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#ibminterconnect

## Lab DAD-5869

How to Build an Enterprise Architecture with TOGAF

**February 2015**



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## Overview

This workshop is an introduction to the practical application of Enterprise Architecture with TOGAF 9.

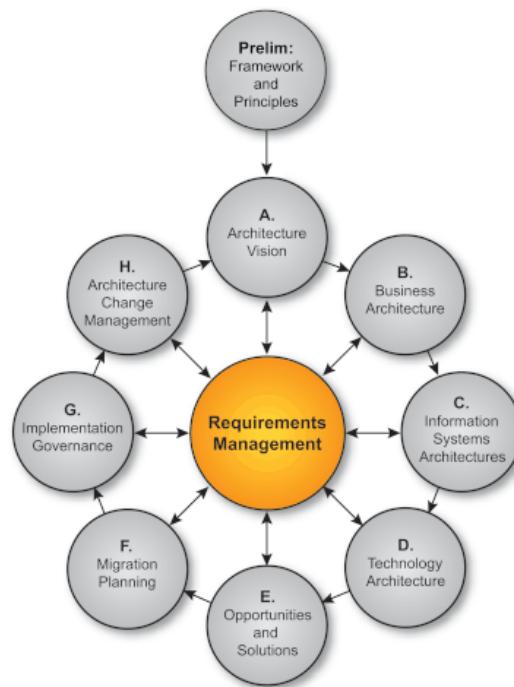
## Introduction

An enterprise architecture blueprint is an important resource to consolidate, link, and analyze organizational information. An enterprise architecture blueprint is created by capturing different domains of the organization, including:

- Missions, goals, strategies and tactics
- Business processes
- Information Systems: applications, services and data
- Technology infrastructures: networks, systems, and hardware components

The real value of possessing the blueprint comes from exploiting the relationships between these domains so that the complexity of the inter-relationships becomes exposed and usable by the technical and business communities to perform analyses and make informed decisions.

In this workshop, you are guided through various phases of a typical enterprise architecture engagement using IBM® Rational® System Architect, using the TOGAF<sup>1</sup> ADM<sup>2</sup> lifecycle to model multiple domains of an enterprise architecture.




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<sup>1</sup> The Open Group Architecture Framework

<sup>2</sup> Architecture Development Method

## Requirements

The workshop is dependent upon:

- IBM Rational System Architect v 11.4.3.2 upwards

You will use IBM Rational System Architect to define and exploit the enterprise architecture blueprints.



### Important!

If you encounter problems during the course of this lab, please call the attention of the workshop instructor or any of the lab assistants.

## Scenario

JK Banking has decided to begin an EA effort to consolidate vital corporate information on infrastructure and business functions, so it can get a handle on where current information lies, how up to date it is, who owns it, where discrepancies lie, and use it to be agile and intelligent in planning changes to the organization. On top of that, the EA team has been tasked with an initial project – provide cause-effect analysis on a project that will provide the following new capabilities:

- Provide Loans to Customers for Vacations
- Allow Customers to apply for Vacation Loans via their Mobile Devices
- Introduce a Gold Star Points system that will provide Customers with lower rates on their Vacation Loan
- Enable Customers to Donate to Charities via their Mobile Devices

### Your main objectives are to

- Begin the EA effort to consolidate key sources of record
- Understand how these new Capabilities can be implemented, and how they affect current Functions, Processes, Applications, and Technologies

## Icons

The following symbols appear in this document at places where additional guidance is available.

Icon	Purpose	Explanation
	Important!	This symbol calls attention to a particular step or command. For example, it might alert you to type a command carefully because it is case sensitive.
	Information	This symbol indicates information that might not be necessary to complete a step, but is helpful or good to know.
	Trouble-shooting	This symbol indicates that you can fix a specific problem by completing the associated troubleshooting information.
	Import	This symbol indicates importing information into the repository.

---

## Lab 1    Lab Preparation

1. Make sure **IBM Rational System Architect 11.4.3.2** or later is installed.
2. Make sure the **IBM\_TOGAF\_Workshop** folder is available on the desktop.

## Lab 2 TOGAF Preliminary Stage

### Goals:

- Create EA Repository (Encyclopedia)
- Establish Metamodel
- Establish Sources of Record
- Establish EA Method

In TOGAF's preliminary stage, it is recommended that you establish the Enterprise Architecture Framework, metamodel, and Method. In our workshop, we have determined to not model Information Services or Platform Services -- we will just model Business Services.

We also want to capture:

- Disaster Recovery plans for Servers at Locations in the organization. We will adjust the metamodel to capture whether or not servers have a Disaster Recovery plan in place.
- Strategic importance of business functions. We'll adjust the metamodel to categorize functions as high, medium, or low in strategic importance.

### 2.1 Create the EA Repository

#### Objectives of this Section:

- Understand what the underlying technology the EA is stored in
- Create the EA Repository



An encyclopedia is the **Rational System Architect** repository of information that you store about your enterprise architecture. The encyclopedia includes all components of your enterprise architecture, namely, the diagrams and definitions that make up your architecture, and references to any external documents or internal documents.

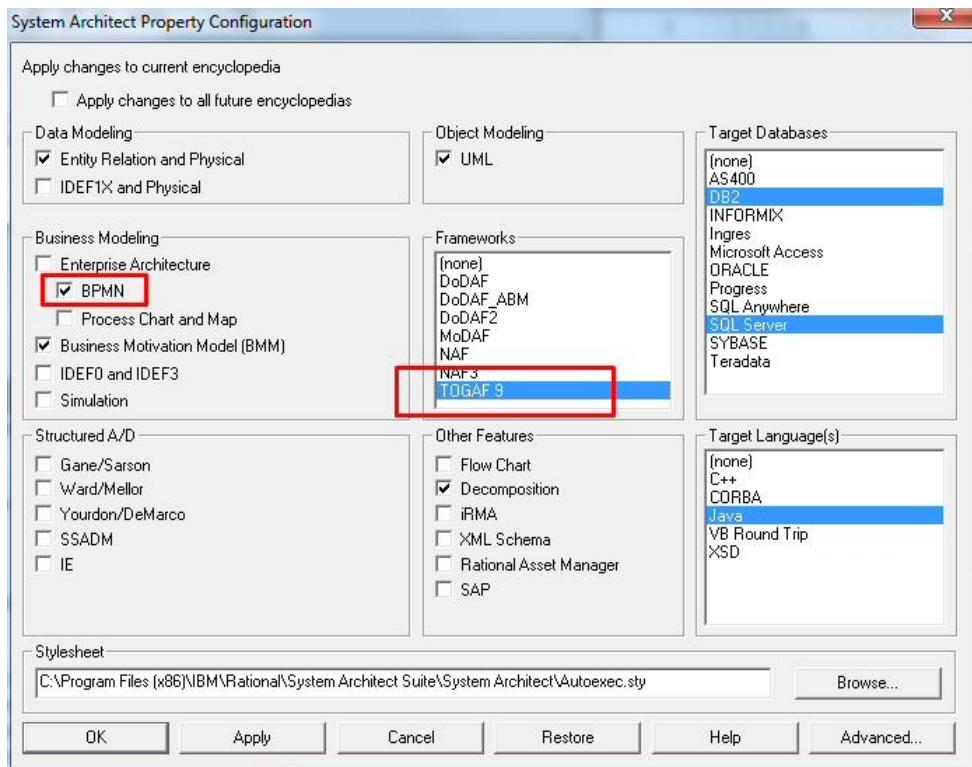
#### 2.1.1 Create a New 'Encyclopedia'

1. In Rational System Architect, select **File, Open Encyclopedia**, or click upon the **New or open an existing encyclopedia** icon on the toolbar.



2. In the **Open Encyclopedia** dialog, select the **New** button on the left.

3. In the **Connection** property, choose the existing server connection from the drop-down list. The connection serves as a pointer between the server and the encyclopedia (database) that you are creating.
4. Type in **TOGAF 9 Workshop** in the **New encyclopedia name** field and select **OK**.
5. In the System Architect Property Configuration dialog, toggle on TOGAF 9 as a framework, and BMM (Business Motivation Model) as a Business Modeling choice, and select OK.



6. Click OK to create the encyclopedia.

## 2.2 Establish Metamodel

### Objectives of this Section:

- Examine the TOGAF 9 Metamodel
- Understand ways to turn on/off portions of the TOGAF metamodel
- Understand how to customize the metamodel

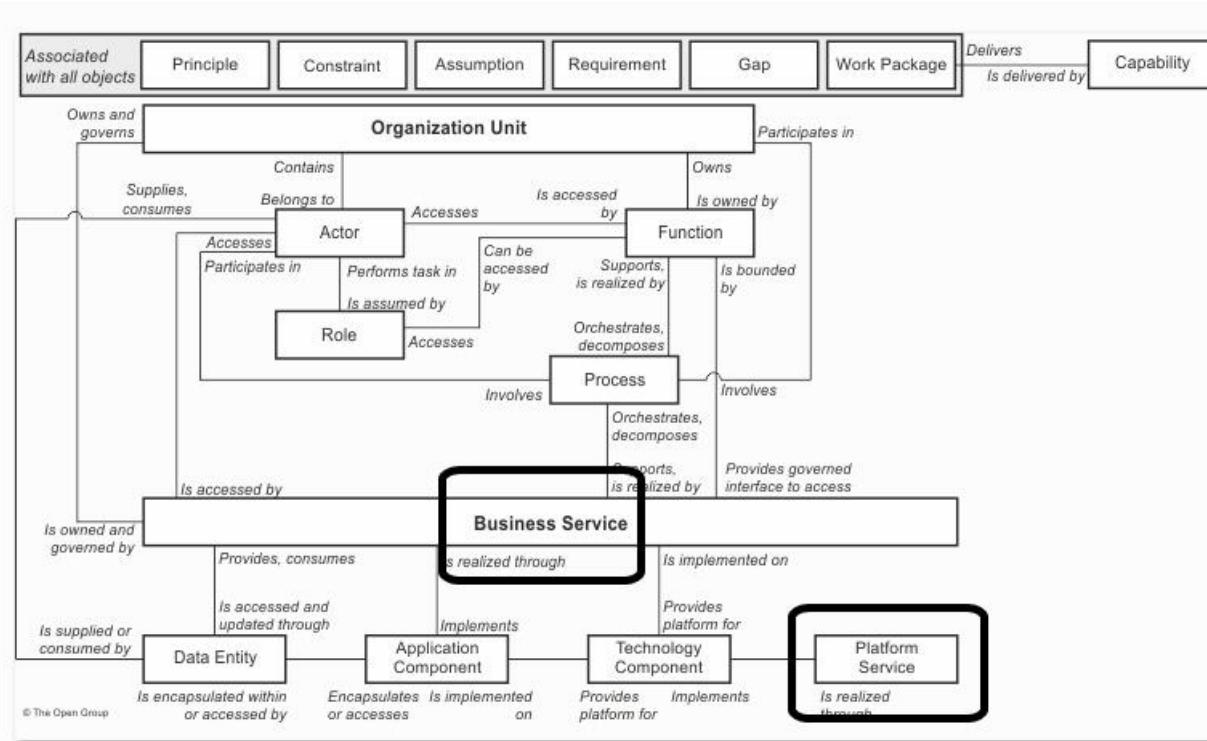
#### 2.2.1 Read Only: How to Turn On/Off Portions of TOGAF 9 Extended Content Metamodel

By default, we have turned on all of TOGAF 9's content metamodel -- and extended content metamodel, as shown in the next two figures.

1. Examine the TOGAF Content metamodel below.

2. Notice that:

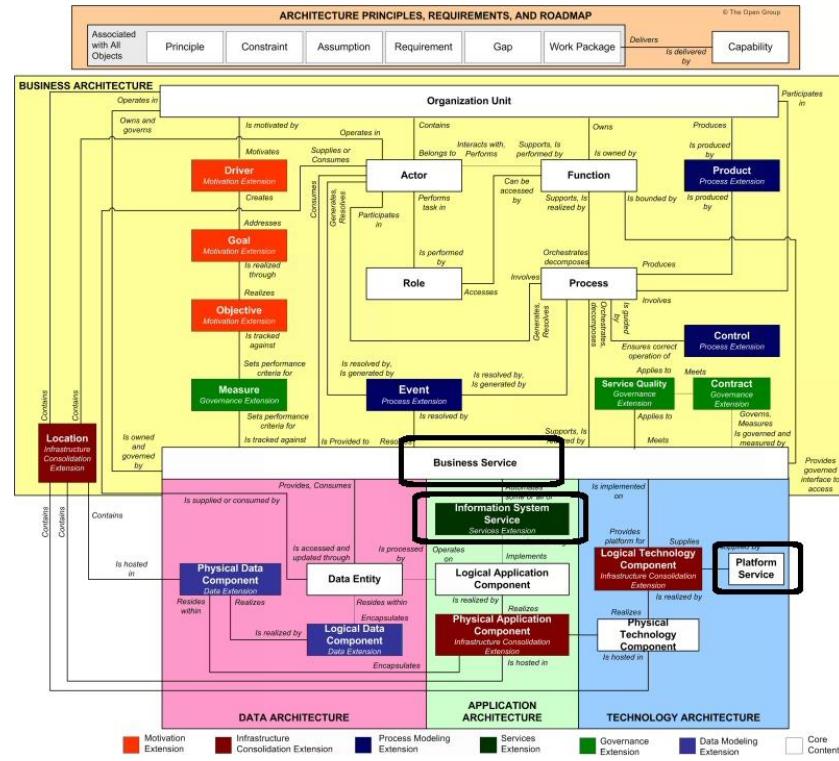
- There are two types of Services modeled -- Business Service and Platform Service,
- Business Service provides a layer between the business elements (above it in the metamodel figure), such as Functions, Processes, and Roles, and IT (below it) such as Application Components and Technology Components,
- Platform Service is a technology service. TOGAF essentially differentiates between business services and technical 'SOA' services,
- Applications are captured as Application Components,
- Application Components are *implemented on* Technology Components,
- Data is captured in the element called Data Entity



TOGAF Content Metamodel

3. Examine the TOGAF 9 **Extended** Content Metamodel in the figure below, and contrast it to the Content Metamodel just examined (above). Notice that:

- The extended content metamodel offers a delineation Logical and Physical Applications,
- The extended content metamodel offers a delineation Logical and Physical Technologies,
- The extended content metamodel offers some additional modeling concepts such as Infrastructure Services, in addition to the Business Service and Platform Service concepts of the normal TOGAF content metamodel.
- The extended content metamodel offers a encapsulating data information types -- Logical Data Component and Physical Data Component, in addition to the standard Data Entity provided in the regular content metamodel.

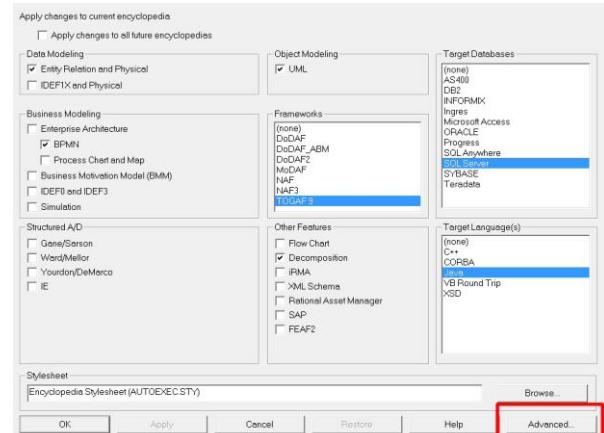


TOGAF Extended Content Metamodel

4. Select **Tools, Customize Method Support, Encyclopedia Configuration** – and click the **Advanced** button in the lower-right-hand corner (see picture at right), to open the Advanced Configure Property Set dialog.

5. Look at the bottom right of the advanced **Configure Property Set** dialog – note that a number of TOGAF 9 Extensions are turned on-- they are all listed in the **Selected Property Sets** field.

Each of these choices turns on/off a portion of the TOGAF metamodel.

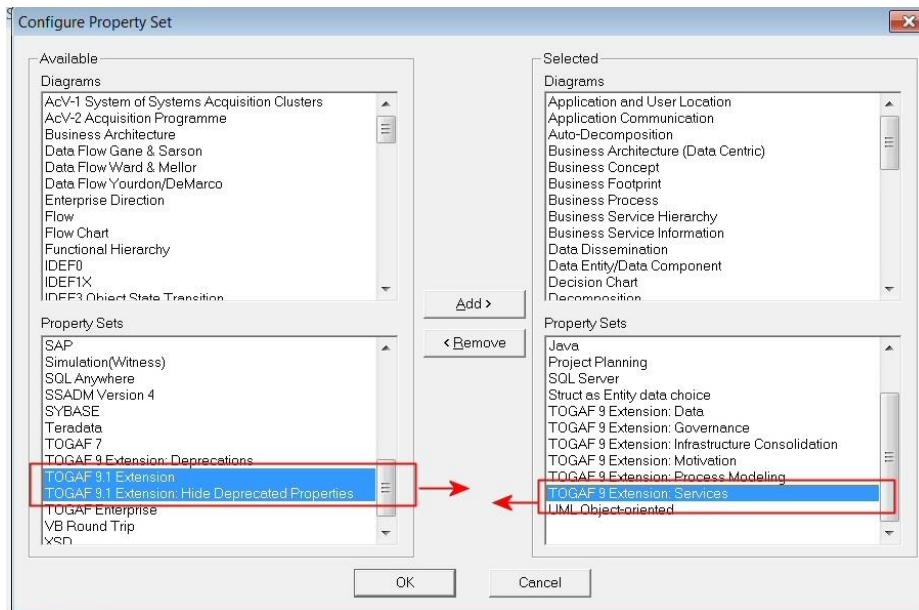


6. Select **TOGAF 9 Extension -- Services**, and click the Remove button. See picture below. This will remove the IS Service definition from availability in this encyclopedia. (It can be turned back on at any time.)

7. Select and Add the two extensions **TOGAF 9.1 Extension** and **TOGAF 9.1 Extension Hide Deprecated Properties**. This will add metamodel extensions to capture Infrastructure

that we will use in the last lab of this workshop.

8. Click OK to save and close all dialogs, and **reopen the encyclopedia** (File, Open Encyclopedia) to make the changes take effect.

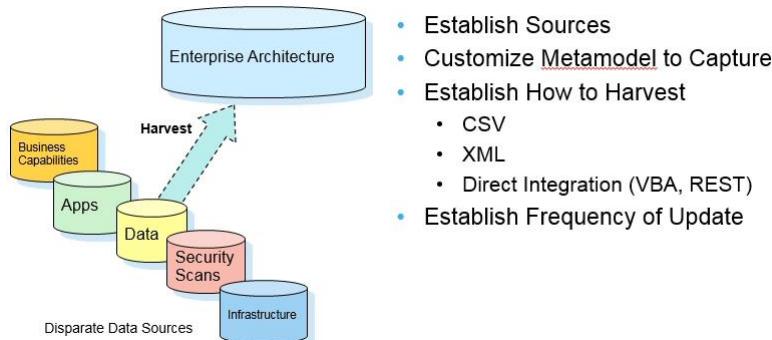


This is the easiest way to configure System Architect for TOGAF 9. In the next section, we'll alter the underlying metamodel to capture information not prescribed in TOGAF's metamodel.

## 2.2.2 Add Metamodel Changes

We want to capture the following for our organization:

- Disaster Recovery (DR) plans of Applications
- Flood Plain Risk of Locations
- Specify which processes are Customer Facing
- Strategic importance of each Function its -- information garnered during Application Portfolio Analysis in a tool such as Unicom Focal Point, CA Clarity, Planview, or a home grown solution
- Specify for each Application its Application Ranking after APM analysis



## Import Usrprops File to Modify Metamodel



### IMPORT INTO REPOSITORY

1. In System Architect, select **Tools, Customize User Properties, Import USRPROPS.TXT (Encyclopedia)**.
2. Browse to and select the **USPROPS.TXT** file provided in the Desktop\IBM\_TOGAF\_Workshop\Student\_Files\k.usrprops directory, and import it.
3. Reopen the encyclopedia for the changes to take effect.
4. **Read** the next section to see what the metamodel extensions the USRPROPS.TXT added to the encyclopedia.

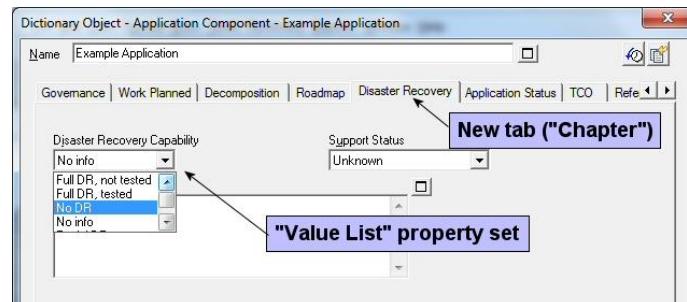
## Disaster Recovery (DR) of Applications

The IT department establishes a disaster recovery plan for each application -- what to do when it fails -- if its license runs out, if the app itself crashes, if its server crashes, does it have a backup application to switch to, etc. We want to import this information from IT into the EA -- capturing the status of each application -- whether a full or partial disaster recovery plan has been put in place for it or not.

The IT dept captures the following for each app:

Disaster Recovery Capability:

- Full disaster recovery plans in place, and tested
- Full disaster recovery plans in place, not tested
- Partial disaster recovery plans
- No disaster recovery plans in place
- No information



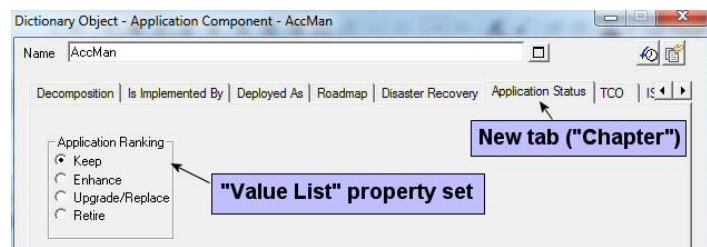
## Application Portfolio Analysis

During Application Portfolio Management (APM), the APM team did comparative analysis of the applications in the organization in a decision analysis tool (such as Focal Point, CA Clarity, Planview, or a home-grown system). We want to port that information into the EA. We make room for it by creating an Application Ranking property for every physical Application Component:

The IT dept captures the following for each app:

Application Status:

- Keep
- Enhance
- Upgrade/Replace
- Retire



## Flood Plane Risk of Locations

The organization operates out of a number of main locations. Each of these physical locations has a flood plane specified for it. We want to capture this information; we adjust the metamodel so that the Location definition has a Flood Risk property.

FEMA tracks flood risk for locations based on the following zones:

Flood Risk:

- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Zone 5



## Strategic Importance of Functions

The organization performs many functions. The business analysis team has prioritized the functions into their strategic importance -- high, medium, or low. We want to capture this in the EA.

Examine the example Function pictured to the right -- notice that there is a Strategic Importance tab that includes a list property that will be used to track the strategic importance of Functions -- High, Medium, and Low.



## Customer Facing Processes

We want to capture which of the business processes are customer facing processes, which by their nature would be important processes.

The usrprops we imported added a Customer Facing tab to a Process that includes a simple check box property that will be used to track customer-facing processes.



We will populate these properties later. Our job for the Preliminary Phase of TOGAF 9 is complete -- we have created our EA repository, decided upon what portions of the TOGAF Extended Content Metamodel to use, and extended the metamodel to capture properties specific to our organization's needs.

## Lab 3 Phase B: Business Architecture

### Goals of this Lab:

- Gather Functions of the Business; Establish Functional Hierarchy
- Understand Function Owners
- Examine How Certain Functions Break Down into Processes
- Understand how some Processes enable numerous Functions across Organizations
- Align Functions with Business Services
- Align Functions with Logical Application Components

### 3.1 Capturing Functions of the Business

#### Objectives of this Section:

- Import business Functions
- Auto-Build Functional Decomposition Diagram

The enterprise architecture team has acquired from the business team a spreadsheet that lists Functions of the business and their owners (in terms of what department in the organization is responsible for the Function).

#### 3.1.1 Import Spreadsheet of Functions

1. If you opened the spreadsheet functions.csv (no need to for this course) you would see the following pictured below.

A	B	C	D	E	F	G	H
1 Name	Description	Stereotype	Component Functions	Parent Function	Is Realized	Orchestrated	Organization Unit
2 Accounting	Accounting entails accounting for assets, liabilities, and financial transactions.	Function Depiction	"Help Desk Services"	"Financial Management"			Accounts
3 Administrative Management	Administrative Management involves the day-to-day management of an organization's resources.	Function Depiction		"Management of Resources"			Business Operations
4 Advising and Consulting	Advising and Consulting involves the guidance and advice provided by experts.	Function Depiction		"Knowledge Creation and Management"			
5 Asset and Liability Management	Assets and Liabilities Management provides accountants with the information needed to prepare financial statements.	Function Depiction		"Financial Management"			
6 Benefits Management	Benefits Management designs, develops, and implements programs to improve employee welfare.	Function Depiction		"Human Resource Management"			
7 Budget and Performance Integration	Budget and Performance Integration involves creating budgets and monitoring performance against them.	Function Depiction		"Planning and Budgeting"			Business Operations
8 Budget Execution	Budget Execution involves the legal (apportionment) of funds.	Function Depiction		"Planning and Budgeting"			Business Operations
9 Budget Formulation	Budget Formulation involves all activities undertaken to develop a budget.	Function Depiction		"Planning and Budgeting"			Business Operations
10 Capital Planning	Capital Planning involves the processes for ensuring the financial stability of an organization.	Function Depiction		"Planning and Budgeting"			Business Operations
11 Checking Accounts		Function Depiction	"Open Checking"	Sales			Commercial Sector
12 Close Checking Accounts		Function Depiction		"Checking Accounts"			Commercial Sector
13 Close Savings Accounts		Function Depiction		"Savings Accounts"			Commercial Sector
14 Collections and Receivables	Collections and Receivables includes deposits, collections, and receivables.	Function Depiction		"Financial Management"			Business Operations

2. Notice that the spreadsheet includes the following columns:

- Name -- any spreadsheet imported into System Architect MUST have Name as the first column, even though this is a spreadsheet of functions -- the property of the name of each function is, Name -- and you are trying to match properties.
- Description
- Component Functions
- Parent Function

- Organization Unit

These column names have been adjust so that they are the same as relevant property names in the Function definition in System Architect.



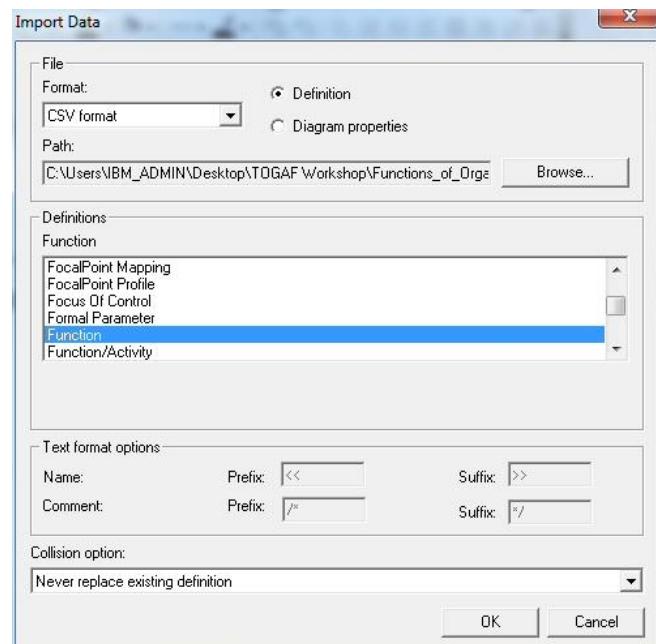
### IMPORT INTO REPOSITORY

#### 3. Select Dictionary, Import Definitions.

4. In the **Import Data** dialog, browse to the directory of the course files --  
C:\Users\IBM\_ADMIN\Desktop\IBM\_TOGAF\_Workshop\Student\_Files\ a. **FunctionalHierarchy**, and select to import the **functions.csv** file.

5. Select **Function** as the Definition type to import the spreadsheet to.  
6. Leave the **Collision Option** at its default. Click **OK** to import the spreadsheet.

Notice that once the spreadsheet is finished importing you receive a message of how many definitions were imported.

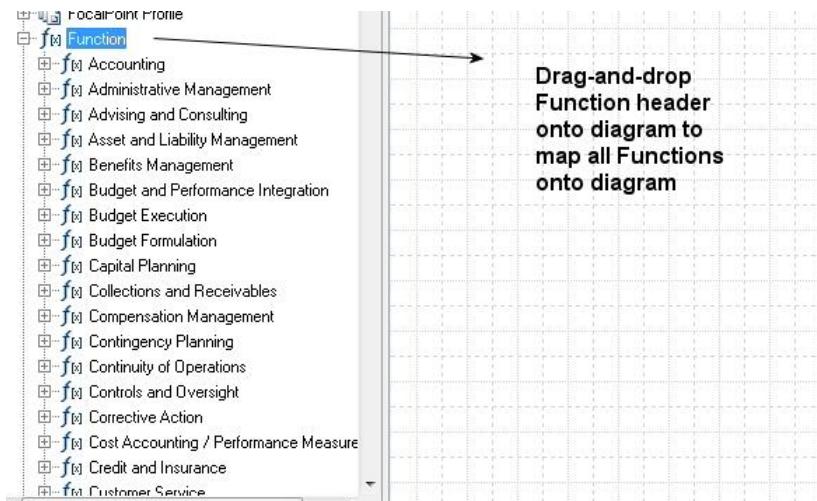


#### 3.1.2 Auto-Create Functional Decomposition Diagram

1. Create a new **Functional Decomposition** diagram named **JK Banking Functional Decomp** (right-mouse click on Diagrams in the Explorer on the left-hand side and select New, then select Functional Decomposition as the type).

2. Drag-and-drop the **Functions** header in the Explorer onto the diagram. This will map all Functions in the encyclopedia onto the diagram.

3. Select **View, Used Area** to see the Functions on the diagram. Use the zoom tool to zoom in.

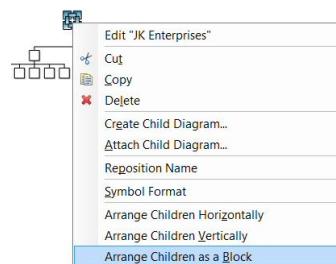
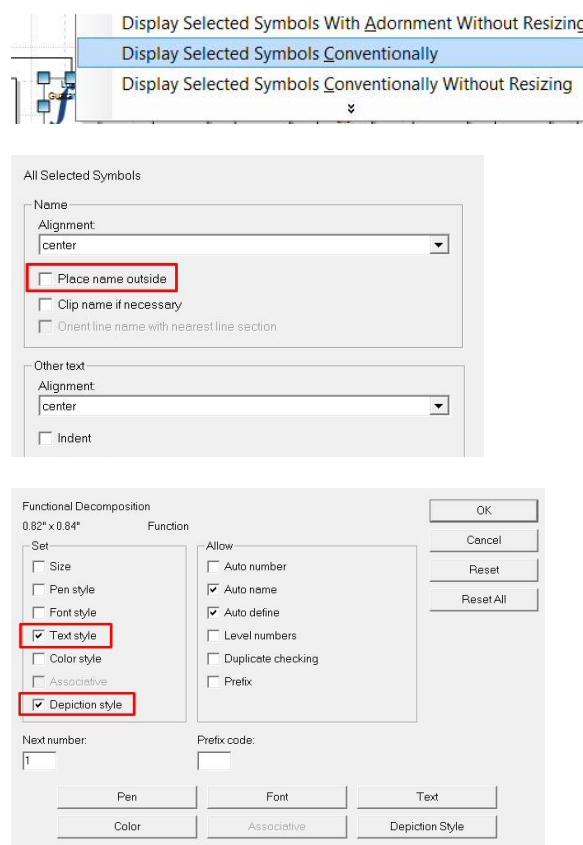


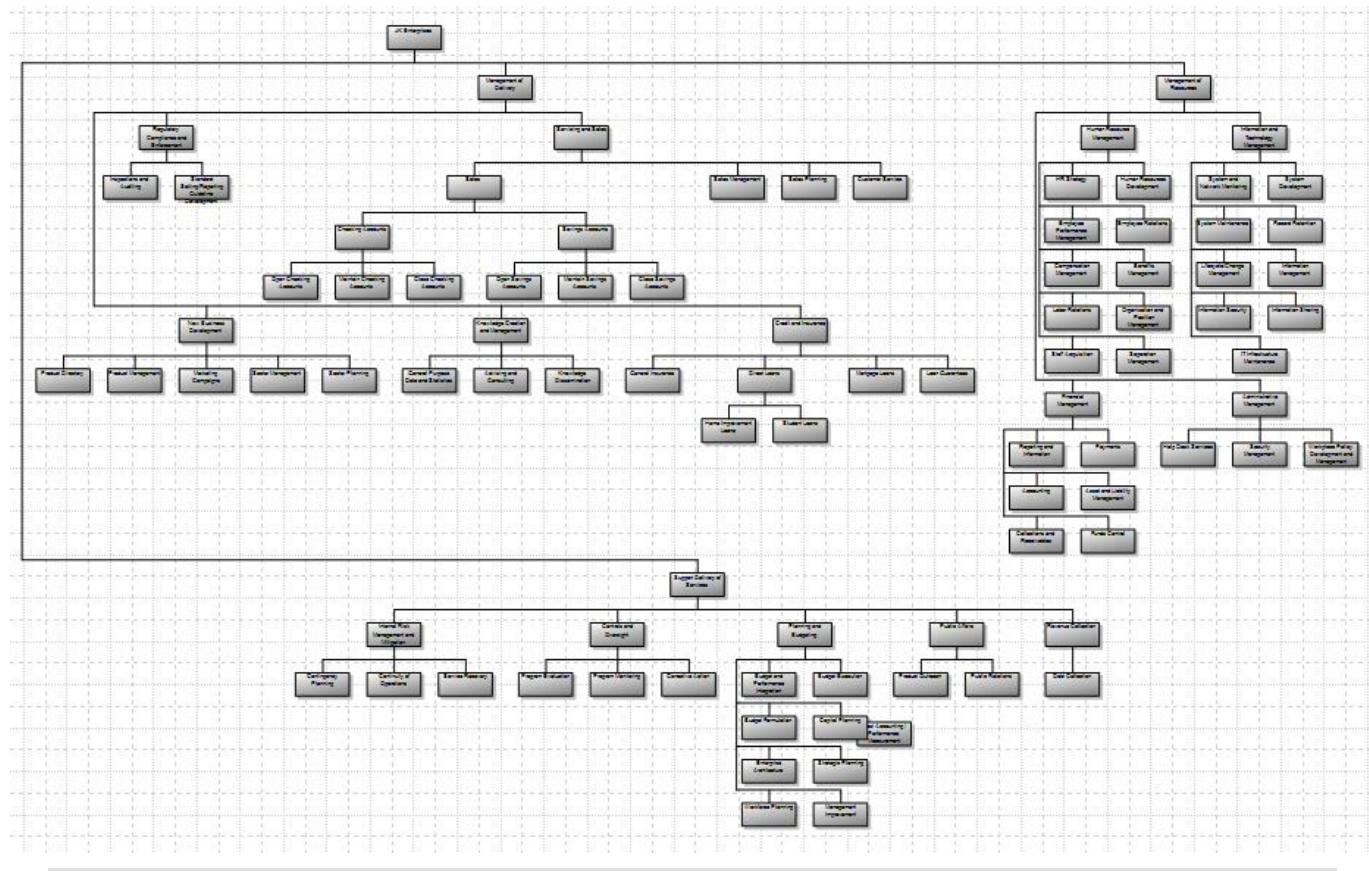
4. The function symbols default to being drawn as a picture. Change to a rectangle -- select all the symbols (**Edit**, **Select All** or lasso them), right-mouse click and choose **Display Selected Symbols Conventionally** to represent them as rectangles.

5. With all functions selected, right-mouse click and select Symbol Format, Text Position (can also be found on Format menu). Toggle OFF the **Place name outside** property.

6. Select any Function symbol on the diagram, and choose **Format**, **Symbol Format**, **Symbol Style**. Toggle on **Text style** and **Depiction style** and click **OK**. This will set the style going forward.

7. You can optionally experiment with right-mouse clicking on a function at the top of any hierarchy group, and select Arrange Children As Block, or Arrange Children Vertically, or Arrange Children Horizontally.





Note: If functions are not connected to each other, then run **Tools, Dictionary Update** and repeat the steps of creating a Functional Hierarchy diagram. Reason: Oftentimes a spreadsheet imported into the tool may have inconsistent information in it; a definition may reference another definition but the second definition may not reference the first. SA runs a Dictionary Update after importing csv files.

### 3.1.3 Add New Functions

1. Use the Find Symbol  binocular button at the top of the menu and type in **Direct Loans** to find this particular function.

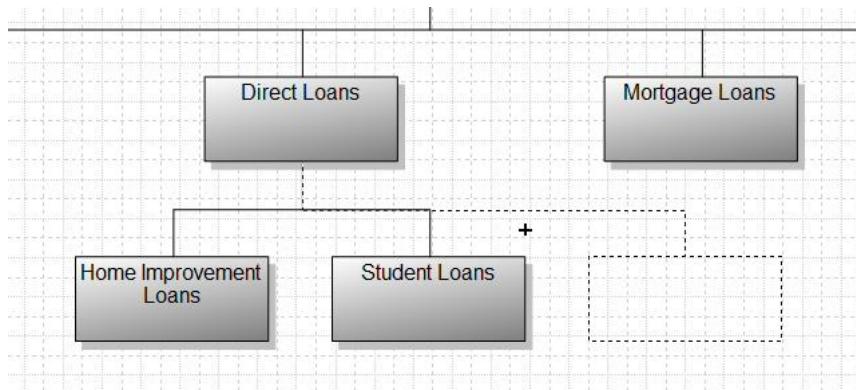
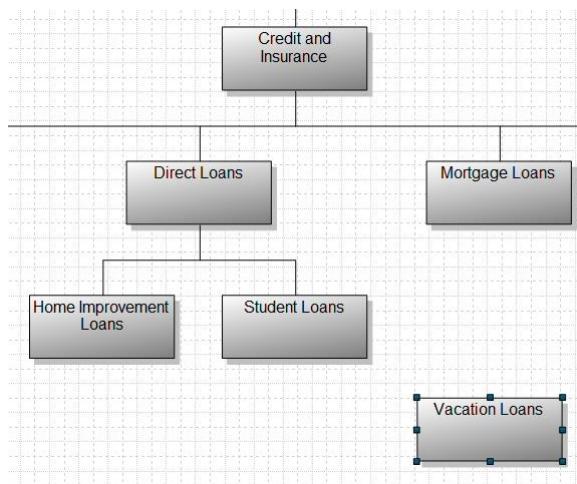
2. Zoom to the area.

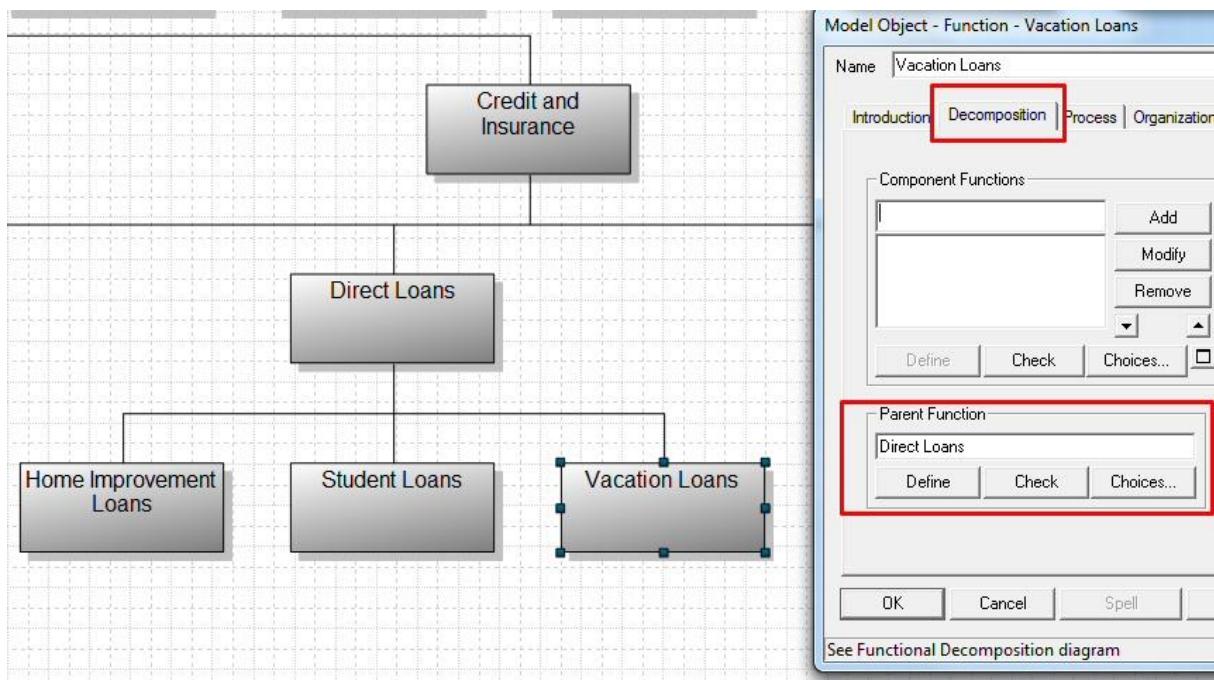
3. Add a new function to the diagram, **Vacation Loans**

4. Switch to pointer symbol (on Draw toolbar), select the Vacation Loans function and move it underneath Direct Loans so that it auto attaches.

5. Once connected, open the definition of Vacation Loans (double click on the symbol or right-mouse click on it and select Edit).

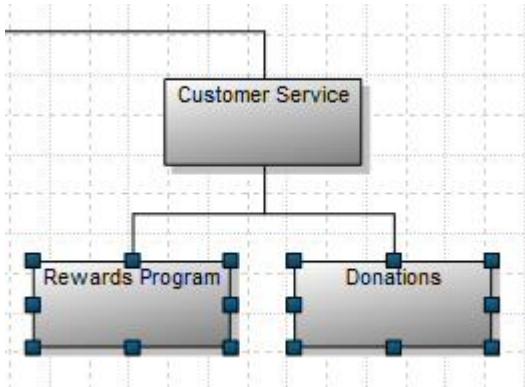
6. Notice that on the Decomposition tab, the Parent Function property is automatically filled in -- the relationship between the two functions has been automatically added to the underlying model.

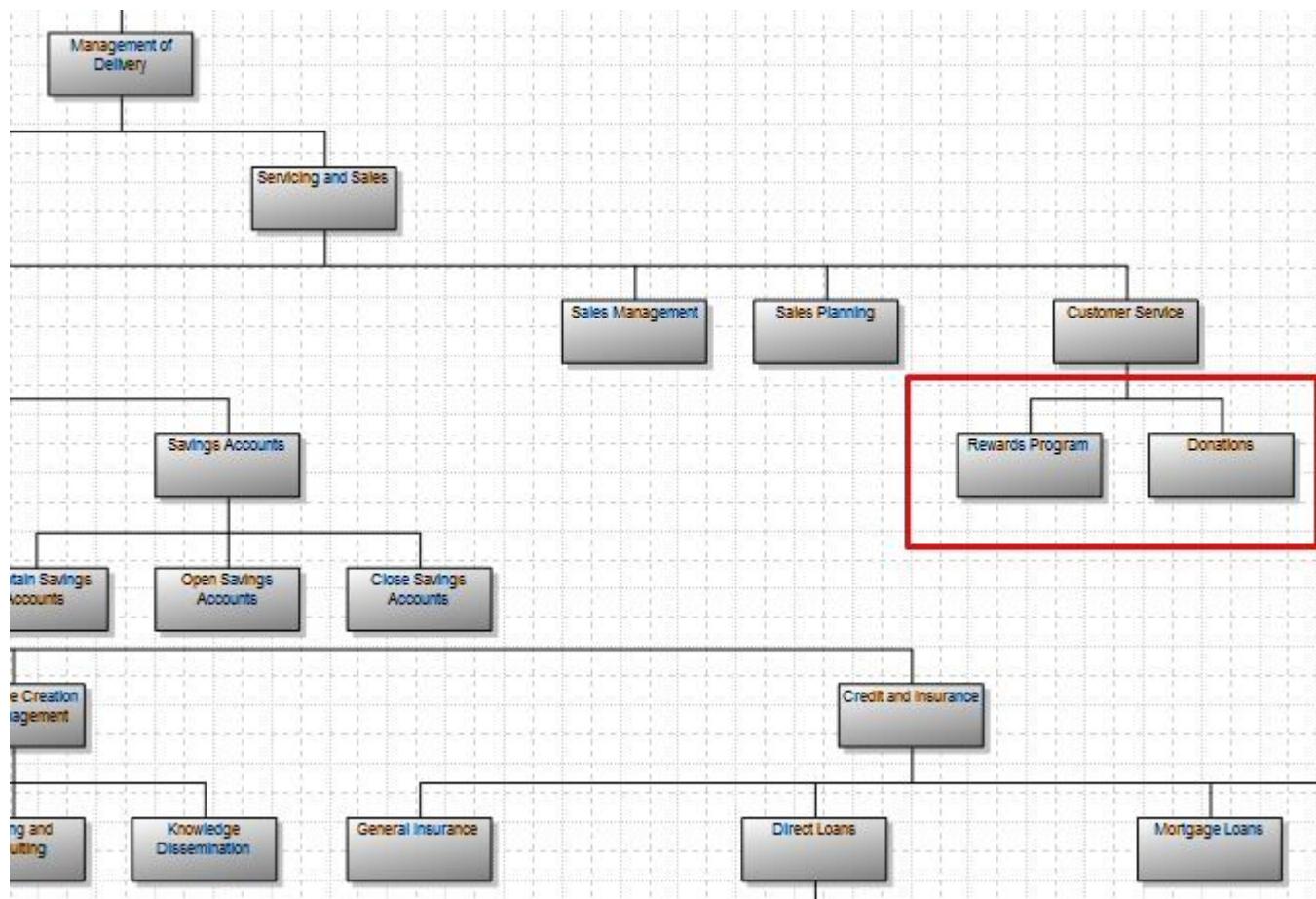




7. Add new Functions to the model, **Rewards Program** and **Donations**, underneath the function **Customer Service**.

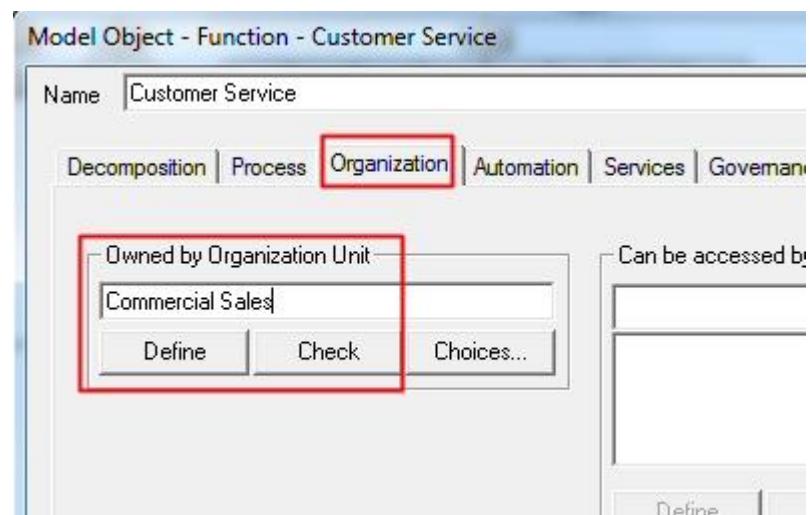
8. Save the diagram (it should look like the diagram pictured below -- new functions colored in green for your edification -- you don't have to color them green).





### 3.1.4 Understand Function Owners (OPTIONAL)

1. Open the definition of the function **Customer Service**, and go to the Organization tab.
2. Notice that this function is owned by the Organizational department **Commercial Sales**
3. Close the definition.
4. Save and close the diagram.
5. Select **View, Matrix Browser**.
6. Select **Organization Unit owns Function** matrix (on the first tab of the Matrix browser) and then select Next, and



Finish (accepting defaults). The Function vs Organization Unit matrix opens.

7. Examine the matrix -- this is another way to visualize or specify what Organization Unit owns what Function. Select the Matrix menu and notice the things you can do with a matrix -- save it (to an Excel spreadsheet), add row or column definitions, etc.

		Organization Unit owns Functions											
Organization Unit	Function	Accounting		Administrative Management		Advising and Consulting		Asset and Liability Management		Budget Execution		Budget Formulation	
		Accounts	X										
Business Operations			X				X	X	X				X
Commercial Credit													
Commercial Sales										X	X	X	
Executive Management Board													
Financial Services & Products													
Human Resources													X
Marketing													



### What did you just do?

You have visualized the Functions of the business in a data centric Functional Decomposition diagram.

## 3.2 Understand Use of Process Hierarchies

### Objectives of this Section:

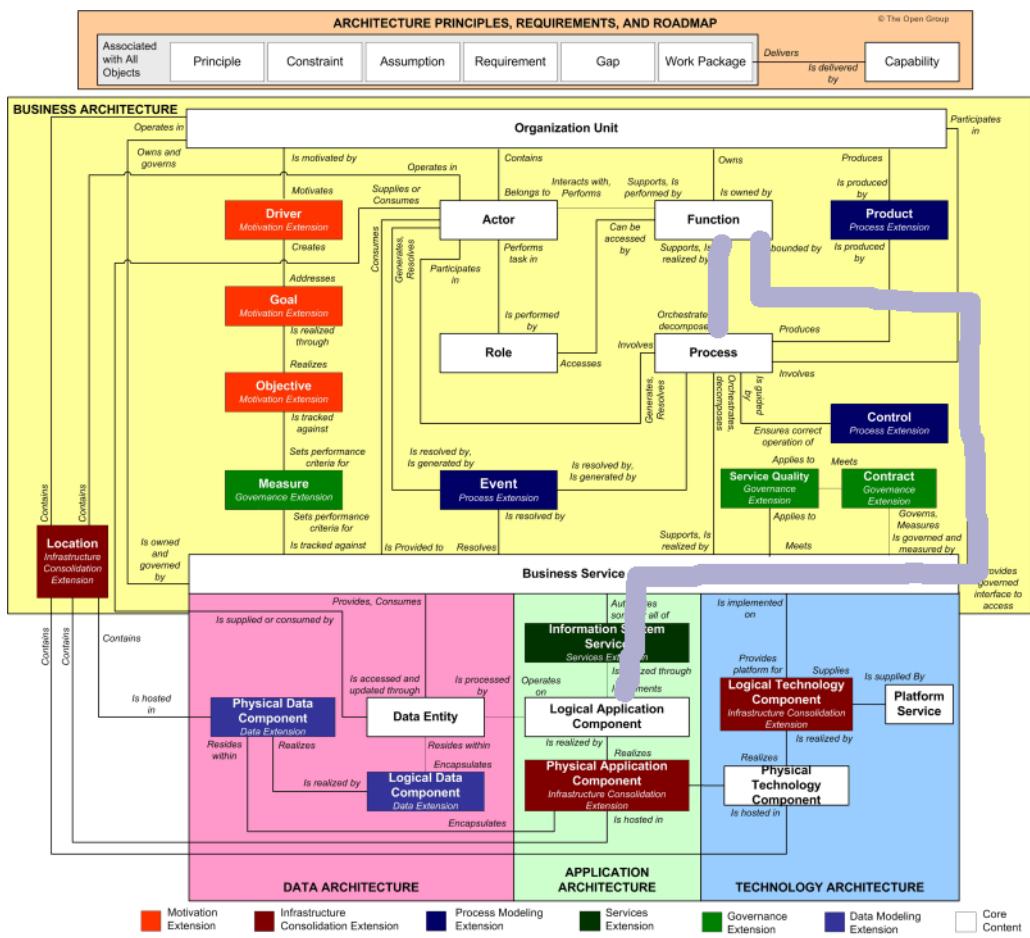
- Understand difference between a Function, Process, Application, & Service
- Understand use of Process Hierarchies
- Learn how to use APQC Processes

#### 3.2.1 Understand difference between Function, Process, Application, & Service

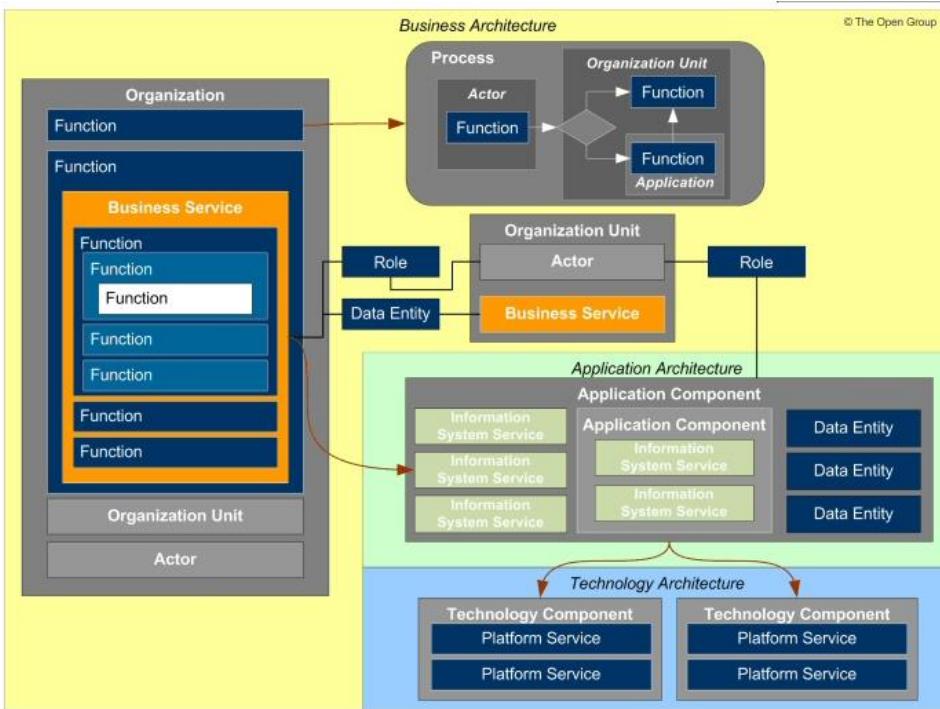
The difference between Process and Function:

- **Function** = something *that* an organization does. According to TOGAF, a function "delivers business capabilities closely aligned to an organization, but not explicitly governed by the organization."
- **Process** = *how* the organization performs a function. There are many cross function processes, and cross organizational processes. According to TOGAF, a process "is a flow of interactions between functions and services that cannot be physically deployed. All processes should describe the flow of execution for a function and therefore the deployment of a process is through the function it supports; i.e., an **application** implements a **function** that has a **process**, **not** an application implements a process."

You can see this described in the TOGAF 9 metamodel -- if you follow the purple crayon path below, Function is realized by Process. Function is bounded by a Business Service which may be automated by an IS Service, which is further implemented by an Application. In this workshop we are not specifically modeling Business Services or Information System (IS) Services; we use the direct relation between Function and Application.



Another TOGAF 9 graphic describes the relationship between Function and Process, and Function and Application (with Business Service bounding the business service):



Function (bounded by Business Service) is implemented by Application Component (which can be broken out into Information System (IS) Services.

### 3.2.2 Understand Use of APQC Processes

The American Productivity and Quality Center (APQC) offers Process classification frameworks that have been developed by the industry, for numerous vertical industries. Process classification frameworks have been developed for:

- Retail
- Consumer Product Goods
- Consumer Electronics
- Electric Utilities
- Healthcare Payer
- Banking
- Aerospace and Defense
- Automotive
- Broadcasting
- Petroleum Downstream Back-Office
- Petroleum Upstream
- Pharmaceuticals
- Telecom

Each process classification framework lists common processes found in each industry, and provides five levels of process delineation:

- Level 1 -- Category (can be considered a Function)
- Level 2 -- Process Group (high-level grouping of processes. (Examples: Accounts payable, Recruit, and Develop sales strategy.)

- Level 3 -- Process (Indicates key events performed when executing a process. Examples: Receive customer requests, Resolve customer complaints, and Negotiate purchasing contracts.)
- Level 4 -- Activity (Key events performed when executing a process.)
- Level 5 -- Task (Generally much more fine grained than Activities and may vary widely across industries.)
- Level 6 -- Sub Task (The most fine grained process element.)

### 3.2.3 Examine APQC Process Framework for Banking

1. Optionally open the pdf supplied with the workshop, K04844\_PCF\_Banking\_Ver\_6\_1\_0.pdf
2. Examine section 4.3 Deliver banking services to customers (17416) – or view picture to right.

We'll use these processes as a guide to modeling a process for opening a checking account via a mobile device, as long as the customer has an existing savings account or mortgage.

According to APQC's [John Tessmer](#), "The PCF was originally envisioned and is still based on the premise that it is a classification system or taxonomy of business processes, similar to how a dictionary classifies words. The categorization does not imply that organizations structure their internal operations according to the taxonomy; it merely provides a facility to help define processes so that they can be understood and referenced in a consistent manner. Similarly, a dictionary won't instruct you in proper grammar or sentence construction—you would have to refer to a style guide for that."

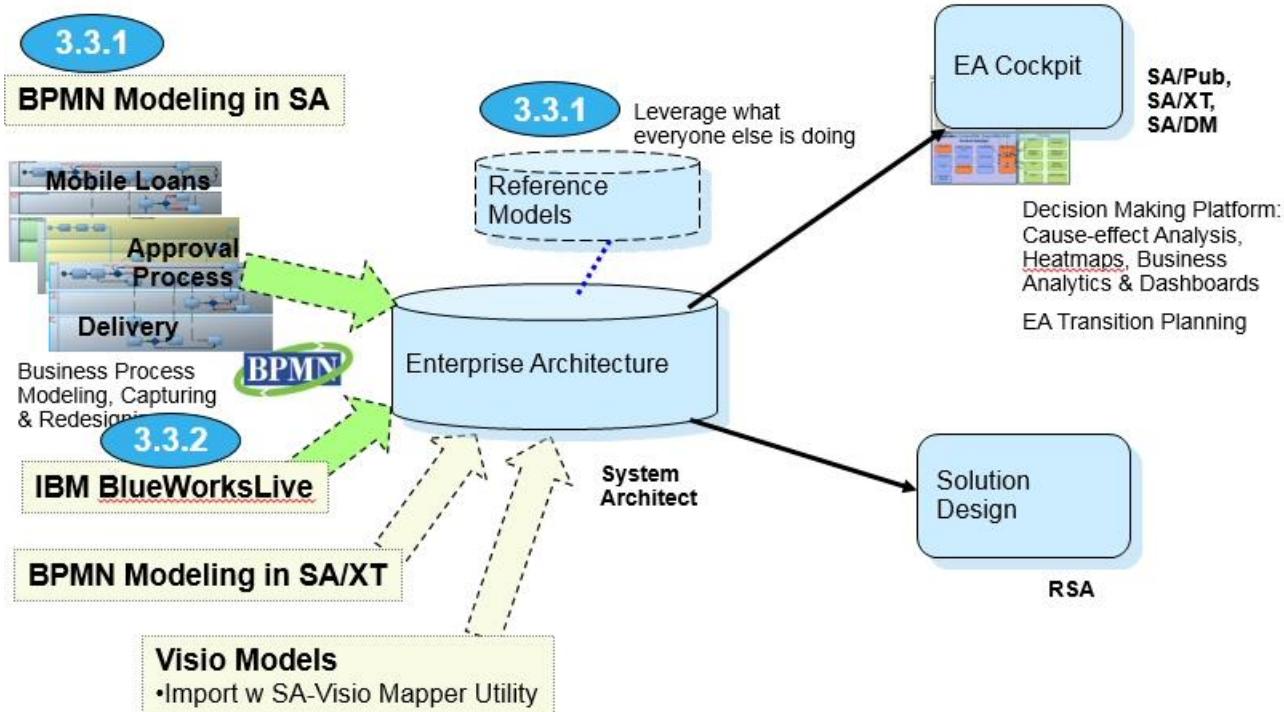
<b>4.3 Deliver banking services to customers (17416)</b>
4.3.1 Open Accounts (17417)
4.3.1.1 Analyze customer creditworthiness (13964)
4.3.1.2 Apply Anti-Money Laundering (AML) policy (13953)
4.3.1.3 Apply customer identification policy (13957)
4.3.1.4 Apply product conditions (17418)
4.3.1.5 Apply product pricing (17419)
4.3.1.6 Evaluate collateral/guarantee (17420)
4.3.1.7 Create customer profile (10325)
4.3.1.8 Set up and activate an account (17421)
4.3.1.9 Fund and disburse proceeds (13961)
4.3.2 Maintain accounts (17422)
4.3.2.1 Monitor account status (13962)
4.3.2.2 Manage fees/interest/commissions (17423)
4.3.2.3 Monitor account transactions (17424)
4.3.2.4 Review collateral/guarantee periodically (17425)
4.3.2.5 Maintain internal accounts (17426)
4.3.2.6 Reconcile accounts (13950)

### 3.3 Understand Core Business Process Flows

#### Objectives of this Section:

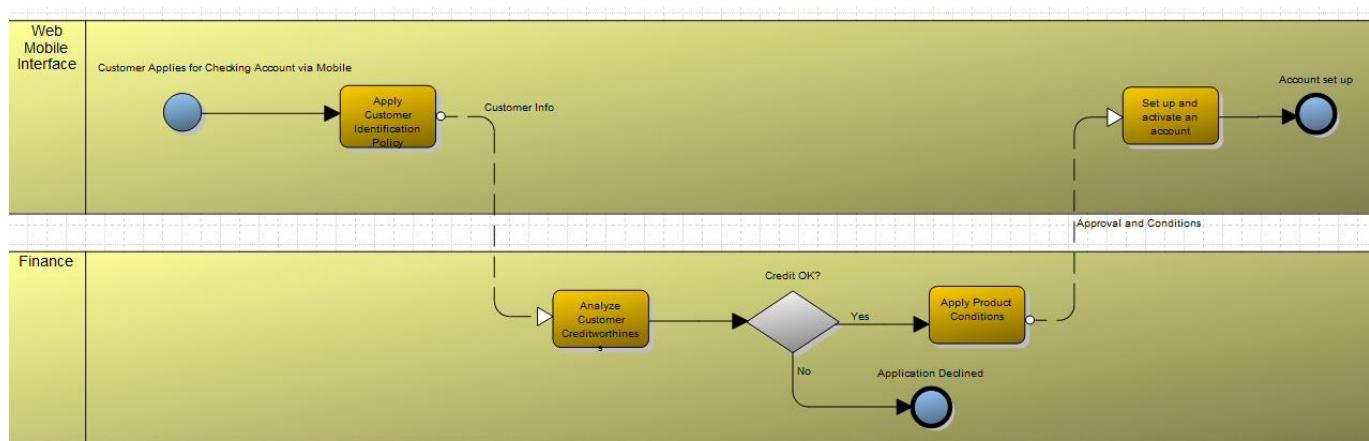
Model a Process Flow with BPMN 2.0 in System Architect

Utilize BPMN 2.0 Interchange to Import Process Flow from Another Tool (IBM BlueWorks Live)



#### 3.3.1 Model a Process Flow with BPMN 2.0

In this section we will create the following BPMN diagram:



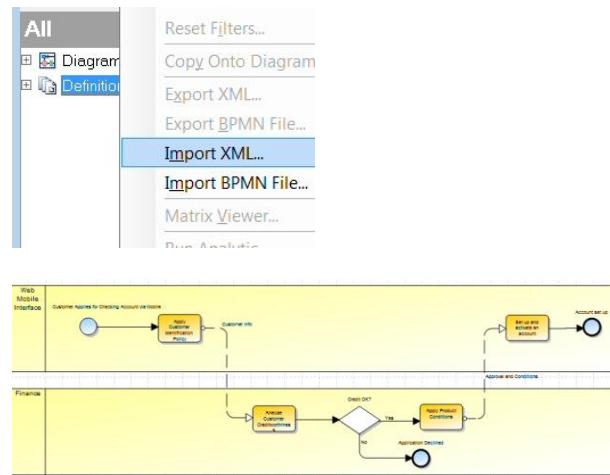
**Option A:**

The instructions in Option B are intended to help you learn drawing in System Architect. If this lab is being given in 2-hour slot, save time by importing this diagram already drawn and skip the steps of Option B.



**OPTIONAL IMPORT INTO  
REPOSITORY – Do this for 2-hour version of lab**

1. Right-mouse click in the Explorer (browser), and select Import XML.
2. Choose **BPMN\_Diagram\_Drawn\_in\_SA.xml** from the **Student\_Files\c. BPMN\_ProcessFlows** folder. Leave default collision options.
3. Open the diagram to investigate it.

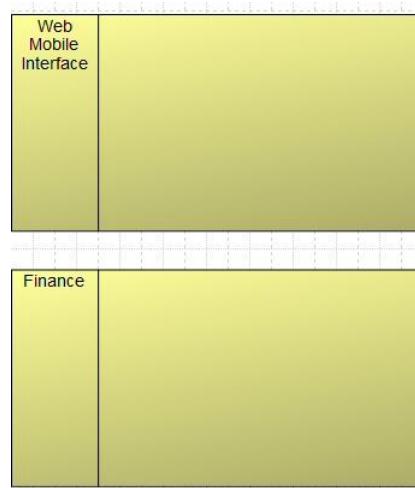
**Option B:**

To manually create this diagram:

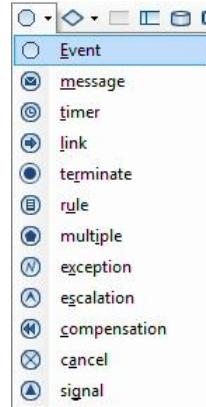
1. Create a new diagram of type **Business Process**, and name it **New Account Via Mobile**
2. Set Line drawing style -- Format, Diagram Auto Routing, Retain Connections

**Note:** by default on a BPMN diagram, lines are set to straight-orthogonal (Format, Symbol Format, Line -- Straight - Orthogonal) and center-to-center routing is turned off (Format, Center-to-Center toggled off).

3. Select the Pool symbol on the Draw toolbar and draw two pools -- **Web Mobile Interface** and **Finance**.



4. Select the Event symbol from the Draw toolbar and draw one on the diagram named **Customer Applies for Checking Account via Mobile**



5. Once drawn, change your cursor to the pointer (by selecting it on the Draw toolbar) and then double click on the symbol to open its definition. View the information you can capture about an event, and click **OK**.



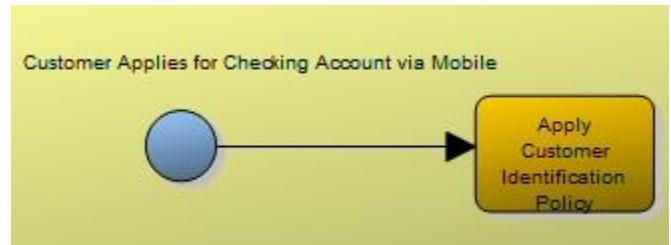
6. Select the Process symbol on the Draw menu and draw a process named **Apply Customer Identification Policy**. The definition dialog should automatically come up after naming it.



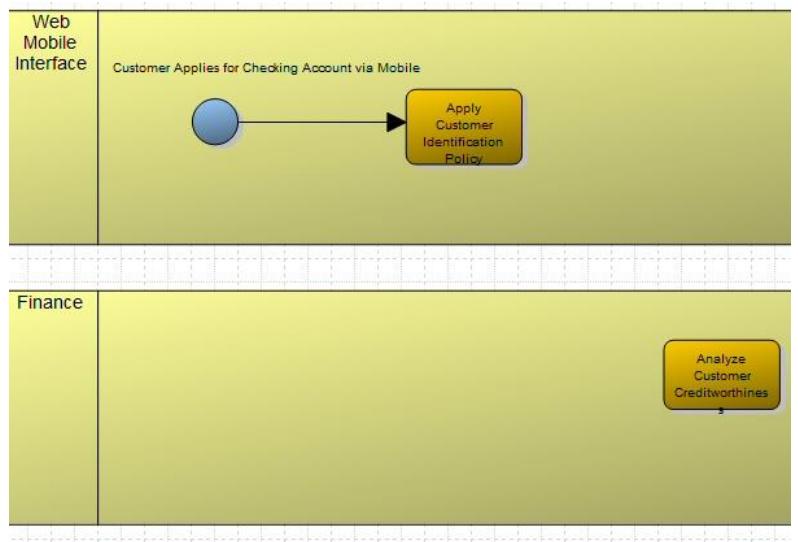
7. Click **OK** to accept the default definition.



8. Select the **Sequence Flow** symbol from the Draw toolbar and draw a line from the event to the process -- the line must be attached on both sides.

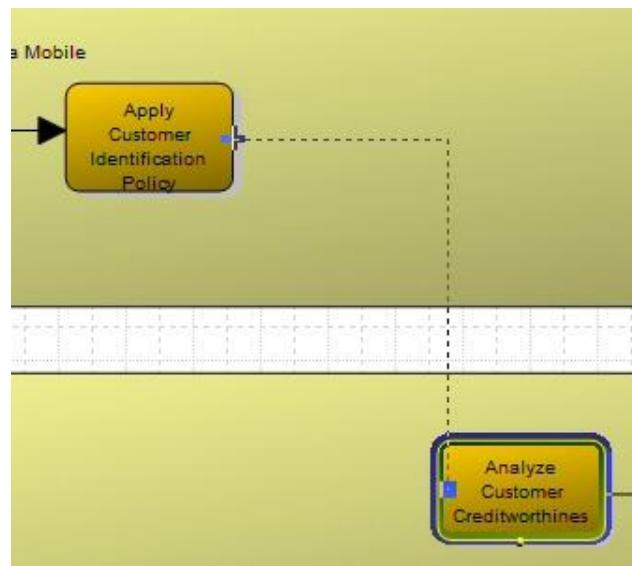


9. Draw a second process on the diagram, in the **Finance** pool, named **Analyze Customer Creditworthiness**.

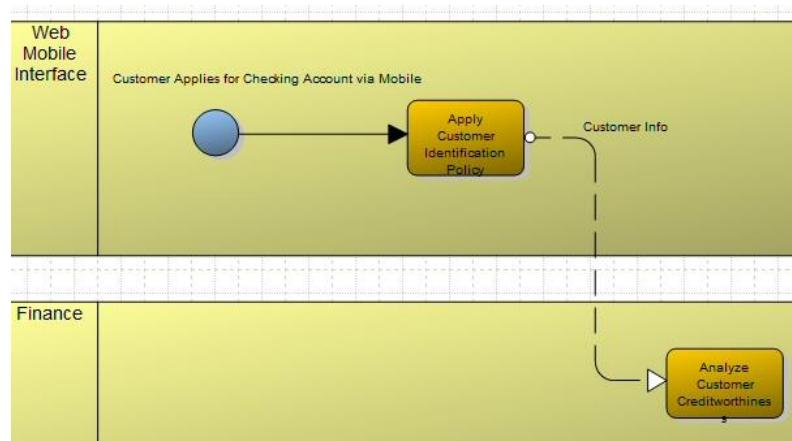


10. Select the Sequence Flow symbol from the Draw toolbar and try to draw a line between the two processes. Notice that you are not allowed to -- a ghostbuster symbol prevents you from attaching the Sequence flow line between two processes in different pools.

**Note:** According to BPMN rules, you must use a Message Flow line to model flow between processes of different pools.

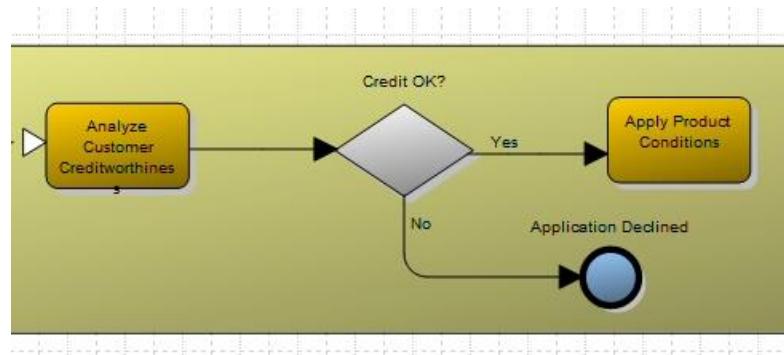


11. Select the Message Flow line and draw a line called **Customer Info** between the two processes.



12. Draw the part of the diagram to the right:

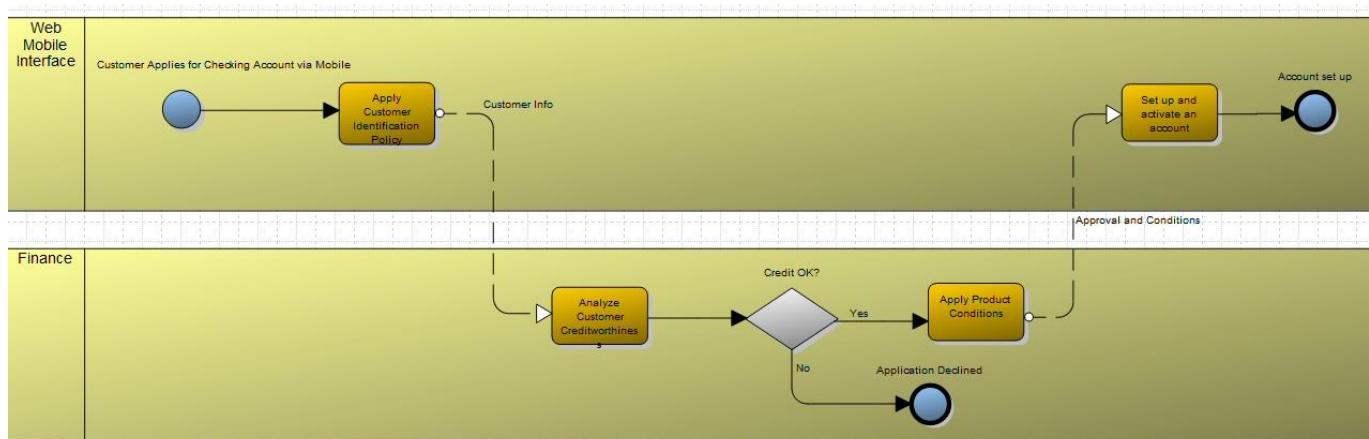
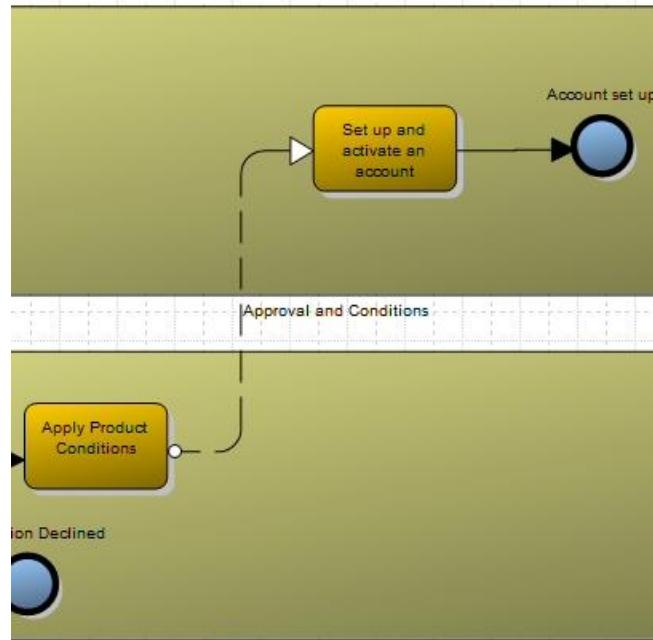
- a gateway symbol named **Credit OK?**
- a process symbol called **Apply Product Conditions**
- an event symbol called **Application Declined**
- a Sequence Flow from the process **Analyze Customer Creditworthiness** to the gateway **Credit Ok?**
- a Sequence Flow from the gateway **Credit Ok?** to the process **Apply Product Conditions**, double click on the Sequence Flow



- and name it **Yes** (overtyping the default Sequence\_Flow\_1)
- f) a Sequence Flow from the gateway **Credit OK?** to the event **Application Declined**, double click on the Sequence Flow and name it **No** (overtyping the default Sequence\_Flow\_2)

13. Continue drawing the BPMN diagram as shown to the right and below.

14. Save the diagram.

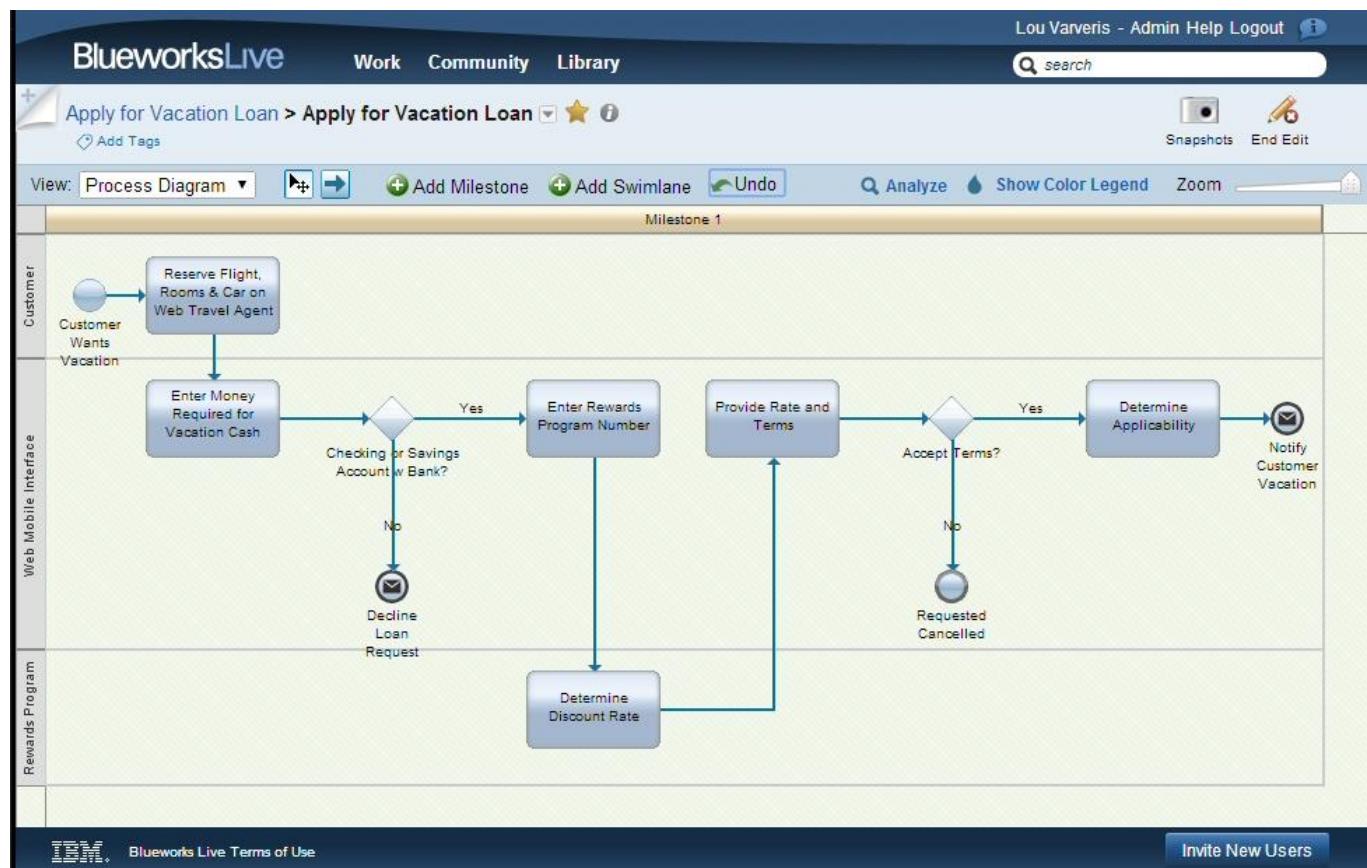


### 3.3.2 Utilize BPMN 2.0 Interchange to Import Process Flow from Another Tool

There are many tools on the market that support BPMN 2.0. The BPMN 2.0 specification also specifies an interchange format -- known as BPMN 2.0 interchange. BPMN process flows can be exchanged between tools supporting the interchange spec. IBM tools supporting the BPMN 2.0 interchange include:

- IBM Rational System Architect
- IBM BlueWorks Live
- IBM Rational Software Architect
- IBM Business Process Manager (formerly known as Lombardi)

For this workshop, we are providing an XML file of BPMN 2.0 interchange produced by IBM BlueWorks Live. BPMN 2.0 interchange files are always produced in an XML file wrapped in a .zip file. For this workshop, a .zip file is provided that was generated from the following diagram in IBM BlueWorks Live:



The diagram above was generated to BPMN 2.0 interchange file by selecting Export Process in IBM BlueWorks Live, shown on left-hand side of graphic below.

Select the format you would like to use for export:

- Microsoft Excel Process Data (.xls)  
Process data displayed in relational tables in Microsoft Excel format.
- XML Process Definition Language (XPDL 2.1)  
An XML-based format for business processes from the WfMC.  
[More Details](#)
- Business Process Model and Notation (BPMN 2.0)  
An XML-based format for business processes from the OMG.  
[More Details](#)
- IBM WebSphere Business Modeler XML (Version 7.0)  
An XML-based format for business processes modeled in IBM WebSphere Business Modeler.

**Export**

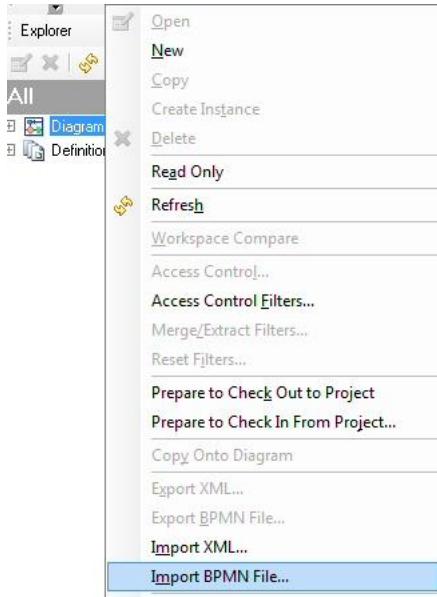
**Export to BPMN 2.0 in IBM BlueWorksLive**



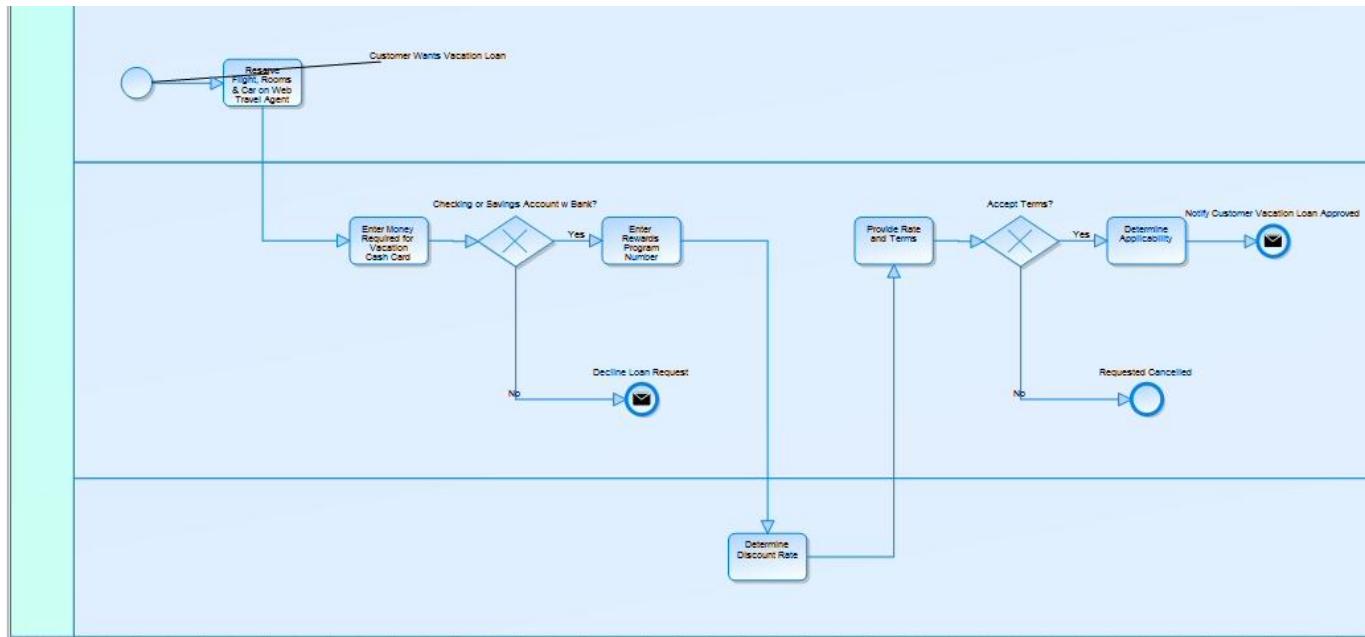
## IMPORT INTO REPOSITORY

In IBM BlueWorks Live, you can export to BPMN 2.0, XPDL 2.1, or other interchange formats, as shown below. We choose BPMN 2.0, as shown in the graphic above right.

1. In System Architect, select Diagrams (or Definitions it doesn't matter), right-mouse click, and choose Import BPMN 2.0.



3. Select the provided file, **Apply for Vacation Loan.zip** in the directory  
..\\Desktop\\IBM\_TOGAF\_Workshop\\Student\_Files\\c. BPMN\_ProcessFlows
4. Leave Collision Options at their defaults and click OK. The diagram from BlueWorks Live is imported. Even position information of symbols is retained.
5. Find the Apply for Vacation Loans diagram under Business Process diagrams and open it. Zoom in on the main part of the diagram to view it.



### 3.4 Link Processes with Functions they Orchestrate

#### Objectives of this Section:

- Create parent-child diagram links from Functions to the BPMN diagrams that show orchestration

As discussed in the previous lab:

- a Function is something that an organization does to deliver a business capability;
- a business process describes a flow of execution that enables a function.
- A function does not change often, whereas a business process might -- for example, an organization performs the function of Marketing. How marketing is performed is a process or sets of processes that will change from time to time due to introduction of new technologies, organizational re-orgs, etc.

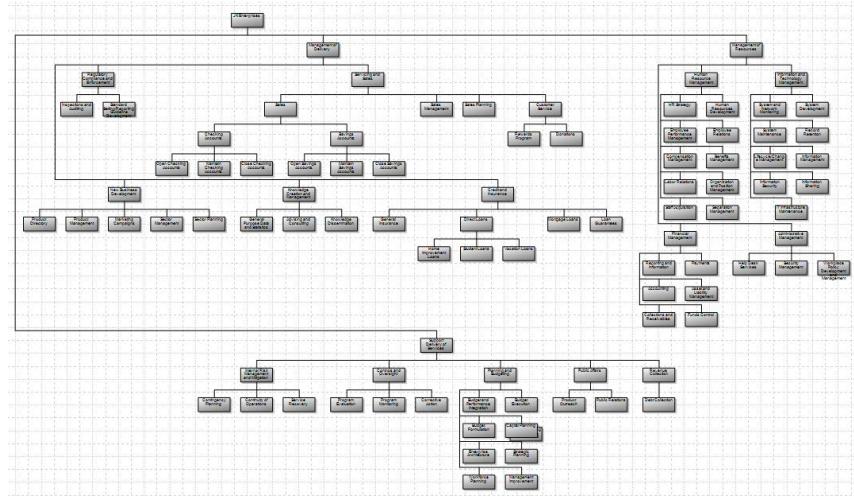
In the EA, we link Functions to the high-level Processes that enable them. Processes themselves may be decomposed, into lower-level processes, creating a hierarchy of processes.

Most importantly -- a Process may belong to many parent Functions. Some processes are cross organizational, and enable multiple Functions during their orchestration.

### 3.4.1 Create Parent-Child Link Between Function and BPMN Diagram

In this section we will create parent-child links from functions to BPMN diagrams. This is just an aid for navigation. To relate the functions to the process definitions on that diagram, you'd need to go the extra step of relating them in a matrix or in the respective definition of a process or function.

1. Reopen or return to the Functional Decomposition diagram we created, **JK Banking Functional Hierarchy**.



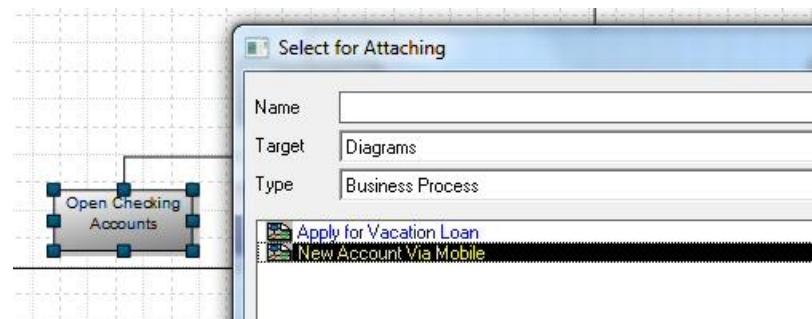
2. Select the binoculars tool on the top menu, and type in the name of the function **Open Checking Accounts** to find it.



3. Click the **Find** button to locate the function on the diagram.

4. Right-mouse click on the function **Open Checking Accounts** and select **Attach Child Diagram**.

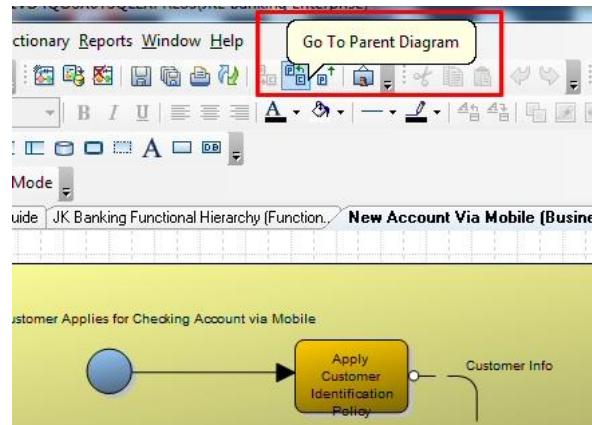
5. Select Type as Business Process to filter the list, and select the Business Process diagram **New Account Via Mobile**. Click Attach.



6. Click **Yes** when asked **Do you want to save changes to the diagram?**

You must click **Yes** to save changes to the diagram -- to click **No** would be like saying you don't want to attach a child.

7. On the child diagram -- the BPMN diagram we created earlier, click **Go To Parent Diagram** tool on the top menu to navigate back to its parent (a diagram could have many parents; if it did, you'd get a list of diagrams to choose).



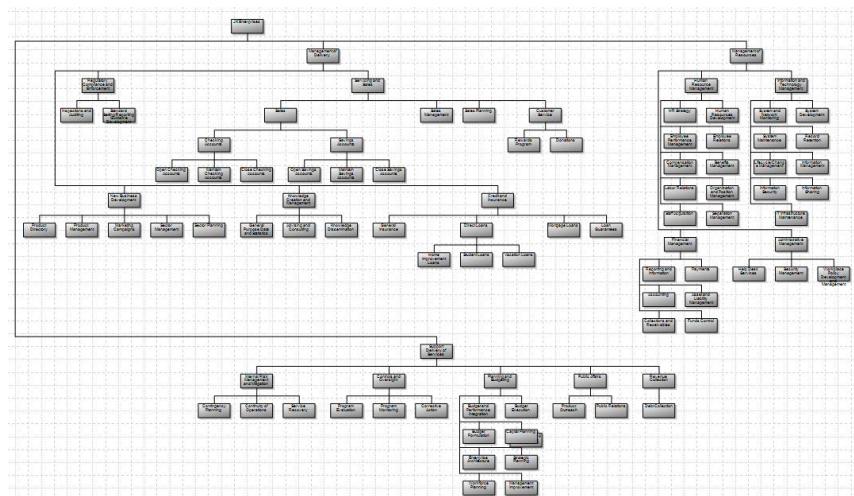
8. Note that on the Functional Decomp diagram, the function **Open Checking Accounts** now has a symbol annotation above -- a downward facing arrow -- it to show it is decomposed by a child diagram.



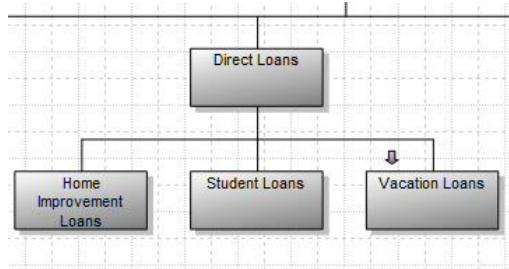
### 3.4.2 Create Another Parent-Child Link Between Function and BPMN Diagram

In this section we hook up the other BPMN diagram to a function via a parent/child link.

1. Reopen or return to the Functional Decomposition diagram we created, **JK Banking Functional Hierarchy**.



2. Repeat the steps of the above section to find and connect the function **Vacation Loans** to the Business Process diagram **Apply for Vacation Loan**.



3. Save all diagrams.



#### What did you just learn?

You just learned how to create parent-child diagram links to enable easy navigation of relevant concepts in the architecture.



Please wait for the next lecture before proceeding to the next lab.

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## Lab 4 Establish Business Service Layer

### Goals of this Lab:

- Establish Business Service Layer
- Understand usage of US Federal Enterprise Architecture (FEA) Reference Model Service Reference Model (SRM)
- Add a Business Service to the architecture
- Tie Certain Functions to Business Services

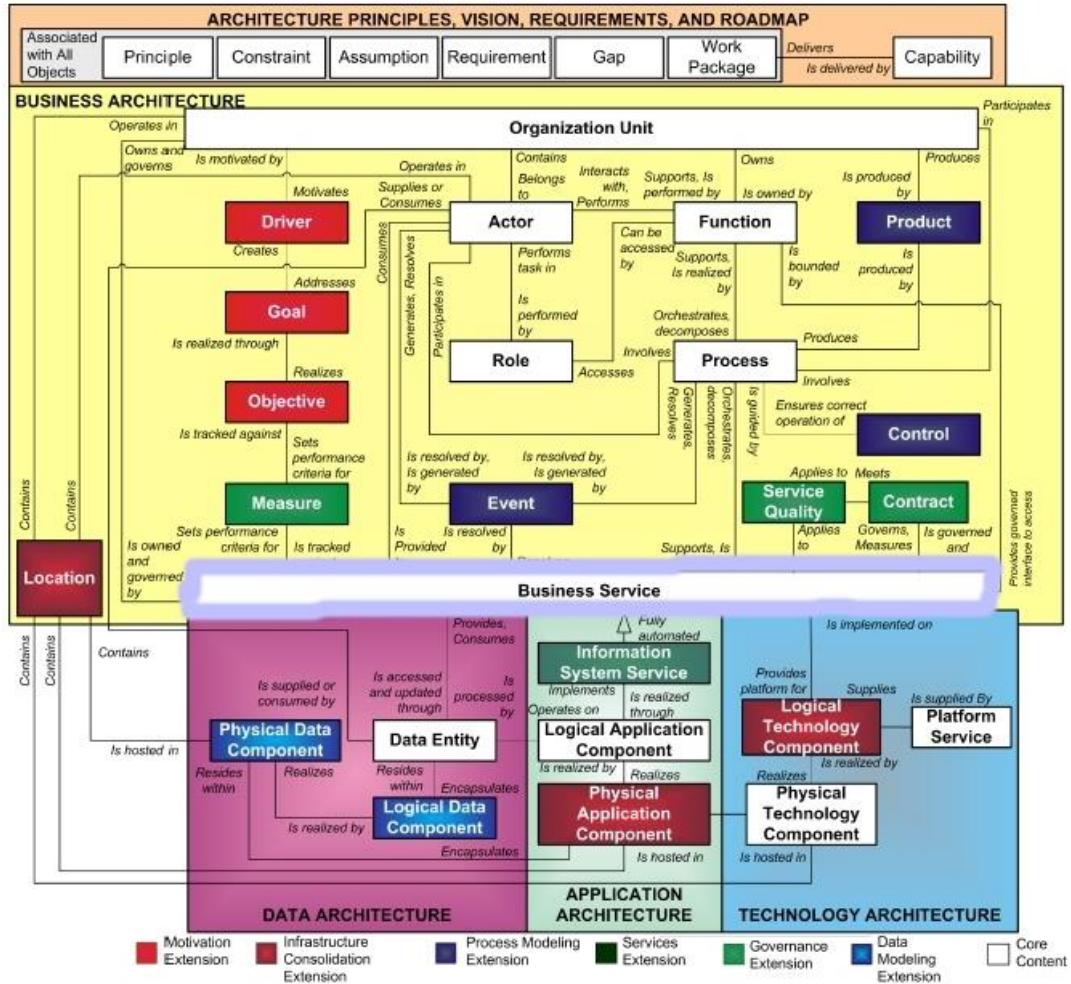
### 4.1 Jumpstart the EA Effort by Importing the SRM

#### Objectives of this Section:

- Establish Business Service Layer
- Jump start the EA by importing the FEA Service Reference Model (SRM)

#### 4.1.1 Examine the TOGAF 9 Metamodel for Business Services

1. Examine the TOGAF 9 metamodel in the area of Business Services -- highlighted in purple crayon below:



2. Note that a Business Service can be **manual or automated**. It:

- provides governed interface to access Functions
  - supports business Processes
  - is implemented by an Information System (IS) Service -- a fully automated service, similar to what the industry might call a SOA service.

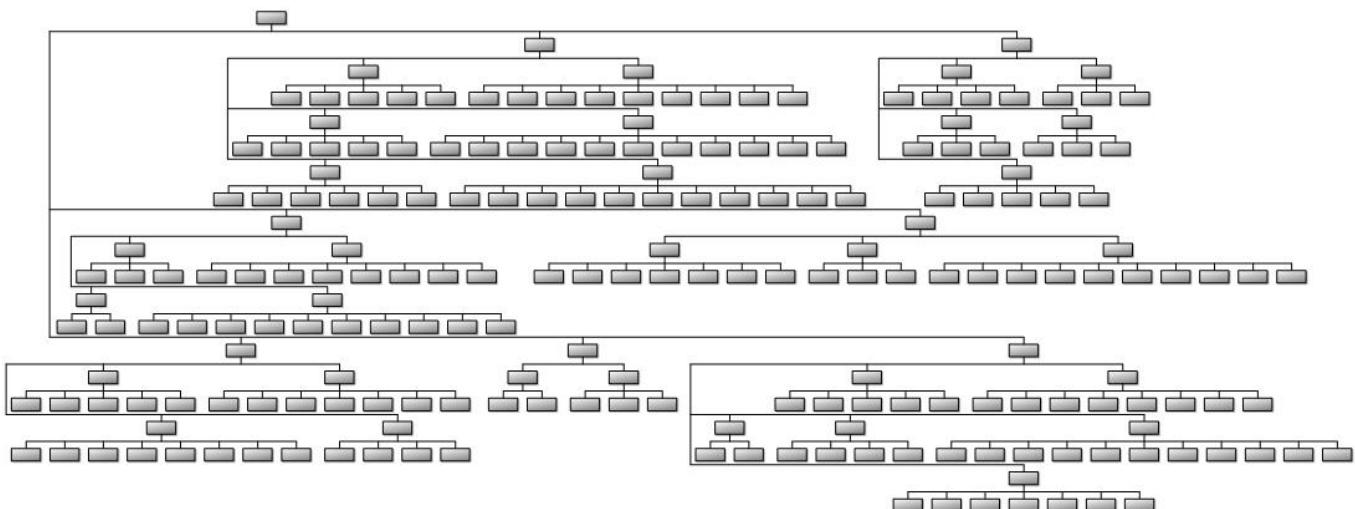
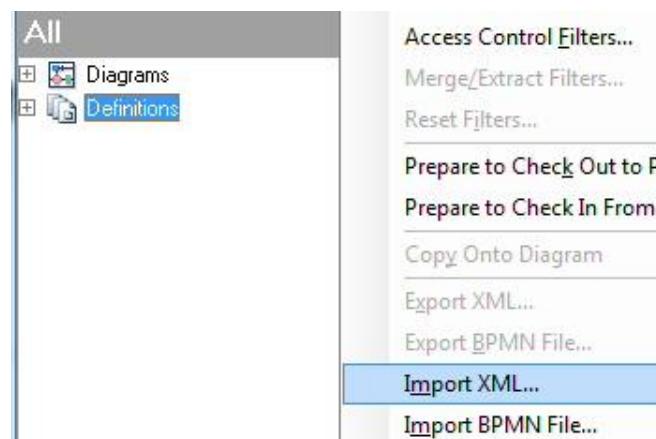
**Note:** in practical architectures, the EA team decides which parts of the TOGAF Extended Content metamodel they will implement. Sometimes Business Services are used, linked directly to Physical Application Components -- and the IS Service and Logical Application layers are not used. Sometimes Business Services are directly related to Physical Apps, and the Logical Application layer is used to categorize Physical Application Components.

#### 4.1.2 Import Service Reference Model (SRM)



##### IMPORT INTO REPOSITORY

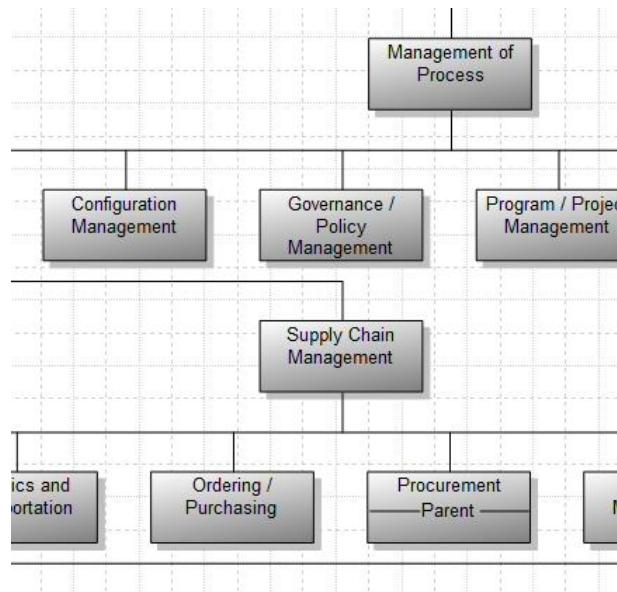
1. Right mouse click in empty space of the Explorer browser and select Import XML.
2. For File to Import, choose the **SRM.XML** file in the **IBM\_TOGAF\_Workshop\Student\_Files\id.SRM** folder.
3. Keep all default collision options and click OK to import the Services Reference Model.
4. Open the new Business Service Hierarchy diagram that has been added to the encyclopedia.



## 5. Briefly examine the SRM:

- it contains a taxonomy of all of the services performed by all agencies of the United States government, as specified by the US Office of Management and Budget (OMB).
- Agencies must show that any system they wish funded support a service in the SRM.
- The commercial industry has adopted the SRM as a guide to what their business is doing/should be doing.

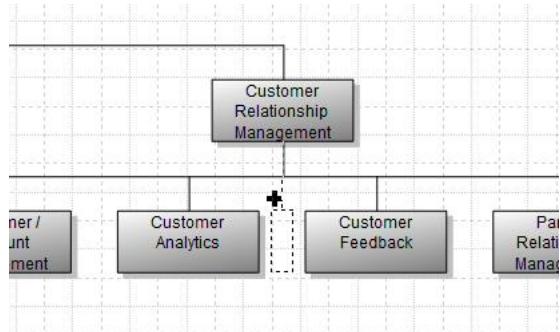
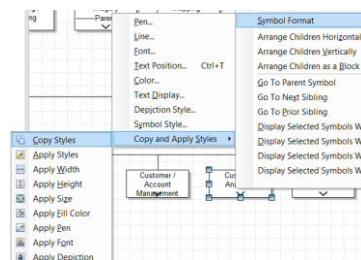
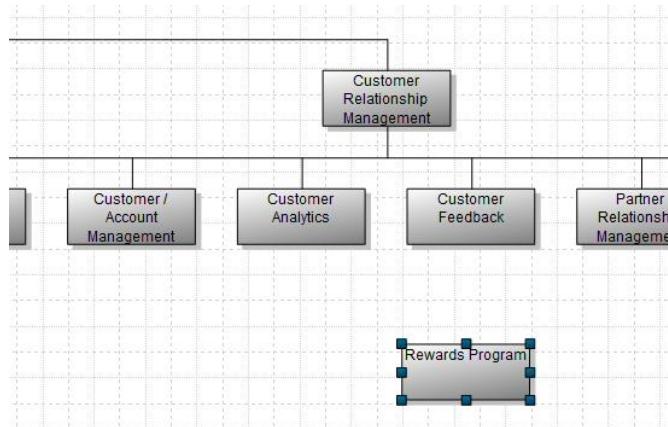
**Note:** the metamodel of the SRM we are importing has been modified from the SRM provided by the US government. In this metamodel, the decomposition property of the Service definition has been utilized to provide the hierarchy of services. In the US government's SRM, the metamodel starts with highest level Service Domain, then breaks down into Service Type, and then Service Component (lowest level). The SA FEA Reference model add-in allows you to import that SRM (provided by the US government via an xml file on whitehouse.gov), align your architecture with it, and produce reports mandated by the OMB.

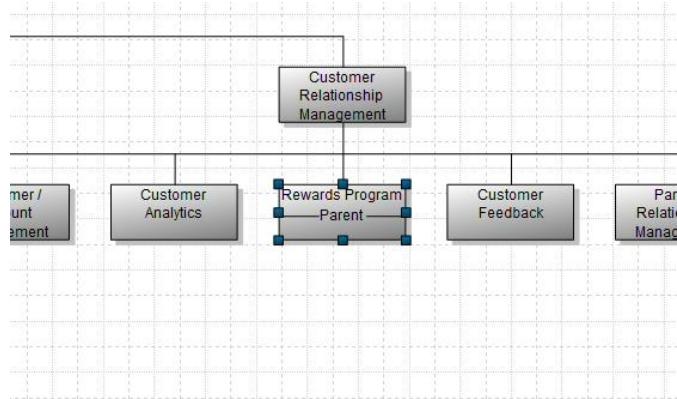


**Best Practice:** After importing the SRM, the Enterprise Architect can delete Business Services not used in the organization, and add Business Services that are used. The SRM is used to jump start the EA effort.

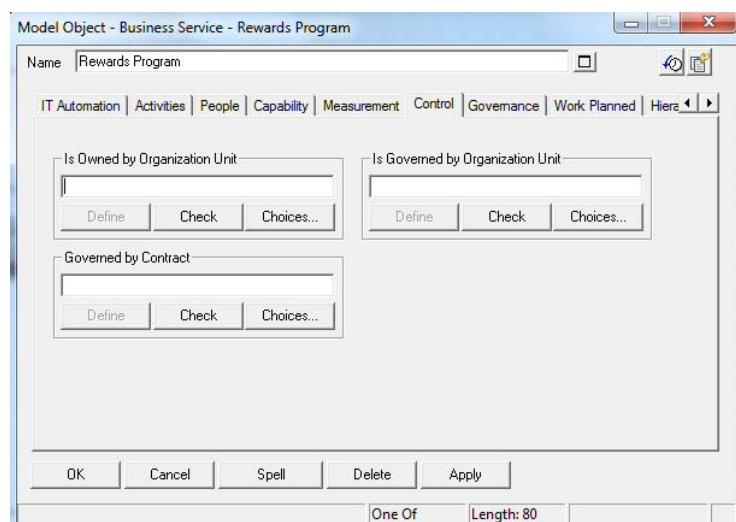
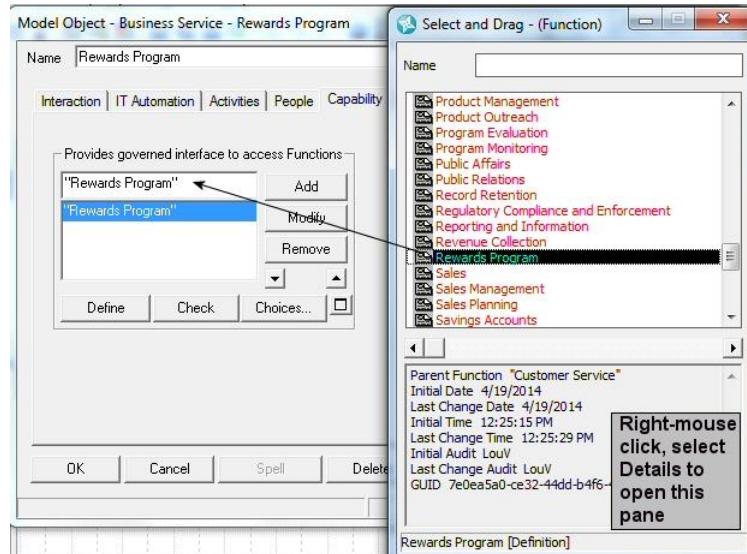
#### 4.1.3 Add a Business Service to the Architecture

1. Use the Find Symbol  binocular button at the top of the menu and type in **Customer Relationship Management** to find this particular Business Service.
2. Zoom into the area, and add a new Business Service to the model, named **Rewards Program**
3. Note: the service is represented by an icon – you can leave it as is (especially in the 2-hour version of this lab). To optionally change it to a rectangle, there are several ways – here's one:
  - right-mouse click on any existing service on the diagram, and choose **Symbol Format, Copy and Apply Styles, Copy Styles**. Then select the Rewards Program service and select **Symbol Format, Copy and Apply Styles, Apply Styles**.
6. Add **Rewards Program** as a child service to **Customer Relationship Management**, by moving it underneath the parent service until it auto-connects.





4. Open the definition of the Rewards Program business service.
5. On the **Capability** tab, click on Choices and drag-and-drop in the Function named **Rewards Program**.
6. Before clicking OK to close the definition -- optionally tour the other tabs -- notice, they reflect relationships of the TOGAF metamodell – for example:
  - on its **Control** tab, you can specify the organization that owns, and that governs the business service, and the contract it is governed by
  - on its **Capability** tab, you can specify what **Functions** it provides a governed interface to
  - on its **Activities** tab, you can specify what business processes the Service realizes or orchestrates
  - on its **IT Automation** tab, you can specify lower-level IS Services, Applications, and Technologies that implement the Business Service
  - on its **Interaction** tab, you can specify how it interacts with other Business Services
  - on its **Information** tab, you can specify data it consumes & provides.



## EA Work – Establishing a Business Service Layer

A business service layer enables flexibility in the architecture. You can establish the services that the organization ‘gets satisfied’ by internally built applications and systems, externally purchased off-the-shelf applications, which are hosted on internal or external environments including cloud environments.

It is your work, as an Enterprise Architect, to align Business Services to the Functions and/or Processes they enable, the Organizations that control them, and the Applications, Technologies, and/or IS Services that enable them. Because of the time limitations of this lab, we established some relationships already in the functions.csv spreadsheet you imported.

# Lab 5 Begin Phase C: Information Systems Architecture

## Goals of this Lab:

- Visualize Physical Applications in the Organization
- Understand interfaces between Physical Applications

### 5.1 Visualize the Physical Applications in the Organization

#### Objectives of this Section:

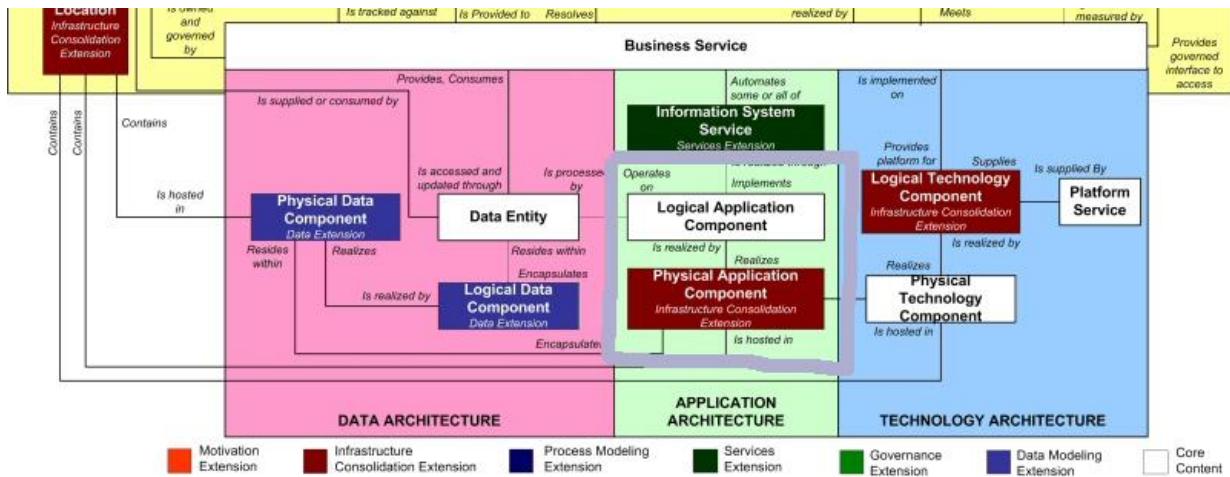
- Understand TOGAF 9 Metamodel for Applications
- Import Spreadsheet of Applications
- Visualize the Spreadsheet Information within the EA

The EA team has queried the IT department and gotten a spreadsheet of the list of Applications in the organization. In TOGAF 9, an actual application is categorized as an Application Component of type Physical.

The enterprise architect assigned to the job modifies the headings of the spreadsheet to match the property set for Application Components of type Physical so it can be ingested into System Architect.

#### 5.1.1 Examine the TOGAF 9 Metamodel for Applications

1. Examine the TOGAF 9 metamodel in the area of Applications -- highlighted in purple crayon below:



2. Note that a Business Service (which can be manual or automated) is implemented by an Information System (IS) Service, is implemented by a Logical Application Component, is realized by a Physical Application Component.

In System Architect, there is one definition -- Application Component -- which has a stereotype property called "Is Physical" that tracks whether an Application Component is Logical or Physical. We'll take a look at that in the next section.

3. Note also in the metamodel graphic above, that a Physical Application Component is Hosted In a Location. And also it is hosted on a Physical Technology Component, which in turn is hosted in a Location. The TOGAF metamodel thus provides flexibility in how you want to capture Location information for an Application.
4. Note that a Business Service is implemented by a Logical Technology Component which is realized by a Physical Technology Component, which is (as mentioned above) hosted in a Location.
5. Note that a Logical Application Component has no relation to a Logical Technology Component.

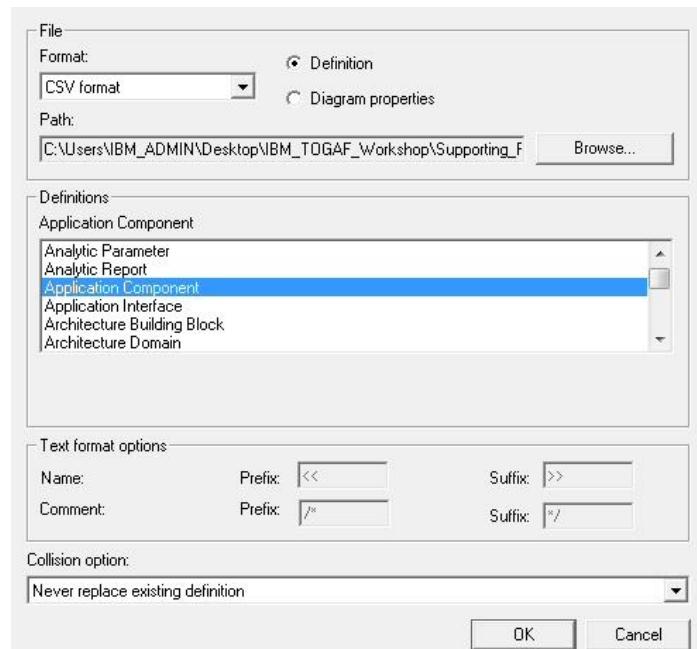
### 5.1.2 Import Spreadsheet of Applications

The enterprise architecture team has acquired from the IT team a spreadsheet that lists the applications of the business.

	<p>Note that often times, the EA team may harvest this kind of information in other forms -- such as an application map diagrams developed in something like Microsoft Visio. If that were the case, the EA team would use the System Architect-Microsoft Visio Mapper tool (available on DeveloperWorks) to automatically map the applications and their interfaces into System Architect. For this workshop, we'll import a spreadsheet.</p>
---	--



1. Select **Dictionary, Import Definitions.**
2. Select Browse, and choose to import the **PhysicalApplications.csv** file in the Desktop\IBM\_TOGAF\_Workshop\Student\_Files\e. PhysicalAppSpreadsheet folder.
3. Select to map to the Definitions type **Application Component**.
4. Accept default collision options and click OK to import the spreadsheet of Applications. Wait for the applications to import – watch the bottom of the screen to view completion status. It should take a minute.
5. **Important:** Select **Tools, Dictionary**

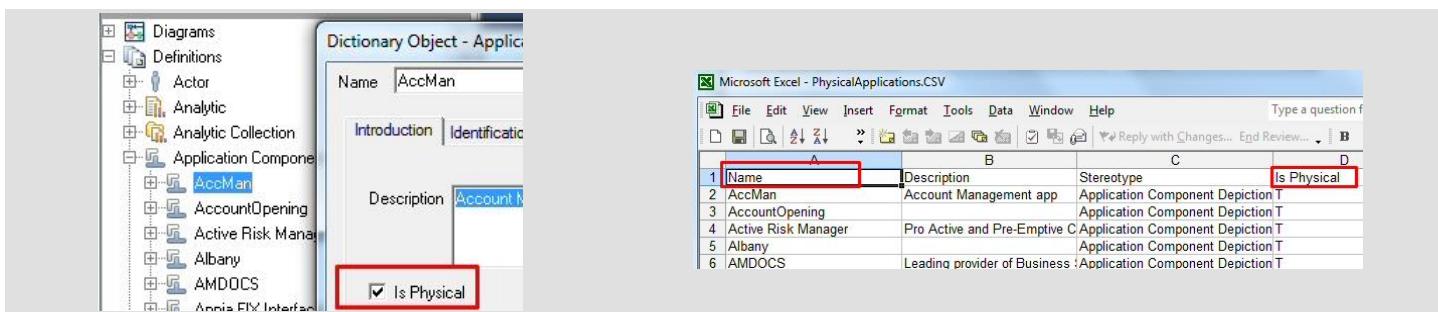


**Update.** It will take a few minutes for the update to run.

**Note:** often times a spreadsheet may have inconsistent relationships between elements imported. To make sure the elements imported are properly related (a references b, and b references a, you should run Dictionary Update.

6. In the Explorer (Browser), expand Definitions, and then expand **Application Components**. The Applications that you imported are listed.

7. Double-click on one of the Applications. Note that on the Introduction tab, the **Is Physical** property is toggled on.



If you opened the Excel spreadsheet (view picture above right), you would see that there is a column called "**Is Physical**" with a value of **T** (true) for each Application. The Enterprise Architect added this column to the spreadsheet of apps provided by IT. In addition, the name of the column that lists the app names was changed to "**Name**" -- to import a list of definitions into System Architect, the column name must be "**Name**".

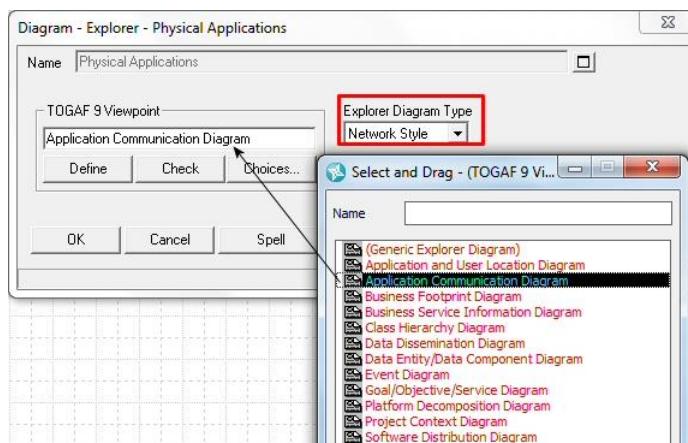
### 5.1.3 Visualize Physical Application Interfaces with TOGAF-Specified Diagram

Let's use a TOGAF 9 diagram to visualize the Applications imported and then show their interfaces.

1. Create a new diagram of type **Explorer**, named **Physical Applications**

2. In the TOGAF 9 Viewpoint property, click **Choices** and drag-and-drop in **Application Communication Diagram**. Keep **Network Style** as the Explorer Diagram Type.

3. From the Explorer (Browser), expand Definitions, and find and select the **Application Component** group -- drag the Application Component heading onto the diagram. All Applications in the



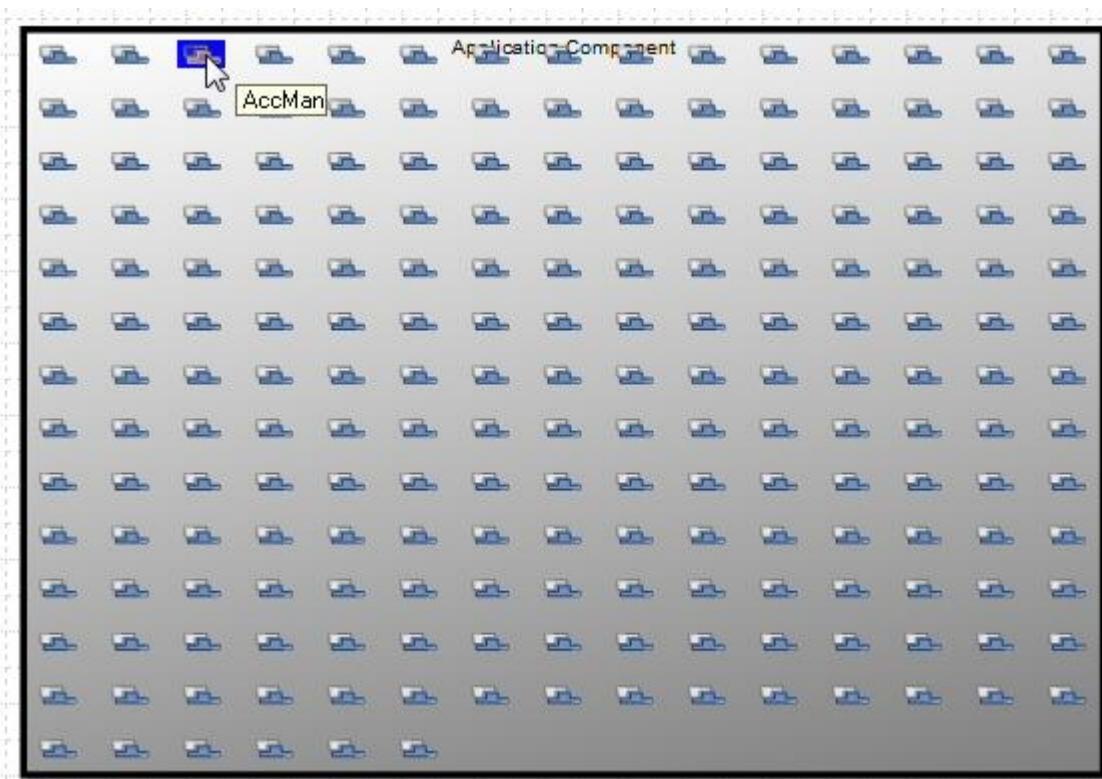
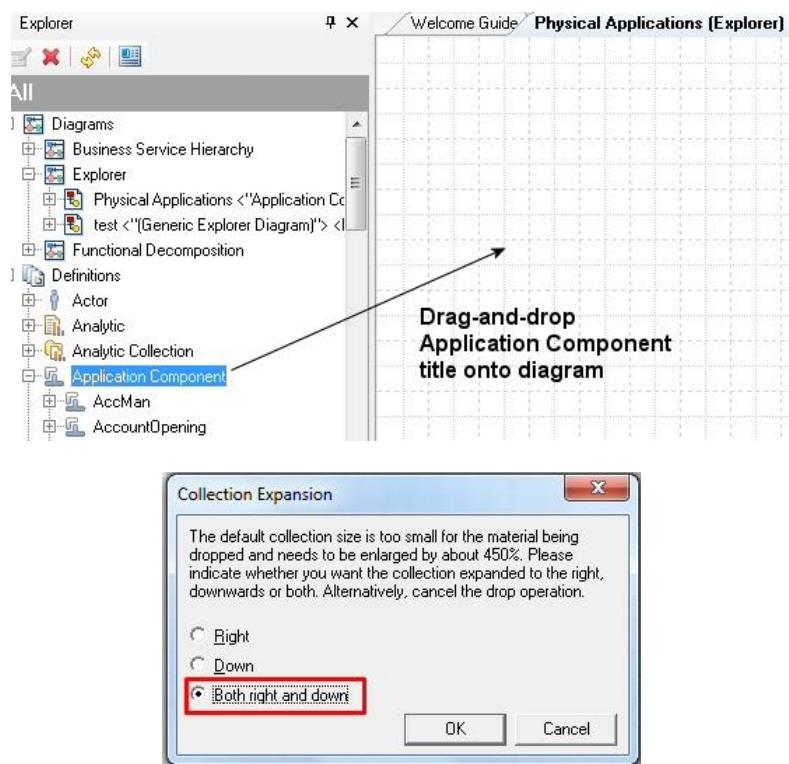
repository are drawn on the diagram.

4. Click **Yes** to the message "You are about to attempt to drop X symbols on the diagram. OK to continue?"

5. In the default layout dialog, select **Both right and down**.

The applications appear on the diagram. If you mouse over an app, its name will pop up.

Note: If you want to move all the apps, select the bounding rectangle -- the collection rectangle -- and move it.



## EA Work

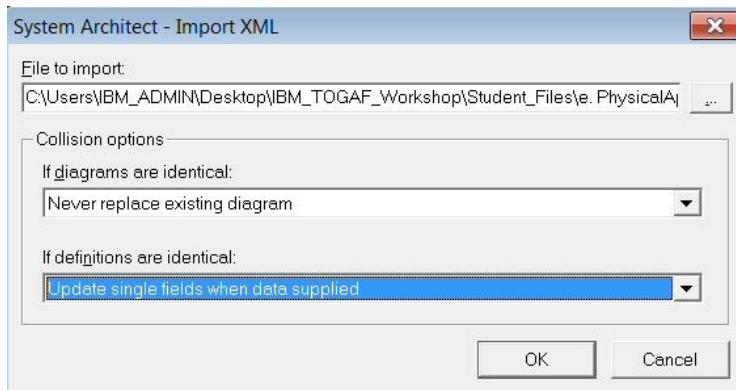
It is the Enterprise Architect's work to establish what Applications have interfaces to other Applications. In our workshop, we'll import an XML file of Application Interfaces already specified.



### IMPORT INTO REPOSITORY

1. In the Explorer (browser), right-mouse click anywhere, and select **Import XML** from the popup menu.
2. Select the file **Application\_Interfaces.xml**, in the directory  
Desktop\IBM\_TOGAF\_Workshop\Student\_Files\e.  
PhysicalAppSpreadsheet

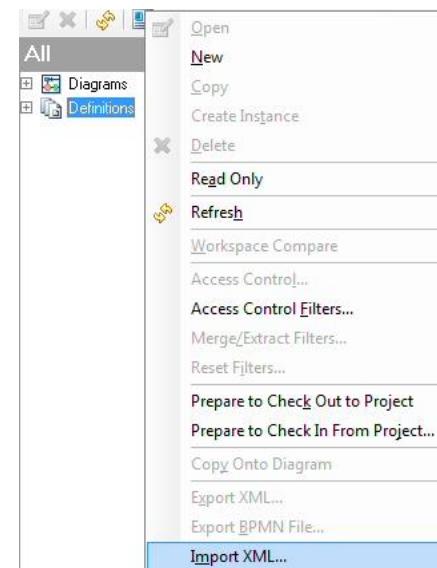
**IMPORTANT** – choose the collision option for Definitions – Update Single Fields When Data Supplied.



3. Click **OK** to import the update of information.

#### 5.1.4 Import Pre-Built Explorer Reports and Analytic Collections

To save you time, we've pre-built some Explorer Relationship and Explorer Object reports. You can import them now.



## Import Pre-Built Explorer Reports



### IMPORT INTO REPOSITORY

1. In the Explorer (browser) pane, right-mouse click in empty space and select XML Import. Select the file **Workshop\_Explorer\_Reports.xml**, in the directory C:\Users\IBM\_ADMIN\Desktop\IBM\_TOGAF\_Workshop\Student\_Files\j.REPORTS\_and\_Analytics

## Import Pre-Built Analytic Reports

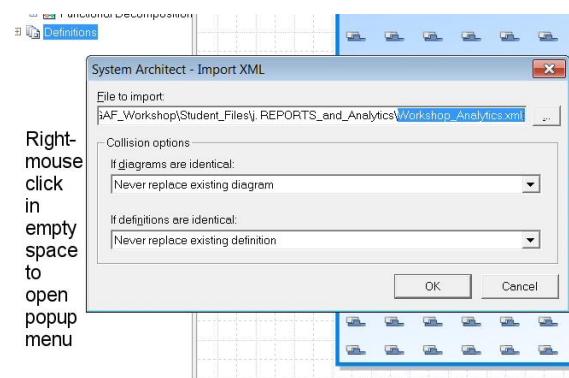
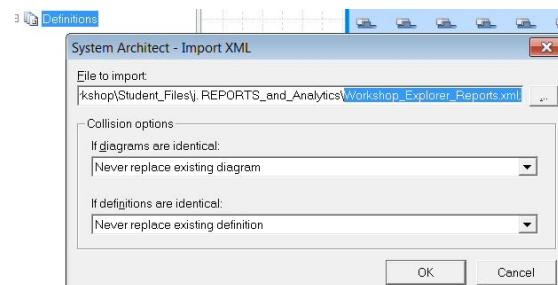


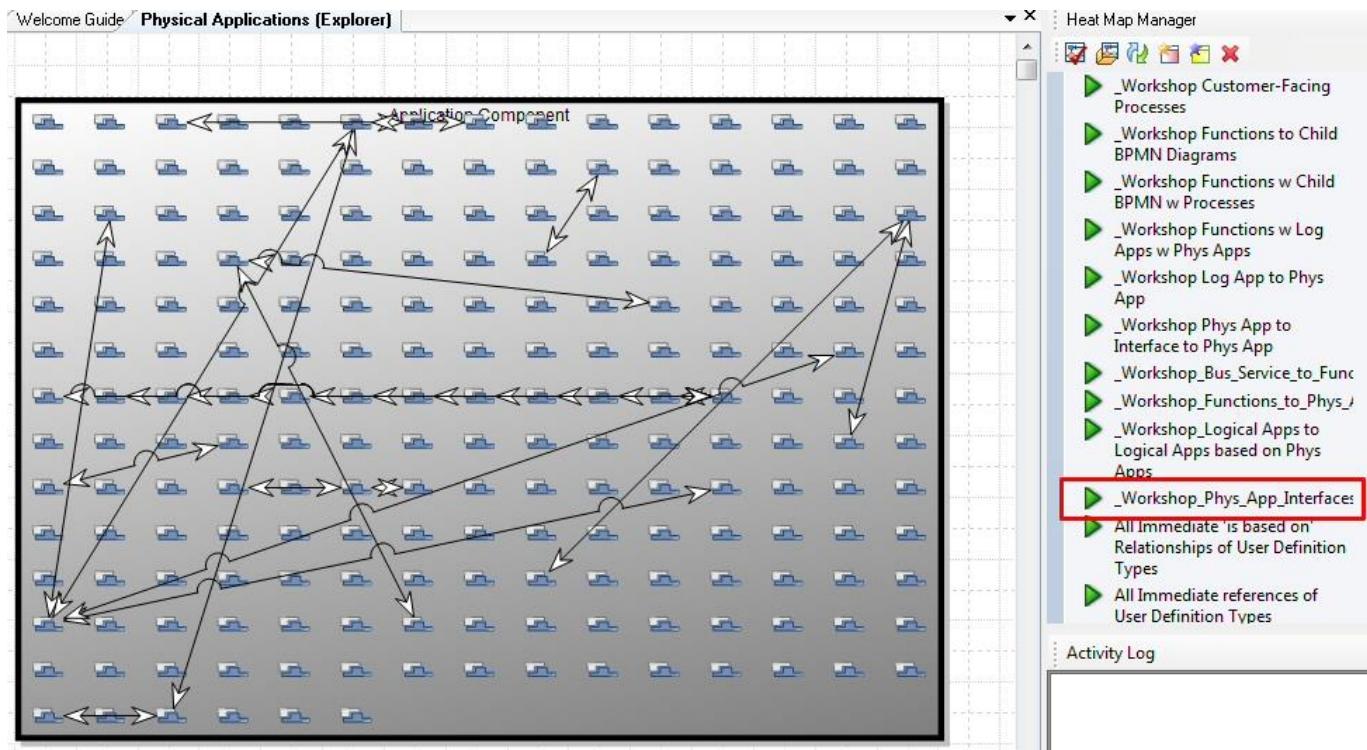
### IMPORT INTO REPOSITORY

4. Using the same technique as above, do an XML import of the file **Workshop\_Analytics.xml** in the directory C:\Users\IBM\_ADMIN\Desktop\IBM\_TOGAF\_Workshop\Student\_Files\j.REPORTS\_and\_Analytics. Leave all default collision options and click **OK**.

## Visualize Application Interfaces

5. Select **View, Heatmap Manager**, to open the Heatmap Manager pane on the right of the workspace.
6. Click on the Explorer Relationship Report named **\_Workshop\_Physical\_App\_** to run it. Interface lines between Applications are drawn.

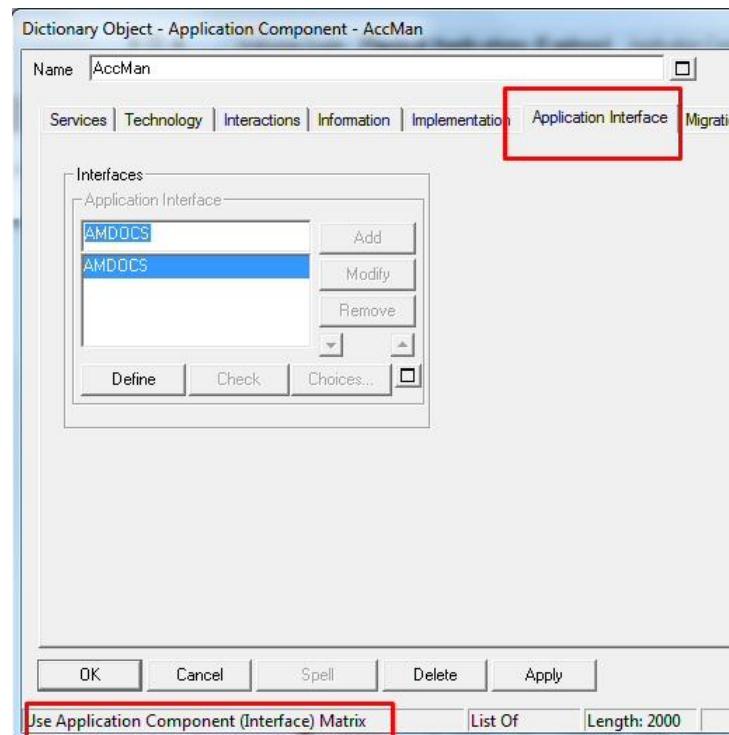




7. **Optional Step:** Open the definition of any Application on the diagram that has a line drawn to it (by double-clicking on the application symbol or right-mouse clicking and choosing Edit) – and go to its **Application Interface** tab -- notice that it has an interface to other applications. [In the example to the left the AccMan definition is opened – it has an interface to AMDOCS.]

The property is read-only -- there is help text at the bottom left of the dialog that tells you to **Use Application Component (Interface) Matrix** to fill in the property.

Click OK to close the definition.



8. Select **View, Matrix Browser**.

9. In the Matrix Browser dialog, select the TOGAF 9 Infrastructure Consolidation tab at the bottom of the dialog (see bottom of picture at right).

10. Click on the **Application Component to Application Component (Interface)** matrix to open it.

11. In the matrix wizard, accept defaults and select Next and Finish.



12. Notice that in the matrix, there is an "x" in each cell where there is an interface between two applications.

13. Right-mouse click on the cell intersecting **AMDOCS** and **AccMan**, and select Edit Cell Definition -- to open the Application Interface definition joining the two applications.

14. Go to the Information tab -- notice you can specify data entities exchanged between the applications.

15. **Close** the definition – leave it unchanged. Leave the matrix open.

Application Component	Application Component							
	A/L Reporter	ABS	AMDOCS	AccMan	Account Management	Accounts Receivables	Active Risk Manager	Albany
A/L Reporter								
ABS								
AMDOCS			X					
AccMan		X						
Account Management								

Edit Cell Definition  
Edit Row Definition

Dictionary Object - Application Interface - MatrixCell634983973

Name	MatrixCell634983973								
<a href="#">Introduction</a>   <a href="#">Interface Type</a>   <a href="#">Complex Interface Rules</a>   <a href="#">Information</a> <b>Information</b>   <a href="#">Identification</a>   <a href="#">Governance</a>   <a href="#">V</a>									
Entities Exchanged <table border="1" style="width: 100px; margin-left: auto; margin-right: auto;"> <tr> <td>Add</td> </tr> <tr> <td>Modify</td> </tr> <tr> <td>Remove</td> </tr> <tr> <td>▼</td> </tr> <tr> <td>▲</td> </tr> <tr> <td>Define</td> </tr> <tr> <td>Check</td> </tr> <tr> <td>Choices...</td> </tr> </table>		Add	Modify	Remove	▼	▲	Define	Check	Choices...
Add									
Modify									
Remove									
▼									
▲									
Define									
Check									
Choices...									

The Application Interface relationship is an example of an **explicit** relationship -- the Application Interface definition joins two Application Component definitions. The Application Interface definition has a property set within which you specify information about the interface.

**Different Types of Relationships**

There are three types of relationships as far as data centricity is concerned:

- Implicit Relationships -- a simple reference; one thing has a list of another thing, and vice versa.
- Explicit Relationships -- the relationship is a definition in of itself, which captures information about the relationship. Think of a relationship between a Process and an Entity, where at the intersection you are capturing if the Process creates, reads, updates, and/or deletes the entity (a CRUD matrix). That info is captured in the relationship itself -- a definition type called Entity/Process.
- Inferred Relationships -- provided via navigation of several definitions -- if X is related to Y is related to Z, then X is related to Z. This is the output of a report, that in System Architect can be visualized on the diagram (especially on an Explorer diagram but also on most diagram types).

These three types of relationships are separate in concept from other lower-level 'types' of relationship, such as Contains, Uses, Is Performed By, etc etc

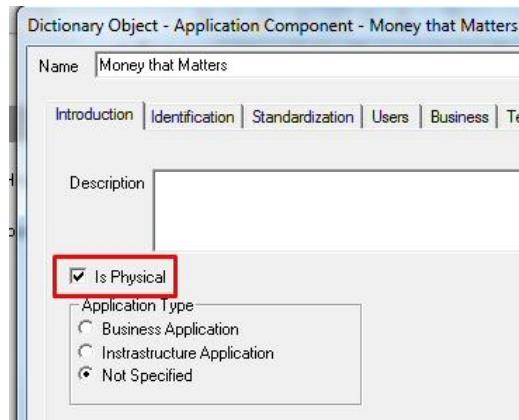
### 5.1.5 Add an Application

The organization is looking to add a new application to the bank -- **Money that Matters (MTM)** -- which is a mobile application that will enable users to apply for a Vacation Loan via their mobile phone. It will also enable users to make a donation to their favorite charity via a mobile device.

There's a lot of ways to add a definition to the repository -- add a definition via the Explorer (browser), add a definition by drawing a symbol on a diagram, etc. Since we have the matrix open, let's add a definition through it.

1. Select **Matrix, Add Row**.
2. In the Dictionary Object -- Application Component dialog, type in the name **Money that Matters**
3. In the definition dialog that opens, toggle on the property **Is Physical**. Click **OK**.
4. Select **Matrix, Reload**. Click **OK** to all messages that come up.

**Money that Matters** is added to the **end** of the matrix (upon matrix reopening, it will be put in alphabetical order).



5. Optionally select **Matrix, Column Label Styles, Horizontal.**

6. Toggle on the cell intersecting "Money that Matters" and **CAT** (a Credit Analysis Tool). You have created an Application Interface join definition between the two.

7. Toggle on the cell intersecting "Money that Matters" and **DLP** (a Digital Loan Processing application). You have created an Application Interface join definition between the two.

Note: if you optionally double clicked on the head of the column "Money that Matters" -- or the row Money that Matters, to open its definition, you would not that on its Application Interface tab, CAT and DLP are now listed.

8. Close the matrix.

Application Component	Application Component
BroadcastByPhone	
CAPS	
CAT	X
CC FIX Router	

Application Component	Application Component
DDS	
DLP	X

---

## Lab 6 Application Portfolio Management

### Goals of this Lab:

Understand Application Portfolio Analysis and Its Impact on EA  
Understand TOGAF 9 Metamodel for Logical Apps vs Physical Apps

### 6.1 Create Groupings of Logical Applications

#### Objectives of this Section:

- Understand Use of Logical Applications
- Import Spreadsheet of Logical Applications
- Visualize the Spreadsheet of Logical Apps vs Physical Apps
- Align Functions with Applications

#### 6.1.1 Understand Use of Logical Applications

Some Enterprise Architects introduce a Logical Application layer into their architecture. Although it introduces a layer of complexity into the architecture, there are advantages to it.

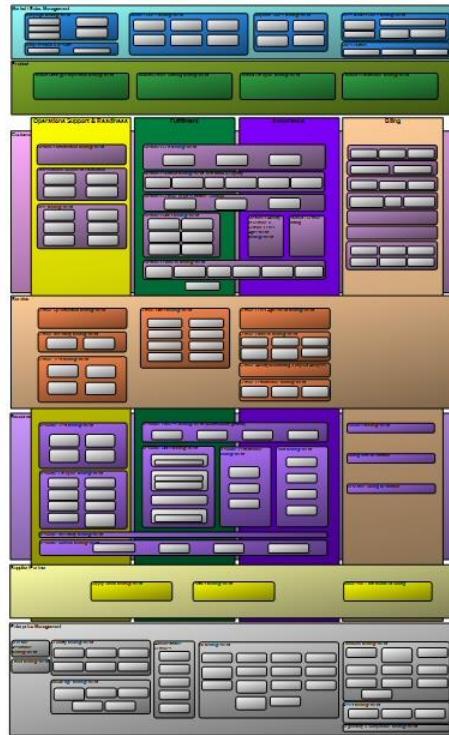
- Oftentimes the name of a physical application means nothing to you or the business user. It is helpful in understanding the architecture to know the role of a physical application.
- Categorizing physical applications by logical application type enables you to quickly see where you have redundancies -- for example, three billing applications, etc.
- There are many ways to build a logical application layer into your architecture. One popular framework is the Telecom Application Mapping (TAM) of the TMForum's Framework. The TMForum Framework provides three frameworks:
  - Telecom Application Mapping (TAM): The TAM provides a taxonomy and grouping of logical application components that support Telecom and media company operational and business support systems.
  - Shared Information/Data (SID): A taxonomy of data (entities or classes) with data model patterns.
  - Enhanced Telecom Operations Mapping (eTOM): a taxonomy of business processes with BPMN process flow patterns for the Telecom industry.

The TAM is not ideal for our Banking architecture, but we'll import it and use some of it as a guide to establish our logical application layer. We would then remove parts of it not applicable to our bank, and add logical Application Components we need.



## IMPORT INTO REPOSITORY

1. Right-mouse click on an empty space in the Explorer (browser), select **Import XML** and import the **TAM\_12.5.xml** file in the Desktop\IBM\_TOGAF\_Workshop\ Student\_Files\g. TAM directory.
2. Notice that a new Explorer diagram is added to the repository -- open the Explorer diagram named **TAM**.
3. Zoom in and examine the TAM framework. Notice how Logical Applications are grouped by business areas of a company, and at the same time by operations areas of a company.



### 6.1.2 EA Work

The work of the Enterprise Architect is to categorize Physical Applications by Logical Application grouping, and to map Logical Applications to Functions or Business Services. We'll cheat in our short workshop by importing a spreadsheet that aligns Functions to Logical Apps to Physical Apps.

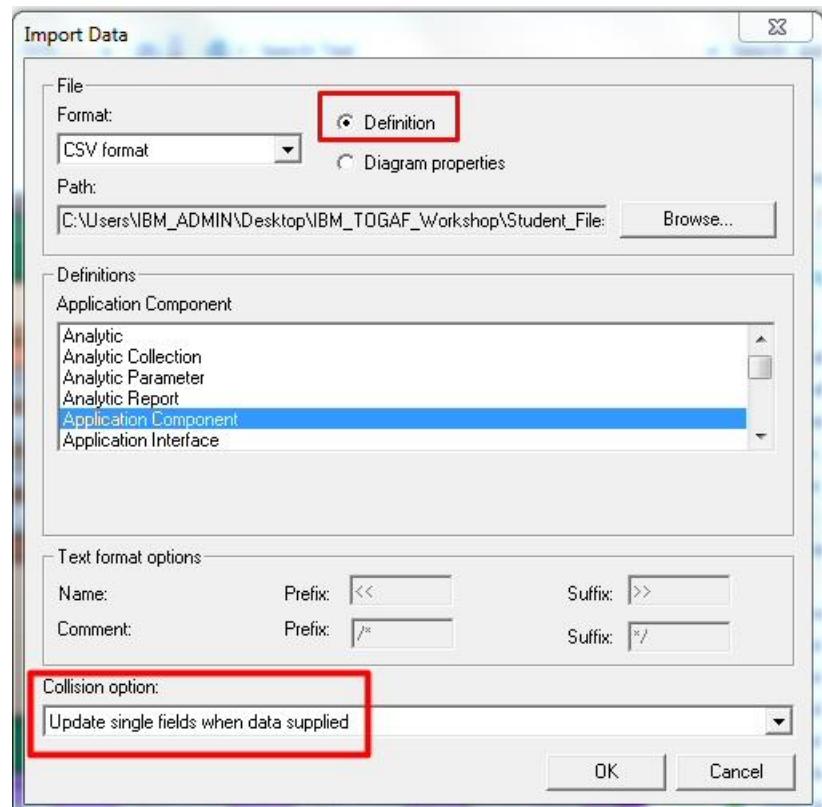


## IMPORT INTO REPOSITORY

1. Select **Dictionary, Import Definitions.**
2. Choose to import the file **Log\_Apps\_w\_Functions\_and\_Phys\_Apps.csv** in the Desktop\IBM\_TOGAF\_Workshop\Student\_Files\g. TAM directory **IMPORTANT:** Choose to import the file as an Application Component definition -- and **very important** -- specify Collision Options of **Update single fields when data supplied.**

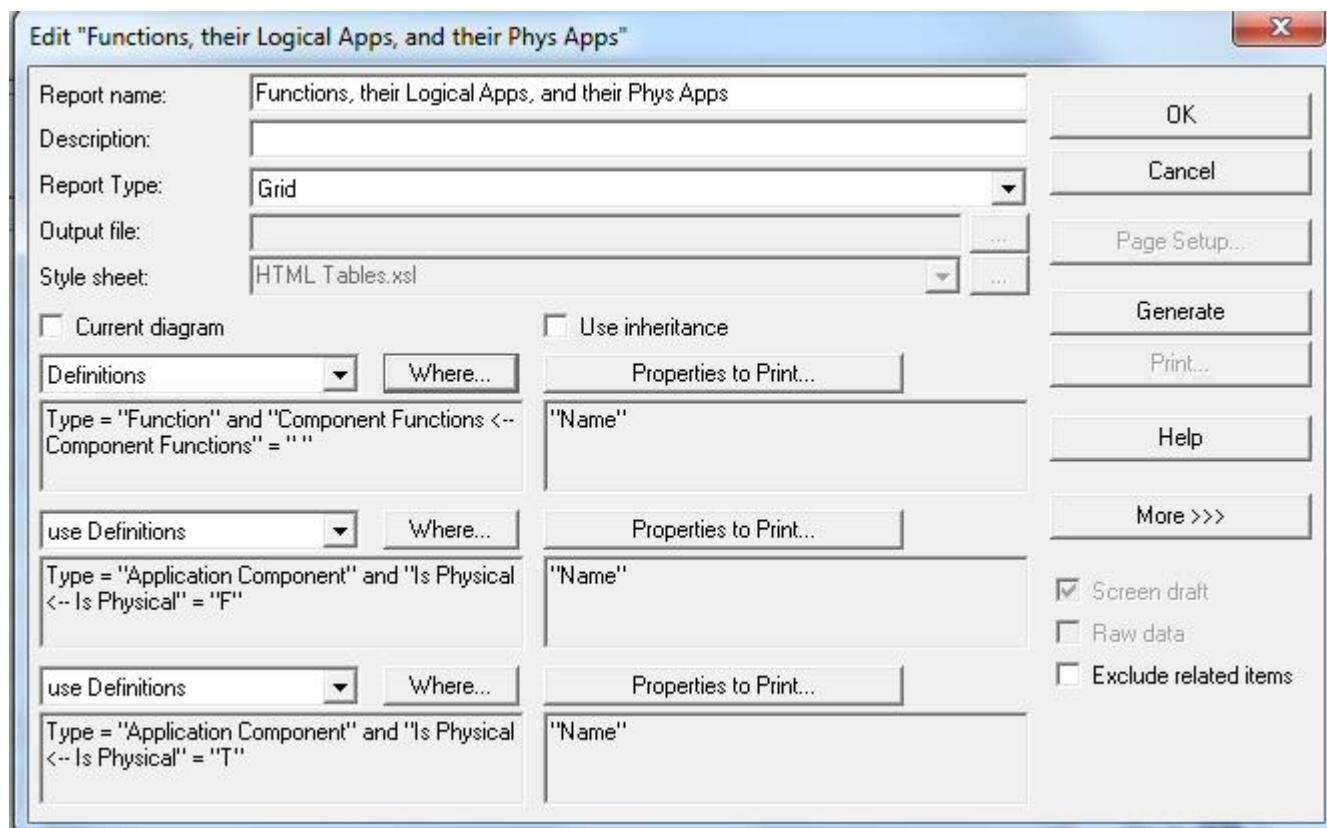


3. **IMPORTANT:** Select **Tools, Dictionary Update.** A spreadsheet may have a relationship from one type of item to another; however the TOGAF metamodel has bidirectional relationships – updating the Dictionary will mirror relationships (example a Function uses an Application; an Application is Used By a Function).

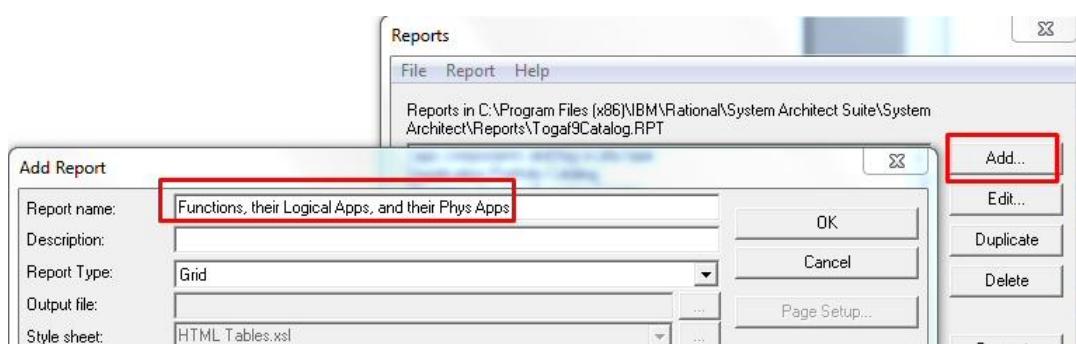


Let's take a look at what Functions are related to what Logical Applications are related to what Physical Applications. We'll build a report.

### 6.1.3 Build a Report



1. Select Reports, Report Generator.
2. Make sure the TOGAF9\_Catalog.rpt file is open -- if not, select File, Open Report File, and open it from the <C>:\Program Files (x86)\IBM\Rational\System Architect Suite\System Architect\Reports directory.
3. Click the Add button in the Report dialog to add a new report.

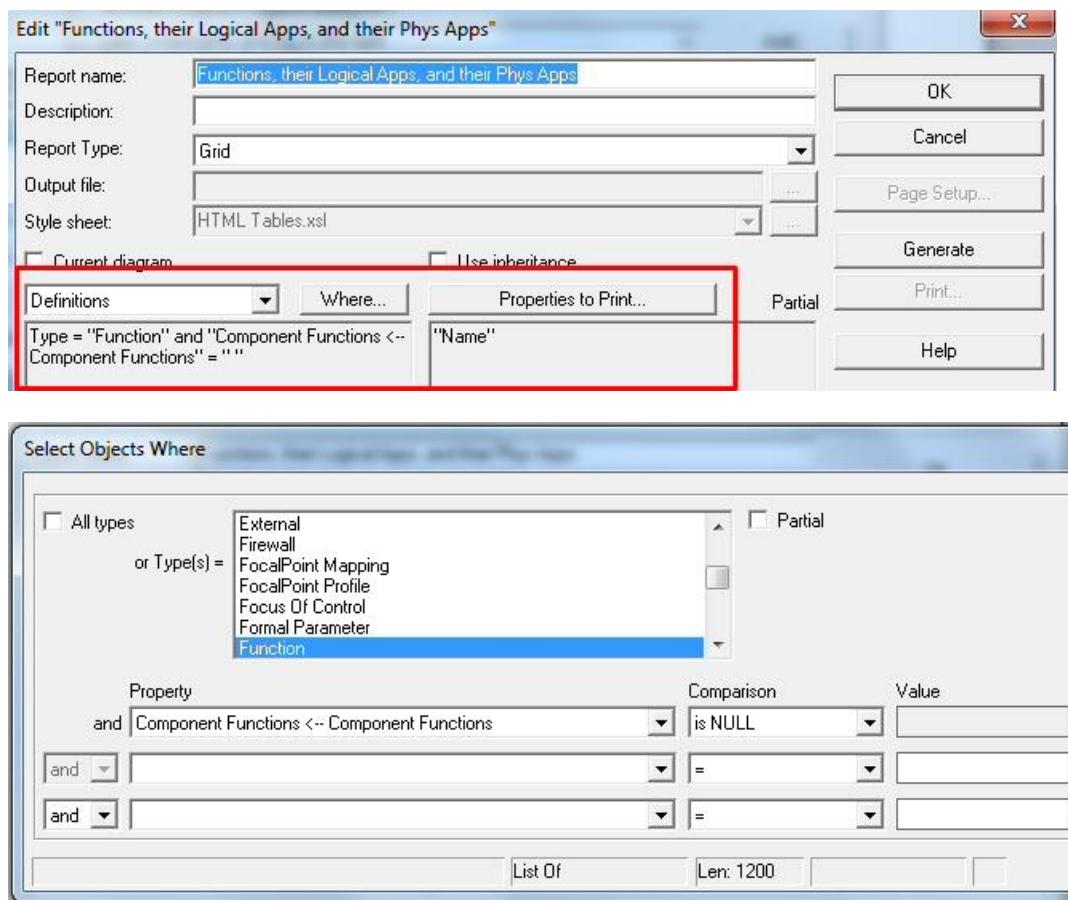


4. Name the new report **Functions, their Logical Apps, and their Phys Apps.**

5. On the first level of the report, specify to get Definitions -- click the Where button and specify **Function** (toggle off All Types).

6. At the bottom of the dialog, select Property **Component Functions** and select Comparison **isNull**. Click OK.

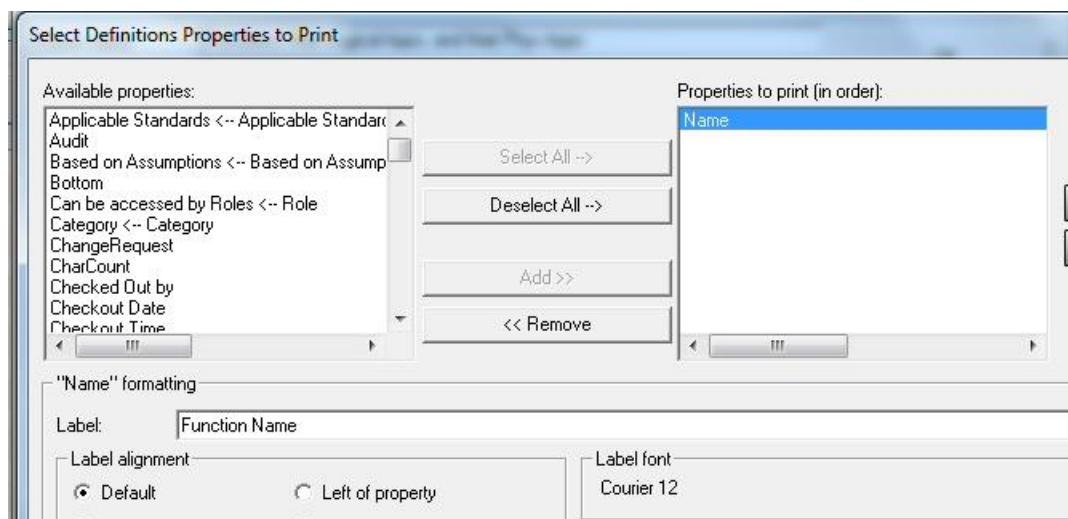
7. Click OK to return to the main report dialog.



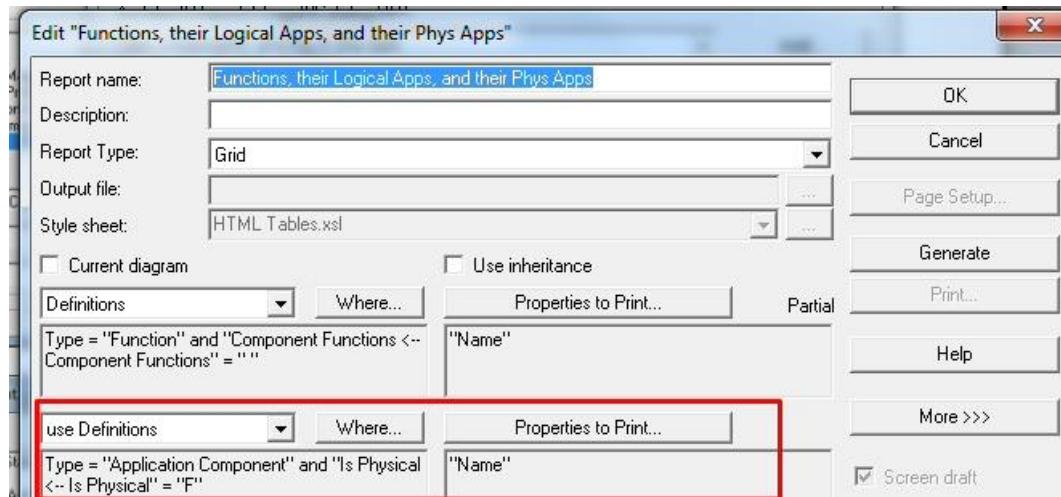
We want to only get leaf-level Functions -- those are not decomposed further. We specify that the report get Functions whose "Component Functions" property is empty -- no further decomposition.

8. Click Properties to Print, and find and select Name -- move it to the right side. Select the **Name** property and type **Function Name** in the Label property.

9. Click OK to return to the main report dialog.



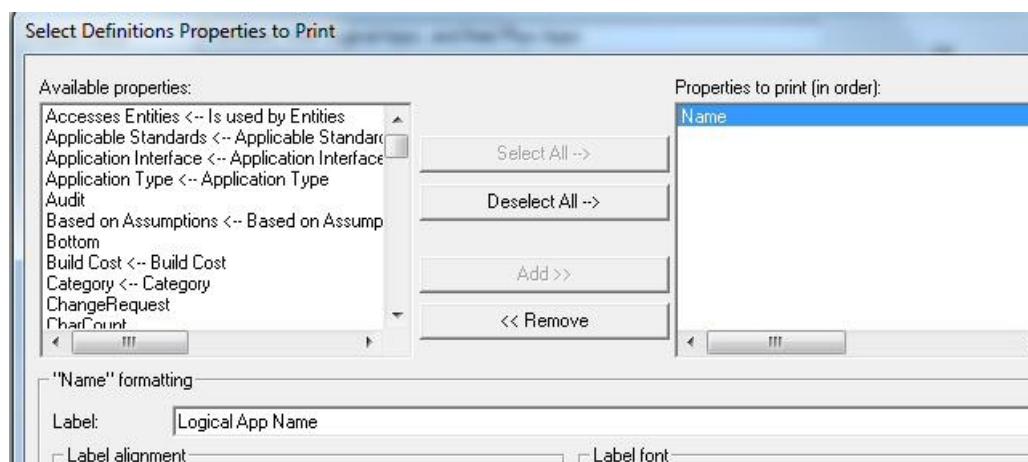
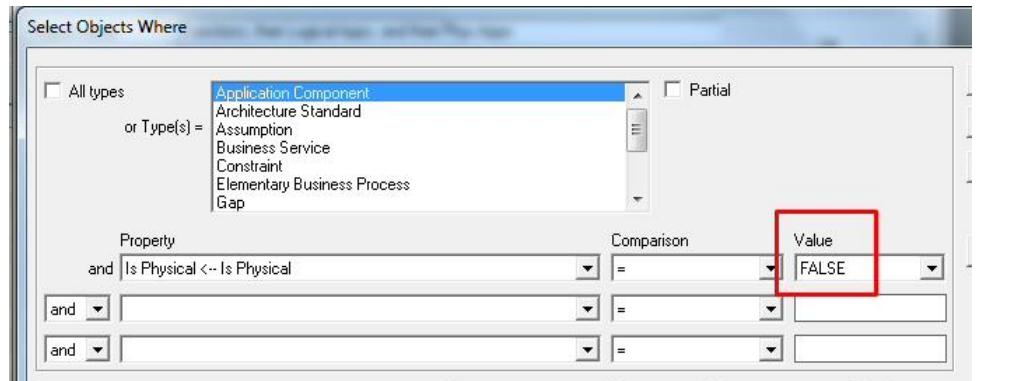
10. For the second layer of the report, select **use Definitions** relationship from the drop-down list and click the **Where** button.



11. In the Select Objects Where dialog, click off All types and select **Application Component**.

12. At the bottom of the dialog, specify property **Is Physical** = FALSE. This will get all Logical Application Components. Click OK.

13. In the main report dialog, specify **Properties to Print** and again select **Name**. Select Name and provide a Label at bottom of dialog -- **Logical App Name**.



14. In the third and final layer of the report, select use Definitions and click the Where button.

15. Toggle off All Types and select **Application Component**. At the bottom of the dialog, select the property **Is Physical = TRUE**.

16. Back in the main report dialog, click Properties to Print and select **Name** -- specify a label of **Phys App Name**.

**Edit "Functions, their Logical Apps, and their Phys Apps"**

Report name: Functions, their Logical Apps, and their Phys Apps

Description:

Report Type: Grid

Output file:

Style sheet: HTML Tables.xls

Current diagram       Use inheritance

Definitions      Where...      Properties to Print...

Type = "Function" and "Component Functions <-- Component Functions" = ""  
"Name"

use Definitions      Where...      Properties to Print...

Type = "Application Component" and "Is Physical <-- Is Physical" = "F"  
"Name"

use Definitions      Where...      Properties to Print...

Type = "Application Component" and "Is Physical <-- Is Physical" = "T"  
"Name"

**Select Objects Where**

All types      Actor      Partial  
or Type(s) = Application Component  
Application Interface      Architecture Standard  
Assumption      Constraint  
Cost Center

Property: Is Physical <-- Is Physical      Comparison: =      Value: TRUE

**Select Definitions Properties to Print**

Available properties:

- Accesses Entities <-- Is used by Entities
- Applicable Standards <-- Applicable Standard
- Application Interface <-- Application Interface
- Application Type <-- Application Type
- Audit
- Based on Assumptions <-- Based on Assump
- Bottom
- Build Cost <-- Build Cost
- Category <-- Category
- ChangeRequest
- CharCount

Properties to print (in order): Name

"Name" formatting

Label: Phys App Name

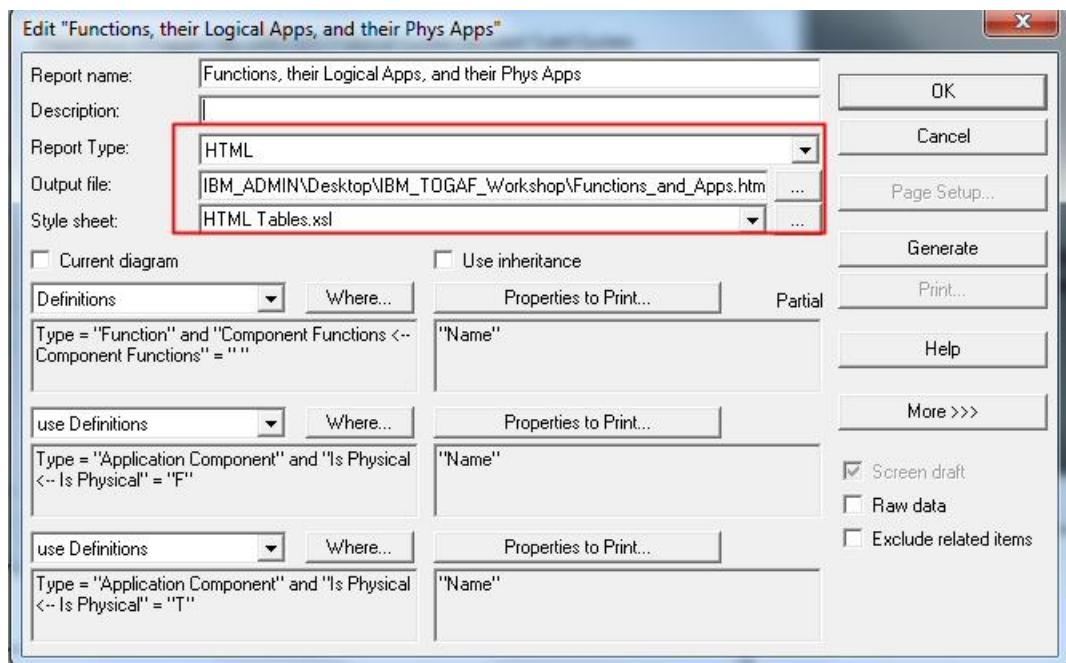
Label alignment:  Default       Left of property

Label font: Courier 12

## Generate the Report to HTML

17. Back in the main report dialog, select Report Type = **HTML**, then specify an output file -- for example, **Functions\_and\_Apps.html**. Leave the default Style sheet at HTML Tables.xlsx.

18. Click **Generate**. The report will automatically open in your default web browser.



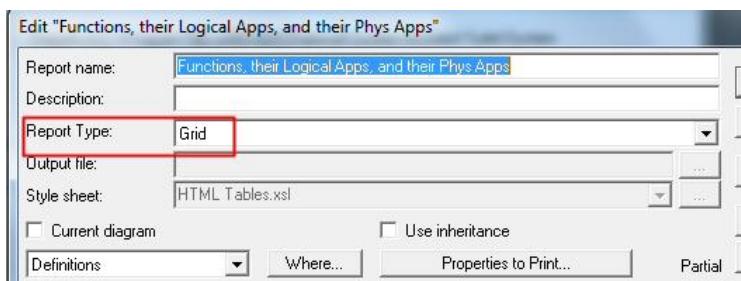
Functions, their Logical Apps, and their Physical Apps		
Function Name	Log App Name	Physical App Name
Accounting	Account Management Accounts Receivables	SmarterCommerce IPBS FISA Enterprise FICO Dept Manager
Collections and Receivables	General Ledger Account Reconciliation	GOLedger Canopus EpaySuite WebAR Wincollect SimplicityCollect Datamatrice
Enterprise Architecture	Enterprise Architecture	IBM Rational Focal Point System Architect
Funds Control	General Ledger Account Reconciliation	GOLedger Canopus EpaySuite WebAR Wincollect SimplicityCollect Datamatrice
Help Desk Services	Customer Problem Lifecycle Management Customer Problem Management	Websphere Customer Center Websphere Customer Center Blue Messenger Pamela Monet Live Callview 360 BroadcastByPhone
Home Improvement Loans	Loan Processing	Money that Matters Unity Loan System Loan Servicing Soft Community Bank Software

## Make the Report Send to Grid

19. Back in the main report dialog, select Report Type = **GRID**.

20. Click **Generate**.

The report will generate to Grid (see below).



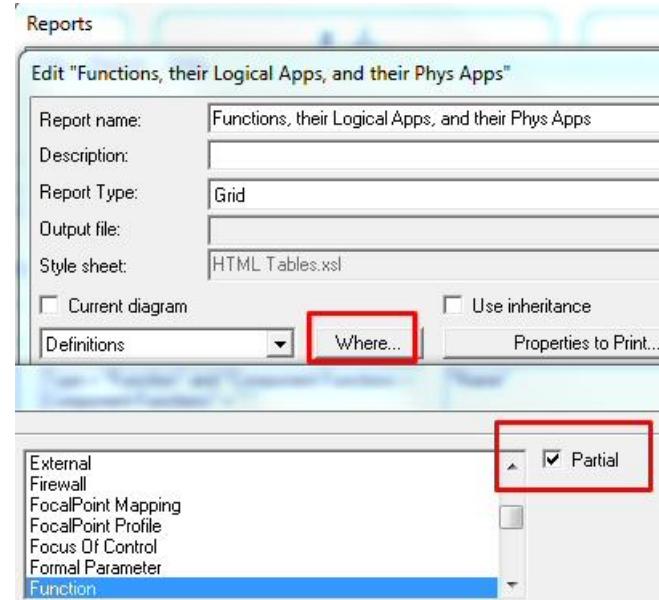
Function Name /	Log App Name	Physical App Name
Accounting	Accounts Receivables	FICO Dept Manager
Accounting	Accounts Receivables	FISA Enterprise
Accounting	Accounts Receivables	IPBS
Accounting	Account Management	SmarterCommerce
Collections and Receivables	General Ledger Account Reconciliation	Canopus EpaySuite
Collections and Receivables	General Ledger Account Reconciliation	Datamatrice
Collections and Receivables	General Ledger Account Reconciliation	GOLedger
Collections and Receivables	General Ledger Account Reconciliation	SimplicityCollect
Collections and Receivables	General Ledger Account Reconciliation	WebAR
Collections and Receivables	General Ledger Account Reconciliation	Wincollect
Enterprise Architecture	Enterprise Architecture	IBM Rational Focal Point
Enterprise Architecture	Enterprise Architecture	System Architect
Funds Control	General Ledger Account Reconciliation	Canopus EpaySuite
Funds Control	General Ledger Account Reconciliation	Datamatrice
Funds Control	General Ledger Account Reconciliation	GOLedger
Funds Control	General Ledger Account Reconciliation	SimplicityCollect
Funds Control	General Ledger Account Reconciliation	WebAR
Funds Control	General Ledger Account Reconciliation	Wincollect
Help Desk Services	Customer Problem Management	Blue Messenger
Help Desk Services	Customer Problem Management	BroadcastByPhone
Help Desk Services	Customer Problem Management	Callview 360
Help Desk Services	Customer Problem Management	Monet Live
Help Desk Services	Customer Problem Management	Pamela
Help Desk Services	Customer Problem Lifecycle Management	Websphere Customer Center
Help Desk Services	Customer Problem Management	Websphere Customer Center
Home Improvement Loans	Loan Processing	ABS
Home Improvement Loans	Loan Processing	BANC Mall
Home Improvement Loans	Loan Processing	Community Bank Software
Home Improvement Loans	Loan Processing	Loan Servicing Soft
Home Improvement Loans	Loan Processing	Money that Matters

The report outputs all Functions -- that have a Logical App assigned that have a Physical App assigned.

## Make the Report "Partial"

Let's get a more complete report -- all Functions with their Logical and Physical Apps no matter if one has been assigned or not.

21. Reopen the report -- select it in the reports dialog and click Edit.
22. Click the Where button for the first layer of the report.
23. In the Select Objects Where dialog (for the Function definition) -- toggle on the **Partial** command. Click OK to close the dialog.
24. Click Generate in the main report dialog.



Functions, their Logical Apps, and their Physical Apps		
Function Name	Log App Name	Physical App Name
Accounting	Account Management	SmarterCommerce
Accounting	Accounts Receivables	IPBS
Accounting	Accounts Receivables	FISA Enterprise
Accounting	Accounts Receivables	FICO Dept Manager
Advising and Consulting		
Asset and Liability Management		
Benefits Management		
Budget Execution		
Budget Formulation		
Budget and Performance Integration		
Capital Planning		
Close Checking Accounts		
Close Savings Accounts		
Collections and Receivables	General Ledger Account Reconciliation	GOLedger
Collections and Receivables	General Ledger Account Reconciliation	Canopus EpaySuite
Collections and Receivables	General Ledger Account Reconciliation	WebAR
Collections and Receivables	General Ledger Account Reconciliation	Wincollect
Collections and Receivables	General Ledger Account Reconciliation	SimplicityCollect
Collections and Receivables	General Ledger Account Reconciliation	Datamatrice
Compensation Management		
Contingency Planning		
Continuity of Operations		
Corrective Action		
Cost Accounting / Performance Measurement		
Debt Collection		
Donations		
Employee Performance Management		
Employee Relations		
Enterprise Architecture	Enterprise Architecture	IBM Rational Focal Point



### Why Is this Useful?

The Grid enables you to double click in any cell and access the definition for editing. It is a useful tool for updating the architecture. You can create any kind of report, and directly access the definitions in it.



25. **IMPORTANT:** In the grid, find the function **Vacation Loans** and double click on to open its definition.
26. On its **Automation** tab, click Choices, and drag-and-drop in two logical applications - "**Loan Applications**" and "**Loan Processing**".

This screenshot shows the 'Dictionary Object - Function - Vacation Loans' window. The 'Automation' tab is selected. Below it, there's a grid titled 'Supported by Logical Application Components'. A row for 'Loan Processing' is selected. To the right of the grid are buttons for 'Add', 'Modify', and 'Remove'. Below the grid are 'Define', 'Check', and 'Choices...' buttons. A tooltip-like window titled 'Select and Drag - (Application)' is overlaid on the screen, pointing to the 'Choices...' button. This window contains a list of logical applications: Indirect Sales Portals, Interaction Management, Internal Sales Portals, Jeopardy Management, Journalization, Knowledge Management, Labor Relations, Lawful Interception, Lead Generation, Legal, Loan Applications, Loan Processing, Manage Bill Cycle Run, Manage Checking Accounts, and Mass Market Sales Management. At the bottom of the tooltip window, it says 'Is Physical F' and 'Supports Function Home Improvement'.

27. Select "Loan Applications" and click Define.
28. In its Implementation tab, click Choices and drag-and-drop in "**Money that Matters**"

This screenshot shows the 'Dictionary Object - Application Component - Loan Applications' window. The 'Implementation' tab is selected. Below it, there's a grid titled 'Is realized by'. A row for 'Money that Matters' is selected. To the right of the grid are 'Define', 'Check', and 'Choices...' buttons. A tooltip-like window titled 'Select and Drag - (Ap...' is overlaid on the screen, pointing to the 'Choices...' button. This window contains a list of application components: MLReporter (IPB), MobilePush, Monet Live, Money that Matters, mTIC, and Odin. At the bottom of the tooltip window, it says 'Is Physical F' and 'Supports Function Home Improvement'.

29. Close the output Grid, and go back to the reporting GUI and re-generate the report. The report output grid will show the results.

System Maintenance		
System and Network Monitoring		
Vacation Loans	Loan Processing	ABS
Vacation Loans	Loan Processing	BANC Mall
Vacation Loans	Loan Processing	Community Bank Software
Vacation Loans	Loan Processing	Loan Servicing Soft
Vacation Loans	Loan Processing	Unity Loan System
Vacation Loans	Loan Processing	Money that Matters
Vacation Loans	Loan Applications	Money that Matters

30. Close the grid and reporting engine interface.

## Lab 7 Analysis

### Goals of this Lab:

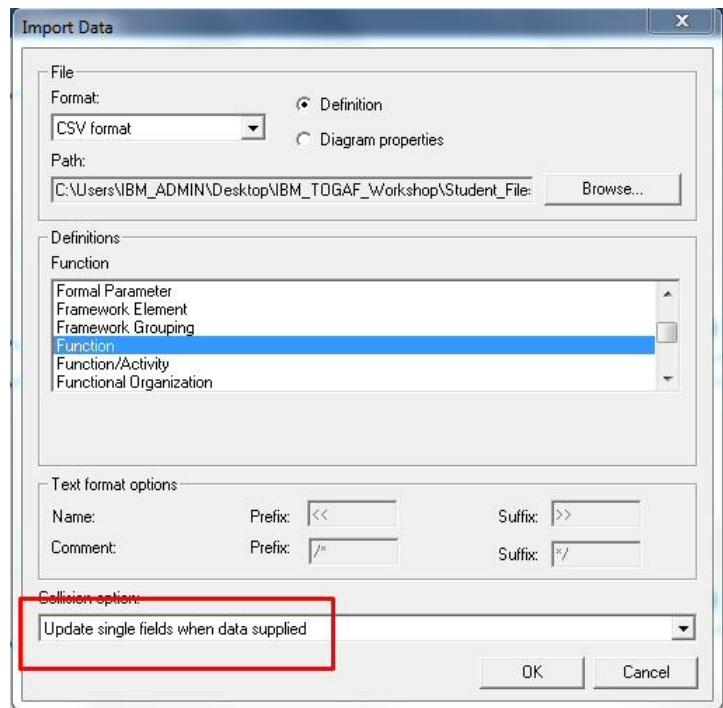
Understand how to use the EA to answer day-in-life strategic questions on the business.

### 7.1 Import APM Analysis Information from APM Tool



#### IMPORT INTO REPOSITORY

1. Select **Dictionary, Import Definitions**.
2. Import the file **apm\_effort\_functions.CSV** in the **Desktop\IBM\_TOGAF\_Workshop\Student\_Files\j.REPORTS\_and\_Analytics** directory as a **Function**. **IMPORTANT** -- on Collision Options, choose **Update single fields when data supplied**.
3. Select **Dictionary, Import Definitions**.
4. Import the file **locations.CSV** in the **Desktop\IBM\_TOGAF\_Workshop\Student\_Files\j.REPORTS\_and\_Analytics** directory as a **Location**. **IMPORTANT** -- on Collision Options, choose **Update single fields when data supplied**.



## 7.2 Cause-Effect Analysis (Optional)

**Note:** In the 2-hour version of this workshop, you can skip this section of the lab – go straight to section 7.3 -- and come back to this section at the end.

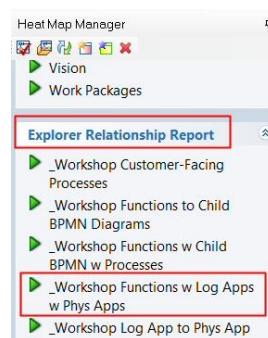
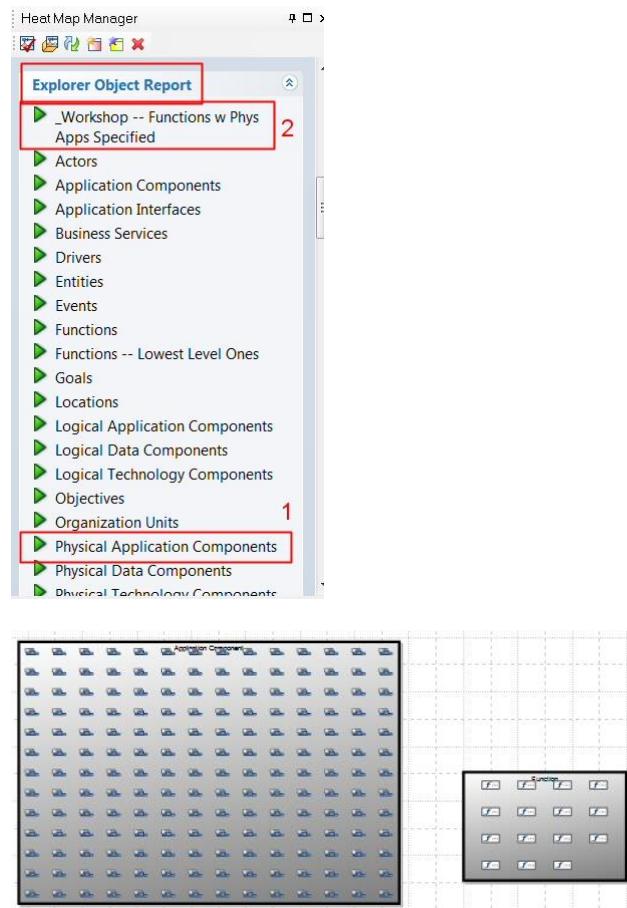
### 7.2.1 Build Explorer Diagram of Style 'Network'

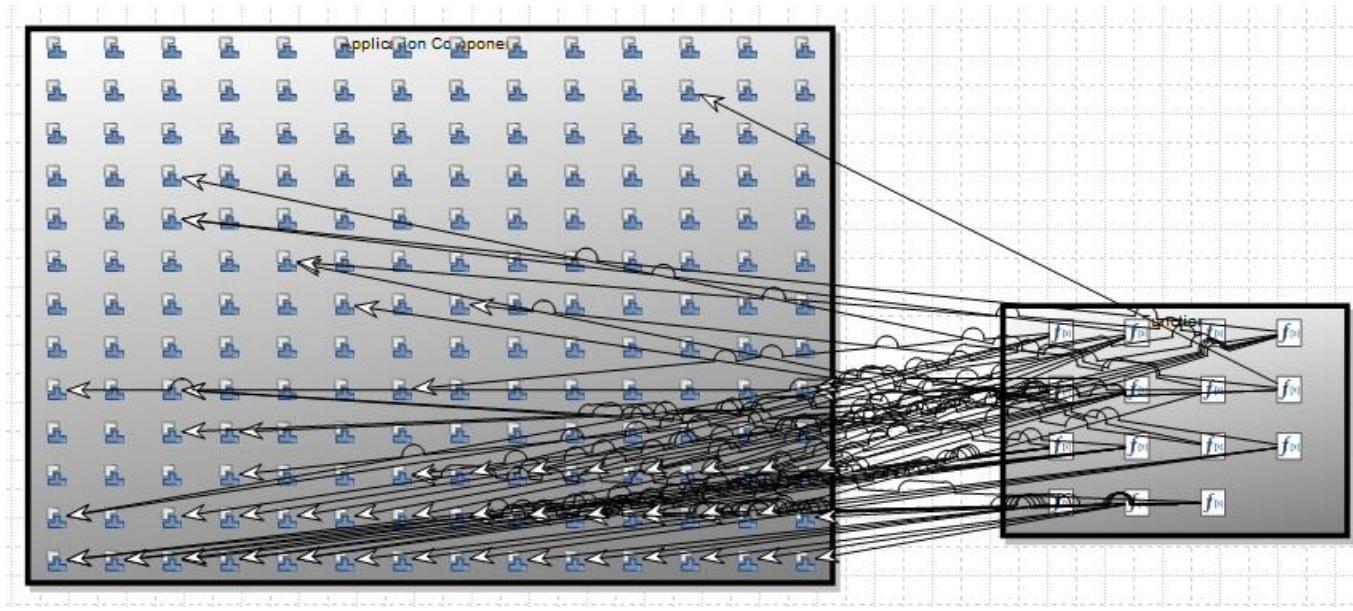
1. Create a new Explorer diagram named **Functions and Physical Applications**, of type **Network**, and stereotype (**Generic Explorer Diagram**).

2. Open the Heat Map Manager.
3. In the Heat Map Manager, run the Explorer Object Report, **Physical Application Components**. (Note if you don't see this report, click the Refresh button at the top of Heatmap manager).

For layout, choose **Both Right and Down**. (Note: if you don't see this report, click the Refresh button at the top of the Heatmap Manager, or reopen it.)

4. In the Heat Map Manager, run the report **\_Workshop -- Functions w Phys Apps Specified**.
5. In the Heat Map Manager, run the Explorer Relationship report **\_Workshop Functions w Log Apps w Phys Apps**.

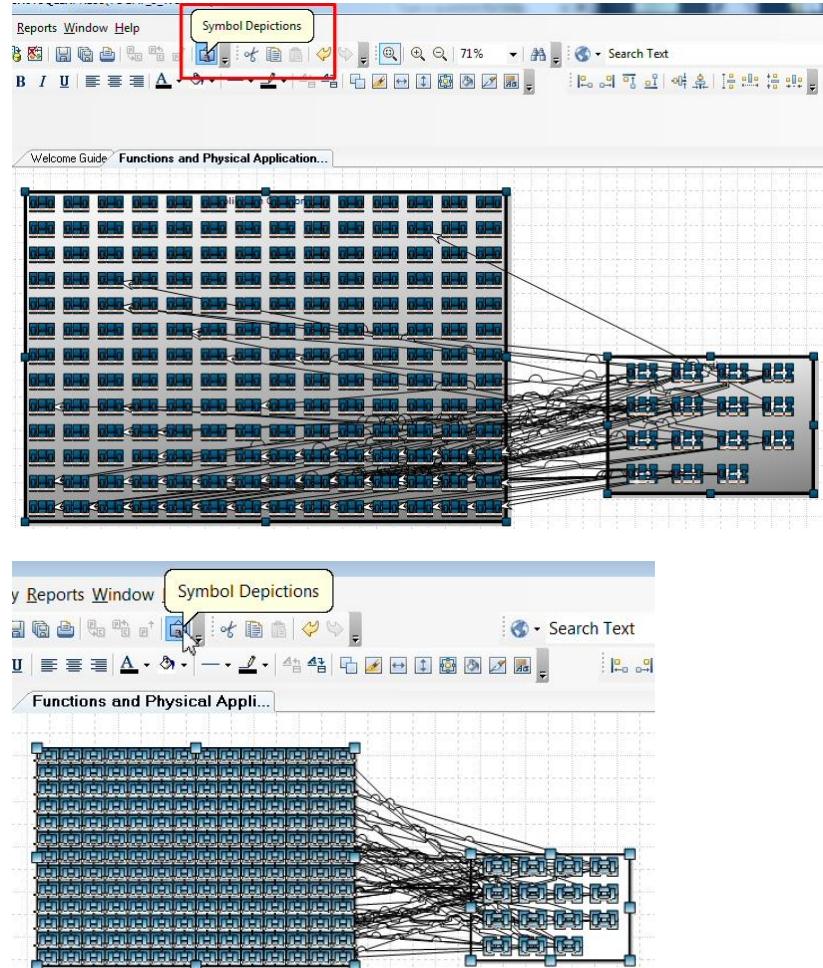


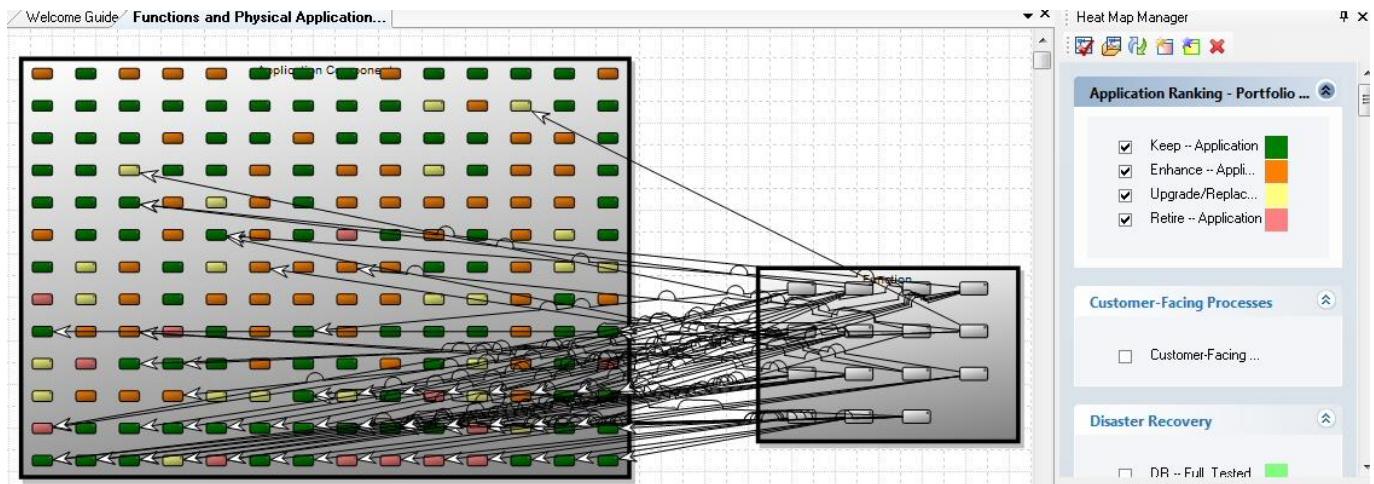


6. NOTE: if you optionally double clicked on one of the relationship lines on the diagram, you will get a message: **That object has no properties to be edited.** The lines simply reflect the running of reports -- you can delete anything on this diagram and it does not affect the architecture -- it is a report.

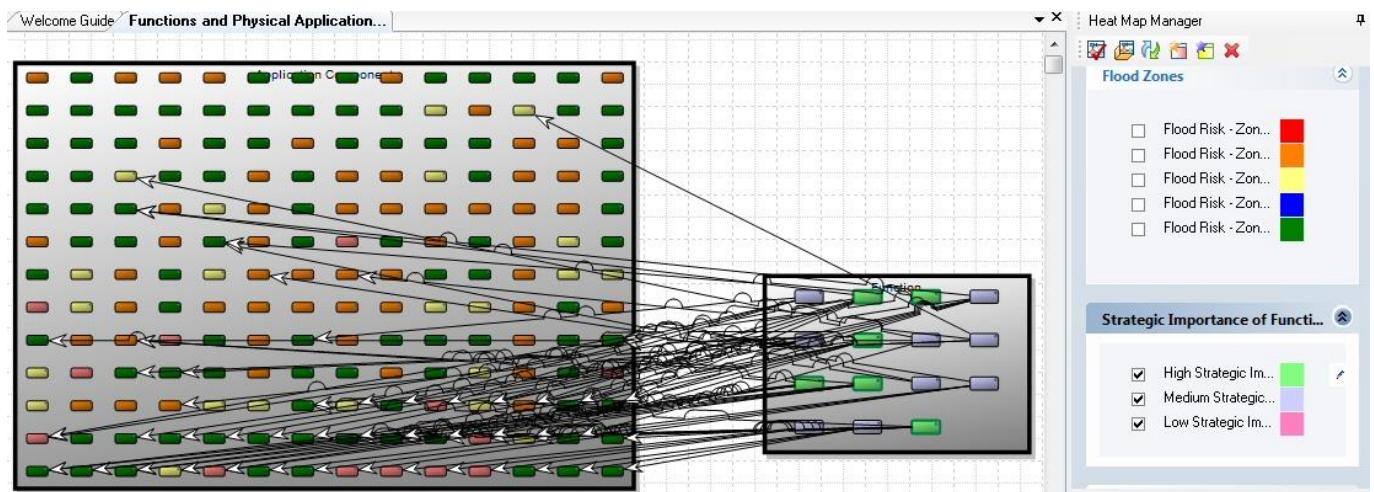
7. Select all symbols (Edit, Select All) and toggle **off** the Symbol Depictions button in the top menu.

8. Toggle ON and run all the reports for the **Application Ranking -- Portfolio Analysis** and **Strategic Importance of Functions** groups (see below)

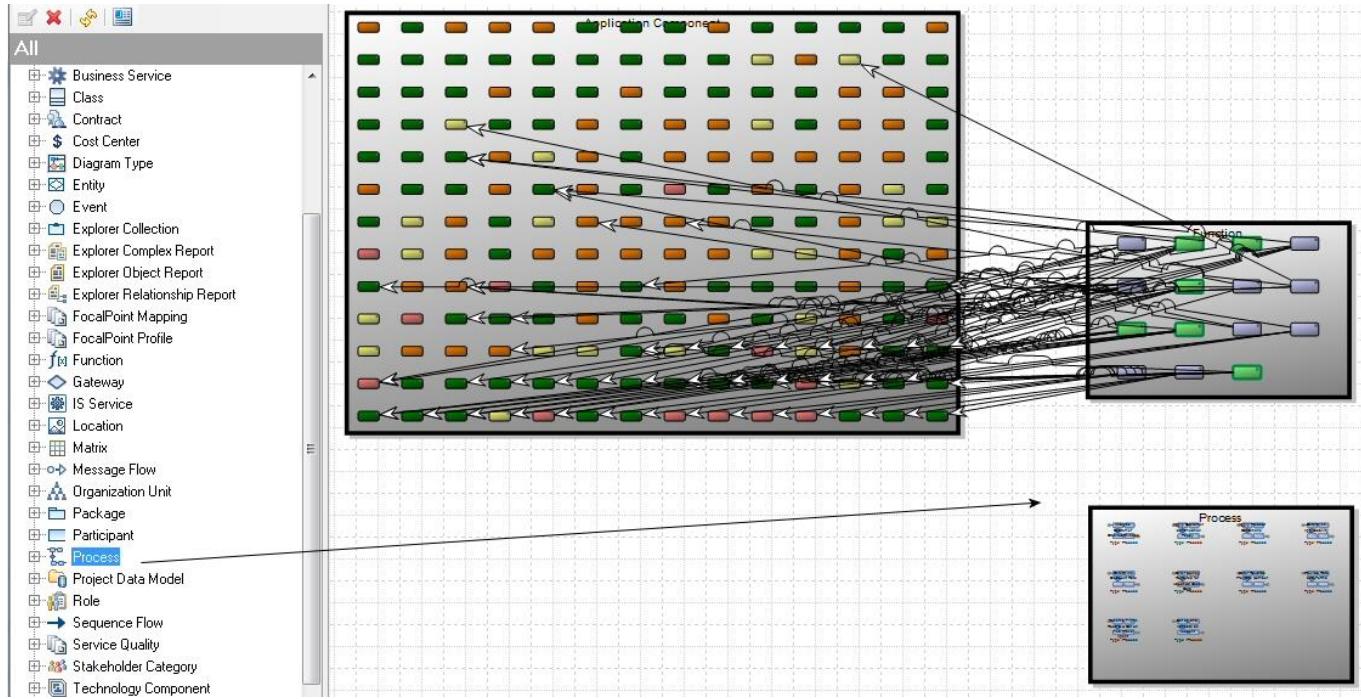




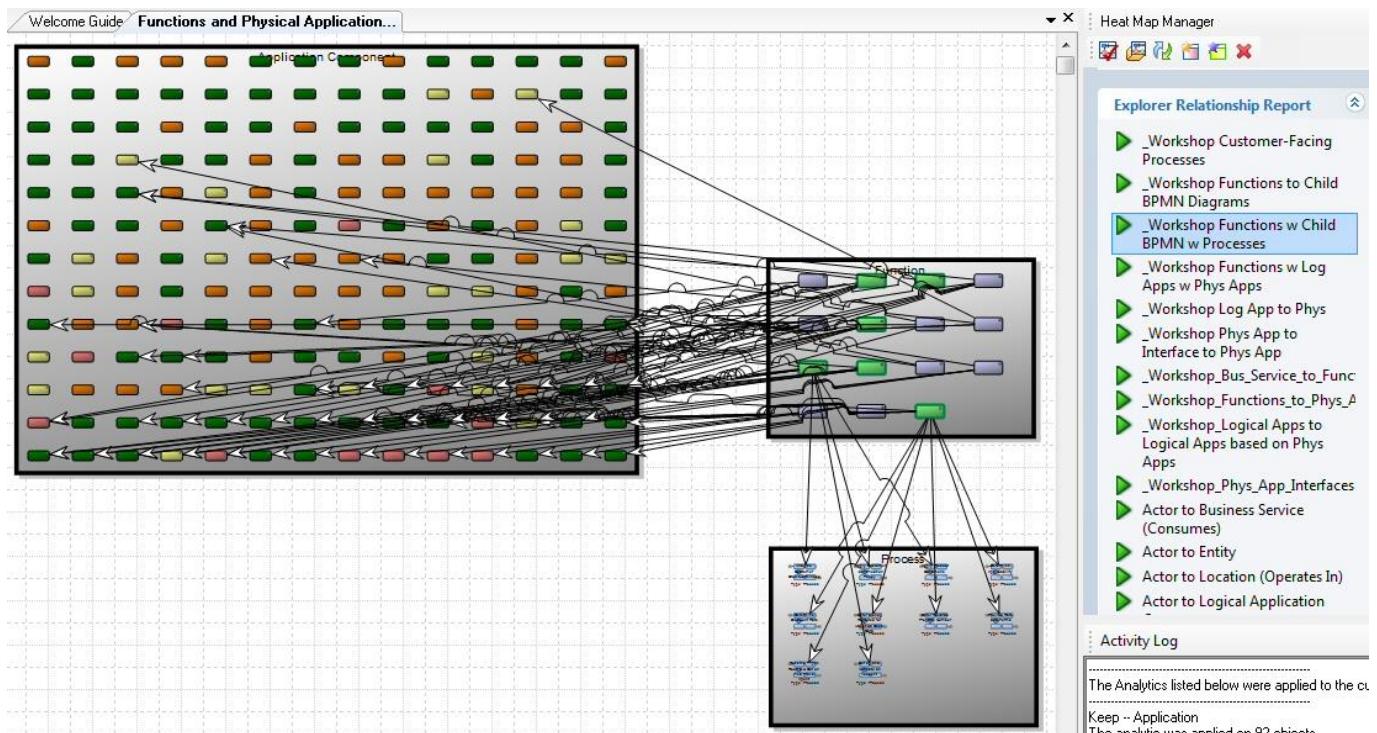
9. Toggle on and run all the reports for the **Strategic Importance of Functions** group (see below).



10. From the Explorer (Browser), in the Definitions section, find the Process header and drag it onto the diagram workspace, underneath the Functions group.



11. From the Heat Map Manager, run the Explorer Relationship report  
**\_Workshop Functions w Child BPMN w Processes**



12. Save the diagram.

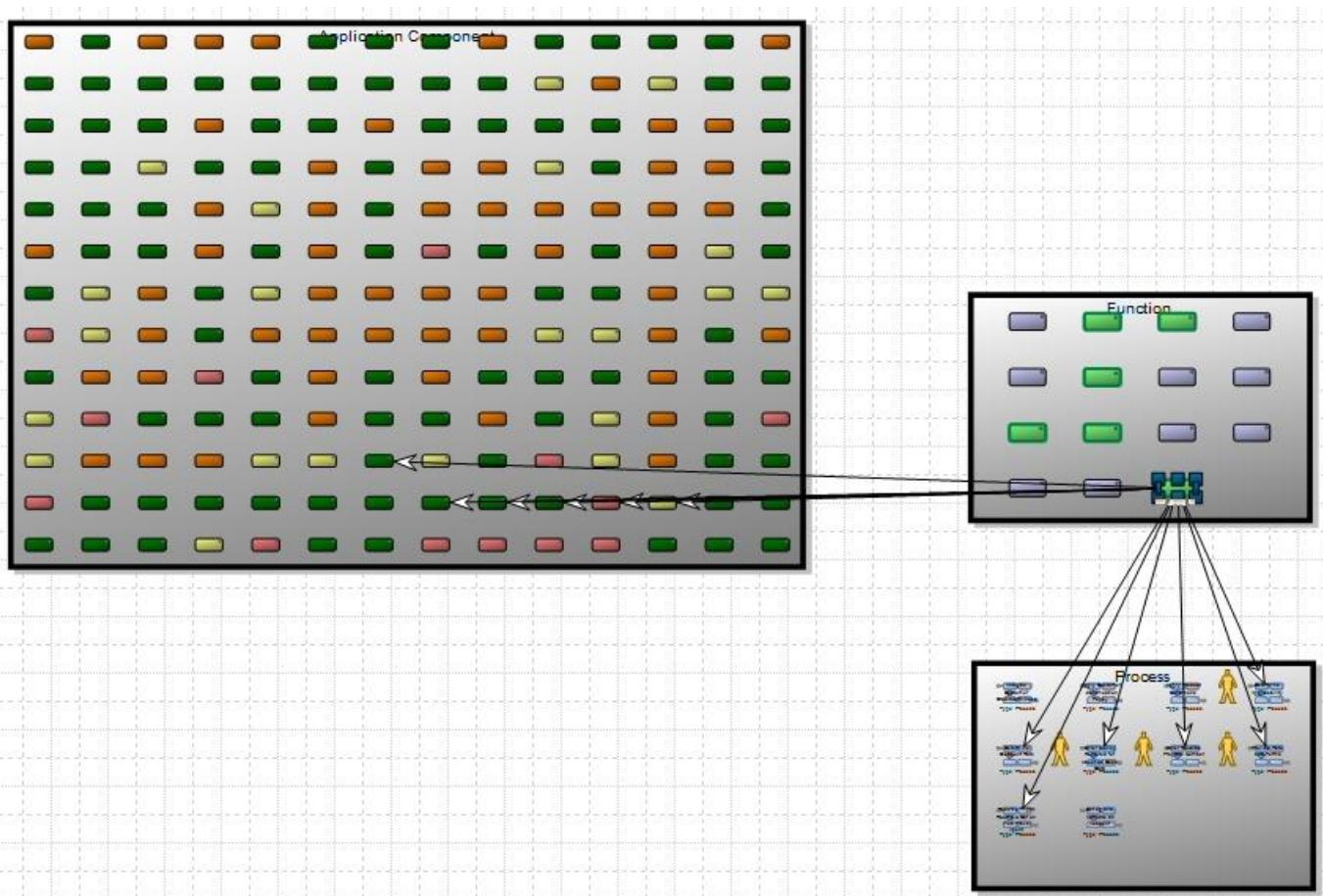
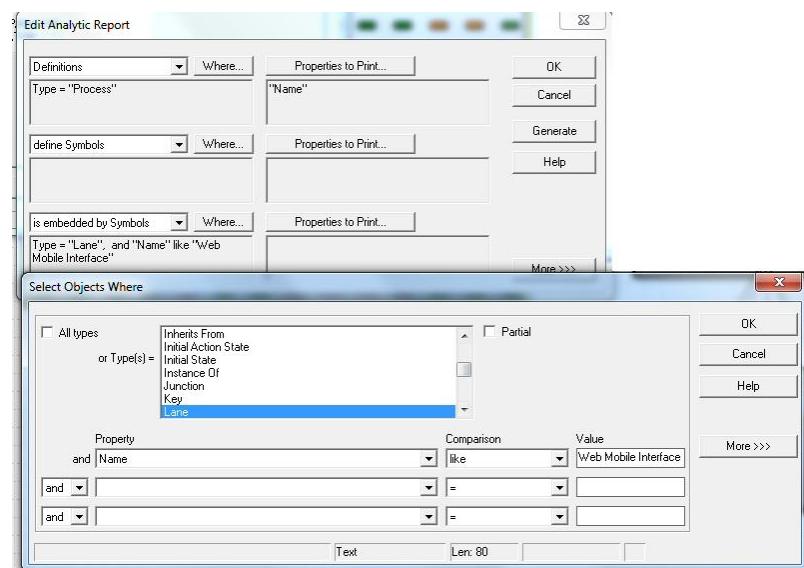
13. Toggle OFF all the analytics previously chosen.

14. From the Heat Map Manager, toggle on the analytic **Customer-Facing Processes** and run it. Notice it puts the picture of a person next to a customer-facing process.

15. Right-mouse click on the diagram workspace, and choose **Hide Relationship Lines Not Attached to Selected Node Objects**.

16. Select the function Vacation Loans (see below).

If you examine the report that this analytic runs, you will see it reports on any process placed in the swimlane named Mobile Web Interface.



17. Save the diagram.

**Why Is this Useful?**



Explorer diagrams provide a 50,000 foot view of the architecture. So far we have built a view that shows direct relationships between Apps and their Locations -- but we could build any combination of Explorer Object and Relationship Reports to show inferred relationships -- for example, show Functions performed at Locations -- leaving out the Logical and Physical Applications that are part of the relationship chain.

In many customer architectures, the Explorer diagram is the central diagram used to expose the architecture.

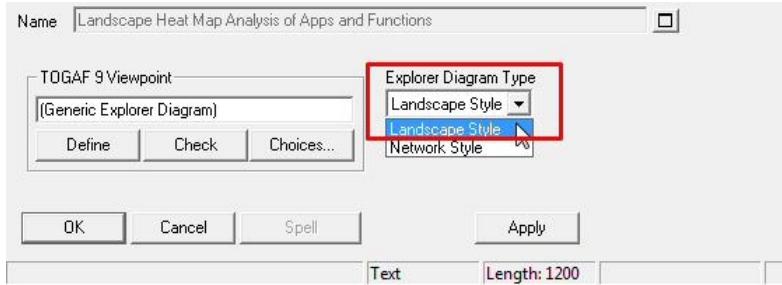
## 7.3 Landscape and Heatmap Analysis

Let's now use a Landscape-style Explorer diagram to visualize the Applications imported their Locations.

### 7.3.1 Build Landscape Explorer Diagram

1. Create a new diagram of type Explorer, named **Landscape Heat Map Analysis of Apps and Functions**.

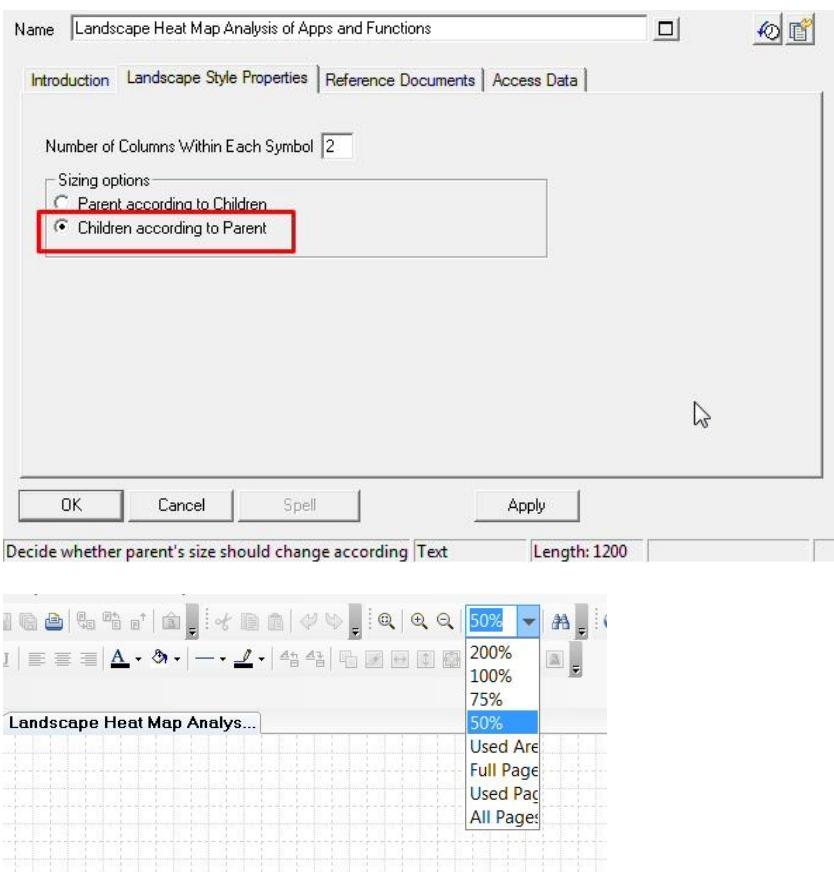
2. **IMPORTANT:** In the dialog that opens, select **Landscape Style** as the Explorer Diagram Type. Also, within the TOGAF 9 Viewpoint property, click **Choices** and drag-and-drop in **(Generic Explorer Diagram)**.



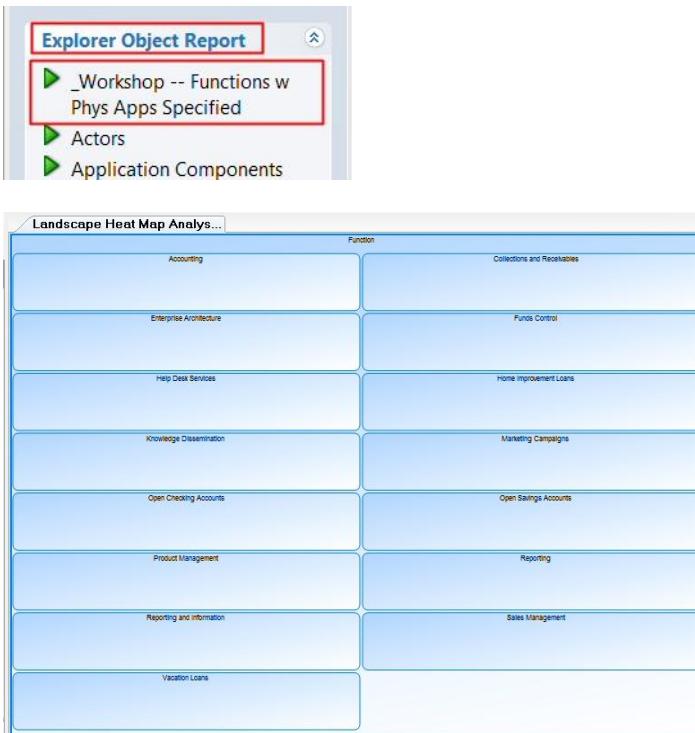
3. Once the diagram is created, right-mouse click on the diagram workspace and choose Diagram Properties.

4. **IMPORTANT:** On the Landscape Style Properties of the Diagram Properties dialog, toggle on **Children according to Parent**. Click OK.

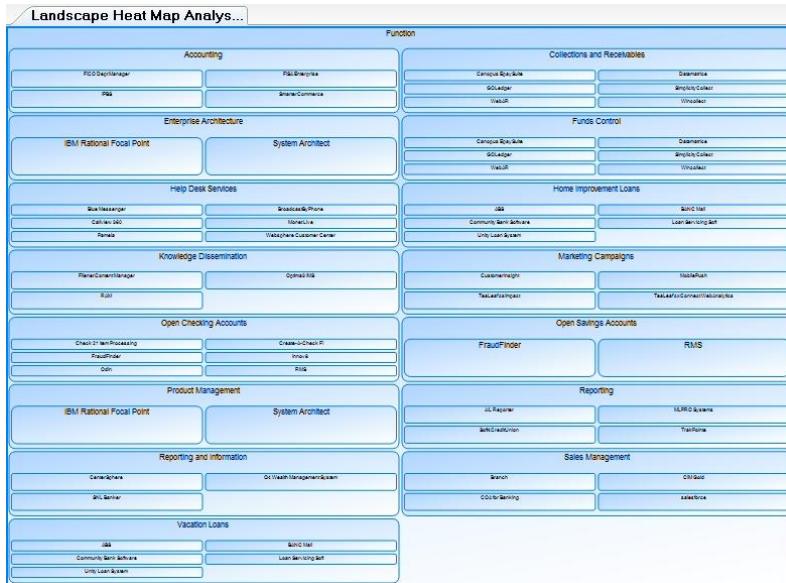
5. **IMPORTANT:** Select 50% view.



6. From the Heat Map Manager, run the Explorer Object report **Workshop -- Functions w Phys Apps Specified**.

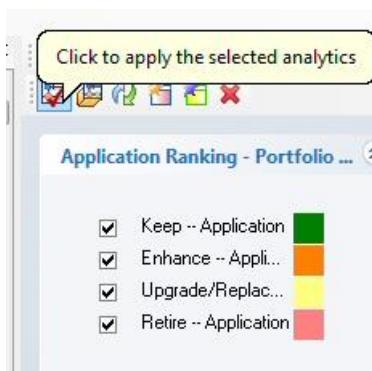


7. From the Heat Map Manager, run the Explorer Relationship report **\_Workshop Functions w Log Apps w Phys Apps.**



8. From the Heat Map Manager, toggle on all of the reports for **Application Ranking** and for **Strategic Importance of Functions**.

9. Click the **Click to apply selected analytics** button.





Note that you can use this **heatmap** to visually examine, or have other readers and executives visually examine, where there are issues -- for example:

- The Vacation Loans function – colored green to denote high strategic importance -- includes our new application, Money that Matters – but also includes several other applications, one set to be retired (colored red due to analytic report), one set to be upgraded or replaced (yellow), and two others that are in good standing. We may want to examine how and why these other apps are being used and by whom.
- The Reporting and Information function above (which has Medium strategic importance – analytic colored blue) is enabled through three applications which are all scheduled to be retired (colored in red) -- a danger point.



## Lab 8 Capture Infrastructure via CMDB

### Goals of this Lab:

Understand how to capture infrastructure information through Configuration Management Database (CMDB) tools and relate it to the EA.

### 8.1 Import Infrastructure Information from CMDB Tool



#### IMPORT INTO REPOSITORY

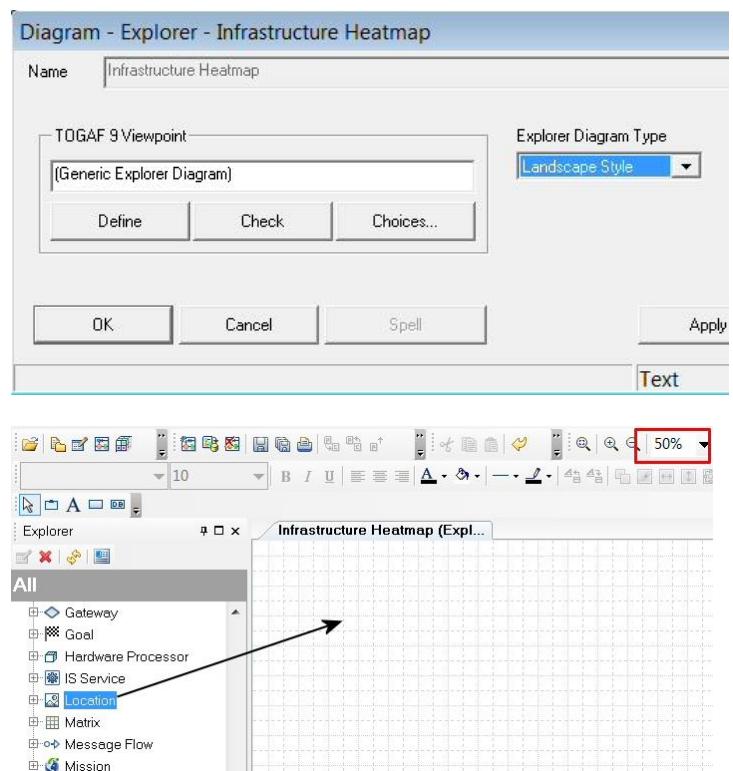
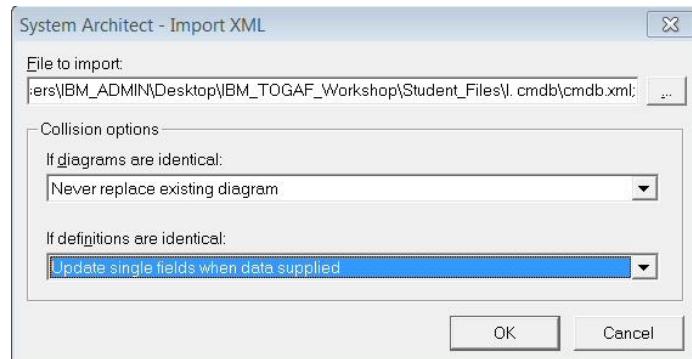
1. In the Explorer (browser), right-mouse click anywhere, and select **Import XML** from the popup menu.
2. Select the file **cmdb.xml**, in the directory **Desktop\IBM\_TOGAF\_Workshop\Student\_Files\l.cmdb**. **IMPORTANT:** Make sure to select the collision option for definitions – **Update single fields when data supplied**. Click OK.

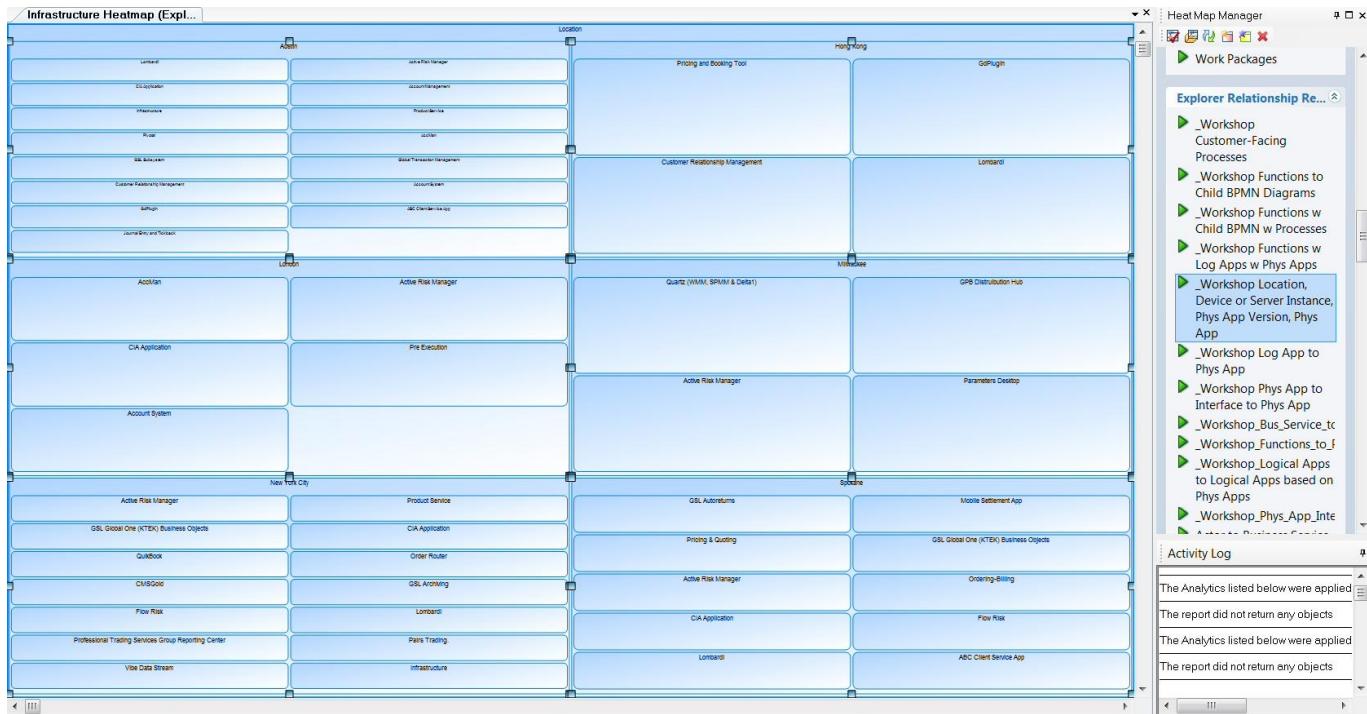
**Note:** It will take a few minutes to import the file of infrastructure information garnered by the CMDB tool sniffing the network.

3. Create a new Explorer diagram named **Infrastructure Heatmap** -- select **Landscape Style** as the Explorer Diagram Type. Also, within the TOGAF 9 Viewpoint property, click **Choices** and drag-and-drop in **(Generic Explorer Diagram)**.



4. Set the diagram to 50% view (see red rectangle at right).
5. From the Explorer (browser) find the Locations group of definitions and drag them onto the diagram.
6. In the Heatmap Manager, run the Explorer Relationship Report **\_Workshop Location, Device or Server Instance, Phys App Instance, Phys App**





- In the Heatmap Manager, toggle on all of the reports for Disaster Recovery, and all of the reports for Flood Zones and click the check mark in Heat Map Manager to run them.

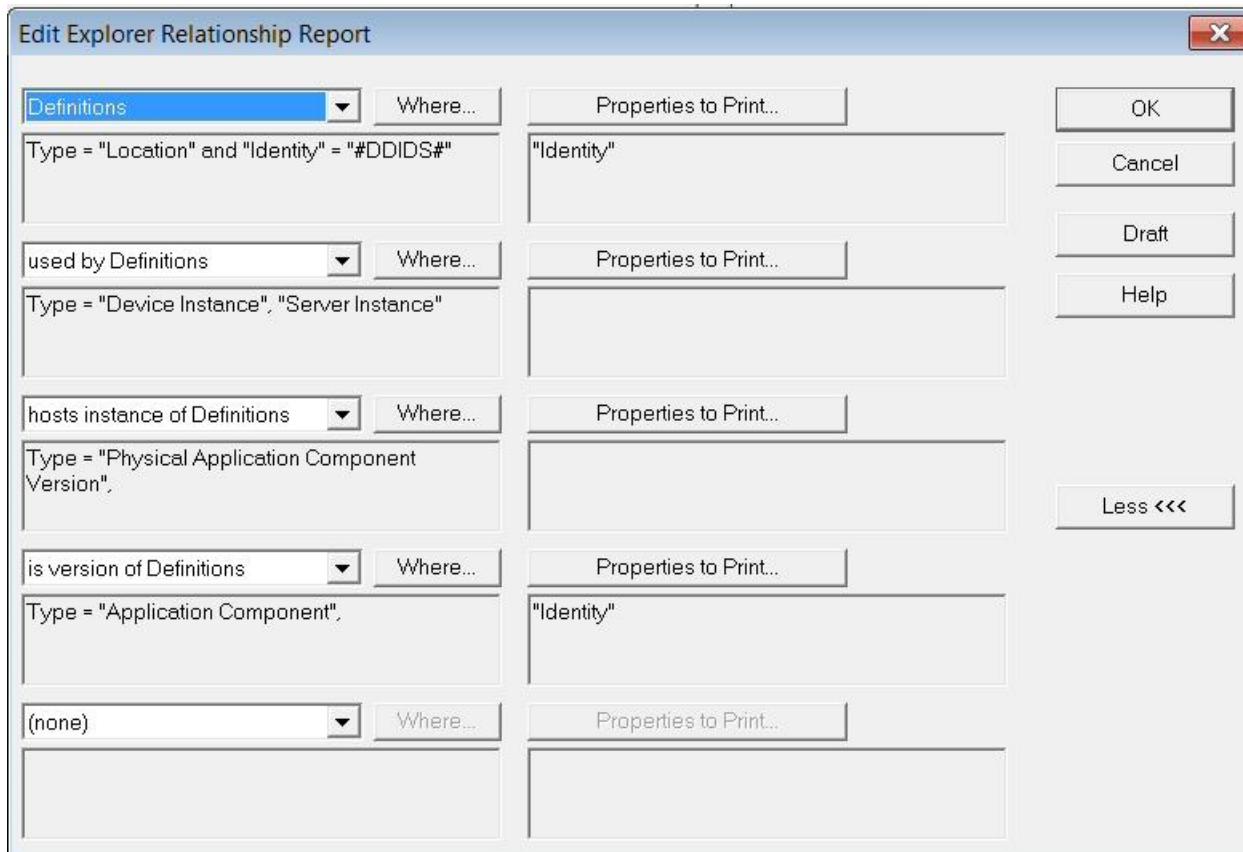
All applications on the diagram will be colored according to their Disaster Recovery status, and all Locations on the diagram will be colored with their Flood Zone analytic color.





If you open the Explorer Relationship Report **\_Workshop Location, Device or Server Instance, Phys App Version, Phys App**, you can see that selects Location, that have Device Instance or Server Instance installed, which host Physical Application Version, which is a version of Physical Application.

The report simply starts with Location and places Physical Applications in them (not showing the in-between information of Server Instances or Physical Application Versions). This is the power of reporting – hiding unnecessary details.



If you opened any of the Applications on the diagram, you can navigate through its definition to see that an **Application (Physical)** is deployed as a **Physical Application Component Version**, is deployed on a **Server Instance or Device Instance** (which has an Operating System version installed), is hosted at a **Location**.

This metamodel is more fine-grained than standard TOGAF 9.1 – it is provided by IBM and was enabled when we turned on TOGAF 9.1 Extension at the beginning of the lab.

The screenshot shows the IBM Rational Application Developer interface. A main window titled "Dictionary Object - Application Component - CMSSGold" is open, displaying the "Deployed As" tab. It lists a "Physical Application Component Version" named "CMSSGold v6.0". Below it, a sub-dialog titled "Dictionary Object - Physical Application Component Version - CMSSGold v6.2" is open, showing a "Deployed Instances" tab with a single entry for "NYC1005". A third dialog, "Dictionary Object - Server Instance - NYC1005", is also visible, showing the "Hosted At" field with the value "Definition:Location:'New York City'".



You have finished the lab. We hope it has been useful for you.

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## **NOTES**



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