

# **Tivoli Business Systems Manager 3.1 Enablement Package for WBI 5.1 Integration**

This document describes the enablement of Business Process Model (BPM) capabilities in IBM Tivoli Business Systems Manager V3.1 through integration with the IBM WebSphere Business Integration Modeler V5.1.

## **1 Introduction to Business Service Management**

*Business Service Management* (BSM) enables businesses to increase operational agility by aligning IT operations and the resources they manage with business priorities. IBM WebSphere Business Integration (WBI) provides end-to-end industry integration solutions for business process modeling, deployment and management of processes focused on specific industry requirements. These business process models can be leveraged within BSM to provide management of IT resources that are business centric.

Managing IT resources in this manner differs from the traditional method of managing resources by technology type (for example, servers, networks and databases). BSM, through business process models, helps the IT staff understand the components that comprise the successful delivery of a service and, when problems occur, helps the IT staff prioritize which issues to resolve first so that they can deliver continuous service to customers, partners and employees.

## **2 Business Process Model Integration in Tivoli Business Systems Manager**

There are four key phases to integrating business process models into Tivoli Business Systems Manager. These are:

1. Identifying and importing the business processes to represent.
2. Creating business systems that support the business process model activities.
3. Assigning business systems to the business process model activities.
4. Tuning business systems over time.

### ***2.1 Identifying and Importing the Business Processes to Represent***

A WBI Business Process Model describes a set of activities that make up a discrete business function. Depending on the particular business process model, some of these activities will require supporting elements that are managed by the business's IT department, such as application servers, network connections, transaction processing systems, etc. Any business process model that contains activities where the supporting IT managed resources can be identified and are represented in Tivoli Business Systems Manager is a good candidate for monitoring in Tivoli Business Systems Manager.

It is not necessary that all activities that make up a business process have supporting IT resources monitored by Tivoli Business Systems Manager. Some business processes are very complex and inevitably will contain activities for which no supporting IT resource can be identified (such as a step that only involves human interaction) or for which the resources are not being monitored in Tivoli Business Systems Manager.

For each WBI Business Process Model that is imported into Tivoli Business Systems Manager, a Tivoli Business Systems Manager business system will be created whose name exactly matches that of the business process model. For every activity in the business process model that is to be monitored, a child business system should be created whose name matches the name of the activity. The workflow relationships between these activities are represented as topology links in Tivoli Business Systems Manager. This mapping enables the Tivoli Business Systems Manager user to see an accurate visual representation of the process model through the business system Topology view.

## ***2.2 Creating Business Systems that Support the Business Process Model Activities***

Tivoli Business Systems Manager business systems should be created to group together IT resources that support the various activities of the business process model. Some of these Business Systems may represent resources that support each activity of the business process model. For example, a business process model where every step involves using a particular application may rely on a business system containing the application server and network resources that make the application available to the user. Another activity in the business process model may rely on executing a particular CICS transaction, and so a business system containing the CICS region and transaction would be assembled.

Note that the paragraph above actually describes a “business-as-usual” scenario for the Tivoli Business Systems Manager administrator, building business systems that align IT resources with business usage is what Tivoli Business Systems Manager is all about.

## ***2.3 Assigning Business Systems to the Business Process Model Activities***

As the supporting Tivoli Business Systems Manager business systems are assembled, they may then be assigned to the business process model by dragging them underneath the business systems that represent the process activities they support, or by using the Tivoli Business Systems Manager automated business system (ABS) facility to make these associations.

## ***2.4 Tuning Business Systems over Time***

As with Tivoli Business Systems Manager in general, one goal with business systems is to be able to respond proactively to exceptional events that threaten the availability of needed resources. Tuning the supporting business systems may involve adding new required resources, or restructuring the business system in order to better control the propagation of events from the resources to the business system. This tuning process is evolutionary in nature, and is another reason why it is in the customer’s best interest to

follow a discipline of grouping the supporting resources into IT-centric business systems, then assigning those IT business systems to process-related business systems.

### **3 Implementing a WBI Process Model in Tivoli Business Systems Manager 3.1**

In order to implement a WBI Process Model in Tivoli Business Systems Manager 3.1, the following prerequisite software must be installed:

- IBM WebSphere Business Integration Modeler V5.1 (WBI Modeler)
- IBM Tivoli Business Systems Manager V3.1, database server
- IBM Tivoli Business Systems Manager V3.1, common listener service
- IBM Tivoli Business Systems Manager V3.1, XML Toolkit
- IBM Tivoli Business Systems Manager Fix pack 3.1.0-TIV-BSM-FP0002

The Tivoli Business Systems Manager 3.1 Enablement Package for WBI 5.1 Integration provides the components to enable a Business Service Management process in Tivoli Business Systems Manager. With the components provided, the following steps summarize the actions required to implement a WBI Process Model as a collection of business systems in Tivoli Business Systems Manager:

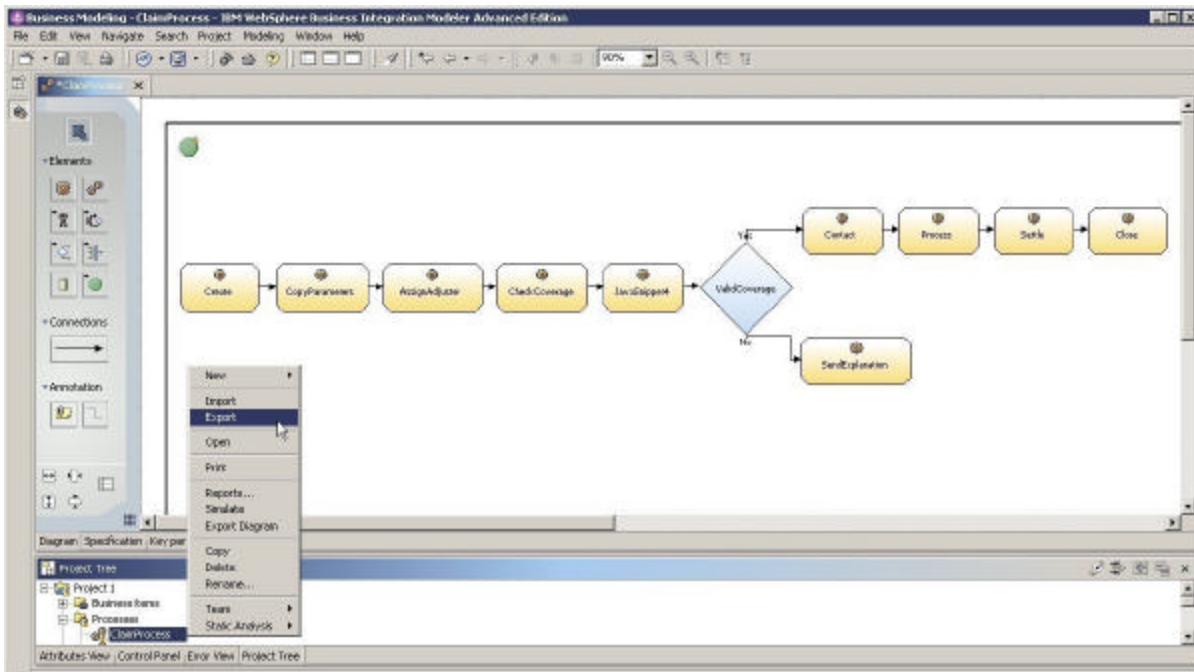
1. Export a business process model constructed within the WBI Modeler as Business Process Execution Language (BPEL) output.
2. Transform the exported business process model BPEL into an input form of XML consumable by Tivoli Business Systems Manager.
3. Import the transformed business process model into Tivoli Business Systems Manager to create a collection of representative business systems.
4. Assign supporting, or child, business systems and resources to the business process model's representative business systems.

In the following sections, each step is detailed using an example Insurance Claim business process constructed within the WBI Modeler. The Insurance Claim business process model has multiple activities for which IT resources may be mapped.

#### ***3.1 Export the Business Process Model from the WBI Modeler***

Once a business process model is constructed in the WBI Modeler, the model must be exported as Business Process Execution Language (BPEL). Figure 1, below, shows the completed 'ClaimProcess' model being exported from the Project Tree view in the WBI Modeler.

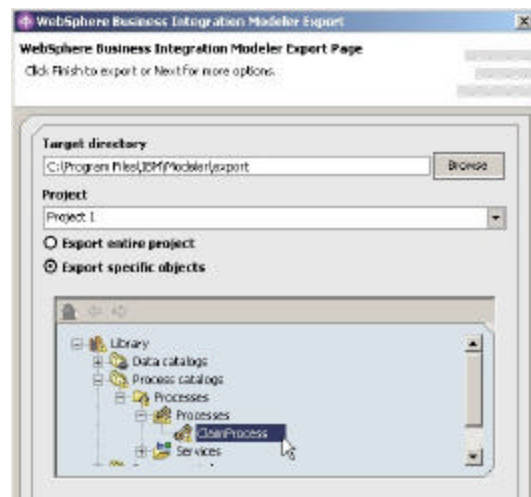
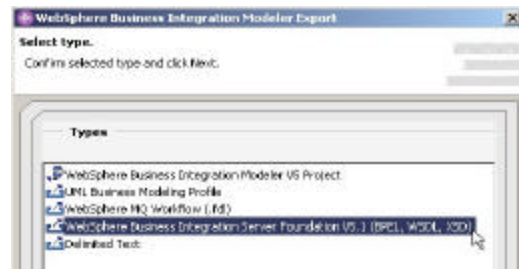
## IBM Tivoli Business Systems Manager 3.1 Enablement Package for WBI 5.1 Integration



**Figure 1 - Exporting a WBI Business Process Model**

WBI Business Process Models can be exported from the WBI Modeler by performing the following steps:

1. Right-click on the business process model in the Project Tree view, under 'Processes', and select 'Export' from the pop-up context menu.
2. On the 'WebSphere Business Integration Modeler Export' dialog, select the 'Server Foundation (BPEL, WSDL, XSD)' export type and click 'Next'.
3. Specify a target directory for the export files and ensure the 'Export Specific Objects' button is selected and the correct business process model is selected in the underlying project tree view.
4. Clicking 'Finish' will generate the requested export files in the specified target directory.



The export process generates the needed BPEL file, with the name of the business process model (i.e. 'ClaimProcess.bpel'), as well as a similarly named WSDL and XSD file. Only the BPEL file is needed for the transformation process. The WSDL and XSD files can be discarded.

### **3.2 Transform the Business Process Model**

The transformation of the exported WBI Business Process Model BPEL, which is an XML-based language, into an input form of XML consumable by Tivoli Business Systems Manager is performed using XSLT (Extensible Stylesheet Language Transformations). XSLT, which is a language for transforming XML documents into other XML documents, uses an XSL stylesheet to specify the 'vocabulary' for transforming and formatting XML documents.

The enablement package includes an XSL stylesheet to transform and format WBI Business Process Model BPEL into XML that can be consumed by the Tivoli Business Systems Manager common listener service. The Tivoli Business Systems Manager transformation process ultimately allows WBI Business Process Elements to be modeled as Tivoli Business Systems Manager Object Classes, which act as Tivoli Business Systems Manager business systems that can be monitored.

Table 1, below, identifies the WBI Business Process Elements which can be modeled as Tivoli Business Systems Manager Object Classes.

| <b>WBI Business Process Element</b> | <b>TBSM Object Class</b> | <b>TBSM Object Class Description</b>                                                                 |
|-------------------------------------|--------------------------|------------------------------------------------------------------------------------------------------|
| Task                                | BPM Task                 | A task in a Business Process model.                                                                  |
| Subprocess                          | BPM Subprocess           | Another business process invoked as a task in the processing flow.                                   |
| Service                             | BPM Service              | A service invoked as a task in the processing flow.                                                  |
| Repository                          | BPM Repository           | Local Information Repository.                                                                        |
| While Loop                          | BPM Loop                 | A loop in the process flow that will execute until its criteria are met.                             |
| Decision                            | BPM Decision             | Directs the process flow to one of several alternatives.                                             |
| Multiple Choice Decision            | BPM Decision             | Directs the process flow to one of several alternatives.                                             |
| Join                                | BPM Join                 | Waits until all of its input paths have received input before allowing the process flow to continue. |
| Fork                                | BPM Fork                 | Makes copies of its input and forwards them to multiple processing paths in parallel.                |
| Merge                               | BPM Merge                | Brings together alternative processing path and directs them into a single flow.                     |

**Table 1 – WBI 5.1 Business Process Elements supported in Tivoli Business Systems Manager 3.1**

The following limitations to the Tivoli Business Systems Manager transformation process should be noted:

- Some WBI Business Process Elements cannot be distinguished from other Business Process Elements within the exported BPEL due to like XML structures. Business Process Elements that cannot be distinguished will be modeled using default Tivoli Business Systems Manager Object classes, either a ‘BPM Function Element’ or a ‘BPM Flow Element’. The Tivoli Business Systems Manager transformation process does, however, support a simple naming convention that will allow WBI Business Process Elements to be distinguished and appropriately modeled to a corresponding Tivoli Business Systems Manager Object class, as previously shown in Table 1. Any WBI Business Process Element whose name is prefixed with the element type (case insensitive) will be modeled to the corresponding Tivoli Business Systems Manager Object class. For example, a WBI Task element with a name of, ‘TASK: CheckCoverage’, will be modeled as a Tivoli Business Systems Manager ‘BPM Task’ object, rather than the default ‘BPM Function Element’ object.

Table 2, below, identifies the default Tivoli Business Systems Manager Object Classes and the WBI Business Process Elements which they can model.

| <b>TBSM Object Class</b> | <b>TBSM Object Class Description</b>                                                                                                                                        |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BPM Function Element     | Default function element in a Business Process Model when the element, such as a Task, Service, Repository, or Join, is not named using the element type naming convention. |
| BPM Flow Element         | Default flow element in a Business Process Model when the element, such as a Decision, Fork, or Merge, is not named using the element type naming convention.               |

**Table 2 – Default TBSM Object Classes for WBI Business Process Elements in Tivoli Business Systems Manager 3.1**

There is no technical requirement for WBI Business Process Elements to be distinguished and appropriately modeled to a corresponding Tivoli Business Systems Manager Object class, as the resulting Tivoli Business Systems Manager business systems that support the business process model activities will support all available business systems functions as expected. The only benefit to appropriately modeling a WBI Business Process Elements to a corresponding Tivoli Business Systems Manager Object class is the rendering of the business system icon, in both the business systems tree view and business system Topology view on the Tivoli Business Systems Manager Console, which will more closely match the icons on the WBI Modeler’s process editor diagram.

- The following WBI Business Process Elements are either not supported by the WBI Modeler’s process editor diagram (in BPEL mode) or by the Tivoli Business Systems Manager transformation process and are not represented in Tivoli Business Systems Manager: Notification Broadcaster, Notification Receiver, Observer, Timer, Map, Do-While, Loop, Start, End, and Stop.

- Descriptions of WBI Business Process Elements entered on the WBI Modeler's process editor diagram are only exported for Task elements. If an exported Task element contains a description attribute, the description will be imported into Tivoli Business Systems Manager and associated with the modeled 'BPM Task' object.

### 3.2.1 Wbitransform Command – Transform the BPEL

The transformation process is driven through a command line interface included in the enablement package. The **wbitransform** command initiates the transformation of the WBI Business Process Model BPEL and generates the Tivoli Business Systems Manager common listener service XML version of the business process model. The **wbitransform** command has the following usage:

**wbitransform** *wbi\_bpel\_file*

- Where *wbi\_bpel\_file* is the exported WBI Business Process Model BPEL.

#### Usage

The **wbitransform.ksh** form of the command must be run in a Korn shell from where the XML toolkit is installed.

Figure 2, below, shows a **wbitransform** usage example for the 'ClaimProcess' model.

```
C:\Program Files\Tivoli\tbsm\XMLtoolkit\bin
> dir "C:\Program Files\IBM\Modeller\export\ClaimProcess.*"

Directory of C:\Program Files\IBM\Modeller\export

02/15/2005  11:41 AM                16,101 ClaimProcess.bpel
              1 File(s)                16,101 bytes

C:\Program Files\Tivoli\tbsm\XMLtoolkit\bin
> wbitransform "C:\Program Files\IBM\Modeller\export\ClaimProcess.bpel"

Transforming the WBI Business Process Model BPEL file...

TBSM Common Listener service XML file created successfully: "C:\Program
Files\IBM\Modeller\export\ClaimProcess.bpel.cl.xml"

C:\Program Files\Tivoli\tbsm\XMLtoolkit\bin
> dir "C:\Program Files\IBM\Modeller\export\ClaimProcess.*"

Directory of C:\Program Files\IBM\Modeller\export

02/15/2005  11:41 AM                16,101 ClaimProcess.bpel
02/17/2005  02:56 PM                23,785 ClaimProcess.bpel.cl.xml
              2 File(s)                39,886 bytes
```

Figure 2 – wbitransform command usage

The output of the **wbitransform** command is a business process model in the form of Tivoli Business Systems Manager common listener service XML. The Tivoli Business

Systems Manager common listener service XML file is created in the same directory as the WBI Business Process Model BPEL file and will be named using the BPEL file name with a '.cl.xml.' suffix.

### 3.3 Import the Business Process Model into Tivoli Business Systems Manager

The import process forwards the business process model XML to the Tivoli Business Systems Manager common listener, where the building of the collection of representative business systems in Tivoli Business Systems Manager begins.

The enablement package requires the installation of the Tivoli Business Systems Manager 3.1 XMLToolkit to import the business process model XML into Tivoli Business Systems Manager.

#### 3.3.1 enqclbpm Command – Queue the BPM XML

The import process is driven through a command line interface included in the enablement package. The **enqclbpm** command queues business process model XML files to the Tivoli Business Systems Manager common listener service using tools supplied in the Tivoli Business Systems Manager XML Toolkit. The **enqclbpm** command has the following usage:

**enqclbpm** *bpm\_common\_listener\_xml\_file*

- Where *bpm\_common\_listener\_xml\_file* is the generate business process model XML file.

#### Usage

The **enqclbpm.ksh** form of the command must be run in a Korn shell from where the XML toolkit is installed.

Figure 3, below, shows an **enqclbpm** usage example for the 'ClaimProcess' model.

```
C:\Program Files\Tivoli\tbsm\XMLtoolkit\bin
> enqclbpm "C:\Program Files\IBM\Modeller\export\ClaimProcess.bpel.cl.xml"

Queuing the Business Process Model XML file to TBSM...

GTMCL5200I: The request for transaction "106" has been queued to TBSM.
```

Figure 3 – **enqclbpm** command usage

The **enqclbpm** command invokes various tools within the Tivoli Business Systems Manager XMLToolkit. The XMLToolkit provides the capability to queue various XML formats to the Tivoli Business Systems Manager common listener service. The common listener service manages and processes the queued XML as a transaction and returns a transaction ID under which the XML is being processed. Refer to the Tivoli Business Systems Manager 3.1 Administrators Guide and Tivoli Business Systems Manager 3.1



Command Reference for XMLToolkit and common listener service documentation for information on how to use the returned transaction ID for querying the transaction's current status using the XMLToolkit's querycltran command. Refer to the Tivoli Business Systems Manager Message Reference for information on messages, with message numbers, returned from the enqclbpm command.

### 3.4 Assign Supporting Business Systems to the Business Process Model in Tivoli Business Systems Manager

After the business process model XML has been imported, the Tivoli Business Systems Manager common listener service will begin to create the business systems using the modeled Tivoli Business Systems Manager Object Classes and their corresponding topology links as defined in the XML file. In the 'ClaimProcess' model example, the created business systems appear in the business systems tree view and business system Topology view on the Tivoli Business Systems Manager Console as shown below in Figure 4.

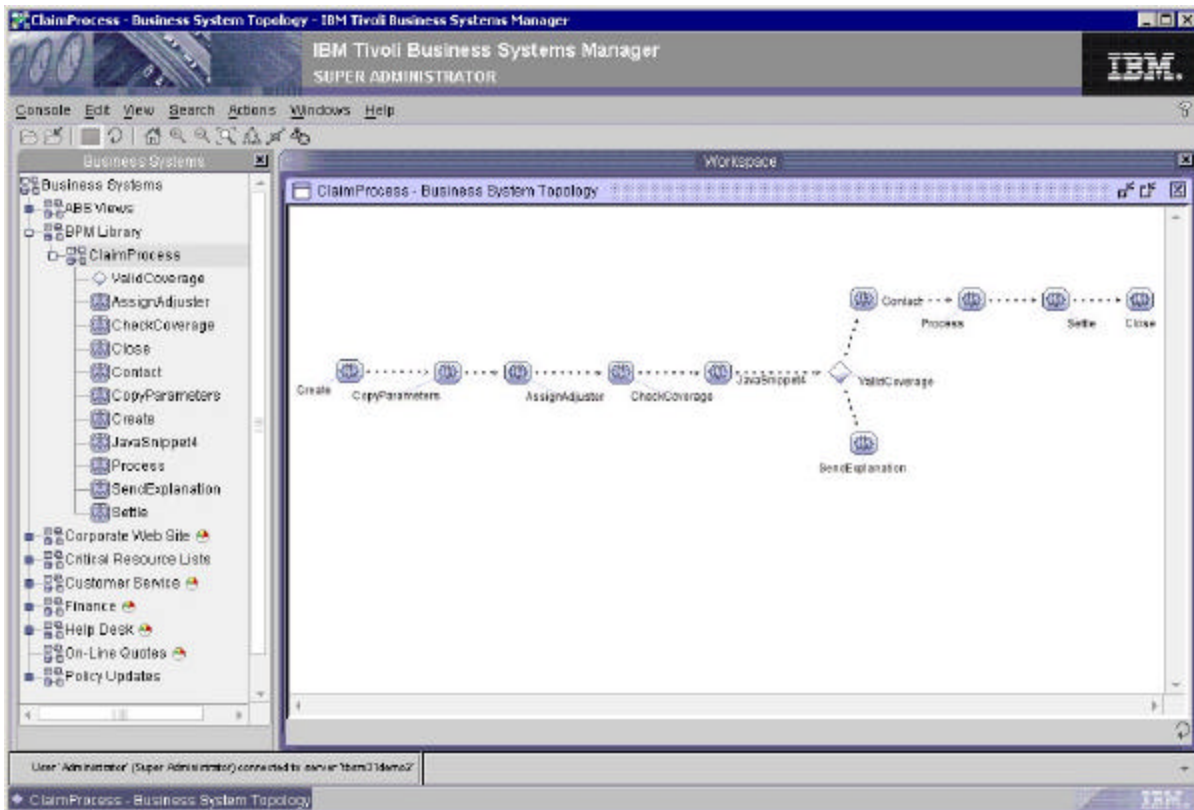


Figure 4 – ClaimProcess Business Process Model in Tivoli Business Systems Manager

Referring back to Figure 1 where the 'ClaimProcess' model was constructed in the WBI Modeler, we can see that an equivalent business process model has implemented in Tivoli Business Systems Manager.

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The business system Topology view launched from the 'Claim' Process' business system will initially display in a symmetric format, but the objects can be manually dragged to new locations to completely emulate the WBI Business Process Model. Alternatively, a hierarchical format can be selected. These changes can then be saved in a workspace. When a topology view is saved in a workspace, the node positions are saved.

It should be noted that all business process models imported in the manner described in this document will be placed in the business system tree view under the 'BPM Library' business system.

Once the business systems for the 'ClaimProcess' model are created, related IT resources that support a particular business system's activities can then be assembled underneath that business system. The related resources, other business systems or physical IT resources, can be assembled by hand using drag-and-drop or by using the ABS facility. Figure 5, below, shows the dragging of the 'Policy Updates' business system to the 'CheckCoverage' business system in the 'ClaimProcess' model.

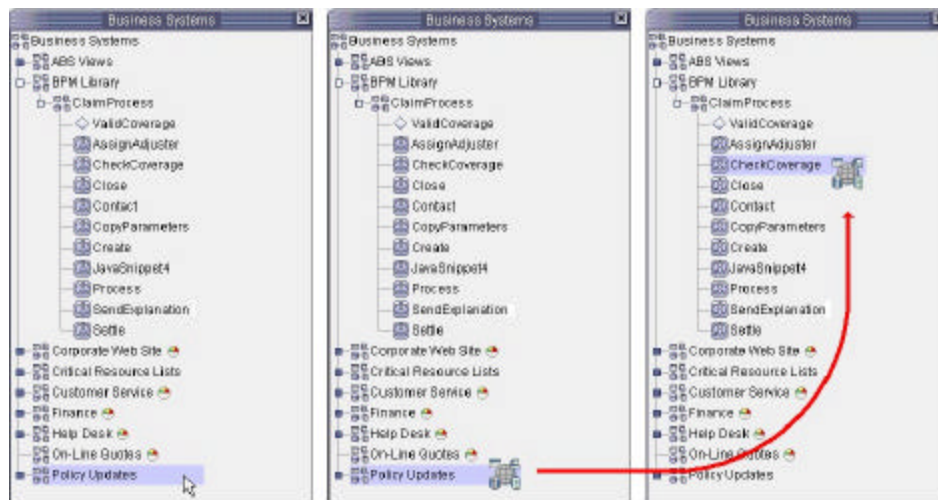


Figure 5 – Click... Drag... Drop... into the 'ClaimsProcess' Business System

Within the context of a business process model, the 'ClaimProcess' model's 'CheckCoverage' activity is then, at least in part, supported by the IT resources used in the 'Policy Updates' business systems and affected by the resources' well-being. In Figure 6, below, we can then see how an IT resource might affect a business process model activity. In this example, a router has gone down within the 'Policy Updates' Business Service, affecting the ability to perform the 'CheckCoverage' activity.

