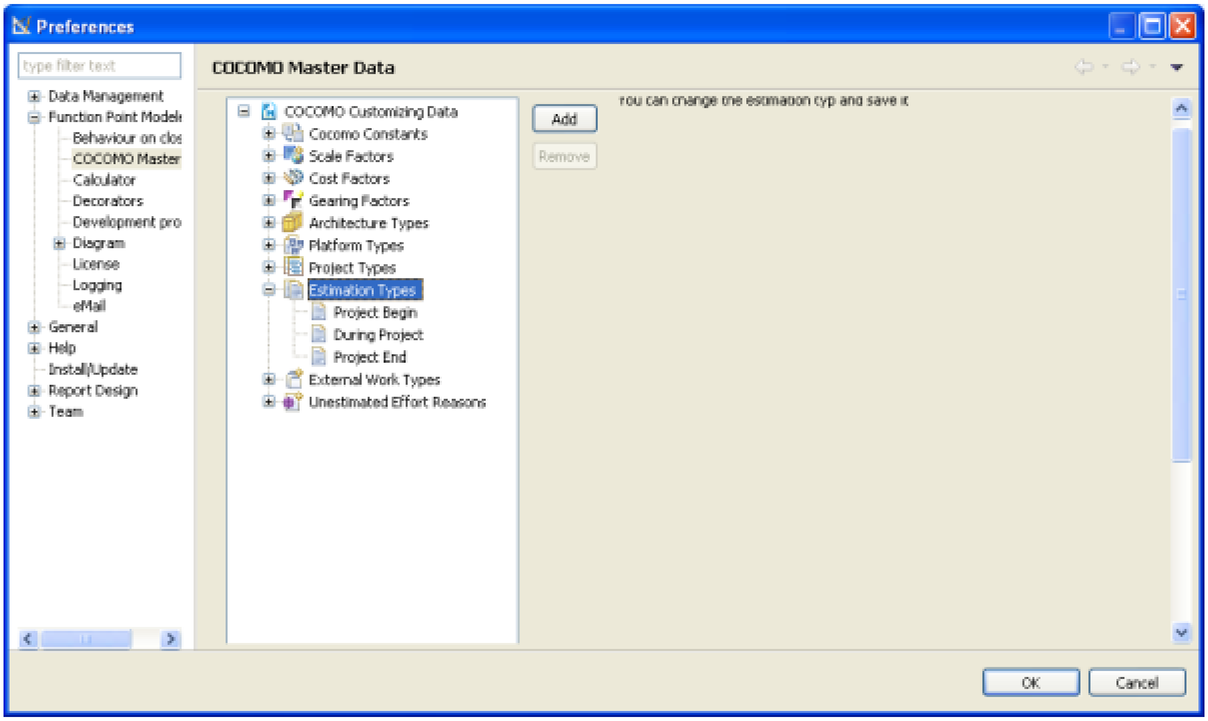


A **function point** is a unit of measuremen
projects<ref>Thomas Cutting, Estimating
Measurement Method. The IFPUG FSM
the technology used to implement the info
currently recognised ISO standards for F

Introduction

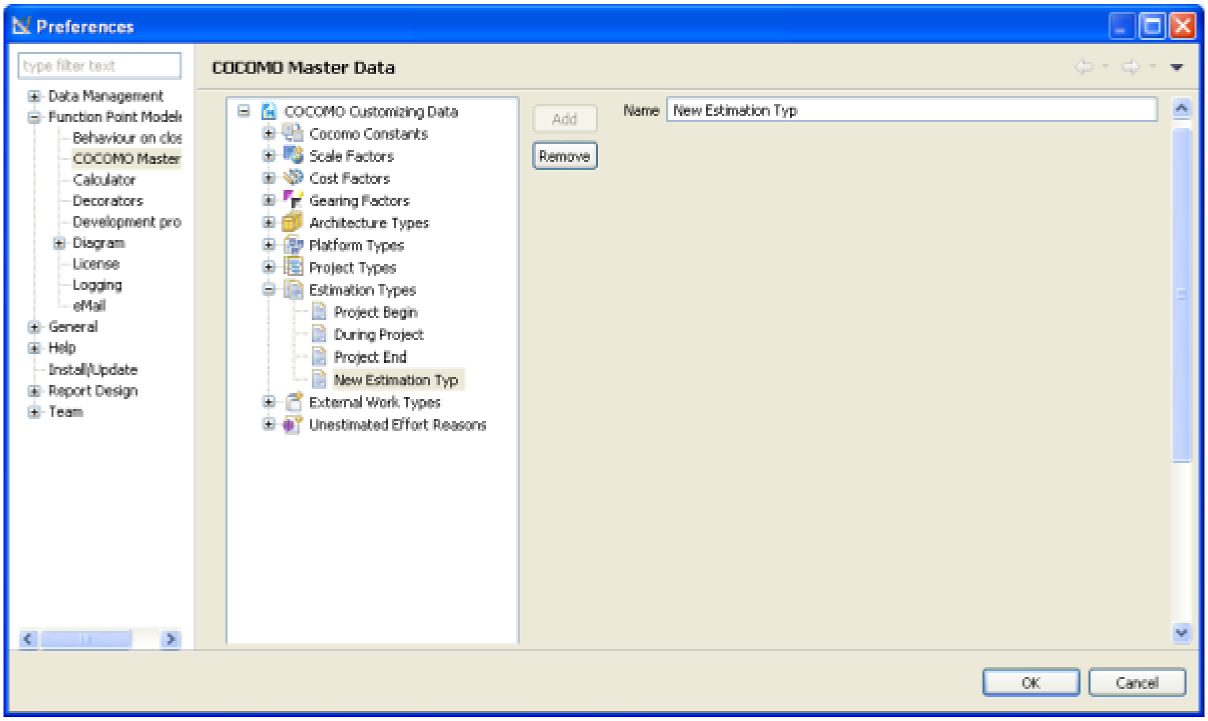
Function points were defined in 1979 in A
GUIDE, and IBM Application Developm
is categorized into one of five types: outpu
of function points. Each of these functiona
make the functions measured in function p
have been different approaches proposec
Albrecht based IFPUG method designed

2. Select the item *Estimation Types* in the tree and click the button **Add**



You can change the estimation typ and save it

The new added **Estimation Types** will be displayed in the tree of **Cocomo Master Data** .



Name: New Estimation Typ

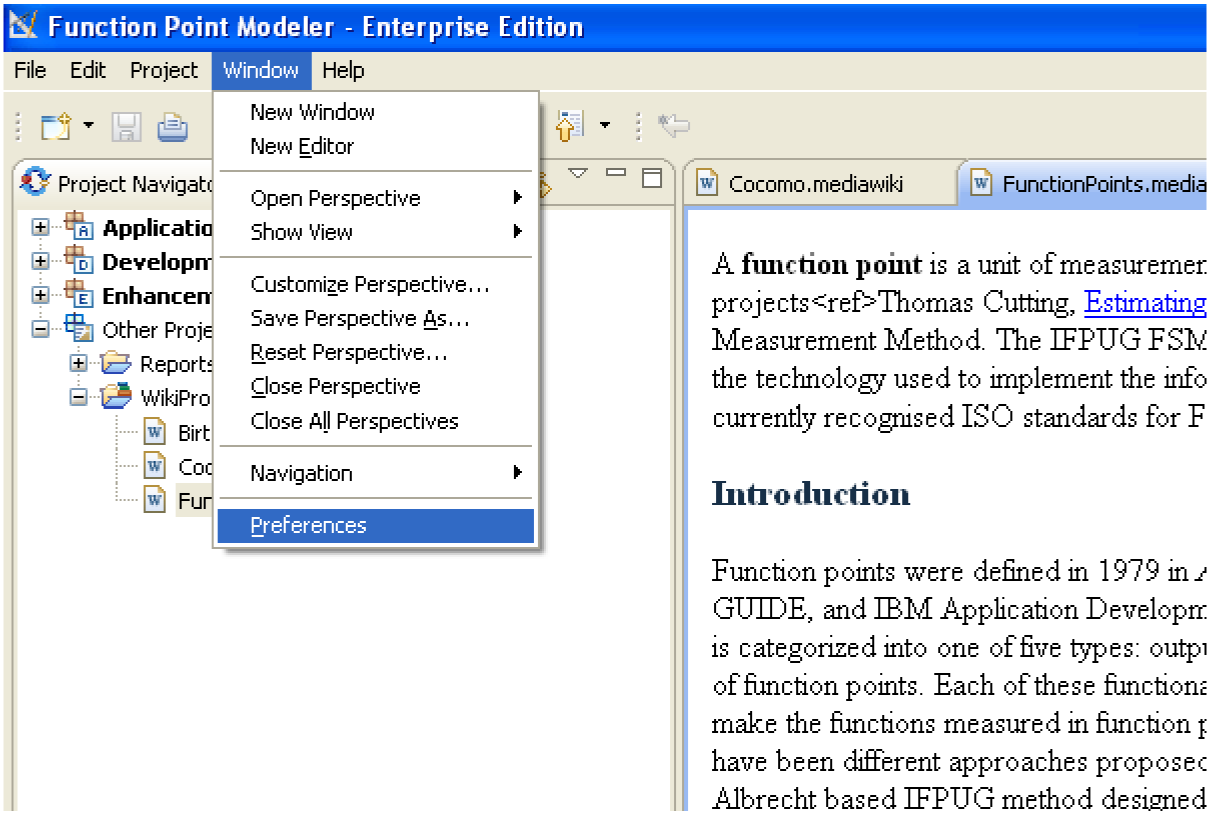
## Add External Work Types

Enterprise Edition

You may add a new *External Work Types* specified for your company.

To add a new **External Work Types** , perform the following steps.

1. Select from the menu **Window >Preferences > Function point Modeler > COCOMO Master Data**

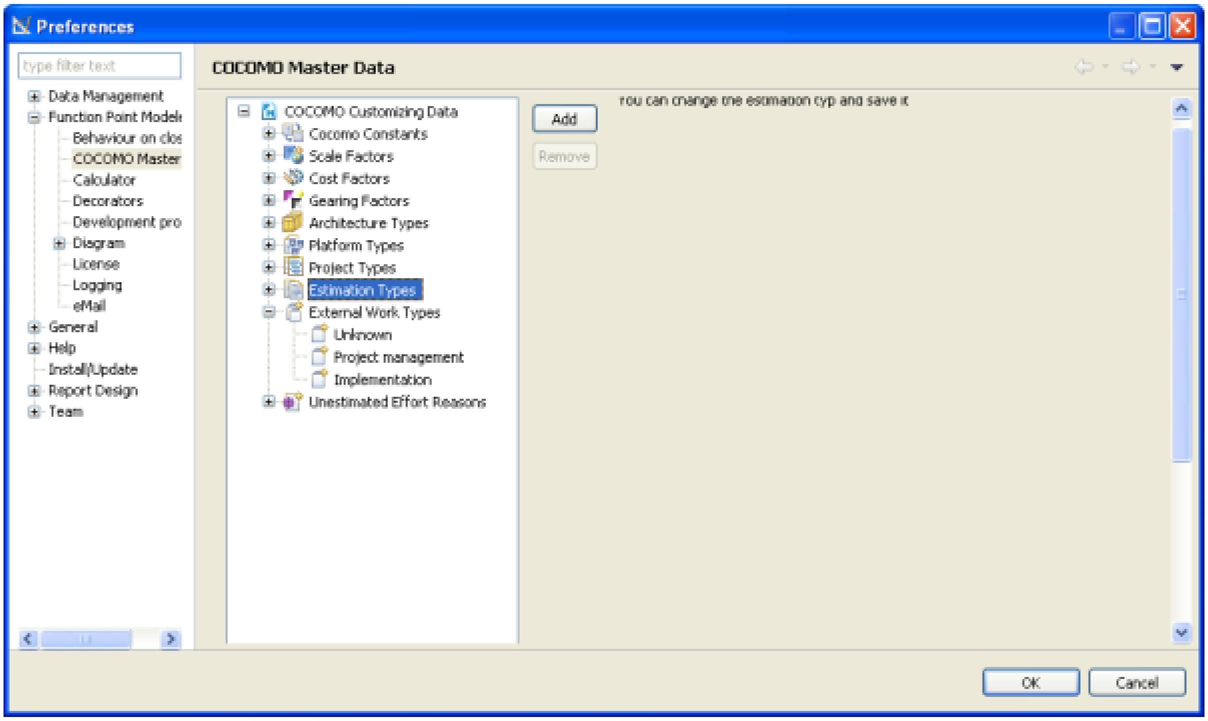


A **function point** is a unit of measuremen
projects<ref>Thomas Cutting, Estimating
Measurement Method. The IFPUG FSM
the technology used to implement the info
currently recognised ISO standards for F

**Introduction**

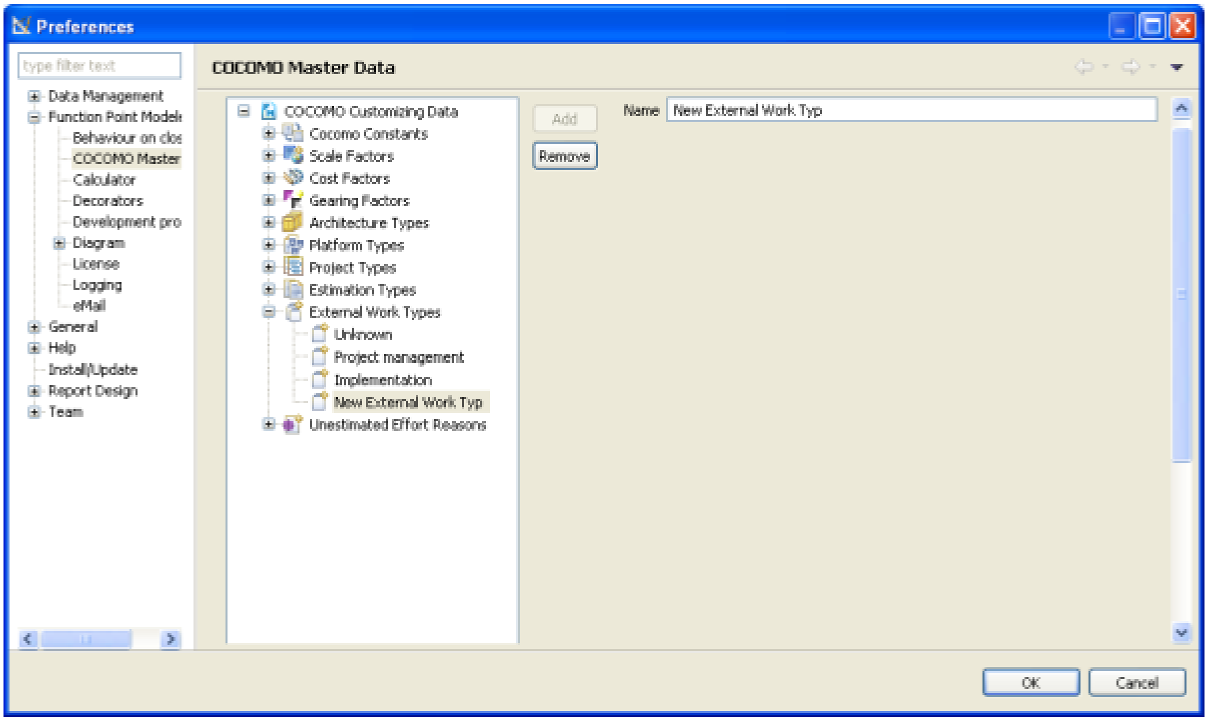
Function points were defined in 1979 in
GUIDE, and IBM Application Developm
is categorized into one of five types: outpu
of function points. Each of these functiona
make the functions measured in function p
have been different approaches proposec
Albrecht based IFPUG method designed

2. Select the item *External Work Types* in the tree and click the button **Add**



You can change the estimation typ and save it

The new added **External Work Types** will be displayed in the tree of **Cocomo Master Data** .



Name: New External Work Typ

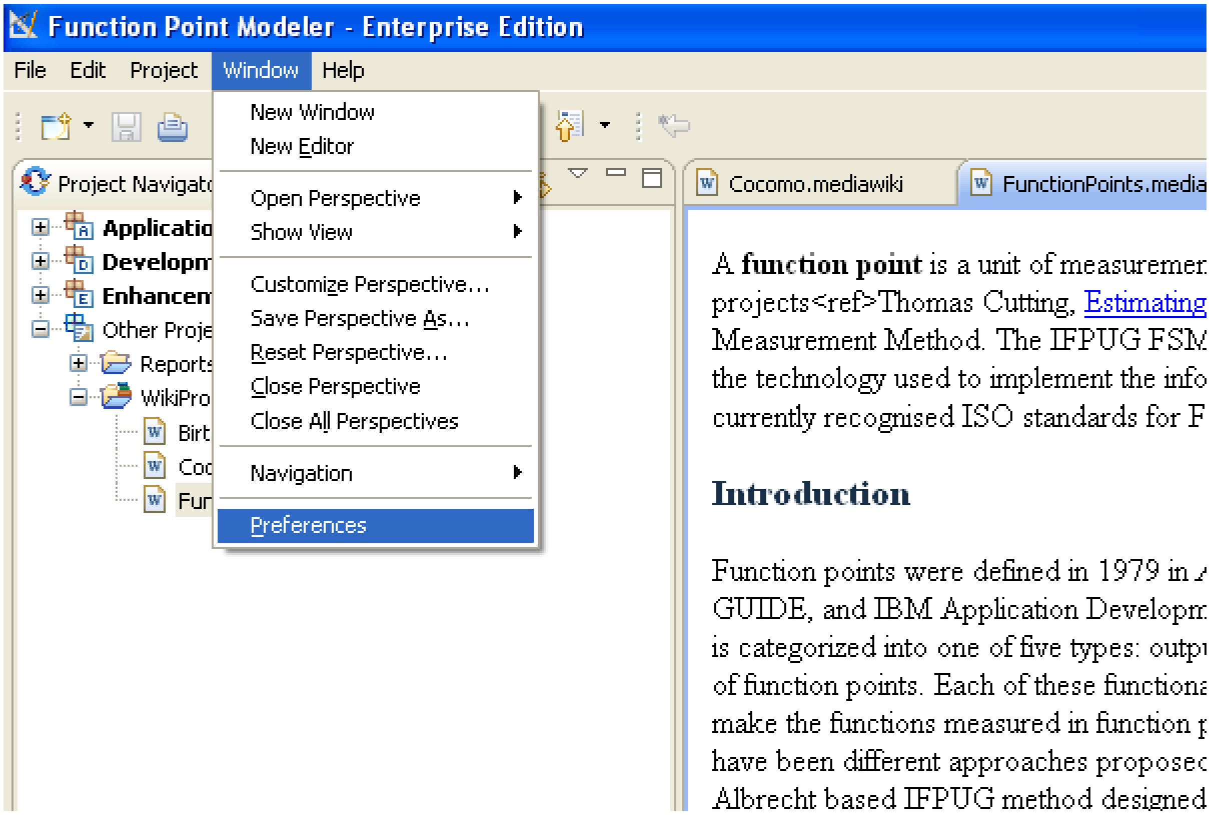
## Add Unestimated Effort Reasons

Enterprise Edition

You may add a new *Unestimated Effort Reasons* specified for your company.

To add a new **Unestimated Effort Reasons** , perform the following steps.

1. Select from the menu **Window >Preferences > Function point Modeler > COCOMO Master Data**

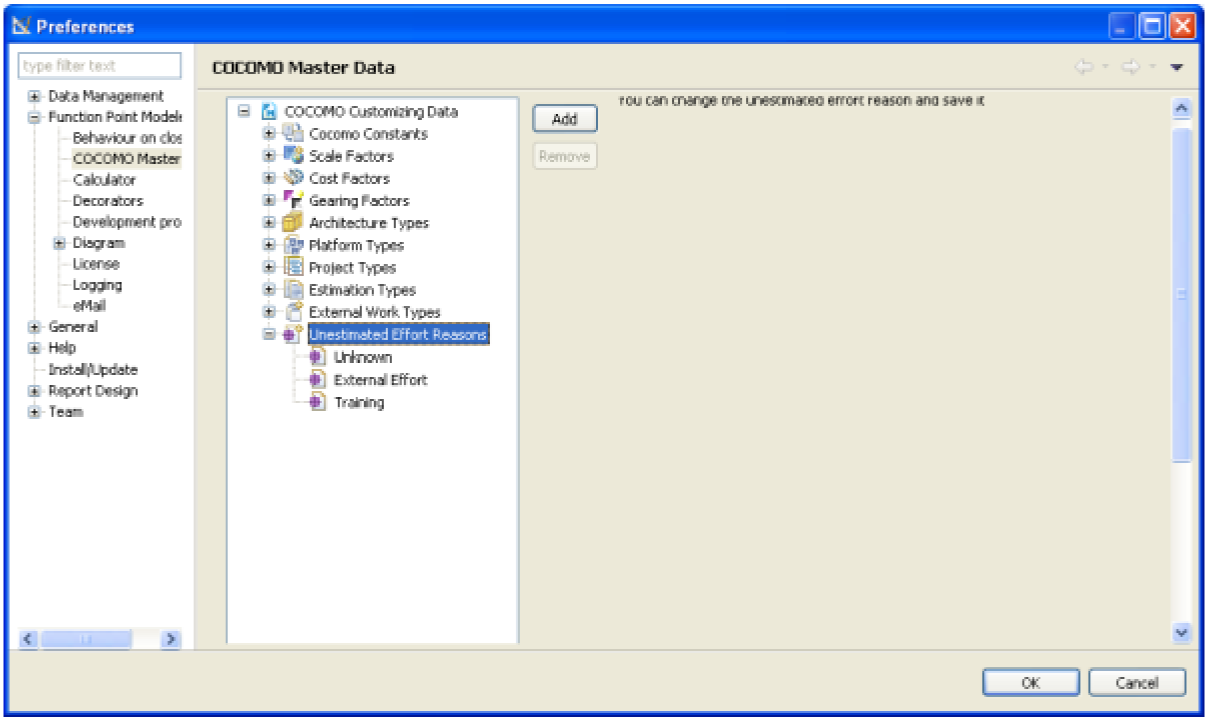


A **function point** is a unit of measuremen
projects<ref>Thomas Cutting, Estimating
Measurement Method. The IFPUG FSM
the technology used to implement the info
currently recognised ISO standards for F

**Introduction**

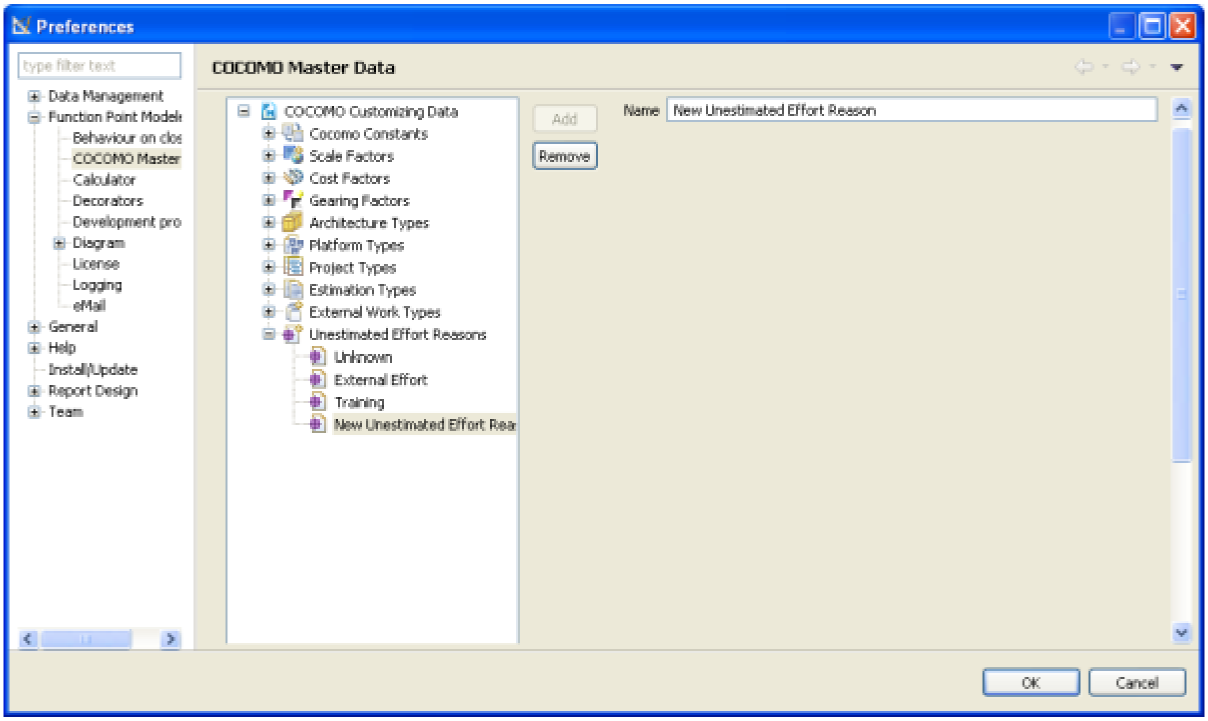
Function points were defined in 1979 in A
GUIDE, and IBM Application Developm
is categorized into one of five types: outpu
of function points. Each of these functiona
make the functions measured in function p
have been different approaches proposec
Albrecht based IFPUG method designed

2. Select the item *Unestimated Effort Reasons* in the tree and click the button **Add**



You can change the unestimated effort reason and save it

The new added **Unestimated Effort Reasons** will be displayed in the tree of **Cocomo Master Data** .



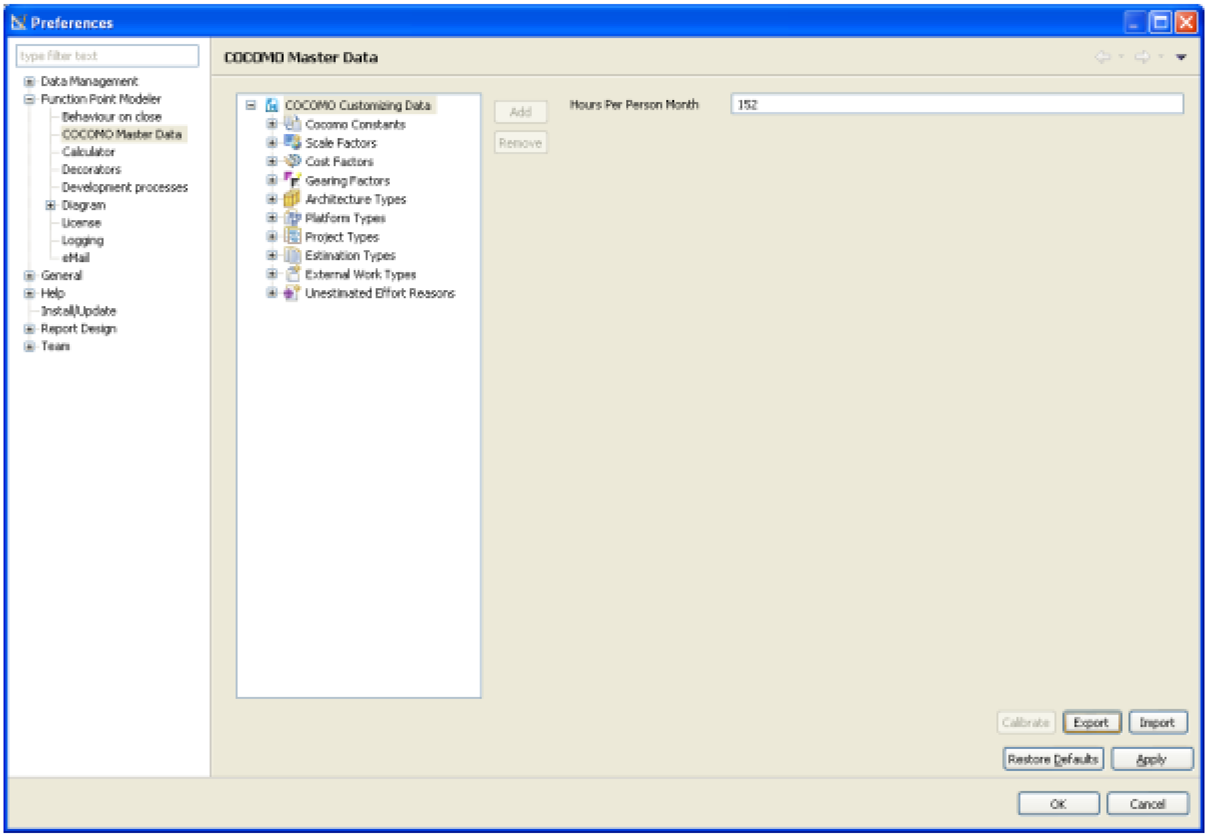
Name: New Unestimated Effort Reason

### Export Cocomo Masterdata

Enterprise Edition

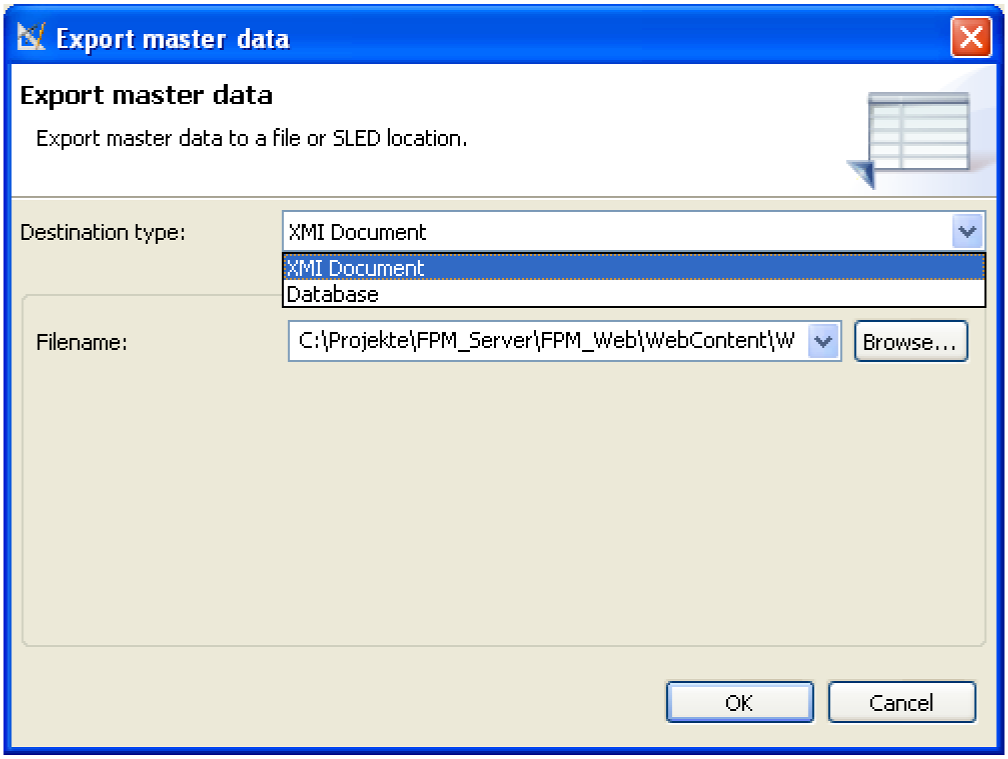
You may export the customized **COCOMO Masterdata** either to xmi file or to a relational database management system **(RDBMS)** to provide this setting your team member centralized.

1. Click the **Export** button to export **COCOMO Masterdata**



Hours Per Person Month 152

2. The following dialog will be showed.



Export master data

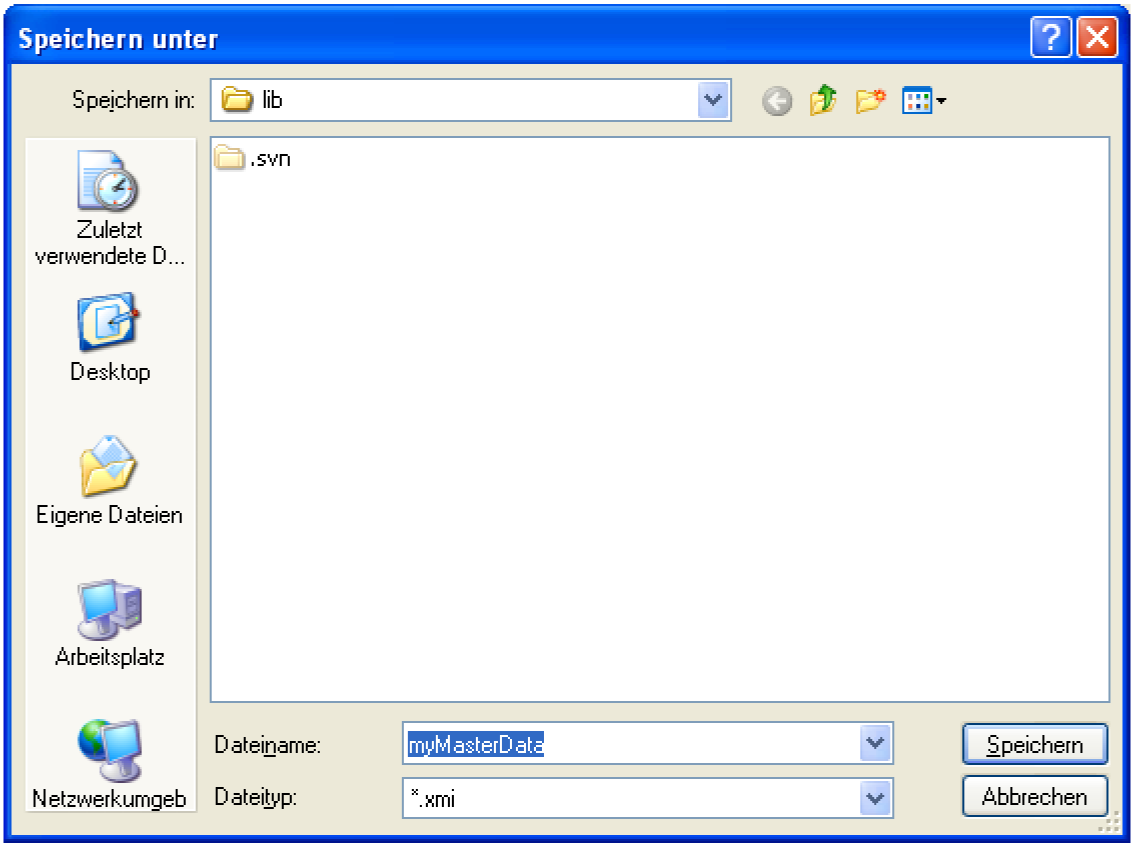
Export master data

Export master data to a file or SLED location.

Destination type: XMI Document

Filename: C:\Projekte\FPM_Server\FPM_Web\WebContent\W

3. Click the **Browse...** button
4. Enter the filename *myMasterData*



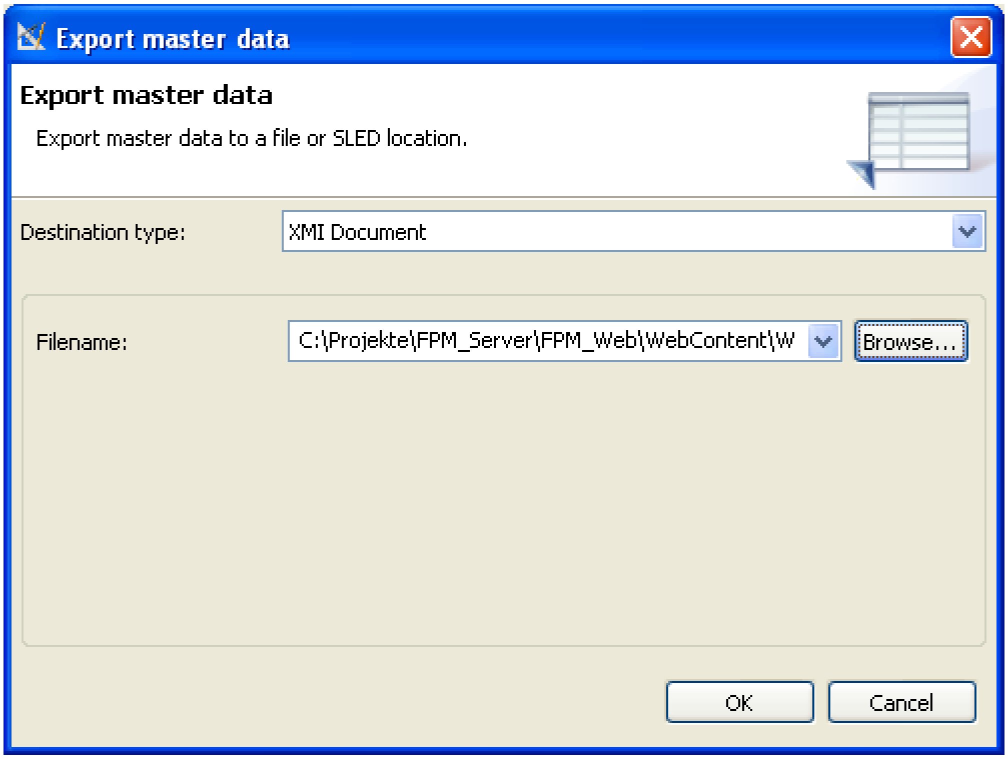
Speichern unter

Speichern in: lib

Dateiname: myMasterData

Dateityp: *.xmi

**5.** Click the **Ok** button



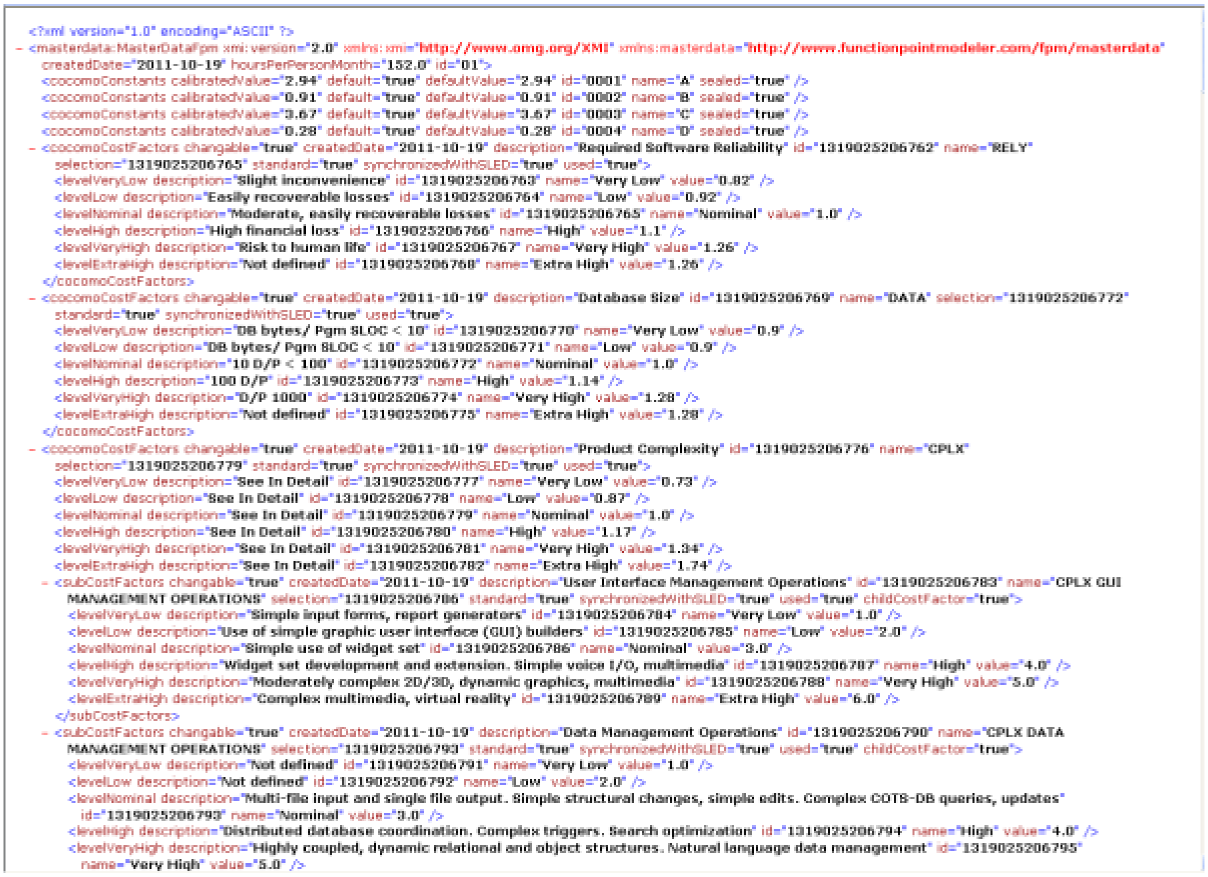
Export master data

Export master data to a file or SLED location.

Destination type: XMI Document

Filename: C:\Projekte\FPM_Server\FPM_Web\WebContent\W

The following picture shows the content of the **COCOMO Masterdata** .



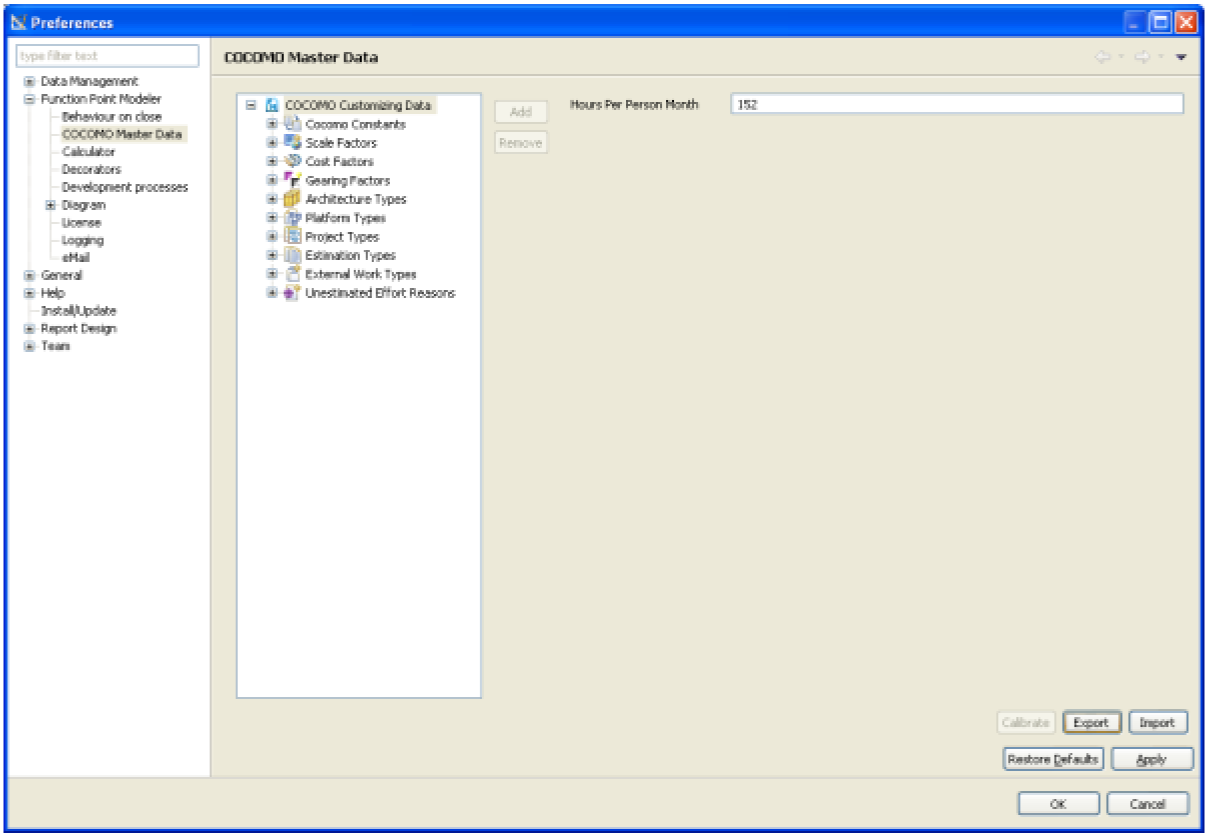
```
  <?xml version="1.0" encoding="ASCII" ?>
- <masterdata:MasterDataFpm xmi:version="2.0" xmlns:xmi="http://www.omg.org/XMI" xmlns:masterdata="http://www.functionpointmodeler.com/fpm/masterdata"
    createdDate="2011-10-19" hoursPerPersonMonth="152.0" id="01">
    <cocomoConstants calibratedValue="2.94" default="true" defaultValue="2.94" id="0001" name="A" sealed="true" />
    <cocomoConstants calibratedValue="0.91" default="true" defaultValue="0.91" id="0002" name="B" sealed="true" />
    <cocomoConstants calibratedValue="3.67" default="true" defaultValue="3.67" id="0003" name="C" sealed="true" />
    <cocomoConstants calibratedValue="0.28" default="true" defaultValue="0.28" id="0004" name="D" sealed="true" />
  - <cocomoCostFactors changable="true" createdDate="2011-10-19" description="Required Software Reliability" id="1319025206762" name="RELY"
      selection="1319025206765" standard="true" synchronizedWithSLED="true" used="true">
      <levelVeryLow description="Slight inconvenience" id="1319025206763" name="Very Low" value="0.82" />
      <levelLow description="Easily recoverable losses" id="1319025206764" name="Low" value="0.92" />
      <levelNominal description="Moderate, easily recoverable losses" id="1319025206765" name="Nominal" value="1.0" />
      <levelHigh description="High financial loss" id="1319025206766" name="High" value="1.1" />
      <levelVeryHigh description="Risk to human life" id="1319025206767" name="Very High" value="1.26" />
      <levelExtraHigh description="Not defined" id="1319025206768" name="Extra High" value="1.26" />
    </cocomoCostFactors>
  - <cocomoCostFactors changable="true" createdDate="2011-10-19" description="Database Size" id="1319025206769" name="DATA" selection="1319025206772"
      standard="true" synchronizedWithSLED="true" used="true">
      <levelVeryLow description="DB bytes/ Pgm SLOC < 10" id="1319025206770" name="Very Low" value="0.9" />
      <levelLow description="DB bytes/ Pgm SLOC < 10" id="1319025206771" name="Low" value="0.9" />
      <levelNominal description="10 D/P < 100" id="1319025206772" name="Nominal" value="1.0" />
      <levelHigh description="100 D/P" id="1319025206773" name="High" value="1.14" />
      <levelVeryHigh description="D/P 1000" id="1319025206774" name="Very High" value="1.28" />
      <levelExtraHigh description="Not defined" id="1319025206775" name="Extra High" value="1.28" />
    </cocomoCostFactors>
  - <cocomoCostFactors changable="true" createdDate="2011-10-19" description="Product Complexity" id="1319025206776" name="CPLX"
      selection="1319025206779" standard="true" synchronizedWithSLED="true" used="true">
      <levelVeryLow description="See In Detail" id="1319025206777" name="Very Low" value="0.73" />
      <levelLow description="See In Detail" id="1319025206778" name="Low" value="0.87" />
      <levelNominal description="See In Detail" id="1319025206779" name="Nominal" value="1.0" />
      <levelHigh description="See In Detail" id="1319025206780" name="High" value="1.17" />
      <levelVeryHigh description="See In Detail" id="1319025206781" name="Very High" value="1.34" />
      <levelExtraHigh description="See In Detail" id="1319025206782" name="Extra High" value="1.74" />
    - <subCostFactors changable="true" createdDate="2011-10-19" description="User Interface Management Operations" id="1319025206783" name="CPLX GUI
        MANAGEMENT OPERATIONS" selection="1319025206786" standard="true" synchronizedWithSLED="true" used="true" childCostFactor="true">
        <levelVeryLow description="Simple input forms, report generators" id="1319025206784" name="Very Low" value="1.0" />
        <levelLow description="Use of simple graphic user interface (GUI) builders" id="1319025206785" name="Low" value="2.0" />
        <levelNominal description="Simple use of widget set" id="1319025206786" name="Nominal" value="3.0" />
        <levelHigh description="Widget set development and extension. Simple voice I/O, multimedia" id="1319025206787" name="High" value="4.0" />
        <levelVeryHigh description="Moderately complex 2D/3D, dynamic graphics, multimedia" id="1319025206788" name="Very High" value="5.0" />
        <levelExtraHigh description="Complex multimedia, virtual reality" id="1319025206789" name="Extra High" value="6.0" />
      </subCostFactors>
    - <subCostFactors changable="true" createdDate="2011-10-19" description="Data Management Operations" id="1319025206790" name="CPLX DATA
        MANAGEMENT OPERATIONS" selection="1319025206793" standard="true" synchronizedWithSLED="true" used="true" childCostFactor="true">
        <levelVeryLow description="Not defined" id="1319025206791" name="Very Low" value="1.0" />
        <levelLow description="Not defined" id="1319025206792" name="Low" value="2.0" />
        <levelNominal description="Multi-file input and single file output. Simple structural changes, simple edits. Complex COTS-DB queries, updates"
          id="1319025206793" name="Nominal" value="3.0" />
        <levelHigh description="Distributed database coordination. Complex triggers. Search optimization" id="1319025206794" name="High" value="4.0" />
        <levelVeryHigh description="Highly coupled, dynamic relational and object structures. Natural language data management" id="1319025206795"
          name="Very High" value="5.0" />
```

### Import Cocomo Masterdata

Enterprise Edition

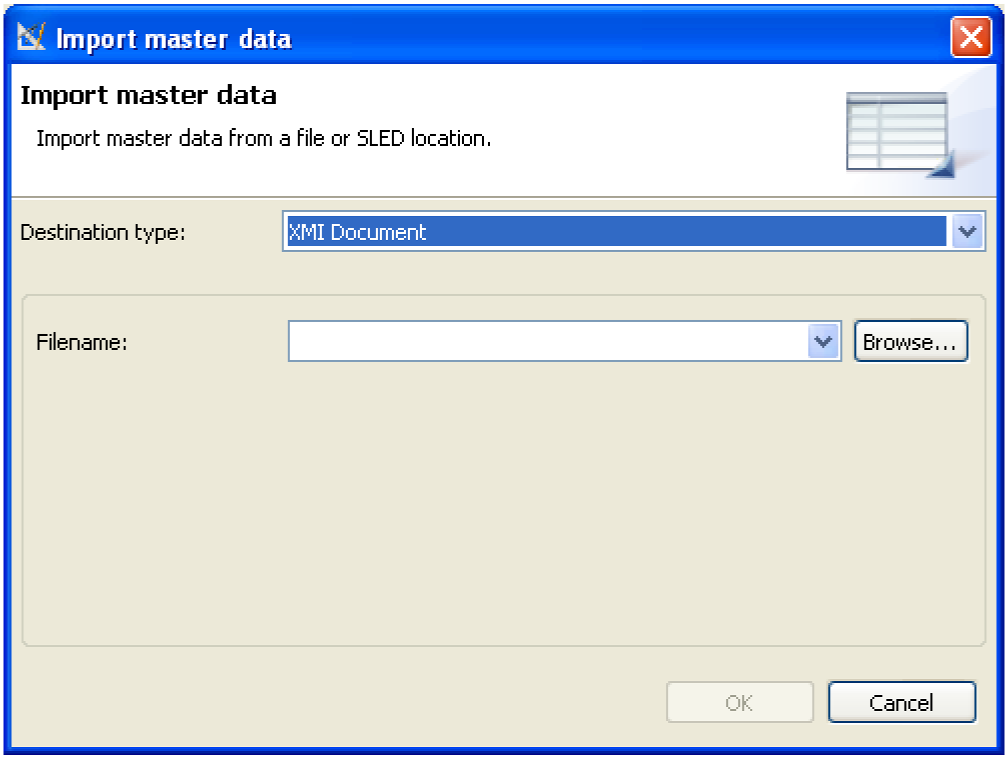
You may also import the customized **COCOMO Masterdata** either from xmi file or from a relational database management system **(RDBMS)** .

**1.** Click the **Import** button to export **COCOMO Masterdata**



Hours Per Person Month: 152

2. The following dialog will be showed.



Import master data

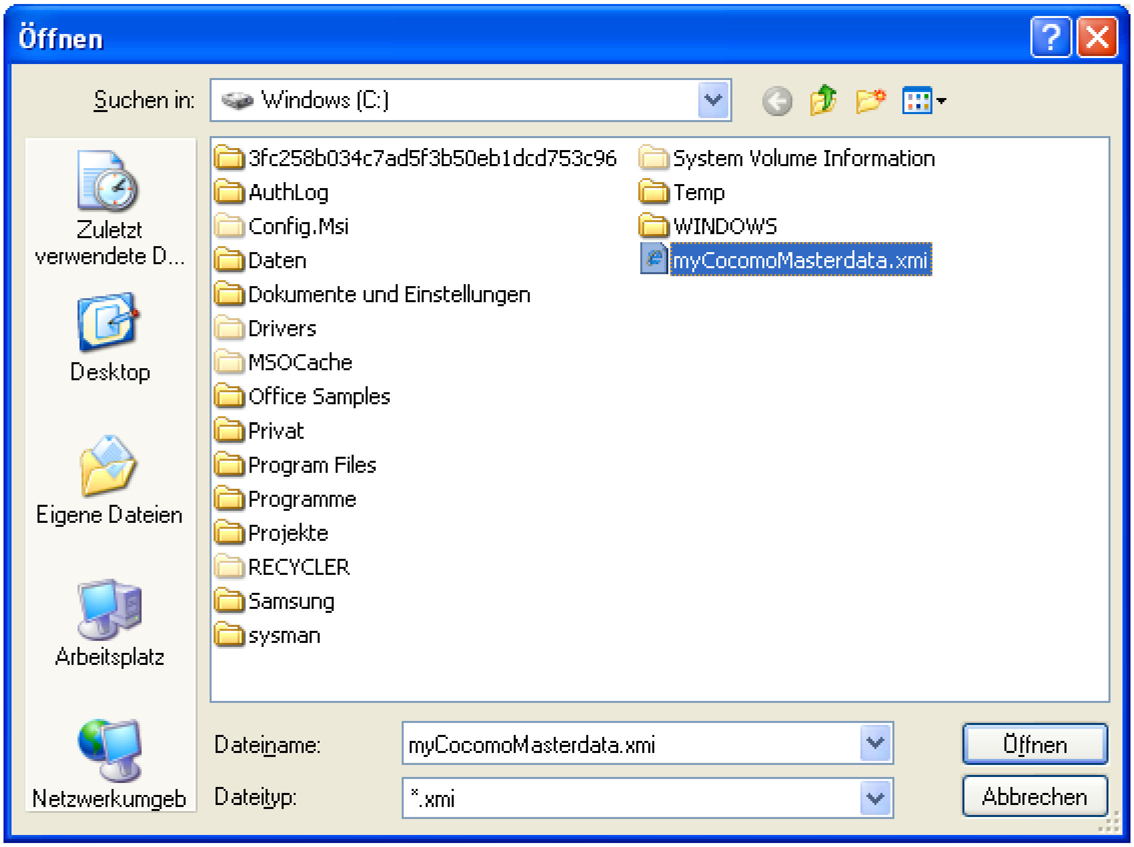
Import master data from a file or SLED location.

Destination type: XMI Document

Filename:

3. Click the **Browse...** button

4. Select the file *myMasterData*

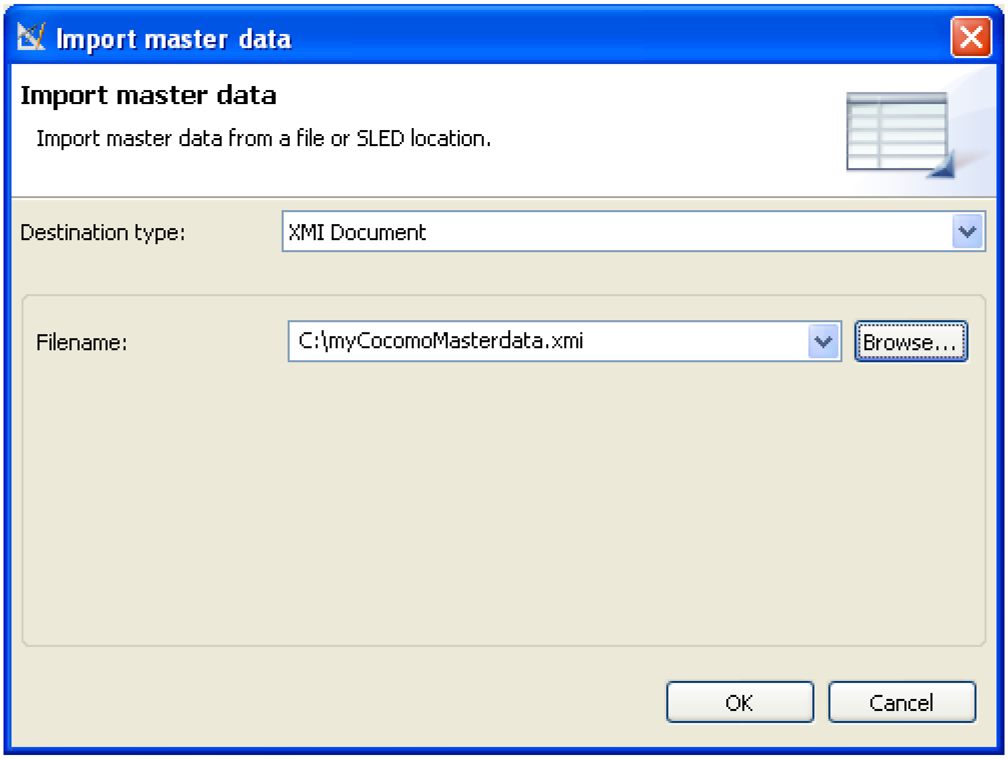


Suchen in: Windows (C:)

Dateiname: myCocomoMasterdata.xmi

Dateityp: *.xmi

5. Click the **Ok** button



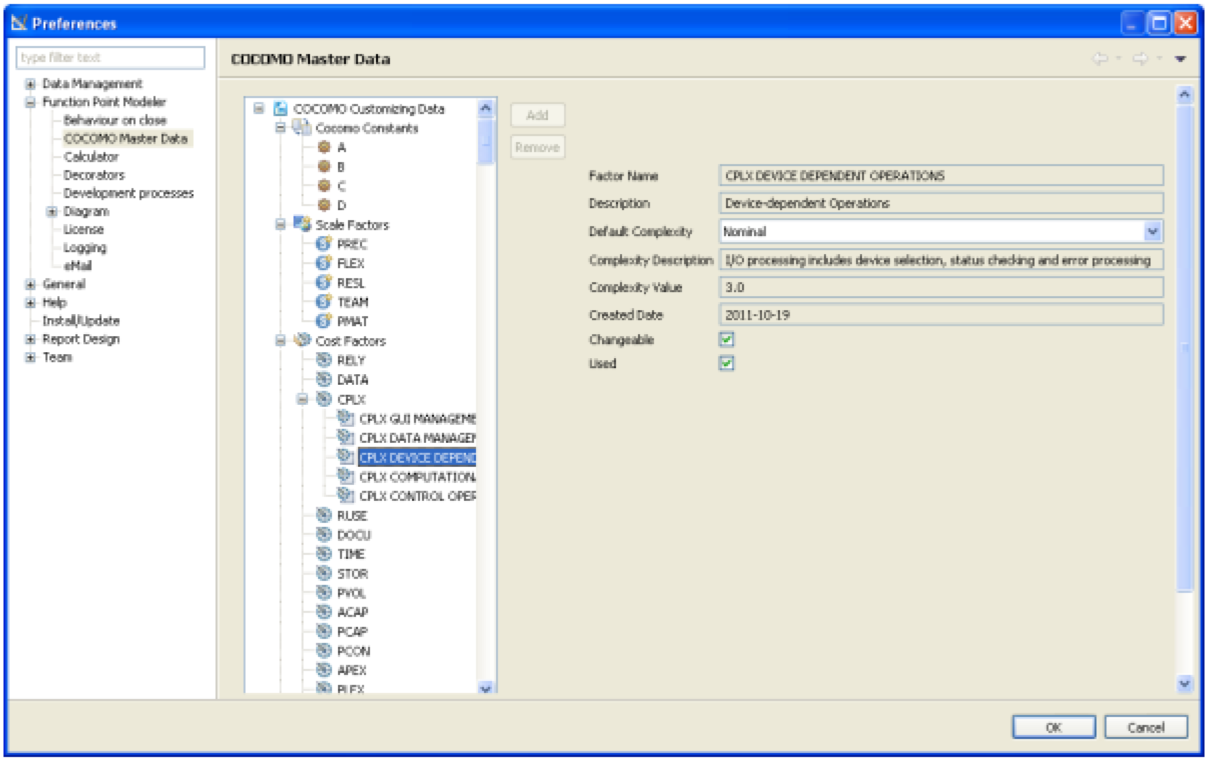
Import master data

Import master data from a file or SLED location.

Destination type: XMI Document

Filename: C:\myCocomoMasterdata.xmi

The following picture shows the content of the **COCOMO Masterdata** .



Factor Name: CPLX DEVICE DEPENDENT OPERATIONS

Description: Device-dependent Operations

Default Complexity: Nominal

Complexity Description: I/O processing includes device selection, status checking and error processing

Complexity Value: 3.0

Created Date: 2011-10-19

Changeable ☑

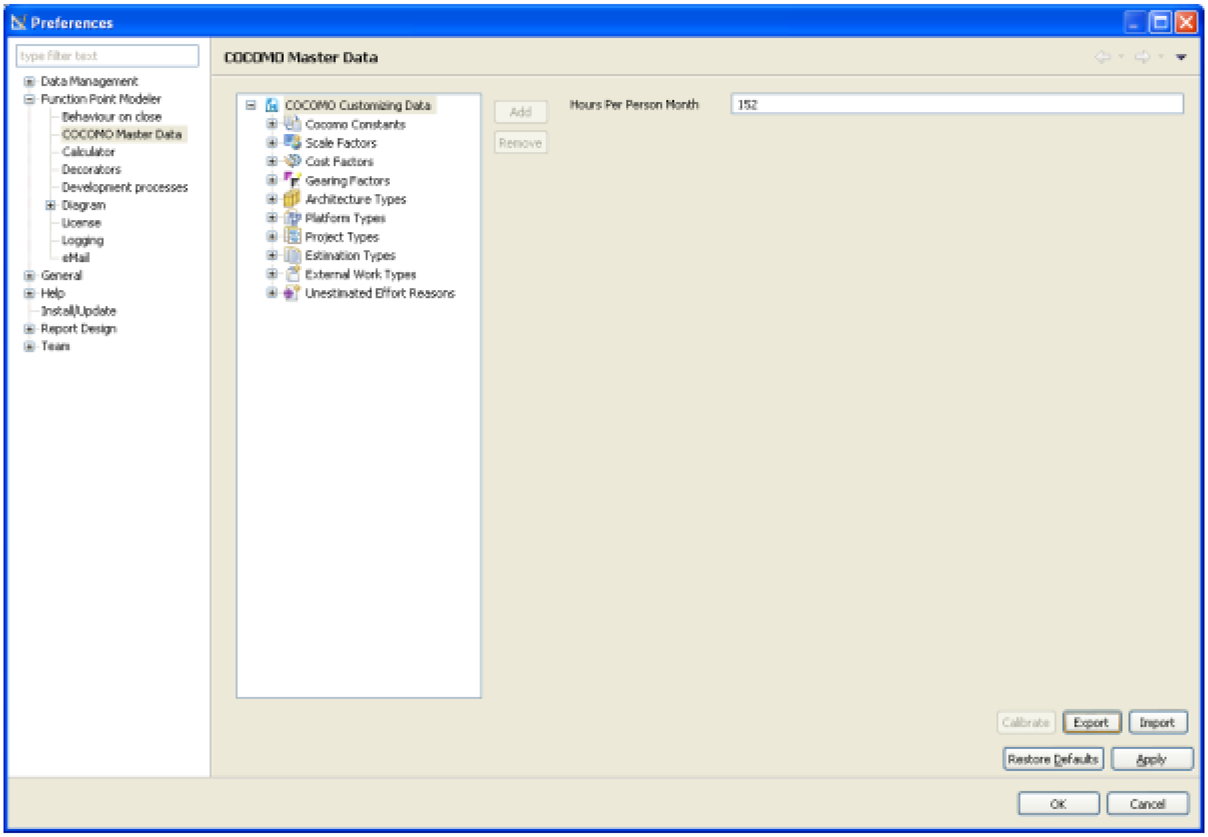
Used ☑

### Restore Defaults Cocomo Masterdata

Enterprise Edition

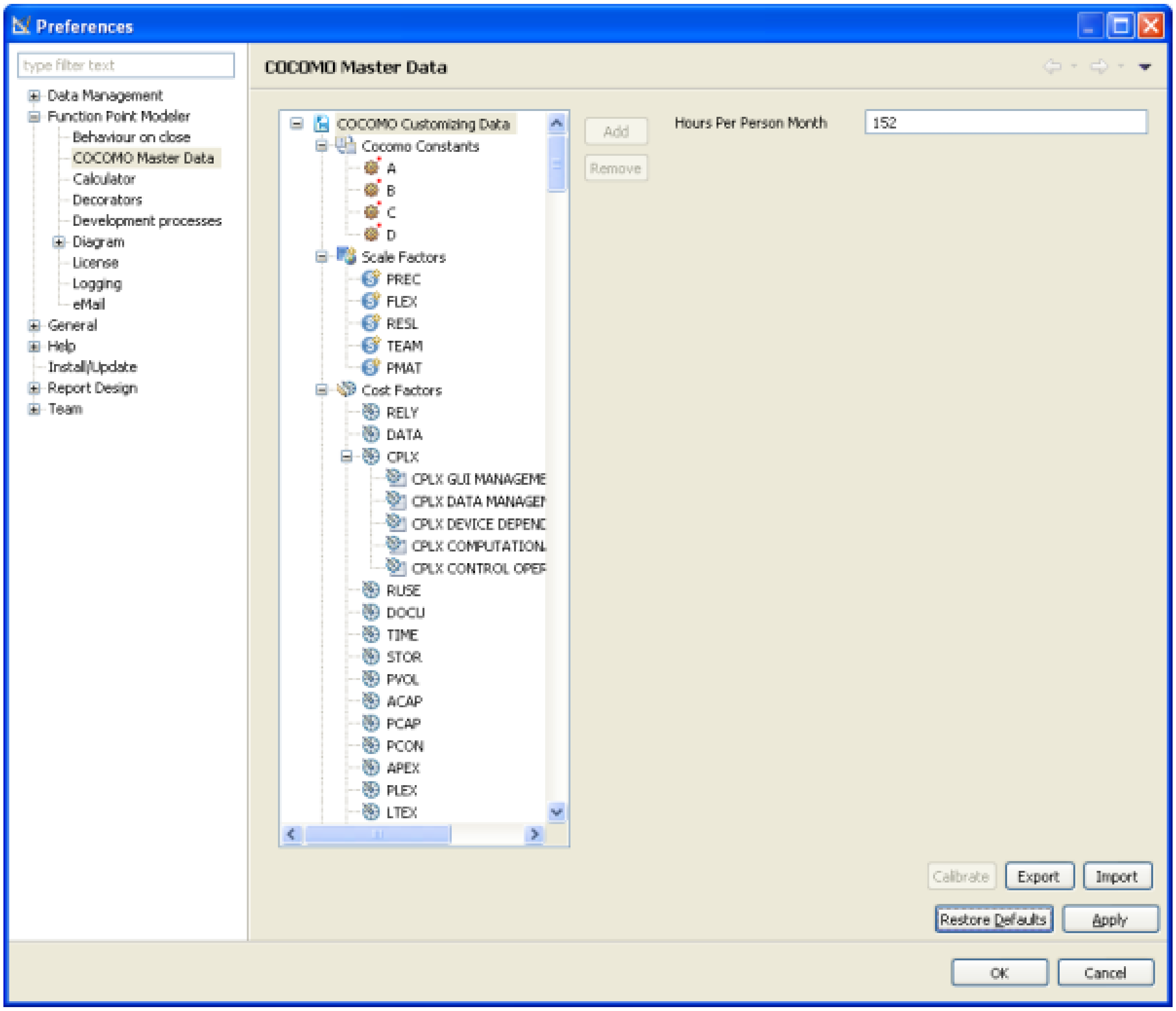
You can restore the default **COCOMO Masterdata** at any time:

To restore the default **COCOMO Masterdata** click the **Restore Defaults** button.



Hours Per Person Month: 152

The following picture shows the content of the **COCOMO Masterdata** .



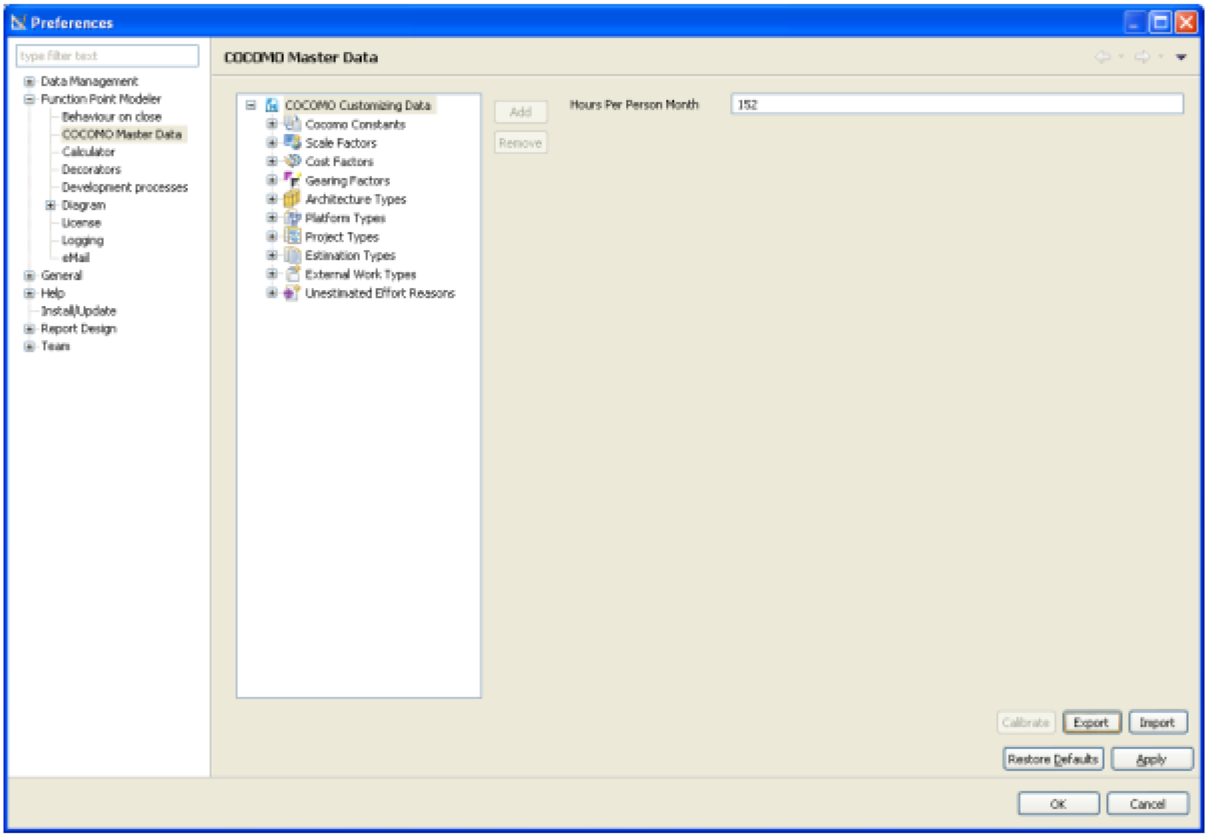
Hours Per Person Month: 152

## Apply Cocomo Masterdata

Enterprise Edition

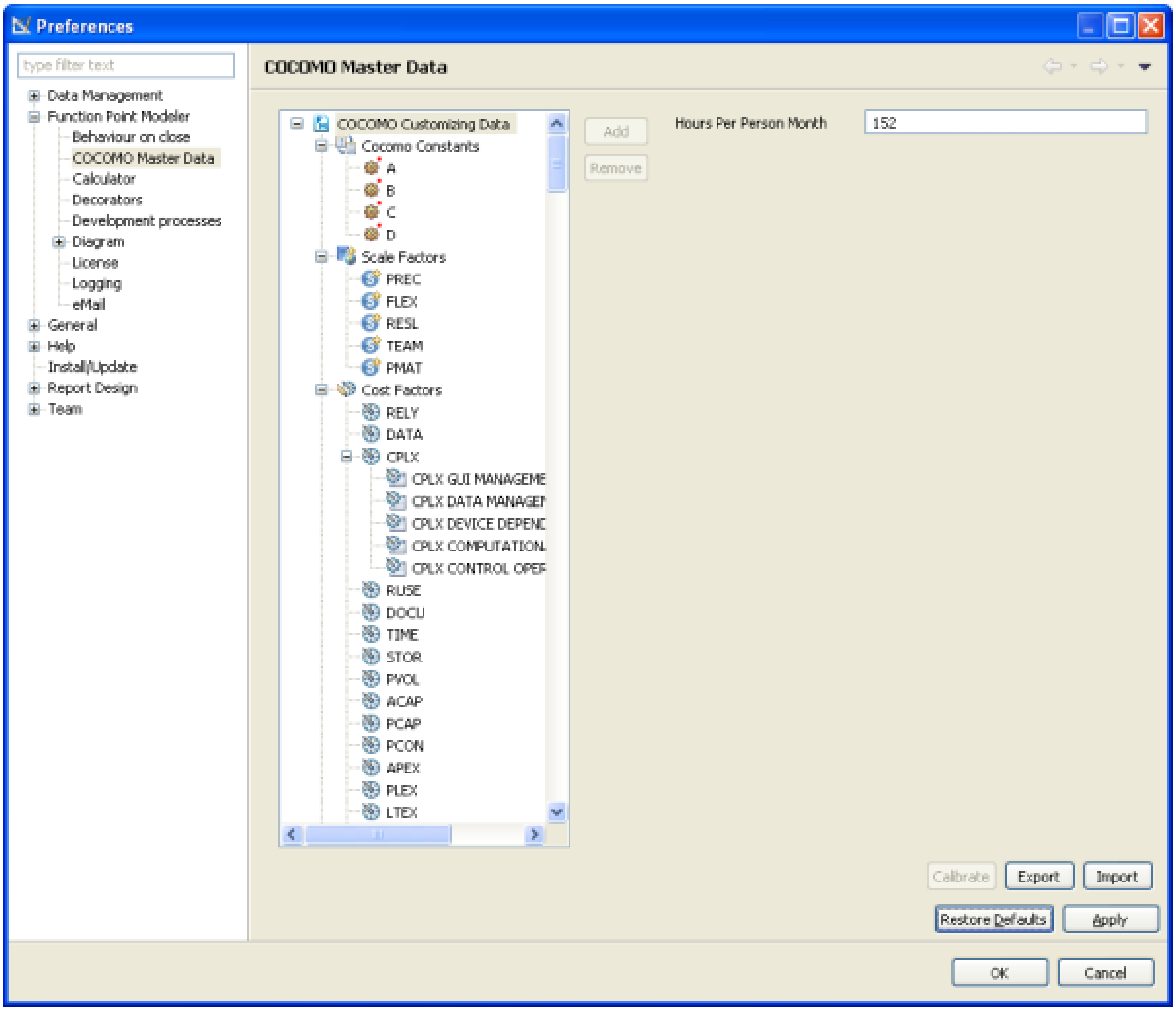
Changes of **COCOMO Masterdata** take effect on editors only after you press Apply or OK.

To apply the changes click the **Apply** or **Ok** button.



Hours Per Person Month: 152

The following picture shows the content of the **COCOMO Masterdata** .



Hours Per Person Month: 152

## Working with Development Processes

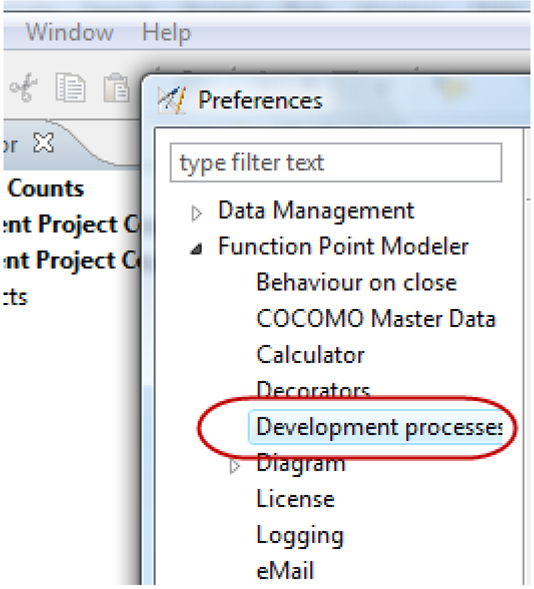
Enterprise Edition

### Create a new Development Process

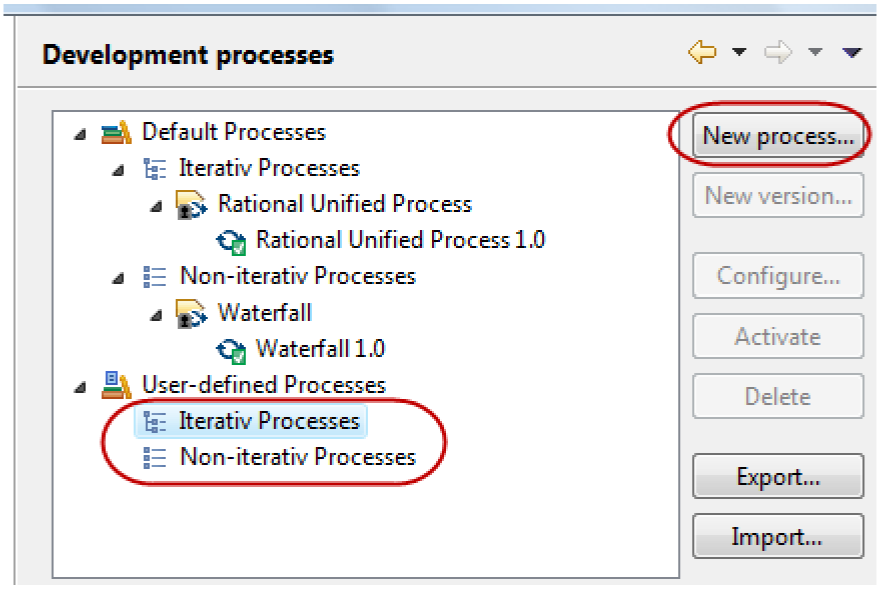
Enterprise Edition

To create a new Development Process, perform the following steps.

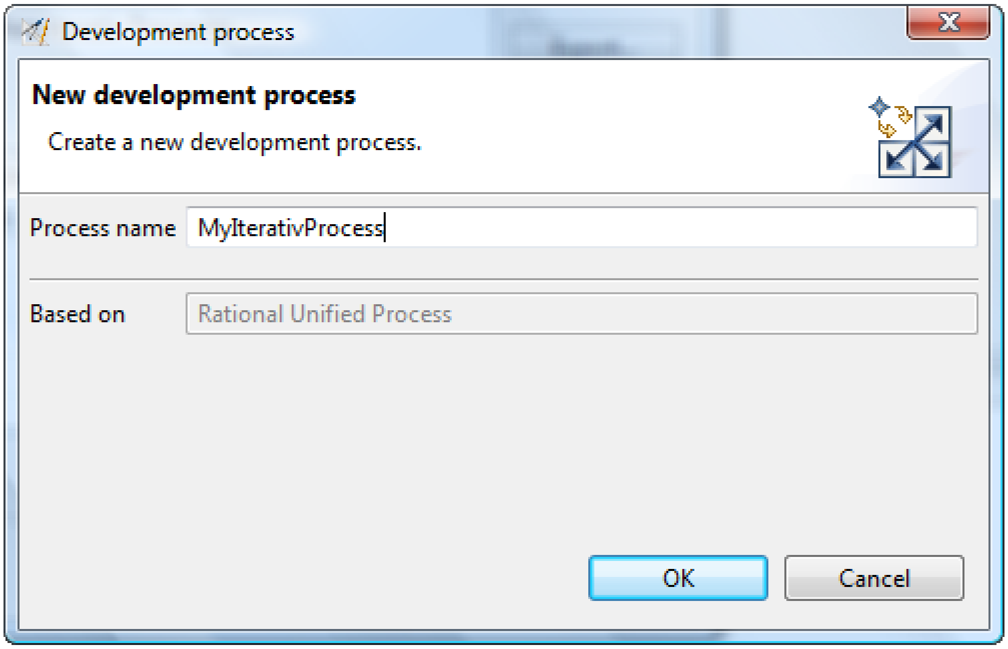
1. Select **Window** > **Preferences** > **Function Point Modeler** > **Development processes** in the menu bar.



2. Select **Iterative Processes** or **Non-iterativ Processes** and click on the **New processes...** button.



3. Enter a valid name for your new Development Process and press the **OK** button.



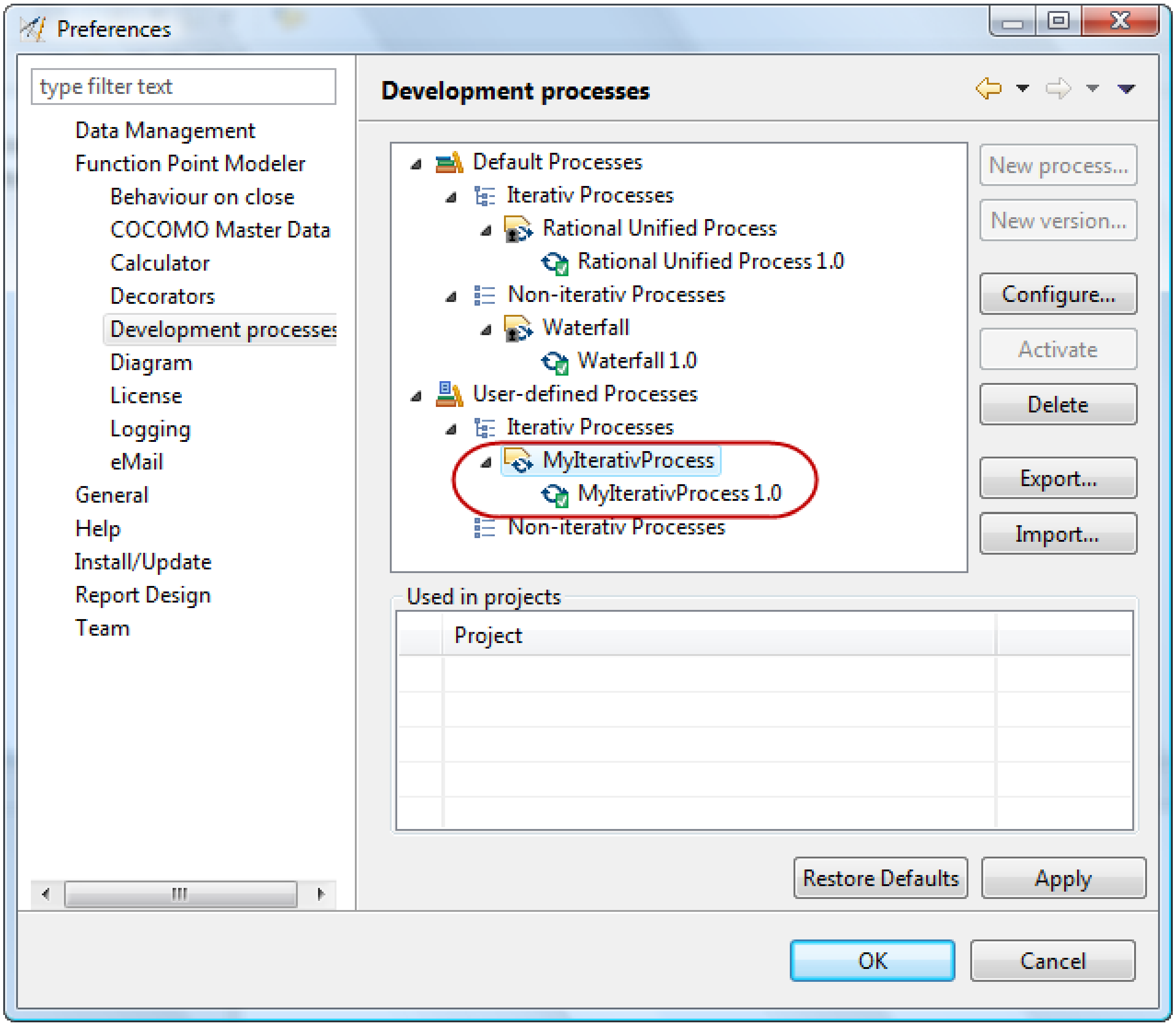
New development process

Create a new development process.

Process name: MyIterativProcess

Based on: Rational Unified Process

A new Development Process will be created. Your new Process contains a Process Version 1.0 by default, because every Development Process must contain exactly one active Process Version.

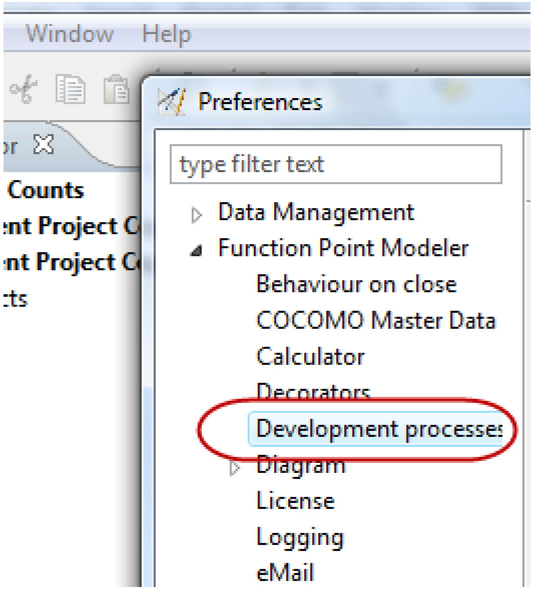


### Create a new Process Version

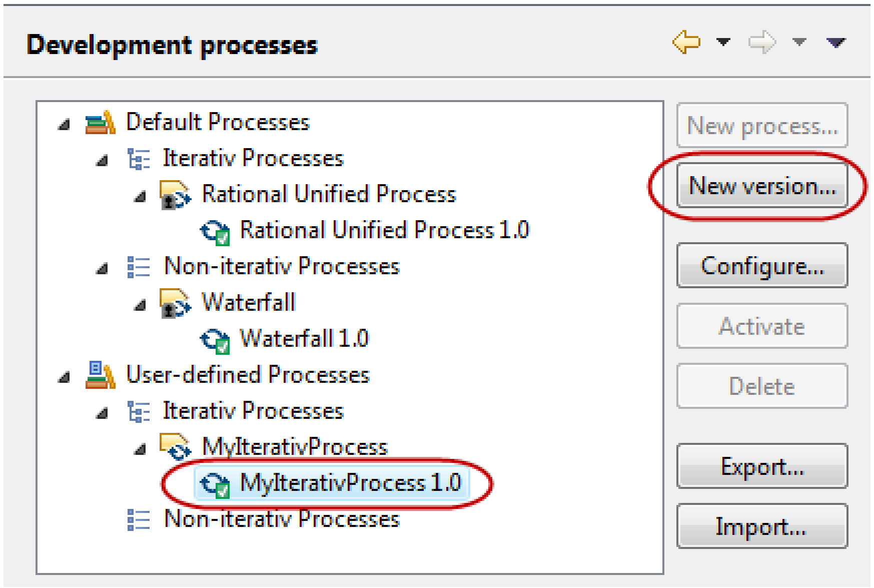
Enterprise Edition

To create a new Development Process Version, perform the following steps.

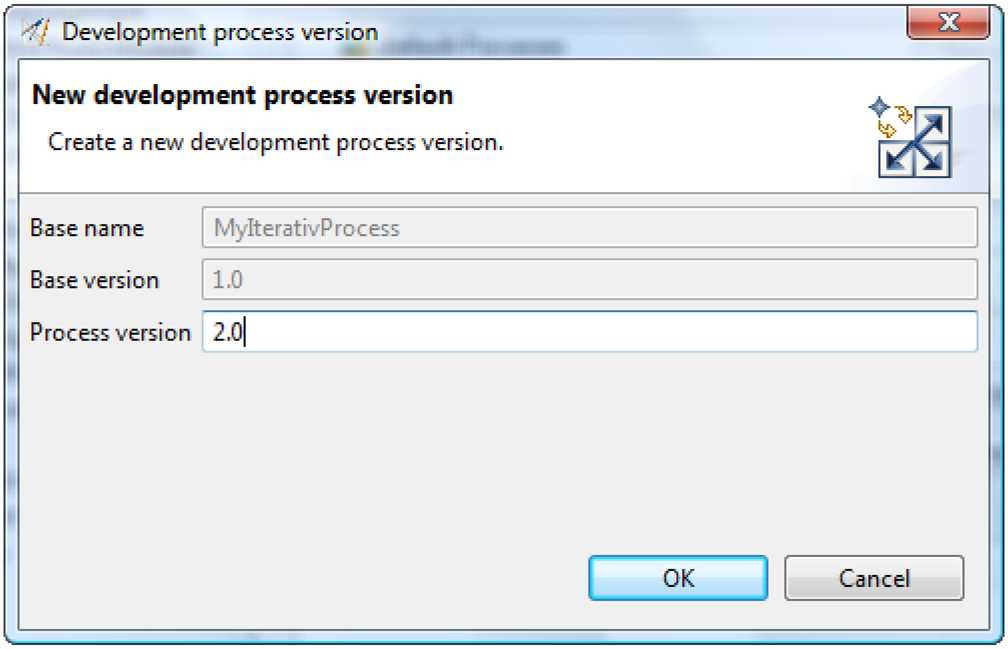
1. Select **Window** > **Preferences** > **Function Point Modeler** > **Development processes** in the menu bar.



2. Select a **Development Process Version** in the subtree User-defined Processes. The selected version is used as a copy basis for the new version to be created. Press the button **New version ...** .



3. Enter a valid name for your new Development Process Version and press the **OK** button.


Development process version

**New development process version**

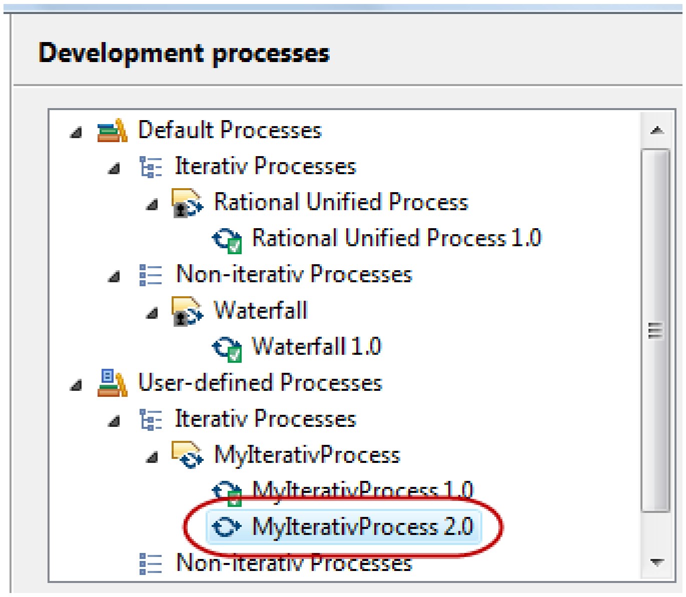
Create a new development process version.

Base name: MyIterativProcess

Base version: 1.0

Process version: 2.0

A new Development Process Version will be created.


**Development processes**

- Default Processes
  - Iterativ Processes
    - Rational Unified Process
      - Rational Unified Process 1.0
  - Non-iterativ Processes
    - Waterfall
      - Waterfall 1.0
- User-defined Processes
  - Iterativ Processes
    - MyIterativProcess
      - MyIterativProcess 1.0
      - MyIterativProcess 2.0
  - Non-iterativ Processes

### Configure a Process Version

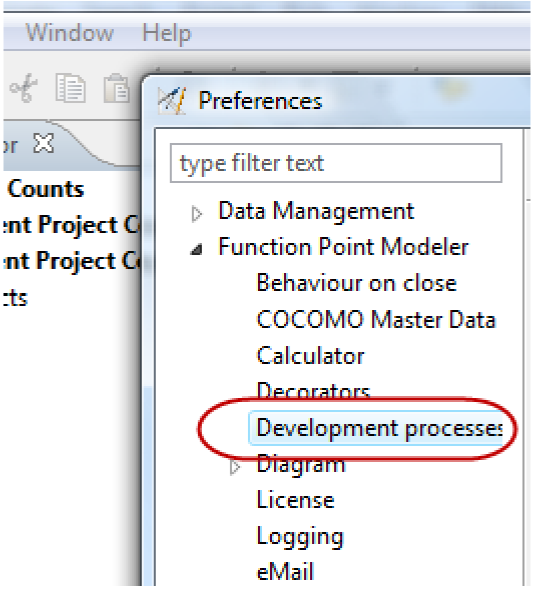
Enterprise Edition

### Configure Process Version Description

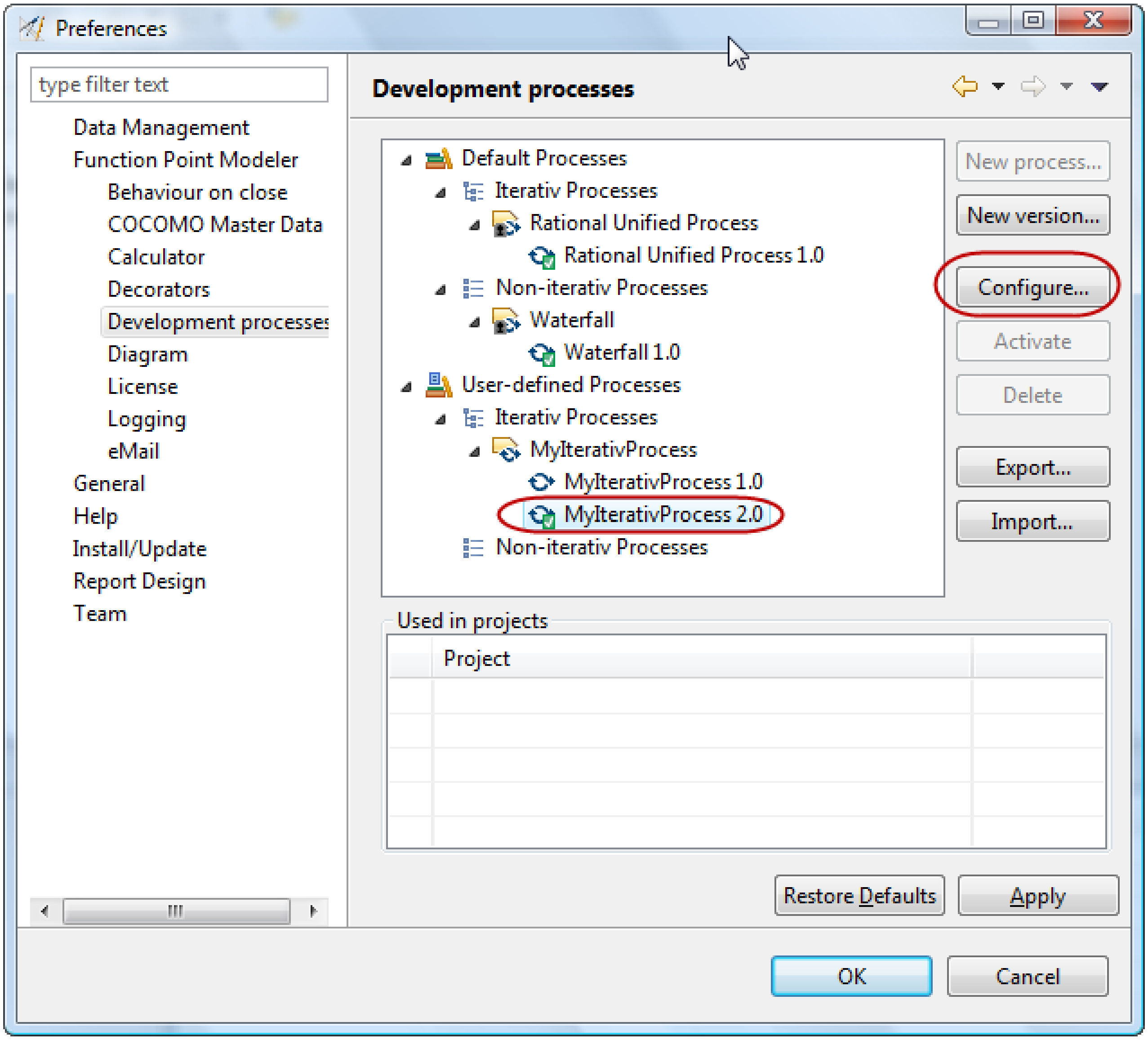
Enterprise Edition

To configure a Process Version Description, perform the following steps.

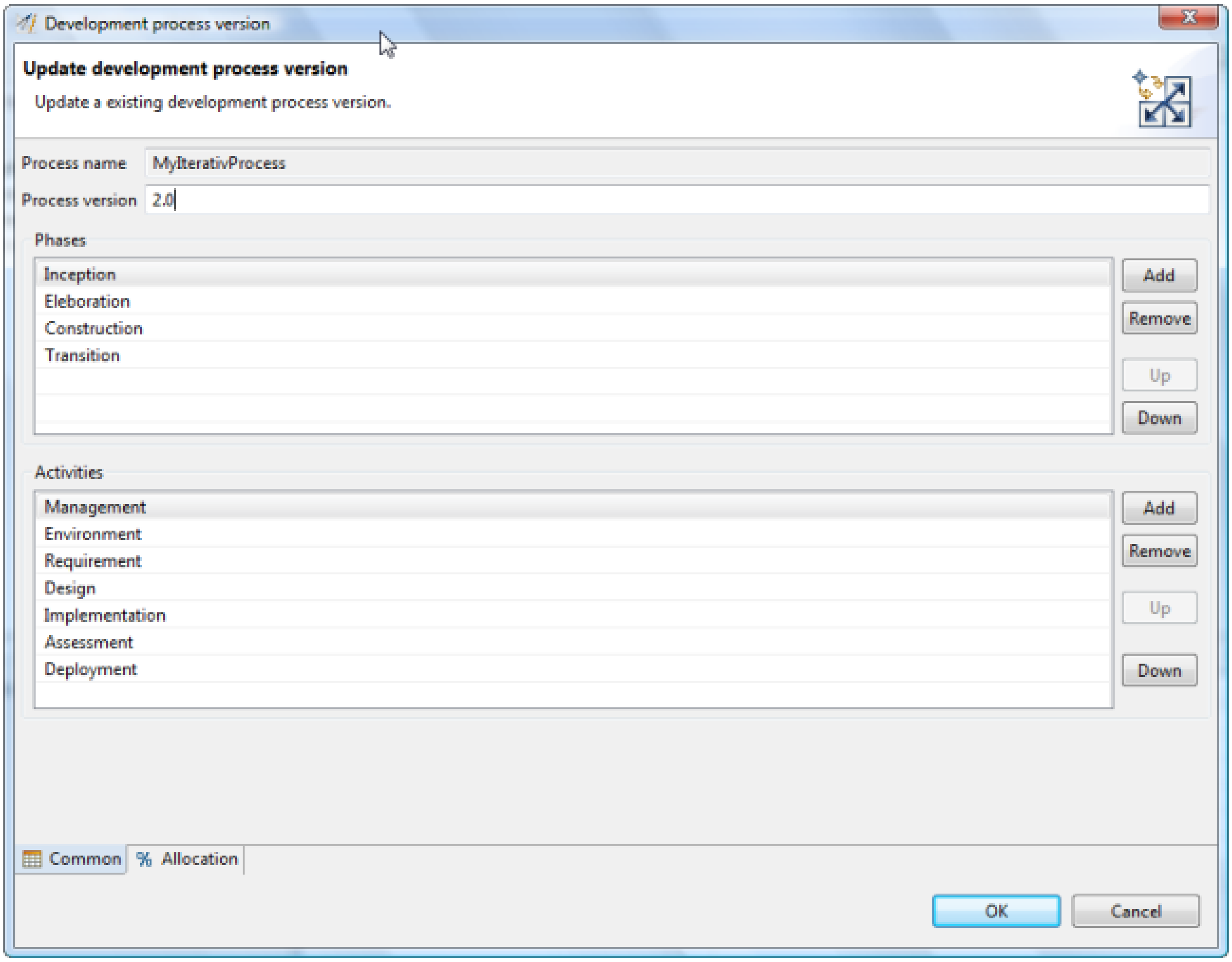
1. Select **Window** > **Preferences** > **Function Point Modeler** > **Development processes** in the menu bar.



2. Select a **Development Process Version** in the subtree User-defined Processes. Press the button **Configure ...** .



3. Select the **Common** tab in the dialog and enter a valid Process Version Description. When finished, press the **OK** button.



Development process version

**Update development process version**

Update a existing development process version.

Process name: MyIterativProcess

Process version: 2.0

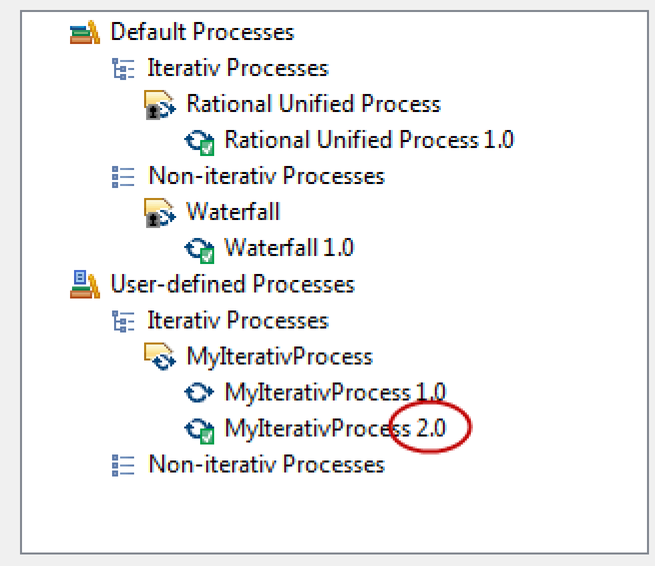
Phases

- Inception
- Eleboration
- Construction
- Transition

Activities

- Management
- Environment
- Requirement
- Design
- Implementation
- Assessment
- Deployment

The new Development Process Version description will be displayed.



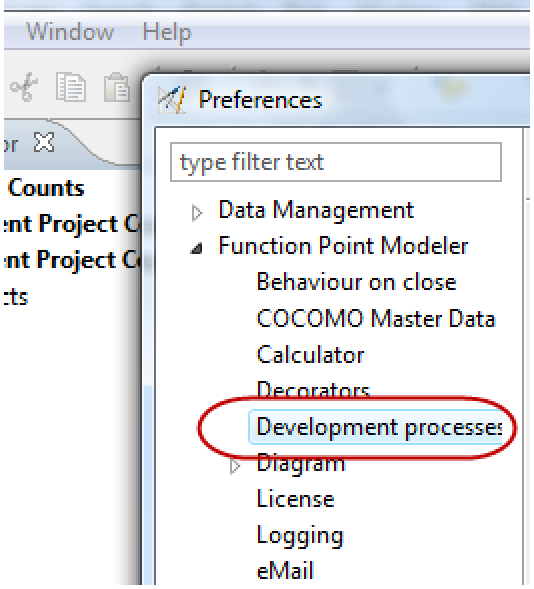
- Default Processes
  - Iterativ Processes
    - Rational Unified Process
      - Rational Unified Process 1.0
  - Non-iterativ Processes
    - Waterfall
      - Waterfall 1.0
- User-defined Processes
  - Iterativ Processes
    - MyIterativProcess
      - MyIterativProcess 1.0
      - MyIterativProcess 2.0
  - Non-iterativ Processes

### Configure Phases

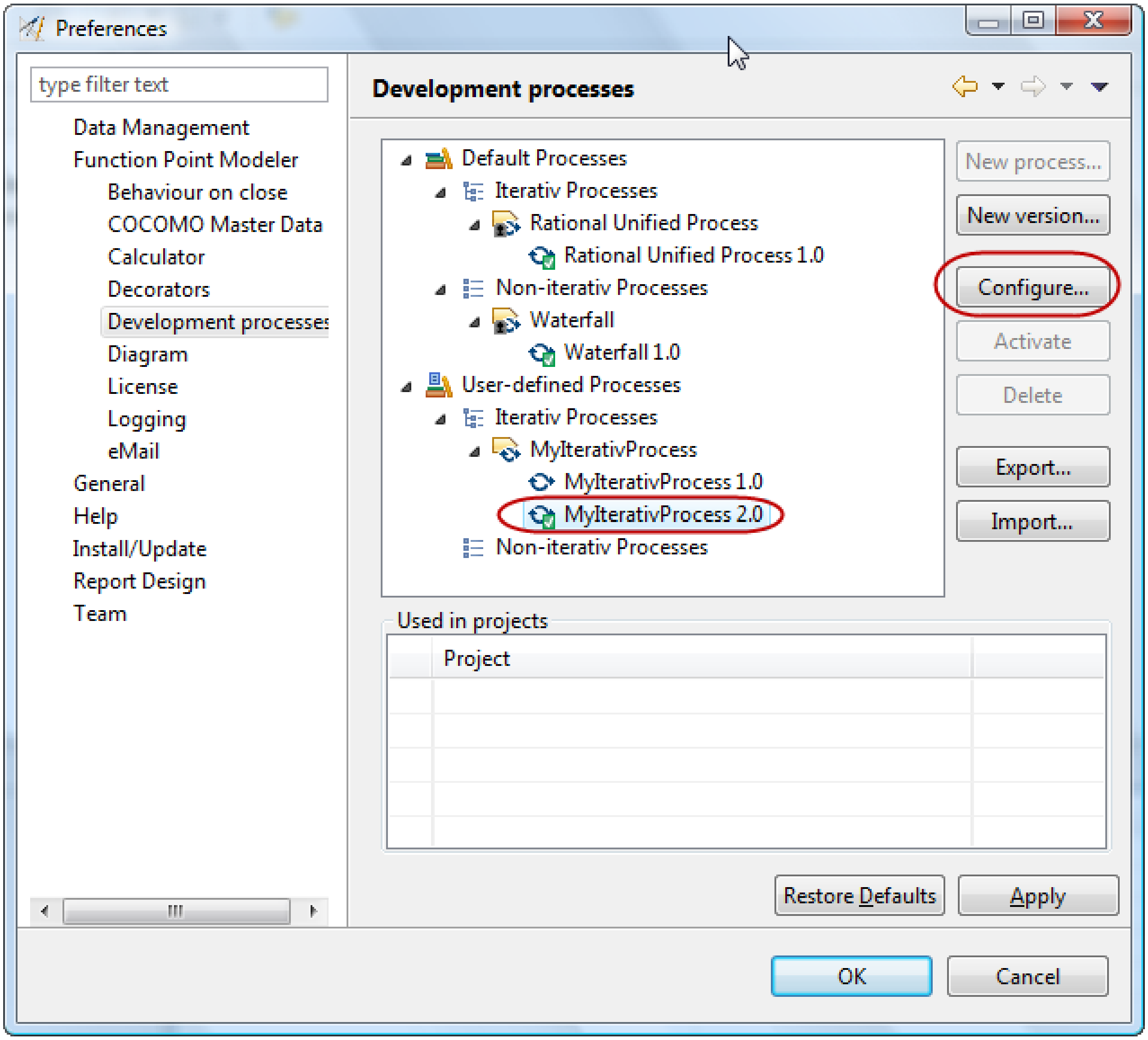
Enterprise Edition

To configure Process Version Phases, perform the following steps.

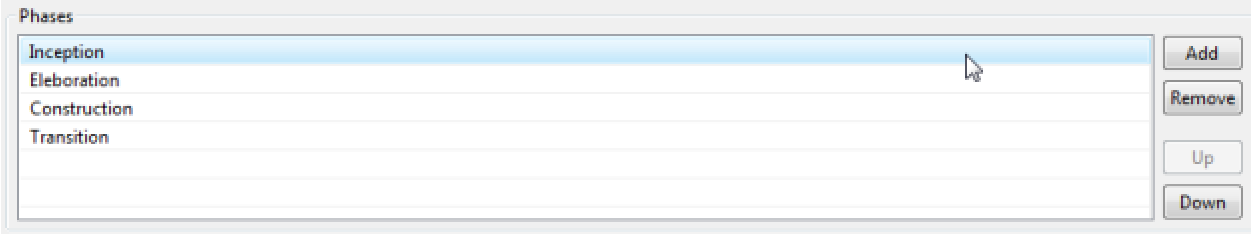
1. Select **Window** > **Preferences** > **Function Point Modeler** > **Development processes** in the menu bar.



2. Select a **Development Process Version** in the subtree User-defined Processes. Press the button **Configure ...** .



3. Select the **Common** tab in the dialog.



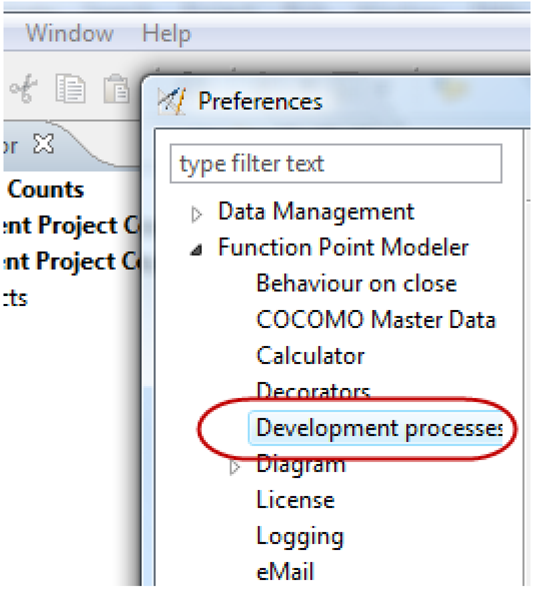
4. Click on an existing phase to change the description.
5. Click on the **Add** button to add a new phase.
6. Click on the **Remove** button to delete the selected phase.
7. Click on the **Up** button to move the selected phase one position upwards.
8. Click on the **Down** button to move the selected phase one position downwards.
9. Click on the **OK** when finished.

### Configure Activities

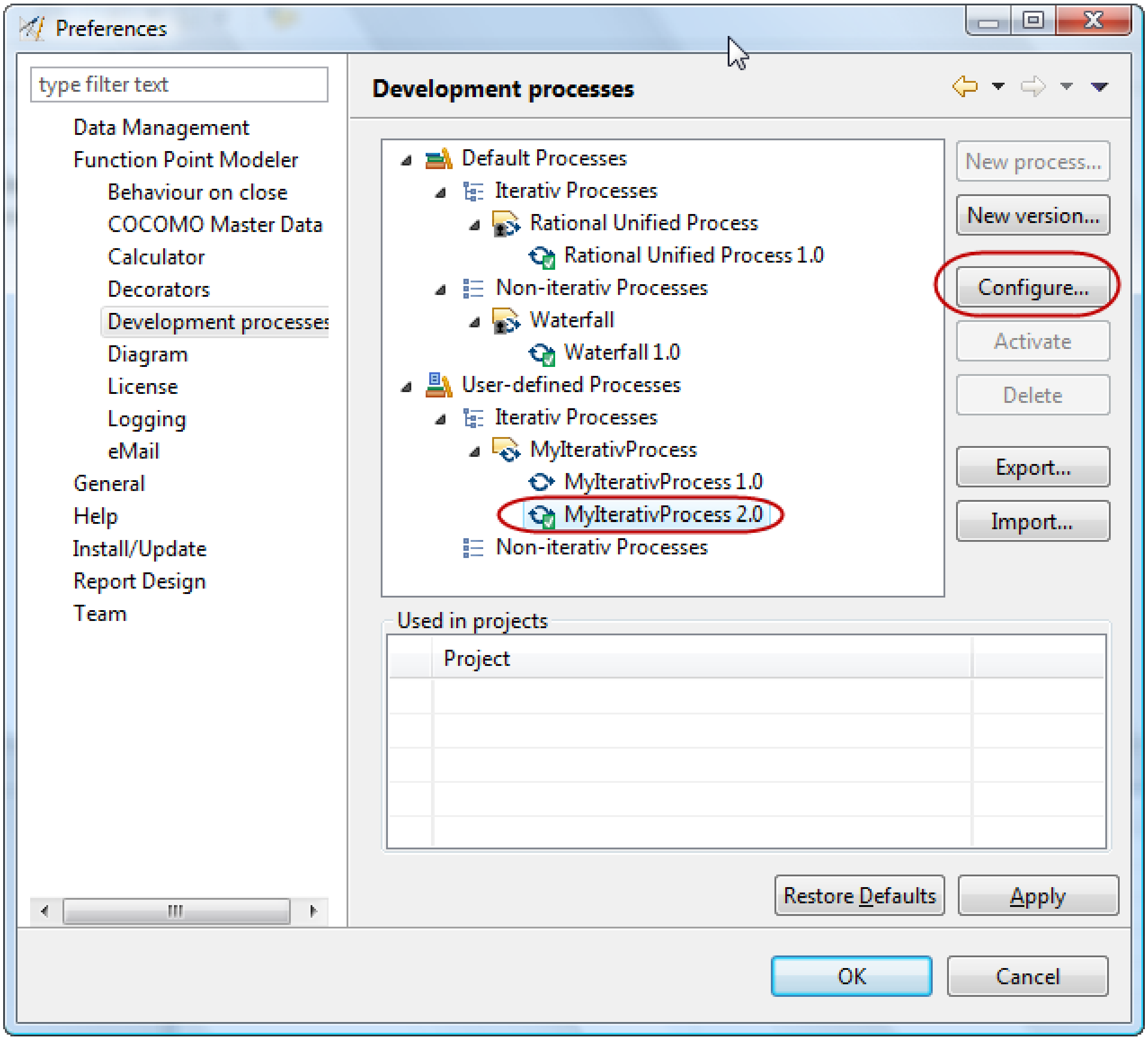
Enterprise Edition

To configure Process Version Activities, perform the following steps.

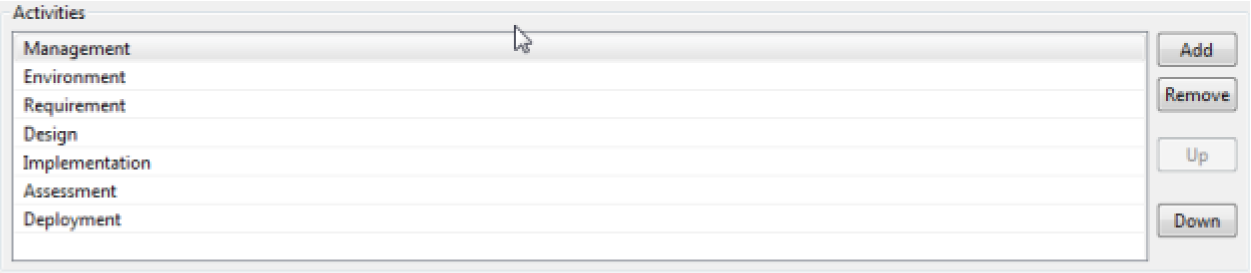
1. Select **Window** > **Preferences** > **Function Point Modeler** > **Development processes** in the menu bar.



2. Select a **Development Process Version** in the subtree User-defined Processes. Press the button **Configure ...** .



3. Select the **Common** tab in the dialog.



4. Click on an existing activity to change the description.
5. Click on the **Add** button to add a new activity.
6. Click on the **Remove** button to delete the selected activity.
7. Click on the **Up** button to move the selected activity one position upwards.
8. Click on the **Down** button to move the selected activity one position downwards.

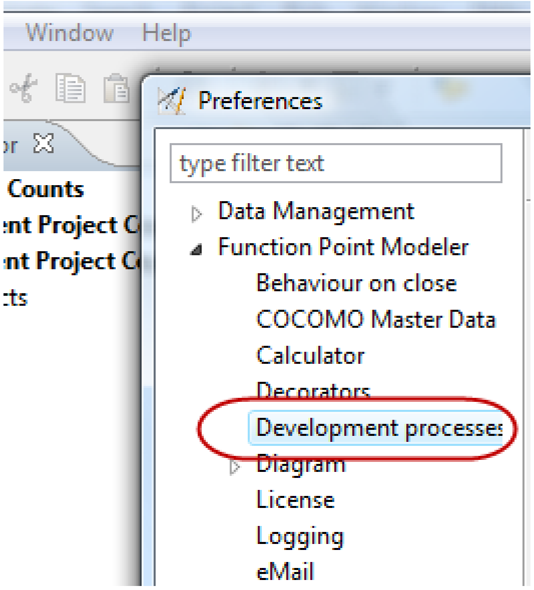
9. Click on the **OK** when finished.

### Configure Allocations

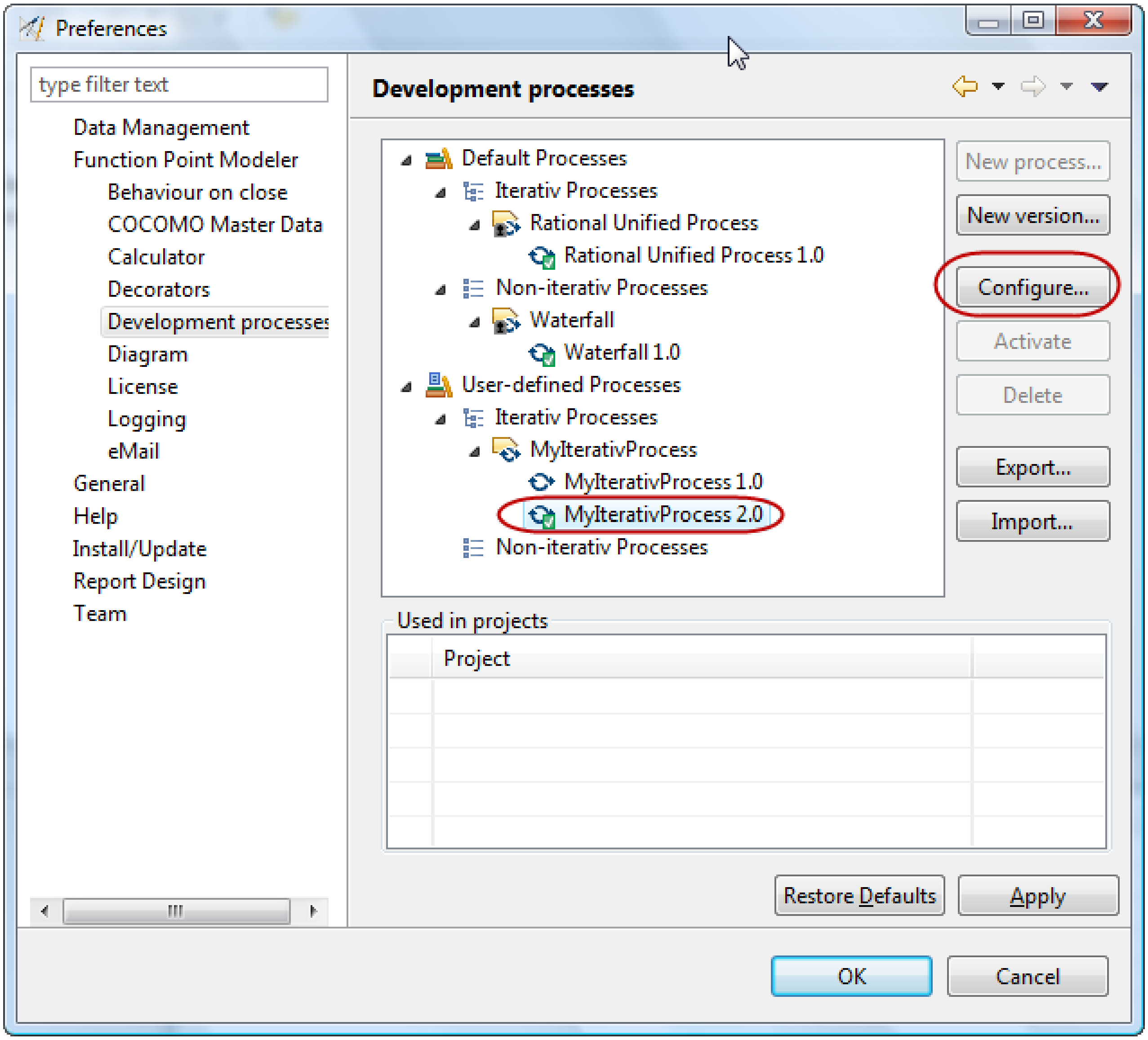
Enterprise Edition

To configure Process Version Allocations, perform the following steps.

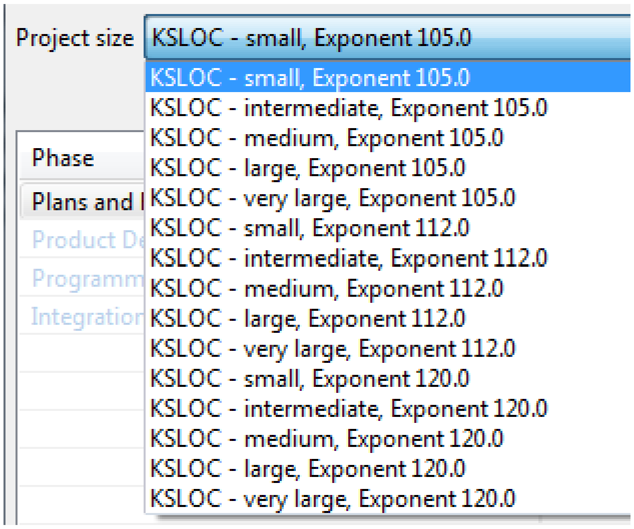
1. Select **Window** > **Preferences** > **Function Point Modeler** > **Development processes** in the menu bar.



2. Select a **Development Process Version** in the subtree User-defined Processes. Press the button **Configure ...** .



3. Select the **Allocations** tab in the dialog.
4. Select the project size, which you want to configure. For iterativ processes only one process size is available. For non-iterativ processes, a large number of sizes can be selected.

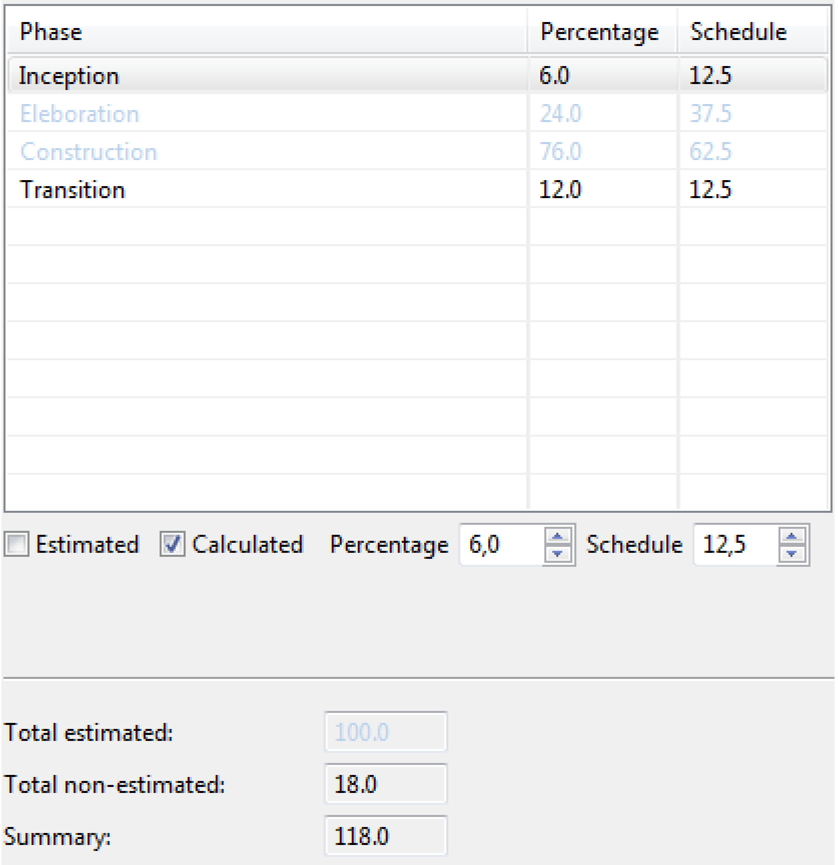


Project size: KSLOC - small, Exponent 105.0

- KSLOC - small, Exponent 105.0
- KSLOC - intermediate, Exponent 105.0
- KSLOC - medium, Exponent 105.0
- KSLOC - large, Exponent 105.0
- KSLOC - very large, Exponent 105.0
- KSLOC - small, Exponent 112.0
- KSLOC - intermediate, Exponent 112.0
- KSLOC - medium, Exponent 112.0
- KSLOC - large, Exponent 112.0
- KSLOC - very large, Exponent 112.0
- KSLOC - small, Exponent 120.0
- KSLOC - intermediate, Exponent 120.0
- KSLOC - medium, Exponent 120.0
- KSLOC - large, Exponent 120.0
- KSLOC - very large, Exponent 120.0

| Phase |
|---|
| Plans and I |
| Product D |
| Programm |
| Integration |

**5.** Select the phase, which you want to configure. Select the checkbox **Estimated** if this phase is estimated by COCOMO. Select the checkbox **Calculaed** if this phase should be considered for calculation statistics. Change the **Percentage** value for this phase. Keep in mind, that the summary percentage for COCOMO phases must be 100 percent. Change the **Schedule** value for this phase. This value will be used to calculate adequat staffing. Keep in mind, that the summary schedule for COCOMO phases must be 100 percent.



| Phase | Percentage | Schedule |
|---|---|---|
| Inception | 6.0 | 12.5 |
| Eleboration | 24.0 | 37.5 |
| Construction | 76.0 | 62.5 |
| Transition | 12.0 | 12.5 |

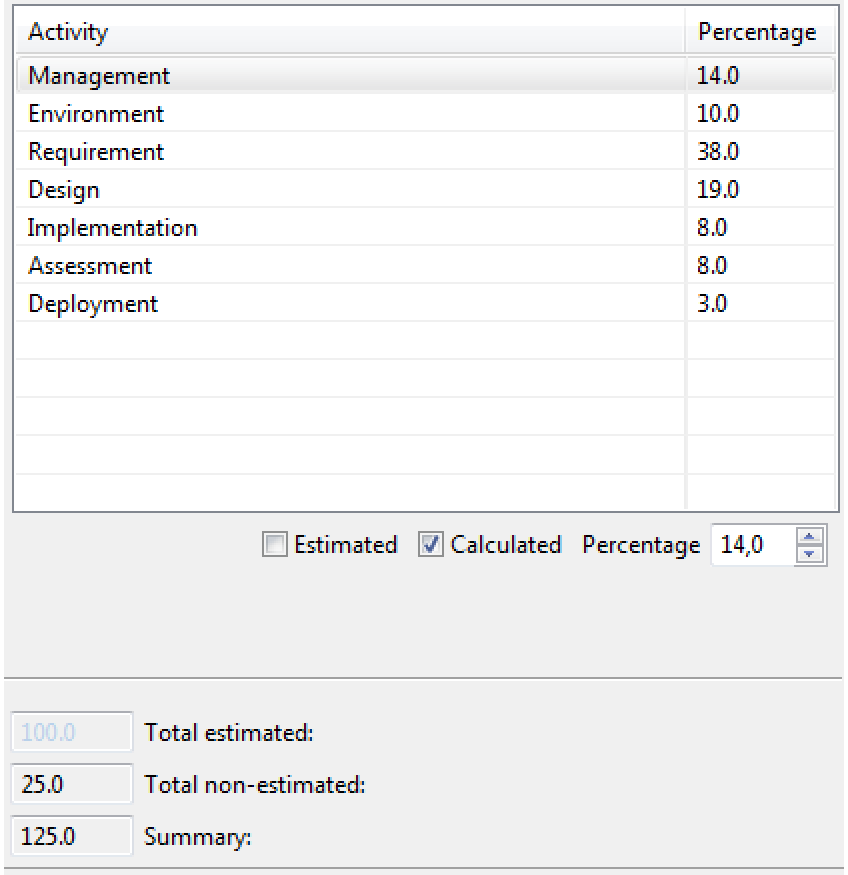
☐ Estimated ☑ Calculated Percentage 6,0 Schedule 12,5

Total estimated: 100.0

Total non-estimated: 18.0

Summary: 118.0

**6.** Select the activity, which you want to configure. Select the checkbox **Estimated** if this activity is estimated by COCOMO. Select the checkbox **Calculaed** if this activity should be considered for calculation statistics. Change the **Percentage** value for this activity. Keep in mind, that the summary percentage for COCOMO activities must be 100 percent.



| Activity | Percentage |
|---|---|
| Management | 14.0 |
| Environment | 10.0 |
| Requirement | 38.0 |
| Design | 19.0 |
| Implementation | 8.0 |
| Assessment | 8.0 |
| Deployment | 3.0 |

□ Estimated ☑ Calculated Percentage 14,0

100.0 Total estimated:

25.0 Total non-estimated:

125.0 Summary:

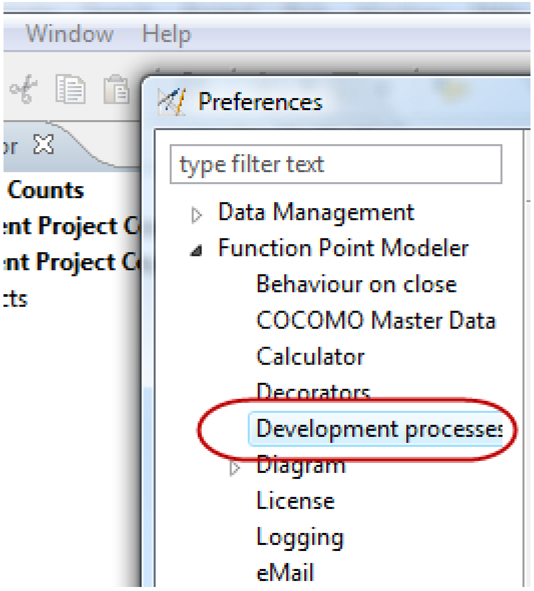
7. Press the **OK** button when finished.

### Activate a Process Version

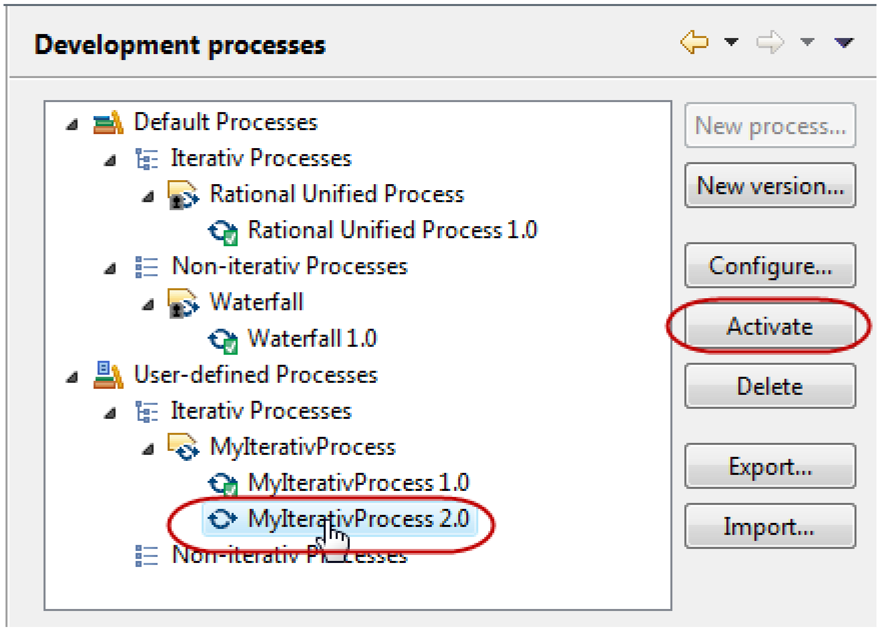
Enterprise Edition

To activate a Development Process Version, perform the following steps.

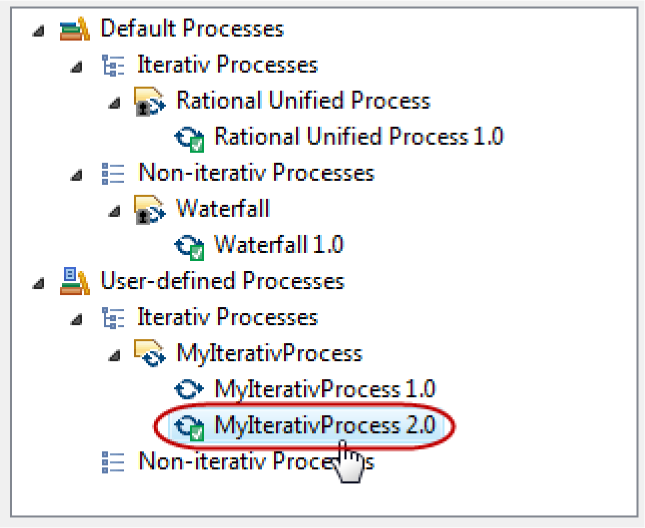
1. Select **Window** > **Preferences** > **Function Point Modeler** > **Development processes** in the menu bar.



2. Select a **Development Process Version** in the subtree User-defined Processes. It's required to select a non-active Version. Press the button **Activate** .



The selected Development Process Version will be activated.

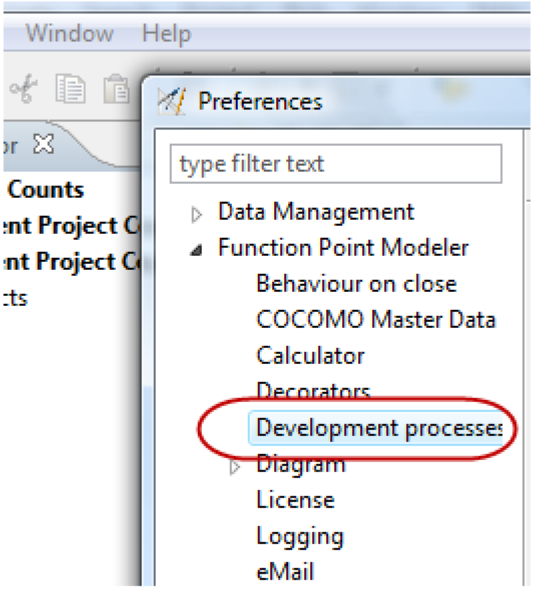


### Delete a Development Process

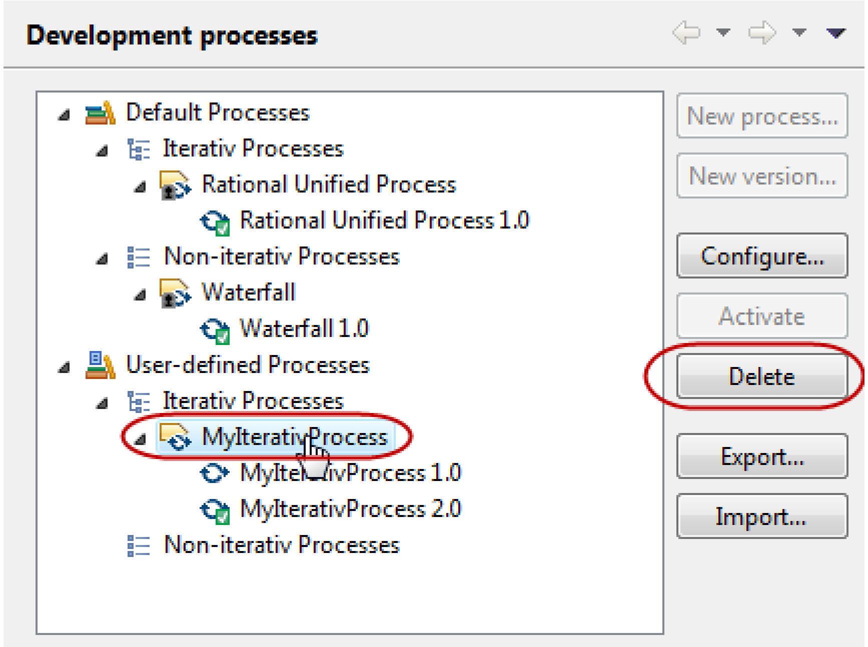
Enterprise Edition

To delete a Development Process, perform the following steps.

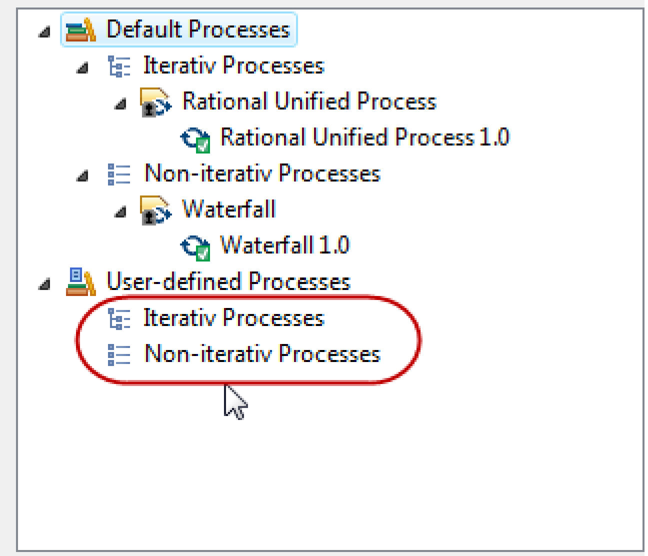
1. Select **Window** > **Preferences** > **Function Point Modeler** > **Development processes** in the menu bar.



2. Select a **Development Process** in the subtree User-defined Processes. Press the button **Delete** .



The selected Development Process will be deleted.

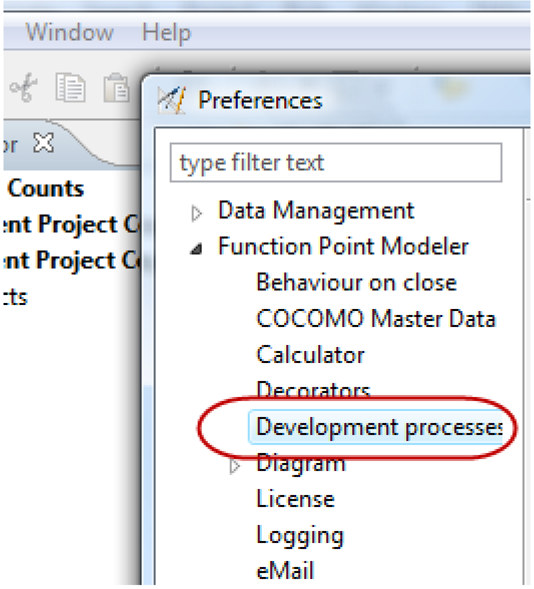


### Delete a Process Version

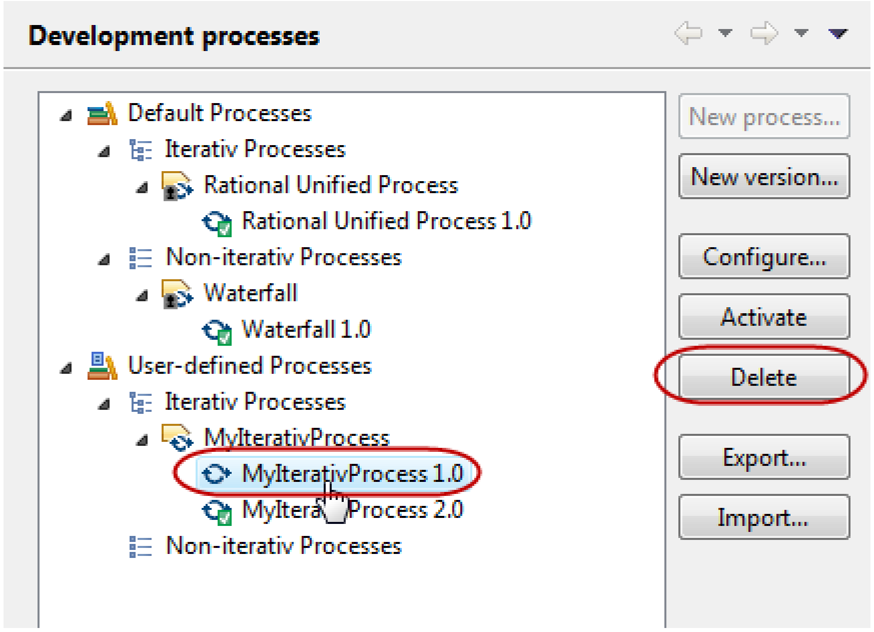
Enterprise Edition

To delete a Development Process Version, perform the following steps.

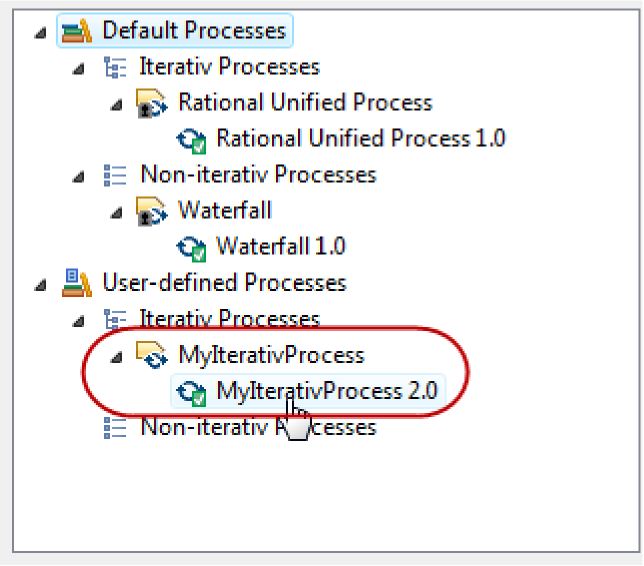
1. Select **Window** > **Preferences** > **Function Point Modeler** > **Development processes** in the menu bar.



2. Select a non-active **Development Process Version** in the subtree User-defined Processes. It's not possible to delete a currently active Version. Press the button **Delete** .



The selected Development Process Version will be deleted.



### Export Development Processes

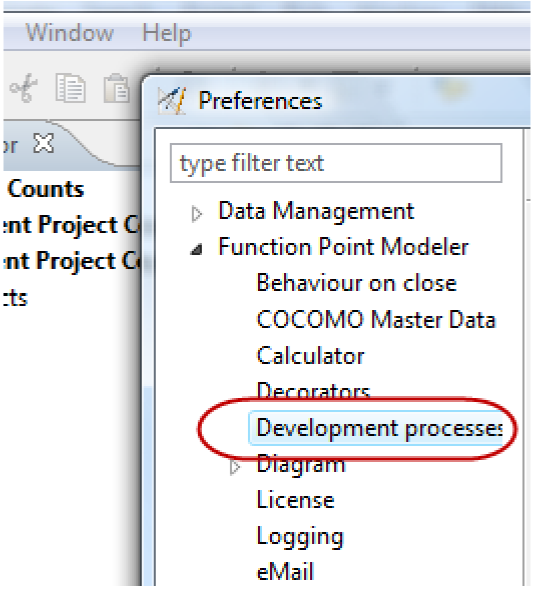
Enterprise Edition

### Export Development Processes to XMI

Enterprise Edition

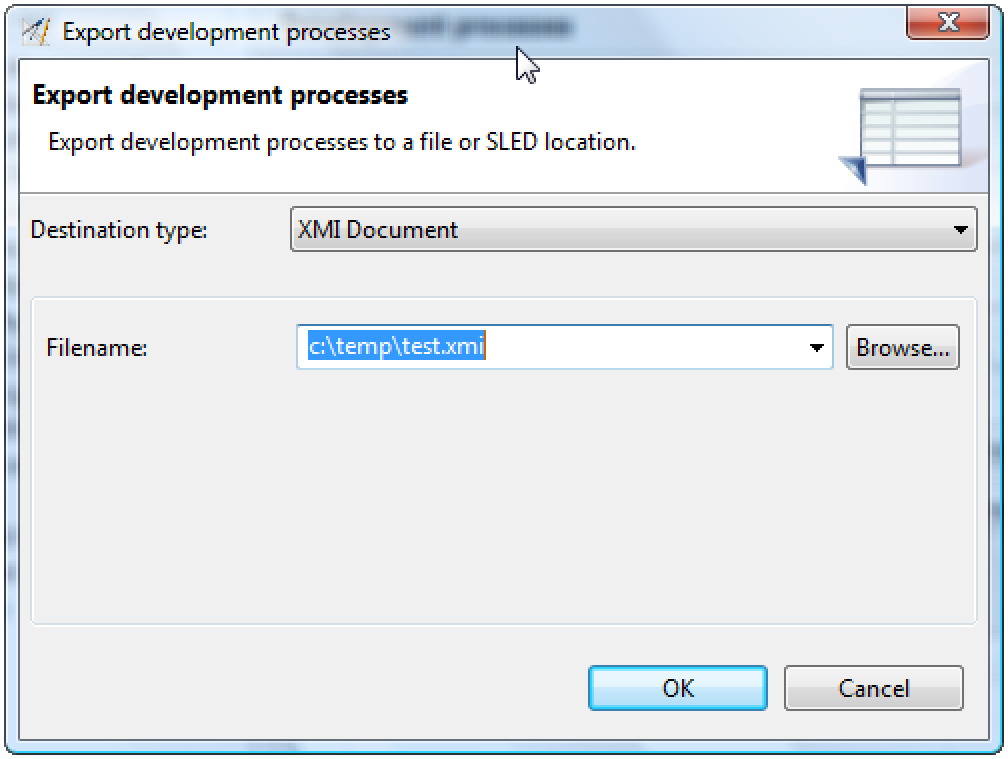
To export Development Processes to an XMI document, perform the following steps.

1. Select **Window** > **Preferences** > **Function Point Modeler** > **Development processes** in the menu bar.



2. Click the button **Export...** .

3. Select the destination type **XMI Document** . Enter a valid filename, select a previous filename or browse for a new location.



Export development processes

**Export development processes**

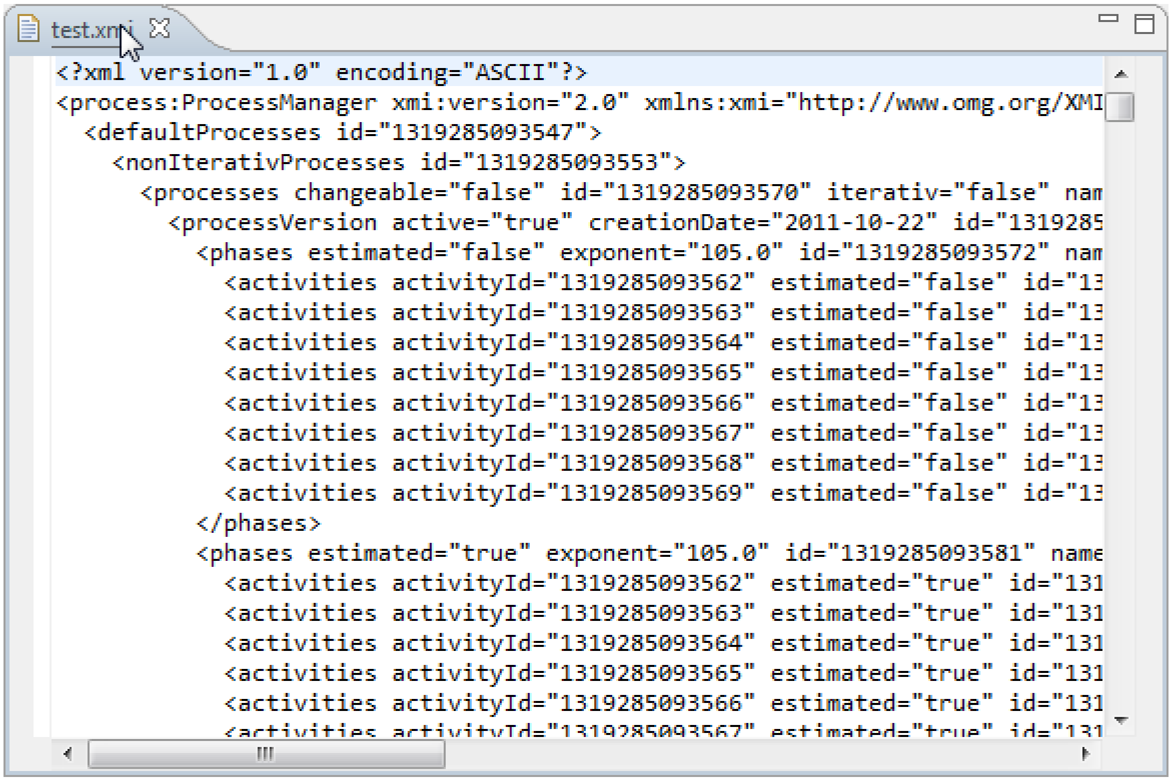
Export development processes to a file or SLED location.

Destination type: XMI Document

Filename: c:\temp\test.xmi

4. Click the button **OK** .

The current Development Processes of your workspaces were exported to the specified XMI document.



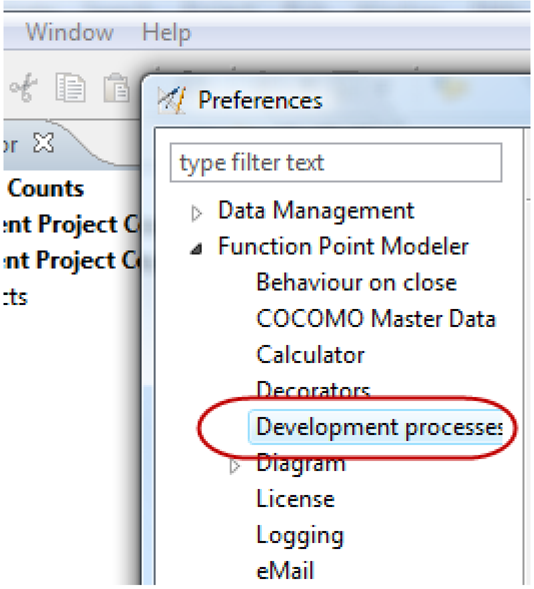
```
<?xml version="1.0" encoding="ASCII"?>
<process:ProcessManager xmi:version="2.0" xmlns:xmi="http://www.omg.org/XMI
  <defaultProcesses id="1319285093547">
    <nonIterativProcesses id="1319285093553">
      <processes changeable="false" id="1319285093570" iterativ="false" nam
        <processVersion active="true" creationDate="2011-10-22" id="1319285
          <phases estimated="false" exponent="105.0" id="1319285093572" nam
            <activities activityId="1319285093562" estimated="false" id="13
            <activities activityId="1319285093563" estimated="false" id="13
            <activities activityId="1319285093564" estimated="false" id="13
            <activities activityId="1319285093565" estimated="false" id="13
            <activities activityId="1319285093566" estimated="false" id="13
            <activities activityId="1319285093567" estimated="false" id="13
            <activities activityId="1319285093568" estimated="false" id="13
            <activities activityId="1319285093569" estimated="false" id="13
          </phases>
          <phases estimated="true" exponent="105.0" id="1319285093581" name
            <activities activityId="1319285093562" estimated="true" id="131
            <activities activityId="1319285093563" estimated="true" id="131
            <activities activityId="1319285093564" estimated="true" id="131
            <activities activityId="1319285093565" estimated="true" id="131
            <activities activityId="1319285093566" estimated="true" id="131
            <activities activityId="1319285093567" estimated="true" id="131
```

### Export Development Processes to SLED

Enterprise Edition

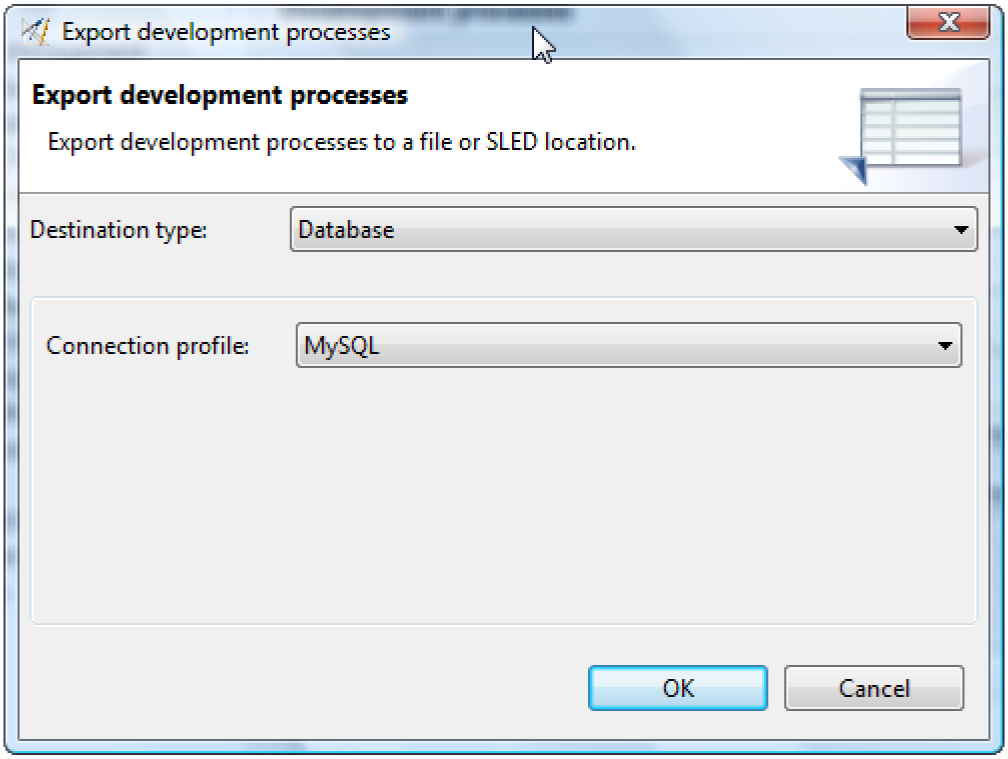
To export Development Processes to a SLED database, perform the following steps.

1. Select **Window** > **Preferences** > **Function Point Modeler** > **Development processes** in the menu bar.



2. Click the button **Export...** .

3. Select the destination type **Database** and select a connection profile. It's only possible to select a currently connected profile.



Export development processes

**Export development processes**

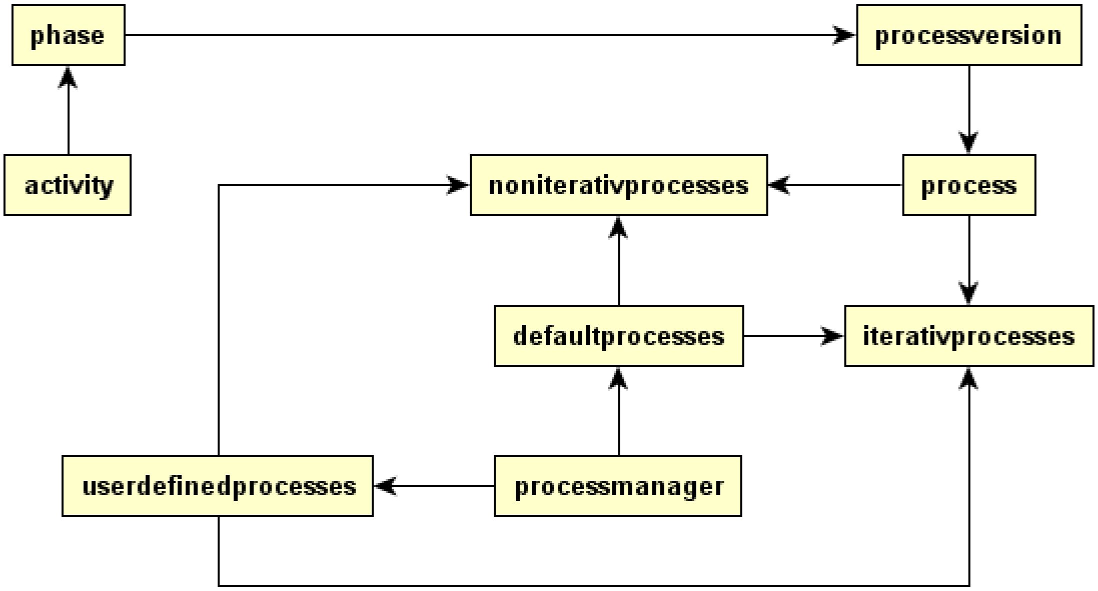
Export development processes to a file or SLED location.

Destination type: Database

Connection profile: MySQL

4. Click the button **OK** .

The current Development Processes of your workspaces were exported to the specified SLED database.



### Import Development Processes

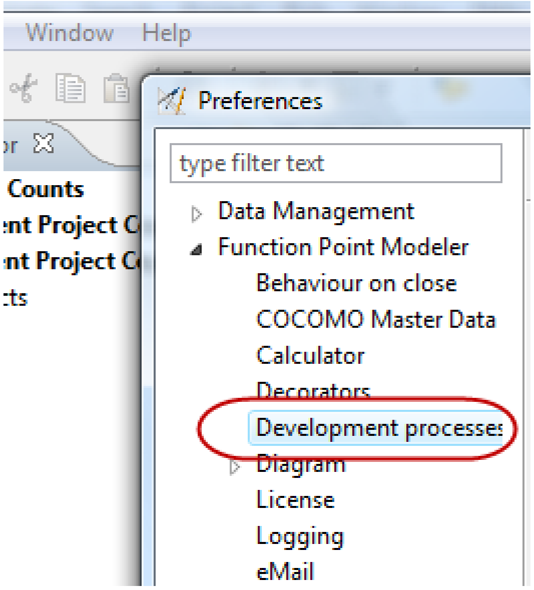
Enterprise Edition

#### Import Development Processes from XMI

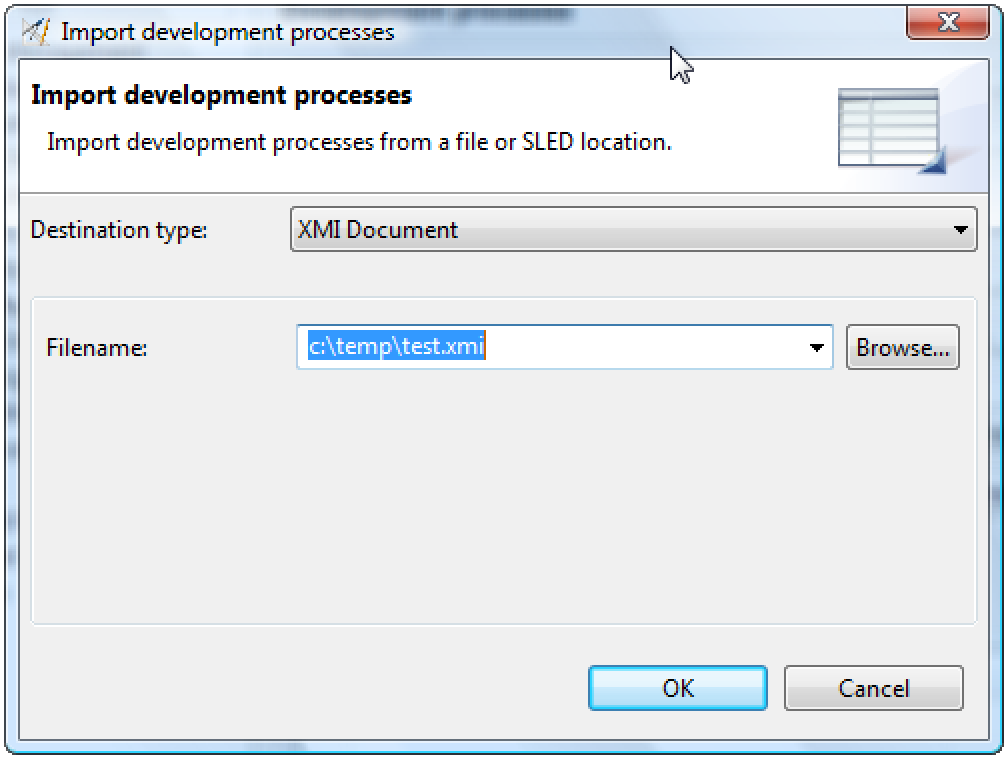
Enterprise Edition

To import Development Processes from an XMI document, perform the following steps.

1. Select **Window** > **Preferences** > **Function Point Modeler** > **Development processes** in the menu bar.



2. Click the button **Import...** .
3. Select the destination type **XMI Document** . Enter a valid filename, select a previous filename or browse for an existing location.



Import development processes

**Import development processes**

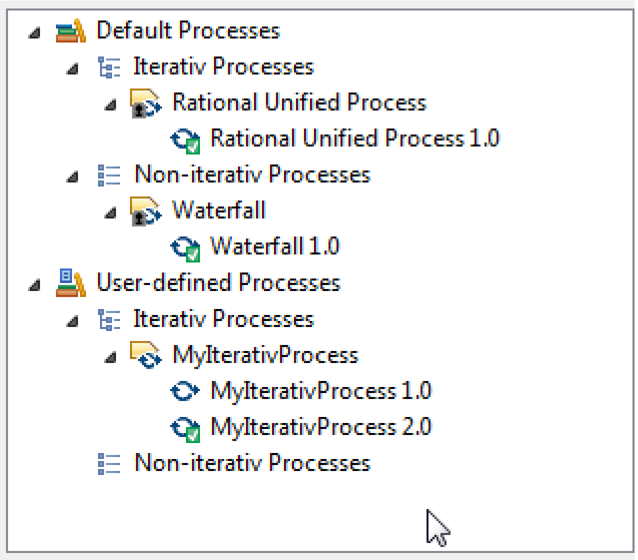
Import development processes from a file or SLED location.

Destination type: XMI Document

Filename: c:\temp\test.xmi

**4.** Click the button **OK** .

The current Development Processes from the specified XMI document were imported to your workspace.



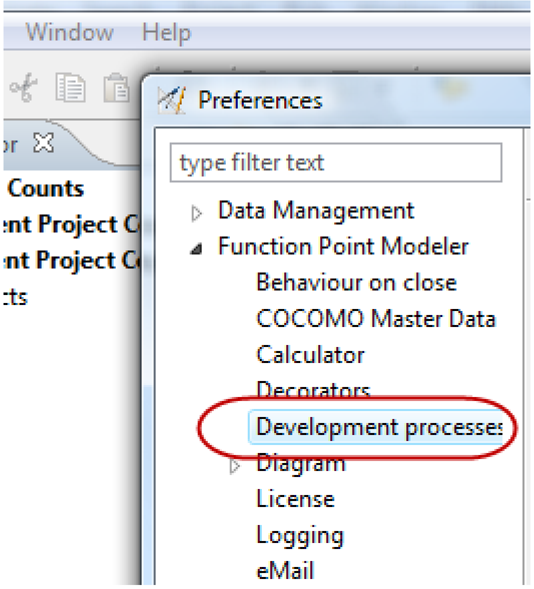
- Default Processes
  - Iterativ Processes
    - Rational Unified Process
      - Rational Unified Process 1.0
  - Non-iterativ Processes
    - Waterfall
      - Waterfall 1.0
- User-defined Processes
  - Iterativ Processes
    - MyIterativProcess
      - MyIterativProcess 1.0
      - MyIterativProcess 2.0
  - Non-iterativ Processes

### Import Development Processes from SLED

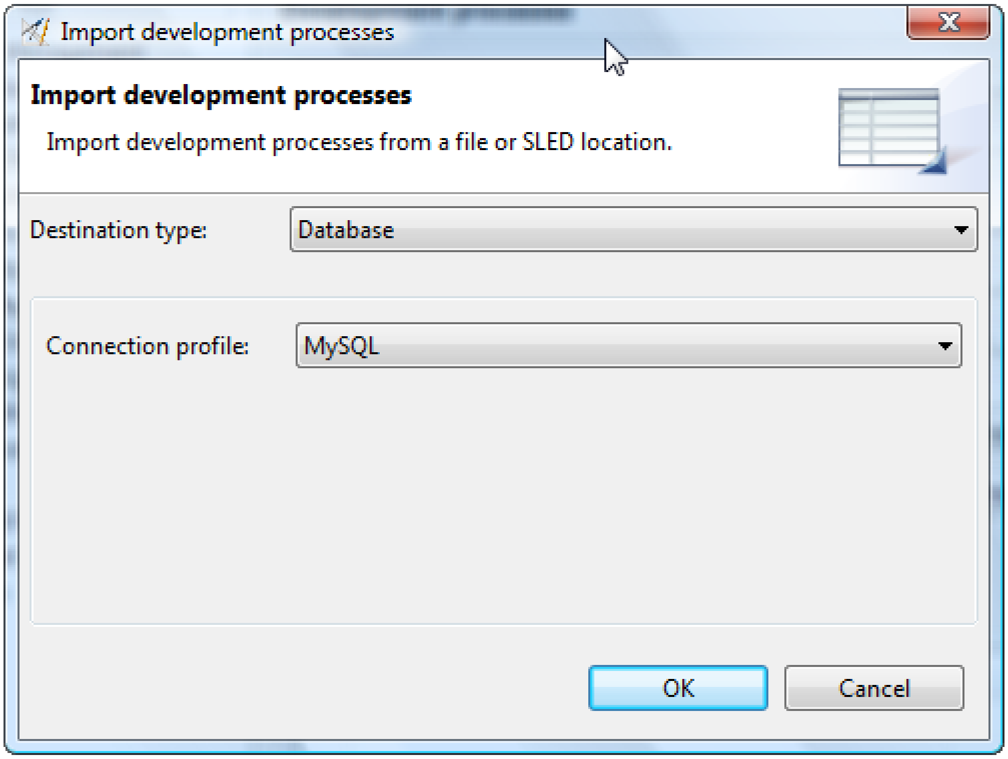
Enterprise Edition

To import Development Processes from a SLED database, perform the following steps.

1. Select **Window** > **Preferences** > **Function Point Modeler** > **Development processes** in the menu bar.



2. Click the button **Import...** .
3. Select the destination type **Database** and select a connection profile. It's only possible to select a currently connected profile.


Import development processes

**Import development processes**

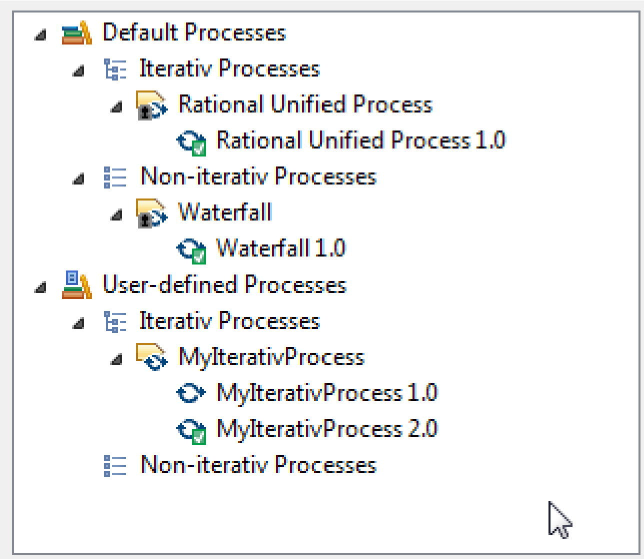
Import development processes from a file or SLED location.

Destination type: Database

Connection profile: MySQL

4. Click the button **OK** .

The current Development Processes from the specified SLED database were imported to your workspace.

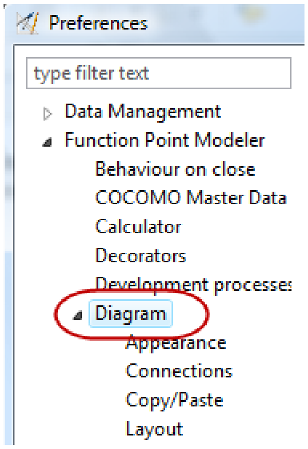


## Working with Diagram Settings

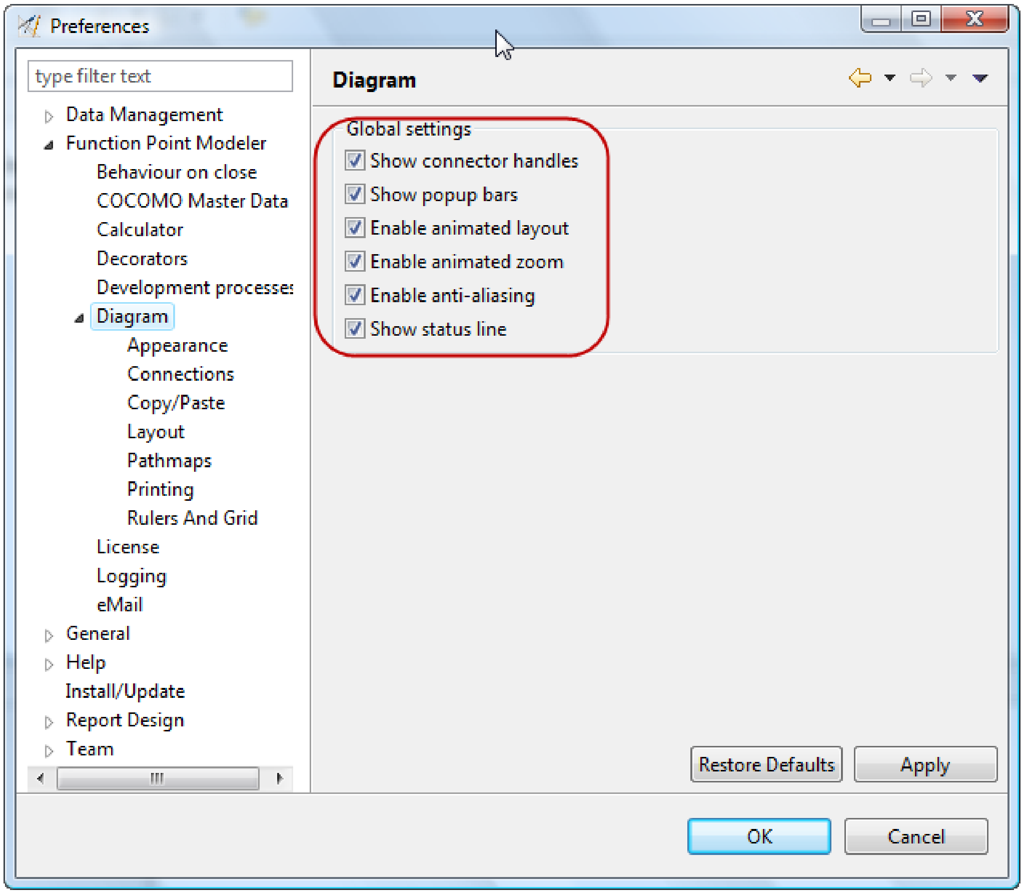
### Change global settings

To change Global Diagram Settings, perform the following steps.

1. Select **Window** > **Preferences** from the menu bar.
2. Select **Function Point Modeler** > **Diagram** on the left side of the dialog window.



3. Select or un-select the possible options in the dialog window.



Diagram

Global settings

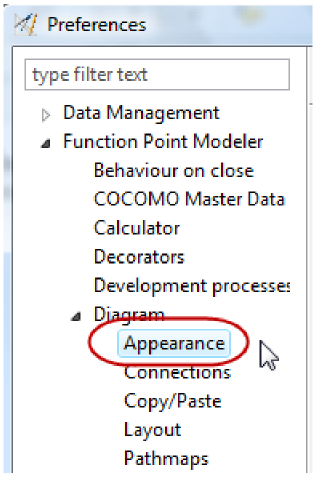
☑ Show connector handles
☑ Show popup bars
☑ Enable animated layout
☑ Enable animated zoom
☑ Enable anti-aliasing
☑ Show status line

4. When finished, press the **Apply** or **OK** button.

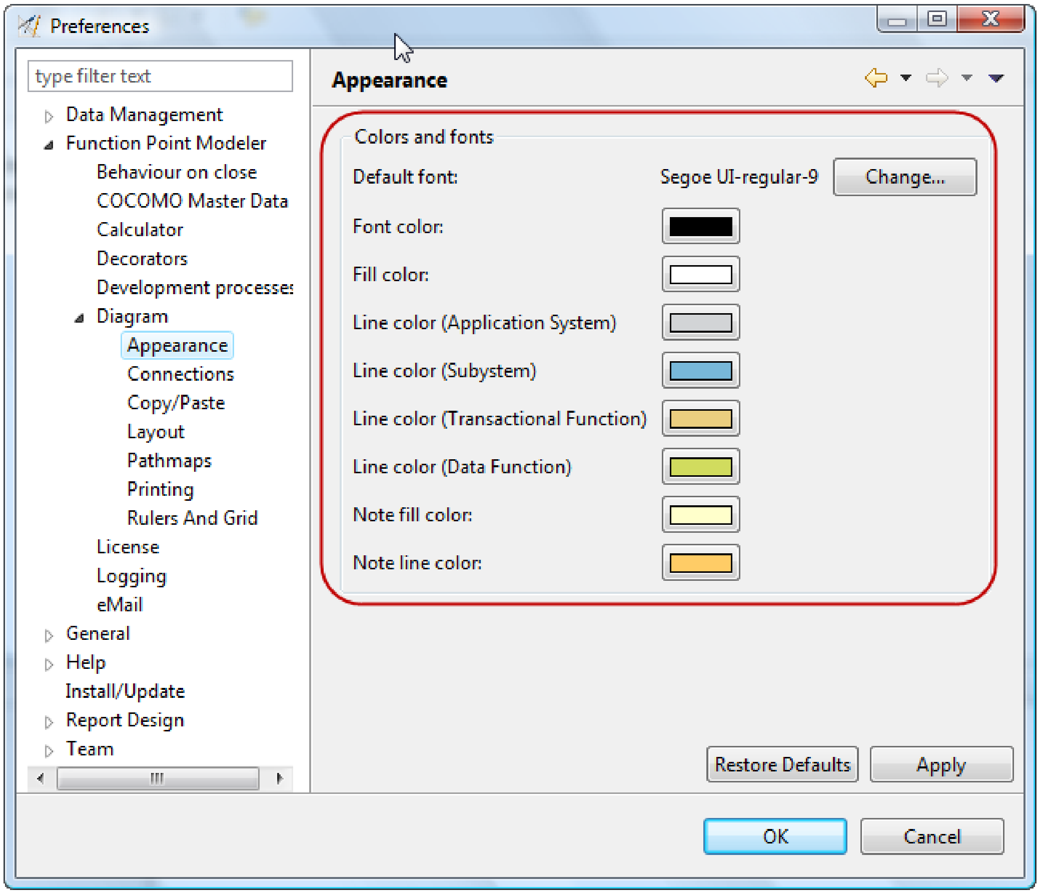
### Change diagram appearance

To change the Diagram Appearance, perform the following steps.

1. Select **Window** > **Preferences** from the menu bar.
2. Select **Function Point Modeler** > **Diagram** > **Appearance** on the left side of the dialog window.



3. Change the available color and font settings in the dialog window.



Appearance

Colors and fonts

Default font: Segoe UI-regular-9

Font color: ⬛

Fill color: ⬜

Line color (Application System) ▨

Line color (Subystem) 🟦

Line color (Transactional Function) 🟧

Line color (Data Function) 🟩

Note fill color: 🟨

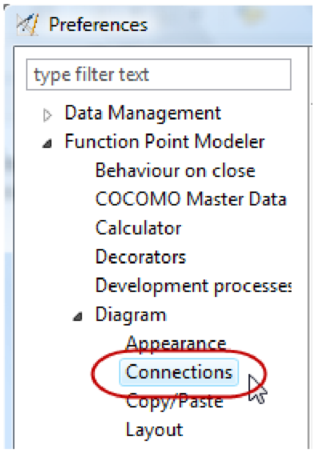
Note line color: 🟧

4. When finished, press the **Apply** or **OK** button.

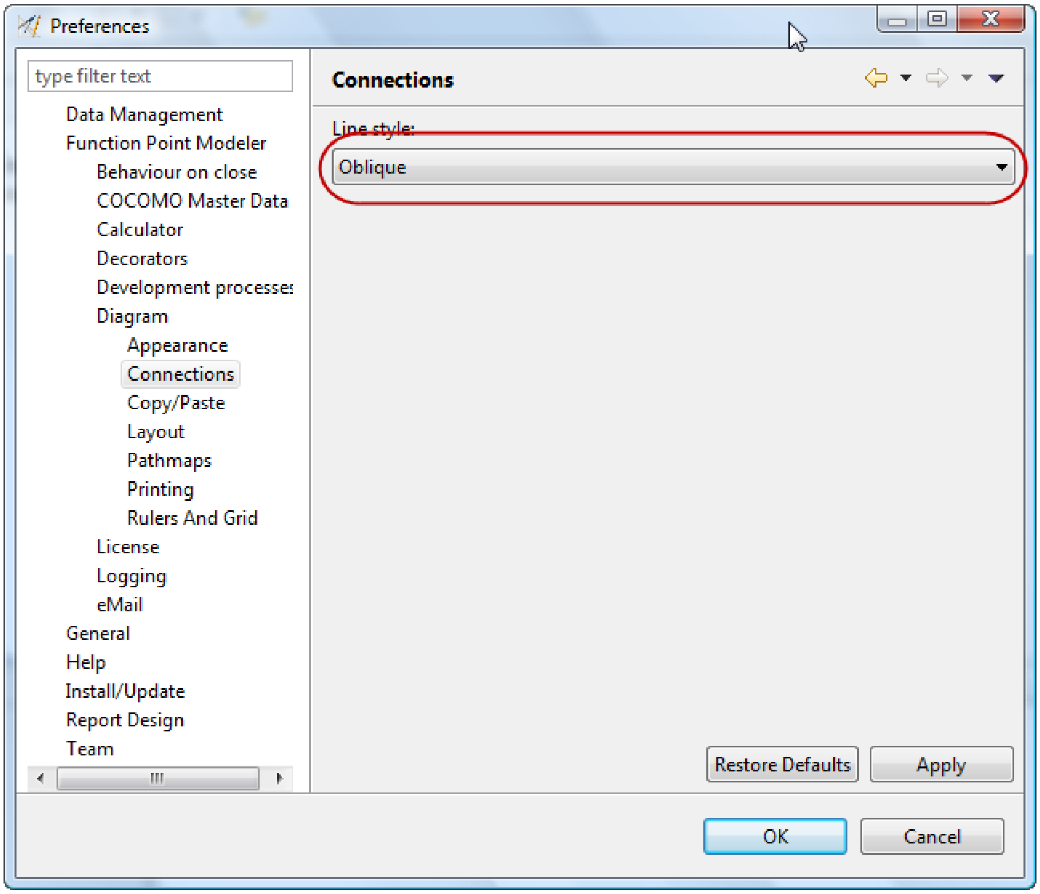
### Set connection styles

To change the Diagram Connection Styles, perform the following steps.

1. Select **Window** > **Preferences** from the menu bar.
2. Select **Function Point Modeler** > **Diagram** > **Connections** on the left side of the dialog window.



3. Change the available connection style settings in the dialog window.



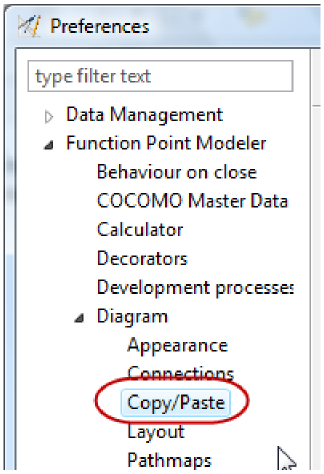
Line style: Oblique

4. When finished, press the **Apply** or **OK** button.

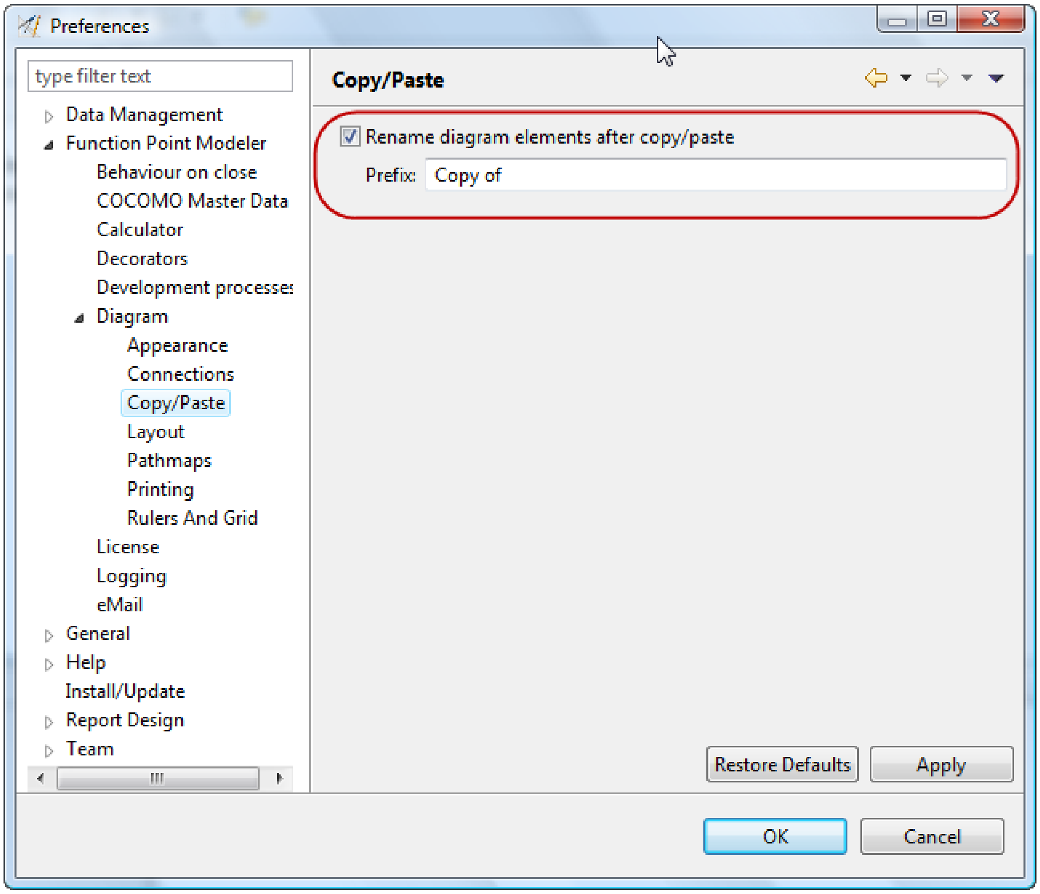
### Set Copy/Paste behaviour

To change the Diagram Copy/Paste Behaviour, perform the following steps.

1. Select **Window** > **Preferences** from the menu bar.
2. Select **Function Point Modeler** > **Diagram** > **Copy/Paste** on the left side of the dialog window.



3. Enable the option, if you want to rename diagram elements after copy/paste operation. Also specify a valid prefix, if this option is enabled.



☑ Rename diagram elements after copy/paste

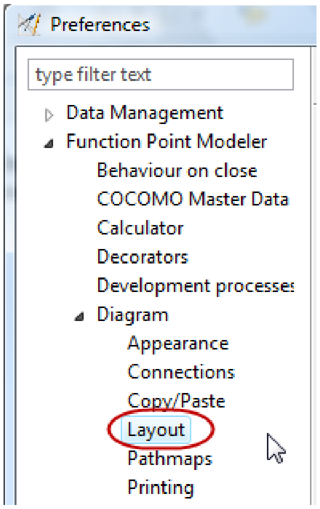
Prefix: Copy of

4. When finished, press the **Apply** or **OK** button.

### Set diagram layout style

To change the Diagram Layout Style, perform the following steps.

1. Select **Window** > **Preferences** from the menu bar.
2. Select **Function Point Modeler** > **Diagram** > **Layout** on the left side of the dialog window.



3. Change the available diagram layout style settings in the dialog window.

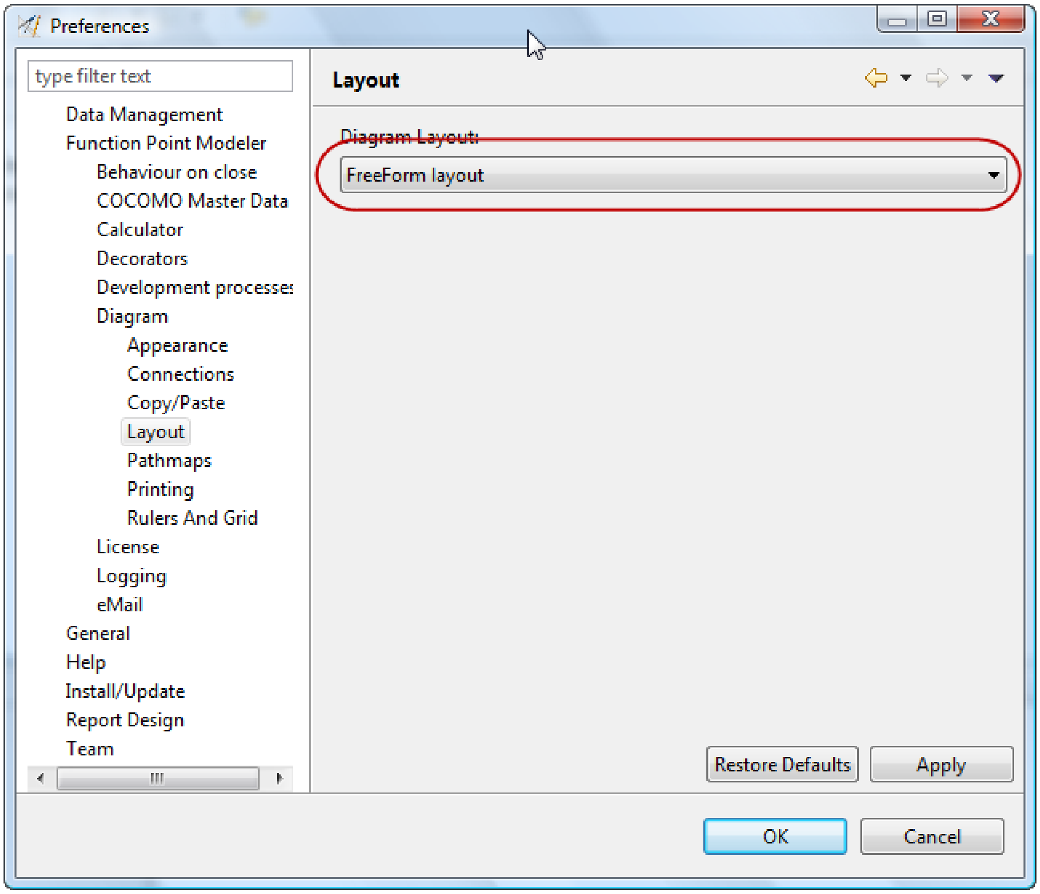


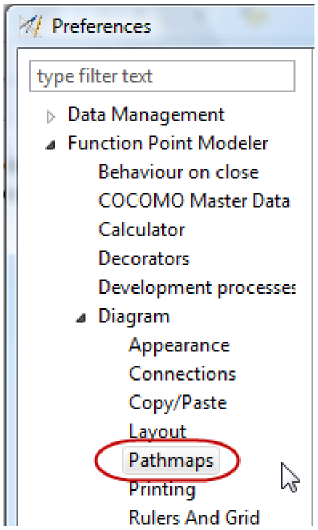
Diagram Layout: FreeForm layout

4. When finished, press the **Apply** or **OK** button.

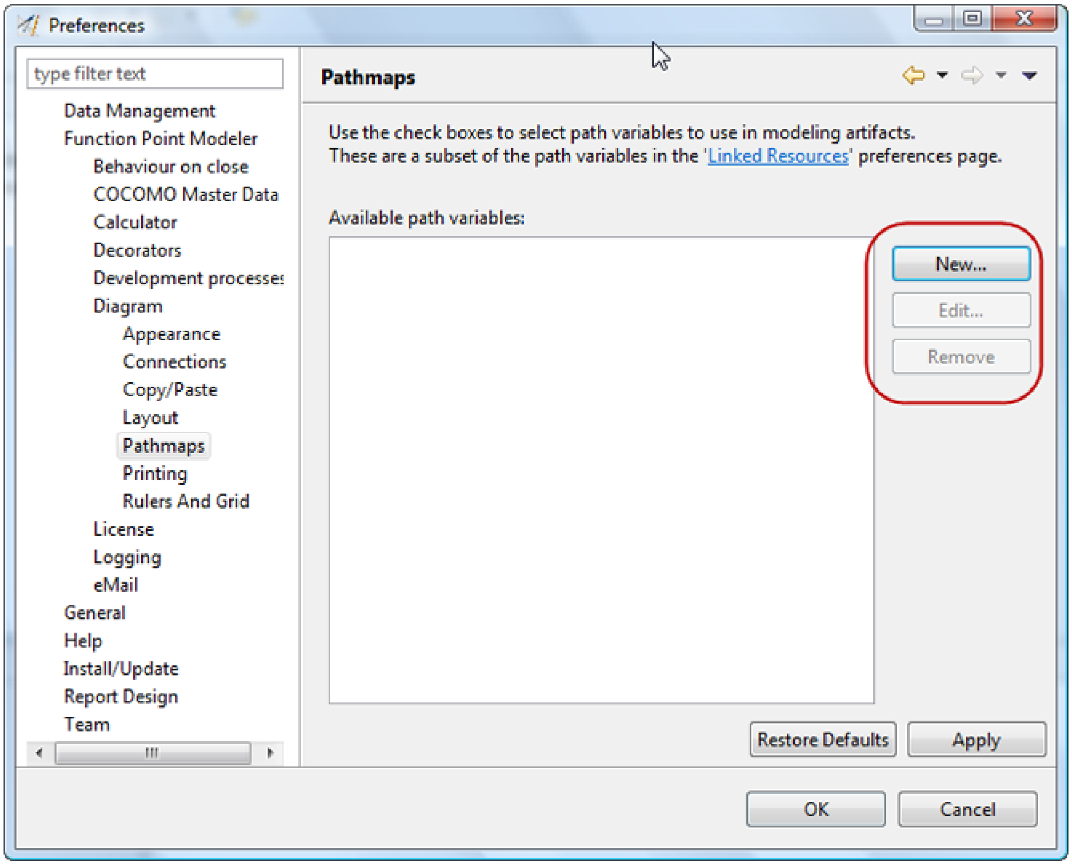
### Change diagram pathmaps

To change the Diagram Pathmaps, perform the following steps.

1. Select **Window** > **Preferences** from the menu bar.
2. Select **Function Point Modeler** > **Diagram** > **Pathmaps** on the left side of the dialog window.



3. Create a new, edit or remove an existing diagram pathmap.



Use the check boxes to select path variables to use in modeling artifacts.
These are a subset of the path variables in the 'Linked Resources' preferences page.

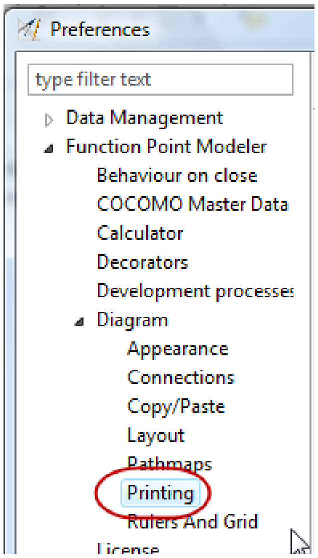
Available path variables:

4. When finished, press the **Apply** or **OK** button.

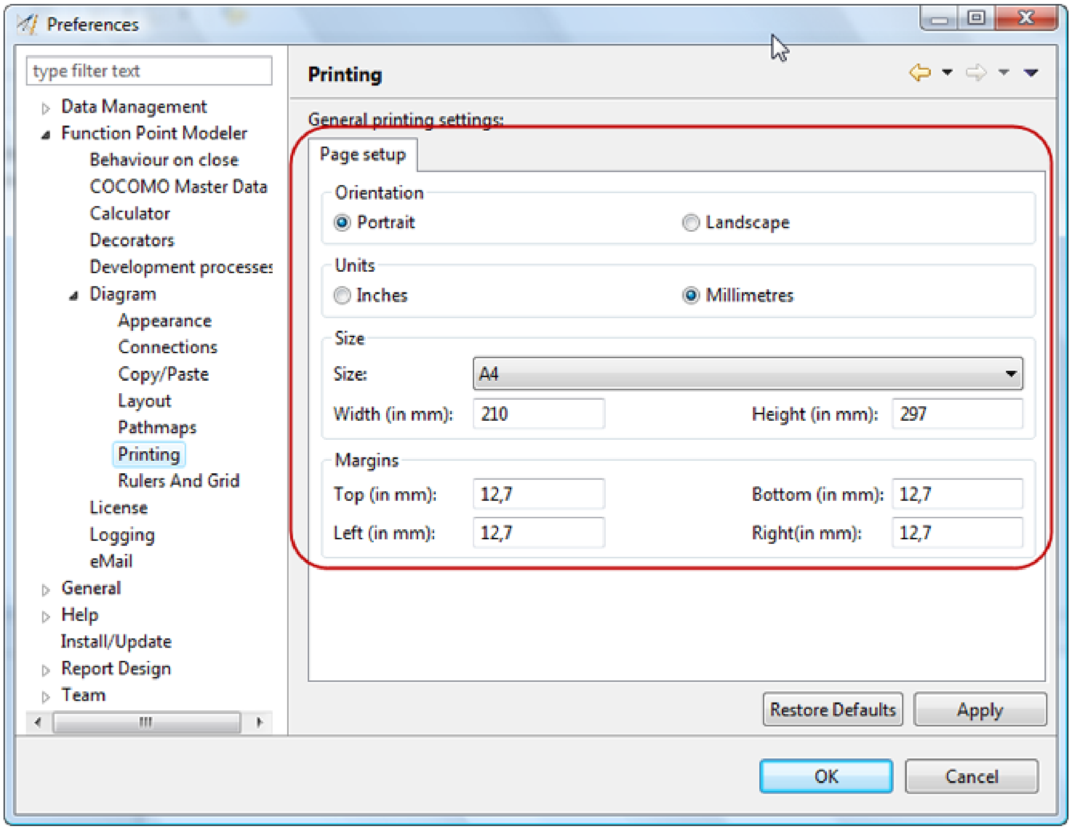
## Setup diagram printing options

To setup the Diagram Printing Options, perform the following steps.

1. Select **Window** > **Preferences** from the menu bar.
2. Select **Function Point Modeler** > **Diagram** > **Printing** on the left side of the dialog window.



3. Adjust the available printing settings.



Printing

General printing settings:

Page setup

Orientation

● Portrait ○ Landscape

Units

○ Inches ● Millimetres

Size

Size: A4

Width (in mm): 210 Height (in mm): 297

Margins

Top (in mm): 12,7 Bottom (in mm): 12,7

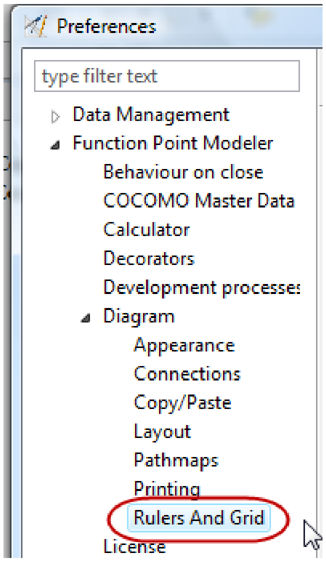
Left (in mm): 12,7 Right(in mm): 12,7

4. When finished, press the **Apply** or **OK** button.

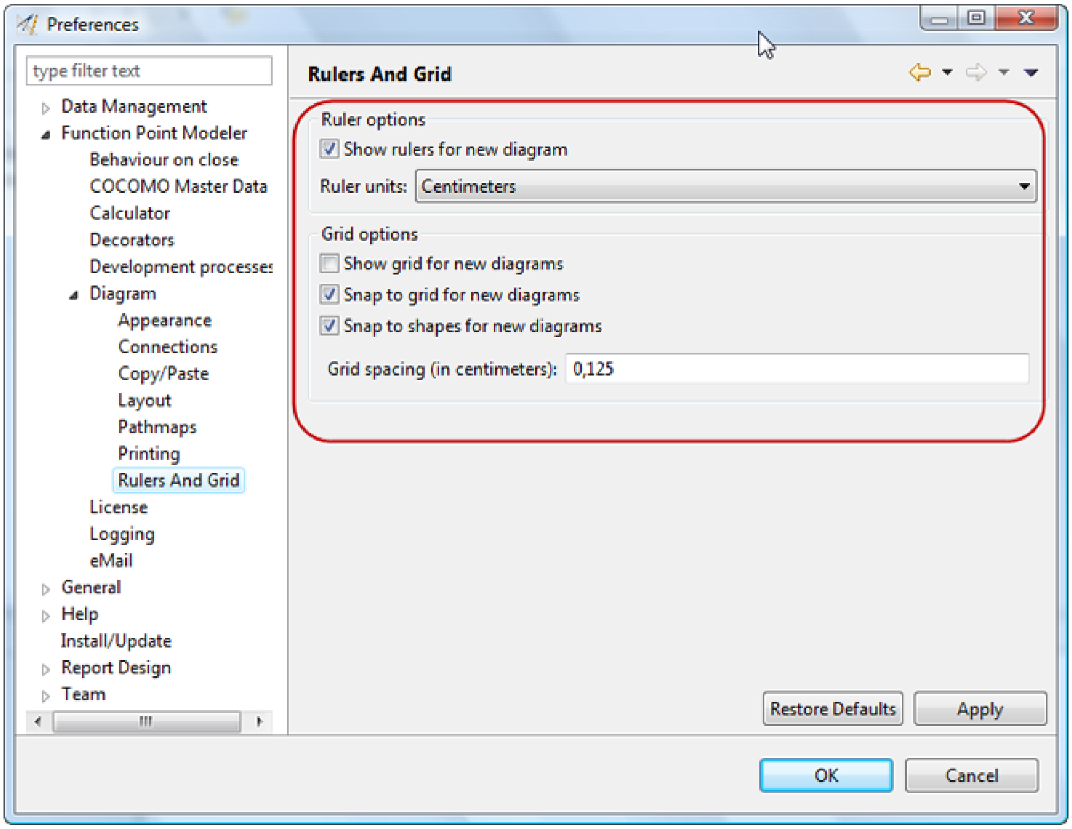
### Change rulers and grid settings

To change the Diagram Rulers and Grid Settings, perform the following steps.

1. Select **Window** > **Preferences** from the menu bar.
2. Select **Function Point Modeler** > **Diagram** > **Rulers And Grid** on the left side of the dialog window.



**3.** Adjust the available rulers and grid options.



Rulers And Grid

Ruler options

☑ Show rulers for new diagram

Ruler units: Centimeters

Grid options

☐ Show grid for new diagrams

☑ Snap to grid for new diagrams

☑ Snap to shapes for new diagrams

Grid spacing (in centimeters): 0,125

**4.** When finished, press the **Apply** or **OK** button.

## Working with the Product license

Enterprise Edition

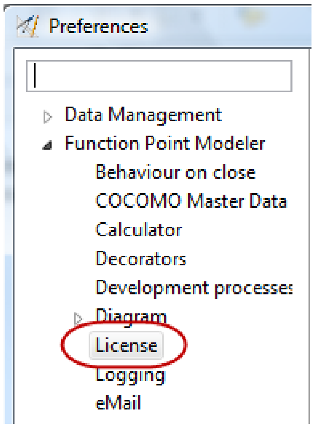
### Register your Product Version

Enterprise Edition

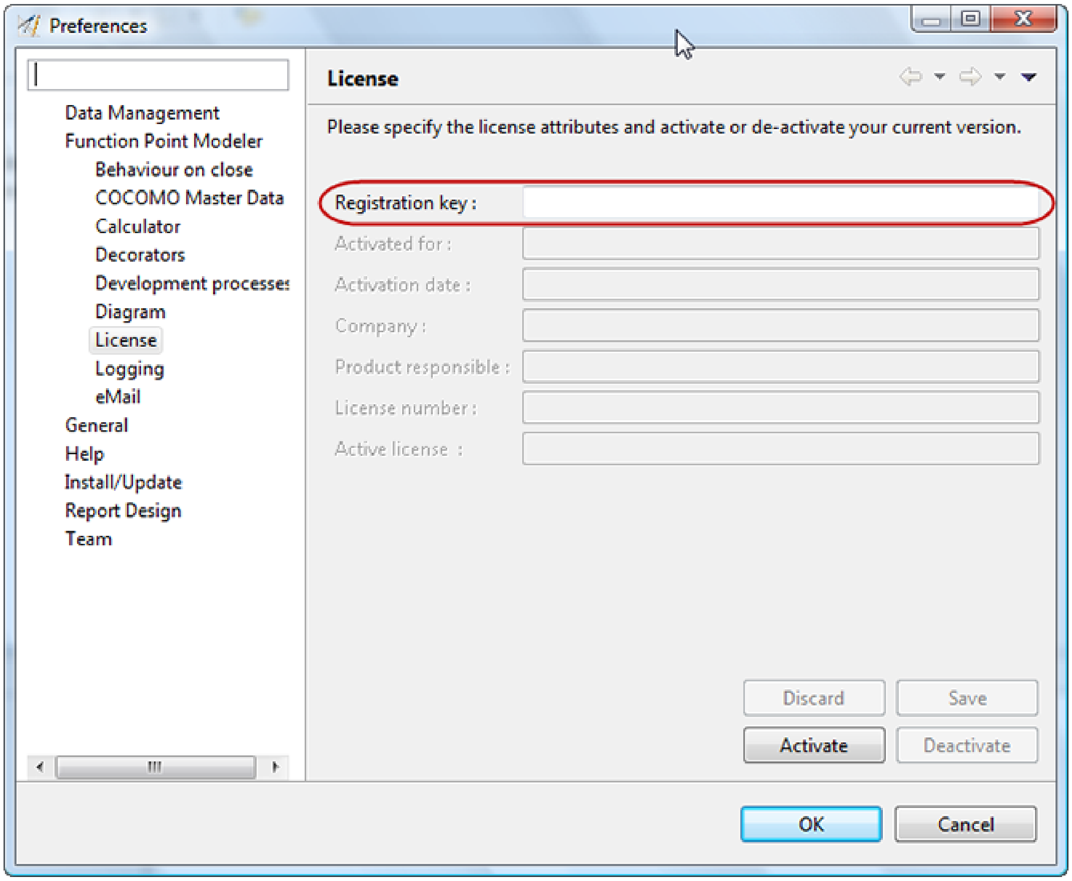
Depending on registration you will receive a license key, which is valid for a certain number of installations. The use of the license key is not hardware dependent, but a license key can only be used for the predetermined number of installations. For this reason, it is possible to activate a license.

To register (activate) your product version, perform the following steps.

1. Select **Windows** > **Preferences** from the menu bar.
2. Select **Function Point Modeler** > **License** on the left side of the dialog.



3. Enter your registration key in the provided location.



Please specify the license attributes and activate or de-activate your current version.

4. Press the **Discard** button to discard your changes.
5. Press the **Save** button to save your changes.
6. To activate your product version, press the **Activate** button.
7. When finished, select the **OK** button.

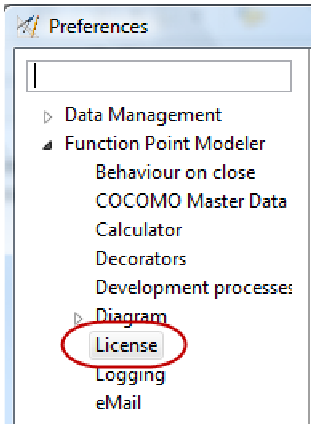
### De-register your Product Version

Enterprise Edition

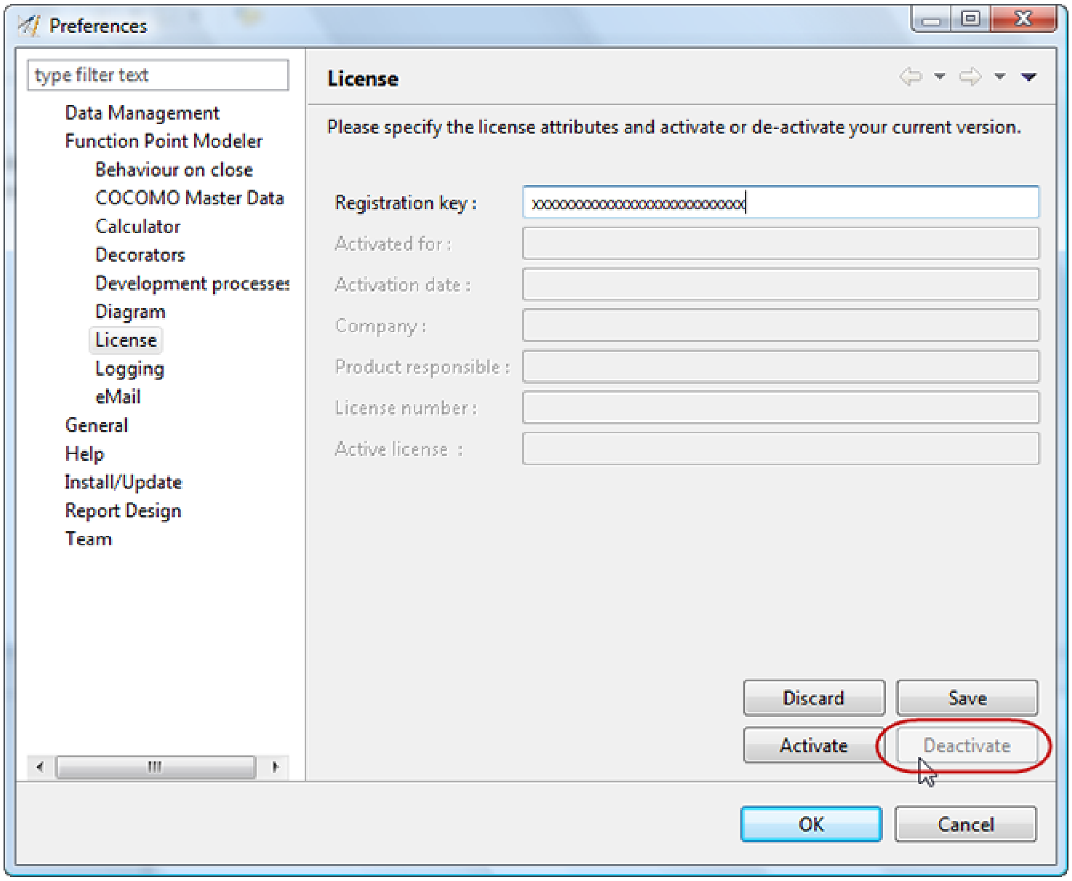
Depending on registration you will receive a license key, which is valid for a certain number of installations. The use of the license key is not hardware dependent, but a license key can only be used for the predetermined number of installations. For this reason, it is possible to deactivate a license.

To de-register (deactivate) your product version, perform the following steps.

1. Select **Windows** > **Preferences** from the menu bar.
2. Select **Function Point Modeler** > **License** on the left side of the dialog.



3. Press the **Deactivate** button to de-register your product version.



License

Please specify the license attributes and activate or de-activate your current version.

Registration key : xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Activated for :

Activation date :

Company :

Product responsible :

License number :

Active license :

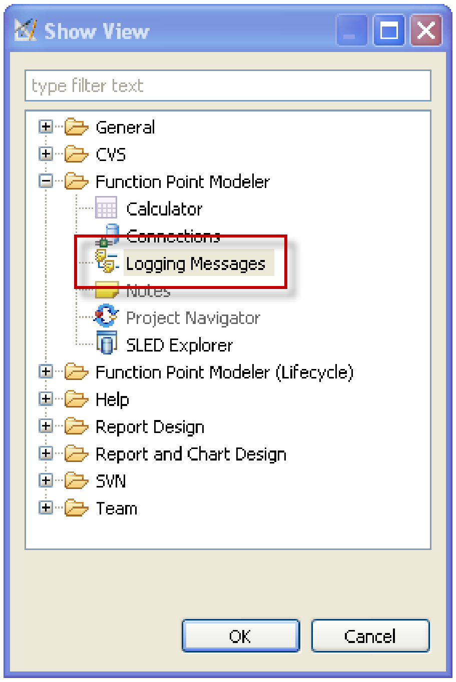
4. When finished, select the **OK** button.

## Working with Project Logging

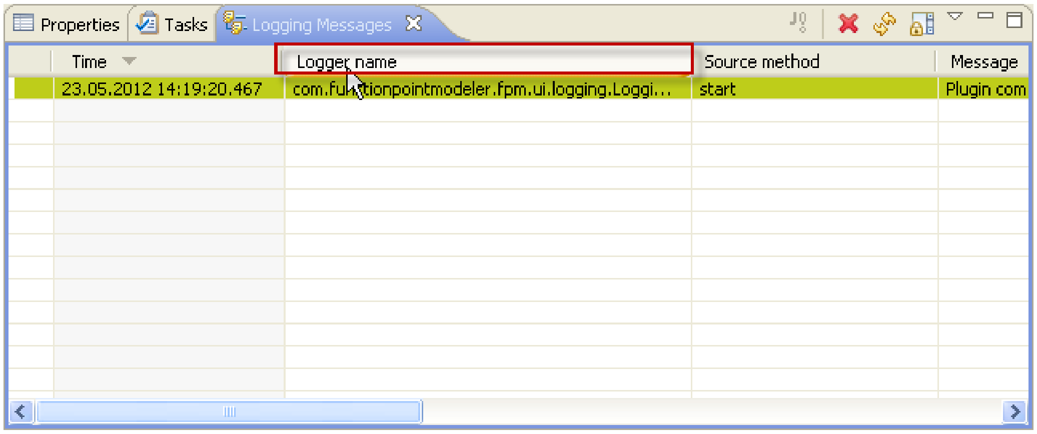
### View Log Messages

To view Application Log Messages, perform the following steps.

1. Select **Window** > **Show View** > **Other...** > **Function Point Modeler** > **Logging Messages** from the menu bar.



2. Click on the table headers to select sorting sequence and order.

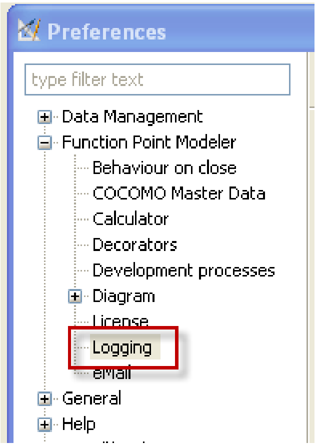


| | Time | Logger name | Source method | Message |
|---|---|---|---|---|
| | 23.05.2012 14:19:20.467 | com.functionpointmodeler.fpm.ui.logging.Loggi... | start | Plugin com |

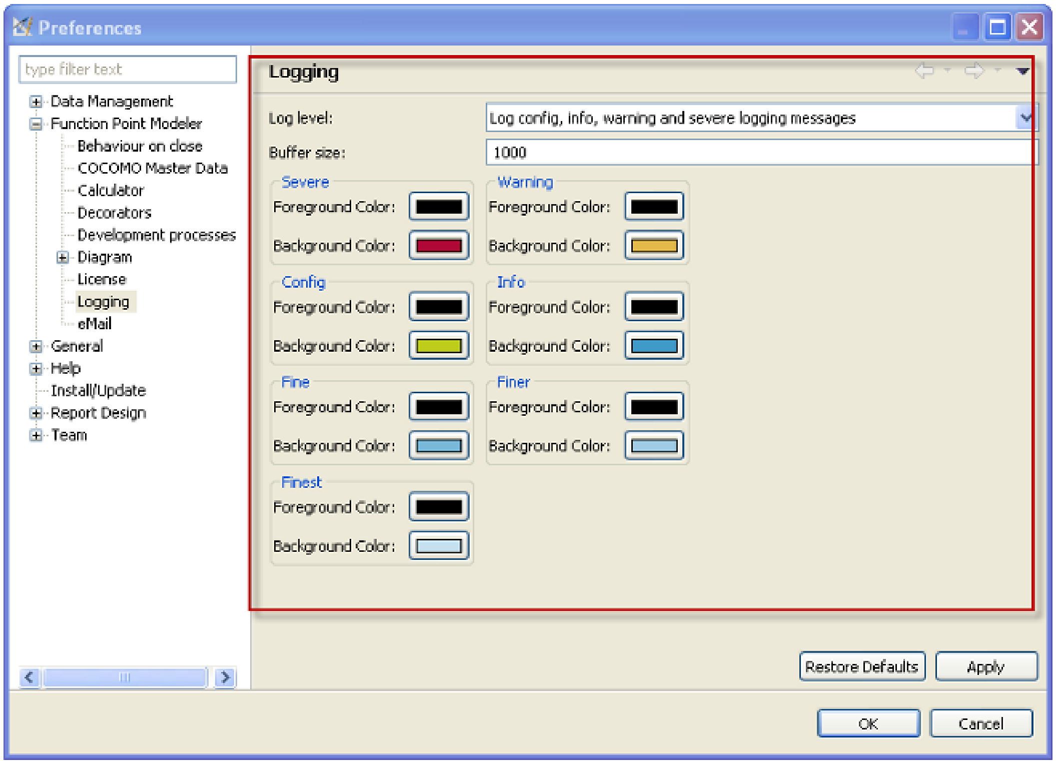
### Change Log-Level

To change Application Log Level, perform the following steps.

1. Select **Window** > **Preferences** from the menu bar.
2. Select **Function Point Modeler** > **Logging** on the left side of the dialog.



3. Change the log level and other possible options as required.



Log level: Log config, info, warning and severe logging messages

Buffer size: 1000

4. When finished, click the **Apply** or **OK** button.

# References

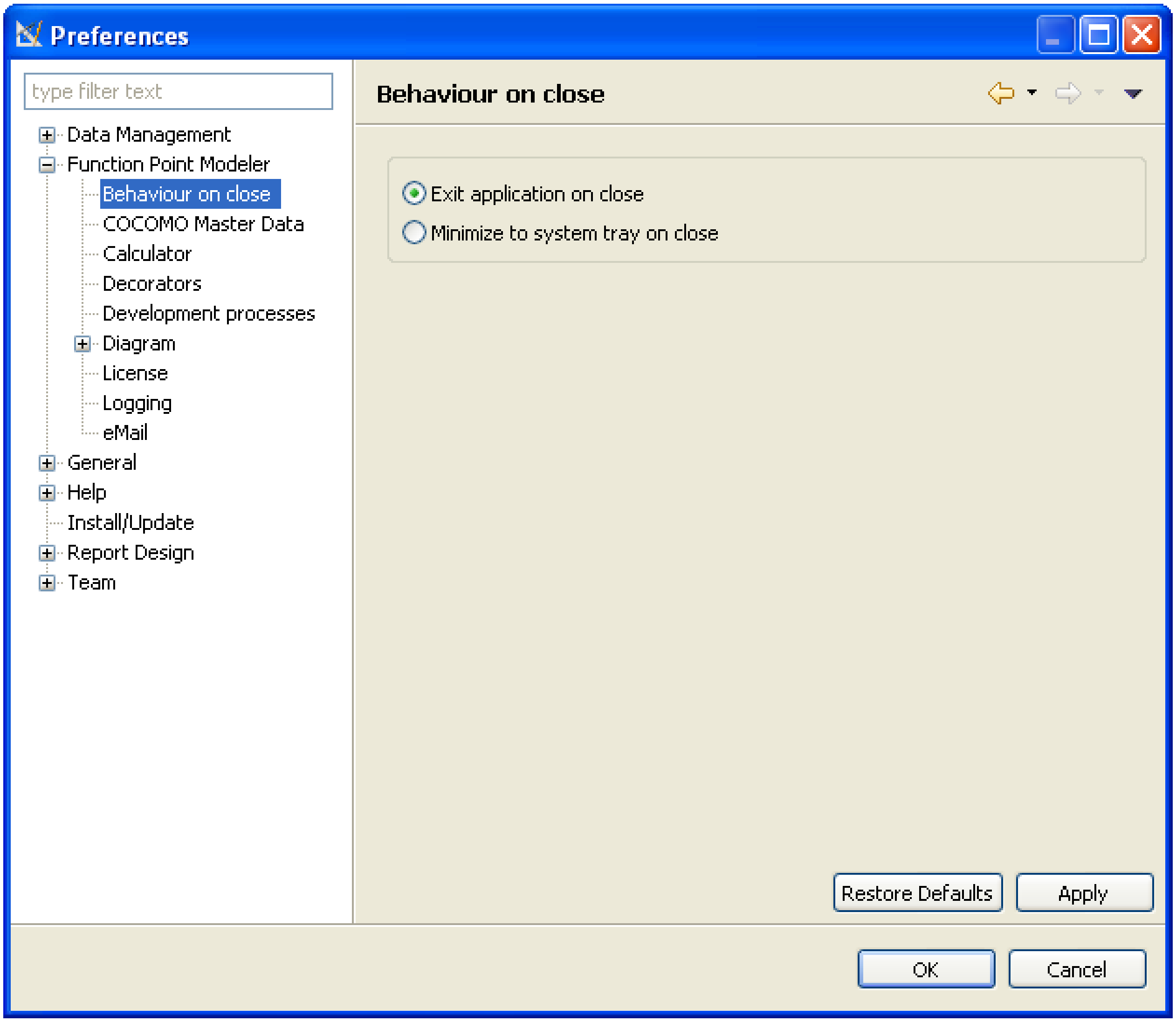
## Preferences

### Behaviour on close

The following preferences can be changed on the **Behaviour on close** preference page.

| Option | Description |
|---|---|
| Exit application on close | If this option is selected, the application will close on exit. |
| Minimize to system tray on close | If this option is selected, the application will be minimized to system tray on exit. |

Here is what the **Behaviour on close** preference page looks like:



● Exit application on close

○ Minimize to system tray on close

### COCOMO Master Data

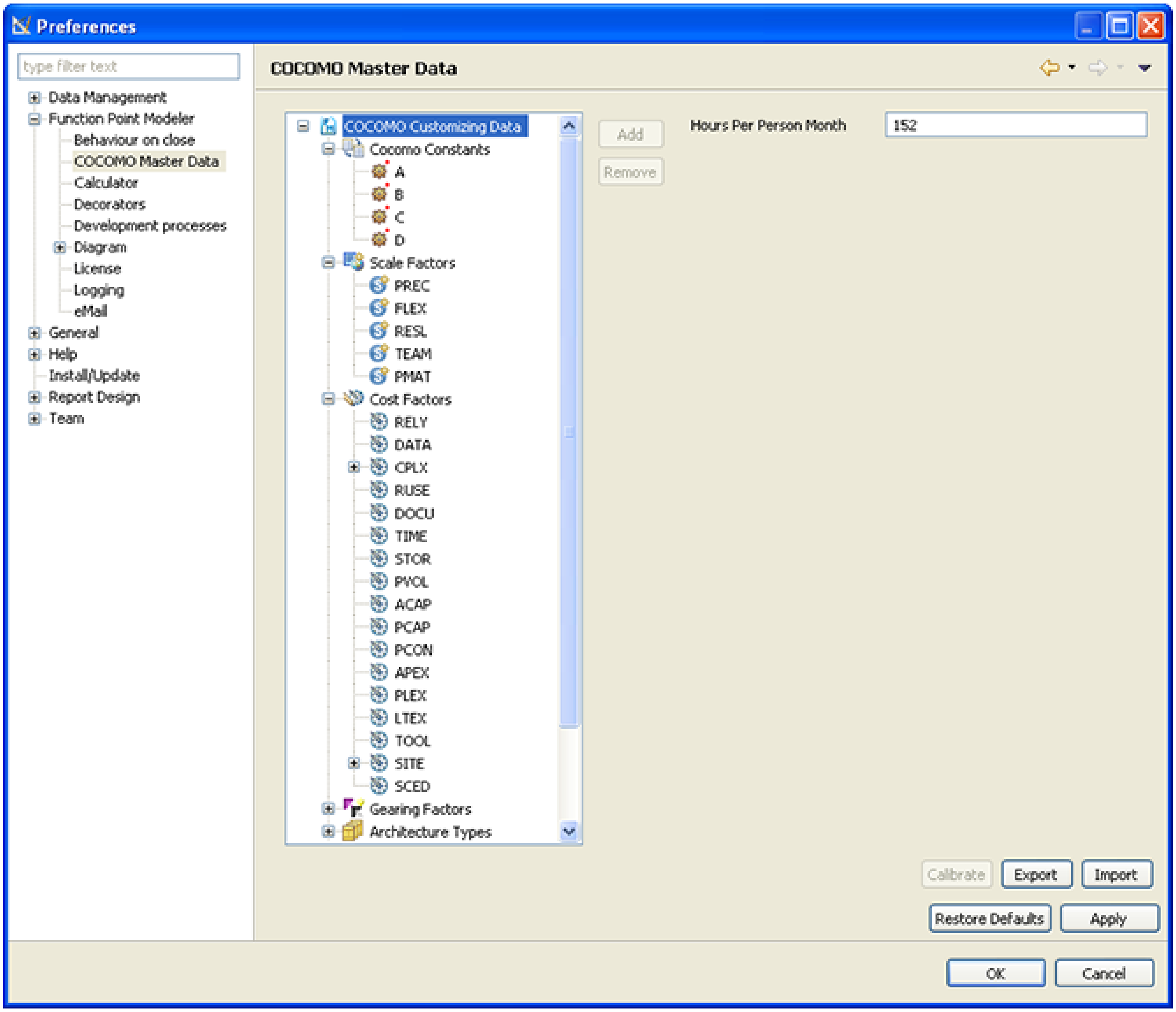
Enterprise Edition

The following preferences can be changed on the **COCOMO Master Data** preference page.

| Option | Description |
|---|---|
| Hours Per Person Month | Sets the average working time of a project member within one month. |
| Cocomo Constants | Additional Cocomo constants can be defined (calibrated) here or deleted. |

| **Option** | **Description** |
|---|---|
| Scale Factors | This makes it possible to modify existing Scale Factors, create new Factors or to delete existing Factors. |
| Cost Factors | This makes it possible to modify existing Cost Factors, create new Factors or to delete existing Factors. |
| Gearing Factors | This makes it possible to modify existing Gearing Factors, create new Factors or to delete existing Factors. |
| Architecture Types | This makes it possible to modify existing Architecture Types, create new Types or to delete existing Types. |
| Platform Types | This makes it possible to modify existing Platform Types, create new Types or to delete existing Types. |
| Project Types | This makes it possible to modify existing Project Types, create new Types or to delete existing Types. |
| Estimation Types | This makes it possible to modify existing Estimation Types, create new Types or to delete existing Types. |
| External Work Types | This makes it possible to modify existing External Work Types, create new Types or to delete existing Types. |
| Unestimated Effort Reasons | This makes it possible to modify existing Unestimated Effort Reasons, create new Reasons or to delete existing Reasons. |

Here is what the **COCOMO Master Data** preference page looks like:



Hours Per Person Month: 152

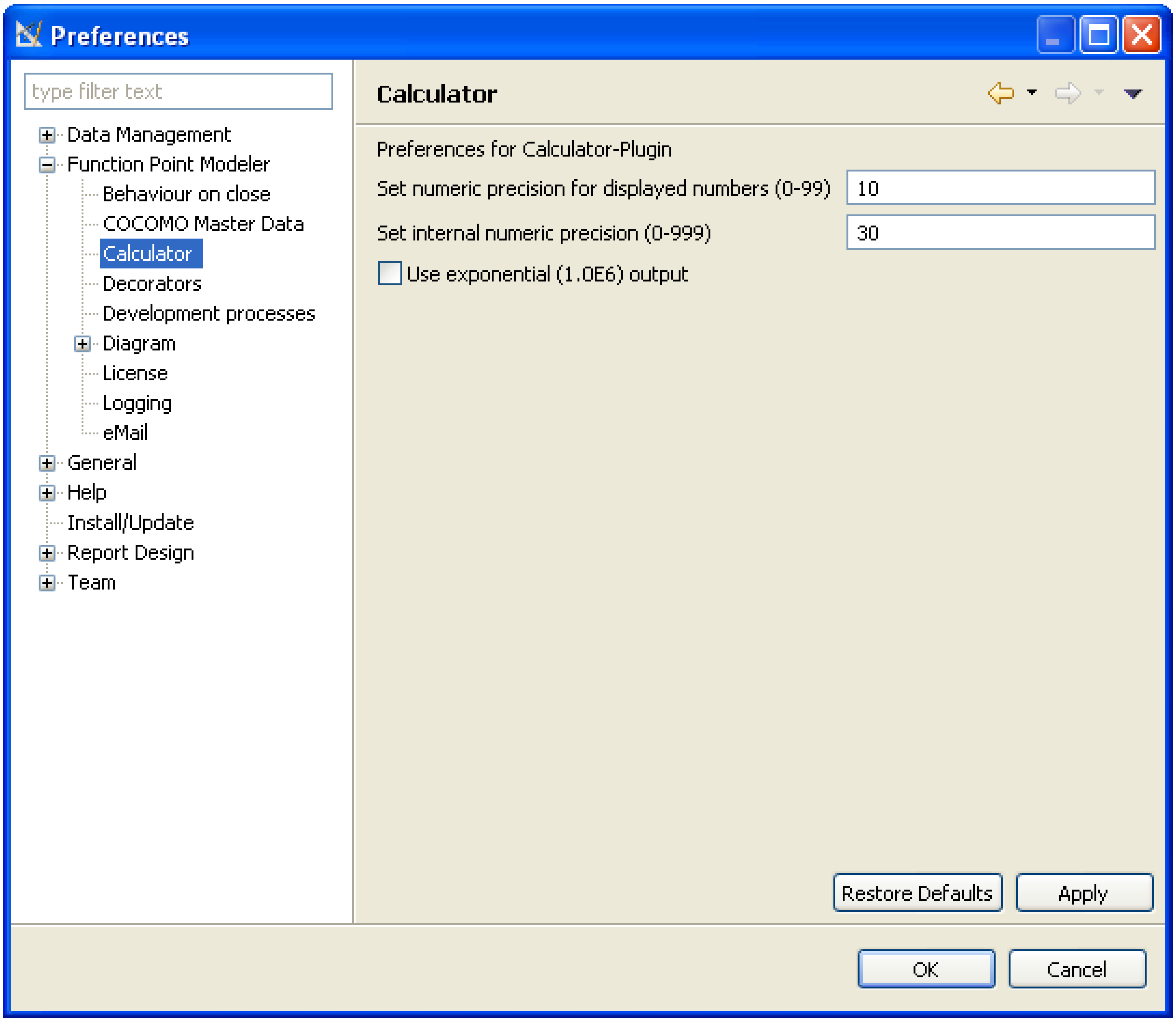
With the help of this preference dialog, you can also export the current Cocomo Settings and in the opposite case you can import this settings as well.

## Calculator

The following preferences can be changed on the **Calculator** preference page.

| Option | Description |
|---|---|
| Set numeric precision for displayed numbers | Determines the display accuracy of numerical values. Valid values are between 0 and 99. The accuracy of the display does not affect the accuracy of a calculation. |
| Set internal number precision | Determines the calculation accuracy of numerical values. Valid values are between 0 and 999. The accuracy of the display does not affect the accuracy of the display. |
| Use exponential (1.0E6) output | If this option is selected, floating point numbers are printed in exponential notation. |

Here is what the **Calculator** preference page looks like:



Calculator

Preferences for Calculator-Plugin

Set numeric precision for displayed numbers (0-99) 10

Set internal numeric precision (0-999) 30

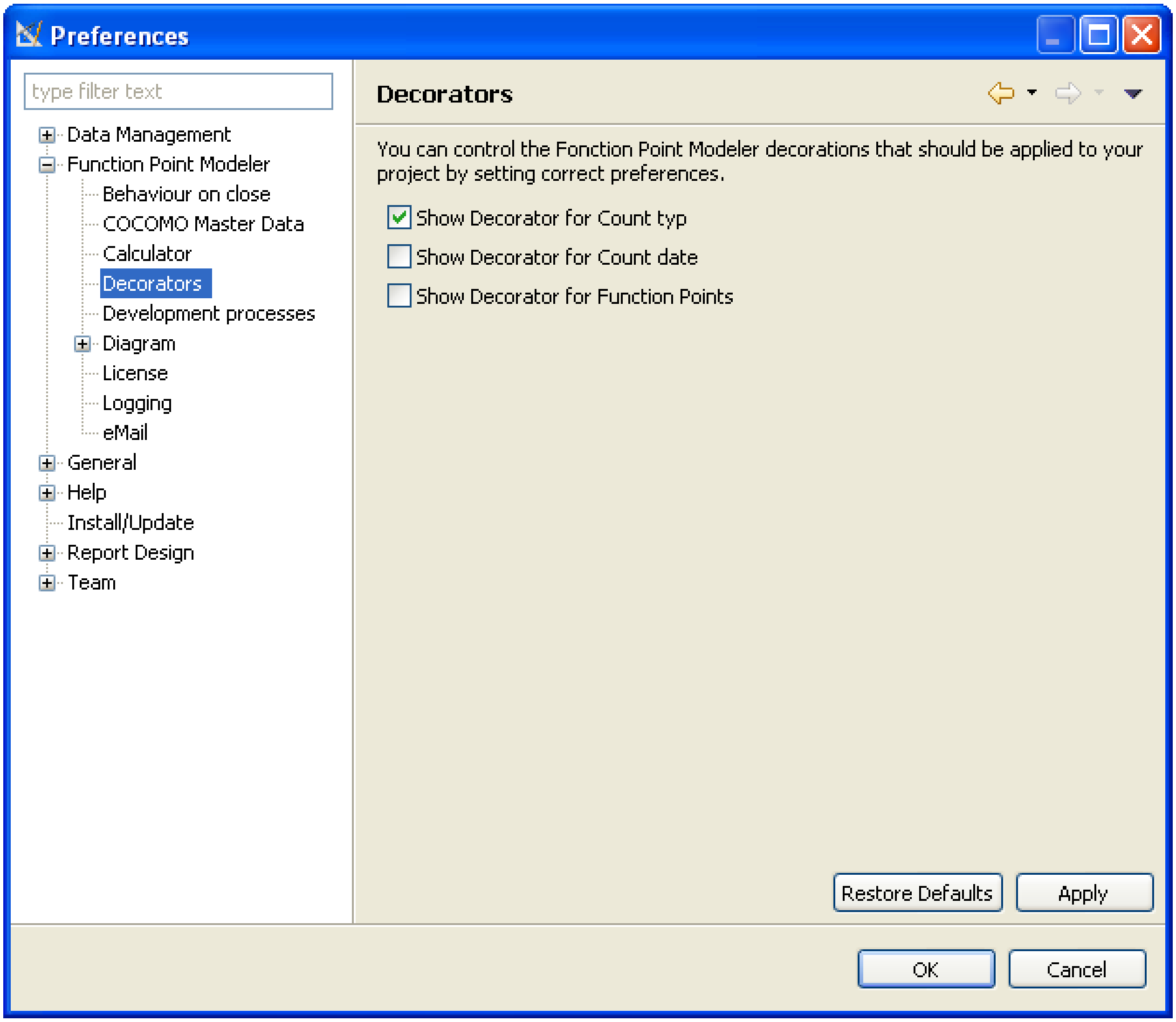
□ Use exponential (1.0E6) output

### Decorators

The following preferences can be changed on the **Decorator** preference page.

| Option | Description |
|---|---|
| Show decorator for Count Typ | If this option is selected, a Count entry in the Project Navigator is decorated with the corresponding Count Typ. |
| Show decorator for Count Date | If this option is selected, a Count entry in the Project Navigator is decorated with the corresponding Count Date. |
| Show decorator for Function Points | If this option is selected, a Count entry in the Project Navigator is decorated with the corresponding Function Points. |

Here is what the **Decorator** preference page looks like:



Decorators

You can control the Fonction Point Modeler decorations that should be applied to your project by setting correct preferences.

☑ Show Decorator for Count typ

□ Show Decorator for Count date

□ Show Decorator for Function Points

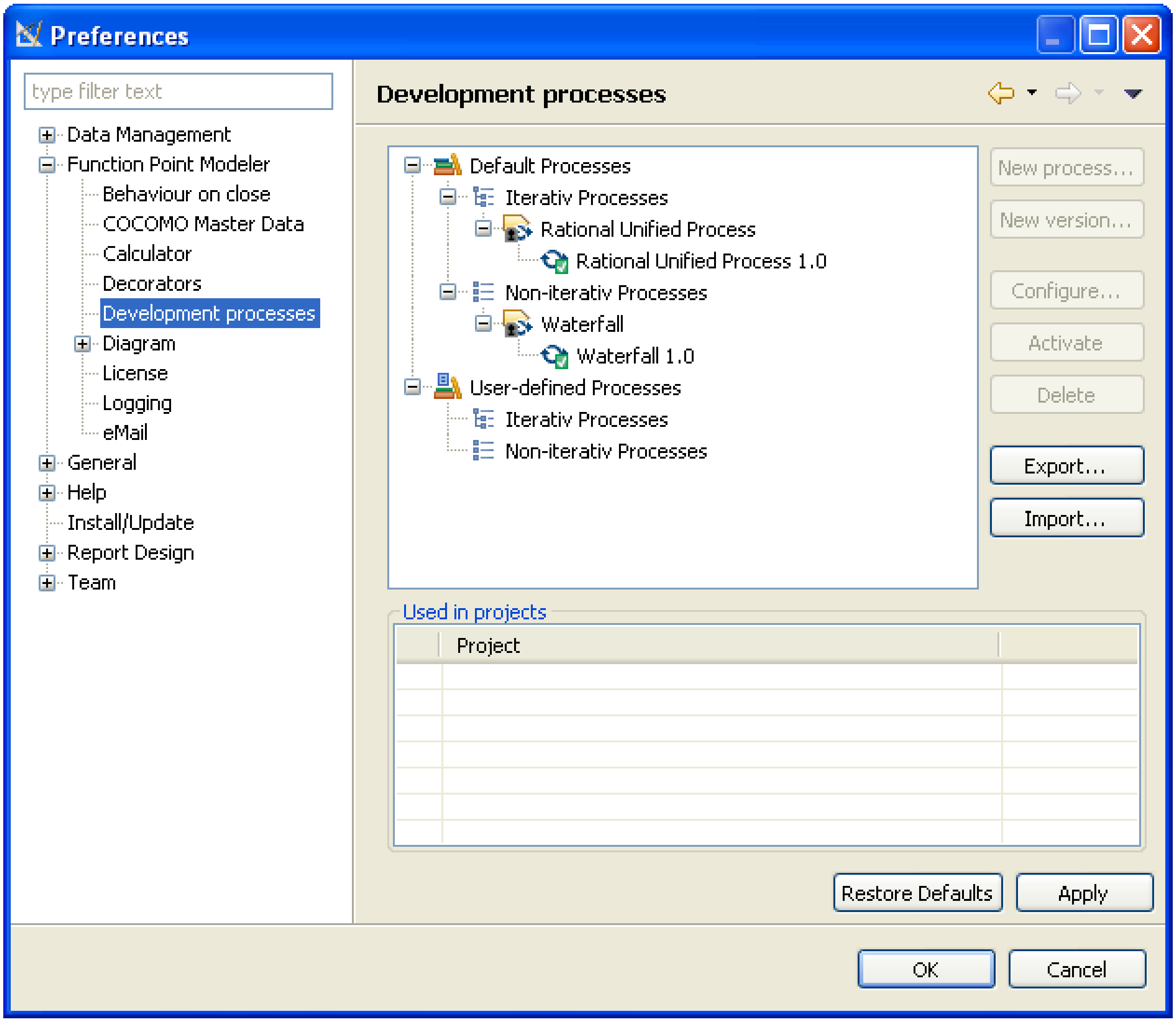
### Development Processes

Enterprise Edition

The following preferences can be changed on the **Development Processes** preference page.

| Option | Description |
|---|---|
| New Process... | Define a new iterativ or non-iterativ development process. |
| New Version... | Define a new process version. |
| Configure | Configures an existing process version. |
| Activate | Activates the selected process version. Only one version of a development process can be active. |
| Delete | Deletes the selected process or process version. An active process version can not be deleted. |
| Export... | Exports the current settings for development processes to an XMI file or to a SLED. |
| Import... | Imports settings for development processes from an XMI file or from a SLED. |

Here is what the **Development Processes** preference page looks like:



The table placed in group **Used in projects** displays workspace projects, where the current selected process version is in use.

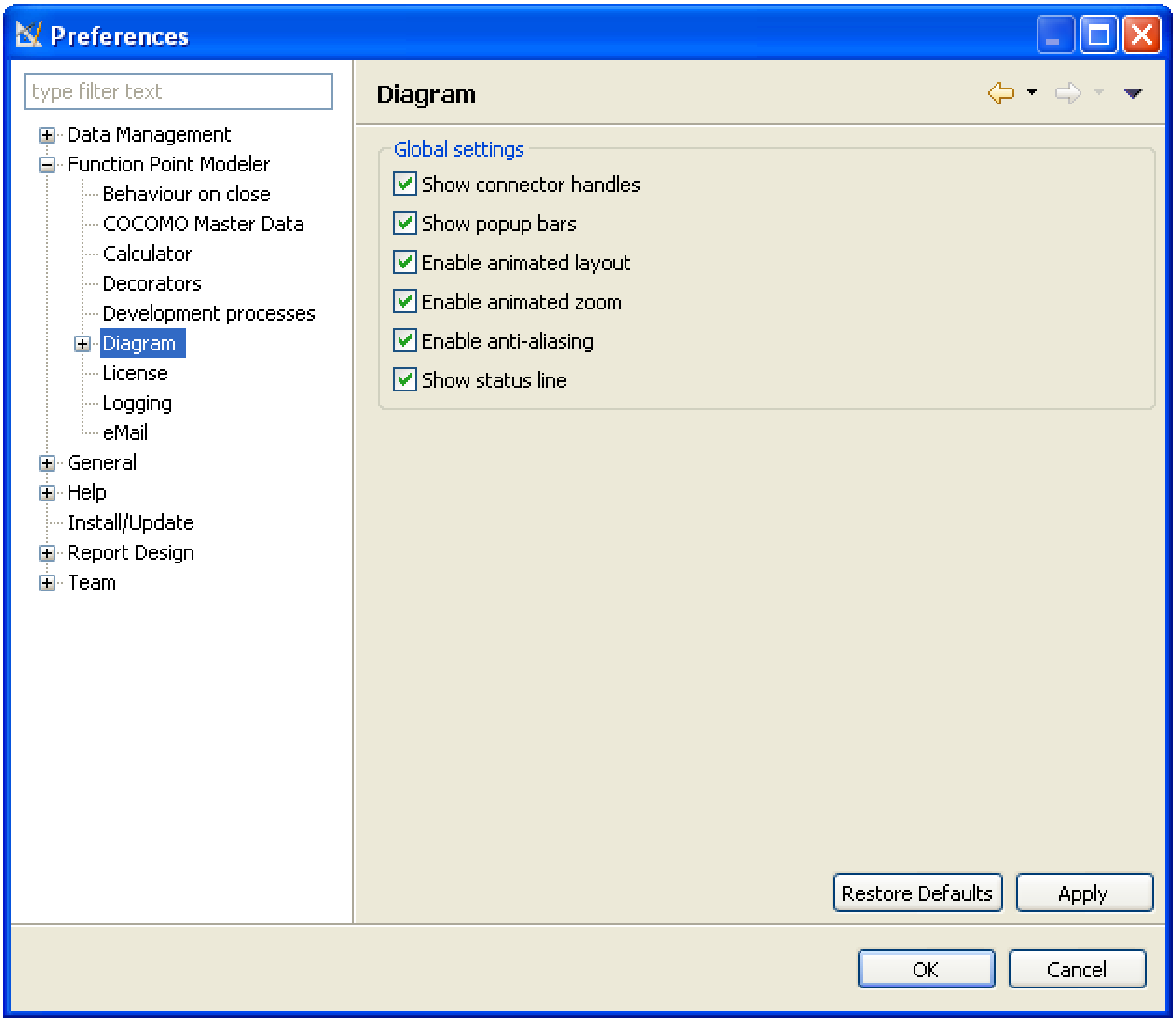
## Diagram

The following preferences can be changed on the **Diagram** preference page.

| Option | Description |
|---|---|
| Show connector handles | If selected, connector handles will be visible. |
| Show popup bars | If selected, a popup bar is shown in the diagram editors when the mouse is positioned at a special location. The popup bar will contain all diagram elements, which are valid for the given cursor position. When the user clicks on one of this elements, a new diagram element for the given type will be created. |
| Enable animated layout | If this option is selected, a new layout request of a diagram will be animated. If this option is not selected, the layout request will be performed in a simple way. |
| Enable animated zoom | If this option is selected, diagram zooming will be animated. If this option is not selected, zooming will be performed in a simple way. |
| Enable anti-aliasing | If selected, anti-aliasing will be enabled in diagram files. |

| Option | Description |
|---|---|
| Show status line | If selected, status line content will be enabled. |

Here is what the **Diagram** preference page looks like:



Diagram

Global settings

☑ Show connector handles

☑ Show popup bars

☑ Enable animated layout

☑ Enable animated zoom

☑ Enable anti-aliasing

☑ Show status line

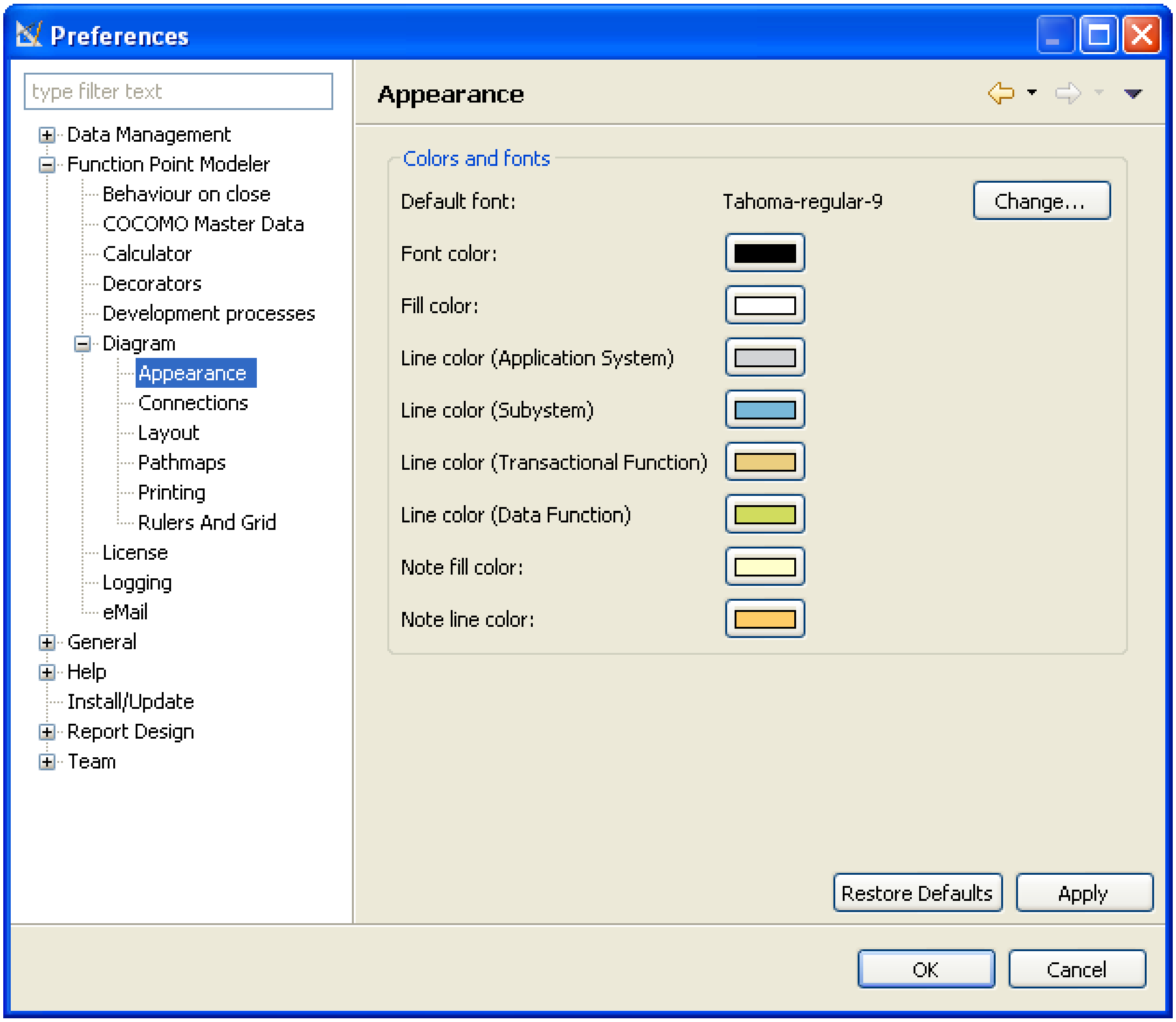
### Appearance

The following preferences can be changed on the **Appearance** preference page.

| Option | Description |
|---|---|
| Default font | Sets the default font set in the diagram editors, which is used for displaying text. |
| Font color | Sets the default font color in the diagram editors, which is used for displaying text. |
| Fill color | Specifies the end color for the gradient representation of diagram elements. An adjustment of this setting affects only new elements. The color of existing elements will not be changed. |
| Line color (Application System) | Specifies the start color for the gradient representation of application system diagram elements. An adjustment of this setting affects only new elements. The color of existing elements will not be changed. |

| Option | Description |
|---|---|
| Line color (Subsystem) | Specifies the start color for the gradient representation of subsystem diagram elements. An adjustment of this setting affects only new elements. The color of existing elements will not be changed. |
| Line color (Transactional Function) | Specifies the start color for the gradient representation of transactional function diagram elements. An adjustment of this setting affects only new elements. The color of existing elements will not be changed. |
| Line color (Data Function) | Specifies the start color for the gradient representation of data function diagram elements. An adjustment of this setting affects only new elements. The color of existing elements will not be changed. |
| Note fill color | Specifies the fill color for a diagram note. |
| Not line color | Specifies the line color for a diagram note. |

Here is what the **Appearance** preference page looks like:



Appearance

Colors and fonts

Default font: Tahoma-regular-9

Font color: ⬛

Fill color: ⬜

Line color (Application System): ⬜

Line color (Subystem): 🟦

Line color (Transactional Function): 🟧

Line color (Data Function): 🟩

Note fill color: 🟨

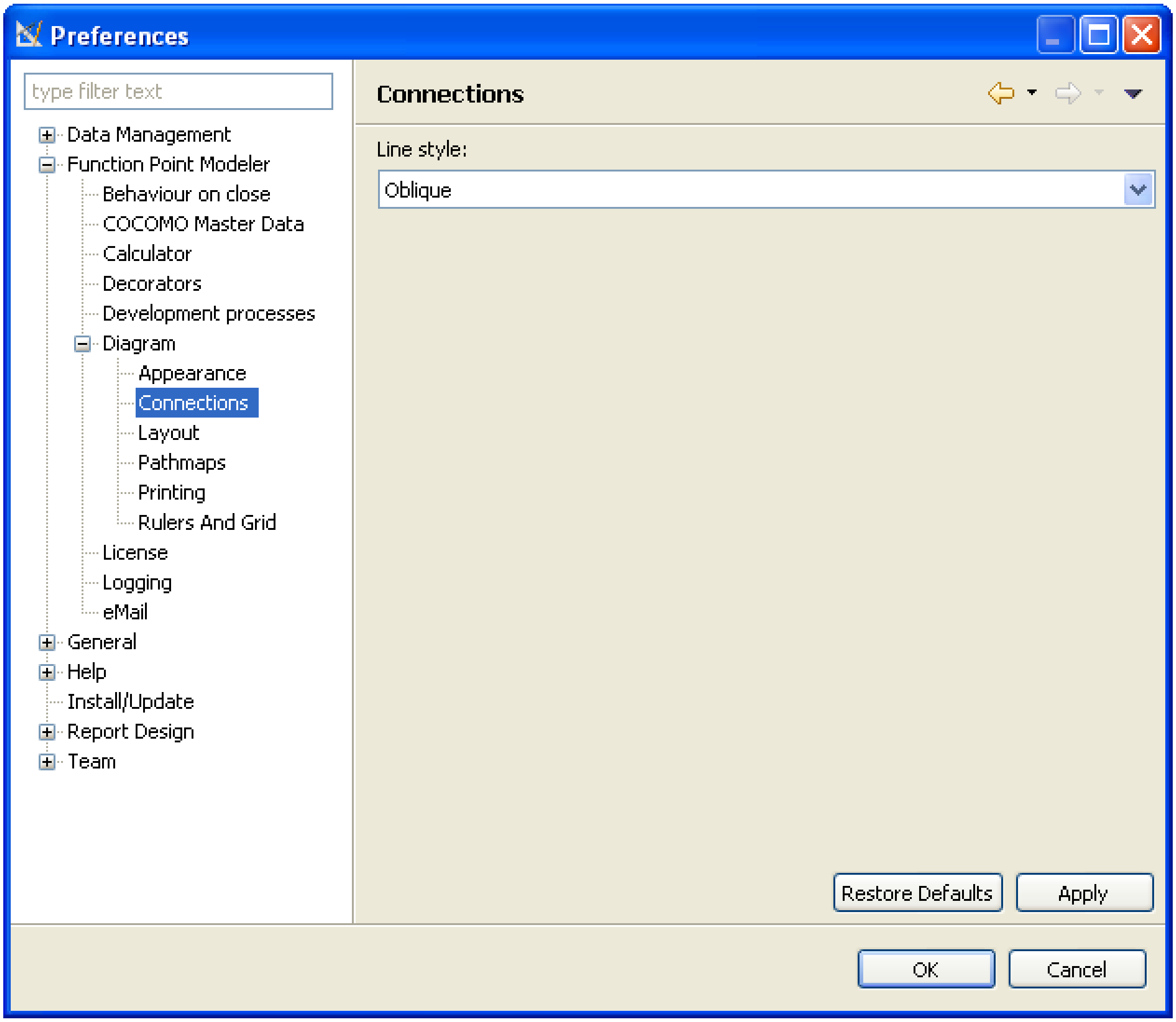
Note line color: 🟧

## Connections

The following preferences can be changed on the **Connections** preference page.

| Option | Description |
|---|---|
| Line style | Specifies the line style for relations in the diagram editior. You can choose between **Oblique** and **Rectlinear** . |

Here is what the **Connections** preference page looks like:



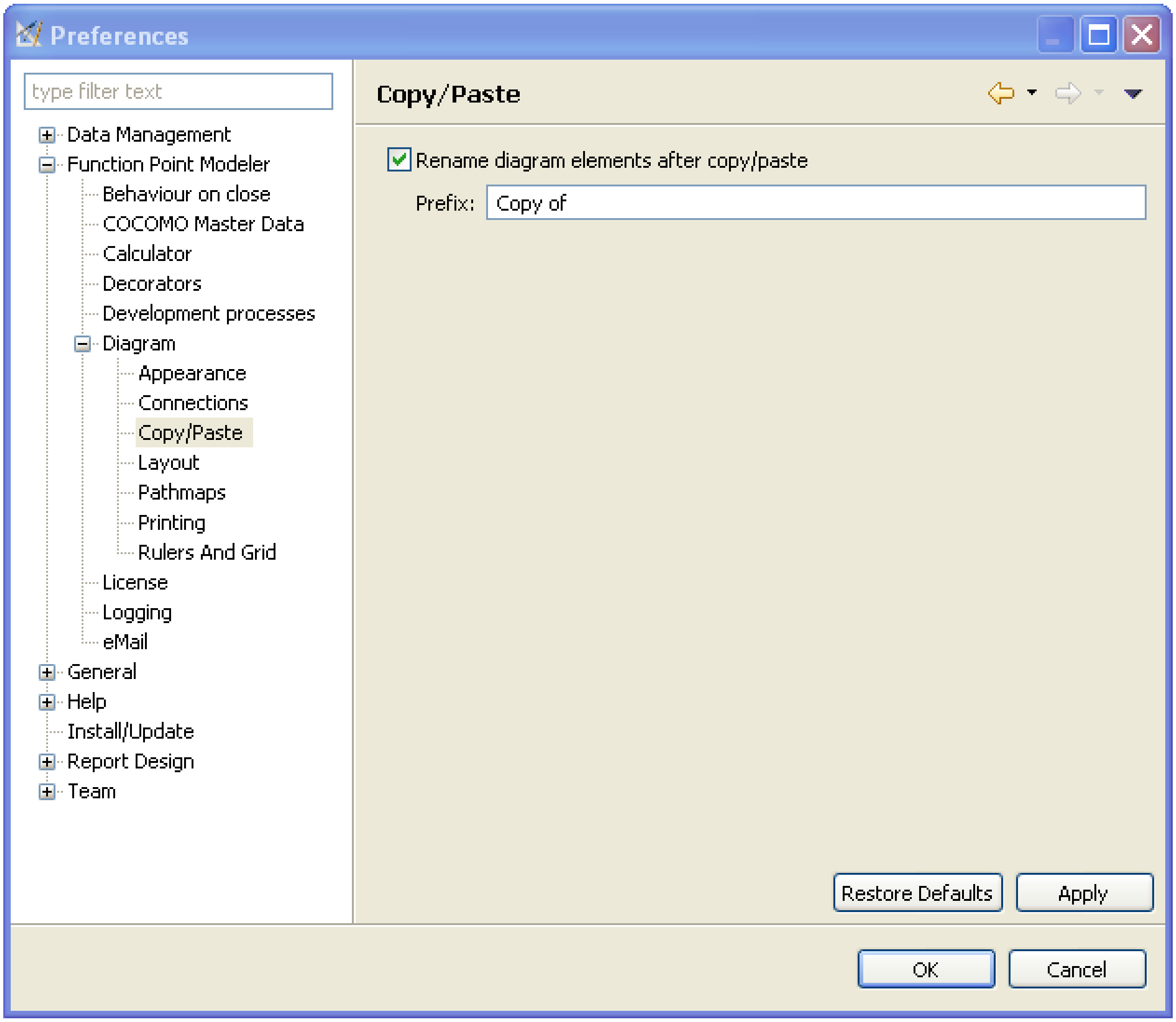
Line style: Oblique

### Copy/Paste

The following preferences can be changed on the **Copy/Paste** preference page.

| Option | Description |
|---|---|
| Rename diagram elements after copy/paste | If this option is enabled, copied elements in a diagram editor will be automatically renamed. |
| Prefix | If option above is enabled, this option specifies the prefix for the rename opration. E.g. if prefix is set to **Copy of** , a diagram element called **MyElement** will be renamed to **Copy of MyElement** . If the option above is disabled, this option has no influence. |

Here is what the **Copy/Paste** preference page looks like:



Copy/Paste

☑ Rename diagram elements after copy/paste

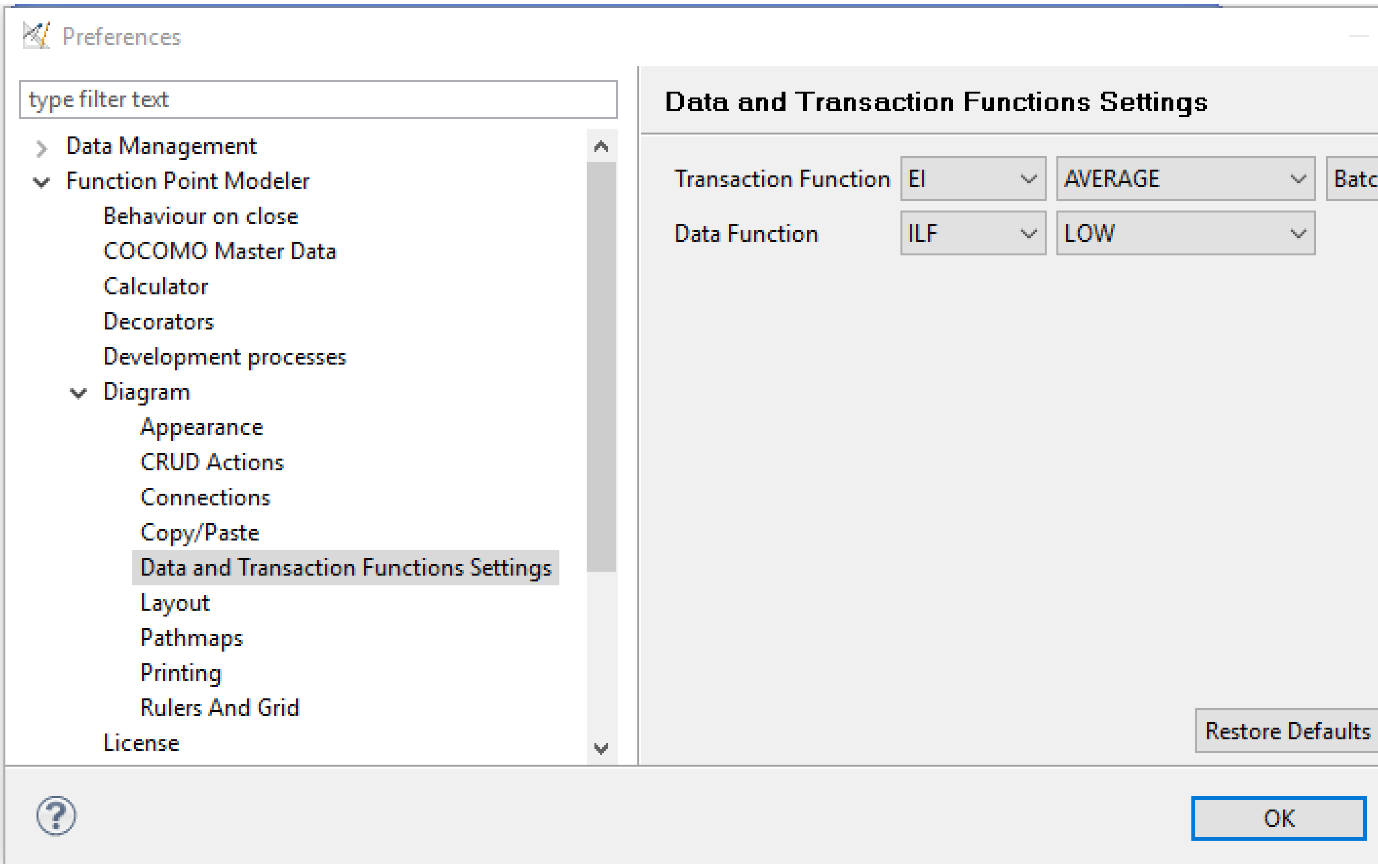
Prefix: Copy of

### Data and Transaction Functions Settings

The following preferences can be changed on the **Data and Transaction Functions Settings** preference page.

| Option | Description |
|---|---|
| Transaction Function | This option specifies the default-settings like **Transaction Function Type**, **Complexity** and **Process Type** of transaction functions. |
| Data Function | This option specifies the default-settings like **Data Function Type** and **Complexity** of data functions. |

Here is what the **Data and Transaction Functions Settings** preference page looks like:



Data and Transaction Functions Settings

Transaction Function: EI, AVERAGE, Batc

Data Function: ILF, LOW

### Layout

The following preferences can be changed on the **Layout** preference page.

| Option | Description |
|---|---|
| Diagram Layout | Specifies the diagram layout method for diagram editors. You can choose between **FreeForm layout** where all diagram elements can be placed free in a diagram editor. Another option is **Grid layout** . If this option is selected, the diagram elements are placed in a defined grid style. You can not move diagram elements by hand. Please keep in mind, a layout change will not affect already opened editors. It is necessary, to close and re-open these editors, so the new layout style will take place. |

Here is what the **Layout** preference page looks like:

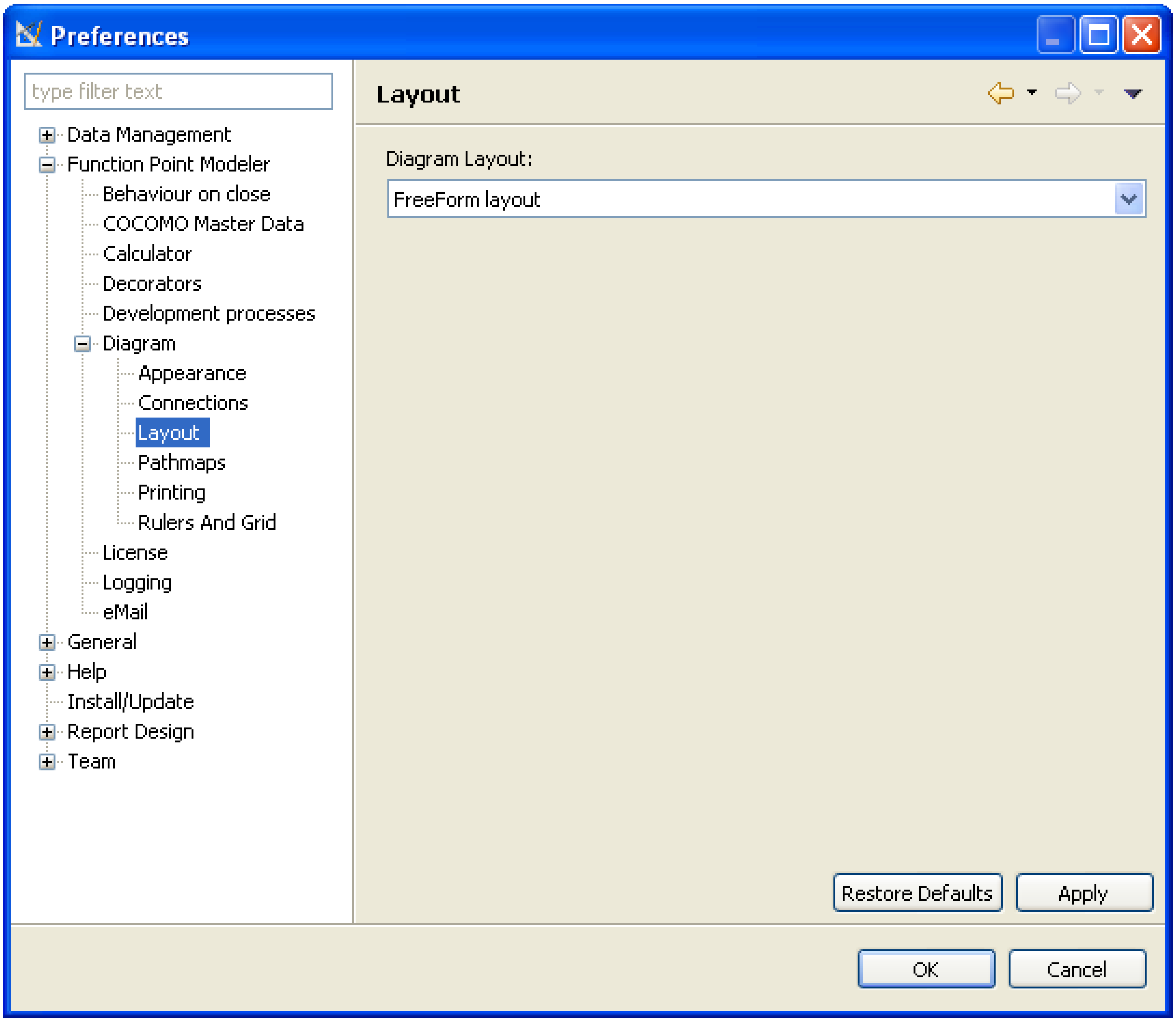


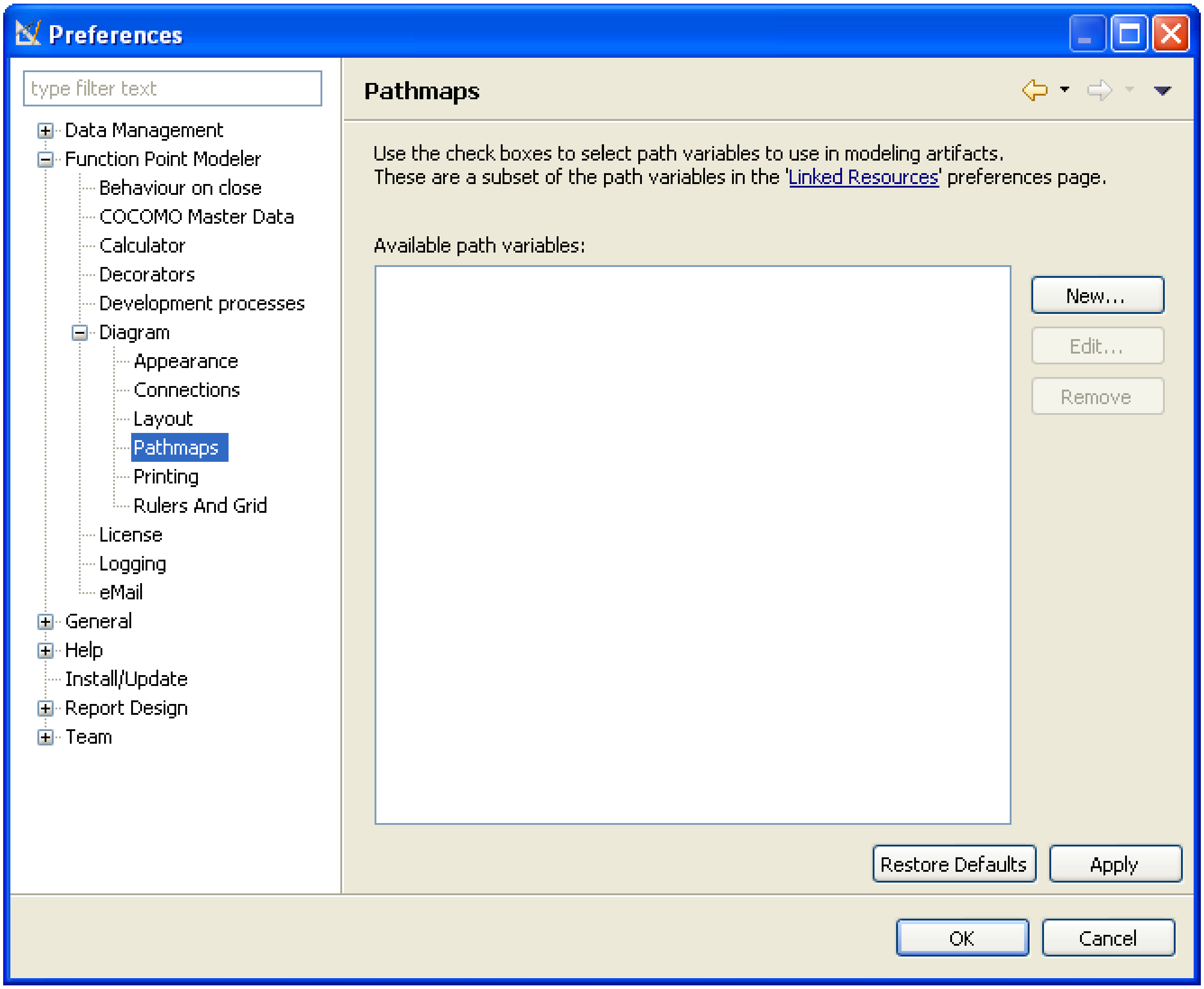
Diagram Layout: FreeForm layout

### Pathmaps

The following preferences can be changed on the **Pathmaps** preference page.

| Option | Description |
|---|---|
| Path variables | Use the checkboxes to select path variables to use in modelling artifacts. These are a subset of the path variables in the **Linked Resources** preference page. Path variables specify a location in the file system. The location of linked resources may be specified relative to these path variables. |

Here is what the **Pathmaps** preference page looks like:



Use the check boxes to select path variables to use in modeling artifacts.
These are a subset of the path variables in the 'Linked Resources' preferences page.

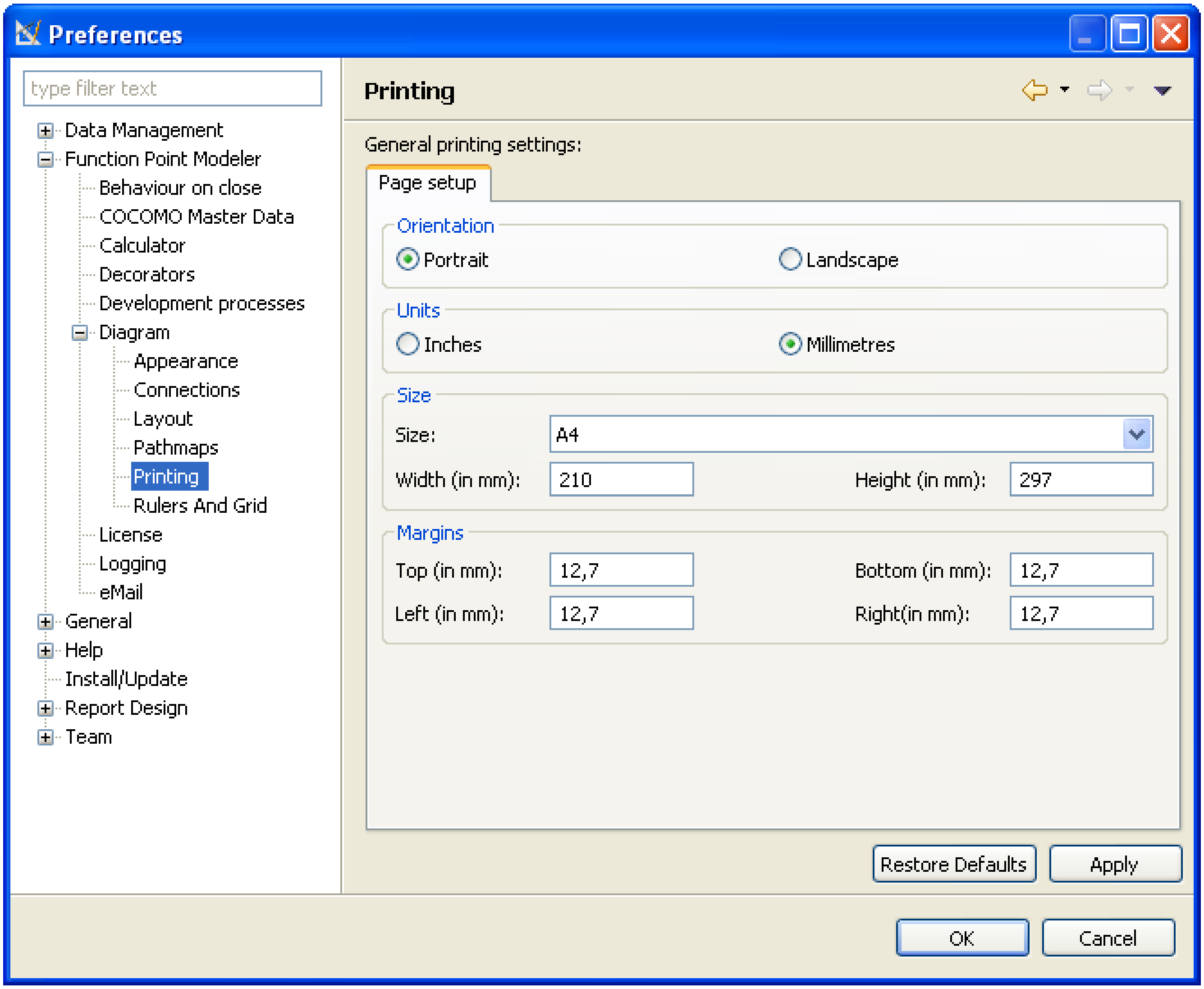
Available path variables:

### Printing

The following preferences can be changed on the **Printing** preference page.

| Option | Description |
|---|---|
| Orientation | Choose between Portrait and Landscape printing layout. |
| Units | Choose between Inches and Millimeters. This selection influences the following settings. |
| Size | Choose the target format for printing, such as e.g. A4, A3 etc. |
| Width | Choose the target format width for printing. Changes for this option will set the size setting to **User Defined** . |
| Height | Choose the target format height for printing. Changes for this option will set the size setting to **User Defined** . |
| Margings Top | Choose the target format margin top size for printing.. |
| Margings Bottom | Choose the target format margin bottom size for printing.. |
| Margings Left | Choose the target format margin left size for printing.. |
| Margings Right | Choose the target format margin right size for printing.. |

Here is what the **Printing** preference page looks like:



General printing settings:

Orientation

● Portrait ○ Landscape

Units

○ Inches ● Millimetres

Size

Size: A4

Width (in mm): 210 Height (in mm): 297

Margins

Top (in mm): 12,7 Bottom (in mm): 12,7

Left (in mm): 12,7 Right(in mm): 12,7

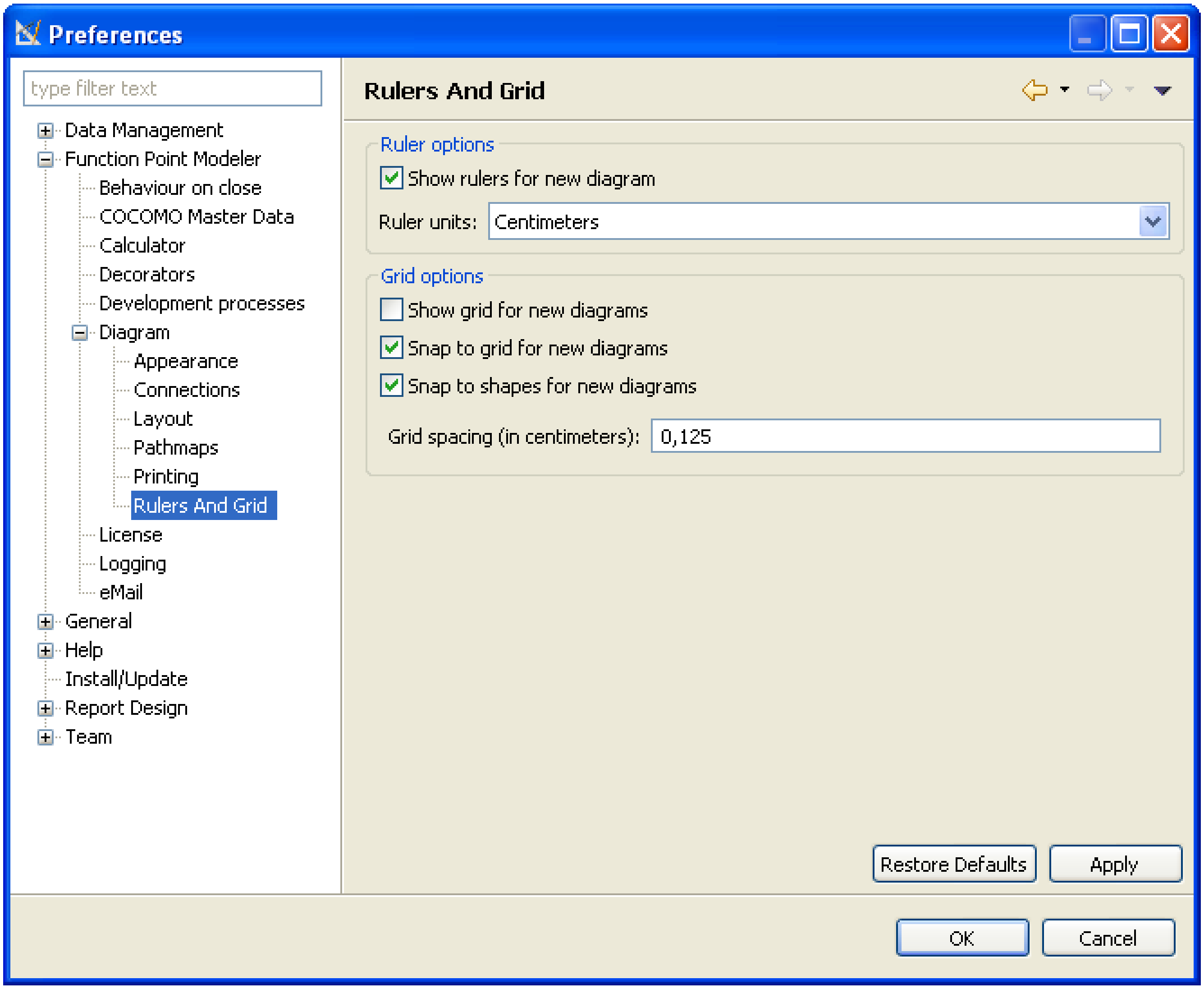
### Rulers And Grid

The following preferences can be changed on the **Rules and Grid** preference page.

| Option | Description |
|---|---|
| Show rulers for new diagram | If selected, horizontal and vertical rulers will be shown in the diagram editors. Changing this option did not affects already opened diagrams. It is required to close and re-open these diagrams so that this selection takes effect. |
| Ruler units | Sets the unit measurement for diagram rulers. |
| Show grid for new diagrams | If selected, horizontal and vertical grids will be shown in the diagram editors. Changing this option did not affects already opened diagrams. It is required to close and re-open these diagrams so that this selection takes effect. |
| Snap to grid for new diagrams | If selected, diagram elements will snap to grid in the diagram editors. Changing this option did not affects already opened diagrams. It is required to close and re-open these diagrams so that this selection takes effect. |

| Option | Description |
|---|---|
| Snap to shapes for new diagrams | If selected, diagram elements will snap to shapes in the diagram editors. Changing this option did not affects already opened diagrams. It is required to close and re-open these diagrams so that this selection takes effect. |
| Grid spacing | Specifies grid spacing in centimeters. |

Here is what the **Rulers and Grid** preference page looks like:



Rulers And Grid

Ruler options

☑ Show rulers for new diagram

Ruler units: Centimeters

Grid options

□ Show grid for new diagrams

☑ Snap to grid for new diagrams

☑ Snap to shapes for new diagrams

Grid spacing (in centimeters): 0,125

### License

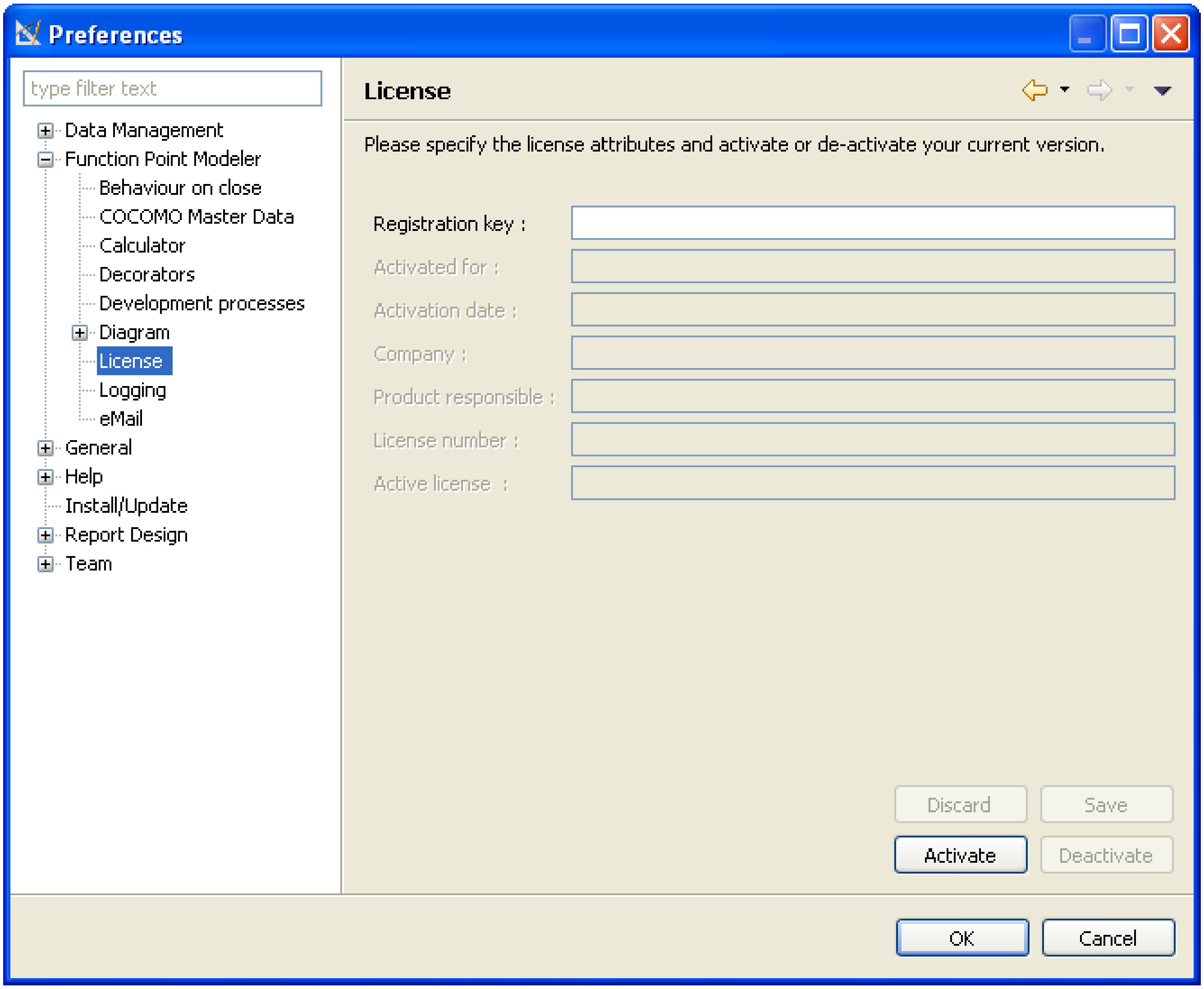
Enterprise Edition

The following preferences can be changed on the **License** preference page.

| Option | Description |
|---|---|
| Registration key | Here you can enter your registration key for the Function Point Modeler Enterprise Edition. |
| Discard | Discard your changes and set back your registration key to the last saved state. |

| Option | Description |
|---|---|
| Save | Save your changes. |
| Activate | Activate your license. |
| Deactivate | Deactivate your license. |

Here is what the **License** preference page looks like:



Please specify the license attributes and activate or de-activate your current version.

If you're using the Standard Edition of Function Point Modeler, this preference dialog is disabled, because this edition is free of charge.

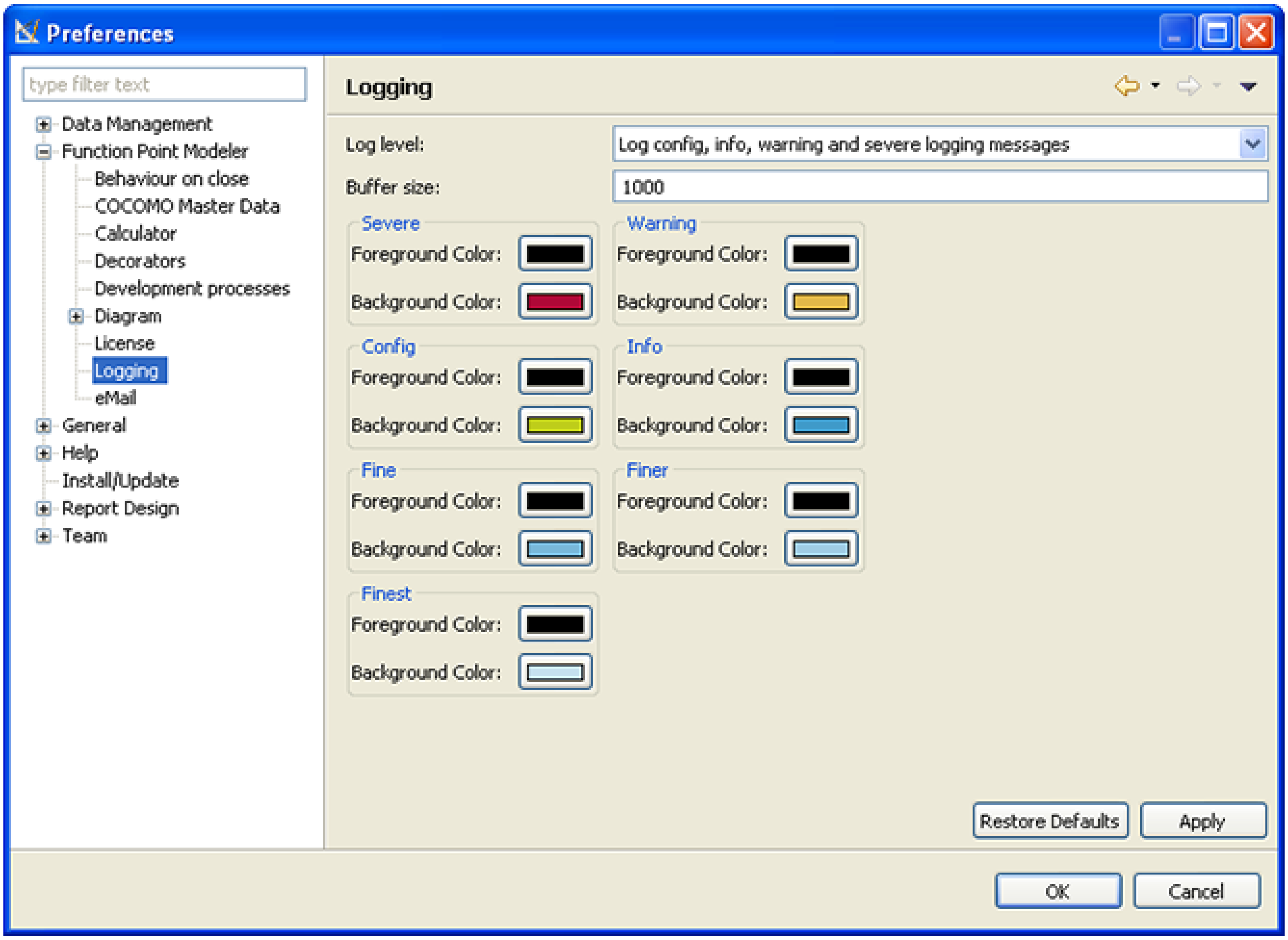
## Logging

The following preferences can be changed on the **Logging** preference page.

| Option | Description |
|---|---|
| Log level | Specify the log levels, which will be shown in the Logging View. |
| Buffer size | Specify the log buffer size. Log messages will be written to a buffer. This specification also defines how many messages can be taken up. |

| Option | Description |
|---|---|
| Severe Foreground/ Background Color | Defines Foregroud and Background Color for messages of level **Severe** . |
| Warning Foreground/ Background Color | Defines Foregroud and Background Color for messages of level **Warning** . |
| Config Foreground/ Background Color | Defines Foregroud and Background Color for messages of level **Config** . |
| Info Foreground/Background Color | Defines Foregroud and Background Color for messages of level **Info** . |
| Fine Foreground/ Background Color | Defines Foregroud and Background Color for messages of level **Fine** . |
| Finer Foreground/ Background Color | Defines Foregroud and Background Color for messages of level **Finer** . |
| Finest Foreground/ Background Color | Defines Foregroud and Background Color for messages of level **Finest** . |

Here is what the **Logging** preference page looks like:



Log level: Log config, info, warning and severe logging messages

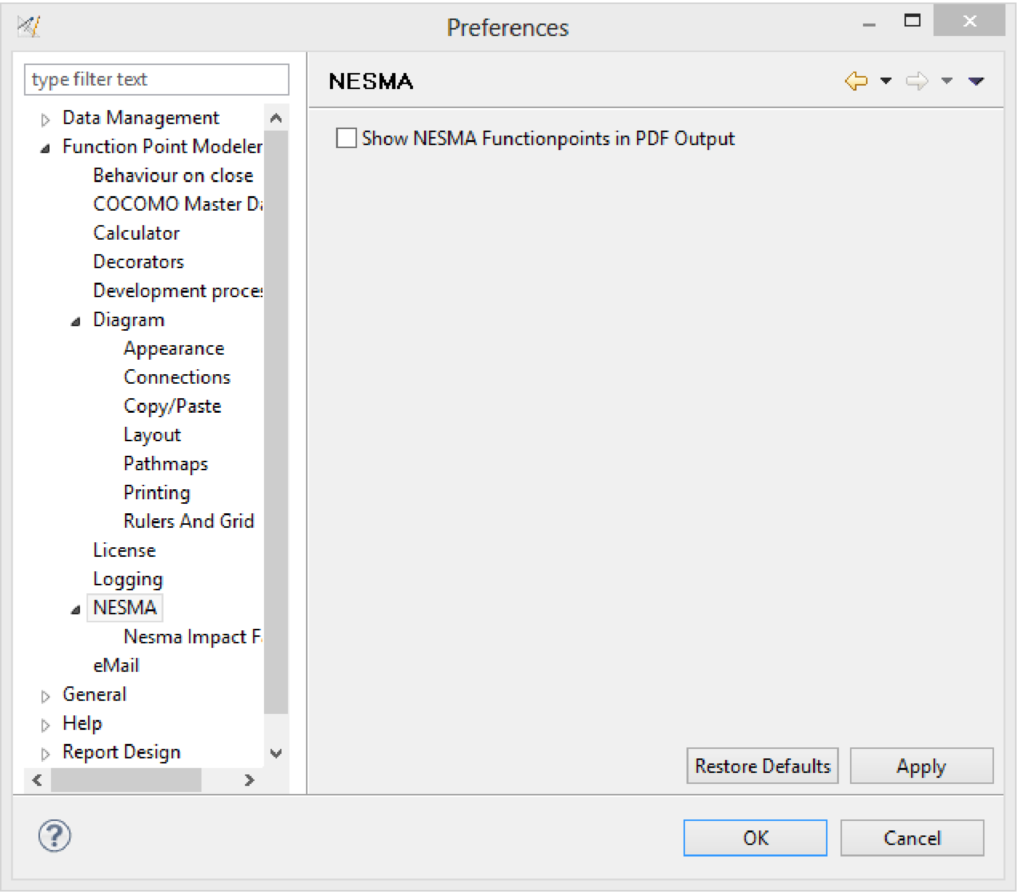
Buffer size: 1000

## NESMA

The following preferences can be changed on the **NESMA** preference page.

| Option | Description |
|---|---|
| Show NESMA Functionpoints in PDF Output | Select this option, if you want to display NESMA Functionpoints in PDF reports. |

Here is what the **NESMA** preference page looks like:



□ Show NESMA Functionpoints in PDF Output

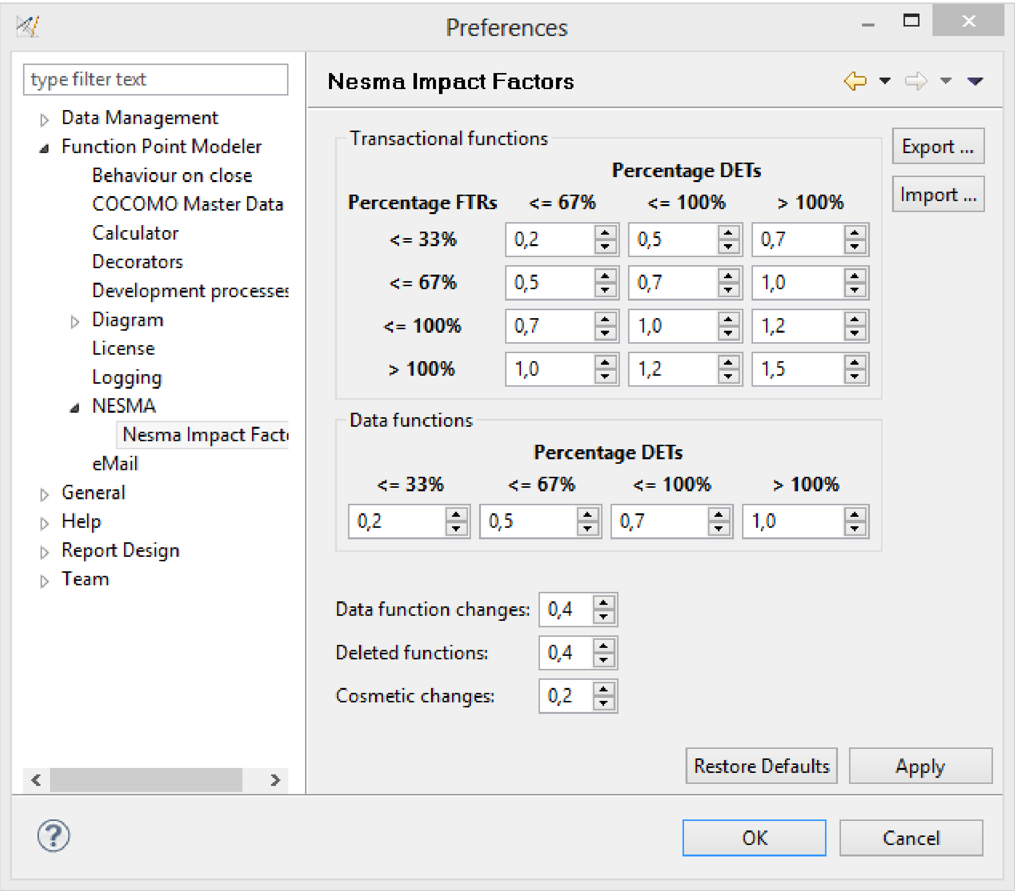
### NESMA Impact Factors

Enterprise Edition

The following preferences can be changed on the **NESMA Impact Factor** preference page.

| Option | Description |
|---|---|
| Transactional Functions | Calibrate Impact Factors for transactional functions. |
| Data Functions | Calibrate Impact Factors for data functions. |
| Data Function Changes | Calibrate Impact Factors for data function changes. |
| Deleted Functions | Calibrate Impact Factors for deleted functions. |
| Cosmetic Changes | Calibrate Impact Factors for cosmetic changes. |
| Export... | Exports the current settings for NESMA Impcat Factors to an XMI file or to a SLED. |
| Import... | Imports settings for NESMA Impact Factors from an XMI file or from a SLED. |

Here is what the **NESMA Impact Factors** preference page looks like:



Nesma Impact Factors

Transactional functions

| | Percentage DETs | | |
|---|---|---|---|
| Percentage FTRs | <= 67% | <= 100% | > 100% |
| <= 33% | 0,2 | 0,5 | 0,7 |
| <= 67% | 0,5 | 0,7 | 1,0 |
| <= 100% | 0,7 | 1,0 | 1,2 |
| > 100% | 1,0 | 1,2 | 1,5 |

Data functions

| Percentage DETs | | | |
|---|---|---|---|
| <= 33% | <= 67% | <= 100% | > 100% |
| 0,2 | 0,5 | 0,7 | 1,0 |

Data function changes: 0,4

Deleted functions: 0,4

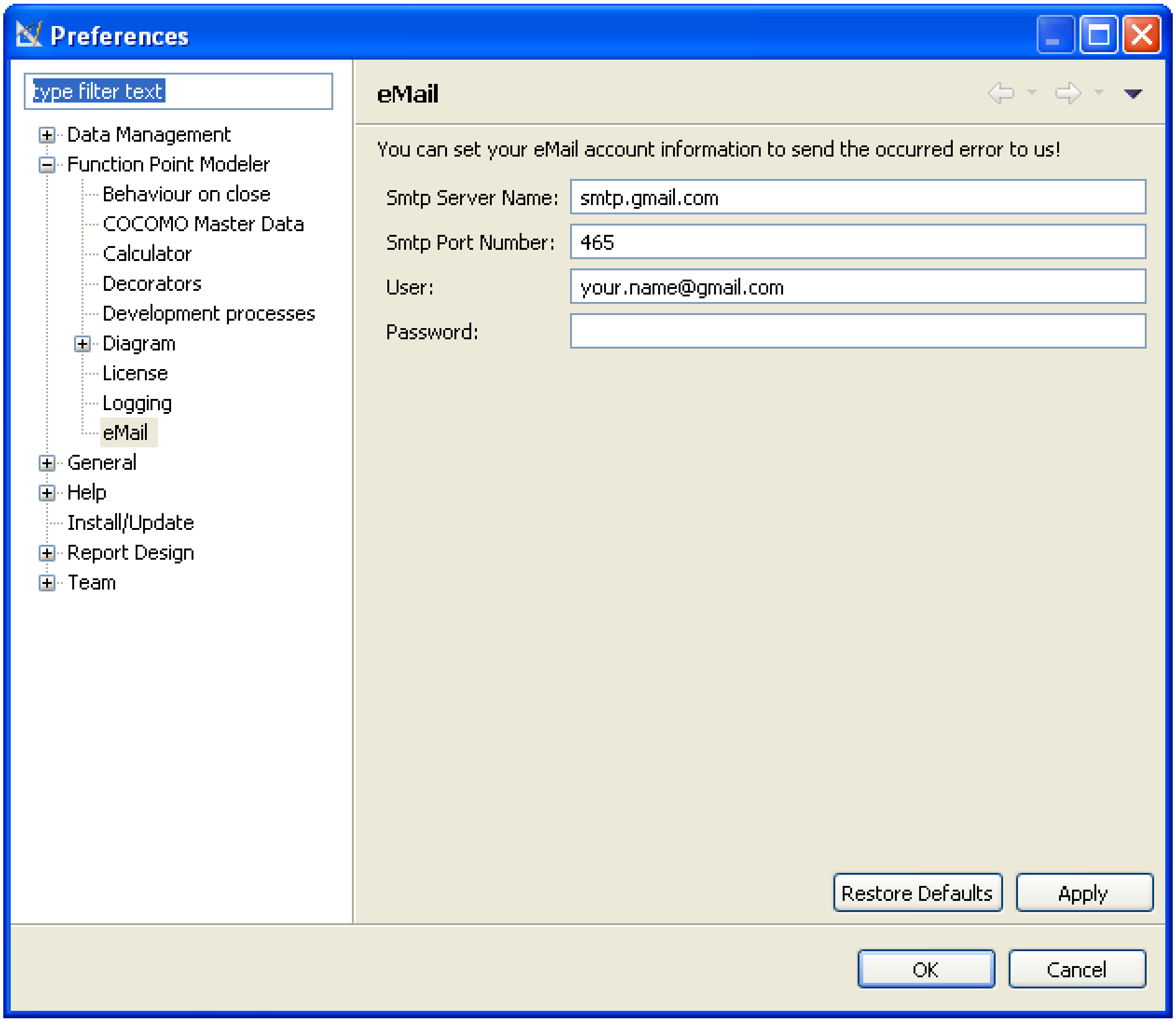
Cosmetic changes: 0,2

## eMail

The following preferences can be changed on the **eMail** preference page.

| Option | Description |
|---|---|
| eMail Address | Enter here a valid eMail Address, such as **your.name@gmail.com** . |
| Smtp Server Name | Enter here a valid Smtp Server Name, such as **smtp.gmail.com** . |
| Smtp Port Number | Enter or select a valid SMTP port. The default port for the SMTP protocol is normally 25. |
| Username | At this point you can enter your appropriate user name. Valid user names typically have the form username@xyz.com. |
| Password | Define here the valid password for your user name, specified above. |
| Connection security | Select security settings for your eMail account. |

Here is what the **eMail** preference page looks like:



eMail

You can set your eMail account information to send the occurred error to us!

Smtp Server Name: smtp.gmail.com

Smtp Port Number: 465

User: your.name@gmail.com

Password:

## User interface information

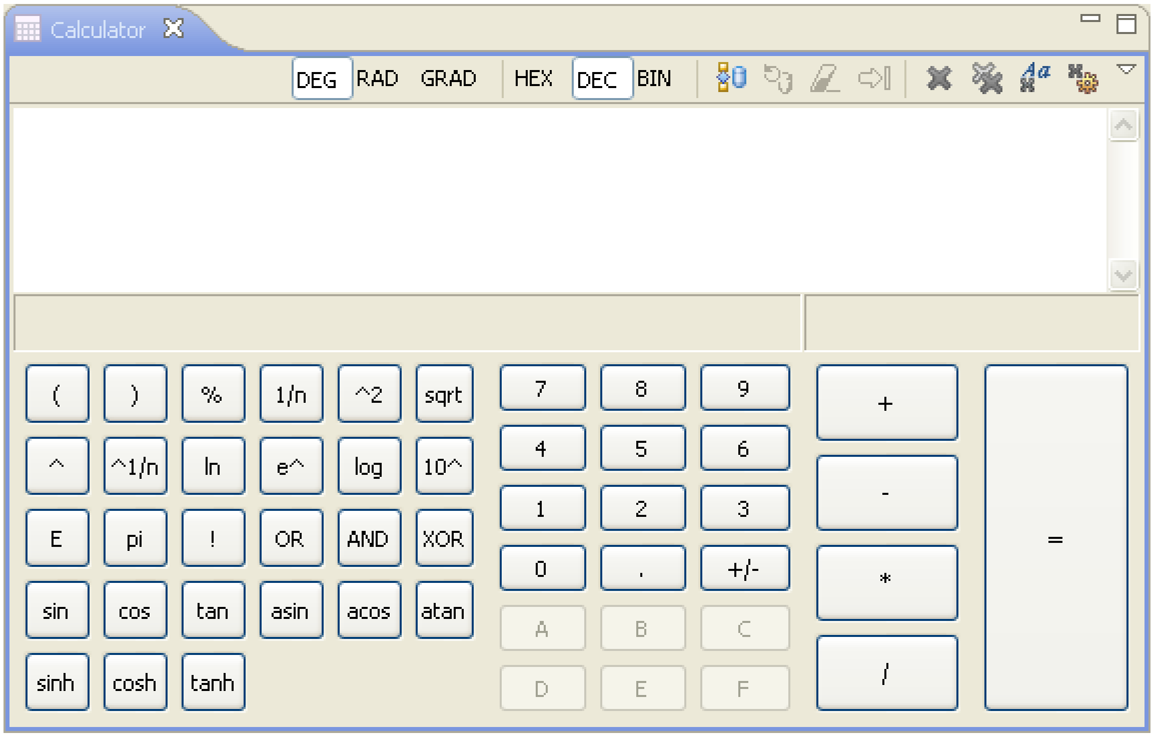
### Views and editors

### Function Point Modeler Views

*Calculator View*

This view displays a scientific calculator with the following features:

- Integrated into the Function Point Modeler workbench
- Standard, scientific and trigonometric calculation
- Display of the calculation in base-n numbers (decimal, hexadecimal, binary)
- Uses arbitrary precision where applicable
- Memory function for a number and the last calculated result
- Enter arithmetic expressions naturally
- Copy and clear as customizable shortcut
- Use comma to enter decimal point (for German keypad i.e.)

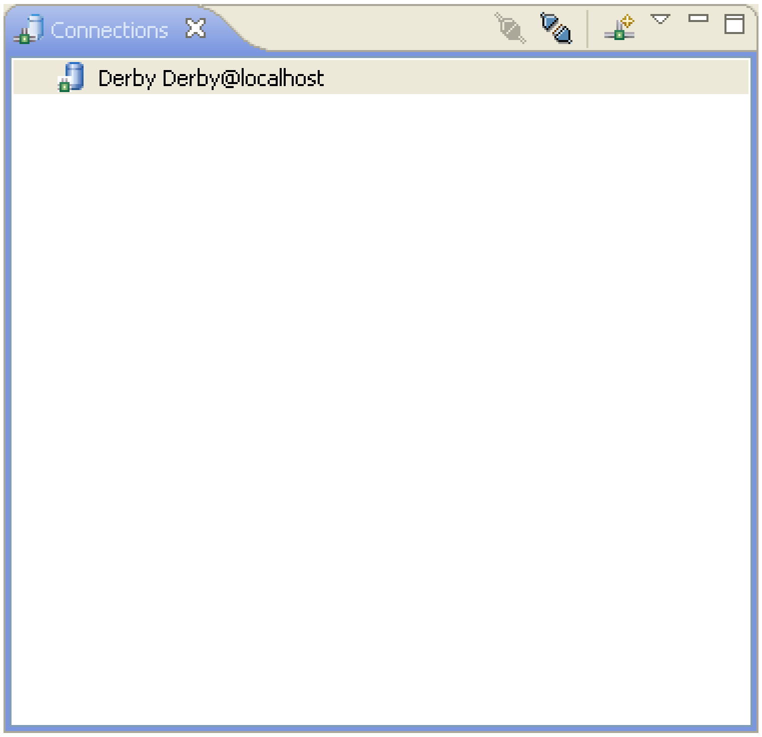


To add the **Calculator View** to the current perspective, click ***Window > Show View > Other > Function Point Modeler > Calculator*** .

### *Connections View*

Enterprise Edition

This view allows you to manage database connections. It is possible to establish new connections and change or delete existing connections. It is also possible to connect to a database or to disconnect.



To add the **Connections View** to the current perspective, click *Window > Show View > Other > Function Point Modeler > Connections* .

### Toolbar

The toolbar of the Connections view includes the following buttons.

Enable a connection to the selected SLED connection profile.

Disable a connection from the selected SLED connection profile.

Create a new SLED connection profile.

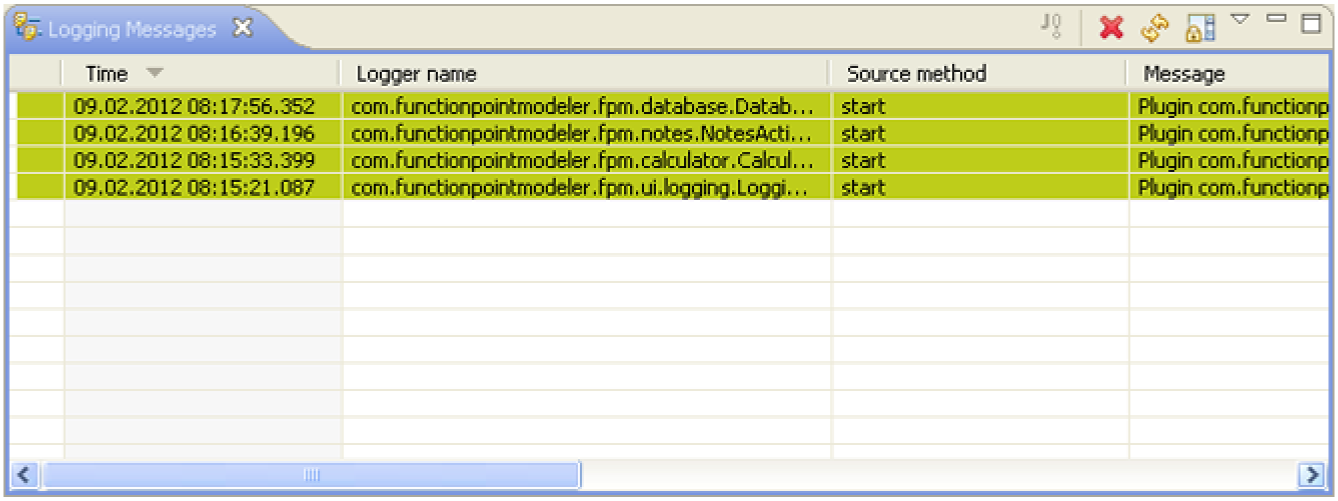
### Menus

Click the icon at the left end of the view's title bar to open a menu of items generic to all views. Click the black upside-down triangle icon to open a menu of items specific to the Connections view. Right-click inside the view to open a context menu.

#### *Logging Messages View*

This view allows you to analyze log messages for the Application **Function Point Modeler** .

The Application itself creates messages at defined time points, which are classified with differentiated levels. With the help of these messages it is e.g. possible to understand, how it came to a problem, at the time when an error occurs.



| Time | Logger name | Source method | Message |
|---|---|---|---|
| 09.02.2012 08:17:56.352 | com.functionpointmodeler.fpm.database.Datab... | start | Plugin com.functionp |
| 09.02.2012 08:16:39.196 | com.functionpointmodeler.fpm.notes.NotesActi... | start | Plugin com.functionp |
| 09.02.2012 08:15:33.399 | com.functionpointmodeler.fpm.calculator.Calcul... | start | Plugin com.functionp |
| 09.02.2012 08:15:21.087 | com.functionpointmodeler.fpm.ui.logging.Loggi... | start | Plugin com.functionp |

To add the **Logging View** to the current perspective, click ***Window > Show View > Other > Function Point Modeler > Logging Messages*** .

## Toolbar

The toolbar of the Logging Messages view includes the following buttons.

Shows the possible available stack trace of the selected table entry.

Deletes the currently selected table entry.

Updates the content of this view.

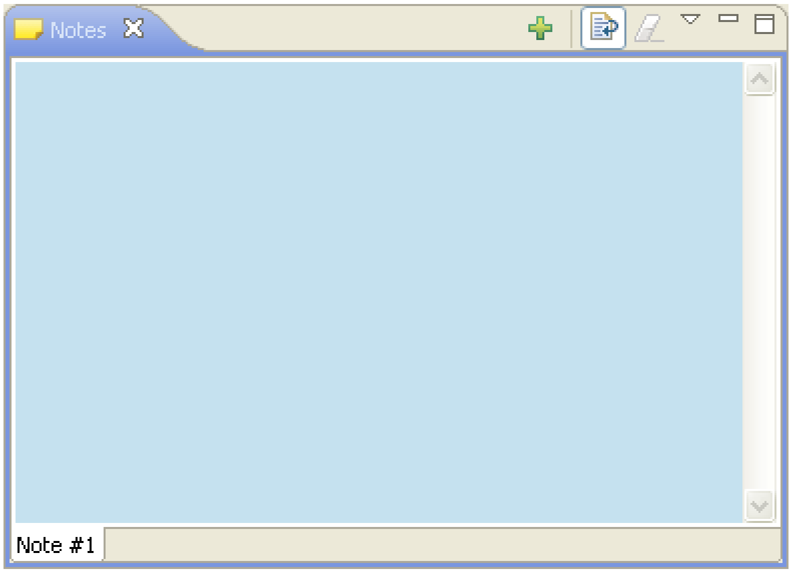
Enables or disables table scroll lock in this view.

## Menus

Click the icon at the left end of the view's title bar to open a menu of items generic to all views. Click the black upside-down triangle icon to open a menu of items specific to the Logging Messages view. Right-click inside the view to open a context menu.

### *Notes View*

This view allows you to enter some notes.



To add the **Notes View** to the current perspective, click ***Window > Show View > Other > Function Point Modeler > Notes .***

The contents of a note is changed by simply overwriting the text area. You can customize the name of the note by executing a double click on the tab at the bottom of a note.

Notes will be deleted by clicking on the little red cross on the tab at the bottom of the note. Please keep in mind that the last note can not be deleted. So at least one note is always open.

### Toolbar

The toolbar of the Note view includes the following buttons.

✚ Create a new empty note.

Toggles word wrap modus in this view.

Clears the content of the current open note.

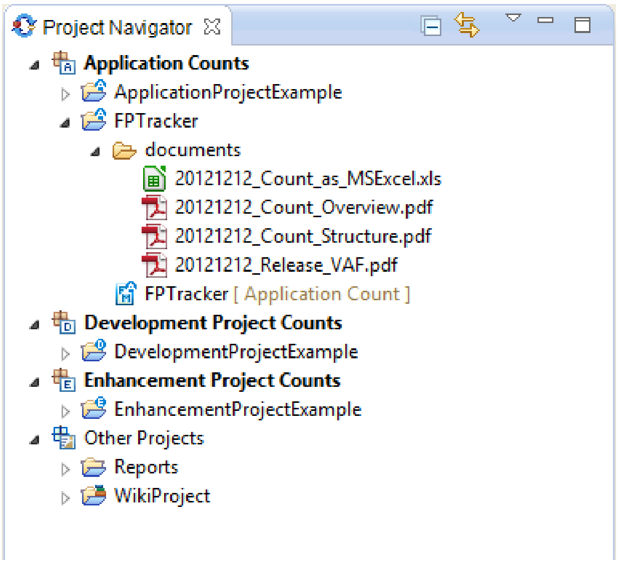
### Menus

Click the icon at the left end of the view's title bar to open a menu of items generic to all views. Click the black upside-down triangle icon to open a menu of items specific to the Note view. Right-click inside the view to open a context menu.

#### *Project Navigator View*

This view provides a hierarchical view of the resources in the Workbench.

Here is what the Project Navigator view looks like:


Project Navigator
Application Counts
ApplicationProjectExample
FPTracker
documents
20121212_Count_as_MSExcel.xls
20121212_Count_Overview.pdf
20121212_Count_Structure.pdf
20121212_Release_VAF.pdf
FPTracker [ Application Count ]
Development Project Counts
DevelopmentProjectExample
Enhancement Project Counts
EnhancementProjectExample
Other Projects
Reports
WikiProject

To add the **Project Navigator View** to the current perspective, click ***Window > Show View > Other > Function Point Modeler > Project Navigator .***

### Toolbar

The toolbar of the Project Navigator view includes the following buttons.

This command collapses the tree expansion state of all resources in the view.

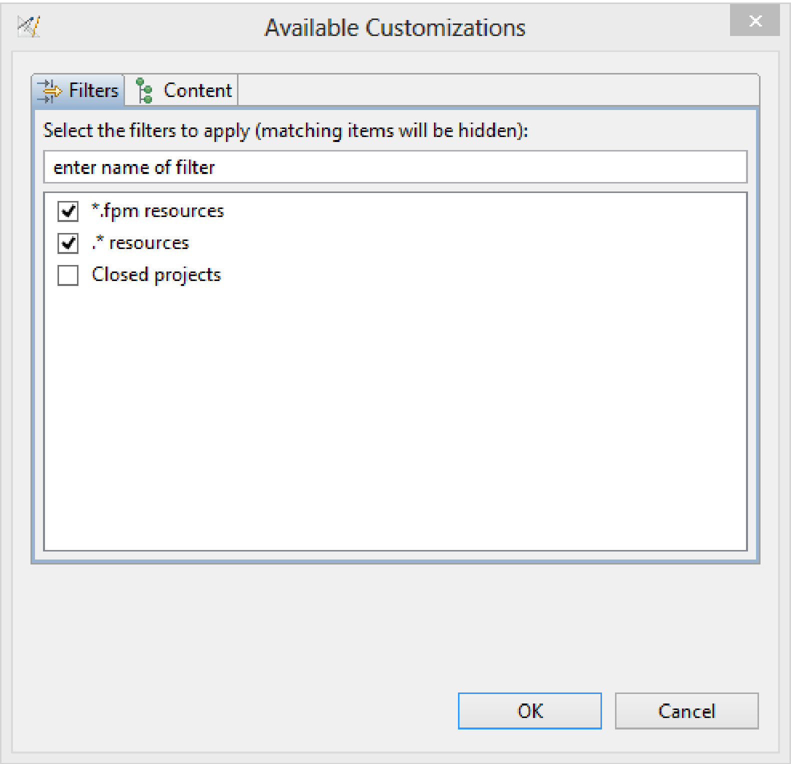
This command toggles whether the Project Navigator view selection is linked to the active editor. When this option is selected, changing the active editor will automatically update the Project Navigator selection to the resource being edited.

### Menus

Click the icon at the left end of the view's title bar to open a menu of items generic to all views. Click the black upside-down triangle icon to open a menu of items specific to the Project Navigator view. Right-click inside the view to open a context menu.

#### Customize View

This command allows customization of view filters and content modules. The previous will allow you to supress the display of certain types of files while the later will allow entirely new types of content to be shown in the view. Here is what the Customize View dialog looks like:



Select the filters to apply (matching items will be hidden):

enter name of filter

☑ *.fpm resources
☑ .* resources
□ Closed projects

**Link with Editor**

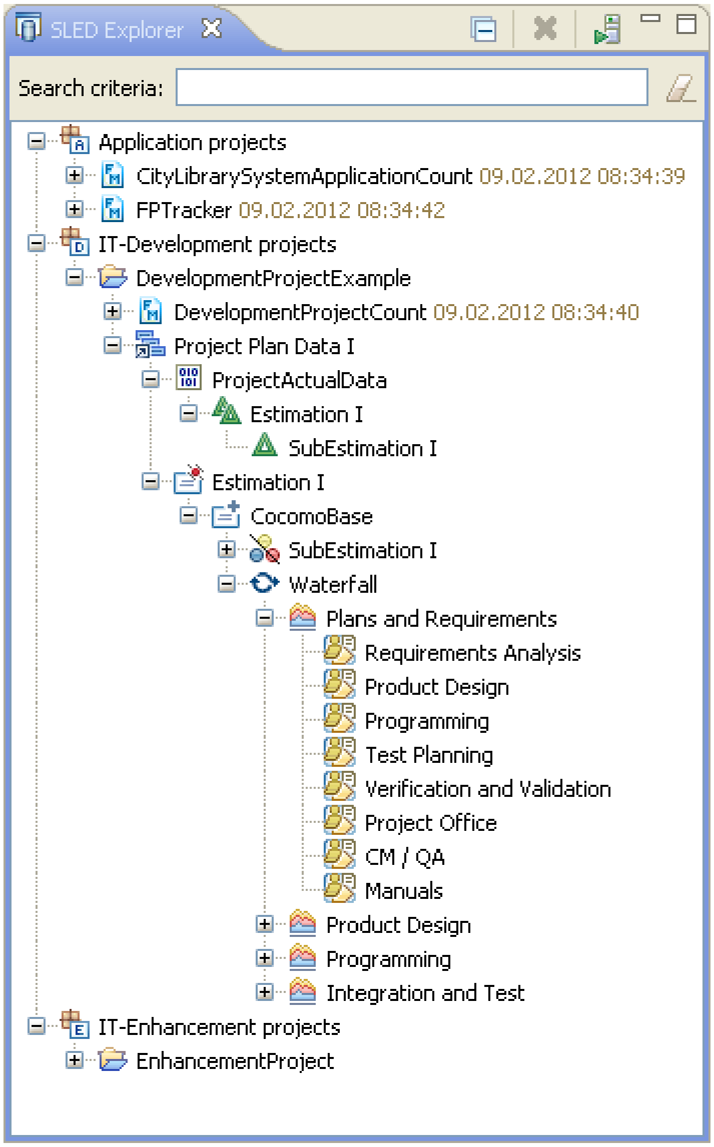
See the toolbar item description above.

*SLED Explorer View*

Enterprise Edition

The SLED Explorer view is the central navigation within the SLED perspective.

Using this view the contents of a SLED database can be analyzed and it is possible to delete individual database content.



SLED Explorer

Search criteria:

- Application projects
  - CityLibrarySystemApplicationCount 09.02.2012 08:34:39
  - FPTracker 09.02.2012 08:34:42
- IT-Development projects
  - DevelopmentProjectExample
    - DevelopmentProjectCount 09.02.2012 08:34:40
    - Project Plan Data I
      - ProjectActualData
        - Estimation I
          - SubEstimation I
      - Estimation I
        - CocomoBase
          - SubEstimation I
          - Waterfall
            - Plans and Requirements
              - Requirements Analysis
              - Product Design
              - Programming
              - Test Planning
              - Verification and Validation
              - Project Office
              - CM / QA
              - Manuals
            - Product Design
            - Programming
            - Integration and Test
- IT-Enhancement projects
  - EnhancementProject

To add the **SLED Explorer View** to the current perspective, click ***Window > Show View > Other > Function Point Modeler > SLED Explorer .***

## Toolbar

The toolbar of the SLED Explorer view includes the following buttons.

This command collapses the tree expansion state of all resources in the view.

This command deletes the selected element from the SLED database.

Reloads the content of the connected SLED database. The predetermined filter is taken into account when determining the results.

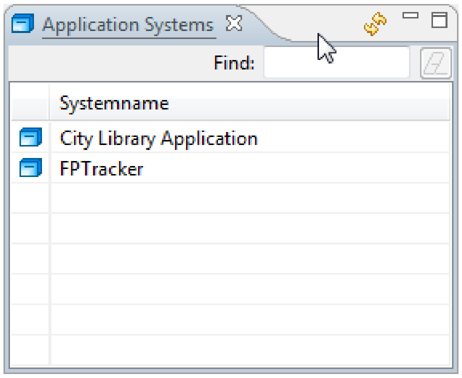
Search criteria: Filters the results of the charging process. Only entries in the database are determined whose name contains the specified filter criteria.

## Function Point Modeler (Lifecycle) Views

### *Application Systems View*

This view lists all the currently available Application Systems within the workbench.

It is used mainly for navigation within the **Lifecycle Perspective** , but can also be used to gain an overview of existing application systems.



| Systemname |
|---|
| City Library Application |
| FPTracker |

To add the **Application Systems View** to the current perspective, click ***Window > Show View > Other > Function Point Modeler (Lifecycle) > Application Systems .***

#### Toolbar

The toolbar of the Application Systems view includes the following buttons.

Allows you to refresh the list of the existing application system.

Find: Allows you to filter the list of the existing application system.

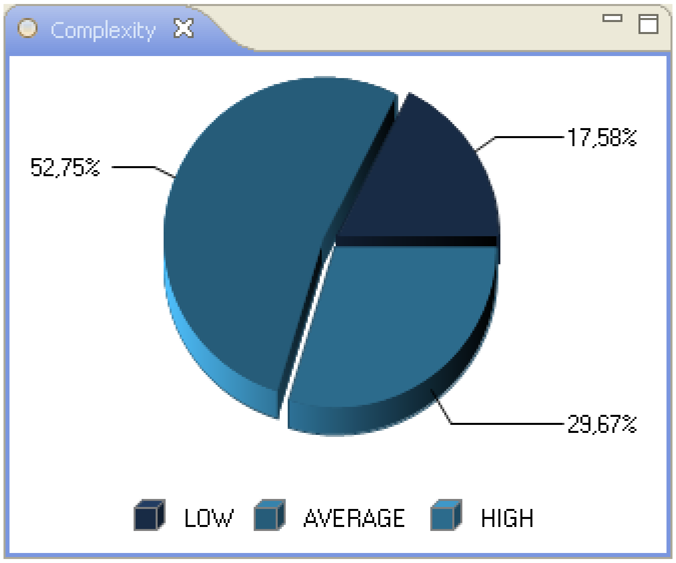
Clears the current filter settings.

### *Complexity View*

This view is mainly used within the **Lifecycle Perspective** to represent the distribution of the complexity of an application system within one measurement.

A distinction is made between the complexities **Low** , **Average** and **High** .

The view provides a graphical representation of the distribution of these complexities.



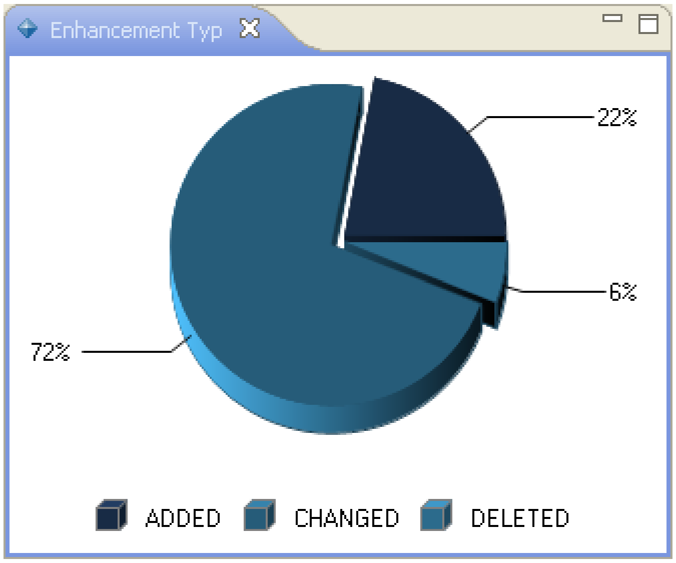
To add the **Complexity View** to the current perspective, click *Window > Show View > Other > Function Point Modeler (Lifecycle) > Complexity* .

### *Enhancement Typ View*

This view is mainly used within the **Lifecycle Perspective** to represent the distribution of the enhancement typ of an application system within one measurement.

A distinction is made between the enhancements **Added** , **Changed** and **Deleted** .

The view provides a graphical representation of the distribution of these enhancements.



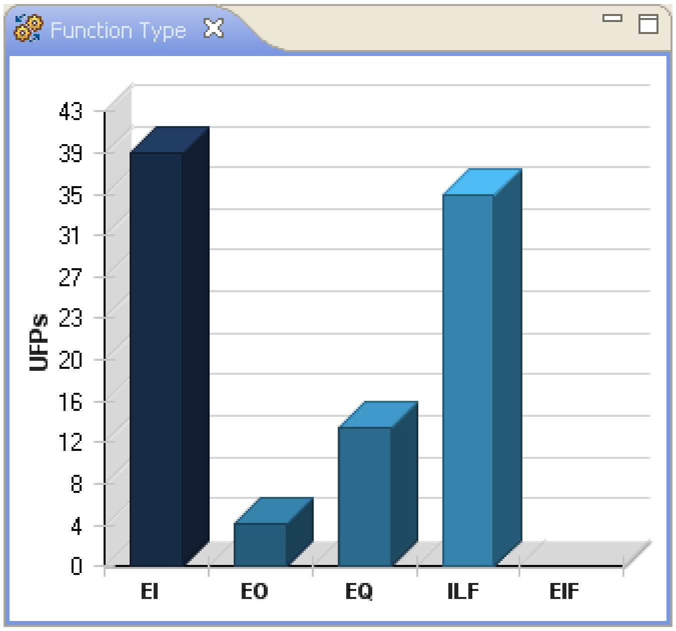
To add the **Enhancement Typ View** to the current perspective, click *Window > Show View > Other > Function Point Modeler (Lifecycle) > Enhancement Typ* .

### *Function Type View*

This view is mainly used within the **Lifecycle Perspective** to represent the distribution of the function types of an application system within one measurement.

A distinction is made between the function types **EI** , **EO** , **EQ** , **ILF** and **EIF** .

The view provides a graphical representation of the distribution of these function types.

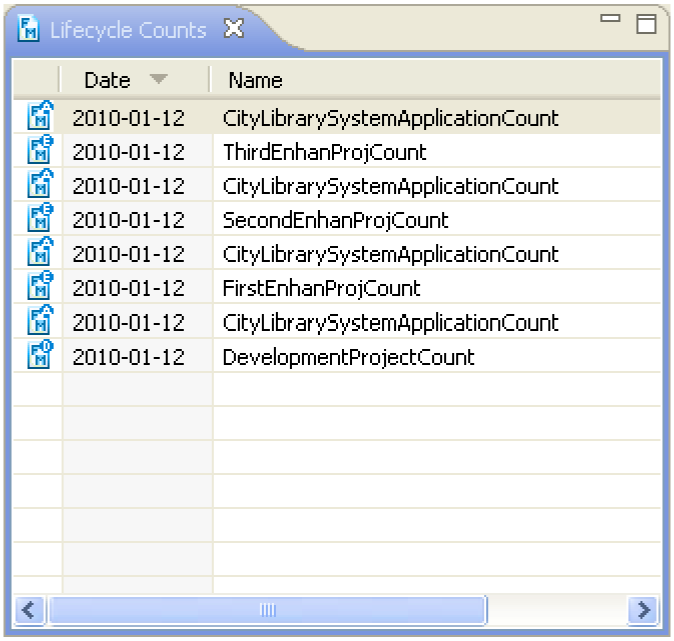


To add the **Function Type View** to the current perspective, click ***Window > Show View > Other > Function Point Modeler (Lifecycle) > Function Type .***

*Lifecycle Counts View*

This view lists all the currently available Counts for a selected Application System within the workbench.

It is used mainly for navigation within the **Lifecycle Perspective** , but can also be used to gain an overview of existing counts.



| Date | Name |
|---|---|
| 2010-01-12 | CityLibrarySystemApplicationCount |
| 2010-01-12 | ThirdEnhanProjCount |
| 2010-01-12 | CityLibrarySystemApplicationCount |
| 2010-01-12 | SecondEnhanProjCount |
| 2010-01-12 | CityLibrarySystemApplicationCount |
| 2010-01-12 | FirstEnhanProjCount |
| 2010-01-12 | CityLibrarySystemApplicationCount |
| 2010-01-12 | DevelopmentProjectCount |

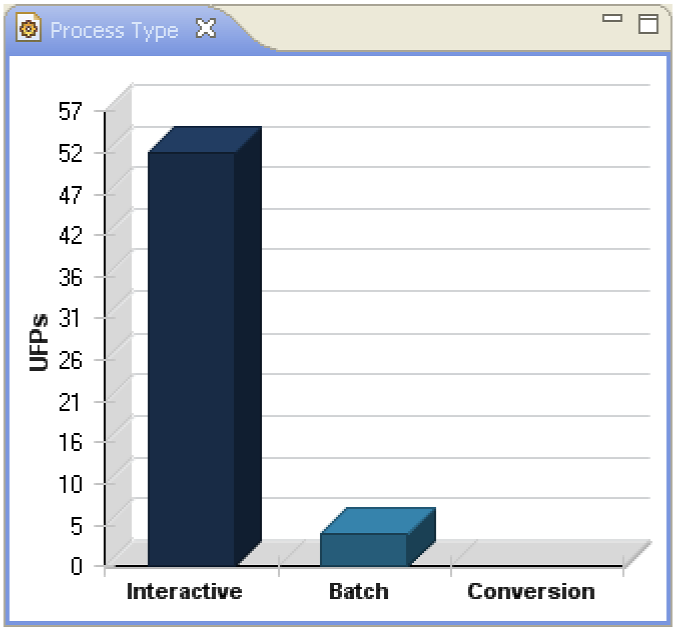
To add the **Lifecycle Counts View** to the current perspective, click ***Window > Show View > Other > Function Point Modeler (Lifecycle) > Lifecycle Counts .***

*Process Type View*

This view is mainly used within the **Lifecycle Perspective** to represent the distribution of the process types of an application system within one measurement.

A distinction is made between the process types **Interactive** , **Batch** and **Conversion** .

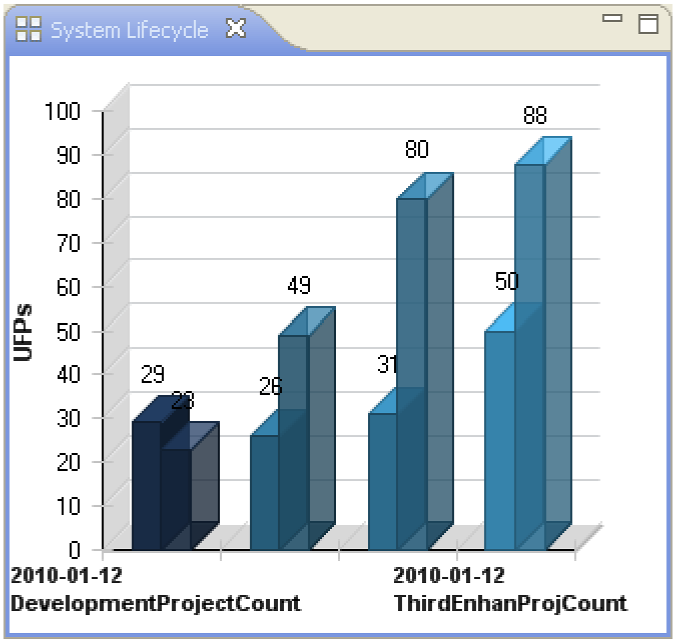
The view provides a graphical representation of the distribution of these process types.



To add the **Process Type View** to the current perspective, click *Window > Show View > Other > Function Point Modeler (Lifecycle) > Process Type .*

*System Lifecycle View*

This view is mainly used within the **Lifecycle Perspective** to manage system lifecycles.

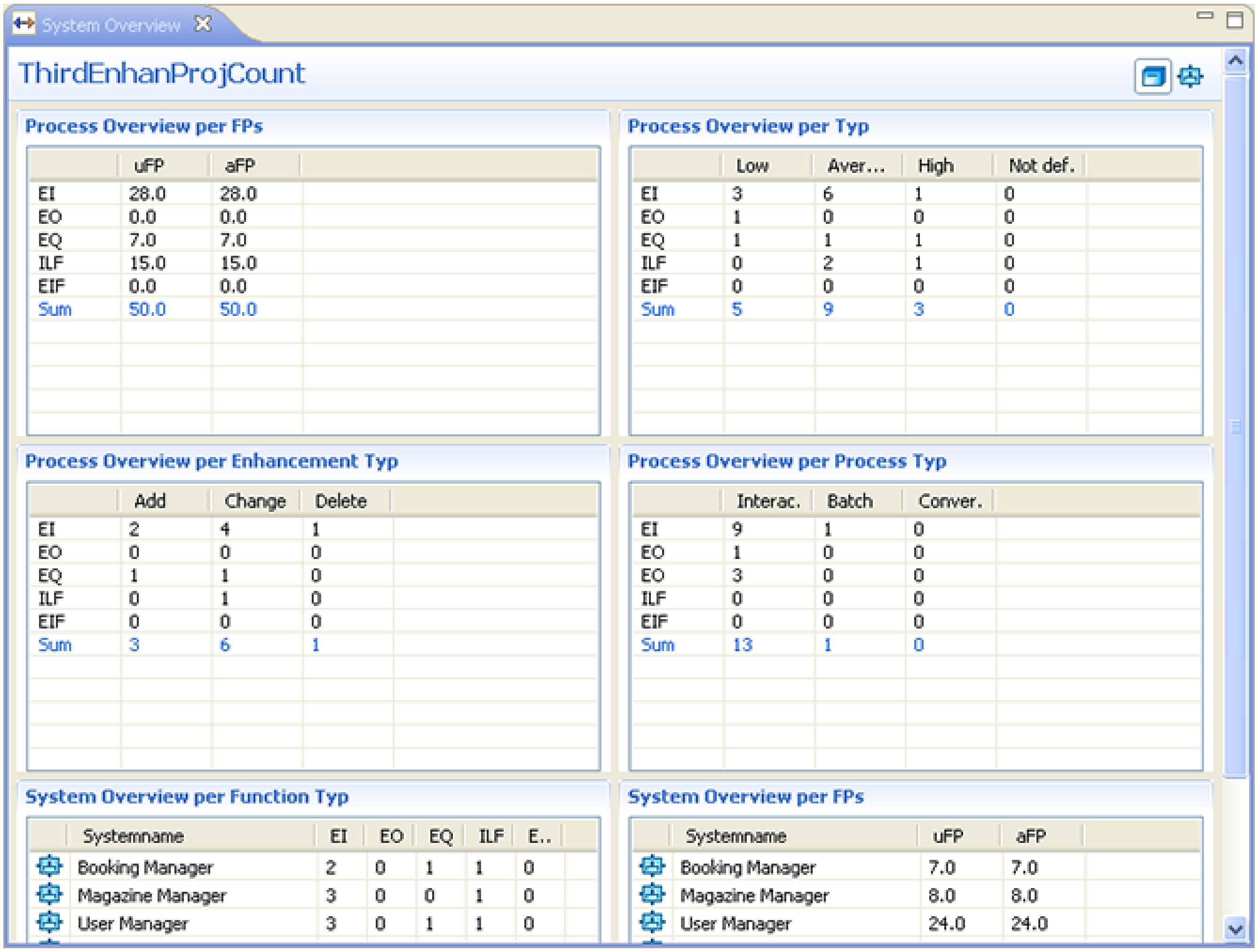


To add the **Process Type View** to the current perspective, click *Window > Show View > Other > Function Point Modeler (Lifecycle) > System Lifecycle .*

*System Overview View*

This view is mainly used within the **Lifecycle Perspective** to give you a detailed overview about an Application System.

Within this view, information about the selected application system within the selected count is processed. You can switch between the view of the application system and the views of the respective subsystems.



ThirdEnhanProjCount

**Process Overview per FPs**

| | uFP | aFP |
|---|---|---|
| EI | 28.0 | 28.0 |
| EO | 0.0 | 0.0 |
| EQ | 7.0 | 7.0 |
| ILF | 15.0 | 15.0 |
| EIF | 0.0 | 0.0 |
| Sum | 50.0 | 50.0 |

**Process Overview per Typ**

| | Low | Aver... | High | Not def. |
|---|---|---|---|---|
| EI | 3 | 6 | 1 | 0 |
| EO | 1 | 0 | 0 | 0 |
| EQ | 1 | 1 | 1 | 0 |
| ILF | 0 | 2 | 1 | 0 |
| EIF | 0 | 0 | 0 | 0 |
| Sum | 5 | 9 | 3 | 0 |

**Process Overview per Enhancement Typ**

| | Add | Change | Delete |
|---|---|---|---|
| EI | 2 | 4 | 1 |
| EO | 0 | 0 | 0 |
| EQ | 1 | 1 | 0 |
| ILF | 0 | 1 | 0 |
| EIF | 0 | 0 | 0 |
| Sum | 3 | 6 | 1 |

**Process Overview per Process Typ**

| | Interac. | Batch | Conver. |
|---|---|---|---|
| EI | 9 | 1 | 0 |
| EO | 1 | 0 | 0 |
| EO | 3 | 0 | 0 |
| ILF | 0 | 0 | 0 |
| EIF | 0 | 0 | 0 |
| Sum | 13 | 1 | 0 |

**System Overview per Function Typ**

| Systemname | EI | EO | EQ | ILF | E.. |
|---|---|---|---|---|---|
| Booking Manager | 2 | 0 | 1 | 1 | 0 |
| Magazine Manager | 3 | 0 | 0 | 1 | 0 |
| User Manager | 3 | 0 | 1 | 1 | 0 |

**System Overview per FPs**

| Systemname | uFP | aFP |
|---|---|---|
| Booking Manager | 7.0 | 7.0 |
| Magazine Manager | 8.0 | 8.0 |
| User Manager | 24.0 | 24.0 |

To add the **System Overview View** to the current perspective, click ***Window > Show View > Other > Function Point Modeler (Lifecycle) > System Overview*** .

### Function Point Modeler Editors

*Diagram Editor*

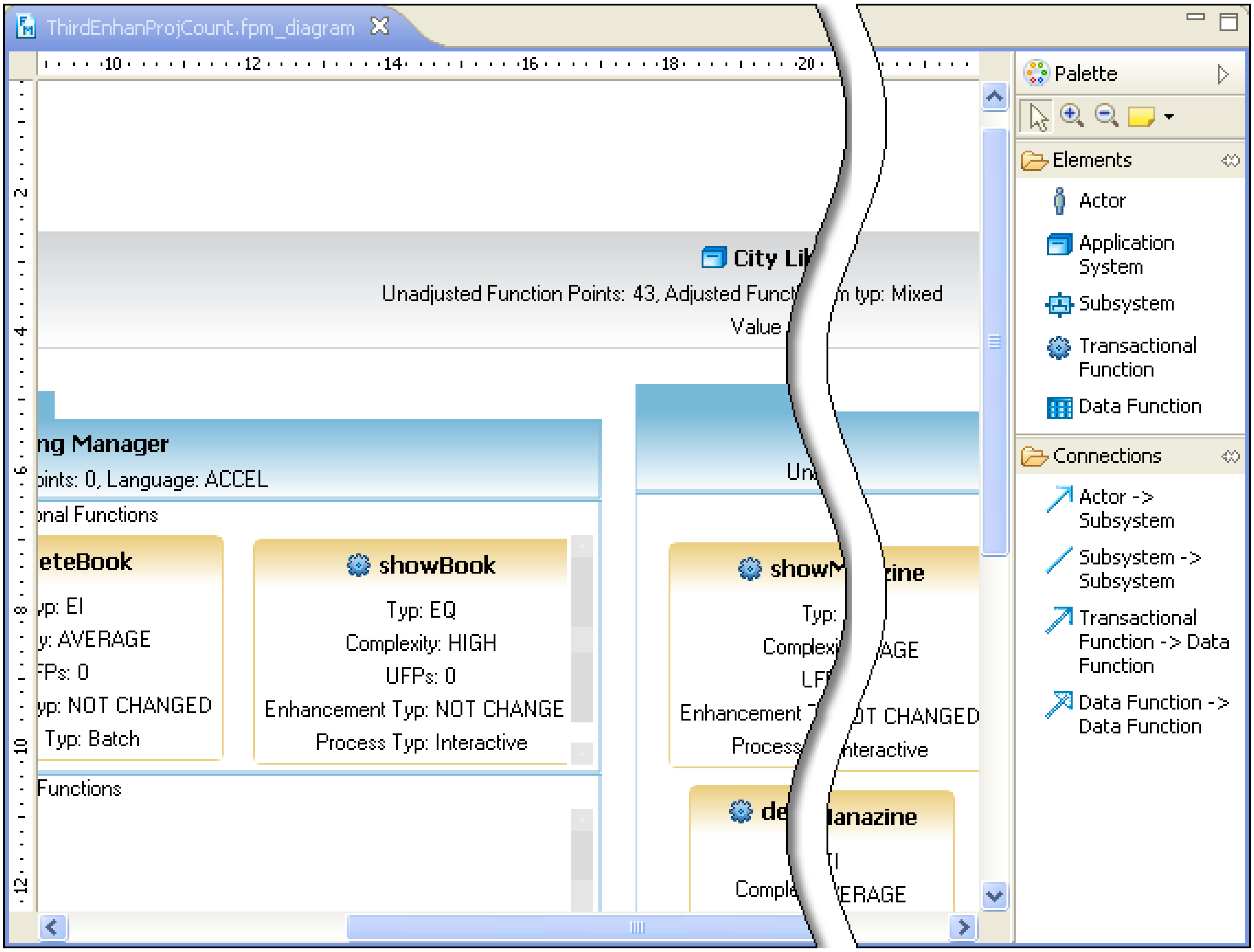
Function Point Modeler includes three diagram editors. The diagram editors allow you to edit each item (Count, Application system and Subsystem ) separately.

The editors allow you to edit only the selected part of a complex count.

Application System Editor

This editor offers the possibility to carry out a count on top level. It contains all the Application Systems for a Count, and also all child elements for this Application Systems.

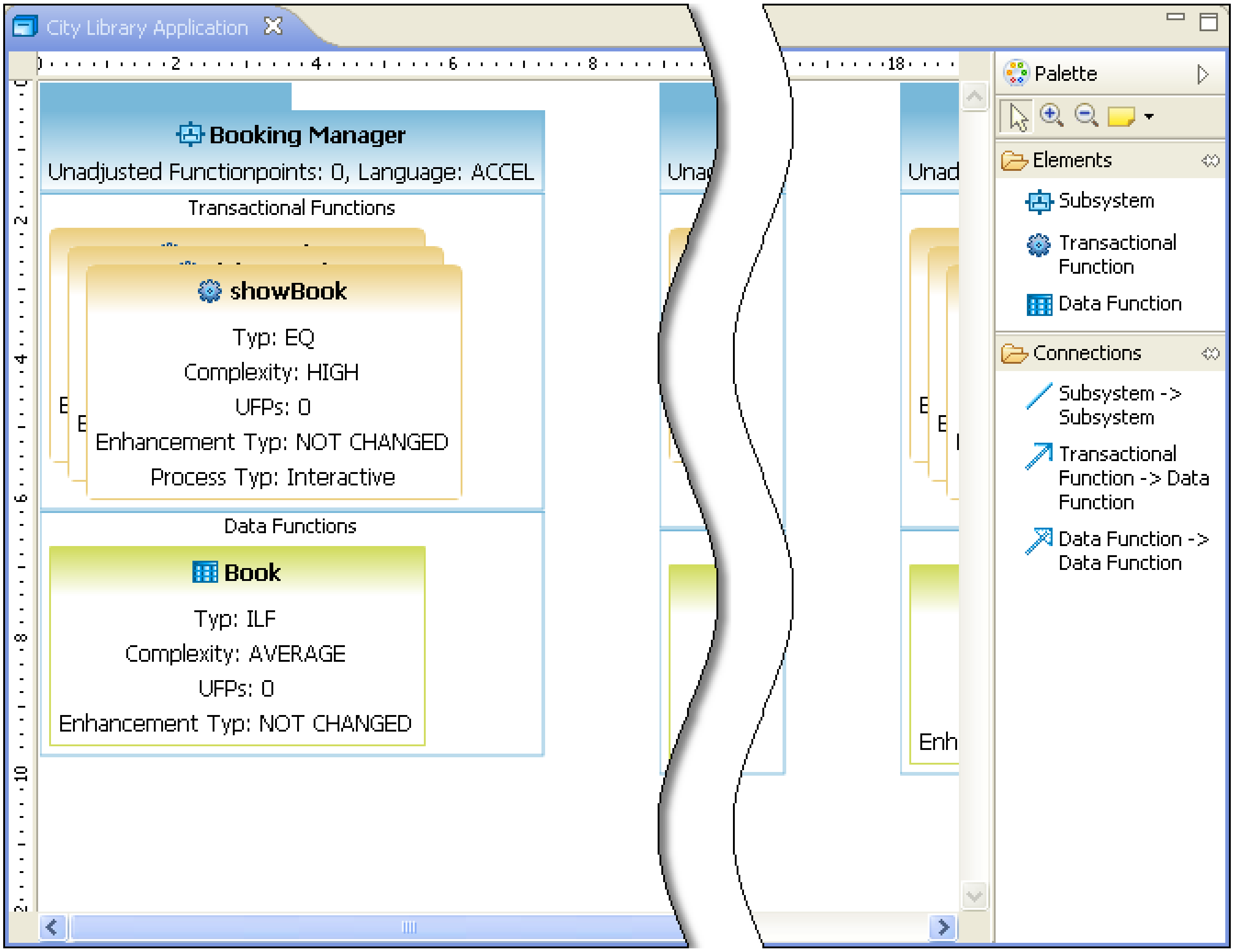
For large measurements, this type of presentation is quickly confusing. This editor is therefore specified for small measurements or for the initial launch of a large measurement.



Subsystem Editor

This editor offers the possibility to carry out a count on medium level. It contains all the Subsystems for a Application System, and also all child elements for this Subsystems.

For large measurements, this type of presentation is sometimes confusing. This editor is therefore specified for medium measurements or for the medium work of a large measurement.



Booking Manager

Unadjusted Functionpoints: 0, Language: ACCEL

Transactional Functions

showBook

Typ: EQ

Complexity: HIGH

UFPs: 0

Enhancement Typ: NOT CHANGED

Process Typ: Interactive

Data Functions

Book

Typ: ILF

Complexity: AVERAGE

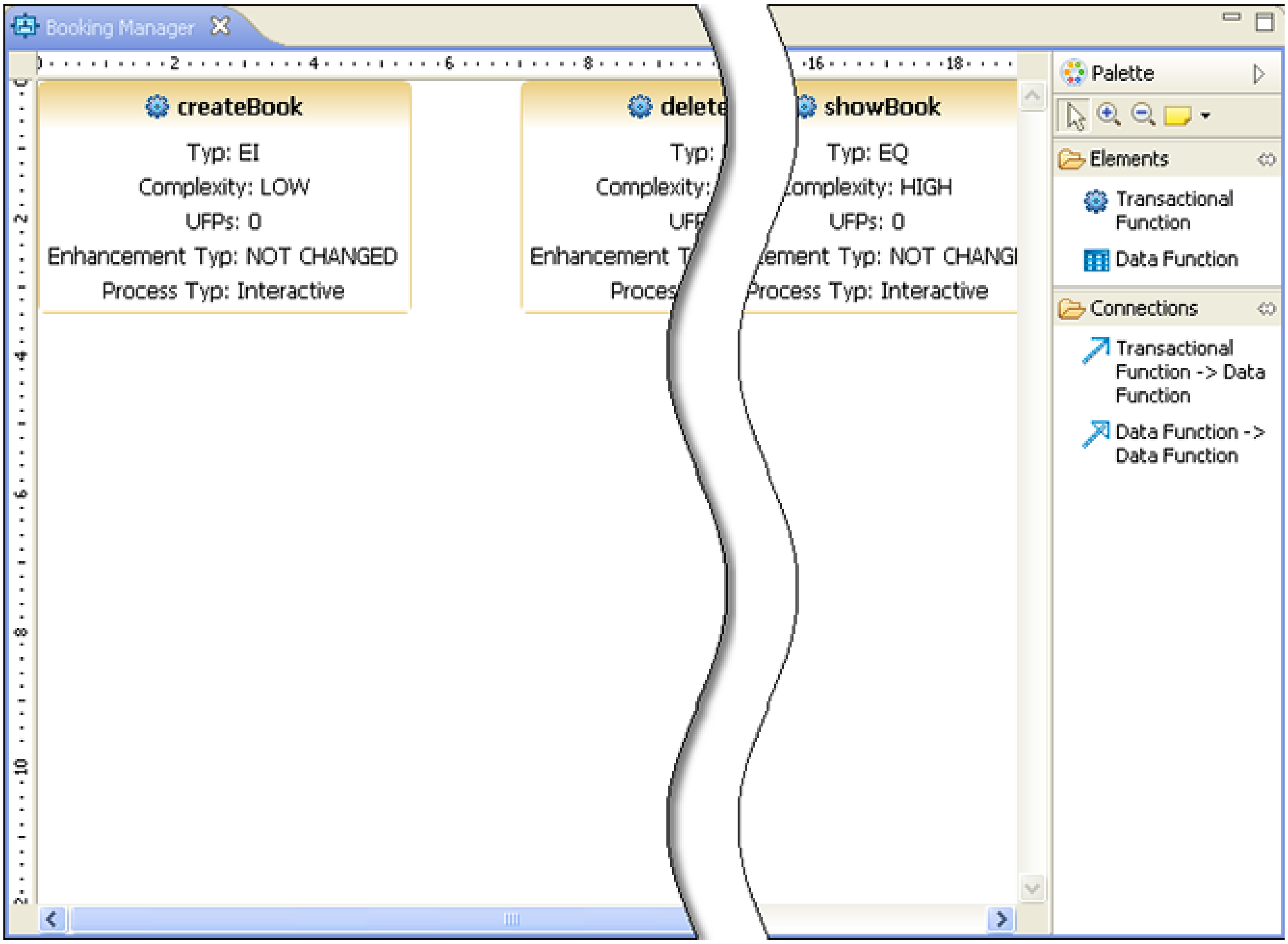
UFPs: 0

Enhancement Typ: NOT CHANGED

Elementar Process Editor

This editor offers the possibility to carry out a count on lowest level. It contains all the Transactional Functions and Data Functions for a Subsystem.

This editor is therefore specified for large measurements on a detailled level.



createBook

Typ: EI

Complexity: LOW

UFPs: 0

Enhancement Typ: NOT CHANGED

Process Typ: Interactive

delete

Typ:

Complexity:

UF

Enhancement T

Proces

showBook

Typ: EQ

omplexity: HIGH

UFPs: 0

ement Typ: NOT CHANG

Process Typ: Interactive

*Projectdata Editor*

The Projectdata Editor allows viewing, editing and evaluation of project-related data. The editor is divided into pages to ensure clarity.

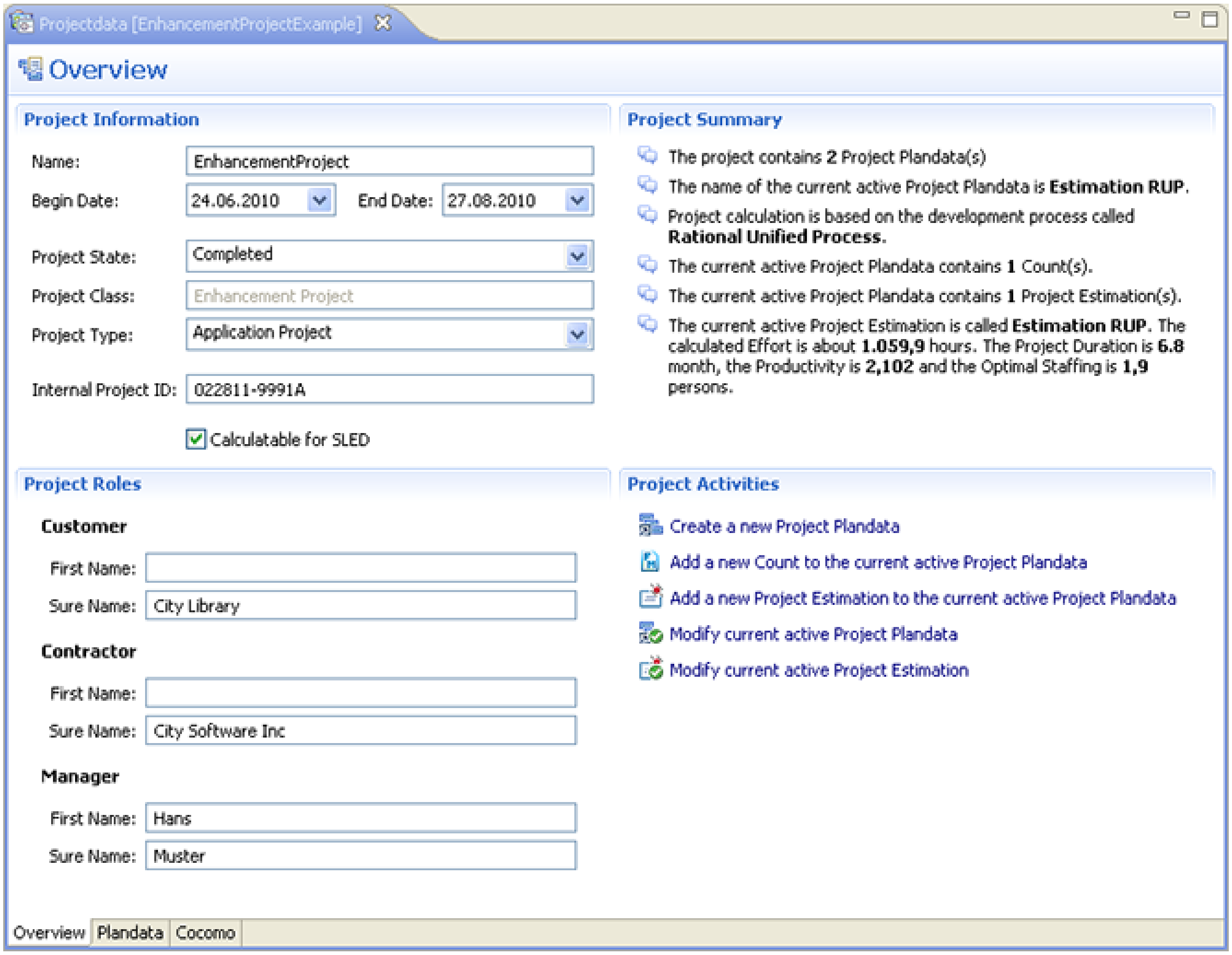
In the Standard Edition of the Function Point Modeler only the **Overview** page is available.

In the Enterprise Edition of the Function Point Modeler, the editor also contains the pages **Plandata** and **Cocomo** .

Overview Page

The **Overview** page, part of the Plandata Editor, allows you to view or change project-related data. The page gives your an overview about the project and additionally provides you with activities such as **Create a new Project Plandata** .

For reasons of clarity and ease the page is divided into several sections. The following diagram shows a example site view. In the Standard Edition of the Function Point Modeler not all visible sections are available, as only the Enterprise Edition of Function Point Modeler includes the COCOMO II module.



Overview

**Project Information**

Name: EnhancementProject

Begin Date: 24.06.2010 End Date: 27.08.2010

Project State: Completed

Project Class: Enhancement Project

Project Type: Application Project

Internal Project ID: 022811-9991A

☑ Calculatable for SLED

**Project Summary**

- The project contains 2 Project Plandata(s)
- The name of the current active Project Plandata is **Estimation RUP**.
- Project calculation is based on the development process called **Rational Unified Process.**
- The current active Project Plandata contains **1** Count(s).
- The current active Project Plandata contains **1** Project Estimation(s).
- The current active Project Estimation is called **Estimation RUP**. The calculated Effort is about **1.059,9** hours. The Project Duration is **6.8** month, the Productivity is **2,102** and the Optimal Staffing is **1,9** persons.

**Project Roles**

**Customer**

First Name:

Sure Name: City Library

**Contractor**

First Name:

Sure Name: City Software Inc

**Manager**

First Name: Hans

Sure Name: Muster

**Project Activities**

- Create a new Project Plandata
- Add a new Count to the current active Project Plandata
- Add a new Project Estimation to the current active Project Plandata
- Modify current active Project Plandata
- Modify current active Project Estimation

## Plandata Page

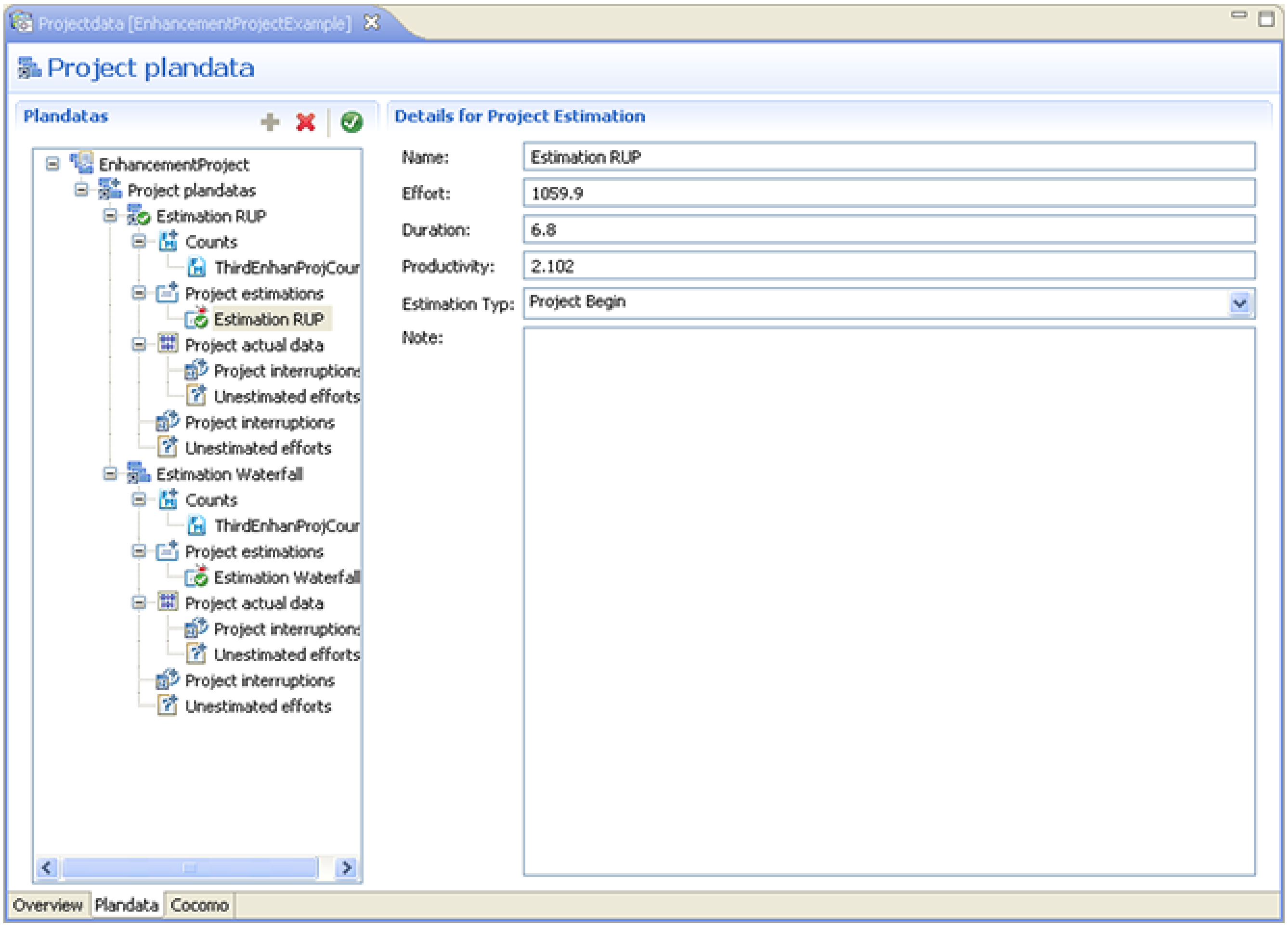
Enterprise Edition

The **Plandata** page, part of the Plandata Editor, allows you to manage project data.

Project data called **ProjectPlanData** includes all project relevant information. You can create more than one ProjectPlanData for a Project. Each of this ProjectPlanData represents a project plan scenario for the project.

For example one of the project plan scenario would be for the Rational Unified Process (RUP) and other for Waterfall or for the software development process specified for your company. A ProjectPlanData can include one or more ProjectEstimation. Each ProjectEstimation represents an estimation scenario for the project. For example one of the ProjectEstimation may be with an expert team and other with a mixed team. One of this ProjectEstimation has to be set as default for the project, which means, that the default ProjectEstimation is the valid estimation for the project.

One of this ProjectPlanData also has to be set as default, which means, that the default ProjectPlanData is valid for the project. Only the default ProjectPlanData of the completed projects in Software Life Cycle Experience Database (SLED) are used for the calibration and other metrics reports.



Name: Estimation RUP

Effort: 1059.9

Duration: 6.8

Productivity: 2.102

Estimation Typ: Project Begin

Note:

Cocomo Page

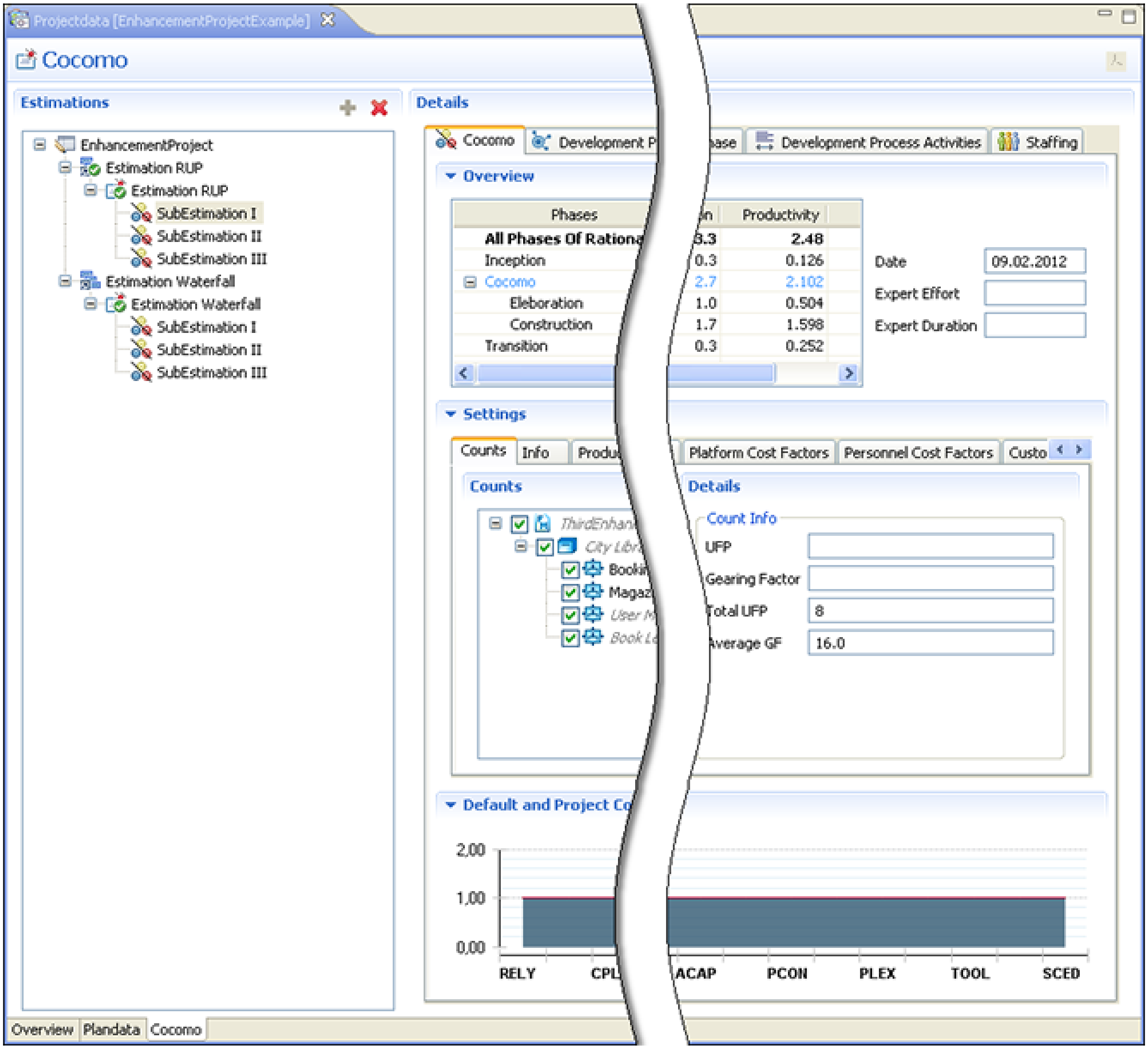
Enterprise Edition

The **Cocomo** page, part of the Plandata Editor, allows you to manage COCOMO estimations for your projects.

The **CO** nstructive **CO** st **MO** del **COCOMO** cost estimation model is used by thousands of software project managers, and is based on a study of hundreds of software projects. Unlike other cost estimation models, **COCOMO** is an open model, so all of the details are published, including:

- The underlying cost estimation equations
- Every assumption made in the model (e.g. "the project will enjoy good management")
- Every definition (e.g. the precise definition of the Product Design phase of a project)
- The costs included in an estimate are explicitly stated (e.g. project managers are included, secretaries aren't)

**COCOMO II** is the latest major extension to the original **COCOMO (COCOMO 81)** model published in 1981. **COCOMO** consists of three submodels, each one offering increased fidelity the further along one is in the project planning and design process. Listed in increasing fidelity, these submodels are called the Applications Composition, Early Design, and Post-architecture models.



| Phases | n | Productivity |
|---|---|---|
| All Phases Of Rationa | 3.3 | 2.48 |
| Inception | 0.3 | 0.126 |
| Cocomo | 2.7 | 2.102 |
| Eleboration | 1.0 | 0.504 |
| Construction | 1.7 | 1.598 |
| Transition | 0.3 | 0.252 |

Date 09.02.2012

Expert Effort

Expert Duration

Count Info

UFP

Gearing Factor

Total UFP 8

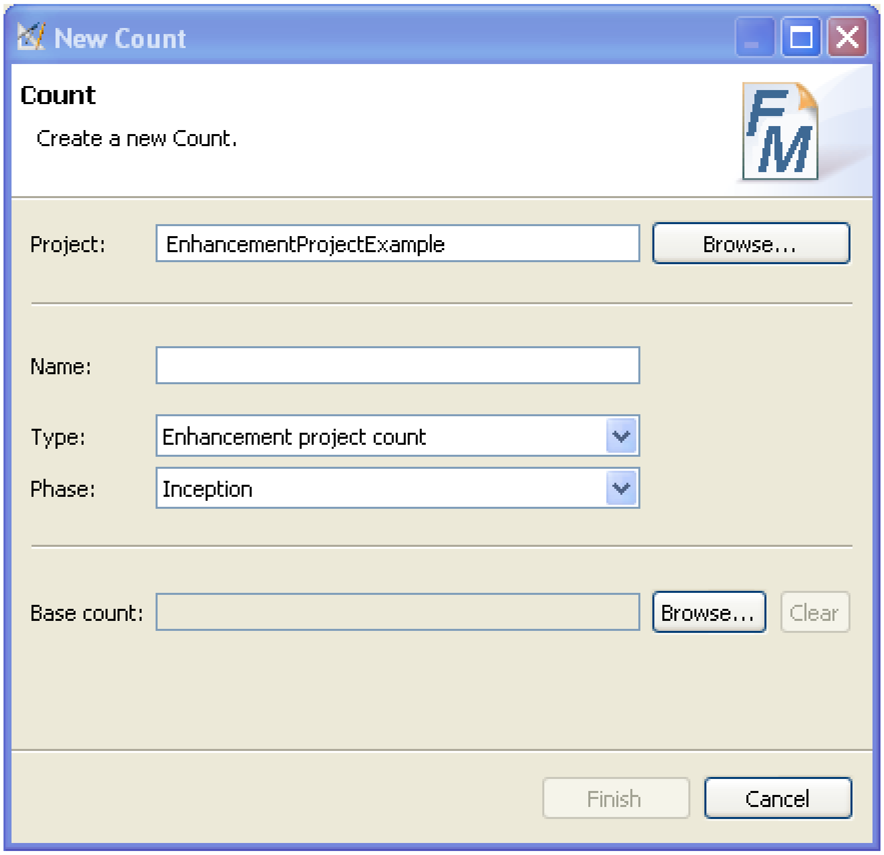
Average GF 16.0

**Wizards**

**Function Point Modeler**

*Count*

This wizard helps you to create a new Count.



**Count**

Create a new Count.

Project: EnhancementProjectExample

Name:

Type: Enhancement project count

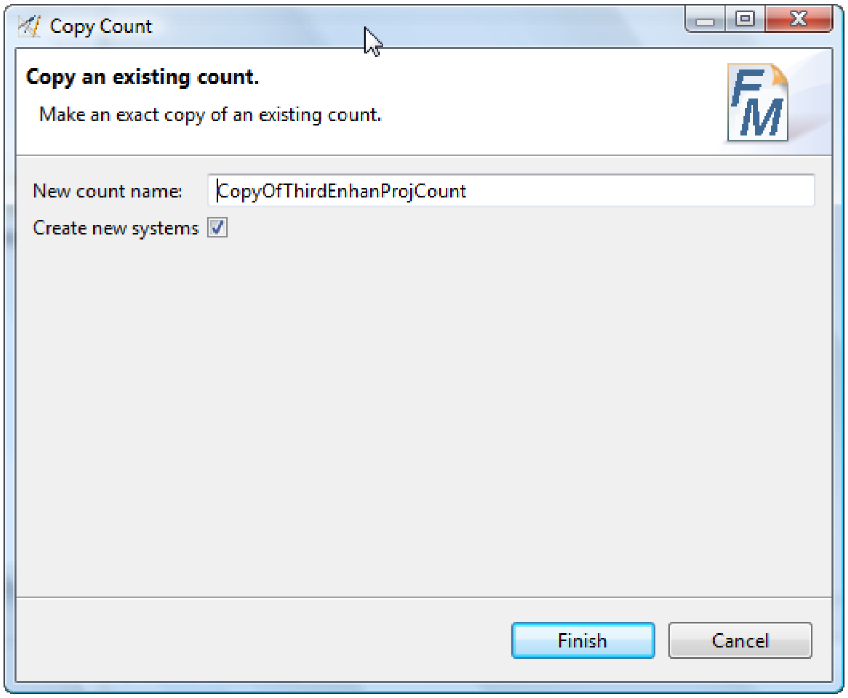
Phase: Inception

Base count:

| Option | Description | Default |
|---|---|---|
| Project | Select the workspace project, where the Count will be created | The selected workspace project in the Project Navigator if this wizard was started with a valid project selection |
| Browse... | Browse for a existing workspace project | |
| Name | Enter the name for the new count here | |
| Type | Select the count type for the new count | Corresponding count type, if this wizard was started with a valid selection |
| Phase | Select the count phase for the new count | Default count phase is inception |
| Base count | The name of the base count, if you create a Enhancement or Application Count and a base count is selected | |
| Browse | Browse for a base count if you create a Enhancement Count or Application Count | |
| Clear | Clear the base count selection | |

### *Copy Count*

This wizard helps you to create/copy a new Count.



Copy Count

**Copy an existing count.**

Make an exact copy of an existing count.

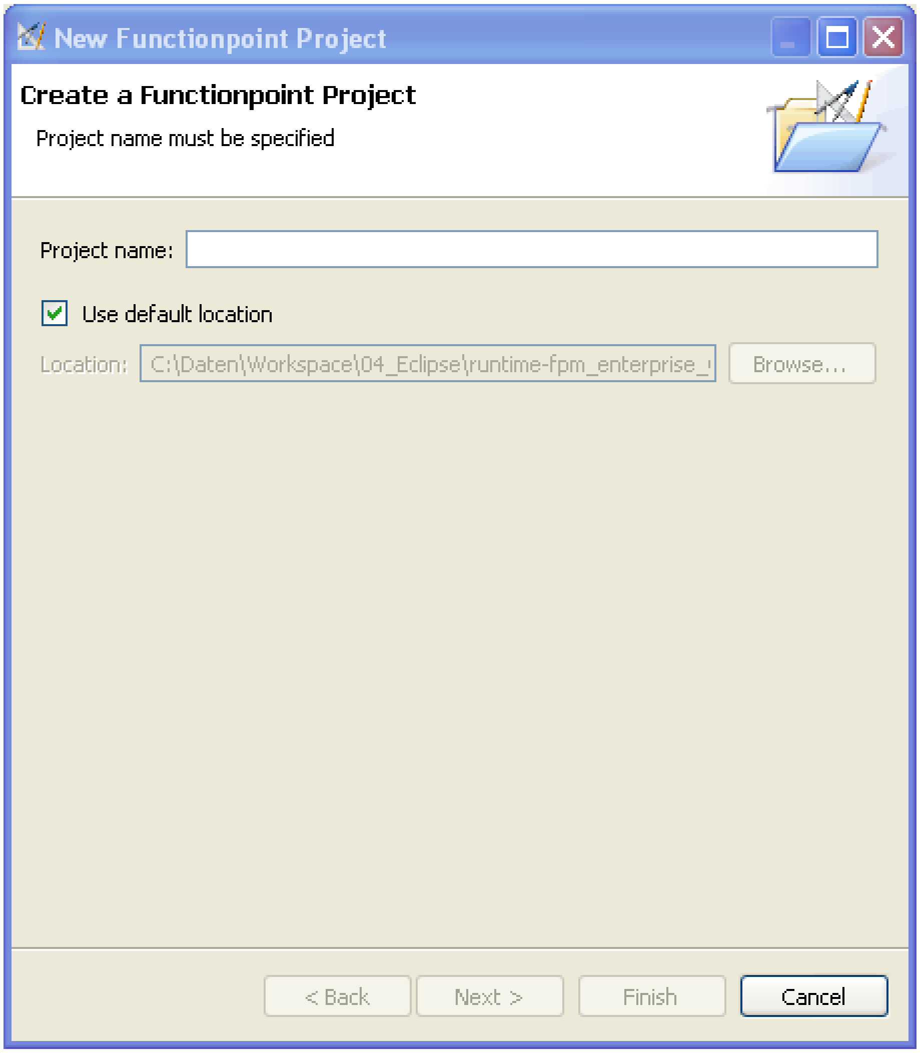
New count name: CopyOfThirdEnhanProjCount

Create new systems ☑

| Option | Description | Default |
|---|---|---|
| New Count Name | Enter the name for the new Count. | Name from base copy extended by CopyOf... |
| Create new System | Select option, if you want to create new Systems. | |

### *Functionpoint Project*

This wizard helps you to create a new Functionpoint Project.



New Functionpoint Project

Create a Functionpoint Project

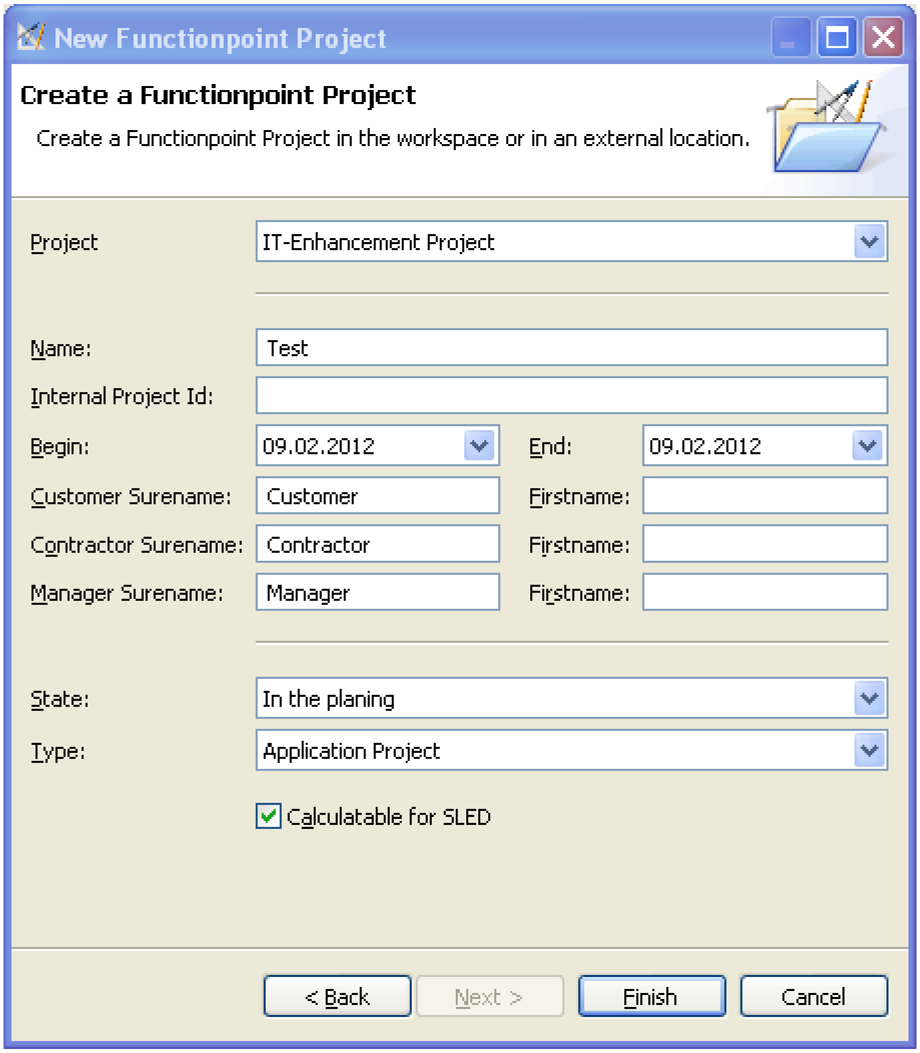
Project name must be specified

Project name:

☑ Use default location

Location: C:\Daten\Workspace\04_Eclipse\runtime-fpm_enterprise_

| Option | Description | Default |
|---|---|---|
| Project name | Enter the project name here | |
| Use default location | Create the new project in the default workspace location | Option is selected by default |
| Location | Enter the project location outside the workspace | Disabled by default. Enabled when option above is deselected |
| Browse... | Browse for a project location | |



New Functionpoint Project

Create a Functionpoint Project

Create a Functionpoint Project in the workspace or in an external location.

Project: IT-Enhancement Project

Name: Test

Internal Project Id:

Begin: 09.02.2012 End: 09.02.2012

Customer Surename: Customer Firstname:

Contractor Surename: Contractor Firstname:

Manager Surename: Manager Firstname:

State: In the planing

Type: Application Project

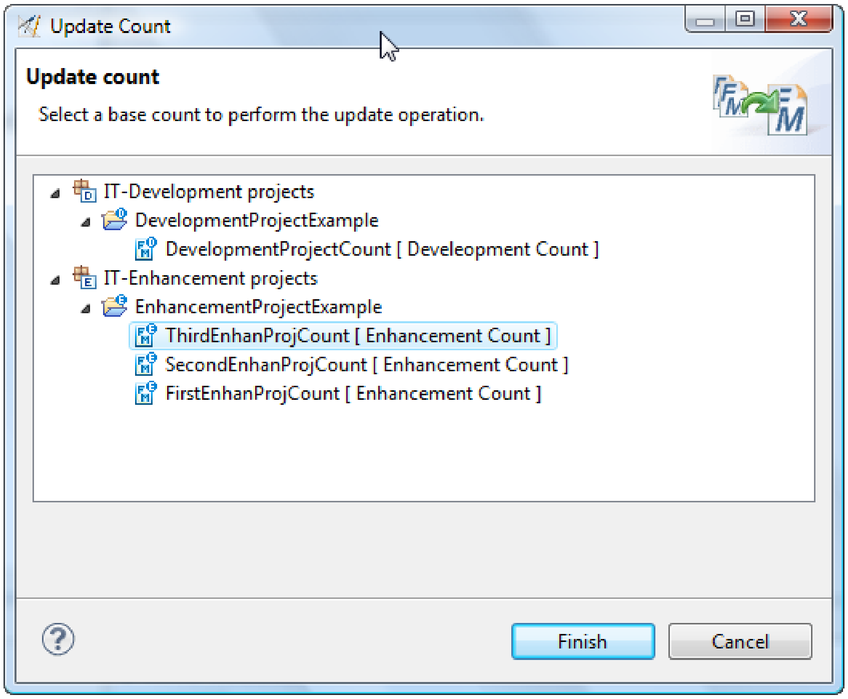
☑ Calculatable for SLED

| Option | Description | Default |
|---|---|---|
| Project | Specify project type here. Options below are disabled for project type Application Project | Application Project |
| Name | The new project name (read only) | |
| Internal Project Id | An optional internal project identifier | |
| Begin | The project begin date | |
| End | The project end date | |
| Customer surename | The project customer surename | |
| Firstname | The project customer firstname | |
| Contractor surename | The project contractor surename | |
| Firstname | The project contractor firstname | |
| Manager surename | The project manager surename | |
| Firstname | The project manager firstname | |
| State | The project state | In the planning |

| Option | Description | Default |
|---|---|---|
| Type | The project type | Application Project |
| Calculatable for SLED | Select this option, if you want to enable the project for SLED calculation | Option is selected by default |

*Update Count*

This wizard helps you to update an existing Application Count.



Update Count

**Update count**

Select a base count to perform the update operation.

- IT-Development projects
  - DevelopmentProjectExample
    - DevelopmentProjectCount [ Develeopment Count ]
- IT-Enhancement projects
  - EnhancementProjectExample
    - ThirdEnhanProjCount [ Enhancement Count ]
    - SecondEnhanProjCount [ Enhancement Count ]
    - FirstEnhanProjCount [ Enhancement Count ]

| Option | Description | Default |
|---|---|---|
| List of available counts | Select a base count to perform the update operation. | |

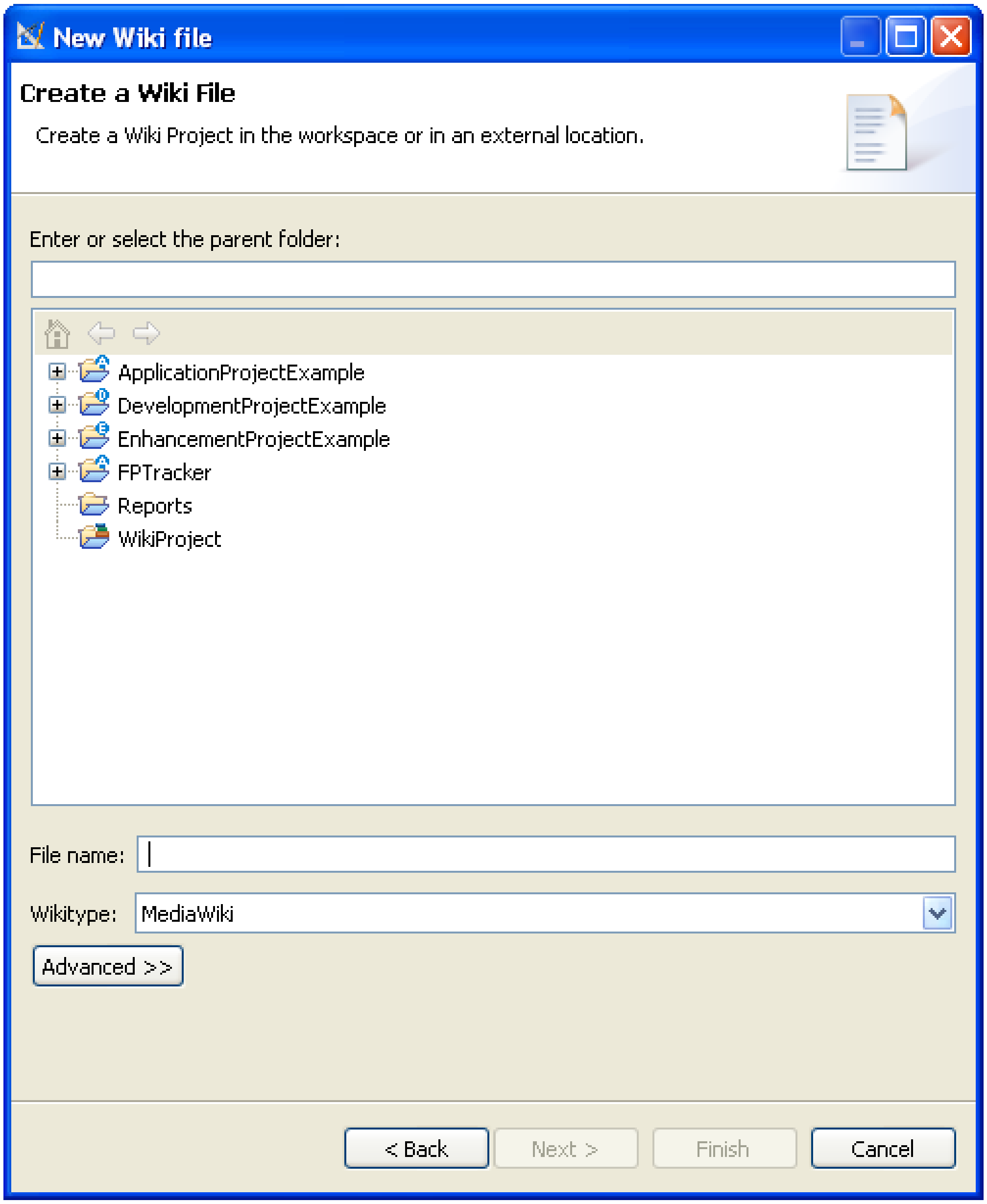
**Wiki**

Enterprise Edition

*Wiki File*

Enterprise Edition

This wizard helps you to create a new Wiki File.



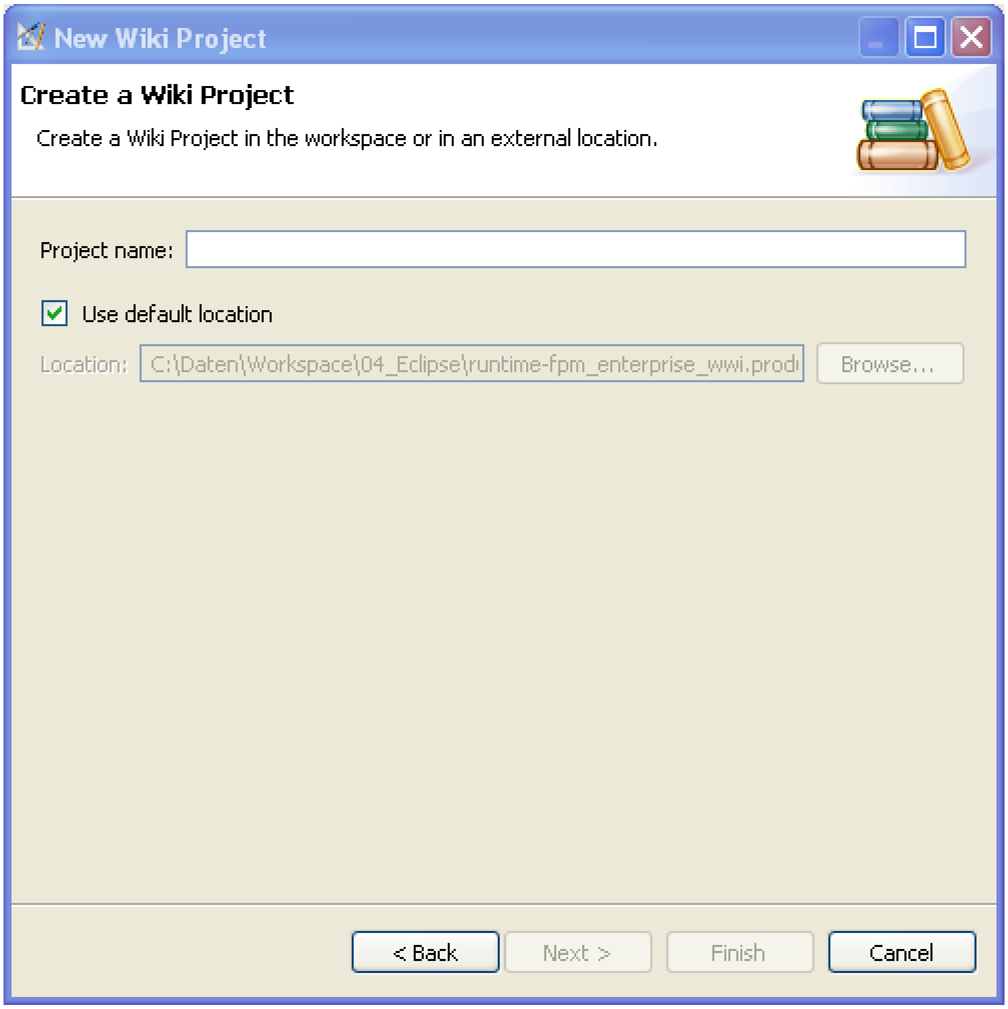
New Wiki file
Create a Wiki File
Create a Wiki Project in the workspace or in an external location.
Enter or select the parent folder:
ApplicationProjectExample
DevelopmentProjectExample
EnhancementProjectExample
FPTracker
Reports
WikiProject
File name:
Wikitype:
MediaWiki
Advanced >>
< Back
Next >
Finish
Cancel

| Option | Description | Default |
|---|---|---|
| Enter or select the parent folder | Enter or select the parent folder where the new wiki file will be created | |
| File name | Enter the new wiki file name here | |
| Wikitype | Specify the type of wiki file | MediaWiki |
| Advanced>> | Toggle advanced options | |
| Link to file in the file system | Select this option if you want to created a linked resource | |
| Browse | Browse for a linked resource | |
| Variables | Created a linked resource by selecting a variable definition | |

### *Wiki Project*

Enterprise Edition

This wizard helps you to create a new Wiki Project.



New Wiki Project

**Create a Wiki Project**

Create a Wiki Project in the workspace or in an external location.

Project name:

☑ Use default location

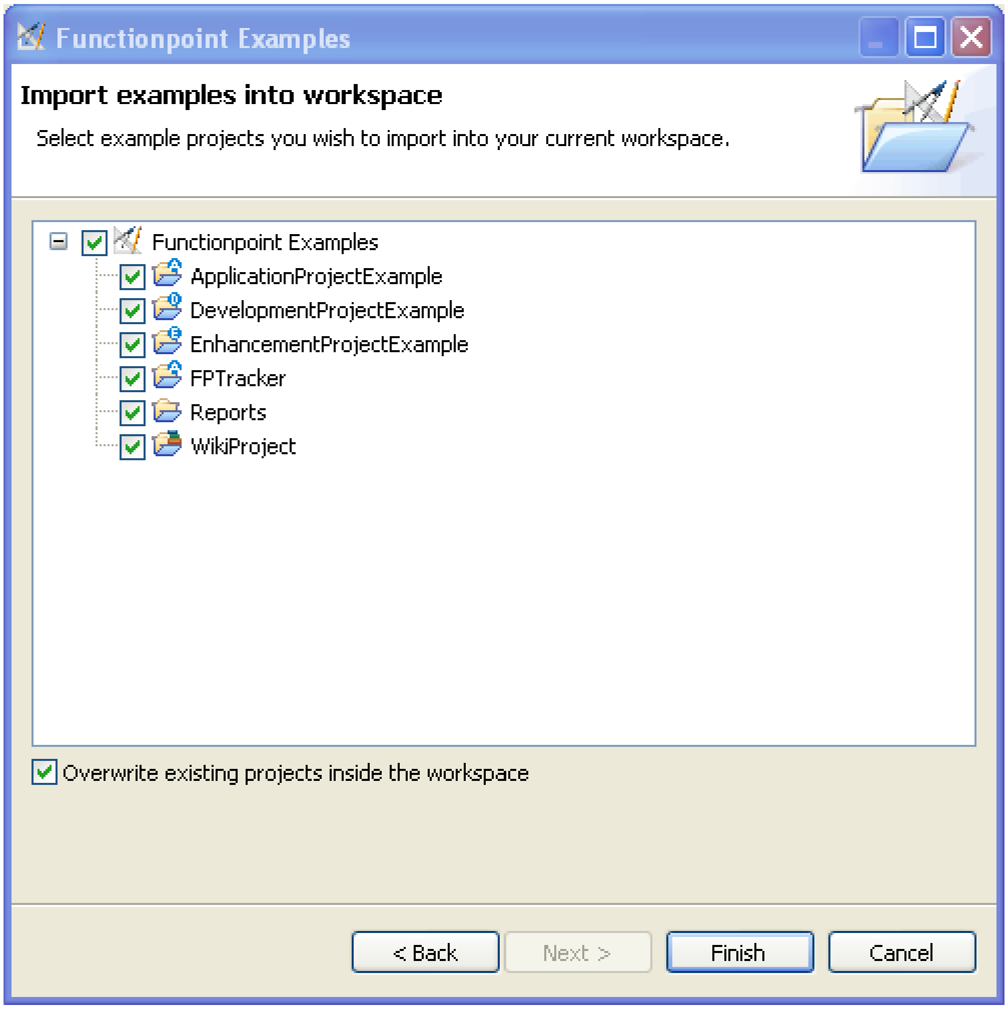
Location: C:\Daten\Workspace\04_Eclipse\runtime-fpm_enterprise_wwi.prod

| Option | Description | Default |
|---|---|---|
| Project name | Enter the project name here | |
| Use default location | Create the new project in the default workspace location | Option is selected by default |
| Location | Enter the project location outside the workspace | Disabled by default. Enabled when option above is deselected |
| Browse... | Browse for a project location | |

## Examples

### *Functionpoint Examples*

This wizard helps you to create some Functionpoint Example Projects.



Import examples into workspace

Select example projects you wish to import into your current workspace.

- ☑ Functionpoint Examples
  - ☑ ApplicationProjectExample
  - ☑ DevelopmentProjectExample
  - ☑ EnhancementProjectExample
  - ☑ FPTracker
  - ☑ Reports
  - ☑ WikiProject

☑ Overwrite existing projects inside the workspace

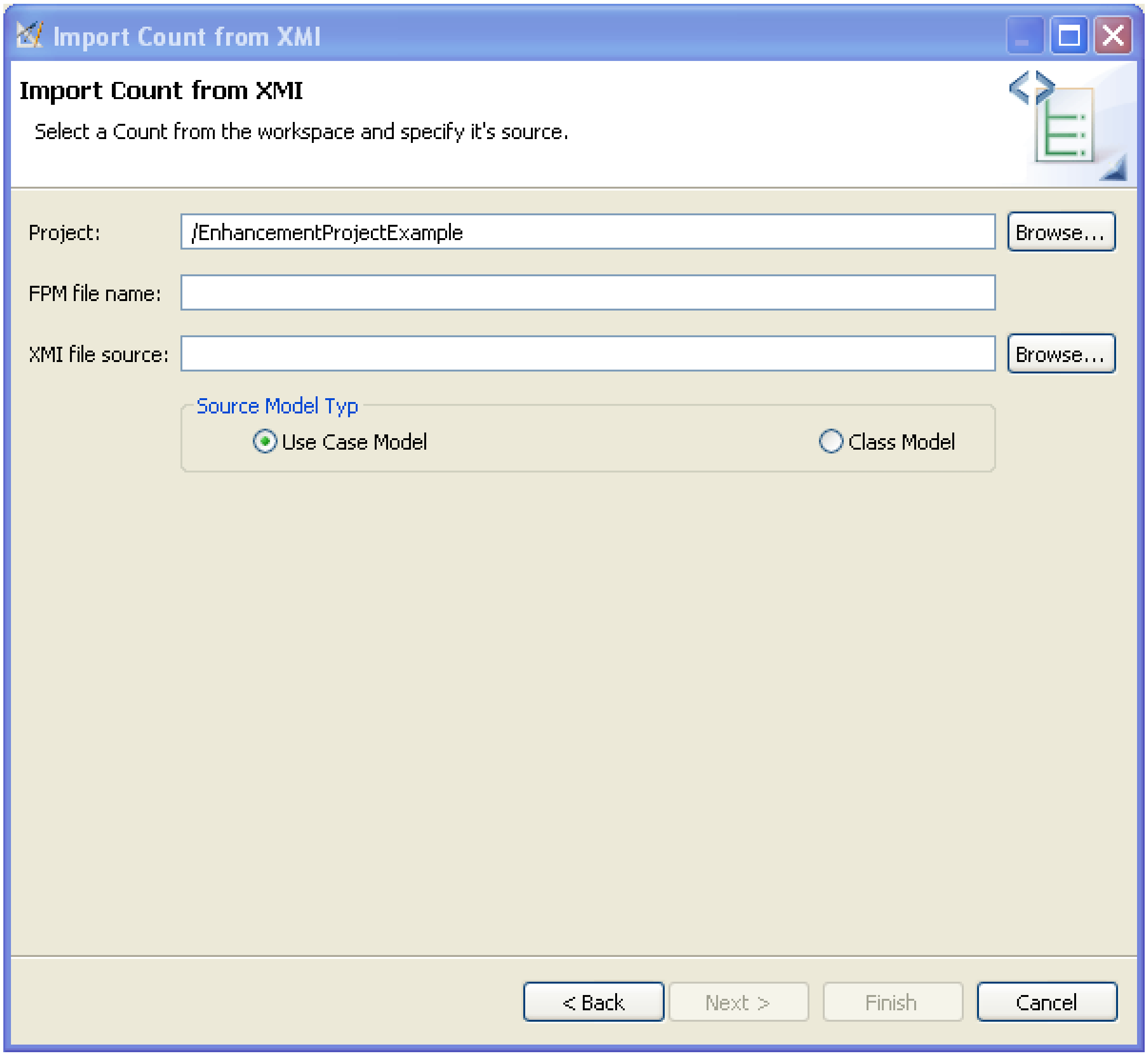
| Option | Description | Default |
|---|---|---|
| Examples | Select examples you want to import to your workspace | All available examples are selected by default |
| Overwrite existing projects inside the workspace | Select this option, if you want to overwrite the workspace files if they already exist. If this option is not selected, you will be prompted for each file which already exists | Option is selected by default |

**Import**
*Count from XMI*

Enterprise Edition

This wizard helps you to import a Count from XMI format.

### Specify file attributes and import type



Import Count from XMI

**Import Count from XMI**

Select a Count from the workspace and specify it's source.

Project: /EnhancementProjectExample [Browse...]

FPM file name:

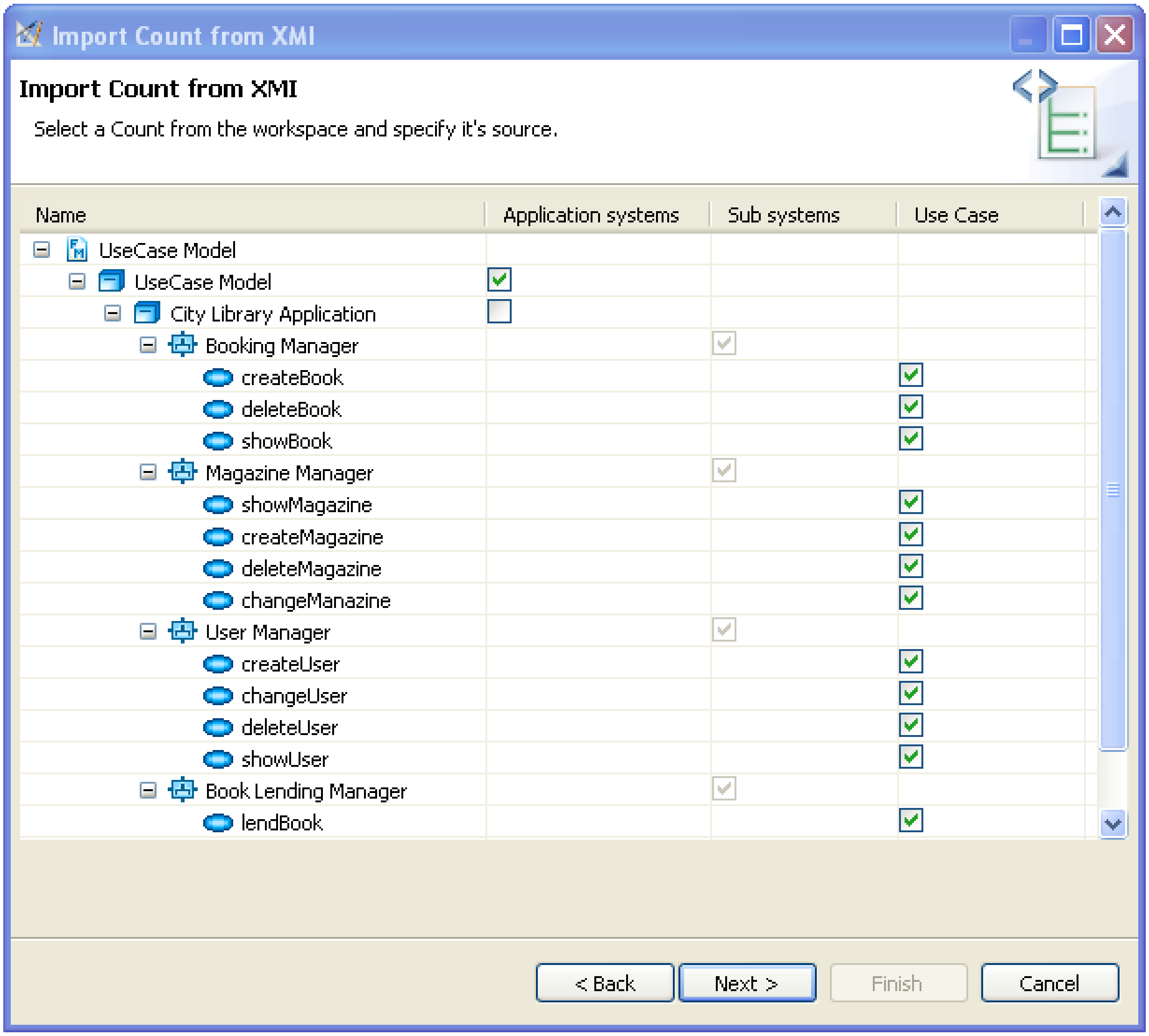
XMI file source: [Browse...]

Source Model Typ

● Use Case Model ○ Class Model

| Option | Description | Default |
|---|---|---|
| Project | Select the workspace project, where the Count will be imported | |
| Browse... | Browse for a existing workspace project | |
| FPM file name | Specify the target name for the Count | |
| XMI file source | Specify the source file which should be imported | |
| Browse... | Browse for a existing source file | |
| Use Case Model | Select this option, if you want to import a XMI Use Case Model | If this option was selected with the last export process |
| Class Model | Select this option, if you want to import a XMI Class Model | If this option was selected with the last export process |

### Specify import options for Use Case Model



Import Count from XMI

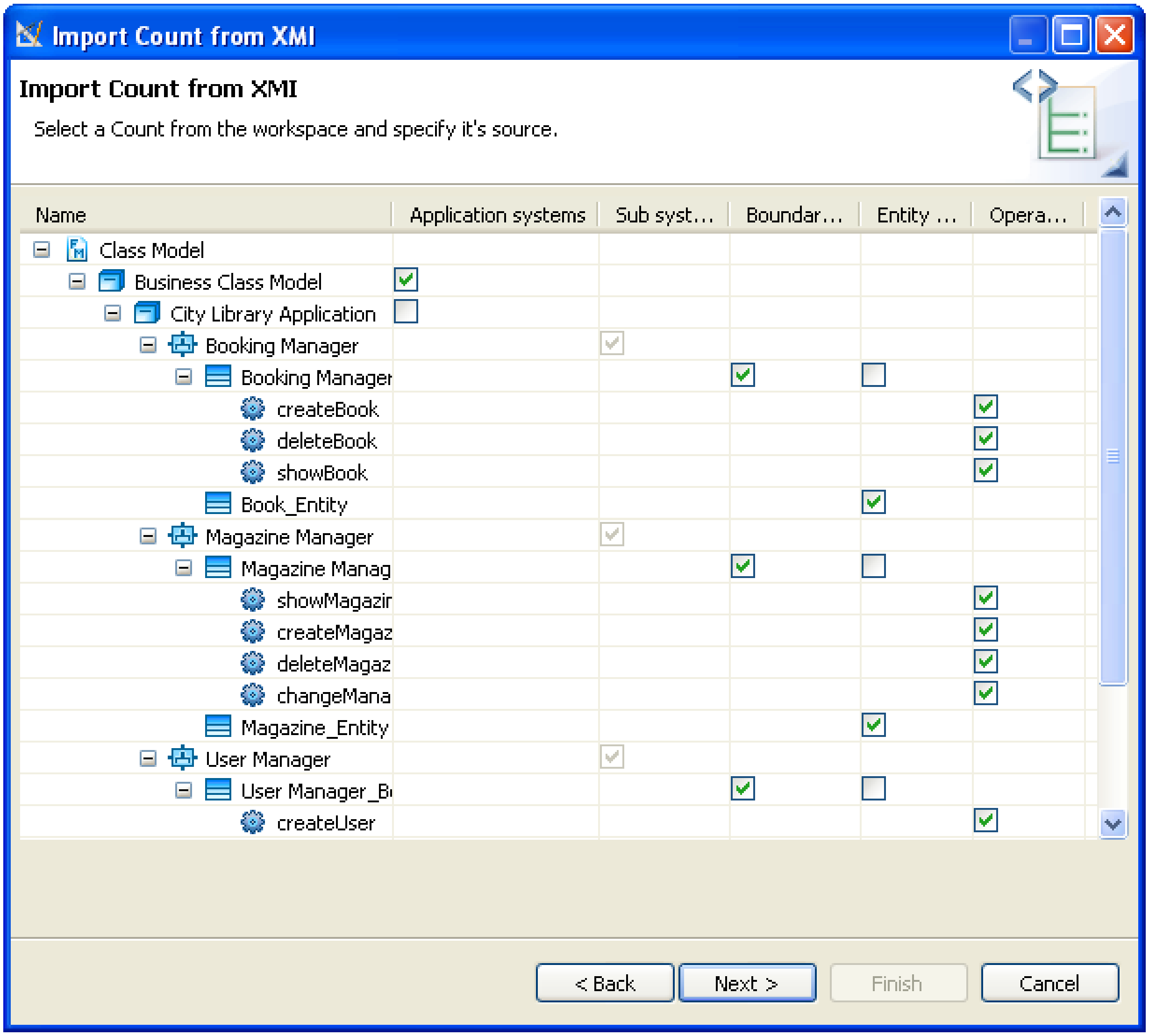
Import Count from XMI

Select a Count from the workspace and specify it's source.

| Name | Application systems | Sub systems | Use Case |
|---|---|---|---|
| ⊟ UseCase Model | | | |
| ⊟ UseCase Model | ☑ | | |
| ⊟ City Library Application | □ | | |
| ⊟ Booking Manager | | ☑ | |
| createBook | | | ☑ |
| deleteBook | | | ☑ |
| showBook | | | ☑ |
| ⊟ Magazine Manager | | ☑ | |
| showMagazine | | | ☑ |
| createMagazine | | | ☑ |
| deleteMagazine | | | ☑ |
| changeManazine | | | ☑ |
| ⊟ User Manager | | ☑ | |
| createUser | | | ☑ |
| changeUser | | | ☑ |
| deleteUser | | | ☑ |
| showUser | | | ☑ |
| ⊟ Book Lending Manager | | ☑ | |
| lendBook | | | ☑ |

| Option | Description | Default |
|---|---|---|
| Application Systems | Select this option if you want to import the tree element as Application System | |
| Sub Systems | Select this option if you want to import the tree element as Subsystem | |
| Use Case | Select this option if you want to import the tree element as Use Case | |

### Specify import options for Class Model



Import Count from XMI

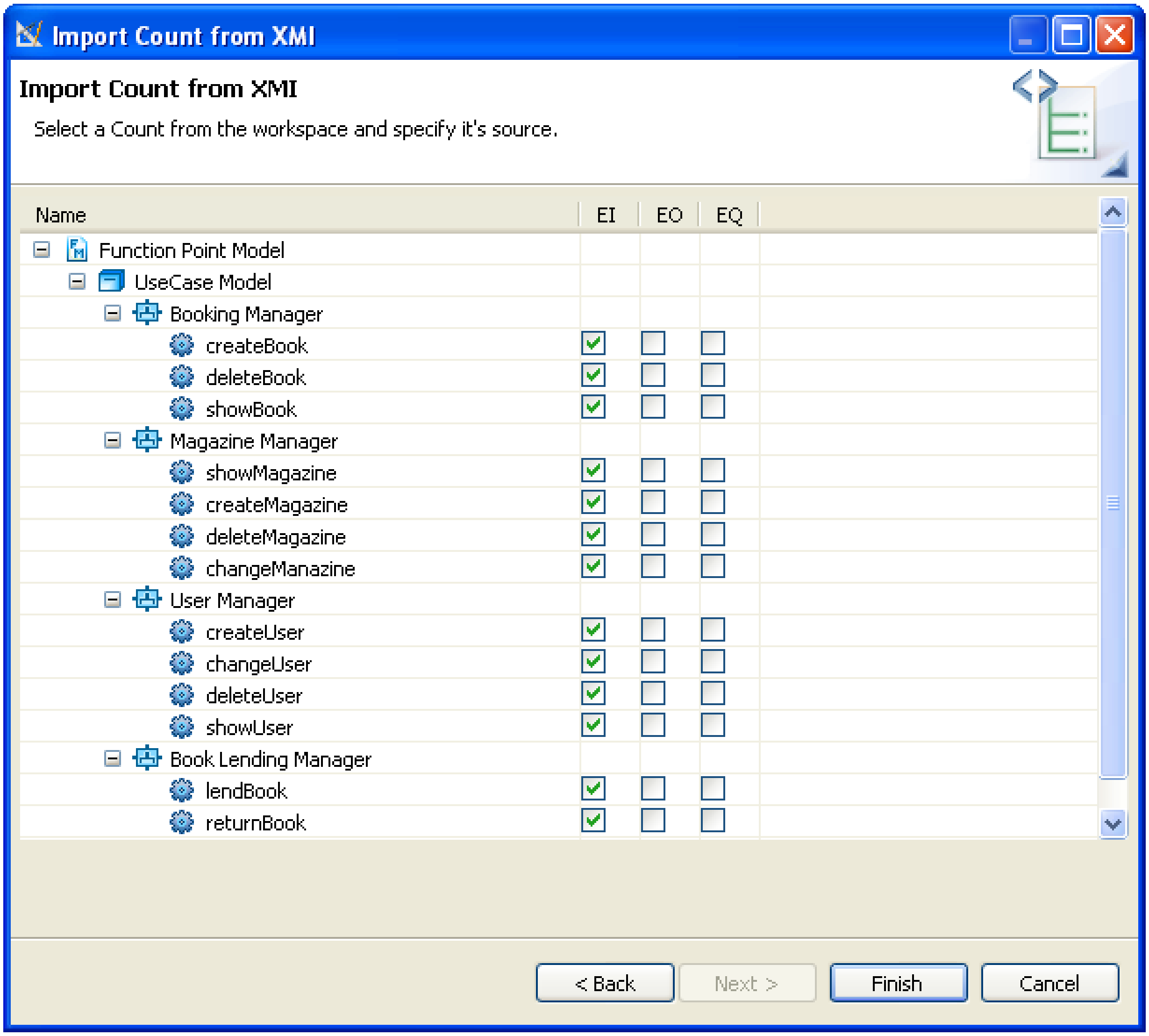
**Import Count from XMI**

Select a Count from the workspace and specify it's source.

| Name | Application systems | Sub syst... | Boundar... | Entity ... | Opera... |
|---|---|---|---|---|---|
| ⊟ Class Model | | | | | |
| ⊟ Business Class Model | ☑ | | | | |
| ⊟ City Library Application | □ | | | | |
| ⊟ Booking Manager | | ☑ | | | |
| ⊟ Booking Manager | | | ☑ | □ | |
| createBook | | | | | ☑ |
| deleteBook | | | | | ☑ |
| showBook | | | | | ☑ |
| Book_Entity | | | | ☑ | |
| ⊟ Magazine Manager | | ☑ | | | |
| ⊟ Magazine Manag | | | ☑ | □ | |
| showMagazir | | | | | ☑ |
| createMagaz | | | | | ☑ |
| deleteMagaz | | | | | ☑ |
| changeMana | | | | | ☑ |
| Magazine_Entity | | | | ☑ | |
| ⊟ User Manager | | ☑ | | | |
| ⊟ User Manager_Bı | | | ☑ | □ | |
| createUser | | | | | ☑ |

| Option | Description | Default |
|---|---|---|
| Application Systems | Select this option if you want to import the tree element as Application System | |
| Sub Systems | Select this option if you want to import the tree element as Subsystem | |
| Boundary class | Select this option if you want to import the tree element as Boundary Class | |
| Entity class | Select this option if you want to import the tree element as Entity Class | |
| Operation | Select this option if you want to import the tree element as Operation | |

### Specify import options for Use Case Model (Elementar Process)



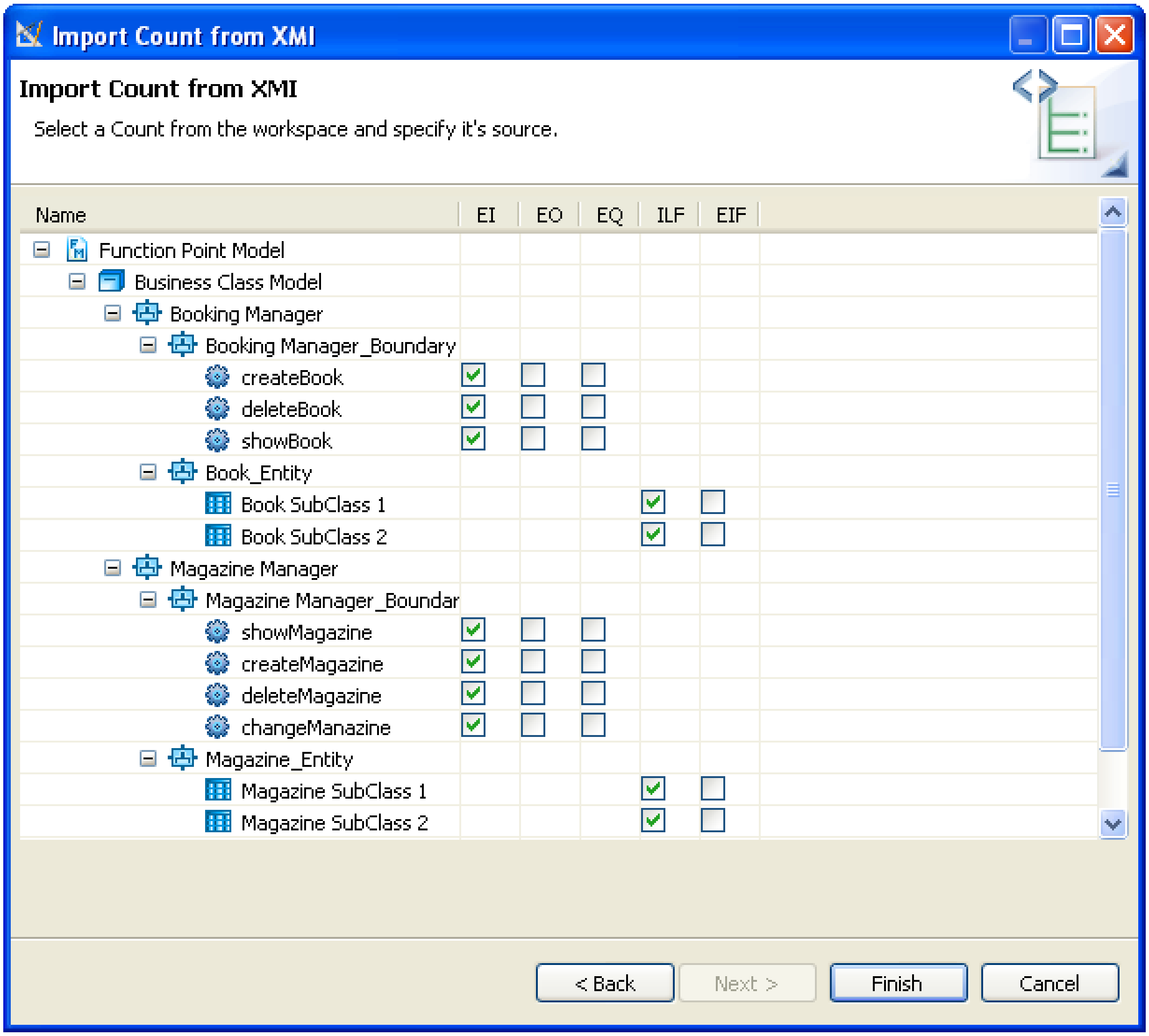
**Import Count from XMI**

Select a Count from the workspace and specify it's source.

| Name | EI | EO | EQ |
|---|---|---|---|
| Function Point Model | | | |
| UseCase Model | | | |
| Booking Manager | | | |
| createBook | ☑ | □ | □ |
| deleteBook | ☑ | □ | □ |
| showBook | ☑ | □ | □ |
| Magazine Manager | | | |
| showMagazine | ☑ | □ | □ |
| createMagazine | ☑ | □ | □ |
| deleteMagazine | ☑ | □ | □ |
| changeManazine | ☑ | □ | □ |
| User Manager | | | |
| createUser | ☑ | □ | □ |
| changeUser | ☑ | □ | □ |
| deleteUser | ☑ | □ | □ |
| showUser | ☑ | □ | □ |
| Book Lending Manager | | | |
| lendBook | ☑ | □ | □ |
| returnBook | ☑ | □ | □ |

| Option | Description | Default |
|---|---|---|
| EI | Select this option if you want to import the tree element as EI | |
| EO | Select this option if you want to import the tree element as EO | |
| EQ | Select this option if you want to import the tree element as EQ | |

**Specify import options for Class Model (Elementar Process)**



Import Count from XMI

Select a Count from the workspace and specify it's source.

| Name | EI | EO | EQ | ILF | EIF |
|---|---|---|---|---|---|
| ⊟ Function Point Model | | | | | |
| ⊟ Business Class Model | | | | | |
| ⊟ Booking Manager | | | | | |
| ⊟ Booking Manager_Boundary | | | | | |
| createBook | ☑ | □ | □ | | |
| deleteBook | ☑ | □ | □ | | |
| showBook | ☑ | □ | □ | | |
| ⊟ Book_Entity | | | | | |
| Book SubClass 1 | | | | ☑ | □ |
| Book SubClass 2 | | | | ☑ | □ |
| ⊟ Magazine Manager | | | | | |
| ⊟ Magazine Manager_Boundar | | | | | |
| showMagazine | ☑ | □ | □ | | |
| createMagazine | ☑ | □ | □ | | |
| deleteMagazine | ☑ | □ | □ | | |
| changeManazine | ☑ | □ | □ | | |
| ⊟ Magazine_Entity | | | | | |
| Magazine SubClass 1 | | | | ☑ | □ |
| Magazine SubClass 2 | | | | ☑ | □ |

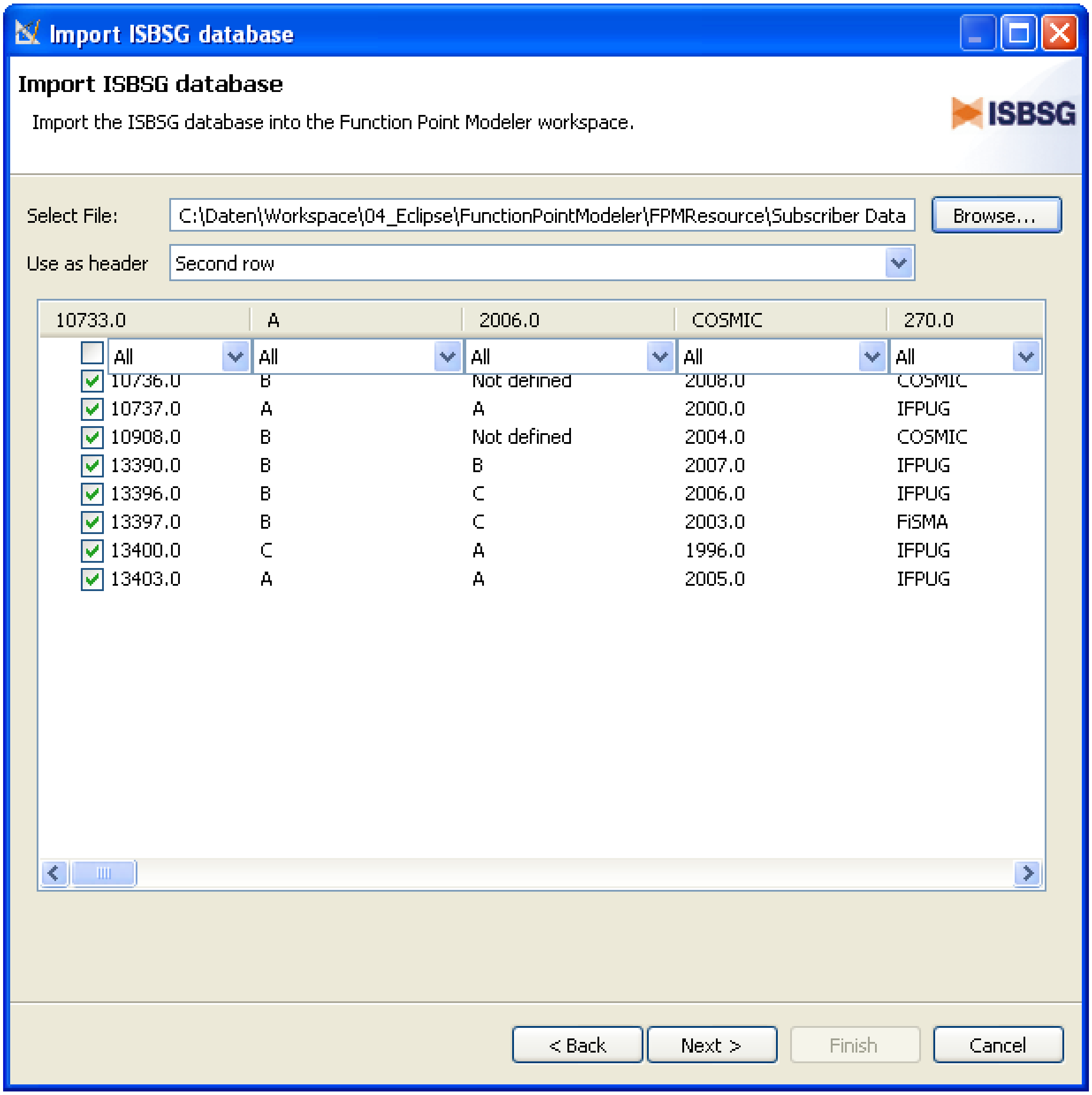
| Option | Description | Default |
|---|---|---|
| EI | Select this option if you want to import the tree element as EI | |
| EO | Select this option if you want to import the tree element as EO | |
| EQ | Select this option if you want to import the tree element as EQ | |
| ILF | Select this option if you want to import the tree element as ILF | |
| EIF | Select this option if you want to import the tree element as EIF | |

*ISBSG Database*

Enterprise Edition

This wizard helps you to import ISBSG data.

### Specify file attributes and import type



**Import ISBSG database**

Import the ISBSG database into the Function Point Modeler workspace.

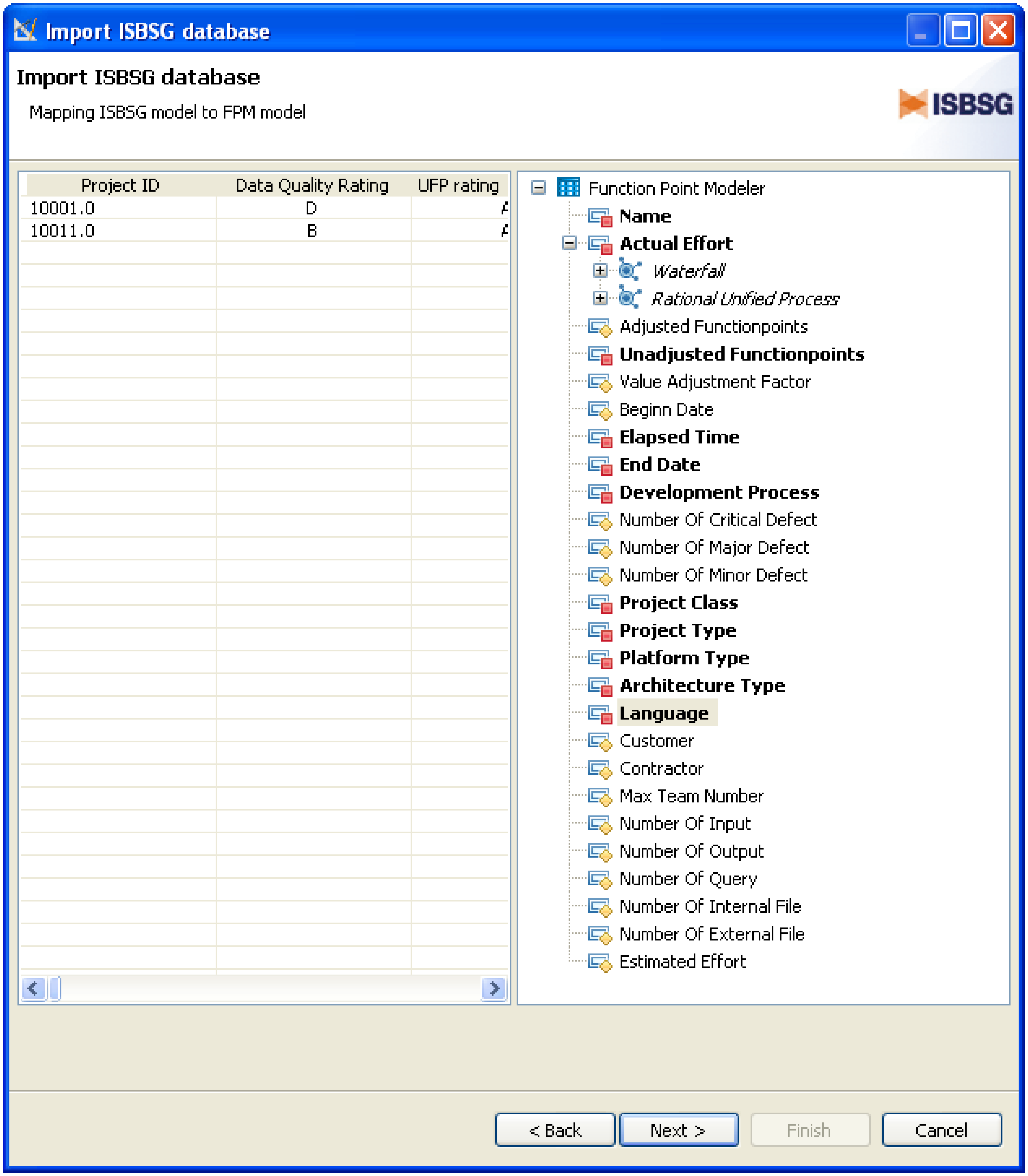
Select File: C:\Daten\Workspace\04_Eclipse\FunctionPointModeler\FPMResource\Subscriber Data

Use as header: Second row

| | 10733.0 | A | 2006.0 | COSMIC | 270.0 |
|---|---|---|---|---|---|
| □ | All | All | All | All | All |
| ☑ | 10736.0 | B | Not defined | 2008.0 | COSMIC |
| ☑ | 10737.0 | A | A | 2000.0 | IFPUG |
| ☑ | 10908.0 | B | Not defined | 2004.0 | COSMIC |
| ☑ | 13390.0 | B | B | 2007.0 | IFPUG |
| ☑ | 13396.0 | B | C | 2006.0 | IFPUG |
| ☑ | 13397.0 | B | C | 2003.0 | FiSMA |
| ☑ | 13400.0 | C | A | 1996.0 | IFPUG |
| ☑ | 13403.0 | A | A | 2005.0 | IFPUG |

| Option | Description | Default |
|---|---|---|
| Select as file | Select the source ISBSG file for import | |
| Browse... | Browse for a existing ISBSG file | |
| Use as header | Specify the header row | |
| File content preview and row selection | Show preview of the import file and select rows for import | |

### Map ISBSG model to FPM model

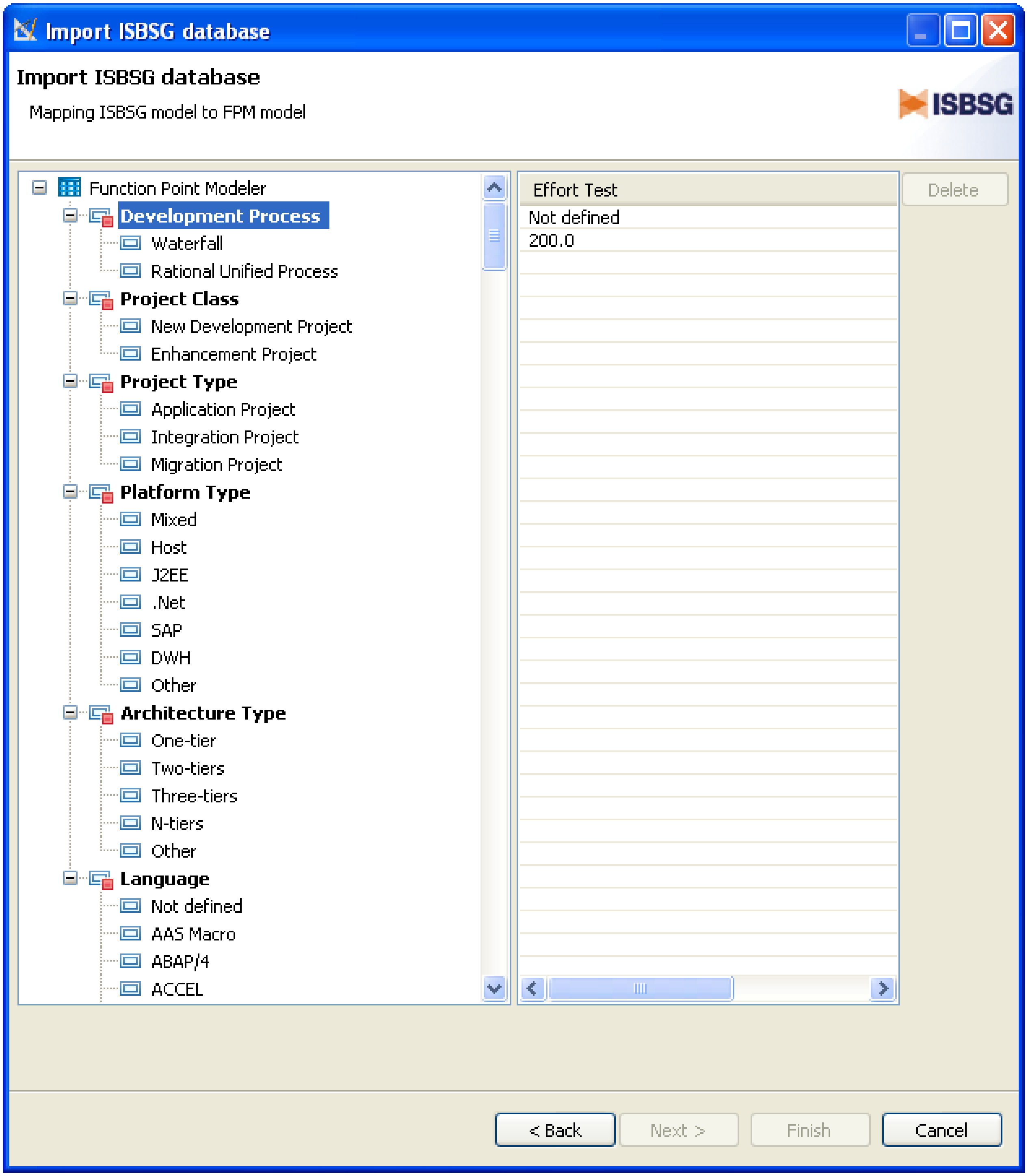


| Project ID | Data Quality Rating | UFP rating |
|---|---|---|
| 10001.0 | D | A |
| 10011.0 | B | A |

- Function Point Modeler
  - **Name**
  - **Actual Effort**
    - *Waterfall*
    - *Rational Unified Process*
  - Adjusted Functionpoints
  - **Unadjusted Functionpoints**
  - Value Adjustment Factor
  - Beginn Date
  - **Elapsed Time**
  - **End Date**
  - **Development Process**
  - Number Of Critical Defect
  - Number Of Major Defect
  - Number Of Minor Defect
  - **Project Class**
  - **Project Type**
  - **Platform Type**
  - **Architecture Type**
  - **Language**
  - Customer
  - Contractor
  - Max Team Number
  - Number Of Input
  - Number Of Output
  - Number Of Query
  - Number Of Internal File
  - Number Of External File
  - Estimated Effort

| Option | Description | Default |
|---|---|---|
| File content preview | Show preview of the import file for mapping | |
| FPM model elements | Show FPM model elements for mapping | |

### Map ISBSG attributes to FPM attributes

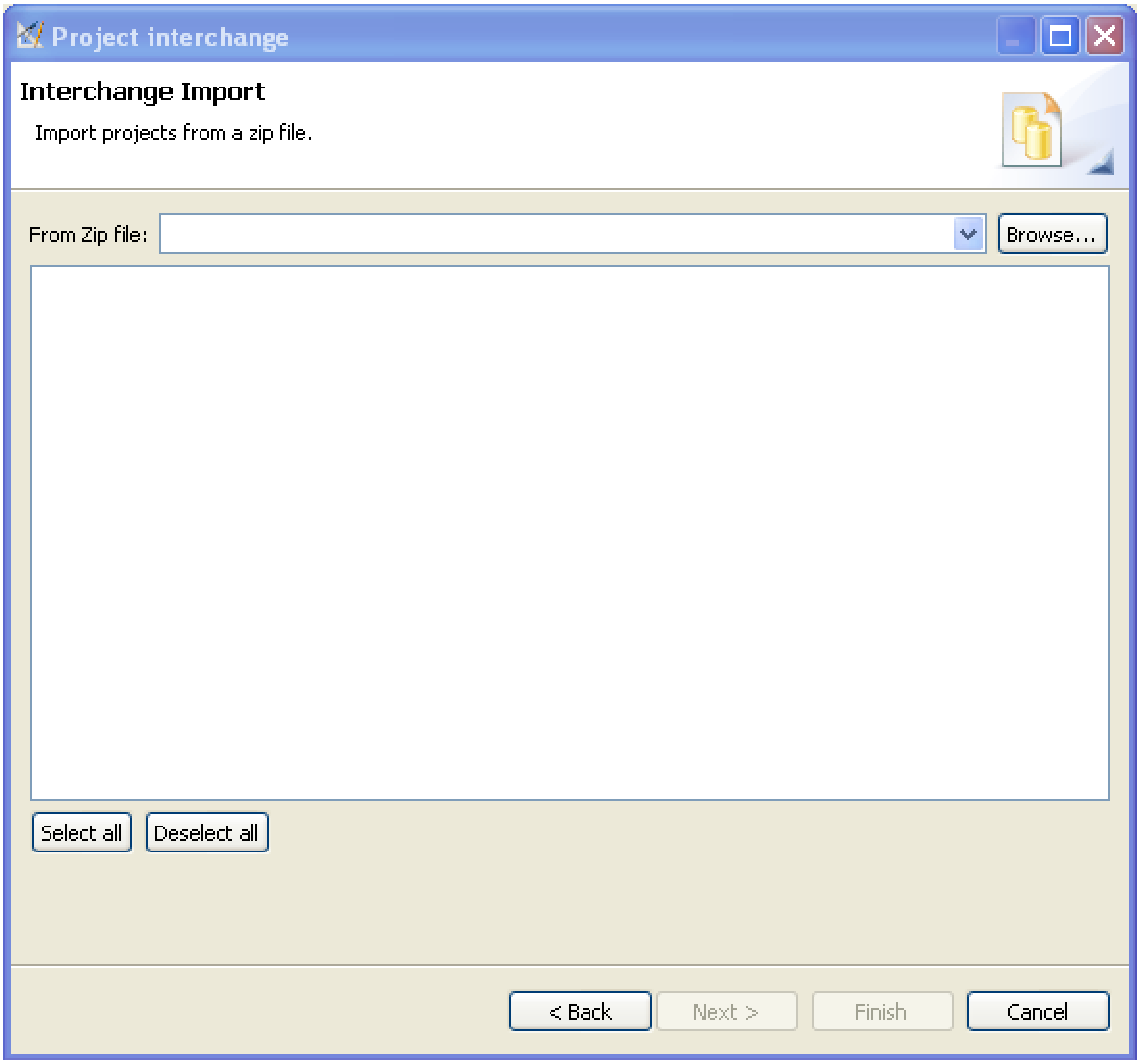


| Effort Test |
|---|
| Not defined |
| 200.0 |

| Option | Description | Default |
|---|---|---|
| FPM model attributes | Show FPM model attributes for mapping | |
| File content preview | Show preview of the import file for mapping | |
| Delete | Deletes the current selected mapping | |

*Project interchange import*

This wizard helps you to import Projects from a special interchange format. There is a corresponding export wizard to export this format from the workspace.



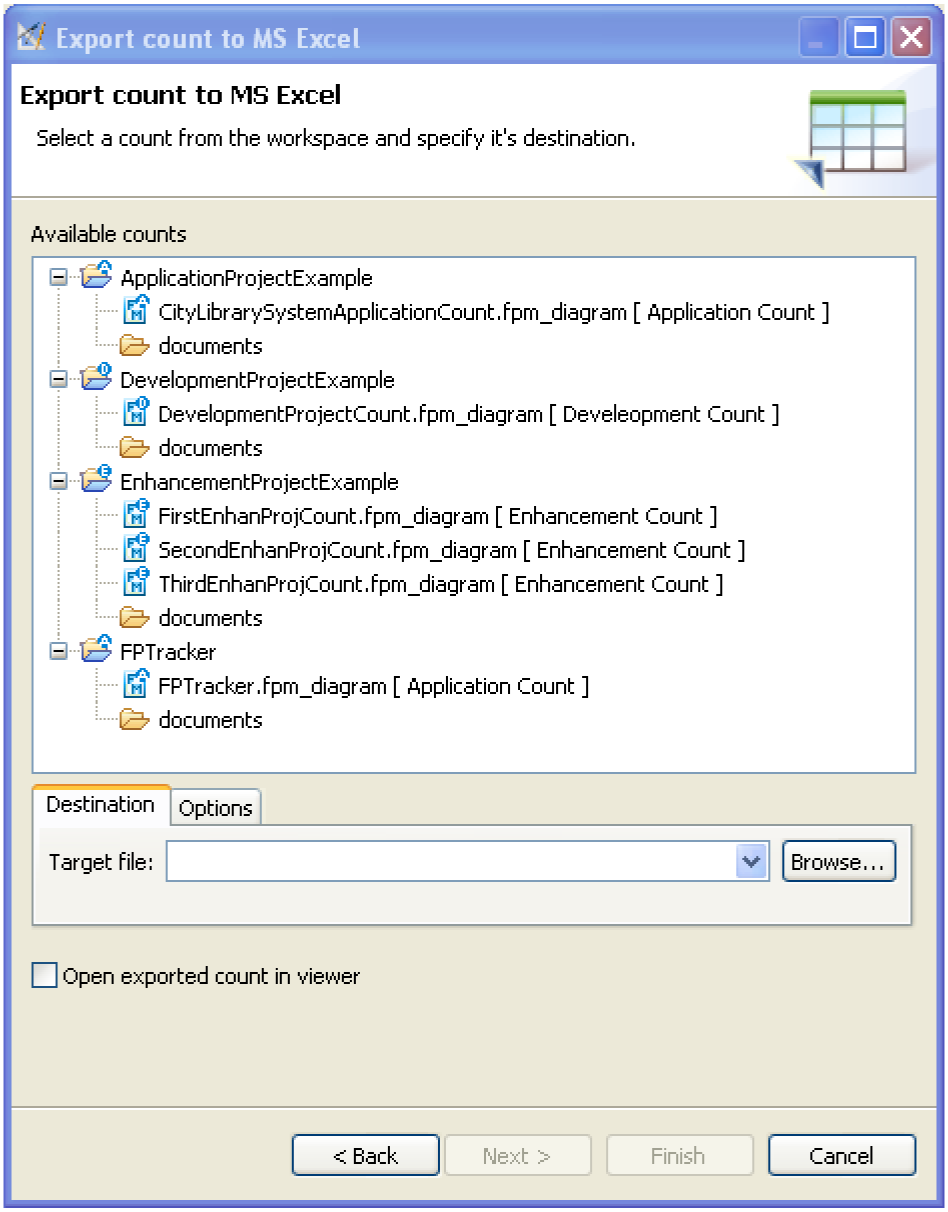
| Option | Description | Default |
|---|---|---|
| From Zip file | Specify the source file or select a a previous entry | |
| Browse... | Browse for a existing source file | |
| Select projects to import | Select the projects which are included in the special interchange format file | |
| Select all | Selects all available interchange projects | |
| Deselect all | Deselects all available interchange projects | |

**Export**

*Count to MS Excel*

Enterprise Edition

This wizard helps you to export a Count to MS Excel format.



Export count to MS Excel

Select a count from the workspace and specify it's destination.

Available counts

- ApplicationProjectExample
  - CityLibrarySystemApplicationCount.fpm_diagram [ Application Count ]
  - documents
- DevelopmentProjectExample
  - DevelopmentProjectCount.fpm_diagram [ Develeopment Count ]
  - documents
- EnhancementProjectExample
  - FirstEnhanProjCount.fpm_diagram [ Enhancement Count ]
  - SecondEnhanProjCount.fpm_diagram [ Enhancement Count ]
  - ThirdEnhanProjCount.fpm_diagram [ Enhancement Count ]
  - documents
- FPTracker
  - FPTracker.fpm_diagram [ Application Count ]
  - documents

Target file:

□ Open exported count in viewer

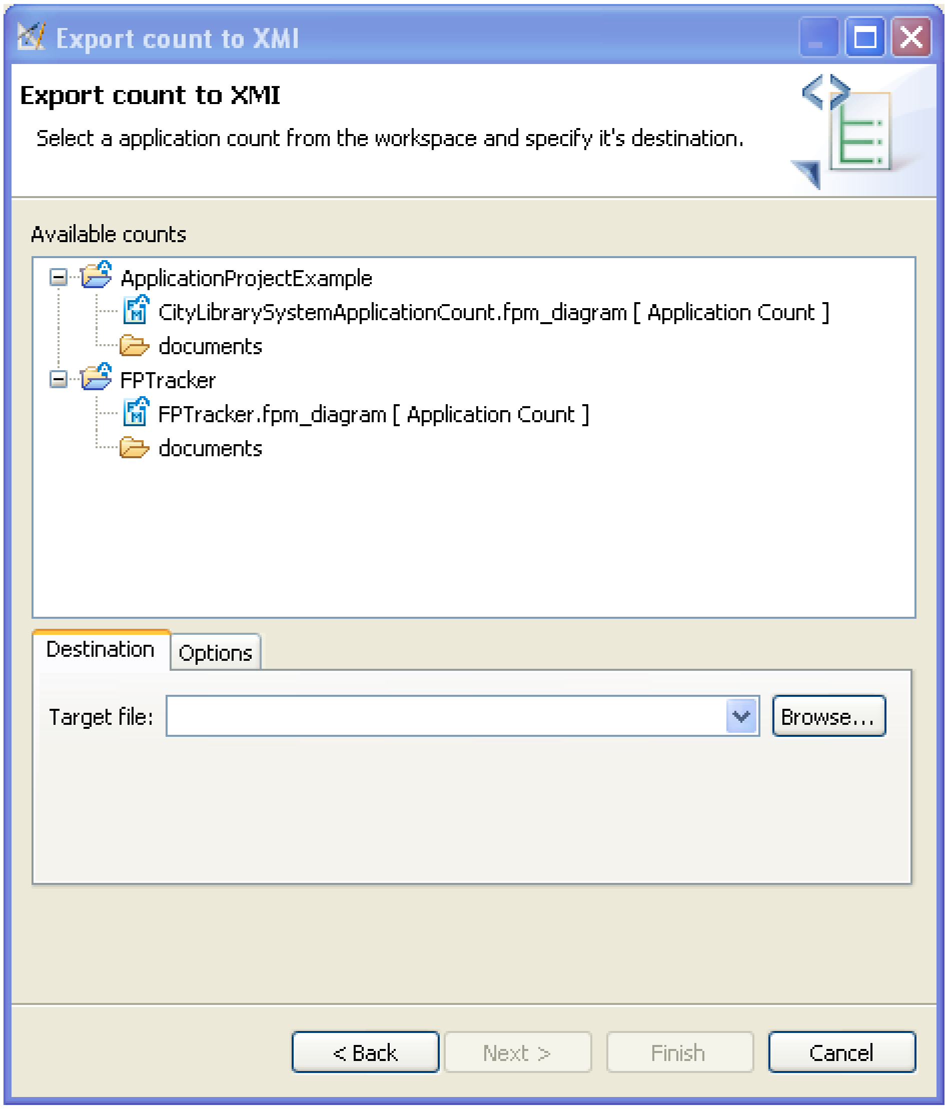
| Option | Description | Default |
|---|---|---|
| Available Counts | Select the Count from the workspace which will be exported | |
| Target File | Specify the target file or select a a previous entry | |
| Browse... | Browse for a existing target file or browse for a location | |
| Excel 97-2007 | Specify output format Excel 97-2007. If this option is selected, the target file must end with '.xls' | If this format was selected with the last export process |

| Option | Description | Default |
|---|---|---|
| Excel 2007+ | Specify output format Excel 2007+. If this option is selected, the target file must end with '.xlsx' | If this format was selected with the last export process |
| Open exported count in viewer | Select this option, if you want to open the created target file with a designated viewer, after the export process has finished | If this option was selected with the last export process |

### *Count to XMI*

Enterprise Edition

This wizard helps you to export a Count to XMI format.



Export count to XMI

Select a application count from the workspace and specify it's destination.

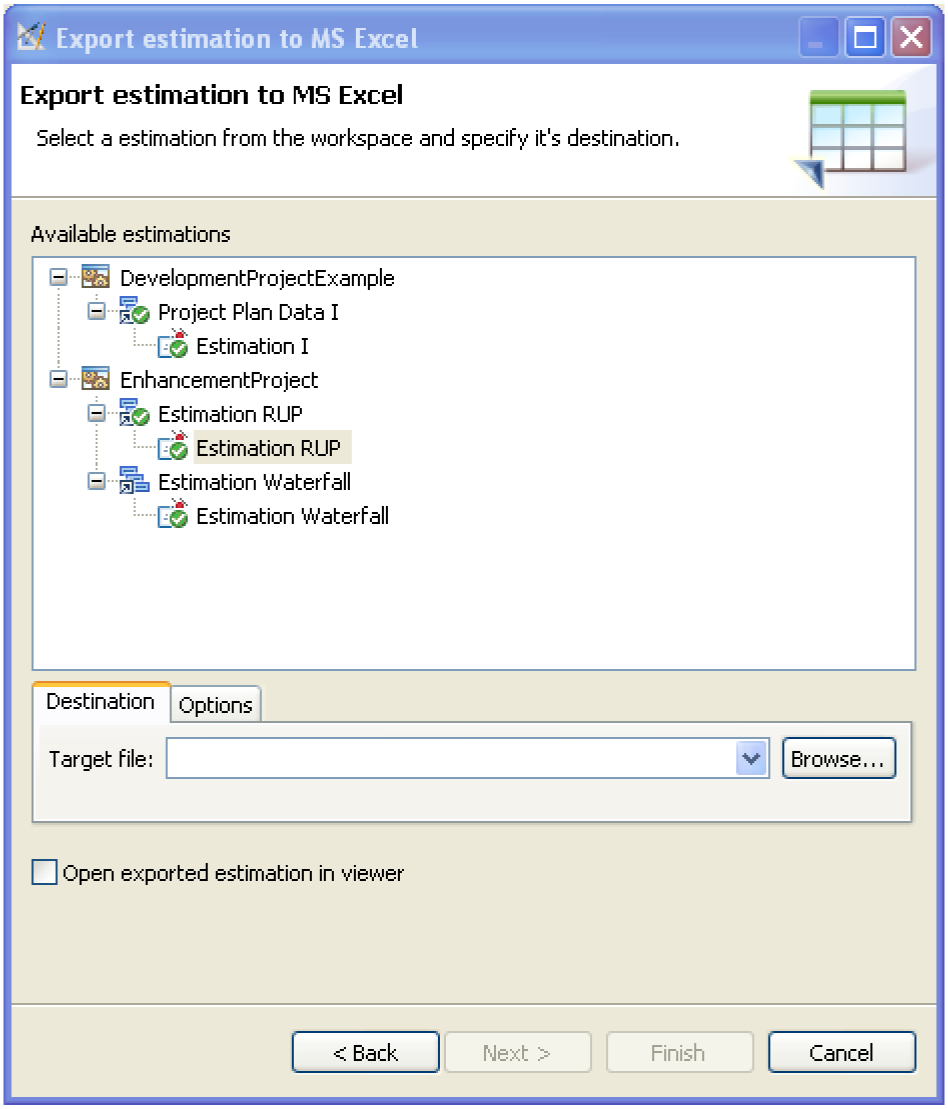
Export count to XMI
Available counts
ApplicationProjectExample
CityLibrarySystemApplicationCount.fpm_diagram [ Application Count ]
documents
FPTracker
FPTracker.fpm_diagram [ Application Count ]
documents
Destination
Options
Target file:
Browse...
< Back
Next >
Finish
Cancel

| Option | Description | Default |
|---|---|---|
| Available Counts | Select the Count from the workspace which will be exported | |
| Target File | Specify the target file or select a a previous entry | |
| Browse... | Browse for a existing target file or browse for a location | |
| XMI Version | Specify XMI and UML version for export | The last selected export version |
| Use Case Model | Select this option, if you want to export XMI Use Case Model | If this option was selected with the last export process |
| Class Model | Select this option, if you want to export XMI Class Model | If this option was selected with the last export process |

### *Estimation to MS Excel*

Enterprise Edition

This wizard helps you to export a Estimation to MS Excel format.



Export estimation to MS Excel

Export estimation to MS Excel

Select a estimation from the workspace and specify it's destination.

Available estimations

Target file:

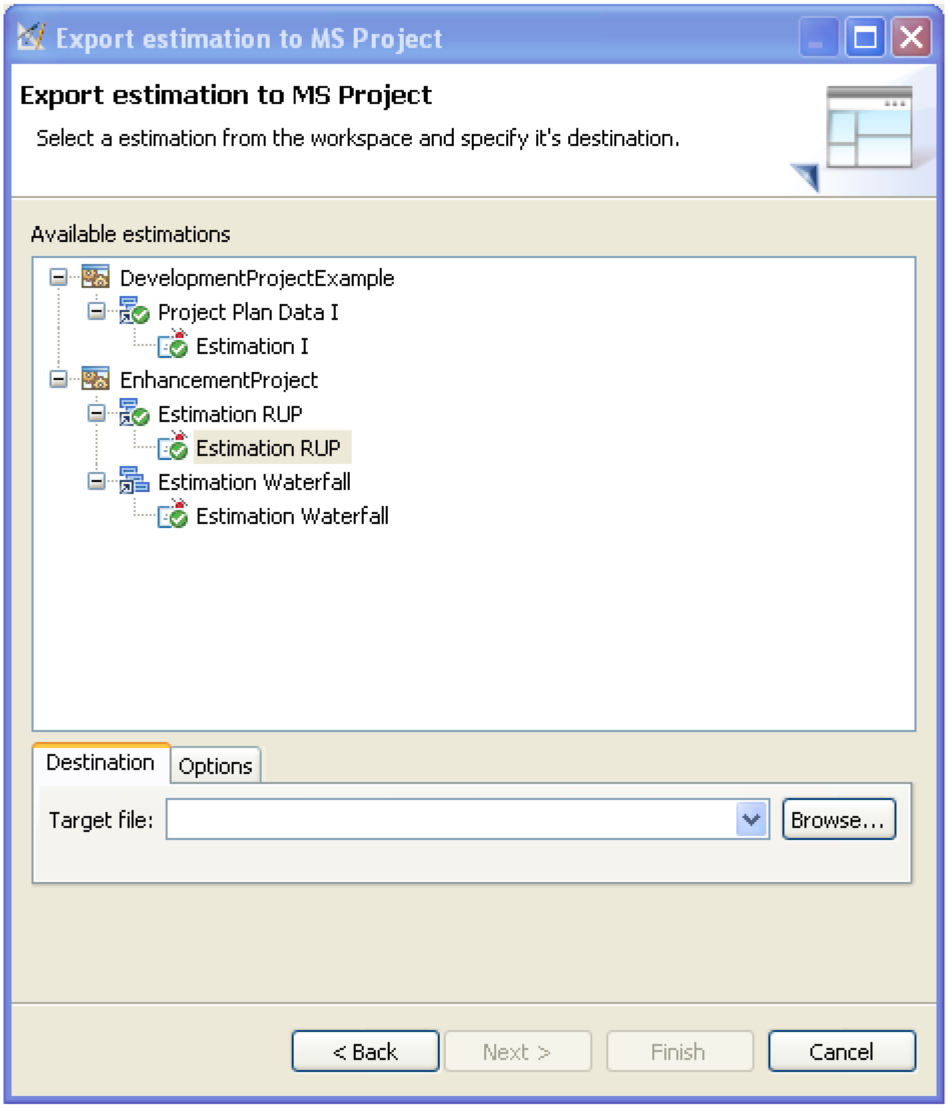
□ Open exported estimation in viewer

| Option | Description | Default |
|---|---|---|
| Available Estimations | Select the Estimation from the workspace which will be exported | |
| Target File | Specify the target file or select a a previous entry | |
| Browse... | Browse for a existing target file or browse for a location | |
| Excel 97-2007 | Specify output format Excel 97-2007. If this option is selected, the target file must end with '.xls' | If this format was selected with the last export process |
| Excel 2007+ | Specify output format Excel 2007+. If this option is selected, the target file must end with '.xlsx' | If this format was selected with the last export process |
| Open exported estimation in viewer | Select this option, if you want to open the created target file with a designated viewer, after the export process has finished | If this option was selected with the last export process |

### *Estimation to MS Project*

**Enterprise Edition**

This wizard helps you to export a Estimation to MS Project format.



Export estimation to MS Project

**Export estimation to MS Project**

Select a estimation from the workspace and specify it's destination.

Available estimations

- DevelopmentProjectExample
  - Project Plan Data I
    - Estimation I
- EnhancementProject
  - Estimation RUP
    - Estimation RUP
  - Estimation Waterfall
    - Estimation Waterfall

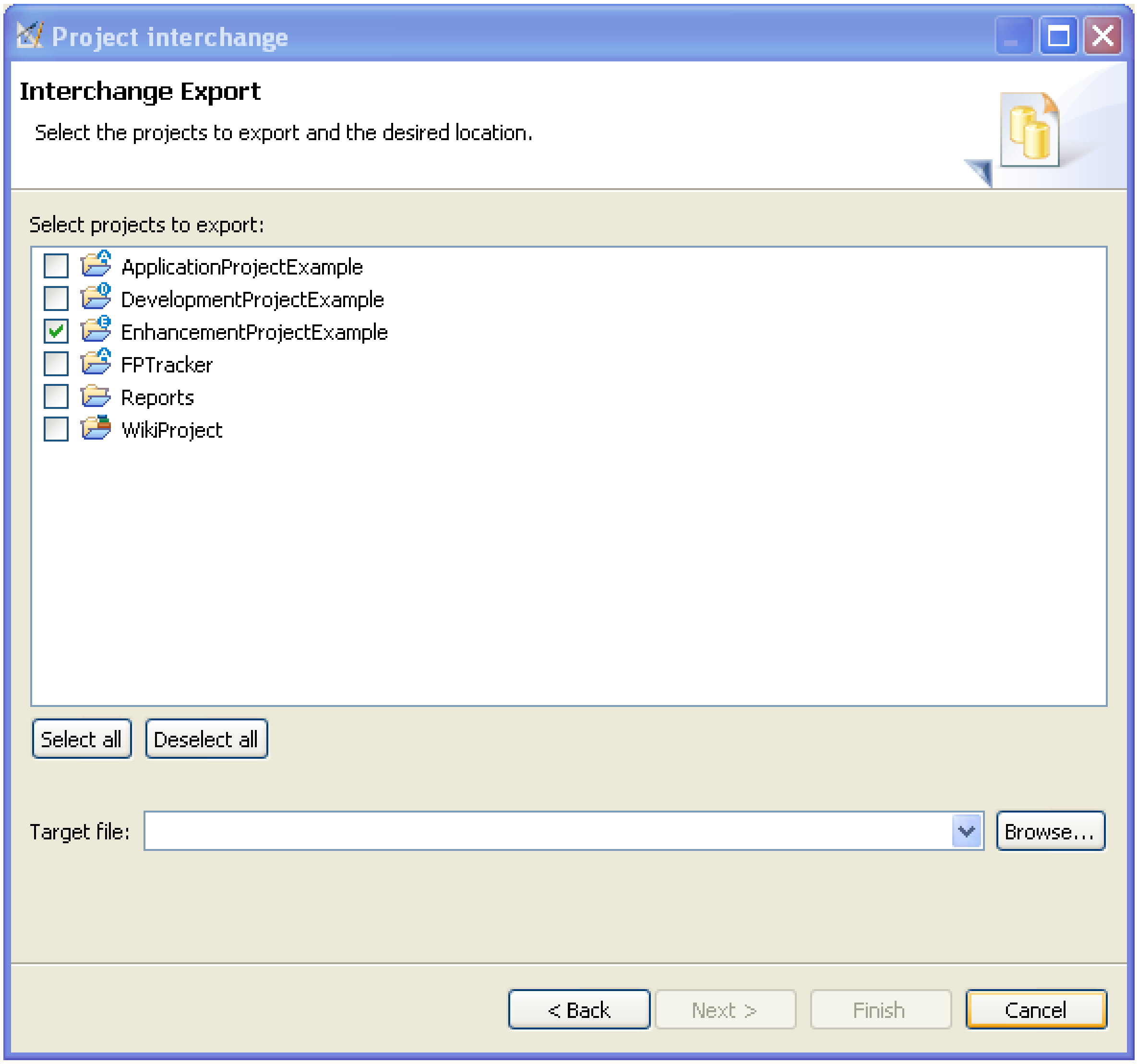
Target file:

| Option | Description | Default |
|---|---|---|
| Available Estimations | Select the Estimation from the workspace which will be exported | |
| Target File | Specify the target file or select a a previous entry | |
| Browse... | Browse for a existing target file or browse for a location | |
| Project 97-2007 | Specify output format Project 97-2007. If this option is selected, the target file must end with '.mpx' | If this format was selected with the last export process |

| Option | Description | Default |
|---|---|---|
| Project 2007+ | Specify output format Project 2007+. If this option is selected, the target file must end with '.xml' | If this format was selected with the last export process |

*Project interchange export*

This wizard helps you to export Projects to a special interchange format. There is a corresponding import wizard to import this format into the workspace.


Project interchange
Interchange Export
Select the projects to export and the desired location.
Select projects to export:
□ ApplicationProjectExample
□ DevelopmentProjectExample
☑ EnhancementProjectExample
□ FPTracker
□ Reports
□ WikiProject
Select all
Deselect all
Target file:
Browse...
< Back
Next >
Finish
Cancel

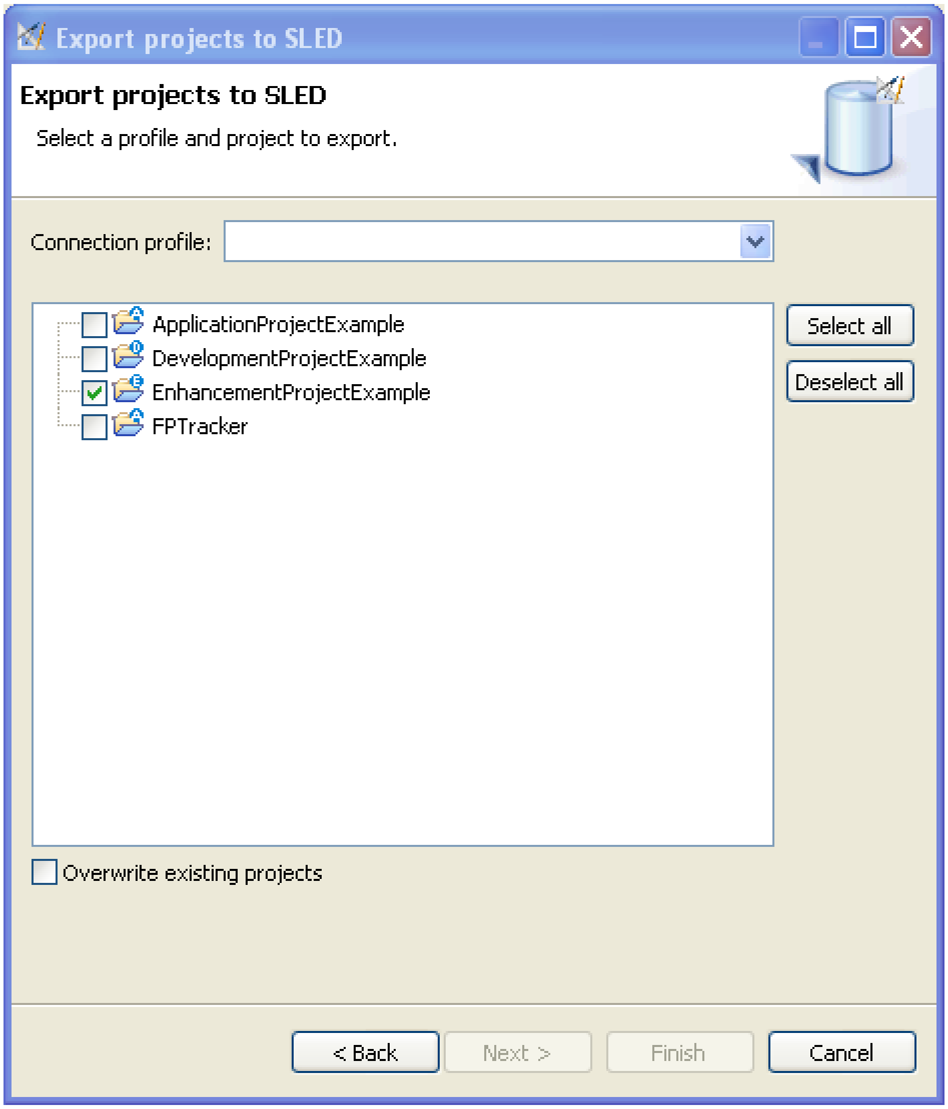
| Option | Description | Default |
|---|---|---|
| Select projects to export | Select the workspace projects which will be included in the special interchange format file | |
| Select all | Selects all available workspace projects | |
| Deselect all | Deselects all available workspace projects | |

| Option | Description | Default |
|---|---|---|
| Target File | Specify the target file or select a a previous entry | |
| Browse... | Browse for a existing target file or browse for a location | |

#### *Project to SLED*

Enterprise Edition

This wizard helps you to export Projects to a Software Lifcecycle Empirical Database (SLED).



Export projects to SLED

Export projects to SLED

Select a profile and project to export.

Connection profile:

□ ApplicationProjectExample
□ DevelopmentProjectExample
☑ EnhancementProjectExample
□ FPTracker

□ Overwrite existing projects

| Option | Description | Default |
|---|---|---|
| Connection profile | Provides a list of available connected profiles. Choose the connection which will be used for export | |

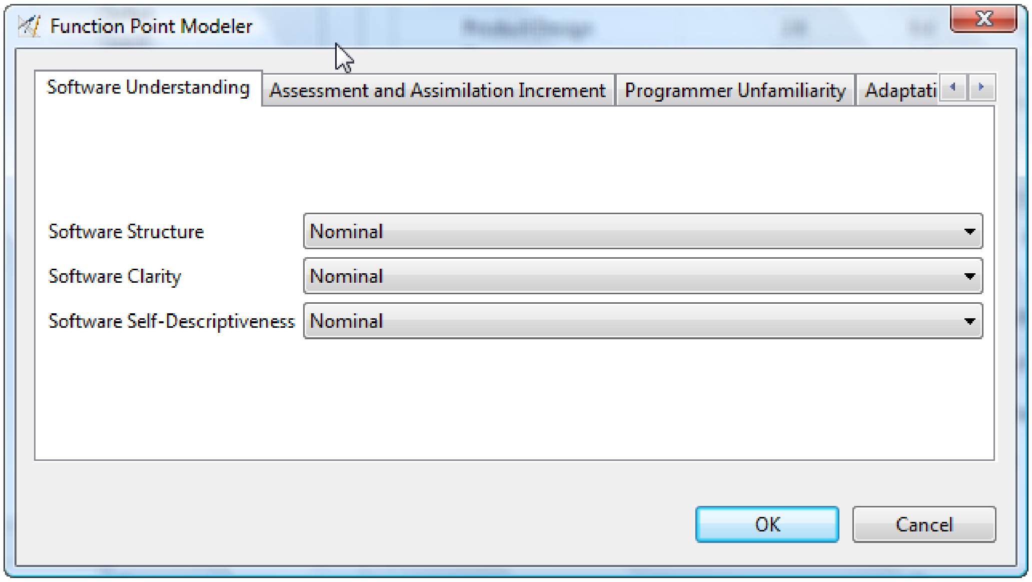
| Option | Description | Default |
|---|---|---|
| Avalable projects | Select the workspace projects which will be exported to SLED | |
| Select all | Selects all available workspace projects | |
| Deselect all | Deselects all available workspace projects | |
| Overwrite existing projects | Overwrite existing projects in SLED without confirmation. If this option is not checked and a selected project already exists in SLED there will be a user confirmation dialog. | Selected or deselected, based on the last export process selection |

### Dialogs

#### Adapted Software Dialog

Enterprise Edition

This dialog allows you to to adjust the **Adaption Adjustment Factor** based on some settings for relevant properties.



Software Structure: Nominal
Software Clarity: Nominal
Software Self-Descriptiveness: Nominal

#### Software Understanding

| Option | Description |
|---|---|
| Software Structure | Understanding increpements for structure<br>• Very low (very low cohesion, high coupling, spaghetti code)<br>• Low (moderately low cohesion, high coupling)<br>• Nominal (reasonably well structured, some weak areas)<br>• High (high cohesion, low coupling)<br>• Very High (strong modularity, information hiding in data/control structure) |
| Software Clarity | Understanding increments for application clarity<br>• Very low (no match between program and application worldviews) |

| Option | Description |
|---|---|
| | - Low (some correlation between program and application)<br>- Nominal (moderate correlation between program and application)<br>- High (good correlation between program and application)<br>- Very High (clear match between program and application worldviews) |
| Software Self-Descriptiveness | Understanding increments for self-descriptiveness<br>- Very low (no match between program and application worldviews)<br>- Low (some correlation between program and application)<br>- Nominal (moderate correlation between program and application)<br>- High (good correlation between program and application)<br>- Very High (clear match between program and application worldviews) |

### Assessment and Assimilation Increment

| Option | Description |
|---|---|
| Rating Scala | - None<br>- Basic module search and documentation<br>- Some module test and evaluation, documentation<br>- Considerable module test and evaluation, documentation<br>- Extensive module test and evaluation, documentation |

### Programmer Unfamiliarity

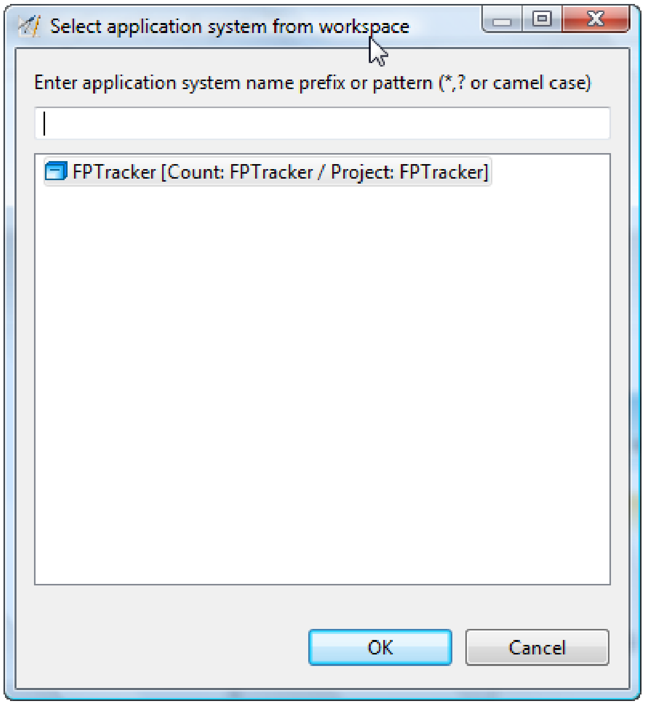
| Option | Description |
|---|---|
| Rating Scala | - Completely familiar<br>- Most familiar<br>- Somewhat familiar<br>- Considerably familiar<br>- Mostly unfamiliar<br>- Completely unfamiliar |

### Adaption Adjustment Factor

| Option | Description |
|---|---|
| Percent Design Modified | Percentage of modified application design |
| Percent Code Modified | Percentage of modified application code |
| Percent of Integration required for adaptable software | Percent of Integration required for adaptable software |

### Application System Selection Dialog

This dialog allows you to select an existing **Application System** from the workspace.



Select application system from workspace

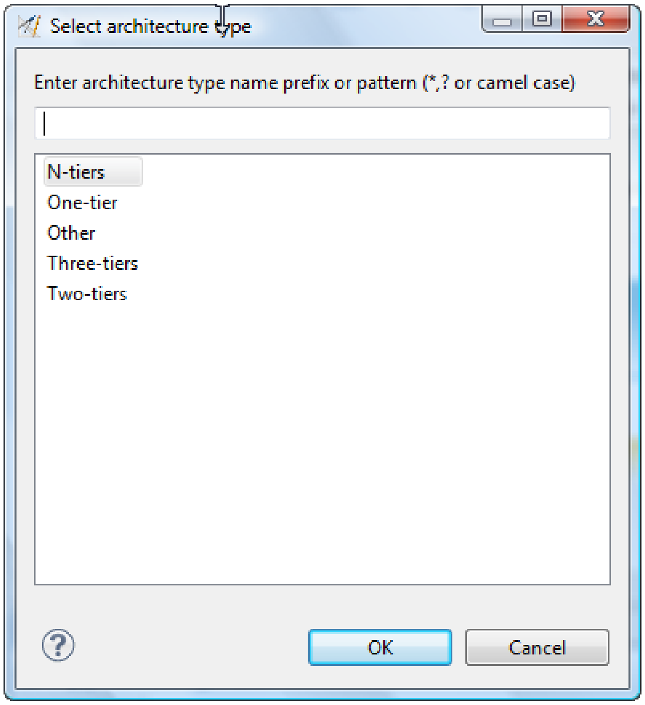
Enter application system name prefix or pattern (*,? or camel case)

FPTracker [Count: FPTracker / Project: FPTracker]

| Option | Description |
|---|---|
| Filter criteria | Enter a Application System prefix or a pattern (*, ? or camel case). The list of Application Systems will be refreshed, matching your input. |
| List of matching **Application Systems** | Select an Application System from the list of available Systems. |
| OK | Accepts the selected Application System. |
| Cancel | Cancels the request. |

### Architecture Type Selection Dialog

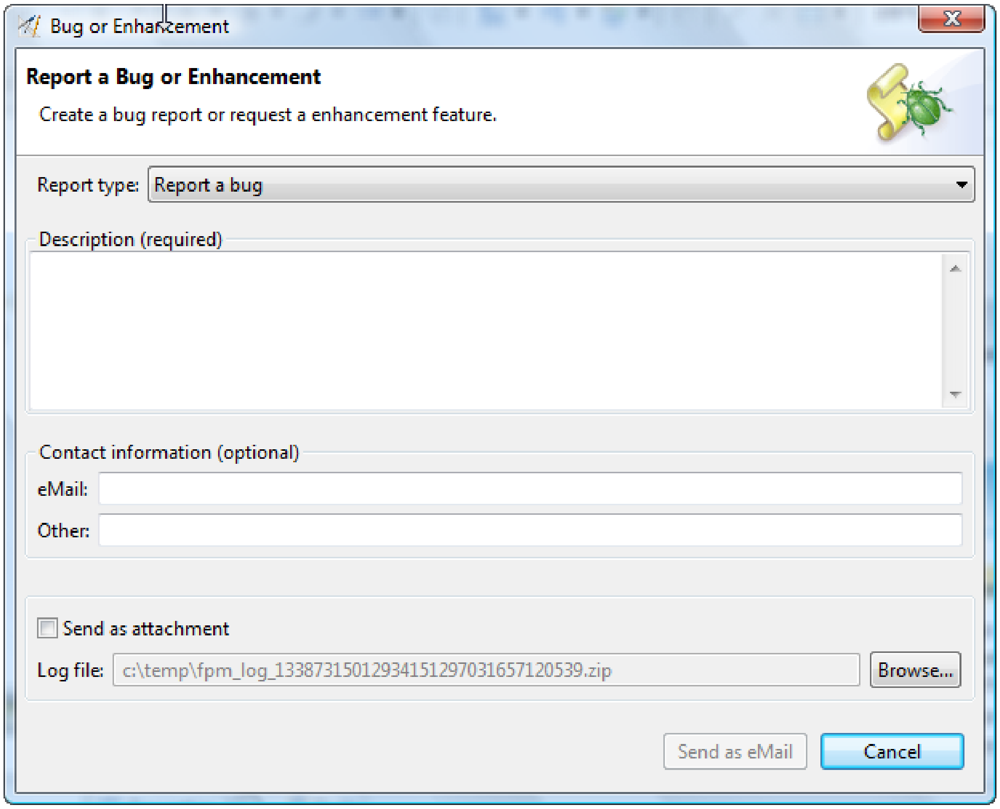
This dialog allows you to select an existing **Architecture Type** from the workspace.



| Option | Description |
|---|---|
| Filter criteria | Enter a Architecture Type prefix or a pattern (*, ? or camel case). The list of Architecture Types will be refreshed, matching your input. |
| List of matching **Architecture Types** | Select an Architecture Type from the list of available Types. |
| OK | Accepts the selected Architecture Type. |
| Cancel | Cancels the request. |

### Bug and Enhancement Dialog

This dialog allows you to report a Bug or Enhancement Feature.



Bug or Enhancement

**Report a Bug or Enhancement**

Create a bug report or request a enhancement feature.

Report type: Report a bug

Description (required)

Contact information (optional)

eMail:

Other:

☐ Send as attachment

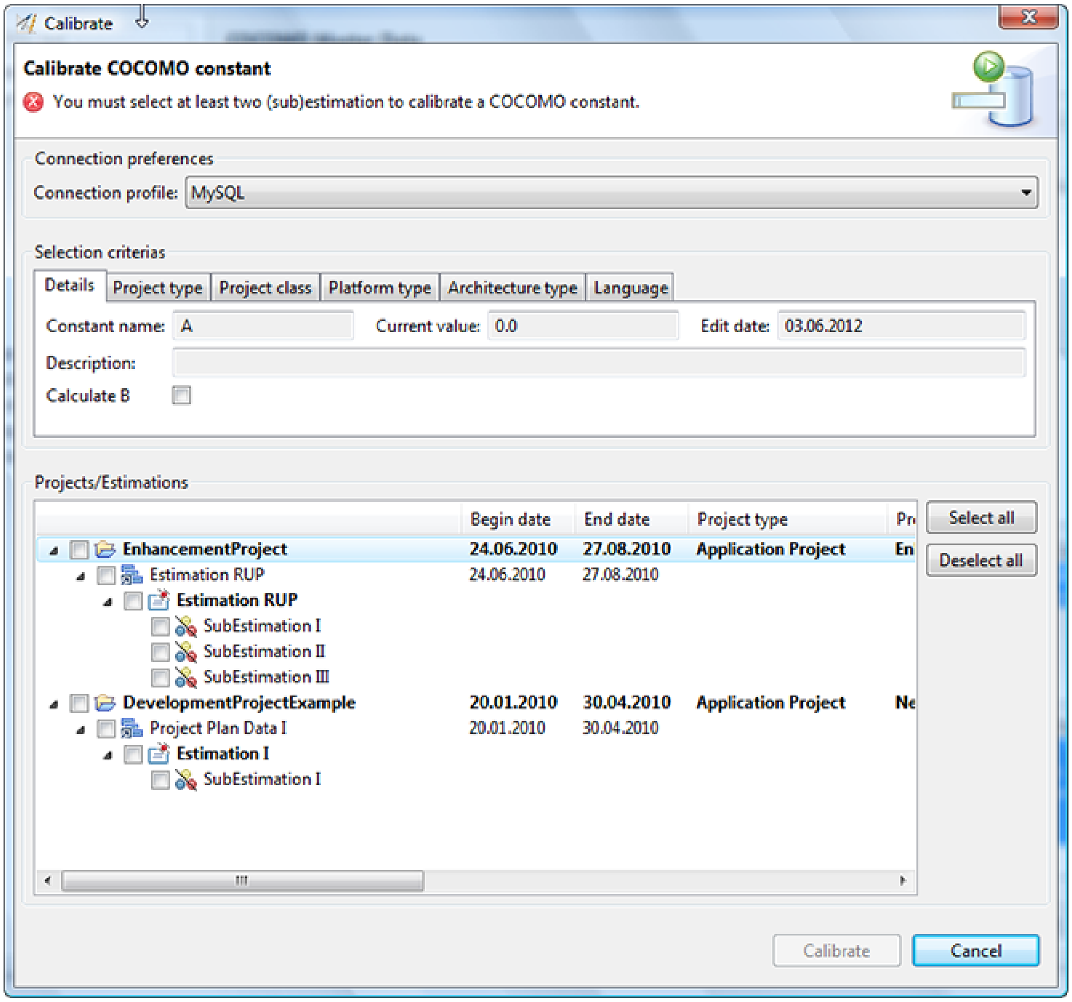
Log file: c:\temp\fpm_log_13387315012934151297031657120539.zip

| Option | Description |
|---|---|
| Report type | The type of report (bug or enhancement feature). |
| Description | The required description for the report. |
| eMail | Optional eMail contact information. |
| Other | Optional other contact information. |
| Send as attachment | For a bug report, the current application log can send as eMail attachment. |
| Browse | Browse the current application log before send as eMail attachment. |
| Send as eMail | Send the report a an eMail. |
| Cancel | Cancel the request. |

### Calibrate from SLED Dialog

Enterprise Edition

This dialog allows you to calibrate a COCOMO constant from SLED.



Calibrate

**Calibrate COCOMO constant**

You must select at least two (sub)estimation to calibrate a COCOMO constant.

Connection preferences

Connection profile: MySQL

Selection criterias

Constant name: A

Current value: 0.0

Edit date: 03.06.2012

Description:

Calculate B □

Projects/Estimations

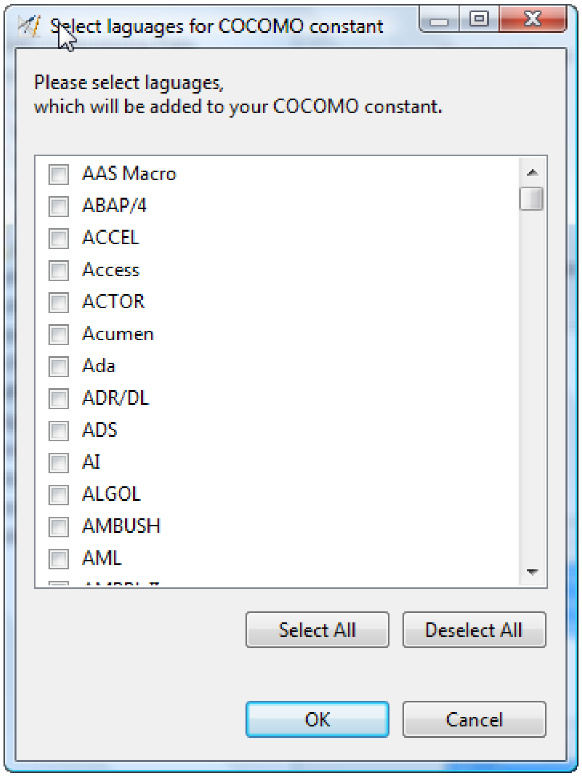
| | Begin date | End date | Project type | Pr |
|---|---|---|---|---|
| □ EnhancementProject | 24.06.2010 | 27.08.2010 | Application Project | En |
| □ Estimation RUP | 24.06.2010 | 27.08.2010 | | |
| □ Estimation RUP | | | | |
| □ SubEstimation I | | | | |
| □ SubEstimation II | | | | |
| □ SubEstimation III | | | | |
| □ DevelopmentProjectExample | 20.01.2010 | 30.04.2010 | Application Project | Ne |
| □ Project Plan Data I | 20.01.2010 | 30.04.2010 | | |
| □ Estimation I | | | | |
| □ SubEstimation I | | | | |

| Option | Description |
|---|---|
| Connection profile | Select a connection profile for a SLED database. Only connected profiles will be listed. |
| Selection criterias | A collection of selection criterias which work as filter for the visible SLED content. These criterias are selected in the previous dialog. |
| Calculate B | Enable this checkbox if you also want to calculate COCOMO Constant B. |
| Projects/Estimation | A collection of projects and estimations matching the filter criterias. Selected estimations in this list will define the base for COCOMO Constant calculation. |
| Calibrate | Perform the COCOMO Constant calibration. |
| Cancel | Cancel the request. |

### COCOMO Language Selection Dialog

Enterprise Edition

This dialog allows you to select one or more programming languages for COCOMO.



Select laguages for COCOMO constant

Please select laguages,
which will be added to your COCOMO constant.

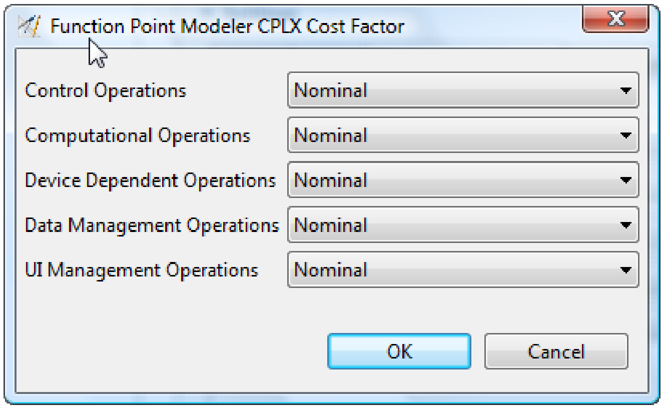
- ☐ AAS Macro
- ☐ ABAP/4
- ☐ ACCEL
- ☐ Access
- ☐ ACTOR
- ☐ Acumen
- ☐ Ada
- ☐ ADR/DL
- ☐ ADS
- ☐ AI
- ☐ ALGOL
- ☐ AMBUSH
- ☐ AML

| Option | Description |
|---|---|
| List of available programming languages. | Select one or more languages. |
| Select all | Selects all available entries in the list. |
| Deselect all | Deselects all available entries in the list. |
| OK | Accepts the selected entries. |
| Cancel | Cancels the request. |

### CPLX Cost Factor Dialog

Enterprise Edition

This dialog allows you to fine granular define the CPLX Cost Factor.



Function Point Modeler CPLX Cost Factor

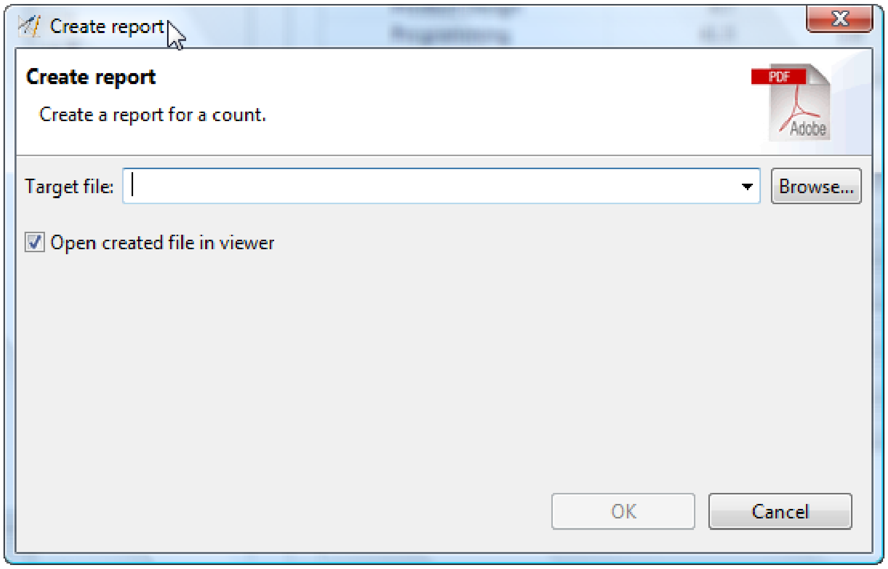
| | |
|---|---|
| Control Operations | Nominal |
| Computational Operations | Nominal |
| Device Dependent Operations | Nominal |
| Data Management Operations | Nominal |
| UI Management Operations | Nominal |

| Option | Description |
|---|---|
| Control operations | • Very low (Straight-line code with a few non-nested structured programming operators: DOs, CASEs, IFTHENELSEs. Simple module composition via procedure calls or simple scripts.)<br>• Low (Straightforward nesting of structured programming operators. Mostly simple predicates.)<br>• Nominal (Mostly simple nesting. Some intermodule control. Decision tables. Simple callbacks or message passing, including middleware-supported distributed processing.)<br>• High (Highly nested structured programming operators with many compound predicates. Queue and stack control. Homogeneous, distributed processing. Single processor soft real-time control.)<br>• Very High (Reentrant and recursive coding. Fixed-priority interrupt handling. Task synchronization, complex callbacks, heterogeneous distributed processing. Single-processor hard real-time control.)<br>• Extra High (Multiple resource scheduling with dynamically changing priorities. Microcode-level control. Distributed hard real-time control.) |
| Computational Operations | • Very low (Evaluation of simple expressions: e.g., A=B+C*(D-E))<br>• Low (Evaluation of moderate-level expressions: e.g., D=SQRT(B**2-4.*A*C))<br>• Nominal (Use of standard math and statistical routines. Basic matrix/vector operations.)<br>• High (Basic numerical analysis: multivariate interpolation, ordinary differential equations. Basic truncation, roundoff concerns.)<br>• Very High (Difficult but structured numerical analysis: near-singular matrix equations, partial differential equations. Simple parallelization.)<br>• Extra High (Difficult and unstructured numerical analysis: highly accurate analysis of noisy, stochastic data. Complex parallelization.) |
| Device Dependent Operations | • Very low (Simple read, write statements with simple formats.)<br>• Low (No cognizance needed of particular processor or I/O device characteristics. I/O done at GET/PUT level.)<br>• Nominal (I/O processing includes device selection, status checking and error processing.)<br>• High (Operations at physical I/O level (physical storage address translations; seeks, reads, etc.). Optimized I/O overlap.)<br>• Very High (Routines for interrupt diagnosis, servicing, masking. Communication line handling. Performance-intensive embedded systems.)<br>• Extra High (Device timing-dependent coding, micro-programmed operations. Performance-critical embedded systems.) |
| Data Management Operations | • Very low (Simple arrays in main memory. Simple COTS-DB queries, updates.)<br>• Low (Single file subsetting with no data structure changes, no edits, no intermediate files. Moderately complex COTS-DB queries, updates.)<br>• Nominal (Multi-file input and single file output. Simple structural changes, simple edits. Complex COTS-DB queries, updates.)<br>• High (Simple triggers activated by data stream contents. Complex data restructuring.)<br>• Very High (Distributed database coordination. Complex triggers. Search optimization.)<br>• Extra High (Highly coupled, dynamic relational and object structures. Natural language data management.) |
| UI Management Operations | • Very low (Simple input forms, report generators.)<br>• Low (Use of simple graphic user interface (GUI) builders.)<br>• Nominal (Simple use of widget set.) |

| Option | Description |
|---|---|
| | • High (Widget set development and extension. Simple voice I/O, multimedia.)<br>• Very High (Moderately complex 2D/3D, dynamic graphics, multimedia.)<br>• Extra High (Complex multimedia, virtual reality.) |

### Create Count Overview Dialog

This dialog allows you to create a PDF file for a Count Overview.



Create report

Create report

Create a report for a count.

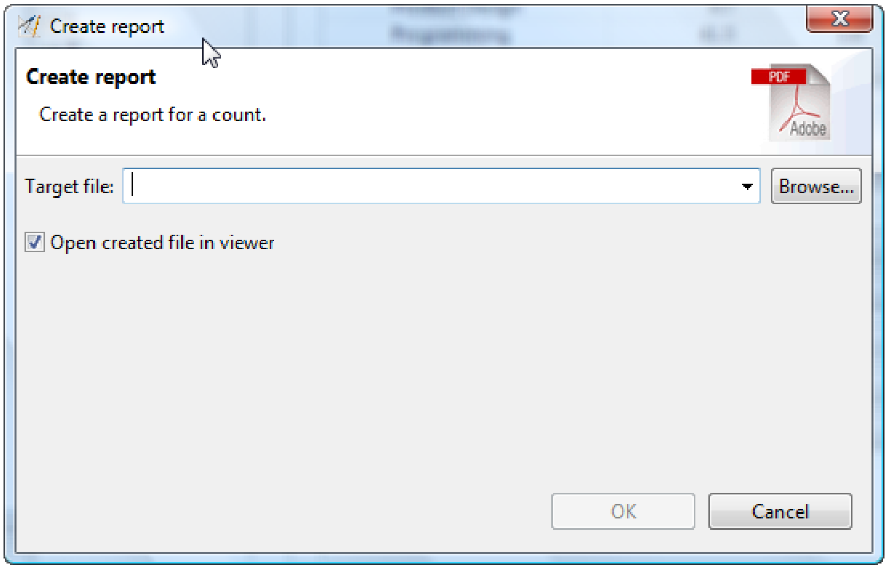
Target file:

☑ Open created file in viewer

| Option | Description |
|---|---|
| Target file | Specify the target file or select a previously selected location. |
| Browse | Browse for a target file location. |
| Open created file in viewer | If selected, the file will be automatically opened with the corresponding viewer after creation. |
| Cancel | Cancel the request. |

### Create Count Structure Dialog

This dialog allows you to create a PDF file for a Count Structure.



Create report

Create a report for a count.

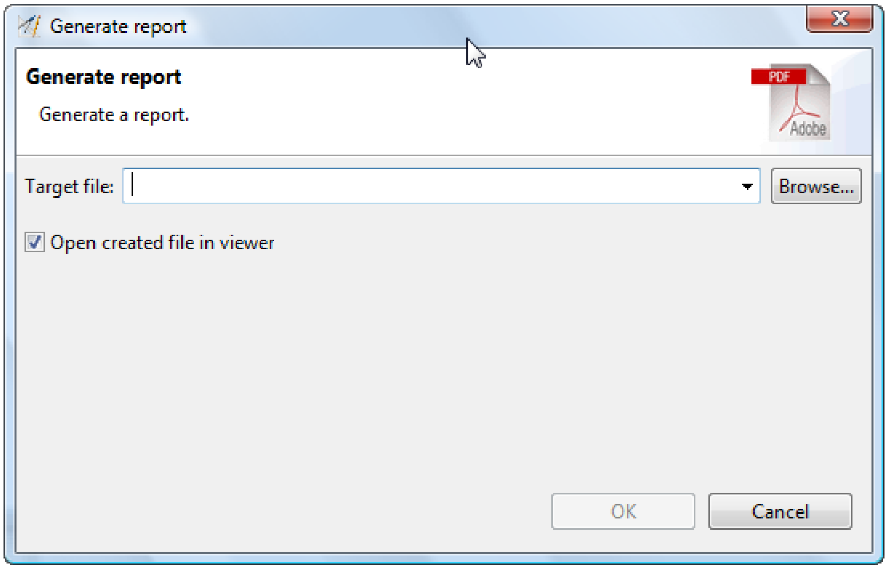
Target file:

☑ Open created file in viewer

| Option | Description |
|---|---|
| Target file | Specify the target file or select a previously selected location. |
| Browse | Browse for a target file location. |
| Open created file in viewer | If selected, the file will be automatically opened with the corresponding viewer after creation. |
| Cancel | Cancel the request. |

### Create PDF Dialog

This dialog allows you to create a PDF file for a report designer file.



Generate report

Generate a report.

Target file:

☑ Open created file in viewer

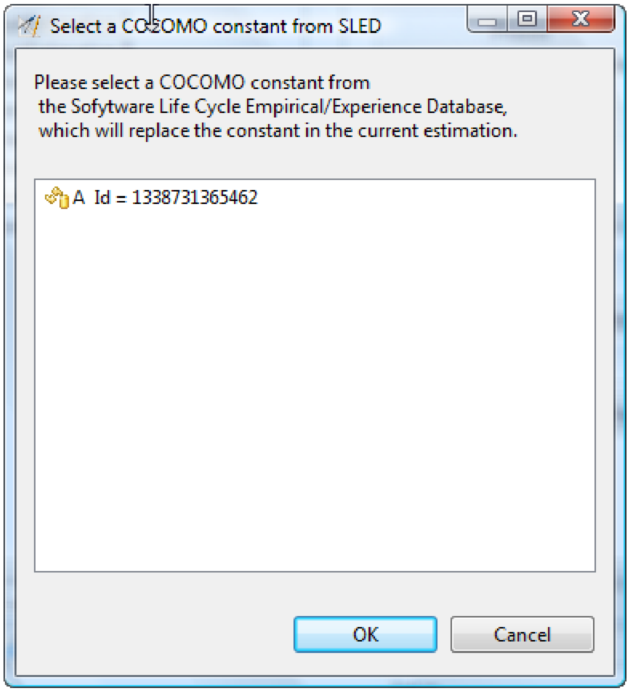
| Option | Description |
|---|---|
| Target file | Specify the target file or select a previously selected location. |
| Browse | Browse for a target file location. |
| Open created file in viewer | If selected, the file will be automatically opened with the corresponding viewer after creation. |

| Option | Description |
|---|---|
| Cancel | Cancel the request. |

### Constant Selection Dialog

Enterprise Edition

This dialog allows you to select a COCOMO constant as replacement for a previously selected constant.



Select a COCOMO constant from SLED

Please select a COCOMO constant from
the Sofytware Life Cycle Empirical/Experience Database,
which will replace the constant in the current estimation.

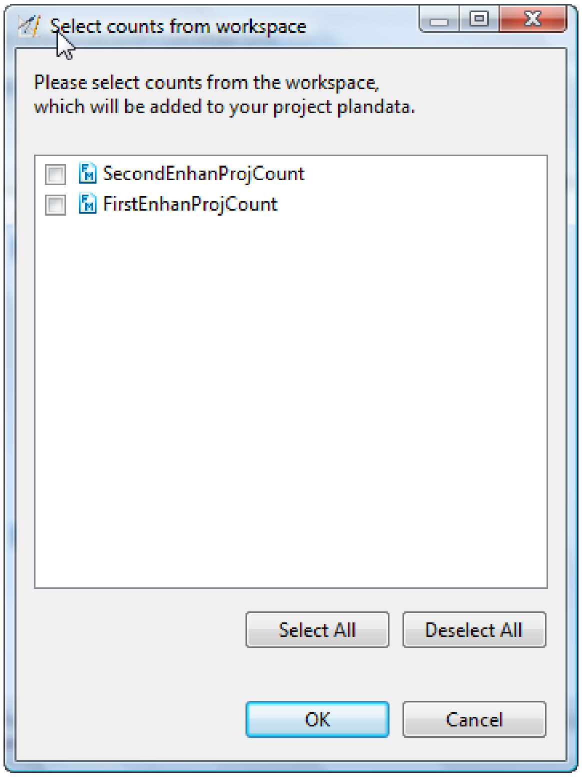
A Id = 1338731365462

| Option | Description |
|---|---|
| COCOMO Constants | A collection of available COCOMO Constants. |
| OK | Accepts the selected COCOMO Constant. |
| Cancel | Cancels the request. |

### Count Selection Dialog

Enterprise Edition

This dialog allows you to select an existing **Count** from the workspace.



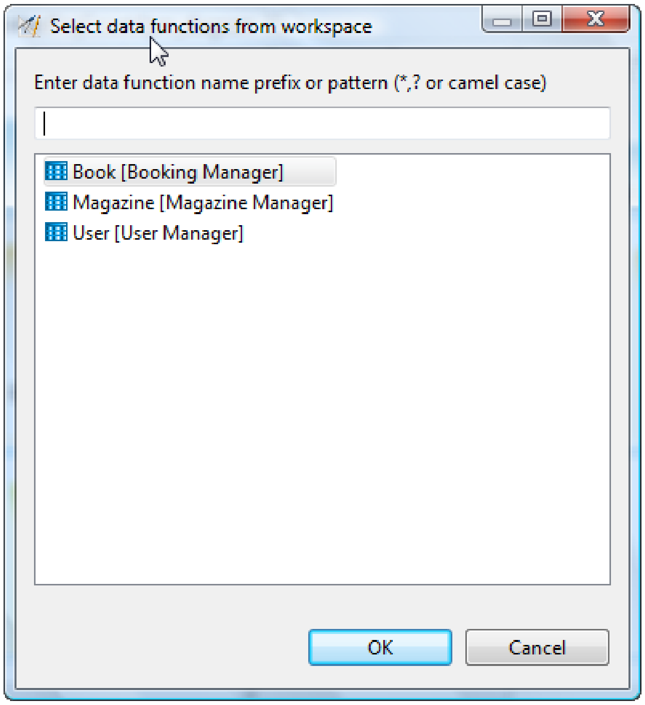
Please select counts from the workspace,
which will be added to your project plandata.

- □ SecondEnhanProjCount
- □ FirstEnhanProjCount

| Option | Description |
|---|---|
| List of available **Counts** | Select one or more Counts from the list of available entries. |
| Select all | Selects all available Counts. |
| Deselect all | Deselects all available Counts. |
| OK | Accepts the selected Counts. |
| Cancel | Cancels the request. |

### Data Function Selection Dialog

This dialog allows you to select an exsisting **Data Function** from the workspace.



Select data functions from workspace

Enter data function name prefix or pattern (*,? or camel case)

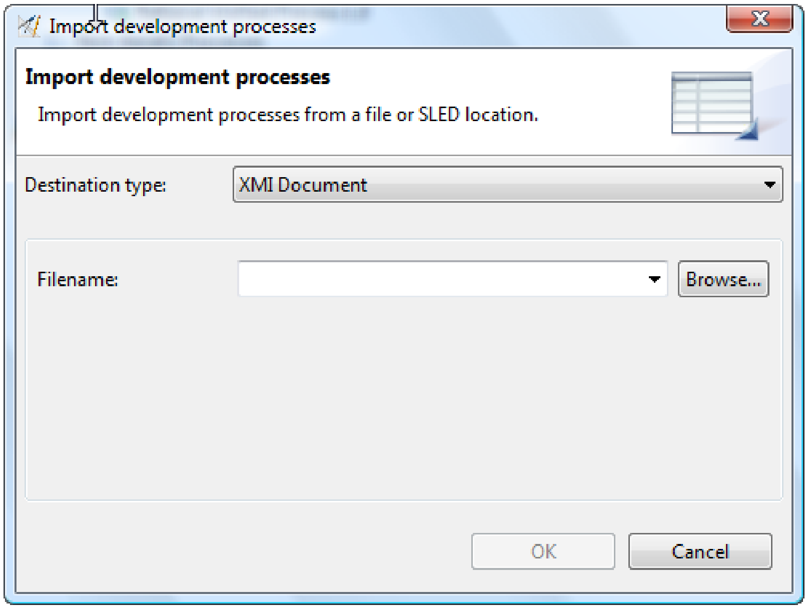
- Book [Booking Manager]
- Magazine [Magazine Manager]
- User [User Manager]

| Option | Description |
|---|---|
| Filter criteria | Enter a Data Function prefix or a pattern (*, ? or camel case). The list of Data Functions will be refreshed, matching your input. |
| List of matching **Data Functions** | Select a Data Function from the list of available functions. |
| OK | Accepts the selected Data Function. |
| Cancel | Cancels the request. |

### Development Process Import Dialog

Enterprise Edition

This dialog allows you to import Development Processes from an XMI File or a SLED location.


Import development processes
Import development processes
Import development processes from a file or SLED location.
Destination type:
XMI Document
Filename:
Browse...
OK
Cancel

| Option | Description |
|---|---|
| Destination type | Select the destination type for import (XMI or SLED). |
| OK | Perform the import process. |
| Cancel | Cancels the request. |

### XMI Document

| Option | Description |
|---|---|
| Filename | Specify the XMI file location or select a previously selected entry. |
| Browse | Browse for a XMI file location. |

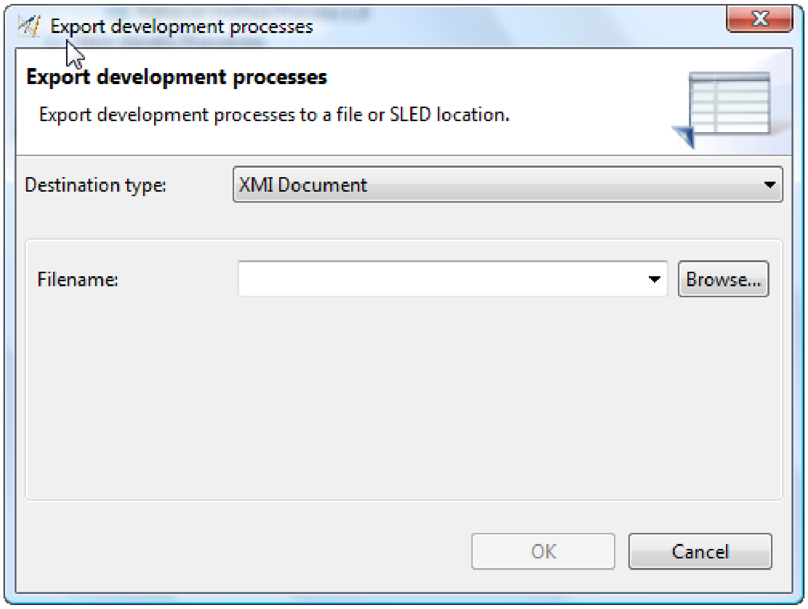
### Database

| Option | Description |
|---|---|
| Connection profile | Select a connection profile. Only connected profiles are available for selection. |

### Development Process Export Dialog

Enterprise Edition

This dialog allows you to export Development Processes to an XMI File or a SLED location.



Export development processes

**Export development processes**

Export development processes to a file or SLED location.

Destination type: XMI Document

Filename:

| Option | Description |
|---|---|
| Destination type | Select the destination type for export (XMI or SLED). |
| OK | Perform the export process. |
| Cancel | Cancels the request. |

### XMI Document

| Option | Description |
|---|---|
| Filename | Specify the XMI file location or select a previously selected entry. |
| Browse | Browse for a XMI file location. |

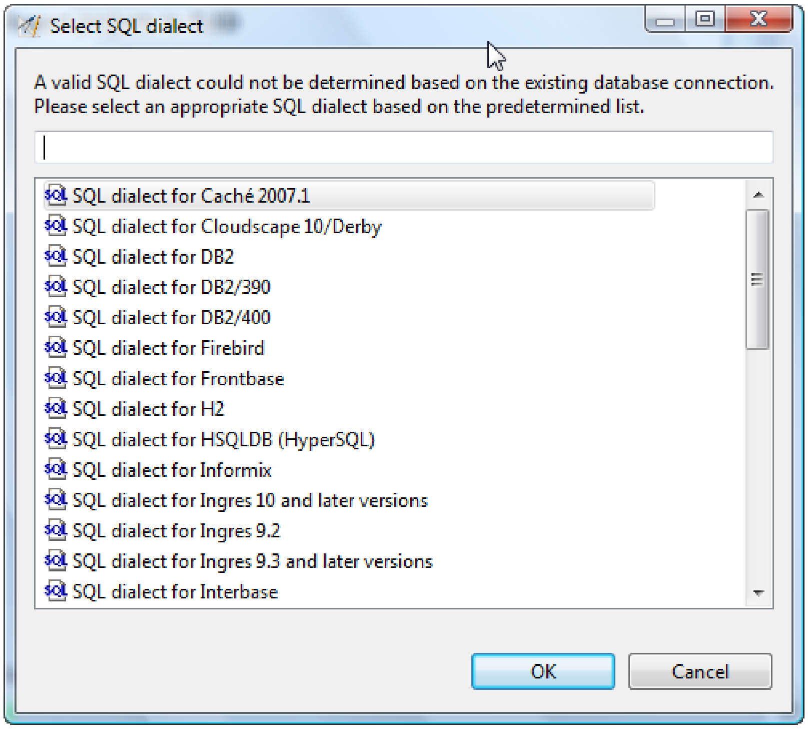
### Database

| Option | Description |
|---|---|
| Connection profile | Select a connection profile. Only connected profiles are available for selection. |

### Dialect Selection Dialog

Enterprise Edition

This dialog allows you to specify a SQL dialect for a SLED operation.



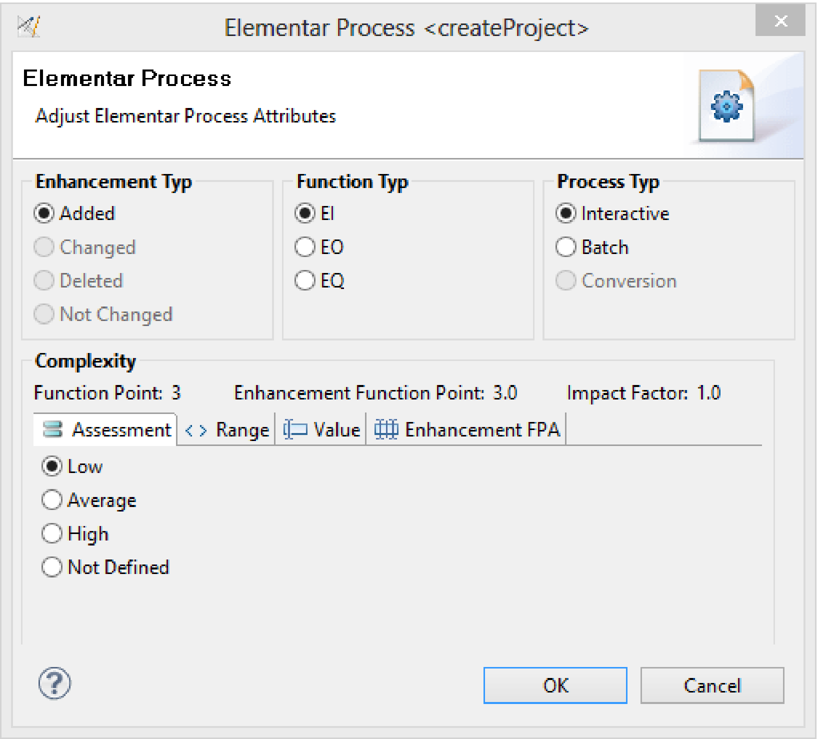
A valid SQL dialect could not be determined based on the existing database connection. Please select an appropriate SQL dialect based on the predetermined list.

- SQL dialect for Caché 2007.1
- SQL dialect for Cloudscape 10/Derby
- SQL dialect for DB2
- SQL dialect for DB2/390
- SQL dialect for DB2/400
- SQL dialect for Firebird
- SQL dialect for Frontbase
- SQL dialect for H2
- SQL dialect for HSQLDB (HyperSQL)
- SQL dialect for Informix
- SQL dialect for Ingres 10 and later versions
- SQL dialect for Ingres 9.2
- SQL dialect for Ingres 9.3 and later versions
- SQL dialect for Interbase

| Option | Description |
|---|---|
| Filter criteria | Enter a SQL dialect prefix. The list of dialects will be refreshed, matching your input. |
| List of matching **SQL Dialects** | Select a SQL dialect from the list of available dialects. |
| OK | Accepts the selected dialect. |
| Cancel | Cancels the request. |

### Elementar Process Adjustment Dialog

This dialog allows you to adjust elementar process properties.



Elementar Process <createProject>

**Elementar Process**

Adjust Elementar Process Attributes

**Enhancement Typ**
- ● Added
- ○ Changed
- ○ Deleted
- ○ Not Changed

**Function Typ**
- ● EI
- ○ EO
- ○ EQ

**Process Typ**
- ● Interactive
- ○ Batch
- ○ Conversion

**Complexity**

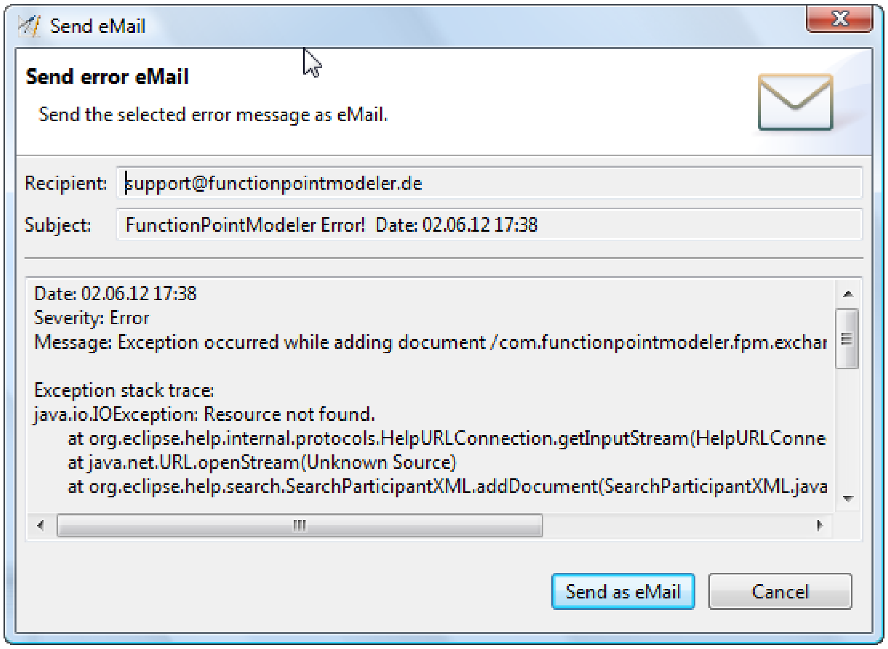
Function Point: 3 Enhancement Function Point: 3.0 Impact Factor: 1.0

- ● Low
- ○ Average
- ○ High
- ○ Not Defined

| Option | Description |
|---|---|
| Enhancement Typ | Select the corresponding enhancement typ for this elementar process. |
| Function Typ | Select the corresponding function typ for this elementar process. |
| Process Typ | Select the corresponding process typ for this elementar process. |
| Complexity | Specify the complexity in form of assessment, range or value and adjust settings for enhanced functionpoints. |
| OK | Accepts the selected values. |
| Cancel | Cancels the request. |

### Error eMail Dialog

This dialog allows you to send an application error as eMail information.



**Send error eMail**

Send the selected error message as eMail.

Recipient: support@functionpointmodeler.de

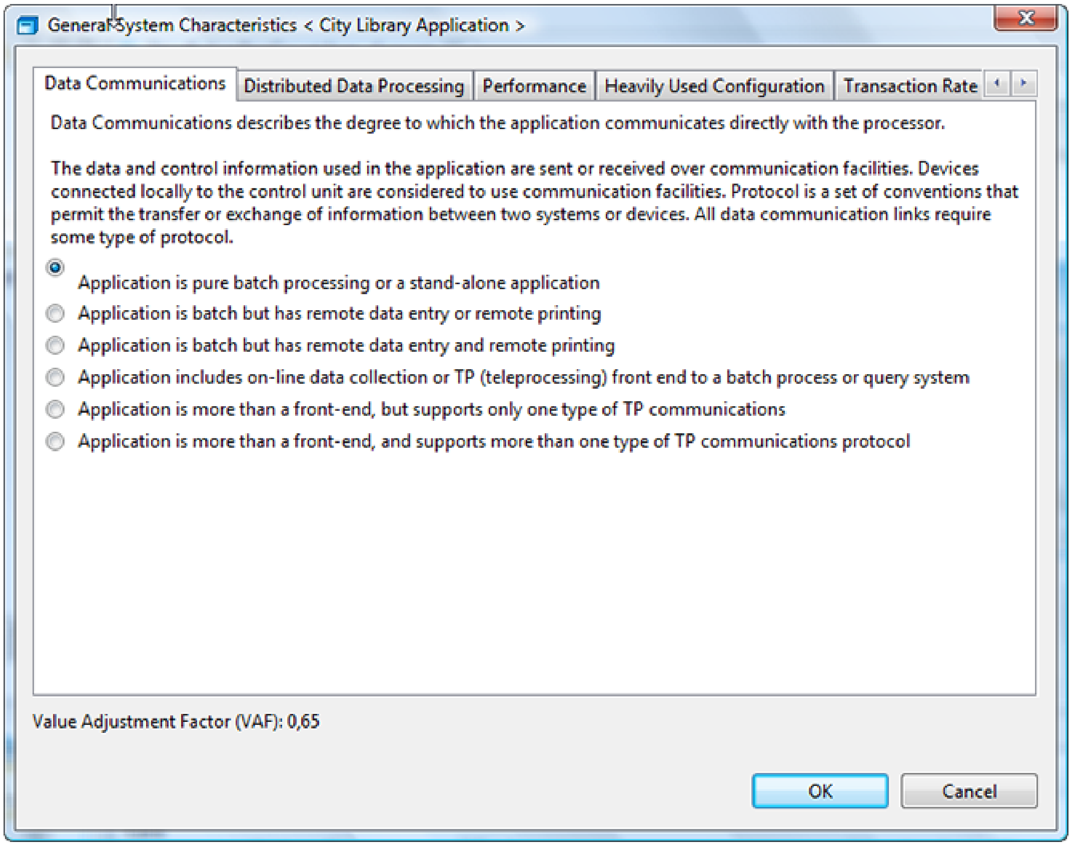
Subject: FunctionPointModeler Error!  Date: 02.06.12 17:38

```
Date: 02.06.12 17:38
Severity: Error
Message: Exception occurred while adding document /com.functionpointmodeler.fpm.exchar

Exception stack trace:
java.io.IOException: Resource not found.
    at org.eclipse.help.internal.protocols.HelpURLConnection.getInputStream(HelpURLConne
    at java.net.URL.openStream(Unknown Source)
    at org.eclipse.help.search.SearchParticipantXML.addDocument(SearchParticipantXML.java
```

| Option | Description |
|---|---|
| Recipient | Information about the eMail recipient. |
| Subject | Information about the eMail subject. |
| eMail Text | Information about the eMail text/content. |
| Send as eMail | Sends this application error as eMail to the specified recipient. |
| Cancel | Cancels the request. |

### General System Characteristics Dialog

This dialog allows you to adjust the general system characteristics for a count.


General System Characteristics < City Library Application >
Data Communications
Distributed Data Processing
Performance
Heavily Used Configuration
Transaction Rate
OK
Cancel

Data Communications describes the degree to which the application communicates directly with the processor.

The data and control information used in the application are sent or received over communication facilities. Devices connected locally to the control unit are considered to use communication facilities. Protocol is a set of conventions that permit the transfer or exchange of information between two systems or devices. All data communication links require some type of protocol.

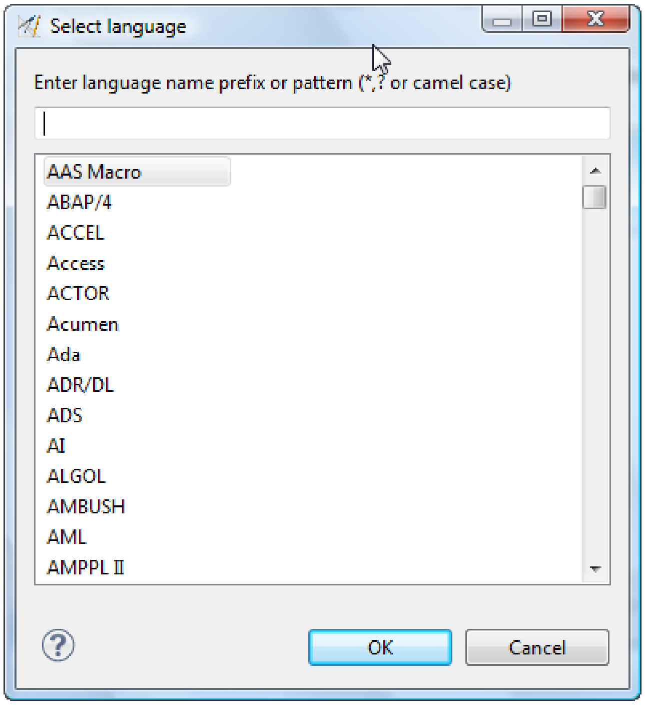
- ● Application is pure batch processing or a stand-alone application
- ○ Application is batch but has remote data entry or remote printing
- ○ Application is batch but has remote data entry and remote printing
- ○ Application includes on-line data collection or TP (teleprocessing) front end to a batch process or query system
- ○ Application is more than a front-end, but supports only one type of TP communications
- ○ Application is more than a front-end, and supports more than one type of TP communications protocol

Value Adjustment Factor (VAF): 0,65

| Option | Description |
|---|---|
| Data communications | How many communication facilities are there to aid in the transfer or exchange of information with the application or system? |
| Distributed data processing | How are distributed data and processing functions handled? |
| Performance | Was response time or throughput required by the user? |
| Heavily used configuration | How heavily used is the current hardware platform where the application will be executed? |
| Transaction rate | How frequently are transactions executed daily, weekly, monthly, etc.? |
| On-Line data entry | What percentage of the information is entered On-Line? |
| End-user efficiency | Was the application designed for end-user efficiency? |
| On-Line update | How many ILF’s are updated by On-Line transaction? |
| Complex processing | Does the application have extensive logical or mathematical processing? |
| Reusability | Was the application developed to meet one or many user’s needs? |
| Installation ease | How difficult is conversion and installation? |
| Operational ease | How effective and/or automated are start-up, back-up, and recovery procedures? |
| Multiple sites | Was the application specifically designed, developed, and supported to be installed at multiple sites for multiple organizations? |
| Facilitate change | Was the application specifically designed, developed, and supported to facilitate change? |
| OK | Accepts the selected values. |
| Cancel | Cancels the request. |

### Language Selection Dialog

This dialog allows you to select an existing **Language** from the workspace.



Select language

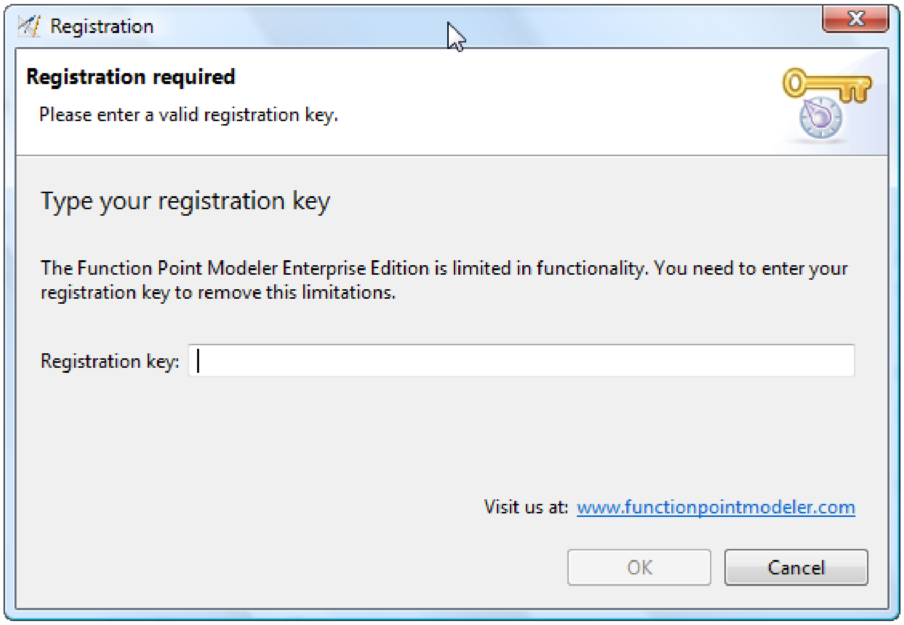
Enter language name prefix or pattern (*,? or camel case)

| Option | Description |
|---|---|
| Filter criteria | Enter a Language prefix or a pattern (*, ? or camel case). The list of Languages will be refreshed, matching your input. |
| List of matching **Languages** | Select a Language from the list of available Languages. |
| OK | Accepts the selected Language. |
| Cancel | Cancels the request. |

### License Warning Dialog

Enterprise Edition

This dialog allows you to register your Application Version. This dialog will only pop-up in Enterprise Edition when a predefined number of Functionpoints exceeds while counting a system.



Registration

**Registration required**

Please enter a valid registration key.

Type your registration key

The Function Point Modeler Enterprise Edition is limited in functionality. You need to enter your registration key to remove this limitations.

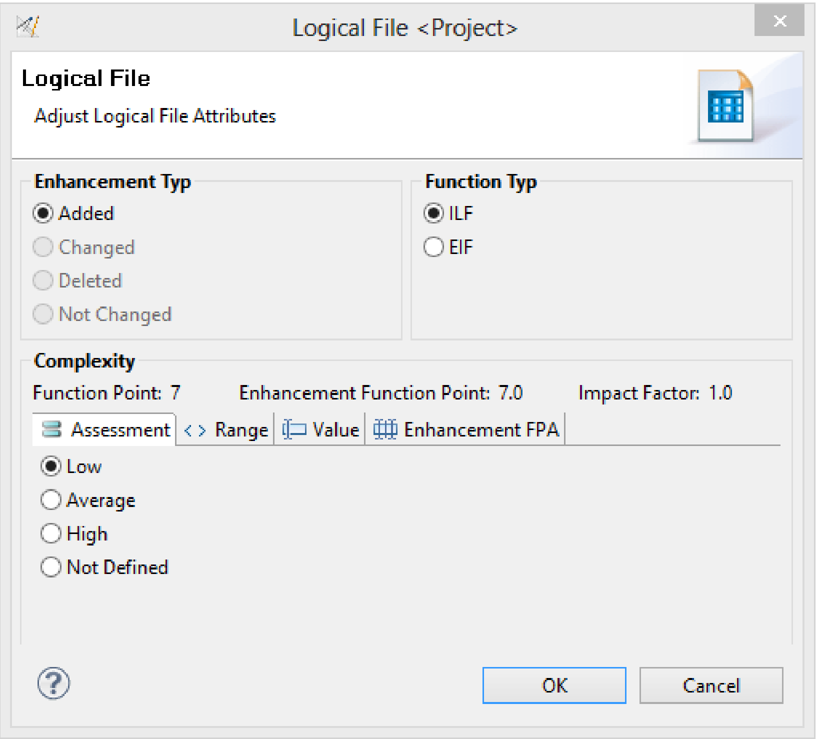
Registration key:

Visit us at: www.functionpointmodeler.com

| Option | Description |
|---|---|
| Registration key | Enter a valid registration key at this location. |
| OK | Perform the registration process. |
| Cancel | Cancels the request. |

### Logical File Adjustment Dialog

This dialog allows you to adjust logical file properties.



Logical File <Project>

**Logical File**

Adjust Logical File Attributes

**Enhancement Typ**

● Added
○ Changed
○ Deleted
○ Not Changed

**Function Typ**

● ILF
○ EIF

**Complexity**

Function Point: 7    Enhancement Function Point: 7.0    Impact Factor: 1.0

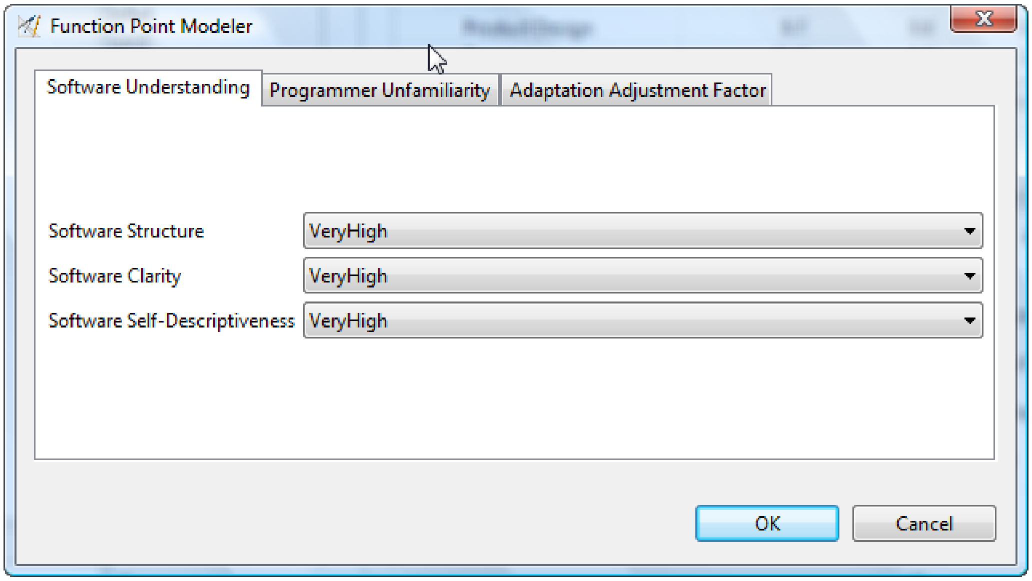
● Low
○ Average
○ High
○ Not Defined

| Option | Description |
|---|---|
| Enhancement Typ | Select the corresponding enhancement typ for this logical file. |
| Function Typ | Select the corresponding function typ for this logical file. |
| Complexity | Specify the complexity in form of assessment, range or value and adjust settings for enhanced functionpoints. |
| OK | Accepts the selected values. |
| Cancel | Cancels the request. |

### Maintenanced Software Dialog

Enterprise Edition

This dialog allows you to to adjust the **Maintenanced Adjustment Factor** based on some settings for relevant properties.



Software Structure: VeryHigh

Software Clarity: VeryHigh

Software Self-Descriptiveness: VeryHigh

### Software Understanding

| Option | Description |
|---|---|
| Software Structure | Understanding increpements for structure<br>• Very low (very low cohesion, high coupling, spaghetti code)<br>• Low (moderately low cohesion, high coupling)<br>• Nominal (reasonably well structured, some weak areas)<br>• High (high cohesion, low coupling)<br>• Very High (strong modularity, information hiding in data/control structure) |
| Software Clarity | Understanding increments for application clarity<br>• Very low (no match between program and application worldviews)<br>• Low (some correlation between program and application)<br>• Nominal (moderate correlation between program and application)<br>• High (good correlation between program and application) |

| Option | Description |
|---|---|
| | • Very High (clear match between program and application worldviews) |
| Software Self-Descriptiveness | Understanding increments for self-descriptiveness<br>• Very low (no match between program and application worldviews)<br>• Low (some correlation between program and application)<br>• Nominal (moderate correlation between program and application)<br>• High (good correlation between program and application)<br>• Very High (clear match between program and application worldviews) |

### Programmer Unfamiliarity

| Option | Description |
|---|---|
| Rating Scala | • Completely familiar<br>• Most familiar<br>• Somewhat familiar<br>• Considerably familiar<br>• Mostly unfamiliar<br>• Completely unfamiliar |

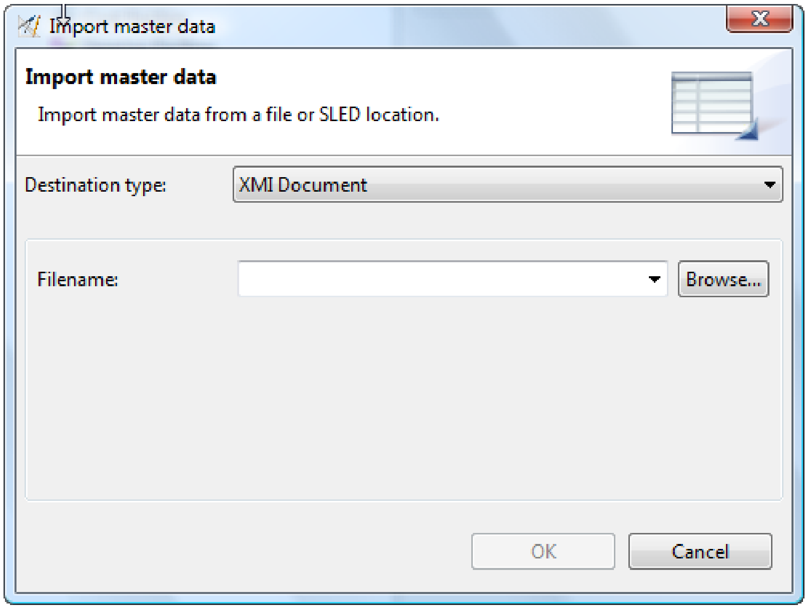
### Adaption Adjustment Factor

| Option | Description |
|---|---|
| Percent Design Modified | Percentage of modified application design |
| Percent Code Modified | Percentage of modified application code |
| Percent of Integration required for adaptable software | Percent of Integration required for adaptable software |

### Masterdata Import Dialog

Enterprise Edition

This dialog allows you to import COCOMO Masterdata from an XMI File or a SLED location.



Import master data

Import master data

Import master data from a file or SLED location.

Destination type: XMI Document

Filename:

| Option | Description |
|---|---|
| Destination type | Select the destination type for import (XMI or SLED). |
| OK | Perform the import process. |
| Cancel | Cancels the request. |

### XMI Document

| Option | Description |
|---|---|
| Filename | Specify the XMI file location or select a previously selected entry. |
| Browse | Browse for a XMI file location. |

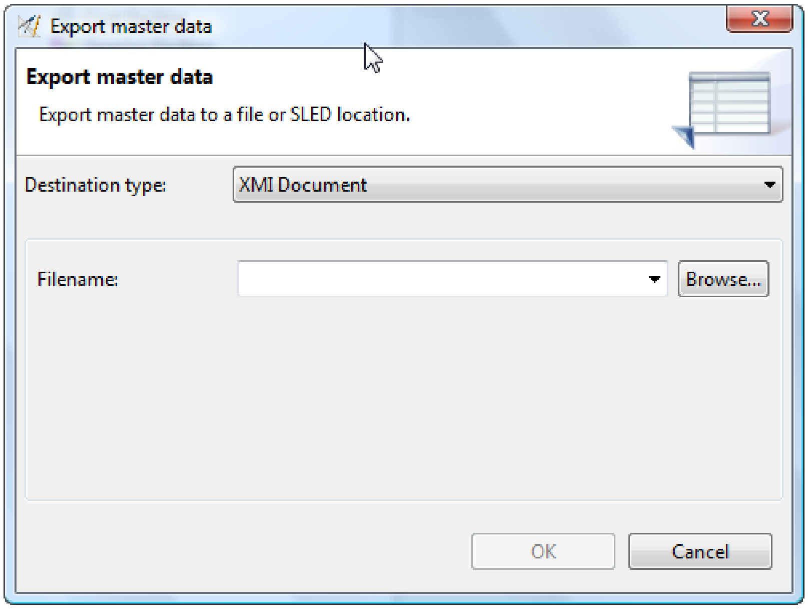
### Database

| Option | Description |
|---|---|
| Connection profile | Select a connection profile. Only connected profiles are available for selection. |

### Masterdata Export Dialog

Enterprise Edition

This dialog allows you to export COCOMO Masterdata to an XMI File or a SLED location.



| Option | Description |
|---|---|
| Destination type | Select the destination type for export (XMI or SLED). |
| OK | Perform the export process. |
| Cancel | Cancels the request. |

### XMI Document

| Option | Description |
|---|---|
| Filename | Specify the XMI file location or select a previously selected entry. |
| Browse | Browse for a XMI file location. |

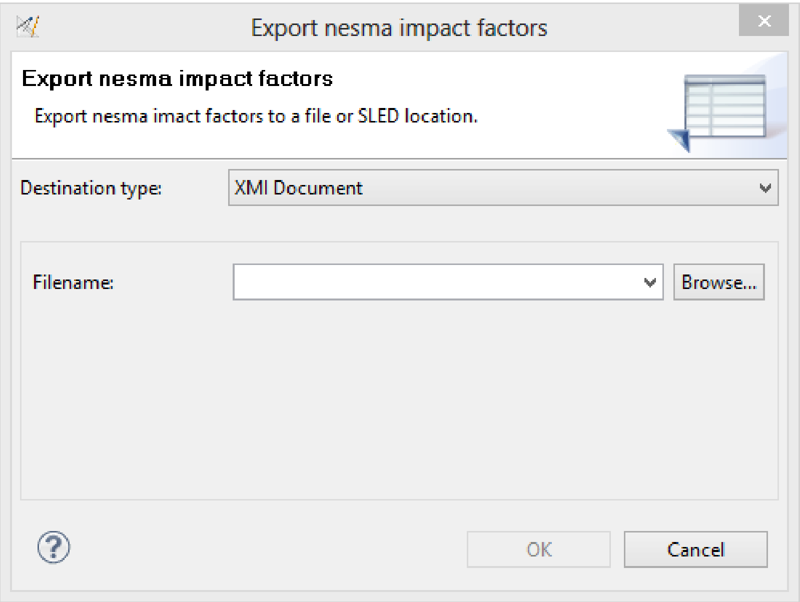
### Database

| Option | Description |
|---|---|
| Connection profile | Select a connection profile. Only connected profiles are available for selection. |

### NESMA Impact Factor Export Dialog

Enterprise Edition

This dialog allows you to export NESMA Impact Factors to an XMI File or a SLED location.


Export nesma impact factors

**Export nesma impact factors**

Export nesma imact factors to a file or SLED location.

Destination type: XMI Document

Filename:

| Option | Description |
|---|---|
| Destination type | Select the destination type for export (XMI or SLED). |
| OK | Perform the export process. |
| Cancel | Cancels the request. |

### XMI Document

| Option | Description |
|---|---|
| Filename | Specify the XMI file location or select a previously selected entry. |
| Browse | Browse for a XMI file location. |

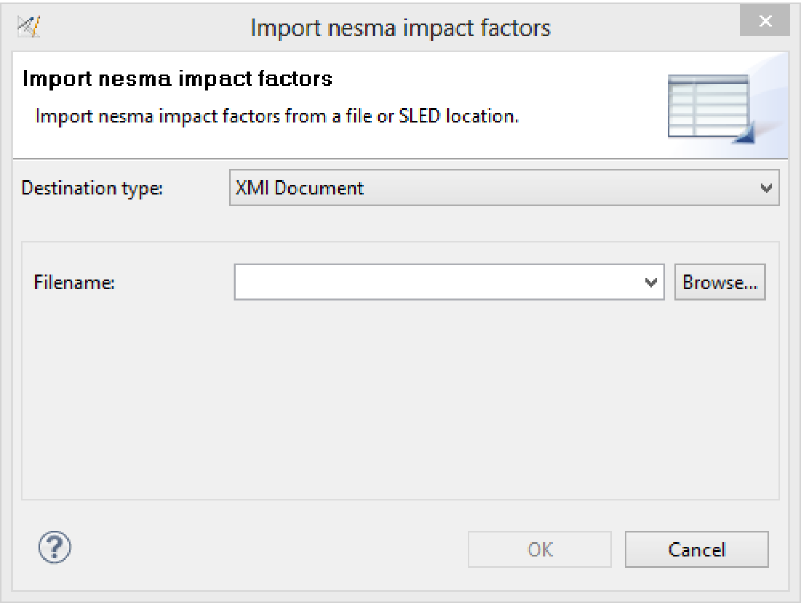
### Database

| Option | Description |
|---|---|
| Connection profile | Select a connection profile. Only connected profiles are available for selection. |

## NESMA Impact Factor Import Dialog

Enterprise Edition

This dialog allows you to import NESMA Impact Factors from an XMI File or a SLED location.



Import nesma impact factors

**Import nesma impact factors**

Import nesma impact factors from a file or SLED location.

Destination type: XMI Document

Filename:

| Option | Description |
|---|---|
| Destination type | Select the destination type for import (XMI or SLED). |
| OK | Perform the import process. |
| Cancel | Cancels the request. |

### XMI Document

| Option | Description |
|---|---|
| Filename | Specify the XMI file location or select a previously selected entry. |
| Browse | Browse for a XMI file location. |

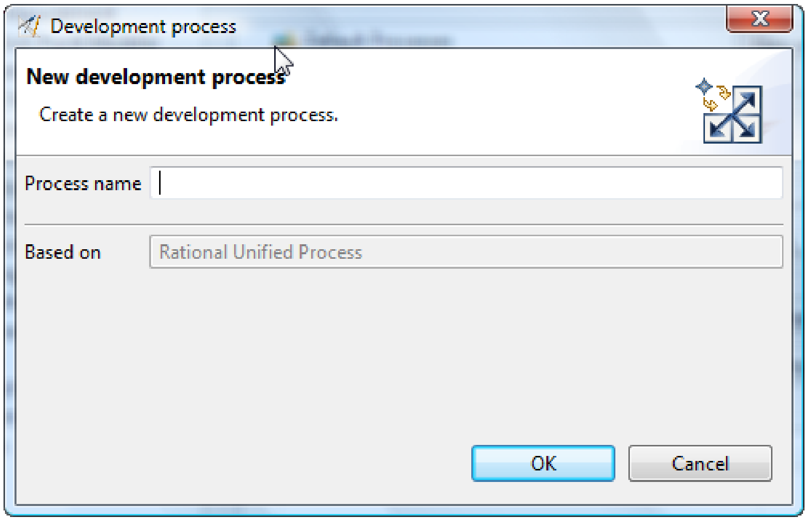
### Database

| Option | Description |
|---|---|
| Connection profile | Select a connection profile. Only connected profiles are available for selection. |

### New Process Dialog

Enterprise Edition

This dialog allows you to create a new Development Process


Development process

New development process

Create a new development process.

Process name

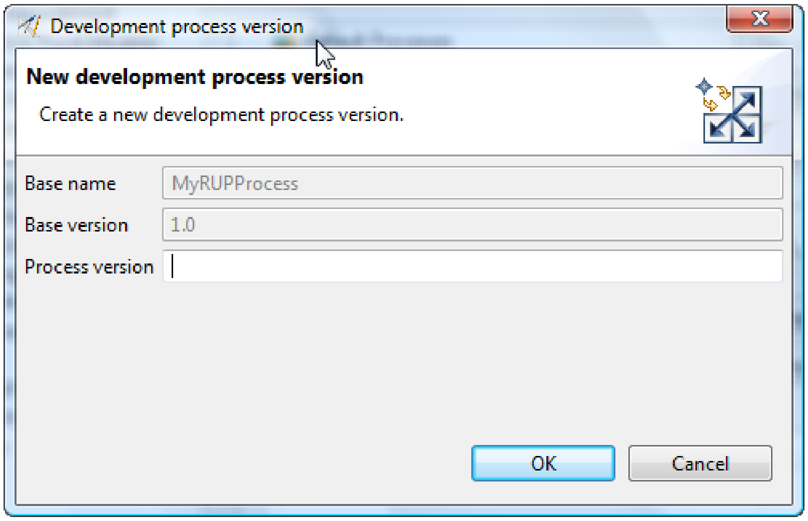
Based on: Rational Unified Process

| Option | Description |
|---|---|
| Process name | Edit the name for the development process. |
| Based on | Information about the base process for this new process. |
| OK | Accepts the changes. |
| Cancel | Cancels the request. |

### New Process Version Dialog

Enterprise Edition

This dialog allows you to create a new Development Process Version


Development process version

New development process version

Create a new development process version.

Base name: MyRUPProcess

Base version: 1.0

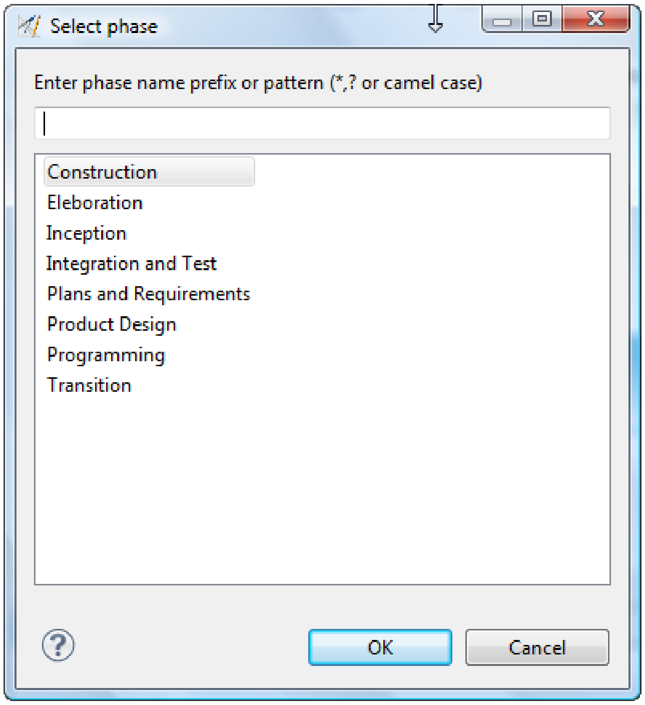
Process version

| Option | Description |
|---|---|
| Based name | Information about the base process for this new process version. |
| Based version | Information about the base process version for this new process version. |
| Process version | Edit the name for the development process version. |

| Option | Description |
|---|---|
| OK | Accepts the changes. |
| Cancel | Cancels the request. |

### Phase Selection Dialog

This dialog allows you to select an existing **Phase** from the workspace.



Select phase

Enter phase name prefix or pattern (*,? or camel case)

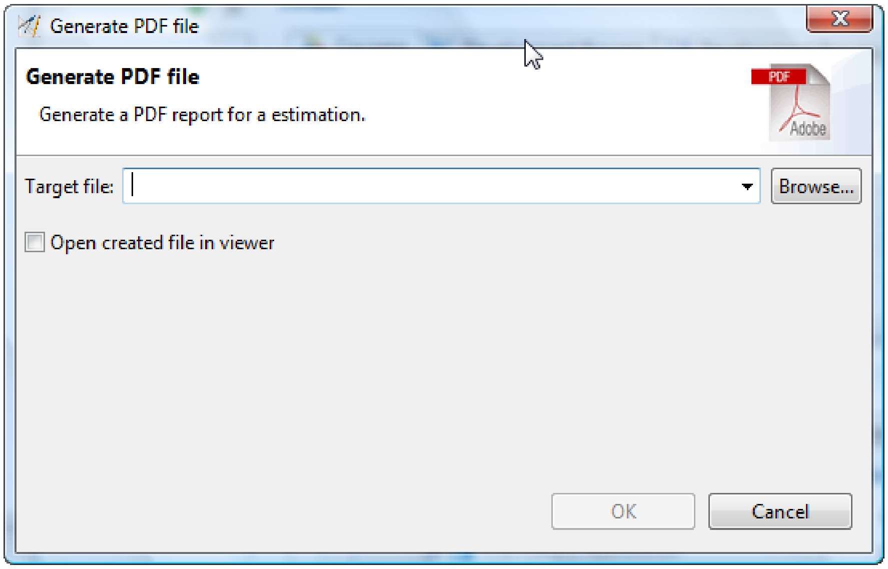
Construction
Eleboration
Inception
Integration and Test
Plans and Requirements
Product Design
Programming
Transition

| Option | Description |
|---|---|
| Filter criteria | Enter a Phase prefix or a pattern (*, ? or camel case). The list of Phases will be refreshed, matching your input. |
| List of matching **Phases** | Select a Phase from the list of Phases. |
| OK | Accepts the selected Phase. |
| Cancel | Cancels the request. |

### PDF Estimation Dialog

Enterprise Edition

This dialog allows you to create a PDF file for an estimation.



Generate PDF file

**Generate PDF file**

Generate a PDF report for a estimation.

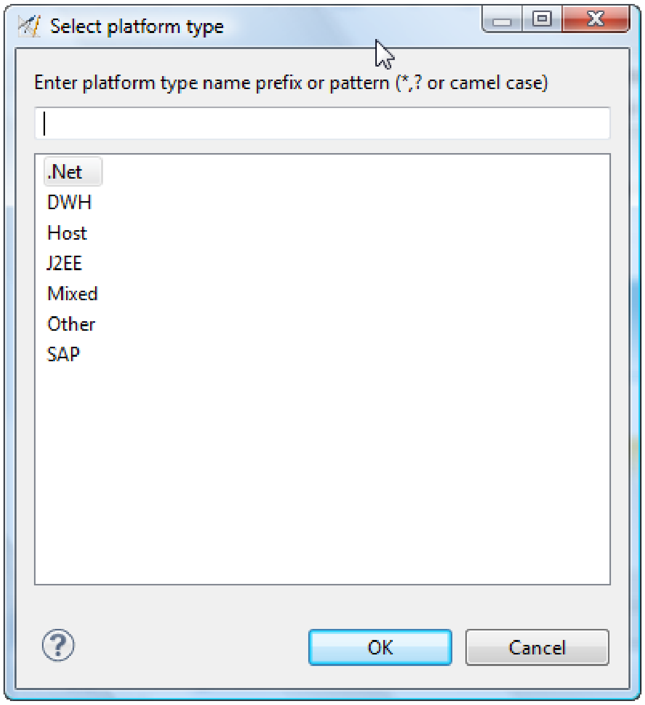
Target file:

☐ Open created file in viewer

| Option | Description |
|---|---|
| Target file | Specify the target file or select a previously selected location. |
| Browse | Browse for a target file location. |
| Open created file in viewer | If selected, the file will be automatically opened with the corresponding viewer after creation. |
| Cancel | Cancel the request. |

### Platform Type Selection Dialog

This dialog allows you to select an existing **Platform Type** from the workspace.



Select platform type

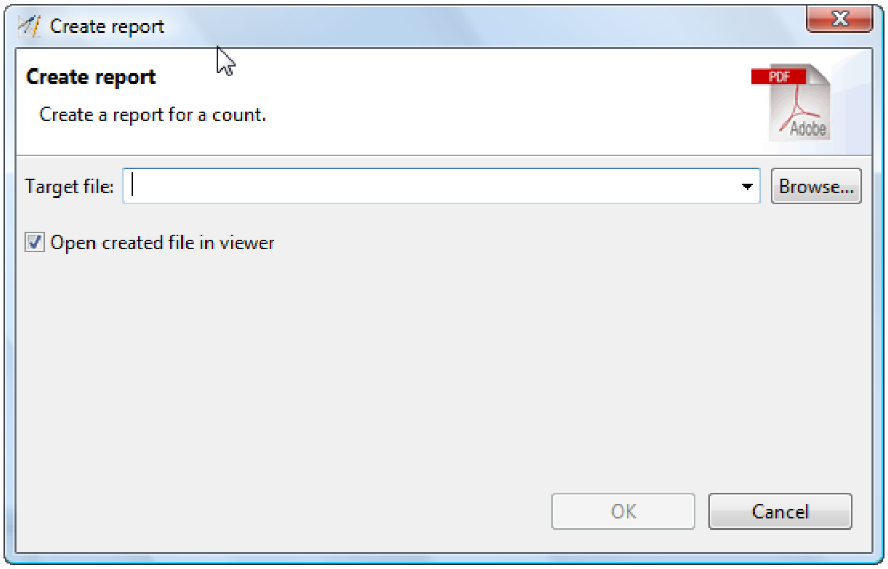
Enter platform type name prefix or pattern (*,? or camel case)

- .Net
- DWH
- Host
- J2EE
- Mixed
- Other
- SAP

| Option | Description |
|---|---|
| Filter criteria | Enter a Platform Type prefix or a pattern (*, ? or camel case). The list of Platform Types will be refreshed, matching your input. |
| List of matching **Platform Types** | Select a Platform Type from the list of available Types. |
| OK | Accepts the selected Platform Type. |
| Cancel | Cancels the request. |

### Release Value Adjustment Factor Dialog

This dialog allows you to create a PDF file for a Release Value Adjustment Factor.



**Create report**

Create a report for a count.

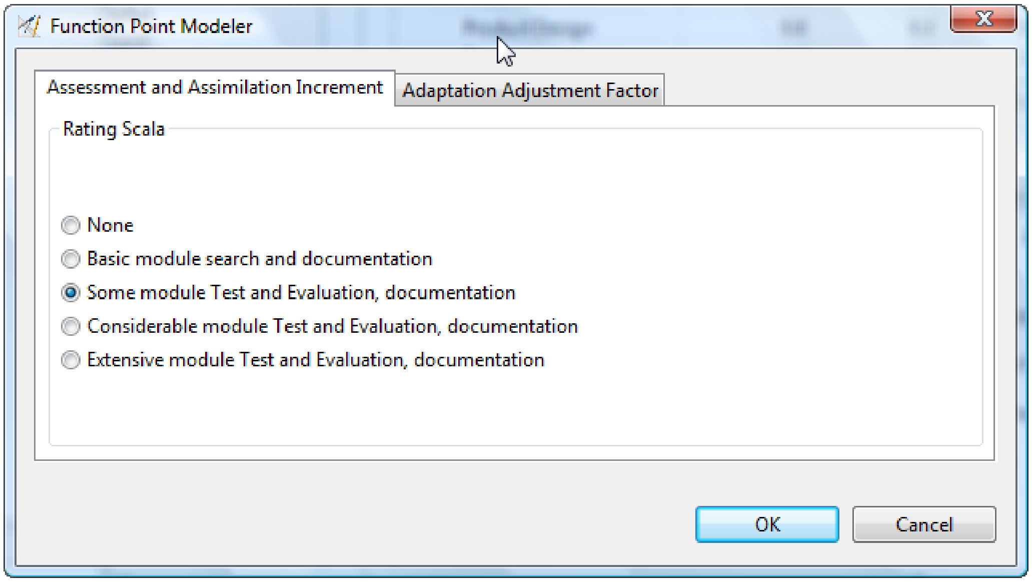
☑ Open created file in viewer

| Option | Description |
|---|---|
| Target file | Specify the target file or select a previously selected location. |
| Browse | Browse for a target file location. |
| Open created file in viewer | If selected, the file will be automatically opened with the corresponding viewer after creation. |
| Cancel | Cancel the request. |

### Reused Software Dialog

Enterprise Edition

This dialog allows you to to adjust the **Reused Adjustment Factor** based on some settings for relevant properties.


Function Point Modeler
Assessment and Assimilation Increment
Adaptation Adjustment Factor
OK
Cancel

Rating Scala

○ None
○ Basic module search and documentation
● Some module Test and Evaluation, documentation
○ Considerable module Test and Evaluation, documentation
○ Extensive module Test and Evaluation, documentation

### Assessment and Assimilation Increment

| Option | Description |
|---|---|
| Rating Scala | • None<br>• Basic module search and documentation<br>• Some module test and evaluation, documentation<br>• Considerable module test and evaluation, documentation<br>• Extensive module test and evaluation, documentation |

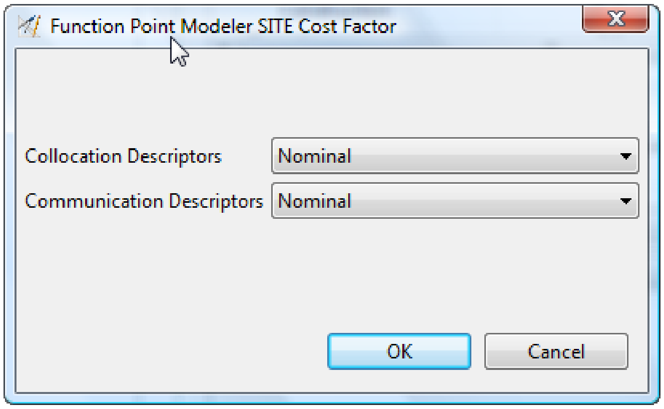
### Adaption Adjustment Factor

| Option | Description |
|---|---|
| Percent of Integration required for adaptable software | Percent of Integration required for adaptable software |

### SITE Cost Factor Dialog

Enterprise Edition

This dialog allows you to fine granular define the SITE Cost Factor.



Function Point Modeler SITE Cost Factor

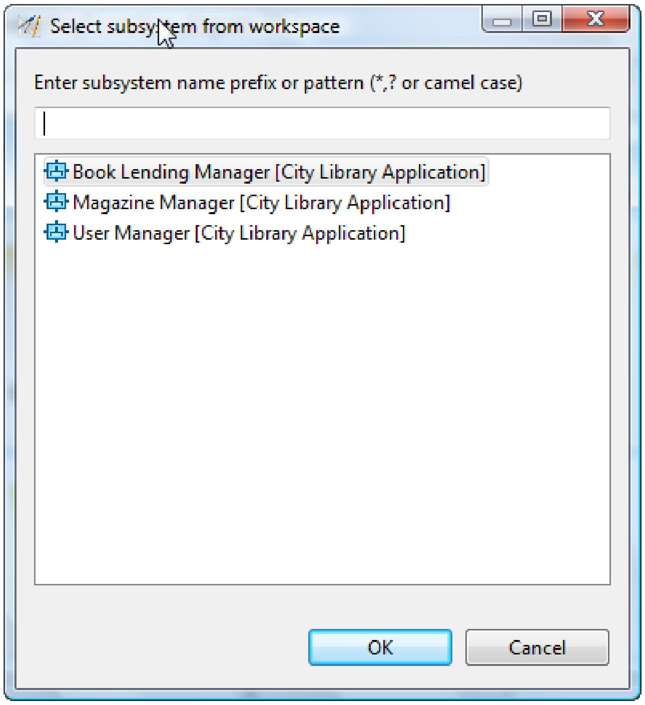
Collocation Descriptors: Nominal

Communication Descriptors: Nominal

| Option | Description |
|---|---|
| Collocation Descriptors | Multisite Development Collocation<br>• Very low (International)<br>• Low (Multi-city and Multi-company)<br>• Nominal (Multi-city or Multi-company)<br>• High (Same city or metro. area)<br>• Very High (Same building or complex)<br>• Extra High (Fully collocated) |
| Communication Descriptors | Multisite Development Communication<br>• Very low (Some phone, mail)<br>• Low (Individual phone, FAX)<br>• Nominal (Narrowband email)<br>• High (Wideband electronic communication)<br>• Very High (Wideband elect. comm, occasional video conf)<br>• Extra High (Interactive multimedia) |

### Subsystem Selection Dialog

This dialog allows you to select an existing **Subsystem** from the workspace.

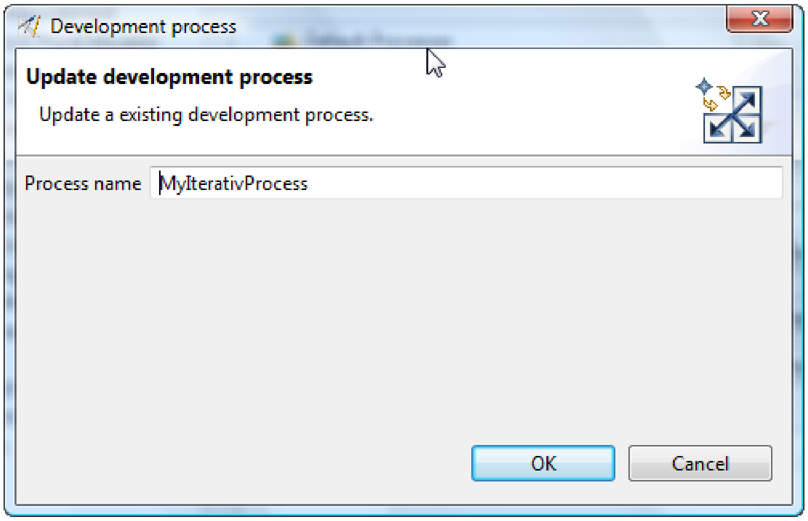

Select subsystem from workspace
Enter subsystem name prefix or pattern (*,? or camel case)
Book Lending Manager [City Library Application]
Magazine Manager [City Library Application]
User Manager [City Library Application]
OK
Cancel

| Option | Description |
|---|---|
| Filter criteria | Enter a Subsystem prefix or a pattern (*, ? or camel case). The list of Subsystems will be refreshed, matching your input. |
| List of matching **Subsystems** | Select a Subsystem from the list of available Systems. |
| OK | Accepts the selected Subsystem. |
| Cancel | Cancels the request. |

### Update Process Dialog

Enterprise Edition

This dialog allows you to update an existing Development Process.


Development process
Update development process
Update a existing development process.
OK
Cancel

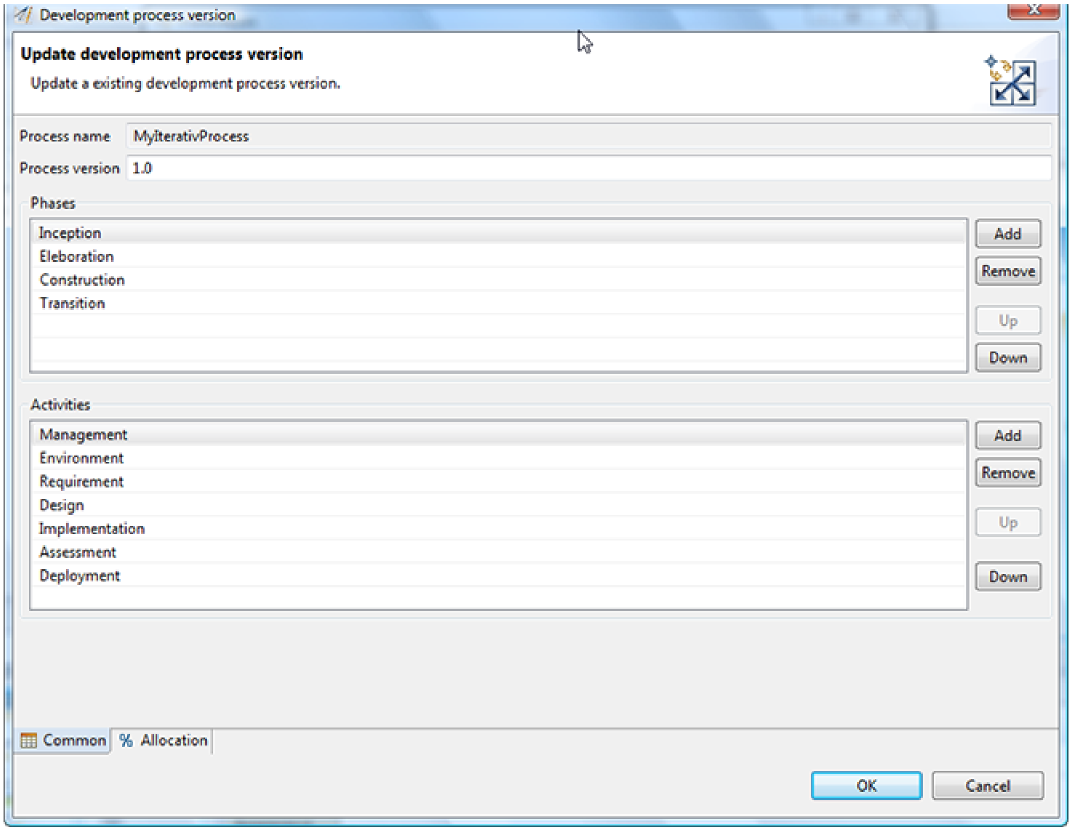
Process name: MyIterativProcess

| Option | Description |
|---|---|
| Process name | Change the name for the development process. |
| OK | Accepts the changes. |
| Cancel | Cancels the request. |

### Update Process Version Dialog

Enterprise Edition

This dialog allows you to update an existing Development Process Version.



Development process version

**Update development process version**

Update a existing development process version.

Process name: MyIterativProcess

Process version: 1.0

Phases

- Inception
- Eleboration
- Construction
- Transition

Activities

- Management
- Environment
- Requirement
- Design
- Implementation
- Assessment
- Deployment

### Common

| Option | Description |
|---|---|
| Process name | Information about the name for the development process. |
| Process version | Identification for the process version. |
| Phases | Allows you to add, remove or change phases. It's also possible to re-arrange phases (move up/down). |
| Activities | Allows you to add, remove or change activities. It's also possible to re-arrange activities (move up/down). |

### Allocation

| Option | Description |
|---|---|
| Project size | Change between the different project sizes within this version. |
| Phase | Visualization for phases for the select project size (name, percentage and schedule). |
| Activity | Visualization for activities for the select project size (name and percentage). |
| Estimate | If selected, the phase/activity will be estimated for COCOMO. |
| Calculate | If selected, the phase will be calculated for estimation. |
| Percentage | Percentage part for the phase/activity. |
| Schedule | Percentage part for the schedule. |
| Total estimated | Information about total percentage for a estimated phase/activity. Sum for COCOMO ingredients must be 100. |
| Total non-estimated | Information about total percentage for a non-estimated phase/activity. |
| Summary | Some of total estimated and non-estimated for a phase/activity. |

### Common

| Option | Description |
|---|---|
| OK | Accepts the changes. |
| Cancel | Cancels the request. |

## Workbench menus

### File menu

The **File** menu enables you to create, save, close, print, import, and export Workbench resources and to exit the Workbench.

| | |
|---|---|
| **New (Shift+Alt+N)** | Enables you to create new resources. Before you can create a new file, you must create a project in which to store the file. |
| **Open File** | Enables you to open a file for editing - including files that do not reside in the Workspace. |
| **Close (Ctrl+W)** | Closes the active editor. You are prompted to save changes before the file closes. |
| **Close All (Shift+Ctrl+W)** | Closes all open editors. You are prompted to save changes before the files close. |
| **Save (Ctrl+S)** | Saves the contents of the active editor. |
| **Save As** | Enables you to save the contents of the active editor under another file name or location. |
| **Save All (Shift+Ctrl+S)** | Saves the contents of all open editors. |
| **Revert** | Replaces the contents of the active editor with the previously saved contents. |
| **Rename (F2)** | Enables you to change the name of the currently selected resource. |
| **Refresh (F5)** | Refreshes the resource with the contents in the file system. |

| | |
|---|---|
| **Convert Line Delimiters To** | Alters the line delimiters for the selected files. Changes are immediate and persist until you change the delimiter again - you do not need to save the file. |
| **Print (Ctrl+P)** | Prints the contents of the active editor. |
| **Page Setup** | Enables page setup of the print output. |
| **Print Preview** | Performs print preview of the content of the active editor. |
| **Switch Workspace** | Opens the Workspace Launcher, from which you can switch to a different workspace. This restarts the Workbench. |
| **Import** | Launches the Import wizard, which enables you to add resources to the Workbench. |
| **Export** | Launches the Export wizard, which enables you to export resources from the Workbench. |
| **Properties (Alt+Enter)** | Opens the Properties dialog for the currently selected resource. |
| **Recent file list** | Contains a list of the most recently accessed files in the Workbench. You can open any of these files from the File menu by simply clicking the file name. You can control the number of files in this list from the Editors preference page. |
| **Exit** | Closes and exits the Workbench. |

### Edit menu

This menu helps you manipulate resources in the editor area.

| | |
|---|---|
| **Undo** | This command reverses your most recent editing action. |
| **Redo** | This command re-applies the editing action that has most recently been reversed by the Undo action. |
| **Cut** | This command removes the selection and places it on the clipboard. |
| **Copy** | This command places a copy of the selection on the clipboard. |
| **Paste** | This command places the text or object on the clipboard at the current cursor location in the currently active view or editor. |
| **Delete** | This command removes the current selection. |
| **Select All** | This command selects all text or objects in the currently active view or editor. |
| **Add Bookmark** | This command adds a bookmark in the active file on the line where the cursor is currently displayed. |
| **Add Task** | This command adds a task in the active file on the line where the cursor is currently displayed. |

### Project menu

The **Project** menu allows you to perform actions on projects in the Workbench.

| | |
|---|---|
| **Open Project** | This command opens the currently selected project or projects. The selected projects must currently be closed for this command to be available. |
| **Close Project** | This command closes the currently selected project or projects. The selected projects must be currently open for this command to be available. Closing a project will remove all of that project's state from memory, but the contents on disk are left untouched. |
| **Open projectdata editor** | This command open the projectdata editor for the selected workspace project. This command is only available for Development Projects or Enhancement Projects. |
| **Properties** | This command opens a dialog showing the properties of the selected project or of the project that contains the selected resource. |

### Window menu

This menu allows you to display, hide, and otherwise manipulate the various views, perspectives, and actions in the Workbench.

| | |
|---|---|
| **New Window** | This command opens a new Workbench window with the same perspective as the current perspective. |
| **New Editor** | This command opens an editor based on the currently active editor. It will have the same editor type and input as the original. |
| **Open Perspective** | This command opens a new perspective in this Workbench window. This preference can be changed on the General > Perspectives preference page. All of the perspectives that are open within the Workbench window are shown on the shortcut bar. The perspectives you will likely want to open are listed first. This list is dependent on the current perspective. From the Other... submenu you can open any perspective. |
| **Show View** | This command displays the selected view in the current perspective. You can configure how views are opened on the General > Perspectives preference page. Views you are likely to want to open are listed first. This list is dependent on the current perspective. From the Other... submenu you can open any view. The views are sorted into categories in the Show View dialog. |
| **Customize Perspective** | Each perspective includes a predefined set of actions that are accessible from the menu bar and Workbench toolbar. |
| **Save Perspective As** | This command allows you to save the current perspective, creating your own custom perspective. You can open more perspectives of this type using the Window > Open Perspective > Other menu item once you have saved a perspective. |
| **Reset Perspective** | This command changes the layout of the current perspective to its original configuration. |
| **Close Perspective** | This command closes the active perspective. |

**Close All Perspectives**

This command closes all open perspectives in the Workbench window.

**Navigation**

This submenu contains shortcut keys for navigating between the views, perspectives, and editors in the Workbench window.

**Preferences**

This command allows you to indicate your preferences for using the Workbench. There are a wide variety of preferences for configuring the appearance of the Workbench and its views, and for customizing the behavior of all tools that are installed in the Workbench.

### Help menu

This menu provides help on using the Workbench.

**Welcome**

This command will open the welcome content.

**Help Contents**

This command displays the help contents in a help window or external browser. The help contents contains help books, topics, and information related to the Workbench and installed features.

**Search**

This command displays the help view opened on the Search page.

**Dynamic Help**

This command displays the help view opened to Related Topics page.

**Key Assist ...**

This command will display a list of key bindings.

**Cheat Sheets ...**

This command will open the cheat sheet selection dialog.

**Report a bug or enhancement ...**

This command will open a dialog which enables you to report a bug or enhancement feature.

**About Function Point Modeler**

This command displays information about the product, installed features, and available plug-ins.

### Icons and buttons

### Project Navigator view icons

The following icons can appear in the Project Navigator view:

| Icon | Description |
|---|---|
| A | Container for all **Application Projects** in the Workbench |
| D | Container for all **Development Projects** in the Workbench |
| E | Container for all **Development Projects** in the Workbench |
|  | Container for all **Other Projects** in the Workbench |
| 📂 | Represents a Workbench Project |
| FM | Represents a Functionpoint Count |

### Toolbar buttons

The following buttons may appear in the Workbench toolbar, toolbars for views, and the shortcut bar:

| Icon | Description | Icon | Description |
|---|---|---|---|
|  | Open a new perspective | 💾 | Save the active editor contents |
| 💾 | Save the contents of all editors | 💾 | Save the active editor contents |
| 🖨 | Print editor contents |  | Open a resource creation wizard |
| 📄 | Open a file creation wizard | 📁 | Open a folder creation wizard |
| 📂 | Open a project creation wizard |  | Open the import wizard |
|  | Open the export wizard | ✂ | Cut selection to clipboard |
| 📋 | Copy selection to clipboard | 📋 | Paste selection from clipboard |
| ↶ | Undo most recent edit | ↷ | Redo most recent undone edit |
| ⇩ | Navigate to next item in a list | ⇧ | Navigate to previous item in a list |
| ⇨ | Navigate forwards | ⇦ | Navigate backwards |
|  | Navigate up one level |  | Add bookmark or task |
| ▼ | Open a views drop down menu | ✕ | Close view or editor |
| 📌 | Pin editor to prevent automatic reuse |  | Filter tasks or properties |
| ⇨ | Go to a task, problem, or bookmark in the editor |  | Restore default properties |
|  | Show items as a tree |  | Refresh view contents |
| a z | Sort list in alphabetical order | ■ | Cancel a long running operation |
| ✖ | Delete selected item or content | ⇦ | Last edit location |

## Samples

The examples illustrate the usage of the key features oft **Function Point Modeler** . It demonstrates how to create an application system from scratch. You will start with Development Project Count and create an application system called Application Count from the previous Development Project Count.

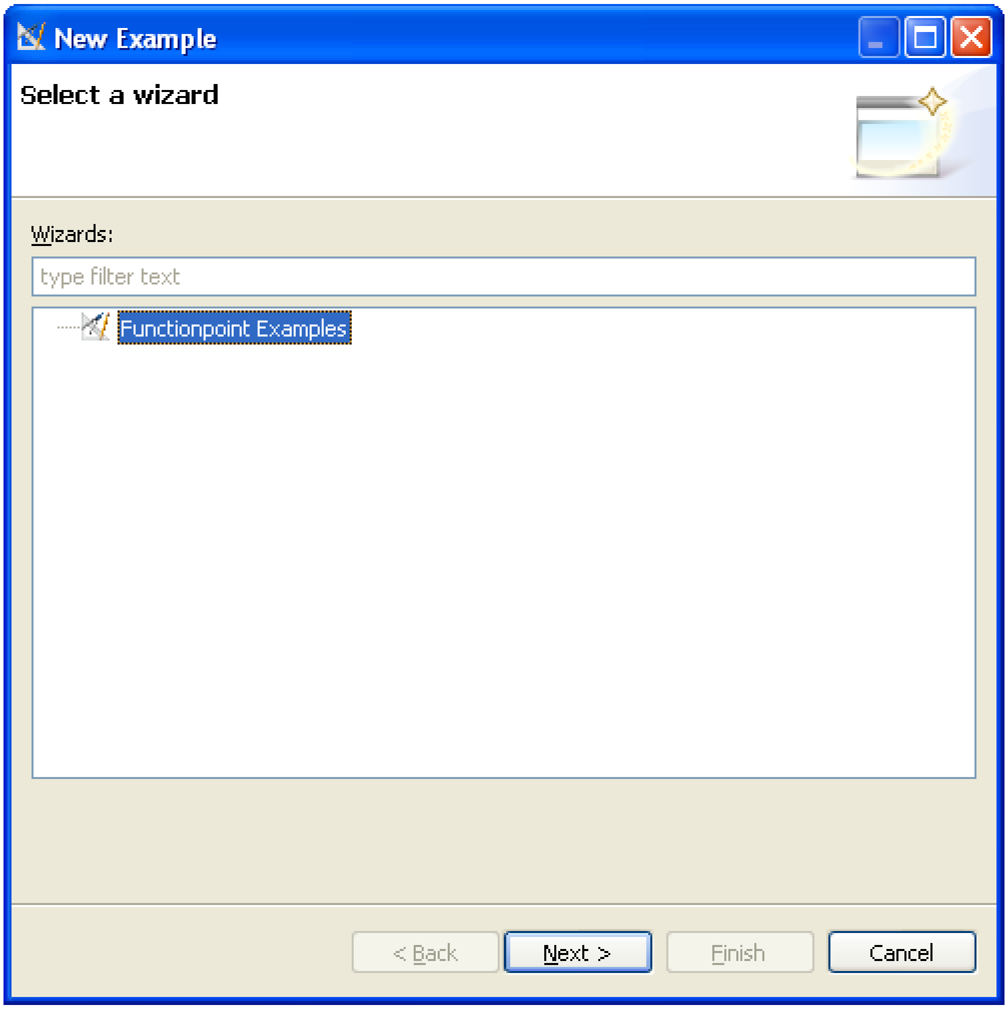
Once you have created Application Count for your application system, you can create an Enhancement Project Count for this current application system. During the Enhancement Project Count you may change/add/delete the Transactional Functions and Data Functions. You may also create an estimation for your enhancement project and gather some Project Actual Data for the project.

Once you have completed your project, you update your original Application Count for your application system. You will see how to manage such typical life cycle of a software with Function Point Modeler.

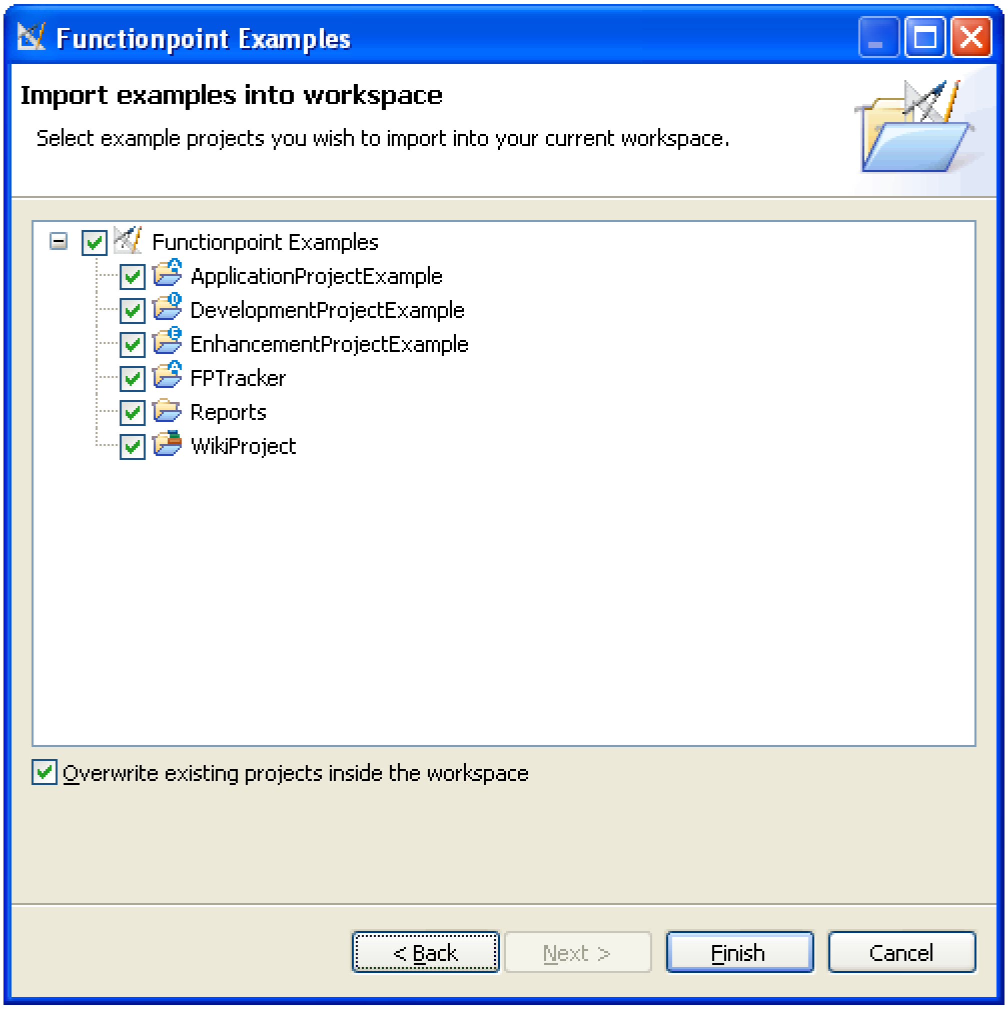
Among the **Function Point Analysis** counting example there are two other examples. One of them is Report Examples for **Function Point Modeler Report Designer** and other is **Wiki Project** example.

If you have not already done so, create the example:

1. From the main menu bar, select ***File >New > Example...***

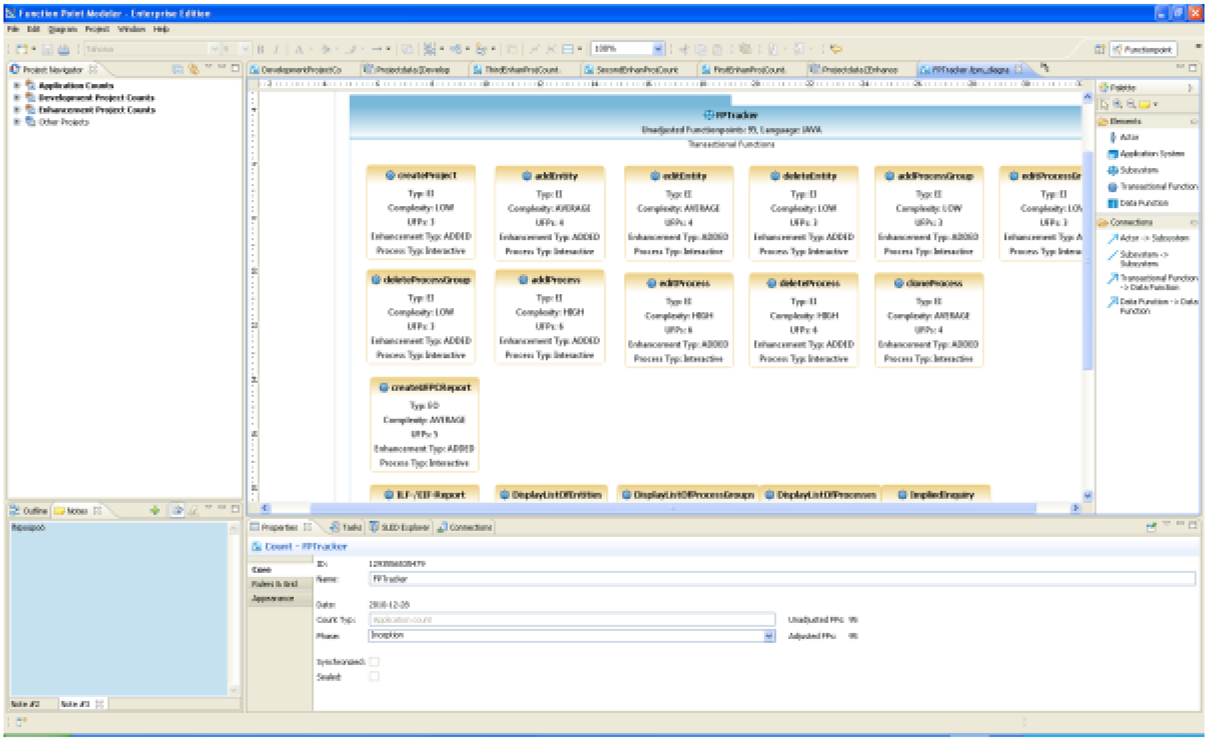


2. Click the button **Next>**


Functionpoint Examples
Import examples into workspace
Select example projects you wish to import into your current workspace.
☑ Functionpoint Examples
☑ ApplicationProjectExample
☑ DevelopmentProjectExample
☑ EnhancementProjectExample
☑ FPTracker
☑ Reports
☑ WikiProject
☑ Overwrite existing projects inside the workspace
< Back
Next >
Finish
Cancel

**3.** And click the button **Finish>**

One you have clicked on the button **Finish>** you will see the following examples on your **Function Point Modeler** workbench.



Name: FPTracker

Count Typ: Application count

Phase: Inception

Unadjusted FPs: 95

Adjusted FPs: 95

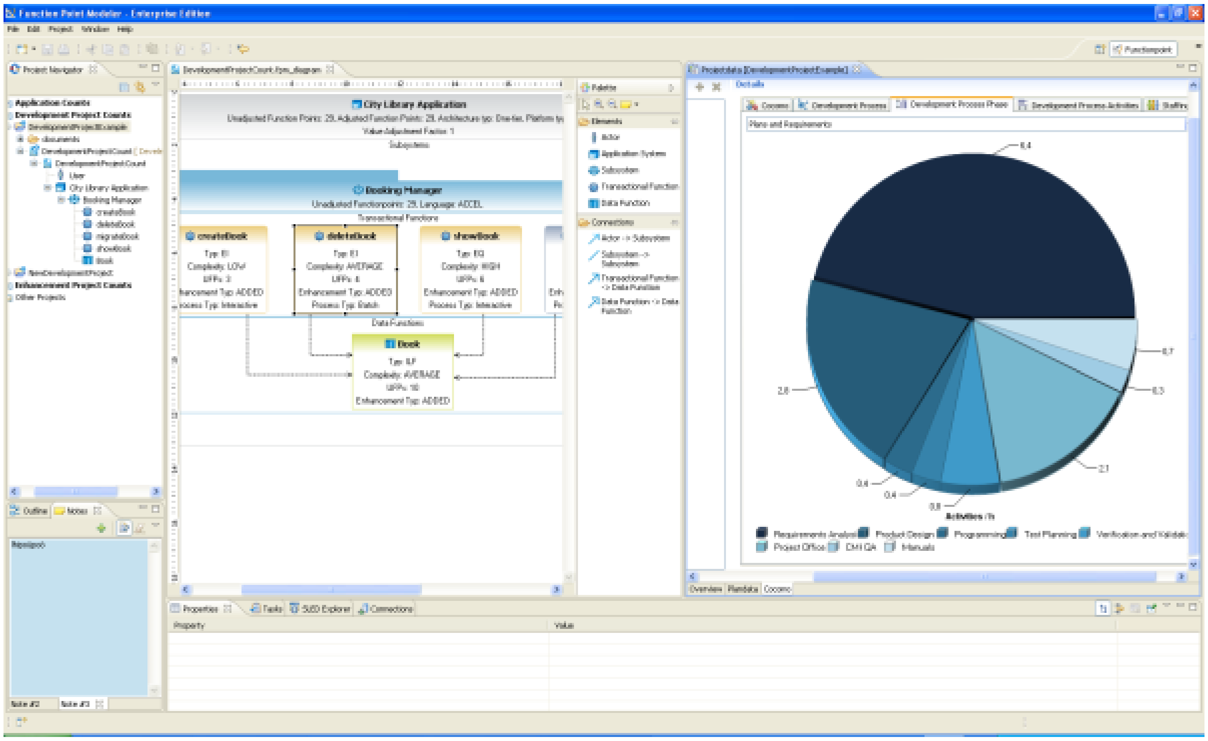
Synchronized: □

Sealed: □

## Development Project Count Example

This example illustrate ***Development Project Count*** . During a development project you create a new application system.

A ***Development Project Count*** can contain Elementar Processes with the **Process Type** *conversion* . If you create an ***Application Count*** from ***Development Project Count*** , the new ***Application Count*** does not contain the Elementar Processes with the **Process Type** *conversion* .



### Development Project Function Point Calculation

The development project function point is used for the new development projects. The development project function point calculation consists of three components of functionality:

1. Application functionality included in the user requirements for the project.
2. Conversion functionality included in the user requirements for the project .
3. Application value adjustment factor.

**Function Point Formula:**

Use the following formula to calculate the development project function point count.

**DFP = (UFP + CFP) * VAF**

Where:

**DFP** is the development project function point count

**UFP** is the unadjusted function point count for the functions that will be available after installation

**CFP** is the unadjusted function points added by the conversion unadjusted function point count

**VAF** is the value adjustment factor

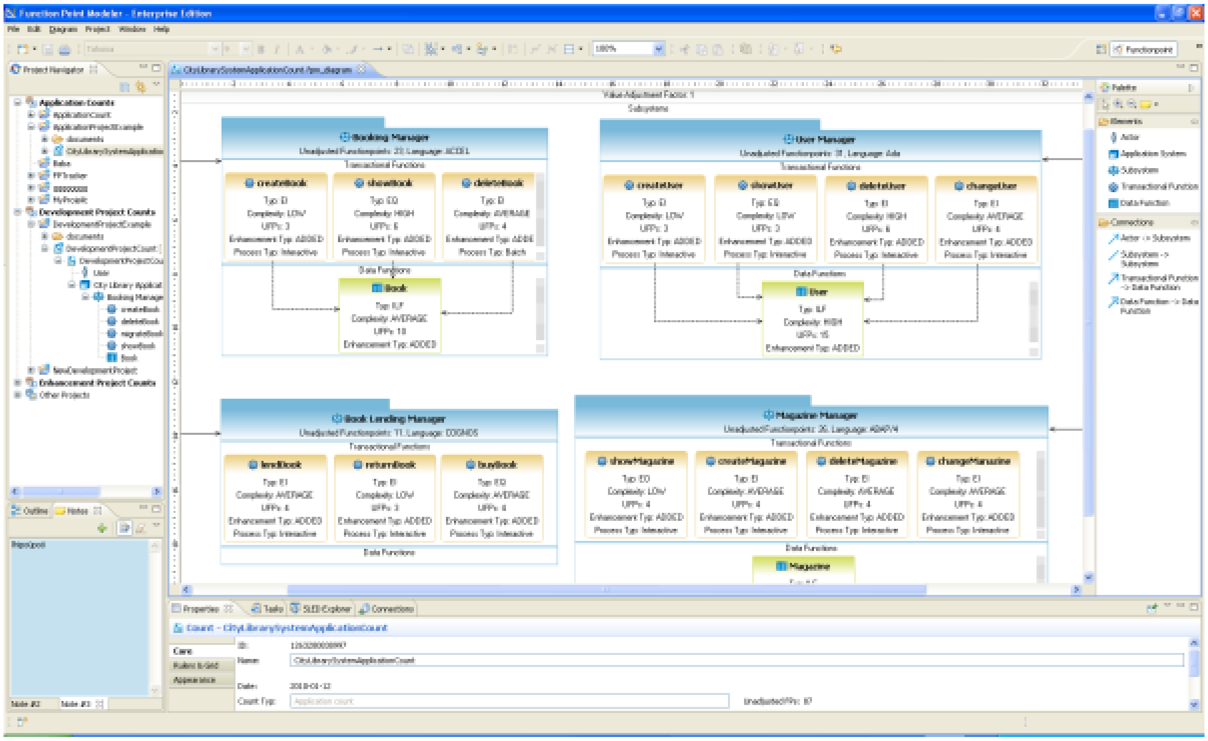
**Note:** After software installation, the ***Application Count*** is calculated using components of the ***Development Project Count*** .

Refer to IFPUG document Function Point Counting Practices Manual for additional information about the function point analysis, or see at: ***IFPUG*** for additional information.

## Application Count Example

This example illustrate ***Application Count*** calculated from ***Development Project Count*** . The ***Application Count*** measures the functions provided to the users with the first installation of the software delivered when the development project is complete.

A *Development Project Count* can contain Elementar Processes with the **Process Type** *conversion* . Once you have created an *Application Count* from *Development Project Count* , the new *Application Count* does not contain the Elementar Processes with the **Process Type** *conversion* .



## Application Function Point Calculation

This section provides the formulas to calculate the *Application Count* . There are two variations of this formula:

1. Formula to establish the initial function point count for an application.
2. Formula to re-establish the function point count for an application after an enhancement project has changed the application functionality.

### Formula to Establish the Initial Count:

Use the formula in this section to establish the initial function point count for an application. Initially, the user is receiving new functionality. There are no changes to the existing functionality or deletions of obsolete or unneeded functionality. The *Application Count* does not include conversion requirements.

**AFP = ADD * VAF**

Where:

**AFP** is the initial application function point count.

**ADD** is the unadjusted function point count of those functions that were installed by the development project.

**VAF** is the value adjustment factor of the application.

### Formula to Reflect Enhancement Projects

When an enhancement project is installed, the existing application function point count must be updated to reflect modifications to the application. The functionality for the application can be altered in one or more ways:

a. Added (new) functionality increases the size of the application
b. Changed functionality increases, decreases, or has no effect on the size of the application
c. Deleted functionality decreases the application size

**d.** Changes to the value adjustment factor increase or decrease the application size

**Note:** Because conversion functionality does not affect the application function point count, any conversion functionality associated with an enhancement project is omitted entirely from the application function point calculation. Use the following formula to calculate the application function point count after an enhancement project:

Use the following formula to calculate the application function point count after an enhancement project:

**AFP = [(UFPB + ADD + CHGA) - (CHGB + DEL)] * VAFA**

Where:

**AFP** is the application's adjusted function point count.

**UFPB** is the application's unadjusted function point count before the enhancement project begins.

**Note:** If this count is unavailable, it can be calculated using the formula **UFBP = AFPB/VAFB** ; where **AFPB** is the adjusted application function point count before the enhancement project. **VAFB** is the value adjustment factor of the application before the enhancement project.

**ADD** is the unadjusted function point count of those functions that were added by the enhancement project.

**CHGA** is the unadjusted function point count of those functions that were changed by the enhancement project. This number reflects the size of the functions after the changes.

**CHGB** is the unadjusted function point count of those functions that were changed by the enhancement project. This number reflects the size of the functions before the changes were made.

**DEL** is the unadjusted function point count of those functions that were deleted by the enhancement project.

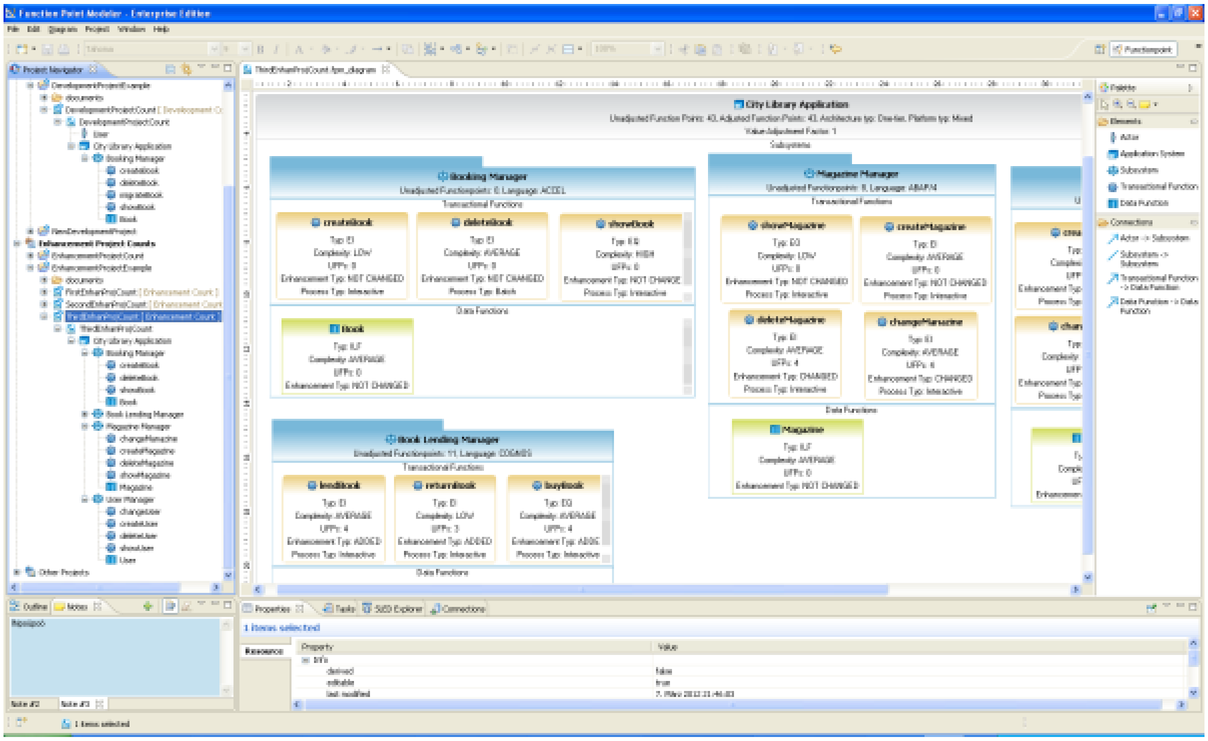
**VAFA** is the value adjustment factor of the application after the enhancement project is complete.

Refer to IFPUG document Function Point Counting Practices Manual for additional information about the function point analysis, or see at: ***IFPUG*** for additional information.

## Enhancement Project Count Example

This example illustrate ***Enhancement Project Count*** calculated from ***Application Count*** .

At the begin all elementary processes have the **Enhancement Type** *NOT CHANGED* . The **Enhancement Type** of *NOT CHANGED* means that this elementary process has not been changed in this current ***Enhancement Project Count*** . If you change the state from *NOT CHANGED* to *CHANGED* or *DELETED* , they will be counted.



## Enhancement Project Function Point Calculation

The enhancement project function point calculation consists of three components of functionality:

1. Application functionality included in the user requirements for the project.
2. Conversion functionality included in the user requirements for the project.
3. Application value adjustment factor.

### Application Functionality

Application functionality consists of:

a. Added (new) functionality increases the size of the application
b. Function points identified from the functionality that is added by the enhancements
c. Function points counted because existing functionality is changed during the enhancement project
d. Function points counted for functionality deleted during the enhancement project

### Function Point Formula

Use the following formula to calculate the enhancement project function point count.

**Note:** Data conversion requirements are included in this count.

**EFP = [(ADD + CHGA + CFP) * VAFA] + (DEL* VAFB)**

Where:

**FEFP** is the enhancement project function point count.

**ADD** is the unadjusted function point count of those functions that were or will be added by the enhancement project.

**CHGA** is the unadjusted function point count of those functions that were or will be modified by the enhancement project. This number reflects the size of the functions after the modifications.

**CFP** is the function point count of those functions added by the conversion.

**VAFA** is the value adjustment factor of the application after the enhancement project is complete.

**DEL** is the unadjusted function point count of those functions that were or will be deleted by the enhancement project.

**VAFB** is the value adjustment factor of the application before the enhancement project begins.

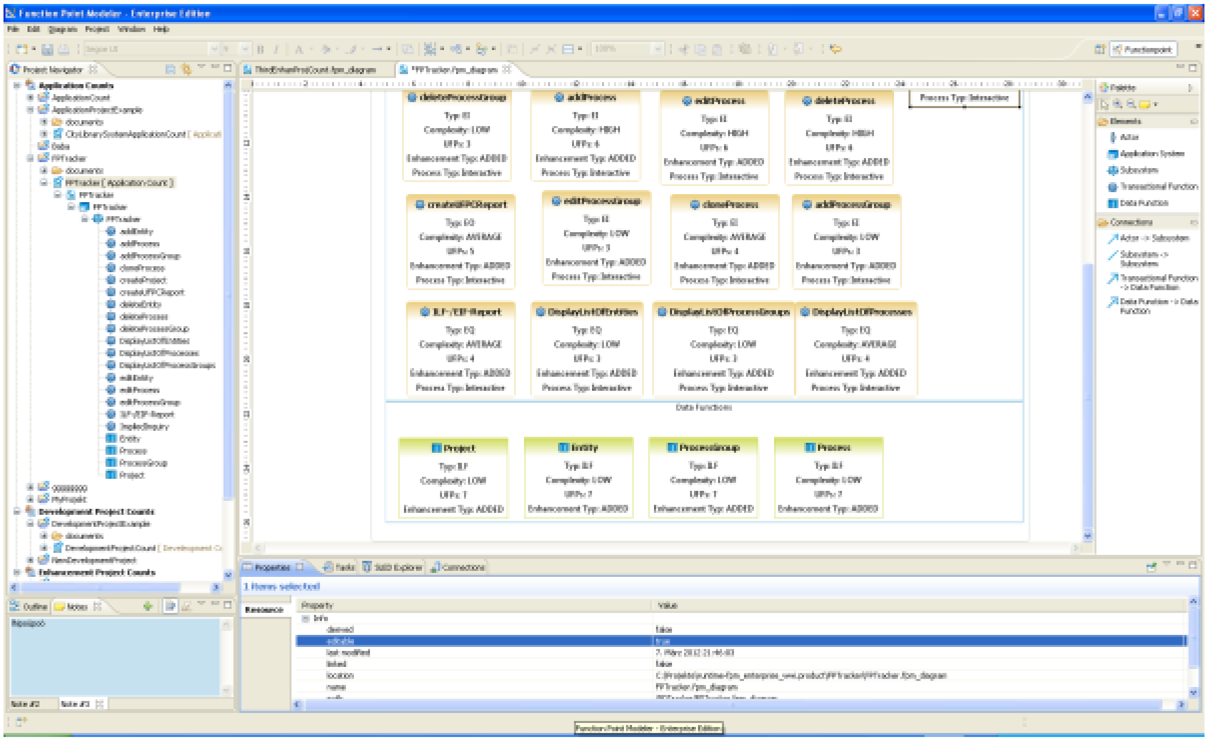
Refer to IFPUG document Function Point Counting Practices Manual for additional information about the function point analysis, or see at: *IFPUG* for additional information.

## FPTracker Example

This example illustrate *Application Count* for the application **FPTracker** starting from scratch. You can also create an *Application Count* without any project count.

You may have such cases if you need an *Application Count* for an existing application system in your company.

It is recommended that all application system have to have an *Application Count* , so that you can track the life cycle of the application system from an enhancement project to other enhancement project. All following *Enhancement Project Count* are to created from the current *Application Count* .



1 Items selected

| Property | Value |
|---|---|
| Info | |
| derived | false |
| editable | true |
| last modified | 7. März 2012 21:46:03 |
| linked | false |
| location | C:\Projekte\runtime-fpm_enterprise_ww.product\FPTracker\FPTracker.fpm_diagram |
| name | FPTracker.fpm_diagram |

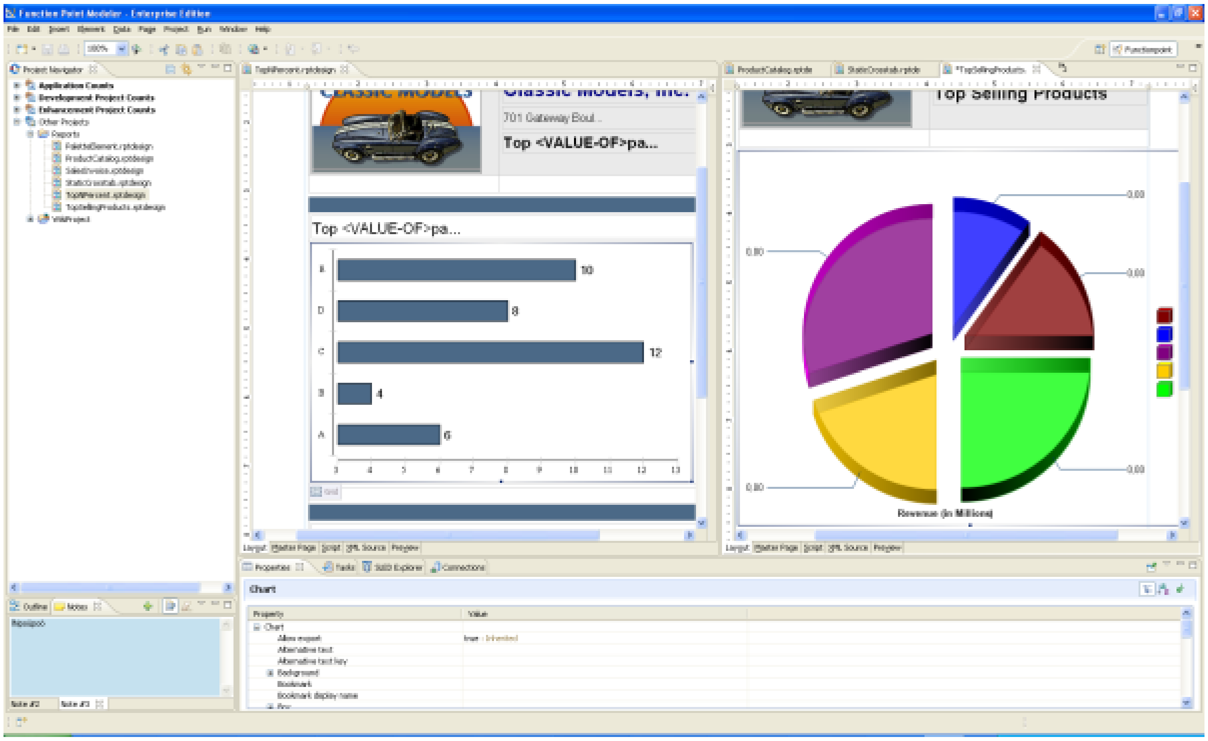
## Report Examples

Enterprise Edition

**Function Point Modeler** includes a powerful **Report Designer** . It enables you to create powerful reports from the Software Lifecycle Empirical / Experience Database *SLED* for the management.

You can also use the **Function point Report Report Designer** for any other relational database management system **(RDBMS)** .

**Function Point Modeler** is released with some report examples.



## Wiki Project Examples

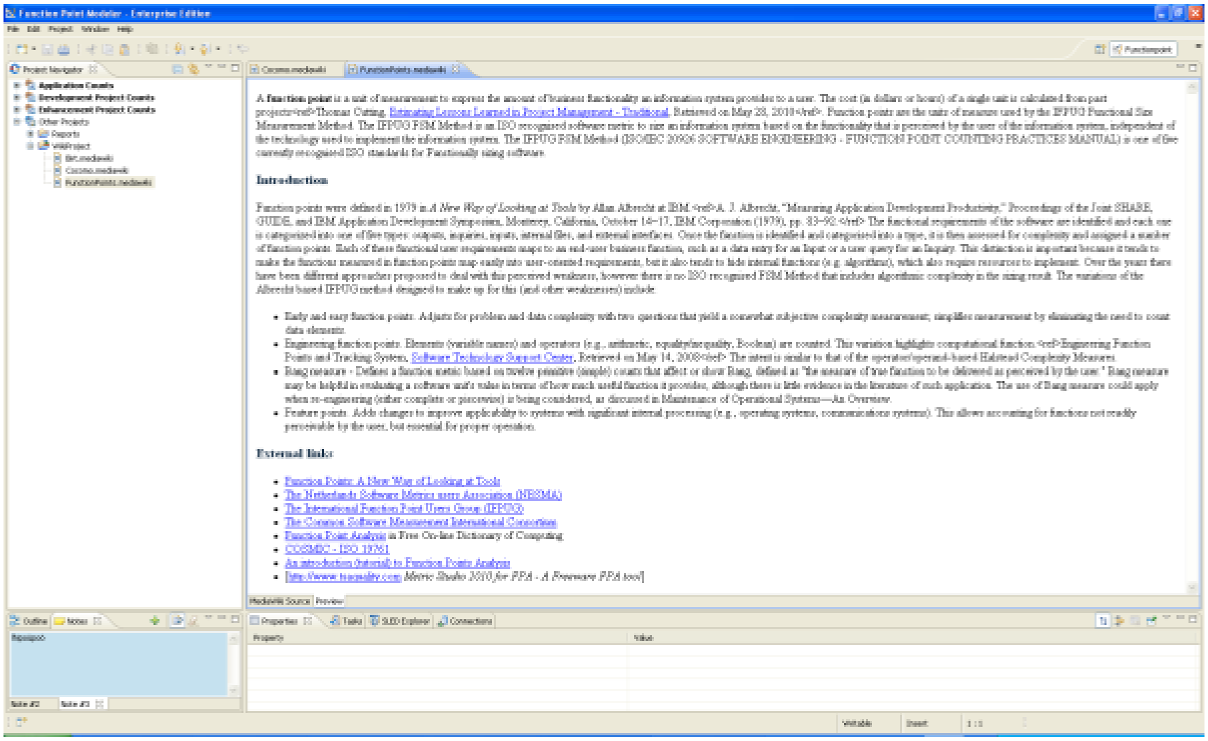
Enterprise Edition

**WikiText** is a set of plug-ins for Eclipse that provide lightweight markup (wiki) parsing, editing and display capabilities to the Eclipse platform and Mylyn. WikiText provides a parser for wiki markup and converts the markup to **HTML** , **Docbook** , **DITA** , or **Eclipse Help** format, either via the API or by using Ant tasks. **WikiText** also provides UI components (such as an editor) integrating with Eclipse and the **Mylyn** task editor.

**Function Point Modeler** includes **WikiText** . It enables you to create powerful documents such PDF or Eclipse help.

**WikiText** enables you to document some some sizing (e.g Function Point Counting rules for your company) or estimation documents centralized. You estimation and sizing team can access this this centralized documents over **Function Point Modeler** . your

**Function Point Modeler** is released with some **WikiText** examples to show key features of the WikiText.



A **function point** is a unit of measurement to express the amount of business functionality an information system provides to a user. The cost (in dollars or hours) of a single unit is calculated from past projects<ref>Thomas Cutting, Estimating Lessons Learned in Project Management - Traditional, Retrieved on May 28, 2010</ref>. Function points are the units of measure used by the IFPUG Functional Size Measurement Method. The IFPUG FSM Method is an ISO recognised software metric to size an information system based on the functionality that is perceived by the user of the information system, independent of the technology used to implement the information system. The IFPUG FSM Method (ISO/IEC 20926 SOFTWARE ENGINEERING - FUNCTION POINT COUNTING PRACTICES MANUAL) is one of five currently recognised ISO standards for Functionally sizing software.

**Introduction**

Function points were defined in 1979 in *A New Way of Looking at Tools* by Allan Albrecht at IBM.<ref>A. J. Albrecht, "Measuring Application Development Productivity," Proceedings of the Joint SHARE, GUIDE, and IBM Application Development Symposium, Monterey, California, October 14–17, IBM Corporation (1979), pp. 83–92.</ref> The functional requirements of the software are identified and each one is categorized into one of five types: outputs, inquiries, inputs, internal files, and external interfaces. Once the function is identified and categorized into a type, it is then assessed for complexity and assigned a number of function points. Each of these functional user requirements maps to an end-user business function, such as a data entry for an Input or a user query for an Inquiry. This distinction is important because it tends to make the functions measured in function points map easily into user-oriented requirements, but it also tends to hide internal functions (e.g. algorithms), which also require resources to implement. Over the years there have been different approaches proposed to deal with this perceived weakness, however there is no ISO recognized FSM Method that includes algorithmic complexity in the sizing result. The variations of the Albrecht based IFPUG method designed to make up for this (and other weaknesses) include:

- Early and easy function points. Adjusts for problem and data complexity with two questions that yield a somewhat subjective complexity measurement; simplifies measurement by eliminating the need to count data elements.
- Engineering function points. Elements (variable names) and operators (e.g., arithmetic, equality/inequality, Boolean) are counted. This variation highlights computational function.<ref>Engineering Function Points and Tracking System, Software Technology Support Center, Retrieved on May 14, 2008</ref> The intent is similar to that of the operator/operand-based Halstead Complexity Measures.
- Bang measure - Defines a function metric based on twelve primitive (simple) counts that affect or show Bang, defined as "the measure of true function to be delivered as perceived by the user." Bang measure may be helpful in evaluating a software unit's value in terms of how much useful function it provides, although there is little evidence in the literature of such application. The use of Bang measure could apply when re-engineering (either complete or piecewise) is being considered, as discussed in Maintenance of Operational Systems—An Overview.
- Feature points. Adds changes to improve applicability to systems with significant internal processing (e.g., operating systems, communications systems). This allows accounting for functions not readily perceivable by the user, but essential for proper operation.

**External links:**

- Function Points: A New Way of Looking at Tools
- The Netherlands Software Metrics users Association (NESMA)
- The International Function Point Users Group (IFPUG)
- The Common Software Measurement International Consortium
- Function Point Analysis in Free On-line Dictionary of Computing
- COSMIC - ISO 19761
- An introduction (tutorial) to Function Points Analysis
- [http://www.tocquality.com *Metric Studio 2010 for FPA - A Freeware FPA tool*]

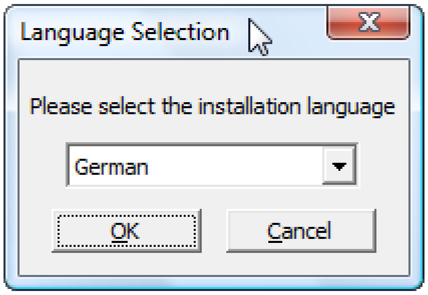
# Installation

## Installation on Windows

Installation on Windows is a simple process. Just perform the following steps.

Start the setup process by running the file **Setup.exe** .

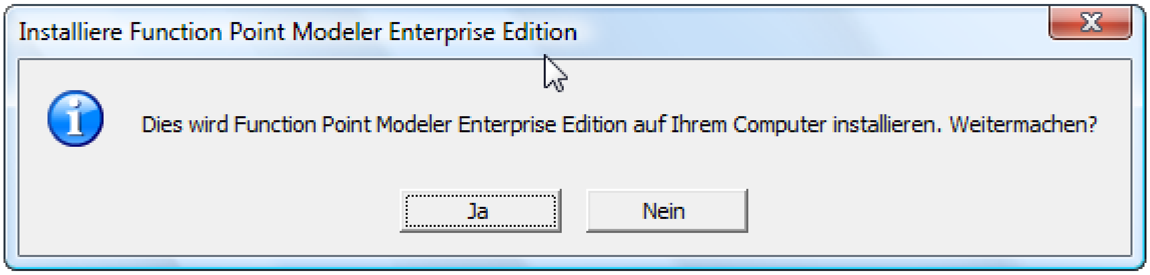
Select your preferred language setting and press the **OK** button.



Please select the installation language

German

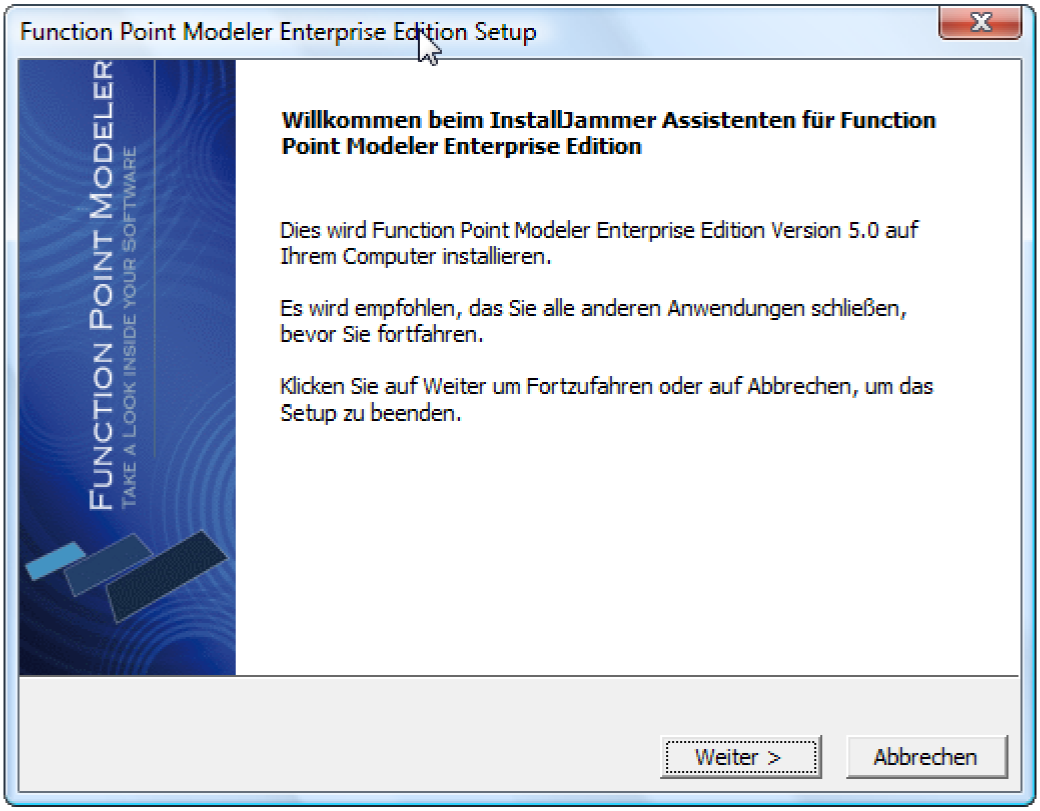
Confirm the following question by pressing the button **Yes** .



Installiere Function Point Modeler Enterprise Edition

Dies wird Function Point Modeler Enterprise Edition auf Ihrem Computer installieren. Weitermachen?

Press button **Next** .



Function Point Modeler Enterprise Edition Setup

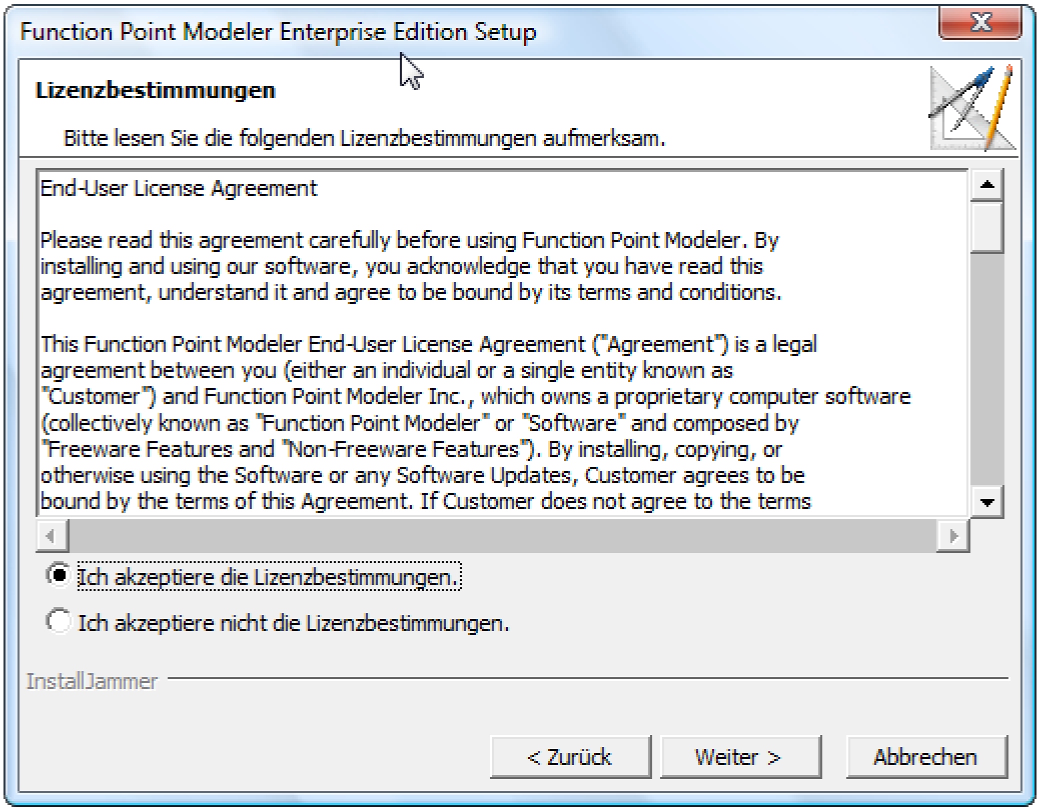
**Willkommen beim InstallJammer Assistenten für Function Point Modeler Enterprise Edition**

Dies wird Function Point Modeler Enterprise Edition Version 5.0 auf Ihrem Computer installieren.

Es wird empfohlen, das Sie alle anderen Anwendungen schließen, bevor Sie fortfahren.

Klicken Sie auf Weiter um Fortzufahren oder auf Abbrechen, um das Setup zu beenden.

Accept the license agreement and press the **Next** button.



Function Point Modeler Enterprise Edition Setup

**Lizenzbestimmungen**

Bitte lesen Sie die folgenden Lizenzbestimmungen aufmerksam.

End-User License Agreement

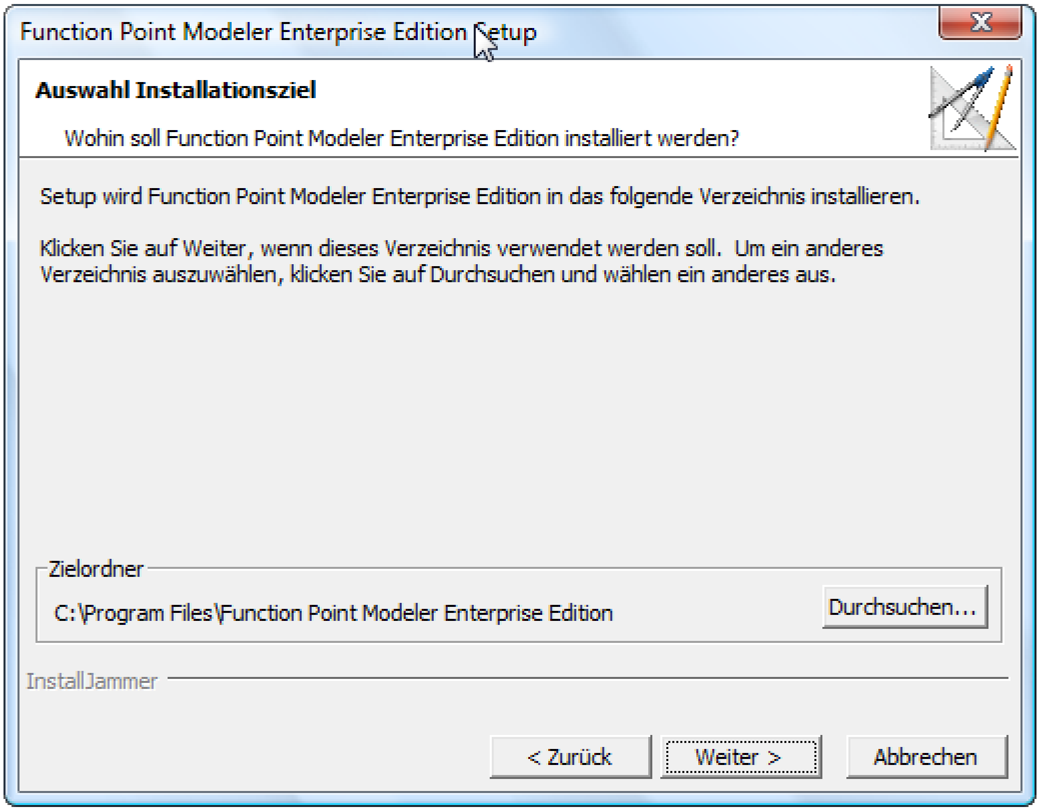
Please read this agreement carefully before using Function Point Modeler. By installing and using our software, you acknowledge that you have read this agreement, understand it and agree to be bound by its terms and conditions.

This Function Point Modeler End-User License Agreement ("Agreement") is a legal agreement between you (either an individual or a single entity known as "Customer") and Function Point Modeler Inc., which owns a proprietary computer software (collectively known as "Function Point Modeler" or "Software" and composed by "Freeware Features and "Non-Freeware Features"). By installing, copying, or otherwise using the Software or any Software Updates, Customer agrees to be bound by the terms of this Agreement. If Customer does not agree to the terms

● Ich akzeptiere die Lizenzbestimmungen.

○ Ich akzeptiere nicht die Lizenzbestimmungen.

Select a destination folder for the installation and press the **Next** button.



Function Point Modeler Enterprise Edition Setup

**Auswahl Installationsziel**

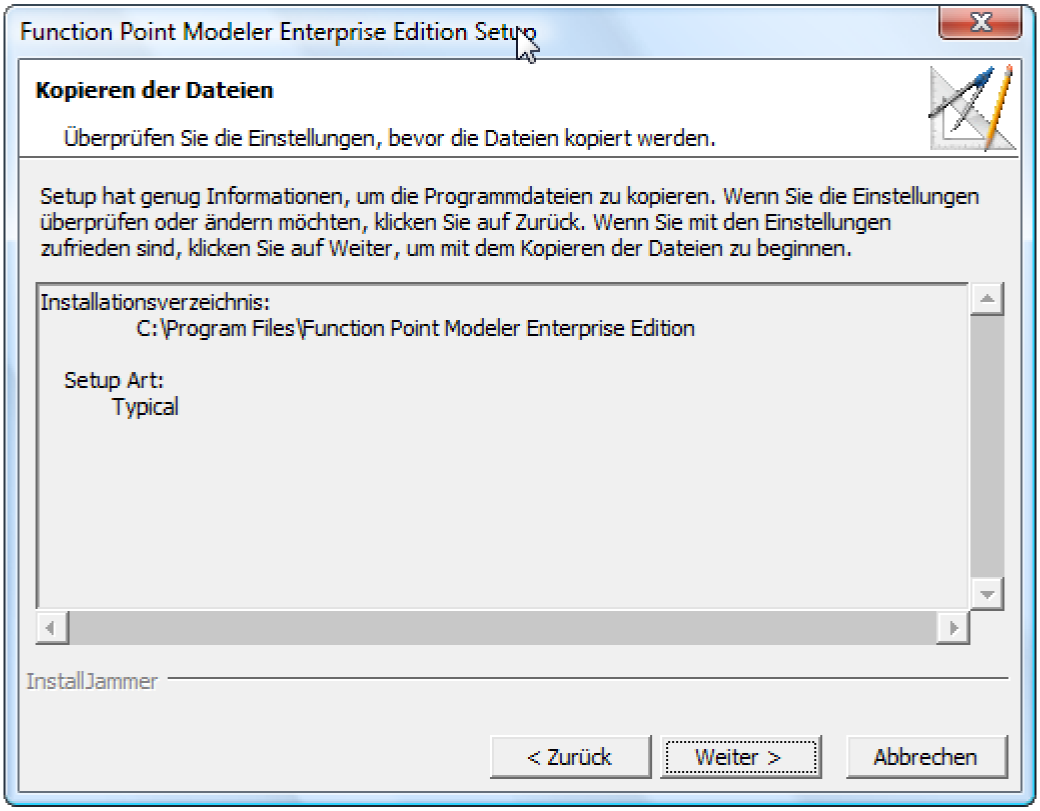
Wohin soll Function Point Modeler Enterprise Edition installiert werden?

Setup wird Function Point Modeler Enterprise Edition in das folgende Verzeichnis installieren.

Klicken Sie auf Weiter, wenn dieses Verzeichnis verwendet werden soll. Um ein anderes Verzeichnis auszuwählen, klicken Sie auf Durchsuchen und wählen ein anderes aus.

Zielordner: C:\Program Files\Function Point Modeler Enterprise Edition

Press the **Next** button.



Function Point Modeler Enterprise Edition Setup

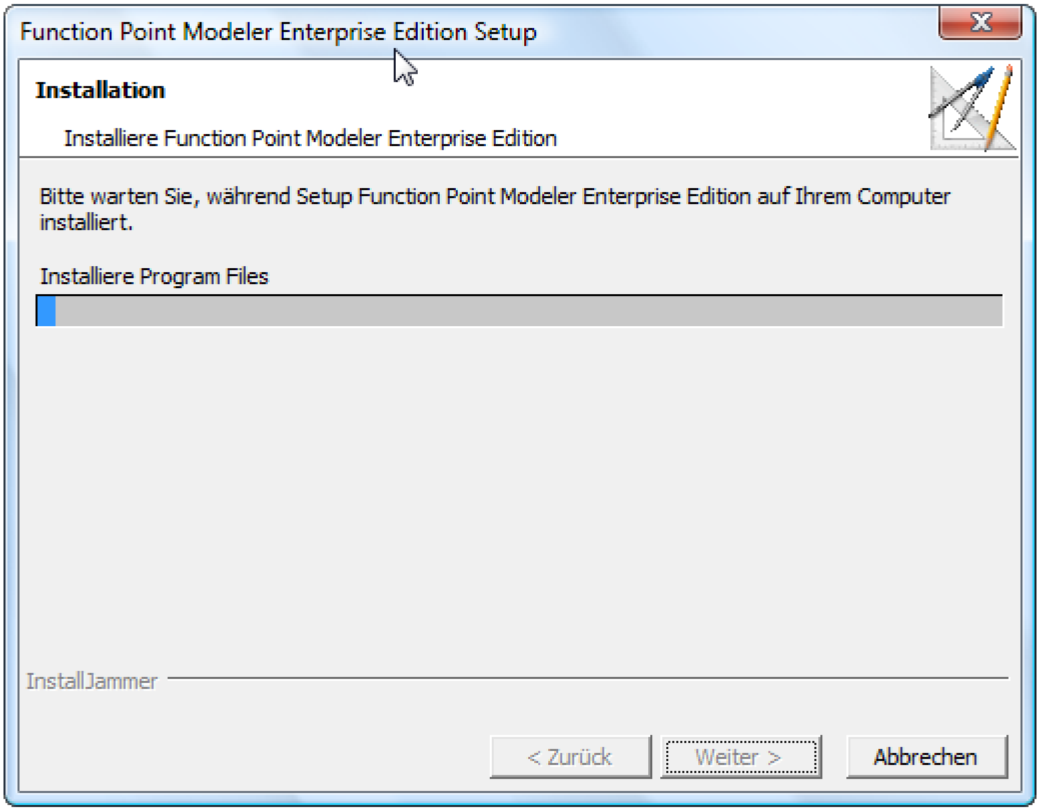
**Kopieren der Dateien**

Überprüfen Sie die Einstellungen, bevor die Dateien kopiert werden.

Setup hat genug Informationen, um die Programmdateien zu kopieren. Wenn Sie die Einstellungen überprüfen oder ändern möchten, klicken Sie auf Zurück. Wenn Sie mit den Einstellungen zufrieden sind, klicken Sie auf Weiter, um mit dem Kopieren der Dateien zu beginnen.

```
Installationsverzeichnis:
        C:\Program Files\Function Point Modeler Enterprise Edition

  Setup Art:
      Typical
```

The installation of the application is running in the selected destination folder.



Function Point Modeler Enterprise Edition Setup

**Installation**

Installiere Function Point Modeler Enterprise Edition

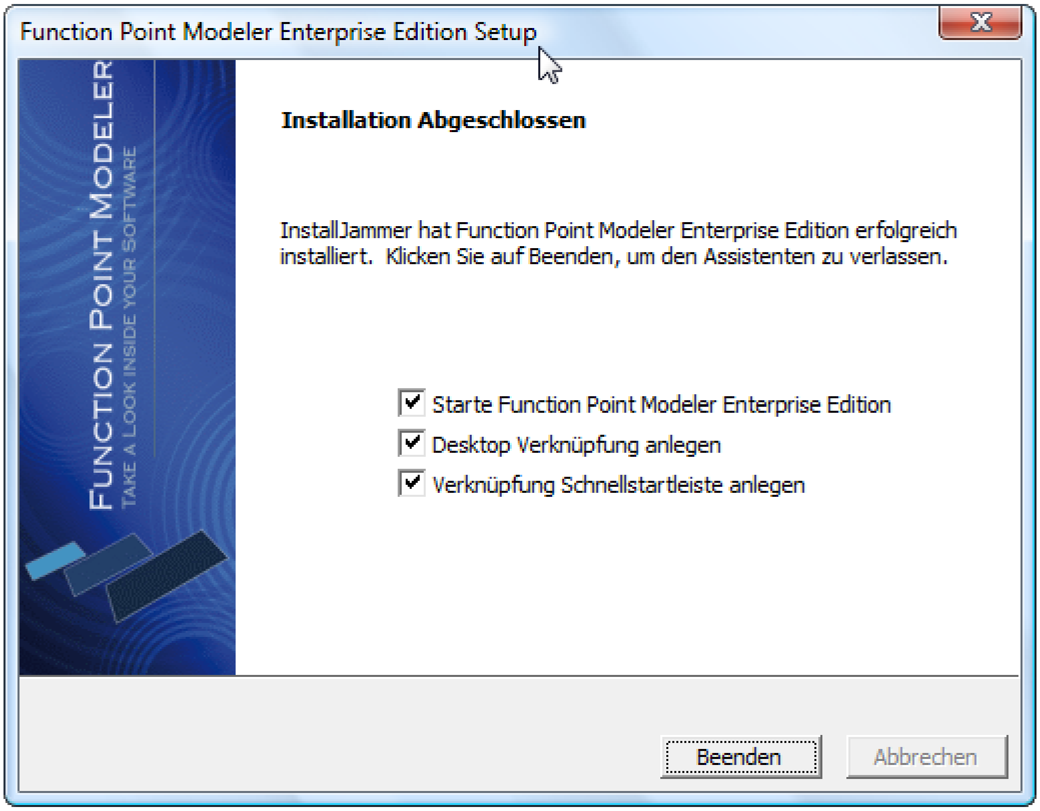
Bitte warten Sie, während Setup Function Point Modeler Enterprise Edition auf Ihrem Computer installiert.

Installiere Program Files

After the installation is completed, you can select whether you want to

- start the application after a successful installation
- want to create a desktop icon
- want to create a icon in the quick start bar

Press the **Finish** button subsequently.


Function Point Modeler Enterprise Edition Setup
FUNCTION POINT MODELER
TAKE A LOOK INSIDE YOUR SOFTWARE
Beenden
Abbrechen

**Installation Abgeschlossen**

InstallJammer hat Function Point Modeler Enterprise Edition erfolgreich installiert. Klicken Sie auf Beenden, um den Assistenten zu verlassen.

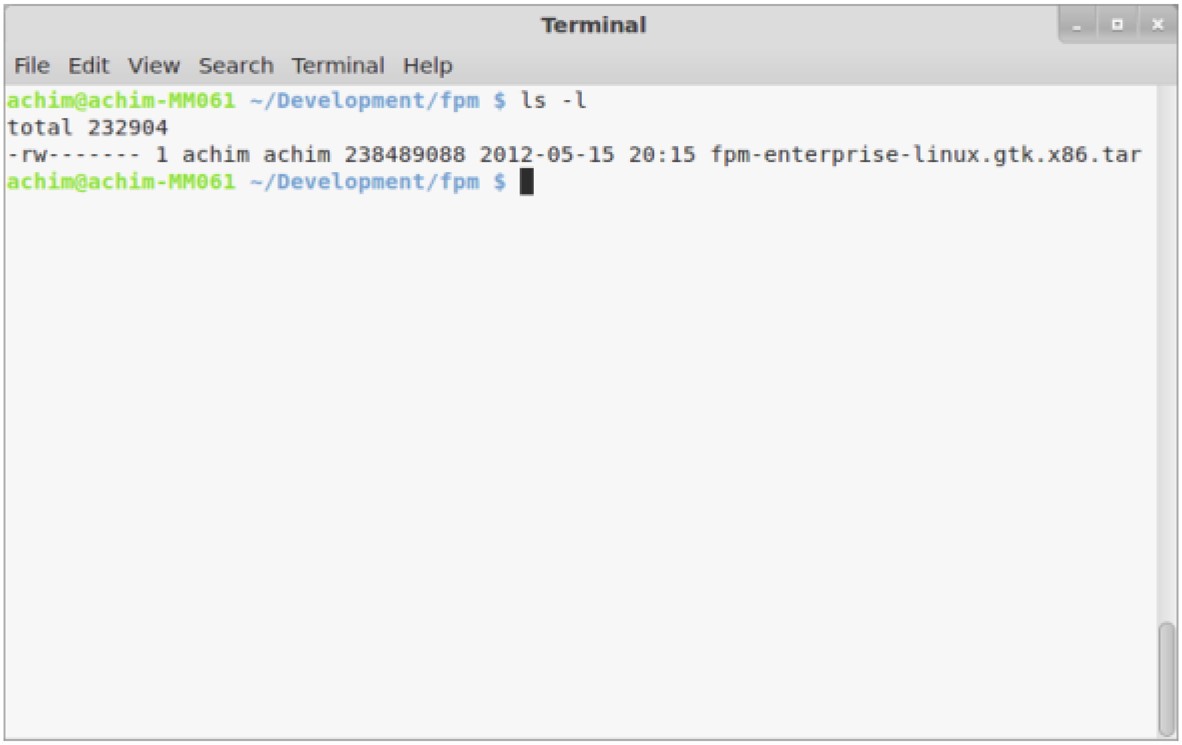
☑ Starte Function Point Modeler Enterprise Edition
☑ Desktop Verknüpfung anlegen
☑ Verknüpfung Schnellstartleiste anlegen

To start the application, perform a double click on the newly created desktop icon, or select the appropriate entry in the start menu.

## Installation on Linux

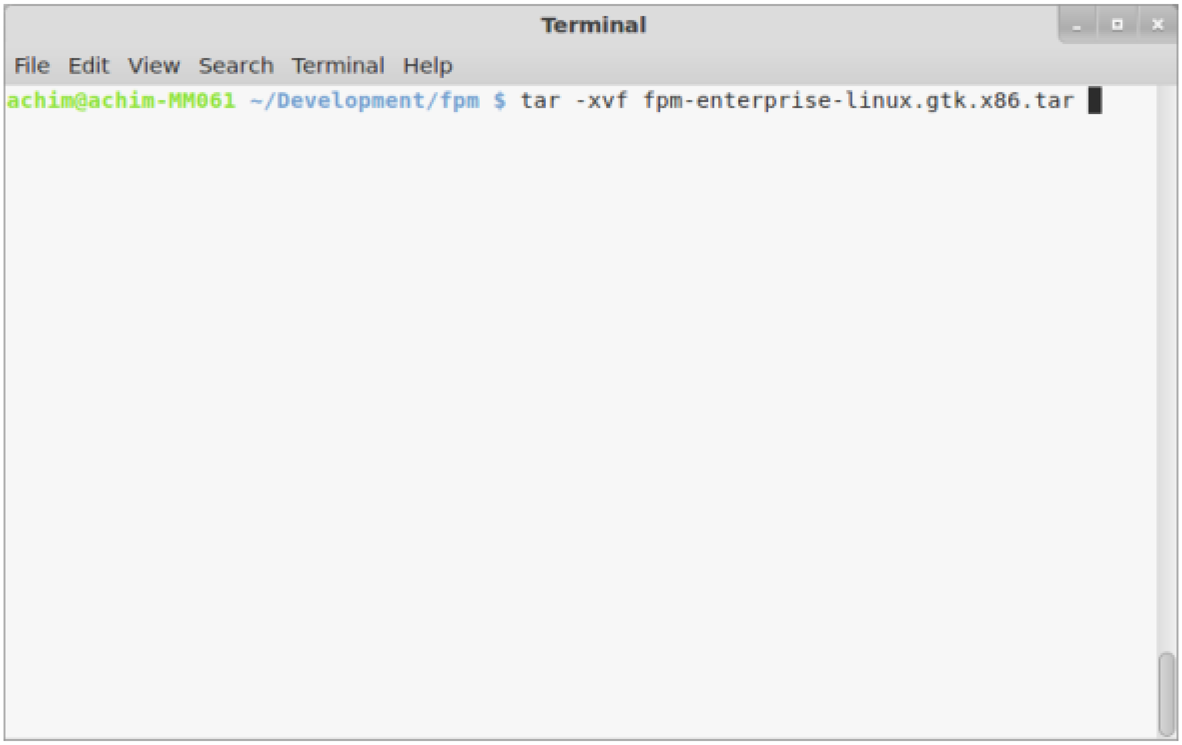
Installation on Linux is a simple process. Just perform the following steps.

Create a folder at a location of your choice and copy the tar file to this location. In our example we create a folder called **fpm** and the enterprise edition file was copied to this folder.



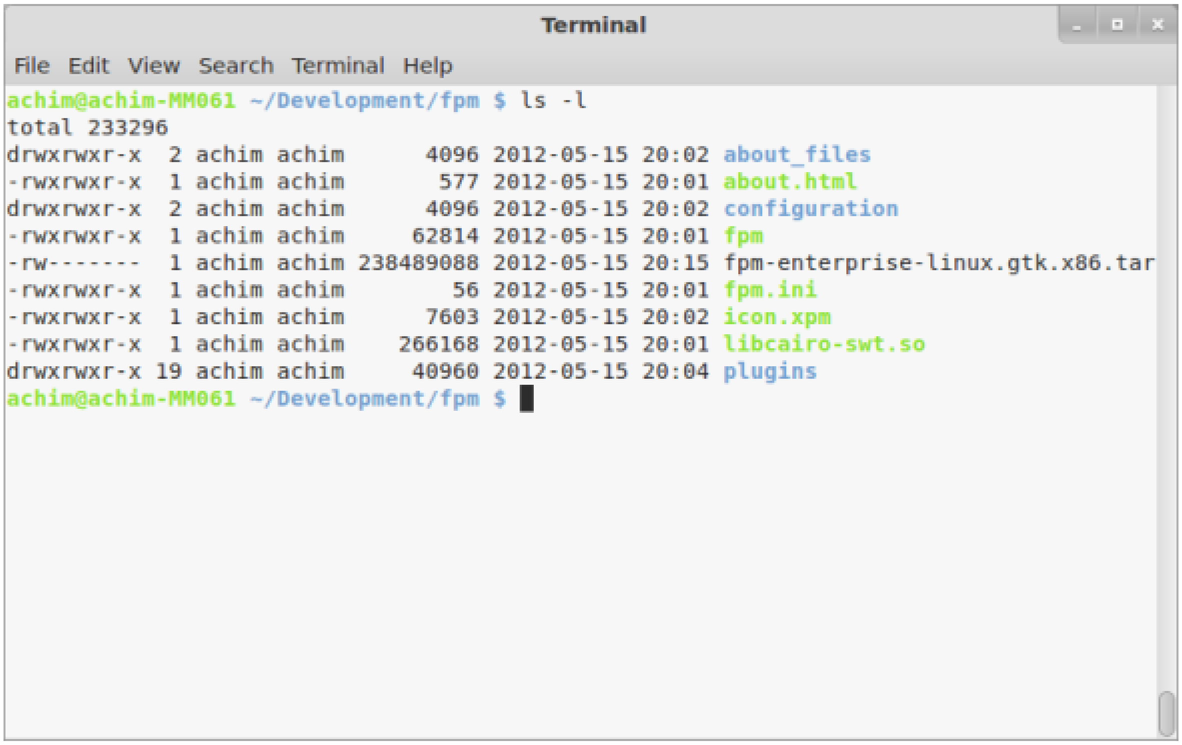
```
achim@achim-MM061 ~/Development/fpm $ ls -l
total 232904
-rw------- 1 achim achim 238489088 2012-05-15 20:15 fpm-enterprise-linux.gtk.x86.tar
achim@achim-MM061 ~/Development/fpm $ 
```

Use the command **tar -xvf FILENAME.tar** to extract this file.



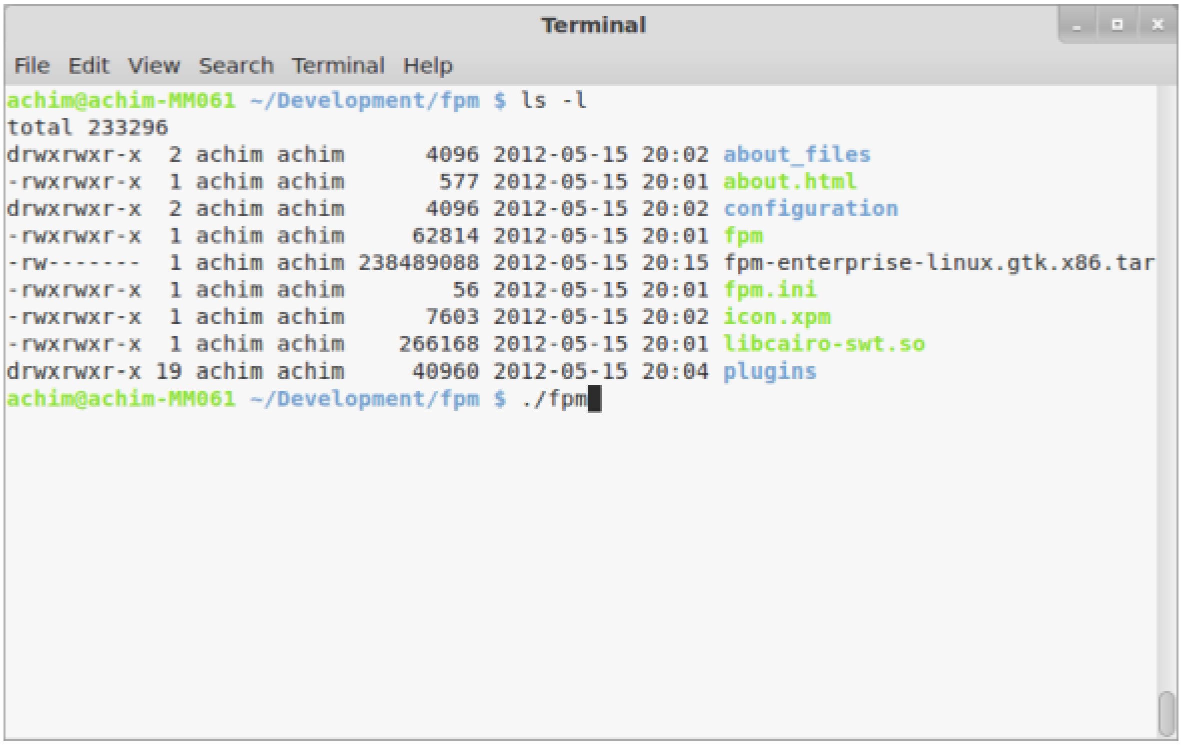
```
achim@achim-MM061 ~/Development/fpm $ tar -xvf fpm-enterprise-linux.gtk.x86.tar 
```

After the command is executed, the contents of your folder should look like this.



```
achim@achim-MM061 ~/Development/fpm $ ls -l
total 233296
drwxrwxr-x  2 achim achim      4096 2012-05-15 20:02 about_files
-rwxrwxr-x  1 achim achim       577 2012-05-15 20:01 about.html
drwxrwxr-x  2 achim achim      4096 2012-05-15 20:02 configuration
-rwxrwxr-x  1 achim achim     62814 2012-05-15 20:01 fpm
-rw-------  1 achim achim 238489088 2012-05-15 20:15 fpm-enterprise-linux.gtk.x86.tar
-rwxrwxr-x  1 achim achim        56 2012-05-15 20:01 fpm.ini
-rwxrwxr-x  1 achim achim      7603 2012-05-15 20:02 icon.xpm
-rwxrwxr-x  1 achim achim    266168 2012-05-15 20:01 libcairo-swt.so
drwxrwxr-x 19 achim achim     40960 2012-05-15 20:04 plugins
achim@achim-MM061 ~/Development/fpm $ 
```

To start the application, simply type the command **./fpm** .



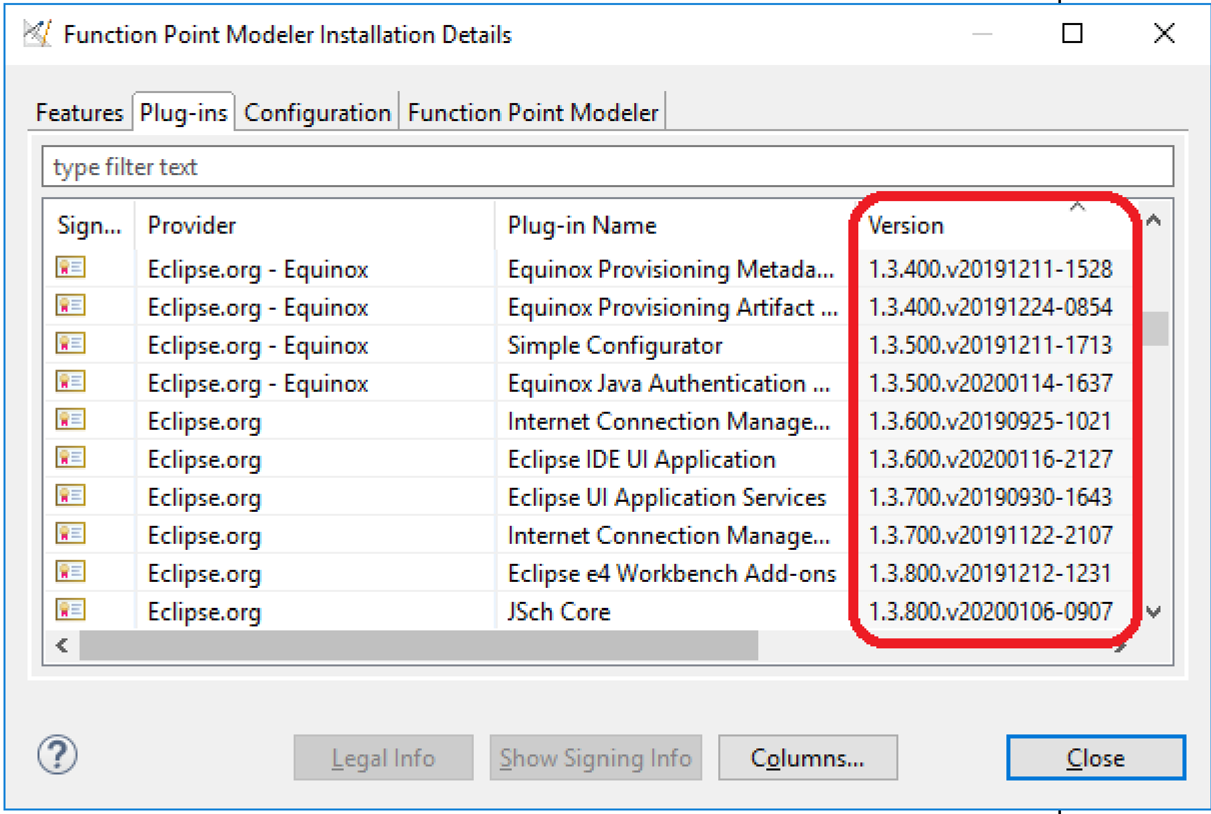
```
achim@achim-MM061 ~/Development/fpm $ ls -l
total 233296
drwxrwxr-x  2 achim achim      4096 2012-05-15 20:02 about_files
-rwxrwxr-x  1 achim achim       577 2012-05-15 20:01 about.html
drwxrwxr-x  2 achim achim      4096 2012-05-15 20:02 configuration
-rwxrwxr-x  1 achim achim     62814 2012-05-15 20:01 fpm
-rw-------  1 achim achim 238489088 2012-05-15 20:15 fpm-enterprise-linux.gtk.x86.tar
-rwxrwxr-x  1 achim achim        56 2012-05-15 20:01 fpm.ini
-rwxrwxr-x  1 achim achim      7603 2012-05-15 20:02 icon.xpm
-rwxrwxr-x  1 achim achim    266168 2012-05-15 20:01 libcairo-swt.so
drwxrwxr-x 19 achim achim     40960 2012-05-15 20:04 plugins
achim@achim-MM061 ~/Development/fpm $ ./fpm
```

## What's new

## New and Noteworthy with Function Point Modeler 5.3

**Adaption to Eclipse_x86_64 4.14.0**

The application is now based on the latest version of the *Eclipse x86_64* framework.



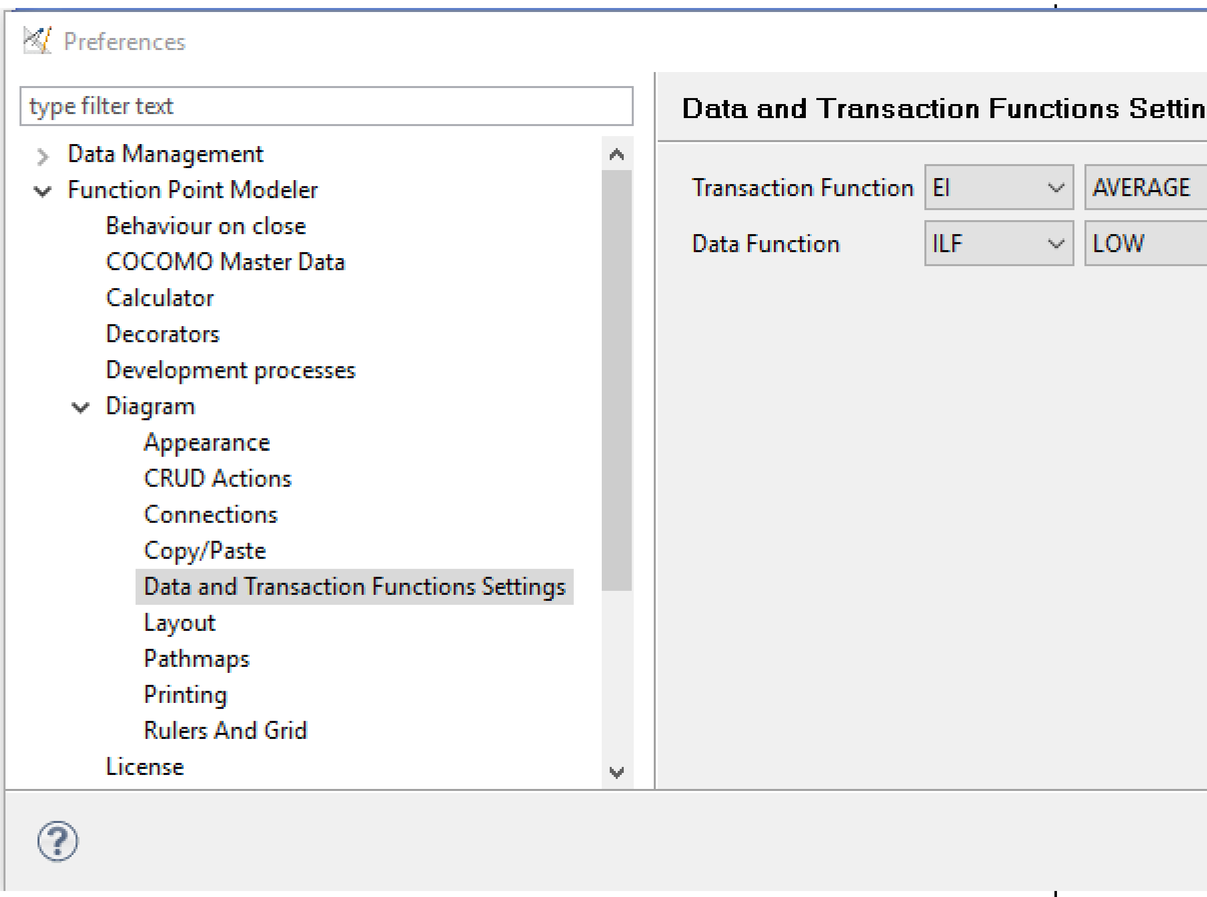
| Sign... | Provider | Plug-in Name | Version |
|---|---|---|---|
| | Eclipse.org - Equinox | Equinox Provisioning Metada... | 1.3.400.v20191211-1528 |
| | Eclipse.org - Equinox | Equinox Provisioning Artifact ... | 1.3.400.v20191224-0854 |
| | Eclipse.org - Equinox | Simple Configurator | 1.3.500.v20191211-1713 |
| | Eclipse.org - Equinox | Equinox Java Authentication ... | 1.3.500.v20200114-1637 |
| | Eclipse.org | Internet Connection Manage... | 1.3.600.v20190925-1021 |
| | Eclipse.org | Eclipse IDE UI Application | 1.3.600.v20200116-2127 |
| | Eclipse.org | Eclipse UI Application Services | 1.3.700.v20190930-1643 |
| | Eclipse.org | Internet Connection Manage... | 1.3.700.v20191122-2107 |
| | Eclipse.org | Eclipse e4 Workbench Add-ons | 1.3.800.v20191212-1231 |
| | Eclipse.org | JSch Core | 1.3.800.v20200106-0907 |

**Support for Java 1.8**

The application is now based on the newest Java VM version 1.8.

**Configuration of Data and Transaction Functions Settings**

**Transaction Function Type** , **Complexity** and **Process Type** of **Transaction Functions** and **Data Function Type Complexity** of **Data Functions** can be configured preference page.



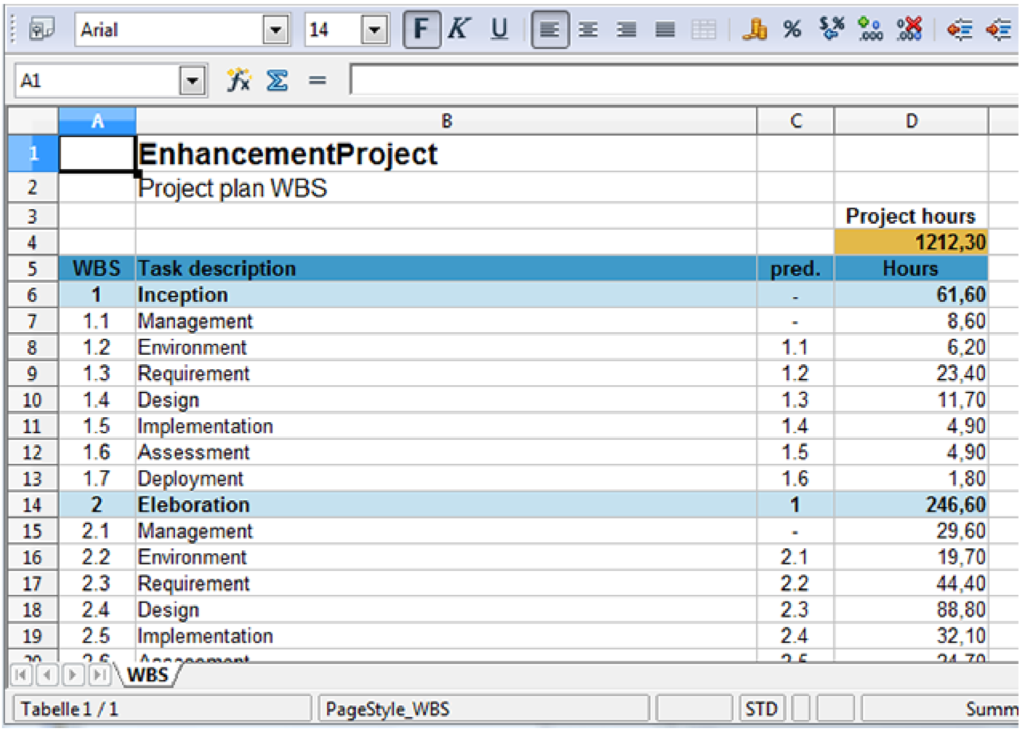
Data and Transaction Functions Settin

Transaction Function EI AVERAGE

Data Function ILF LOW

**Export estimation to spreadsheet**

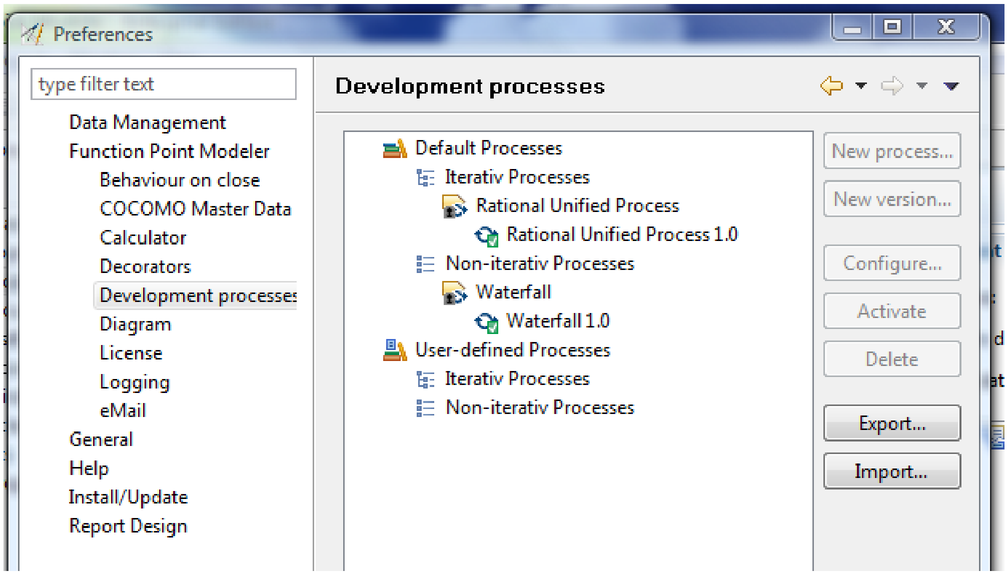
With **Function Point Modeler 4.2** you now can export your project estimation to MS Excel or Open Office Calc as a work breakdown structure.



| | A | B | C | D |
|---|---|---|---|---|
| 1 | | EnhancementProject | | |
| 2 | | Project plan WBS | | |
| 3 | | | | Project hours |
| 4 | | | | 1212,30 |
| 5 | WBS | Task description | pred. | Hours |
| 6 | 1 | Inception | - | 61,60 |
| 7 | 1.1 | Management | - | 8,60 |
| 8 | 1.2 | Environment | 1.1 | 6,20 |
| 9 | 1.3 | Requirement | 1.2 | 23,40 |
| 10 | 1.4 | Design | 1.3 | 11,70 |
| 11 | 1.5 | Implementation | 1.4 | 4,90 |
| 12 | 1.6 | Assessment | 1.5 | 4,90 |
| 13 | 1.7 | Deployment | 1.6 | 1,80 |
| 14 | 2 | Eleboration | 1 | 246,60 |
| 15 | 2.1 | Management | - | 29,60 |
| 16 | 2.2 | Environment | 2.1 | 19,70 |
| 17 | 2.3 | Requirement | 2.2 | 44,40 |
| 18 | 2.4 | Design | 2.3 | 88,80 |
| 19 | 2.5 | Implementation | 2.4 | 32,10 |
| 20 | 2.6 | Assessment | 2.5 | 24,70 |

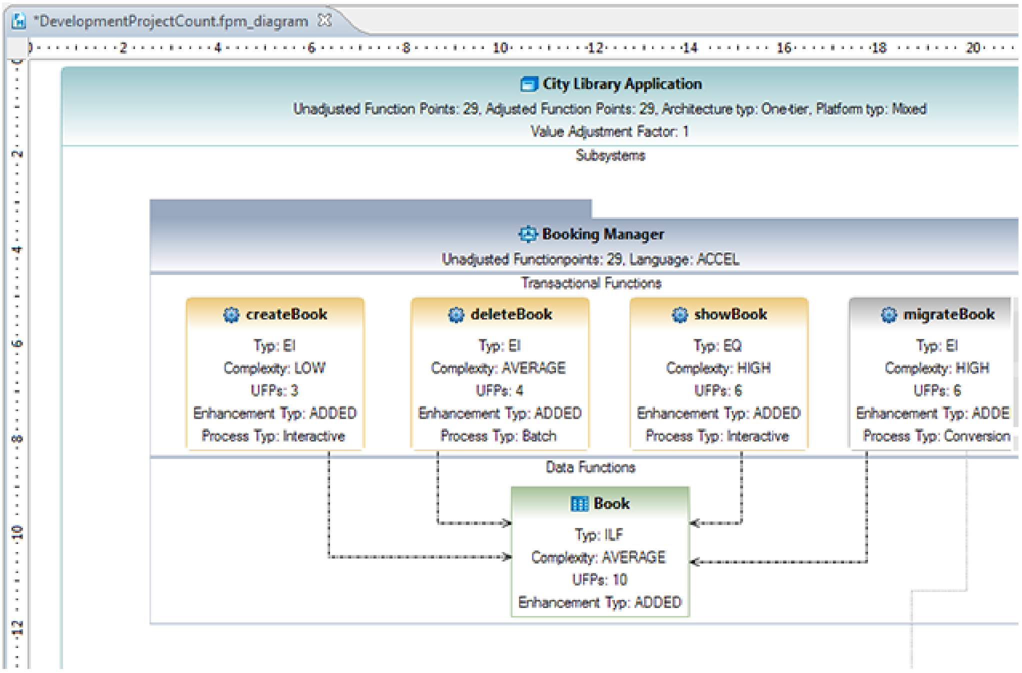
**Import/Export development processes**

You are now able to import/export development processes optional to a XML file or to your SLED database. With the help of the SLED database, it is easier than ever, to exchange development processes with your colleagues or associates.



**Name suggestion**

**Function Point Modeler** now offers you a simple name suggestion. When you add a new element to your diagramm, the workbench suggests a element name based on the element type.



Unadjusted Function Points: 29, Adjusted Function Points: 29, Architecture typ: One-tier, Platform typ: Mixed
Value Adjustment Factor: 1

Unadjusted Functionpoints: 29, Language: ACCEL

createBook
Typ: EI
Complexity: LOW
UFPs: 3
Enhancement Typ: ADDED
Process Typ: Interactive

deleteBook
Typ: EI
Complexity: AVERAGE
UFPs: 4
Enhancement Typ: ADDED
Process Typ: Batch

showBook
Typ: EQ
Complexity: HIGH
UFPs: 6
Enhancement Typ: ADDED
Process Typ: Interactive

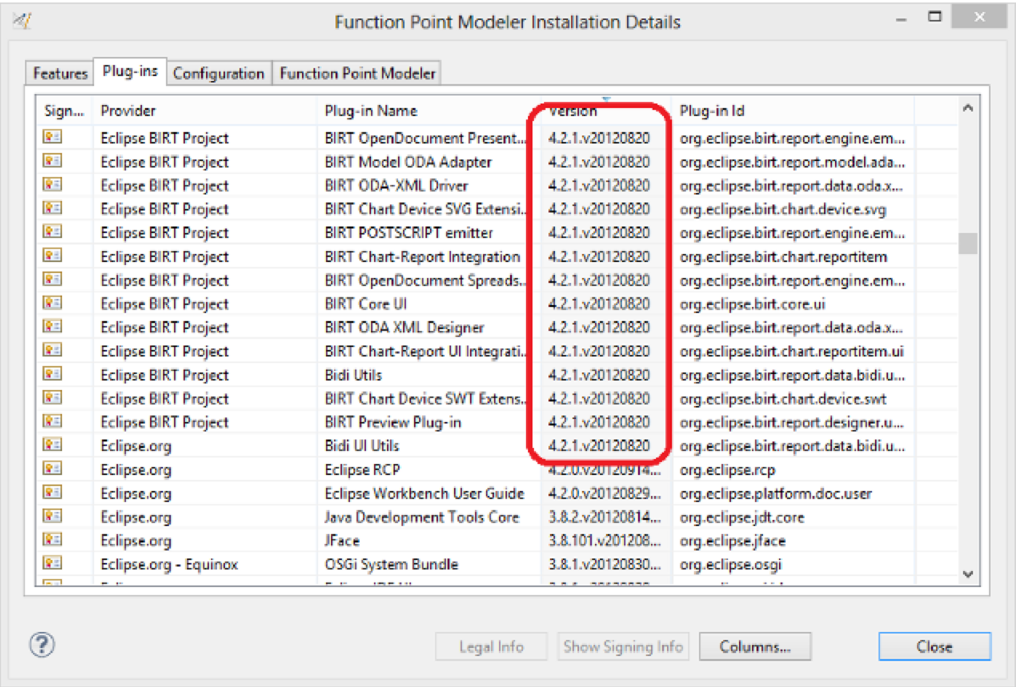
migrateBook
Typ: EI
Complexity: HIGH
UFPs: 6
Enhancement Typ: ADDE
Process Typ: Conversion

Book
Typ: ILF
Complexity: AVERAGE
UFPs: 10
Enhancement Typ: ADDED

## New and Noteworthy with Function Point Modeler 5.2

**Adaption to Eclipse 4.2.1**

The application is now based on the very latest version of the *Eclipse* framework.



Function Point Modeler Installation Details

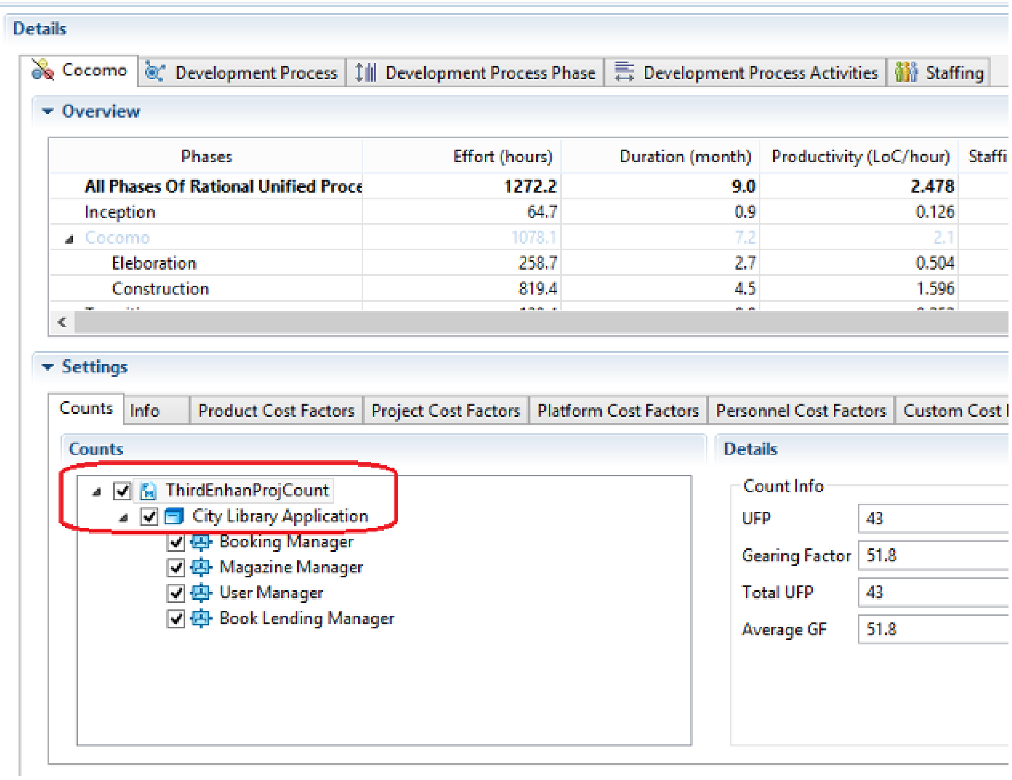
| Sign... | Provider | Plug-in Name | Version | Plug-in Id |
|---|---|---|---|---|
| | Eclipse BIRT Project | BIRT OpenDocument Present... | 4.2.1.v20120820 | org.eclipse.birt.report.engine.em... |
| | Eclipse BIRT Project | BIRT Model ODA Adapter | 4.2.1.v20120820 | org.eclipse.birt.report.model.ada... |
| | Eclipse BIRT Project | BIRT ODA-XML Driver | 4.2.1.v20120820 | org.eclipse.birt.report.data.oda.x... |
| | Eclipse BIRT Project | BIRT Chart Device SVG Extensi... | 4.2.1.v20120820 | org.eclipse.birt.chart.device.svg |
| | Eclipse BIRT Project | BIRT POSTSCRIPT emitter | 4.2.1.v20120820 | org.eclipse.birt.report.engine.em... |
| | Eclipse BIRT Project | BIRT Chart-Report Integration | 4.2.1.v20120820 | org.eclipse.birt.chart.reportitem |
| | Eclipse BIRT Project | BIRT OpenDocument Spreads... | 4.2.1.v20120820 | org.eclipse.birt.report.engine.em... |
| | Eclipse BIRT Project | BIRT Core UI | 4.2.1.v20120820 | org.eclipse.birt.core.ui |
| | Eclipse BIRT Project | BIRT ODA XML Designer | 4.2.1.v20120820 | org.eclipse.birt.report.data.oda.x... |
| | Eclipse BIRT Project | BIRT Chart-Report UI Integrati... | 4.2.1.v20120820 | org.eclipse.birt.chart.reportitem.ui |
| | Eclipse BIRT Project | Bidi Utils | 4.2.1.v20120820 | org.eclipse.birt.report.data.bidi.u... |
| | Eclipse BIRT Project | BIRT Chart Device SWT Extens... | 4.2.1.v20120820 | org.eclipse.birt.chart.device.swt |
| | Eclipse BIRT Project | BIRT Preview Plug-in | 4.2.1.v20120820 | org.eclipse.birt.report.designer.u... |
| | Eclipse.org | Bidi UI Utils | 4.2.1.v20120820 | org.eclipse.birt.report.data.bidi.u... |
| | Eclipse.org | Eclipse RCP | 4.2.0.v20120914... | org.eclipse.rcp |
| | Eclipse.org | Eclipse Workbench User Guide | 4.2.0.v20120829... | org.eclipse.platform.doc.user |
| | Eclipse.org | Java Development Tools Core | 3.8.2.v20120814... | org.eclipse.jdt.core |
| | Eclipse.org | JFace | 3.8.101.v201208... | org.eclipse.jface |
| | Eclipse.org - Equinox | OSGi System Bundle | 3.8.1.v20120830... | org.eclipse.osgi |

**Support for Java 1.7**

The application is now based on the newest Java VM version 1.7.

**Simplified assignment for COCOMO estimations**

Within the COCOMO editor, assignment of Subsystems to Subestimations has been simplified. It is now possible to assign all underlying Subsystems to a Subestimation in one step, by a selection of the corresponding Count or ApplicationSystem. However, once at least one subsystem to assigned to another Subestimation, the selection of Subsystems has to be done individually.



Details

Cocomo | Development Process | Development Process Phase | Development Process Activities | Staffing

Overview

| Phases | Effort (hours) | Duration (month) | Productivity (LoC/hour) | Staffi |
|---|---|---|---|---|
| **All Phases Of Rational Unified Proce** | **1272.2** | **9.0** | **2.478** | |
| Inception | 64.7 | 0.9 | 0.126 | |
| Cocomo | 1078.1 | 7.2 | 2.1 | |
| Eleboration | 258.7 | 2.7 | 0.504 | |
| Construction | 819.4 | 4.5 | 1.596 | |

Settings

Counts | Info | Product Cost Factors | Project Cost Factors | Platform Cost Factors | Personnel Cost Factors | Custom Cost I

Counts

- ☑ ThirdEnhanProjCount
  - ☑ City Library Application
    - ☑ Booking Manager
    - ☑ Magazine Manager
    - ☑ User Manager
    - ☑ Book Lending Manager

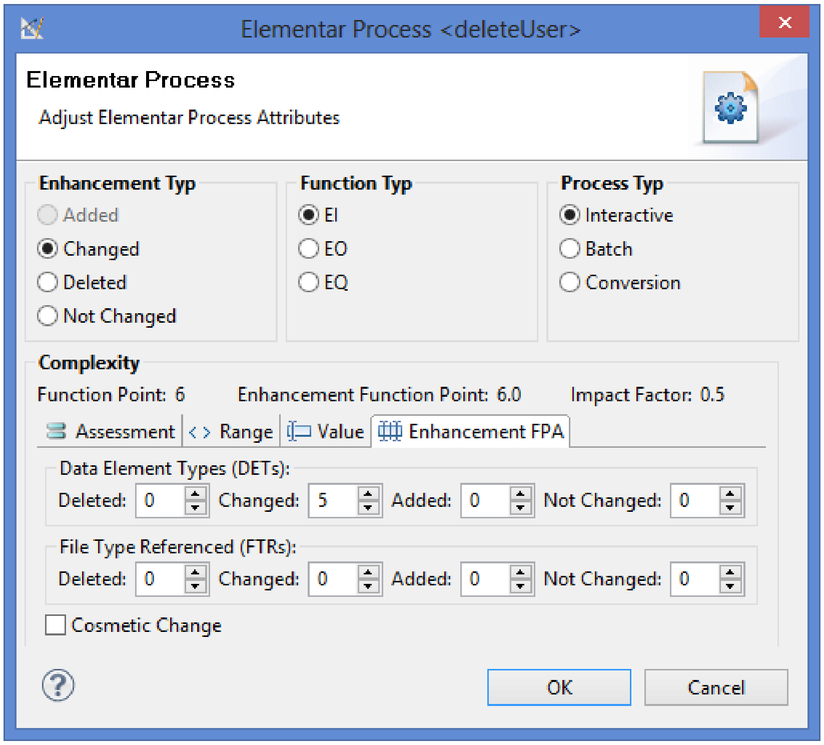
Details

Count Info

| | |
|---|---|
| UFP | 43 |
| Gearing Factor | 51.8 |
| Total UFP | 43 |
| Average GF | 51.8 |

**Support for NESMA Function Size Method**

The application now supports calculation of NESMA Functionpoints for Enhancement Counts.



Elementar Process <deleteUser>

Elementar Process

Adjust Elementar Process Attributes

Enhancement Typ

- ○ Added
- ● Changed
- ○ Deleted
- ○ Not Changed

Function Typ

- ● EI
- ○ EO
- ○ EQ

Process Typ

- ● Interactive
- ○ Batch
- ○ Conversion

Complexity

Function Point: 6 Enhancement Function Point: 6.0 Impact Factor: 0.5

Assessment | Range | Value | Enhancement FPA

Data Element Types (DETs):

Deleted: 0 Changed: 5 Added: 0 Not Changed: 0

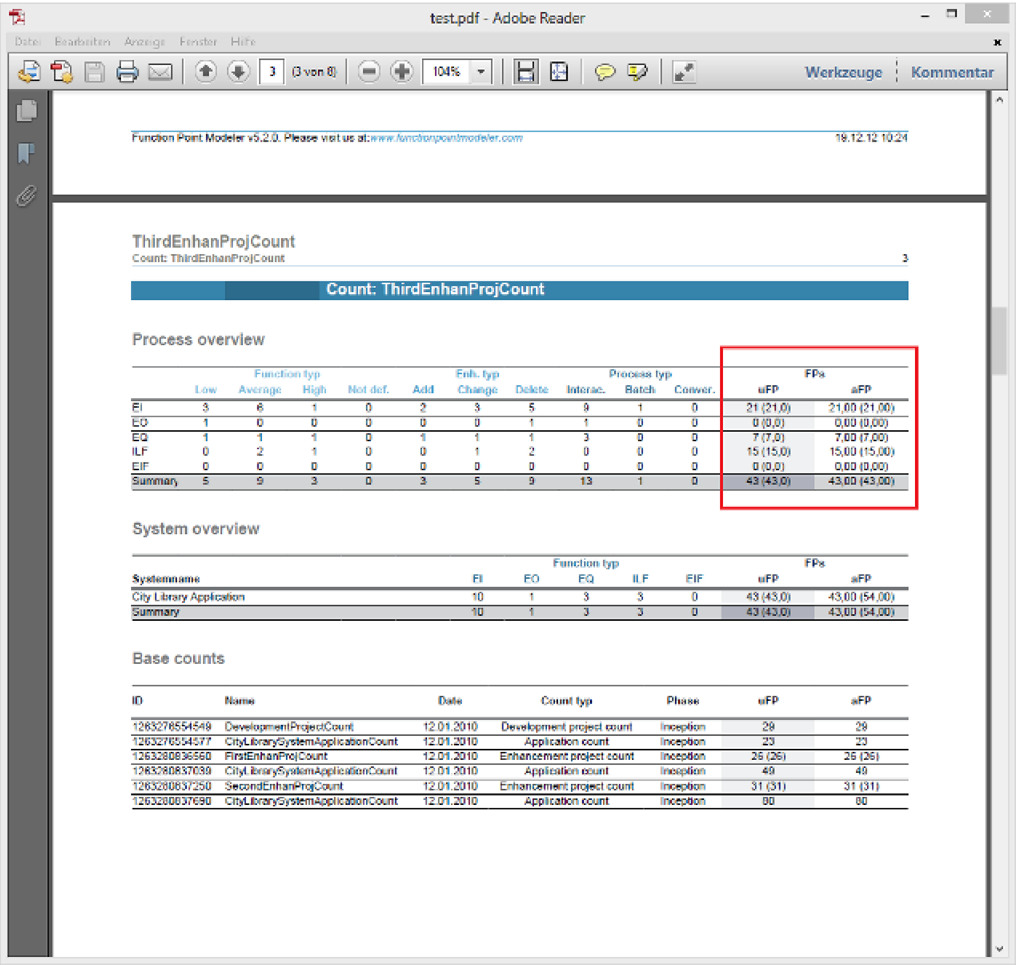
File Type Referenced (FTRs):

Deleted: 0 Changed: 0 Added: 0 Not Changed: 0

☐ Cosmetic Change

**Report Integration of NESMA Function Size Method**

NESMA Function Size Method attributes are now included in reports for Enhancement Counts.



Function Point Modeler v5.2.0. Please visit us at: www.functionpointmodeler.com 19.12.12 10:24

ThirdEnhanProjCount

Count: ThirdEnhanProjCount 3

Count: ThirdEnhanProjCount

Process overview

| | Function typ | | | | Enh. typ | | | Process typ | | | FPs | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Low | Average | High | Not def. | Add | Change | Delete | Interac. | Batch | Conver. | uFP | aFP |
| EI | 3 | 6 | 1 | 0 | 2 | 3 | 5 | 9 | 1 | 0 | 21 (21,0) | 21,00 (21,00) |
| EO | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 (0,0) | 0,00 (0,00) |
| EQ | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 3 | 0 | 0 | 7 (7,0) | 7,00 (7,00) |
| ILF | 0 | 2 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 15 (15,0) | 15,00 (15,00) |
| EIF | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 (0,0) | 0,00 (0,00) |
| Summary | 5 | 9 | 3 | 0 | 3 | 5 | 9 | 13 | 1 | 0 | 43 (43,0) | 43,00 (43,00) |

System overview

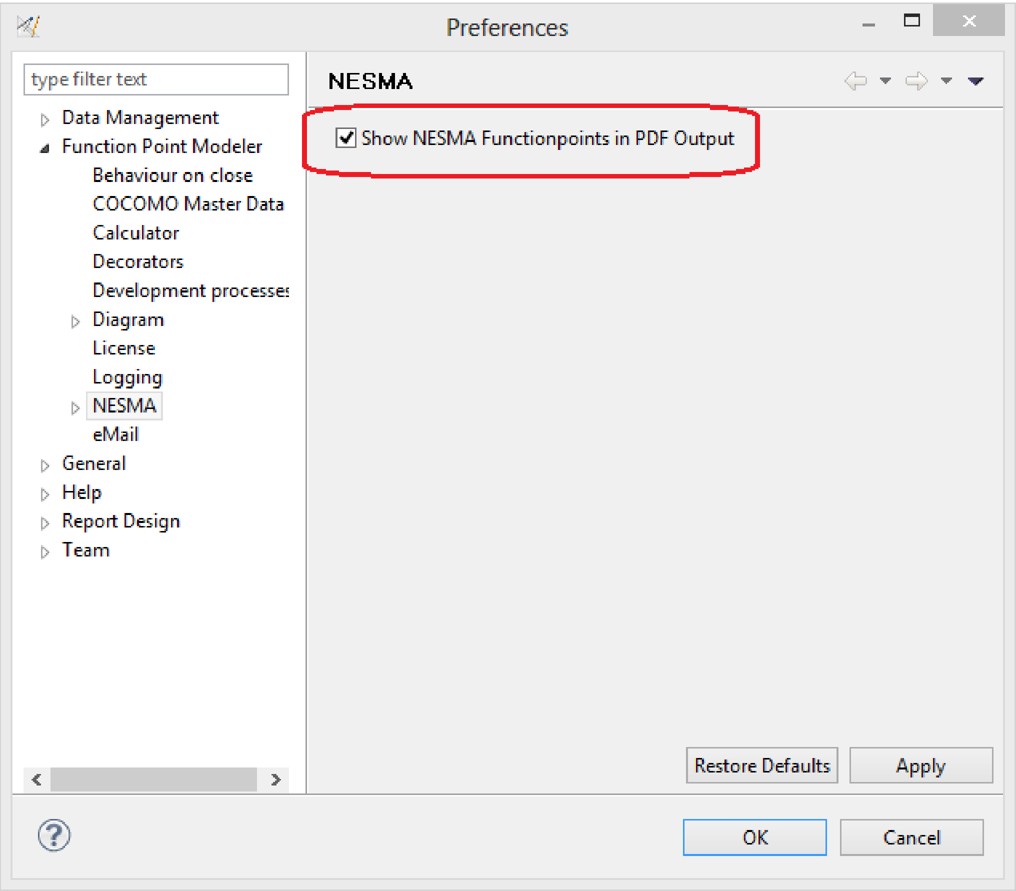
| | Function typ | | | | | FPs | |
|---|---|---|---|---|---|---|---|
| Systemname | EI | EO | EQ | ILF | EIF | uFP | aFP |
| City Library Application | 10 | 1 | 3 | 3 | 0 | 43 (43,0) | 43,00 (54,00) |
| Summary | 10 | 1 | 3 | 3 | 0 | 43 (43,0) | 43,00 (54,00) |

Base counts

| ID | Name | Date | Count typ | Phase | uFP | aFP |
|---|---|---|---|---|---|---|
| 1263276554549 | DevelopmentProjectCount | 12.01.2010 | Development project count | Inception | 29 | 29 |
| 1263276554577 | CityLibrarySystemApplicationCount | 12.01.2010 | Application count | Inception | 23 | 23 |
| 1263280836560 | FirstEnhanProjCount | 12.01.2010 | Enhancement project count | Inception | 26 (26) | 26 (26) |
| 1263280837039 | CityLibrarySystemApplicationCount | 12.01.2010 | Application count | Inception | 49 | 49 |
| 1263280837250 | SecondEnhanProjCount | 12.01.2010 | Enhancement project count | Inception | 31 (31) | 31 (31) |
| 1263280837690 | CityLibrarySystemApplicationCount | 12.01.2010 | Application count | Inception | 80 | 80 |

**Optional Integration for NESMA Information**

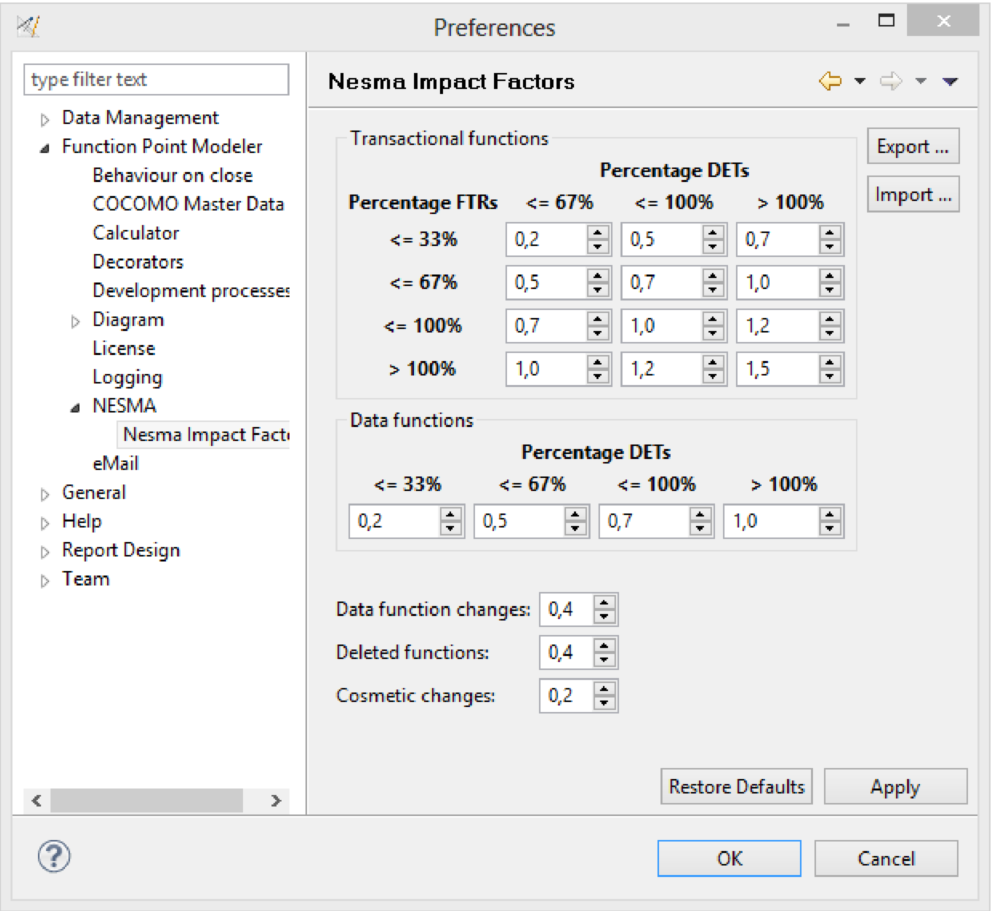
NESMA Function Size Method attributes for Enhancement Counts are optional for reports. The representation of attributes for Enhancement Counts within the reports, can be turned on or of with the help of properties.



☑ Show NESMA Functionpoints in PDF Output

**Configuration of NESMA Impact Factors**

Calculation of NESMA Function Size Method for Enhancement Counts is adaptable. NESMA Impact Factors can be changed with the help of properties.



Nesma Impact Factors

Transactional functions

| | Percentage DETs | | |
|---|---|---|---|
| Percentage FTRs | <= 67% | <= 100% | > 100% |
| <= 33% | 0,2 | 0,5 | 0,7 |
| <= 67% | 0,5 | 0,7 | 1,0 |
| <= 100% | 0,7 | 1,0 | 1,2 |
| > 100% | 1,0 | 1,2 | 1,5 |

Data functions

| Percentage DETs | | | |
|---|---|---|---|
| <= 33% | <= 67% | <= 100% | > 100% |
| 0,2 | 0,5 | 0,7 | 1,0 |

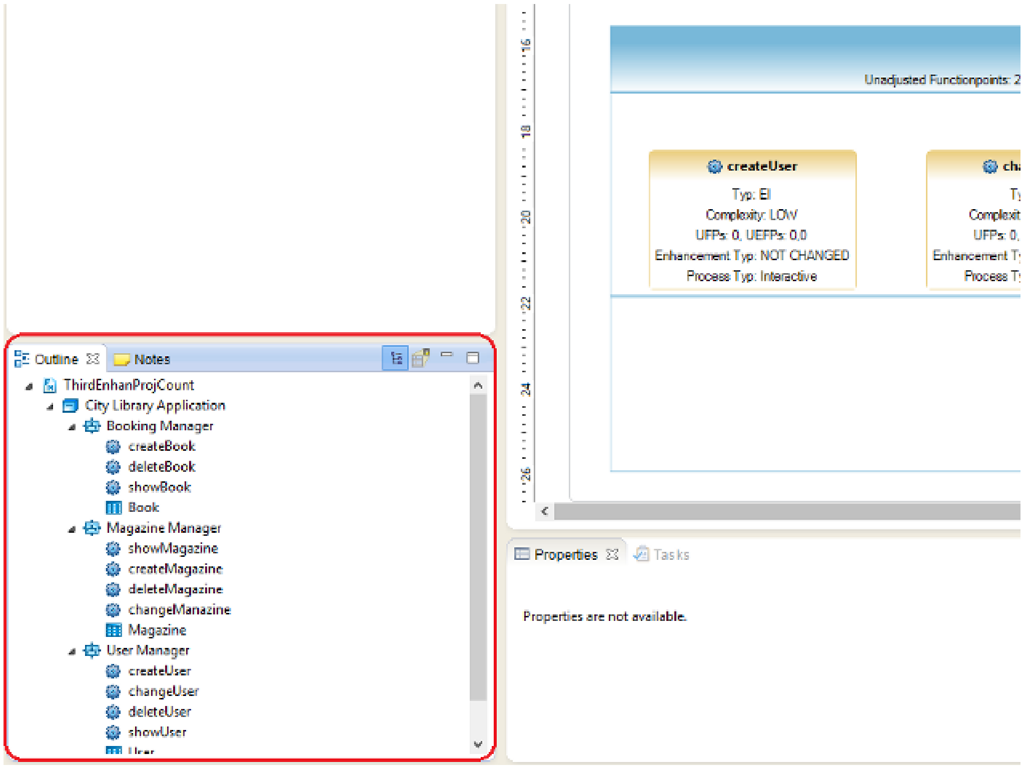
Data function changes: 0,4

Deleted functions: 0,4

Cosmetic changes: 0,2

**Simplified Navigation in Diagrams**

Navigation through graphical charts has been greatly simplified. In addition to the previous graphical representation within the Outline View, a tree view has been created, which represents the current state of the graphical diagram. By electing an element in the tree, direct navigation to the graphical representation in the diagram is possible. The structural view of the diagram is preset as the default, but at any time you can switch back to the graphical representation of the Outline View. In addition, when selecting an item in the tree view, Properties View is updated automatically. Thus, it is now possible to make fast adjustments of the selected element.



Unadjusted Functionpoints: 2

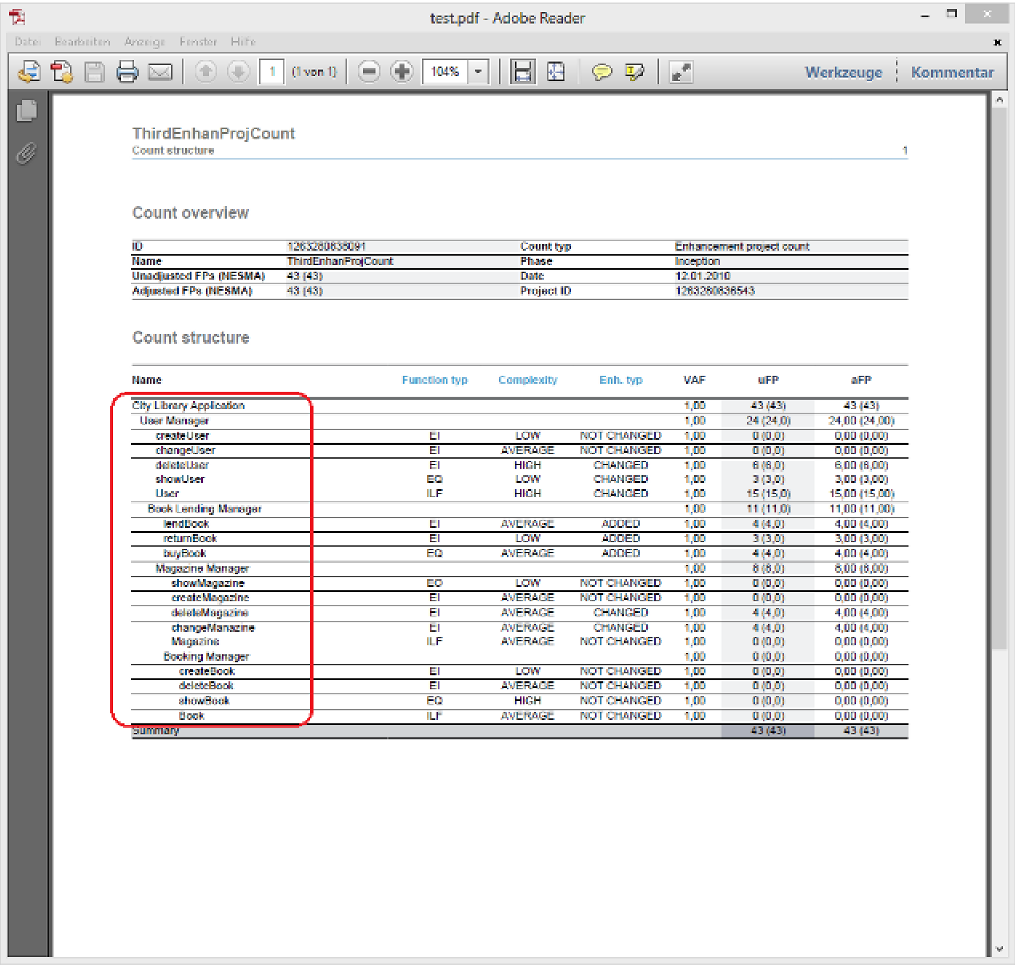
createUser

Typ: EI
Complexity: LOW
UFPs: 0, UEFPs: 0,0
Enhancement Typ: NOT CHANGED
Process Typ: Interactive

Properties are not available.

**Visualize Relations between Subsystems in Count Structure Report**

A relation between Subsystems is now visualized within the report **Count Structure** by indentation the tree structure.



ThirdEnhanProjCount

Count structure 1

Count overview

| | | | |
|---|---|---|---|
| ID | 1263280838091 | Count typ | Enhancement project count |
| Name | ThirdEnhanProjCount | Phase | Inception |
| Unadjusted FPs (NESMA) | 43 (43) | Date | 12.01.2010 |
| Adjusted FPs (NESMA) | 43 (43) | Project ID | 1263280836543 |

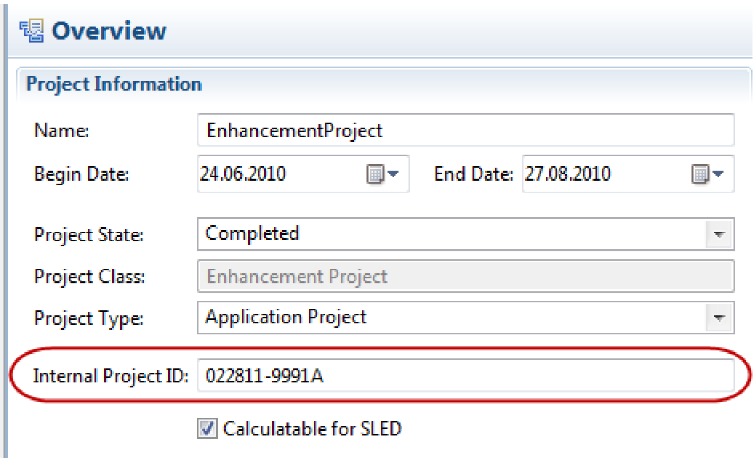
Count structure

| Name | Function typ | Complexity | Enh. typ | VAF | uFP | aFP |
|---|---|---|---|---|---|---|
| City Library Application | | | | 1,00 | 43 (43) | 43 (43) |
| User Manager | | | | 1,00 | 24 (24,0) | 24,00 (24,00) |
| createUser | EI | LOW | NOT CHANGED | 1,00 | 0 (0,0) | 0,00 (0,00) |
| changeUser | EI | AVERAGE | NOT CHANGED | 1,00 | 0 (0,0) | 0,00 (0,00) |
| deleteUser | EI | HIGH | CHANGED | 1,00 | 6 (6,0) | 6,00 (6,00) |
| showUser | EQ | LOW | CHANGED | 1,00 | 3 (3,0) | 3,00 (3,00) |
| User | ILF | HIGH | CHANGED | 1,00 | 15 (15,0) | 15,00 (15,00) |
| Book Lending Manager | | | | 1,00 | 11 (11,0) | 11,00 (11,00) |
| lendBook | EI | AVERAGE | ADDED | 1,00 | 4 (4,0) | 4,00 (4,00) |
| returnBook | EI | LOW | ADDED | 1,00 | 3 (3,0) | 3,00 (3,00) |
| buyBook | EQ | AVERAGE | ADDED | 1,00 | 4 (4,0) | 4,00 (4,00) |
| Magazine Manager | | | | 1,00 | 8 (8,0) | 8,00 (8,00) |
| showMagazine | EO | LOW | NOT CHANGED | 1,00 | 0 (0,0) | 0,00 (0,00) |
| createMagazine | EI | AVERAGE | NOT CHANGED | 1,00 | 0 (0,0) | 0,00 (0,00) |
| deleteMagazine | EI | AVERAGE | CHANGED | 1,00 | 4 (4,0) | 4,00 (4,00) |
| changeManazine | EI | AVERAGE | CHANGED | 1,00 | 4 (4,0) | 4,00 (4,00) |
| Magazine | ILF | AVERAGE | NOT CHANGED | 1,00 | 0 (0,0) | 0,00 (0,00) |
| Booking Manager | | | | 1,00 | 0 (0,0) | 0,00 (0,00) |
| createBook | EI | LOW | NOT CHANGED | 1,00 | 0 (0,0) | 0,00 (0,00) |
| deleteBook | EI | AVERAGE | NOT CHANGED | 1,00 | 0 (0,0) | 0,00 (0,00) |
| showBook | EQ | HIGH | NOT CHANGED | 1,00 | 0 (0,0) | 0,00 (0,00) |
| Book | ILF | AVERAGE | NOT CHANGED | 1,00 | 0 (0,0) | 0,00 (0,00) |
| Summary | | | | | 43 (43) | 43 (43) |

## New and Noteworthy with Function Point Modeler 5.1

**New attribute Internal Project ID**

A new attribute *Internal Project ID* was introduced. You can use this attribute to map a reference to your company's internal project numbers.



Overview

Project Information

Name: EnhancementProject

Begin Date: 24.06.2010 End Date: 27.08.2010

Project State: Completed

Project Class: Enhancement Project

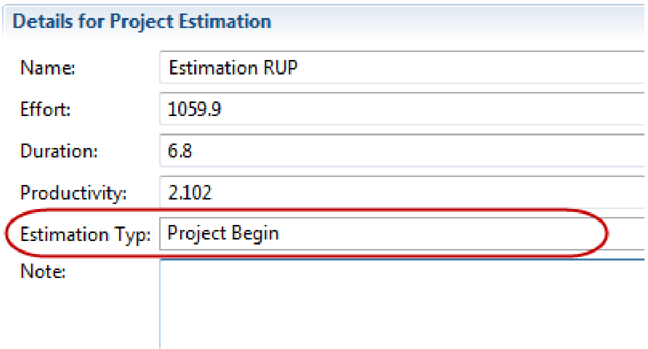
Project Type: Application Project

Internal Project ID: 022811-9991A

☑ Calculatable for SLED

**New classification for estimations**

A new classification attribute *Estimation Typ* was introduced for estimations. You can use this attribute to classify an estimation.

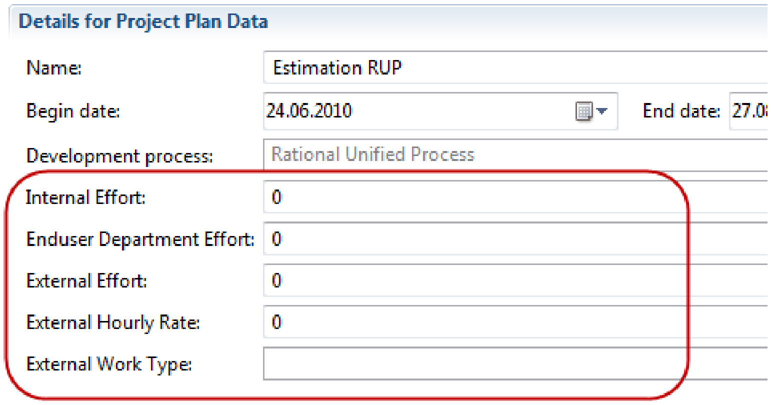


Details for Project Estimation

| | |
|---|---|
| Name: | Estimation RUP |
| Effort: | 1059.9 |
| Duration: | 6.8 |
| Productivity: | 2.102 |
| Estimation Typ: | Project Begin |
| Note: | |

**Several new attributes for ProjectPlandata**

Several new attributes for *ProjectPlandata* were introduced. Using these attributes, it is possible to capture data from plandatas for projects in more detail.

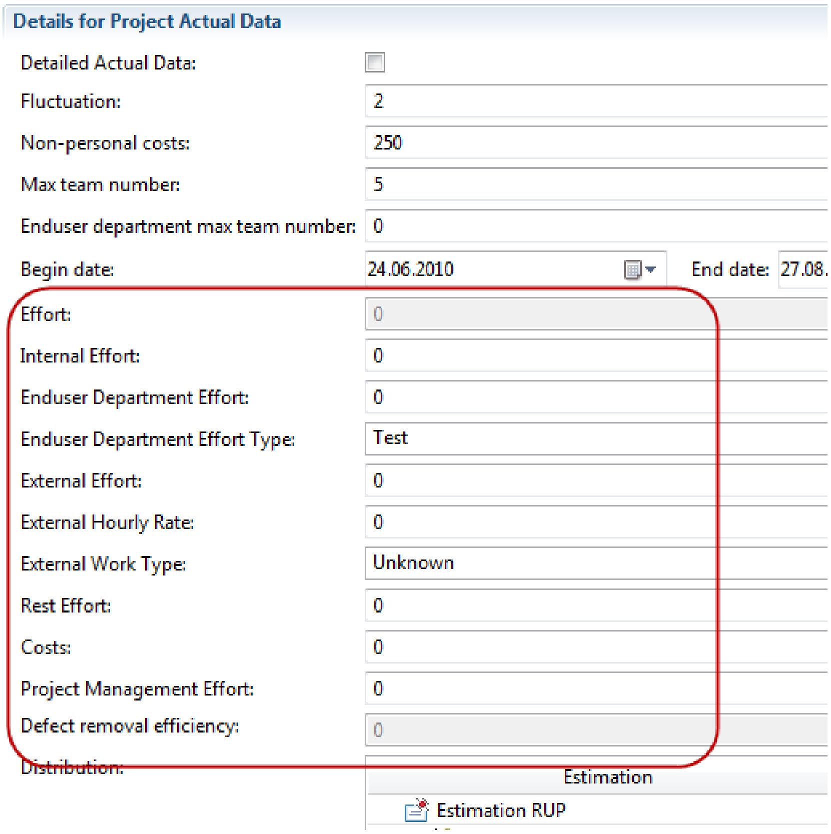


Details for Project Plan Data

| | | | |
|---|---|---|---|
| Name: | Estimation RUP | | |
| Begin date: | 24.06.2010 | End date: | 27.0 |
| Development process: | Rational Unified Process | | |
| Internal Effort: | 0 | | |
| Enduser Department Effort: | 0 | | |
| External Effort: | 0 | | |
| External Hourly Rate: | 0 | | |
| External Work Type: | | | |

**Several new attributes for ProjectActualData/ ProjectPhaseActualData**

Several new attributes for *ProjectActualData* and *ProjectPhaseActualData* were introduced. Using these attributes, it is possible to capture actual datas from projects in more detail.



Details for Project Actual Data

Detailed Actual Data: □

Fluctuation: 2

Non-personal costs: 250

Max team number: 5

Enduser department max team number: 0

Begin date: 24.06.2010 End date: 27.08.

Effort: 0

Internal Effort: 0

Enduser Department Effort: 0

Enduser Department Effort Type: Test

External Effort: 0

External Hourly Rate: 0

External Work Type: Unknown

Rest Effort: 0

Costs: 0

Project Management Effort: 0

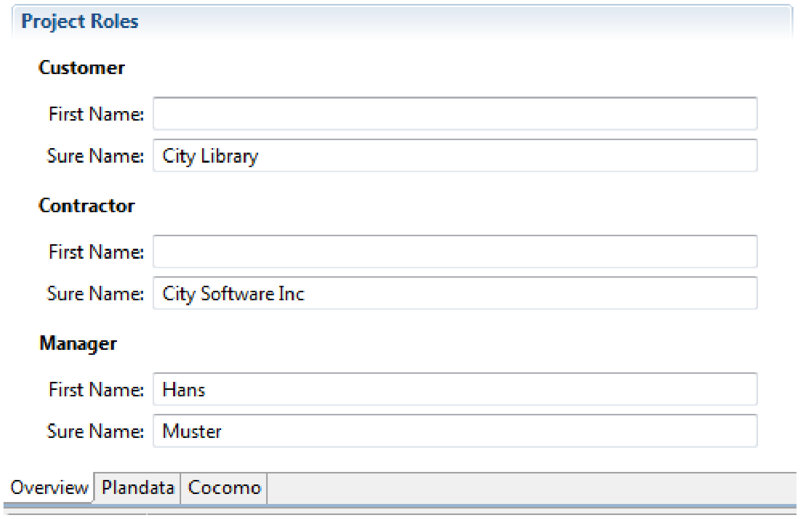
Defect removal efficiency: 0

Distribution: Estimation

Estimation RUP

### Splitting names for managers, contractors and customers

The names for the project roles manager, contractor and customer have been split into first and last name. It is now possible to record these names more accurately and consistently.



Project Roles

**Customer**

First Name:

Sure Name: City Library

**Contractor**

First Name:

Sure Name: City Software Inc

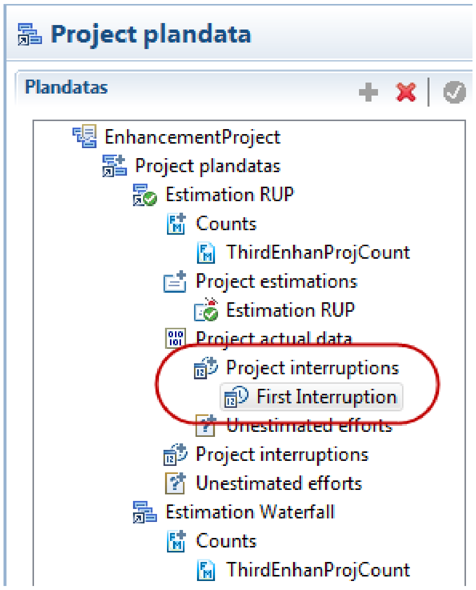
**Manager**

First Name: Hans

Sure Name: Muster

### New entity Project Interruption introduced

A new entity *Project Interruption* was introduced. You can use this entity in the planning data of a project to collect and document project interruptions.



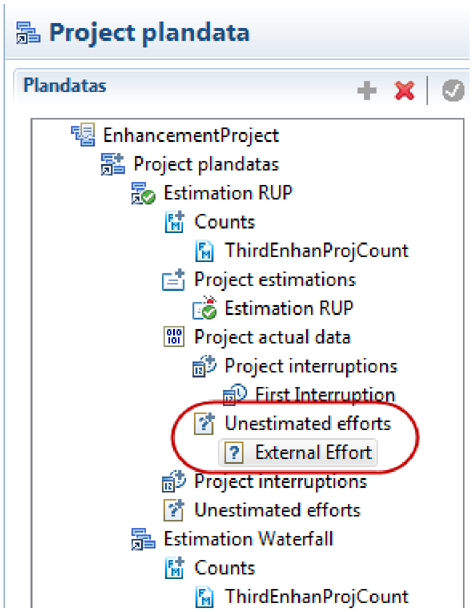
Project plandata

Plandatas

- EnhancementProject
  - Project plandatas
    - Estimation RUP
      - Counts
        - ThirdEnhanProjCount
      - Project estimations
        - Estimation RUP
      - Project actual data
        - Project interruptions
          - First Interruption
        - Unestimated efforts
      - Project interruptions
      - Unestimated efforts
    - Estimation Waterfall
      - Counts
        - ThirdEnhanProjCount

**New entity Unestimated Effort introduced**

A new entity *Unestimated Effort* was introduced. You can use this entity in the planning data of a project to collect and document unestimated project efforts.



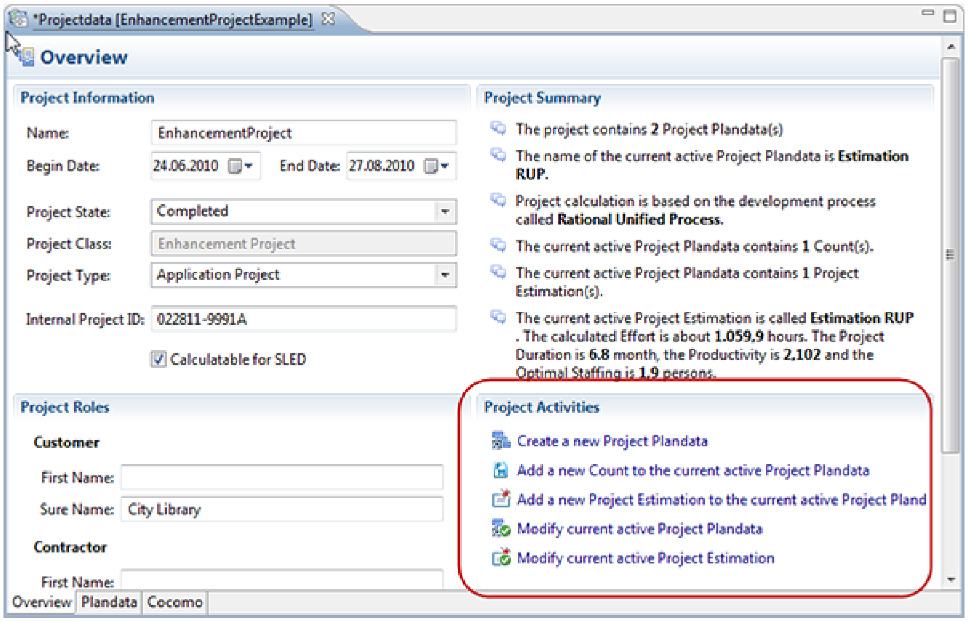
Project plandata

Plandatas

- EnhancementProject
  - Project plandatas
    - Estimation RUP
      - Counts
        - ThirdEnhanProjCount
      - Project estimations
        - Estimation RUP
      - Project actual data
        - Project interruptions
          - First Interruption
        - Unestimated efforts
          - External Effort
      - Project interruptions
      - Unestimated efforts
    - Estimation Waterfall
      - Counts
        - ThirdEnhanProjCount

**Redesign for overview page in projectdata editor**

The overview page of the projectdata editor has been completely redesigned. It is now possible, among other things, to run activities for projects directly from this page.



*Projectdata [EnhancementProjectExample]

Overview

Project Information

Name: EnhancementProject

Begin Date: 24.06.2010 End Date: 27.08.2010

Project State: Completed

Project Class: Enhancement Project

Project Type: Application Project

Internal Project ID: 022811-9991A

☑ Calculatable for SLED

Project Summary

- The project contains **2** Project Plandata(s)
- The name of the current active Project Plandata is **Estimation RUP.**
- Project calculation is based on the development process called **Rational Unified Process.**
- The current active Project Plandata contains **1** Count(s).
- The current active Project Plandata contains **1** Project Estimation(s).
- The current active Project Estimation is called **Estimation RUP** . The calculated Effort is about **1.059,9** hours. The Project Duration is **6.8** month, the Productivity is **2,102** and the Optimal Staffing is **1.9** persons.

Project Roles

**Customer**

First Name:

Sure Name: City Library

**Contractor**

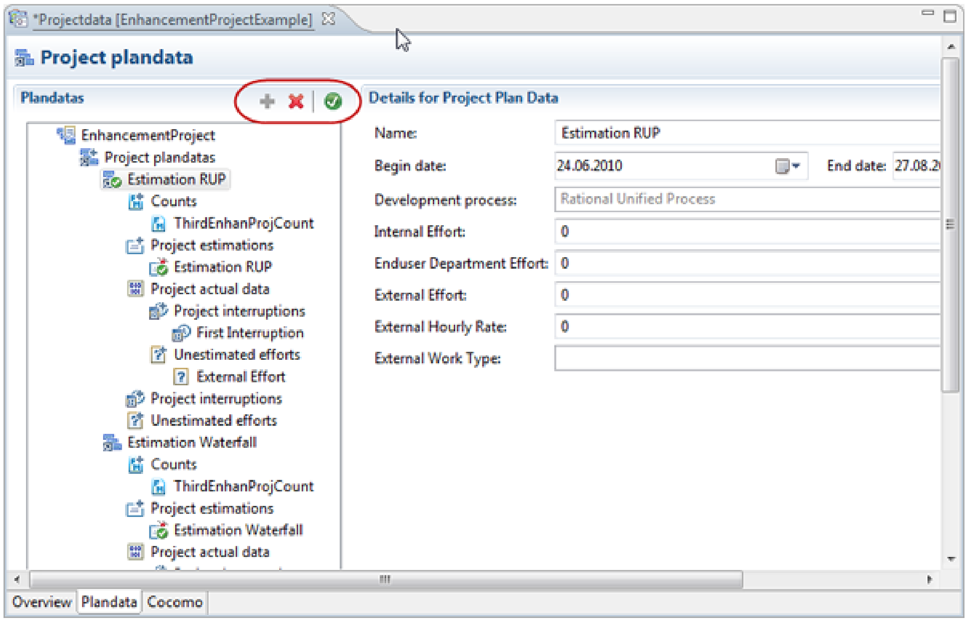
First Name:

Project Activities

- Create a new Project Plandata
- Add a new Count to the current active Project Plandata
- Add a new Project Estimation to the current active Project Pland
- Modify current active Project Plandata
- Modify current active Project Estimation

### Redesign for plandata page in projectdata editor

The plandata page of the projectdata editor has been completely redesigned. The creation and deletion of structural elements is now supported with the help of buttons in the section heading.



*Projectdata [EnhancementProjectExample]

Project plandata

Plandatas

- EnhancementProject
  - Project plandatas
    - Estimation RUP
      - Counts
        - ThirdEnhanProjCount
      - Project estimations
        - Estimation RUP
      - Project actual data
        - Project interruptions
          - First Interruption
        - Unestimated efforts
          - External Effort
      - Project interruptions
      - Unestimated efforts
    - Estimation Waterfall
      - Counts
        - ThirdEnhanProjCount
      - Project estimations
        - Estimation Waterfall
      - Project actual data

Details for Project Plan Data

Name: Estimation RUP

Begin date: 24.06.2010 End date: 27.08.2

Development process: Rational Unified Process

Internal Effort: 0

Enduser Department Effort: 0

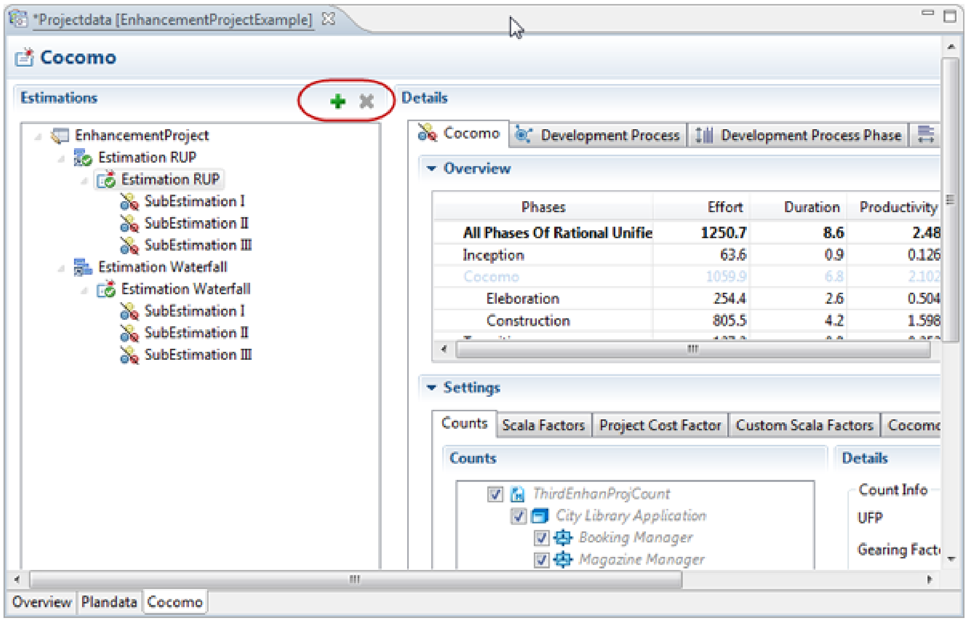
External Effort: 0

External Hourly Rate: 0

External Work Type:

### Redesign for cocomo page in projectdata editor

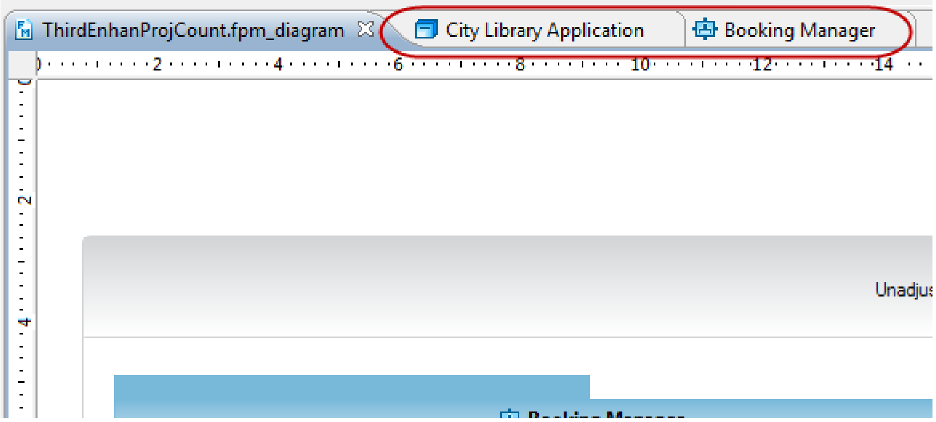
The cocomo page of the projectdata editor has been completely redesigned. The creation and deletion of structural elements is now supported with the help of buttons in the section heading.



| Phases | Effort | Duration | Productivity |
|---|---|---|---|
| **All Phases Of Rational Unifie** | **1250.7** | **8.6** | **2.48** |
| Inception | 63.6 | 0.9 | 0.126 |
| Cocomo | 1059.9 | 6.8 | 2.102 |
| Eleboration | 254.4 | 2.6 | 0.504 |
| Construction | 805.5 | 4.2 | 1.598 |

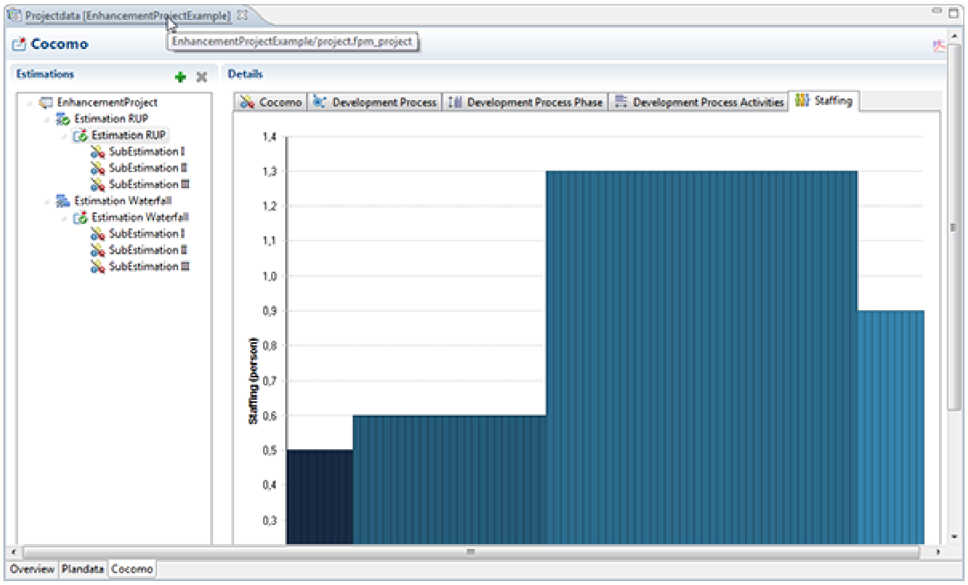
**Talking and readable editor titles**

The titles of the graphical editors for ApplicationSystems, Subsystems and ElementarProcesses are now more meaningful.



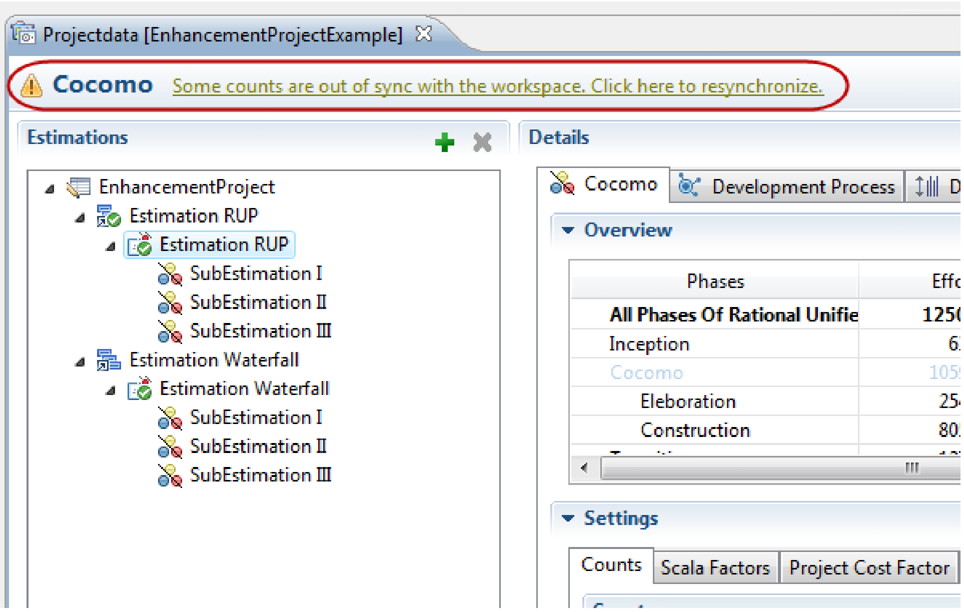
**Staffing in COCOMO calculation**

In connection with the calculation of COCOMO efforts for projects, now also the optimal staffings will be calculated. The underlying calculation formulas can be defined as required in the development processes.



**Synchronization option in the projectdata editor**

If counts were changed after they are already included in the project data, now a warning message appears in the project editor. By selecting this message, the correction of count data within the project data will be carried out fully automatically.

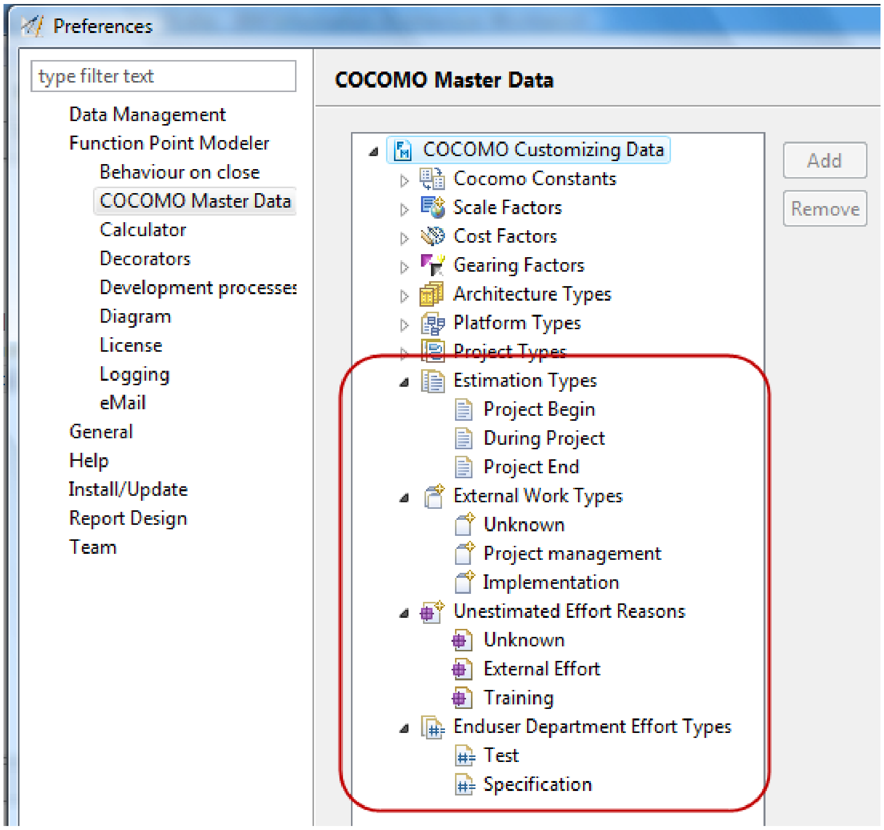


Some counts are out of sync with the workspace. Click here to resynchronize.

| Phases | Effo |
|---|---|
| **All Phases Of Rational Unifie** | **125(** |
| Inception | 6. |
| Cocomo | 105 |
| Eleboration | 25 |
| Construction | 80. |

**Extension of Cocomo Master Data**

There were several new user-defined types included within Cocomo Master Data. Thes types already contain fundamental characteristics, but may be extended.



Preferences

type filter text

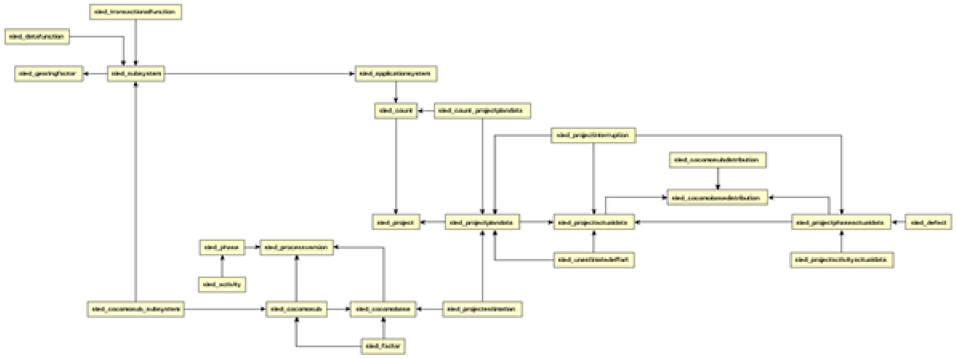
- Data Management
- Function Point Modeler
  - Behaviour on close
  - COCOMO Master Data
  - Calculator
  - Decorators
  - Development processes
  - Diagram
  - License
  - Logging
  - eMail
- General
- Help
- Install/Update
- Report Design
- Team

COCOMO Master Data

- COCOMO Customizing Data
  - Cocomo Constants
  - Scale Factors
  - Cost Factors
  - Gearing Factors
  - Architecture Types
  - Platform Types
  - Project Types
  - Estimation Types
    - Project Begin
    - During Project
    - Project End
  - External Work Types
    - Unknown
    - Project management
    - Implementation
  - Unestimated Effort Reasons
    - Unknown
    - External Effort
    - Training
  - Enduser Department Effort Types
    - Test
    - Specification

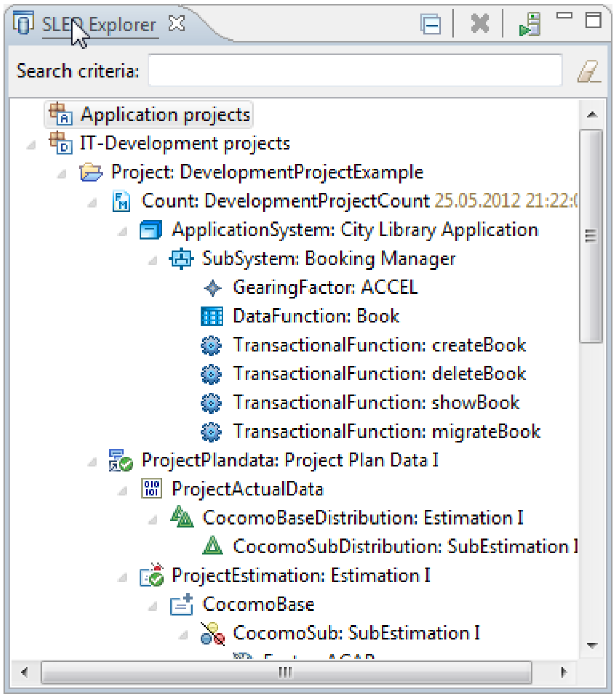
**Extension of SLED Export**

Exports to SLED has been thoroughly revised and expanded. All new attributes and entities have been taken into account. Now all elementary functions, phases and activities will be exported. Also now all Counts and Estimations for a project will be exported to SLED, regardless of whether they are used within the project or active/inactive.



**Revision for SLED explorer**

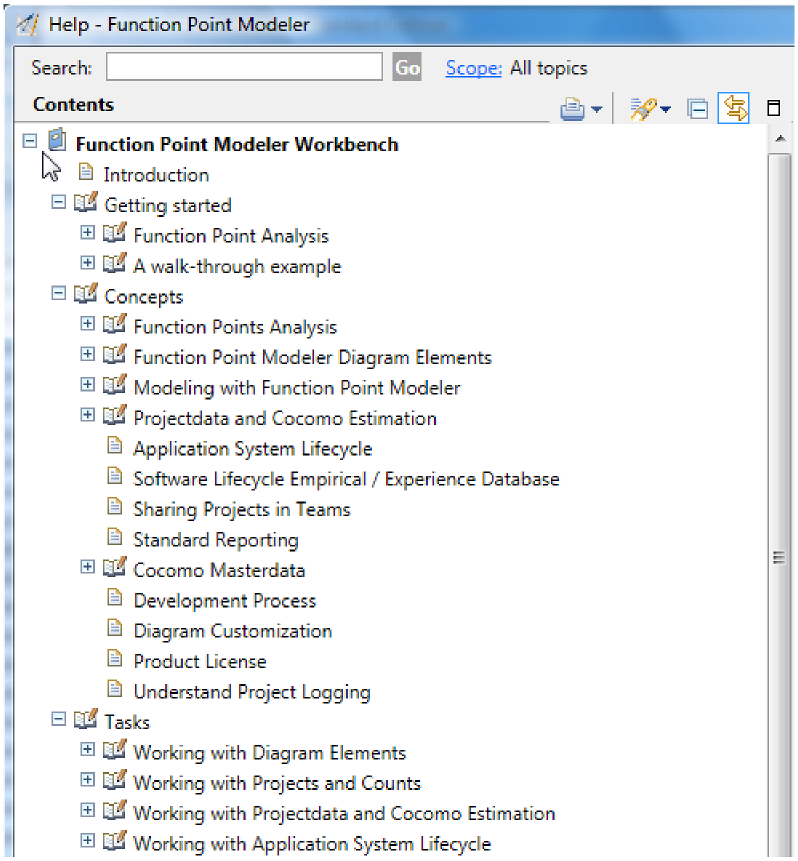
The SLED Explorer view has been completely redesigned and equipped with new features. It is now much easier to check or verfy the contents of a SLED database.



- Application projects
- IT-Development projects
  - Project: DevelopmentProjectExample
    - Count: DevelopmentProjectCount 25.05.2012 21:22:
      - ApplicationSystem: City Library Application
        - SubSystem: Booking Manager
          - GearingFactor: ACCEL
          - DataFunction: Book
          - TransactionalFunction: createBook
          - TransactionalFunction: deleteBook
          - TransactionalFunction: showBook
          - TransactionalFunction: migrateBook
    - ProjectPlandata: Project Plan Data I
      - ProjectActualData
        - CocomoBaseDistribution: Estimation I
          - CocomoSubDistribution: SubEstimation I
      - ProjectEstimation: Estimation I
        - CocomoBase
          - CocomoSub: SubEstimation I

**Complete redesign of application help**

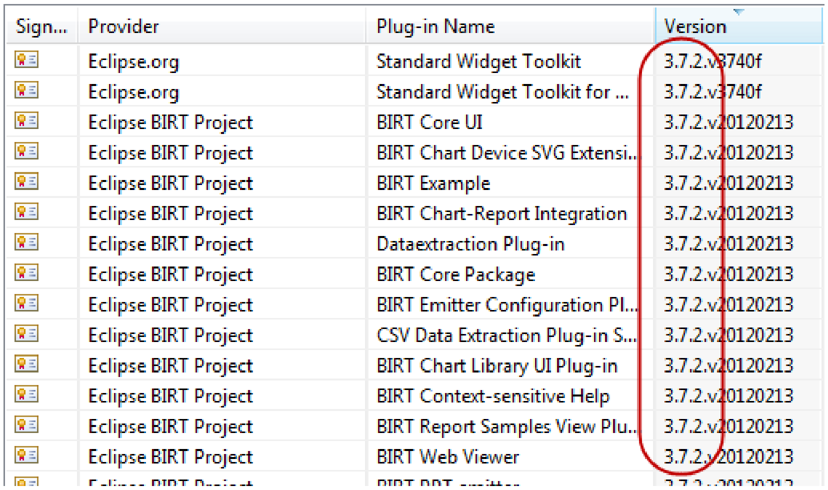
The application help was written in this version from scratch. It is now also available in PDF form and includes a total of more than 650 pages.



- **Function Point Modeler Workbench**
  - Introduction
  - Getting started
    - Function Point Analysis
    - A walk-through example
  - Concepts
    - Function Points Analysis
    - Function Point Modeler Diagram Elements
    - Modeling with Function Point Modeler
    - Projectdata and Cocomo Estimation
    - Application System Lifecycle
    - Software Lifecycle Empirical / Experience Database
    - Sharing Projects in Teams
    - Standard Reporting
    - Cocomo Masterdata
    - Development Process
    - Diagram Customization
    - Product License
    - Understand Project Logging
  - Tasks
    - Working with Diagram Elements
    - Working with Projects and Counts
    - Working with Projectdata and Cocomo Estimation
    - Working with Application System Lifecycle

**Adaption to Eclipse 3.7.2**

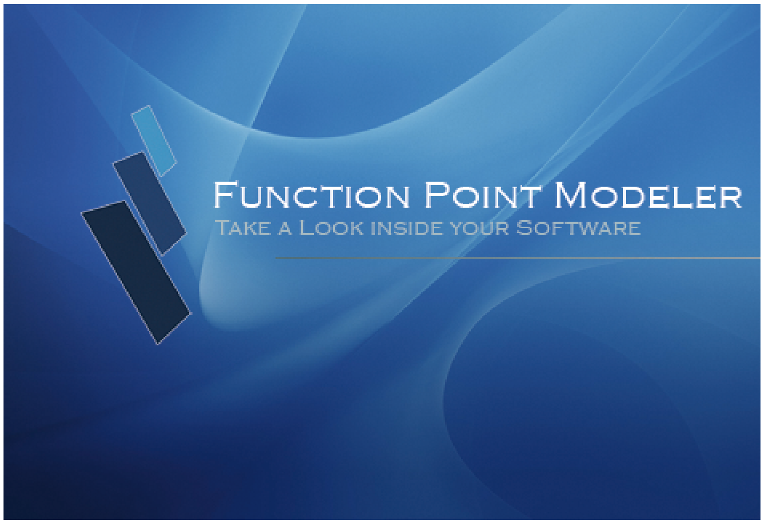
The application is now based on the very latest version of the *Eclipse* framework.



| Sign... | Provider | Plug-in Name | Version |
|---|---|---|---|
|  | Eclipse.org | Standard Widget Toolkit | 3.7.2.v3740f |
|  | Eclipse.org | Standard Widget Toolkit for ... | 3.7.2.v3740f |
|  | Eclipse BIRT Project | BIRT Core UI | 3.7.2.v20120213 |
|  | Eclipse BIRT Project | BIRT Chart Device SVG Extensi... | 3.7.2.v20120213 |
|  | Eclipse BIRT Project | BIRT Example | 3.7.2.v20120213 |
|  | Eclipse BIRT Project | BIRT Chart-Report Integration | 3.7.2.v20120213 |
|  | Eclipse BIRT Project | Dataextraction Plug-in | 3.7.2.v20120213 |
|  | Eclipse BIRT Project | BIRT Core Package | 3.7.2.v20120213 |
|  | Eclipse BIRT Project | BIRT Emitter Configuration Pl... | 3.7.2.v20120213 |
|  | Eclipse BIRT Project | CSV Data Extraction Plug-in S... | 3.7.2.v20120213 |
|  | Eclipse BIRT Project | BIRT Chart Library UI Plug-in | 3.7.2.v20120213 |
|  | Eclipse BIRT Project | BIRT Context-sensitive Help | 3.7.2.v20120213 |
|  | Eclipse BIRT Project | BIRT Report Samples View Plu... | 3.7.2.v20120213 |
|  | Eclipse BIRT Project | BIRT Web Viewer | 3.7.2.v20120213 |
|  | Eclipse BIRT Project | BIRT PPT emitter | 3.7.2.v20120213 |

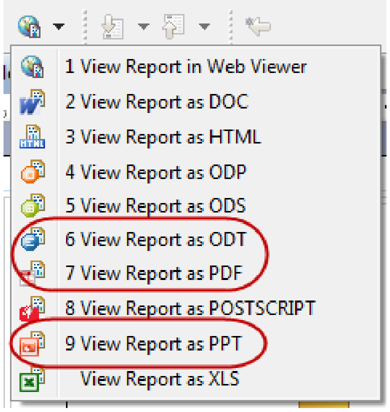
**New Splash Screen**

A new Splash Screen was added to the current product version.



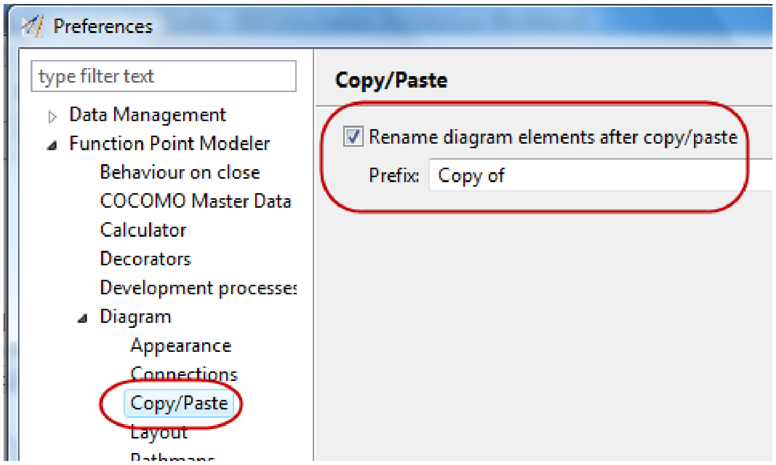
**New Output Formats for Report Designer**

Reports, that are created using the Report Designer can now be exported to PDF, ODT or PPT.



**Renaming diagram elements after copy/ paste**

Diagram elements can now automatically renamed after copy/paste actions. The guidelines for the renaming can be defined in the application properties.

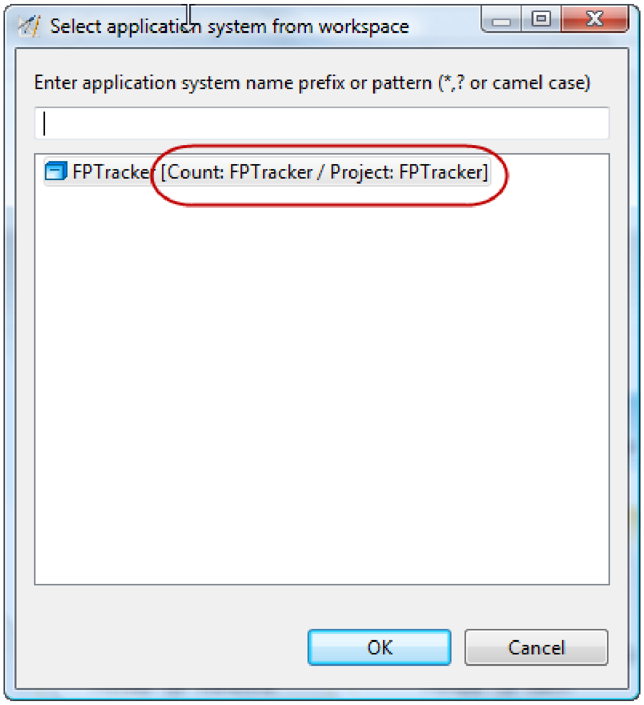


☑ Rename diagram elements after copy/paste

Prefix: Copy of

**Extension of the selection dialog for existing application systems**

The selection dialog for existing application systems have been extended to the respective project name, where the system is located. In the original version, systems of the same name but different projects can not be distinguished.

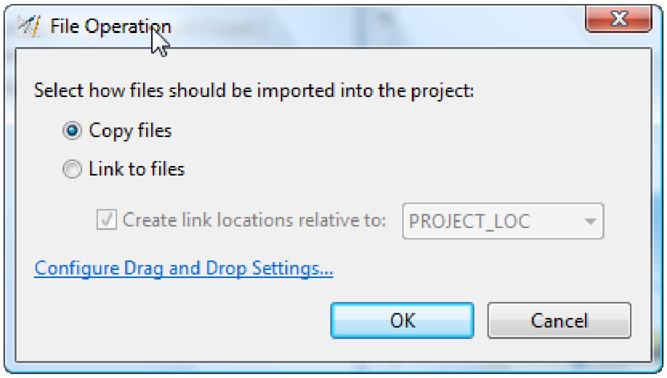


Enter application system name prefix or pattern (*,? or camel case)

FPTracker [Count: FPTracker / Project: FPTracker]

**New prompt dialog during drag/drop in the project navigator**

When drag/drop files into the project navigator, a dialog will be offered, which allows the requested action to be more specific.



Select how files should be imported into the project:

● Copy files

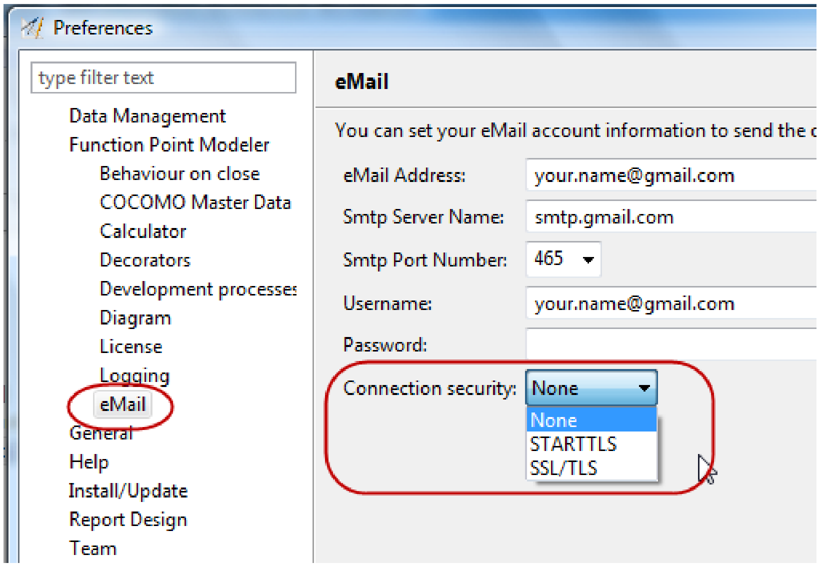
○ Link to files

☑ Create link locations relative to: PROJECT_LOC

Configure Drag and Drop Settings...

**eMail by SSL**

The application configuration now supports sending of SSL emails. The supported protocols are *STARTTLS* and *SSL/TLS* .



You can set your eMail account information to send the c

eMail Address: your.name@gmail.com

Smtp Server Name: smtp.gmail.com

Smtp Port Number: 465

Username: your.name@gmail.com

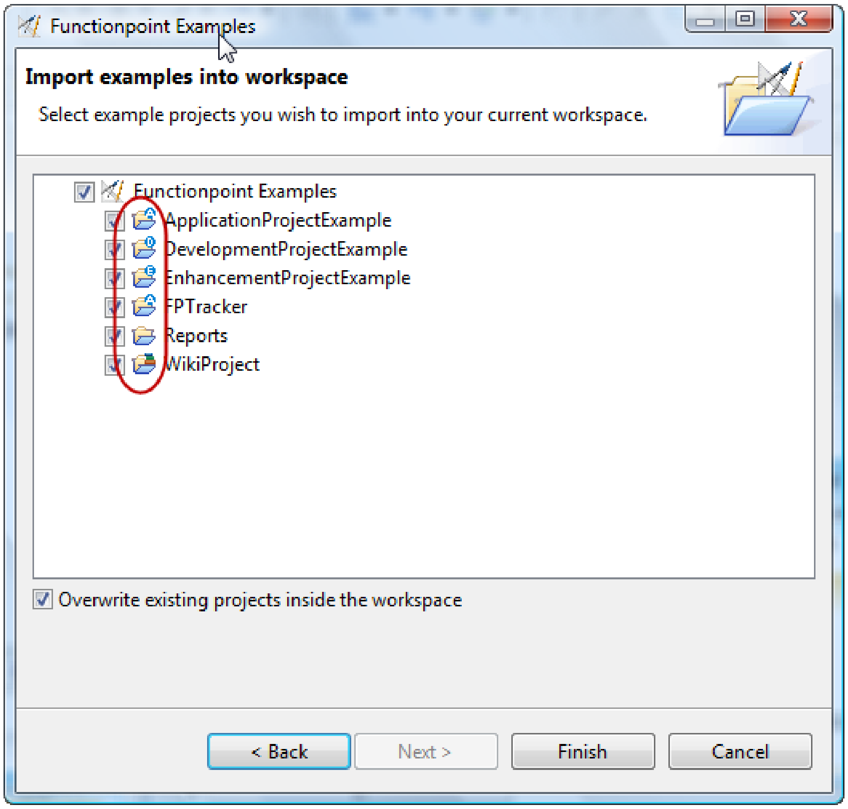
Password:

Connection security: None

**Decorators added to different wizards**

Decorators for projects and counts were added to the following wizards:

- Example Wizard
- Export to SLED Wizard
- Import Project Interchange Wizard


Functionpoint Examples

**Import examples into workspace**

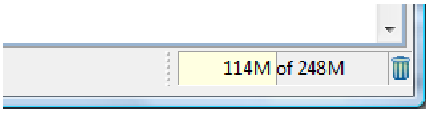
Select example projects you wish to import into your current workspace.

- ☑ Functionpoint Examples
  - ☑ ApplicationProjectExample
  - ☑ DevelopmentProjectExample
  - ☑ EnhancementProjectExample
  - ☑ FPTracker
  - ☑ Reports
  - ☑ WikiProject

☑ Overwrite existing projects inside the workspace

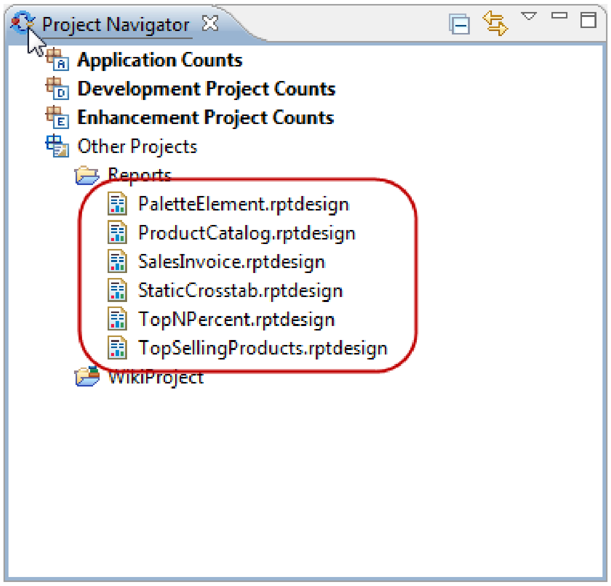
**Display of the memory monitor**

The memory monitor is now automatically displayed in the status bar for the first time the application was started. The behavior and appearance of the monitor can be defined in the settings of the application.


114M of 248M

**New report examples included**

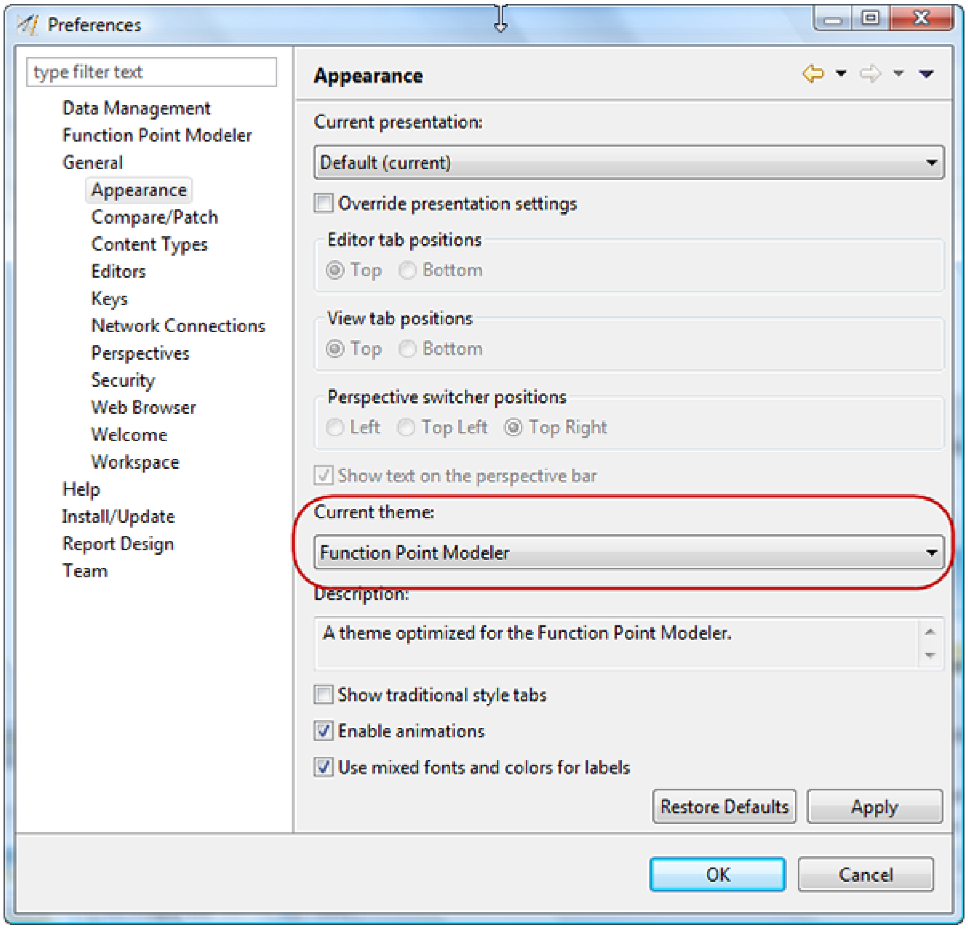
Some new report designs are included in the project examples.


Project Navigator

- **Application Counts**
- **Development Project Counts**
- **Enhancement Project Counts**
- Other Projects
  - Reports
    - PaletteElement.rptdesign
    - ProductCatalog.rptdesign
    - SalesInvoice.rptdesign
    - StaticCrosstab.rptdesign
    - TopNPercent.rptdesign
    - TopSellingProducts.rptdesign
  - WikiProject

**Presentation factory introduced**

A simple presentation factory was introduced in this version. This is disabled by default, but can be activated within the properties of the application.



Current presentation: Default (current)

☐ Override presentation settings

Editor tab positions: ● Top ○ Bottom

View tab positions: ● Top ○ Bottom

Perspective switcher positions: ○ Left ○ Top Left ● Top Right

☑ Show text on the perspective bar

Current theme: Function Point Modeler

Description: A theme optimized for the Function Point Modeler.

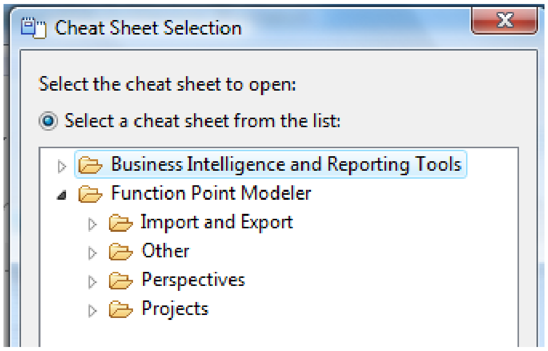
☐ Show traditional style tabs

☑ Enable animations

☑ Use mixed fonts and colors for labels

**Cheat Sheets**

Several new and existing Cheat Sheets were established. They were also grouped into categories to improve the clarity in the selection.

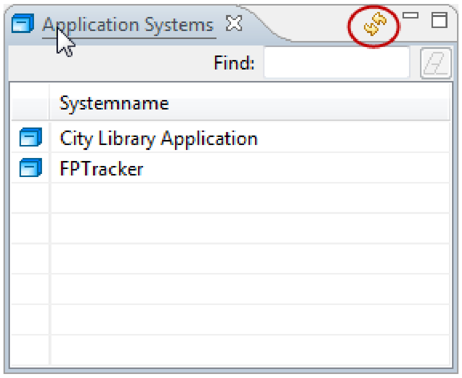


Select the cheat sheet to open:

● Select a cheat sheet from the list:

**Refresh list of application systems**

A button was added to the toolbar of the Application System view, which allows you to refresh the list of available application systems from the current workspace.


Application Systems

Find:

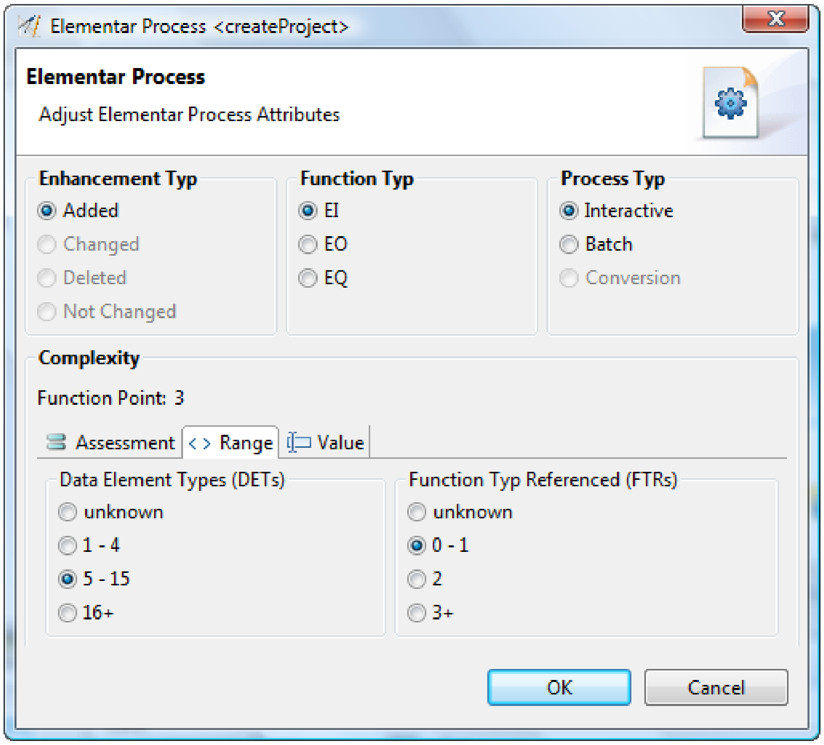
| Systemname |
|---|
| City Library Application |
| FPTracker |

## New and Noteworthy with Function Point Modeler 5.0

**Elementar Process properties**

A new, completely redesigned dialog for editing properties of an elementary process was introduced. With this dialog it is now possible, to select the complexity of an elementary process either with the help of three different ways.

- **Assessment** - The complexity is explicitly selected
- **Range** - The complexity is determined by selecting an area
- **Value** - The complexity is determined by specifying a precise value


Elementar Process <createProject>

Elementar Process

Adjust Elementar Process Attributes

Enhancement Typ: ● Added ○ Changed ○ Deleted ○ Not Changed

Function Typ: ● EI ○ EO ○ EQ

Process Typ: ● Interactive ○ Batch ○ Conversion

Complexity

Function Point: 3

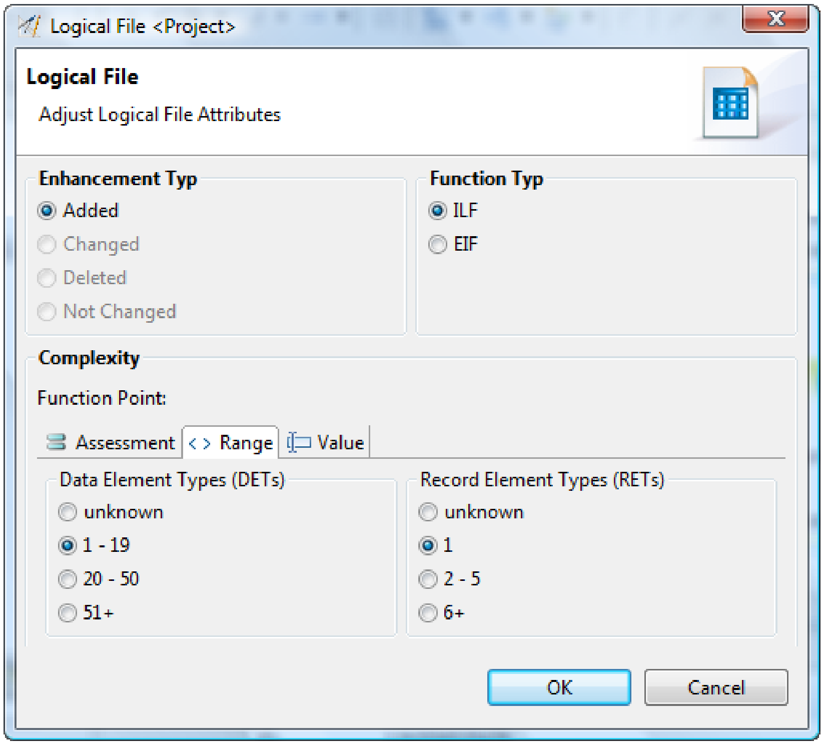
Data Element Types (DETs): ○ unknown ○ 1 - 4 ● 5 - 15 ○ 16+

Function Typ Referenced (FTRs): ○ unknown ● 0 - 1 ○ 2 ○ 3+

**Logical File properties**

A new, completely redesigned dialog for editing properties of a logical file was introduced. With this dialog it is now possible, to select the complexity of a logical file either with the help of three different ways.

- **Assessment** - The complexity is explicitly selected
- **Range** - The complexity is determined by selecting an area
- **Value** - The complexity is determined by specifying a precise value



**Logical File**

Adjust Logical File Attributes

**Enhancement Typ**

● Added
○ Changed
○ Deleted
○ Not Changed

**Function Typ**

● ILF
○ EIF

**Complexity**

Function Point:

Data Element Types (DETs)

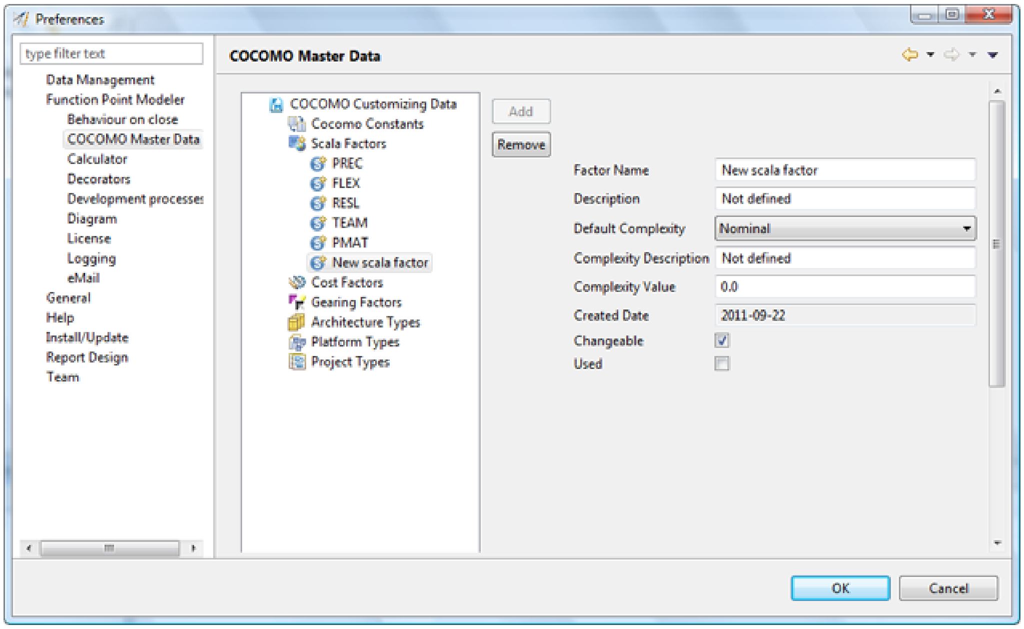
○ unknown
● 1 - 19
○ 20 - 50
○ 51+

Record Element Types (RETs)

○ unknown
● 1
○ 2 - 5
○ 6+

**Create and/or Customize the Cost, Scala, Factors, Language, Platform, etc.**

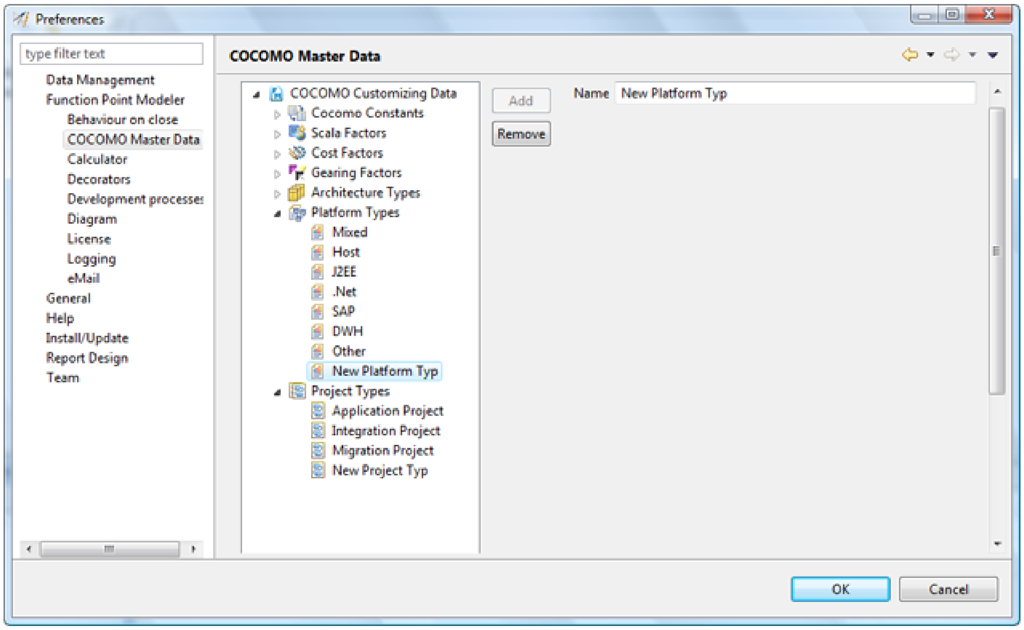
It is now possible to create or customize your own Scala Factors, Cost Factors, Architecture Types, Platform Types etc. Simply create a new element of your own, change the settings and use it in your measurements and estimations.



**COCOMO Master Data**

- COCOMO Customizing Data
  - Cocomo Constants
  - Scala Factors
    - PREC
    - FLEX
    - RESL
    - TEAM
    - PMAT
    - New scala factor
  - Cost Factors
  - Gearing Factors
  - Architecture Types
  - Platform Types
  - Project Types

| | |
|---|---|
| Factor Name | New scala factor |
| Description | Not defined |
| Default Complexity | Nominal |
| Complexity Description | Not defined |
| Complexity Value | 0.0 |
| Created Date | 2011-09-22 |
| Changeable | ☑ |
| Used | ☐ |



Preferences

type filter text

- Data Management
- Function Point Modeler
  - Behaviour on close
  - COCOMO Master Data
  - Calculator
  - Decorators
  - Development processes
  - Diagram
  - License
  - Logging
  - eMail
- General
- Help
- Install/Update
- Report Design
- Team

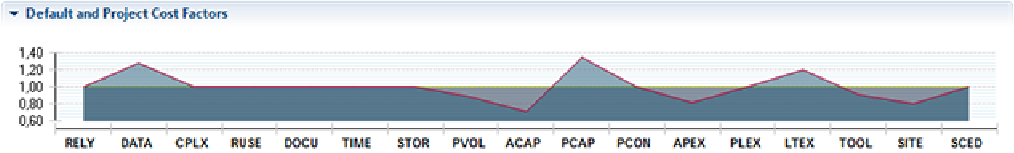
COCOMO Master Data

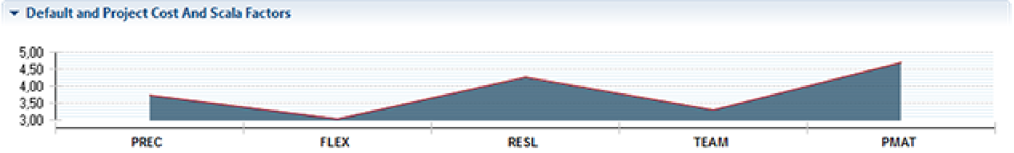
- COCOMO Customizing Data
  - Cocomo Constants
  - Scala Factors
  - Cost Factors
  - Gearing Factors
  - Architecture Types
  - Platform Types
    - Mixed
    - Host
    - J2EE
    - .Net
    - SAP
    - DWH
    - Other
    - New Platform Typ
  - Project Types
    - Application Project
    - Integration Project
    - Migration Project
    - New Project Typ

Name: New Platform Typ

### Redesign of Cost/ Scala Factors visualization

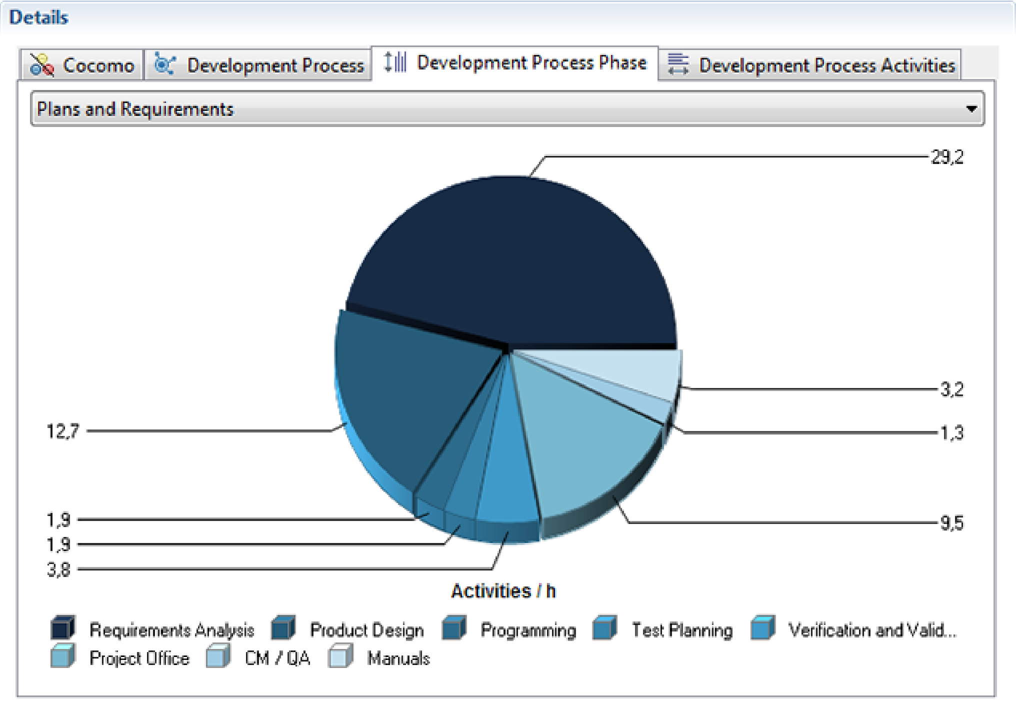
The visualization of Cost Factors and Scala Factors in the Cocomo editor has been redesigned and unified.





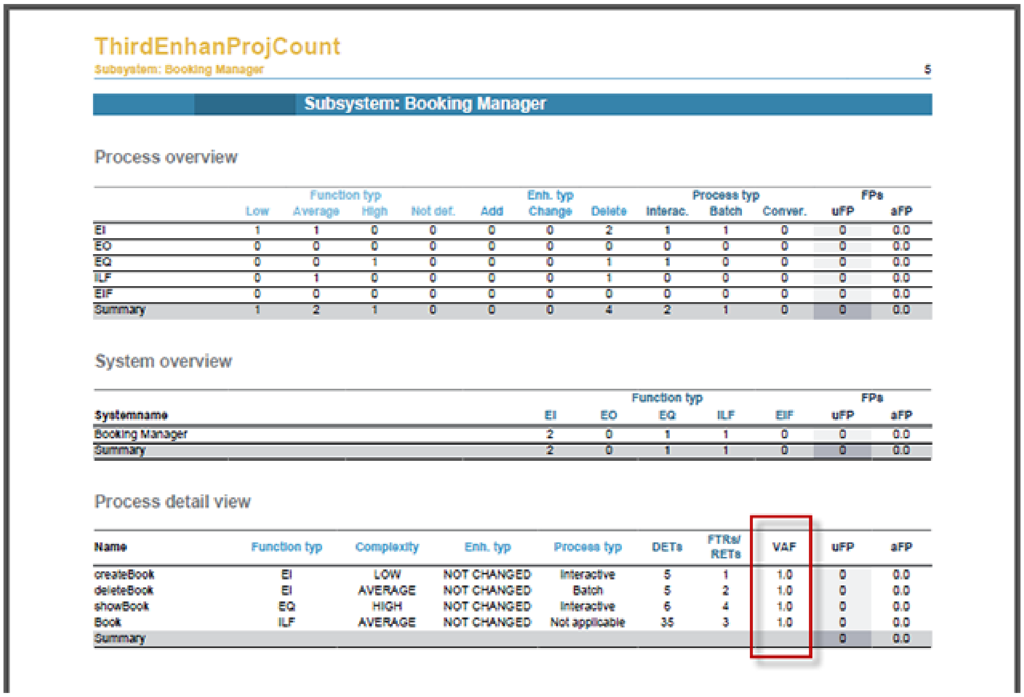
### New color schema introduced

A new color scheme was introduced. All plots within the application are now in a uniform blue color schema shown.



### VAF in Count Overview

The VAF was added to the report **Count Overview** .



ThirdEnhanProjCount

Subsystem: Booking Manager 5

Subsystem: Booking Manager

Process overview

| | | Function typ | | | | Enh. typ | | | Process typ | | FPs | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Low | Average | High | Not def. | Add | Change | Delete | Interac. | Batch | Conver. | uFP | aFP |
| EI | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 0 | 0 | 0.0 |
| EO | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| EQ | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0.0 |
| ILF | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.0 |
| EIF | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Summary | 1 | 2 | 1 | 0 | 0 | 0 | 4 | 2 | 1 | 0 | 0 | 0.0 |

System overview

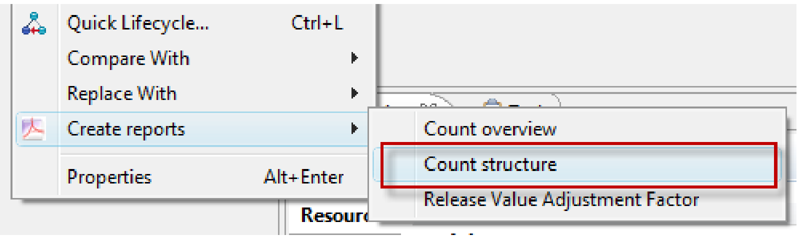
| | | | Function typ | | | FPs | |
|---|---|---|---|---|---|---|---|
| Systemname | EI | EO | EQ | ILF | EIF | uFP | aFP |
| Booking Manager | 2 | 0 | 1 | 1 | 0 | 0 | 0.0 |
| Summary | 2 | 0 | 1 | 1 | 0 | 0 | 0.0 |

Process detail view

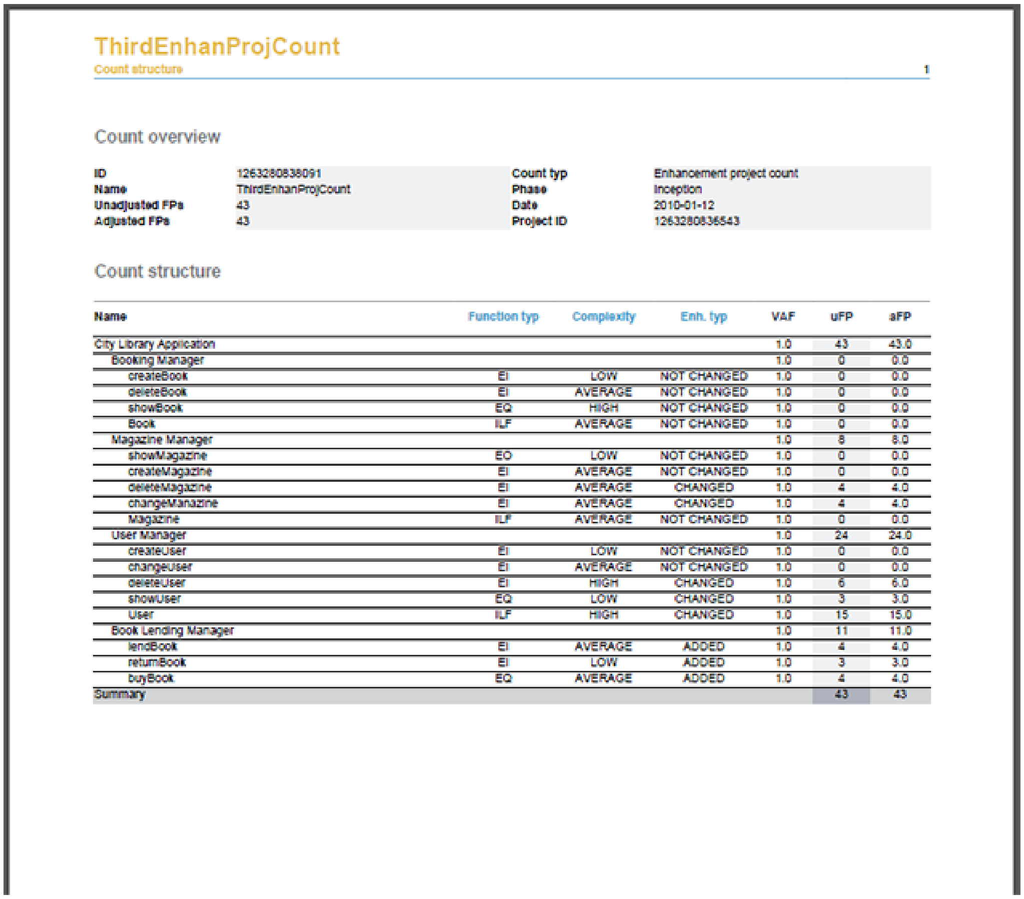
| Name | Function typ | Complexity | Enh. typ | Process typ | DETs | FTRs/ RETs | VAF | uFP | aFP |
|---|---|---|---|---|---|---|---|---|---|
| createBook | EI | LOW | NOT CHANGED | Interactive | 5 | 1 | 1.0 | 0 | 0.0 |
| deleteBook | EI | AVERAGE | NOT CHANGED | Batch | 5 | 2 | 1.0 | 0 | 0.0 |
| showBook | EQ | HIGH | NOT CHANGED | Interactive | 6 | 4 | 1.0 | 0 | 0.0 |
| Book | ILF | AVERAGE | NOT CHANGED | Not applicable | 35 | 3 | 1.0 | 0 | 0.0 |
| Summary | | | | | | | | 0 | 0.0 |

### New Count Structure Report

A new report showing the structure of a measurement was integrated. To call the report just use the menu **Create reports > Count structure** .



The report represents the structure of a measurement in a simple tree structure, and gives a quick overview of the state the measurement.



ThirdEnhanProjCount

Count structure 1

Count overview

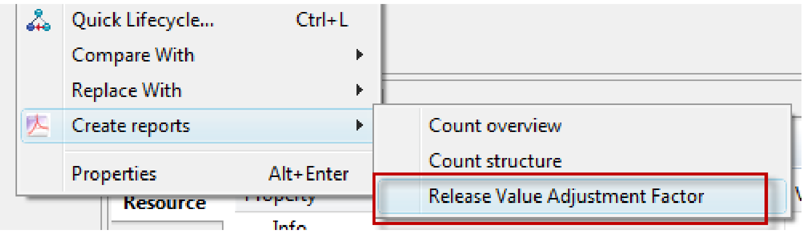
| | | | |
|---|---|---|---|
| ID | 1263280838091 | Count typ | Enhancement project count |
| Name | ThirdEnhanProjCount | Phase | Inception |
| Unadjusted FPs | 43 | Date | 2010-01-12 |
| Adjusted FPs | 43 | Project ID | 1263280836543 |

Count structure

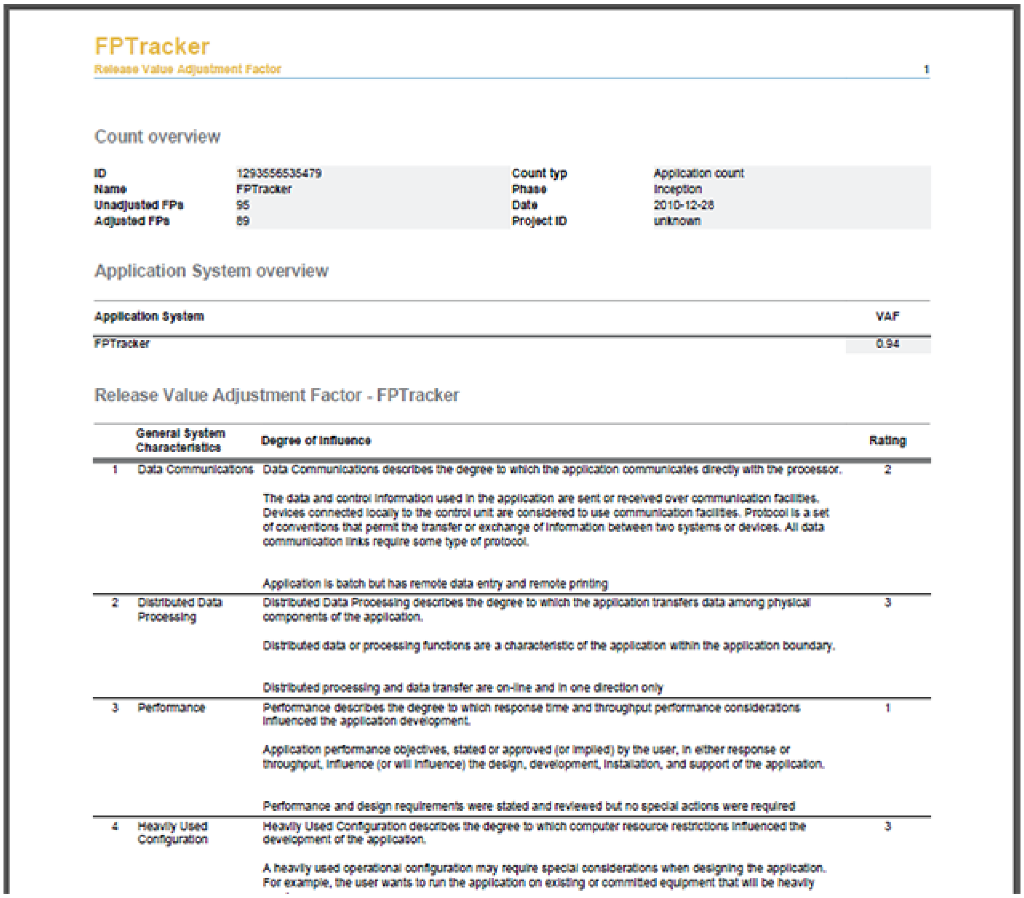
| Name | Function typ | Complexity | Enh. typ | VAF | uFP | aFP |
|---|---|---|---|---|---|---|
| City Library Application | | | | 1.0 | 43 | 43.0 |
| Booking Manager | | | | 1.0 | 0 | 0.0 |
| createBook | EI | LOW | NOT CHANGED | 1.0 | 0 | 0.0 |
| deleteBook | EI | AVERAGE | NOT CHANGED | 1.0 | 0 | 0.0 |
| showBook | EQ | HIGH | NOT CHANGED | 1.0 | 0 | 0.0 |
| Book | ILF | AVERAGE | NOT CHANGED | 1.0 | 0 | 0.0 |
| Magazine Manager | | | | 1.0 | 8 | 8.0 |
| showMagazine | EO | LOW | NOT CHANGED | 1.0 | 0 | 0.0 |
| createMagazine | EI | AVERAGE | NOT CHANGED | 1.0 | 0 | 0.0 |
| deleteMagazine | EI | AVERAGE | CHANGED | 1.0 | 4 | 4.0 |
| changeManazine | EI | AVERAGE | CHANGED | 1.0 | 4 | 4.0 |
| Magazine | ILF | AVERAGE | NOT CHANGED | 1.0 | 0 | 0.0 |
| User Manager | | | | 1.0 | 24 | 24.0 |
| createUser | EI | LOW | NOT CHANGED | 1.0 | 0 | 0.0 |
| changeUser | EI | AVERAGE | NOT CHANGED | 1.0 | 0 | 0.0 |
| deleteUser | EI | HIGH | CHANGED | 1.0 | 6 | 6.0 |
| showUser | EQ | LOW | CHANGED | 1.0 | 3 | 3.0 |
| User | ILF | HIGH | CHANGED | 1.0 | 15 | 15.0 |
| Book Lending Manager | | | | 1.0 | 11 | 11.0 |
| lendBook | EI | AVERAGE | ADDED | 1.0 | 4 | 4.0 |
| returnBook | EI | LOW | ADDED | 1.0 | 3 | 3.0 |
| buyBook | EQ | AVERAGE | ADDED | 1.0 | 4 | 4.0 |
| Summary | | | | | 43 | 43 |

### New Release VAF Report

A new report showing the release VAF of a measurement was integrated. To call the report just use the menu **Create reports > Release Value Adjustment Factor** .



The report represents the current state of the Value Adjustment Factors of a measurement.



FPTracker

Release Value Adjustment Factor 1

Count overview

| | | | |
|---|---|---|---|
| ID | 1293556535479 | Count typ | Application count |
| Name | FPTracker | Phase | Inception |
| Unadjusted FPs | 95 | Date | 2010-12-28 |
| Adjusted FPs | 89 | Project ID | unknown |

Application System overview

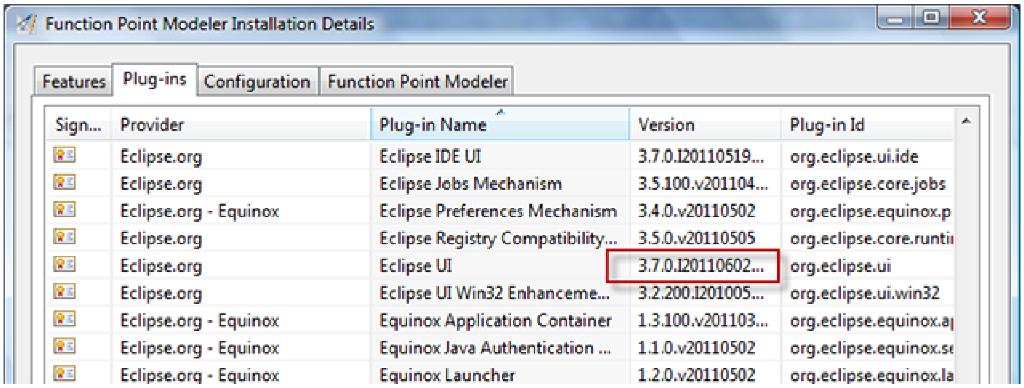
| Application System | VAF |
|---|---|
| FPTracker | 0.94 |

Release Value Adjustment Factor - FPTracker

| | General System Characteristics | Degree of Influence | Rating |
|---|---|---|---|
| 1 | Data Communications | Data Communications describes the degree to which the application communicates directly with the processor.<br>The data and control information used in the application are sent or received over communication facilities. Devices connected locally to the control unit are considered to use communication facilities. Protocol is a set of conventions that permit the transfer or exchange of information between two systems or devices. All data communication links require some type of protocol.<br>Application is batch but has remote data entry and remote printing | 2 |
| 2 | Distributed Data Processing | Distributed Data Processing describes the degree to which the application transfers data among physical components of the application.<br>Distributed data or processing functions are a characteristic of the application within the application boundary.<br>Distributed processing and data transfer are on-line and in one direction only | 3 |
| 3 | Performance | Performance describes the degree to which response time and throughput performance considerations influenced the application development.<br>Application performance objectives, stated or approved (or implied) by the user, in either response or throughput, influence (or will influence) the design, development, installation, and support of the application.<br>Performance and design requirements were stated and reviewed but no special actions were required | 1 |
| 4 | Heavily Used Configuration | Heavily Used Configuration describes the degree to which computer resource restrictions influenced the development of the application.<br>A heavily used operational configuration may require special considerations when designing the application. For example, the user wants to run the application on existing or committed equipment that will be heavily | 3 |

**Based on Eclipse 3.7.1**

**Function Point Modeler 5.0** is now based on Eclipse 3.7.1. (Indigo)

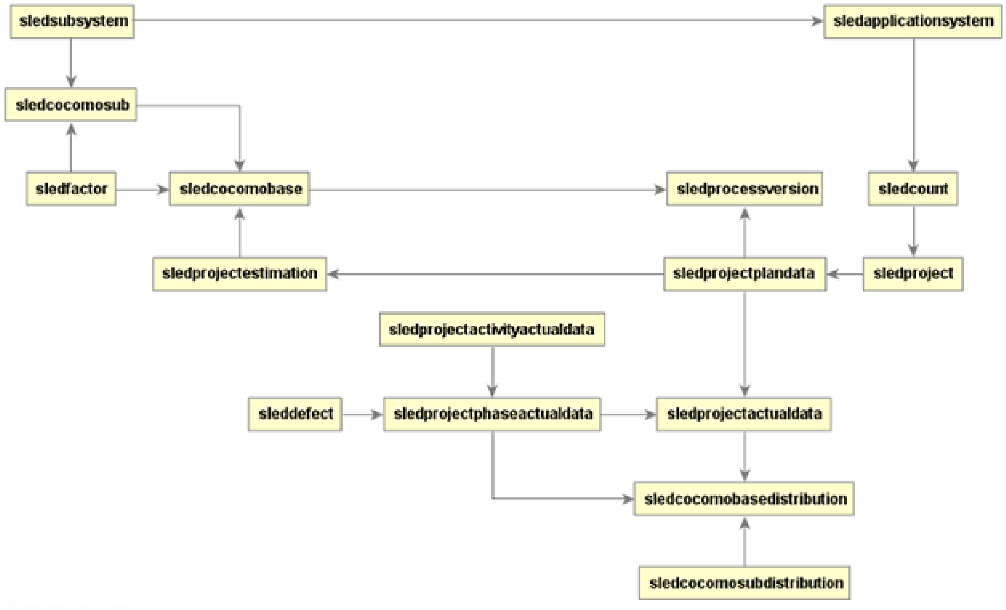


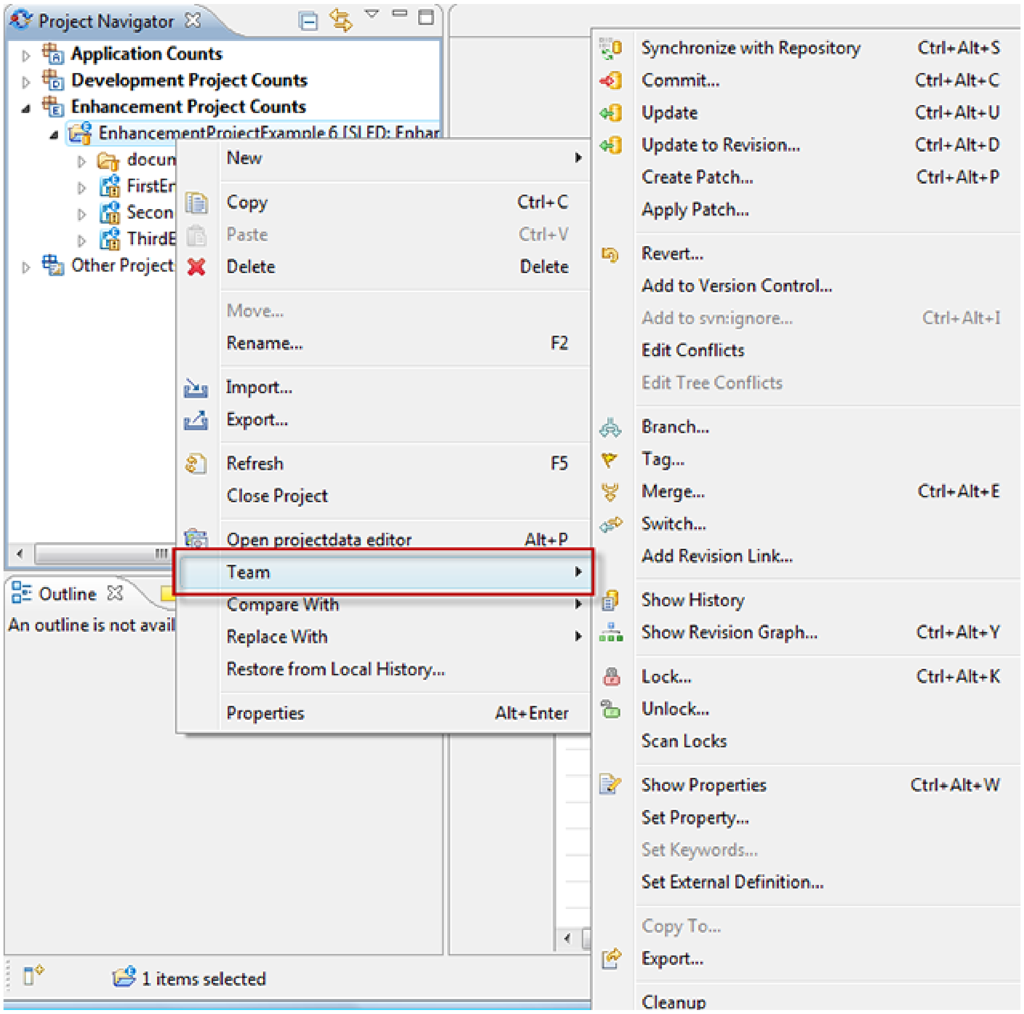
Function Point Modeler Installation Details

| Sign... | Provider | Plug-in Name | Version | Plug-in Id |
|---|---|---|---|---|
| | Eclipse.org | Eclipse IDE UI | 3.7.0.I20110519... | org.eclipse.ui.ide |
| | Eclipse.org | Eclipse Jobs Mechanism | 3.5.100.v201104... | org.eclipse.core.jobs |
| | Eclipse.org - Equinox | Eclipse Preferences Mechanism | 3.4.0.v20110502 | org.eclipse.equinox.p |
| | Eclipse.org | Eclipse Registry Compatibility... | 3.5.0.v20110505 | org.eclipse.core.runti |
| | Eclipse.org | Eclipse UI | 3.7.0.I20110602... | org.eclipse.ui |
| | Eclipse.org | Eclipse UI Win32 Enhanceme... | 3.2.200.I201005... | org.eclipse.ui.win32 |
| | Eclipse.org - Equinox | Equinox Application Container | 1.3.100.v201103... | org.eclipse.equinox.a |
| | Eclipse.org - Equinox | Equinox Java Authentication ... | 1.1.0.v20110502 | org.eclipse.equinox.se |
| | Eclipse.org - Equinox | Equinox Launcher | 1.2.0.v20110502 | org.eclipse.equinox.la |

**Simplified SLED Model**

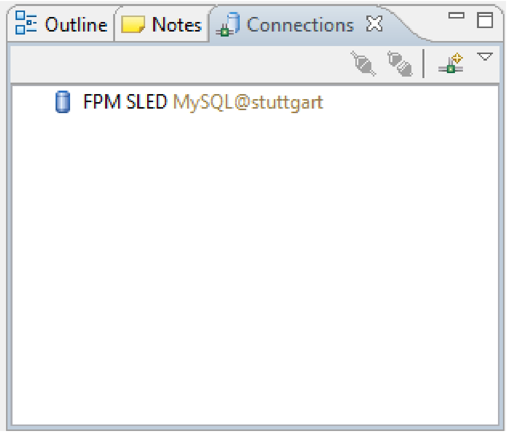
The SLED database model has been completely revised and simplified. Now you can find all needed information for evaluation purposes and statistics in a compact and clear presentation.

| | |
|---|---|
| |   sledsubsystem<br>sledapplicationsystem<br>sledcocomosub<br>sledfactor<br>sledcocomobase<br>sledprocessversion<br>sledcount<br>sledprojectestimation<br>sledprojectplandata<br>sledproject<br>sledprojectactivityactualdata<br>sleddefect<br>sledprojectphaseactualdata<br>sledprojectactualdata<br>sledcocomobasedistribution<br>sledcocomosubdistribution |
| **Team integration** | With version 5.0, the team integration has completely changed. In earlier versions of **Function Point Modeler** cross-team sharing of measurements was performed using the SLED database. This process brought some disadvantages. For this reason, the methodology for the exchange of measurements has completely revised. It is now possible with the help of popular source management systems, to share and synchronize the work between different teams. **Function Point Modeler** already provides two possible team provider for this purpose. Out of the box CVS and Subversion are supported. Due to the plugin technology **Function Point Modeler** however is able to integrate the source control system of your choice. Prerequisite for this is that your Source Management System delivers a common connection to Eclipse in form of a plug-in. |



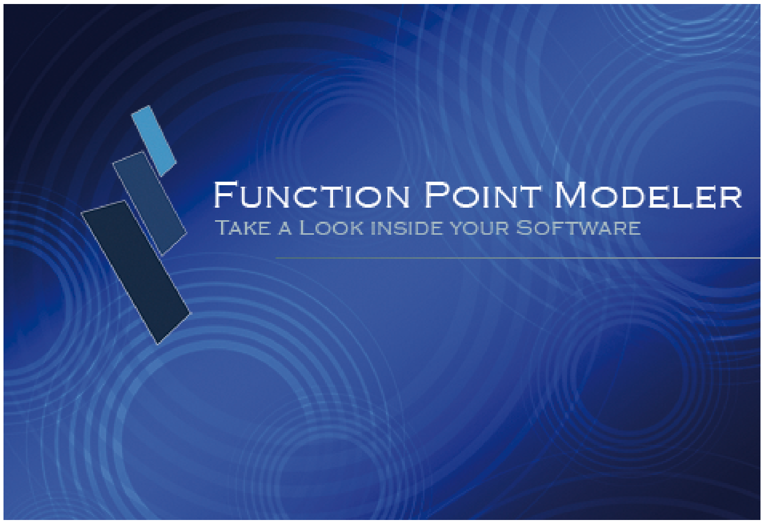
### Create and manage connections

Database connections are now created and managed centrally in one postion. Function Point Modeler provides a new view for this. To open this view, select in the menu bar **Window** > **Show View** > **Other** > **Function Point Modeler** > **Connections** . This view offers a variety of possibilities, to create new connection profiles, modify, or delete them. With one mouse click, it is now possible to establish a connection or to disconnect. At any point within the application where a database connection is required (e.g. Export SLED) you can now simply select an already created connection profile which is already connected to the underlying database.



**New Splash Screen**

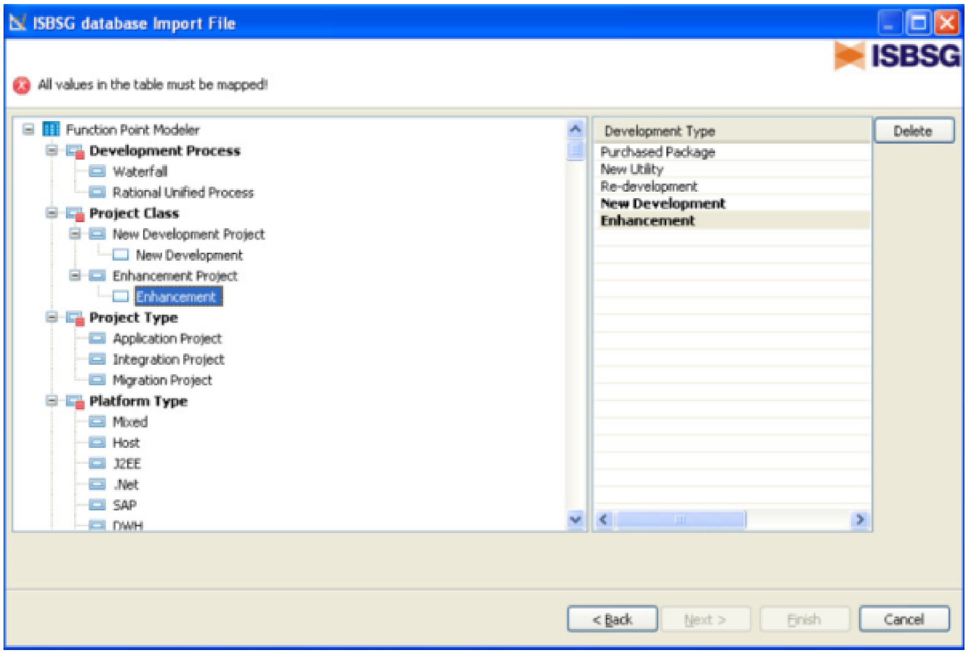
**Function Point Modeler 5.0** has a completely redesigned Splash Screen.



## New and Noteworthy with Function Point Modeler 4.4

**ISBSG Import Interface**

**Function Point Modeler 4.4 Enterprise Edition** now offers you the opportunity to import International Software Benchmarking Standard Group **ISBSG** data into the **Function Point Modeler** in order to calibrate **COCOMO** based on the ISBSG data. This allows you to select from the ISBSG database, projects that are similar to the project that you wish to estimate. You can then import these projects into the **SLED** and use them to calibrate the cost factors in **COCOMO** to provide you with a reliable estimate.


ISBSG database Import File

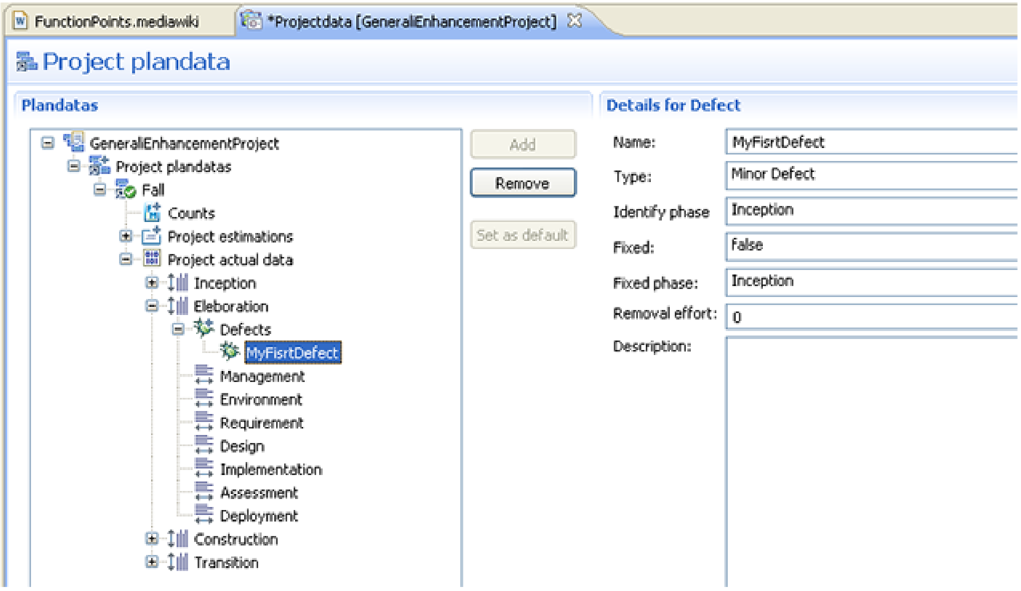
All values in the table must be mapped!

```
Function Point Modeler
  Development Process
    Waterfall
    Rational Unified Process
  Project Class
    New Development Project
      New Development
    Enhancement Project
      Enhancement
  Project Type
    Application Project
    Integration Project
    Migration Project
  Platform Type
    Mixed
    Host
    J2EE
    .Net
    SAP
    DWH
```

| Development Type |
|---|
| Purchased Package |
| New Utility |
| Re-development |
| **New Development** |
| **Enhancement** |

**Project Actual Data Detail Editor**

**Function Point Modeler 4.4 Enterprise** includes a new detail editor for project actual data. It enables you to gather more detail project actual data based on activities for each phase and defects.



FunctionPoints.mediawiki | *Projectdata [GeneralEnhancementProject]

**Project plandata**

**Plandatas**

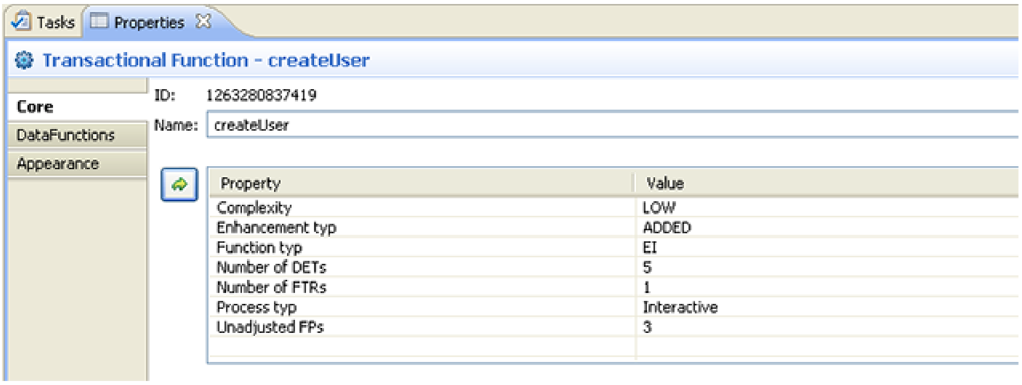
- GeneralEnhancementProject
  - Project plandatas
    - Fall
      - Counts
      - Project estimations
      - Project actual data
        - Inception
        - Eleboration
          - Defects
            - MyFisrtDefect
          - Management
          - Environment
          - Requirement
          - Design
          - Implementation
          - Assessment
          - Deployment
        - Construction
        - Transition

**Details for Defect**

| | |
|---|---|
| Name: | MyFisrtDefect |
| Type: | Minor Defect |
| Identify phase | Inception |
| Fixed: | false |
| Fixed phase: | Inception |
| Removal effort: | 0 |
| Description: | |

### New Properties Editor

The new properties editor is included in the **Function Point Modeler 4.4** . All properties of the selected items are also managed in this new editor.



Tasks | Properties

**Transactional Function - createUser**

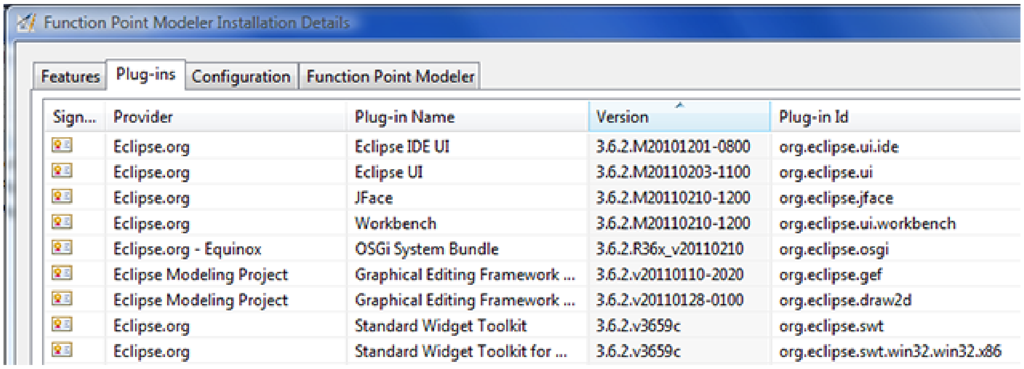
ID: 1263280837419

Name: createUser

| Property | Value |
|---|---|
| Complexity | LOW |
| Enhancement typ | ADDED |
| Function typ | EI |
| Number of DETs | 5 |
| Number of FTRs | 1 |
| Process typ | Interactive |
| Unadjusted FPs | 3 |

### Based on Eclipse 3.6.2

**Function Point Modeler 4.4** is now based on Eclipse 3.6.2. (Helios)

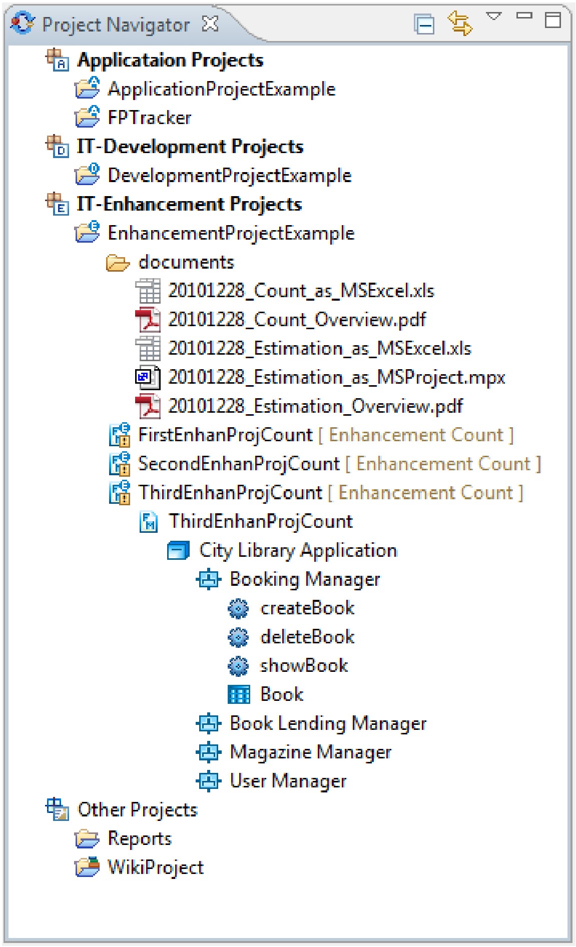


Function Point Modeler Installation Details

| Sign... | Provider | Plug-in Name | Version | Plug-in Id |
|---|---|---|---|---|
| | Eclipse.org | Eclipse IDE UI | 3.6.2.M20101201-0800 | org.eclipse.ui.ide |
| | Eclipse.org | Eclipse UI | 3.6.2.M20110203-1100 | org.eclipse.ui |
| | Eclipse.org | JFace | 3.6.2.M20110210-1200 | org.eclipse.jface |
| | Eclipse.org | Workbench | 3.6.2.M20110210-1200 | org.eclipse.ui.workbench |
| | Eclipse.org - Equinox | OSGi System Bundle | 3.6.2.R36x_v20110210 | org.eclipse.osgi |
| | Eclipse Modeling Project | Graphical Editing Framework ... | 3.6.2.v20110110-2020 | org.eclipse.gef |
| | Eclipse Modeling Project | Graphical Editing Framework ... | 3.6.2.v20110128-0100 | org.eclipse.draw2d |
| | Eclipse.org | Standard Widget Toolkit | 3.6.2.v3659c | org.eclipse.swt |
| | Eclipse.org | Standard Widget Toolkit for ... | 3.6.2.v3659c | org.eclipse.swt.win32.win32.x86 |

### Project Navigator

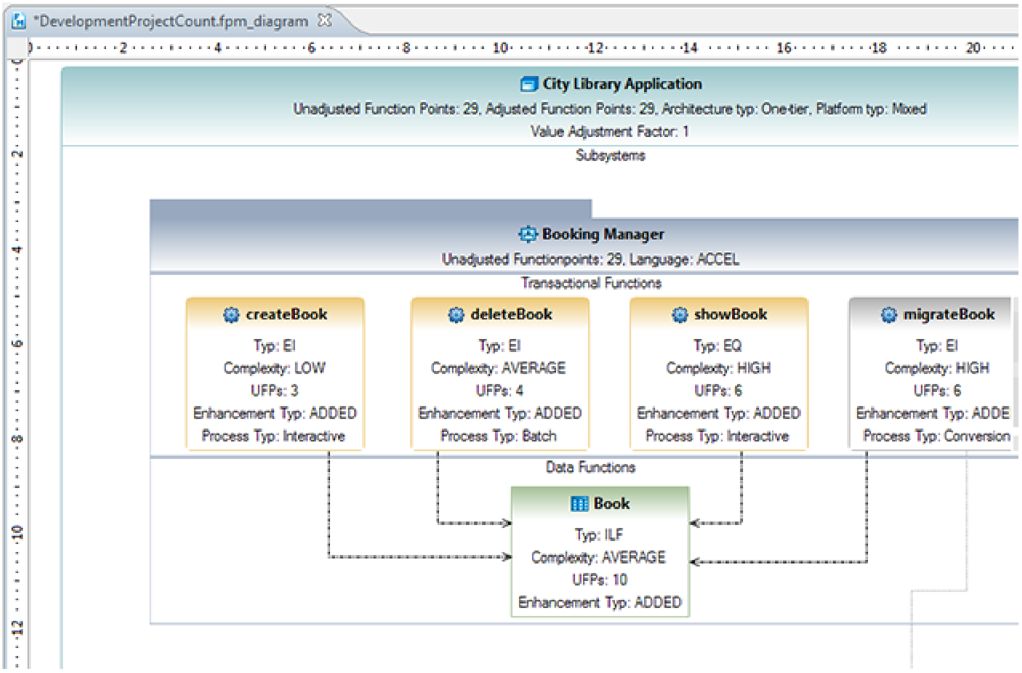
**Function Point Modeler 4.4** now offers you a brand new project navigator. Projects are now arranged and categorized. It is now much easier for users to get an overview of the actual content of his workspace.



- Applicataion Projects
  - ApplicationProjectExample
  - FPTracker
- IT-Development Projects
  - DevelopmentProjectExample
- IT-Enhancement Projects
  - EnhancementProjectExample
    - documents
      - 20101228_Count_as_MSExcel.xls
      - 20101228_Count_Overview.pdf
      - 20101228_Estimation_as_MSExcel.xls
      - 20101228_Estimation_as_MSProject.mpx
      - 20101228_Estimation_Overview.pdf
    - FirstEnhanProjCount [ Enhancement Count ]
    - SecondEnhanProjCount [ Enhancement Count ]
    - ThirdEnhanProjCount [ Enhancement Count ]
      - ThirdEnhanProjCount
        - City Library Application
          - Booking Manager
            - createBook
            - deleteBook
            - showBook
            - Book
          - Book Lending Manager
          - Magazine Manager
          - User Manager
- Other Projects
  - Reports
  - WikiProject

**Name suggestion**

**Function Point Modeler 4.4** now offers you a simple name suggestion. When you add a new element to your diagramm, the workbench suggests a element name based on the element type.



City Library Application

Unadjusted Function Points: 29, Adjusted Function Points: 29, Architecture typ: One-tier, Platform typ: Mixed

Value Adjustment Factor: 1

Subsystems

Booking Manager

Unadjusted Functionpoints: 29, Language: ACCEL

Transactional Functions

createBook
Typ: EI
Complexity: LOW
UFPs: 3
Enhancement Typ: ADDED
Process Typ: Interactive

deleteBook
Typ: EI
Complexity: AVERAGE
UFPs: 4
Enhancement Typ: ADDED
Process Typ: Batch

showBook
Typ: EQ
Complexity: HIGH
UFPs: 6
Enhancement Typ: ADDED
Process Typ: Interactive

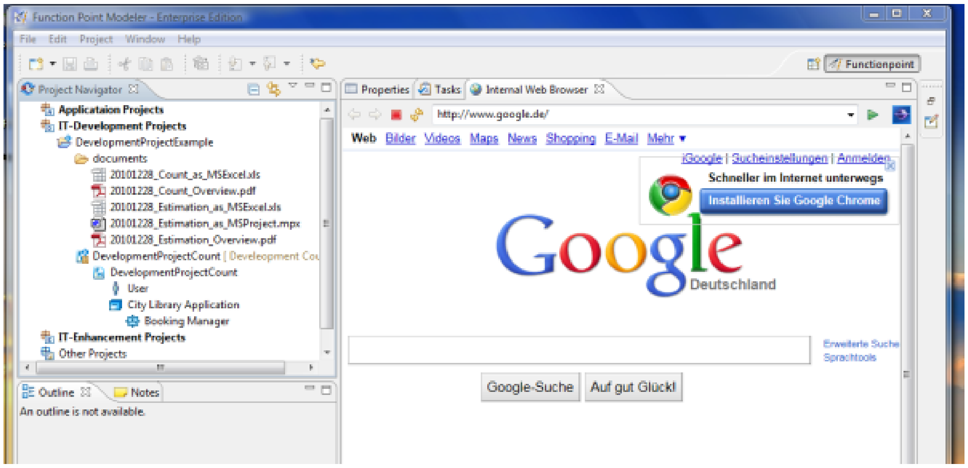
migrateBook
Typ: EI
Complexity: HIGH
UFPs: 6
Enhancement Typ: ADDE
Process Typ: Conversion

Data Functions

Book
Typ: ILF
Complexity: AVERAGE
UFPs: 10
Enhancement Typ: ADDED

**Web Browser Integration**

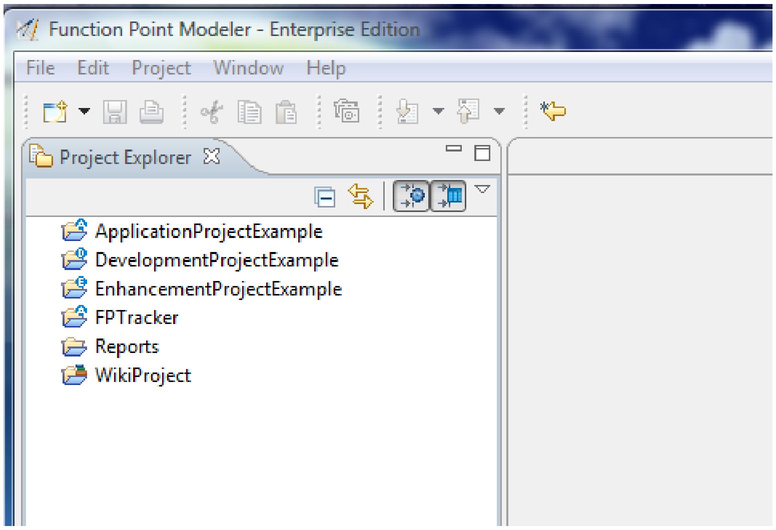
**Function Point Modeler 4.4 Enterprise Edition** now offers you a integrated web browser. Surf the internet and visit your favorite sites without having to leave the familiar Function Point Modeler workbench.


Function Point Modeler - Enterprise Edition
File Edit Project Window Help
Functionpoint
Project Navigator
Applicataion Projects
IT-Development Projects
DevelopmentProjectExample
documents
20101228_Count_as_MSExcel.xls
20101228_Count_Overview.pdf
20101228_Estimation_as_MSExcel.xls
20101228_Estimation_as_MSProject.mpx
20101228_Estimation_Overview.pdf
DevelopmentProjectCount | Deveolopment Cou
DevelopmentProjectCount
User
City Library Application
Booking Manager
IT-Enhancement Projects
Other Projects
Outline
Notes
An outline is not available.
Properties
Tasks
Internal Web Browser
http://www.google.de/
Web Bilder Videos Maps News Shopping E-Mail Mehr ▾
iGoogle | Sucheinstellungen | Anmelden
Schneller im Internet unterwegs
Installieren Sie Google Chrome
Google
Deutschland
Erweiterte Suche
Sprachtools
Google-Suche
Auf gut Glück!

## New and Noteworthy with Function Point Modeler 4.3

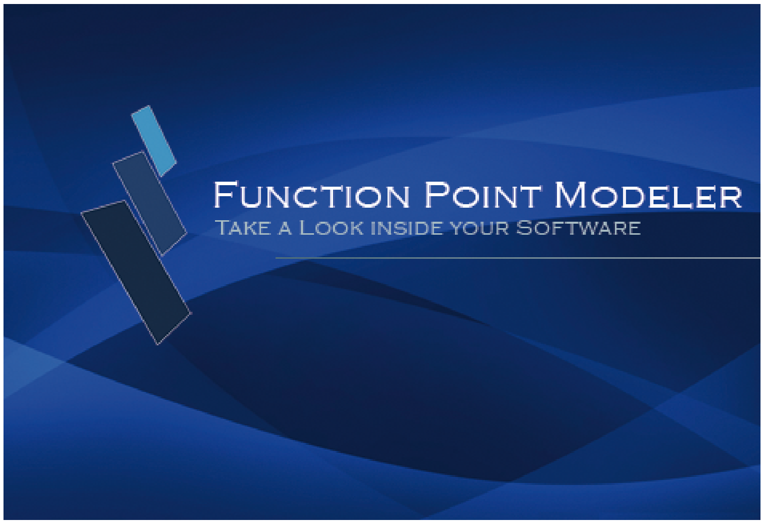
**Reduction to two Editions**

**Function Point Modeler 4.3** is now available in two editions. First of all the Standard Edition which is totally free for personal, educational or commercial use. Sencond, the Enterprise Edition the only product on the market today that not only sizes software with Function Point Analysis or estimates software with COCOMO, but also manages all of the IT-Metrics (Project, Product and Process Metrics) of your company in a Software Life Cycle Experience Database (SLED). It is the best Application Lifecycle Management (ALM) tool based on Function Point Analysis


Function Point Modeler - Enterprise Edition
File Edit Project Window Help
Project Explorer
ApplicationProjectExample
DevelopmentProjectExample
EnhancementProjectExample
FPTracker
Reports
WikiProject

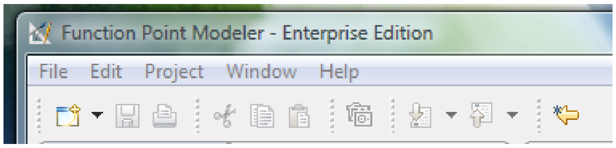
**New Splash Screen**

**Function Point Modeler 4.3** has a completely redesigned Splash Screen.



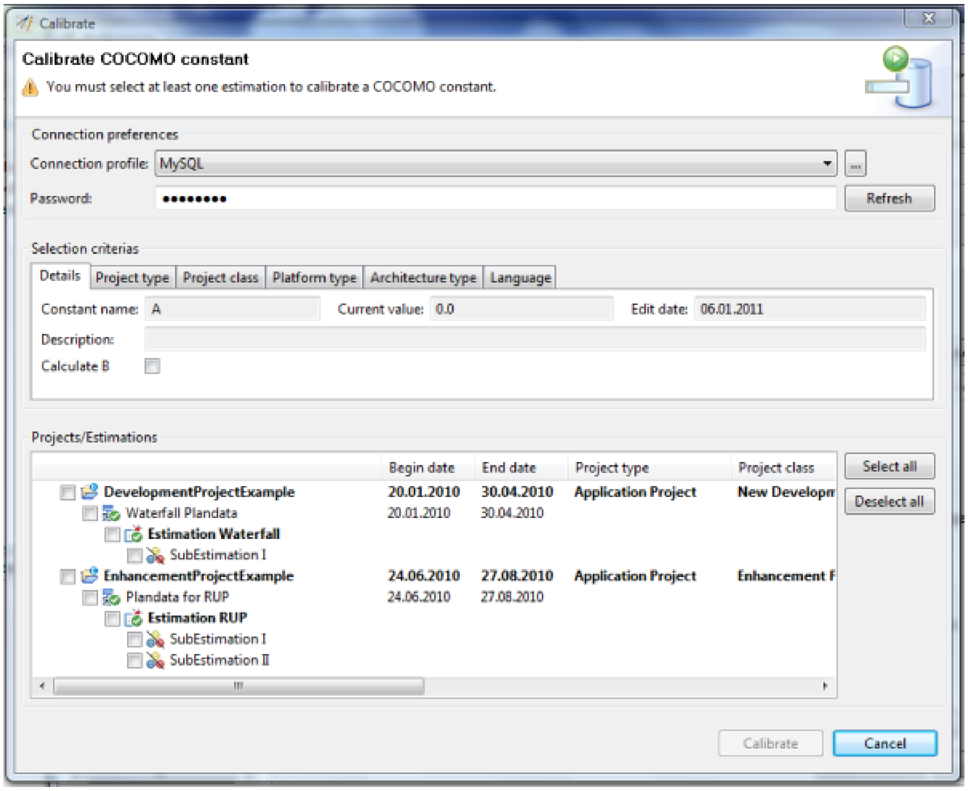
**Product version in title bar**

**Function Point Modeler 4.3** now shows the current product version in it's title bar.



**Calibrate COCOMO constants**

**Function Point Modeler 4.3** now offers the possibility to calibrate COCOMO constants on the basis of projects in the SLED database. You are now able to calibrate your constants on the basis of empirical informations.



Calibrate COCOMO constant

You must select at least one estimation to calibrate a COCOMO constant.

Connection preferences

Connection profile: MySQL

Password: •••••••••

Refresh

Selection criterias

Constant name: A Current value: 0.0 Edit date: 06.01.2011

Description:

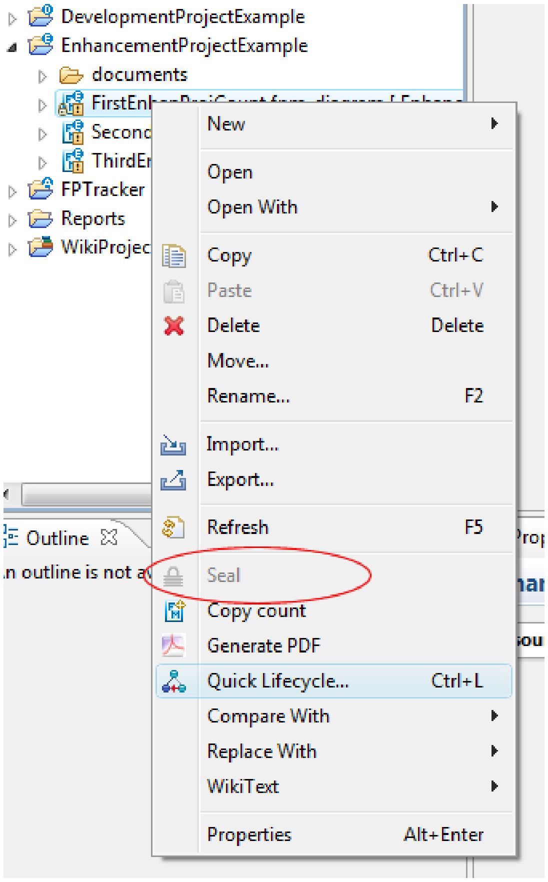
Calibrate B □

Projects/Estimations

| | Begin date | End date | Project type | Project class |
|---|---|---|---|---|
| □ DevelopmentProjectExample | 20.01.2010 | 30.04.2010 | Application Project | New Developm |
| □ Waterfall Plandata | 20.01.2010 | 30.04.2010 | | |
| □ Estimation Waterfall | | | | |
| □ SubEstimation I | | | | |
| □ EnhancementProjectExample | 24.06.2010 | 27.08.2010 | Application Project | Enhancement F |
| □ Plandata for RUP | 24.06.2010 | 27.08.2010 | | |
| □ Estimation RUP | | | | |
| □ SubEstimation I | | | | |
| □ SubEstimation II | | | | |

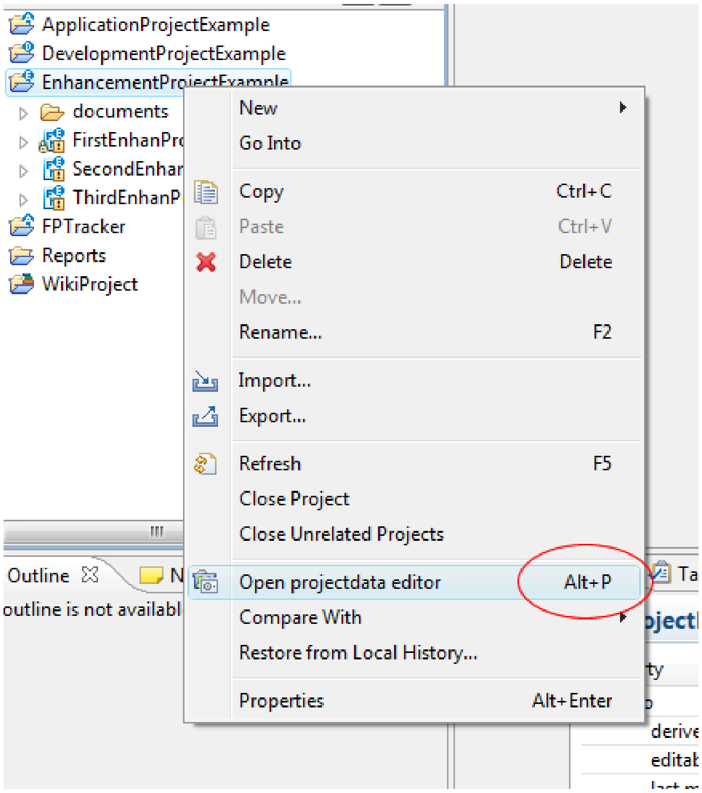
**Seal count**

It is now possible to seal a count. Sealed counts can no longer be edited by the user. Of course you can unseal a count whenever you want.



### New Shortcut for project editor

To view or edit the project editor you are able now to use an even faster shortcut. Just select a development or enhancement project and press the key combination ALT + P.



**New diagram layout** You can now select between the well known free-form layout or a new grid layout to display your diagrams. With the free-form layout your diagram elements will be positioned by yourself. With the new grid layout all diagram elements are arranged automatically by a predefined grid.

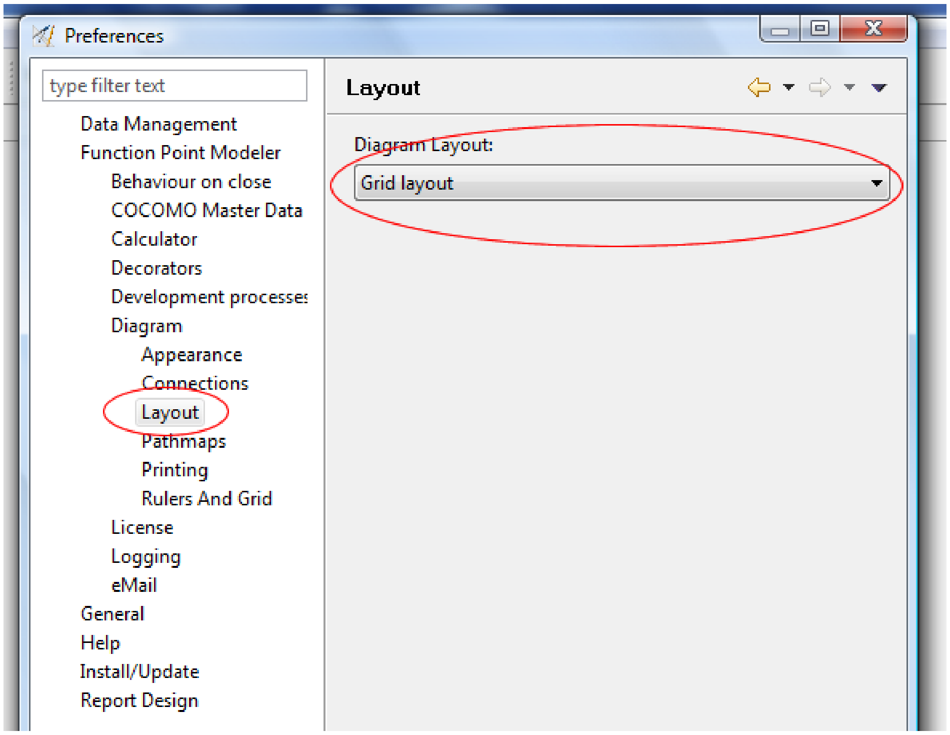
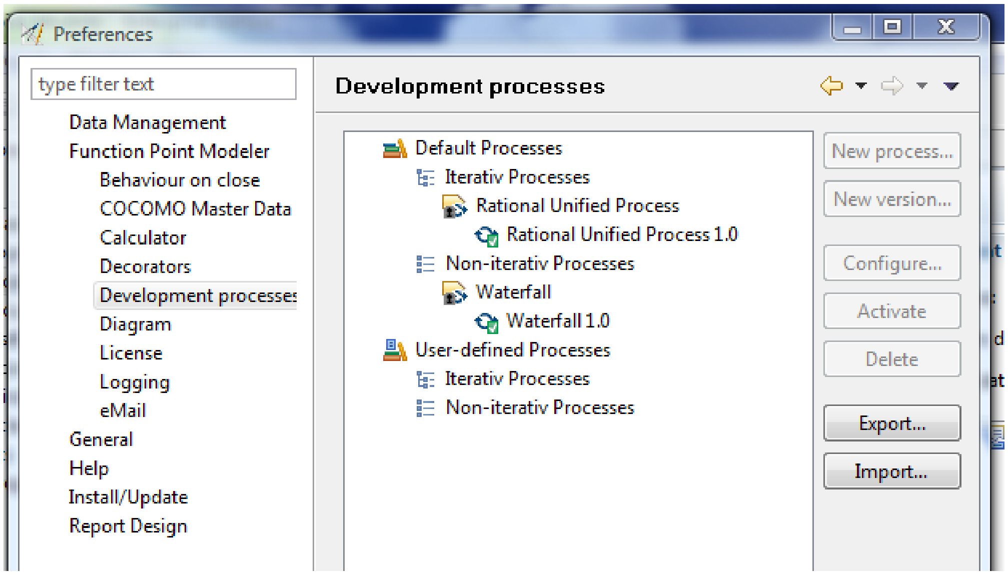


Diagram Layout: Grid layout

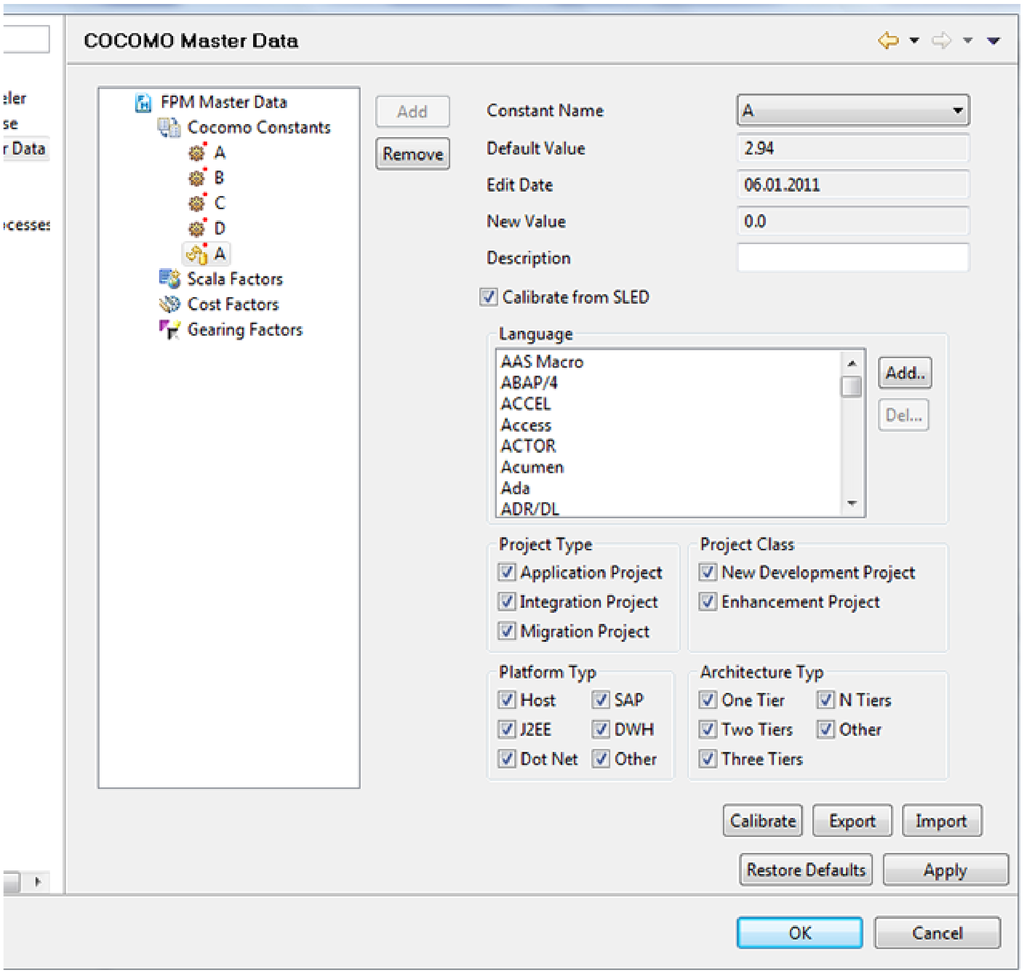
### Import/Export development processes

You are now able to import/export development processes optional to a XML file or to your SLED database. With the help of the SLED database, it is easier than ever, to exchange development processes with your colleagues or associates.



### Import/Export COCOMO masterdata

You are now able to import/export COCOMO masterdata optional to a XML file or to your SLED database. With the help of the SLED database, it is easier than ever, to exchange COCOMO masterdata with your colleagues or associates.



COCOMO Master Data

- FPM Master Data
  - Cocomo Constants
    - A
    - B
    - C
    - D
    - A
  - Scala Factors
  - Cost Factors
  - Gearing Factors

Add  Remove

| | |
|---|---|
| Constant Name | A |
| Default Value | 2.94 |
| Edit Date | 06.01.2011 |
| New Value | 0.0 |
| Description | |

☑ Calibrate from SLED

Language

AAS Macro
ABAP/4
ACCEL
Access
ACTOR
Acumen
Ada
ADR/DL

Add..  Del...

Project Type

☑ Application Project
☑ Integration Project
☑ Migration Project

Project Class

☑ New Development Project
☑ Enhancement Project

Platform Typ

☑ Host ☑ SAP
☑ J2EE ☑ DWH
☑ Dot Net ☑ Other

Architecture Typ

☑ One Tier ☑ N Tiers
☑ Two Tiers ☑ Other
☑ Three Tiers

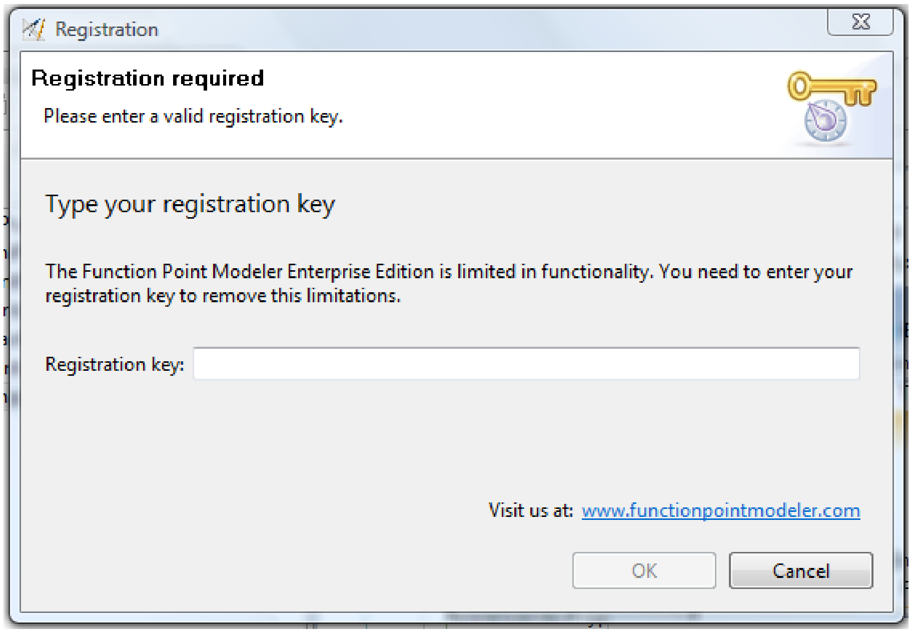
Calibrate  Export  Import

Restore Defaults  Apply

OK  Cancel

**Revision of license information**

In the Edition Edition the dialog to display license advice has been revised. The required serial number to unlock the Enterprise Edition can now be entered directly in this dialog.



Registration

**Registration required**

Please enter a valid registration key.

Type your registration key

The Function Point Modeler Enterprise Edition is limited in functionality. You need to enter your registration key to remove this limitations.

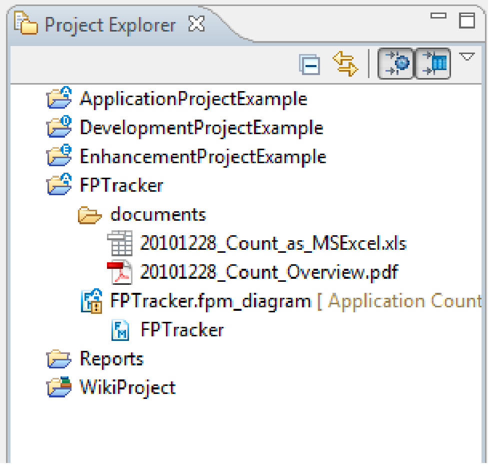
Registration key:

Visit us at: www.functionpointmodeler.com

OK  Cancel

**Example projects enhanced**

The sample projects of **Function Point Modeler** has been enhanced by examples of document fragments. A new example to demonstrate the versatility of the tool was added. This example is the implementation of the Help chapter **Function Point Analysis** .

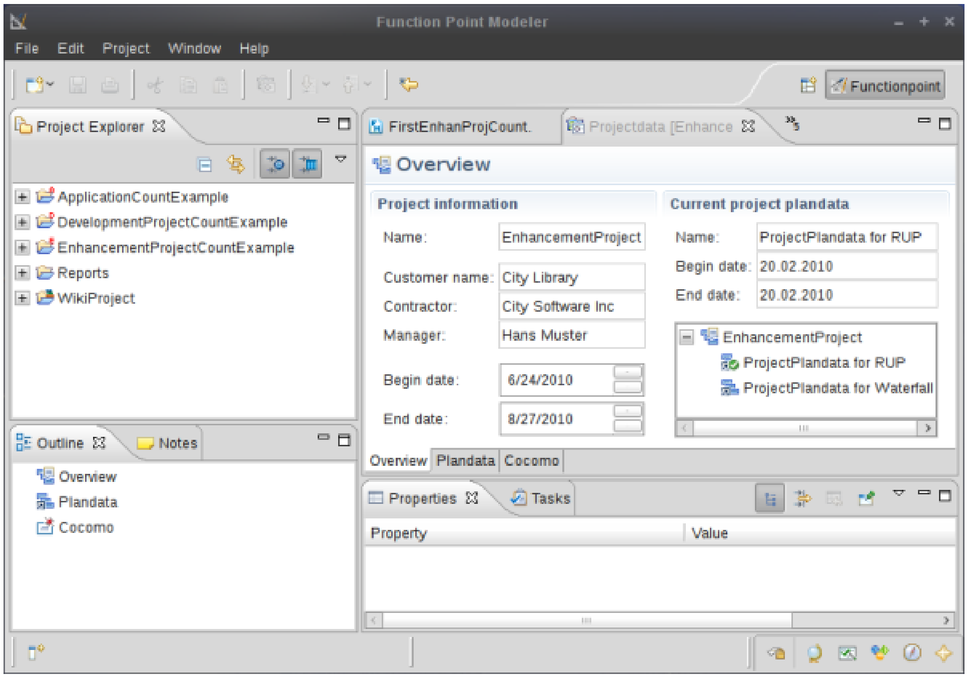


- ApplicationProjectExample
- DevelopmentProjectExample
- EnhancementProjectExample
- FPTracker
  - documents
    - 20101228_Count_as_MSExcel.xls
    - 20101228_Count_Overview.pdf
  - FPTracker.fpm_diagram [ Application Count
    - FPTracker
- Reports
- WikiProject

## New and Noteworthy with Function Point Modeler 4.2

**New operating system support**

**Function Point Modeler 4.2** now runs on Windows XP, Windows Vista, Windows 7 or Linux GTK (32- or 64-bit)..



- ApplicationCountExample
- DevelopmentProjectCountExample
- EnhancementProjectCountExample
- Reports
- WikiProject

Overview

Project information

| | |
|---|---|
| Name: | EnhancementProject |
| Customer name: | City Library |
| Contractor: | City Software Inc |
| Manager: | Hans Muster |
| Begin date: | 6/24/2010 |
| End date: | 8/27/2010 |

Current project plandata

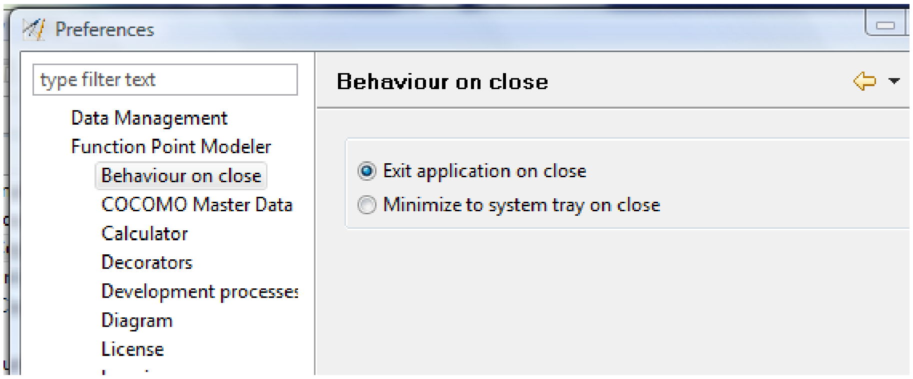
| | |
|---|---|
| Name: | ProjectPlandata for RUP |
| Begin date: | 20.02.2010 |
| End date: | 20.02.2010 |

- EnhancementProject
  - ProjectPlandata for RUP
  - ProjectPlandata for Waterfall

| Property | Value |
|---|---|

**Run in system tray**

**Function Point Modeler 4.2** now provides the possibility to minimize the application to the system tray on program exit.


Preferences

type filter text

- Data Management
- Function Point Modeler
  - Behaviour on close
  - COCOMO Master Data
  - Calculator
  - Decorators
  - Development processes
  - Diagram
  - License

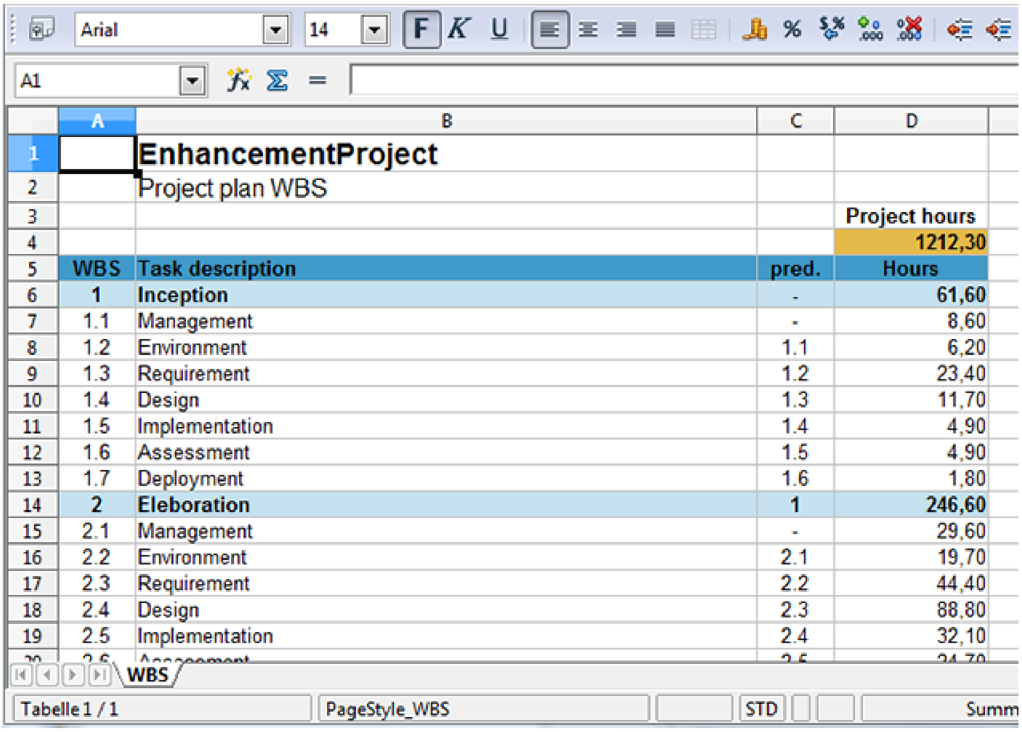
**Behaviour on close**

● Exit application on close

○ Minimize to system tray on close

**Export estimation to spreadsheet**

With **Function Point Modeler 4.2** you now can export your project estimation to MS Excel or Open Office Calc as a work breakdown structure.



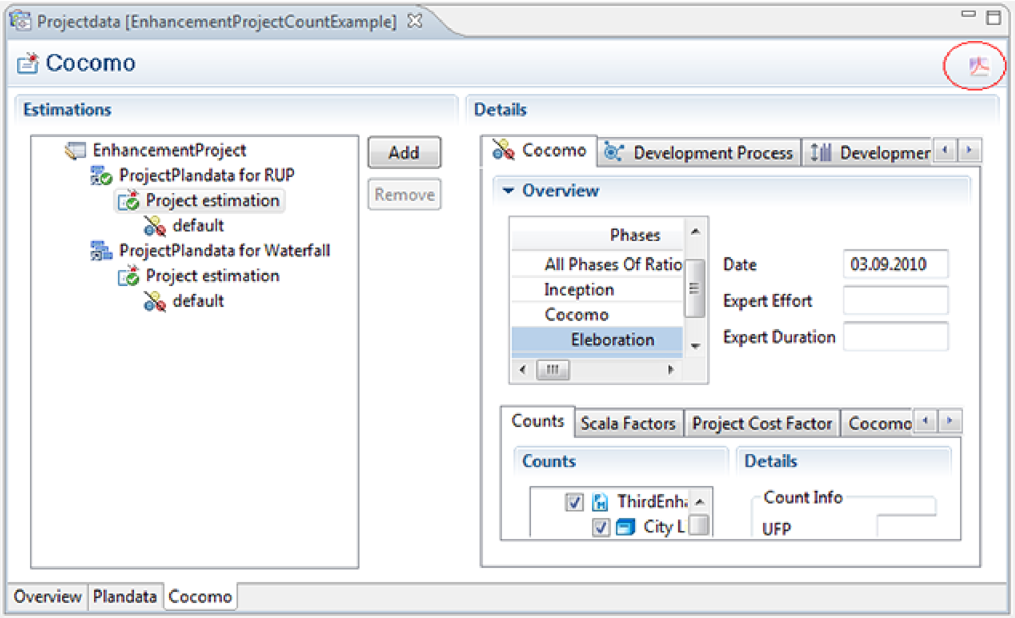
|  | A | B | C | D |
|---|---|---|---|---|
| 1 |  | EnhancementProject |  |  |
| 2 |  | Project plan WBS |  |  |
| 3 |  |  |  | Project hours |
| 4 |  |  |  | 1212,30 |
| 5 | WBS | Task description | pred. | Hours |
| 6 | 1 | Inception | - | 61,60 |
| 7 | 1.1 | Management | - | 8,60 |
| 8 | 1.2 | Environment | 1.1 | 6,20 |
| 9 | 1.3 | Requirement | 1.2 | 23,40 |
| 10 | 1.4 | Design | 1.3 | 11,70 |
| 11 | 1.5 | Implementation | 1.4 | 4,90 |
| 12 | 1.6 | Assessment | 1.5 | 4,90 |
| 13 | 1.7 | Deployment | 1.6 | 1,80 |
| 14 | 2 | Eleboration | 1 | 246,60 |
| 15 | 2.1 | Management | - | 29,60 |
| 16 | 2.2 | Environment | 2.1 | 19,70 |
| 17 | 2.3 | Requirement | 2.2 | 44,40 |
| 18 | 2.4 | Design | 2.3 | 88,80 |
| 19 | 2.5 | Implementation | 2.4 | 32,10 |
| 20 | 2.6 | Assessment | 2.5 | 24,70 |

WBS

Tabelle 1 / 1 | PageStyle_WBS | STD | Summ

**New estimation printing option**

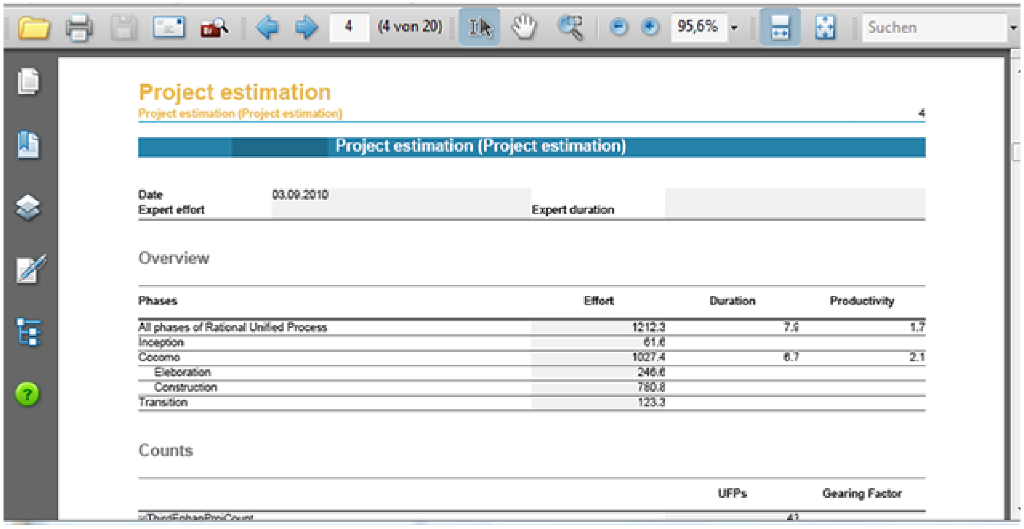
**Function Point Modeler 4.2** provides extended printing capability for estimations. The new cooperate design for estimations is now also part of the count printing option.



Date 03.09.2010

Expert Effort

Expert Duration



Project estimation

Project estimation (Project estimation) 4

Project estimation (Project estimation)

| | | | |
|---|---|---|---|
| Date | 03.09.2010 | | |
| Expert effort | | Expert duration | |

Overview

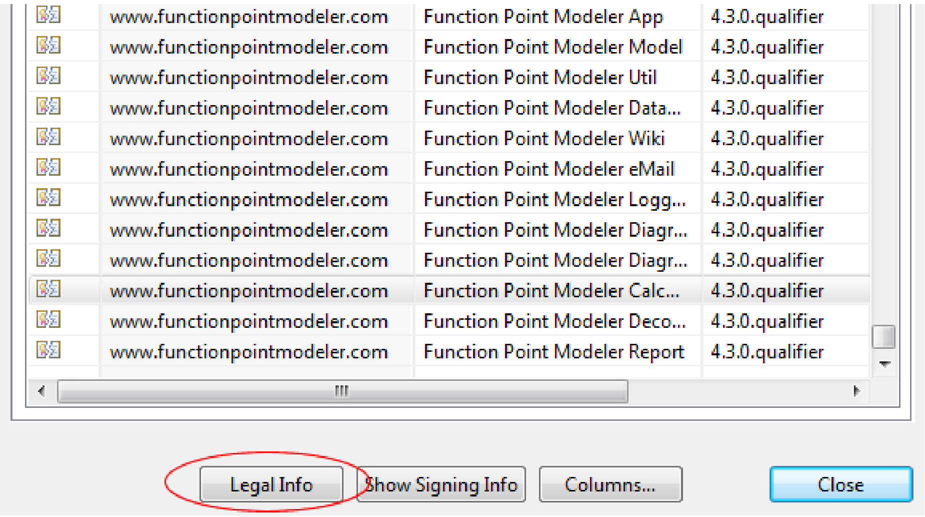
| Phases | Effort | Duration | Productivity |
|---|---|---|---|
| All phases of Rational Unified Process | 1212.3 | 7.9 | 1.7 |
| Inception | 61.6 | | |
| Cocomo | 1027.4 | 6.7 | 2.1 |
| Eleboration | 246.6 | | |
| Construction | 780.8 | | |
| Transition | 123.3 | | |

Counts

| | UFPs | Gearing Factor |
|---|---|---|
| ThirdEnhanProjCount | 42 | |

**Legal info**

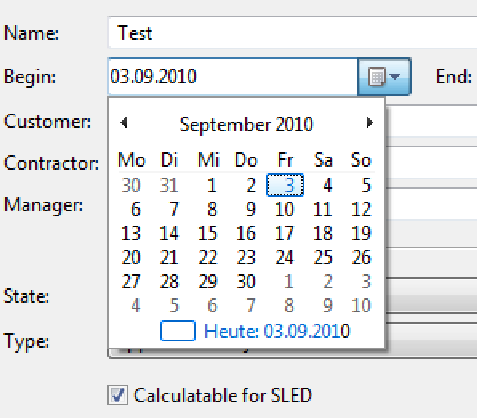
**Function Point Modeler 4.2** now shows legal informations in the about dialog for all referenced plugins.



| | | |
|---|---|---|
| www.functionpointmodeler.com | Function Point Modeler App | 4.3.0.qualifier |
| www.functionpointmodeler.com | Function Point Modeler Model | 4.3.0.qualifier |
| www.functionpointmodeler.com | Function Point Modeler Util | 4.3.0.qualifier |
| www.functionpointmodeler.com | Function Point Modeler Data... | 4.3.0.qualifier |
| www.functionpointmodeler.com | Function Point Modeler Wiki | 4.3.0.qualifier |
| www.functionpointmodeler.com | Function Point Modeler eMail | 4.3.0.qualifier |
| www.functionpointmodeler.com | Function Point Modeler Logg... | 4.3.0.qualifier |
| www.functionpointmodeler.com | Function Point Modeler Diagr... | 4.3.0.qualifier |
| www.functionpointmodeler.com | Function Point Modeler Diagr... | 4.3.0.qualifier |
| www.functionpointmodeler.com | Function Point Modeler Calc... | 4.3.0.qualifier |
| www.functionpointmodeler.com | Function Point Modeler Deco... | 4.3.0.qualifier |
| www.functionpointmodeler.com | Function Point Modeler Report | 4.3.0.qualifier |

**New date chooser widget**

**Function Point Modeler 4.2** comes with a new date chooser widget to provide comfortable date selection to the user.



Name: Test

Begin: 03.09.2010

End:

Customer:

Contractor:

Manager:

State:

Type:

September 2010

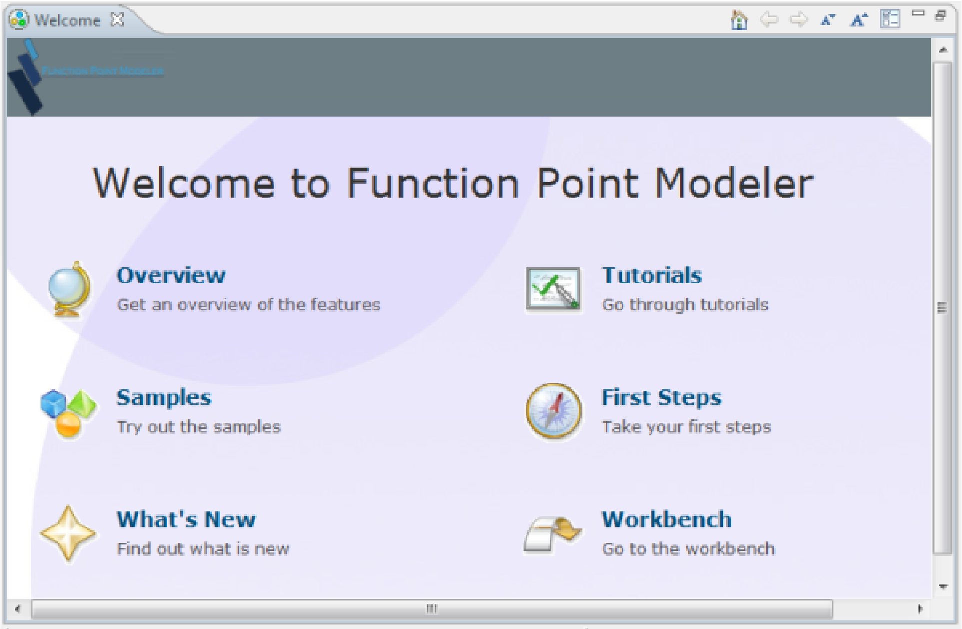
| Mo | Di | Mi | Do | Fr | Sa | So |
|---|---|---|---|---|---|---|
| 30 | 31 | 1 | 2 | 3 | 4 | 5 |
| 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30 | 1 | 2 | 3 |
| 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Heute: 03.09.2010

☑ Calculatable for SLED

**New intro theme**

By default **Function Point Modeler 4.2** comes with a new intro theme called Slate.



Welcome to Function Point Modeler

**Overview**
Get an overview of the features

**Tutorials**
Go through tutorials

**Samples**
Try out the samples

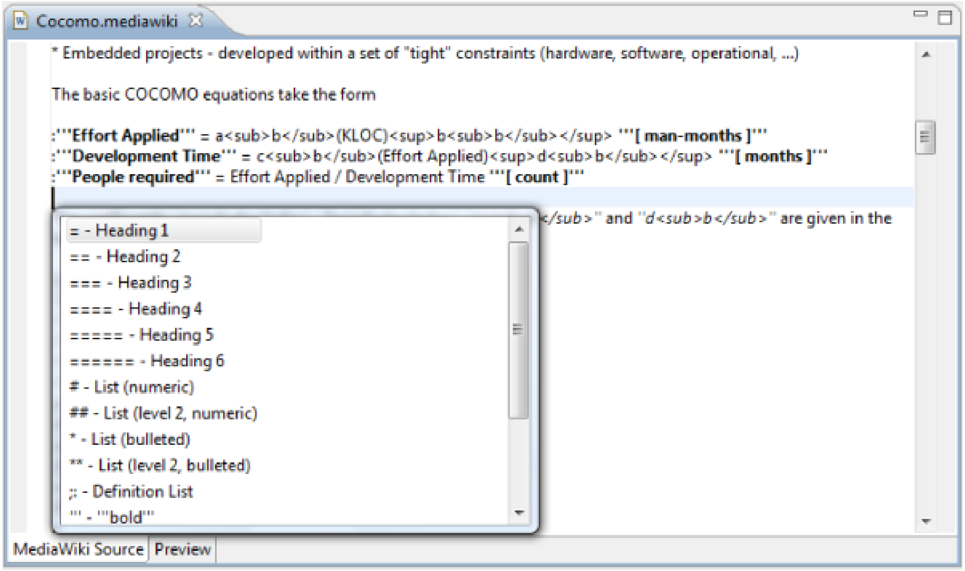
**First Steps**
Take your first steps

**What's New**
Find out what is new

**Workbench**
Go to the workbench

**Complete Wiki feature**

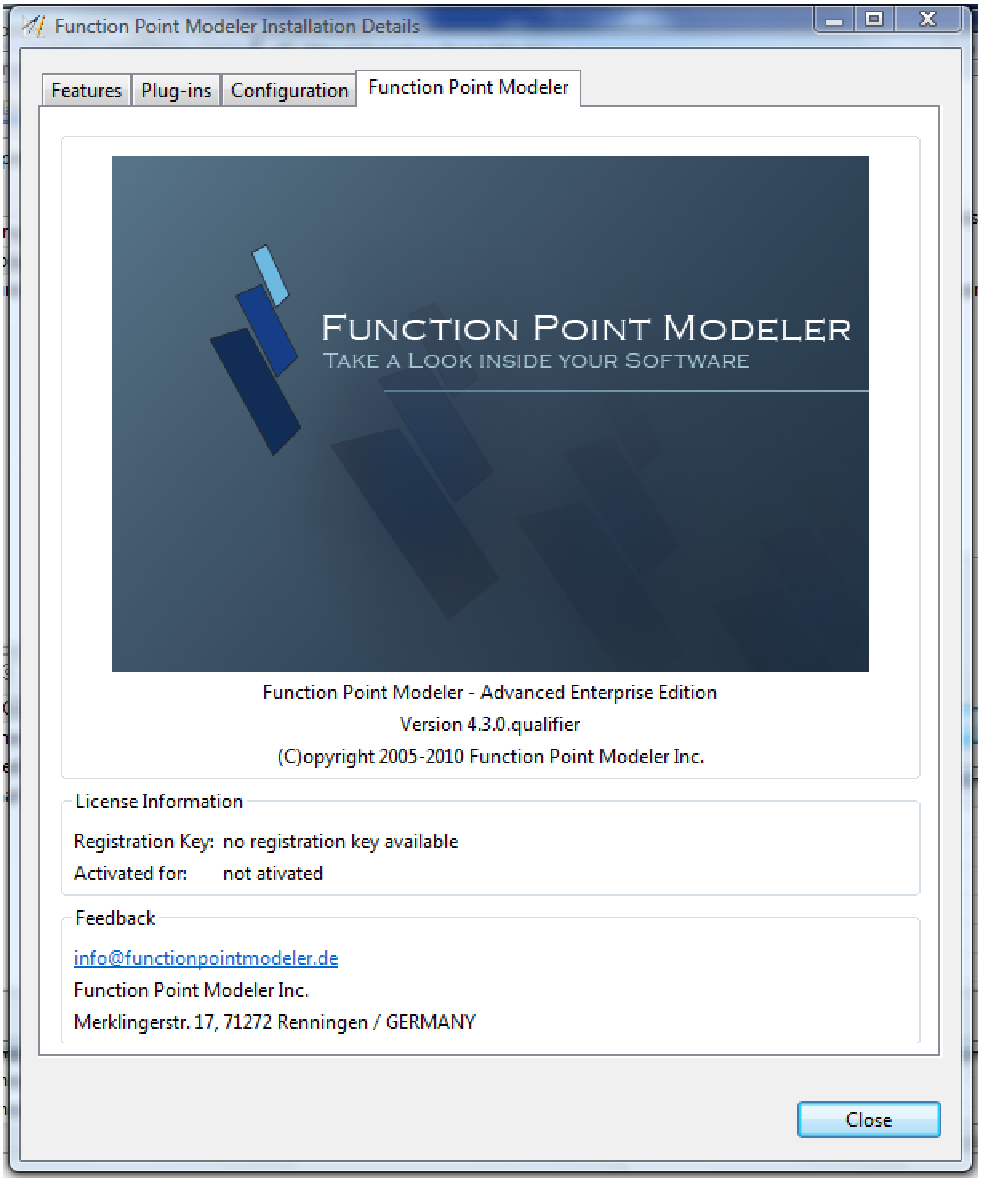
**Function Point Modeler 4.2** includes a complete set of Wiki feature with editors and wizards to create your own wiki with MediaWiki, Textile, Confluence, TracWiki and TWiki markup.



```
* Embedded projects - developed within a set of "tight" constraints (hardware, software, operational, ...)

The basic COCOMO equations take the form

:'''Effort Applied''' = a<sub>b</sub>(KLOC)<sup>b<sub>b</sub></sup> '''[ man-months ]'''
:'''Development Time''' = c<sub>b</sub>(Effort Applied)<sup>d<sub>b</sub></sup> '''[ months ]'''
:'''People required''' = Effort Applied / Development Time '''[ count ]'''

</sub>'' and ''d<sub>b</sub>'' are given in the
```

**Extended installation information**

**Function Point Modeler 4.2** provides an extended installation information in the about dialog..



Function Point Modeler - Advanced Enterprise Edition

Version 4.3.0.qualifier

(C)opyright 2005-2010 Function Point Modeler Inc.

License Information

Registration Key: no registration key available

Activated for: not ativated

Feedback

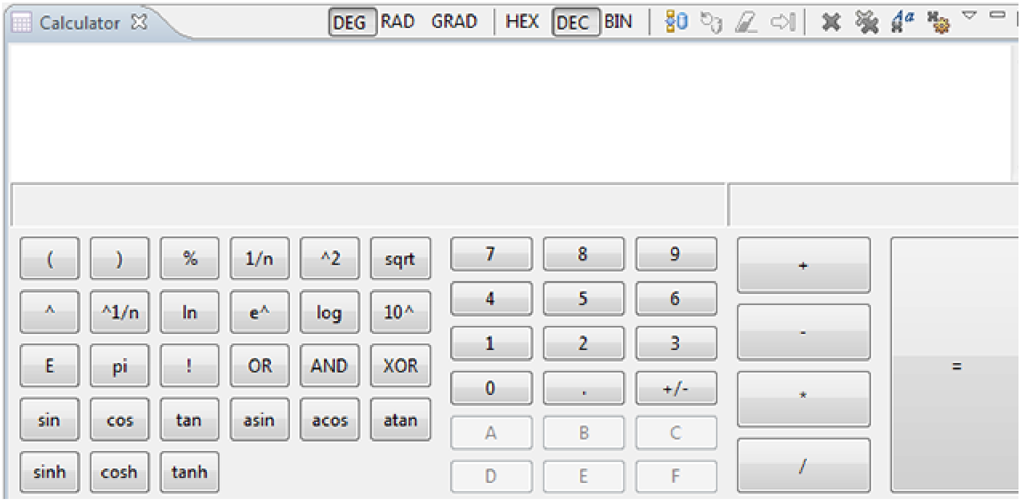
info@functionpointmodeler.de

Function Point Modeler Inc.

Merklingerstr. 17, 71272 Renningen / GERMANY

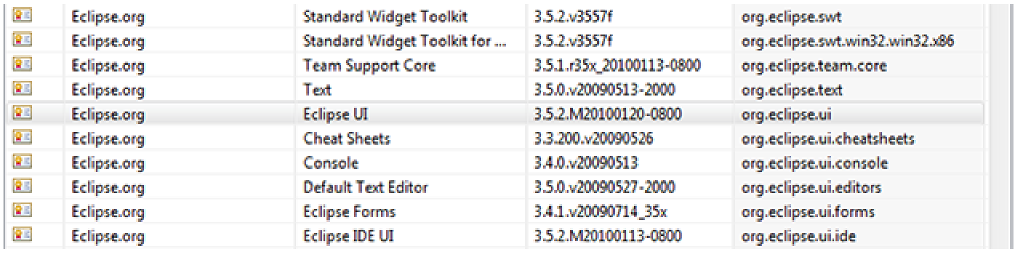
## New and Noteworthy with Function Point Modeler 4.1

| | |
|---|---|
| **Simple but powerful calculator** | **Function Point Modeler 4.1** includes a simple but powerful calculator who works in HEX, DEC or BIN modus. |



**Based on Eclipse 3.5.2**

**Function Point Modeler 4.1** is now based on Eclipse 3.5.2.

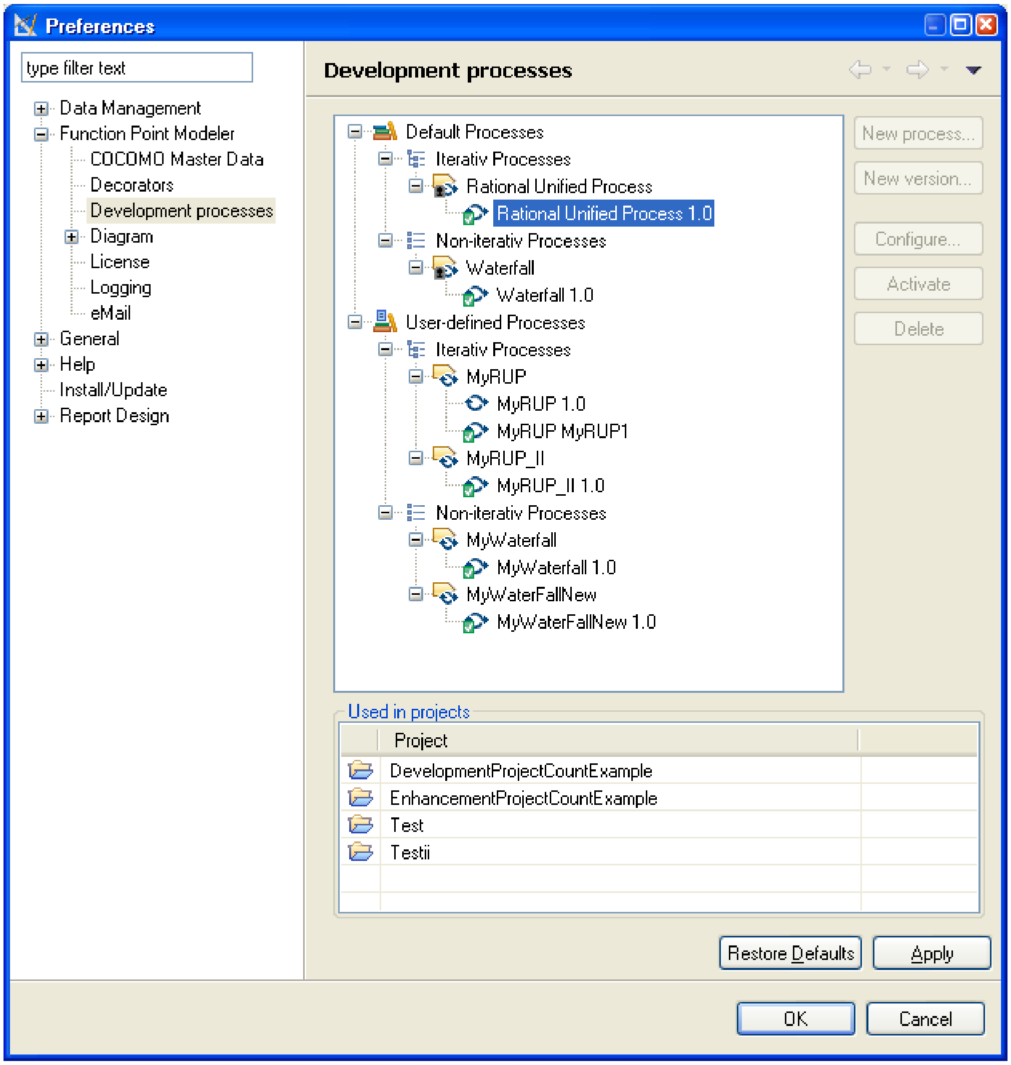


| | | | |
|---|---|---|---|
| Eclipse.org | Standard Widget Toolkit | 3.5.2.v3557f | org.eclipse.swt |
| Eclipse.org | Standard Widget Toolkit for ... | 3.5.2.v3557f | org.eclipse.swt.win32.win32.x86 |
| Eclipse.org | Team Support Core | 3.5.1.r35x_20100113-0800 | org.eclipse.team.core |
| Eclipse.org | Text | 3.5.0.v20090513-2000 | org.eclipse.text |
| Eclipse.org | Eclipse UI | 3.5.2.M20100120-0800 | org.eclipse.ui |
| Eclipse.org | Cheat Sheets | 3.3.200.v20090526 | org.eclipse.ui.cheatsheets |
| Eclipse.org | Console | 3.4.0.v20090513 | org.eclipse.ui.console |
| Eclipse.org | Default Text Editor | 3.5.0.v20090527-2000 | org.eclipse.ui.editors |
| Eclipse.org | Eclipse Forms | 3.4.1.v20090714_35x | org.eclipse.ui.forms |
| Eclipse.org | Eclipse IDE UI | 3.5.2.M20100113-0800 | org.eclipse.ui.ide |

## New and Noteworthy with Function Point Modeler 4.0

**Manage your software development process**

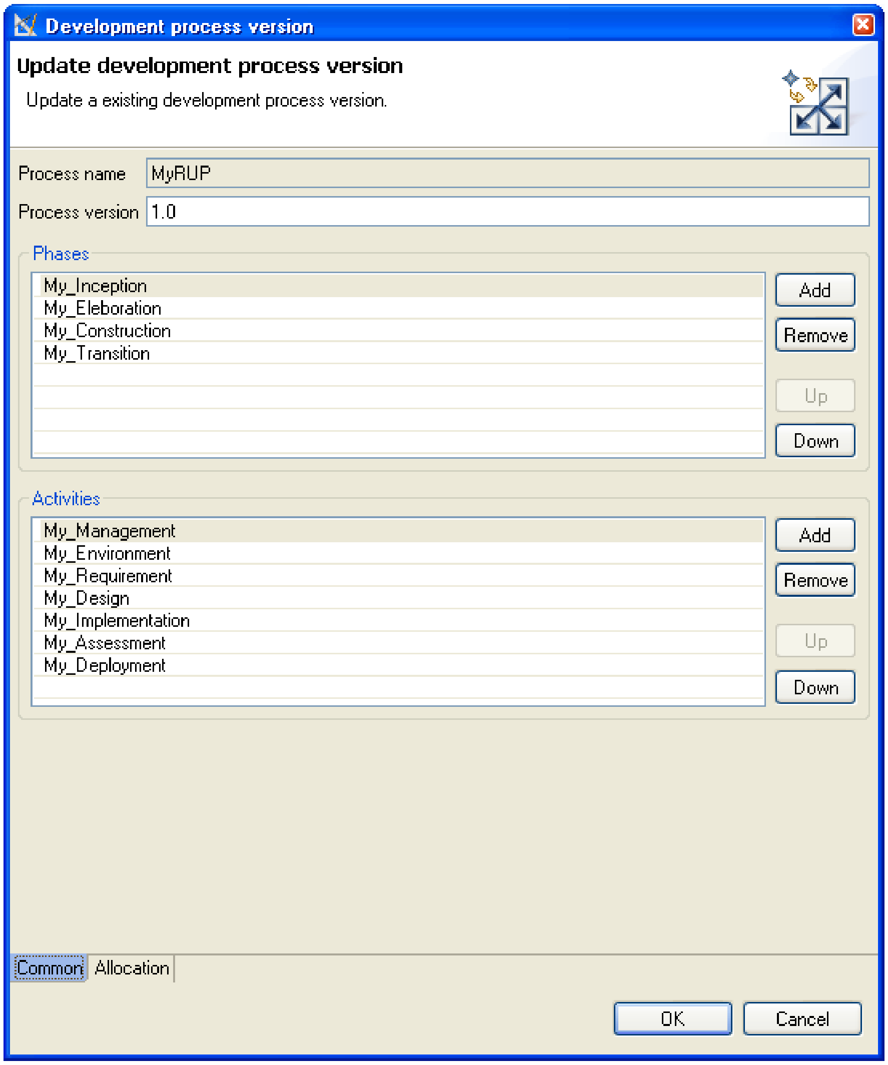
**Function Point Modeler 4.0** allows you to manage the software development process in your company.



- Default Processes
  - Iterativ Processes
    - Rational Unified Process
      - Rational Unified Process 1.0
  - Non-iterativ Processes
    - Waterfall
      - Waterfall 1.0
- User-defined Processes
  - Iterativ Processes
    - MyRUP
      - MyRUP 1.0
      - MyRUP MyRUP1
    - MyRUP_II
      - MyRUP_II 1.0
  - Non-iterativ Processes
    - MyWaterfall
      - MyWaterfall 1.0
    - MyWaterFallNew
      - MyWaterFallNew 1.0

| Project |
|---|
| DevelopmentProjectCountExample |
| EnhancementProjectCountExample |
| Test |
| Testii |

You can add, remove and change the software development process phase and activities as they are defined in your company.



Update development process version

Update a existing development process version.

Process name MyRUP

Process version 1.0

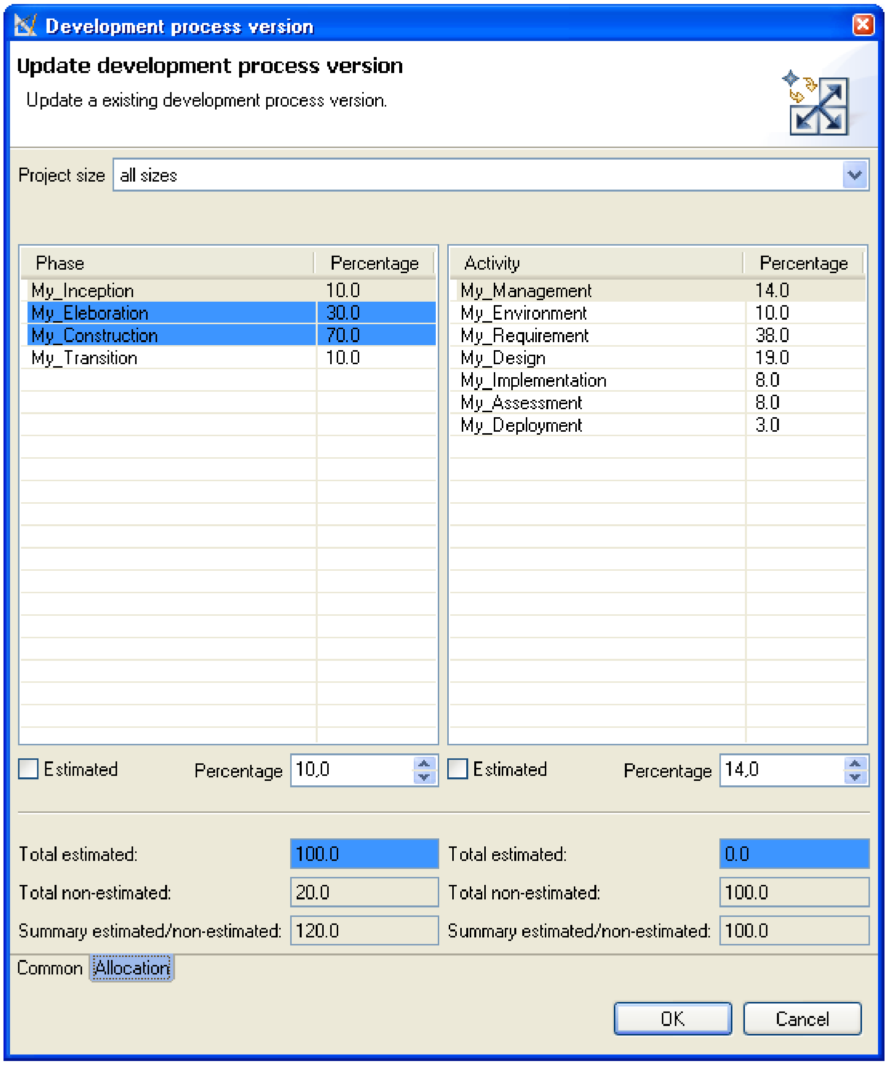
Phases

- My_Inception
- My_Eleboration
- My_Construction
- My_Transition

Activities

- My_Management
- My_Environment
- My_Requirement
- My_Design
- My_Implementation
- My_Assessment
- My_Deployment

You can also change the estimation distribution for each phase or activity.



Development process version

Update development process version

Update a existing development process version.

Project size: all sizes

| Phase | Percentage |
|---|---|
| My_Inception | 10.0 |
| My_Eleboration | 30.0 |
| My_Construction | 70.0 |
| My_Transition | 10.0 |

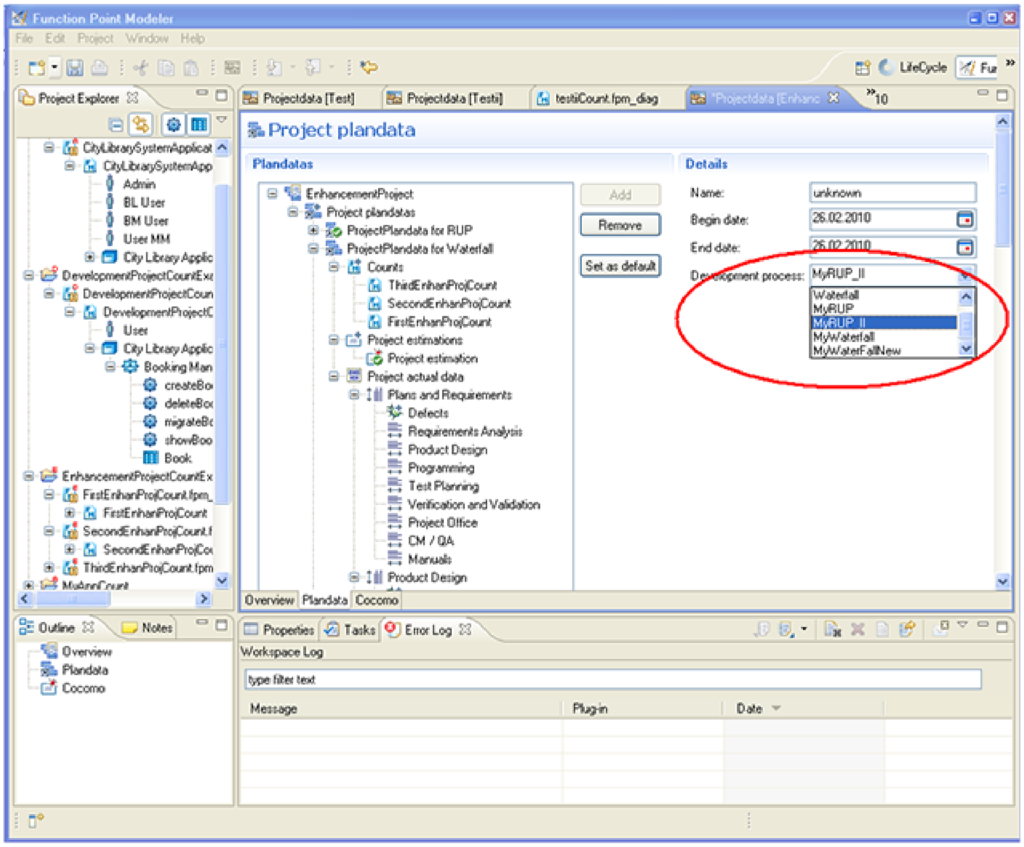
| Activity | Percentage |
|---|---|
| My_Management | 14.0 |
| My_Environment | 10.0 |
| My_Requirement | 38.0 |
| My_Design | 19.0 |
| My_Implementation | 8.0 |
| My_Assessment | 8.0 |
| My_Deployment | 3.0 |

□ Estimated Percentage 10,0

□ Estimated Percentage 14,0

| | | | |
|---|---|---|---|
| Total estimated: | 100.0 | Total estimated: | 0.0 |
| Total non-estimated: | 20.0 | Total non-estimated: | 100.0 |
| Summary estimated/non-estimated: | 120.0 | Summary estimated/non-estimated: | 100.0 |

You can use now the new defined software development process for your estimations. It appears in development process *ComboBox* .



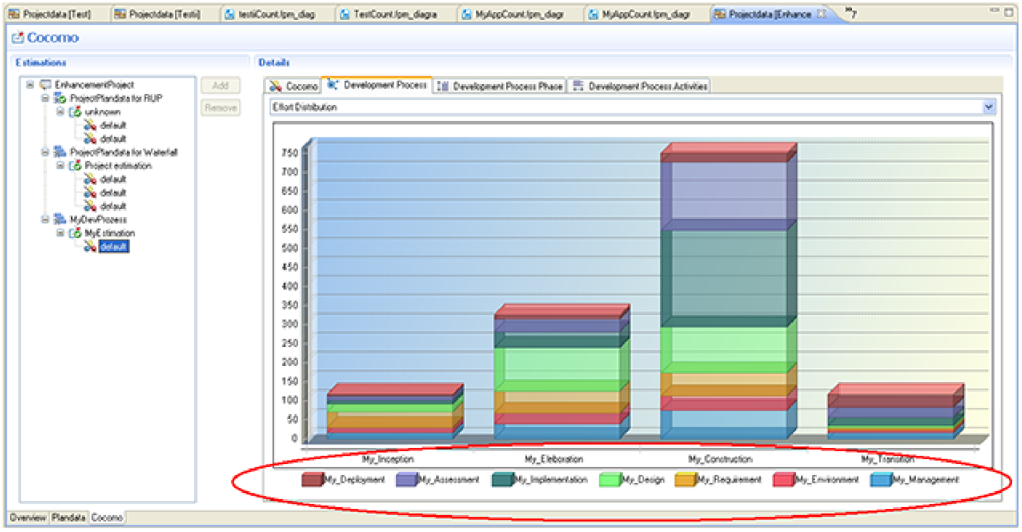
Name: unknown

Begin date: 26.02.2010

End date: 26.02.2010

Development process: MyRUP_II

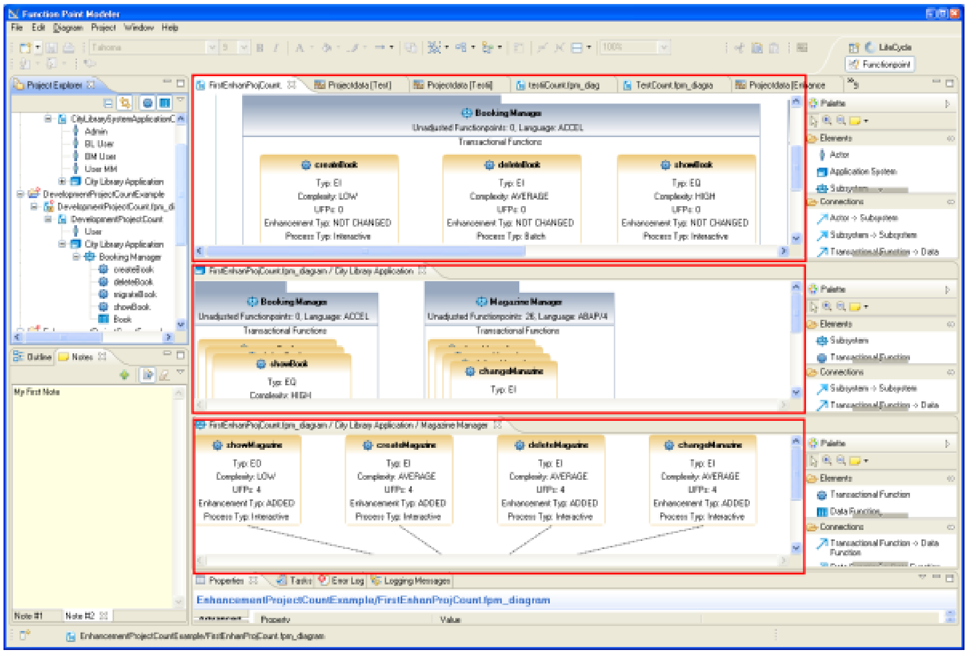
Your estimation is now distributed based on the new defined software development process.



**New editors for Counts, Application Systems and Sub Systems**

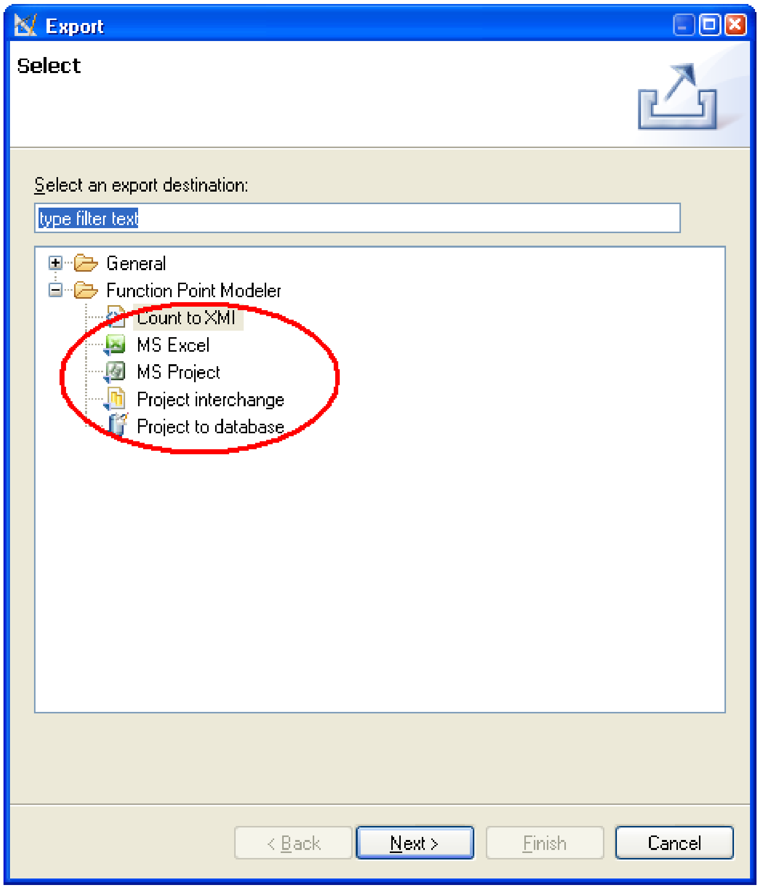
**Function Point Modeler 4.0** includes now **3** diagram editors. The new diagram editors allow you to edit each item ( *count, application system und sub system* ) separately. In the count diagram editor, double click the application system to edit the selected application separately.

The editors allow you to edit only the selected part of a **complex** count.

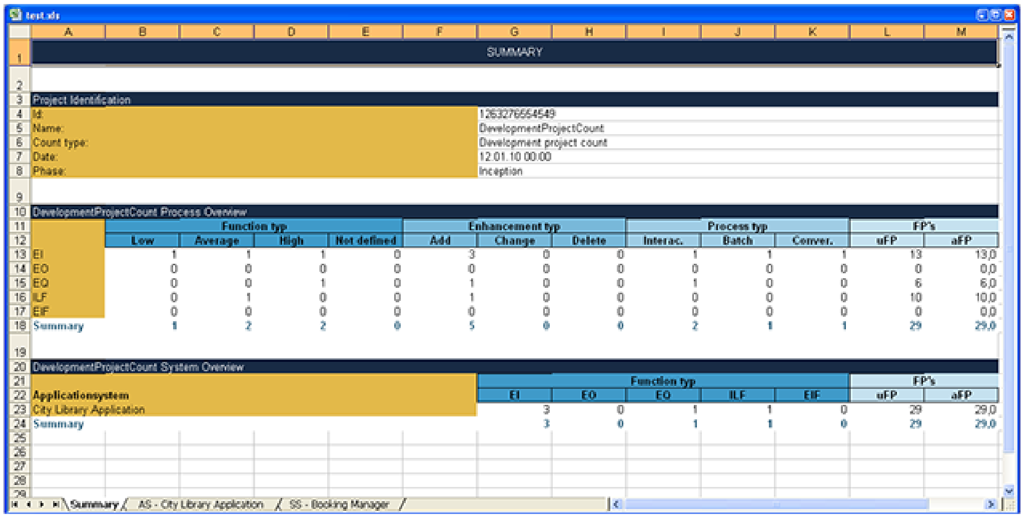


## New Exports

**Function Point Modeler 4.0** includes two export functions.



You can export counts as excel sheet.


test.xls

SUMMARY

**Project Identification**

| | |
|---|---|
| Id: | 1263276654549 |
| Name: | DevelopmentProjectCount |
| Count type: | Development project count |
| Date: | 12.01.10 00:00 |
| Phase: | Inception |

**DevelopmentProjectCount Process Overview**

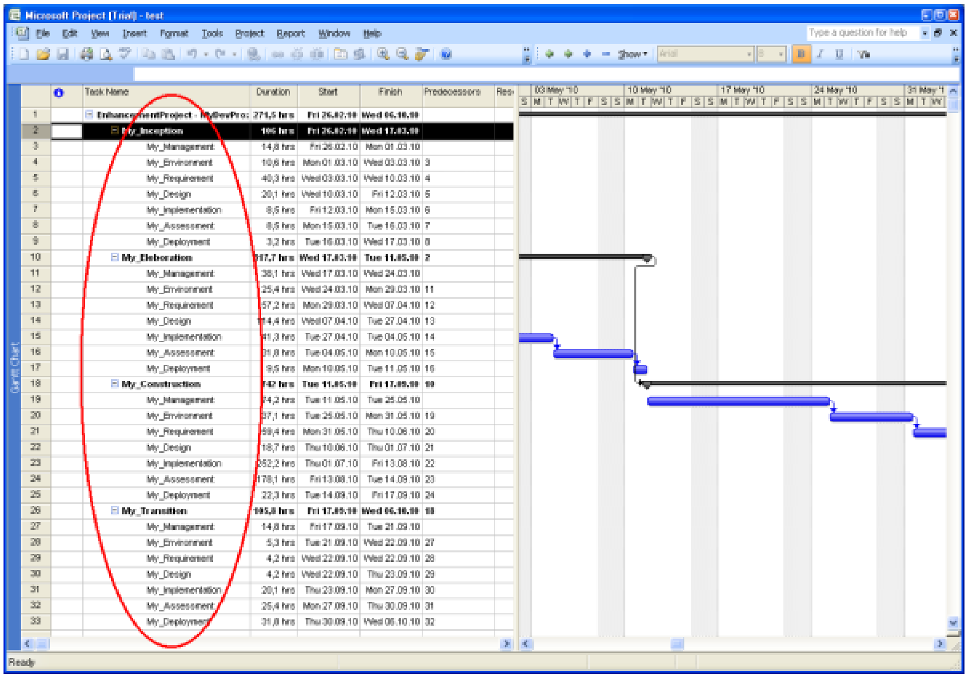
| | Function typ | | | | Enhancement typ | | | Process typ | | | FP's | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Low | Average | High | Not defined | Add | Change | Delete | Interac. | Batch | Conver. | uFP | aFP |
| EI | 1 | 1 | 1 | 0 | 3 | 0 | 0 | 1 | 1 | 1 | 13 | 13,0 |
| EO | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,0 |
| EQ | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 6 | 6,0 |
| ILF | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 10 | 10,0 |
| EIF | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,0 |
| Summary | 1 | 2 | 2 | 0 | 5 | 0 | 0 | 2 | 1 | 1 | 29 | 29,0 |

**DevelopmentProjectCount System Overview**

| | Function typ | | | | | FP's | |
|---|---|---|---|---|---|---|---|
| Applicationsystem | EI | EO | EQ | ILF | EIF | uFP | aFP |
| City Library Application | 3 | 0 | 1 | 1 | 0 | 29 | 29,0 |
| Summary | 3 | 0 | 1 | 1 | 0 | 29 | 29,0 |

Summary / AS - City Library Application / SS - Booking Manager

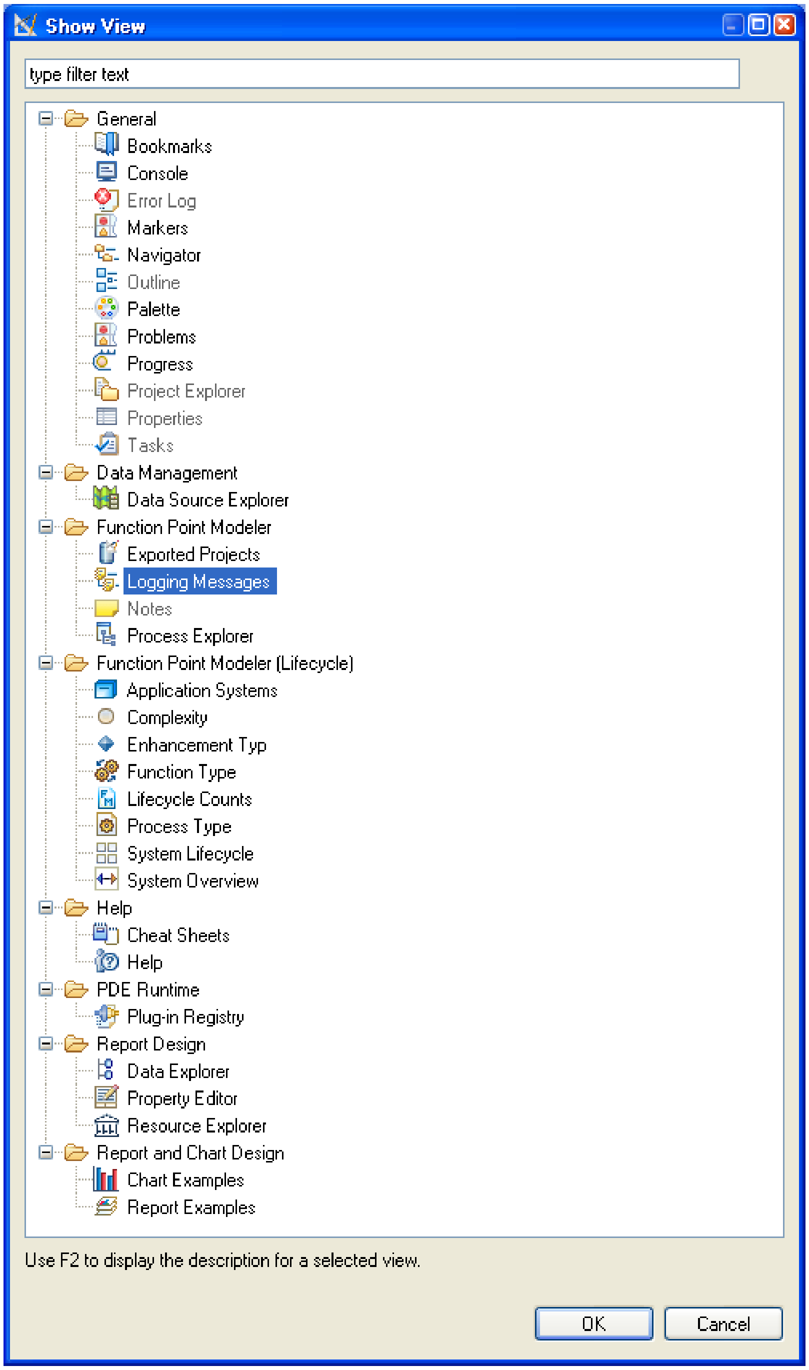
You can also export estimations to any project managment tool e.g. MS project as project plan


Microsoft Project (Trial) - test

| | Task Name | Duration | Start | Finish | Predecessors |
|---|---|---|---|---|---|
| 1 | **EnhancementProject - MyDevPro:** | **271,5 hrs** | **Fri 26.02.10** | **Wed 06.10.10** | |
| 2 | **My_Inception** | **106 hrs** | **Fri 26.02.10** | **Wed 17.03.10** | |
| 3 | My_Management | 14,8 hrs | Fri 26.02.10 | Mon 01.03.10 | |
| 4 | My_Environment | 10,6 hrs | Mon 01.03.10 | Wed 03.03.10 | 3 |
| 5 | My_Requirement | 40,3 hrs | Wed 03.03.10 | Wed 10.03.10 | 4 |
| 6 | My_Design | 20,1 hrs | Wed 10.03.10 | Fri 12.03.10 | 5 |
| 7 | My_Implementation | 8,5 hrs | Fri 12.03.10 | Mon 15.03.10 | 6 |
| 8 | My_Assessment | 8,5 hrs | Mon 15.03.10 | Tue 16.03.10 | 7 |
| 9 | My_Deployment | 3,2 hrs | Tue 16.03.10 | Wed 17.03.10 | 8 |
| 10 | **My_Eleboration** | **317,7 hrs** | **Wed 17.03.10** | **Tue 11.05.10** | **2** |
| 11 | My_Management | 38,1 hrs | Wed 17.03.10 | Wed 24.03.10 | |
| 12 | My_Environment | 25,4 hrs | Wed 24.03.10 | Mon 29.03.10 | 11 |
| 13 | My_Requirement | 57,2 hrs | Mon 29.03.10 | Wed 07.04.10 | 12 |
| 14 | My_Design | 114,4 hrs | Wed 07.04.10 | Tue 27.04.10 | 13 |
| 15 | My_Implementation | 41,3 hrs | Tue 27.04.10 | Tue 04.05.10 | 14 |
| 16 | My_Assessment | 31,8 hrs | Tue 04.05.10 | Mon 10.05.10 | 15 |
| 17 | My_Deployment | 9,5 hrs | Mon 10.05.10 | Tue 11.05.10 | 16 |
| 18 | **My_Construction** | **742 hrs** | **Tue 11.05.10** | **Fri 17.09.10** | **10** |
| 19 | My_Management | 74,2 hrs | Tue 11.05.10 | Tue 25.05.10 | |
| 20 | My_Environment | 37,1 hrs | Tue 25.05.10 | Mon 31.05.10 | 19 |
| 21 | My_Requirement | 59,4 hrs | Mon 31.05.10 | Thu 10.06.10 | 20 |
| 22 | My_Design | 118,7 hrs | Thu 10.06.10 | Thu 01.07.10 | 21 |
| 23 | My_Implementation | 252,2 hrs | Thu 01.07.10 | Fri 13.08.10 | 22 |
| 24 | My_Assessment | 178,1 hrs | Fri 13.08.10 | Tue 14.09.10 | 23 |
| 25 | My_Deployment | 22,3 hrs | Tue 14.09.10 | Fri 17.09.10 | 24 |
| 26 | **My_Transition** | **105,8 hrs** | **Fri 17.09.10** | **Wed 06.10.10** | **18** |
| 27 | My_Management | 14,8 hrs | Fri 17.09.10 | Tue 21.09.10 | |
| 28 | My_Environment | 5,3 hrs | Tue 21.09.10 | Wed 22.09.10 | 27 |
| 29 | My_Requirement | 4,2 hrs | Wed 22.09.10 | Wed 22.09.10 | 28 |
| 30 | My_Design | 4,2 hrs | Wed 22.09.10 | Thu 23.09.10 | 29 |
| 31 | My_Implementation | 20,1 hrs | Thu 23.09.10 | Mon 27.09.10 | 30 |
| 32 | My_Assessment | 25,4 hrs | Mon 27.09.10 | Thu 30.09.10 | 31 |
| 33 | My_Deployment | 31,8 hrs | Thu 30.09.10 | Wed 06.10.10 | 32 |

Ready

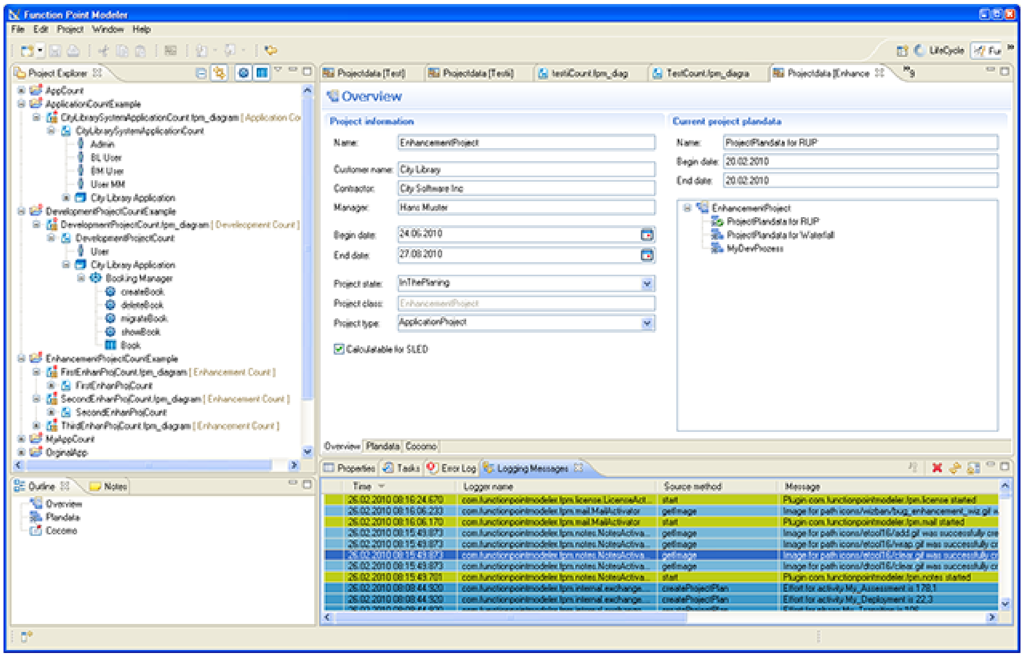
**Additional Views** **Function Point Modeler 4.0** includes now more than 30 views.



Use F2 to display the description for a selected view.

### New Logging Message View

The new *customizable* **logging message view** allows you to take look at the inside of **Function Point Modeler.**



Overview

Project information

Name: EnhancementProject

Customer name: City Library

Contractor: City Software Inc

Manager: Hans Muster

Begin date: 24.06.2010

End date: 27.08.2010

Project state: InThePlaning

Project class: EnhancementProject

Project type: ApplicationProject

☑ Calculatable for SLED

Current project plandata

Name: ProjectPlandata for RUP

Begin date: 20.02.2010

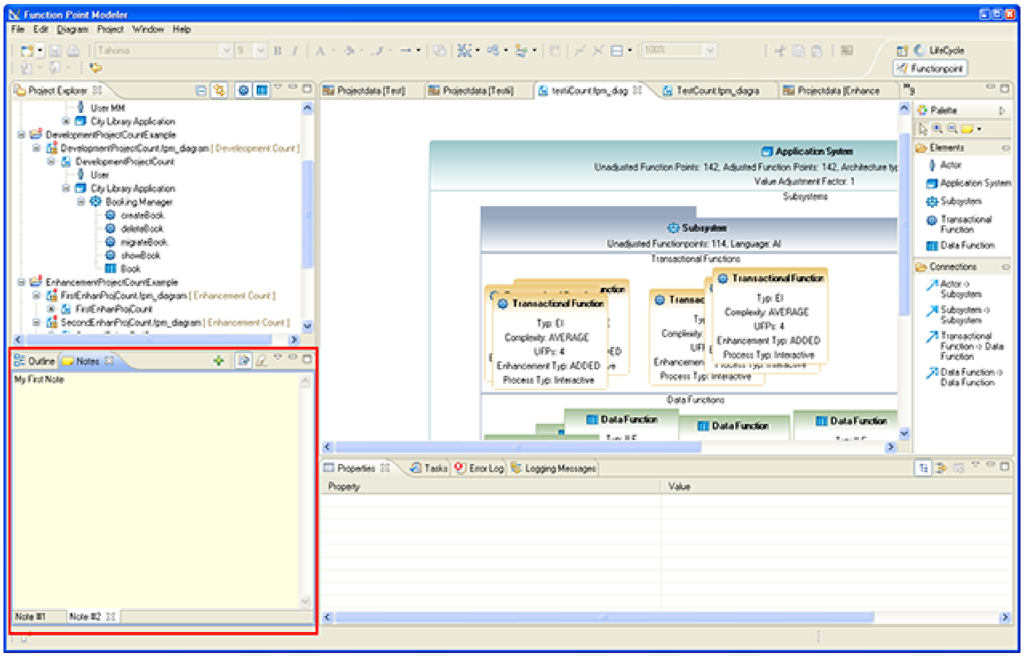
End date: 20.02.2010

- EnhancementProject
  - ProjectPlandata for RUP
  - ProjectPlandata for Waterfall
  - MyDevProzess

Properties | Tasks | Error Log | Logging Messages

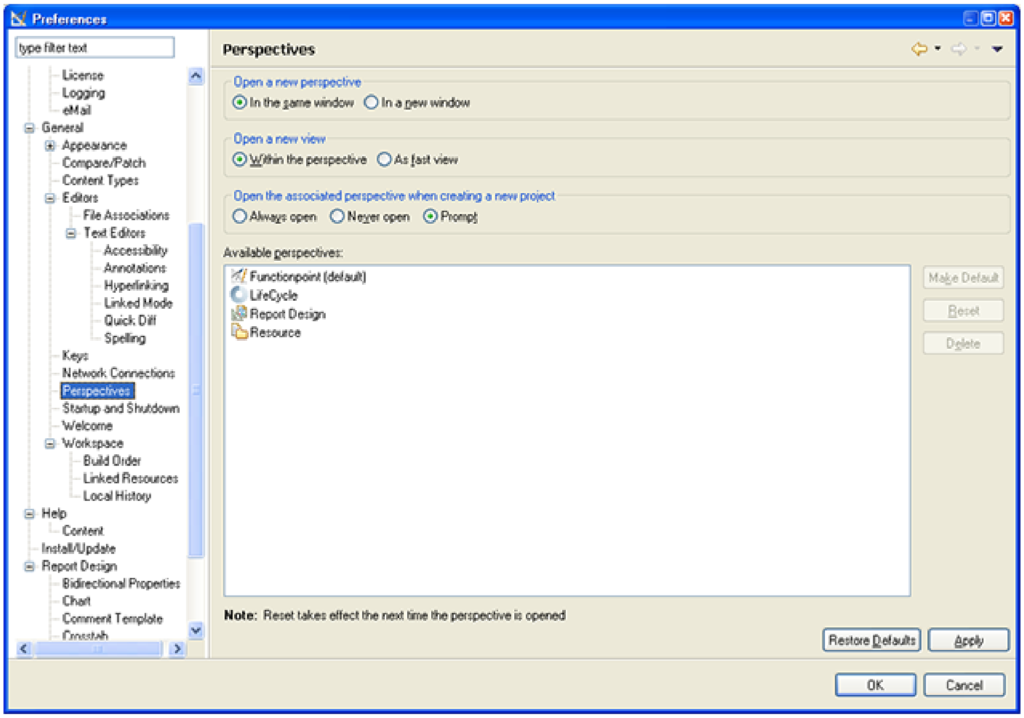
```
Time                     Logger name                                     Source method      Message
26.02.2010 08:16:24.670  com.functionpointmodeler.fpm.license.LicenseAct...  start              Plugin com.functionpointmodeler.fpm.license started
26.02.2010 08:16:06.233  com.functionpointmodeler.fpm.mail.MailActivator     getImage           Image for path icons/wizban/bug_enhancement_wiz.gif w
26.02.2010 08:16:06.170  com.functionpointmodeler.fpm.mail.MailActivator     start              Plugin com.functionpointmodeler.fpm.mail started
26.02.2010 08:15:49.873  com.functionpointmodeler.fpm.notes.NotesActiva...   getImage           Image for path icons/etool16/add.gif was successfully cre
26.02.2010 08:15:49.873  com.functionpointmodeler.fpm.notes.NotesActiva...   getImage           Image for path icons/etool16/wrap.gif was successfully cr
26.02.2010 08:15:49.873  com.functionpointmodeler.fpm.notes.NotesActiva...   getImage           Image for path icons/etool16/clear.gif was successfully cr
26.02.2010 08:15:49.873  com.functionpointmodeler.fpm.notes.NotesActiva...   getImage           Image for path icons/dtool16/clear.gif was successfully cr
26.02.2010 08:15:49.701  com.functionpointmodeler.fpm.notes.NotesActiva...   start              Plugin com.functionpointmodeler.fpm.notes started
26.02.2010 08:08:44.920  com.functionpointmodeler.fpm.internal.exchange...   createProjectPlan  Effort for activity My_Assessment is 178.1
26.02.2010 08:08:44.920  com.functionpointmodeler.fpm.internal.exchange...   createProjectPlan  Effort for activity My_Deployment is 22.3
```

**Notes Editor** You can take take notes in your count or projects



My First Note

**More Prefernces** **Function Point Modeler 4.0** includes much more *preference* setting to customize your **Function Point Modeler**



Perspectives

Open a new perspective
● In the same window ○ In a new window

Open a new view
● Within the perspective ○ As fast view

Open the associated perspective when creating a new project
○ Always open ○ Never open ● Prompt

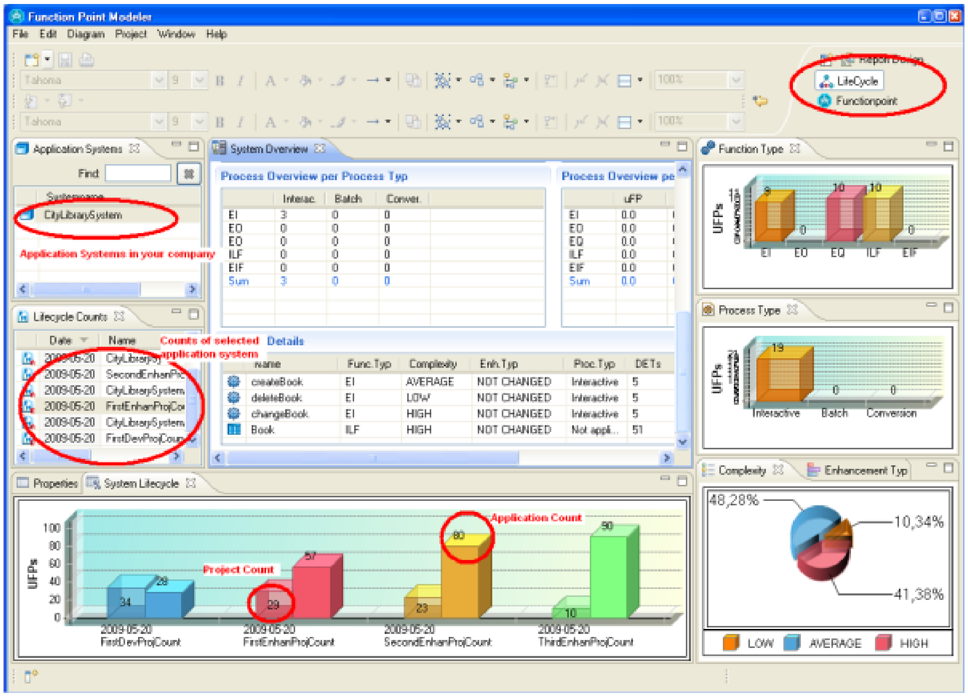
Available perspectives:
- Functionpoint (default)
- LifeCycle
- Report Design
- Resource

**Note:** Reset takes effect the next time the perspective is opened

## New and Noteworthy with Function Point Modeler 3.x

**Life Cycle Perspective**

You can now view the life cycle of application systems in your company. The **Life Cycle Perspective** shows you each function point analysis detail from the first development of the application system till current application system count . The **Life Cycle Perspective** includes a lot of views for the counts and sub system of an application system.



| Date | Name |
|---|---|
| 2009-05-20 | CityLibrarySy |
| 2009-05-20 | SecondEnhanPro |
| 2009-05-20 | CityLibrarySystem |
| 2009-05-20 | FirstEnhanProjCo |
| 2009-05-20 | CityLibrarySystem |
| 2009-05-20 | FirstDevProjCoun |

Process Overview per Process Typ

| | Interac. | Batch | Conver. |
|---|---|---|---|
| EI | 3 | 0 | 0 |
| EO | 0 | 0 | 0 |
| EQ | 0 | 0 | 0 |
| ILF | 0 | 0 | 0 |
| EIF | 0 | 0 | 0 |
| Sum | 3 | 0 | 0 |

Process Overview pe

| | uFP |
|---|---|
| EI | 0.0 |
| EO | 0.0 |
| EQ | 0.0 |
| ILF | 0.0 |
| EIF | 0.0 |
| Sum | 0.0 |

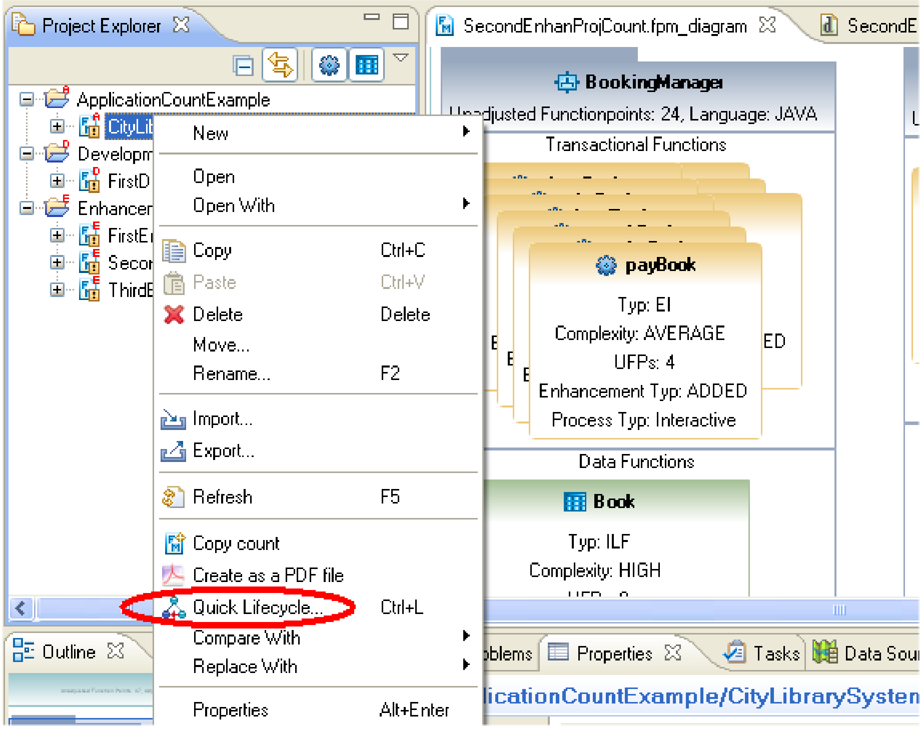
Details

| Name | Func.Typ | Complexity | Enh.Typ | Proc.Typ | DETs |
|---|---|---|---|---|---|
| createBook | EI | AVERAGE | NOT CHANGED | Interactive | 5 |
| deleteBook | EI | LOW | NOT CHANGED | Interactive | 5 |
| changeBook | EI | HIGH | NOT CHANGED | Interactive | 5 |
| Book | ILF | HIGH | NOT CHANGED | Not appl... | 51 |

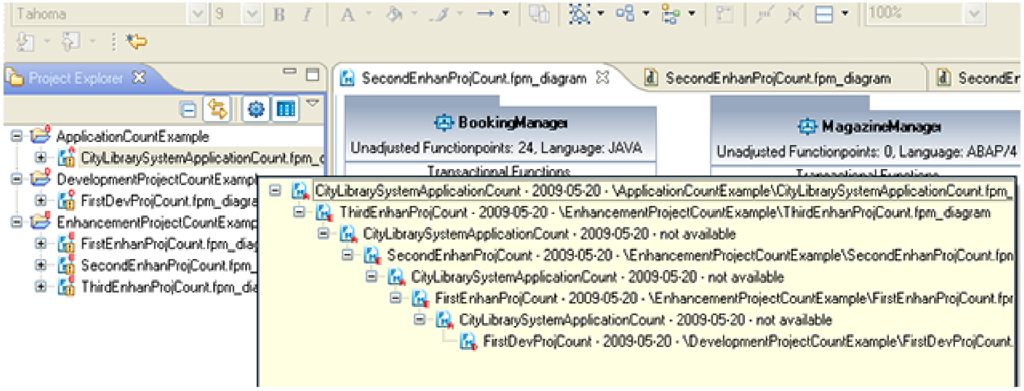
**Quick Life Cycle**

The **Quick Life Cycle** give you historical overview of the selected count ( *development project count > application count > enhancement project, etc.* ). You can start the **Quick Life Cycle**

**Ctrl+L.** You can start **Quick Life Cycle** from the context menu. You can also use the keyboard shortcut **Ctrl+L** .



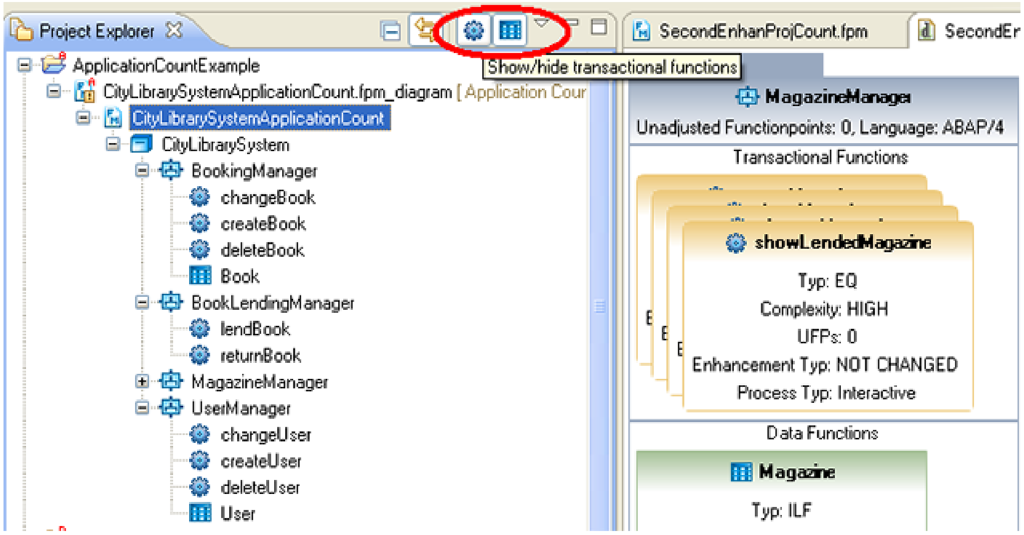
You can also select a count from **Quick Life Cycle** View to open it in diagram editor.


Tahoma
9
100%
Project Explorer
ApplicationCountExample
CityLibrarySystemApplicationCount.fpm_d
DevelopmentProjectCountExampl
FirstDevProjCount.fpm_diagra
EnhancementProjectCountExamp
FirstEnhanProjCount.fpm_diag
SecondEnhanProjCount.fpm_
ThirdEnhanProjCount.fpm_di
SecondEnhanProjCount.fpm_diagram
SecondEnhanProjCount.fpm_diagram
SecondEr
BookingManager
Unadjusted Functionpoints: 24, Language: JAVA
Transactional Functions
MagazineManager
Unadjusted Functionpoints: 0, Language: ABAP/4
Transactional Functions

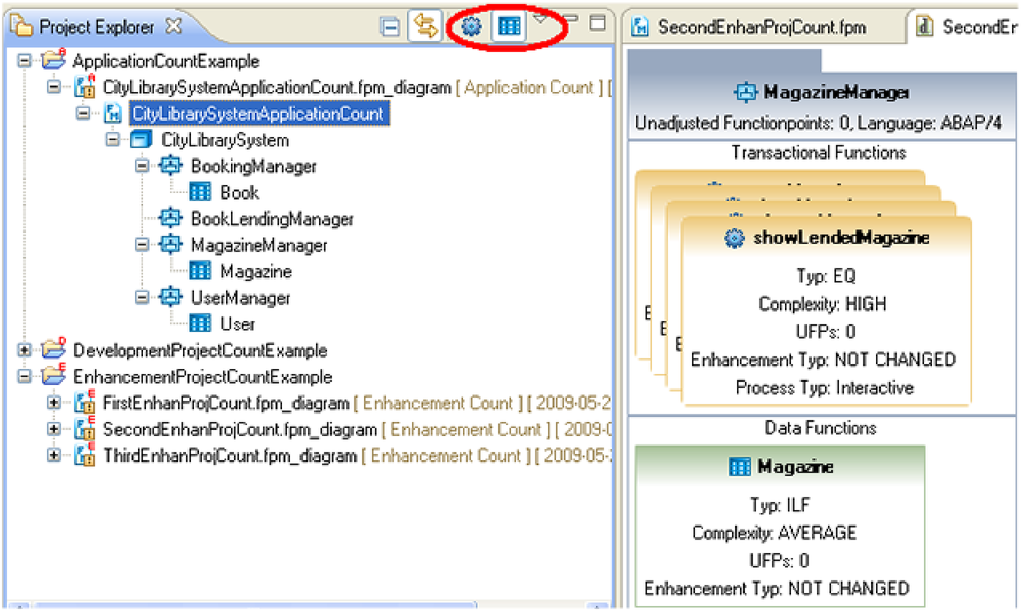
```
CityLibrarySystemApplicationCount - 2009-05-20 - \ApplicationCountExample\CityLibrarySystemApplicationCount.fpm_
  ThirdEnhanProjCount - 2009-05-20 - \EnhancementProjectCountExample\ThirdEnhanProjCount.fpm_diagram
    CityLibrarySystemApplicationCount - 2009-05-20 - not available
      SecondEnhanProjCount - 2009-05-20 - \EnhancementProjectCountExample\SecondEnhanProjCount.fpm
        CityLibrarySystemApplicationCount - 2009-05-20 - not available
          FirstEnhanProjCount - 2009-05-20 - \EnhancementProjectCountExample\FirstEnhanProjCount.fp
            CityLibrarySystemApplicationCount - 2009-05-20 - not available
              FirstDevProjCount - 2009-05-20 - \DevelopmentProjectCountExample\FirstDevProjCount.
```

**Transactional Function and Data Function Filter**

Function Point Modeler 3.1 now allows you to show or hide the *transactional functions* and *data functions* in a count.

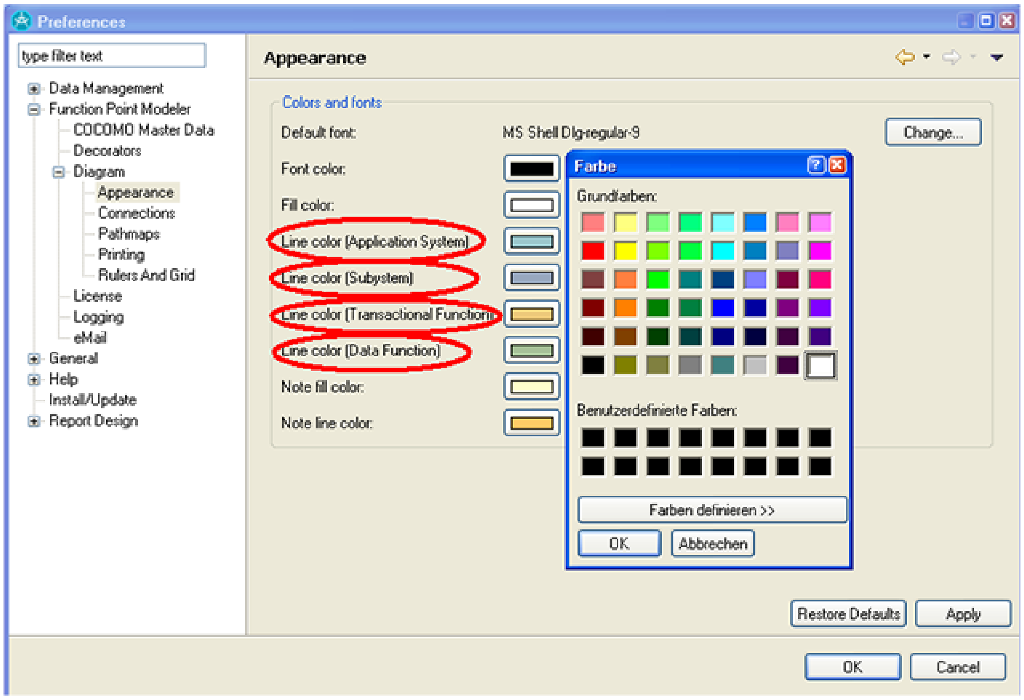


The *transactional functions* of a count are hided in the following screen shot.


Project Explorer
SecondEnhanProjCount.fpm
SecondEr
ApplicationCountExample
CityLibrarySystemApplicationCount.fpm_diagram [ Application Count ] [
CityLibrarySystemApplicationCount
CityLibrarySystem
BookingManager
Book
BookLendingManager
MagazineManager
Magazine
UserManager
User
DevelopmentProjectCountExample
EnhancementProjectCountExample
FirstEnhanProjCount.fpm_diagram [ Enhancement Count ] [ 2009-05-2
SecondEnhanProjCount.fpm_diagram [ Enhancement Count ] [ 2009-0
ThirdEnhanProjCount.fpm_diagram [ Enhancement Count ] [ 2009-05-
MagazineManager
Unadjusted Functionpoints: 0, Language: ABAP/4
Transactional Functions
showLendedMagazine
Typ: EQ
Complexity: HIGH
UFPs: 0
Enhancement Typ: NOT CHANGED
Process Typ: Interactive
Data Functions
Magazine
Typ: ILF
Complexity: AVERAGE
UFPs: 0
Enhancement Typ: NOT CHANGED

**Defining your favorite Line Color and Fill Color in the Editor**

The **Window** > **Preference** > **Connections** > **Function Point Modeler** > **Diagram** >**Appearance** page allows you to specify the line colour of each item separately.



Colors and fonts

Default font: MS Shell Dlg-regular-9

Font color:

Fill color:

Line color (Application System)

Line color (Subsystem)

Line color (Transactional Function)

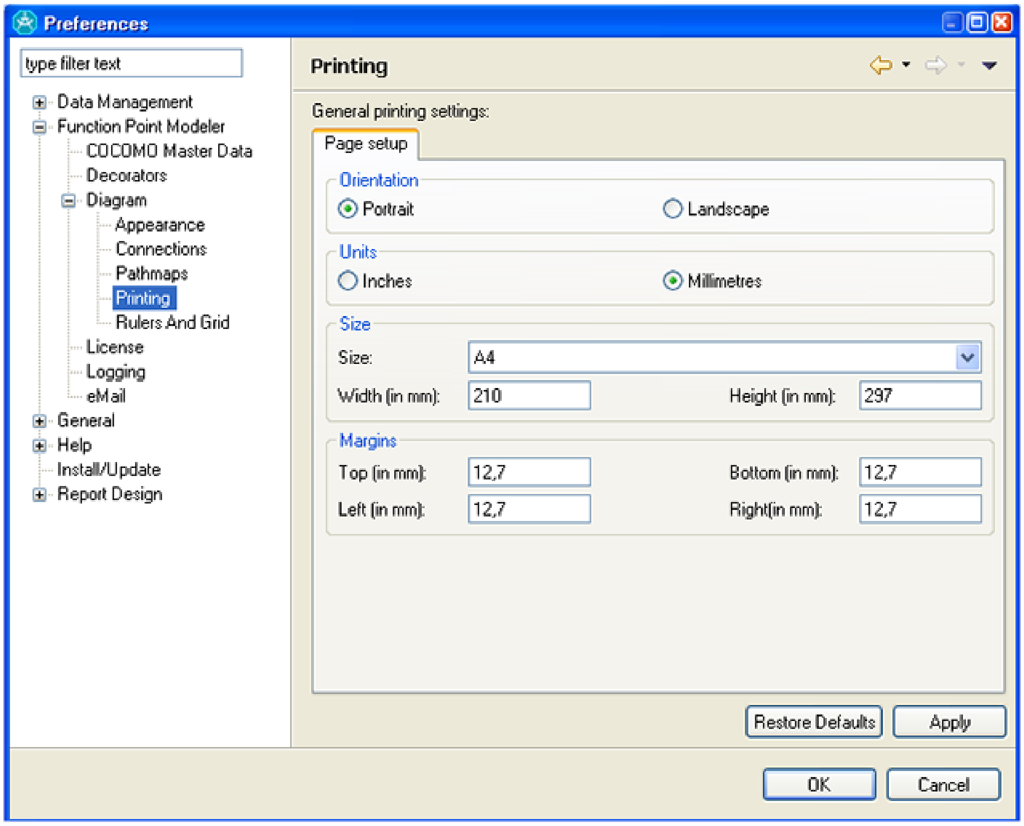
Line color (Data Function)

Note fill color:

Note line color:

**Defining your setting**

The **Window** > **Preference** > **Connections** > **Function Point Modeler** > **Diagram** > **Printing** page allows you to specify you print setting.



Printing

General printing settings:

Orientation

● Portrait ○ Landscape

Units

○ Inches ● Millimetres

Size

Size: A4

Width (in mm): 210 Height (in mm): 297

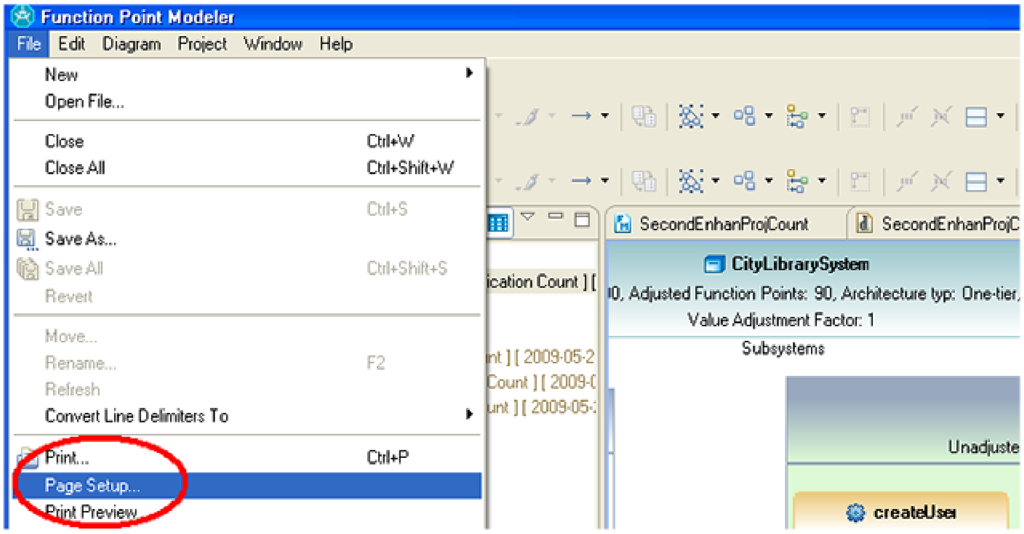
Margins

Top (in mm): 12,7 Bottom (in mm): 12,7

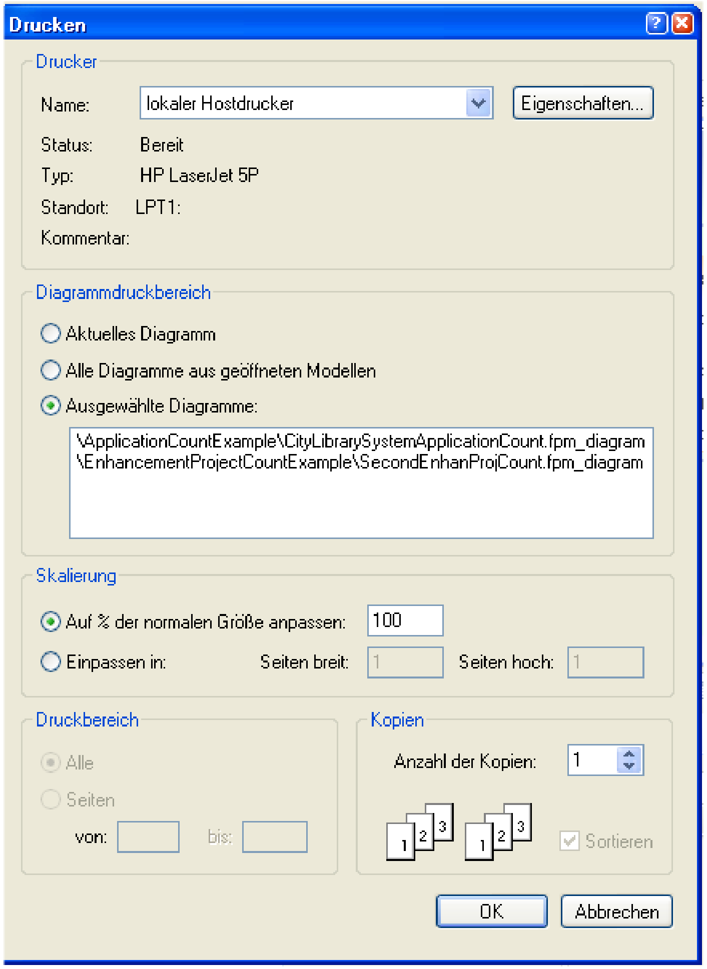
Left (in mm): 12,7 Right(in mm): 12,7

**Print your Function Point Modeler diagram**

Standard printing features are now available for printing **Function Point Modeler** diagrams.



You can also specify which diagrams you want to print and how to scale them to fit on the paper.


Drucken

Drucker

Name: lokaler Hostdrucker | Eigenschaften...

Status: Bereit

Typ: HP LaserJet 5P

Standort: LPT1:

Kommentar:

Diagrammdruckbereich

○ Aktuelles Diagramm

○ Alle Diagramme aus geöffneten Modellen

● Ausgewählte Diagramme:

\ApplicationCountExample\CityLibrarySystemApplicationCount.fpm_diagram
\EnhancementProjectCountExample\SecondEnhanProjCount.fpm_diagram

Skalierung

● Auf % der normalen Größe anpassen: 100

○ Einpassen in: Seiten breit: 1 Seiten hoch: 1

Druckbereich

● Alle

○ Seiten

von: bis:

Kopien

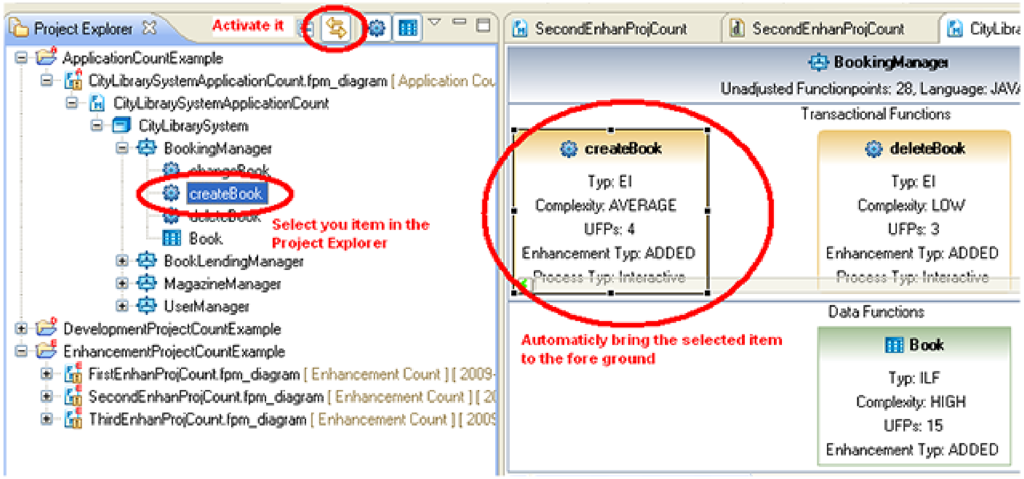
Anzahl der Kopien: 1

☑ Sortieren

OK | Abbrechen

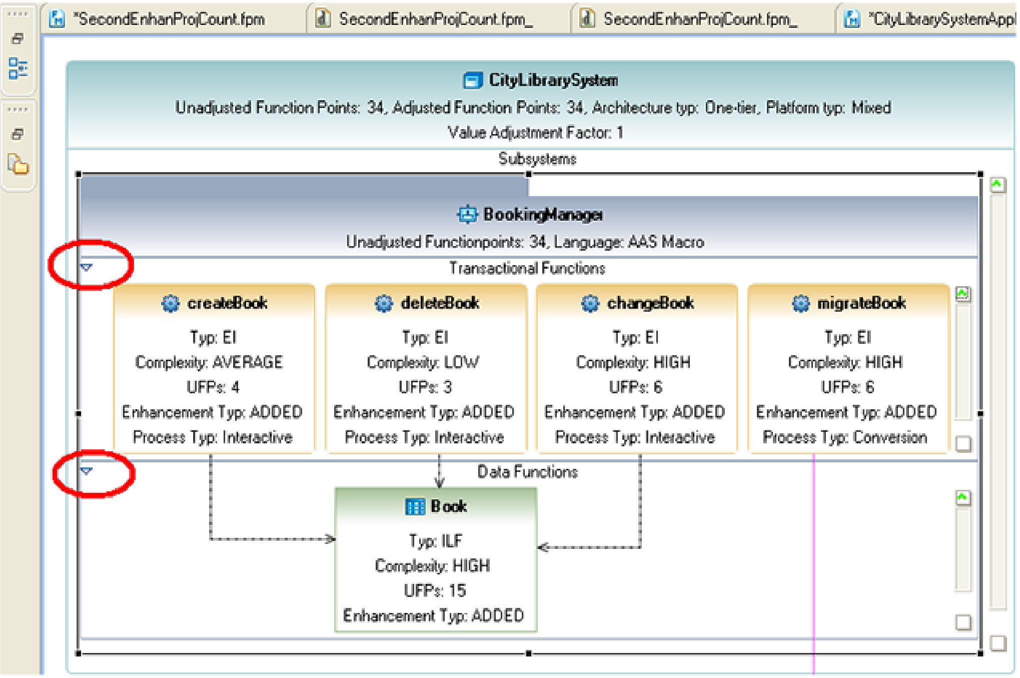
**Linking the Navigator view to the active editor**

When you have multiple files open for editing, you can configure one of the navigation views to automatically bring an open file to the foreground (make its editor session the active editor) every time you select that open file in one of the navigation views.

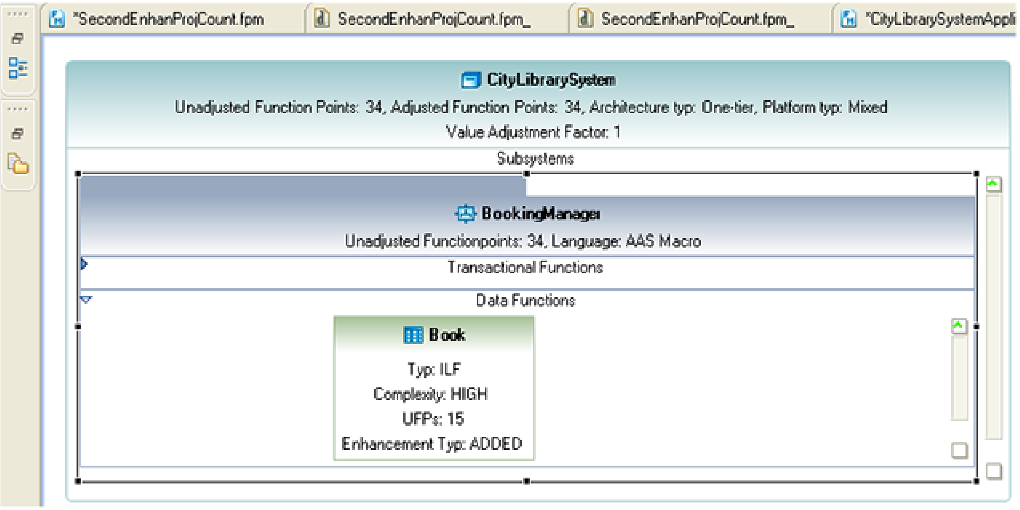


**Collapsing compartments**

You can collapse a compartment in a data diagram to a minimal size to allow more space for the other compartments in a shape.



After the *Transactional Functions* compartment is collapsed.


*SecondEnhanProjCount.fpm
SecondEnhanProjCount.fpm_
SecondEnhanProjCount.fpm_
*CityLibrarySystemAppli
Subsystems
Transactional Functions
Data Functions

CityLibrarySystem

Unadjusted Function Points: 34, Adjusted Function Points: 34, Architecture typ: One-tier, Platform typ: Mixed

Value Adjustment Factor: 1

BookingManager

Unadjusted Functionpoints: 34, Language: AAS Macro

Book

Typ: ILF

Complexity: HIGH

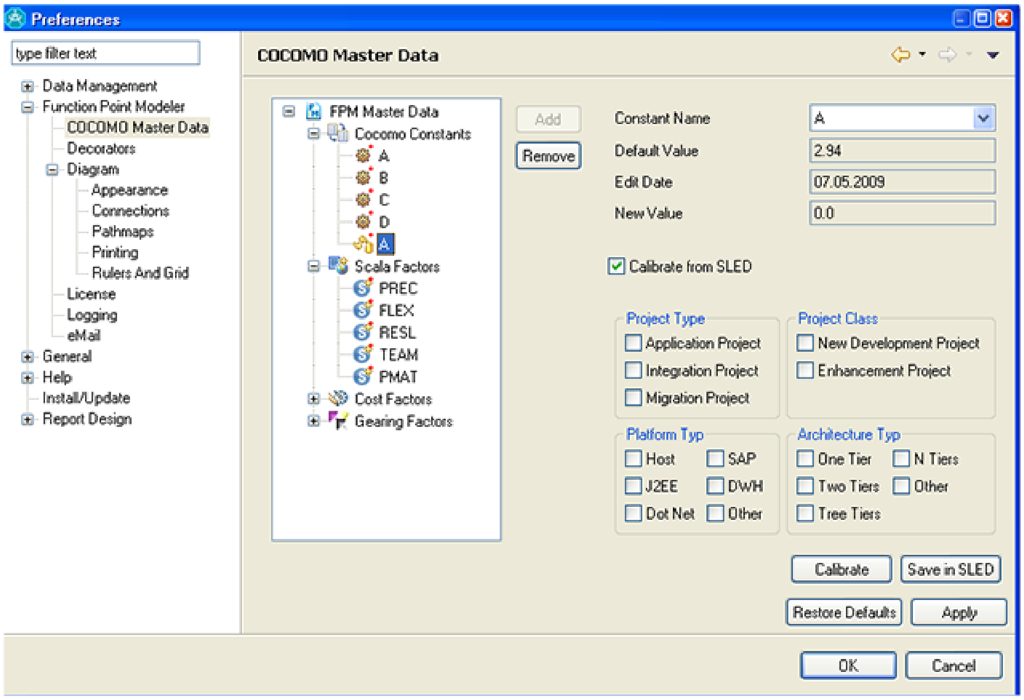
UFPs: 15

Enhancement Typ: ADDED

**Calibrate or set new vale of COCOMO constants .**

**Function Point Modeler Advanced Enterprise 3.1 Cocomo II** tool now allows you to calibrate or set the new value of COCOMO constants.

You can use the for your company calibrated constants in your estimation.



COCOMO Master Data

Constant Name: A

Default Value: 2.94

Edit Date: 07.05.2009

New Value: 0.0

☑ Calibrate from SLED

Project Type

□ Application Project

□ Integration Project

□ Migration Project

Project Class

□ New Development Project

□ Enhancement Project

Platform Typ

□ Host □ SAP

□ J2EE □ DWH

□ Dot Net □ Other

Architecture Typ

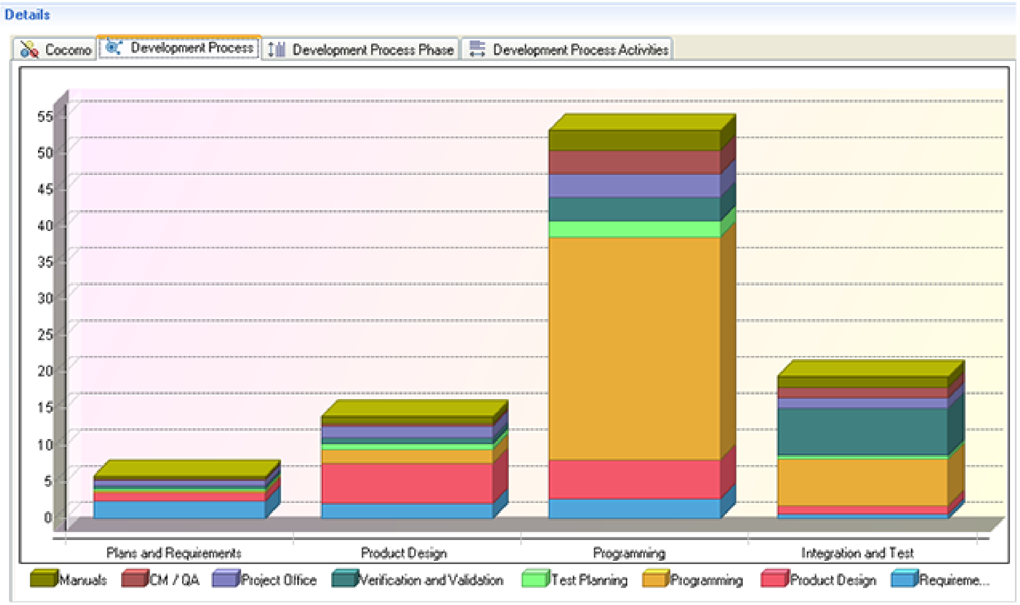
□ One Tier □ N Tiers

□ Two Tiers □ Other

□ Tree Tiers

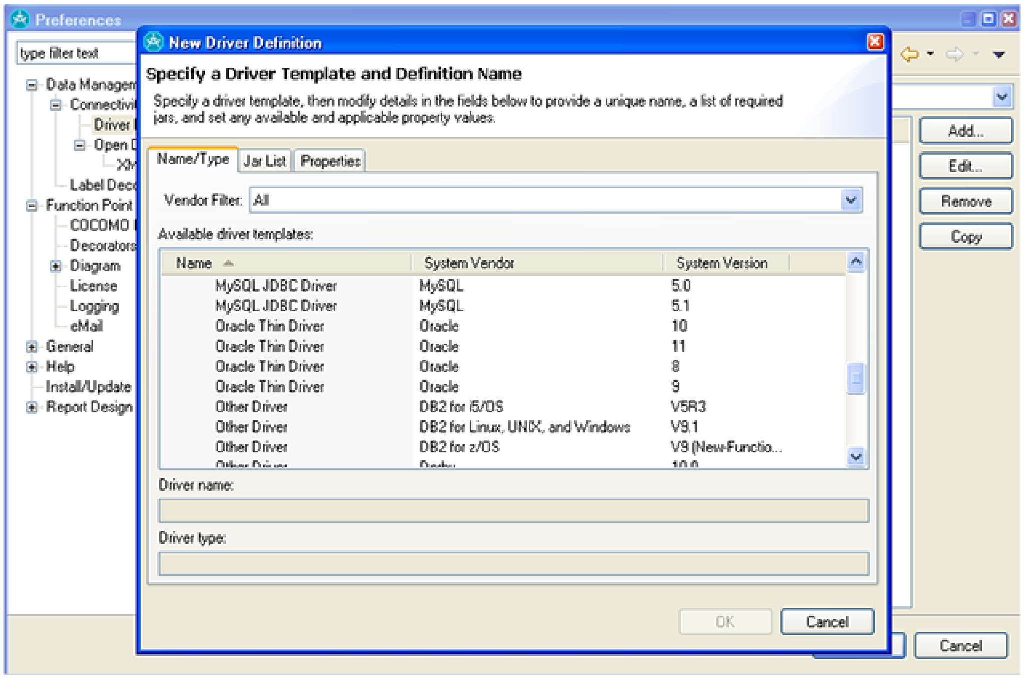
**Project estimation calculated based on the RUP**

**Function Point Modeler Advanced Enterprise 3.1Cocomo II** tool supports Rational Unified Software Development Process.



**Database support extended**

**Function Point Modeler Advanced Enterprise 3.1** now supports all well-known database vendors for your SLED.



New Driver Definition

Specify a Driver Template and Definition Name

Specify a driver template, then modify details in the fields below to provide a unique name, a list of required jars, and set any available and applicable property values.

Name/Type | Jar List | Properties

Vendor Filter: All

Available driver templates:

| Name | System Vendor | System Version |
|---|---|---|
| MySQL JDBC Driver | MySQL | 5.0 |
| MySQL JDBC Driver | MySQL | 5.1 |
| Oracle Thin Driver | Oracle | 10 |
| Oracle Thin Driver | Oracle | 11 |
| Oracle Thin Driver | Oracle | 8 |
| Oracle Thin Driver | Oracle | 9 |
| Other Driver | DB2 for i5/OS | V5R3 |
| Other Driver | DB2 for Linux, UNIX, and Windows | V9.1 |
| Other Driver | DB2 for z/OS | V9 (New-Functio... |
| Other Driver | Derby | 10.0 |

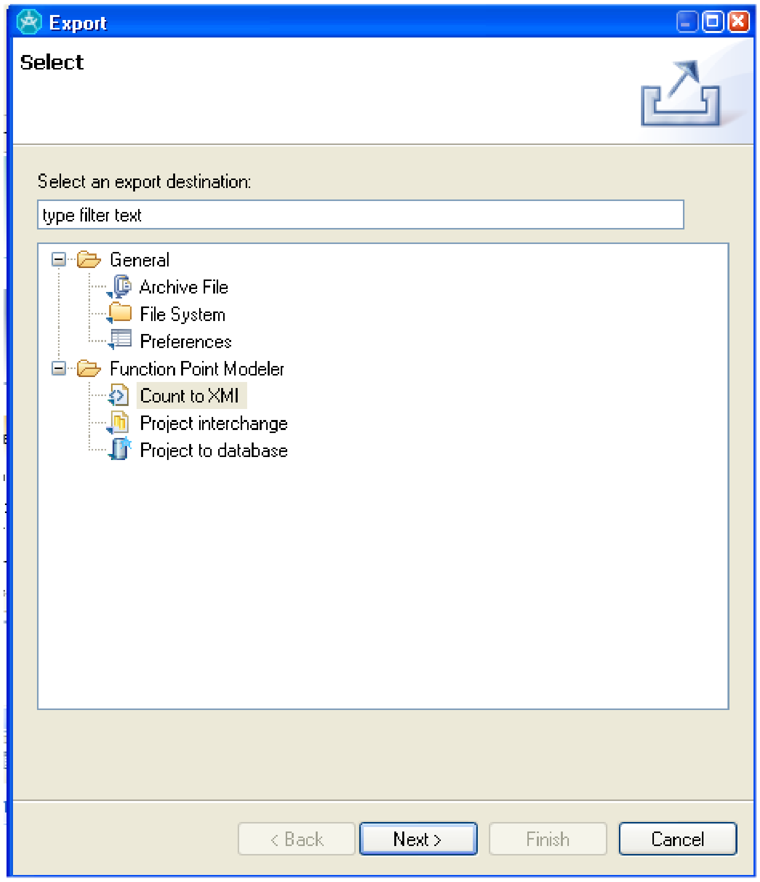
Driver name:

Driver type:

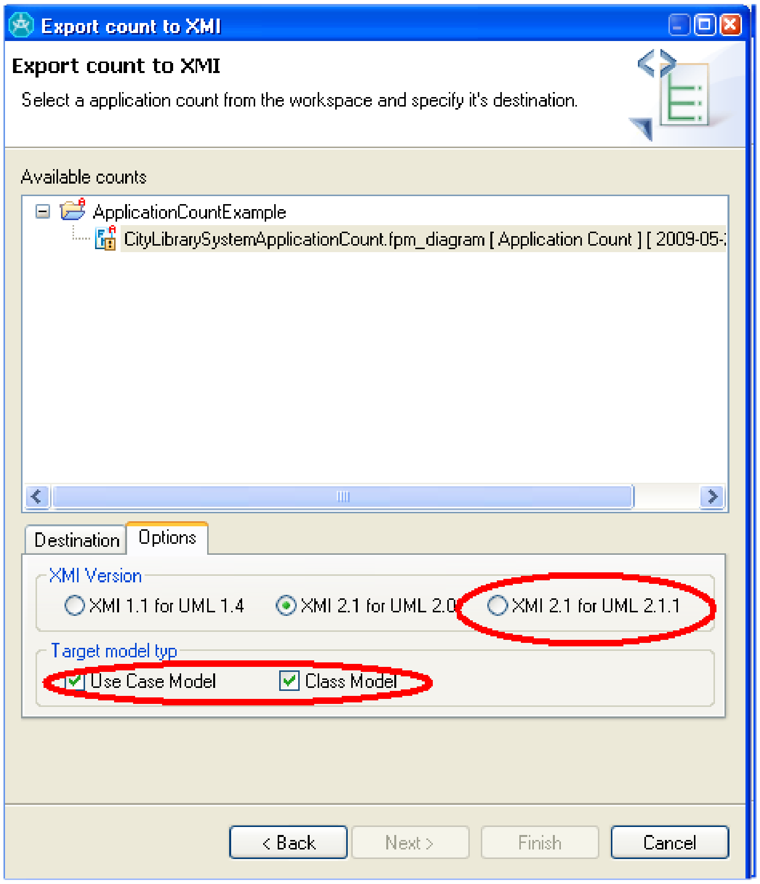
OK Cancel

**XMI 2.1 for UML 2.1.1 for example IBM RSA**

**Function Point Modeler Advanced Enterprise 3.1** now supports XMI 2.1 and UML 2.1.1 export/import.



You can also export your Function Point Model as Business Object Model to any UML tool.


Export count to XMI

Export count to XMI

Select a application count from the workspace and specify it's destination.

Available counts

- ApplicationCountExample
  - CityLibrarySystemApplicationCount.fpm_diagram [ Application Count ] [ 2009-05-

Destination | Options

XMI Version

○ XMI 1.1 for UML 1.4 ● XMI 2.1 for UML 2.0 ○ XMI 2.1 for UML 2.1.1

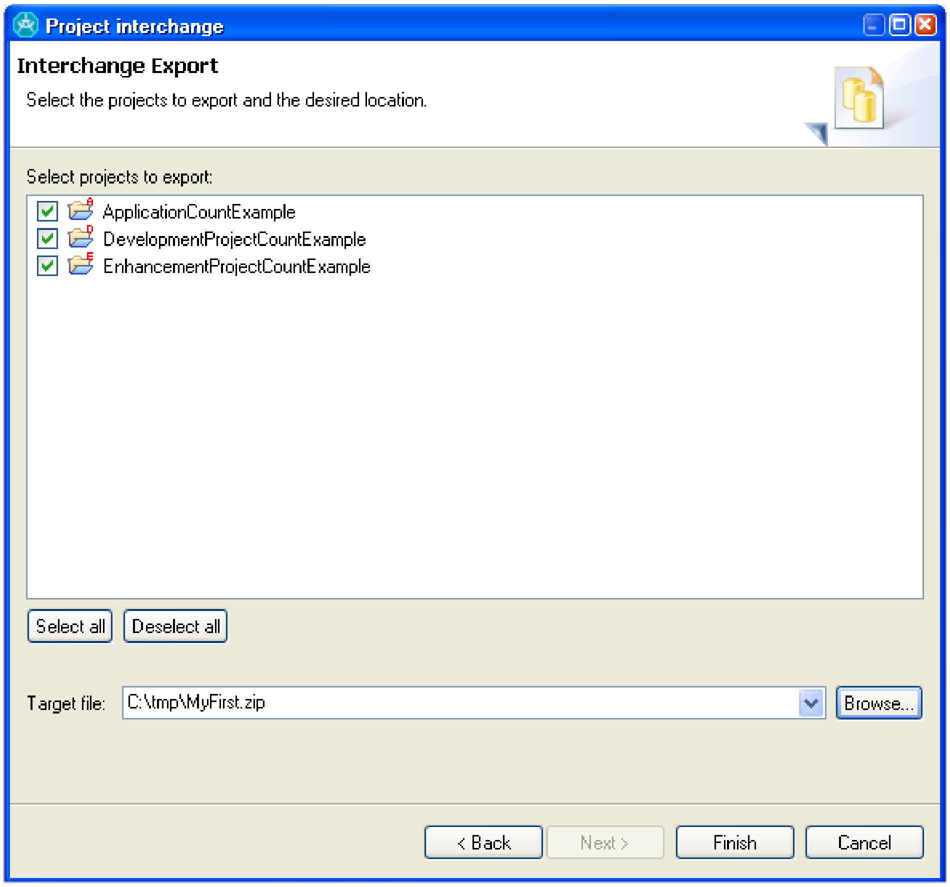
Target model typ

☑ Use Case Model ☑ Class Model

***Project Interchange to export & import projects***

Sharing projects using Project Interchange. If you are not using SLED database you can use the Project Interchange feature to share your project in the Function point Modeler

You export projects into ZIP files, which can be imported.



Project interchange

**Interchange Export**

Select the projects to export and the desired location.

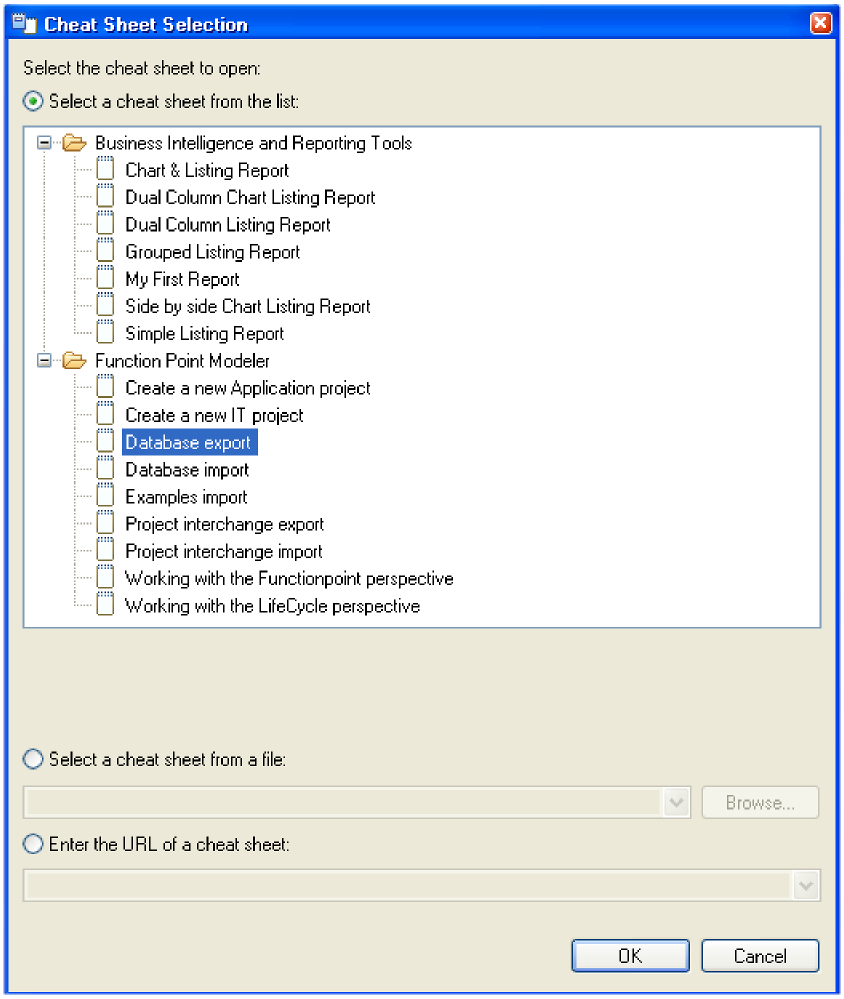
Select projects to export:

- ☑ ApplicationCountExample
- ☑ DevelopmentProjectCountExample
- ☑ EnhancementProjectCountExample

Target file: C:\tmp\MyFirst.zip

## Cheat Sheets

**Function Point Modeler 3.1** provides cheat sheets to guide you through some of its function point counting and report designer processes. Each cheat sheet is designed to help you complete some task, and it lists the sequence of steps required to help you achieve that goal.



Cheat Sheet Selection

Select the cheat sheet to open:

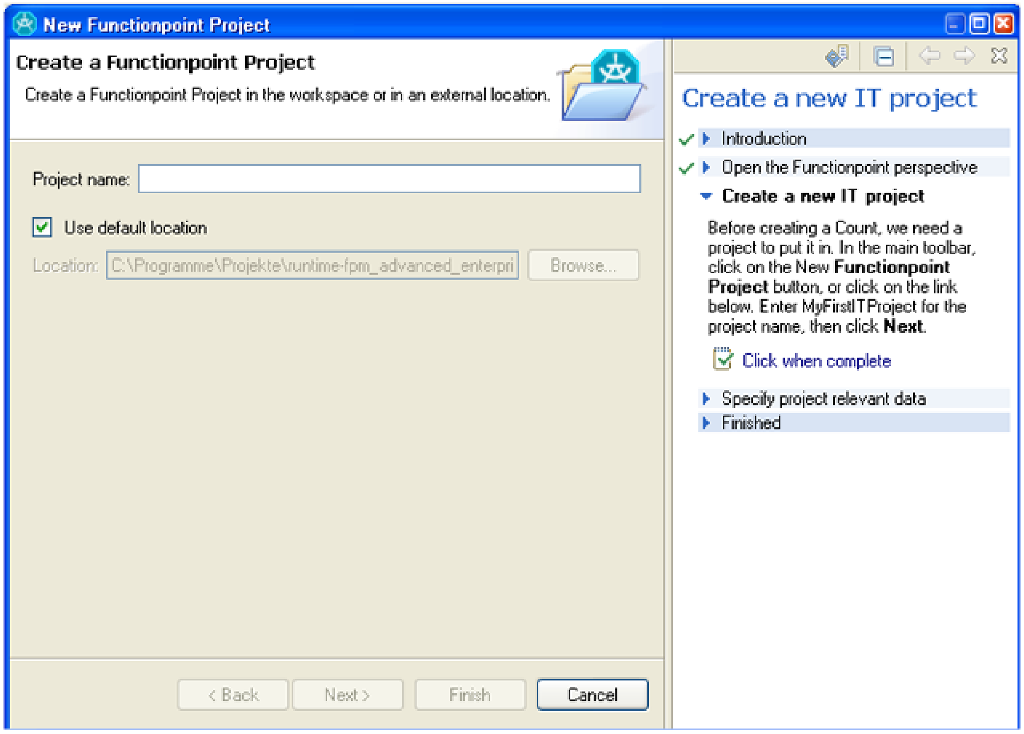
● Select a cheat sheet from the list:

- Business Intelligence and Reporting Tools
  - Chart & Listing Report
  - Dual Column Chart Listing Report
  - Dual Column Listing Report
  - Grouped Listing Report
  - My First Report
  - Side by side Chart Listing Report
  - Simple Listing Report
- Function Point Modeler
  - Create a new Application project
  - Create a new IT project
  - Database export
  - Database import
  - Examples import
  - Project interchange export
  - Project interchange import
  - Working with the Functionpoint perspective
  - Working with the LifeCycle perspective

○ Select a cheat sheet from a file:

○ Enter the URL of a cheat sheet:

As you progress from one step to the next, the cheat sheet will automatically launch the required tools for you. If there is a manual step in the process, the step will tell you to perform the task and click a button in the cheat sheet to move on to the next step.



**Create a Functionpoint Project**

Create a Functionpoint Project in the workspace or in an external location.

Project name:

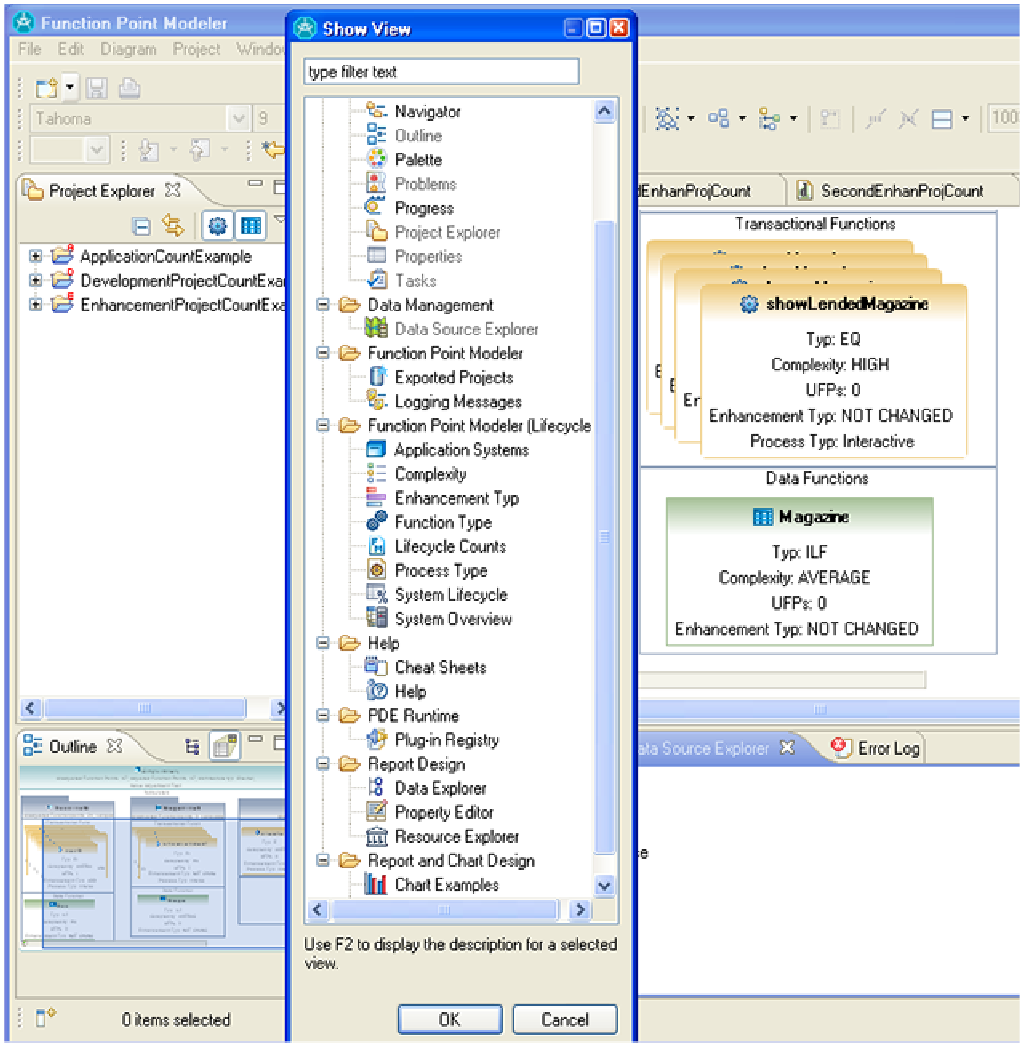
☑ Use default location

Location: C:\Programme\Projekte\runtime-fpm_advanced_enterpri

Create a new IT project

Before creating a Count, we need a project to put it in. In the main toolbar, click on the New **Functionpoint Project** button, or click on the link below. Enter MyFirstITProject for the project name, then click **Next**.

**More Views** **Function Point Modeler 3.1** includes a lot of useful views



Use F2 to display the description for a selected view.

showLendedMagazine

Typ: EQ

Complexity: HIGH

UFPs: 0

Enhancement Typ: NOT CHANGED

Process Typ: Interactive

Magazine

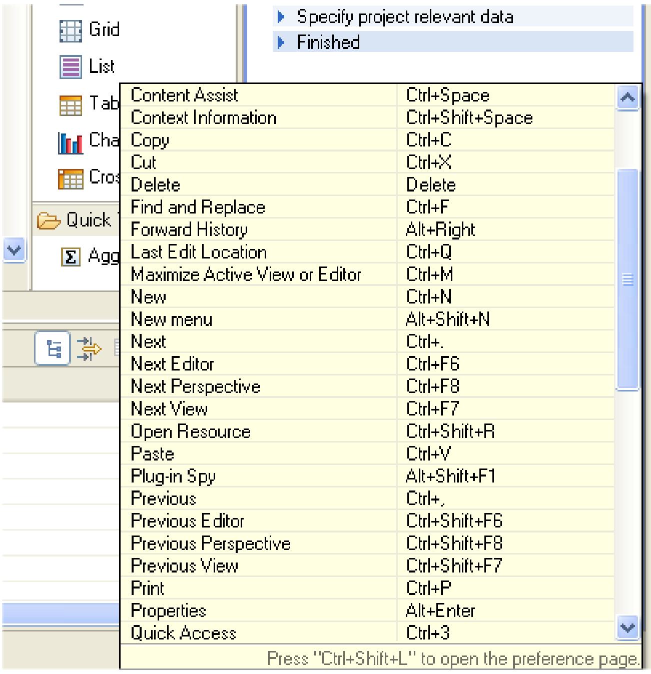
Typ: ILF

Complexity: AVERAGE

UFPs: 0

Enhancement Typ: NOT CHANGED

**Key Assist** This command will display a list of key bindings



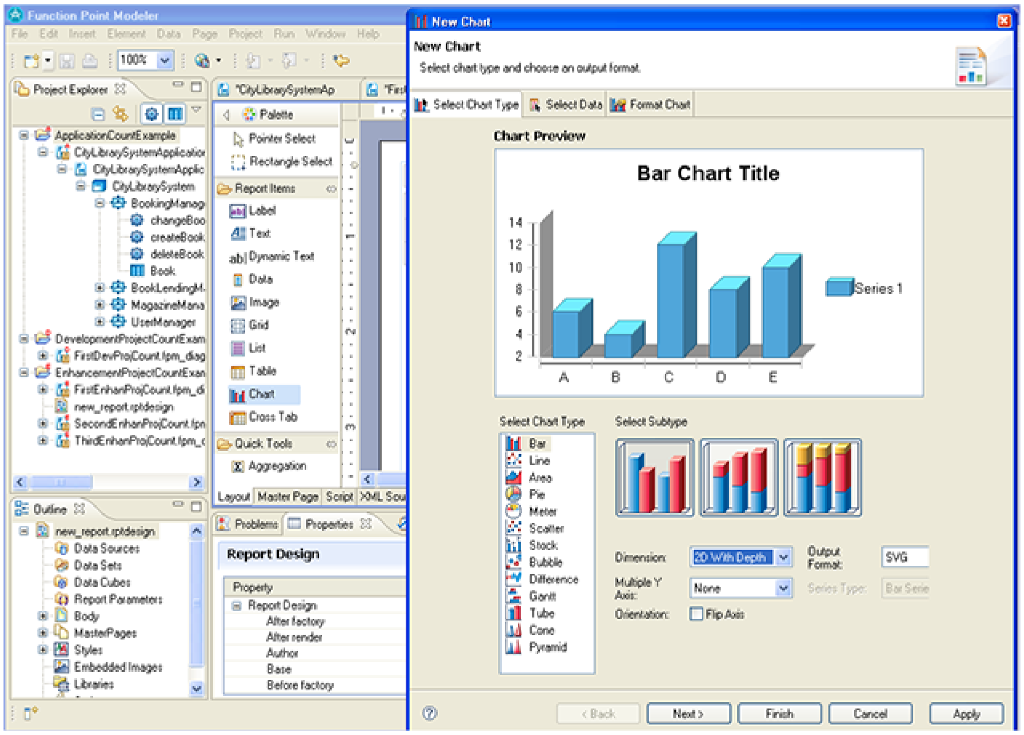
| | |
|---|---|
| Content Assist | Ctrl+Space |
| Context Information | Ctrl+Shift+Space |
| Copy | Ctrl+C |
| Cut | Ctrl+X |
| Delete | Delete |
| Find and Replace | Ctrl+F |
| Forward History | Alt+Right |
| Last Edit Location | Ctrl+Q |
| Maximize Active View or Editor | Ctrl+M |
| New | Ctrl+N |
| New menu | Alt+Shift+N |
| Next | Ctrl+. |
| Next Editor | Ctrl+F6 |
| Next Perspective | Ctrl+F8 |
| Next View | Ctrl+F7 |
| Open Resource | Ctrl+Shift+R |
| Paste | Ctrl+V |
| Plug-in Spy | Alt+Shift+F1 |
| Previous | Ctrl+, |
| Previous Editor | Ctrl+Shift+F6 |
| Previous Perspective | Ctrl+Shift+F8 |
| Previous View | Ctrl+Shift+F7 |
| Print | Ctrl+P |
| Properties | Alt+Enter |
| Quick Access | Ctrl+3 |

Press "Ctrl+Shift+L" to open the preference page.

**FPM Report Designer and mor useful features**

**Function Point Modeler Advanced Enterprise 3.1 Report Designer** is now more powerful than ever.

You can now create more complex reports using the **FPM Report Designer Chart** Wizard.



New Chart

Select chart type and choose an output format.

## Legal

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