

**ERPZ'**  
STUDENTS

## Script 8: Project Management

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# 1 Project Management

This teaching unit aims at giving you an understanding of Project Management in the SAP system.

## Educational objectives in this unit:

After this teaching unit, you will be able to:

- Describe the functions of
  - o Work Breakdown Structures
  - o Networks and Activities
  - o Project Builder
  - o Project Planning Board and other graphical tools
- Explain the purpose of planning WBS dates and scheduling
- Define the types of resource planning
- Describe different types of project cost and revenue planning
- Describe the budgeting process for projects
- Explain the differences between cost planning and budgeting
- Explain the function of budget availability control
- Describe different methods of posting labor, dates, and costs for projects
- Define the external and internal procurement of activities, services, and materials for a project
- Describe period-end closing activities for projects
- Explain cost settlement for projects
- Discuss the reporting and analysis tools used in the Project System
- Discuss the integration points of the Project System with other SAP applications

## Scenario for the Case Study

A customer, who annually sends a successful team to a three-week bicycle race in France, contacts your company. The customer is tired of his suppliers from the chemical and pharmaceutical industries and wants to gain an advantage by using technical resources instead. Therefore, you and some of your engineers are in charge of a project for developing a new racing bicycle, which is superior to all other competitive products. The project has the code name *techno-doping*.

In the practical application of this unit, you will firstly maintain the master data required for performing the project. You will create a dummy material master record, an activity type and a personnel master record. Maintaining master data also includes the subsequent step of project definition. Thereby, the project structure is visualized in the system by using Work Breakdown Structures and Networks.

After creating the master data in the system, you will carry out project planning. This includes scheduling, resource planning and cost planning. After releasing the project, the sales order is entered and the project is carried out. In project processing, you will enter costs and activities incurring during project execution and you will assign them to the project structure. Based on this, you will create the customer invoice.

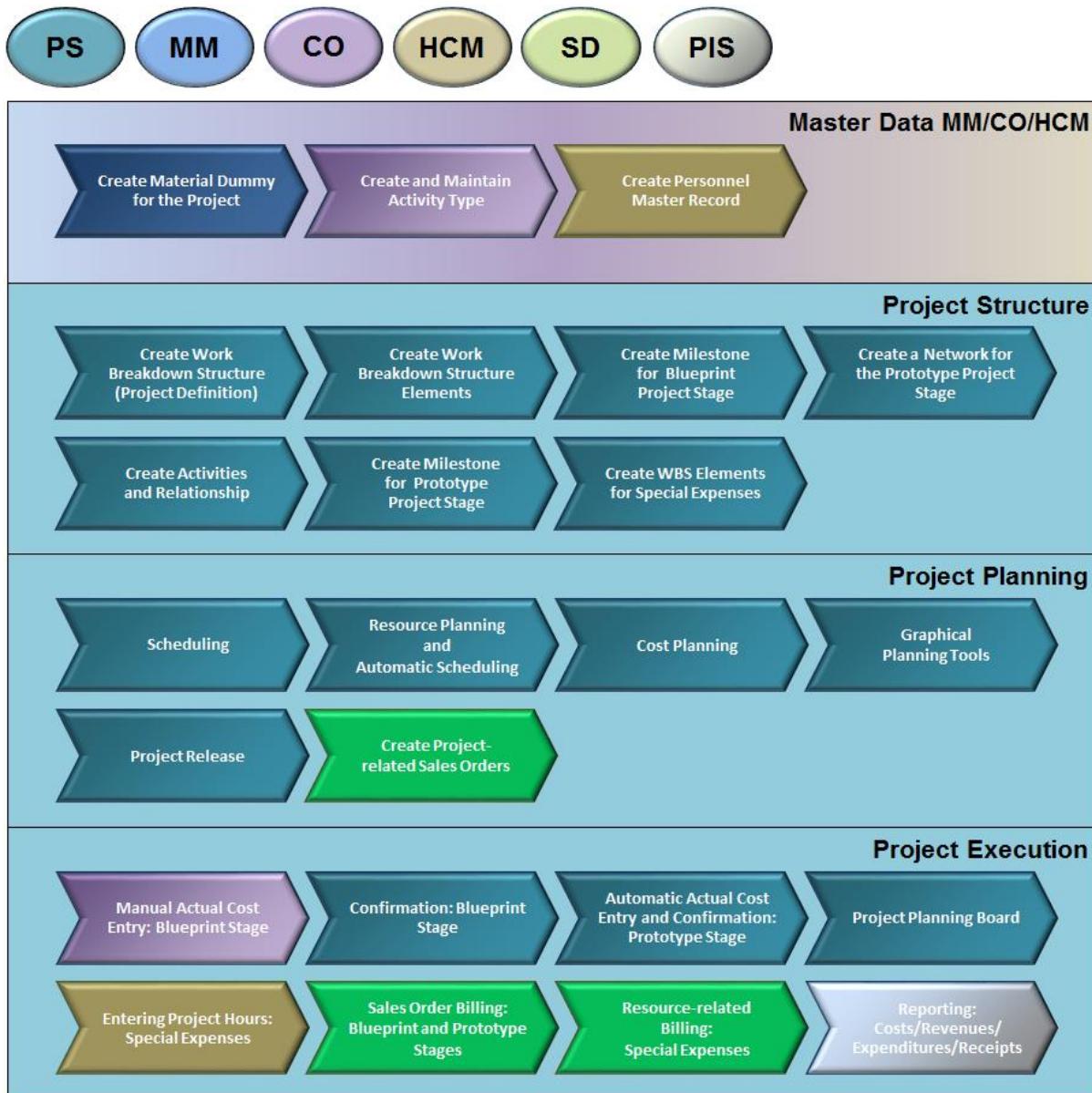


Figure 1: Process Overview: Project Management

## 2 Basics of Project Management

This section gives you an overview of SAP Project System (SAP PS) and explains the organizational levels utilized in SAP PS. Furthermore, master data of and project structures in SAP PS are introduced.

### 2.1 Theory: Basics of Project System



**THEORY**

Both large scale projects such as building a factory and small-scale projects such as organizing a trade fair require precise planning of the many detailed activities involved. The project manager has the job of ensuring that the project is executed efficiently, on time and within budget – which he or she achieves by ensuring that the required resources and funds are available as and when needed.

*What is a project?*

Projects are tasks characterized by special characteristics:

- Usually, projects are complex, unique and include a high risk for the company.
- Precise targets between contractor and sold-to party are negotiated in a project.
- Projects are temporary, and they are cost- and capacity-intensive.
- Several departments are involved in processing a project.
- Projects feature particular quality requirements.
- Usually, projects are of high strategic relevance for a company that is carrying out the project.

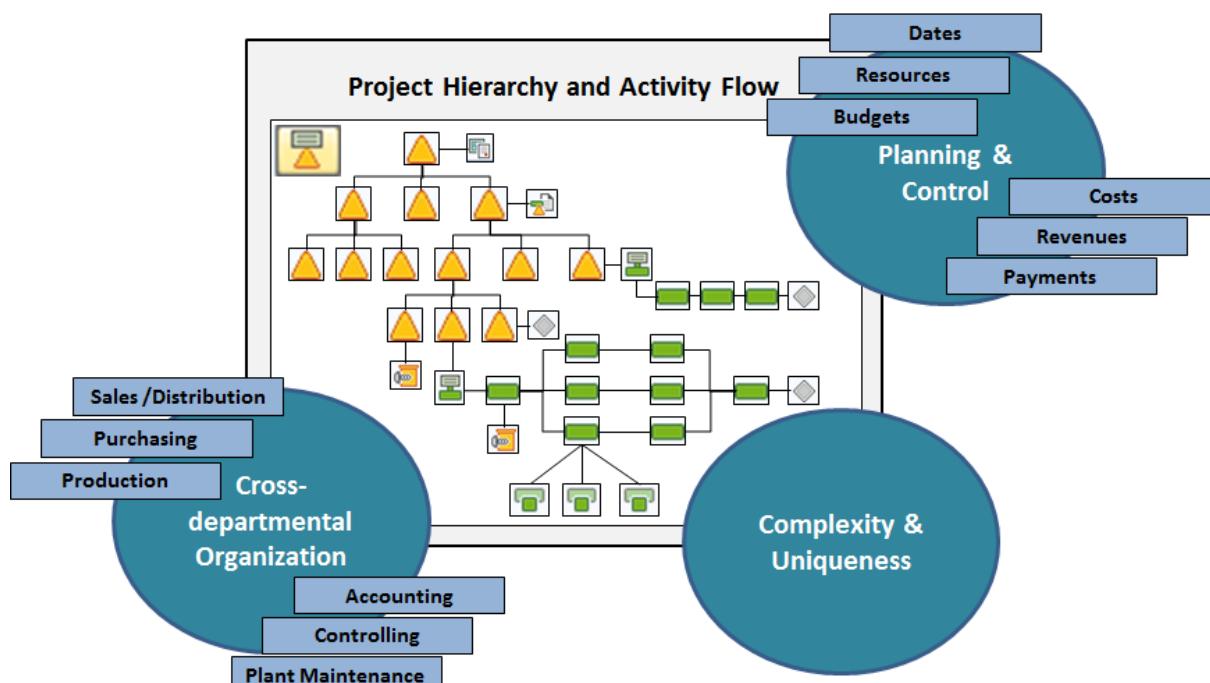


Figure 2: Project Characteristics

Usually, projects are included in the business activities of a company. To be able to control all tasks occurring when implementing a project, a project-specific organization is required. The project structures, therefore, should be located centrally to the departments involved in the

project and should, thus, have (technical) interfaces with all departments (integration of organizational units).

### 2.1.1 Organizational Levels of the Project System

The project system in the SAP system does not feature own organizational levels, like you already have witnessed for all the other applications of the SAP system. Depending on type and configuration of a project, organizational units of different areas are used (SD, purchasing, production, accounting, controlling, HR, etc.). Thereby, you incorporate the project into the existing structure by making assignments to the organizational units in Accounting and Logistics, etc. This also shows the integrative function of a project.

Each project starts with the definition and classification of the structures required, for processing (WBS Elements, Networks, etc.), and the incorporation of these elements into the existing enterprise structure (Controlling Area, Company Code, Plant, etc.).

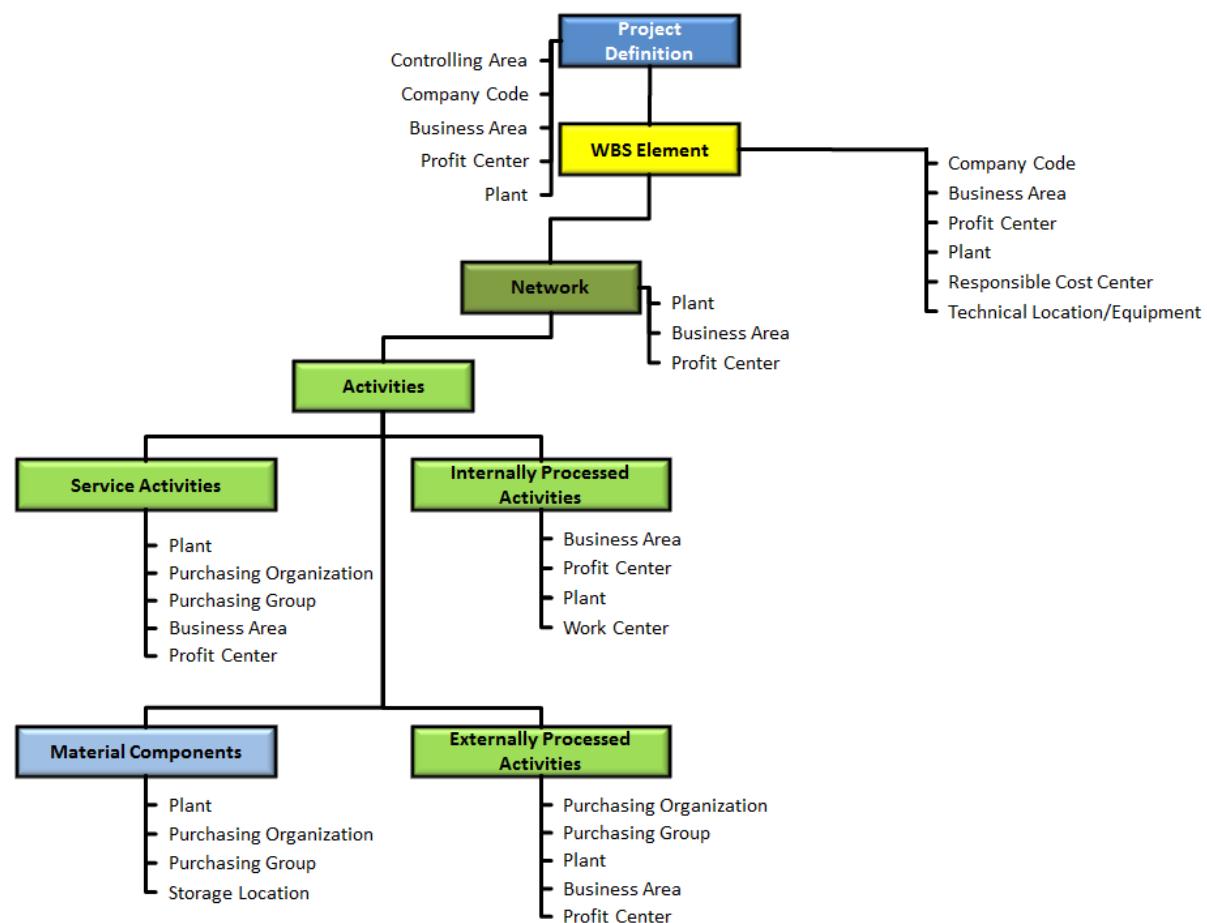


Figure 3: Organizational Levels in SAP PS (SAP Online Library)

The figure displays the organizational levels that might be relevant for each structure element of SAP PS. You see that a project is an integrating organizational structure within the SAP system and utilizes diverse organizational levels from all applications.

In controlling, a project (the **project definition**) is always assigned to one **controlling area**. This controlling area is valid for all WBS elements assigned to the project and cannot be changed once a project has been saved. In addition, a company code and a business area (if

business area specific income statements are required) need to be assigned to a project definition. The assignment of plants and profit centers is optional.

On the level of the **WBS elements** that are assigned to a project, each WBS element is assigned to a company code. Thereby, each WBS element can be assigned to a different company code, if processing cross-company projects is necessary. Furthermore, the following organizational units can be assigned to WBS elements:

- Profit Centers
- Business Areas
- Persons Responsible
- Partners (internal and external)
- Cost Centers Responsible for the project

These assignments are used mainly for reporting purposes and allow various analyses and further actions within the project:

- You can use project summarization for analyzing a large number of projects together based on the business area and the person responsible parameters.
- It is also possible to analyze the key figures of a several projects in the cost center hierarchy or profit center hierarchy.
- When documents are assigned to the WBS, the business area and profit center are derived from the WBS element. This information is used for reporting based on business areas as well as in profit center accounting.
- You can generate cost center-based settlement rules for cost projects.
- You can specify in the system that an email is to be sent to the person responsible for the WBS element if the budget is exceeded.
- You can also use partner processing to assign customers, vendors, personnel numbers, system users, work centers, shipping points, HR organizational units, and other objects to WBS elements. When you do so, the system performs checks against existing SAP master data.

### 2.1.2 Phases of a Project

During the execution of a project, different phases are accomplished. Executing complex projects requires a high degree of precise planning and coordination. When planning the project flow, scheduling deadlines, making resources available and providing budgets is required. The project system in SAP supports all phases of project execution and benefits from the integration with other SAP functional areas.

The SAP PS application provides support in all project phases:

- **Concept**
  - o Create WBS
  - o Assign documents to describe the project and outline goals
- **Rough-Cut Planning**
  - o Create WBS elements on the highest level
  - o Create Network and Activities on the highest level
  - o Request for Quotations and make first cost calculations as basis for budget assignment

- **Detailed Planning**
  - o Create detailed hierarchical model of the project using WBS Elements, Milestones, PS Texts
  - o Create detailed process flow model of the project by using Activities, Activity Elements, Milestones, PS Texts
  - o Schedule dates
  - o Plan costs in detail
  - o Plan resources required
- **Approval**
  - o Budget is approved and assigned
  - o Project is released
- **Execution**
  - o Activities are executed
  - o Orders (SD, CO, PP) are realized and confirmed
  - o Goods receipts, goods issues are confirmed
  - o Commitments, costs, revenues are posted
  - o Milestones are confirmed
- **Period-end Closing**
  - o Costs are settled to controlling objects
  - o Invoices are issued
  - o Project is closed
  - o Project is analyzed and evaluated

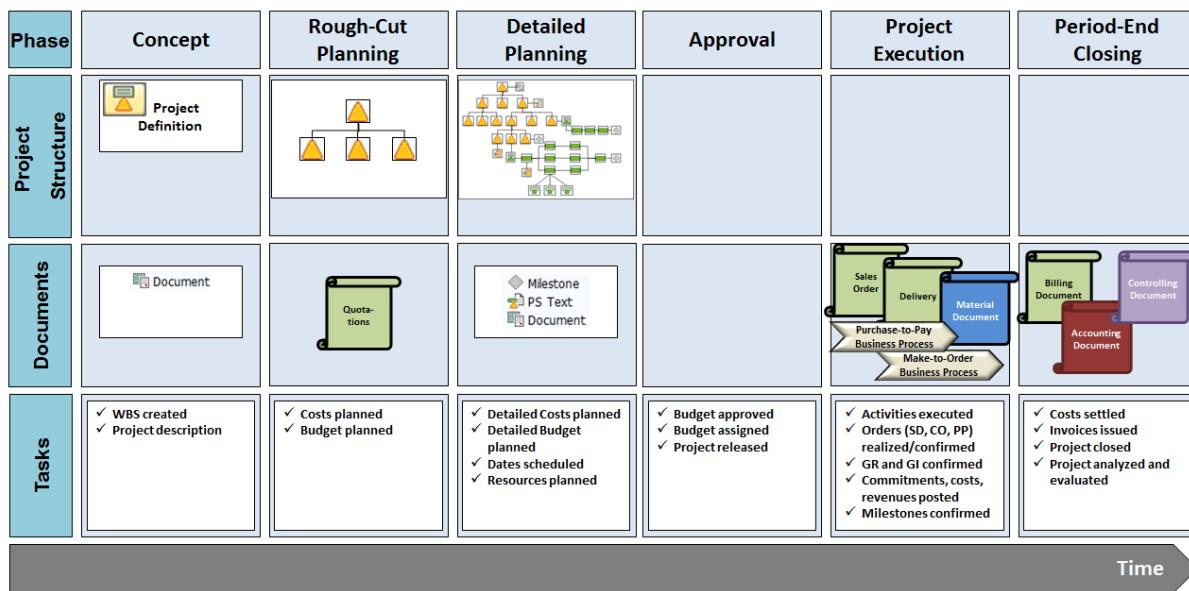


Figure 4: Phases of a Project

### 2.1.3 Project Structures of the Project System

Depending on the requirements of a project that is supposed to be performed in the SAP system, projects are visualized and structured using different elements that represent the hierarchical structure of the project and the flow of activities within the project.

The top node of any project in the SAP system is the **Project Definition (Work Breakdown Structure)** to which further elements can be assigned that describe the project details:

- **Work Breakdown Structure Elements (WBS Elements)** represent the organization of a project in the SAP system and are, thus, a model of the project which *hierarchically* visualizes the tasks to be carried out in the project (*hierarchy-oriented*). A WBS Element represents the operative basis for planning costs, revenues and payments as well as for scheduling and budgeting. A project definition can contain one or multiple WBS Elements.
- **Networks** describe and visualize the *flow of tasks (process-oriented)* within a project or parts of a project. A project definition can contain one or multiple Networks, which can be assigned to WBS Elements if required. The flow of tasks in a network is represented by using **Activities** that are linked to each other via **Relationships**:
  - **Activities** are used to represent the tasks performed within a project. Activities are the operative basis of planning and controlling dates, costs and resources (personnel, machines, production resources/tools, material). A network can group multiple Activities.  
When a network is assigned to a **WBS Elements**, dates and costs of the Activities involved in the network are totaled up to the WBS Elements and can be evaluated on the aggregated level of the WBS. Activity funds are checked against the budgets of WBS Elements.  
Activities can be broken down to more detailed task levels by creating and assigning **Activity Elements** to the Activity.
  - **Relationships** are used to link two Activities (individual tasks) in order to constitute the flow of tasks within a project.

Depending on the requirements of a project that is supposed to be mapped in the SAP system, projects can be visualized and structured using a *Work Breakdown Structure (WBS)* or with one or several *Networks* or with a combination of both:

- Work Breakdown Structures without assigned Networks are often used to represent projects that focus on controlling aspects (e.g., cost and investment projects), as opposed to logistical processes.
- Networks are used to represent the logistical functions within a project definition. Examples of this are automatic time planning by using scheduling, planning resources or procuring materials.

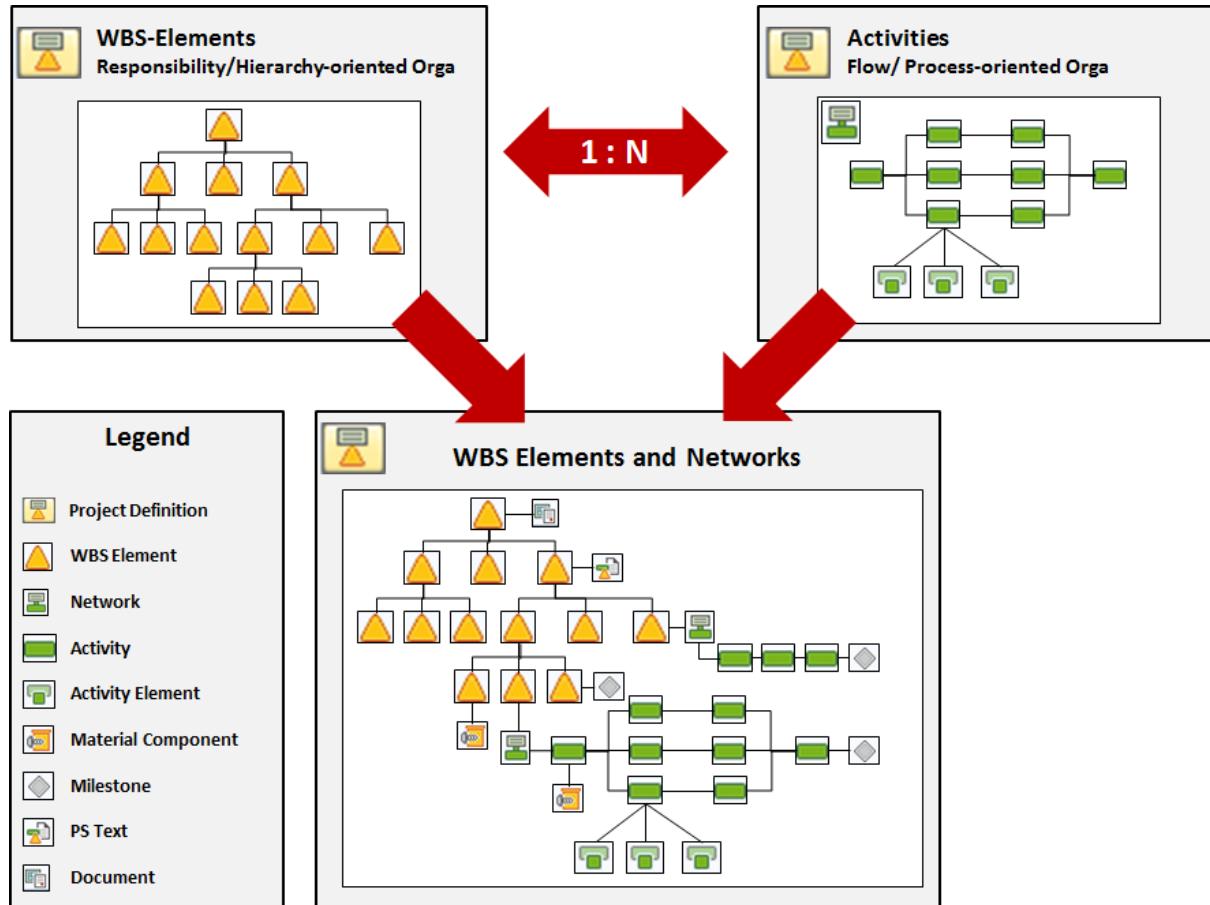


Figure 5: Structures of a Project Definition

### 2.1.3.1 Work Breakdown Structure

The **Work Breakdown Structure** (WBS) represents the organization of a project in the SAP system and refers to the entire project definition. The Work Breakdown Structure can be further detailed using **Work Breakdown Structure Elements** (WBS Elements), which are used to build and visualize the hierarchical project structure. The individual project parts are represented by WBS Elements until the required level of detail for a project is reached.

Generally, a project can contain up to 99 structure levels in the SAP system and you can assign any number of WBS Elements to the individual levels. Due to performance reasons, however, a Work Breakdown Structure should contain 10000 WBS Elements at most.

#### 2.1.3.1.1 Functions of Work Breakdown Structures

The Work Breakdown Structure encompasses all the work steps that are involved in a project and is the functional basis for the detail planning in the project. The WBS gives a clear picture of the project and facilitates the coordination and implementation of the project from a management standpoint. The main focus is on planning, describing, managing and monitoring costs, key dates and the budget. Planning dates, costs, and payment dates are often carried out by using Network Activities that are assigned to WBS Elements.

Following, the functions of the Work Breakdown Structure in the SAP system are listed:

- Planning and recording dates manually
- Hierarchical budget management

- Detailed cost and revenue planning
- Posting of actual costs and revenues
- Planning and monitoring payment flows
- Assignment of purchase requisitions and purchase orders
- Inventory management for materials
- Diverse period-end tasks
- Monitoring the project progress
- Aggregated evaluation of data

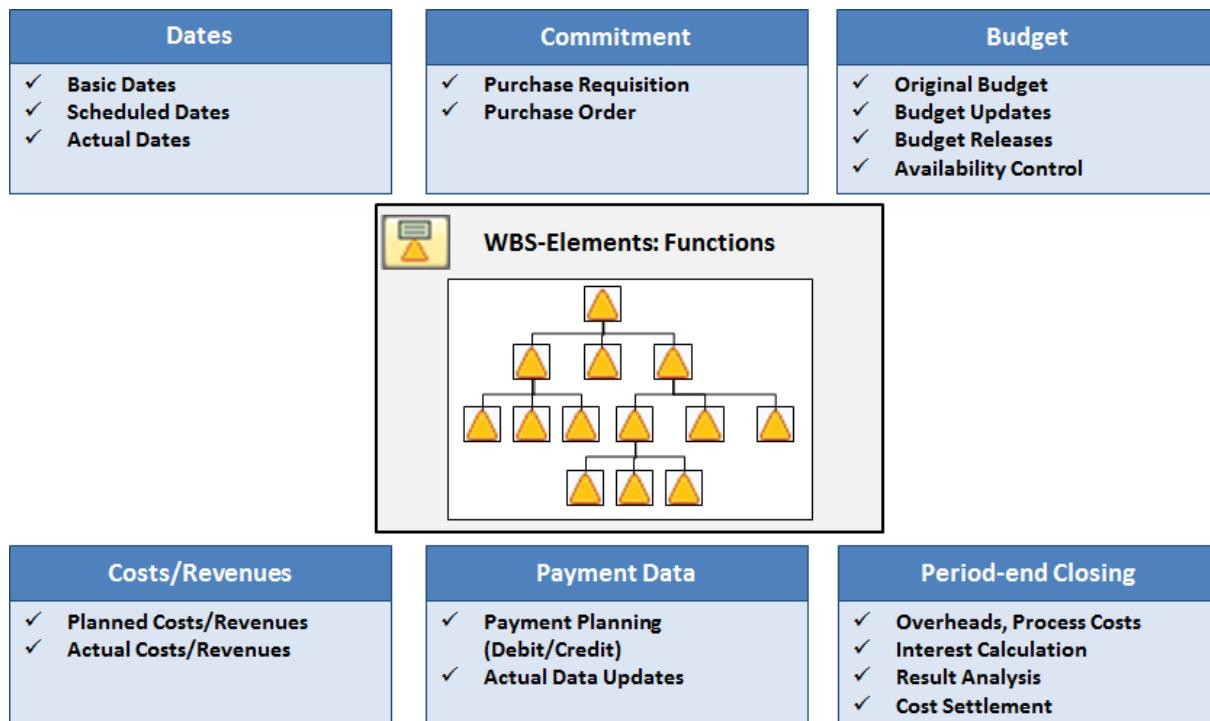


Figure 6: Functions of Work Breakdown Structures

The Work Breakdown Structure should contain all relevant aspects of a project to allow for complete planning and analysis of the project in the SAP system. The tasks and functions of individual project parts should be distinguished clearly and defined uniquely. There are several ways to structure a Work Breakdown Structure within a hierarchy level. For example, you can structure a level according to phases, functions or organizational characteristics:

- **Phase-oriented structuring:** WBS Elements could, e.g. represent elements of construction procurement or an assembly phase. This form of structuring is especially relevant for significant scheduling and gradual processing of projects.
- **Function-oriented structuring:** This form allows, e.g., for structuring a ship-building project according to functional components and their manufacturing. Thus, you would create WBS Elements for the engine, the cabins, etc. When using project stocks (material stocks), you can manage separate stocks for the individual assemblies.
- **Organizational-oriented Structuring:** Structures can, e.g., contain WBS Elements for SD, purchasing and production or contain a separation according to cost centers. This form of structuring allows for the immediate identification of cost proportions according to different organizational units in reporting.

The following figure shows a schematic image of the project definition for the techno-doping project. Thereby, a phase-oriented structuring was chosen for the project definition.

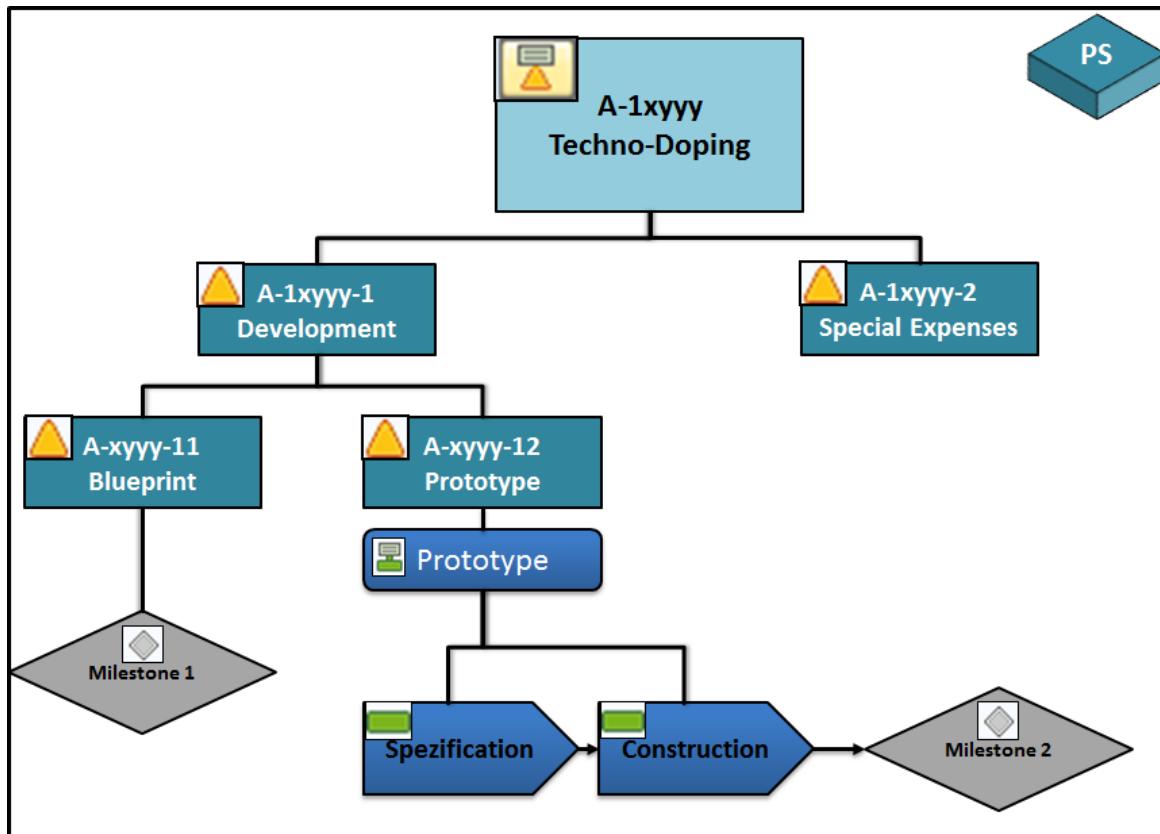


Figure 7: Project Definition Techno-Doping

#### 2.1.3.1.2 Operative Indicators of WBS Elements

WBS Elements are equipped with several **operative indicators** that can be selected to set specific characteristics for controlling WBS Elements. With these operative indicators, you determine for what tasks a WBS Element can be used during project execution. You can set the following operative indicators on the **basic data** tab of WBS Elements:

- **Planning Element:** By setting this indicator, you allow manual cost planning for the WBS Element.
- **Account Assignment Element:** By setting this indicator, you allow posting actual costs to the WBS Element.
- **Billing Element:** By setting this indicator, you allow planning revenues and posting possible actual revenues for a WBS Element.

Independently from the level in the Work Breakdown Structure, you can set any combination of these three indicators for any WBS Element in the project definition.

Another indicator affecting the controlling characteristics of a WBS Element is the **Statistic** indicator. This indicator specifies whether a WBS element can be posted to only statistically or whether it can receive real cost postings. Thus, if this indicator is set, cost postings are updated on the WBS Element only using value type 11 (statistic actual) instead of value type 4 (actual). In this case, the cost postings to this statistical WBS Element always require an additional "real"

cost assignment object (e.g., cost center, sales order) as receiver of the costs. Statistic assignments are usually used for analyses and reporting.

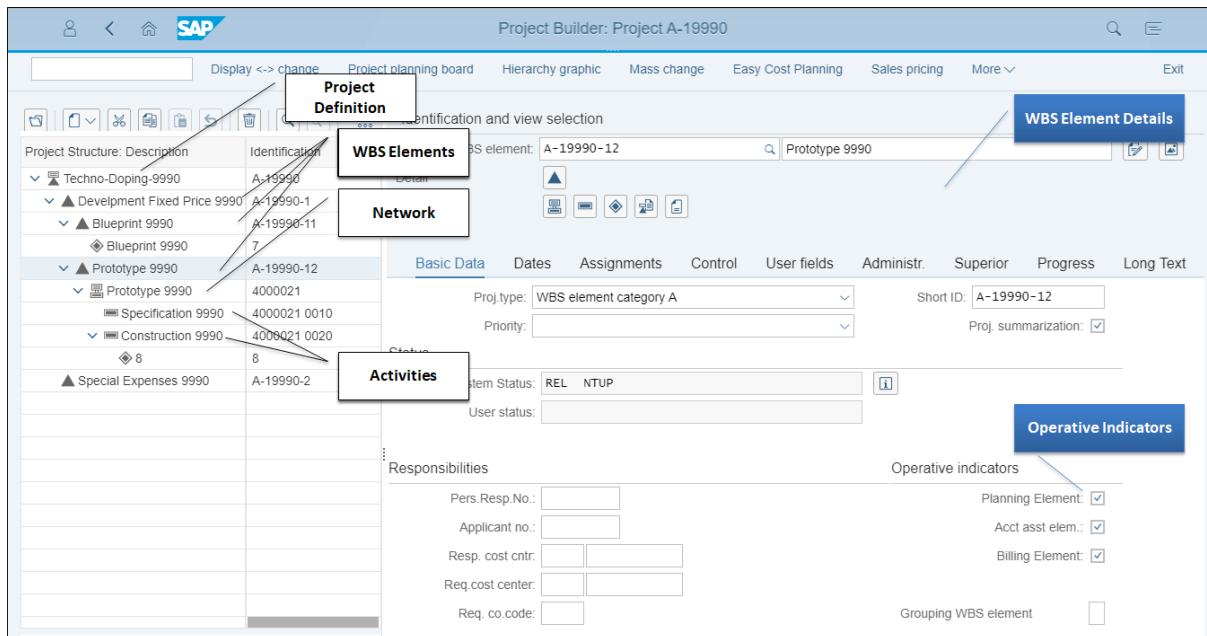


Figure 8: Operative Indicators of the Work Breakdown Structure: SAP-System-Screenshot

### 2.1.3.1.3 Hierarchy Chart

The Hierarchy Chart is a graphical tool within the Project Builder (transaction CJ20n) that allows displaying the hierarchical organization of a Work Breakdown Structure in a graphical way. Depending on the graphical profile of a project and the selections under *display WBS Elements*, different data can be displayed for each WBS Element.

In addition to the graphical display, it is also possible to make changes to the project definition directly from within the Hierarchy Chart. Available modification and navigation options are:

- Changing the operative indicators of WBS Elements
- Calling up the detail screen of a WBS Element
- Creating a WBS Element and – if authorized – delete WBS Elements as well.



NOTE

*Since Fiori UX only uses the non-native Project Builder App, the Hierarchy Graphic is not available in Fiori UX, yet. To use this graphic and the full potential of the Project Builder, you still need to work with the classic SAP GUI.*

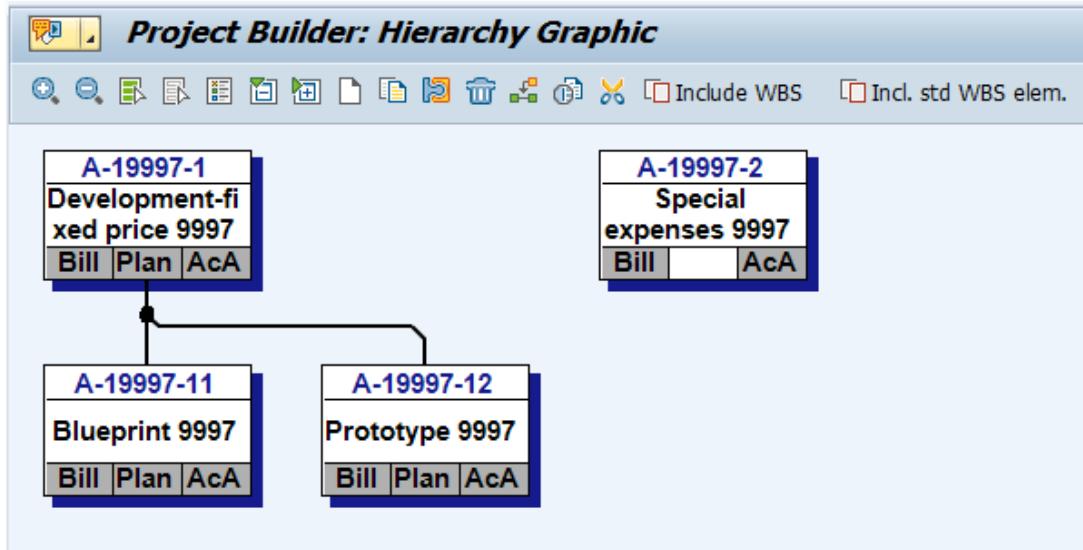


Figure 9: Hierarchy Chart: SAP-System-Screenshot

### 2.1.3.2 Network

**Networks** are used in a project definition to represent the flow of tasks (activities) within the project. Project activities and their sequence and links are represented by using **Activities** and **Relationships**. Using Networks, you can particularly make use of the logistical integration with materials management, production, maintenance, capacity planning and purchasing.

Networks should not exceed a size of 500 Activities, since usually there is only one manager per Network in the system. Moreover, you have to pay attention to the lock logic in the SAP system when conceiving a Network. Each time a Network element (activities) is processed, the entire Network is locked.

Usually, Networks and their Activities are created for and assigned to WBS Elements. Using this assignment, planned and actual data of Activities (dates, costs and payment data) are aggregated on the level of the superordinate WBS Elements. However, a project can also be created without using WBS Elements or Work Breakdown Structures and only feature a Network with Activities.

#### 2.1.3.2.1 Structure of Networks and Activities

A Network consists of a **Network Header** and **Activities**. Activities can be linked with each other by using **Relationships**. You can use **Activity Elements** to further detail Activities.



*Do not confuse Activities (and Activity Elements) of SAP PS with activities or activity types of SAP CO. Since both are used throughout this whole teaching unit, the SAP PS Activities will always start with a capital letter.*

**CAUTION**

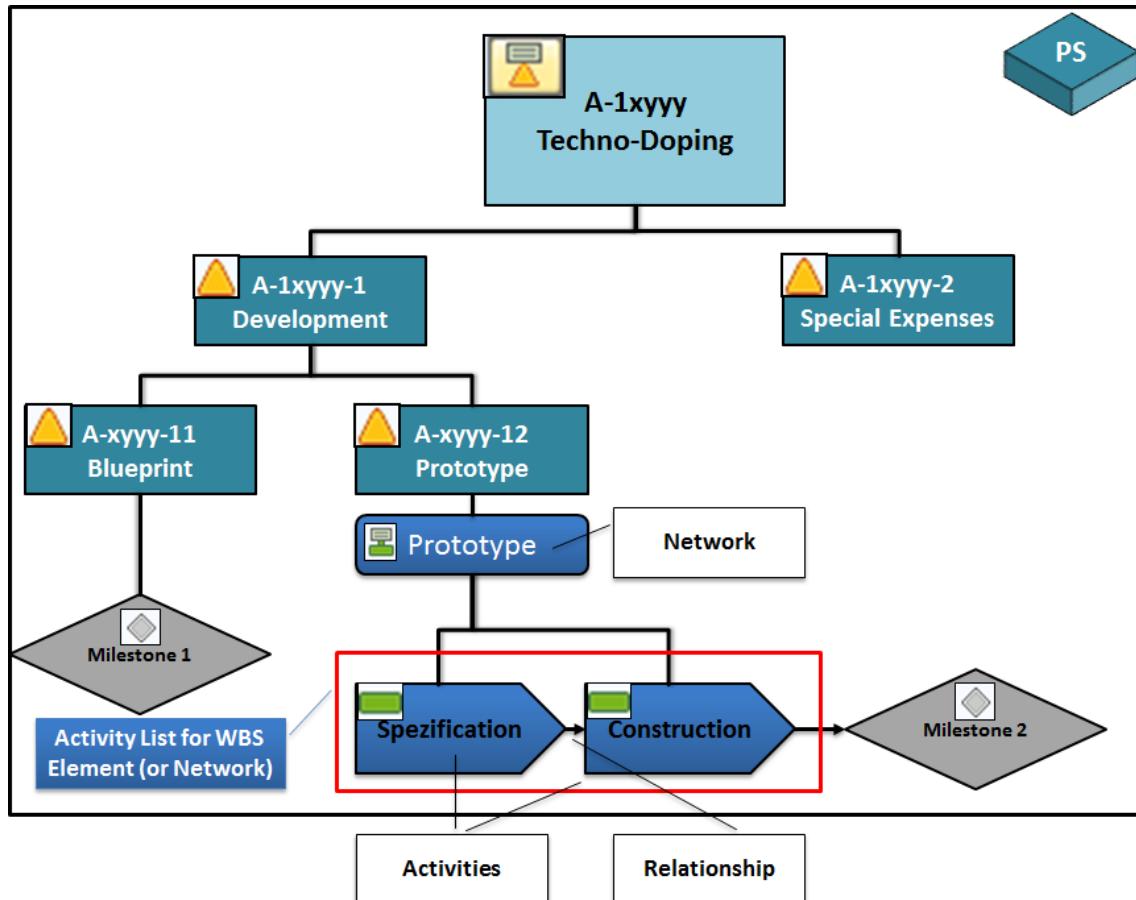


Figure 10: Networks and Activities

## Network Header

The Network Header is a frame for the different elements of a Network. It contains controlling profiles and indicators as well as default values for the different Network elements. The main settings for the Network Header include a Network profile, a Network type and the plant in which the project is processed. Using the plant, the system can determine to which company code and controlling area the Project Network belongs.

## Activities

The Activities in a project describe the individual tasks and project steps. Activities are linked with each other via Relationships in order to establish a causal and timely sequence. Moreover, Activities depict the basis for planning different quantity structures:

- Dates (automatically via scheduling)
- Costs (automatically via costing)
- Resources (internal and external Activities)
- Material requirements (via assigned components)

There are four **Activity categories** in Networks:

- **Internal Processing:** An Internal Processing Activity is used to plan and enter an activity that is provided by capacities (e.g., personnel, machines) of your own company.
- **External Processing:** An External Processing Activity is used to plan and procure an Activity provided by a company-external resource. Using the specifications of the

External Activity, the end date of the External Activity, the material group and the purchasing organization in charge as well as the purchasing group, the system can later generate a purchase requisition.

- **Service:** Similarly, to External Processing Activities, Service Activities are used to plan and procure external activities via purchasing. While a specific activity is procured in External Processing, Service Activities allow planning and procuring services as well as entering data referring to activities that are not yet specified exactly.
- **Costs:** Cost Activities can be used for planning and later assigning additional primary costs that do not incur due to internal activities, procurement of external activities via purchasing or material consumption. Examples are travel expenses or other primary costs.

## Relationships

Using Relationships, sequences of Activities are defined. When creating a Relationship between two Activities, you determine which one is the antecessor and which one is the successor. Correspondingly, you specify a logical sequence. The following types of Relationships are available in the SAP system:

- **FS Relationship:** The subsequent Activity starts when the previous one is finished.
- **SS Relationship:** The subsequent Activity starts simultaneously or after the previous Activity starts.
- **FF Relationship:** The subsequent Activity ends simultaneously or after the previous Activity ends.
- **SF Relationship:** The previous Activity starts after the subsequent Activity ends.

## Activity Elements

Each Activity can be further detailed using Activity Elements. Therefore, the following Activity Element types are available in SAP PS:

- **Internal Processing Element**
- **External Processing Element**
- **Service Element**
- **Cost Element**

The individual types feature the same functionality as mentioned for the Activity categories. However, in contrast to the Activities, Activity Elements do not feature Relationships and are, thus, not relevant to scheduling the Network.

### 2.1.3.2.2 Functions of Networks and Activities

Using one or several Networks, projects or parts of it can be represented in a flow-oriented way in the SAP system. The Relationships between two Activities define their logical sequence and timely dependencies. Linking Activities of different Networks allows for representing cross-network Activities. One important advantage of Networks is that the SAP system automatically determines plan dates for each Activity and the entire Network, as well as buffer times and timely critical Activities based on the duration of the individual Activities and their sequence. Using Network Activities, personnel, capacities, materials, resources/tools and services required for the different tasks of the project can be planned. Central functions here are:

- Scheduling
- Resource planning
- Confirmation of work
- External procurement of Activities
- Material planning, procurement, and delivery
- Network costing
- Several period-end closing tasks
- Monitoring of the project progress

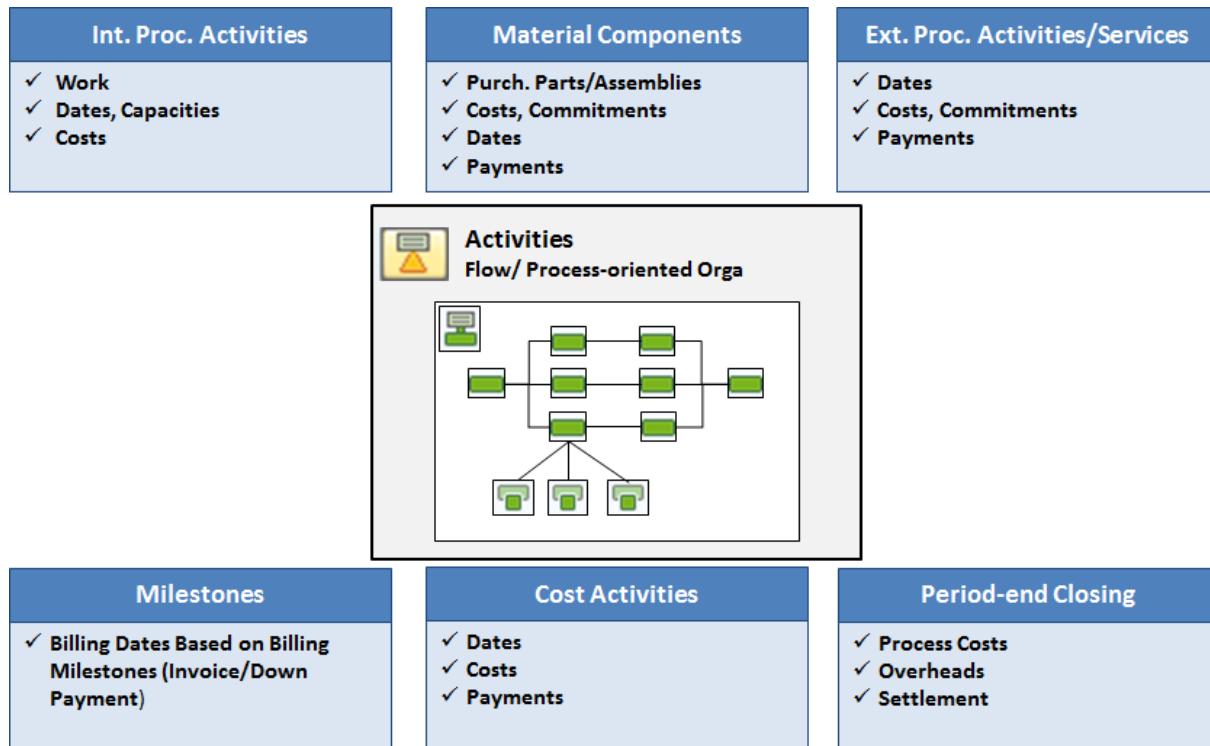


Figure 11: Functions of Networks and Activities

### 2.1.3.2.3 Network Structure Graphic

The **Network Structure Graphic** is a graphical tool within the Project Builder (transaction CJ20n) that allows visualizing Activities of one or more Networks graphically. The system organizes the Activities according to their logical sequence. Activities can be grouped according to the work centers that they use or WBS Elements to which they are assigned. The Network Structure Graphic can be called up by using different transactions of the project system, e.g., from the Project Builder, the information system and the Project Planning Board.

In addition to the graphical display, it is also possible to make changes to networks and activities directly from within this tool. Available modification and navigation options are:

- Networks, Activities and Relationships can be created directly in the Network Structure Graphic.
- The sequence of Activities can be changed manually using drag & drop functionality.
- A cycle analysis can be carried out. This function can only be executed from the Network Structure Graphic and allows identifying and processing (correcting) cycles within the Network.

A cycle is a closed loop of Relationships and Activities. That is, if you start at a particular Activity and return to this very same Activity via the assigned Relationships, then a network cycle is in place. Networks that contain this kind of cycles cannot be scheduled as they are logically erroneous (infinite loop).

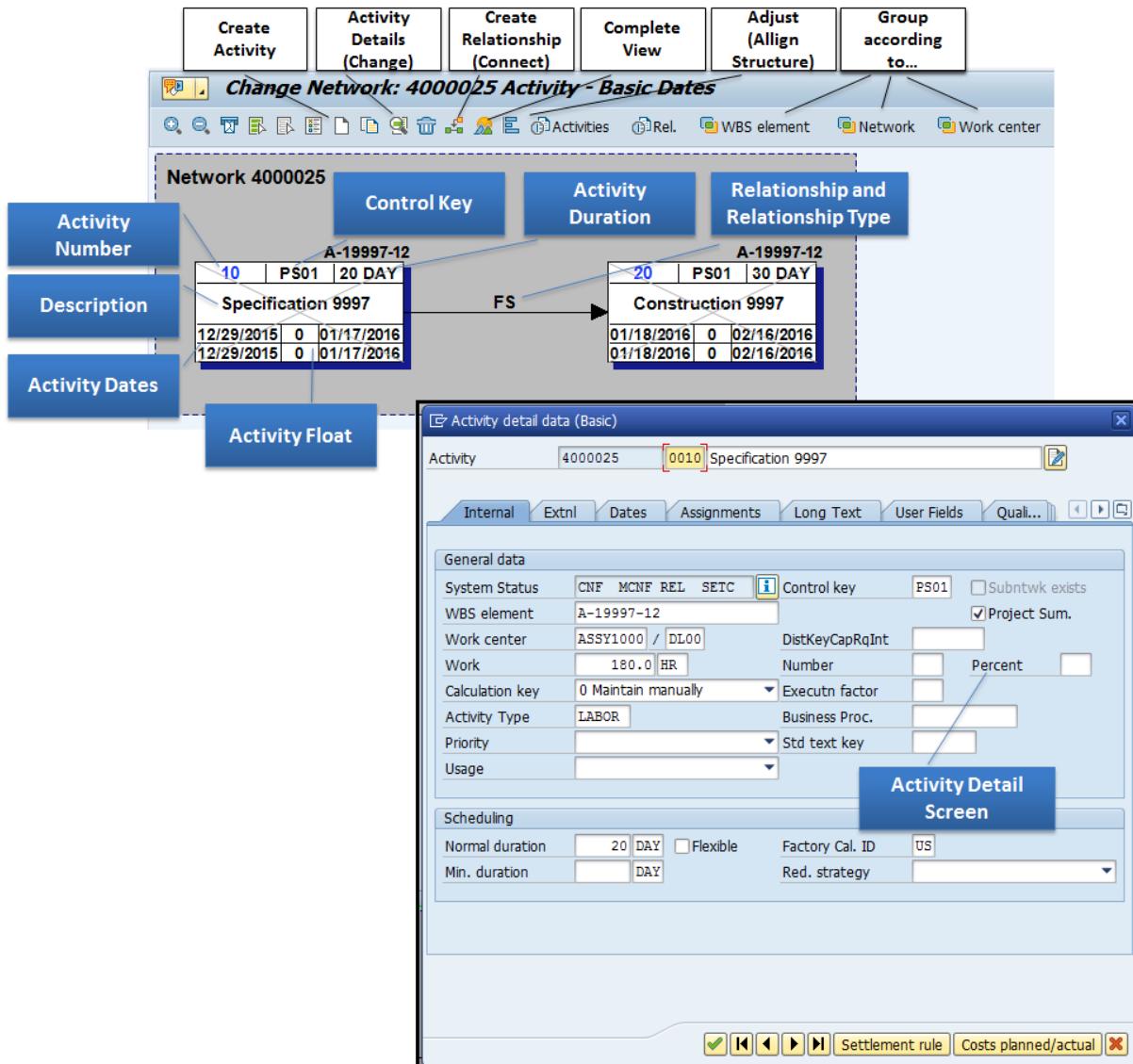


Figure 12: Network Structure Graphic: SAP-System-Screenshot



**NOTE**

Since Fiori UX only uses the non-native Project Builder App, the Network Structure Graphic is not available in Fiori UX, yet. To use this graphic and the full potential of the Project Builder, you still need to work with the classic SAP GUI.

### 2.1.3.3 Further Structures

In addition to the structure elements introduced so far, SAP Project Systems provides the elements **Material Component**, **PS Texts**, **Documents**, and **Milestones** that can be assigned to Work Breakdown Structure (Elements) and Network (Activities) and fulfill certain tasks within the project definition.

### Material Component ()

Material Components is used to plan and monitor the material requirements and costs in projects, to control the flow of materials and for scheduling. It forms a link from a project to Sales (SAP SD), Materials Management (SAP MM), and Production Planning and Control (SAP PP). Via the assignment of material components to network activities, you determine the assemblies and raw materials that must be reserved or ordered for project and trigger procurement via MRP (production) or purchasing.

### Milestones ()

Milestones are used in the project system to represent events of importance, e.g., entering important project steps. They generally serve for information purposes (e.g., a project phase has been accomplished). However, they can also trigger functions in the project (e.g., the billing of a sales order or the release of subsequent activities). The range of functions that a milestone provides can vary depending on the settings of the milestone. For instance, you can set up a milestone to be used for *Milestone Billing* in SD or for starting workflow tasks.

Milestones can be assigned to Network Activities and WBS Elements. When defining a milestone, you enter data regarding the intended use and function, a short and long text as well as a planned date at which the milestone is presumably completed. When a milestone is reached during project execution then this is documented by setting the actual date in the milestone.

### PS Texts ()

PS Texts (Project Structure Texts) are individually defined texts that can be assigned to WBS Elements or Network Activities. Their purpose is to provide additional information and documentation for the individual project parts. Thus, PS texts serve only for information purposes and for reporting.

PS Texts are defined and managed in a PS Text Catalog in the SAP system and stored in the SAP database. The texts are differentiated according to different text types that can be used for different purposes within the project. The texts and structures of the PS Text documents can be maintained in SAP script or in Microsoft Word format.

### Integration with Document Management System ()

The SAP Document Management System (DMS) can be used in SAP PS to assign **document info records** to WBS Elements or Activities.

A document info record is an object in DMS, which can store original documents (such as technical drawings, manuals, documentations, etc.) in different formats (e.g., Excel, Word, PPT, BMP, TIF, CAD formats) and assign these documents to the SAP system specific object such as material master data, orders or project elements (WBS, Activities, etc.).

When working on a project, documents info records and the corresponding originals can be displayed from the project information system online or via the Internet. This allows users to access documents that they require during project execution directly from within the Project System.

## 2.1.4 Defining Projects of the Project System

SAP provides different options for creating project definitions:

- Project Builder (Transaction CJ20N)
- Project Planning Board (Transaction CJ27)
- Special Maintenance Functions (different transactions for creating and maintaining individual project elements)

### 2.1.4.1 Project Builder

The **Project Builder** is the central tool for defining projects in the SAP system and offers a user-friendly method for accessing the Project System. The Project Builder was developed to allow accessing all *Special Maintenance Functions* of SAP PS centrally from one transaction that, in addition, provides a graphical maintenance tool with which projects can be defined and maintained using drag & drop functionality. The Project Builder enables users to maintain all objects except for assignment of production resources/tools.

Using the Project Builder, operative project structures can be created manually or by copying (standard) templates. Standard Work Breakdown Structures, standard Networks and some other project structures and simulation versions can serve as copy templates.

The straightforward Project Builder screen consists of three areas that provide a comfortable working environment:

- **Worklist and Template area:** In the work list on the lower left screen of the Project Builder, the last five projects processed by a user are displayed. The template area, which is located on the lower left screen as well, displays individual objects (WBS Elements, Activities, etc.) that can be used to create the structure of a project. You can add template objects to the project definition by double-clicking them, using drag & drop, or the context-sensitive menus. Objects that are added to the project definition are displayed in the upper left area (Structure Tree). You can also define your own worklist and template pool to facilitate work with projects.
- **Structure Tree:** The structure tree of the Project Builder (upper left area) displays the currently processed project in its hierarchical organization. This includes the project definition, WBS Elements, Network headers, Activities, etc. of a project including their identification and description.
- **Detailed work area:** The detail screen on the right-hand side displays individual entry fields for controlling the project element that is currently selected from the structure tree. This is also where all entries required for controlling the project are made (e.g., dates, resources, assignments).

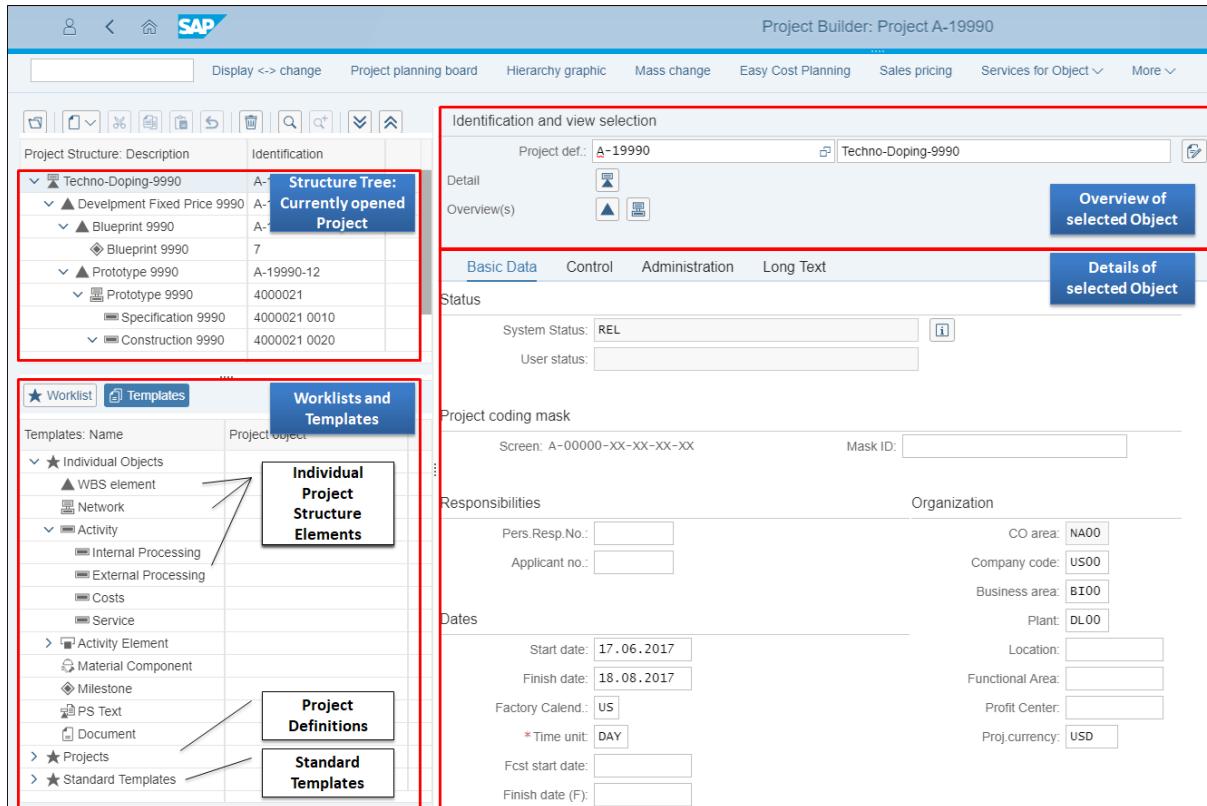


Figure 13: Project Builder (1): SAP-System-Screenshot

The Project Builder provides the following maintenance options:

- Manually create or change objects in the project such as the project definition, WBS Elements, Activities, Activity Elements, PS Texts, documents, milestones or material components (1 and 2).
- Access detailed screens lists or charts (Hierarchy Chart, Network Structure Graphic) (3 and 4).
- Include WBS structures, standard WBS structures and standard Networks in an already existent project structure (5).
- Copy an operative project or a standard project including all objects of subsequent levels (WBS Elements, Activities, PS texts, documents, milestones, items) (6).
- Use standard project structures (WBS structures or Networks) or standard structures (standard WBS structures, standard Networks) as copy templates (7).

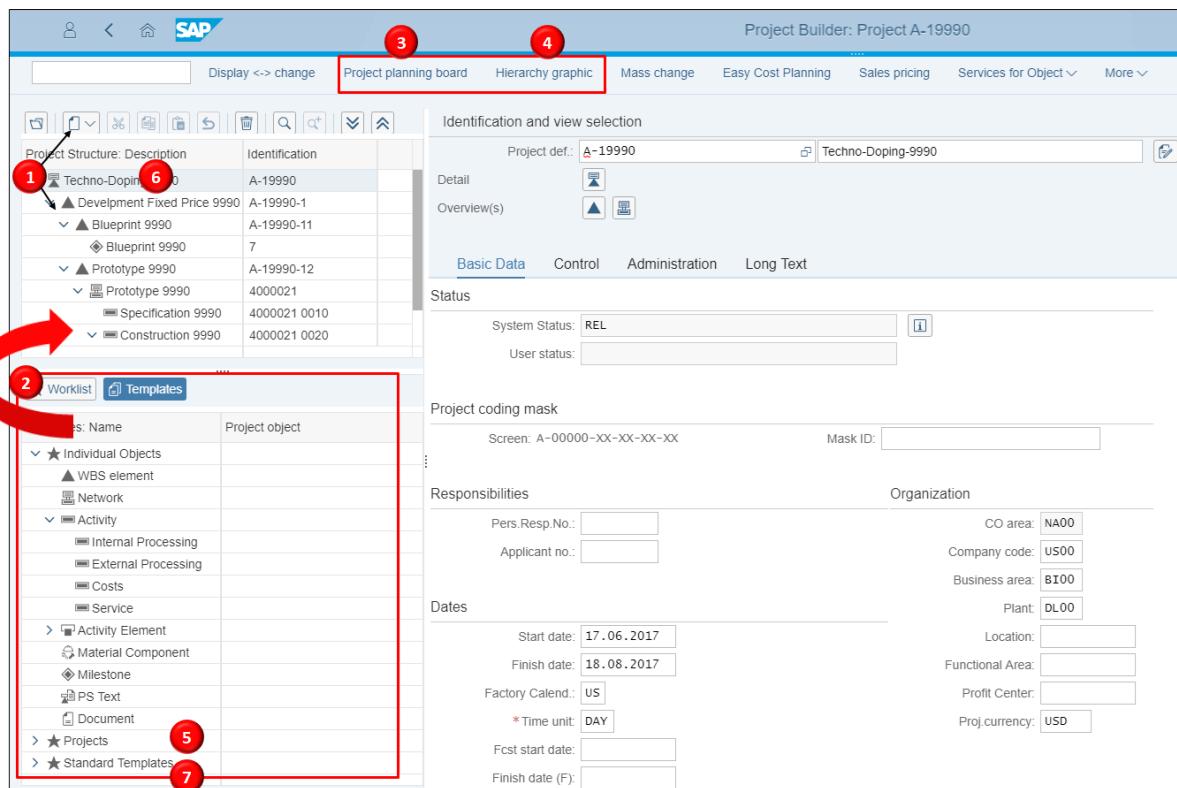


Figure 14: Project Builder (2): SAP-System-Screenshot

#### 2.1.4.2 Project Planning Board

The **Project Planning Board** is another graphical user interface that can be used to create and process all data for a project in an integrated environment. You can use either the Project Builder or the Project Planning Board to create and change the project definitions and maintain projects in either tabular or graphical mode. You can navigate from the Project Builder directly into the Project Planning Board and vice versa.

The Project Planning Board allows you to

- Create project definitions, WBS Elements, Activities, Relationships, Milestones, Documents and PS Texts
- Plan dates and resources (internal/external processing)
- Perform cost planning via Activities
- Simulate projects at various stages and use this information for planning in order to estimate costs, deadlines and capacities during the quotation phase and to compare various options during the course of the project. You can then use the best option in your operative project.



**NOTE**

*Since Fiori UX only uses the non-native Project Builder App, the Project Planning Board is not available in Fiori UX, yet. To use this graphic and the full potential of the Project Builder, you still need to work with the classic SAP GUI.*

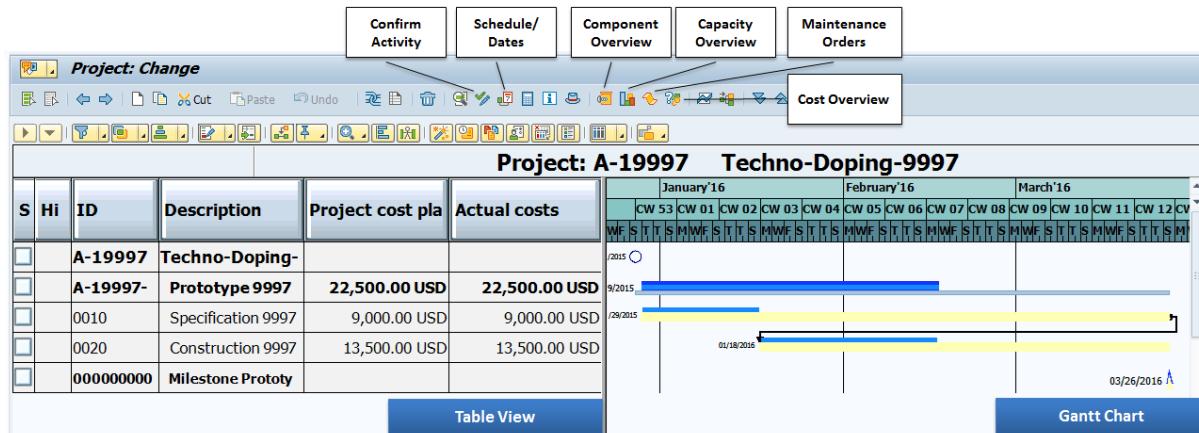


Figure 15: Project Planning Board: SAP-System-Screenshot

The central purpose of the **Project Planning Board** is to run all planning activities of a project. Therefore, the Project Planning Board features an interactive SAP GANTT chart as the central element for visualizing the project. This GANTT chart consists of a table area and a diagram area, which show the hierarchical setup of the project as well as the corresponding scheduling situation. You can process the project directly in the Gantt chart. SAP GANTT chart provides useful navigation options:

- By double-clicking the Project Planning Board items, you can branch into detailed screens to change field selections or time settings.
- By clicking the right mouse button, all options for the corresponding cursor position are displayed (important: the options depend on the cursor position!).
- When selecting all objects and choosing *show all dependent objects*, all objects of the Project Planning Board are displayed.

In addition to WBS elements and activities, you can show or hide other overviews such as the capacity overview in the lower area of the GANTT chart if necessary.

You can use the Project Planning Board to create all plan data required for a project (first and foremost, the dates) and process and evaluate this data in a graphical interface. The display of project data in table format and as graphical display provides users with a comprehensive overview of the project at any time and allows them to:

- plan, check and change dates
- plan, schedule and check resources
- determine and distribute work
- compare capacity
- calculate costs

If a project definition without Networks is used, dates for WBS Elements can be scheduled manually (as basic dates). The Project Planning Board allows performing the following tasks:

- Schedule dates for a WBS Element manually by clicking into the specific date in the chart.
- Extrapolate basic dates from lower-level to higher-level WBS Elements or pass on basic dates from higher-level to lower-level WBS Elements
- Check the consistency of scheduling data within the WBS structure

If Networks are used in the project's definition, Activities can be used to schedule dates automatically. Scheduled dates (or earliest and latest dates for activities) are determined automatically when Network Activities are scheduled. Scheduled dates are determined for WBS Elements by summarizing the scheduling data of the corresponding activities.

Consider that other interfaces can also be used for project planning and execution. For instance, the Project Builder or the Special Maintenance Transactions can be used to maintain the very same data for planning and scheduling. It depends on the user's preferences which tools are utilized.

## 2.2 Practice: Basics of SAP S/4HANA Project System



The SAP S/4HANA Project System is integrated with almost every application of SAP S/4HANA. Thus, to accomplish a project by using SAP PS, you need to maintain several master data from different SAP applications.

**PRACTICE**



*In the chapters of this script you will primarily work with the SAP Easy Access Menu. You have got an introduction to the SAP Easy Access Menu in script 0. If necessary, read the respective pages again.*

**NOTE**

*You can solve all tasks that involve the Easy Access Menu of any transaction codes alternatively using the SAP GUI instead of Fiori.*

### 2.2.1 Master Data MM/CO/HCM

Prior to entering your project into the SAP system, maintain all master data from the other functional areas involved. This includes

- a material master record,
- an activity type and its price,
- a sales condition and
- personnel master record.

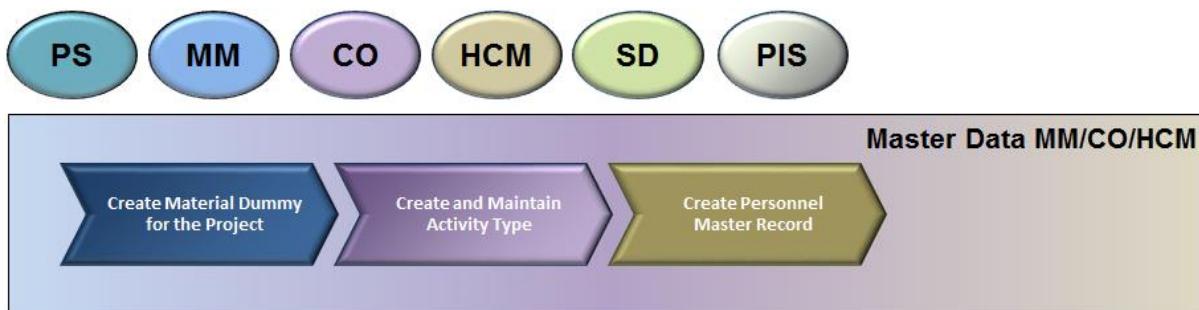


Figure 16: Process Overview: Master Data MM/CO/HCM

Subsequently, enter the project definition into the SAP S/4HANA system.

#### 2.2.1.1 Create Material Dummy for the Project

To be able to settle the project with the customer, you need to create a material master record for a material dummy. This “material” is sold as a placeholder for a project to the customer. Dummy master records are usually created for non-physical “materials” or products (e.g., services). Create a **dummy material master record** for the project.

##### Dummy material master record:

This material master record will be used in the sales document as dummy substituting the project to be sold.

Within the tile group **Script 8 – Project System**, select the app **Create Material**.

1. Enter the following data:
  - **Material** *Techno-xyyy*
  - **Industry sector** *Mechanical engineering*

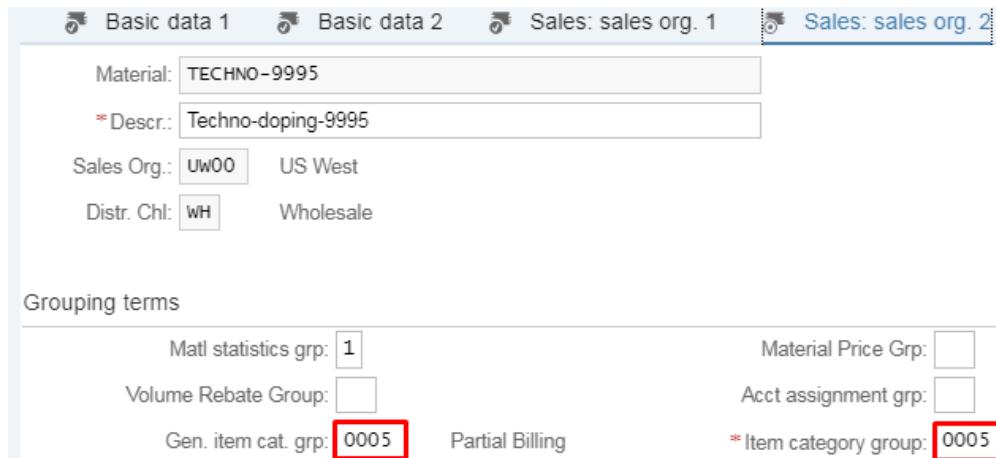
- Material type      **Service**
  - Press *Enter*.
2. The system displays the views to select. Pick the following views:
- **Basic Data 1 and 2**
  - **Sales: Sales Org. Data 1 and 2**
  - **Sales: General/Plant Data**
  - **MRP 1, 2, 3 and 4**
3. Enter the following organizational units:
- Plant                    **DL00 (Dallas)**
  - Sales Organization     **UW00 (US West)**
  - Distribution Channel   **WH (Wholesale)**
  - Leave the **Storage Location** field **blank**, since a Service cannot be stored!
  - Confirm your entries with *Enter*.
4. **Basic data 1:**
- Description            **Techno-doping-xyyy**
  - Base Unit of Measure   **EA**
  - Division                **BI**
  - GenItemCatGroup        **0005 (Partial Billing)**
5. **Sales: sales org. 1:**
- Delivering Plant        **DL00 (Dallas)**
  - Tax classification      **1** (you have to enter **1** in all three rows, scroll down to display the third row)

C...	Country	Tax...	Tax category	... Tax classification
us	USA	UTX1	Tax Jurisdct.Code	1
us	USA	UTX2	County Sales Tax	1
us	USA	UTX3	City Sales Tax	1

Figure 17: Tax Indicator: SAP- System-Screenshot

6. Sales: sales org. 2:

- Matl statistics grp **1 ("A" Material)**
- Gen. item cat. grp **0005 (Partial billing)**
- Item category group **0005 (Partial billing)**



Basic data 1 Basic data 2 Sales: sales org. 1 Sales: sales org. 2

Material: TECHNO-9995  
\* Descr.: Techno-doping-9995

Sales Org.: UW00 US West  
Distr. Chl: WH Wholesale

Grouping terms

Matl statistics grp: 1	Material Price Grp: <input type="text"/>
Volume Rebate Group: <input type="text"/>	Acct assignment grp: <input type="text"/>
Gen. item cat. grp: 0005	Partial Billing
* Item category group: 0005	

Figure 18: Item Category: SAP-System-Screenshot

7. Sales: General/Plant:

- Availability check **KP (No check)**

8. MRP 1:

- Purchasing Group **N00 (North America)**
- MRP Type **ND (No Planning)**

9. MRP 2:

- Planned Deliv. Time **60 days**

10. MRP 3:

- Strategy group **21**



With the setting of the Strategy group sales-order-related production/project settlement you can link this material in the sales document with a WBS Element from the PS module later in this case study.

NOTE

11. Finally select the Additional Data button. Within the second row, type in the Language key **DE** and the Material Description **Techno-doping-xyyy**.
12. Save the new material and finally, press **Finish**.

### 2.2.1.2 Create and Maintain Activity Type

Next, create the **master data in SAP CO**. You are already familiar with these process steps as well.

You have to hire a test driver for the new bike to be able to evaluate the prototype regarding its technical advantage in comparison to competing products. The hours worked by the test driver are supposed to be entered by using a separate activity.

### 2.2.1.2.1 Create an Activity Type for the Test Driver

First, create an activity type for the test driver. Therefore, scroll down to the tile group **Script 8 – Project System** and select the app **Manage Activity Types**.

1. First, click on **Create** to create a new activity type.
2. Make sure, that **NA00** is entered das **Controlling Area**.



**NOTE**

If there is another entry than **NA00** in the Controlling Area field, you have to set the correct controlling area in the user settings of your user, first. Then, open the **Manage Activity Types** app again, and press **Create** one more time.

The following figure illustrates the proceeding:

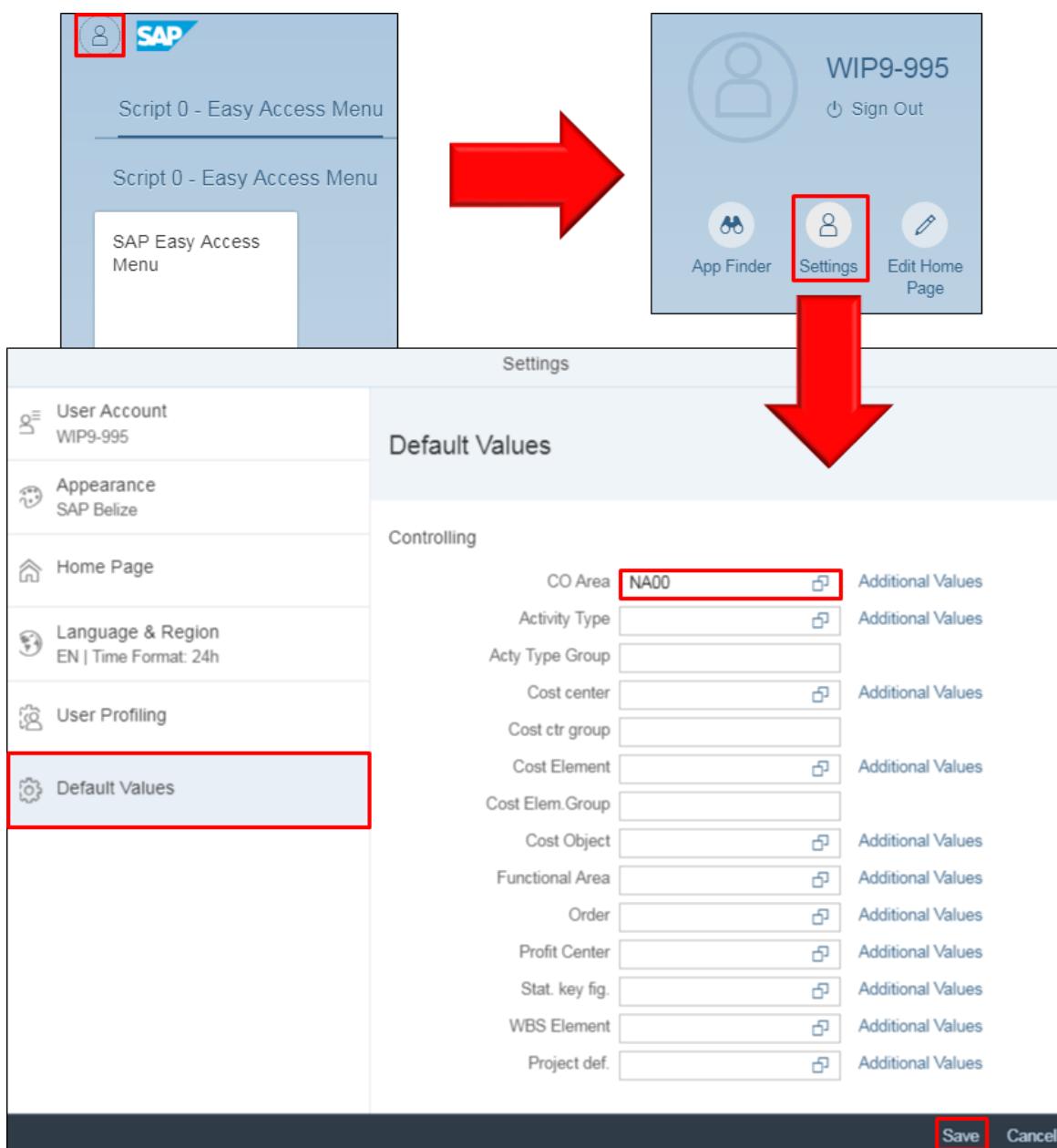


Figure 19: Set Controlling Area: SAP-System-Screenshot

3. Enter the following data:

- **Activity Type** *T-xxxx*
  - **Valid From** *01.01.(!) of this year*
  - **Valid to** *31.12.9999*
  - Confirm with **Continue**.
4. Now, enter the following data:
- |                                       |   |
|---------------------------------------|---|
| - <b>Name (next to Activity Type)</b> | <i>Testdriver-xxxx</i>  |
| - <b>Activity Type Description</b>    | <i>Testdriver-xxxx</i>  |
| - <b>Cost Center Categories</b>       | <i>* (All) → press  and select the entry from the list</i> |
| - <b>Activity Unit</b>                | <i>HR (Hours)</i>   |
| - <b>Activity Type Category</b>       | <i>Manual entry, manual allocation</i>  |

*An error notification regarding cost element for activity cat. 1 can be ignored since we enter the demanded allocation cost element in the next step.*



**NOTE**

- **Allocation Cost Element** *900043 (043 HR Trade Fair)*

5. Confirm with **Enter**, **save** your entries and leave the view.

### 2.2.1.2.2 Plan Hourly Rates for the Activity Type

To valuate the test driver's working hours, an internal hourly rate is supposed to be planned. Cost center **NAQM1000** is responsible for this. 100 \$ costs incur for the test driver per hour. Please bear in mind that these are only internal cost items for controlling. The customer is charged with higher costs, since you want to gain profits with hiring the test driver. You will find more on this issue later in the case study (Dynamic Items Profile).

Scroll down to the tile group **Script 8 – Project System** and select the app **Enter Prices for Activity Types**.

1. Enter the following data:
  - **Version** *0*
  - **From Period** *1*
  - **To Period** *12*
  - **Fiscal year** *current year*
  - **Cost Center** *NAQM1000 (Quality Management Costs)*
  - **Activity Type** *T-xxxx (Testdriver-xxxx)*
  - Make sure, that all other fields are empty and press **Overview Screen**.
2. Enter an hourly rate of **100** into the **Price (Fixed)** column.
3. **Save (Post)** your entries and press **Exit**.

### 2.2.1.2.3 Assign the Activity Type to an Activity Type Group

Subsequently, you will assign the previously created activity type to an **activity type group**. This assignment will be the **foundation of resource-related billing** later in the business process. **Therefore, make sure that your data is equal to the following figures.**



**CAUTION**

*Since all participants of this case study assign their activity types to the same Activity type group, there may be brief lock issues as another participant may assign his/her activity type at the same time and, thus, locks data access. This data base lock is necessary to ensure data consistency in the system. In this case, wait briefly and try the subsequently described procedure again!*

Scroll down to the tile group **Script 8 – Project System** and select the app **Manage Activity Type Groups**.

1. Enter **Activity Type Group Testdriver** and confirm with **Go**.
2. Within the result list, select the displayed activity type group **Testdriver** and press the  button.
3. Assign your activity type **T-xxxx** to the activity type group by selecting the **Testdriver** entry in the upper area and then pressing **Add → Add Activity Type**.

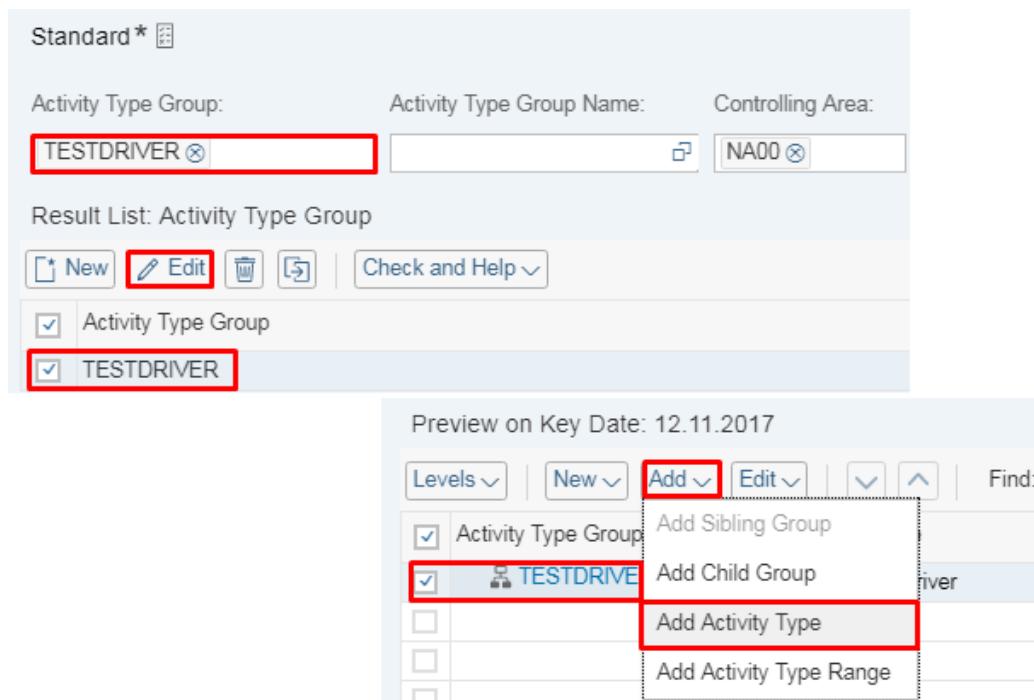


Figure 20: Assign Activity Type to Activity Type Group (1): SAP-System-Screenshot

4. Within the **Activity Type** field, enter your activity type **T-xxxx** and confirm with **Go**.
5. Then, select your displayed activity type **T-xxxx** and confirm with **OK**.

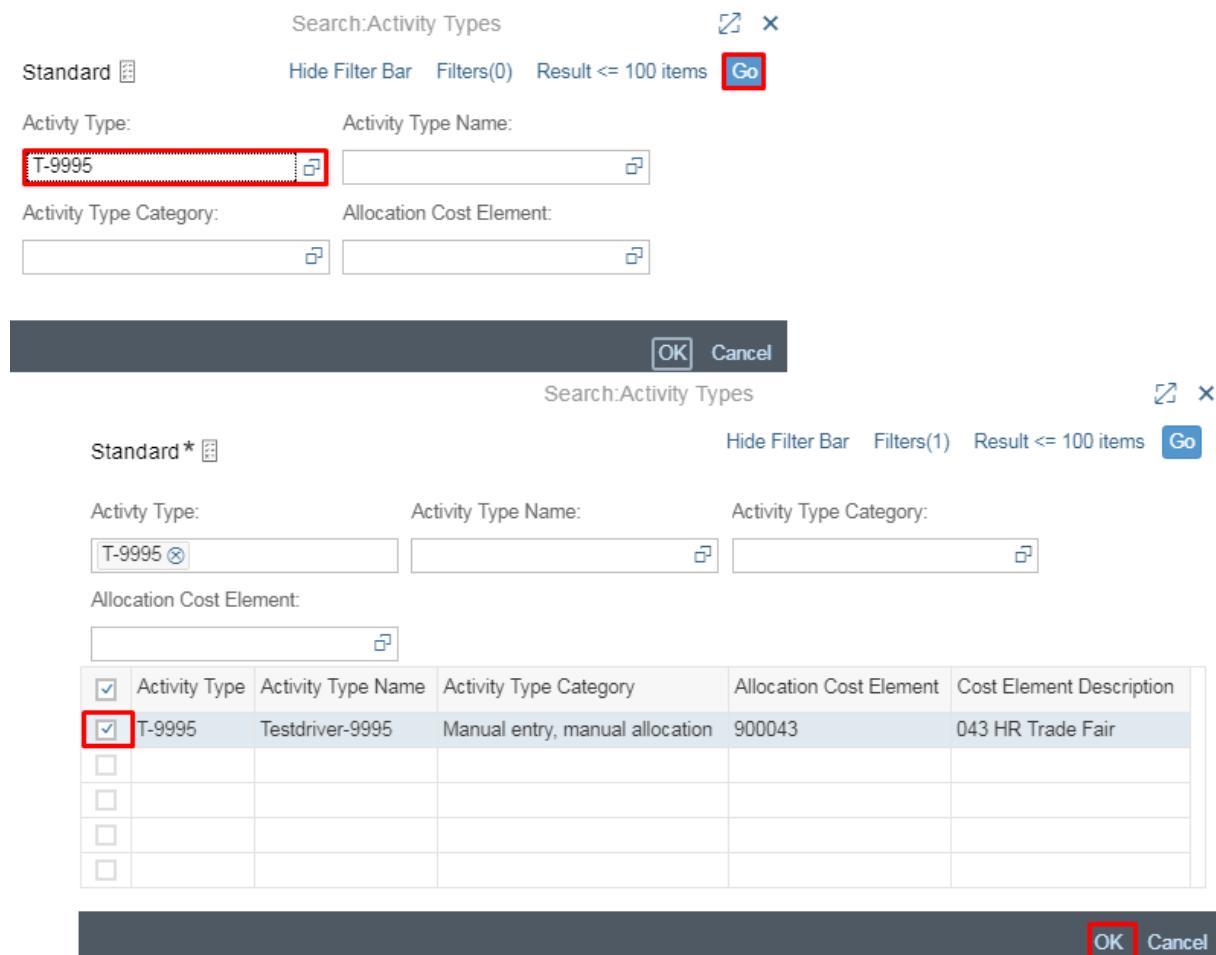


Figure 21: Assign Activity Type to Activity Type Group (1): SAP-System-Screenshot

6. Your activity type should now be displayed below the **Testdriver** node. *Save* your entries and leave the screen.

### 2.2.1.3 Create Personnel Master Data Record

Next, you have to maintain the personnel master record for the test driver. Since there is no app for this step, open the SAP Easy Access Menu and select:

**Human Resources → Personnel Management → Administration → HR Master Data → Personnel Actions (PA40)**

1. Enter the following data:
  - **Personnel no.** *leave empty*
  - **From field** *01.01. (!) of the current year*
2. Select **Action Type Time Recording (mini-master)** by clicking the row so that it is entirely highlighted. Then, press **Execute**.
3. In the next screen, assign the employee to
  - **Personnel area** *DL00 (Dallas)*
  - **Employee group** *I (Active)*
  - **Employee subgroup** *U4 (Salaried employees)*
  - Save your entries and confirm a possible customizing request.

4. In the next dialog, complete all mandatory fields (indicated with the  symbol) as follows:

- <b>Title</b>	<i>Mr. (select male as gender)</i>
- <b>Last name</b>	<i>Test</i>
- <b>First name</b>	<i>Tom-xyyy</i>
- <b>SSN</b>	<b>999-98-xyyy</b>
- <b>Date of Birth</b>	<b>01.01.1980</b>
- <b>Gender</b>	<b>Male</b>
- <i>Save</i> your entries.	
5. On the **Create Organizational assignment** screen, enter

- <b>Business area (Bus. area)</b>	<b>BI00</b>
- <b>Subarea</b>	<b>IT00</b>
- <i>Save</i> .	
6. On the next screen, do not change any entries but click **Continue** only (copy assignment).
7. Skip possible warnings with *Enter*.
8. On the **Create Planned Working Time** screen, enter

- <b>Daily working hours</b>	<b>8</b>
- <b>Weekly workdays</b>	<b>5</b>
9. *Save* the entries note your personnel number proposed by the system on your data sheet! A possible popup *Error messages* can be skipped by clicking on .

#### **Personnel Number:**

10. Leave the dialogue and press *Exit*.

Your employee is now recorded in the system. Next, you need to extend the personnel master record to allow for using time sheets. Thereby, you enter which activities (previously entered activity type **T-xyyy**) are provided by the employee to settle them by using the corresponding prices.

#### **Extend the Personnel Master Record**

Within the SAP Easy Access Menu, choose the following transaction:

**Human Resources → Personnel Management → Administration → HR Master Data → Maintain (PA30)**

1. Enter your previously created **personnel number** into the **Personnel no.** field.
2. Enter **Infotype 0315 (Time Sheet Defaults)** at the bottom of the screen. Press *Enter*.
3. Click the **Create**.
4. Enter the following data:

- <b>Sender Cost Center</b>	<b>NAQM1000</b>
- <b>Activity Type</b>	<b>T-xyyy</b>
- <b>Plant</b>	<b>DL00 (Dallas)</b>

5. Save your entries and leave the view by pressing **Exit**.

With this, you have created all master data required for processing the case study. To recapitulate, you have created:

- a material master record in the logistics functional area
- an activity type and a corresponding price in controlling
- personnel master for the test driver who is supposed to provide special activity expenditures.

Next, we will focus on the project structure.

### 2.2.2 Project Structures

In contrast to previous master data records, PS master data for structuring projects are maintained by using the **Project Builder**, since it can inherently represent the organizational logic of the project.

In the following section we will carry out **project structuring**.

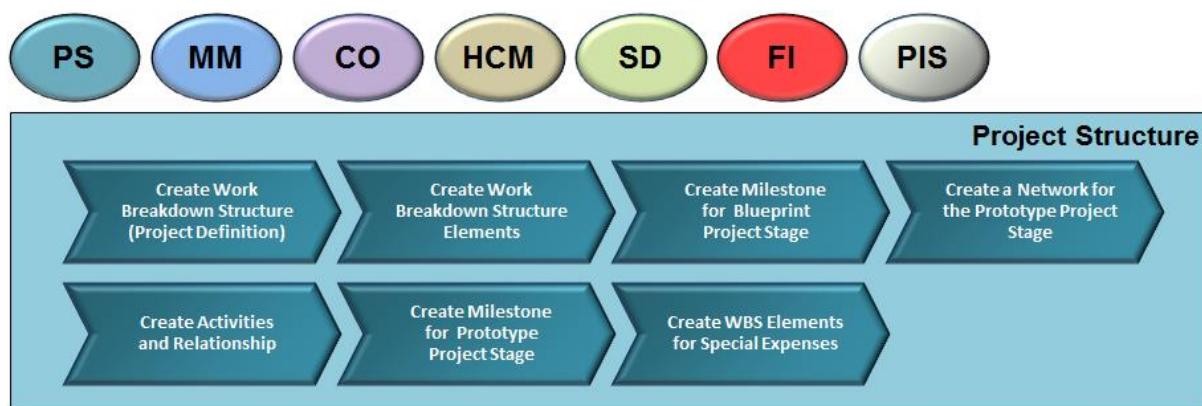


Figure 22: Process Overview: Project Structure

Your project deals with developing a new racing bicycle for your customer. When conceptualizing the project structure, you determine that your project is divided into the **developing and test stages**. The developing stage consists of the project parts **Blueprint** and **Prototype**. Both parts are represented as Work Breakdown Structure. In the Blueprint stage, your engineers are going to produce drawings of the new racing bicycle. You plan 2 weeks for that (milestone 1). The project phase prototype includes the production of a bicycle prototype. This stage is structured into the **Activities Specification** and subsequently, **Construction**. Specification and construction are correspondingly represented in a Network. The duration of phase 2 is derived from the duration of Activities in the Network (milestone 2). Corresponding billing sets are linked with the milestones. When the first milestone is reached, 30% of the customer invoice is recorded. When reaching the second milestone, 70% of the project price is due.

The **test stage** of the project is later billed as special Activity. Therefore, **resource-related billing** is used. Thus, the test phase is not settled using a fixed price but according to testing expenses.

Below, you can see the organization of the project described in this case study.

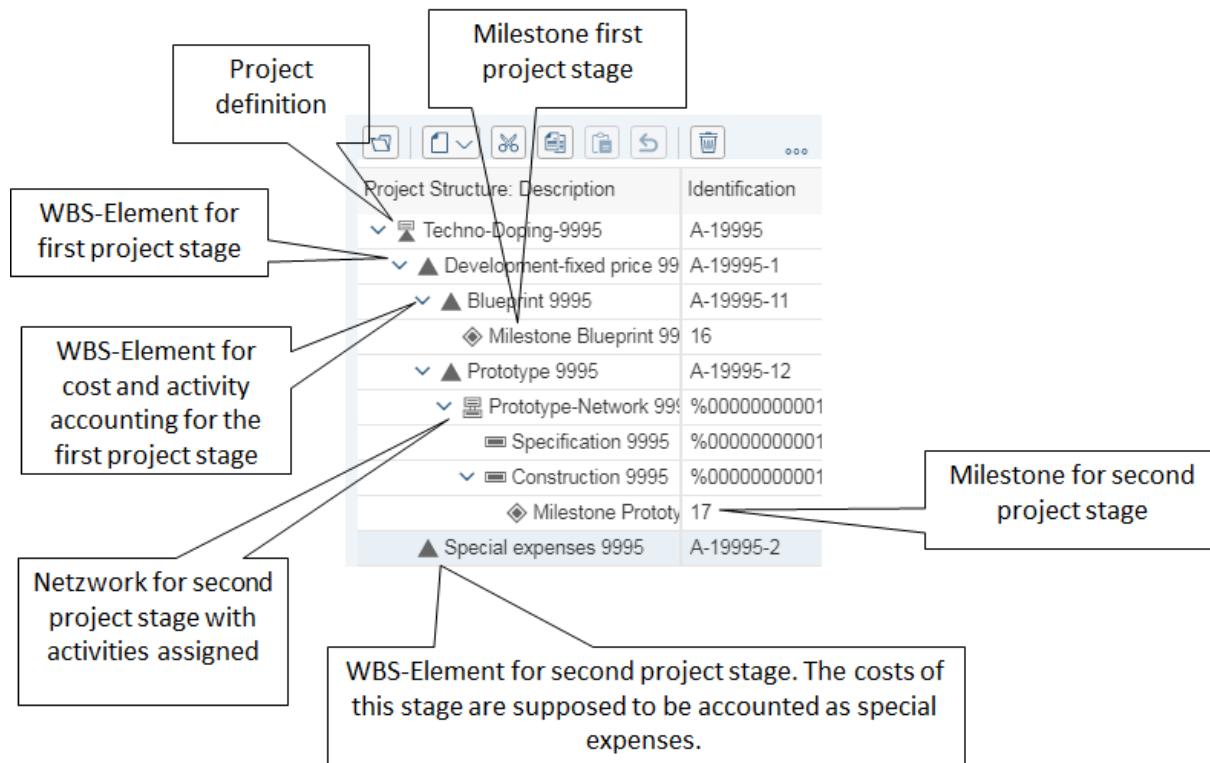


Figure 23: Project Structure: SAP-System-Screenshot

### 2.2.2.1 Create Work Breakdown Structure (Project Definition)

The project definition is the basis of the project. This is your first task. Therefore, scroll down to the tile group **Script 8 – Project System** and select the app **Project Builder**.

1. When calling up the transaction for the first time, a screen appears saying “**Welcome to the Project Builder...**”. Select *Skip this in future* and press *Enter*. Possibly, the **Project Builder: User-specific options** menu appears. Accept the proposed settings with *Continue*.
2. You are now in the **Project Builder**. To create a new project, click the symbol (**Create**) and choose **Project**.

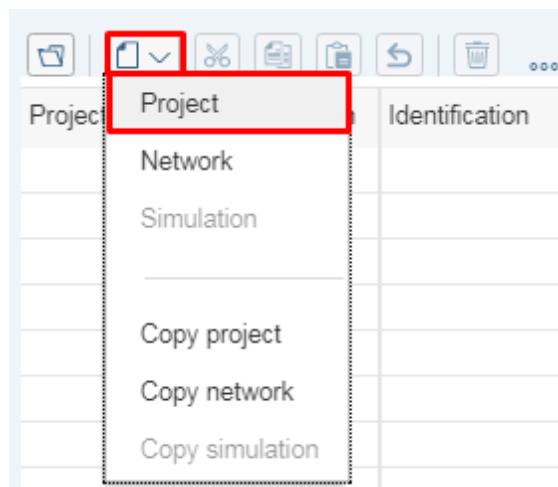


Figure 24: Create new Project: SAP-System-Screenshot

3. In the project header, enter the following data:
 

- <b>Project def.</b>	<b>A-1xxyy</b>
- <b>Text</b>	<b>Techno-Doping-xyyy</b>
- <b>Project Profile</b>	<b>Cost projects (US)</b>
- Press <i>Enter</i> .	
4. Go to the **Basic Data** view on the lower screen. Enter the following data:
 

- <b>CO area</b>	<b>NA00</b>
- <b>Company code</b>	<b>US00</b>
- <b>Business area</b>	<b>BI00</b>
- <b>Plant</b>	<b>DL00</b>

In the **Dates** section set

- |                           |                     |
|---------------------------|---------------------|
| - <b>Factory calendar</b> | <b>US (USA)</b>     |
| - <b>Start date</b>       | <b>Current date</b> |
| - <b>Finish date</b>      | <b>leave empty</b>  |
| - Press <i>Enter</i> .    |                     |



*If you receive a notification concerning the date, e.g., the date is not a working day, skip the message with Enter.*

**CAUTION**

**Work Breakdown Structure is the top-level element of the project definition**

The screenshot shows the SAP Project Definition screen. Key elements include:

- Identification and view selection:** Shows Project def.: A-19995 and Techno-Doping-9995.
- Basic Data:** Status: System Status: CRTD, Project status = Created.
- Project coding mask:** Screen: A-00000-XX-XX-XX-XX, Mask ID: [ ].
- Responsibilities:** Pers. Resp. No.: [ ].
- Organization:** CO area: NA00, Company code: US00, Business area: BI00, Plant: DL00.
- Dates:** Start date: 12.11.2017, Finish date: [ ] (highlighted with a red box), Factory Calend.: US, Time unit: DAY.
- Project structure overview:** A red box highlights the 'Project structure overview' button in the toolbar.
- Project structure elements (templates):** A red box highlights the 'Project structure elements (templates)' button in the toolbar.
- Key dates and factory calendar:** A red box highlights the 'Key dates and factory calendar' field in the Dates section.
- Organizational Units involved:** A red box highlights the 'Organizational Units involved' section under Organization.

Figure 25: Project Definition: SAP-System-Screenshot

5. In the **Control** tab, choose the following options:
- **Sched. scenario**      *Bottom-up scenario (pre-defined)*
  - **Plan. meth/basic**      *Bottom-up (taking dates of higher-level WBS into account)*
  - **Plan. meth/fcst**      *Bottom-up (taking dates of higher-level WBS into account)*

Our project consists of two phases. In the first stage, the research team is supposed to develop technical plans and the prototype (**development**). The second stage focuses on testing the prototype (**test**).

### 2.2.2.2 Create Work Breakdown Structure Elements

You use **Work Breakdown Structure Element** to further detail your project definition.

#### 2.2.2.2.1 Create a WBS Element for the Development Project Stage

Create the first **Work Breakdown Structure Element** (WBS Element). This Element is for the development stage.

1. This WBS Element is created for milestone billing. Right-click your project definition **A-1xyyy** and select **Create → WBS element**.

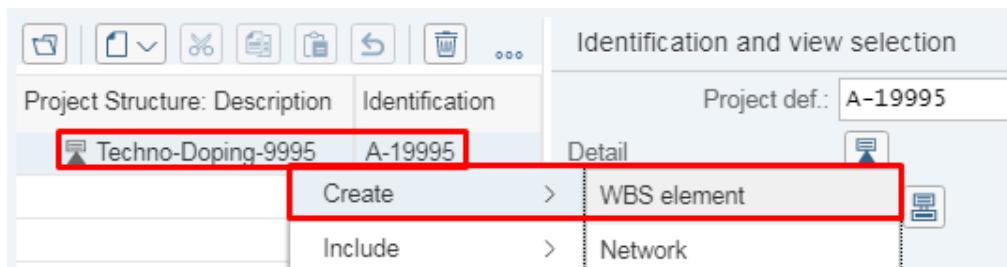


Figure 26: WBS Element Development (1): SAP-System-Screenshot

2. Select **A-1xyyy-1** (make sure that a minus (-) before the last digit is available) as name for the **WBS element** on the right screen.
3. Enter the text **Development-fixed price xyyy** into the field right next to it.
4. In the **Basic Data** tab, select the additional options:
  - **Billing Element**
  - **Acct asst elem (Account Assignment Element)**
  - **Planning Element**
  - **Proj. summarization**
 - Press **Enter** and the system will display the new Element in the project structure on the upper left screen.

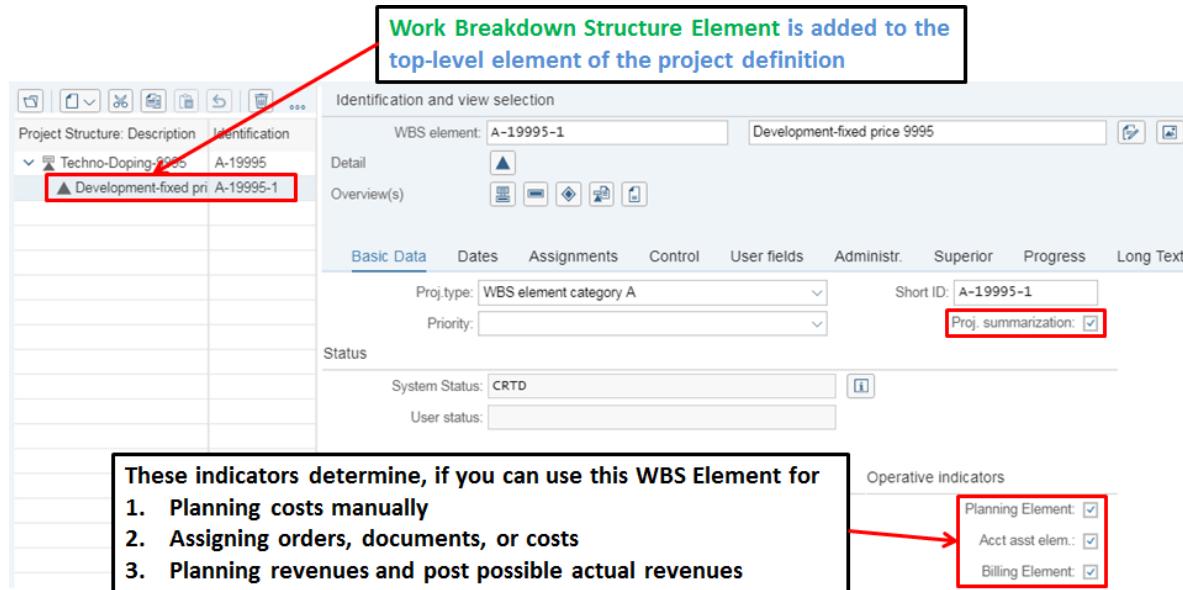


Figure 27: WBS Element Development (2): SAP-System-Screenshot

#### 2.2.2.2 Create a WBS Element for the Blueprint Project Stage

The project part (development-fixed prices) consists of two project stages. You have to create a WBS Element for each stage. Commence with the Element for the **project stage Blueprint**.

1. Right-click the just created element **Development-fixed price xyyy (A-1xyyy-1)** and select **Create → WBS element**.
2. The system assigns the entry **A-1xyyy-11** as **project definition**.
3. Right next to this, enter the text **Blueprint xyyy** and confirm with *Enter*.
4. The Element is included in the project structure on the left hand side.
5. In the **Basic data** tab, select the additional options:
  - **Billing Element**
  - **Acct asst elem (Account Assignment Element)**
  - **Planning Element**
  - **Proj. summarization**
6. Confirm with *Enter*.

#### 2.2.2.3 Create a WBS Element for the Prototype Project Stage

Create another WBS Element for the **project stage Prototype**.

1. Once again, right-click the element **Development-fixed price xyyy (A-1xyyy-1)** and select **Create → WBS element**.
2. The system assigns the entry **A-1xyyy-12** as **project definition**.
3. Right next to this, enter the text **Prototype xyyy** and confirm with *Enter*.
4. The Element is again included in the project structure on the left hand side.
5. In the **Basic data** tab, select the additional options:
  - **Billing Element**
  - **Acct asst elem (Account Assignment Element)**
  - **Planning Element**
  - **Proj. summarization**
6. Confirm with *Enter*.
7. The following figure displays how your project structure should look like this far.

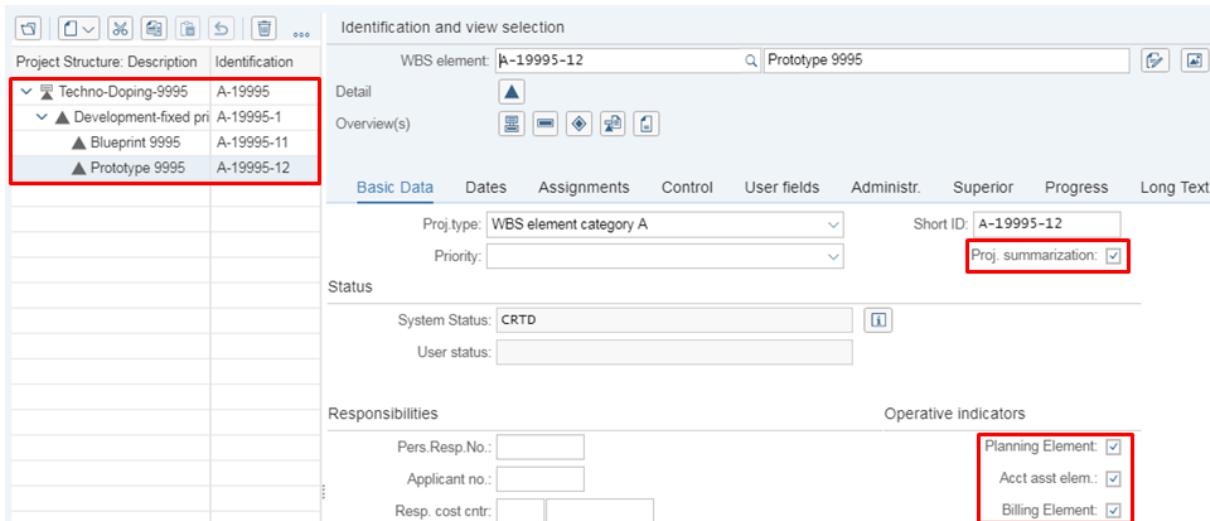


Figure 28: Add Lower-Level WBS Elements: SAP-System-Screenshot

### 2.2.2.3 Create a Milestone for the Blueprint Project Stage

You have to create a milestone for the Blueprint project stage.

1. Right-click the just created **WBS Element A-1xxyy-11 Blueprint** and select **Create → Milestone**.
2. Enter the **text Milestone Blueprint xyy**.
3. Enter **00003** into the **Usage** field.
4. Set the **Sales doc. date** flag.
5. Choose a percentage of value to be invoiced (**InvoicePercentg**) of **30%**.
6. Confirm with **Enter**. The system automatically assigns a **milestone number** for unique identification.

Write down the Milestone ID on your datasheet.

#### Milestone Blueprint:

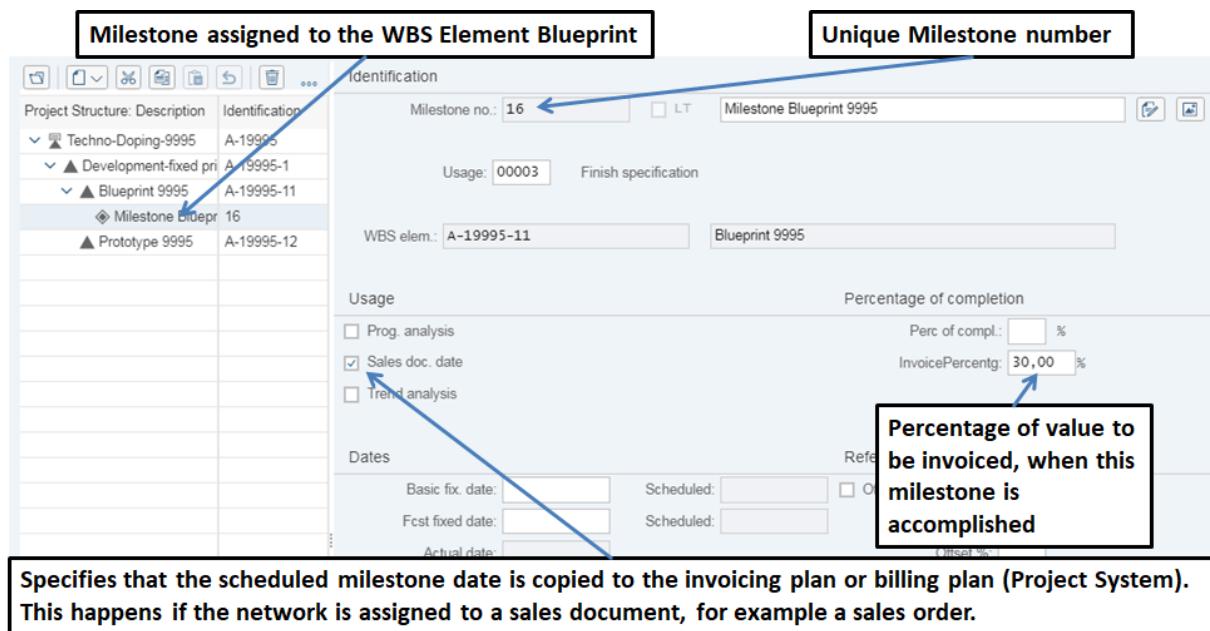


Figure 29: Assign Milestone: SAP-System-Screenshot

### 2.2.2.4 Create a Network for the Prototype Project Stage

The prototype stage contains two related Activities. Firstly, create the Network.

1. Right-click the WBS Element for the project stage **Prototype** and select **Create → Network** to add the Network to this project stage.
2. Right behind the Network field, enter the long text **Prototype-Network xyyy**.
3. In the **Control** tab, enter **PS02** into the **Network type** field and confirm with *Enter*.
4. The Network is added to the project structure on the left upper screen.
5. In the **Scheduling** tab maintain
 

<ul style="list-style-type: none"> <li>- <b>Start Date</b></li> <li>- <b>End Date</b></li> <li>- <b>Scheduling type</b></li> <li>- <b>Schedule automat.</b></li> <li>- <b>Capacity requirements</b></li> <li>- <b>Exact break times</b></li> </ul>	<i>the current date + 14 days</i> <i>delete any entry</i> <i>Forwards</i> <i>deselect</i> <i>deselect</i> <i>deselect</i> Confirm with <i>Enter</i> .
--	---

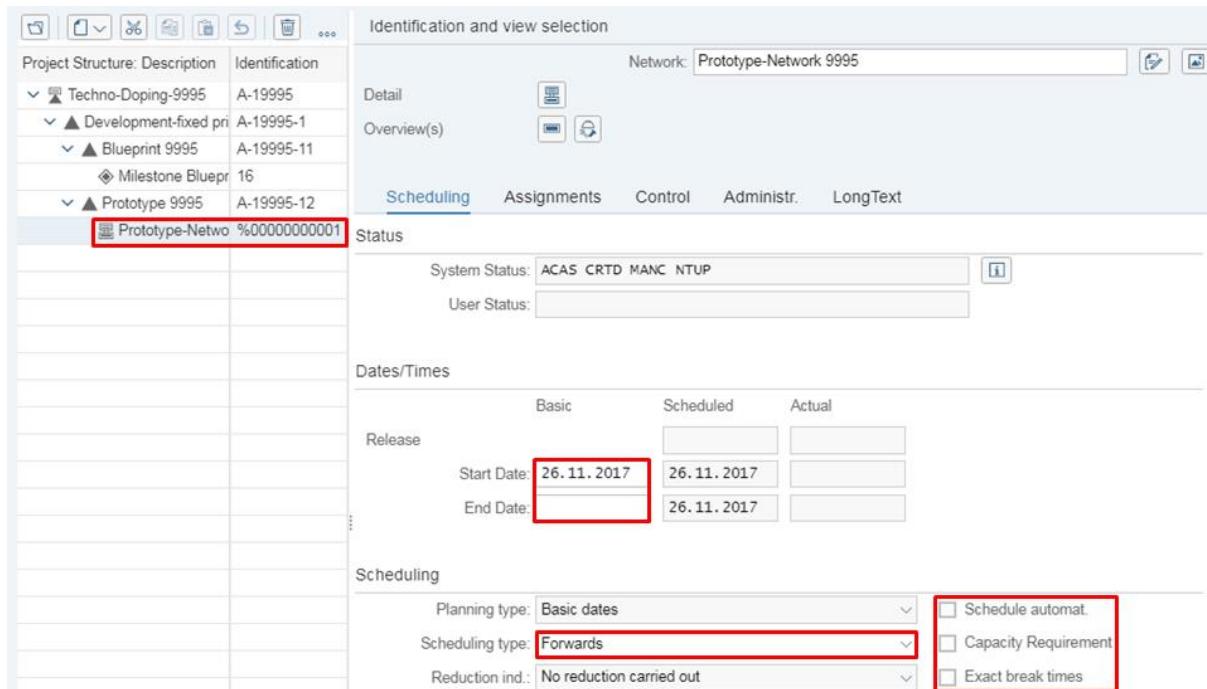


Figure 30: Create Network: SAP-System-Screenshot

### 2.2.2.5 Create Activities and Relationship

The prototype stage contains two related Activities. Now create two Activities within the Network and link them with each other by using a relationship. Thereby, the Specification is supposed to be finished first, before the Construction begins.

#### 2.2.2.5.1 Create an Activity for Specification

Now, create the Activity for the specification.

1. Right-click your network **Prototype-Network xyyy** and select **Create → Activity (internal)** to add the Activity to this Network.

2. As description, enter the text **Specification** *xxxx*.
3. Select the option **Project Sum**.
4. Confirm with *Enter*.

### 2.2.2.5.2 Create an Activity for Construction

Next, create the construction Activity.

1. Right-click your network **Prototype-Network** *xxxx* and select **Create → Activity (internal)** to add the Activity to this Network.
2. As description, enter the long text **Construction** *xxxx*.
3. Select the option **Project Sum**.
4. Confirm with *Enter*.

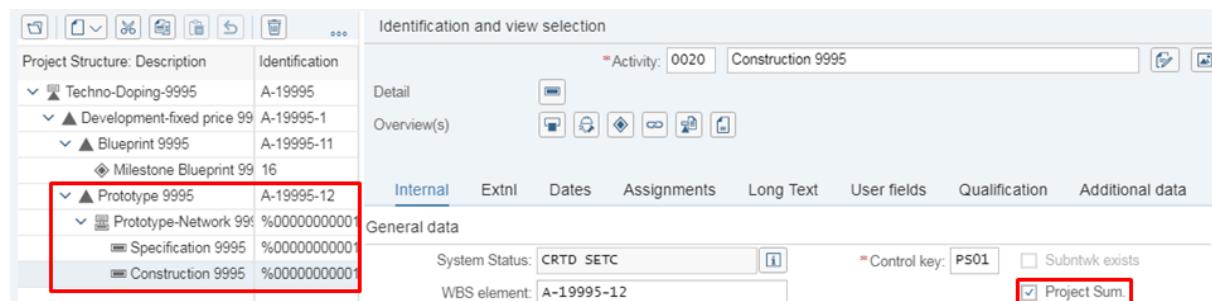


Figure 31: Create Activities: SAP-System-Screenshot

### 2.2.2.5.3 Create a Relationship between the Activities

Now, create a Relationship between the two Activities.

1. Double-click on the Activity **Construction** in the left upper frame.
2. Choose the button.

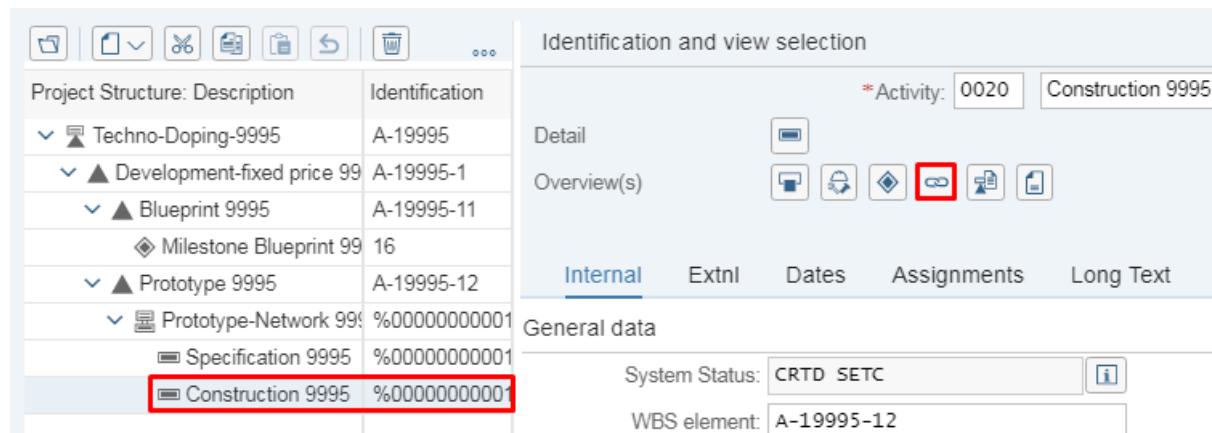


Figure 32: Create Relationship (1): SAP-System-Screenshot

3. In the **Relationships** area, click into the first field of the **Act.** column. Choose the F4 help and double click the only proposal **0010 (Specification)**.
4. In the column **Type (Ty.)**, make sure the entry **FS** is selected.
5. Confirm with *Enter*.
6. Hereby, the Activity **Specification** is determined as predecessor of the **Construction Activity**.

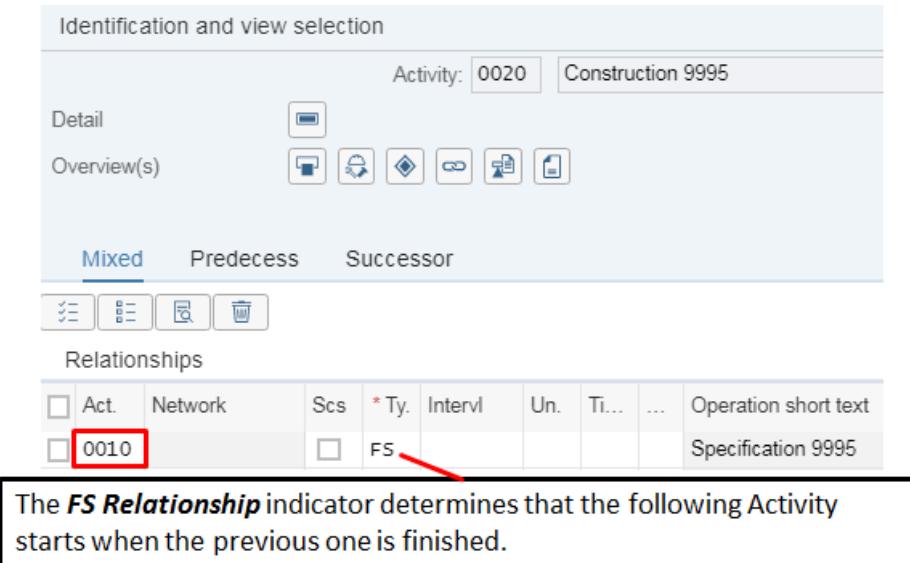


Figure 33: Create Relationship: SAP-System-Screenshot

#### 2.2.2.6 Create a Milestone for the Prototype Project Stage

You have to create a milestone for the Prototype project stage as well.

1. Right-click your **Activity Construction** and select **Create → Milestone**.
2. Enter the **long text Milestone Prototype xyyy**.
3. On the lower screen, enter **00006** into the **Usage** field.
4. Select **Sales document date** and **Milestone functions** flags and choose an **InvoicePercentg of 70%**. Confirm with **Enter**.

Write down the Milestone ID on your datasheet.

#### Milestone Prototype:

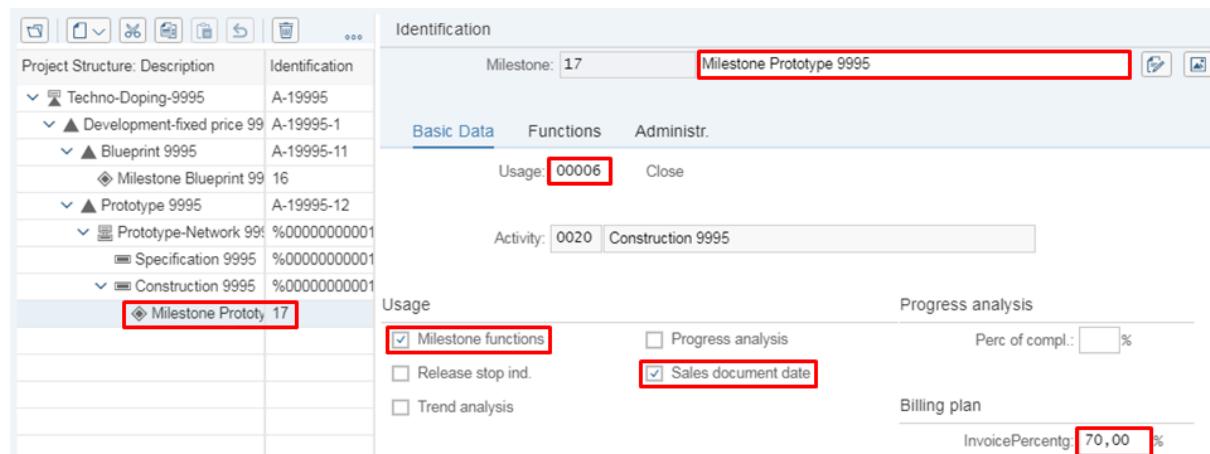


Figure 34: Create Milestone Prototype: SAP-System-Screenshot

#### 2.2.2.7 Create a WBS Element for Special Expenses

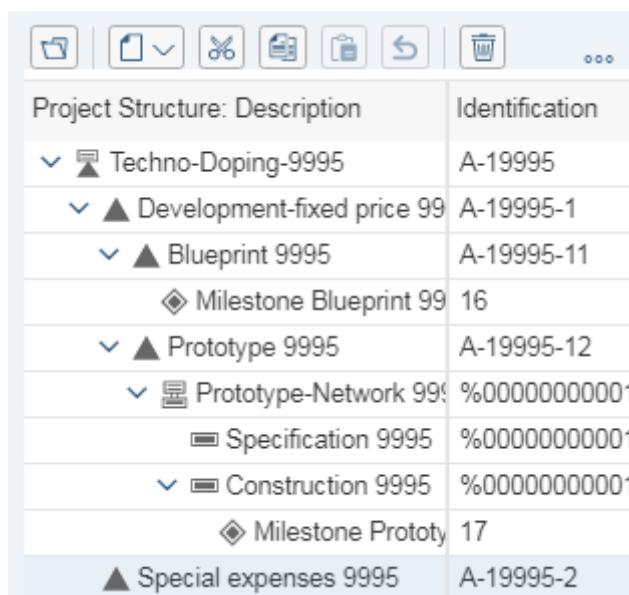
For the occurring **special expenses**, i.e., additional activities that need to be provided for the customer, you need to create another WBS Element to allow for billing later.

1. Right-click the firstly created element **Techno-Doping-xyyy (A-1xyyy)** and select **Create → WBS element**.

2. Assigns the name **A-1xyyy-2** (make sure that a minus (**-**) before the last digit is available) as **WBS Element ID**.
3. Right next to this, enter the text **Special expenses xyyy**.
4. On the **Basic Data** tab, select the options:
  - **Proj. summarization**
  - **Billing Element**
  - **Acct. asst. elem.**
  - Confirm with *Enter*.

**For comparison:**

The following figure displays how your project should look like now.



The screenshot shows a SAP Project Builder interface with a toolbar at the top containing icons for search, filter, cut, copy, paste, undo, redo, and delete, followed by an ellipsis. Below the toolbar is a table titled 'Project Structure: Description' with two columns: 'Description' and 'Identification'. The table lists the following hierarchy:

Description	Identification
Techno-Doping-9995	A-19995
Development-fixed price 99	A-19995-1
Blueprint 9995	A-19995-11
Milestone Blueprint 99	16
Prototype 9995	A-19995-12
Prototype-Network 99	%000000000001
Specification 9995	%000000000001
Construction 9995	%000000000001
Milestone Prototype	17
Special expenses 9995	A-19995-2

Figure 35: Project Definition in the Project Builder: SAP-System-Screenshot

5. Save your project and leave the Project Builder by pressing **Exit**.

Thus, representing the project structure is completed. We will now focus on project planning.

### 3 Project Management with the Project System

The following section deals with the activities performed during planning and execution of projects using the SAP Project System (SAP PS).

#### 3.1 Theory: Project Planning with the Project System



**THEORY**

After representing the project by using a Work Breakdown Structure and/or a Network, you can use different functions in the SAP project system to plan dates, anticipate costs and possible revenues, plan internal or external procured resources or materials and ensure availability on schedule prior to project execution.

The SAP PS application provides several options for planning different project-related facets. This includes:

- Dates (Scheduling)
- Resources
- Materials
- Costs and Budgets
- Revenues and Payments

The main tools used for planning purposes are the Project Builder or the Project Planning Board.

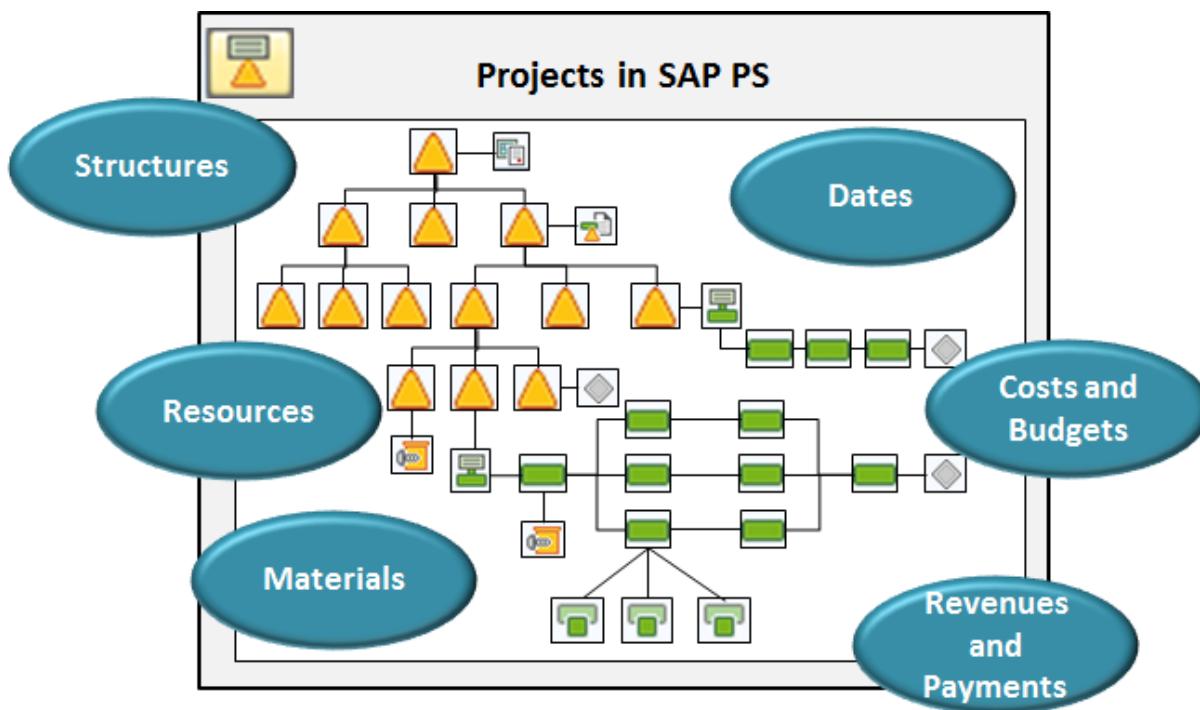


Figure 36: Aspects of Planning

##### 3.1.1 Planning Dates (Scheduling)

Scheduling (planning dates) of projects or project parts is a crucial aspect of project planning. For example, capacity planning requires previous scheduling. In addition, cost planning using Easy Cost Planning or using Network Costing refers to scheduled project dates.

You can use the Project Planning Board as well as the Project Builder to schedule projects. There are different functions available for project scheduling, depending on whether Work Breakdown Structures or Networks (or both) are used to map a project.

### 3.1.1.1 Scheduling with WBS Elements

In the project definition, you can schedule dates and enter key dates for individual WBS Elements. Already when creating a project, you can determine **planned start** and **end dates** of a project. However, generally, this is done in the **rough-cut planning** phase. Thereby, the corresponding planned start and end dates are entered in the detail screen of the WBS Elements in the Project Builder and serve as basis and binding dates for the subsequent detailed planning.

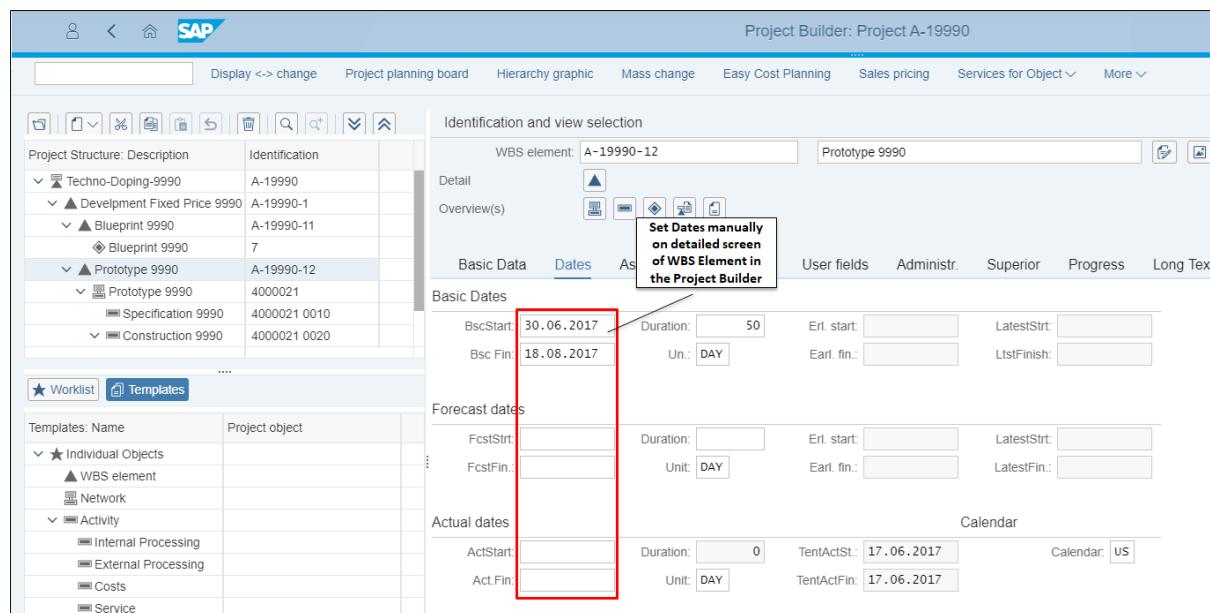


Figure 37: Scheduling with WBS Elements in the Project Builder: SAP-System-Screenshot

You can then plan the dates in the Project Planning Board by using the table or graphic display. Here the rough-cut plan is used as a basis for detailed planning or scheduling with Networks, as long as Networks are used in the project definition.

Using several scheduling functions, you can later compare, coordinate or calculate dates. For example, if a date changes for a WBS Element in detailed planning, the system issues only a warning in case of dates that are out of the date range of the project definition. Moreover, date changes do not automatically result in changes to planned dates of other WBS Elements because there are no Relationships between WBS Elements.

If required, dates scheduled in the WBS can be inherited or extrapolated in the project definition. Dates are always inherited top-down, i.e., from the highest WBS Element downwards and extrapolation is carried out bottom-up. Dates can also be adjusted (overwritten) manually in the WBS Elements if necessary.

You can check the consistency of your scheduling data within the WBS structure.

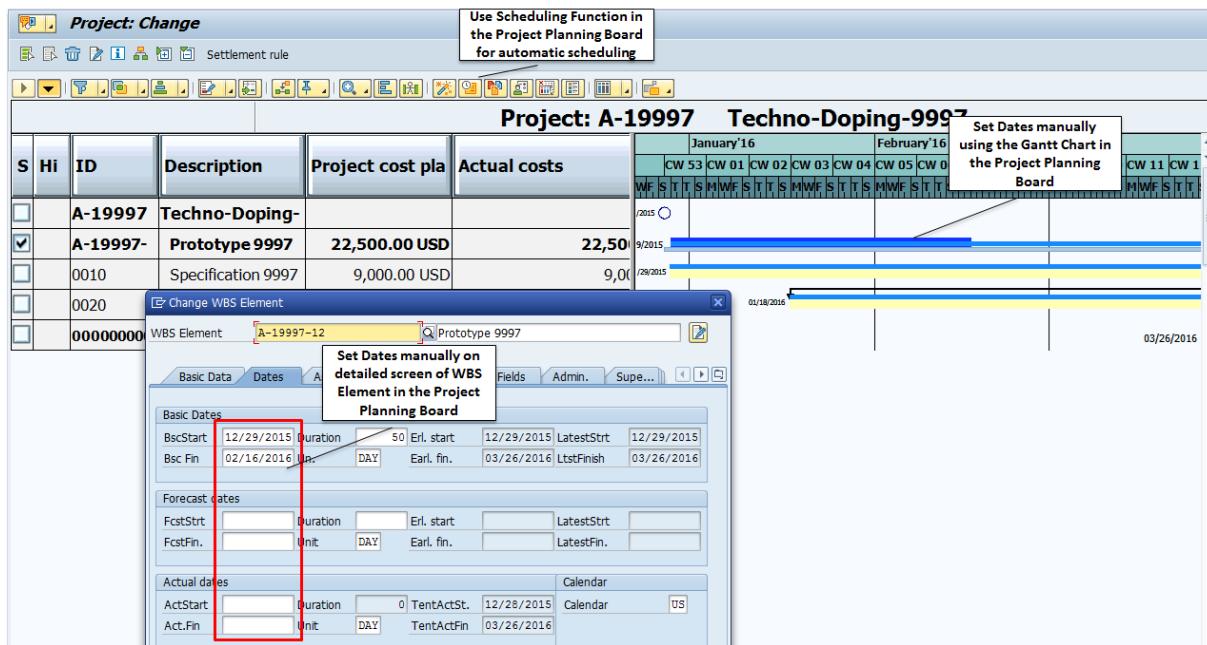


Figure 38: Scheduling with WBS Elements in the Project Planning Board: SAP-System-Screenshot



NOTE

Since Fiori UX only uses the non-native Project Builder App, the Project Planning Board is not available in Fiori UX, yet. To use this graphic and the full potential of the Project Builder, you still need to work with the classic SAP GUI.

### 3.1.1.2 Scheduling with Networks

While plan dates for WBS Elements can also be entered manually by inheriting or extrapolating, plan dates of Activities in Networks are generally calculated automatically by the system. This form of planning dates in Networks is referred to as *scheduling*. That is, for projects, which use Networks, the Network Activities can be used to schedule dates automatically. Thereby, scheduled dates (or earliest and latest dates for Activities) are determined automatically when Network Activities are scheduled. Scheduled dates are determined for WBS elements by summarizing the scheduling data of the corresponding Activities

The planned dates for networks, activities, and activity elements are referred to as basic dates. You can maintain the following three sets of dates for network activities:

- Basic dates
- Actual dates
- Forecast dates

You can either enter dates manually or, in case of basic dates and forecast dates, schedule them automatically. If you want to schedule dates for networks and its sub-elements, you need to enter activity durations and define relationships between the activities.

The following options are available in the Project Builder (and Project Planning Board):

- **Network plan scheduling:** In network plan scheduling, exactly one Network is scheduled. All Activities of the Network are selected and their dates are determined.
- **Overall scheduling:** In overall scheduling, several Networks are scheduled at the same time. Therefore, the individual Networks must be linked via relations. All Activities of the Networks involved are scheduled.
- **WBS scheduling:** In WBS scheduling, one or multiple WBS Element or the entire project are selected, and scheduling is initiated. The system selects all Activities for scheduling assigned to the selected WBS Elements and calculates their dates.

Networks are always scheduled forwards and backwards. The scheduling parameters determine how scheduling is carried out. In Customizing, you can configure the appropriate scheduling parameters or use predefined scheduling scenarios. In the scheduling parameters, the scheduling type specifies the direction in which you begin scheduling. There are two principles available for scheduling: Dates can be determined by using **forward scheduling** or **backward scheduling**.

- In **forward scheduling**, the system considers Activities that do not have any predecessors anymore. Based on their start dates and the Activity durations, the earliest start dates for all Activities involved are calculated. Forward scheduling determines the **earliest starting point** for Activities.
- Contrastingly, in **backward scheduling** Activities are selected that do not have any successors anymore and using end dates and Activity durations, the latest end dates for all Activities involved are calculated. Thus, backward scheduling determines the **latest starting point** of Activities.

The difference between the earliest and the latest date of an Activity is referred to as a float. A float can be zero or negative. If the float is negative, the activity is critical.

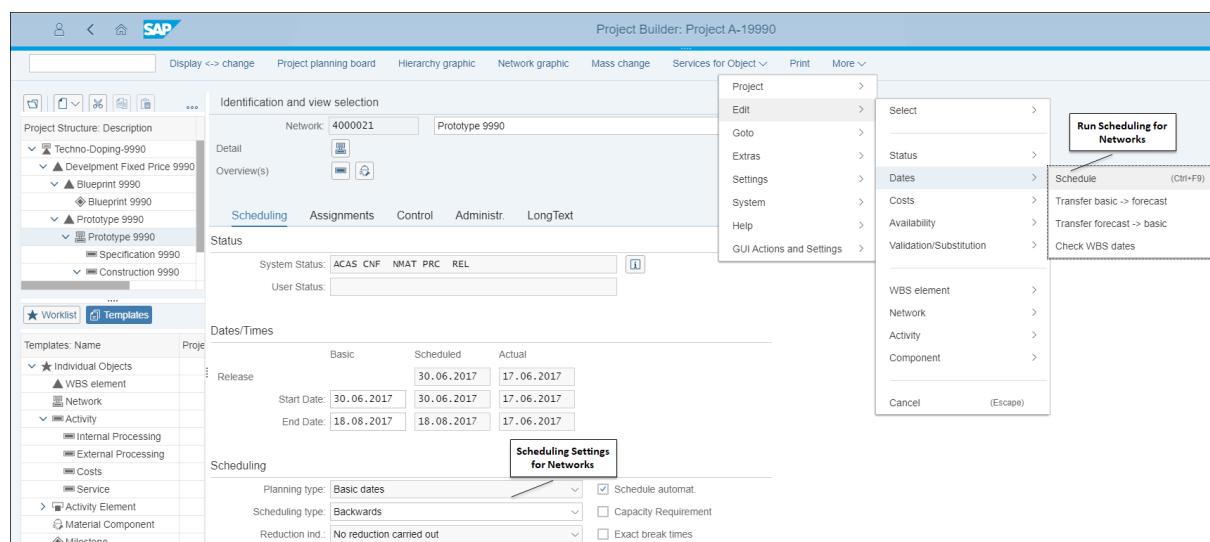


Figure 39: Scheduling with Networks in the Project Builder: SAP-System-Screenshot

**NOTE**

*Progress Tracking which is a function available as of SAP ERP 6.0 EhP3 enables you to closely monitor the progress of Network components in the Project System and purchase orders in Materials Management, by tracking events that you have defined in Customizing for Progress Tracking or in the Progress Tracking function itself. For processing dates that are directly assigned to Activities, time events can be created and assigned to Activities. For example, you could create, draft, review, and specify events and assign them to the first Activity. You can add dates and texts for these events. The traffic lights indicate whether these events comply with the planned dates.*

### 3.1.2 Planning Resource

When representing a project with a Work Breakdown Structure, you can plan costs for internal and external resources and later, for example, assign costs for activity allocations, purchase requisitions, goods receipts and inspections to WBS Elements and, thus, costs for resource consumption can be posted to the project directly.

Resource planning in terms of capacity planning or automatic data transfer between project structures and purchasing documents is only possible in the project system when using Networks. Manual cost planning for the required resources and manual allocation of purchasing documents on WBS Element-level is not necessary when using Networks. Correspondingly, we will focus on capacity planning by using Networks in the subsequent sections.

You can use the corresponding Activities in the Network for planning resources required for a project. In the Project System, there are the following resources that you are already familiar with:

- **Internally Processed Activities** are used to describe tasks that are performed by company-internal resources. Thus, they determine activities that are provided by the output of machines and/or personnel within the company. Therefore, work centers that perform this work are entered in the Activity. This allows evaluating capacity requirements for work centers and leveling capacities using the Project Planning Board. In addition, the Project Planning Board can be used to distribute the work among employees (workforce planning).
- **Externally Processed Activities** are used to describe tasks that are performed by company-external resources. Thus, they determine activities (services) that are provided by the output of entities outside the company. Using this type of Activity, you can plan external processing or service activities that are realized by generating purchase requisitions in Purchasing (e.g., when the Activity is released). The purchasing department then procures the required services from an external source.
- **Service Activities** are used for *externally procured activities* as well. In contrast to *Externally Processed Activities*, Service Activities allow drawing up service specifications and set value limits for any unplanned services. Again, the purchasing department carries out service processing and the entry and acceptance of the services performed.

### 3.1.2.1 Internal Processing

To plan capacities for a project and to be able to calculate costs for Activities, you need to maintain work data (**work**, **work center**, **duration**, **activity type**) for an Activity. You have to enter the amount of work involved and the work center at which the work is performed. Using work centers is a prerequisite for capacity planning with Networks.

The **work** determines the output to be provided by machines or personnel for the execution of Activities. The **work center** is the location at which these Activities are carried out or the work output is produced, respectively. As you already know from the *Design-to-Operate* teaching unit, work centers contain costing data (planned prices for activity types), which allow determining the costs for performing Activities.

In addition, work centers contain scheduling and capacity data required for scheduling and capacity planning. You can determine work center capacities for the Activities and if necessary, use the Project Planning Board or the Capacity Planning Tables to level capacities. You can also distribute the work among employees (workforce planning).

When an Activity is confirmed (later on during project execution), activities provided by the work center are consumed (and capacity requirements are reduced) and actual dates as well as actual costs are updated on the project.

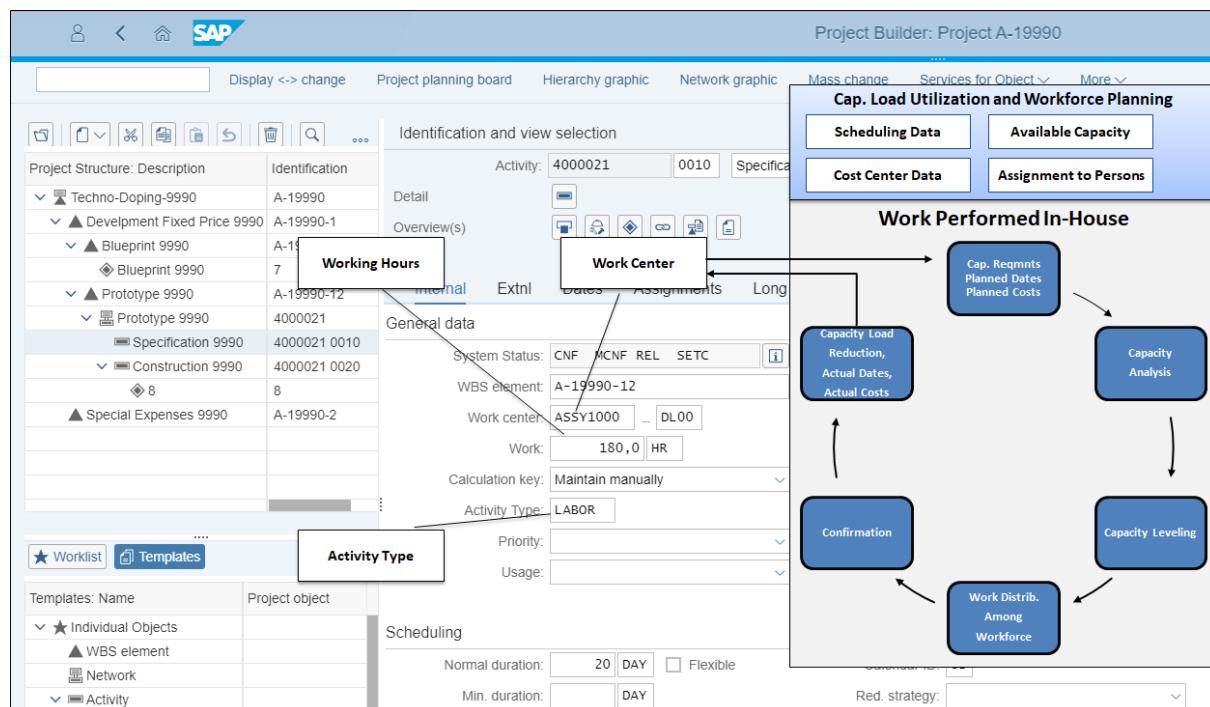


Figure 40: Internally Processed Activity: SAP-System-Screenshot

### 3.1.2.2 External Processing

Activities and Activity Elements in a Network can be created as Externally Processed Activities or Externally Processed Activity Elements. For instance, you could outsource the design or construction of a machine to a construction office. In this case, the External Processed Activity creates a purchase requisition in SAP MM, which is then further processed by the purchasing department. The system can access data from purchasing for external processing (e.g., purchasing info record containing prices and delivery times for external processing).

You use the control key to determine whether an activity is externally processed or not.

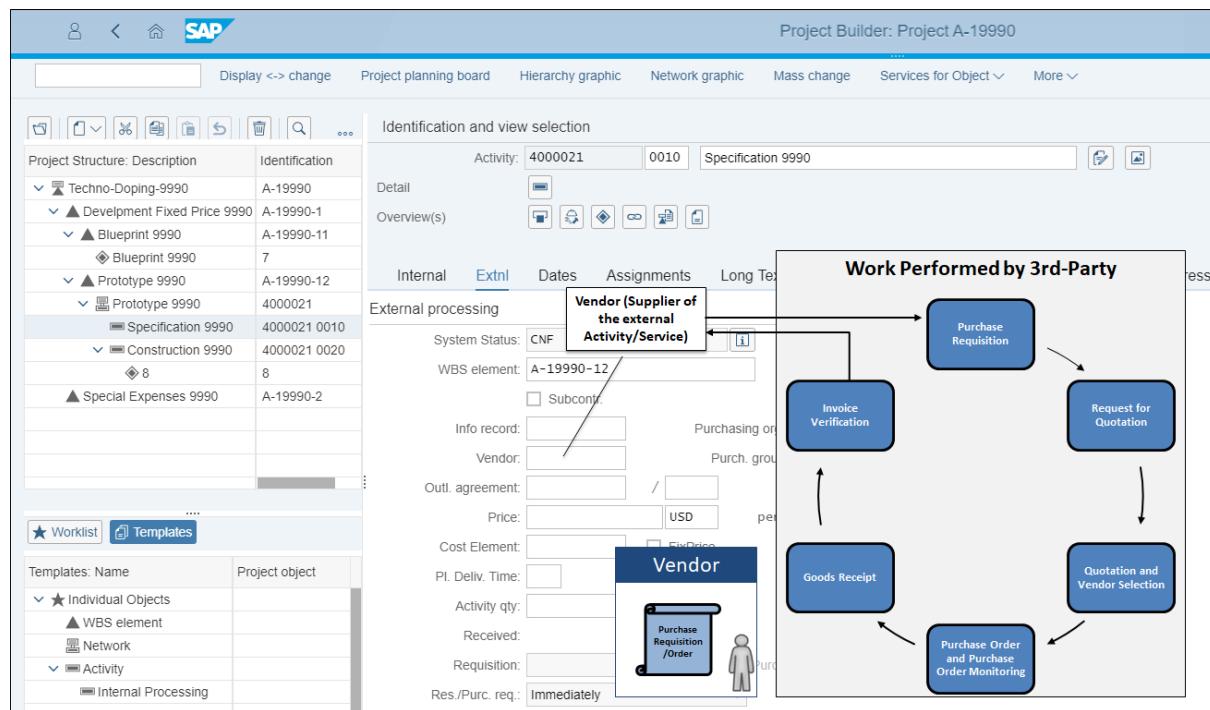


Figure 41: Externally Processed Activity: SAP-System-Screenshot

A **Service Activity** triggers a similar purchasing process as an Externally Processed Activity. However, it can also contain a hierarchy of planned services that are supposed to be purchased from a vendor, and value limits for unplanned services. In contrast to the purchasing process of a regular material, service purchasing does not have a goods receipt. Instead, a services receipt is processed using a *service entry sheet*. This process consists of two steps:

- Entry of services performed
- Acceptance of services performed.

### 3.1.2.3 Materials in the Project

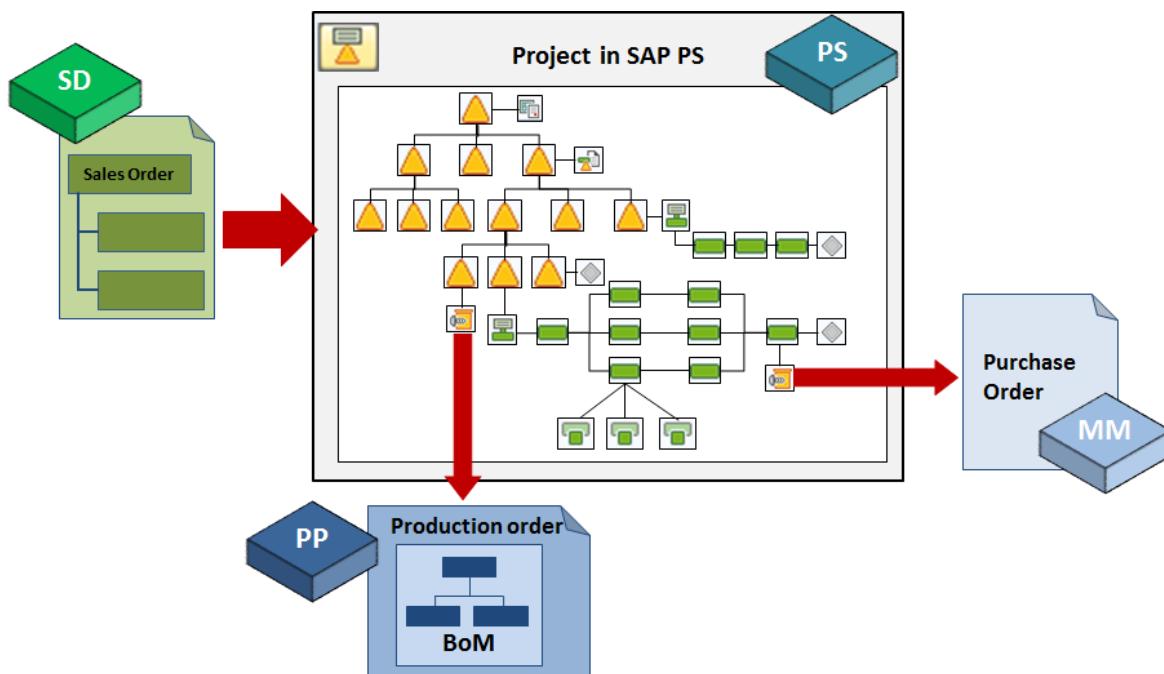
Materials are often required for the execution of projects. In the project planning phase the procurement, consumption and delivery of materials required for project execution can be planned. The **Material** element in SAP PS depicts the link of the Project System (PS) to Sales and Distribution (SD), Material Management (MM) and Production Planning (PP) and allows assigning materials to the project structure.

Material requirements are planned in a project by assigning **Material** components to Activities. They then form the basis for procurement (in-house production or external procurement).

If a Material is assigned to a WBS Element, costs for procured materials can be planned and several documents such as material reservations, purchase requisitions, orders, goods issues, and goods receipts can be assigned to the WBS Element.

An integrated material planning featuring an automatic data transfer between a project and purchasing, or production is only available when Networks (Activities) are used. Here, you plan material requirements by assigning Material components to an Activity. This can be done manually, or you can use the BOM-PS interface to assign BOM components automatically to

an Activity.



**Figure 42: Material in the Project**

When planning material requirements for a project a distinction is made between stock and non-stock items.

### Stock Items

The item category **L (stock item)** is used for materials that are kept in stock (warehouse, project, or sales order stock). The project creates reservations for stock items.

**Independent requirements** (finished goods, assemblies, trading goods, and spare parts) trigger requirements planning in SAP MM, which determines order quantities and dates and schedules the corresponding procurement documents to cover these requirements. Procurement documents include planned orders for production (are converted into production orders) and purchase requisitions (are converted into purchasing orders) for externally procured materials. In addition, **dependent requirements** for materials produced in-house are determined by exploding the bill of material of the independent requirement materials. You can create planned orders at each BOM level to cover requirements when a material shortage occurs.

### Non-stock Items

The item category **N (non-stock item)** is used for components that are not procured for stock (warehouse stock, project stock, or sales order stock), but are procured directly by the Network Activity for consumption.

For non-stock materials that are assigned to a project, purchase requisitions are created and directly passed to Purchasing. Upon goods receipt, the materials are not placed into stock but posted to the Activity and directly consumed.

### 3.1.3 Planning Costs

SAP Project Systems provides different methods for planning costs in a project. These methods can be distinguished into manual and automatic cost planning methods as well as the Easy Cost Planning.

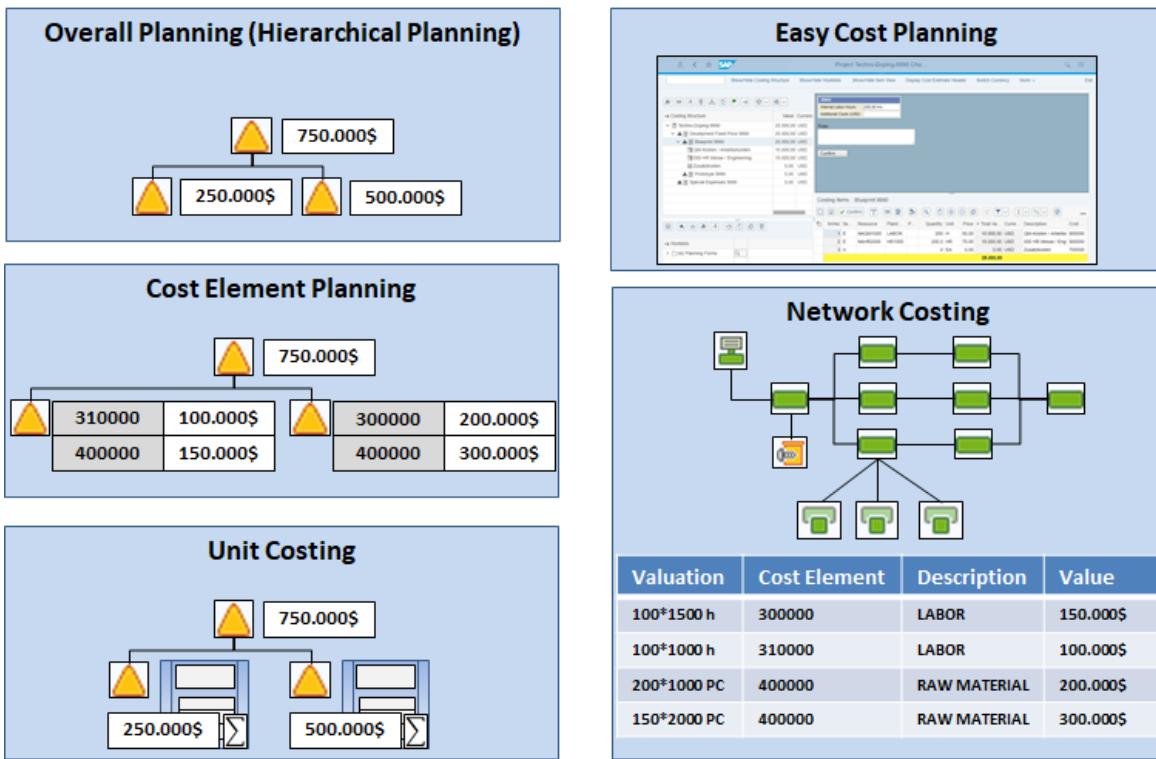


Figure 43: Cost Planning in an SAP PS Project

#### 3.1.3.1 Manual Cost Planning

When using only Work Breakdown Structures for representing projects, costs must be planned manually on WBS Element level for the subsequent execution of the individual project parts. Cost planning in WBS Elements includes:

- **Hierarchical Planning (Overall planning):** *Hierarchical planning* (also referred to as structure-oriented planning) is the roughest form. You can enter costs for each WBS Element. If desired, you can split costs according to fiscal year.
- **Detail Planning:** *Detail planning* of primary costs and activity inputs is a cost element based and period-based way of planning.
- **Unit Costing:** In *unit costing*, a profile for entering quantities (materials, internal processes, external processes, variable items, etc.) is used for each WBS Element. This form of planning is cost element based.

#### 3.1.3.2 Easy Cost Planning

As of release 4.6C, the SAP system provides an easy-to-use tool for period-specific cost planning by cost element in a quantity structure on the level of WBS Elements. This tool is called **Easy Cost Planning** and can be executed from the Project Builder by pressing the Easy Cost Planning button ( ).

The application of Easy Cost Planning and correspondingly, planning costs for projects, is facilitated particularly by using ***planning templates*** for entering costing items. The planning templates can be based on SAP standard (best practice solutions) or on projects completed in the past. The idea behind Easy Cost Planning is to use the cost structure of an already completed project (or a SAP best practice solution), which can be compared to your current project in order to estimate costs for the new project.

For instance, you have a template of the cost structure (used activity types, work centers, resources, etc.) of a software project. Now you want to estimate costs for a new software project. You use the template to estimate the costs for the new project. You only need to enter the amounts such as work hours, employees, material amounts used, etc. The rest is calculated by using the costing data available from the template.

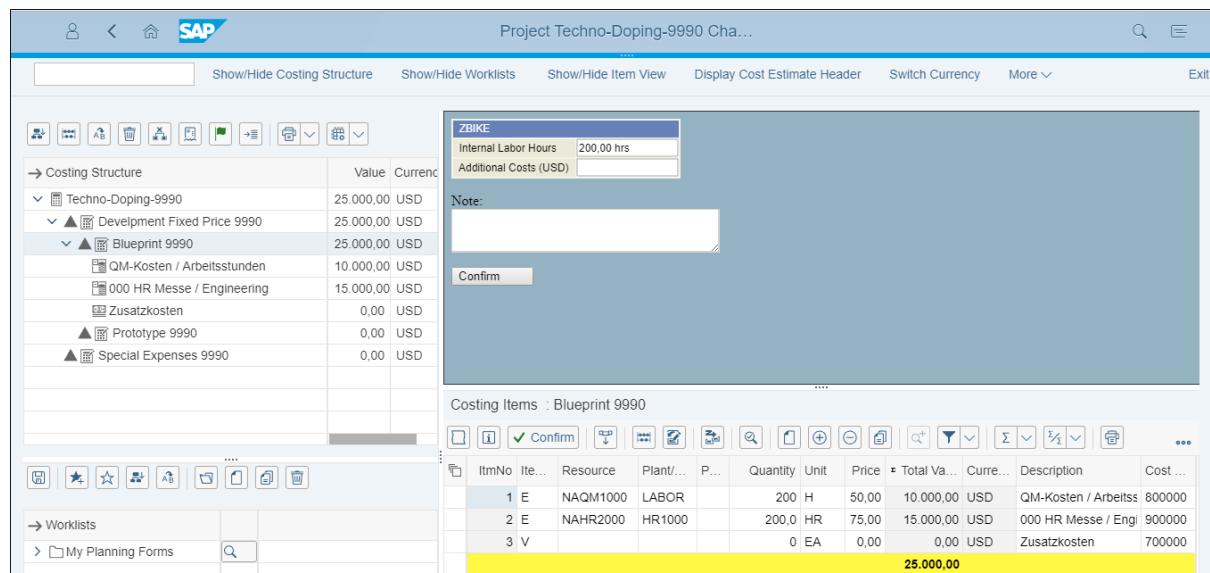


Figure 44: Easy Cost Planning: SAP-System-Screenshot

The example shows *work in hours* being valued at 75\$. The cost planner only enters the internal labor hours in the form. Based on the saved costing template, the system translates the entry into the required working hours and the internal costs for performing this activity. Therefore, the characteristic values from the planning forms are linked to quantities, values or actions from the costing items. In the example, the link is to the quantity for an internal activity. The planned costs are in the periods of the basic start dates of the WBS elements. If the basic start dates are changed and a revaluation takes place, the costs are redistributed.

If you use Easy Cost Planning to plan costs for WBS Elements, you can then use Execution Services to enter the commitment and actual cost data.

### 3.1.3.3 Network Costing

You can use network costing in the following ways:

- Manually
- While saving the network
- With the specific network costing

Along with manual planning in the WBS, you can also create Activities for WBS Elements and plan costs by using these Activities. Based on resource and material planning as well as dates planned with Networks (Activities and Activity Elements), the SAP system can automatically calculate planned costs for procurement and consumption of resources and materials. **Activity elements are costed as if they were activities.**

This form of cost planning is called Network Costing and has the following advantages:

- The resulting plan can be copied to a new project.
- When postponing project parts, cost planning changes in accordance with the Activities.
- Planning via Network Activities is cost-element-specific and period-specific according to the network schedule.

Planned costs are determined for the following objects:

- Activity inputs for internally processed activities (an internal activity) are casted using planned or actual prices for the consumed *activity type* on the involved cost center.
- Primary cost elements are used to cost externally processed activities and service activities (an external service).
- Primary cost elements are used for general costs activities.
- Primary cost elements are used for material components procured for a project.
- Overhead costs are calculated according to the configuration of the network.

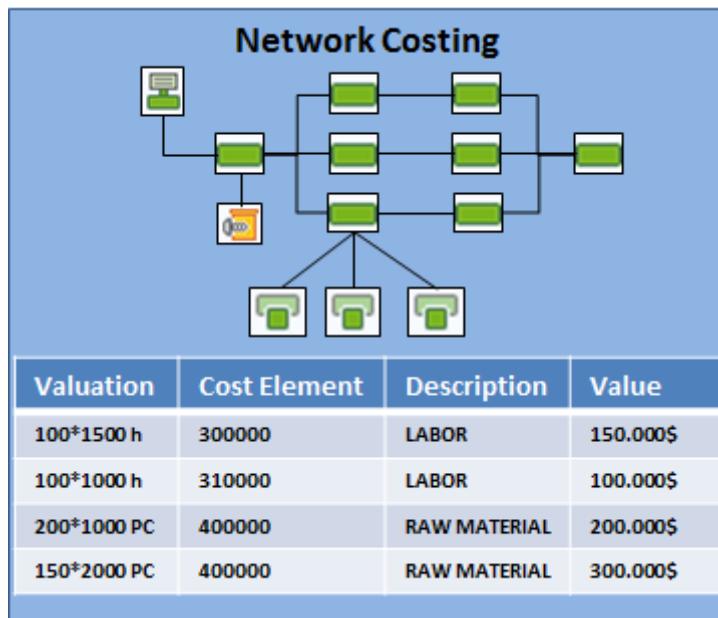


Figure 45: Automatic Cost Planning: Network Costing

### 3.1.4 Planning Budgets

Depending on the company requirements, different function for budget control of projects can be used. In the planning stage, project costs are estimated as precisely as possible. In the subsequent approval stage, funds are assigned in form of a budget. The budget differs from the project cost planning in its binding character. Having estimated the costs as accurately as possible by using the different tools during the planning phase, you then prescribe the funds

available for your order in the form of a budget. The budget is the framework for developing the project costs within a particular period, determined by the management.

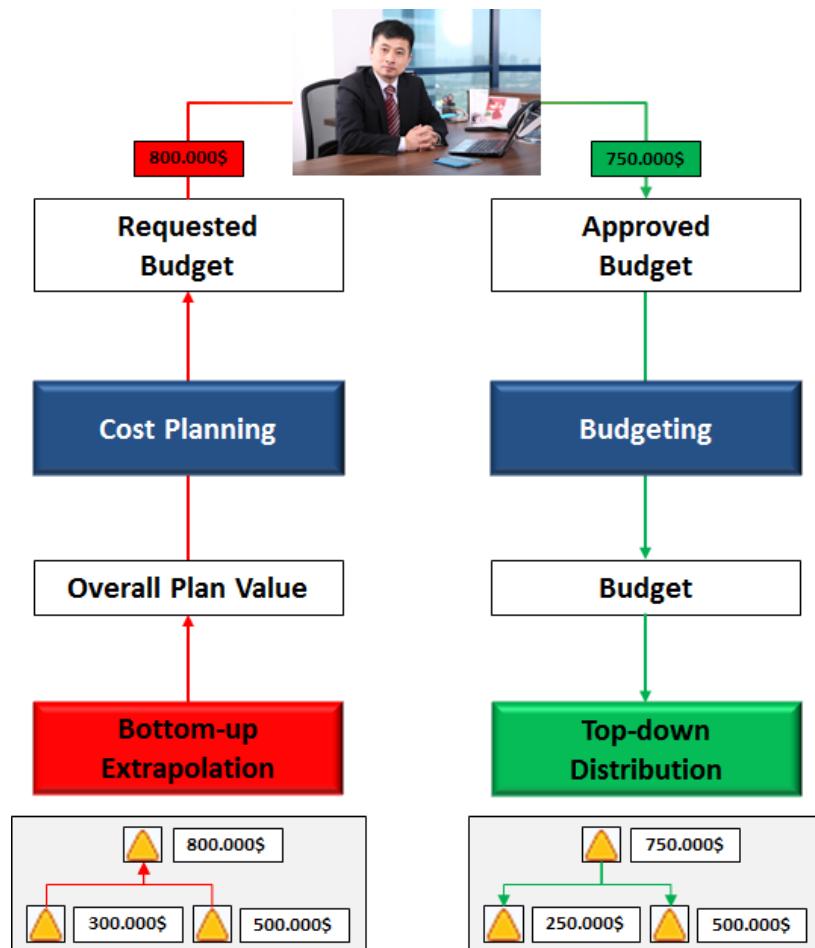


Figure 46: Cost Planning and Budgeting

### 3.1.4.1 Budgeting

While you must estimate your project costs as accurately as possible during cost planning, it is in the approval phase that funds are assigned in the form of a budget. The budget planning process consists of the following steps:

- **Original Budget:** The first step of budgeting a project in the SAP system is assigning a so-called **original budget**. The original budget is the originally allocated budget. After a point in time that you specify, this budget can only be corrected by using *budget updates*.

To assign funds to a project and to its parts, the transaction “maintain original budget” (CJ30) needs to be called up. This transaction lists all WBS Elements of a project in a table. The entire budget of a project can be allocated to subordinate WBS Elements top-down, or it can be combined from individual budgets bottom-up. The hierarchical consistency check ensures project consistency. Moreover, you can set in the budget profile whether the budget is assigned completely or separated into years.

Additionally, you can determine that only particular users may maintain the entire budget in the system by assigning corresponding user status. When locking (freeze) the

original budget for particular user groups in this way, budget changes can only be carried out by defining supplements, returns and transfers by these users.

- **Budget Update:** During a project, it can become necessary to adjust the budget of the project or individual WBS Elements to the actual costs. Therefore, you can either modify the original budget (transaction CJ30), or more reasonably, you can carry out a **budget update**. For budget updates, the system distinguishes between **budget supplements**, **budget returns** and **budget transfers**.
- **Budget Release:** Sometimes it makes sense to base budget allocation on the actual release of budgets for the execution of projects or project parts. For this purpose, SAP features the **budget release** function. It allows for releasing a budget at different times during a fiscal year.
- **Carry-forward Budget:** The **carry-forward budgets** function allows you to transfer unused funds from the previous year to the new fiscal year.
- **Current Budget:** The current budget is derived from: Original budget + Supplements – Returns +/- Transfers

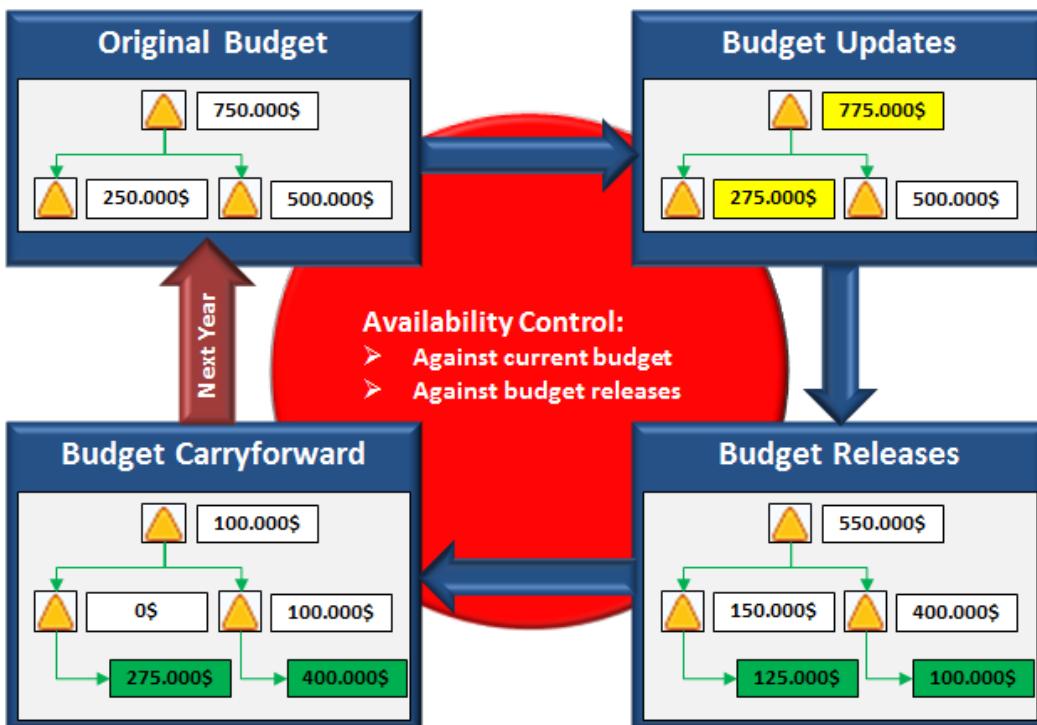


Figure 47: Budgeting Process

### 3.1.4.2 Fund Commitment and Availability Control

You use the **Fund Commitment** functionality to assign anticipated costs or revenues to project parts for which you do not yet know which business transaction will later cause them (e.g., purchase order, material reservation, etc.). This allows reserving parts of the project budget in advance.

When a project has started, the available funds are committed to the individual project parts. During project execution, these commitments and the actual costs that incur, together with the costs of apportioned orders form the assigned funds.

The **Availability Control** functionality of the SAP system enables project managers to monitor and control project costs. The project manager can use availability control to call up an

overview of the assigned funds and see which type they are. This funds overview with their assignment and type can be considered a *passive availability check*.

However, the Project system also supports *active availability control*. Funds commitments that are assigned to a WBS Element, a Network or an internal order are subject to active budget availability control. The funds commitment checks whether the available budget is still sufficient, or not, taking defined tolerance limits below and above the budget into account. If the tolerance limits are violated (a shortfall in the budget or a cost overrun in the budget), various system responses can be triggered (e.g., sending e-mail to responsible manager). In Customizing for the tolerance limits, you can specify which response is to be triggered and when.

Availability control enables you to control costs actively by issuing warnings and error messages when costs are incurred. The component is fully integrated with upstream and downstream components, for example:

- Controlling (CO)
- Financial Accounting (FI)
- Production Planning and Control (PP)
- Materials Management (MM)

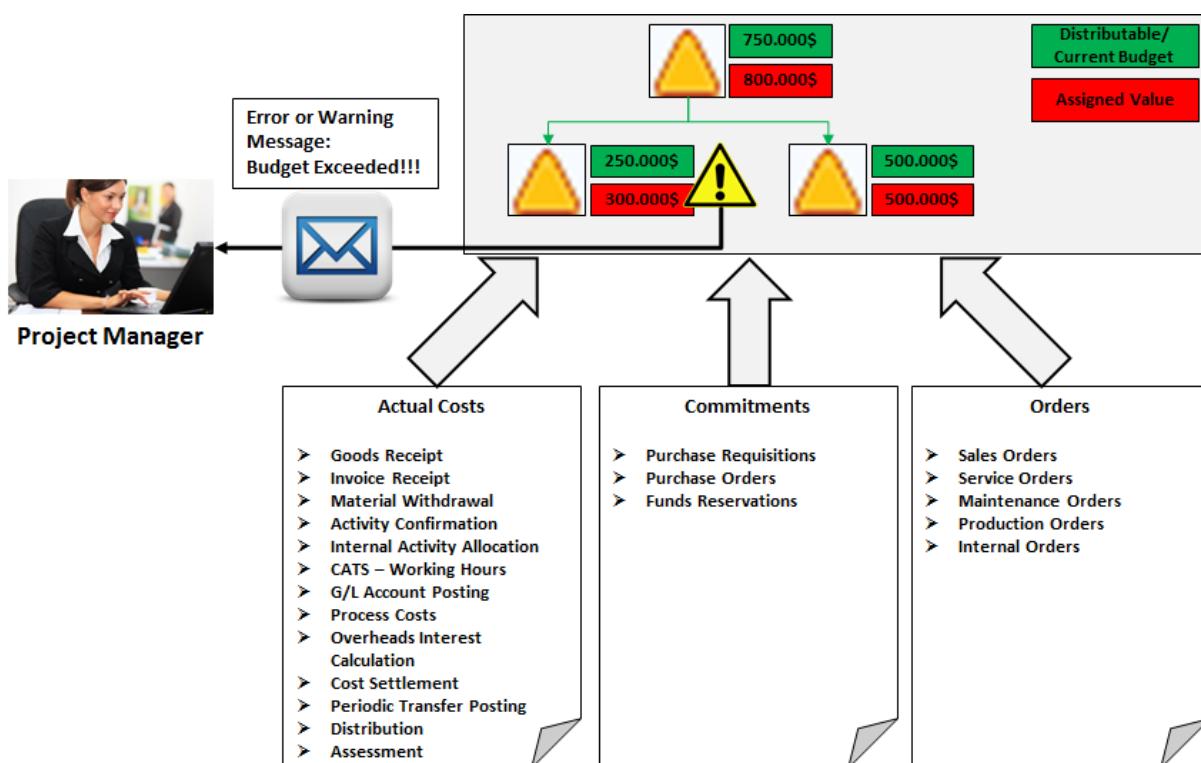


Figure 48: Fund Commitment and Availability Control

## 3.2 Practice: Project Planning



Subsequently, you will carry out project planning. You need to schedule the individual project phases and determine the resources required for processing the project as well as carry out cost planning.

PRACTICE

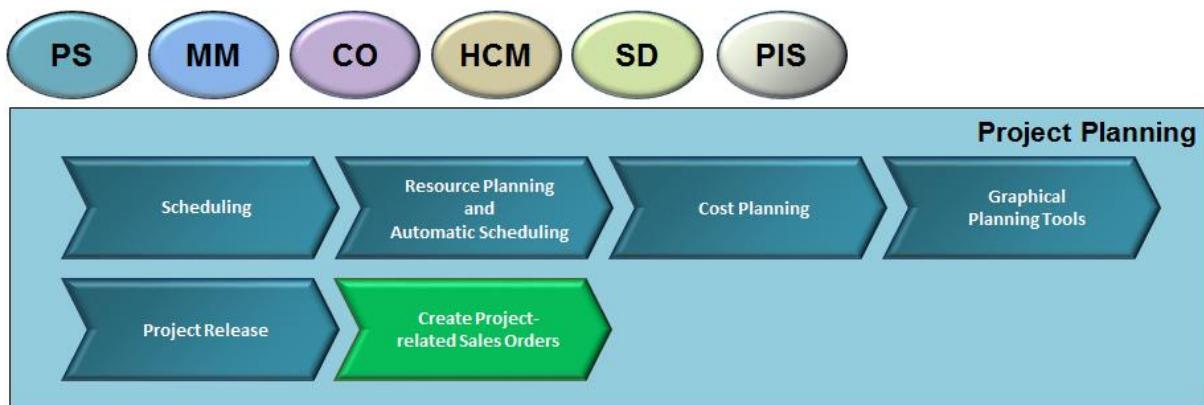


Figure 49: Process Overview: Project Planning

### 3.2.1 Scheduling

Schedule the individual project parts. Set the basic data if known.

#### 3.2.1.1 Scheduling WBS Element Development

Scroll down to the tile group **Script 8 – Project System** and select the app **Project Builder**.

1. On the lower left screen, you see the previously processed project under **Worklist/ Last Projects Processed**. Double-click the project definition to display your project.

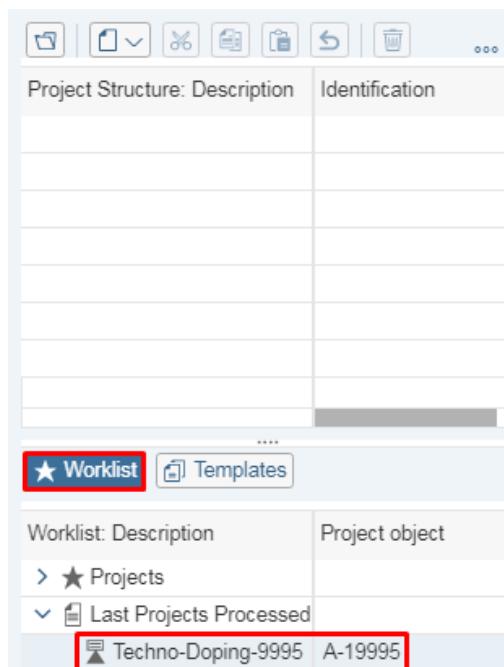


Figure 50: Worklist: SAP-System-Screenshot

2. Select the WBS Element for the first project stage (***Development-fixed price***) in the project structure (left upper screen). Go to the **Dates** tab.
3. To enter **basic dates**, enter the ***current date*** into the **BscStart** field.
4. Confirm with *Enter*.
5. Skip possible notifications (e.g., no working day) with *Enter*.

### 3.2.1.2 Scheduling WBS Element Blueprint

Go to the WBS Element **Blueprint**.

1. Choose the **Dates** tab.
2. Again, enter the ***current date*** as **BscStart** date.
3. Into the **BscFin** field, enter the ***current date + 14 days***.
4. Confirm with *Enter*. Skip possible notifications (e.g., no working day) with *Enter*.

### 3.2.1.3 Scheduling Milestone Blueprint

Go to the Milestone **Blueprint**.

1. Enter the **Basic fixed date today + 14 days**.
2. Confirm with *Enter*.
3. Skip possible notifications (e.g., no working day) with *Enter*.

### 3.2.1.4 Scheduling WBS Element Prototype

Go to the WBS Element **Prototype**.

1. Go to the **Dates** tab.
2. Enter the ***current date + 14 days*** as **BscStart**.
3. Confirm with *Enter*.
4. Skip possible notifications (e.g., no working day) with *Enter* and save your data.

Further scheduling of the prototype project stage is carried out automatically by using the scheduling function of the Network. Therefore, resource planning is a prerequisite.

## 3.2.2 Resource Planning and Automatic Scheduling

Subsequently, you will plan the resources for the Activities **Specification** and **Construction**.

### 3.2.2.1 Resource Planning Specification

The specification of the new racing bicycle is carried out by work center **ASSY1000** in plant **DL00**. The engineers at the work center will need approximately **20** days.

1. Open your project again by double-clicking the project entry below **Worklist/ Last Projects Processed**. Alternatively, you can open your project via **More → Project → Open**. Then, enter the **Project definition A-1xyyy** and confirm.
2. Select the **Activity Specification xyyy**.
3. Select the **Internal** tab.

4. Enter the following data:
  - **Work center** **ASSY1000**
  - **Plant (behind the slash)** **DL00**
  - Confirm with *Enter*.
5. The system automatically fills in the field **Activity Type** with **LABOR** (Labor hours).
6. Enter the scheduling duration as **20** (days) in the **Normal duration** field.
7. Confirm with *Enter*.
8. The system could calculate the work provided by the work center by using work center formulas. If not, write **180** hours manually into the **Work** field.
9. Confirm with *Enter*.

The screenshot shows the SAP Resource Planning Specification screen. At the top, there's a header bar with 'Identification and view selection' and various buttons. Below it, the 'General data' tab is selected, showing fields like System Status (CRTD SETC), WBS element (A-19995-12), Work center (ASSY1000 / DL00), Work (180,0 HR), and Activity Type (LABOR). The 'Scheduling' tab is also visible at the bottom.

General data	
System Status:	CRTD SETC
WBS element:	A-19995-12
Work center:	ASSY1000 / DL00
Work:	180,0 HR
Calculation key:	Maintain manually
Activity Type:	LABOR
Priority:	
Usage:	

Scheduling	
Normal duration:	20 DAY
Min. duration:	
Calendar ID:	US
Red. strategy:	

Figure 51: Resource Planning Specification: SAP-System-Screenshot

### 3.2.2.2 Resource Planning Construction

The construction of the prototype is carried out by work center **ASSY1000** in plant **DL00**. The engineers at the work centers will need approximately **30** days to do so.

1. Select **Activity Construction**.
2. Select the **Internal** tab.
3. Enter **Work center ASSY1000** and behind the slash **plant DL00**.
4. Confirm with *Enter*.
5. The system automatically fills in the field **Activity Type** with **LABOR** (labor hours).
6. Enter the scheduling duration as **30** (days) in the **Normal duration** field.
7. Confirm with *Enter*.
8. The system calculates the work provided by the work center by using work center formulas and writes **270** hours into the **Work** field. If not write them manually.

9. Confirm with *Enter*.

Thus, you have completed resource planning for the project stage. To conclude, carry out scheduling for the entire project.

10. Select the project definition **Techno-Doping-xxxx** from the project structure on the upper left screen.
11. Select **More → Edit → Dates → Schedule**.
12. The system should display **scheduling carried out** in the status bar.
13. Double-click on your network (**Prototype Network xxxx**) and write down the value in the **End Date** field on your data sheet.

**End Date of Network:**

14. Then, within the WBS element **Prototype xxxx**, check in the **Dates** tab, if the previously noticed value is equal to the value in the **Bsc Fin** field. If the value is not equal (e.g. because of a bug), overwrite the value with the noticed date and confirm any system notifications.
15. Since for your project no automatic schedule is set, the whole project must be scheduled again. Therefore, in the upper left area select your project definition **Techno-Doping-xxxx** and select **More → Edit → Dates → Schedule**.

You can ensure scheduling consistency by choosing the **WBS Element Development-fixed price** and selecting the **Dates** tab. There should be a date in the **order finish field**. This date should be in accordance with the **order finish date** for the WBS Element **Prototype** and with the **end date** of the **Network**.

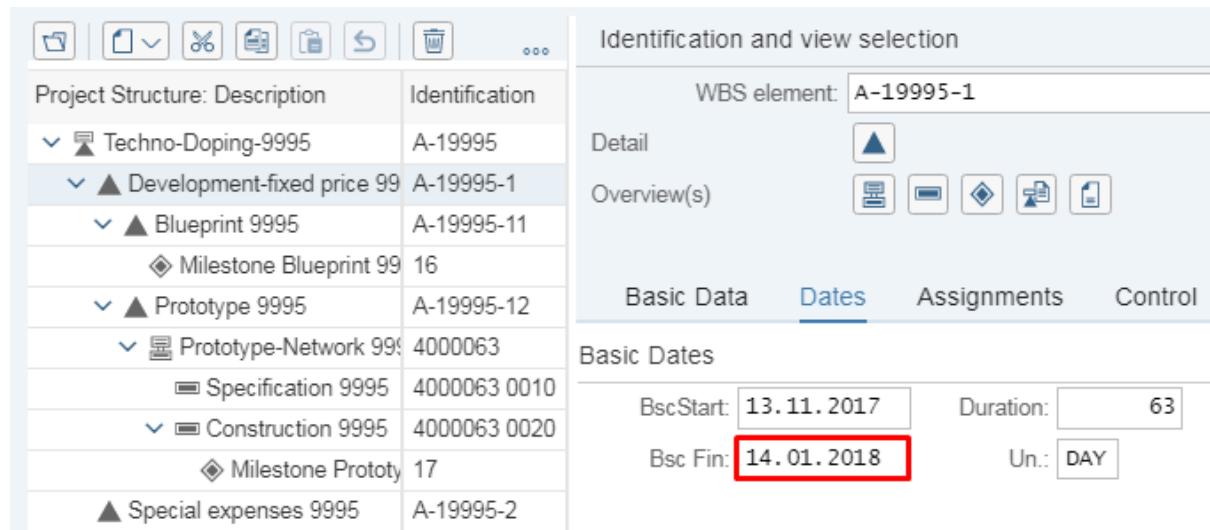


Figure 52: Dates WBS Element Prototype: SAP-System-Screenshot

Also, check the dates in the **Dates** tab of the individual Activities. **Start date** of the Activity **Specification** should be in correspondence to the **start date** of the **Network** and its **end date** should be prior to the **start date** of the **construction** Activity.

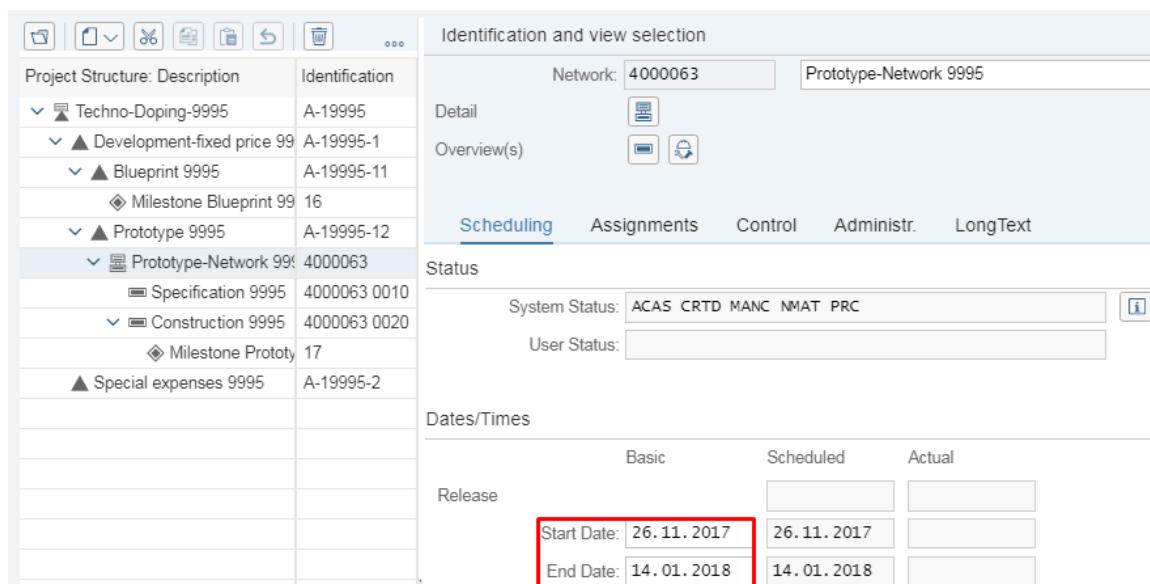


Figure 53: Dates Network Prototype: SAP-System-Screenshot

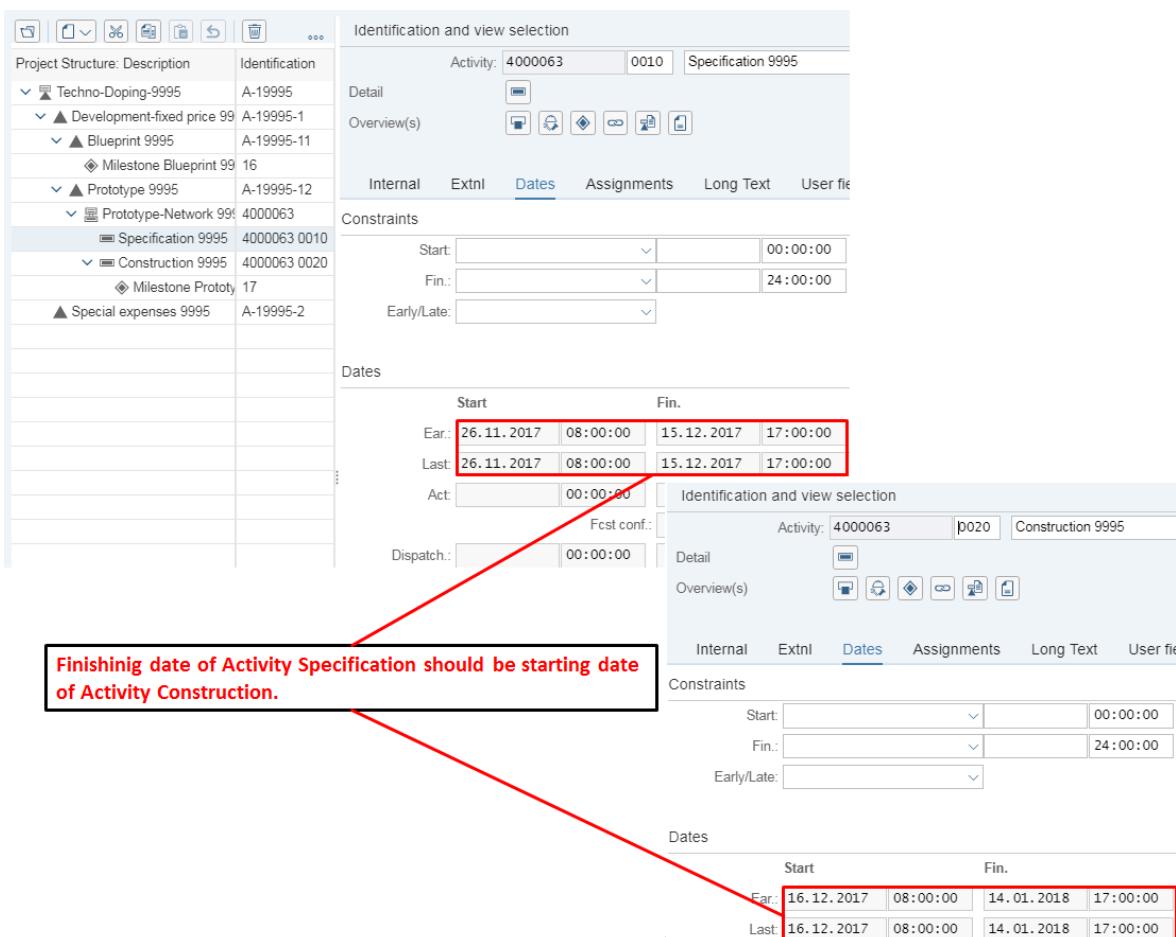


Figure 54: Dates Activity Specification/Construction: SAP-System-Screenshot

If this is not the case, carry out scheduling for the Activity **Specification** once again. If the finishing date of Specification is not the starting date of Construction, check the FS Relationship indicator in the Relationship between the two Activities.

#### 16. Save your project.

### 3.2.3 Cost Planning

Cost planning is next. Firstly, plan the costs of the Blueprint stage manually by using Easy Cost Planning.

#### 3.2.3.1 Easy Cost Planning

Open your project again.

1. Select the WBS Element **Blueprint** from the project structure.
2. Select **Easy Cost Planning**.
3. Enter **Costing Variant PS06**.
4. Press **Create Cost Estimate**.
5. On the left screen, select **Blueprint xyyy**. On the right screen, **Choose Planning Form** appears. Press it.
6. On the appearing search screen, confirm with **Find**.
7. A **planning reference** is displayed that are available in the SAP S/4HANA system.
8. Double-click **planning reference Z\_GBIKE**. On the right screen of Easy Cost Planning, an entry field for **Internal Labor Hours** and **Additional costs** appears.

We assume that executing the project stage, Blueprint will take approximately 200 engineering hours and that there will be no additional costs.

9. Enter **200** into the **Internal Labor Hours** field. Leave the **Additional Costs** field blank.
10. Confirm by clicking the **Confirm** button. Ignore any system notification regarding an error log.
11. Now, on the left screen under the Blueprint stage, there are two cost items listed (QM-Kosten/Arbeitsstunden and 000 HR Messe/Engineering) with a total amount of **25.000 \$**.
12. Select the **Show/Hide Item View** button to take a look at the individual cost items. You should see the following screen:

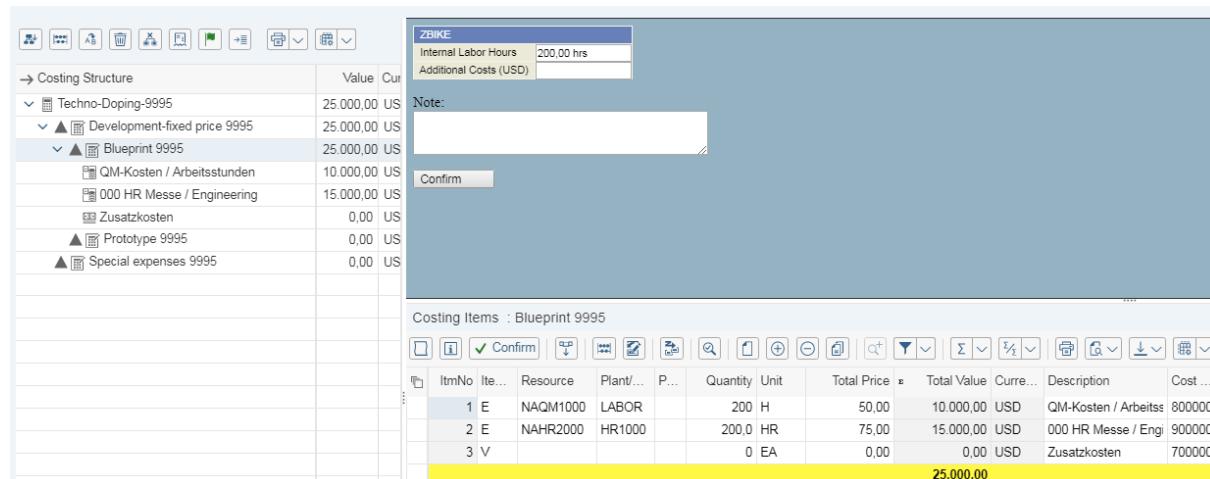


Figure 55: Easy Cost Planning: SAP-System-Screenshot

You can modify or delete items in the individual listing on the lower screen. If required, you can also add additional items. We will accept this costing for our **project cost planning** without any changes.

1. Mark the first two rows (use Control-button on your keyboard) and press the **Confirm** button. Ignore any system notification regarding an error log.
2. On the left screen, select the node **Blueprint** again and press the button to complete costing.
3. Return to the Project Builder. The system issues a notification: "*The cost estimate has been transferred*".

As you can see, Easy Cost Planning is a comfortable tool for **manual** cost planning concerning WBS Elements by using pre-defined planning references and their links with controlling (work centers, Activity types, prices, etc.). References are based on either previously completed projects or SAP best practice solutions, or can be created individually if required. Corresponding functions to create planning references are available in SAP S/4HANA.

### 3.2.3.2 Network Costing

Next, you will carry out costing for the prototype stage. This step is easier than the one using Easy Cost Planning, since all required values (work center, work time, activity types, etc.) were already entered in the Network (or in the Activities, respectively) in resource planning and scheduling.

Also, that is the great advantage of Network Costing, since all required data for calculating costs are derived from the SAP CO master data (work center, work time, activity types, activity prices etc.) and, thus, costing is performed automatically.

1. On the upper left screen, select your **Network (Prototype-Network)** from the project structure.
2. Select **More → Edit → Costs → Calculate costs** from the menu.
3. The system issues a notification that the costs were calculated.
4. Select **More → Edit → Costs → Costs itemization**. You can see that the individual cost items for the Network total up to approx. 22.500 \$ (there may be deviances regarding the individual values and the number of rows).

...	Resource	Cost Element	Quantity	Un	Total Value	Fixed Value	COCr	Resource (Text)
E	NAPR1000 ASSY1000 LABOR	800000	45	H	2.250,00	0,00	USD	Specification 9995
E	NAPR1000 ASSY1000 LABOR	800000	135	H	6.750,00	0,00	USD	Specification 9995
E	NAPR1000 ASSY1000 LABOR	800000	144	H	7.200,00	0,00	USD	Construction 9995
E	NAPR1000 ASSY1000 LABOR	800000	126	H	6.300,00	0,00	USD	Construction 9995
					22.500,00		0,00 USD	

Figure 56: Network Costing: SAP-System-Screenshot

5. Go one step back and **save** your project.

### 3.2.4 Graphical Planning Tools

Performing the chapter **Graphical Planning Tools** is only possible by using the **SAP GUI**.

Open transaction code **CJ20N** via command field in the SAP GUI.

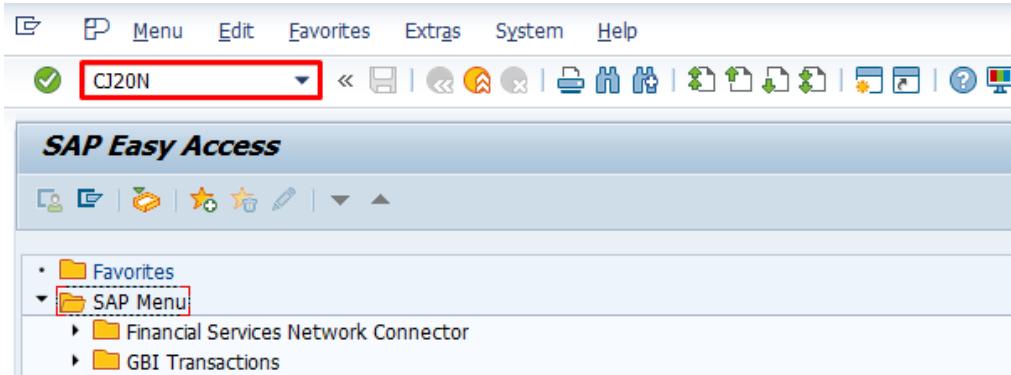


Figure 57: Opening Project Builder via SAP GUI: SAP-System-Screenshot

#### 3.2.4.1 Hierarchy Graphic

Take a look at your project by using the Hierarchy Graphic tool.

1. Open your project A-1xxyy via selecting **Project → Open** from the menu.

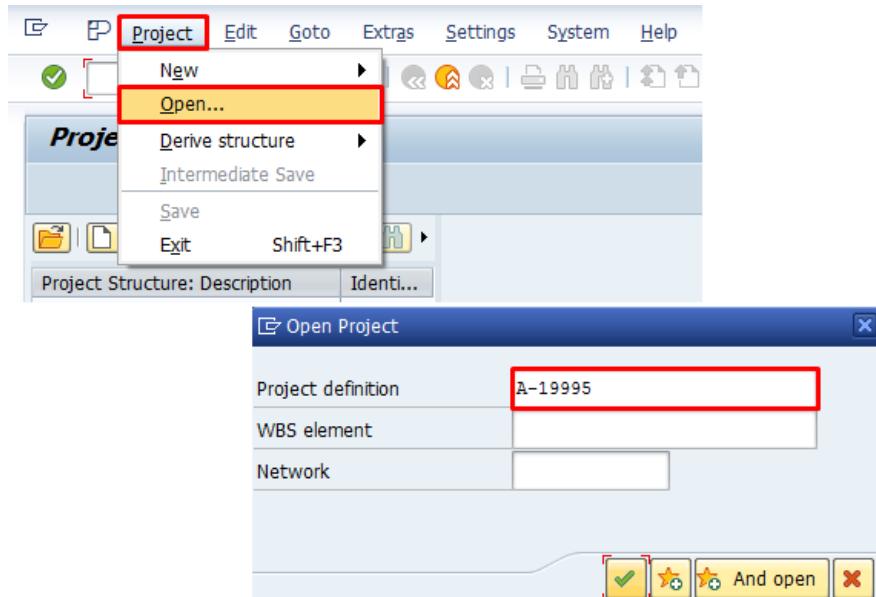


Figure 58: Opening Project: SAP-System-Screenshot

2. Select the highest node of your **project definition** (Techno-Doping-xyyy).
3. Select the  button.

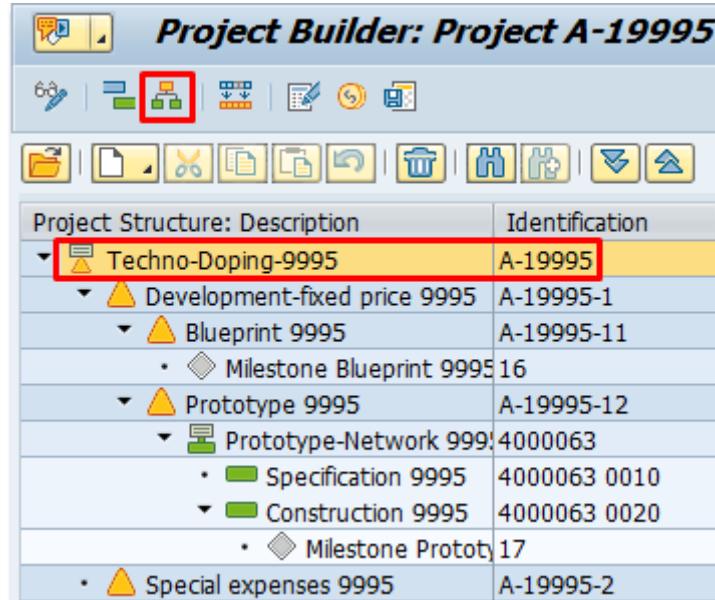


Figure 59: Open Hierarchy Graphic: SAP-System-Screenshot

4. You can see the hierarchy graphic of your Work Breakdown Structure.

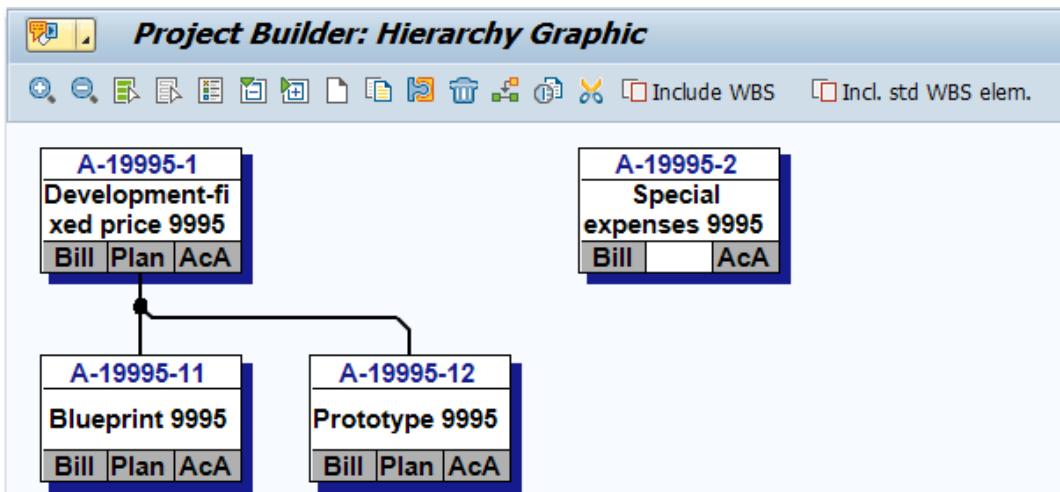


Figure 60: Hierarchies Graphic: SAP-System-Screenshot

5. All functions to maintain your project are available from this graphic. By double-clicking the individual WBS Elements, you can branch into details and modify them. Moreover, you can create new WBS Elements, re-arrange or delete them.
6. Go back ( ) to the Project Builder.

### 3.2.4.2 Network Graphic

Select your Network.

1. Choose the button.
2. The Network graphic for your prototype Network is displayed including the individual Activities and their Relationships.

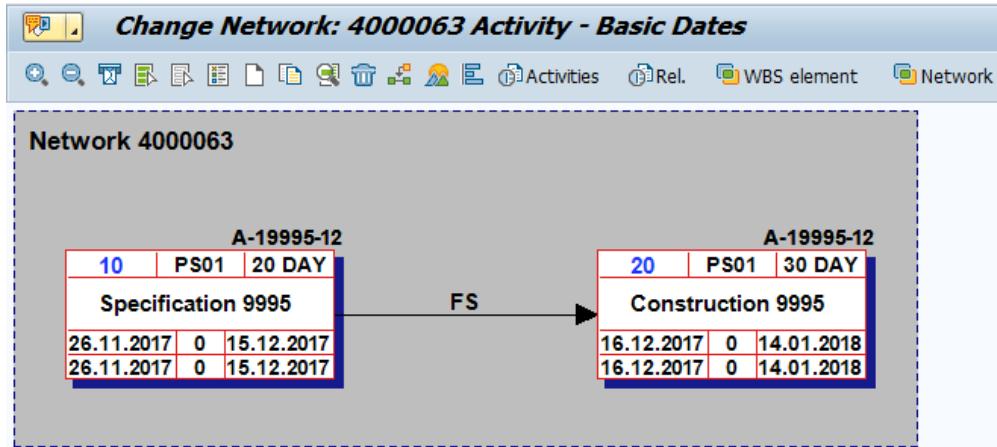


Figure 61: Network Graphic: SAP-System-Screenshot

3. The Network graphic provides you with all options for maintaining your Network as well. Along with Activities and Relationships, you can see the start and end dates of the Activities. By double-clicking an Activity, you can branch into the details.
4. Go back to the Project Builder.

### 3.2.4.3 Project Planning Board

Display your project in the Project Planning Board.

1. On the upper left screen, **expand** all nodes of your project structure. Choose the **highest node** of your project definition (Techno-Doping-xxxx).
2. Choose the button.

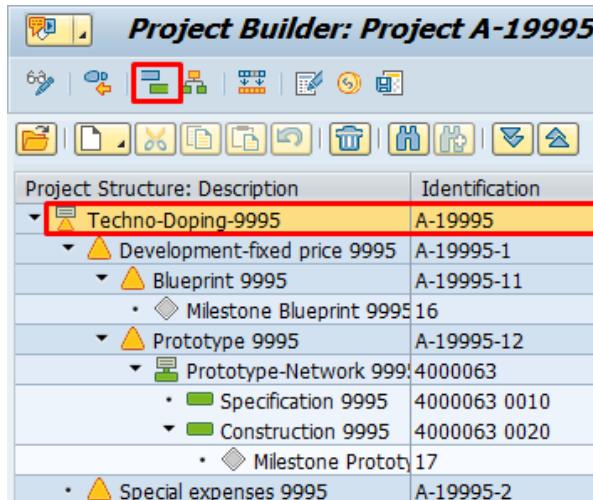


Figure 62: Open Project Planning Board: SAP-System-Screenshot

3. The Project Planning Board for your project definition is displayed.
4. As you know from the theoretical section, this tool is a complete replacement of the Project Builder. All functions of the Project Builder are available from the Project Planning Board.

5. On the right screen, all project stages are displayed on a timeline. On the left screen, the individual project items are listed in a table with the corresponding plan costs and dates, etc. Of course, actual costs and revenue is not listed yet.



By using the (Field selection) button, you can display further fields (e.g. Duration, Actual costs, Project Revenue Plan etc.).

**NOTE**

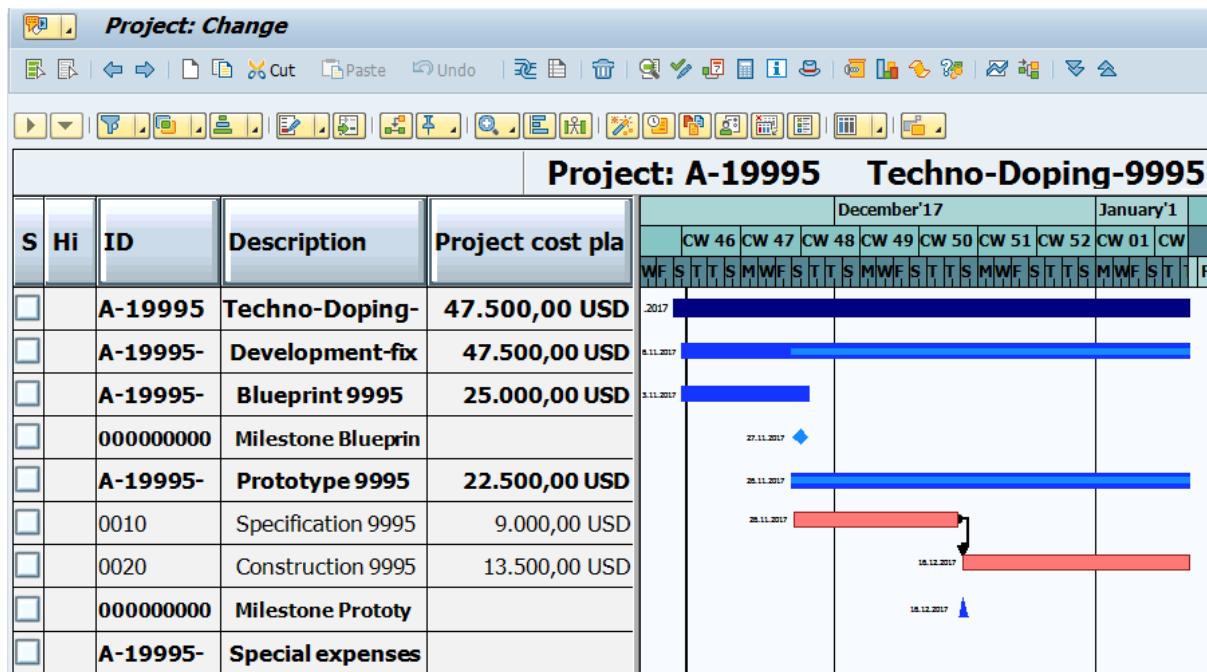


Figure 63: Project Planning Board: SAP-System-Screenshot

- Leave the Project Planning Board (save if prompted).
- Save your project. Leave the Project Builder.

### 3.2.5 Project Release

Now that you have planned dates, resources and costs, you can start negotiating with the customer. With your customer (Lead-to-Cash case study), you agree on carrying out the project for 60.000 USD plus costs for special expenses. The customer agrees and you release the order. After order release, you can create a sales order for the customer.

Again, log in to SAP S/4HANA via Fiori and within the tile group **Script 8 – Project System**, select the app **Project Builder**.

- Select your project.
- On the upper left screen, the system displays the project structure. On the right screen, you can see the **System Status** field on the **Basic Data** tab. This status should be **Created (CRTD)**, since this value is automatically set when creating a project.
- To be able to operatively process the project, you need to release it. Therefore, choose the following from the menu: **More → Edit → Status → Release**.
- The **System Status** is now **Released (REL)**.

To receive further information regarding the status, click the symbol.

Choose the button to go back to the project overview.

5. Save the released project and close the **Project Builder**.

### 3.2.6 Create Project-related Sales Orders

Subsequently, you will create the sales orders. For order processing and subsequent billing, you need to enter the sales orders for the project. Overall, you must enter two sales documents: One for the project part, which is charged with the fixed negotiated price and one for the order, billed according to the actual expenses of the tests. The relationship between project and order is visualized below.

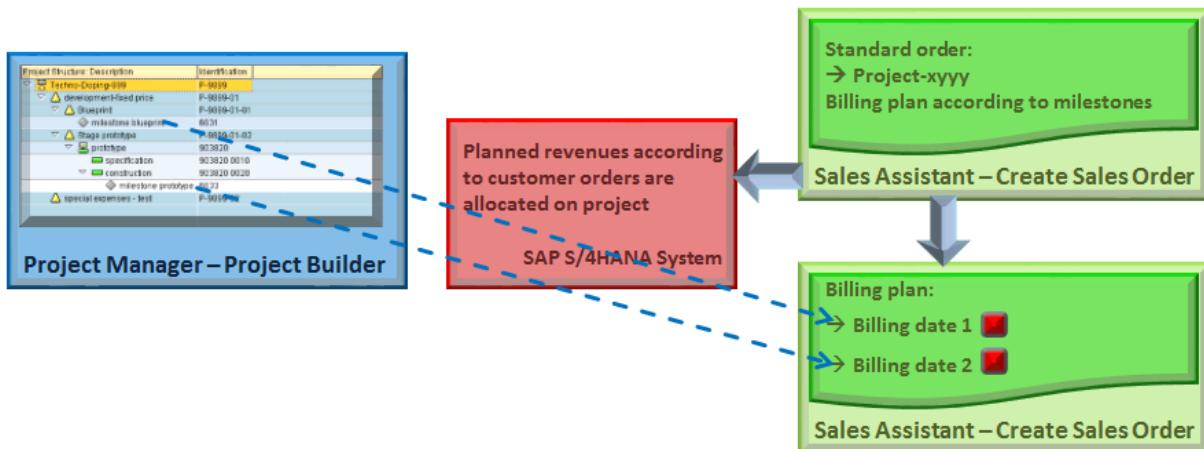


Figure 64: Sales Order and Milestone Billing: Integration Case Studies SAP PS, 2007

As you can see from the figure above, a sales order for milestone billing is created. The sales order refers to the project to be carried out. The two milestones in the project structure are transferred to the order in correspondence with the basic dates. Thus, billing of the sales order is carried out by using the individual milestones of the Work Breakdown Structure. As soon as a milestone is reached, e.g., when the first project stage Blueprint is completed, the customer can be charged with reference to the standard order.

#### 3.2.6.1 Create Order for Milestone Billing

Create an **order for milestone billing**. Therefore, you need to carry out the steps described subsequently. Clarify the relationship to the project created in the first part of this case study when processing the following steps.

Therefore, within the tile group **Script 8 – Project System**, select the app **Manage Sales Order**. Then press the **Create Sales Order** button.

Enter the following data:

- |                               |                            |
|-------------------------------|----------------------------|
| - <b>Order Type</b>           | <b>OR (Standard Order)</b> |
| - <b>Sales Organization</b>   | <b>UW00 (US West)</b>      |
| - <b>Distribution Channel</b> | <b>WH (Wholesale)</b>      |
| - <b>Division</b>             | <b>BI (Bicycles)</b>       |
| - Press Enter.                |                            |

2. Enter the following data:

- **Sold-To Party** *your Customer (see data sheet 3 – Order-to-Cash)*
- **Cust. Reference** *1234xyyy*
- Confirm with *Enter* and confirm any system notification.

3. As **Material**, enter the previously created dummy master record **Techno-xyyy** and enter **Order Quantity 1**. Confirm with any system notifications by pressing *Enter*.



*The system now notifies you about a **pricing error**. In this case, it is on purpose. The price for a project is always subject to actual negotiations and must be entered manually.*

**NOTE**

4. Select the line of the material so that it is highlighted. Choose **More → Goto → Item → Conditions**.
5. You are in the **Conditions** tab for item 10.
6. In the first white line of the table (that means you have to scroll down), enter into the condition type (**CnTy**) column **PR00 (Price)** and into the **Amount** column **60.000**. Confirm with *Enter*.
7. The system carries out costing again and moves the line to the top. The **total amount** of **60.000** appears.

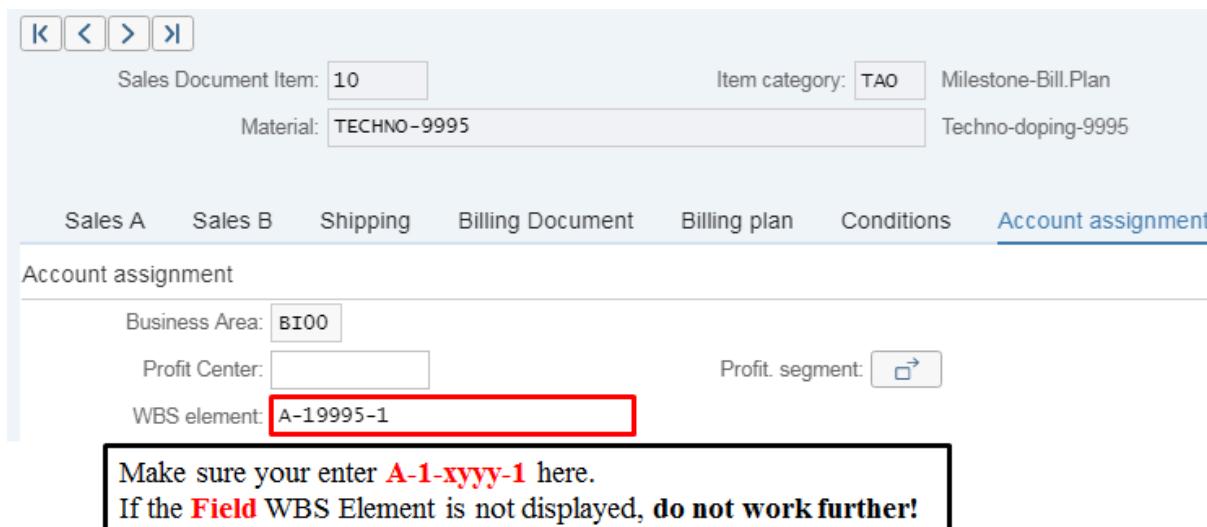
Sales A	Sales B	Shipping	Billing Document	Billing plan	Conditions	Account assignme			
Quantity:	1	EA		Net: 60.000,00 USD					
				Tax: 0,00					
<b>Pricing Elements</b>									
	I...	CnTy	Name	Amount	Crcy	per	UoM	Condition Value	Curr.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	PR00	Price	60.000,00	USD	1	EA	60.000,00	USD
<input type="checkbox"/>			Gross Value	60.000,00	USD	1	EA	60.000,00	USD
<input type="checkbox"/>			Discount Amount	0,00	USD	1	EA	0,00	USD
<input type="checkbox"/>			Rebate Basis	60.000,00	USD	1	EA	60.000,00	USD
<input type="checkbox"/>			Net Value for Item	60.000,00	USD	1	EA	60.000,00	USD
<input type="checkbox"/>			Net Value 2	60.000,00	USD	1	EA	60.000,00	USD
<input type="checkbox"/>			Total	60.000,00	USD	1	EA	60.000,00	USD
<input type="checkbox"/>	<input checked="" type="checkbox"/>	SKTO	Cash Discount	0,000	%			0,00	USD
<input type="checkbox"/>		VPRS	Internal price	0,00	USD	1	EA	0,00	USD
<input type="checkbox"/>			Standard - USA /With	60.000,00	USD	1	EA	60.000,00	USD

Figure 65: Condition for Project Sales Order: SAP-System-Screenshot

8. Click the **Account assignment** tab. In the **WBS Element** field, enter the fixed price element of the project: **A-1xyyy-1**. Thus, the order is linked with the project structure.

**CAUTION**

If the **field WBS Element** is not displayed, then you have an error in your material master of Techno-xyyy. In that case, leave this transaction **without saving** and go back to MM02. Enter Techno-xyyy and check whether you have entered the Strategy Group 21 and the Item Groups 0005. Then restart 3.2.6.1. If the **field WBS Element** still is not displayed, contact your tutor. **Do not work further without solving this issue!**



Sales Document Item: 10      Item category: TAO      Milestone-Bill.Plan  
 Material: TECHNO-9995      Techno-doping-9995

Sales A   Sales B   Shipping   Billing Document   Billing plan   Conditions   **Account assignment**

Account assignment

Business Area:	BI00
Profit Center:	
WBS element:	A-19995-1

Profit. segment: 

Make sure you enter **A-1-xyyy-1** here.  
**If the Field WBS Element is not displayed, do not work further!**

**Figure 66: Account Assignment to Project: SAP-System-Screenshot**

9. Next, select the **Billing plan** tab.
10. The system opens the **Selection Criteria** window (if not, click on the  button, first). Select **WBS element** and enter your project part **A-1xyyy-1**. Confirm with *Continue*.
11. The system displays two milestones. Select both rows and click the  symbol.
12. The system copies both milestones including planning data and billing percentages from the planning structure. In the **Block** column, both entries should be **Complete Confirmation Missing (02)**. Thus, it is ensured that invoices are only issued after completing a milestone.

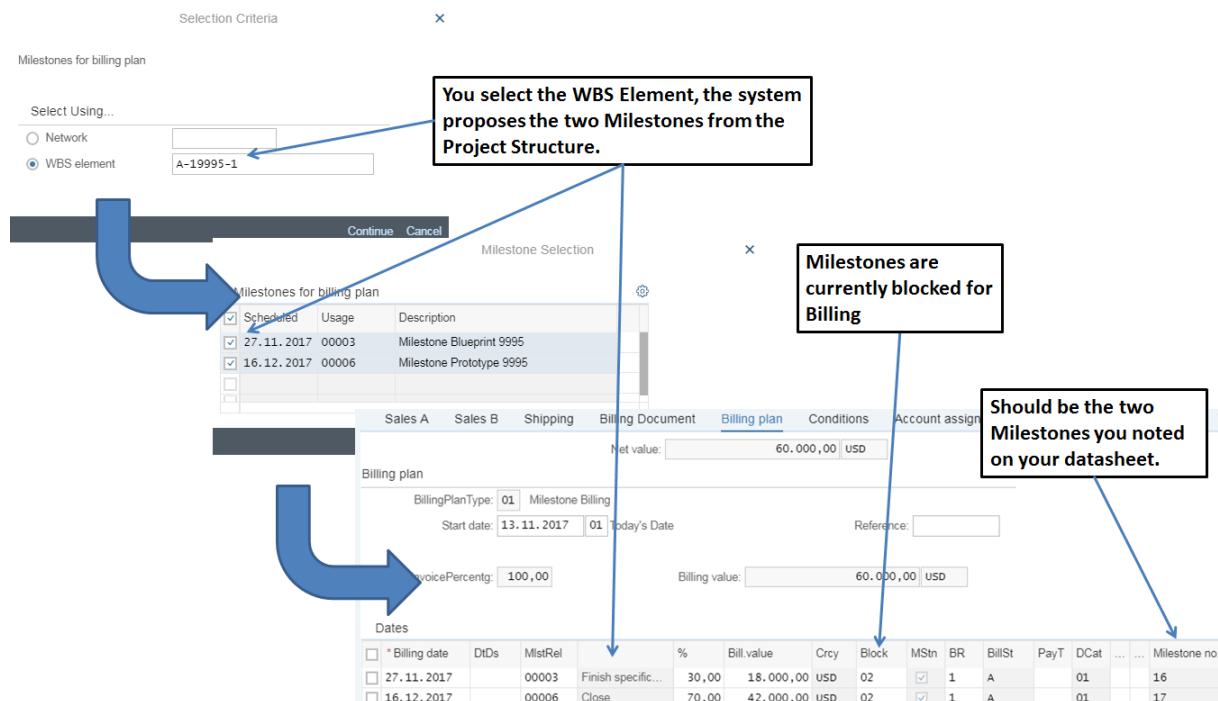


Figure 67: Billing Plan: SAP-System-Screenshot

13. Choose the button.
14. **Save** your order and list the **order number**. Skip possible information with *Enter* and close the view by pressing **Exit**.

#### Standard Order 1 (Milestone Billing):

##### 3.2.6.2 Create Order for Resource-related Billing

Create the second **order for the resource-related billing**. Complete the following steps.



**CAUTION**

In the context of resource-related billing, expenses (confirmed consulting hours = source data) are mapped to sales materials. Instead of the internal hourly price, a (higher) SD sales price is calculated. Thereby, the internal hourly rate that you set for the test driver (Activity type T-xxxx) and the costs for the Activity are stated and replaced by an external sales price in correspondence to the material testdriver1. Your tutor prepared this material previously. This material is the dummy material for the second standard order to allocate the consulting Activities.

In billing, you will subsequently receive a pending invoice of 200 Dollar. Do **not** process this bill, but only process the amount of 8000 \$ resulting from mapping in resource-related billing. This amount also takes account of the quantity of the Activity provided.

Within the tile group **Script 8 – Project System**, select the app **Create Sales Order**.

1. Enter the following data:
  - **Order Type** *OR*
  - **Sales Organization** *UW00*

- **Distribution Channel** WH
  - **Division** BI
  - Press *Enter*
2. Enter the following data:
- **Sold-to Party** *your customer*
  - **Cust. Reference** 1234xyyy
  - Confirm with *Enter* and confirm any system notification.
3. Enter **Material Testdriver1** and **Order Quantity 1**. This material was previously created by your tutor. Confirm with any system notifications by pressing *Enter*.
4. The system determines a **price of 200 USD**.
5. In addition, open the **Sales** tab and from the **Order Reason** (if necessary, scroll down) dropdown menu, choose *any order reason*.

The screenshot shows the SAP Fiori interface for creating a sales order. The top section displays basic order details: Standard Order (empty), Net Value (200.00 USD), Sold-To Party (25015, Taymaz Khatami / Denver 80220), Ship-To Party (25015, Taymaz Khatami / Denver 80220), Cust. Reference (12349995), and Cust. Ref. Date (empty). Below this, the Sales tab is active, showing various order parameters: Req. Deliv.Date (13.11.2017), Complete Dlv. (unchecked), Delivery Block (empty), Billing Block (empty), Card type (empty), Card Verif.Code (empty), Pyt Terms (0001, Pay immediately w/o deduction), Inc. Version (empty), Incoterms (EXW), Inc. Location1 (Ex Works), Inc. Location2 (empty), Order Reason (dropdown menu open, showing options: Customer recommendation, Damaged in transit, Excellent price, Fast delivery, Free of charge sample, Good service, with 'Excellent price' highlighted), Sales Area (empty), and Sales Area (empty). At the bottom, there are buttons for All items, Item, Material, and TESTDRIVE, along with columns for Jn, S, Description, and HR, and a row for Testdriver Hours.

Figure 68: Choose Order Reason: SAP-System-Screenshot

The test driver hour is only a dummy value, since invoice creation is subsequently not carried out with reference to the order quantity (here: 1 hour) but with reference to the actually provided times (will be discussed together with the Dynamic Items Profile later).

6. To link the order with the corresponding project structure, select the first line and choose **More → GoTo → Item → Account Assignment**.
7. Enter the previously created Element for **Special expenses A-1xyyy-2** into the **WBS Element** field.

Sales Document Item: 10      Item category: TAX      Non-stock Item  
Material: TESTDRIVER1      Testdriver Hours

Sales A   Sales B   Shipping   Billing Document   Conditions   Account assignment

Account assignment

Business Area: BI00      Order: [ ]

Profit Center: [ ]      Profit segment: [ ]

WBS element: A-19995-2      Enter A-1xxyy-2 here!

Figure 69: Account Assignment Special Expenses: SAP-System-Screenshot

8. Press *Enter*. Skip a possible notification concerning **the event object being derived again** by clicking *Enter* once again.
9. Go to the **Sales B** tab.
10. In the **Control of Resource-related Billing and Creation of Quotations** section, enter **WIP** into the **DIP profile (Dynamic Item Profile)** field.

Sales A   Sales B   Shipping   Billing Document   Conditions   Account assignment   Schedule lines

Pricing and Statistics

Pr. Ref. Matl: [ ]  
Prod.hierarchy: [ ]  
Material Group: [ ]  
MatGroup 1: [ ]  
MatGroup 2: [ ]  
Division: BI Bicycles      Mat.Price Grp: [ ]  
Customer Group: [ ]      Price Group: Bulk buyer  
Price List: [ ]      Sales District: 000002      Southe

Control of Resource-related Billing and Creation of Quotations

Billing form: [ ]      DIP profile: **WIP** [ ]

**Dynamic Item**  
Summarized intermediate level of data that is produced during processing (for example, during resource-related billing or quotation creation).  
The system summarizes data (for example, line items that result from confirmations, or goods movements) from defined sources (for example, actual costs line items or actual costs totals records) into dynamic items. This summarization is controlled by the dynamic item processor profile.  
Afterwards, the dynamic items can be transferred into sales documents (for example, billing requests or quotations).

The **dynamic item processor** is a tool that the system uses to summarize data (for example, line items, totals records) into **dynamic items** in sales price calculation, resource-related billing, or data determination.  
The DI profile controls how the system summarizes the data into dynamic items. A DI processor profile can have different usages.

Figure 70: Dynamic Items Profile: SAP-System-Screenshot

11. Confirm with *Enter* and *save* your order.
12. List the order number and leave the view.

**Standard Order 2 (resource-related billing):**

### 3.3 Theory: Project Execution with the Project System



THEORY

Once the project planning is accomplished and the project is released, a project can be executed. In the project execution phase, the project work is performed and confirmed. This might include consumption of work center capacities by internal Activities, consumption of external resources, purchasing and production of materials, consumption of these materials and delivery of the project results. Finally, vendor invoices are received, customer billings are issued, and payments are booked.

#### 3.3.1 Project Execution and Confirmations

When project work is performed and accomplished, many different data needs to be updated for the project. Considering all aspects of project execution would go beyond the limits of this teaching unit. Thus, we will only briefly focus on several aspects regarding the recording of dates and posting of costs to projects.

##### 3.3.1.1 Recording Project Dates and Activities

One of the main aspects of recording the progress of project is the confirmation of activities performed in the project. The results of confirmations include posting the actual costs, dates, and labor (work) and, if applicable, changing the activity status. There are different options for entering confirmations in SAP PS:

- Using the **Project Builder**, you can perform individual or collective confirmations for Networks, Activities, Activity Elements or capacities.
- Using the **Project Builder** or **Project Planning Board** you can enter actual completion dates for individual WBS Elements.
- Using the **Structure Information System**, you can select Activities and access individual or collective confirmations or send a confirmation workflow to another user or organizational unit.
- Using the **Cross-Application Time Sheet** (CATS) you can post employee working times to WBS Elements of the project
- Using the Internet, Smartphones, Handhelds via the open PS-Interface or Via the PDC (process data capturing) interface you can send confirmations of work times and activities to the Project System

##### Actual Dates for WBS Element

During the *planning phase*, you enter **basic planned dates** for WBS elements. For instance, you create graphical time bars in the Project Planning Board or enter plan start and end dates for individual WBS Elements.

In the *execution phase*, you can set **actual dates** in the same way in the Project Planning Board or in the Project Builder. Actual dates refer to dates at which a project phase (e.g. an individual WBS Element) started or was accomplished. In order to be able to set actual start or end dates the status Partially Released or Released must be set for the WBS element or the project.

To monitor dates in the project, you compare the basic dates with the actual dates. That is, you compare the planned dates with the actual dates or forecasted completion dates. You can use the Project Planning Board or Structure Information System for analysis purposes.

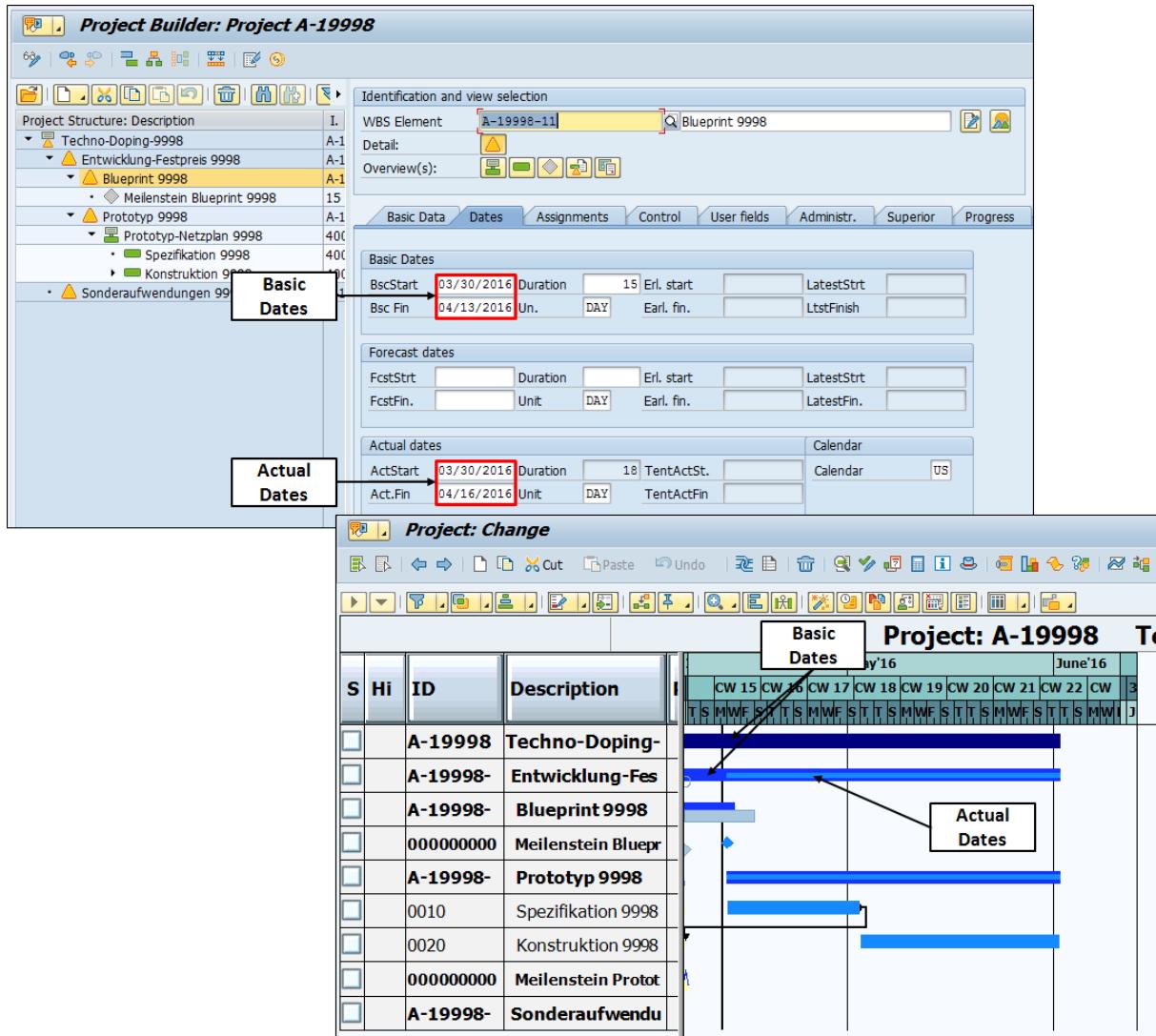


Figure 71: Actual Dates for WBS Element: SAP-System-Screenshot



Since Fiori UX only uses the non-native Project Builder App, the Project Planning Board is not available in Fiori UX, yet. To use this graphic and the full potential of the Project Builder, you still need to work with the classic SAP GUI.

### Activity and Network Confirmations

When *Internally Processed Activities* are completed during project execution, they are confirmed in the Project Builder or the Structure Information System either individually or collectively. The confirmation of activities leads to the update of dates, working hours as well as corresponding costs on the project. Thereby, the system calculates the costs of the activities performed by multiplying the planned costs for the involved activity type on the cost center (work center) that performs this activity.

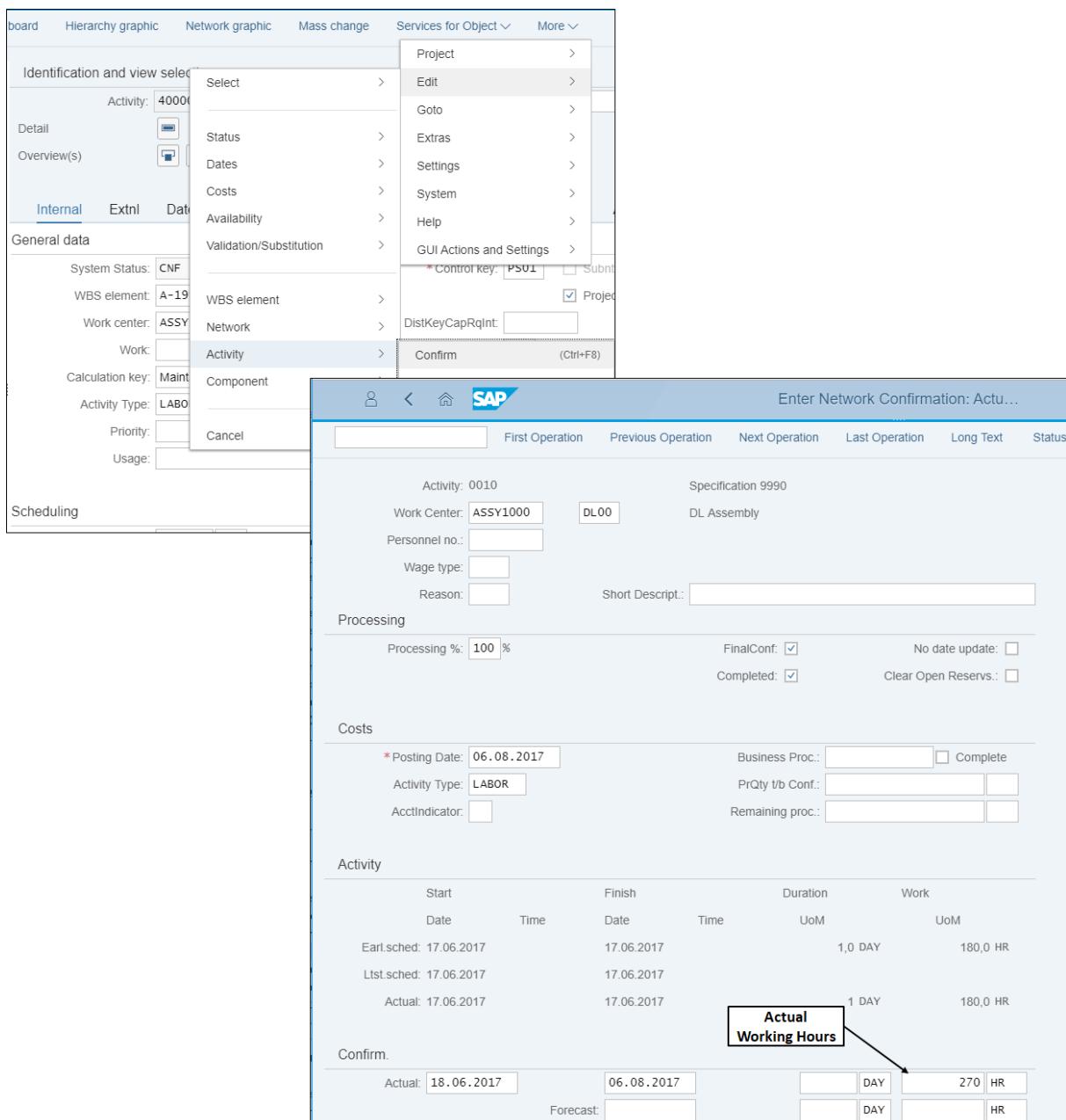


Figure 72: Activity Confirmation: SAP-System-Screenshot

### Cross Application Time Sheet - CATS

Companies that implement the SAP system generally also use the CATS time sheet as central transaction for recording working times of their employees. The time data recorded with CATS can be approved and subsequently be transferred to other applications such as controlling or project system and, thereby, create activity allocations or confirmations automatically. Thus, CATS is an integrated function to record activities relevant to HCM, PS, PM, CS, and CO. Layouts can be individually set by using entry profiles.

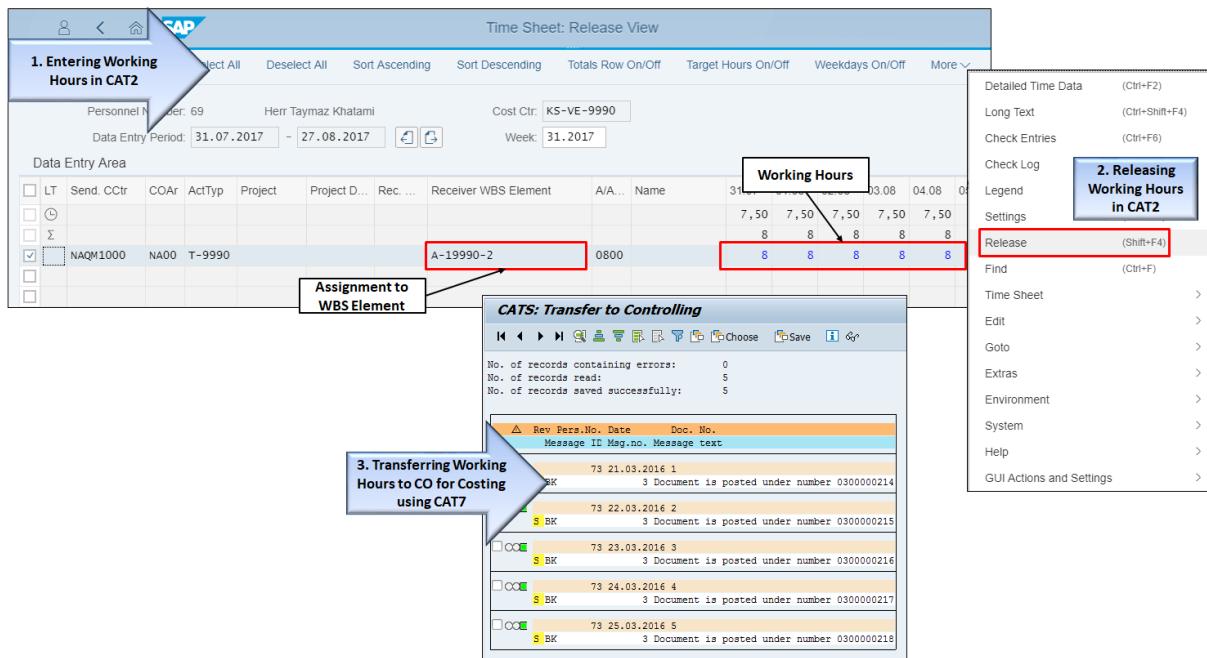


Figure 73: Cross Application Time Sheet: SAP-System-Screenshot

### 3.3.1.2 Account Assignment and Cost Postings in Projects

If Networks are used in the project definition that contain *External Processing Activities*, *Service Activities* or directly procured *Material* components, then the Network will generate purchase requisitions upon execution and transfer them to the purchasing department for further processing.

As you already know from the Source-to-Pay business process, Purchasing in SAP MM includes several process steps. Depending on the particular item that needs to be purchased, this can include a request for quotation to a vendor, quotation entry, vendor selection, transfer of the purchase requisition into a purchase order and purchase order monitoring until goods receipt and invoice receipt are completed.

If a Service Activity is used within the Network, a similar purchasing process like the one for an External Processing Activity is triggered. However, this can contain a complete hierarchy of planned services that need to be purchased from a vendor and value limits for unplanned services. Goods receipt for services encompasses two steps: service entry and accepting the services performed.

When the Project System generates a purchase requisition for a project, then this purchase requisition posts a **purchase requisition commitment** to the Activity (External, Service, Material) or WBS Element it is assigned to. Thus, the WBS Element or Activity depicts the account assignment object for the purchase requisition from the point of view of Controlling and receives the costs of the purchasing process.

When the purchase requisition is converted into a purchase order, a **purchase order commitment** is generated on the account assignment object. The purchase order commitment has a different value type than purchase requisition commitments. Depending on the account assignment category of the purchase order, the actual costs can be posted on the account assignment object either upon goods receipt (valuated goods receipt) or invoice receipt (non-valuated goods receipt). Correspondingly, the relevant goods movement documents (goods receipt) are assigned to the Network Activity or WBS element and the commitment is reduced.

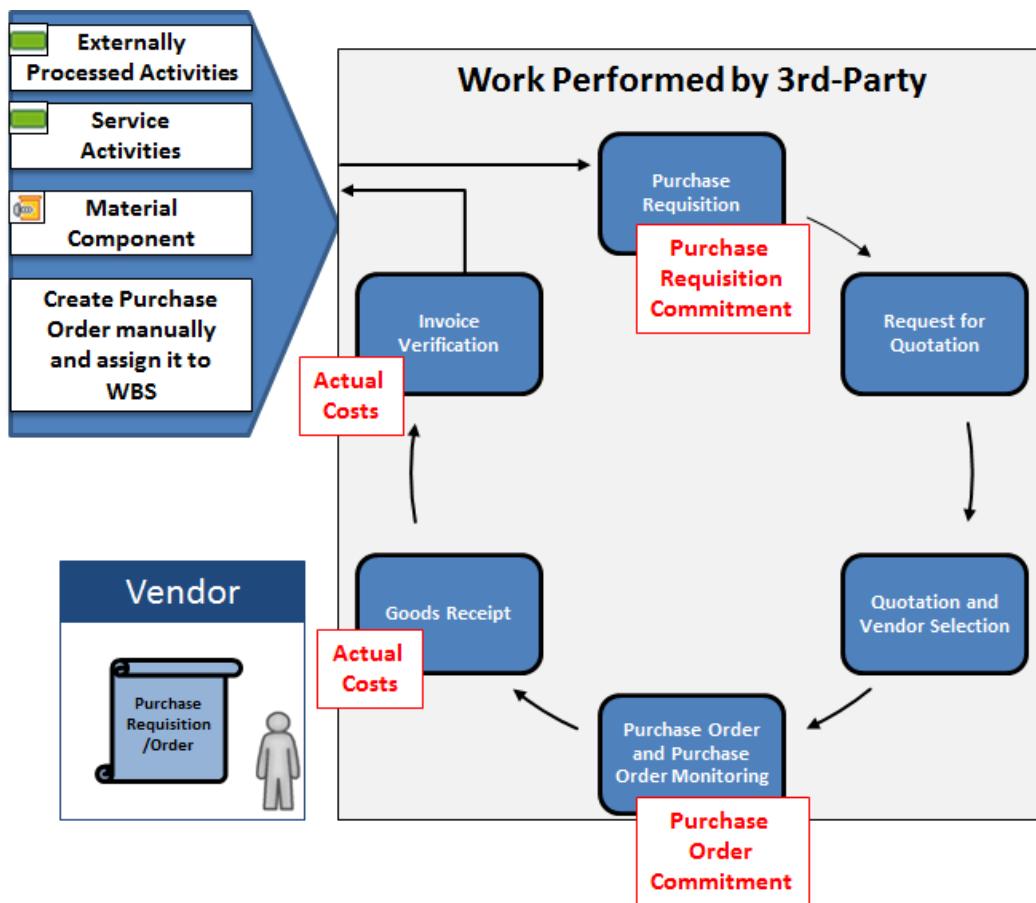


Figure 74: Account Assignment and Cost Postings in Projects

The purchasing process does not necessarily need to be triggered by a Network Activity during project management. It is also possible to create a purchase requisition or purchase order regularly in SAP MM and then assign it to a WBS Element or Network manually on the account assignment tab of the purchase document.

The above-described purchasing process or the confirmation of Internal Processing Activities are only two examples for activities in project management that result in cost postings on project components. The following figure summarizes different business transactions that establish a connection to a project by means of account assignment to WBS Elements or Network Activities. The result of the assignment of WBS Elements or Networks to the particular documents is that any planned costs, commitments, or actual costs are posted directly to the project components when they occur.

Examples of cost assignments are:

- Costs for purchase requisitions, purchase orders, and goods receipts on Networks or Activity level, resulting from Externally Processed Activities, Service Activities, or Material components that are procured directly
- Stock withdrawn from the warehouse using the appropriate stock items
- Invoices posted by using cost activities and costs arising as a result of confirmations by using Internally Processed Activities
- Actual costs and revenues arising from purchase requisitions, purchase orders, goods receipts, activity allocations, and invoices for WBS elements match the values of the primary costs, activity input, and revenue planning data for the WBS.

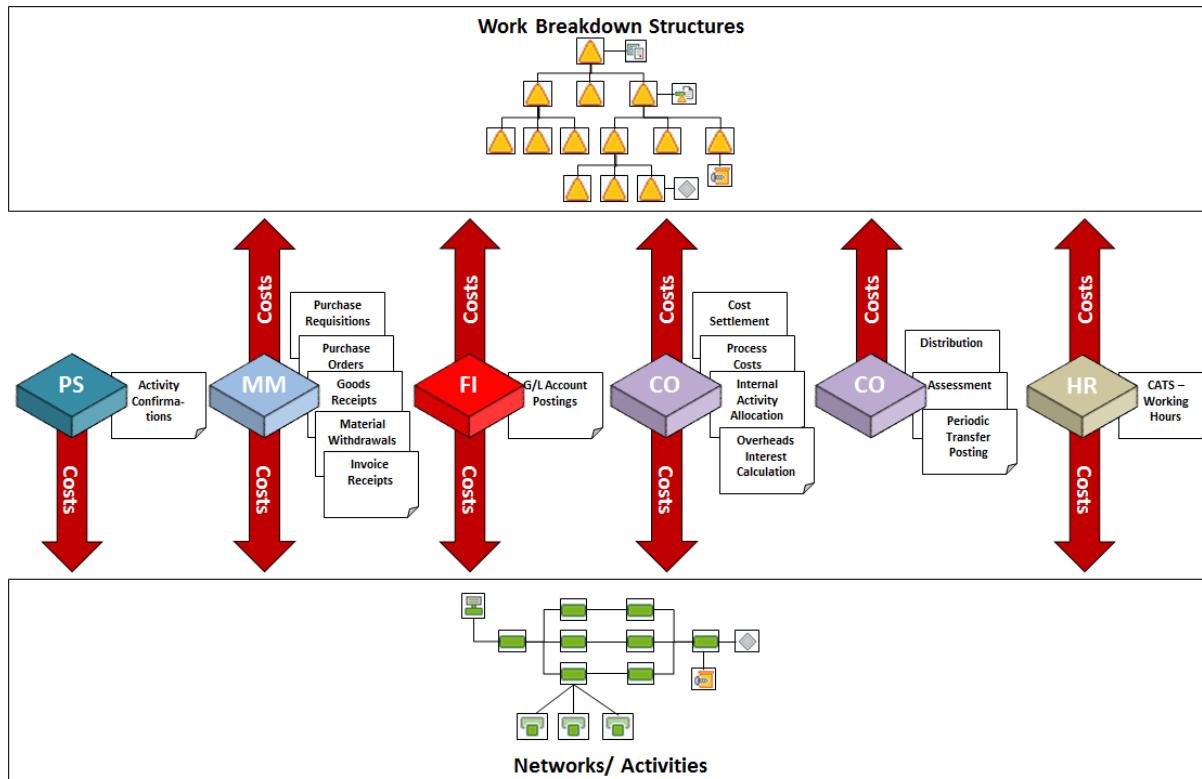


Figure 75: Document and Cost Assignment to Project Elements

### 3.3.1.3 Information System of SAP PS

For monitoring and controlling projects, reports are required that provide you with current information regarding, e.g., costs, revenues, dates and resources. Therefore, the reporting of the Project System provides you with different standard reports. For the evaluation of important key figures of a project, you can use the following information systems:

- Structure Information System
- Cost, Revenue, and Payment (Controlling) Information System with hierarchy reports, cost element reports, and SAP List Viewer for line items
- Capacity Analysis
- Order Report
- The Stock or Requirements List
- Lists of Reservations, Purchase Requisitions, and Purchase Orders pertaining to the Project
- ProMan
- Progress Analysis and Progress Tracking
- SAP NetWeaver Business Warehouse (SAP BW)

The following reports and systems are available for cross-project evaluations:

- Project Summarization
- Executive Information System
- Profit Center Accounting reports
- Profitability Analysis reports

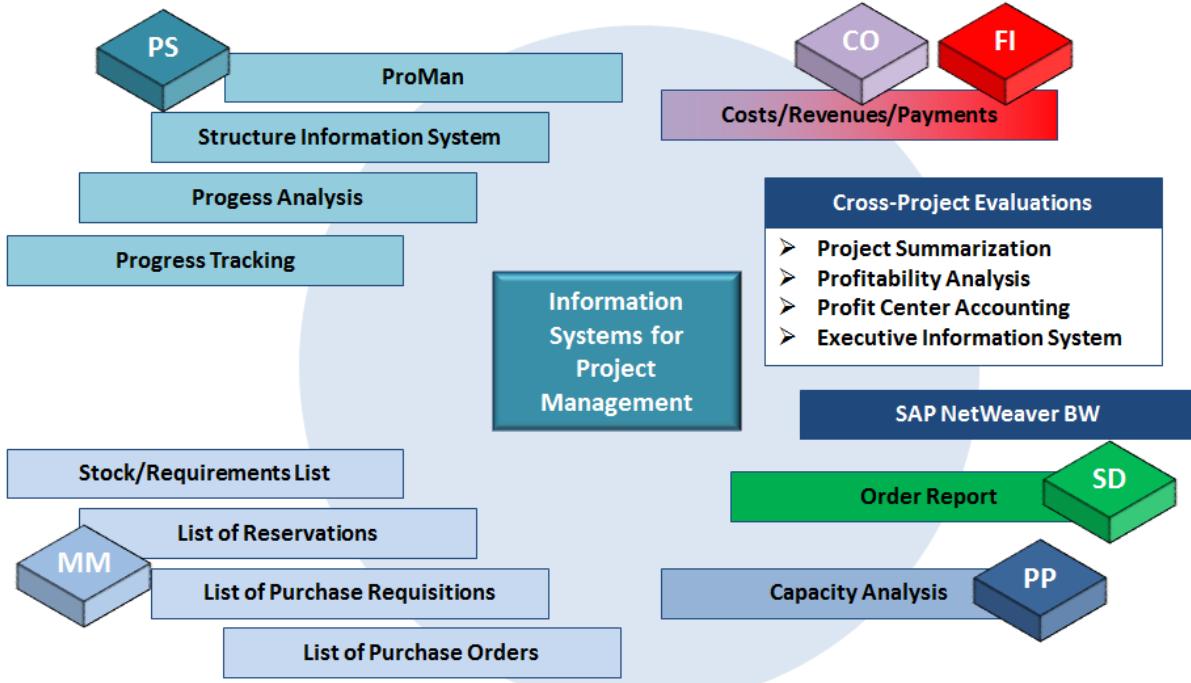


Figure 76: Information Systems for Project Management

The Structure Information System is not only a tool for displaying project information and analyze it, but it can also be used for editing project structures directly from within the reports. You can use the Structure Information System, for instance, in the following cases for displaying and editing project structures:

- A multi-level product structure with production and planned orders that are assigned to WBS elements can be displayed in the structure overview and edited. You can also call up other assigned orders to change or display objects.
- You can confirm Activities and trigger confirmations and confirmation workflows.

The following figure shows the control functions in the Structure Information System, which can be accessed through transaction CN41N.

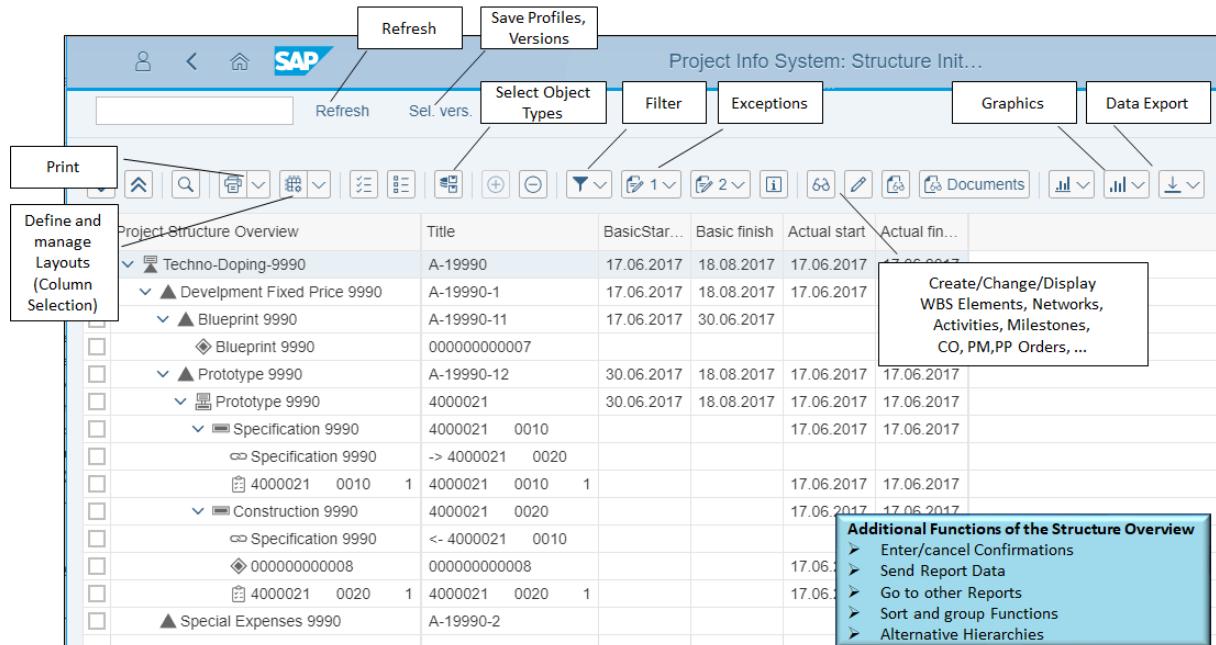


Figure 77: Structure Information System: SAP-System-Screenshot

### 3.3.2 Period-end Closing

Period-end closing deals with all period-related activities and business transactions that ensure determining and correctly assigning all the data belonging to a period and that the data is available for controlling purposes. This includes the following activities:

- **Template Allocation:** While a distributed flat rate is used overhead, the template allocation distributes overhead from business processes or cost center or activity types.
- **Overhead Rates:** Use overhead costing to allocate overhead through percentage-based or quantity-based overhead rates. The basis for the allocation is the primary cost elements that you post as overhead costs.
- **Project Interest Calculation:** Valuates fund commitments, using costs, revenues, or payments to achieve the best possible project payment flow.
- **Cost Forecast:** Cost forecast is used to adapt cost planning for changing circumstances. For the cost to complete, the system determines and values the remaining activities on the basis of the plan, forecast, and actual values in the network. The resulting figure is arrived at by adding the actual and commitment costs already incurred in the project to the updated cost to complete.
- **Progress Analysis:** Used to determine planned and actual project progress values, and to compare the two sets of data. The system uses the overall planned costs to evaluate the work done, therefore the evaluation is not dependent on the costs planned or posted by period. You can determine the relevant values at any time or as part of the period end closing. Use progress analysis to obtain information on the status of your project and how it is developing, which enables you to take corrective action if the project is differing from its plan.
- **Results Analysis:** A periodic valuation of the project is performed. You can analyze the results of WBS element costs, which are capitalized and used to set up provisions. Results analysis is usually performed in the billing element.

- **Incoming Orders:** The system uses this function to determine the costs and revenues expected to arise from orders closed or changed in the current period. You can evaluate the values for incoming orders, open orders in the project information system and settle them using profitability analysis.
- **Settlement:** Project settlement is used to allocate the costs and revenues in projects or allocate the results analysis data to one or more receivers.

As mentioned before, a project definition or rather its components such as WBS Elements, Networks and Activities can function as real account assignment objects and receive costs and revenues from many different business processes in the SAP system. Generally, a project collects a variety of costs during its execution. Actual costs and actual revenues arise in a project or order as a result of the following activities:

- Material withdrawals and goods receipts
- Vendor invoices
- Customer billing
- Internal activity allocations, transfers, cost distribution, process costs, and overheads
- Confirmation of network activities

As with other account assignment objects and temporary cost collectors, projects must also settle these costs to one or more cost receivers before they can be closed. This is done with the **settlement** process as part of the period-end closing process. Thereby, all the actual costs incurred for the WBS Elements, Networks or Activities in a project definition are allocated, in whole or in part, to one or more cost receivers in the settlement process. The offset entries crediting the project are generated automatically and the debit postings remain in the receivers after settlement. You can display the debit postings in the information system. You can record the settled costs in the relevant receiver and evaluate them in reporting.

In settlement, costs or revenues are transferred to different recipients in accordance with the settings specified in the **settlement rule** of the sender object (WBS, Network, Activity). The sender objects of a project must contain a settlement rules to be able to settle costs to cost receivers (e.g., cost centers). Settlement rules can be created manually in the Project Builder. For WBS elements, the *Create Settlement Rule* transaction or Fiori app can be used. Depending on predefined strategies, these transactions create settlement rules for cost centers or profitability segments, or they inherit predefined settlement rules.

The settlement rules are stored in the sender objects within a project and contain distribution rules and settlement parameters for the sender object. These distribution rules and parameters determine which portions of sender's costs are transferred to which cost receiver or receivers. Recipients of the settlement can be of different departments:

- Financial Accounting (G/L accounts)
- Asset Accounting (fixed assets)
- Cost Accounting or Profitability Analysis (order, cost center, and profitability segments)
- Project System (other WBS Elements, Networks, and Activities)

The following figure displays the typical scenarios for settling project costs.

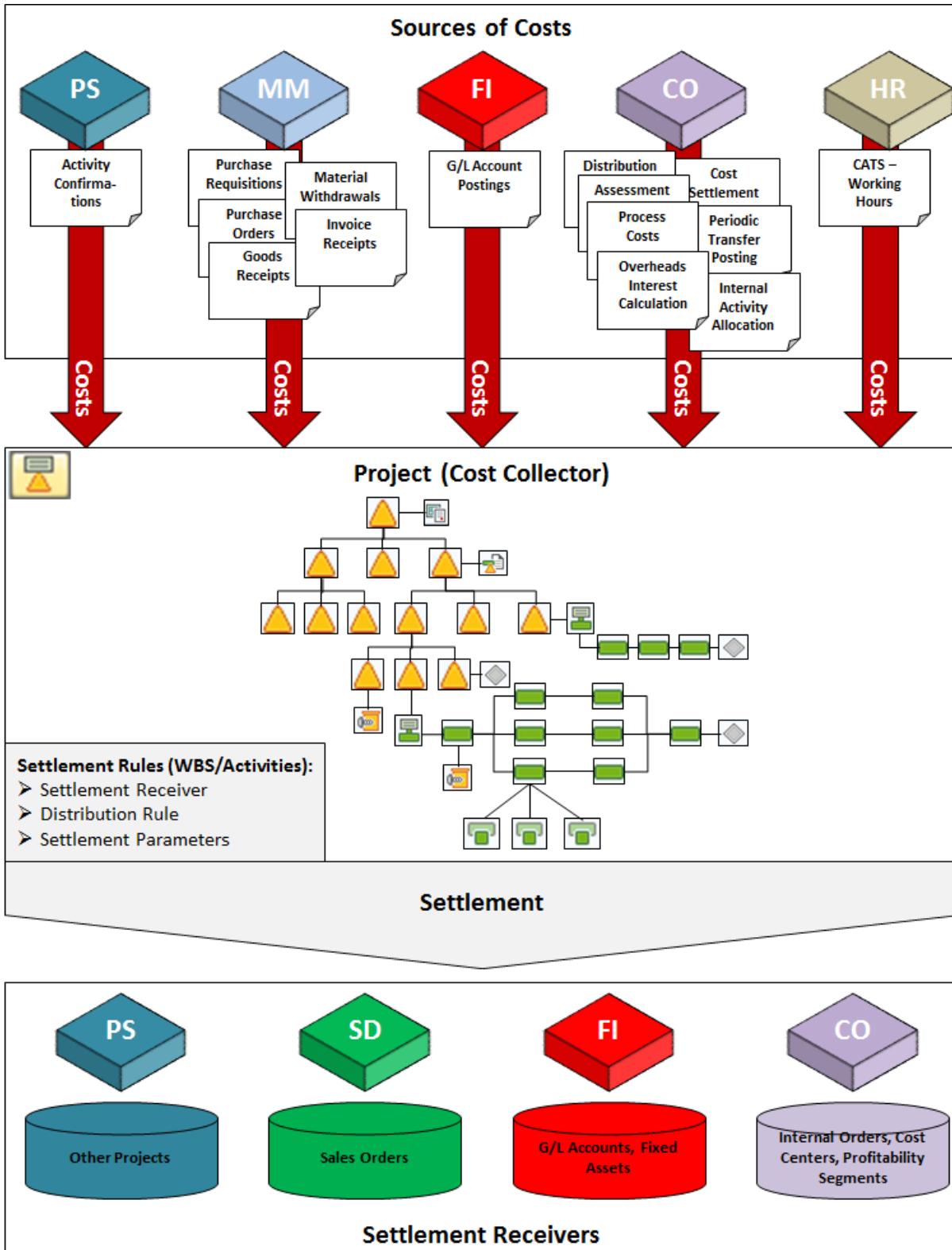


Figure 78: Debit-Credit Settlement

### 3.4 Practice: Project Execution



You have executed the project and corresponding cost items incurred. Subsequently, you have to enter these actual costs.

PRACTICE

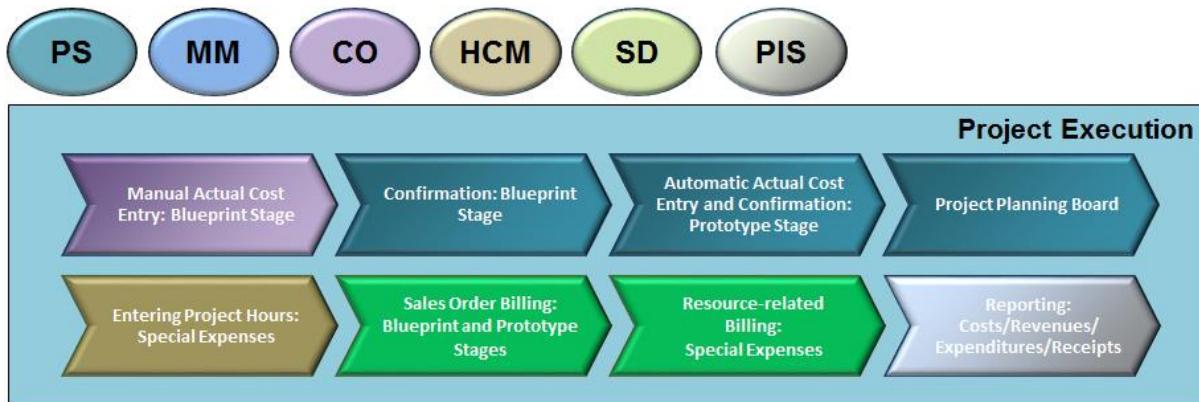


Figure 79: Process Overview: Project Execution

#### 3.4.1 Manual Actual Cost Entry: Blueprint Stage

In the first project stage, your engineers worked well at cost center NAHR2000 and they created the construction plans. They used the planned 200 (activity type HR1000) hours completely. These activities need to be posted to the project by CO to record the incurred costs (Direct Activity Allocation), correctly.

Within the tile group **Script 8 – Project System**, select the app **Enter Activity Allocation**.

1. If prompted, enter Controlling Area **NA00**.
2. Enter the current date as **Document Date and Posting Date**.
3. Select the entry **WBS element/order** from the **Scrn variant** drop-down field.
4. Select the entry **List Entry** from the **Input Type** drop-down field.
5. In the first line, enter the following data:

- SendCCtr	<b>NAHR2000</b>
- SATyTyp	<b>HR1000</b>
- Receiver WBS element	<b>A-1xyyy-11</b>
- Total Quantity	<b>200</b>
6. Enter the following data into the second line:

- SendCCtr	<b>NAQM1000</b>
- SATyTyp	<b>LABOR</b>
- Receiver WBS Element	<b>A-1xyyy-11</b>
- Total Quantity	<b>200</b>
7. Confirm with **Enter** and scroll up to display the entries within the table, if necessary.

The screenshot shows the SAP Actual Cost Entry Blueprint screen. At the top, there are fields for CO Area (NA00), Doc. Date (13.11.2017), Postg Date (13.11.2017), Ref. Doc. (empty), and Doc. Text (empty). Below these are buttons for Doc. Type (checkbox), Val. Date (empty), Period (11), and Confirm (button). A dropdown menu shows "WBS element/order" and "List Entry" is selected. The main area is a table titled "Items" with columns: ItemNo., Send. CCtr, SATyp, Rec. order, RAccl, Receiver WBS Element, Total Quantity, UM, Amount, Crcy, and Cost Elemt. Two rows of data are listed:

ItemNo.	Send. CCtr	SATyp	Rec. order	RAccl	Receiver WBS Element	Total Quantity	UM	Amount	Crcy	Cost Elemt.
0001	NAHR2000	HR1000			A-19995-11	200,0	HR	15.000...	USD	900000
0002	NAQM1000	LABOR			A-19995-11	200	H	10.000...	USD	800000

Figure 80: Actual Cost Entry Blueprint: SAP-System-Screenshot

Save (**Post**) the document and list the document number. Finally, press **Exit**.

#### Document Blueprint:

### 3.4.2 Confirmation Blueprint Stage

Now that the Blueprint stage is completed and the costs for the project stage were entered, you must complete the project stage in the Project Builder. Complete the first project stage by setting the **actual date** for the milestone of **project stage 1**.

The following figure integrates this step into the project context.

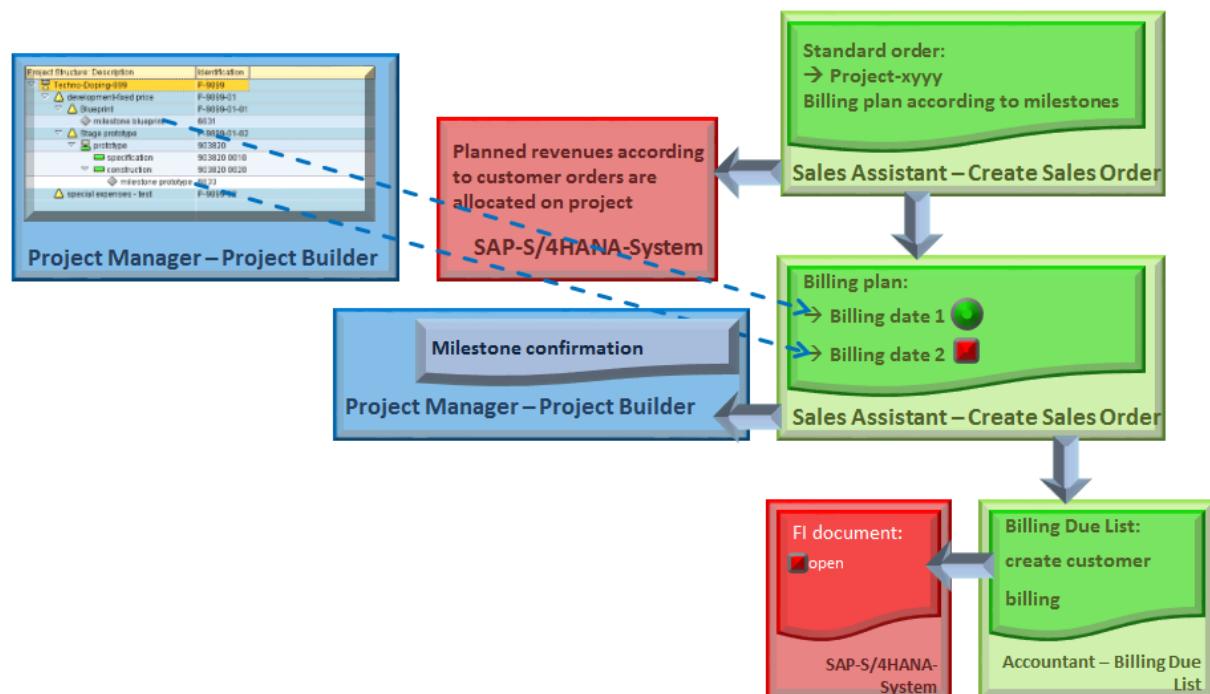


Figure 81: Milestone Billing

After completing a project stage (e.g., reaching the first milestone), billing for the first sales order is created automatically. Since the project structure is linked with the sales order, scheduling the first milestone results in entering the billing for this stage into the billing due list. This billing due list contains all billings that are not yet processed. You can create a customer invoice from the corresponding billing.

Within the tile group **Script 8 – Project System**, select the app **Project Builder**.

1. Open your project **A-1xyyy** by double-clicking it from the work list of recently processed projects.
2. Branch into the structure on the upper left screen until you reach the **Milestone Blueprint xyyy**. Select it so that it is highlighted.
3. On the right screen, you can now see the detailed data for the milestone. Enter the **current date** as **Actual date** and **save**. Possible warning messages can be confirmed with **Enter**.

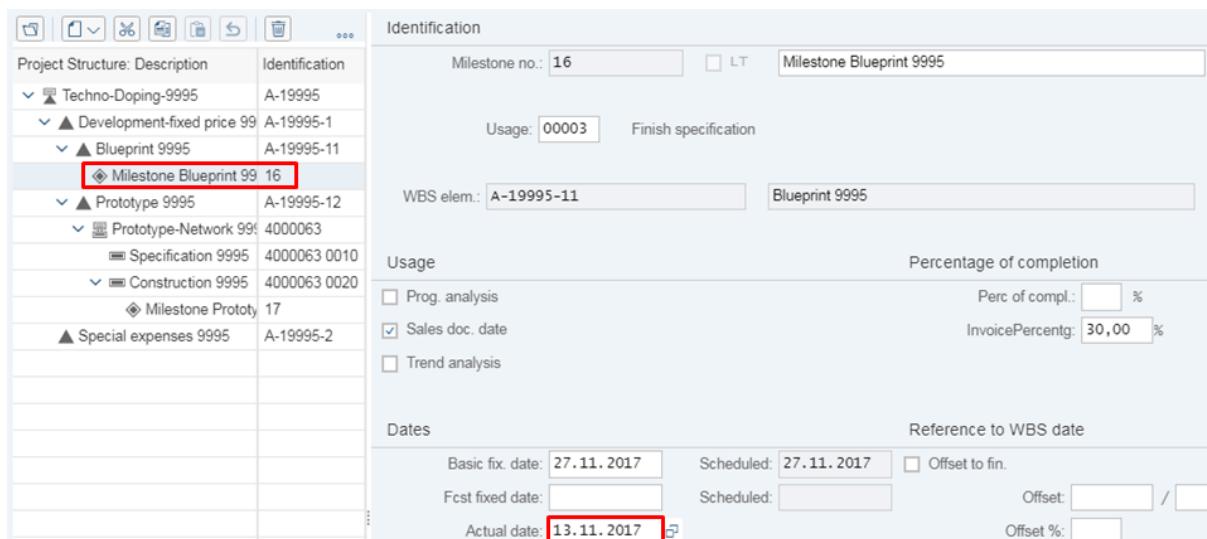


Figure 82: Milestone Billing: SAP-System-Screenshot



*By entering the actual date, this stage is completed and the **billing block (02, missing confirmation)** that was previously set in the billing plan of your first sales order is deleted. Thus, you can **create an invoice** for the first project stage.*

However, you have already completed the entire project and you want to process the other project parts first, before creating a customer invoice.

### 3.4.3 Automatic Actual Cost Entry and Confirmation: Prototype Stage

Your engineers have finished the creation of the prototype. Therefore, you must confirm both Activities to enter the actual costs. Entering costs of the second stage (prototype) can be executed from the Network directly. Open your project again.

1. Select the first **Activity Specification**.

2. Choose **More → Edit → Activity → Confirm.**

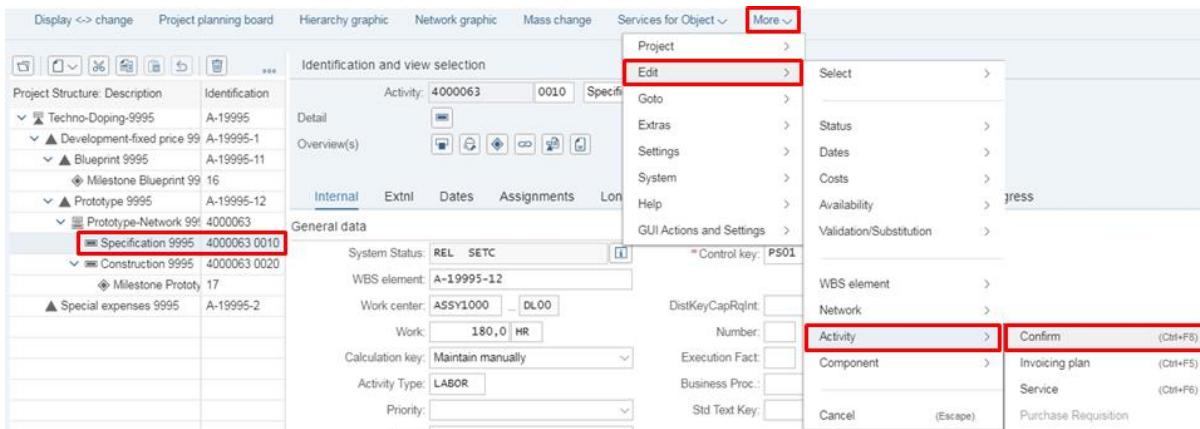


Figure 83: Confirm Activity Specification (1): SAP-System-Screenshot

3. A dialog screen appears, prompting you to enter the provided work hours.

This is a detailed screenshot of the 'Enter Network Confirmation: Actual Data' dialog box. It contains several sections:

- Activity:** 0010
- Specification:** 9995
- Work Center:** ASSY1000
- DL:** DL Assembly
- Personnel no.:** (empty field)
- Wage type:** (empty field)
- Reason:** (empty field)
- Short Descrip.:** (empty field)
- Processing:**
  - Processing %: 100 %
  - FinalConf:
  - No date update:
  - Completed:
  - Clear Open Reservs.:
- Costs:**
  - Posting Date: 13.11.2017
  - Business Proc.: (empty field)  Complete
  - Activity Type: LABOR
  - PrQty t/b Conf.: (empty field)
  - AcctIndicator: (empty field)
  - Remaining proc.: (empty field)
- Activity:**

Start	Finish	Duration	Work
Date	Date	UoM	UoM
Earl.sched: 26.11.2017	15.12.2017	20,0 DAY	180,0 HR
Lst.sched: 26.11.2017	15.12.2017		
Actual:		0 DAY	0,0 HR
- Confirm:**

Actual: 13.11.2017	13.11.2017	(empty field) DAY	180,0 HR
Forecast: (empty field)	(empty field) DAY	(empty field) HR	

Figure 84: Confirm Activity Specification (2): SAP-System-Screenshot

- We assume here as well that the planned 180 hours were actually provided. Dependent on the system settings the dialogue opens either within a new view or within a popup. If the dialogue opens within a new view, confirm with **Enter** and go one step back (). In case the dialogue is opened within a popup, confirm by pressing the green checkmark.
- Skip possible notifications (current date is not a working day) with **Enter**.

6. Now, the Activity status is set to **CNF** (confirmed).

Internal	Extnl	Dates	Assignments	Long Text	User fields	Qualification	Additional data
<b>General data</b>							
System Status: <b>CNF</b> MCNF REL SETC				<input type="button" value="i"/>	* Control key: PS01	<input type="checkbox"/> Subntwk exists	
WBS element: A-19995-12				<input checked="" type="checkbox"/> Project Sum.			
Work center: ASSY1000		... DL00		DistKeyCapRqlnt: <input type="text"/>			
Work: 180,0		HR		Number: <input type="text"/>		Percent: <input type="text"/>	
Calculation key: Maintain manually				Execution Fact: <input type="text"/>			
Activity Type: LABOR				Business Proc.: <input type="text"/>			

Figure 85: Activity Status: SAP-System-Screenshot

7. Select the second **Activity Construction**.
8. Again, choose **More → Edit → Activity → Confirm**.
9. A dialog screen appears, prompting you to enter the provided work hours.
10. We assume here as well that the planned 270 hours were actually provided.
11. Confirm the confirmation. Dependent on the system settings the dialogue opens either within a new view or within a popup. If the dialogue opens within a new view, confirm with **Enter** and go one step back (). In case the dialogue is opened within a popup, confirm by pressing the green checkmark.
12. Skip possible notifications (current date is not a working day) with **Enter**.
13. Thus, the Network and the **project stage Prototype** are confirmed and the costs are entered automatically. Go to the **second milestone**. You can see that from the link of the milestone with **second Activity Construction**, the **actual date** was set automatically and, thus, the second project stage was completed as well.

Project Structure: Description	Identification	
Techno-Doping-9995	Milestone: 17 Milestone Prototype 9995	
Development-fixed price 99	Basic Data Functions Administr.	
Blueprint 9995	Usage: 00006 Close	
Prototype 9995	Activity: 0020 Construction 9995	
<b>Usage</b>		
<input checked="" type="checkbox"/> Milestone functions	<input type="checkbox"/> Progress analysis	Perc of compl.: <input type="text"/> %
<input type="checkbox"/> Release stop ind.	<input checked="" type="checkbox"/> Sales document date	
<input type="checkbox"/> Trend analysis	Billing plan	
	InvoicePercent: 70,00 %	
<b>Dates</b>		
Fixed date: 13.11.2017 00:00:00	<input type="checkbox"/> Latest dates	
Actual date: 13.11.2017 24:00:00	<input type="checkbox"/> Offset to fin.	
Scheduled date: 13.11.2017 24:00:00	Offset: <input type="text"/> / <input type="text"/> %	

Figure 86: Milestone End Date set Automatically: SAP-System-Screenshot

14. Save your project.

### 3.4.4 Project Planning Board

Performing the chapter **Project Planning Board** is only possible by using the SAP GUI.

Call up the Project Planning Board to display the project's progress and to be able to comprehend actual costs entry.

1. Within the transaction **CJ20N**, open your project and expand all the nodes in the structure.
2. Select the top node of your project (Techno-Doping-xxxx) and choose .
3. You can see that the actual costs are listed on the Project Planning Board (small deviances to the planning data are possible).



By using the  (**Field selection**) button, you can display further fields (e.g. Duration, Actual costs, Project Revenue Plan etc.).

**NOTE**

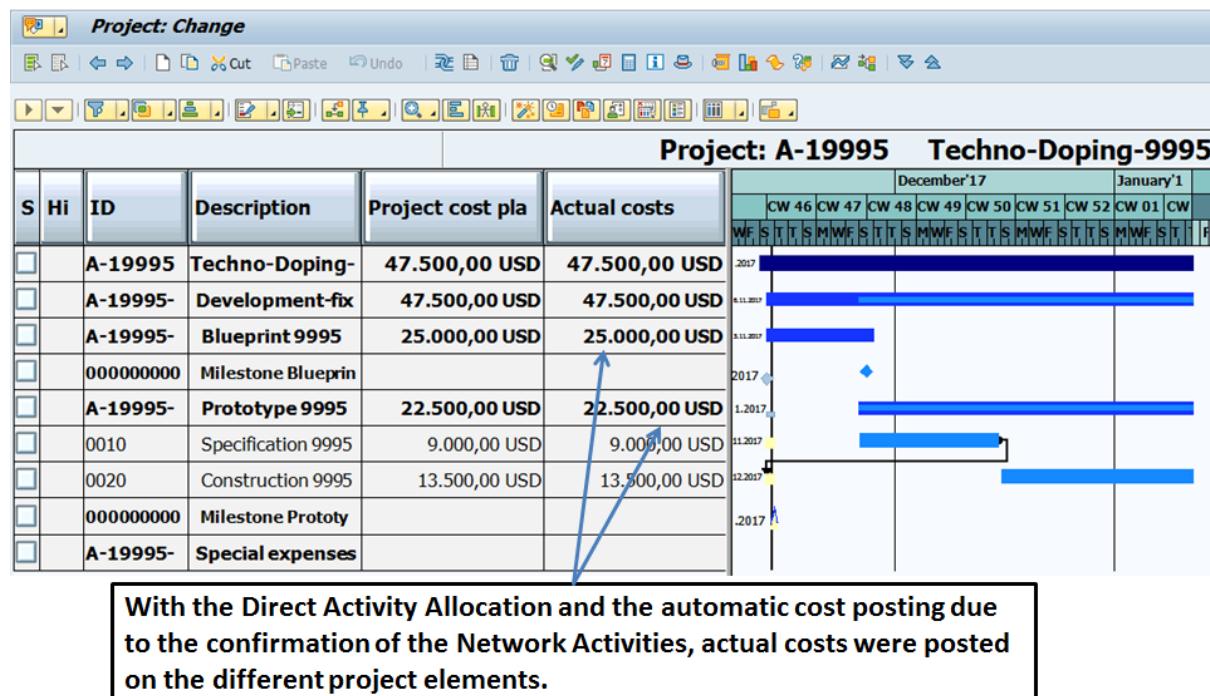


Figure 87: Actual Costs – Project Planning Board: SAP-System-Screenshot

### 3.4.5 Entering Project Hours: Special Expenses

Your test driver worked tirelessly and tested the new racing bicycle 40 hours a week. You task is to enter the time and to further process these time data.

#### 3.4.5.1 Entering Project Times in CATS

The SAP component CATS (cross application time sheet) is used for time entry. This **cross-application component** can collect all types of time data and provides them subsequently for further processing in many SAP applications. The following figure is meant as further comprehension of the explanations above.

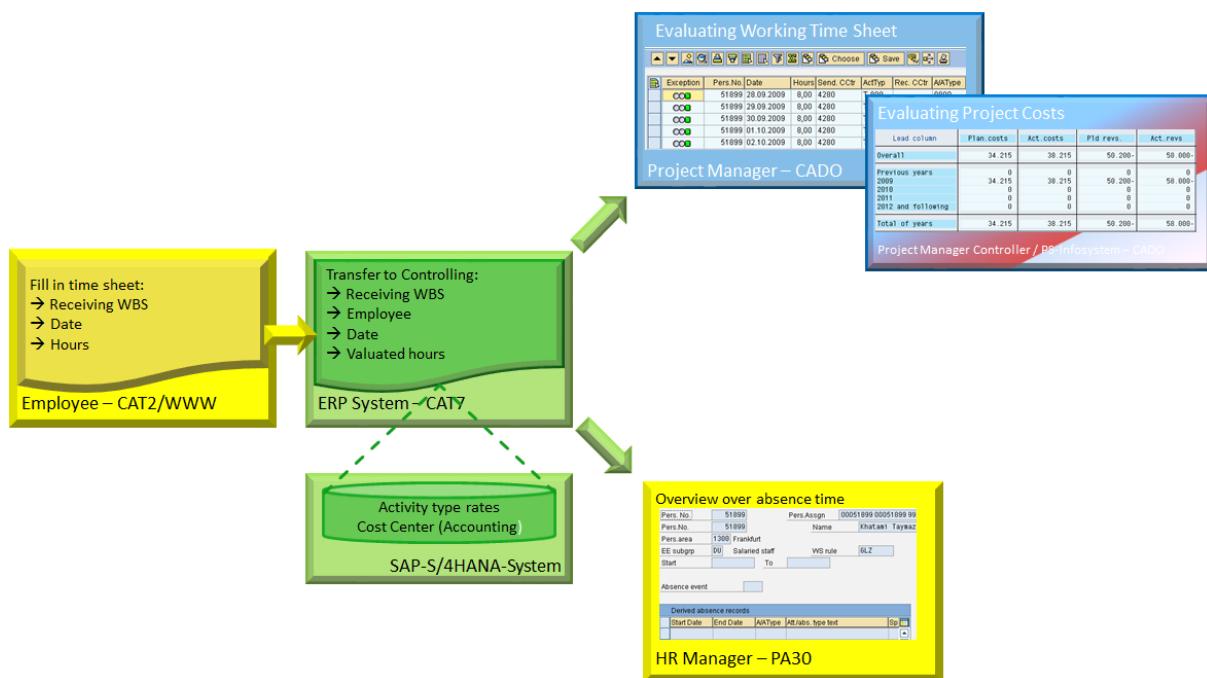


Figure 88: CATS (Cross Application Time Sheet)

Times entered under CAT2 in the personnel master of the consultant are transferred to controlling by using transaction CAT7. Thus, the provided expenses are available in cost accounting and in the project system for evaluation and for assigning incurred costs.

Enter the time data for your employee by selecting the following transaction within the SAP Easy Access Menu:

**Human Resources → Time Management → Time Sheet → CATS Classic → Record Working Times (CAT2)**

1. Enter **Data Entry Profile 1303**. Press *Enter*.
  2. Enter the previously created personnel number of employee Tom-xyyy Test (see current data sheet) into the **Personnel Number** field. Press *Enter*.
  3. Enter the **current date** as **Key date**. After that, click on **Enter Times**.
  4. The **Time Sheet: Data Entry View** screen appears. Enter the stage **A-1xxyy-2 (special expense)** into the first white line of the **Receiver WBS Element** (scroll to the right) column.
  5. Enter **8 hours** for each of the **first five working days** in this line.
  6. Confirm with *Enter*.
  7. The system automatically fills in the fields **Send.CCtr** (cost center NAQM1000) and **activity type (T-xyyy)** with the corresponding data from the personnel master record.
- Compare your entries with the following image.

Personnel Number: 76		Mr Tom-9995 Test		Cost Ctr:		Make sure you entered the correct WSB Element!										
Data Entry Period: 13.11.2017 - 10.12.2017																
Data Entry Area		LT	Send. CCtr	COAr	ActTyp	Proj...	Project Description	Rec. CCtr	Receiver WBS Element	A/A...	Name	13.11	14.11	15.11	16.11	17.11
<input type="checkbox"/>	NAQM1000		NA00	T-9995					A-19995-2		0800	7,50	7,50	7,50	7,50	7,50
<input type="checkbox"/>												8	8	8	8	8
<input type="checkbox"/>												8	8	8	8	8
<input type="checkbox"/>												8	8	8	8	8

Figure 89: Time Entry Consultant Hours: SAP-System-Screenshot

8. Release the entered times for the target applications HR/PS/CO by clicking the symbol (**release view**).
9. Select the previously entered line and click on **More → Release**.

Select All	Deselect All	Sort Ascending	Sort Descending	Totals Row On/Off	More											
Personnel Number: 76	Mr Tom-9995 Test															
Data Entry Period: 13.11.2017 - 10.12.2017																
Data Entry Area	LT	Send. CCtr	COAr	ActTyp	Project	Project Description	Rec. CCtr	Target Hours On/Off (F7)	Weekdays On/Off (F8)	Detailed Time Data (Ctrl+F2)	Long Text (Ctrl+Shift+F4)	Check Entries (Ctrl+F6)	Check Log (Ctrl+F7)	Legend (Shift+F6)	Settings (Shift+F1)	Release (Shift+F4)
<input type="checkbox"/>	NAQM1000	NA00	T-9995													
<input checked="" type="checkbox"/>																
<input type="checkbox"/>																
<input type="checkbox"/>																
<input type="checkbox"/>																

Figure 90: Release Working Hours: SAP-System-Screenshot

10. The system issues a message saying that **5 times** were released. **Save** the time sheet and close the transaction by pressing **Exit**.

### 3.4.5.2 Further Processing of Time Data

As mentioned in the description of the CATS component, recorded project hours are, in contrast to HR, **not** automatically transferred to the CO and PS functional areas.

Transfer and allocation have to be triggered explicitly. This is your next task.

Within the SAP Easy Access Menu, choose the following transaction:

**Human Resources → Time Management → Time Sheet → Transfer → Accounting (CAT7)**

1. Enter the **personnel number** of your employee (**Tom-xxxx**). Then, click on **Execute**.
2. Three documents should be posted and the system should issue the following message:  
**All data were transferred to CO.**



Figure 91: Data Transfer to SAP CO: SAP-System-Screenshot

- Leave the transaction by pressing **Exit** twice.

### 3.4.6 Sales Order Billing: Blueprint and Prototype Stages

By entering actual dates into milestones and confirming individual project stages. Stages are considered completed and the previously set billing block in the billing plan of the first sales order (**billing block 02 missing confirmation**) is deleted. Thus, you can *create an invoice for the first project stage*. Since the project represents a service (and is not delivered, in contrast to goods) **billing with reference to the order** is carried out, as opposed to billing with reference to delivery (such as in the logistics integration case study). According to the billing plan for the first sales order, **30% of the order value** is due after completion of the first project stage and **70%** are due after completion of the second project stage. Next, you will create both invoices. For creating the invoices, choose within the tile group **Script 8 – Project System** the app **Create Billing Documents**.

Usually, the billing due list contains all billable transactions of a company at a selected due date. To avoid billing orders of another case study participant, you need to limit the results to your customer.

- Enter the following data:

- **Billing date to** *the end date of the second milestone* (or a date far in the future, e.g., current day + 4 month).
- **Sold-To Party** *your customer*
- **Order-Related** *Select*
- Press on **Display Billing List** button to display the billing due list.

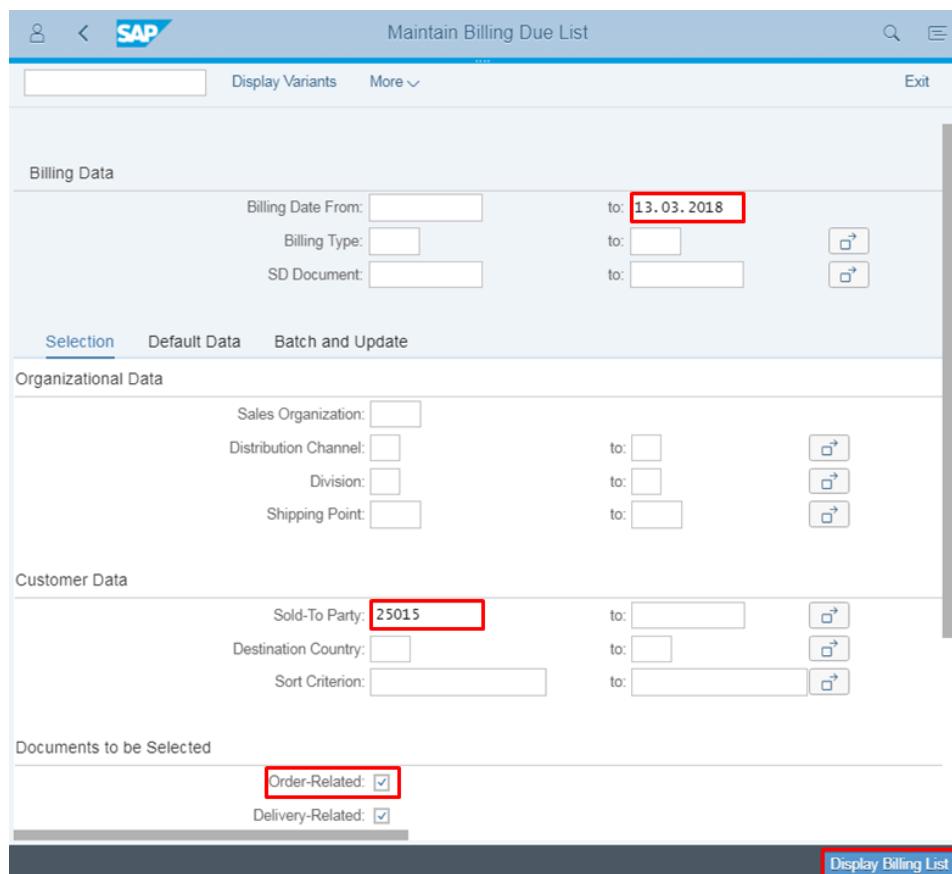


Figure 92: Billing (1): SAP-System-Screenshot

2. Select the row (if both rows are selected you have to uncheck the other row) from the billing due list that contains the number of your first standard order (milestone billing) and a net value of **18.000** Dollar. After selecting the row, click the **Individual billing document** button (**individual billing document**).

S	BiCat	SOrg.	Bill.date	Sold-to pt	BillT	DstC	SD Doc.	DChl	Dv	Doc.Cat.	Address	Sold-to party	Sold-toLoc	S...	Net Value	Curr.
<input checked="" type="checkbox"/>	X	A	UW00	27.11.2017	25015	F2	US	37	WH	Bl	C	134500	Taymaz Khatami	Denver		18.000,00 USD
	X	A	UW00	16.12.2017	25015	F2	US	37	WH	Bl	C	134500	Taymaz Khatami	Denver		42.000,00 USD

Figure 93: Billing (2): SAP-System-Screenshot

3. The system generates the billing document. **Save** and list the billing document number.

#### Billing Document 1 (Milestone 1):

4. Next, select the row from the billing due list containing a net value of **42.000** Dollar. After selecting the row, click the **Individual billing document** button (**Individual billing document**).
5. The system generates the billing document. **Save** and list the billing document number.

#### Billing Document 2 (Milestone 2):

6. Leave the view by pressing **Exit** twice.
7. Before the accounting document for the second billing is created, the just created billing document must be released to accounting, first. Therefore, within the tile group **Script 8 – Project System** choose the app **Change Billing Document**.
8. Enter the **number of the recently created (second) billing document** and choose **More → Billing Document → Release to Accounting**.
9. Now, display the billing document. Therefore, within the tile group **Script 8 – Project System** the app **Display Billing Document**.
10. Enter the **number of the recently created (second) billing document**, confirm with **Enter** and press **Accounting** button (**accounting**) to display the created accounting documents for the billing document. On the appearing screen, double-click on **accounting document**.

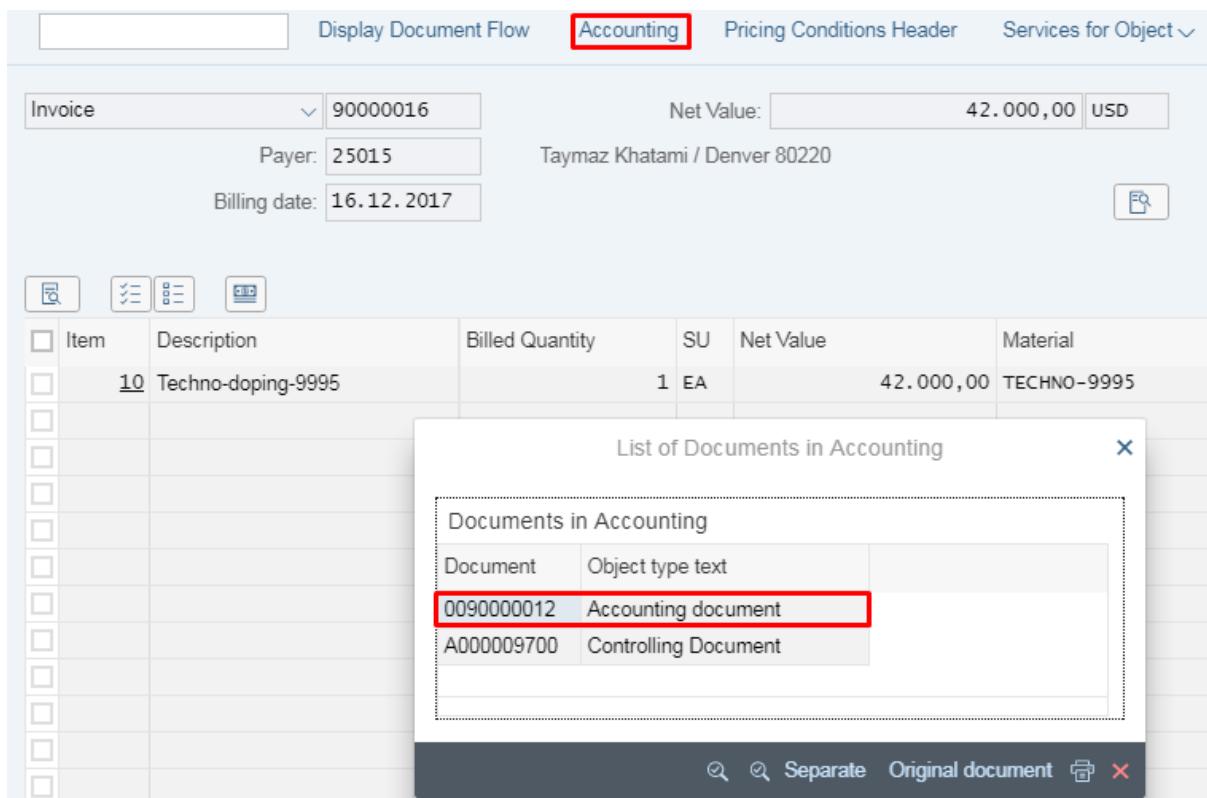


Figure 94: Accounting Document (1): SAP-System-Screenshot

11. You can see the accounting document, which caused posting the payment to the customer account (here: 25015). Double-click the posting row containing **revenue account 600000** in which the net revenue was entered.

Co...	Item	Key	...	Account	Description	Amount	Curr.	Tx	WBS Element
US00	1	01		25015	Taymaz Khatami	42.000,00	USD		A-19995-1
	2	50		600000	Sales Revenue	42.000,00-	USD		

Figure 95: Accounting Document (2): SAP-System-Screenshot

You can see the details for the posting item. Thus, you completed the fixed price project and you settled it with the customer. We will now focus on the provided special Activities.

### 3.4.7 Resource-related Billing: Special Expenses

In contrast to the previously executed milestone billing, you will now run a **resource-related billing** for the special expenses.

**Resource-related billing:**

In the framework of resource-related billing, expenses (in this case, the consumed test driver hours as origin data) are converted into sales materials (dynamic items). Instead of the internal hourly price, a higher external SD price is calculated. The system then creates a billing request out of these dynamic items, which is then the basis of billing.



*This excursus is supposed to give you an in-depth understanding of resource-related billing and will clarify why you assigned the Activity type T- xyyy to activity type group testdriver.*

**EXCURSUS**

*Your tutor created the activity type group **testdriver** as preparation for this course. Furthermore, your tutor has created the DIP profile WIP. The DIP Profile WIP converts all dynamic items "collected" during the sales process for the second sales order into Billing Request items accounting for price and quantity of the dynamic items.*

*Thereby, the activity type group (and, thus, the assigned activity type T-xxxx) is linked with dummy material **testdriver1**. Moreover, condition record **PR00** with a sales price of 200 \$ was assigned to material **testdriver1**.*

*Since you assign your activity type **T-xxxx** to activity type group **testdriver**, your activity type is also linked with the material **testdriver1** and the corresponding condition record, so that you sell your activity type at a price of 200 \$ to the customer.*

*The following figure will clarify the procedure:*

1. *The material **testdriver1** is linked with the activity type group **testdriver** via DIP profile **WIP**.*
2. *Your activity type **T-xxxx** was assigned to activity type group **testdriver**. Thus, your activity type is also linked with the material.*
3. *Your activity type **T-xxxx** is entered in the personnel master record of your test driver. Thus, all hours provided by your employee are settled/allocated with this activity type.*
4. *You entered all time data for your employee in the CATS application to WBS Element **A-1xxxx-2**. Thus, the 40 hours provided by your employee (performed expenses = resources consumed, therefore: resource-related billing) are assigned to this WBS Element.*
5. *You have entered the material **testdriver1** in your second sales order (quantity = 1, price = 200 \$). Furthermore, you have entered the WBS Element **A-1xxxx-2** as Account Assignment Element in the second sales order. Thus, there is a link with the provided testing hours and the quantity of material **testdriver1** entered in the sales order.*
6. *The DIP profile **WIP**, which you have entered in the second order on the Sales B tab, ensures that for resource-related billing, the assigned material in the order is updated with a quantity of 40 hours. Thereby, the sales order (material **testdriver1**) collects the provided working hours of the employee as Dynamic Items.*
7. *When performing resource-related billing in transaction **DP91**, the dynamic items produce the billing request positions (in this case only 1 position). The position contains the 40 hours (performed activity type amount of **T-xxxx**) times 200 \$ (price for material **testdriver1**) due to the "calculation"-procedure in the DIP profile. This results in a final*

revenue of 8000\$ (without taxes), including the condition of 200\$ that is debited to the customer.

Note that you entered a price of 100 \$ for your activity type T-xxxx. However, the DIP profile does not contain a price indicator (on purpose) and, thus, the material price of 200 \$ is taken into account. That is, you use the activity type price for internal cost allocation and cost determination, but you use a different price to sell this activity to your customer. Thus, you make an extra profit by charging the customer 8000 \$ instead of 4000 \$.

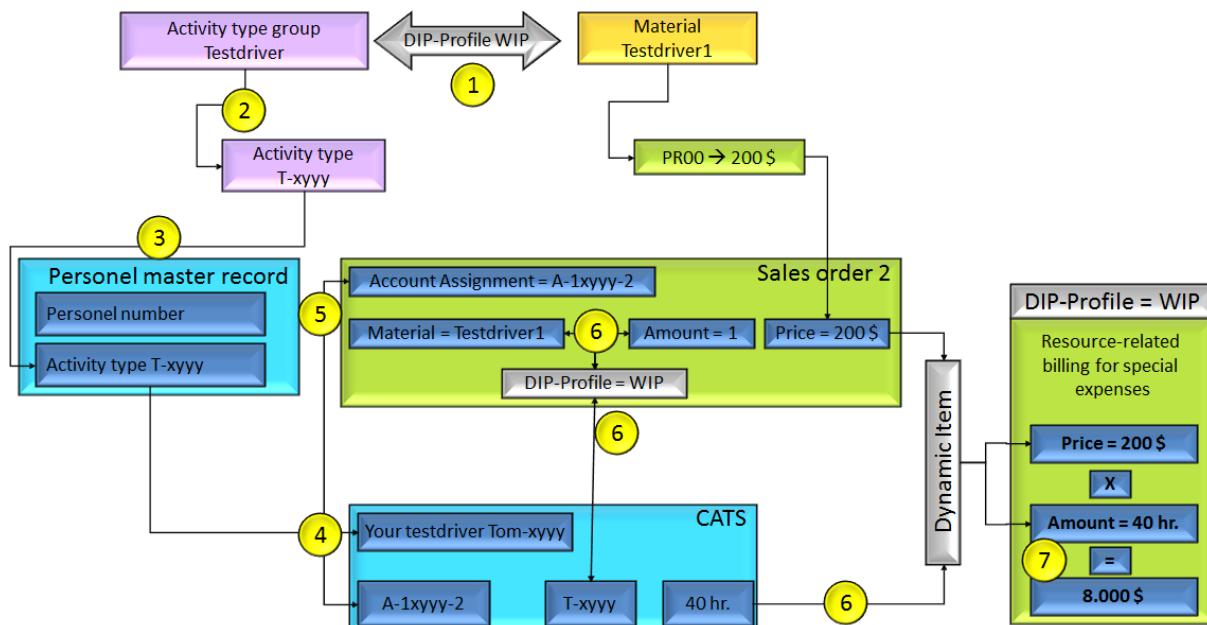


Figure 96: Schema of Resource-related Billing

The DIP profile, thus, links controlling (activity type T-xxxx) with SD (material testdriver1) via quantity update (time data from CATS). To simplify, the provided quantity for an item of the sales order is entered by using activity type T-xxxx, not directly in the sales order. The advantage of this is that you do not need to enter a quantity that is yet unknown in the sales order.

### 3.4.7.1 Determine Activities for Billing

To settle the special expenses of the test driver appropriately (resource-related), determine the Activities to be invoiced.

Within the tile group **Script 8 – Project System** select the app **Ressource-Related Billing Request**.

- Enter the **number** of the **second (!) sales order** (standard order 2 from datasheet 8) into the **sales document field** on the appearing screen. Enter **the last day of the next month** as **posting date**. Click on the **Expenses** button.

The screenshot shows the SAP Sales and Distribution interface. At the top, there are tabs: Expenses (highlighted with a red box), Sales price, Billing request, and More. Below the tabs, under Sales and Distribution, the Sales document number is set to 38. Under Pricing, the Pricing date is left empty. Under Source, the Posting date to is set to 31.12.2017. A checkbox for Process Open Items Only is unchecked.

Figure 97: Resource-related Billing (1): SAP-System-Screenshot

2. The system switches to the expense view in which the activities to be invoiced are displayed with their internal (!) hourly prices. With a click on the small triangle in front of the order number, expand further entries and double-click the bottom one. The system should display **testdriver costs** with an original amount of **4000 USD**. This is NOT the amount that the customer is debited with, but the company-internal hourly price. Click the **quantity** tab.

The screenshot shows the SAP Sales and Distribution interface in the expense view. Two boxes highlight specific information:

- Internal price \* Quantity consumed = costs that are posted to your project**: This box is positioned above the table header and applies to the top row of the table.
- Material price \* Quantity consumed = revenues that are posted to your project**: This box is positioned above the quantity tab and applies to the bottom row of the table.

The table displays two rows of data. The first row (row 38) has a yellow background and shows a quantity of 40 H. The second row (row 38/10) has a white background and shows a quantity of 40 H. A red arrow points from the first box to the first row, and a green arrow points from the second box to the second row.

Description	St...	Amt to be bill...	Cu...	Qty to be bil...	...	% t...	Net value	Cu...
38		4.000,00	USD	40	H	100,0	8.000,00	USD
38/10		4.000,00	USD	40	H	100,0	8.000,00	USD

Description	... Lo...	Original quan...	Quantity billed	Open quantity	Qty to be billed
Σ 38/10		40	0	40	40
TESTDRIVER1 Testdriver Hours		40	0	40	40

Figure 98: Resource-related Billing (2): SAP-System-Screenshot



NOTE

If you perform the case study throughout different months, maybe in the lower area there are displays two rows. In this case the origin quantity is split (e.g. origin quantity 40 is split in 8 + 32).

3. The system displays the number of provided hours, and you can differ between already invoiced quantities, quantities to be invoiced now and open quantities. You could, for example, postpone billing here as well. Do **not** leave the dialog!

### 3.4.7.2 Create Billing Request

Create a **debit memo request** from the dynamic item to initiate the invoice creation process.

1. Click the **Billing request** button (**billing request**).
2. Answer the question with **Yes**.
3. Next, a billing request is created. For the moment, this billing request is only an internal document and later the template for creating the customer billing document.
4. By default, a newly created debit memo request is blocked for billing to allow for checking them again. In the **Item overview** tab select the **empty entry (!!!)** from the **Billing Block** field (drop-down field), to release the billing request.

The screenshot shows the SAP system interface for creating a debit memo request. At the top, there are fields for 'Debit Memo Request' (70000002), 'Net Value' (8.000,00 USD), 'Sold-To Party' (25015), 'Ship-To Party' (25015), 'Cust. Reference', and 'Cust. Ref. Date'. Below this, the 'Item overview' tab is selected in a navigation bar. The 'Billing date' is set to 13.11.2017. The 'Billing Block' dropdown menu is open, showing options like 'Check Debit Memo', 'Calculation Missing', 'Check Credit Memo', etc., with 'Check Debit Memo' currently selected. A red box highlights the 'Select empty entry' option at the bottom of the dropdown menu. An arrow points from this highlighted option to a callout box labeled 'Select empty entry'. To the right, there's a table for managing items, showing one row for 'TESTDRIV' with a target quantity of 40 H and a net value of 8.000,00 USD. The table has columns for Target Quantity, UoM, Net Value, and Doc... (partially visible).

Figure 99: Resource-related Billing (3): SAP-System-Screenshot

5. Save your document.

#### Debit memo request:

### 3.4.7.3 Create Customer Billing Document

Finally, your task is to create the **billing document for the customer**.

Therefore, within the tile group **Script 8 – Project System** the app **Create Billing Documents**.

1. Enter the following data:
  - **Billing date to** **the end date of the second milestone** (or a date far in the future, e.g., current day + 4 month)
  - **Sold-To Party** **your customer**

- **Order-Related Select**
- Press the **Display Billing List** button to display the billing due list.

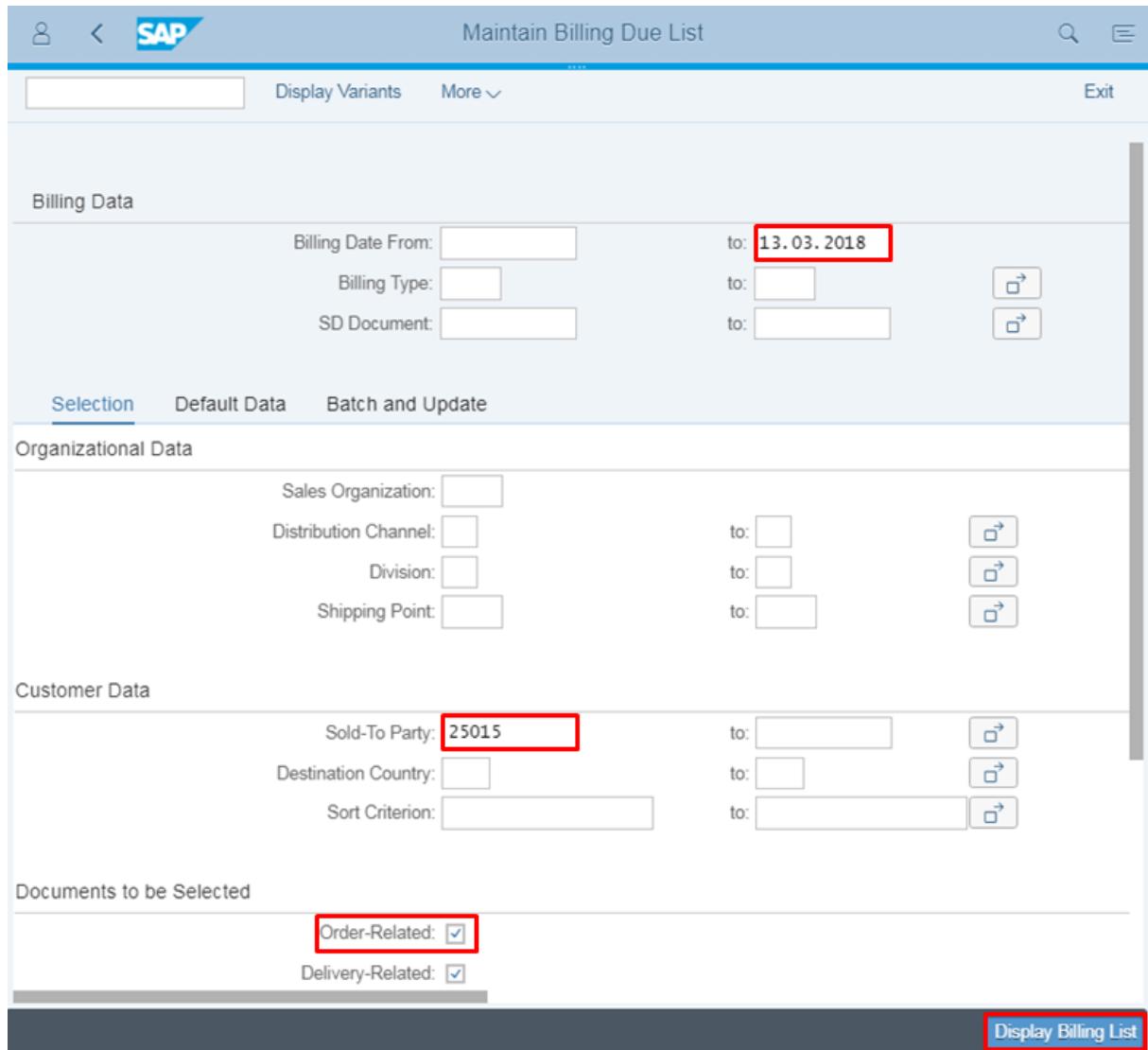


Figure 100: Resource-related Billing (5): SAP-System-Screenshot

2. On the next screen, select the *line of your previously created debit memo request with the amount of 8000 \$*. Again, click the **Individual billing document** button (**Individual billing document**).

S	BICat	SOrg.	Bill.date	Sold-to pt	BillT	DstC	Document	DChl	Dv	Doc.Cat.	Address	Sold-to party	Sold-toLoc	Net Value	Curr
X	A	UW00	13.11.2017	25015	L2	US	70000002	WH	Bl	L	134500	Taymaz Khatami	Denver	8 000,00	USD

Figure 101: Resource-related Billing (6): SAP-System-Screenshot

3. The system generates a debit memo with the corresponding items for the consulting hours. **Save** it and list the document number.

**Document (for debit memo):**

4. To display the debit memo you just created, choose within the tile group **Script 8 – Project System** the app **Display Billing Documents**.
5. Enter the **number of the previously created debit memo** into the **billing document field** and press Enter.

The screenshot shows the SAP Billing Document interface. At the top, there are fields for 'Debit Memo' (90000017), 'Net Value' (8.000,00 USD), 'Payer' (25015), and 'Billing date' (13.11.2017). Below these, a message says 'Taymaz Khatami / Denver 80220'. On the right, there is a search icon. The main area displays a table with columns: Item, Description, Billed Quantity, SU, Net Value, and Material. One row is visible: Item 10, Description Testdriver Hours, Billed Quantity 40 H, Net Value 8.000,00, and Material TESTDRIVER1.

Item	Description	Billed Quantity	SU	Net Value	Material
10	Testdriver Hours	40 H		8.000,00	TESTDRIVER1

Figure 102: Billing Document: SAP-System-Screenshot

## Data Sheet

*Congratulations! You completed the **Project Management** case study.*

*The subsequent case studies are based on the results of this case study. In case your data differs from the description in the script, please contact your tutor prior to processing another case study.*

Finally, please **submit the carefully completed data sheet** to your tutor (use support email address from the welcome mail) for the case study **Project Management**.

*Please comply with the naming rules. Non-compliant data sheets will not be accepted; i.e., rename the document that you downloaded from this course's download area as follows:*

**08-Project\_Management-xxxx-zzz-lastname.doc**

Thereby, you need to replace **xxxx** with your user number **without** the “**WIP**“ and without the hyphen (WIPx-xyy) and replace **zzz** with the number of the client you are working on.

Example:

Your name is **Max Mustermann**, you are working on **client 700** and your **user number is WIP9-999**. Then, name the document as follows:

**08-Project\_Management-9999-700-Mustermann.doc**

## List of Literature

**Franz, M.** (2014a): Projektmanagement mit SAP Projektsystem. 4. Auflage. Galileo Press.

**Franz, M.** (2014b): Project Management with SAP Project System. 4th Edition. Galileo Press.

**Dowling, K.** (2015): Project Builder in SAP Project System—Practical Guide. Rheinwerk Verlag.

**SAP Online Library:** <http://help.sap.com>

**SAP University Alliances** (2012): Introduction to SAP ERP – Global Bike Inc. Version 2.11