



From Visio to Process Simulation with BPMN

Webinar 2

Adding Precision to the Decision Making Process



EA Expert & Trainer

Objectives

- Explore the issues in documenting business processes using drawing tools like Visio
- Examine the steps taken to improve the development of business processes using a modeling tool and a standard language
- Explore the potential for improving the quality of business processes by employing a standard simulation environment to execute the processes as part of the development process

- BPMN

- Product of the OMG
- Current version -
<http://www.omg.org/spec/BPMN/2.0.2/>
- Model interchange -Multi-Vendor BPMN Interchange Demonstration June 2015
https://www.youtube.com/watch?v=iLg1_QLHzGY

- BPSim

- Product of the Workflow Management Coalition (WfMC)
- Current version at
<http://www.bpsim.org/>

Models Not Diagrams

- Model Characteristics

- Abstract
 - Emphasize important aspects while removing irrelevant ones
- Understandable
 - Expressed in a form that is readily understood by observers
- Accurate
 - Faithfully represents the modeled system
- Predictive
 - Can be used to derive correct conclusions about the modeled system
- Traceable
 - Create and maintain links between elements

- Diagrams

- May be expressive and accurate BUT
- Limited capability to be predictive
- Traceability between elements is dependent upon the modeler
- Difficult to ensure that model elements are consistent across different diagrams and files

Case Study

- Primary organization
 - 5 BA's
 - Government Department of Community Services and Development (CSD)
 - Providing low income households with home energy solutions
 - Addressing issues of lead hazards
- Secondary organization
 - 10-15 BA's
 - State health care regulator

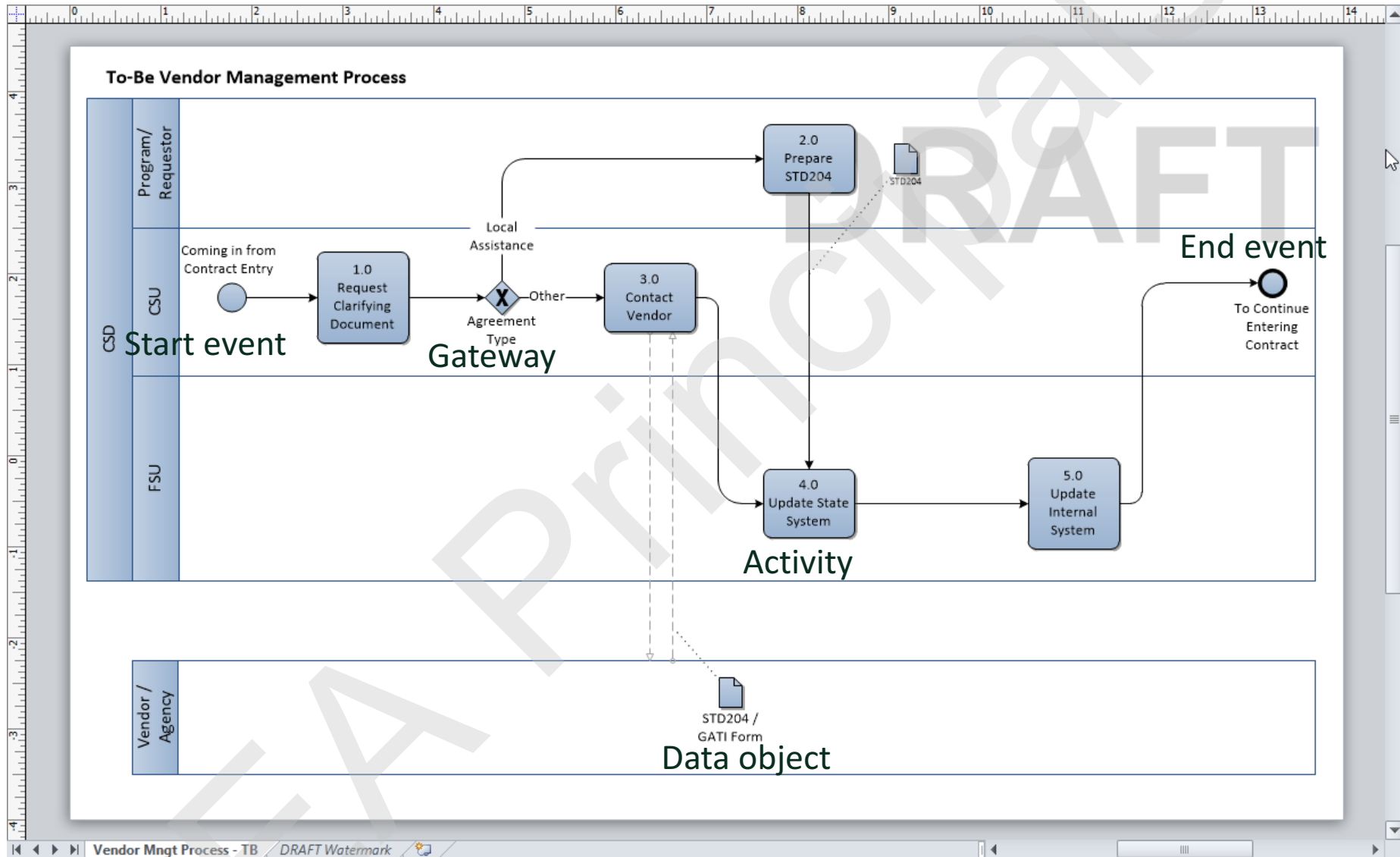
Business Analyst Team

- Betty – 19+ years domain experience
- Bill – 5+ years
- Bob – 0-1 year
- Brian - 0-1 year
- Brenda – 0-1 year
- Changing business needs required changes in business processes that were in some cases developed by previous team members
- New business processes needed to be developed with limited domain knowledge
- A modeling tool approach was chosen to provide possibility of automated evaluation

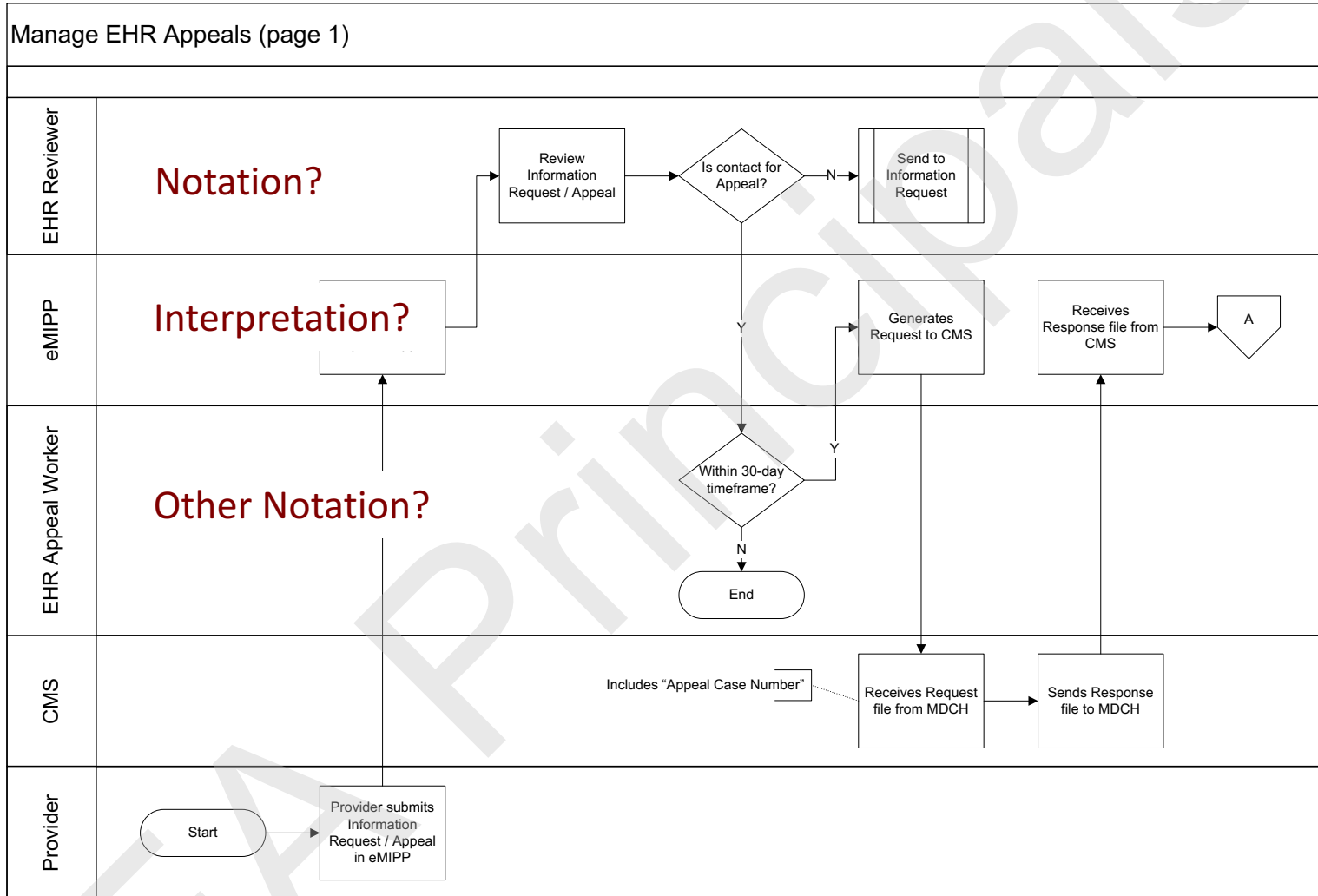
Visio Evaluation

- Existing business process descriptions were mostly in Visio
- Three different and unique representations
 - Diagrams drawn with the BPMN template
 - Diagrams drawn with a different business process template
 - Diagrams with a mix of business process and other diagram elements
- Each representation required a different approach to incorporate into the new model

Visio with BPMN

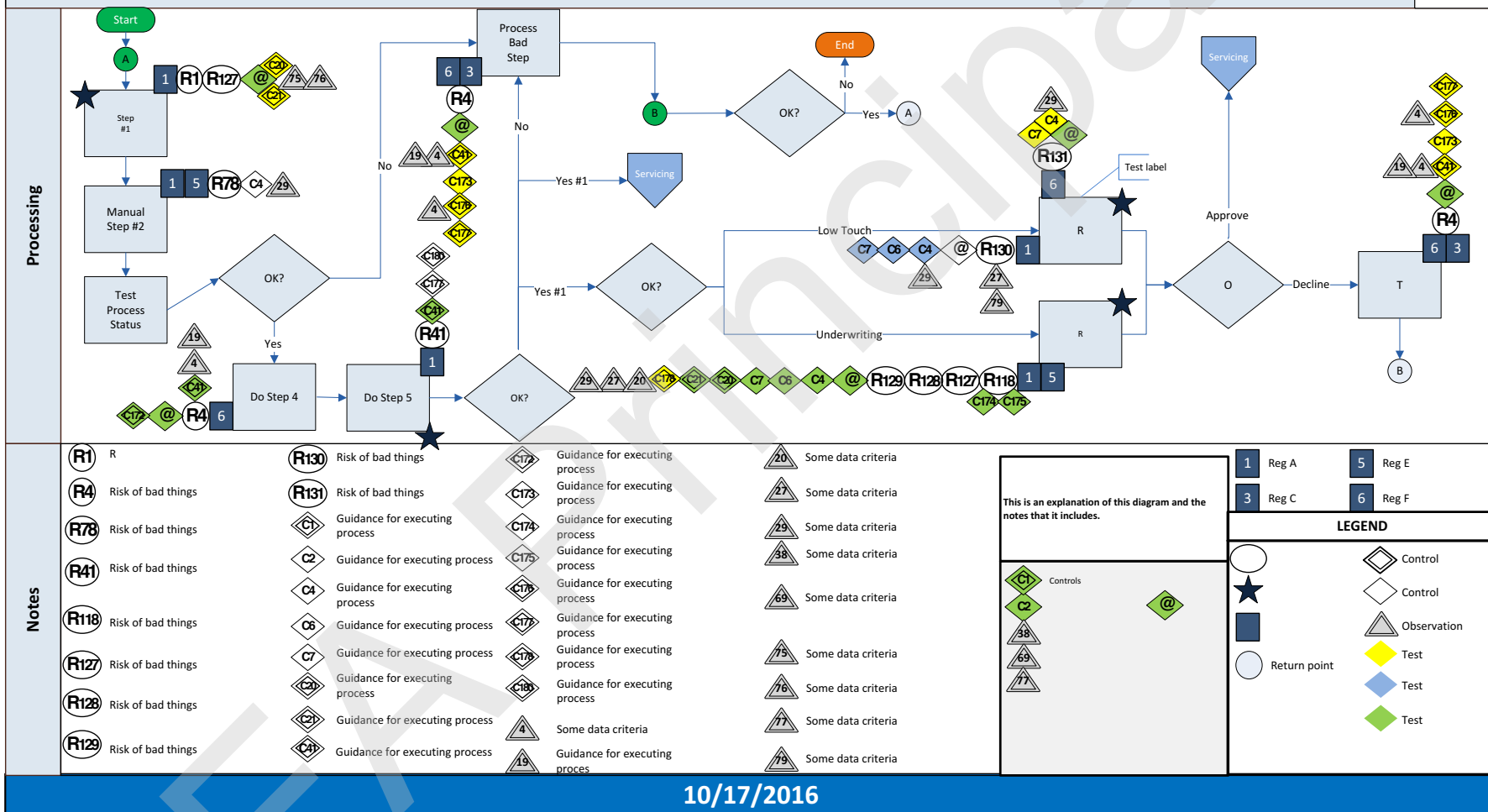


Visio Drawings with Other Notation



Other Notation with Other Elements

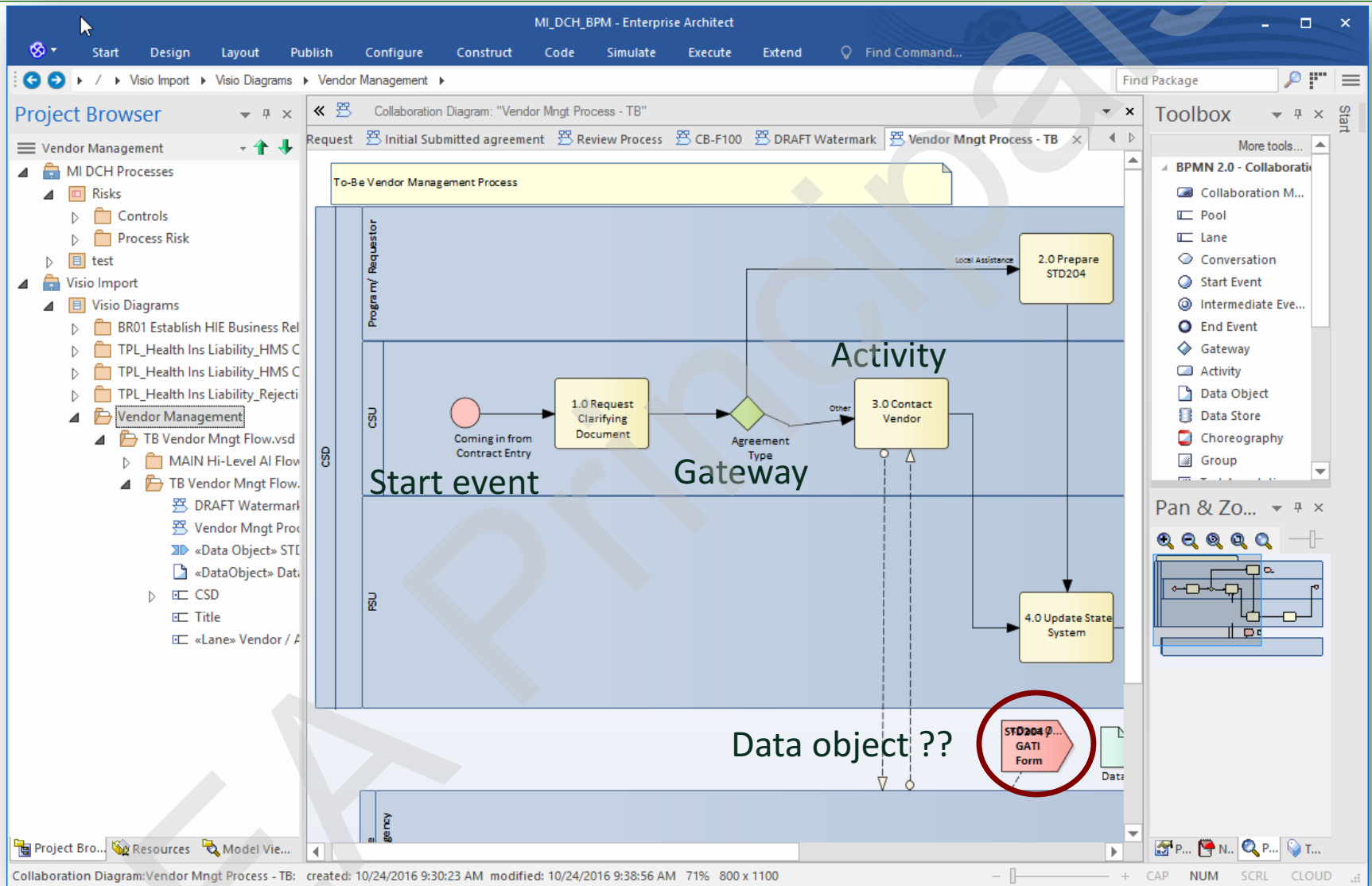
Consumer Processing



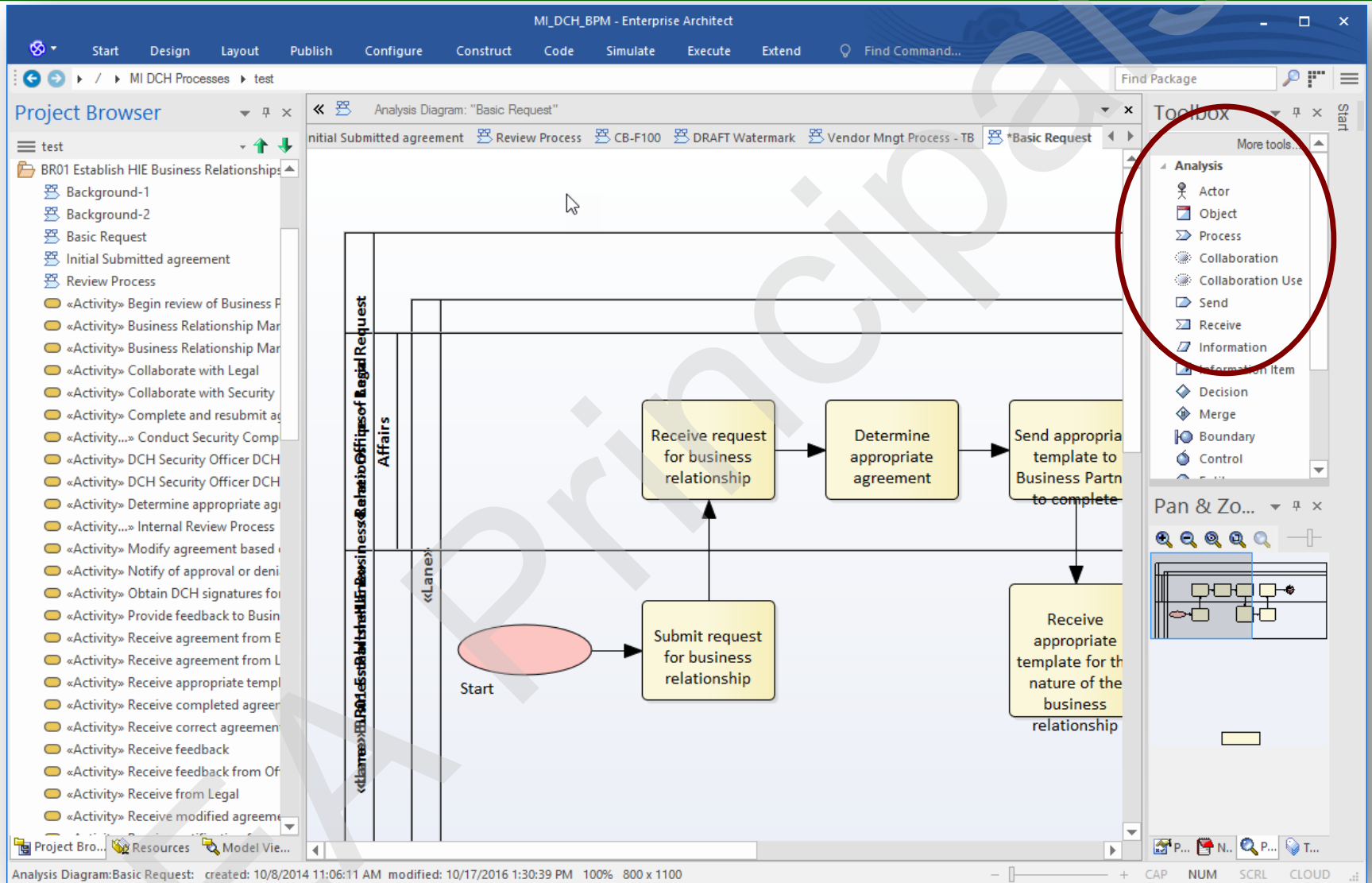
Correcting the Defects

- Import the Visio diagrams into the modeling tool
- Compare the Visio diagrams with the model diagrams
- Evaluate opportunities for automated review
- Evaluate opportunities for automated revision
- Sometimes the best way to do the import is just to recreate the diagram in the modeling tool

Direct Import



Import Other Notation



Transforming to BPMN

ML_DCH_BPM - Enterprise Architect

Start Design Layout Publish Configure Construct Code Simulate Execute Extend Find Command...

Find Package

Project Browser

- test
 - BR01 Establish HIE Business Relationships
 - Background-1
 - Background-2
 - Basic Request
 - Initial Submitted agreement
 - Review Process
 - «Activity» Begin review of Business P
 - «Activity» Business Relationship Mar
 - «Activity» Business Relationship Mar
 - «Activity» Collaborate with Legal
 - «Activity» Collaborate with Security
 - «Activity» Complete and resubmit ag
 - «Activity...» Conduct Security Comp
 - «Activity» DCH Security Officer DCH
 - «Activity» DCH Security Officer DCH
 - «Activity» Determine appropriate ag
 - «Activity...» Internal Review Process
 - «Activity» Modify agreement based o
 - «Activity» Notify of approval or deni
 - «Activity» Obtain DCH signatures for
 - «Activity» Provide feedback to Busin
 - «Activity» Receive agreement from E
 - «Activity» Receive agreement from L
 - «Activity» Receive appropriate templ
 - «Activity» Receive completed agree
 - «Activity» Receive correct agreement
 - «Activity» Receive feedback
 - «Activity» Receive feedback from Of
 - «Activity» Receive from Legal
 - «Activity» Receive modified agree

ConvertImportedVisioDiagramsToBPMN

```
1 option explicit
2
3 ' Script to change Type and Stereotype for elements and connectors that were created from impor
4 ' Visio diagram (with EA Visio Importer v1.7) to appropriate types for BPMN.
5 '
6 ' Copyright (c) 2011-2014 Armstrong Process Group, Inc. All rights reserved. www.aprocessgroup.
7
8 !INC APG Diagram Script Utilities.VBScript-EAConstants
9
10 Dim project as EA.Project
11
12 sub Start()
13
14     Repository.EnsureOutputVisible("Script")
15
16     Session.Output( "Convert Imported Visio Diagrams to BPMN v1.1" )
17     Session.Output( "=====")
18
19     dim theElement as EA.Element
20     dim topLevelPackage as EA.Package
21
22     set project = Repository.GetProjectInterface()
23
24     set theElement = Repository.GetTreeSelectedObject()
25
26     if not theElement is nothing and theElement.ObjectType = otPackage then
27
28         set topLevelPackage = Repository.GetTreeSelectedPackage()
29
30         ConvertPackageDiagrams topLevelPackage
31
32         Repository.RefreshModelView topLevelPackage.PackageID
33
34     else
35
36         MsgBox( "This script requires a package be selected in the Project Browser." & chr(10) &
37             "Please select a package in the Project Browser and try again." )
38     end if
39 end sub
```

Scripting

- APG Diagram Script Utilities
- APG Diagram Scripts
- APG Project Browser Scripts
 - ConvertImportedVisioDiagramsToBPMN
- ArchiMate® 3
- Local Scripts
- SysML 1.3
- SysML 1.4

Scripts Console

What About the Other Notation with Other Elements?



- Too much clutter to import cleanly
- Too much clutter to evaluate automatically
- Position the modeling tool on one screen and the Visio diagram on another screen
- Re-create the process model
- Consider capturing all of the other types of elements in the model as well
 - E.G. Risks can be captured in EA and then traced to the process elements

Process Model Reviews

The screenshot displays the Enterprise Architect interface with the 'Extend' tab selected. The main workspace shows a BPMN diagram for a process titled 'Basic Request' within a pool named 'Office of Legal Affairs'. The process flow includes a 'Start' event, a 'Submit request for business relationship' task, a 'Receive request for business relationship' task, a 'Determine appropriate agreement' task, and a 'Send appropriate template to Business Partner to complete' task. A 'Business Partner' lane is also visible.

A 'System Output' window is open, displaying validation results:

```
System Output
Error on IntermediateEvent <A>: [R48] => An Intermediate Catch Event of Definition type Link ca
Error on IntermediateEvent <A>: [R59] => An Intermediate Event in normal flow must be the targ
Warning on Lane <Business Partner>: [R27] => The Lane <Business Partner> graphically contains
Warning on Lane <Business Partner>: [R27] => The Lane <Business Partner> graphically contains
Warning on Lane <Business Partner>: [R27] => The Lane <Business Partner> graphically contains
Total Errors : 3
Total Warnings : 3
```

The status bar at the bottom indicates: 'Business Process Diagram: Basic Request: created: 10/9/2014 9:08:04 AM modified: 10/24/2016 9:58:29 AM 100% 800 x 1100'.

Beyond Process Models

The screenshot displays the Sparx Systems Enterprise Architect software interface. The main window shows a 'Custom Diagram: "Modify agreement based on feedback"' with a yellow background and a red box labeled 'R1 - system risk'. A text overlay on the diagram reads: 'The model can contain many other types of elements that can be related to the business process'. The left sidebar shows the 'Project Browser' with a tree view of the model structure, including 'Conceptual Model', 'Requirements View', 'Use Case View', 'Stakeholders', 'Use Cases', 'Risks', 'Controls', 'Process Risk', 'test', and 'Visio Import'. The right sidebar shows the 'Toolbox' with various elements like 'Package', 'Requirement', 'Issue', 'Change', 'Screen', 'UI Control', 'Test Case', 'Entity', 'Custom Relationships', 'Common', and 'Artifacts'. The bottom status bar indicates the diagram was created on 10/24/2016 and modified on 11/2/2016.

MI_DCH_BPM - Enterprise Architect

Start Design Layout Publish Configure Construct Code Simulate Execute Extend Find Command...

Window Browser Navigator Search Model Views Element Browser Resources Mail Calendar My Kanban My Gantt My Work Sets Discussion Notes Summary Properties Document Relationships Tagged Values Manage Perspectives Views Visual Style Full Screen Preferences Help

Find Package

Project Browser

- Conceptual Model
 - MI DCH Processes
 - Business Context
 - Conceptual Model
 - Requirements View
 - Customer Requirements
 - Use Case View
 - Stakeholders
 - Use Cases
 - Risks
 - Controls
 - Process Risk
 - test
 - Visio Import

Custom Diagram: "Modify agreement based on feedback"

Start Page Modify agreement based on feedback

R1 - system risk

The model can contain many other types of elements that can be related to the business process

Toolbox

- Custom
 - Package
 - Requirement
 - Issue
 - Change
 - Screen
 - UI Control
 - Test Case
 - Entity
 - Custom Relationships
 - Common
 - Artifacts

Tagged Values

- Package (Conceptual Model)

Document

[Reading] - Conceptual Model

Conceptual Model

Package in package 'Business Context'

Project Browser Resources Model Views

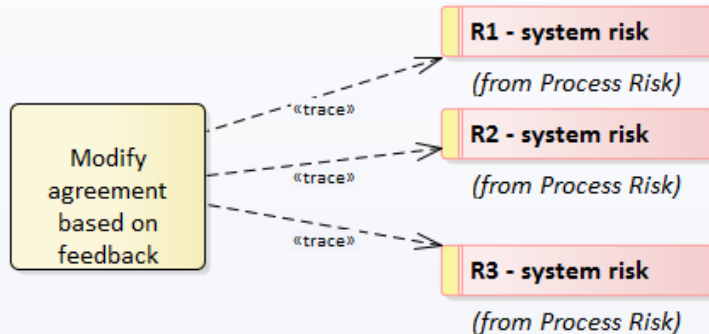
Dynamic Document Linked Document

Custom Diagram:Modify agreement based on feedback: created: 10/24/2016 10:53:24 AM modified: 11/2/2016 11:33:37 AM 100% 815 x 1067

Pro... No... Pa... Tag...

+ CAP NUM SCRL CLOUD

Extending Process Relationships



The model contains the elements and relationships while still presenting a clean process diagram that conforms to the BPMN specification

The elements and relationships can be created and displayed in multiple ways. The repository can be searched to produce the display and ensure nothing is lost or forgotten.

Start Page | Relationship Matrix | *Modify agreement based on feedback

Source: test Type: Activity Link Type: Trace Profile: risk to task Refresh

Target: Process Risk Type: Risk Direction: Source -> Target Overlays: <None> Options

| Target + | R1 - system risk | R2 - system risk | R3 - system risk | R4 - system risk | R5 - system risk | R6 - system risk | R7 - system risk | R8 - system risk |
|--|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| + Source | | | | | | | | |
| Begin review of Business Partner agreement | ↑ | | | ↑ | | | | |
| BR01 | | ↑ | | ↑ | | ↑ | | |
| Collaborate with Legal | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ |
| Collaborate with Security | | | | | | | | |
| CollaborationModel | ↑ | | ↑ | | | | | |
| Complete and resubmit agreement template | | | | | | | | |
| Conduct Security Compliance Review | | | | ↑ | | | | |
| Determine appropriate agreement | | | | | | ↑ | | |

Results

- Process models became more consistent across all of the members of the modeling team
 - Tool and BPMN language training were a significant factor
- Process models became more accurate and precise
- Opportunities for process/task reuse became evident
- Working in a modeling environment rather than in separate document files encouraged better team dynamics

Next Steps - BPSim



- Team believed that process execution would enable more opportunities for validation
 - Intend to offer BPSim results to demonstrate regulatory compliance

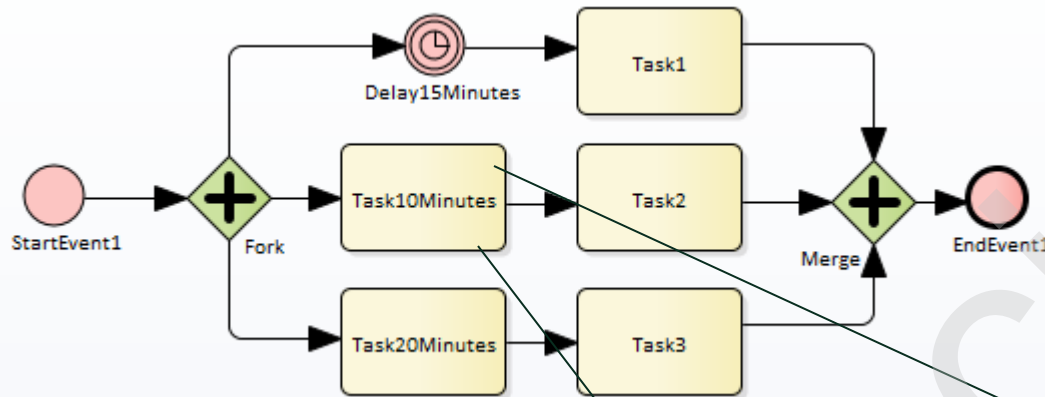
BPSim Configuration

- The BPMSim configuration screens have been divided into multiple Perspectives, each of which focuses on one aspect of the setup process at a time. The three Perspectives are:
 - Control Perspective
 - Time (Temporal) Perspective
 - Resource Perspective
- You can also maintain multiple versions of a configuration

Simulation Perspectives

- Control Perspective
 - examines how activity flows through the process, moderated by the likelihood of a sequence of events and the priorities of certain events
- Time (Temporal) Perspective
 - examines how the duration of one or more phases in the processing of an Activity influences the business process
- Resource Perspective
 - examines the involvement of types and roles of workers and other resources, their required numbers, their costs and their availability

BPSim Configuration



Setting the parameter and executing the simulation allows the BA to evaluate timing and gateway operation

The task implies it takes 10 minutes in its name. Notes or annotations may suggest timing relationships for static reviews but they are just text.

The screenshot shows the BPSim configuration interface. On the left, a tree view under 'Activity' lists tasks: Task1, Task10Minutes, Task2, Task20Minutes, and Task3. 'Task10Minutes' is selected. The main panel has tabs for 'Control', 'Resource', 'Cost', 'Properties', and 'Priority'. The 'Control' tab is active, showing a table with columns 'Type', 'Value', 'Unit', and 'Calendar'. The 'Value' column contains '000:000:000 000:10:00'. Below this, a table lists parameters with checkboxes for 'KPI' and 'SLA'.

| Parameter | Result Request | KPI | SLA |
|----------------|----------------|--------------------------|--------------------------|
| TransferTime | | <input type="checkbox"/> | <input type="checkbox"/> |
| QueueTime | | <input type="checkbox"/> | <input type="checkbox"/> |
| WaitTime | | <input type="checkbox"/> | <input type="checkbox"/> |
| SetUpTime | | <input type="checkbox"/> | <input type="checkbox"/> |
| ProcessingTime | | <input type="checkbox"/> | <input type="checkbox"/> |
| ValidationTime | | <input type="checkbox"/> | <input type="checkbox"/> |
| ReworkTime | | <input type="checkbox"/> | <input type="checkbox"/> |

BPSim Configuration (2)

The screenshot displays the Enterprise Architect (EA) interface. The top ribbon includes tabs for Start, Design, Layout, Publish, Configure, Construct, Code, Simulate, Execute, and Extend. The Project Browser on the left shows a hierarchy of models, with 'BPSim Models' expanded. The main workspace shows a BPMN diagram with a sequence flow from 'Task10Minutes' to 'Task2'. A dialog box titled '<<SequenceFlow>>Task10Minutes-->Task2 : Probability' is open, showing the 'Distribution' tab. The 'Distribution' list includes Beta, Binomial, Erlang, Gamma, LogNormal, NegativeExponential, Normal, Poisson, Triangular, and TruncatedNormal. The 'Unit' field is empty. The 'Document' pane at the bottom shows the current model structure.

Saved Configurations

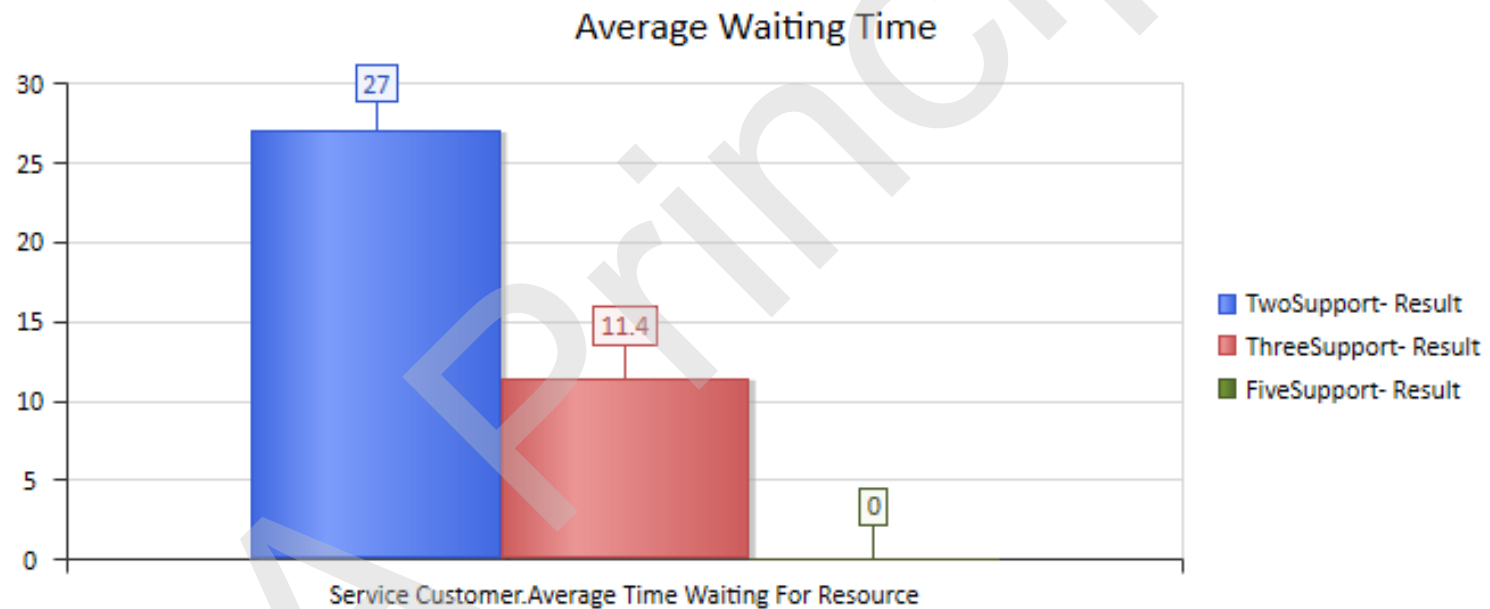
The screenshot displays the Enterprise Architect software interface. The top menu bar includes options like Start, Design, Layout, Publish, Configure, Construct, Code, Simulate, Execute, and Extend. The left sidebar shows the Project Browser with a tree view of the model structure. The main workspace is titled 'IntermediateEvent - Standalone - Timer' and shows a configuration table for a timer event. The table has columns for Type, Value, Unit, and Calendar. The current configuration shows a Probability of 0.0. A yellow highlight is placed over the configuration table, and a text box explains that users can create multiple configurations (e.g., best case, worst case, nominal behavior) and save them in the model. The bottom status bar shows 'Dynamic Document' and 'Linked Document'.

Users can create multiple configurations – e.g. best case, worst case, nominal behavior and save them in the model. Result reports are also saved in the model.

BPSim Report

| Item | FiveSupport- Result | ThreeSupport- Re |
|---|---------------------|------------------|
| Time | | |
| <<Activity>>Service Customer | | |
| Average Message Wait Time | 0 | 0 |
| Mean Of Processing Time | 10 | 10 |
| Average Time In Task | 10 | 21.4 |
| Average Time Waiting For Message | 0 | 0 |
| Average Time Waiting For Resource | 0 | 11.4 |
| Average Token Wait Time | 0 | 0 |
| Max Of Processing Time | 10 | 10 |
| Maximum Time In Task | 10 | 34 |
| Maximum Time Waiting For Message | 0 | 0 |
| Maximum Time Waiting For Resource | 0 | 24 |
| Min Of Processing Time | 10 | 10 |
| Minimum Time In Task | 10 | 10 |
| Minimum Time Waiting For Message | 0 | 0 |
| Minimum Time Waiting For Resource | 0 | 0 |
| Number Of Tokens Waiting To Start | 0 | 0 |
| Sum Of Processing Time | 200 | 200 |
| Total Time In Task | 200 | 428 |
| Total Time Interrupted | 0 | 0 |
| Total Time Waiting For Message | 0 | 0 |
| Total Time Waiting For Resource | 0 | 228 |
| >> <<Resource>>Support | | |
| >> <<BusinessProcess>>Help Desk Phone Support Process | | |

Visualize the Results



Questions

The BPSim Execution Engine

To run a BPSim simulation with Enterprise Architect you will need an appropriate execution engine that can understand the BPSim standard. Sparx Systems has teamed up with Lanner (recognised as the world's leading business process simulation and optimisation organisation) to provide you with the MDG BPSim Execution Engine, which enables seamless integration between model, configuration, simulation and results.

