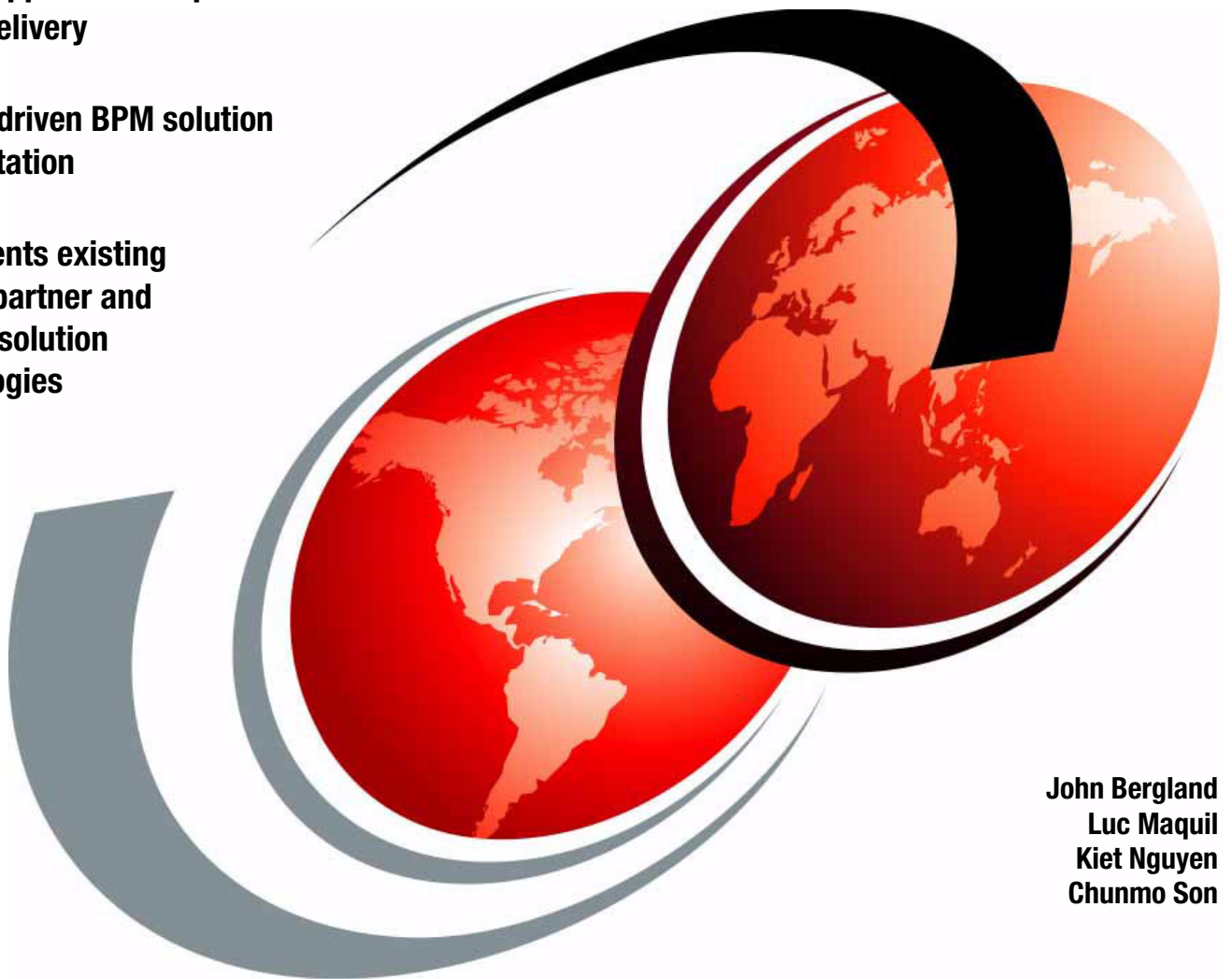


# BPM Solution Implementation Guide

**Practical approach to rapid BPM  
solution delivery**

**Business-driven BPM solution  
implementation**

**Complements existing  
business partner and  
customer solution  
methodologies**



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International Technical Support Organization

**BPM Solution Implementation Guide**

October 2009

**Note:** Before using this information and the product it supports, read the information in “Notices” on page ix.

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# Preface

This IBM® Redpaper™ publication provides a practical bridge toward achieving successful BPM solution implementation within 60 days. It is based on an approach using phases and specific activities outlined in the *IBM Business Process Management Prescriptive Guide to Solution Implementation*. To provide a realistic context for the solution, we incorporate the process, business model, and specific scenario from a health care provider. The context is based on a live code demo that consists of a fictitious application based on a customer scenario, using the approach in the *IBM Business Process Management Prescriptive Guide to Solution Implementation* to assemble the solution. This paper discusses how to analyze, model, and manage the processes within this realistic health care scenario.

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# Introduction to the BPM Prescriptive Guide to Solution Implementation

The goal of Business Process Management (BPM) is to improve your organization's ability to model, assemble, deploy, and manage your processes and improve your business. This IBM Redpaper publication provides a practical bridge toward achieving successful BPM solution implementation within 60 days. It is based on an approach using phases and specific activities outlined in the *IBM Business Process Management Prescriptive Guide to Solution Implementation*. To provide a realistic context for the solution, we incorporate the process, business model and specific scenario from a health care provider. The context is based on a live code demo which consists of a fictitious application based on a customer scenario, using the approach in the *IBM Business Process Management Prescriptive Guide to Solution Implementation* to assemble the solution. This paper discusses how to analyze, model, and manage the processes within this realistic health care scenario.

This chapter establishes a foundation for implementing a BPM Solution by introducing the key characteristics of a successful BPM initiative. It reviews the fundamental relationship between BPM and a service-oriented architecture (SOA), while introducing the IBM BPM methodology, the *IBM Business Process Management (BPM) Enabled by SOA Method*. It also introduces the key phases and activities from the *IBM Business Process Management Prescriptive Guide to Solution Implementation*, which is used to implement the health care scenario BPM solution.

## 1.1 Scope and focus of this IBM Redpaper publication

The goal of the paper is to provide a definitive and practical guide to BPM Solution Development. As a starting point, we structure our approach using the IBM asset *IBM Business Process Management Prescriptive Guide to Solution Implementation* as a framework and specific reference point. We proceed through the phases of building a BPM solution using a live, working demo based on a fictitious health care insurance company to provide specific and practical context to the approach. By doing this we intend to make the *IBM Business Process Management Prescriptive Guide to Solution Implementation* more consumable, less complex, and more practical. Accordingly, this paper is not exclusively focused on only the detailed steps outlined in the *IBM Business Process Management Prescriptive Guide to Solution Implementation*, nor is it limited to only serving as a step-by-step guide on how to build the health care demo. It serves as a practical bridge, illustrating how to begin with the approach provided in the *Prescriptive Guide to Solution Implementation*, and apply this toward the practical solution demonstrated in the demo for the health care insurance company. Figure 1-1 illustrates the scope and positioning of this paper as a bridge from the *Prescriptive Guide to Solution Implementation* toward implementing the solution shown in the working example for Health Insurance Company ABC.

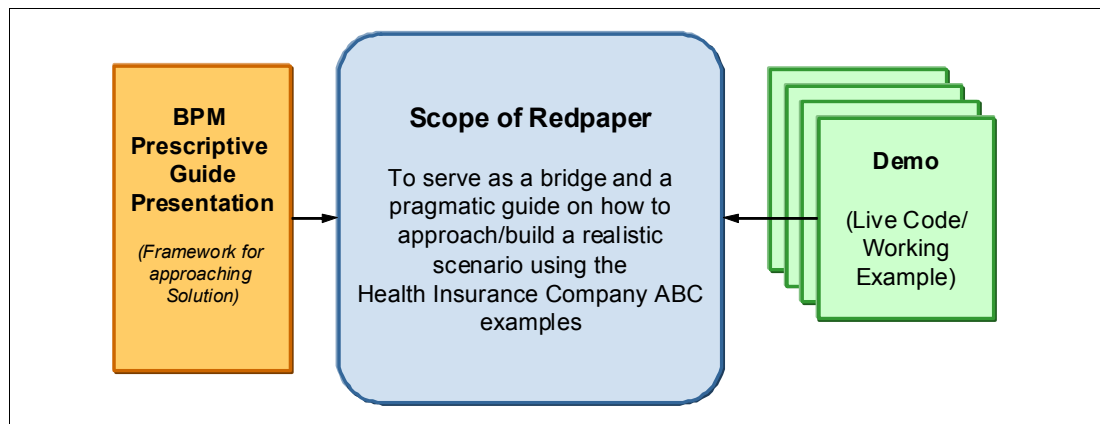


Figure 1-1 Visual positioning of this paper

### Objectives

The objectives within this paper are as follows:

- ▶ Illustrate a Business Driven solution.

As we describe the approach for developing the solution in this paper, we emphasize how your organizations' underlying business needs and processes are identified, mapped, analyzed and simulated. We discuss how IBM WebSphere BPM tools provide the capability for modeling, simulating and ultimately monitoring and managing the efficiency of your business solution, but it is the business need at the core of the strategic solution.

- ▶ Provide a practical context which guides you from theoretical, prescribed approach outlined in the *IBM Business Process Management Prescriptive Guide to Solution Implementation*, and implementing this into a realistic solution. (See 1.3, "Introduction to the BPM Prescriptive Guide to Solution Implementation" on page 6 for more details on the focus and objectives of this prescriptive guide.)

This paper describes which tools from the IBM BPM Toolsuite are used, and gives you the guidance as a business analyst on how you can use these tools to model and develop a solution. This is all done using a realistic context from a fictitious health care company, and it is all based on a working, live code demo.

- ▶ Illustrate the power and flexibility of the core tools used from the IBM BPM suite.

The IBM BPM tools we highlight in this paper demonstrate how you can discover, analyze, modify, and manage your business process for continued improvement. We discuss specific capabilities in individual tools with the emphasis being placed on how the tools are well-integrated to drive you toward a comprehensive solution. This is not a single step process, but one that allows for iterative improvements and adaptability as business needs change in the future.

After the solution is modeled, you can simulate best case and worst case scenarios to determine the best path to greater return on investment (ROI). As you model and simulate different scenarios, you can refine the process and monitor the results, all before deploying the solution into a live production environment. This allows for flexibility and a better understanding of the impact of process improvements, without the cost and complexity of making these changes in a production environment. Much of this initial simulation is demonstrated in Chapter 3, “Storyboarding” on page 35.

#### **What is the role of IT in this scenario?**

This paper discusses a *business driven* solution. That is, one designed and analyzed primarily by a business analyst and key business stakeholders, representing the line of business (LOB). The activities and steps demonstrated throughout this paper are performed primarily through the business analyst perspective.

With this in mind, the reality is that IT is a critical partner in achieving a BPM solution. They need to do the technical work of integrating the solution with the infrastructure. In many cases, they are actually participants in the business-driven design that was done earlier in the process. For example, an enterprise architect may be needed to work with a business stakeholder and refine the process sufficiently for deployment.

IT has development responsibilities, while working closely with the business analysts to realize the technical solution, based on the business needs. The IT team would be responsible for installing and configuring the underlying IBM BPM Suite tools as a foundation to begin working with the tools. In some specific tasks, such as the IPD phase (direct deployment process) described in Chapter 4, “Experience” on page 81, or tasks related to the larger scale roll-out of the solution in Chapter 6, “Deployment” on page 187, we make it clear that this is primarily an IT responsibility.

This solution illustrates how the business is the primary driver, supported by IBM technology.

## **1.2 Introduction to Business Process Management**

BPM is most often associated with the life cycle of a business process. The process life cycle spans identifying and improving processes that deliver business capability to deploying and managing the process when it is operational. What is often forgotten about is managing process performance after a process is operational. In a way, this is probably the most important phase of the life cycle. After a business process is deployed, it must be managed. To manage the business process, you must have visibility into process performance. When a process is no longer meeting its performance goals, it is time to jump back in the life cycle to assess the root cause of the performance problem and to look for improvement opportunities.

## 1.2.1 The BPM vision

Dramatic increases in computing power are leading to new approaches and smarter solutions, in which flexible, intelligent, and dynamic infrastructures can be applied to address current and future opportunities. Businesses can instrument activities so that they can be measured and improved, interconnect across silos, partners, and the broader value chain, and intelligently derive insight from an interconnected world of devices, systems, and businesses.

BPM manifests itself in numerous ways in business environments. Typical BPM solutions are all around us:

- ▶ Supply chain processes for inventory management
- ▶ Self service portals for managing employee benefits
- ▶ Financial processes for compliance
- ▶ Call center management reports for service organizations

Whether your business needs to document existing processes, define flexible policy options to handle a broad scope of business situations, facilitate human task flows, or gather operational details about how well the business is running, BPM is there.

As the pace of change and competition accelerates in today's challenging economic climate, enterprises are under tremendous pressure to improve the way they do business. Leaders from around the world are focused more than ever on the economic, social, and environmental changes driven by global integration, where free trade agreements, the Internet, and globalization are simultaneously making the world smaller, flatter, and smarter.

These leaders have articulated the need to deliver products and services faster, raise the quality of what they deliver, rein in costs, grow revenues, take advantage of market opportunities, react to unforeseen events, and see long term trends. Businesses need to be more agile, flexible, and responsive to market demands. Regardless of how well the enterprise runs, it needs to adapt and improve, or it will be outdone by competitors.

What is the downside of inflexible business models and siloed solutions? Production and service outages, backlogs and process bottlenecks, supply chain disruptions, stock outs, missed service level agreements, ineffective use of staff, poor customer satisfaction, operational reports that provide too little too late, and the list goes on. No one wants to be the next case study on enterprise failure.

By working smart, business achieve the agility to succeed. Overcome the restrictions of the past by moving to an agile business model, use Web 2.0 to build interactive ecosystems to meet the situational needs of knowledge workers, build dynamic processes that use reusable, service-based components, and embrace the Smart SOA approach that turns applications into reusable services.

## 1.2.2 Characteristics of BPM Success

The following section highlights the key characteristics of a holistic BPM infrastructure.

- ▶ Choice

Business dynamics change, regardless of how well plans are thought out. But how easy is it to modify an IT solution without a massive IT effort? The choices made today should not limit the choices that need to be made in the future.

- ▶ Agility

There are many decisions to make as processes run. The right decision is often influenced by various factors and cannot simply be expressed as a set of conditional if-then-else statements. The business needs to express a dynamic business policy in terms that IT infrastructure can harness, and that the business can manage on the fly as that policy changes.

- ▶ Flexibility

Invariably, disparate departments in an enterprise often develop and grow their missions and capabilities isolated from other departments. As these departmental silos grow, so do their IT systems. At some point, you realize that there is valuable information that should be shared across departments. Enabling departments to share information reveals business efficiencies (for example, by eliminating the need to enter duplicate data) and provides broader business insight across the organization. But can these disparate systems work together without costly and risky rip-and-replace initiatives?

- ▶ Speed

Business no longer has the luxury of taking years to develop solutions. IT departments require the tools to assemble solutions based on reusable assets, minimal coding, robust integrated test facilities, and a straightforward deploy capability. Heterogeneous environments introduce the additional challenge of integrating various hardware and software platforms, which dare not slow down solution development.

- ▶ Skills

To improve business processes, an organization cannot, and should not, rely solely on IT resources to design, collaborate, improve, build, deploy, and monitor those processes. The line of business (LOB) brings subject matter expertise and domain knowledge into the definition of what the business needs (requirements), why certain needs are prioritized higher than others (business goals), and how those needs are reflected in process definitions (models). LOB writes the specification for the business solution, whereas IT ensures it is implemented, tested, and deployed on a robust and scalable infrastructure. Striking the right balance across your organization to use strengths and experiences across both IT and LOB departments facilitates the speed and agility that you need to succeed. LOB needs to take an active role in both defining business processes and seeing the business results in real-time so they can react swiftly with business insight. LOB needs tools that can be easily tailored and used, tools that provide the necessary handoffs and integration points with the IT organization.

## 1.3 Introduction to the BPM Prescriptive Guide to Solution Implementation

The *IBM Business Process Management Prescriptive Guide to Solution Implementation* provides a detailed, phased approach for implementing a BPM development solution. It is not an actual methodology, but instead serves as an approach or framework giving step-by-step guidance for a prescribed set of activities to deliver a BPM solution into production for smaller scale, departmental class projects within 60 days. One of the core assumptions within the guide is that it is business-driven. That means business leaders, analysts, and users are a key part of the approach and play a continuous role. In fact, the business analysts do a lot of the development in the human-centric cases. The approach in the *IBM Business Process Management Prescriptive Guide to Solution Implementation* covers the core products within the IBM WebSphere BPM suite of product (including Modeler, Publishing Server, Monitor, WPS, WID, WSRR-ALE).

**Note:** You can access the *IBM Business Process Management Prescriptive Guide to Solution Implementation* in either of the following ways:

Internal IBM users can access the *IBM Business Process Management Prescriptive Guide to Solution Implementation* through the following Web page:

<https://w3.tap.ibm.com/com.ibm.ram/assetDetail/generalDetails.faces?guid={699338B4-3441-CF1A-B87C-5FE235A39E66}&v=1.0&submission=false>

External IBM users should refer to Appendix A, “Additional material” on page 249 for instructions on how to download the Prescriptive Guide.

### 1.3.1 Understanding the goals, objectives, and intended audience of the Prescriptive Guide to Solution Implementation

As mentioned in the objectives of this paper, the approach for solution implementation within this paper is modeled on the *IBM Business Process Management Prescriptive Guide to Solution Implementation*. Accordingly, it is important to understand the goals and objectives of the guide, together with an understanding of the intended audience.

#### What is it?

- ▶ It provides prescriptive guidance that is simple and usable on how to use BPM products to deliver a solution into production within 60 days.
- ▶ It is focused on departmental projects that are weighted towards interactive process design and human-centric processing scenarios.
- ▶ It covers the core products within the IBM WebSphere BPM suite (Modeler, Publishing Server, Monitor, WPS, WID, WSRR-ALE).
- ▶ Business leaders, analysts and users are a key part of the method and continuously play a role. In fact the business analysts do a lot of the development in the human centric cases.

#### Who are the intended users?

- ▶ IBM Tech Sales, Black belt in delivering customer departmental solutions
- ▶ ISSW delivering a departmental BPM solution
- ▶ Business Partners working on a BPM solution implementation
- ▶ Customers implementing BPM solutions

## Ownership: How is this document going to be maintained?

PLM and development own this document and will update with every release

### What the guide is not

- ▶ It is not intended to replace GBS, business partner, or ISSW methodologies, but to feed into those methodologies as guidance on product usage. For example, it builds upon many of the concepts in the formal BPM Enabled by SOA Methodology. For additional information about this methodology, refer to the IBM Redpaper publication REDP-4495, *Business Process Management Enabled by SOA*, available at the following Web page: <http://www.redbooks.ibm.com/abstracts/redp4495.html>
- ▶ It is not intended to replace product how to guides, which go into a more detail on specific product usage.

At the core of *IBM Business Process Management Prescriptive Guide to Solution Implementation* are five phases, ultimately spanning the life cycle of solution delivery. The phases are as follows:

- ▶ Discovery
- ▶ Storyboarding
- ▶ Experience
- ▶ Manage
- ▶ Deploy

Figure 1-2 illustrates an iterative view of the first four phases, with a view of which human task roles are involved during each of the phases.

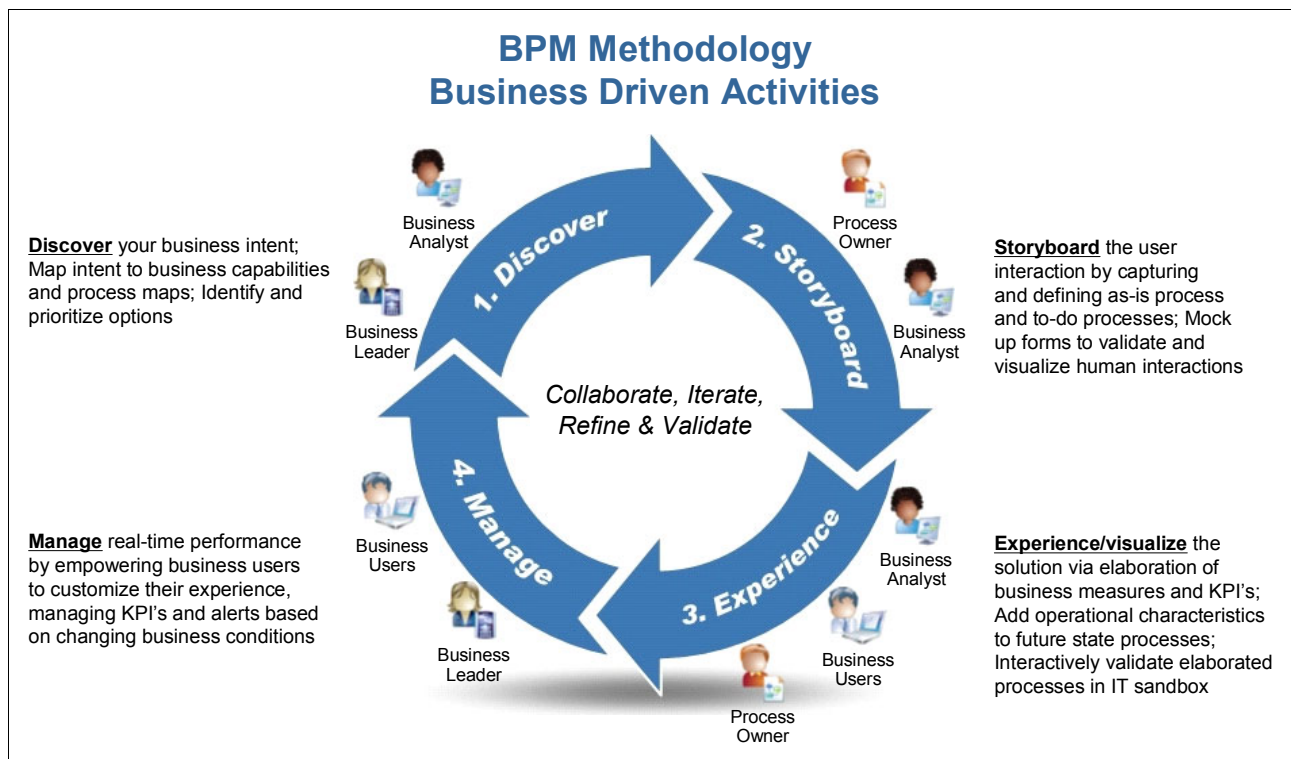


Figure 1-2 Overview of the phases within the IBM Business Process Management Prescriptive Guide to Solution Implementation

The high level objectives within each phase are as follows:

- ▶ Discovery: Discover your business intent
  - Capture business intent
  - Map business capabilities
  - Create high level process maps
  - Identify options/prioritization
- ▶ Storyboarding: Story board the user interaction
  - Capture/refine current state process; Examine alternate ROI to determine approach
  - Define future state process
  - Define inputs and outputs and mock up forms for human interactions
  - Validate and visualize human interactions
- ▶ Experience: Experience/visualize the solution
  - Elaboration of business measures and KPIs
  - Add operational characteristics to future state process
  - Refine forms
  - Interactively validate elaborated process in IT sandbox
- ▶ Management: Manage & Optimize performance
  - Empower business users to customize user experience
  - Assign access rights; Optimize work assignments; Govern change
  - Manage real time business performance, KPIs, and alerts based on changing business conditions
  - Take corrective actions against process instances
- ▶ Production: Put solution into production
  - Set up IT environments
  - Prepare and deploy production artifacts
  - Unit test solution
  - Monitor health of your solution to ensure process integrity

**Note:** The *Prescriptive Guide* is primarily aimed at an initial BPM solution rollout based on a slightly smaller scale (for example, a departmental solution which can be achieved within a 60-day time line). So, for the sake of this paper effort, both the functional and non-functional requirements associated with a full scale enterprise deployment into a production environment are not covered in detail. The goal is to highlight some of the key steps and considerations associated with a production deployment in Chapter 6, “Deployment” on page 187, but then refer the reader to a more detailed source of information that is specifically focused on deployment steps and related activities.

Throughout the subsequent chapters in this paper, we use the phases, goals, and steps identified in the *IBM Business Process Management Prescriptive Guide to Solution Implementation* to approach developing the health care demo scenario.



## 1.4 Roles involved with the BPM Solution Implementation

Within the *IBM Business Process Management Prescriptive Guide to Solution Implementation*, specific roles are identified for performing tasks in the different phases of the solution implementation. The goal of this section is to better identify these roles and their supporting skill sets.

The primary roles referred to within the *IBM Business Process Management Prescriptive Guide to Solution Implementation* involve the following aspects:

- ▶ Business roles
  - Business analyst/Business leader
  - Subject matter expert (SME)
  - Business executive
- ▶ IT roles
  - IT solution developer
  - IT administrator
  - IT architect

The descriptions in 1.4.1, “Business roles” on page 9 and 1.4.2, “Technical roles” on page 11 help clarify the skills, goals, and tasks commonly associated with each of these roles.

### 1.4.1 Business roles

#### **Business analyst**

- ▶ Skills/Education
  - Business background with no technical background
  - Extremely knowledgeable of the business; usually have been with the company for many years and have a solid understanding of the business and its goals
  - Mostly senior personnel (for example, been around business for okay)
  - Skilled at Office suite (for example, PowerPoint, Visio)
- ▶ Goals
  - Build consensus from different stakeholders on as is and to be process model
  - Accurately communicate process details
  - Look for opportunities to improve current business
- ▶ Tasks
  - Conduct SME interviews (group or 1-on-1) for input into models (as is process) and validating to be processes
  - Define detailed business requirements, models business processes, gathers simulation data (resource costs, and so forth), assess process execution in production
  - Define and refine business metrics usually done outside of Modeler (for example, captured in MS Word or Excel)
  - Manage review and iteration of current model sharing and publishing models with SMEs; generate PDF and JPEGs to distribute
  - Review models produced either on WebSphere Publisher Server or using the Business Leader Widgets available through the following Web page:

<http://www-01.ibm.com/software/solutions/smartwork/bpmbblueworks/>

- Provide input to test cases and training materials; can also act as a tester and trainer
- Process analysis (for example, metrics, cost benefit analysis)
- Mock up application user interface
- ▶ Tools
  - Skilled at Office suite (for example, PowerPoint, Visio)
  - Internet Explorer
  - NetMeeting?
  - MS Outlook or Lotus Notes

## **Business executive**

- ▶ Skills/Education
  - Extensive business background, MBA or similar
  - Has a good level of understanding of technology but will call the IT department right away if there is a problem
  - Extremely knowledgeable of the business; has a solid understanding of the business and its goals
  - Mostly senior personnel (for example, been around business for a while)
  - Spends a large portion of the day away from the desktop
  - Device for information delivery is important (for example, reports on a Blackberry device)
  - Needs to be provided information on timely basis (regular or ad hoc)
  - Engages in light exploration and prefers to get details on demand
  - Uses dashboards and scorecards for at-a-glance view
  - Prefers any tool that understands patterns and can predict (and suggest) what the right information might be ahead of time
- ▶ Goals
  - Get the right information right now. Has no time to sift through information to find what is relevant. If it is more than one or two clicks away, it does not exist.
  - Direct the business unit. Needs to detect trends, changes, and exceptions easily. Must communicate how they map to corporate strategy.
  - Keep context. Must be able to maintain information from various sources in one context (one place).
  - Improve over last quarter. Needs up-to-the minute, focused information to measure how the organization is doing and understand how to increase performance going forward.
  - Keep up with the numbers. Insists on knowing what is going on around and them. Keeps a close watch on key numbers and metrics.
  - Monitor key customers. Needs to know what customers need and offer it to them. Prefers to offer them something they want before they know they want it.
  - Knowing what the team is doing. Has to keep track of what happens with information and who is accountable for what to make sure the company is getting maximum value for their investments.

- ▶ Tasks
  - Monitor company results against targets through reports and dashboards.
  - Keep on top of what the company is doing relative to the competition.
  - Communicate strategy on an ongoing basis.
  - Attend regular meetings, prepared with a full set of information around a topic.
  - Communicate with customers directly to understand and help them with their issues
- ▶ Tools
  - Microsoft® Office, especially Outlook and PowerPoint?
  - Internet Explorer
  - Blackberry e-mail
  - Report viewing tools

### **Subject matter expert (SME)**

SMEs are the experts who know and provide the content for a specific business area. They understand the intricacies of a specific business area, know the terminology, and can help to explain how a specific process should work according to the business need.

- ▶ SMEs are responsible on how tasks, to include the order of performance steps, are to be performed
- ▶ SMEs are responsible for technical terminology and jargon.
- ▶ SMEs are responsible for determining acceptable performance levels.
- ▶ SMEs are responsible for providing the performance objectives.

## **1.4.2 Technical roles**

### **IT administrator**

- ▶ Skills/Education
  - Patience and courtesy
  - Trouble ticket management
  - Detailed understanding of the process authoring life cycle, including the tools, test server, and deployment
  - WPS Administration
- ▶ Goals
  - Support the LOB when they want to author a process, need a new role, need a new service, or get confused
  - Work with a test and production environment which empowers the business user and is up 24/7
- ▶ Tasks
  - Install the Directly Deployed (D2D) test server environment
  - Seed the Directly Deployed (D2D) organizational role model
  - Create server config files, and distribute them to new process authors
  - Teach new process authors about the Directly Deployed (D2D) life cycle and the tools

- Help new process authors connect to the test server environment, WSRR server, RAM servers, and so forth.
- Provide first point of contact when process authors run into trouble, and handoff to the relevant IT expert
- Manage the incoming requests for new roles and new services
- Meet with Archie, the IT Architect, on a regular basis to determine which services should be implemented
- Notify the LOB when new services and roles become available
- Encourage centralization and sharing across the LOB
- ▶ Tools
  - Business Space, WebSphere Process Server
  - E-mail

## **IT architect**

- ▶ Skills/Education
  - Detailed understanding of overall technical goals of the business and the current hardware and software inventory
  - Detailed understanding of industry patterns and approaches related to the infrastructure for the business
  - Detailed understanding of solutions or technologies that map to company needs as well as prerequisites and hardware/software requirements
  - Detailed knowledge of the business and technology domains
  - Basic understanding of company's entire business and IT operations
  - Expert understanding of one or more particular solutions
  - Proficient communication
  - Proficient creating and communicating the overall vision for the software application
  - Proficient development activity leadership
  - Basic understanding of many technologies (in other words, a generalist rather than a specialist)
  - Proficient broad technical decision making
- ▶ Goals
  - Support the business to achieve their goals
  - Design and build the software function required while meeting performance, availability, and scalability requirements
- ▶ Tasks
  - Analyze, digest, and prioritize the business and IT requirements for new software function
  - Design the high level architecture for the software function
  - Write the Software Architecture Document that describes the application's components and their interfaces within and outside of the software system, including clear specifications of functional and nonfunctional requirements for the solution
  - Define expected behaviors of service in terms of performance, service levels, and so on

- Incorporate existing components and services into the design
  - Describe how the functionality of the system is distributed across physical nodes
  - Construct and assess architectural proof-of-concepts
  - Establish the structure in which the implementation will reside
  - Guide the development team, review detailed designs, and generally nudge the implementation towards the architectural vision
  - Define architectural patterns, key mechanisms, and modeling conventions for software development
- ▶ Tools
    - Microsoft Office
    - WebSphere Integration Developer
    - Rational® Software Architect
    - Telelogic Software Architect

## 1.5 Tools from IBM BPM Suite of products used in this solution

The IBM BPM Suite contains a comprehensive set of role-based capabilities that enable customers to model, simulate, run, rapidly change, monitor, and optimize core business processes. Within this paper, we do not use or cover all of the products offered in the IBM WebSphere Dynamic Process Edition 6.2. For more complete information about the complete suite offered in IBM WebSphere Dynamic Process Edition 6.2, refer to the following Web page:

<http://www-01.ibm.com/software/integration/wdpe/>

The goal of this paper is to highlight and focus on a subset of the BPM Toolsuite that aligns closely to the phases and tasks outlined in the *IBM Business Process Management Prescriptive Guide to Solution Implementation*. The specific IBM BPM tools we discuss in detail include:

- ▶ Business Leader Widgets available through IBM BPM Blueworks.  
(<http://www-01.ibm.com/software/solutions/smartwork/bpmbblueworks/>)
- ▶ WebSphere Business Modeler Publishing Server V6.2
- ▶ WebSphere Business Modeler V6.2
- ▶ WebSphere Business Monitor V6.2

Figure 1-3 illustrates which IBM BPM products are used during specific phases of the BPM Solution Implementation approach.

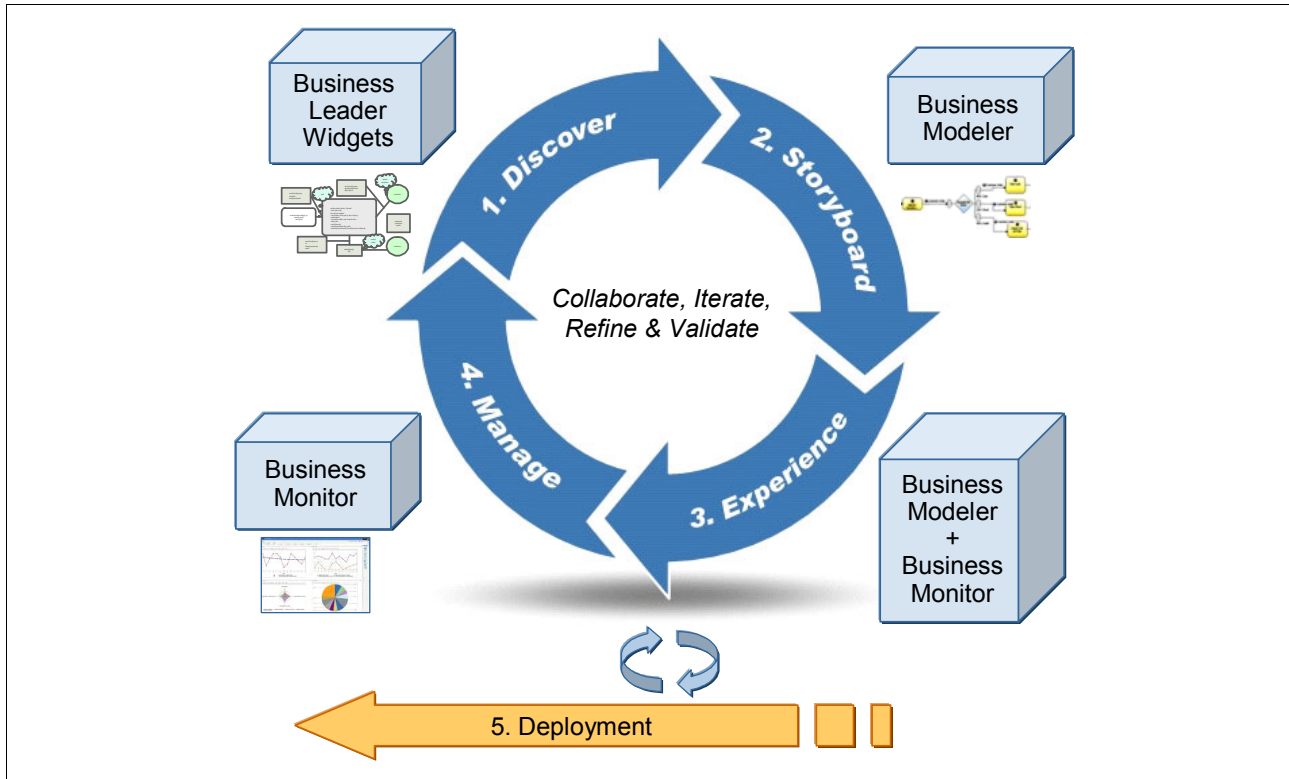


Figure 1-3 Mapping of WebSphere BPM Toolsuite products to phases within the Prescriptive Guide approach

### 1.5.1 Business Leader Widgets: WebSphere Business Publishing Server

The Business Leader Widgets, available as part of WebSphere Business Modeler Publishing Server v. 6.2 (and also available through IBM BPM Blueworks), enable users to share process models and BPM assets through a Web browser. They allow users to validate BPM assets with SMEs to create best practice process models and optimize processes. They enable users to publish an array of BPM assets including process models, WebSphere Business Monitor dashboard designs, and user interface forms. Additionally, they provide enhanced process-model visuals to display labels and the latest WebSphere Business Modeler notation formats.

Within this paper, WebSphere Business Publishing Server, specifically the Business Leader Widgets, are used to produce the high level strategy maps discussed and created in the Discovery phase, in Chapter 2, "Discover" on page 25.

### 1.5.2 WebSphere Business Modeler

With WebSphere Business Modeler, a business analyst can fully visualize, understand, document, test, and share business processes. You can simulate process runs to identify bottlenecks and inefficiencies, and define key performance indicators and business metrics for use in WebSphere Business Monitor. Then, you can use the real business results in WebSphere Business Modeler simulations for continuous process improvement. In addition,

WebSphere Business Modeler can generate IT implementation artifacts for WebSphere Process Server and facilitate testing of human-centric processes in a process server environment.

Within this paper, WebSphere Business Modeler is used to model, analyze, and simulate the claim processing process for the Storyboarding phase (Chapter 3, “Storyboarding” on page 35), and, to some extent for visualizing and refining elements of the process, during the Experience phase (Chapter 4, “Experience” on page 81).

### 1.5.3 WebSphere Business Monitor

WebSphere Business Monitor is an integrated business activity monitoring (BAM) environment that provides end-to-end visibility of business activity on WebSphere Process Server, WebSphere MQ Workflow, FileNet® Business Process Manager, and other enterprise applications. Web-based and portal-based dashboards provide near real-time information so business leaders can make timely operational and strategic decisions. Fully configurable dashboards show you only what you need to see, and deliver alerts to e-mail, pagers, or PDAs. Monitoring results can be used in WebSphere Business Modeler simulations to complete the BPM feedback cycle, and the WebSphere Business Monitor development toolkit provides templates and a test environment to further accelerate time to value.

Within this paper, WebSphere Business Monitor provides the view of the Business space, illustrating integrated BAM and a view into key performance indicator (KPI) values for the health care claim scenario. In Chapter 5, “Manage” on page 135 we discuss these KPIs and show how to better analyze and manage these for further optimization of business processes.

## 1.6 Introduction to the health care demo scenario

This paper builds upon the set of prescribed activities and phases outlined in the *Prescriptive Guide*, while using a specific IBM demo as the practical context for the solution. Within IBM, this demo has been built on information from a fictitious health insurance company. It walks the audience through a health care claims processing scenario in a business audience-oriented way. The demo focuses on all the business user touchpoints, from how the process is captured, to an integrated user interface, and how business users can change and interact with live processes through interactive process design. This is a comprehensive demo that spans a wide range of our BPM capabilities in a truly integrated fashion.

**Note:** The goal of this section is only to provide an introduction the scenario. Subsequent chapters of the paper will provide in-depth details on specific process modelling, process improvements and how KPIs were more efficiently monitored and managed.

### 1.6.1 High level business goals

The health care insurance company scenario is based on the high-level goals of reducing costs and improving claims processing times through automation of manual tasks and processes and integrating people with back-end systems. Additionally, they plan to improve customer satisfaction by addressing denied claims and working with the customer earlier in the cycle to correct an incorrectly submitted claim.

**Note:** For a more detailed listing of the specific business goals and objectives, see 2.2, “Reviewing the business challenges, goals, and strategy for the health care scenario” on page 28.

## 1.6.2 Overview of the overall claims process

Figure 1-4 illustrates an overview of the complete claim process. After a claim is successfully received and approved into the system, it is processed by a claims specialist who analyzes the amount requested for the claim and determines the pending amount to be paid. With pricing set, the claim proceeds to the adjudication sub-process, where it will be classified as either a dental, medical, or mental health type of claim.

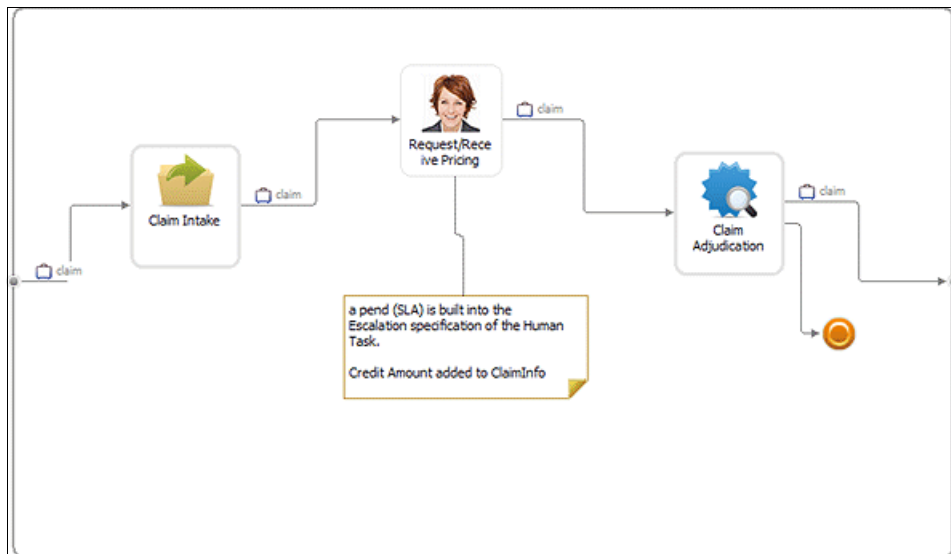


Figure 1-4 Overview of the complete claim handling process



Figure 1-5 illustrates one of the sub-processes for claim intake. One of the tasks, Select Provider, is a human task and will be reviewed for ways in which automation can lower the cost and improve the efficiency of the process.

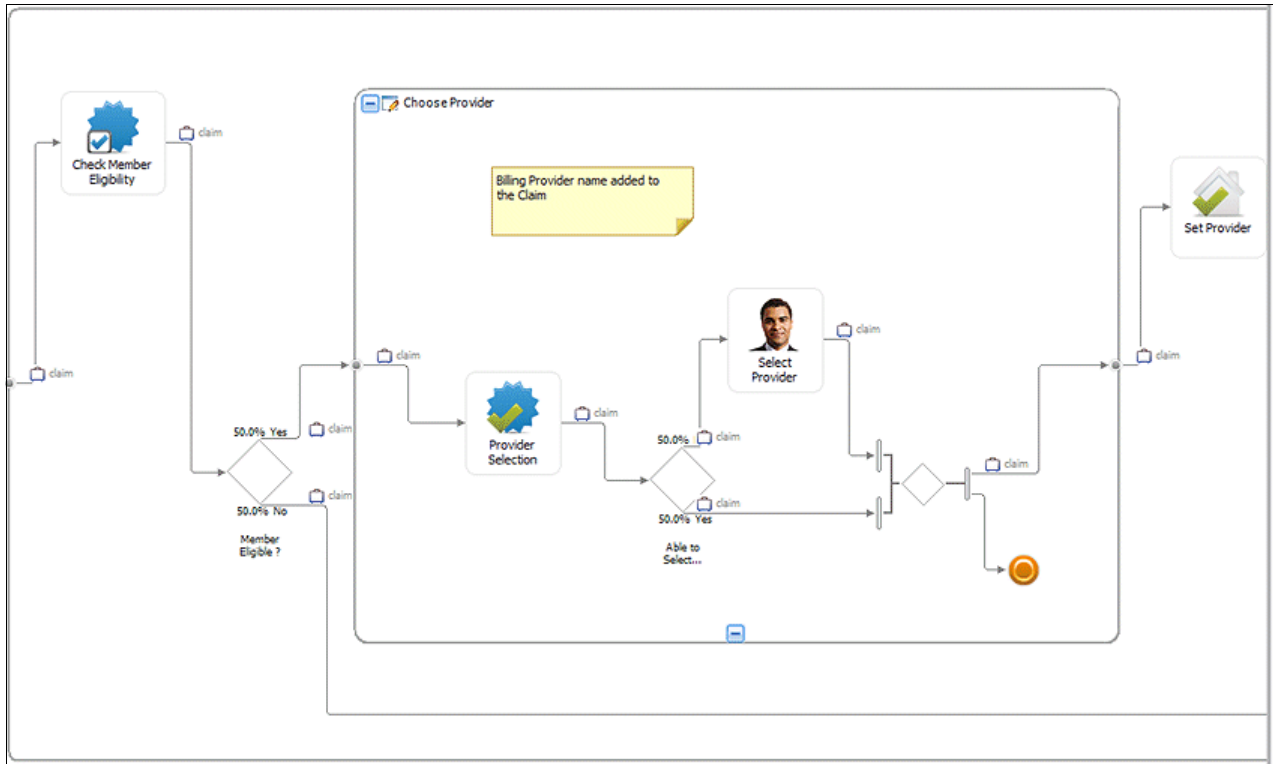


Figure 1-5 Overview of the claim intake sub process

Figure 1-6 illustrates the adjudication sub-process. Currently, in the “as-is” state of the process, there are three automated tasks to assign the claim:

- ▶ Handle Medical
- ▶ Handle Dental
- ▶ Handle Mental

If a claim has been rejected, it bypasses this sub-process, remains in the denied state, and the customer is notified through mail approximately 30–60 days later. As we discuss in Chapter 3, “Storyboarding” on page 35, a modification to this process represents an opportunity to improve customer satisfaction. For example, if we add an additional task in this phase, which would “inform customer of denial”, and automatically notify a customer of a potential claim rejection, this could provide a more a pro-active approach to correct the issue earlier and boost customer satisfaction.

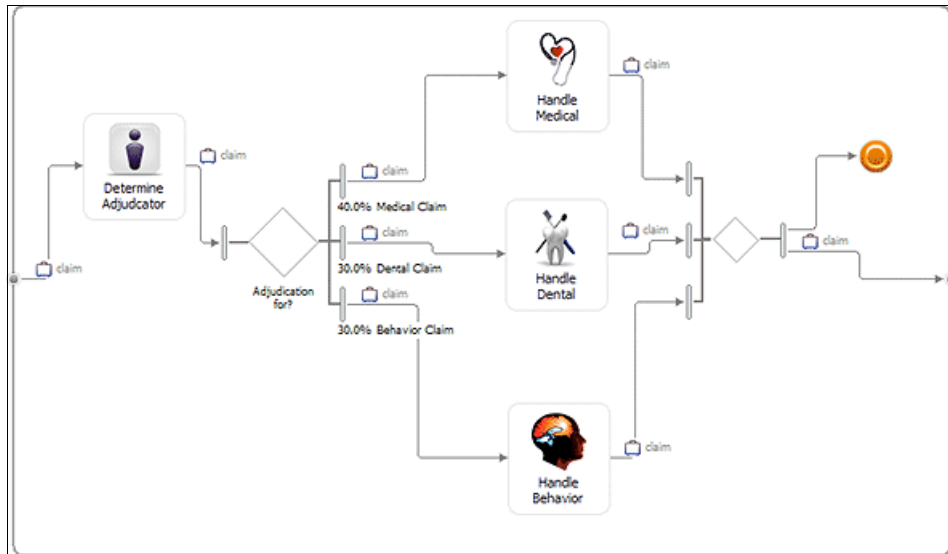


Figure 1-6 Overview of the claim adjudication sub-process

### 1.6.3 Interacting with the process through the business space

In this section, we introduce the Business Space. The Business Space represents a single point of entry for users, as well as other key process stakeholders to view the process and collaborate on process reviews and potential process improvements.

We now are seeing the process through the perspective of the customer service representative who enters the claim information and begins the claim intake process. Figure 1-7 on page 19 illustrates a form into which a customer service representative of the system enters information.

Figure 1-7 Claim intake form

As specific information is entered about the claim, the claim analyst works through a role specific form that supports custom views of data for different users of the system. The fields on the form provide data validation as information is entered and the process proceeds. (Figure 1-8)

Figure 1-8 Entering claim information: The form is specific to the role of the user of the system

Figure 1-9 illustrates an overview of the tasks in progress from within the Business Space. This view represents a supervisor's view into the system, allowing the supervisor to review the progress of work allocated across the team. If necessary, the supervisor can re-allocate tasks amongst resources to more evenly distribute the workload.

**Note:** Chapter 5, “Manage” on page 135 provides in-depth coverage of the Business Space and its capabilities.

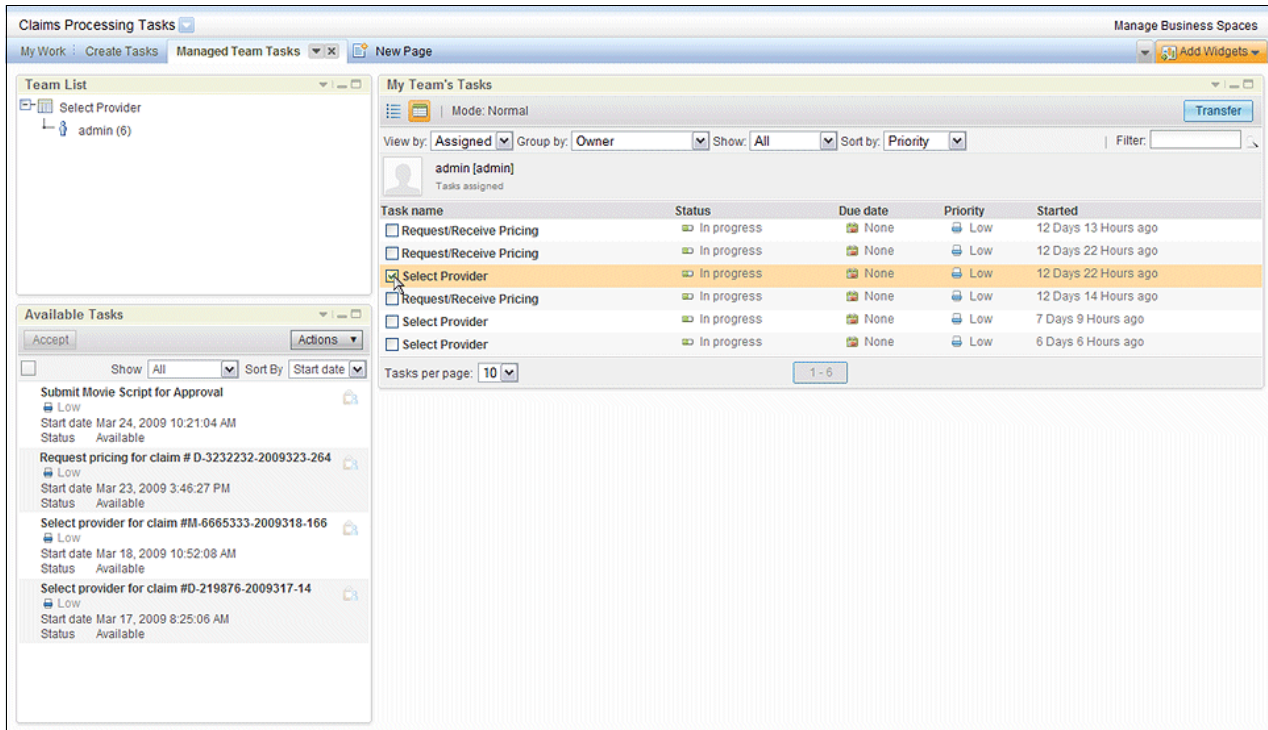


Figure 1-9 Overview of the Business Space: Manager perspective

## 1.6.4 Monitoring and managing the performance

Figure 1-10 on page 21 provides an in-depth view into the Business Space. The Business Space allows users and managers to view what is happening in the process. It provides a quick and simple overview of the following items:

- ▶ Number of claims processed
- ▶ Duration of the average claim processing time
- ▶ Trends in claim processing over time

Using the Business Space, managers and analysts have an aggregate view of the business data they really need in a way that makes sense. They can drill down to obtain more specific details for processes as needed.

**Note:** Chapter 5, “Manage” on page 135 provides in-depth coverage of the Business Space and its capabilities.

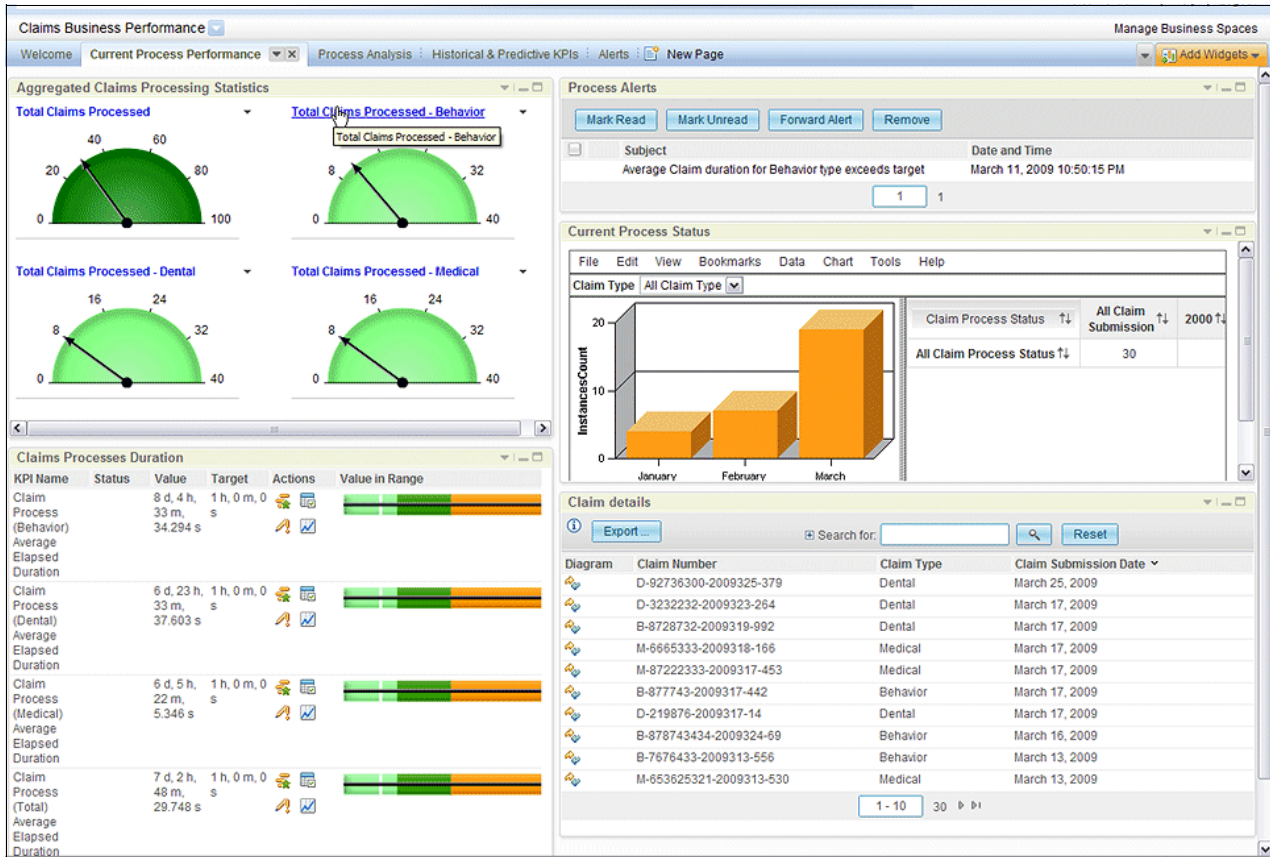


Figure 1-10 Using the Business Space to monitor and manage performance

## 1.6.5 Modifications to be made to the process to address business goals

In the following chapters, we provide details on how the fictitious company in our scenario has modified their processes to improve their claim handling efficiency and reduce costs.

The modifications to the process we discuss in this paper include the following modifications:

- ▶ Business rule modifications

Within the process, we illustrate how to make the following business rules that are aimed at reducing the number of claim rejections, thereby reducing costs and increasing customer satisfaction.

- Focusing on the claim intake subprocess (see Figure 1-11 on page 22), we perform an analysis in the Storyboarding phase that illustrates the potential cost savings if the number of claims handled automatically versus being routed to the manual task were increased to 90% from the current level of 50%. See 3.4.5, “Issue 3: Cost of service intake” on page 61 for more details on this analysis.

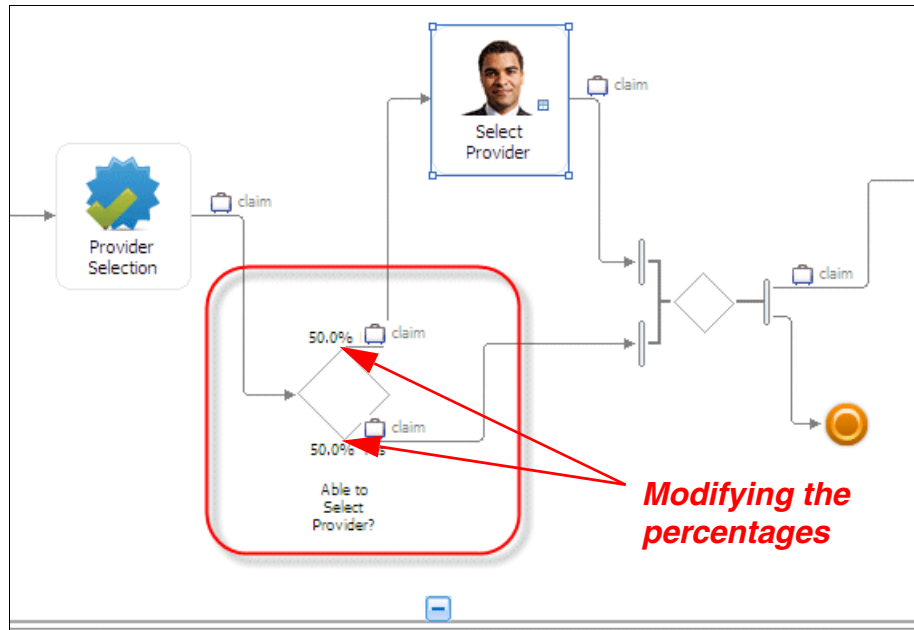


Figure 1-11 Modifying the percentages routed to the manual task of Select Provider

- Reduce the overall number of claim rejections by modifying claim eligibility and encouraging a greater number of claims to be handled automatically. This is going to be addressed by changing the efficiency of the tasks “Check Member Eligibility”, “Set Provider” and “Clean Claim Edits” to different ratios. See 3.4.6, “Issue 4: Cost of claim adjudication” on page 63.
- ▶ Process modification
  - To address customer complaints that are not informed of their rejected claims in a timely manner, we propose adding a task within the adjudication process called “Notify Rejection to Customer”. In the existing process, claim rejections are not pro-actively handled and the customer must often wait up to 60 days simply to be informed of a rejected claim. Figure 1-12 on page 23 illustrates where we add this task in the process. This is discussed in 3.4.6, “Issue 4: Cost of claim adjudication” on page 63.

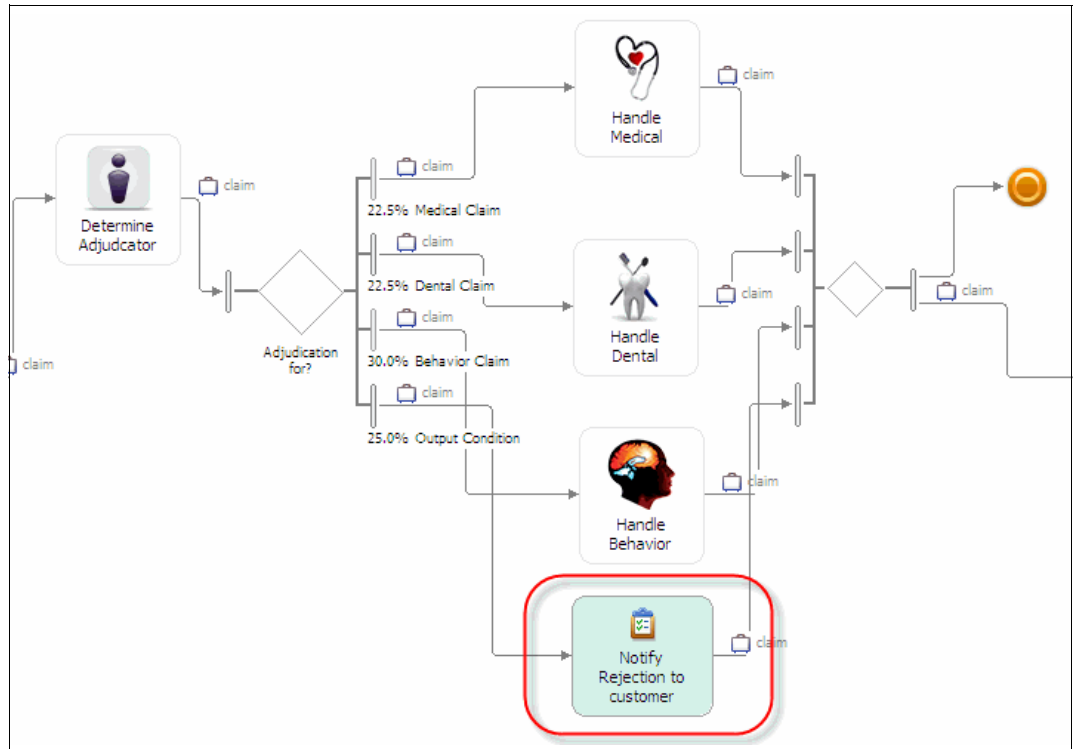


Figure 1-12 Adding a task to handle notification of rejections

- ▶ To address overall efficiency within a Human Task - Select Provider, we add an operational characteristic to the task that results in escalation if the duration of a task is in a pending state beyond one hour. This escalation improves quality of service by reducing the number of claims unnecessarily waiting in a pending state. It also reduces cost by maximizing the efficiency of the human task. This is described in 4.4, “Add operational characteristics” on page 85.

## 1.7 Key assumptions

Throughout the steps described in this paper toward implementing the BPM Solution for the Health Care Services Provider, the effort is based on the following assumptions:

- ▶ Positioning of the *IBM Business Process Management Prescriptive Guide to Solution Implementation* is intended as a solution toward a smaller scale, initial deployment at, for example, a departmental level.

The *IBM Business Process Management Prescriptive Guide to Solution Implementation* is an approach based on a subset of tasks initially in accordance with the more formal IBM BPM Enabled by SOA Method. The *Prescriptive Guide* is most suited for an initial smaller scale implementation, because it does not formally address many of the non-functional requirements for an enterprise scale, production deployment.

- ▶ The testing approach used in this paper is based on the IPD (Interactive Process Design) approach to deploying the model into a runtime environment. We do not cover a full scale deployment using WebSphere Integration Developer, (WID), WebSphere Process Server and other products which would typically be involved in a larger scale deployment.







# Discover

This chapter introduces the “Discover” phase within the approach outlined in the *Prescriptive Guide*. This is the first phase in the approach, with the goal of capturing the business intent through documenting and creating basic models for the business goals, objectives, and strategy. Within the chapter, we review the steps of the Discover phase using the specific context from the health care scenario introduced in 1.6, “Introduction to the health care demo scenario” on page 15.

## 2.1 Overview of steps in the Discover phase

Discover is the first phase in the approach described in *IBM Business Process Management Prescriptive Guide to Solution Implementation*. This is the phase in which the business goals, objectives, and strategies are reviewed and agreed upon. From these goals, you can then use high level strategic maps to visualize the goals and begin review and better understand the process. Figure 2-1 illustrates the Discover phase as the initial phase.



Figure 2-1 Business activity phases

The steps to be accomplished in this phase include:

1. Identify business challenges
2. Strategize on solution
3. Define business/solution goals
4. Define business measures
5. Create business capability maps
6. Create high level processes for high priority business capabilities
7. Obtain executive sign-offs and approvals

Now that we have an understanding of the formal steps, we bring this together into a more meaningful context and explain the rationale which binds these activities together.

For example, the business (Health Care Insurance Co. ABC.) defines a set of initiatives for the year to meet its financial and transformation targets. From there, they need to define the strategies, or the high level *what* they will do to accomplish those initiatives. After they have defined those business measures, they then define measures to evaluate criteria for success and operational performance. After we have defined the *what*, we then look to *who* in our organization (people/asset/capability, and so forth) that will support the execution of the strategy. From there we map those organizations into a high level process, which represents the *how* of execution, that will realize and support those initiatives. Bringing all of these steps together and defining the *what*, the *how*, and the *who* is what makes up the Discover process.

Figure 2-2 on page 27 illustrates an overview of these tasks from a visual model perspective.

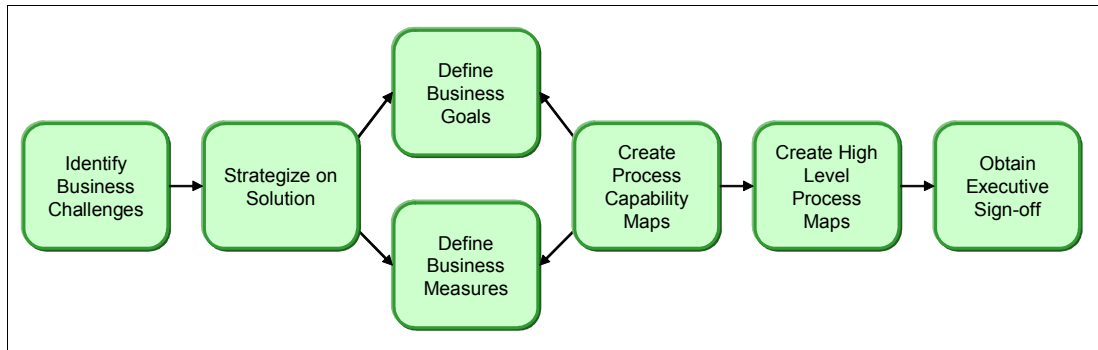


Figure 2-2 Visualization of the steps performed within the Discover phase

### 2.1.1 Activities within each task

This section provides more detail into the activities to be accomplished within each task. In 2.2.2, “Defining business goals and measurements” on page 29, we map these steps into the specific context of challenges, goals, and strategy for Health Care Insurance Co. ABC.

1. Identify business challenges
  - Work with business leaders to determine which business challenges might need to be addressed.
  - Prioritize and assess the challenges, and document them.
2. Strategize on the solution
  - Create strategies related to business challenges to determine their relationships to downstream goals and capabilities based on priorities.
3. Define business/solution goals
  - Identify specific, measurable goals to ensure that the solution is meeting the business needs.
4. Define business measures
  - Based on the identified strategy and goals, define business measurements (such as KPI’s, business SLA’s, and metrics) that can be tracked and monitored periodically to ensure the solution is meeting the specific business goals identified.

**Note:** The first four steps define the *what* aspect of what the organization will do. They understand the challenges and have identified a strategy containing goals and specific measurements for gauging their ability to reach that goal.

5. Create business capability maps
  - Prioritize capabilities based on business challenges.
6. Create high level processes for high priority business capabilities

**Note:** Steps 5 and 6. address the *who* and the *how* of the approach. Who is supported by specific business roles.

7. Obtain executive sign-offs and approvals
  - Ensure that executive level sign off is achieved to proceed to the next set of phases.

## 2.1.2 Tooling used for mapping strategic objectives, capabilities, and process maps

Within the Discover phase, strategic maps, capability maps, and high-level process maps can be created using one of several tooling options. For the purposes of this IBM Redpaper publication, we highlight the capabilities of the Business Leader Widgets that can be accessed and used collaboratively within the cloud.

- ▶ BPM Blueworks provides business users an easy on-ramp to BPM with cloud-based process and strategy tools.
  - Business leaders and business analysts can create, share, and collaborate using pre-built BPM content and contributions from BPM experts and users around the world to move quickly from strategy mapping to process execution.
  - Users of BPM BlueWorks can perform the following tasks
    - Capture and collaborate on BPM Business Designs in the cloud, including strategy maps, capability maps, and process maps, starting from scratch, using prebuilt templates, or using contributions from the community
    - Discover and contribute industry-specific BPM content that covers a full spectrum of BPM strategies, trends, capabilities, and best practices for making the smartest business decisions around BPM
    - Participate in the community by blogging, creating local meetups, and chatting with BPM experts

**Note:** Refer to the following Web page to learn more about the capabilities and tooling provided with IBM BPM BlueWorks:

<http://www-01.ibm.com/software/solutions/smartwork/bpmbblueworks/index.html>

## 2.2 Reviewing the business challenges, goals, and strategy for the health care scenario

This section discusses the underlying business challenges, goals, and objectives identified during the Discover phase.

### 2.2.1 Identifying business challenges

Using the fictitious scenario for Health Care Insurance Co. ABC, the primary business challenge is how to compete effectively in an environment where the following circumstances are true:

- ▶ Costs are increasing dramatically.
- ▶ Customers are becoming increasingly frustrated due to the complexity of the claim submission process and amount of repetitive paperwork required to submit a claim.
- ▶ Many of the manual tasks (for example, tasks involving humans processing paperwork and manually entering information into a system) are slow, error prone, and costly in terms of the number of steps required to complete the process.

To compete effectively and survive, Health Care Insurance Co. ABC must improve and automate their claim handling process.

## 2.2.2 Defining business goals and measurements

After strategizing on how to best meet the business challenges presented above, the business leaders and analysts have identified the following business objectives for Health Care Insurance Co. ABC:

- ▶ Streamline and automate manual processes where possible
- ▶ Reduce claim processing turn around time
- ▶ Reduce manual processing costs
- ▶ Improve customer satisfaction

In terms of how they measure this success toward the goal, this is defined through the following means:

- ▶ Number of claims processed. Claims will also be segmented by type of claims, namely medical, mental, and dental
- ▶ Average processing time for claim

Figure 2-3 illustrates a high-level strategy map, illustrating objectives, and the measurements for success. This map was created using tooling from the IBM BPM Blueworks and Business Leader widgets. The creation of this map has also set the foundation for defining specific business measures, such as service level agreements (SLAs) and KPIs.

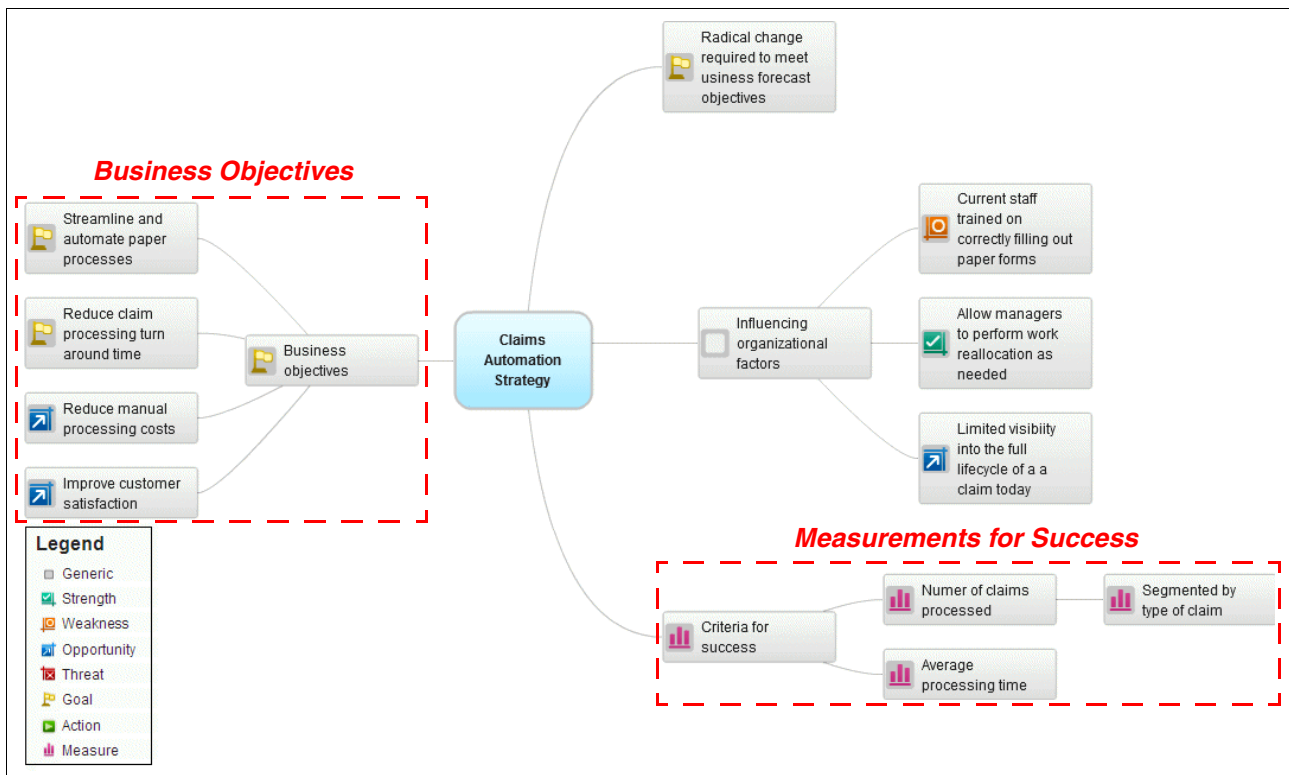


Figure 2-3 High level strategy map with objectives and basic measures

## Establishing base KPIs

As the process is analyzed and refined, Health Care Insurance Co. ABC can define metrics that can be tracked and monitored periodically to ensure the solution is meeting business goals. Some of the base KPIs that will be used in the simulation model discussed in Chapter 3, “Storyboarding” on page 35, include the following tasks:

- ▶ Number of claims handled on a daily basis
- ▶ Number of claims rejected
- ▶ Percentage of claims routed to the manual, human task “Select Provider”.
- ▶ Duration required for the human task “Select Provider”.

This is a manual process that is time consuming and expensive, so the goal is to bring the duration of this task down.

- ▶ Maintaining the percentage of claim rejections to below 25 percent of overall submitted claims.

Accomplishing a reduction in rejected claims achieves two objectives:

- It increases customer satisfaction, a primary goal.
- It reduces cost associated with handling rejected claims.

**Note:** See 3.9, “Definition of control points to prepare experience” on page 77 for details on how these KPIs are used during the modeling simulation.

Refer to 5.6, “Manage in real-time using KPIs” on page 149 for details on monitoring and managing these KPIs during the Manage phase.

## 2.2.3 Creating high-level capability maps

By creating a basic capability map, the goal is to make sure that the organizational capabilities can and will align with the strategic objectives. This can help to identify gaps between the organization’s existing capabilities and the strategic objective, prompting modification to the capabilities, goals, or both.

Figure 2-4 on page 31 illustrates the basic capability map in terms of organizational resources and IT resources, mapping these against the objective for claims processing and handling. It is possible from the high-level capability map to drill down into more detailed models within the organizational resources and the IT resources.

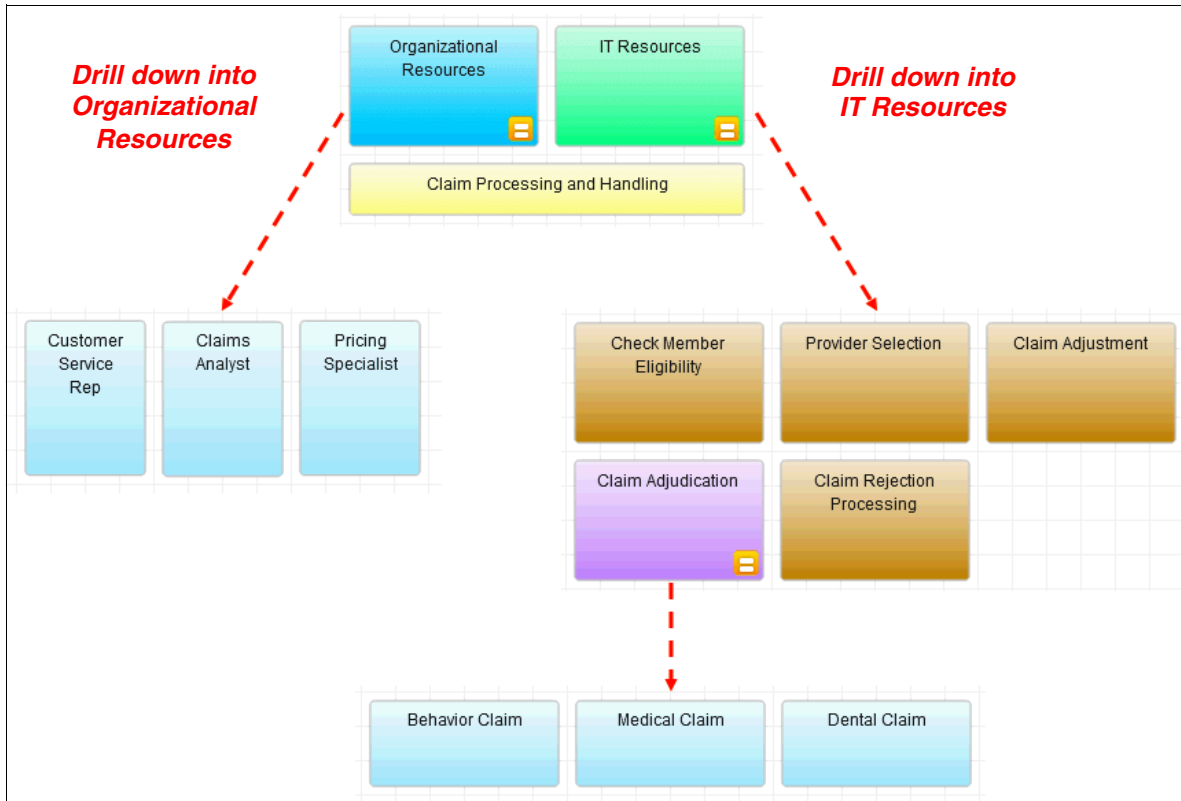


Figure 2-4 Example of a capability map

## 2.2.4 Creating high-level process maps

The next step in the Discover phase is for Health Care Insurance Co. ABC to create high level process maps for the high priority business capabilities. Figure 2-5 shows an initial, high-level process map.

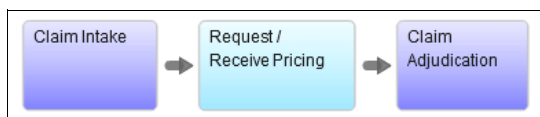


Figure 2-5 High level process map

The top level processes and their immediate sub-processes consist of the following elements:

- ▶ Claim Intake
  - Determine member eligibility
  - Choose provider
  - Clean up claim data
  - Approve or reject claim

Figure 2-6 illustrates the claim intake process.

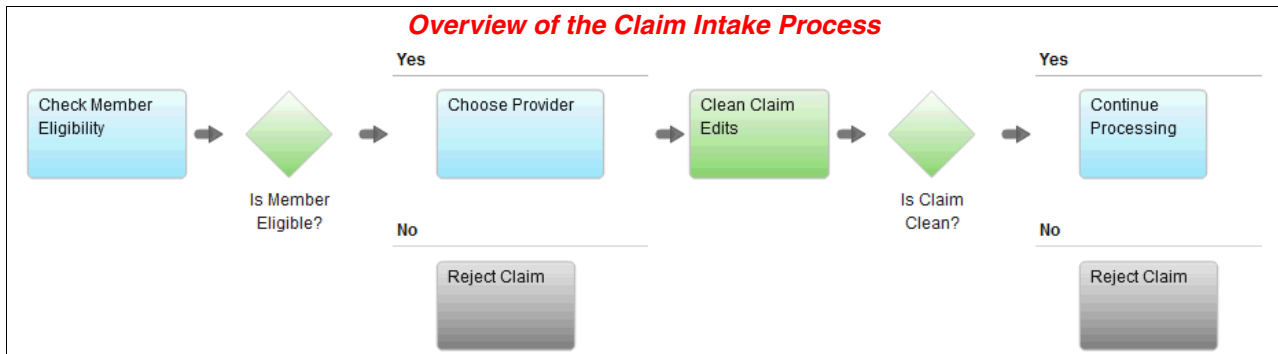


Figure 2-6 Overview of the claim intake process

- ▶ Adjust pricing
  - Determine payable amount based on plan membership eligibility.
- ▶ Determine adjudicator
  - Determine how to handle this claim,
  - Route to appropriate department, depending upon if this is a medical, dental, or mental health claim and perform claim adjudication

Figure 2-7 illustrates an overview of the claim adjudication sub-process.

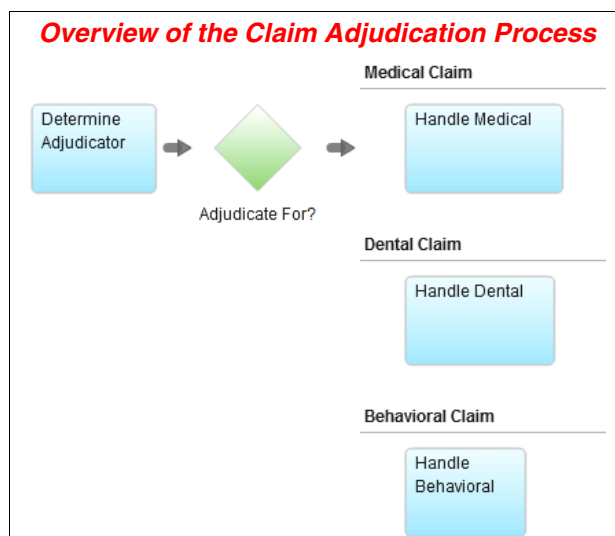


Figure 2-7 Claim adjudication process



**Note:** These process maps represent the initial, high-level process maps. In Chapter 3, “Storyboarding” on page 35, we explain the process model in detail, beginning with a more detailed model of the process, representative of what a customer might provide as their understanding of the documented ‘as-is’ business process.

## 2.3 Summary

In this chapter, we have provided the basic business context for the scenario based on Health Care Insurance Co. ABC. Using the steps outlined in the Discover phase in the *IBM Business Process Management Prescriptive Guide to Solution Implementation*, we have analyzed and mapped the strategic business goals and objectives in a strategy map. We have also identified the base metrics and KPIs to monitor and manage our success toward reaching these goals. These metrics are a foundation and will be refined and simulated throughout the upcoming Storyboarding, Experience, and Manage phases of the effort. Finally, we created a high-level capability map to confirm that the organization’s capabilities are in alignment with the strategic objectives, while also beginning to map out the top level processes based on capability prioritization.

Before proceeding to the Storyboarding phase, we should have executive level sign-off approving the strategic objectives, goals, and maps produced during this phase.





# Storyboarding

The goal of Storyboarding consists of assessing the current processes, process performance, and process enablers (technology, organization, and knowledge) to develop the requirements for future processes. The considered processes and measures, which have been selected during the discovery phase, are first documented and assessed for potential issues and improvements. Then they are explored for automatization, and specified with measures, or control points.

This chapter provides documentation of the as-is situation, gap analysis, and definition of the future state of the process model and measures. It explains how to perform the following tasks:

1. Capture the as-is state of the selected business process. The as-is state of the selected business process has been previously captured within the Business Leader Space of BPM Blueworks.
2. Simulate the captured business process through the simulation capabilities of WebSphere Business Modeler. Determination of the most expensive and the less efficient paths in the process.
3. Assess and discuss improvements in the business process by taking into consideration simulation results, but also strategy and goals of the company determined during the discovery phase.
4. Define the new future state of the Business Process Flow and Measures (KPIs) based on strategy and discussion outcome.

#### **Tools used in this chapter:**

WebSphere Business Modeler models the “as is” process, the “to be” process, and its process measurement requirements. Refer to the following Web page for more information:

<http://www-01.ibm.com/software/integration/wbimodeler/index.html>

### 3.1 Overview of steps in Storyboarding phase

Storyboarding is the second phase in the approach described in *IBM Business Process Management Prescriptive Guide to Solution Implementation*. This is the phase in which the user interactions and the accompanying business processes are reviewed and modeled. The goals are to capture and refine the current state/as-is process so that you can understand how enhancements can be incorporated to arrive at an improved future state process. During this phase you will validate the inputs and outputs and review and validate human interactions with the system.

An overview of the tasks in this activity phase is as follows:

- ▶ Capture/refine current state process
- ▶ Examine alternate ROI to determine best approach
- ▶ Define/refine future state process
- ▶ Capture roles
- ▶ Identify process steps as candidates for business rules
- ▶ Define task inputs and outputs and mock up forms for human interactions
- ▶ Validate and visualize human interactions.

Figure 3-1 illustrates the steps involved in the Storyboard phase.

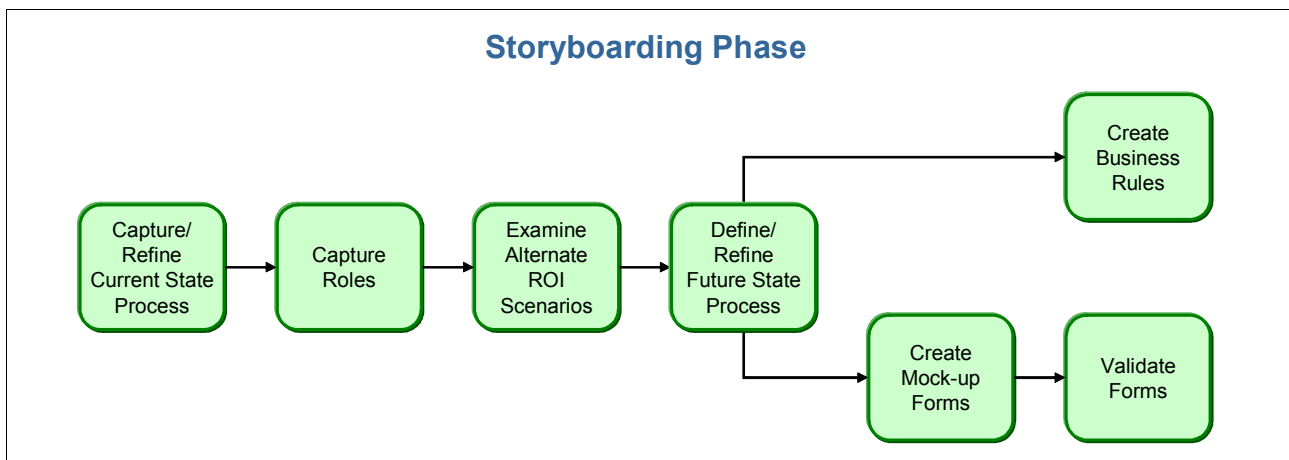


Figure 3-1 Steps involved in the Storyboard phase

**Note:** Throughout this chapter, we use the Health Care Insurance Co. ABC scenario demo for specific context. If you are not yet familiar with the Health Care Insurance Co. ABC scenario, refer 1.6, “Introduction to the health care demo scenario” on page 15.

### 3.2 Capture and refine the current state process

The first step of storyboarding is named “Capture/Refine current state process” as seen in Figure 3-2 on page 37.

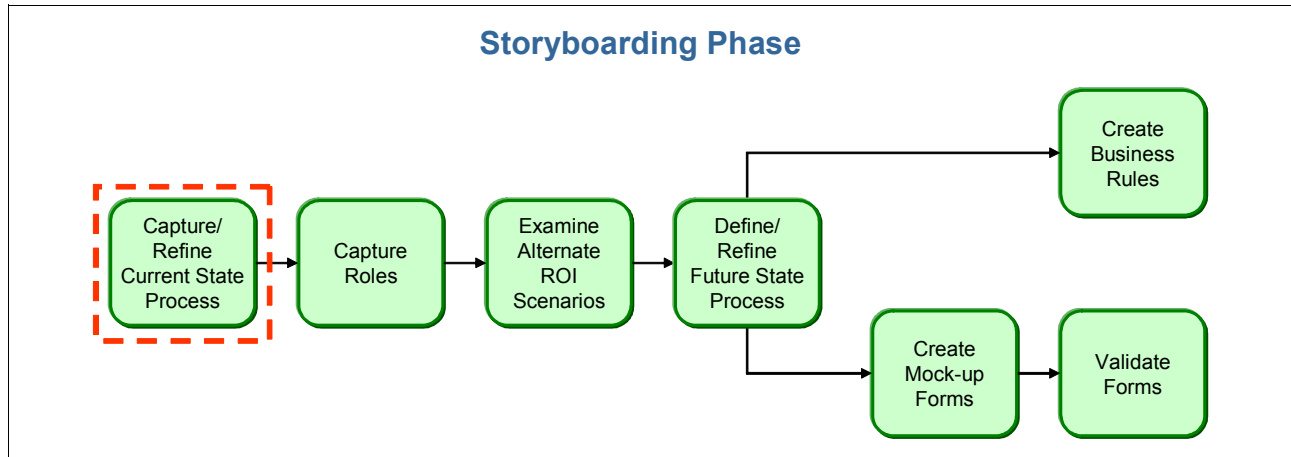


Figure 3-2 Capture and refine current state model

Capture of a business process means the translation of this business process into a meta language named “BPMN2.0”. In reality, these business processes exist in one of the following forms:

- ▶ Paper form
- ▶ High level diagram created within a software tool
- ▶ Intellectual capital of the employees

Regardless of the form, assuming the knowledge about the processes has previously been documented, the result of the first step of Storyboarding consists of standardizing the knowledge about this process and translating it into a common meta-language using an IT tool. This common meta language is BPMN.

**Note:** The value of standardizing business processes that existed previously in in paper form allows for re-use, flexibility and ease of change going forward. Standardized processes can be easily annotated with improvement suggestions, measure points, critical points, roles, costs and other important process information. These annotations happen within a collaboration space to enable easy exchange of information between business leaders and business analysts. This brings a fast time to market and high adaptation capabilities to change.

Based on the fictitious scenario, Health Care Insurance Co. ABC claims process, we show the business value of standardized and meta-language-based modelization based on a real-life scenario.

The sub-sections of this chapter explain the value of and how to perform the following tasks:

- ▶ Import high-level process diagrams
- ▶ Refine imported process model
- ▶ Add business item information

### 3.2.1 Import high level process diagrams

This IBM Redpaper publication assumes that high-level process diagrams have been created within BPM Blueworks or using the Business Leader Widgets from IBM WebSphere Publishing Server. We assume that three processes have been created based on the high-level process diagrams, strategy maps, and capability maps explained in Chapter 2, “Discover” on page 25:

- ▶ Claim process
- ▶ Claim intake
- ▶ Claim adjudication

Figure 3-3 shows the repository of the three created processes. These processes can be visualized within a Web Browser on either BPM Blueworks or using the Business Leader Widgets.

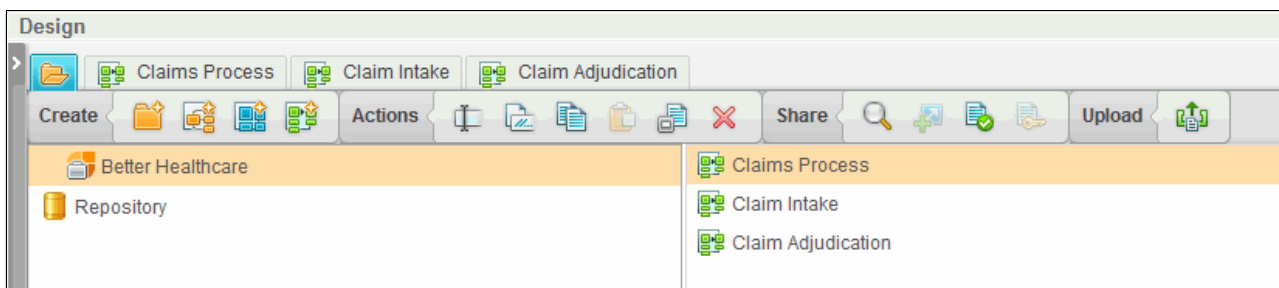


Figure 3-3 Health Care Insurance Co. ABC repository showing three created processes

The Business Leader Widgets permit sharing of artifacts within the Web browser and enables collaboration on these processes.

Figure 3-4 shows the high level process diagram of claim adjudication. Although that the diagram is high level, it already contains a lot of information, including branch activity name, branches, and condition information. In addition, the user can link activities to documents, make comments, and collaborate on this model with his peers. Collaboration occurs through the Web browser.

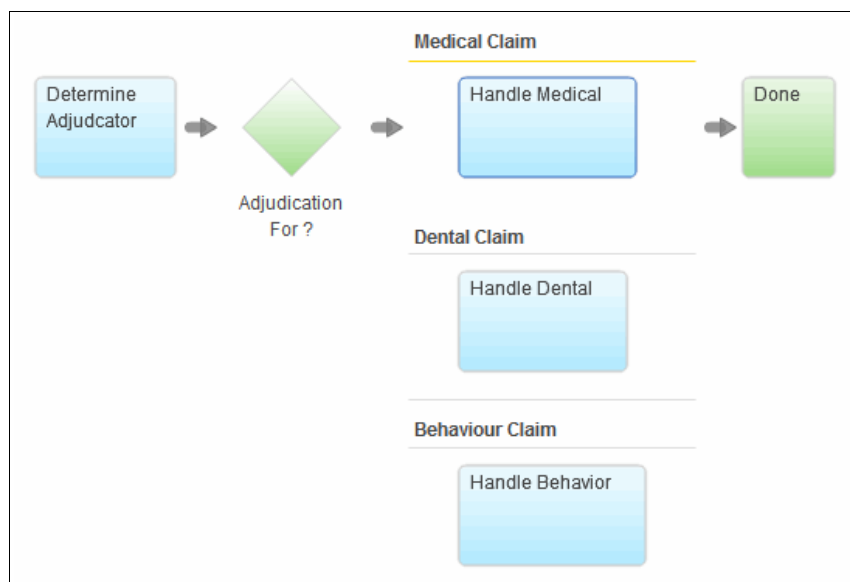


Figure 3-4 High level process diagram of claim adjudication

Figure 3-5 and Figure 3-6 show a high-level process diagram of process claim intake. Branches have been named and we added so-called “go to” activities pointing to Reject Claim. They permit the user to indicate that a particular task or activity is pointing to another task or activity (in this case, claim rejection).

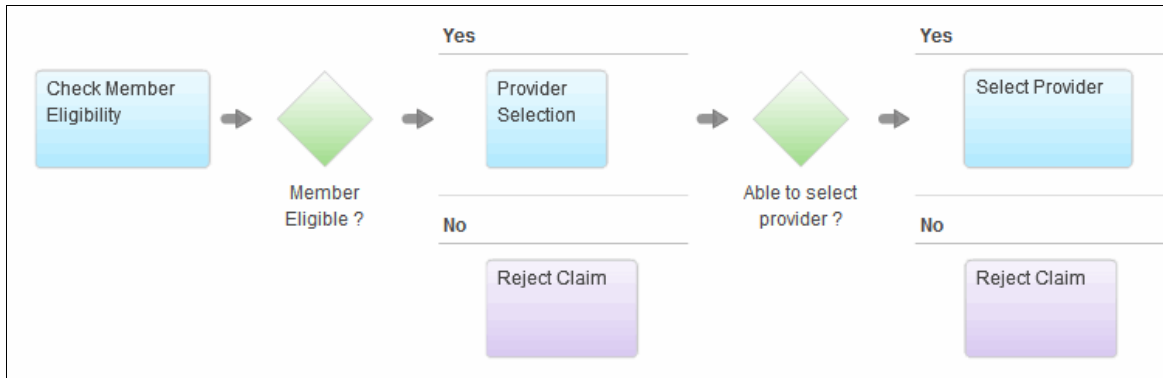


Figure 3-5 High-level process diagram of claim intake (Part 1)

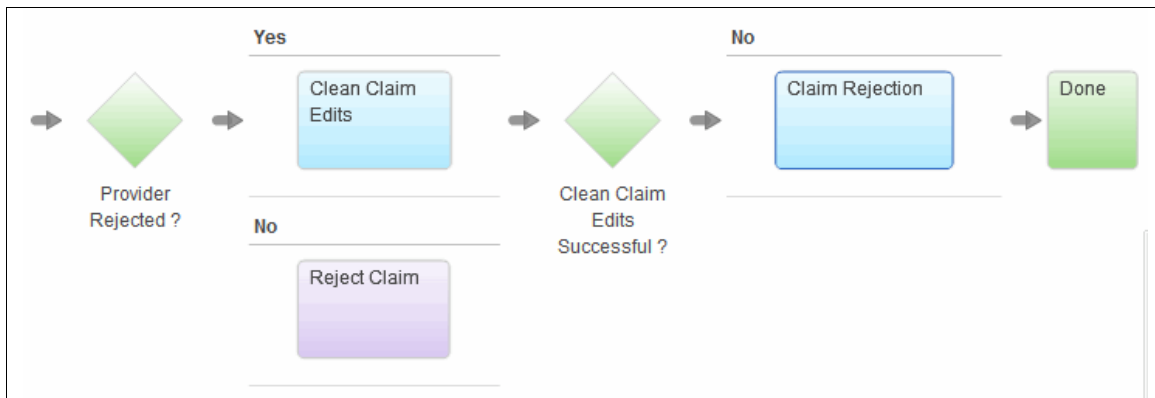


Figure 3-6 High-level process diagram of claim intake (Part 2)

The following steps detail the export of the processes towards the WebSphere Business Modeler.

1. Click **Export** in the toolbar and wait for the export functionality to appear. See Figure 3-7.

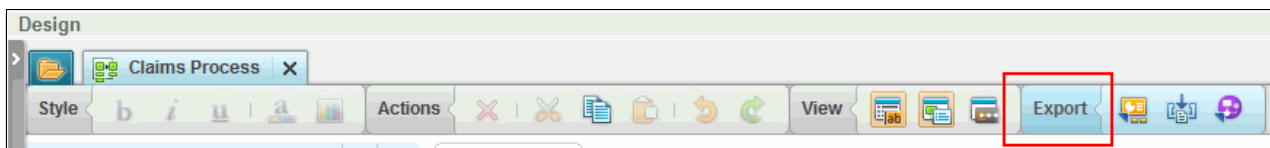


Figure 3-7 The **Export** button

2. Select the **WebSphere Business Modeler** icon from the toolbar, as shown in Figure 3-8.

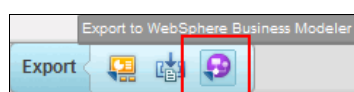


Figure 3-8 Business Modeler icon in Export toolbar

3. Click **OK** to download the XML to your server. Repeat the steps with the three processes including “Claim Intake”, “Claim Process” and “Claim Adjudication”

**Note:** Appendix A, “Additional material” on page 249, contains appendix material that shows how to import a Business Process Flow from third-party tools. In this case we use an existing Business Process Flow diagram designed in Microsoft Powerpoint. In several cases business process diagrams already exist in a third-party tool, and you might want to import these diagrams into the WebSphere Business Modeler.

Refer to Appendix A, “Additional material” on page 249 for information about how to download this additional information.

### 3.2.2 Refine process model after import

The following steps show the imported process model for Process Intake, Process Adjudication and Claim Process. Some of the information in these flows is not needed. We highlighted this information with red boxes. It is part of the capture process to standardize and refine the processes to make the processes as logical as possible.

1. The merge activity is not needed. It can be deleted and Provider Selection can directly be wired to the next activity (See Figure 3-9).

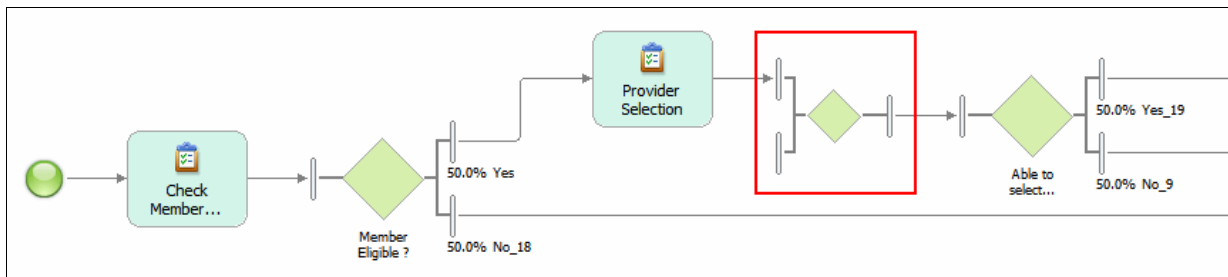


Figure 3-9 Claim intake (Part 1 of 3)

2. Another merge activity and duplicate Reject Claim activities are not needed. They can be deleted and wired directly to the next activity (Refer to Figure 3-10.).

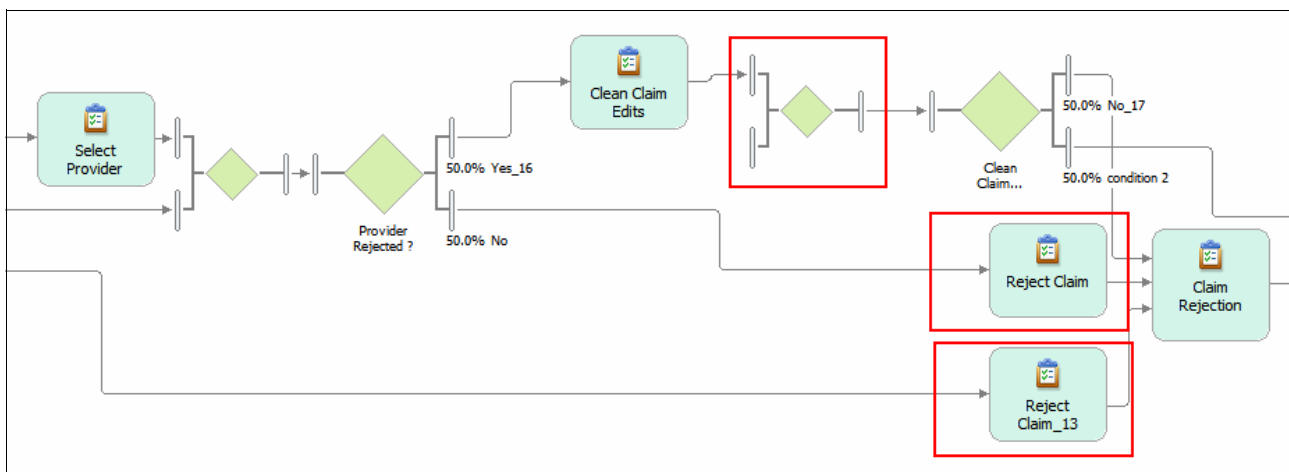


Figure 3-10 Claim intake (Part 2 of 3)



3. Scroll to the end of the process. The Done activity is not needed. Remove this activity and delete it from the process pane. (Refer to Figure 3-11.)

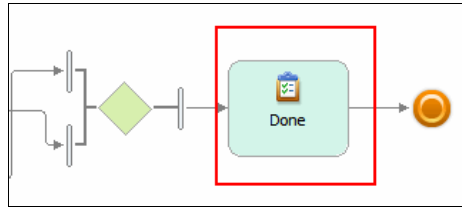


Figure 3-11 Claim intake (Part 3 of 3)

4. Switch to the Claim Adjudication process. The Done activity is not needed. Remove the activity and rewire the process correctly. (Refer to Figure 3-12.)

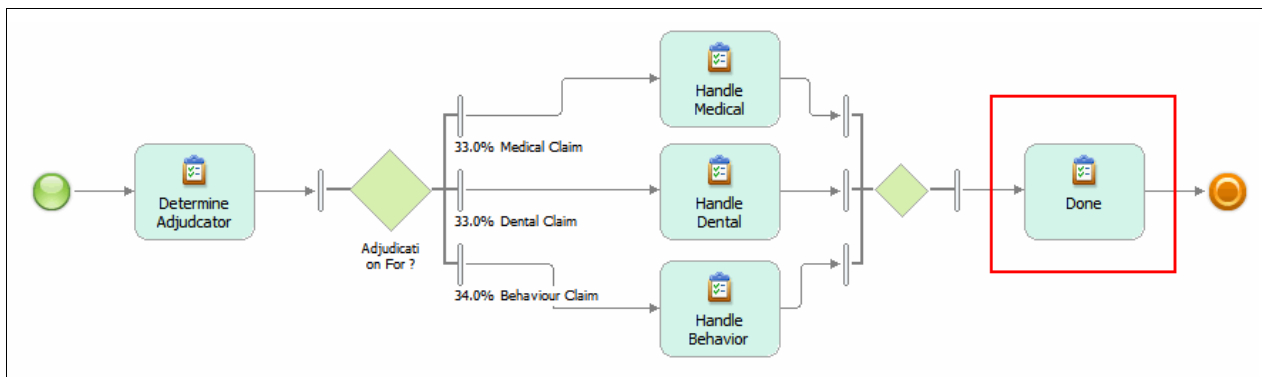


Figure 3-12 Claim adjudication process

At this point the three processes shown in Figure 3-13 (Claim Intake, Claim Adjudication and Claim Process) will be successfully imported and adjusted. None of the processes is wired to its input node. Without having the input node correctly wired, it is not clear what type of data is needed to start the process. Also simulation would not run correctly.

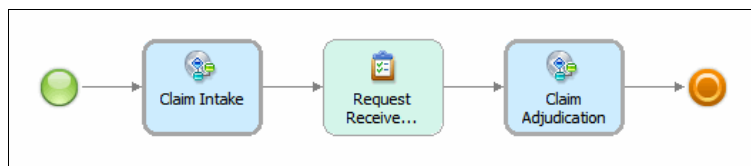


Figure 3-13 Claims process

5. Wire “Check Member Eligibility” to the input node of the process. Figure 3-15 on page 42 shows a wire between the process input (bullet on left side of figure) and the next task named Check Member Eligibility.

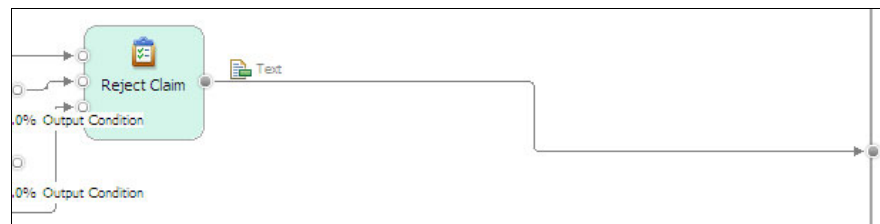


Figure 3-14 Wire output node of process.

- The last activity named "Reject Claim" needs to be wired to the process output. Figure 3-14 on page 41 shows the link between Reject Claim and the Business Process Output. This is necessary to specify the output information of the process.

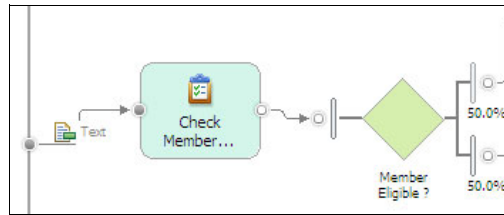


Figure 3-15 Wire input node of process

- Simulation requires that every process is finished with a terminate node. Figure 3-16 shows the Reject Claim activity linked to a terminate node.

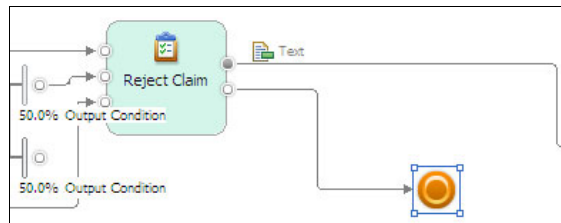


Figure 3-16 Reject claim activity linked to a terminate node

**Important:** The End Node and Terminate Node look similar. Make sure you created a Terminate Node and not an End Node.

- Repeat step Figure 3-9 on page 40 through 7 for the Claim Adjudication process. Wire the input node of the process to the first activity and wire the last activity to the output node, as shown in Figure 3-17. Add a terminate node if none are present. At this stage, you should have three processes:

- Claim Intake
- Claim Adjudication
- Claim Process

The processes should have linked inbound and outbound communication respectively an end Bullet.

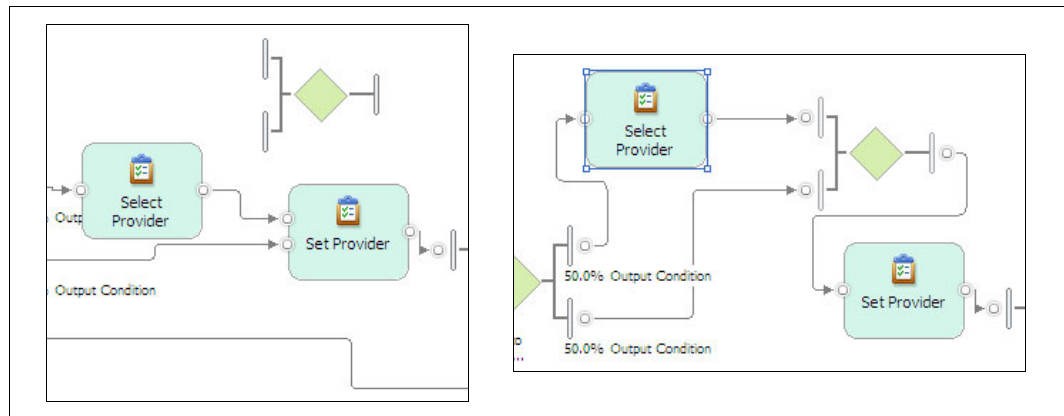


Figure 3-17 Completing wiring for the input and output nodes

### 3.2.3 Add business item to process flow

Business items are business documents, work products, or commodities that are transformed in business operations. Examples of business items are manufacturing order, mother board, power supply, and memory chip (in a PC assembly process), itinerary and customer information record (in a trip reservation process), and passenger (in a transportation process).

The business item used within the claim process for Health Care Insurance Co. ABC is described in Table 3-1.

Table 3-1 Business item description

Field Name	Type
FirstName	Text
LastName	Text
ClaimNumber	Text
ClaimType	Text
Amount	Integer
Plan	Text
BillingProvider	Text
MemberNumber	Text
ContactPhone	Text
ContactAddress	Text
ReasonCode	Text
Cause	Text
Date	Date
UsedAmbulance	Boolean

**Note:** Instead of using WebSphere Business Modeler to edit a business item, a business item could also be defined in a third-party tool such as Excel and later imported into WebSphere Business Modeler. Refer to the WebSphere Business Modeler Information Center for more details:

<http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp>

The following procedure describes how the business item-named claim has been imported into WebSphere Business Modeler.

1. Right-click **Claims-Model** within the Project Tree view of WebSphere Business Modeler and select **Import** from the context menu. Figure 3-18 displays a listing of formats to import.

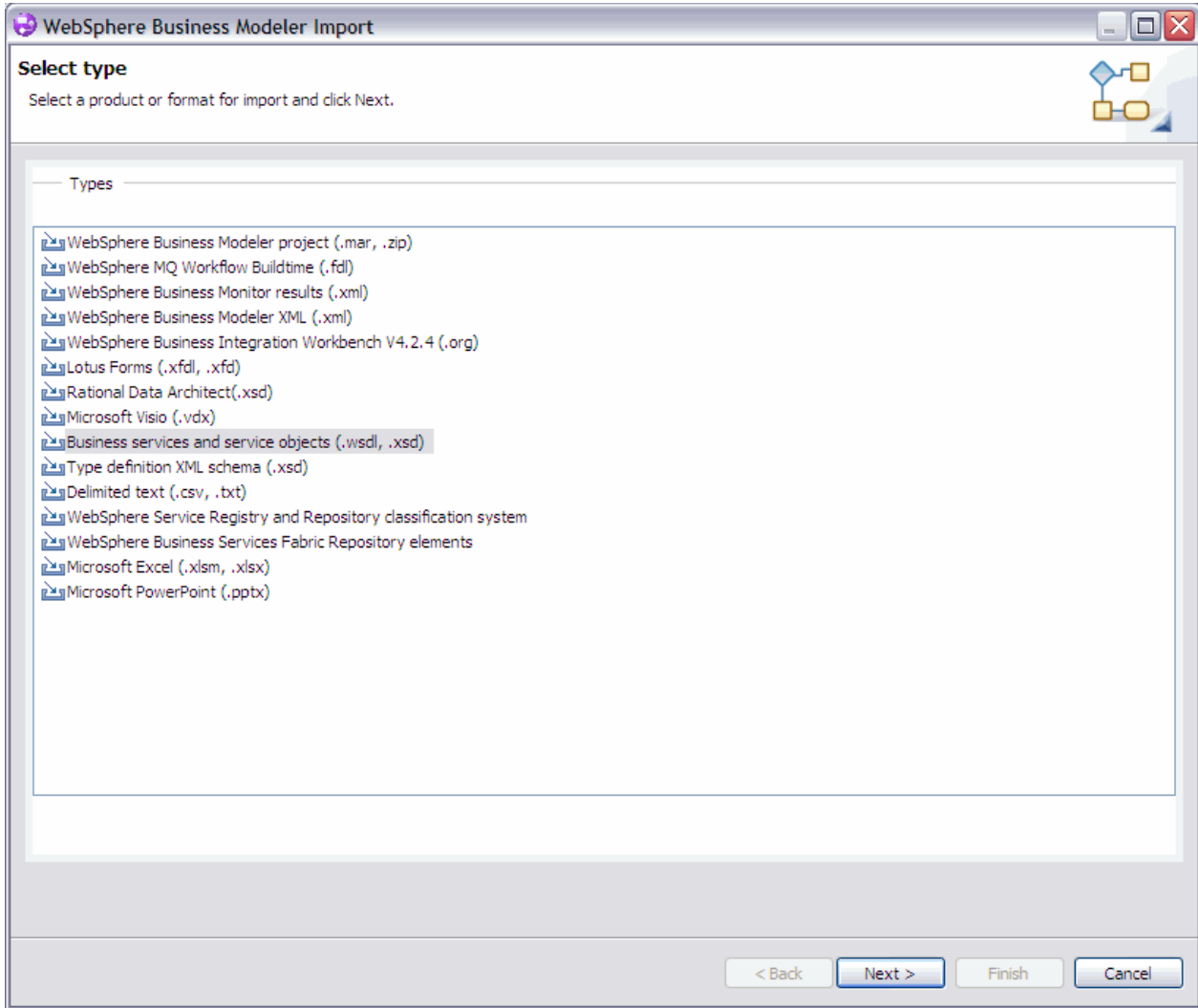


Figure 3-18 Listing of formats available for import

2. Click **Next** and select the folder containing the Business Item XSD file as shown in Figure 3-19.

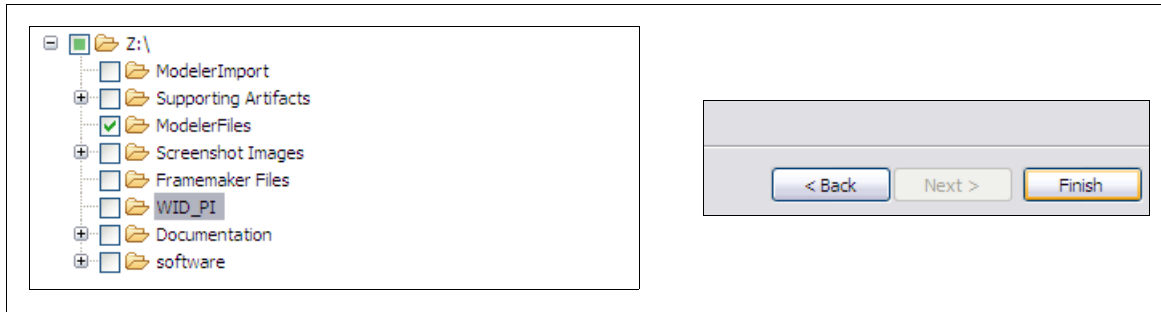


Figure 3-19 Folder containing the Business Item XSD file

3. Click **Finish**.
4. Switch to the “Advanced Mode” of WebSphere Business Modeler by selecting **Modeling** → **Mode** → **Advanced** from the menu.
5. Drag the Claim” Business Item to every path in your Business Process Flow Model. This needs to be done exactly on every link (path) within the Claim Adjudication, Claim Intake, and Claim Process processes. See Figure 3-20.

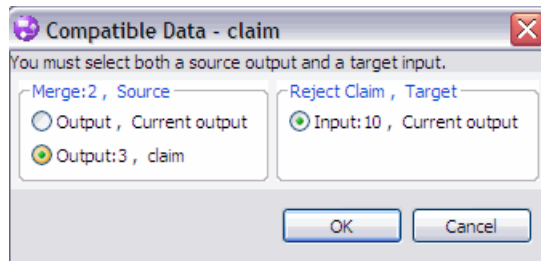


Figure 3-20 Specify correct input and output task during drag and drop of business item

While performing this operation, you might be presented with the dialog box shown in Figure 3-20. If this occurs, select the “Claim” option in that dialog box.

6. Change type of input and output from tasks, if needed. See Figure 3-21.

**Important:** Make sure WebSphere Business Modeler changes existing inputs and outputs to “claim”. In some cases, WebSphere Business Modeler might want to generate additional inputs and outputs instead of converting the existing inputs and outputs. If this happens, you can remove the superfluous inputs and outputs or change the existing datatype to “claim”. See Figure 3-21.

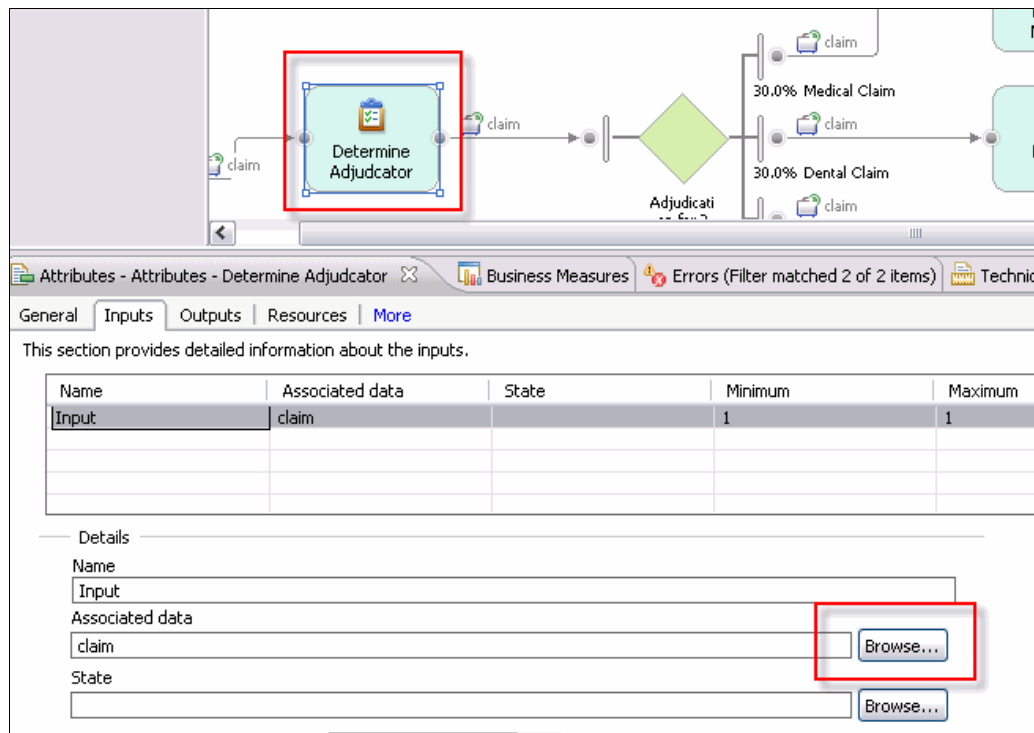


Figure 3-21 Change Input and Output type of tasks

### 3.3 Add roles and cost to as-is process

The next step of Storyboarding is called “Capture Roles, Create Human Tasks and add Roles to Human Tasks” as seen in Figure 3-22 on page 47.

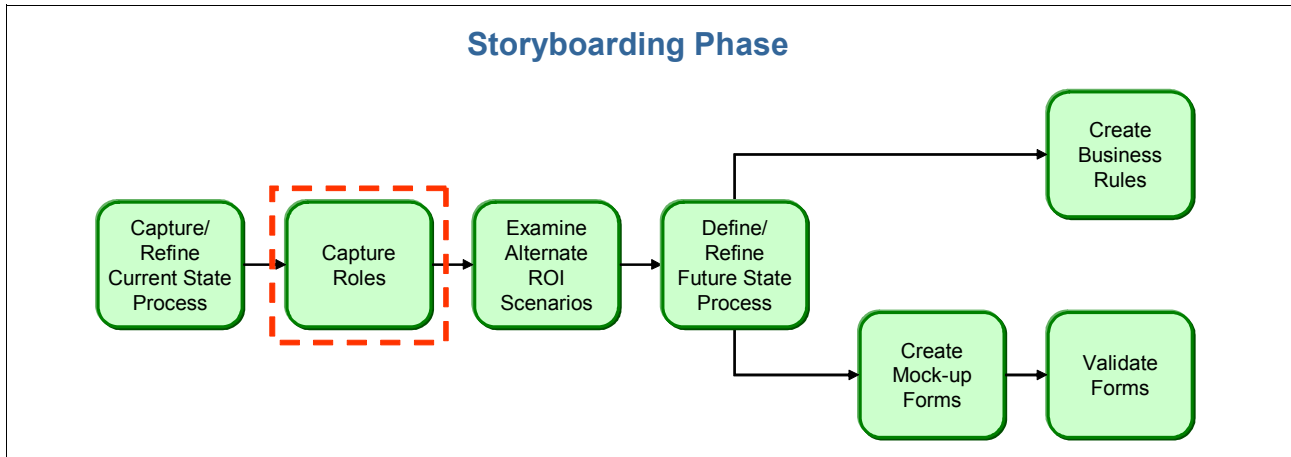


Figure 3-22 Capture roles, assign human tasks, and add cost

This section concentrates on adding roles and cost information to the BPM. The initial Powerpoint describing the process flow does not give that information, making it difficult to understand what is the most expensive path within the process and making it difficult to optimize the process. Overall this is done through the following procedures:

- ▶ Capturing all relevant human roles that perform steps in the process
- ▶ Capturing all cost and duration information and association of this information to the steps in the process

**Note:** WebSphere Business Modeler gives possibilities to attribute roles to tasks. A role is an additional characteristic to a resource. An employee resource could have the role of customer service representative for example.

### 3.3.1 Adding roles to as-is process

Table 3-2 describes the roles that need to be defined for Health Care Insurance Co. ABC.

Table 3-2 Process roles

Role Name	Description	Attributed to
Claims Analyst	The claims analyst is in charge to claim requests to determine an appropriate billing provider	Task "Select Provider"
Customer Service Rep	The Customer Service Representative processes claim information, either over the counter or through phone.	Not attributed.
Pricing Specialist	The Pricing Specialist looks at the claim information and adjusts the claim amount based on the nature of the claim	Task "Request Receive Pricing"

The following steps describe how you can create the roles for Health Care Insurance Co. ABC:

1. Create roles as shown on Figure 3-23. Right-click **Resources** → **New** → **Role**. The “Create a new role” dialog box displays. Name the new role “Pricing Specialist” and give a meaningful description. For example: “The Pricing Specialist looks at the claim information and adjusts the claim amount based on the nature of the claim.” Create two more roles named “Customer Service Rep” and “Claim Analyst”. Describe the roles as indicated in Table 3-2 on page 47.

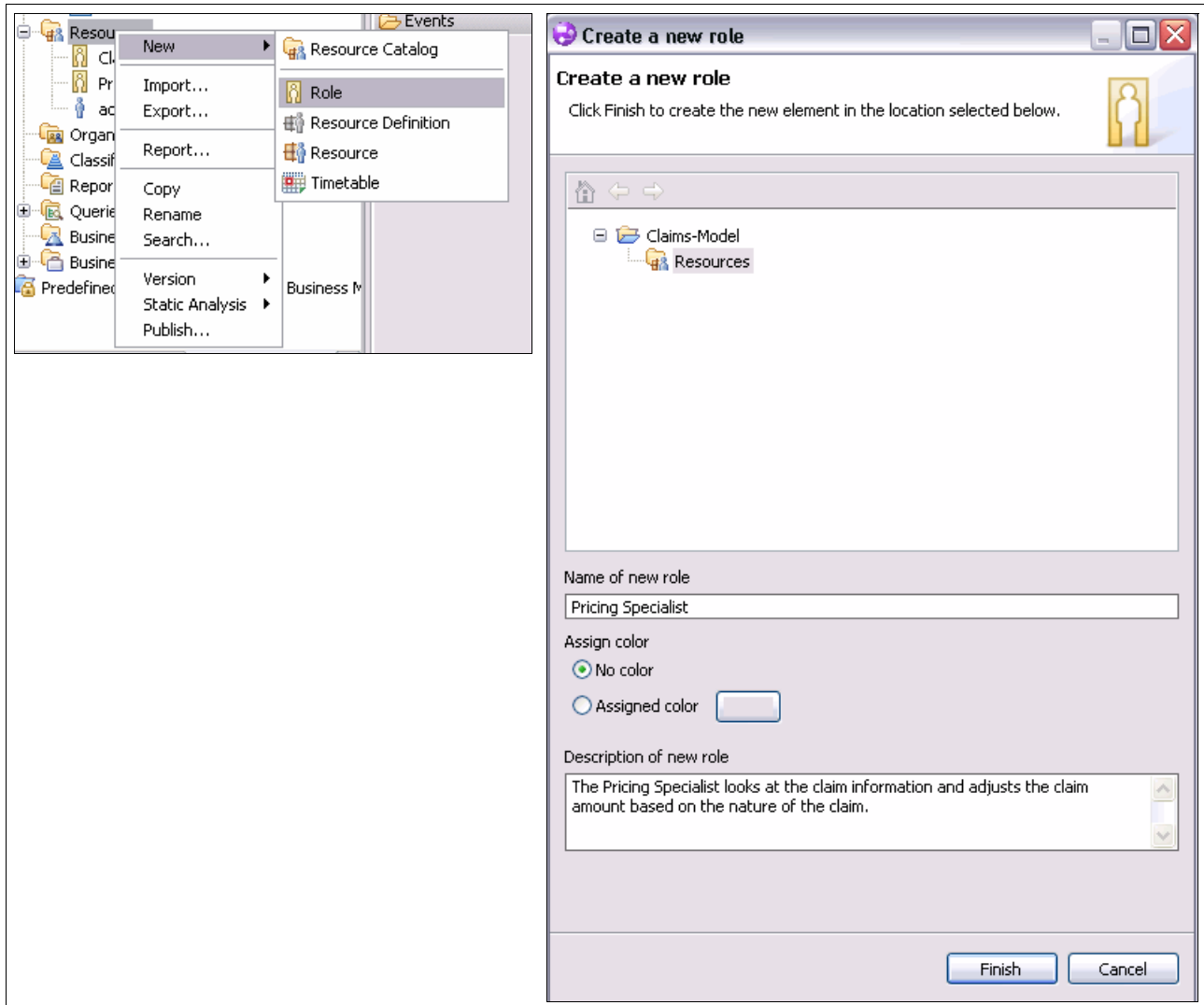


Figure 3-23 Create new role

2. Add “Pricing Specialist” and “Customer Service Representative” roles.

**Note:** After having attributed a role to a resource, the business analyst could switch to the swimlane layout. The swimlane layout rearranges elements in the diagram according to which organization unit, location, individual resource definition, or role requirement they have. Using swimlane mode shows who is performing what in the process. Swimlane layout based on roles is activated by navigating to **View** → **Switch to Swimlane Layout** → **Role**.



**Note:** The user can change the image of the various tasks of the process flow. WebSphere Business Modeler has predefined images for tasks, making the model easier to read. Right-click **Task** and navigate to **Change Image** → **Custom Image** from the context menu.

### 3.3.2 Add cost information to As-Is process

Every activity task within the claim process costs money to Health Care Insurance Co. ABC. To make our simulation as accurate as possible, we need to define costs as precisely as possible prior to starting the simulation. The following type of costs can be modeled within WebSphere Business Modeler:

► **One-time cost**

A one-time cost for a role or resource applies every time that the role or resource is associated with a task in the process.

► **Cost per time unit**

A cost per time unit is a cost that increases with the amount of time the process uses the resource. An example of a cost per day is the rental of a piece of equipment required for the process.

► **Cost per quantity**

A cost per quantity is a cost that increases with the amount of the resource that the process requires. For example, hydro has a cost per kilowatt hour. You can associate costs per quantity unit with bulk resources.

► **Cost per quantity and time unit**

A cost per quantity and time unit is a cost that increases with both the amount of the resource and the time for which it is required. You can associate costs per quantity and time unit with bulk resources

The claims process from Health Care Insurance Co. ABC requires one-time costs, cost per time units, and cost per quantity and time unit. The as-is process is paper-based and includes the following types of cost:

1. **Manual tasks**

Manual tasks are tasks being executed solely on paper. A person receives the claim through internal post, works on the claim, and transfers it to his peer using the internal post. These pure manual tasks are time-intensive and executed solely by employees without the intervention of an IT system.

2. **External tasks**

These tasks are executed by an external department. They are out of scope of the process.

3. **Semi-automatic tasks**

These tasks are executed by an IT system. However, the data required to process this task needs to be entered by an employee. The calculated cost is actually the time needed to enter that data and afterwards print the result for further processing. Table 3-3 on page 50 highlights the cost information based on the resource role and type.

Table 3-3 As-is process cost information

Resource description	Type of resource	Cost information
Claims Analyst	Role (Human Being)	\$20 per hour
Pricing Specialist	Role (Human Being)	\$25 per hour
Determine Adjudicator	Manual Task	1 hour by claims analyst
Handle Medical	External Task	\$100 per claim
Handle Dental	External Task	\$87 per claim
Handle Behavior	External Task	\$111 per claim
Check Member Eligibility	Manual Task	15 minutes by claims analyst
Provider Selection	Manual Task	15 minutes by claims analyst
Select Provider	Manual Task	1 hour by claims analyst
Set Provider	Semi-Automatic Task	10 minutes by claims analyst
Clean Claim Edits	Semi-Automatic Task	10 minutes by claims analyst
Reject Claim	Semi-Automatic Task	10 minutes by claims analyst
Request Receive Pricing	Manual Task	2 hours by Pricing Specialist

The following steps describe how to set the costs within the Processes of Health Care Insurance Co. ABC.

1. Double-click **Resources Claim Analyst** within the project tree. The “Claims Analyst” dialog box appears. Change to the “Costs” tab and click **Add** to add new costs to the resource. See Figure 3-24.

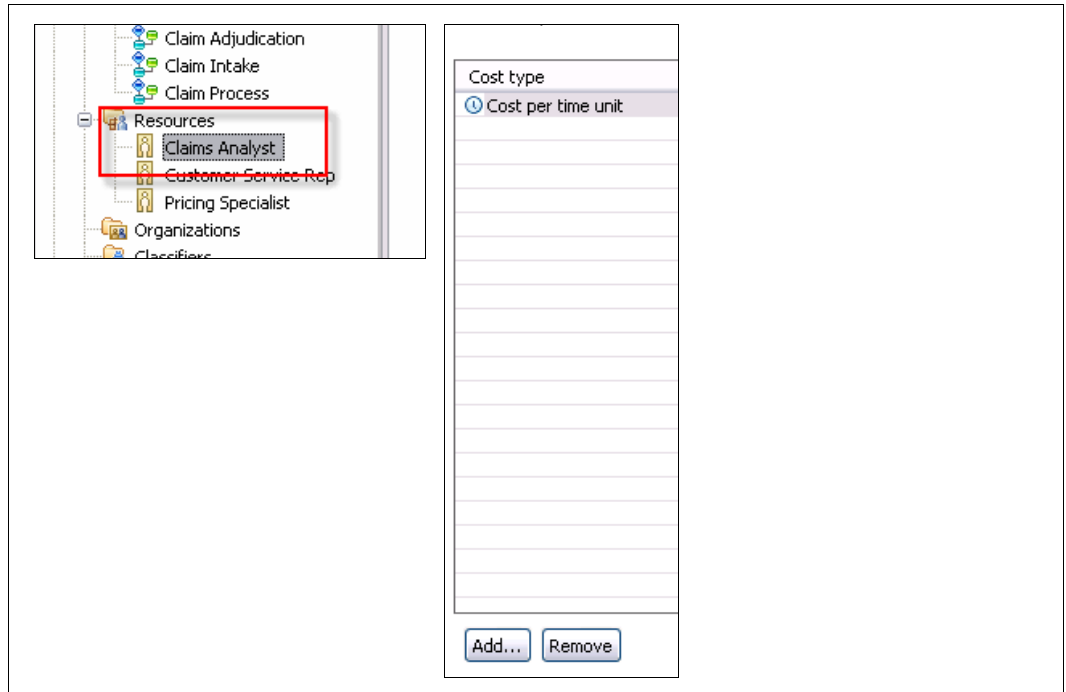


Figure 3-24 Add cost information to role

2. Select the **Cost per time unit** radio button, as shown in Figure 3-25. Insert \$25 as a value and 1 hour as cost details. This means that the resource price analyst is going to cost \$25 per hour.

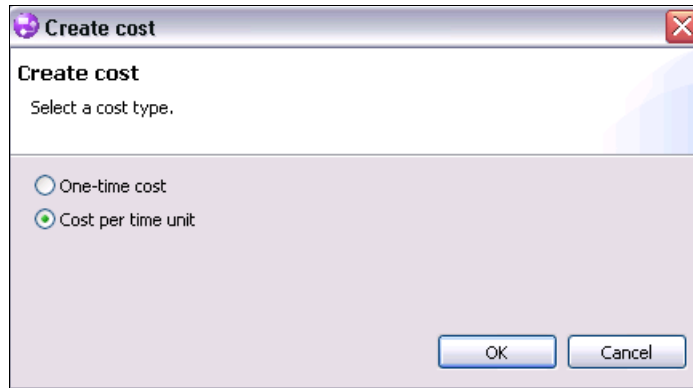


Figure 3-25 Specify type of cost

3. Select the “Handle Medical” task within the “Claim Adjudication” process. Select **Cost and Revenue** and add a Specific amount of 111 USD to the task, as shown in Figure 3-26. Add fixed cost information on the “Handle Dental” and “Handle Behavior” tasks.

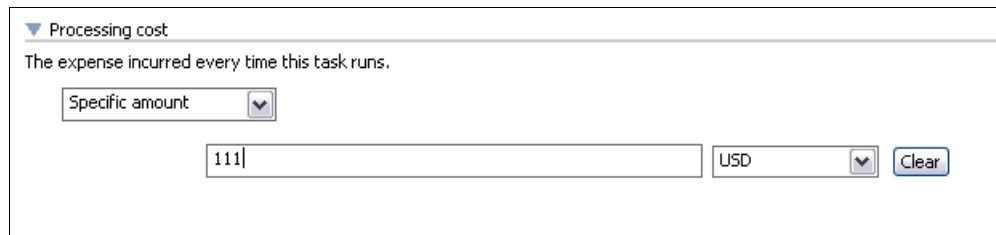


Figure 3-26 Specify fix cost on task

**Note:** If the menu does not give the possibility to select **Cost and Revenue**, click **More** and add **Cost and Revenue** by selecting it as shown in Figure 3-27.

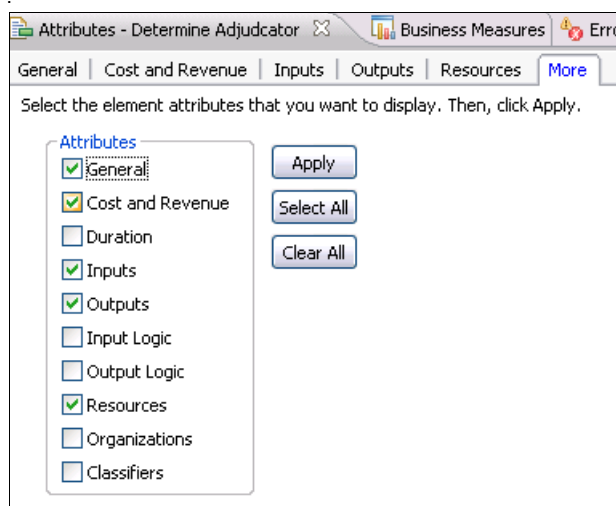


Figure 3-27 Add cost tab to attributes panel

4. Add the following duration information to the Manual Tasks “Request Receive Pricing”, “Check Member Eligibility”, “Provider Selection”, “Select Provider”, and “Request Receive Pricing”. Duration information needs to be added to the Manual Tasks “Request Receive Pricing” and “Select Provider”. Figure 3-28 shows where to add duration information.

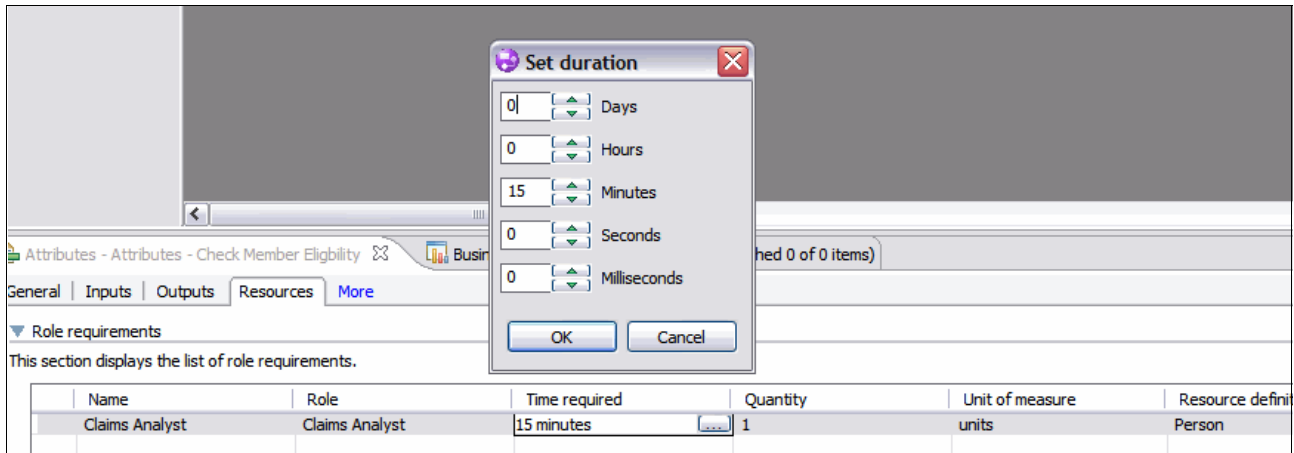


Figure 3-28 Add duration information to tasks

Table 3-4 below summarizes all task durations.

Table 3-4 Duration information

Task	Role	Duration
Determine Adjudicator	Claims Analyst	1 hour
Check Member Eligibility	Claims Analyst	15 minutes
Provider Selection	Claims Analyst	15 minutes
Select Provider	Claims Analyst	1 hour
Set Provider	Claims Analyst	10 minutes
Clean Claim Edits	Claims Analyst	10 minutes
Reject Claim	Claims Analyst	10 minutes
Request Receive Pricing	Pricing Specialist	2 hours

### 3.4 Examine alternate ROI scenarios

This section uses case analysis to determine which usage scenarios/use cases best fit the goals that were defined during discovery. The major goal determined in the discovery section was cost reduction. Simulation and analysis in the present chapter will therefore target cost reduction as a priority. Figure 3-29 on page 53 illustrates the current focus of this section within the context of the overall Storyboarding phase.

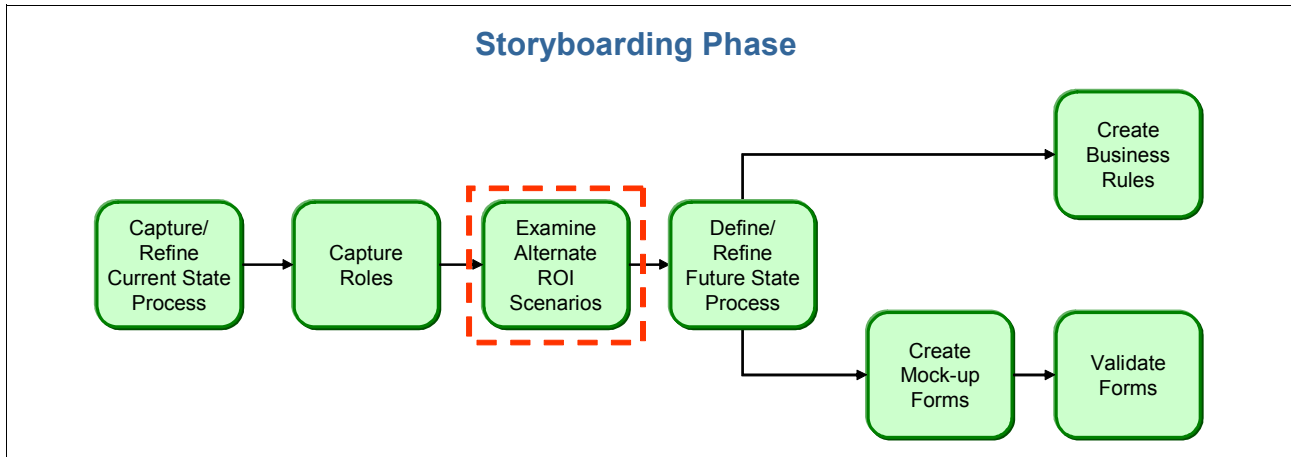


Figure 3-29 Determine most effective paths in process

### 3.4.1 Baseline Simulation

1. Right click the **Claim Process** process and select **Simulate** from the context menu, as shown in Figure 3-30. A simulation snapshot will be created. Wait until the creation completes.

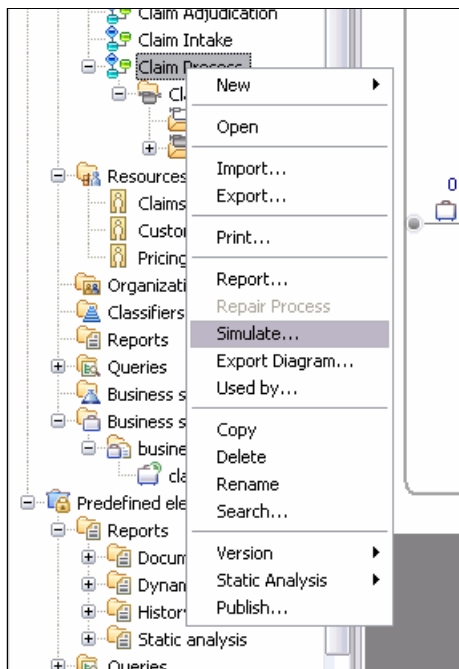


Figure 3-30 Select "Simulate" from the context menu

- Click the process background of the newly created simulation background. You will be able to select the Attributes Tab and configure the Total Number of Tokens. Click **Edit** next to the “Total Number of Tokens” field, which is set to 1 by default. This is a too small a number to actually see relevant simulation data. Click edit to set the number of tokens to generate, as shown in Figure 3-32.

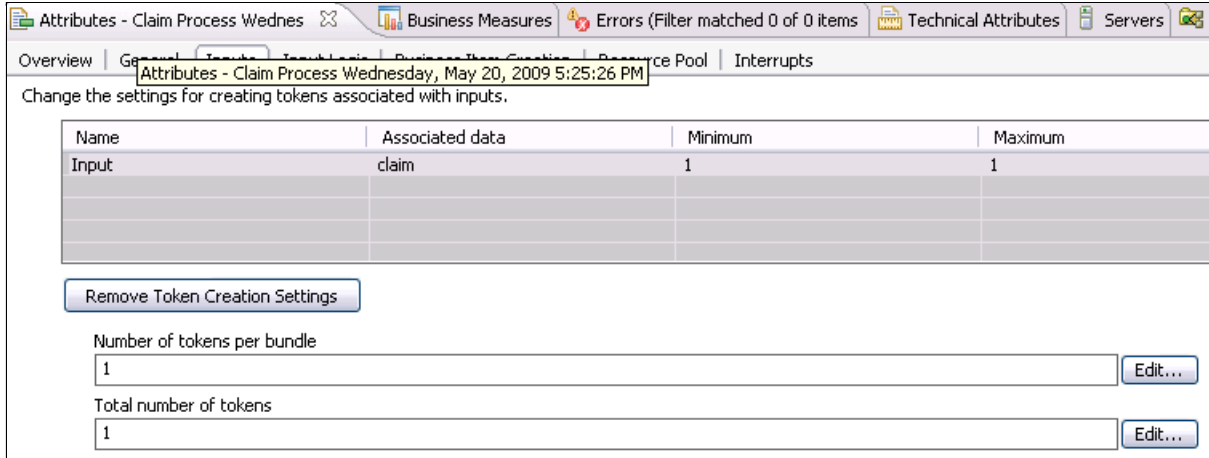


Figure 3-31 Specify a number of tokens to generate

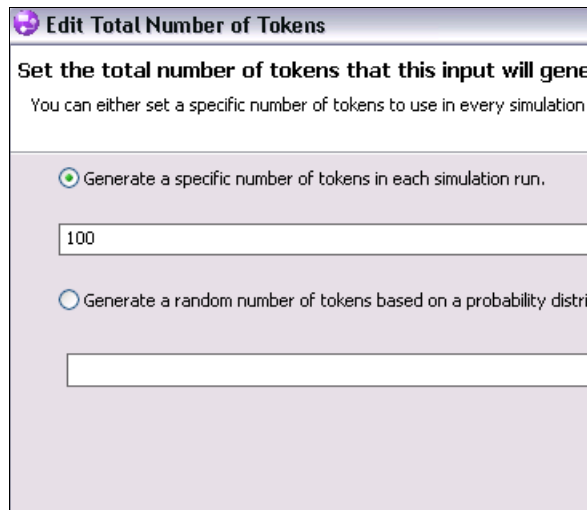


Figure 3-32 Setting the number of tokens for simulation

- The “Edit Total Number of Tokens” dialog box will display. Select the **Generate a specific number of tokens in each simulation run** radio box and set the number to 100 as shown in Figure 3-32.
- Select the “Simulation Control Panel” tab and click the white triangle next to the **Play** button. The “Simulation Settings” dialog box displays. Clear the **Display animation during simulation** button and make sure the speed is set to a higher rate. (Refer to Figure 3-33 on page 55.)

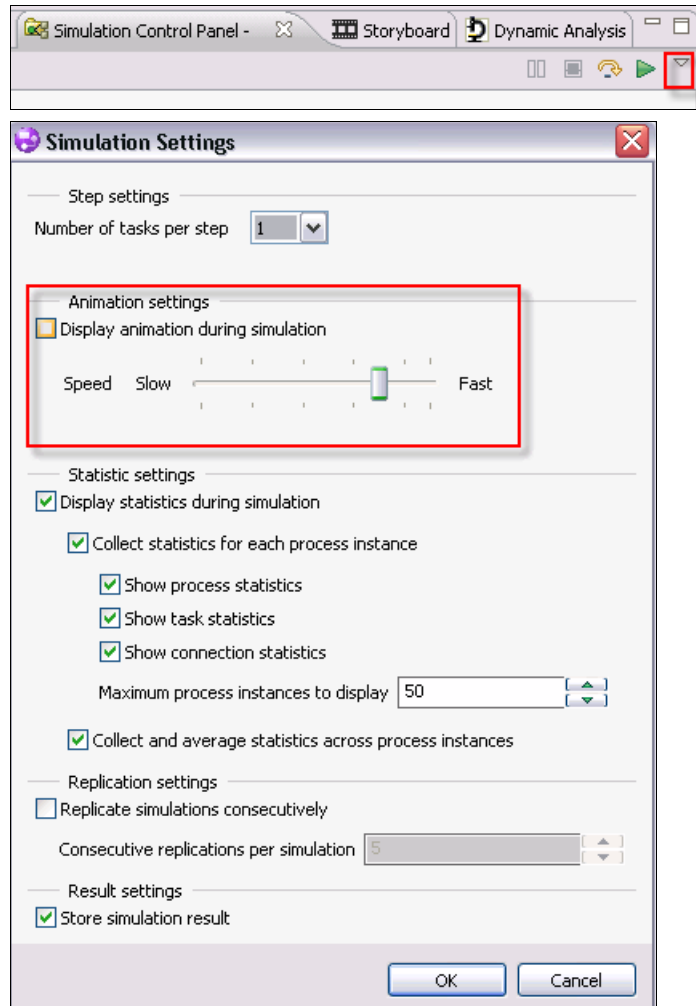


Figure 3-33 Specify Simulation settings

5. Click **Play** next to the **Settings** button to start the simulation, as shown in Figure 3-34.



Figure 3-34 The “Play” Button

6. Wait for the simulation to complete. Individual Cost information will appear. This is shown in Figure 3-35. The results are showing a case-by-case execution of the claims process and highlighting the average cost of every case. It only shows this analysis at a Parent Process Level, however, giving less insight on the actual expensive paths of the process. The following sections provide more detail on this:

- 3.4.5, "Issue 3: Cost of service intake" on page 61
- 3.4.6, "Issue 4: Cost of claim adjudication" on page 63.

The 100 instances processed have an average cost of \$184.367 USD.

	Simulation start time	Instances created	Instances completed	Average duration	Average revenue	Average cost
Claim Process Sunday, June 21, 2009 12:09:02...	Saturday, June 20, 200...	100	100	3 hours 40 minutes 52 ...	0 USD	184.367 USD

Figure 3-35 Initial simulation results

### 3.4.2 Issue 1: Efficiency of manual tasks

Reducing paper and optimizing information flows have become key priorities. A traditional manual task is processed as follows:

Every employee participating in a workflow has an inbound mail basket and an outbound mail basket on his desk. Internal post would bring him new work, he would process this work, and give it to his outbound mail basket. It would then be sent to another employee (for example, to the manager for approval).

This way of working has several issues:

► **Quality of Service:**

It is only difficult to monitor the time the employee passes on processing the claim he needs to process. A claim can be lost or unattended for a long time, having a negative impact on customer satisfaction and, indirectly, also on cost.

► **Limited workflow capabilities**

Even though the workflow exists on paper, there is no guarantee that employees actually follow the workflow. Unless there is severe control of every employee, the degree of freedom is large and a bypass or change can be enacted without actually reflecting this as a change to the paper-based process.

► **Escalation capabilities**

It is difficult to act on lost claims. Because it is difficult to monitor a paper-based process, it is also difficult to act directly (real-time) on lost claims. A possible reaction could be the escalation to a manager.

A first possible action would be to implement manual tasks as automatized human tasks. In this case, the automatized workflow handles the inbox and outbox of the employee. If a given state in the process is reached, a work item would simply appear in the To Do list of the employee. This To Do list is part of the corporate intranet site. Within the IBM BPM suite, the Business Space would be the place where users could work on human tasks.



A second possible action would be to implement manual tasks as fully automatized business rules. In this case, the execution would be fully automatized and no human interaction is necessary. This would be convenient if the rules to be applied to the claim can be defined as expressions in a business rule engine. This applies to rules based on decision tables, such as the decision to ask for approval if the amount of claimed money is bigger than USD 5000.

**Note:** Business Space powered by WebSphere enables business users to create an integrated and customized user experience so that they can access contextualized process information in a secure role-based environment. Using the single sign on, Web 2.0-based mashup environment, Business Space users can collaborate with colleagues and SMEs by sharing process content and working together to review BPM assets.

Figure 3-36 illustrates the notion of converting manual tasks as automatized human tasks.

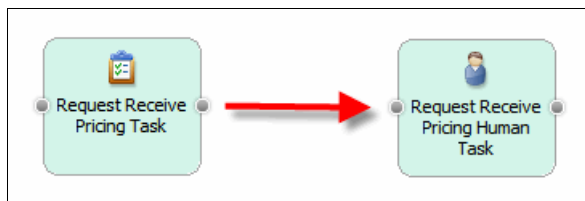


Figure 3-36 Manual task to human task

At this stage no changes should be done. The changes are indicated as comment boxes on the process, and the cost changed so that the impact of a future change can be estimated. Before the definition of a future state, we are still in the process of simulation and exploration of changes. No changes should be applied at this moment.

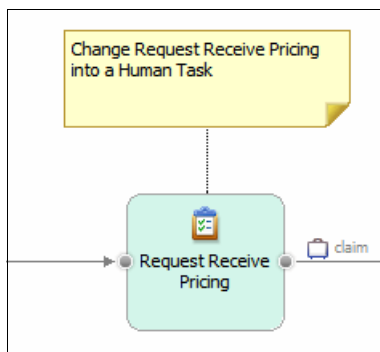


Figure 3-37 Annotation to mark future changes to process

Candidates for automatization changes are as follows:

- ▶ Request Receive Pricing: Change to Human Task
- ▶ Check Member Eligibility: Change to Business Rule
- ▶ Provider Selection: Change to Business Rule
- ▶ Select Provider: Change to Human Task
- ▶ Determine Adjudicator: Change to Business Rule

**Important:** The action suggestions are assumptions which are tested during simulation. To reflect these assumptions, we are going to change the cost table in Table 3-5 on page 59.

### 3.4.3 Issue 2: Efficiency of semi-automatic tasks

In this paper we named a semi-automatic task a moment in the process where the employee accesses an IT system to work on a claim. The claim is still posted to the employee's paper-based inbox, but the action on the claim is performed in a backend system. This often contains additional state information about the to-be-processed claim. In the case of Clean Claim Edits, for example, the employee accesses the corporate ERP system and cleans claim edits manually. This action requires the employee to connect to the ERP system, perform the changes, and disconnect.

This approach creates the following issues:

- ▶ The procedure is error-prone  
The employee can make errors when copying information or simply clean the claim changes on the wrong claim. Consequences of such a human error are having a huge impact to the claim processing.
- ▶ Quality of service  
There is no real-time monitoring and guarantee that the employee actually performs these changes. There are also limited capabilities in sending out an escalation event, if the action does not occur within a defined amount of time.

The recommended action to address this issue consists of accessing the backend ERP system automatically. Actually no manual login and data retrieval would be required. The action (for example, Clean Claim Edits) in the ERP system is executed automatically. An automatic access to a backend system is called "Internal Webservice" and "External Webservice". If internal, the Web service will be in the scope of the Business Process. If external, the Web service is in charge on another department and implies cost.

**Note:** The paragraph above assumes that backend systems such as ERP systems are accessible by the workflow. Ultimately, this is a responsibility for the IT department to ensure that backend systems are accessible within the workflow. Please refer to Chapter 6, "Deployment" on page 187 for details on how to expose these systems. To access backend systems directly, the systems need to be accessible as Web services through for example an Enterprise Service Bus.

The following semi-automatic tasks should be implemented as Internal WebServices:

- ▶ Set Provider
- ▶ Clean Claim Edits
- ▶ Reject Claim

The following semi-automatic tasks should be implemented as External Web Services

- ▶ Handle Medical
- ▶ Handle Dental
- ▶ Handle Behavior

**Important:** At this stage the changes are not actually implemented. They will be assumed and reflected into the adapted cost table to be seen within Table 3-5 on page 59. Actual changes will be performed in Chapter 4, "Experience" on page 81.

### 3.4.4 Changes to cost table and second simulation

At this point the cost table needs to be adapted to reflect changes given by sections 3.4.3, “Issue 2: Efficiency of semi-automatic tasks” on page 58 and 3.4.2, “Issue 1: Efficiency of manual tasks” on page 56. Internal Web services and business rules are going to be treated automatically. This means that no cost will be involved. Table 3-5 shows the changes.

Table 3-5 Cost table based on process automatization assumptions

Resource description	Type of resource	Cost information
Claims Analyst	Role (Human Being)	\$20 per hour
Pricing Specialist	Role (Human Being)	\$25 per hour
Determine Adjudicator	Business rule	no cost involved
Handle Medical	External WebService	\$100 per claim
Handle Dental	External WebService	\$87 per claim
Handle Behavior	External WebService	\$111 per claim
Check Member Eligibility	Business rule	no cost involved
Provider Selection	Business rule	no cost involved
Select Provider	Human Task	1 hour by claims analyst
Set Provider	Internal Web Service	no cost involved
Clean Claim Edits	Internal Web Service	no cost involved
Reject Claim	Internal Web Service	no cost involved
Request Receive Pricing	Human Task	2 hours by Pricing Specialist

Before assessing improvements, a second simulation needs to be performed. We then compare the outcome of this simulation with the baseline results and highlight improvements made.

Execute a simulation by clicking **Claims Process** → **Simulate**. Make sure to run the simulation with 100 tokens and to deactivate Animation in the simulation settings.

Check for the average cost to appear in the Processes tab of the simulation results, as shown in Figure 3-38.

Simulation complete

Time that simulation has been running: 00:00:03

Processes | Tasks | Connections | Forms

	Simulation start time	Average duration	Average revenue	Average cost
Claim Process Sunday, June 21, 2009 11:40:00...	Saturday, June 20, 200...	2 hours 9 minutes 41 s...	0 USD	152.93 USD

Figure 3-38 Second simulation results

Assessment is all about uncovering inefficiencies in existing processes. Identifying the inefficiencies within the context of the initial goals of process improvement is important. These goals have been identified in Chapter 2, “Discover” on page 25.

Claim process is a cost-driven process. Healthcare Insurance ABC wants to reduce the cost of this process and looks for improvements in the process. A secondary goal of the process improvement at Health Care Insurance Co. ABC is customer satisfaction.

The following steps show how to generate a more meaningful analysis report from your simulation.

1. Right-click your simulation result within the Project Tree. Select **Dynamic Analysis** → **Processes Comparison Analysis** → **Processes Cost Comparison** and wait for the report to generate.
2. Figure 3-39 shows the results and shows that from baseline up to now we could make an improvement of about 6.27%. This only through automatization of the tasks. Additionally customer satisfaction will be improved.

Process Instances Summary   Simulation result Sunday, ...		Processes Cost Comparison   Simulation result Sunday, ...			Activity Cost   Simulation result Sunday, June 21		
	Simulation Result Name	Process Name	Average Revenue	Average Run Cost	Average Delay Cost	Average Resource Cost	Average Cost
	Simulation result Sun...	Claim Process	USD0.00	USD99.73	USD0.00	USD53.20	USD152.93
	Simulation result Sun...	Claim Process	USD0.00	USD100.75	USD0.00	USD83.62	USD184.37
Difference			USD0.00	(USD1.02)	USD0.00	(USD30.42)	(USD31.44)
Percent...			undefined	-1.02%	undefined	-57.17%	-20.56%

Figure 3-39 Second simulation cost comparison

At this point we would like to make a even deeper analysis and see if we can improve the performance results of the current flow even more. It would be interesting to look at the distribution of execution of the various activities in the business process. The following procedure describes a deeper analysis of activity cost.

Process Instances Summary   Simul...		Processes Cost Comparison   Simula...			Activity Cost   Simulation result Sun...		Processes Cost Comparison   Simula...	
Activity Name	Average Revenue	Average Run Cost	Average Delay Cost	Average Resource Cost	Average Cost	Average Profit		
Claim Adjudication	USD0.00	USD99.73	USD0.00	USD0.00	USD99.73	(USD99.73)		
Adjudication for ?	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00		
Determine Adjudicator	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00		
Handle Behavior	USD0.00	USD111.00	USD0.00	USD0.00	USD111.00	(USD111.00)		
Handle Dental	USD0.00	USD87.00	USD0.00	USD0.00	USD87.00	(USD87.00)		
Handle Medical	USD0.00	USD100.00	USD0.00	USD0.00	USD100.00	(USD100.00)		
Merge	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00		
Claim Intake	USD0.00	USD0.00	USD0.00	USD3.20	USD3.20	(USD3.20)		
Able to select provider ?	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00		
Check Member Eligibility	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00		
Claim Edits Clean ?	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00		
Clean Claim Edits	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00		
Member Eligible ?	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00		
Merge	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00		
Merge:2	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00		
Merge:3	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00		
Provider Rejected ?	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00		
Provider Selection	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00		
Reject Claim	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00		
Select Provider	USD0.00	USD0.00	USD0.00	USD20.00	USD20.00	(USD20.00)		
Set Provider	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00	USD0.00		
Claim Process	USD0.00	USD99.73	USD0.00	USD53.20	USD152.93	(USD152.93)		
Request Receive Pricing	USD0.00	USD0.00	USD0.00	USD50.00	USD50.00	(USD50.00)		

Figure 3-40 Aggregated analysis of activity cost

Right-click your Simulation result within the Project Tree. Select **Dynamic Analysis** → **Aggregated Analysis** → **Activity Cost** and wait for the report to generate. The report shown in Figure 3-39 will appear.

Note the cost of \$111, \$87, and \$100, which occurred on “Handle Behavior”, “Handle Dental” and “Handle Medical”. These services are outsourced from Health Care Insurance Co. ABC and cannot bring more cost gain. A message could be forwarded to the business leaders trying to negotiate a cost rebate or to look for another outsourced service provider. Another idea would be to call these services when needed.

Note the cost of \$20 which occurred on provider selection. This is basically the salary of the claims analyst which worked for 1 hour on that case. This can be a potential process issue we might want to improve. It makes the actual average cost of Service Intake relatively high.

Note the average cost of \$152.93 we would like to reduce.

### 3.4.5 Issue 3: Cost of service intake

This section focuses on understanding why the cost of “Service Intake” is high and how it could be potentially improved.

1. Execute a simulation snapshot on “Service Intake”. Make sure you generate 100 tokens and that visual simulation is switched off. Refer to Figure 3-32 on page 54 Figure 3-33 on page 55 on how to do that.
2. Dynamic analysis on Service Intake. Right-click the simulation result and select **Dynamic Analysis** → **Process Instances Summary** from the context menu. A new report will be generated. You can do case-by-case analysis and spot the reason why certain cases are taking \$20 of cost and others not. The reason is that we have a human intervention required within task named Provider Selection task. See Figure 3-41 for a case-to-case analysis.

Case Name	Distribution	Success Status	Process Instance Name	Cost
Case 1	14.00%	Succeeded		USD20.00
Case 2	49.00%	Succeeded		USD0.00
Case 3	4.00%	Succeeded		USD20.00
Case 4	14.00%	Succeeded		USD0.00
Case 5	7.00%	Succeeded		USD0.00
Case 6	7.00%	Succeeded		USD20.00
Case 7	5.00%	Succeeded		USD0.00
All Cases	100.00%			USD5.00

Figure 3-41 Dynamic Analysis: Process Instances Summary

**Note:** When highlighting a case, WebSphere Business Modeler actually displays the execution path of the process chosen in that case in blue.

When analyzing these results we see that 14% + 4% + 7% = 35% causes cost of USD20.

When looking at the business process, we see that we assume a 50% to 50% ratio between Provider Selection and Select Provider. Remember that Provider Selection is planned to be a business rules task and Select Provider is planned to be a human task. This assumption is a bit too generous. We would at this point target the business rules task to be implemented in a way that it permits to filter 90% of the cases and send only 10% of the cases to the human task. Figure 3-42 on page 62 shows the 50% to 50% ratio on the split activity.

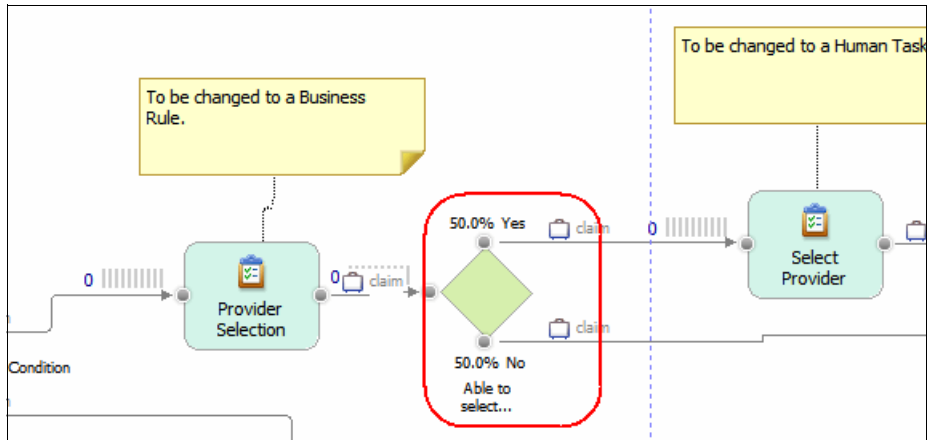


Figure 3-42 50% to 50% ratio between Provider Selection and Select Provider

**Important:** The action would be to increase efficiency of the business rules engine task “Provider Selection” so that more claims can be processed automatically. Human Activity performed under “Select Provider” shall be reduced to 10% of the cases. It is recommended to indicate this requirement with an annotation. This is beneficial for collaboration. The same way of thinking counts for the “Check Member Eligibility” task, The target filtering of this business rules engine is also targeted to be 10% rejected cases and 90% accepted cases.

A further improvement in the process can be seen when trying to focus on the rejected cases. The Dynamic Analysis on Process Instances gives this view. Actually, when doing a case-by-case analysis we can determine that rejected cases are also sent to claim adjudication. This is expensive, as these claims will be processed and increase cost. In addition, it has a negative impact on customer satisfaction, as the customer is not notified if his claim is rejected.

Figure 3-43 shows that even if the claim is rejected, we do not stop process execution and we execute claim adjudication. This ultimately will result in unnecessary costs within the claim adjudication process.

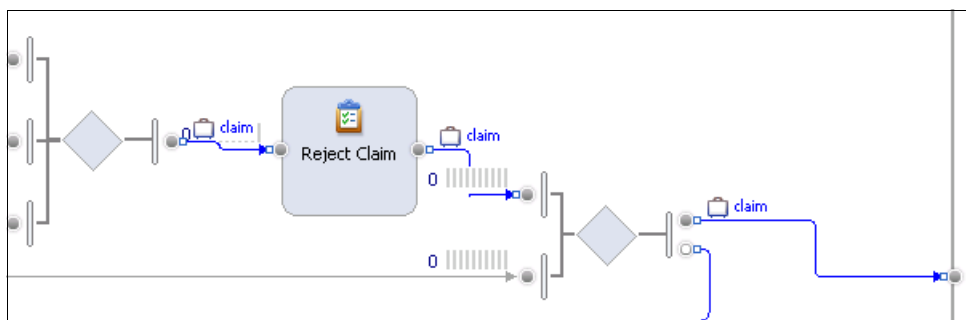


Figure 3-43 Process Flow if claim is rejected

A potential resolution to this issue would be to consider rejected cases, which according to the business analysts are high (overall a total of 86%). This number can be identified when adding all the case rejection cases in the analysis table shown in Figure 3-41 on page 61.

**Important:** Two decisions are forwarded to the business leaders:

▶ Decision 1

A process improvement is suggested to actually reduce the amount of claim rejection. The question is open: “Do we focus on the right customers”.

▶ Decision 2

Another process improvement is suggested to treat automatically rejected cases. This will be explained in section 3.4.6, “Issue 4: Cost of claim adjudication” on page 63.

### 3.4.6 Issue 4: Cost of claim adjudication

This section focuses on reducing the cost of claim adjudication. Again a simulation of claim adjudication shall be executed to see where the highest cost is occurring.

Figure 3-44 on page 64 shows that rejection cases are either sent to “Handle Medical”, “Handle Dental”, or “Handle Behavior”. We would like to avoid claims being sent to an outsourced department and cause unnecessary costs. This is a significant obstacle for customer satisfaction. Claims are basically rejected without the customer being notified.

**Important:** A cure to this issue is to introduce an additional automatic task named “Notify rejection to customer”, which would treat the rejected claims.

At this point, no further improvements can be found. The following sections apply the recommended changes and run a simulation for validation purposes.

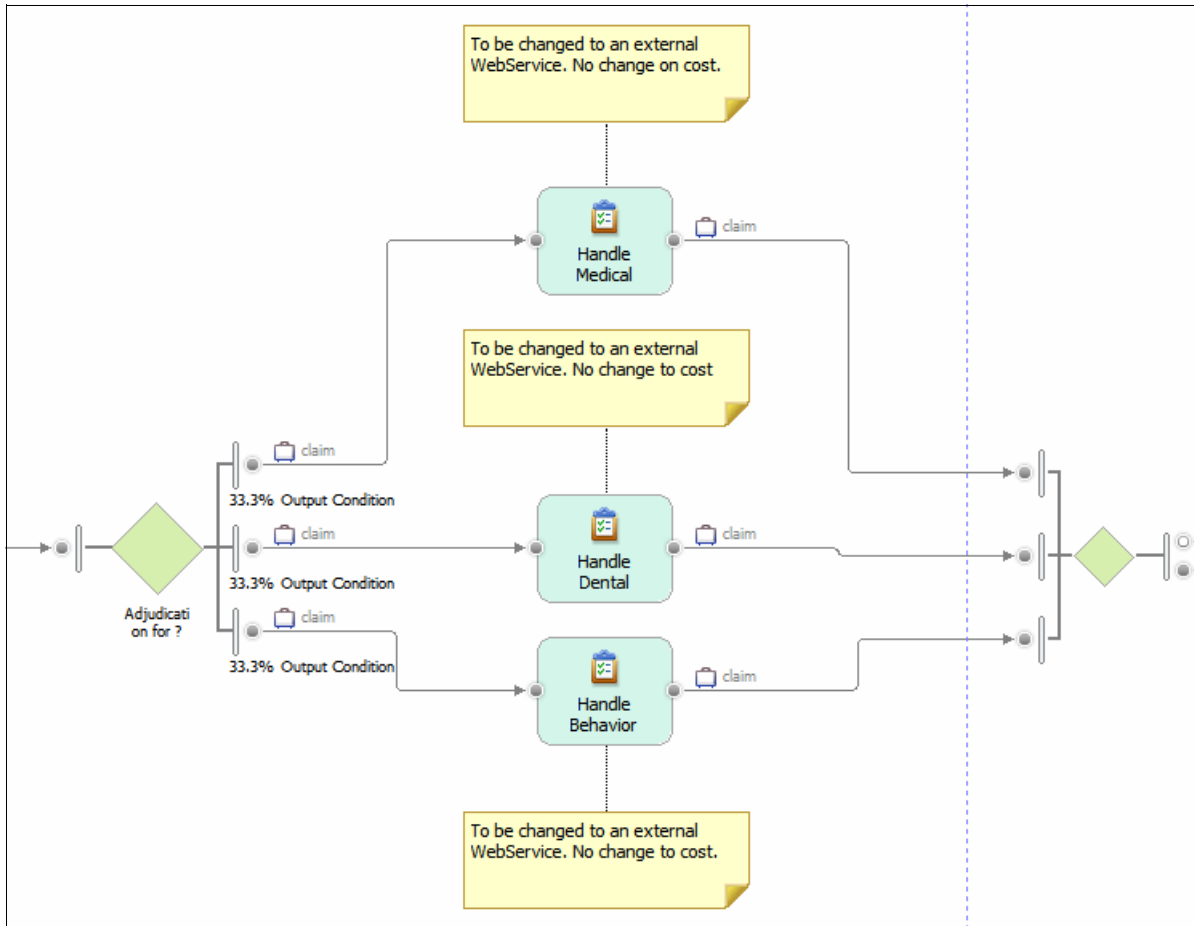


Figure 3-44 Missing rejection notification

### 3.5 Define the future state scenario

The goal of this section is to define and refine future state business process models that achieves the closest results to the most cost-effective alternative chosen from case analysis.

**Note:** In this stage, we execute future state scenarios to model the potential cost reduction benefits. Later in the chapter, we also discuss the ability to import the actual monitor data back into simulation.

Figure 3-45 on page 65 illustrates the current focus of this section within the context of the overall Storyboarding phase.



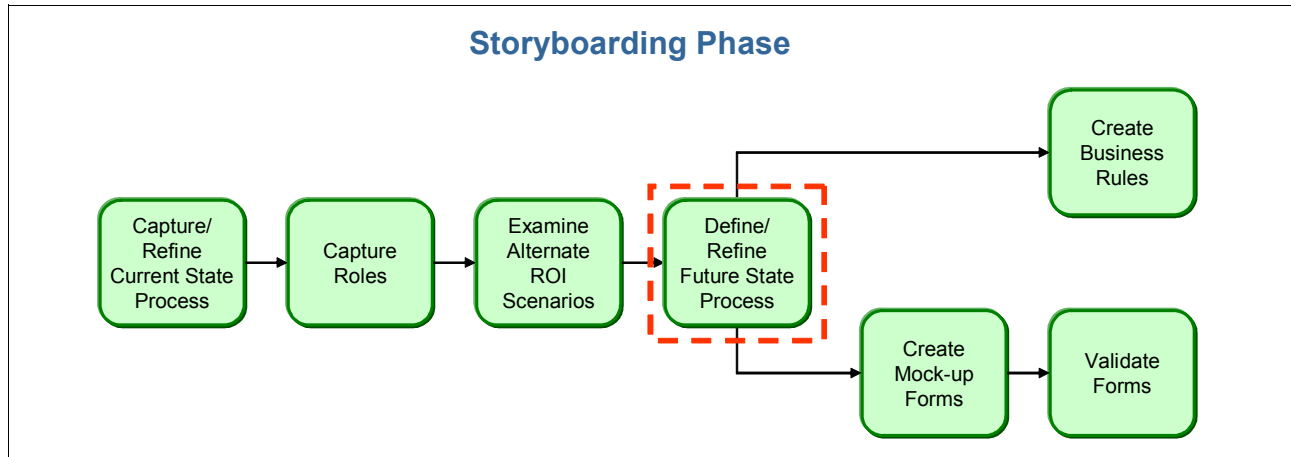


Figure 3-45 Define and refine future state scenario

More concretely for Health Care Insurance Co. ABC, this means that in 3.4, “Examine alternate ROI scenarios” on page 52 we identified four major issues and pinpointed actions to address these issues.

In review, these are the actions to be taken to address the issues:

1. Implementation of Human tasks
2. Implementation of WebServices
3. Implementation of business rules
4. Add additional Task named “Notify rejection to customer”
5. Adapt control flow ratios to reflect simulation data.

### 3.5.1 Implementation of human tasks

Within a WebSphere Business Modeler Process Flow, by default, all tasks are generic and do not give any information about if they are going to be executed automatically (by a machine) or manually (by a human being). If a task is identified as a human task, it permits WebSphere Modeler automatically to generate configurable IT artifacts, such as a todo list, authorizations, escalations, and so forth. During simulation analysis within 3.4.2, “Issue 1: Efficiency of manual tasks” on page 56, we found that it would be efficient for our processes to use human tasks instead of pure manual paper-based tasks. Within the same section we did not implement these tasks. We only simulated the effect of using them. In the present section we are going to show how to implement these tasks as human tasks.

The following are going to transform two tasks from the Health Care Insurance Co. ABC processes into human tasks.

1. Right-click the human task and select **Convert To** → **Local Human Task**. Figure 3-46 below will appear.

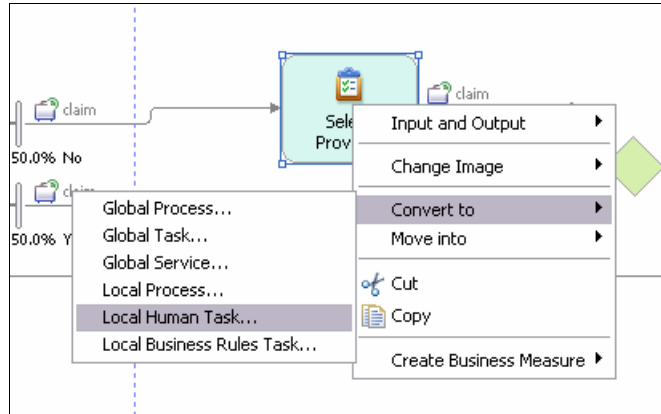


Figure 3-46 Convert manual task to local human task

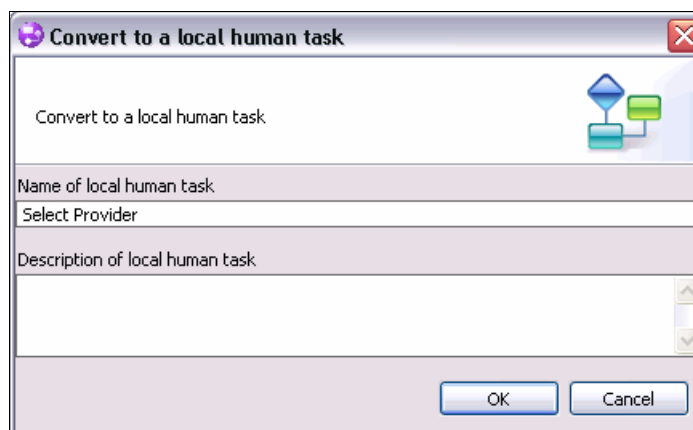


Figure 3-47 Add name to local human task

2. Click OK to complete the creation.

The icon of the task will change and a few options will be added in the attributes.

### 3.5.2 Implementation of WebServices

At this stage no particular implementations are required to convert Tasks into WebServices. WebServices Tasks need to be completed with operational characteristics to make them really executable. We discuss this in section 4.5.1, “Adding services to deployable applications” on page 99. For the time being we use Annotations to indicate these required changes during the “Experience phase”.

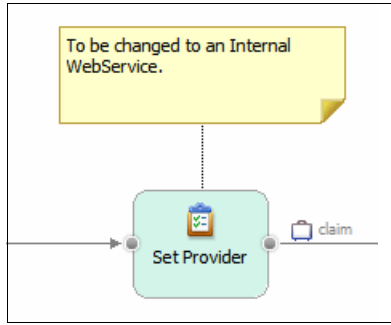


Figure 3-48 Annotation indicating that task has to be implemented by a WebService

### 3.5.3 Implementation of business rules tasks

The following tasks explained in Table 3-6 shall be implemented as business rule tasks.

Table 3-6 Tasks to be implemented as business rules tasks

Business rule	Characteristics
Provider Selection	Business rule engines makes assessment on amount and sets provider to “billing provider” if the amount within claim is smaller than amount specified in the business rules engine. This is a clear example of request qualification what is perfectly executable by a business rules task.
Determine Adjudicator	Based on the claim type and patient details this business rules will determine which department will handle the claim. This is another example of request qualification.
Check Member Eligibility	Business rule assesses the Claim and decides if Member is eligible or not by setting the appropriate output field to “true” or “false”. This is an example of a question in the process. We would like to determine if the member is eligible or not. The answer is evaluated based on input content and either “No” or “Yes”.

To convert existing Tasks into business rules tasks, right-click **Determine Adjudicator** and select **Convert To** → **Local Business Rules Task** from the context menu. See Figure 3-49 for more details. Repeat this operation for **Check Member Eligibility**, **Determine Adjudicator**, and **Provider Selection**.

**Note:** 3.6, “Identify business rules content” on page 73 gives details about the rules to be included. Chapter 4, “Experience” on page 81 specifies these rules for the business rules task.

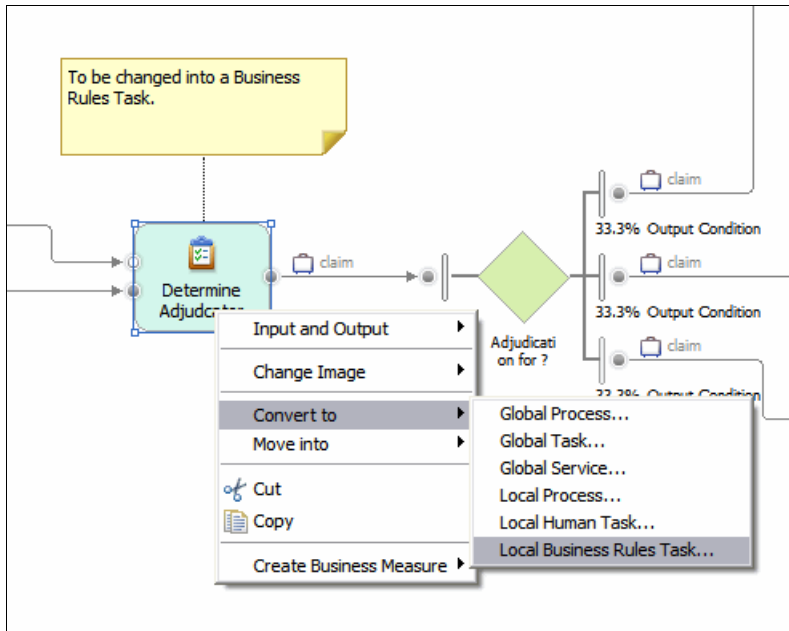


Figure 3-49 Convert existing task into Local business rules task

### 3.5.4 Add additional Task “Notify Rejection to customer”

Next, we add a task to the “Claim Adjudication” process. This new task which will be in charge to notify customer of a rejected claim, as shown in Figure 3-50 on page 69.

After the changes are completed recreate a snapshot of “Claim Process”, rerun a simulation and an Aggregated Process Activity Cost Analysis. The results obtained show a considerable improvement.

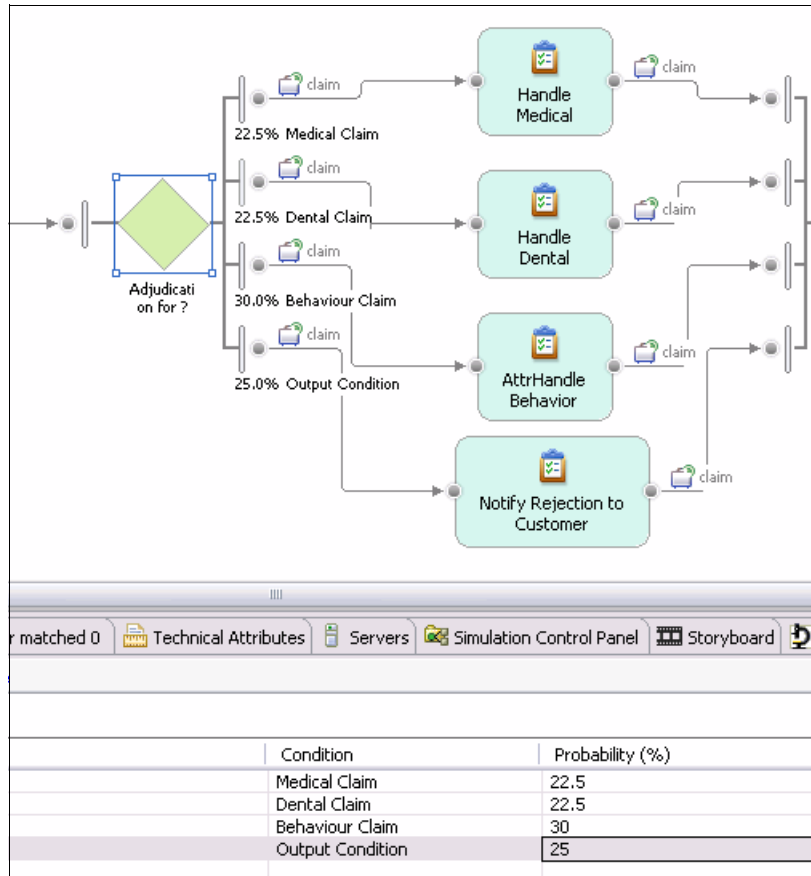


Figure 3-50 Add additional task “Notify Rejection to Customer”

### 3.5.5 Adapt control flow ratios to reflect insertion of business rules tasks

3.5.3, “Implementation of business rules tasks” on page 67 describes the goals to place business rules tasks into the process flow to automatize manual activity. A business rule is often introduced to avoid human activity. However, human activity cannot always be avoided. The human activity in the flow actually deals with exceptions that cannot be handled by the business rules tasks. Figure 3-51 on page 70 shows a business rules task called “Provider Selection”, which has the intention to filter requests and either continue normal execution if filtering was successful, or go into human exception handling addressed by “Select Provider” implemented as a human task.

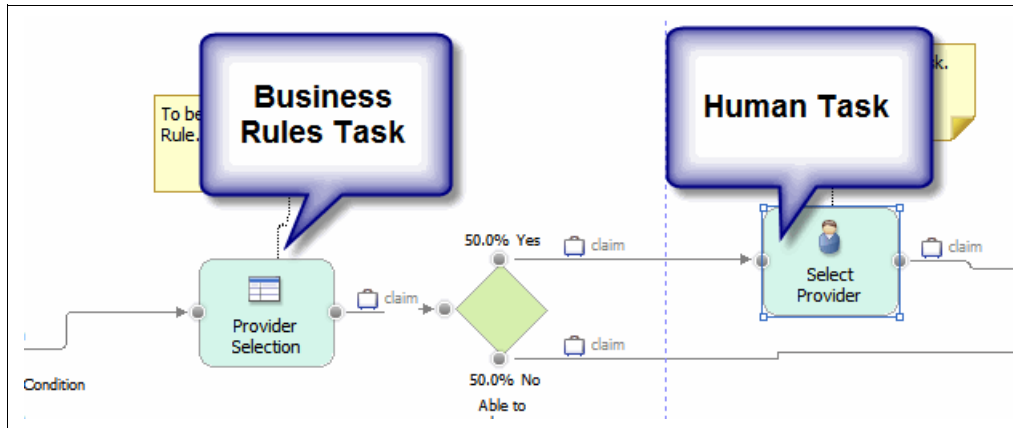


Figure 3-51 Human tasks as exception handlers for business rules tasks

**Note:** The ratio of 50% to 50% for this kind of pattern is too generous. The business rules tasks has to filter more than just 50% of the requests. We recommend a ratio of 10% to 90%. The same is true for “Check Member Eligibility” and “Determine Adjudicator” business rules tasks. Eventually, a precise monitoring of these ratios as part of KPI’s will determine the real settings. As this is a paper-based process, no such detail is available and an assumption has to be made.

Change “Member Eligible?” ratios from 50% and 50% to 10% and 90%. Figure 3-52 shows the ratio for “Member Eligible?”. Change this ratio to 10% non eligible and 90% eligible.

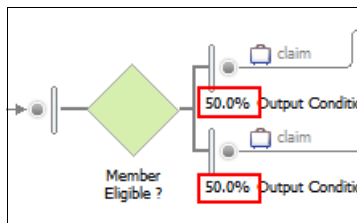


Figure 3-52 Change “Member Eligible” ratios

**Note:** This change will not influence actual execution of the business process. It has to be seen as a target in execution based on either real-time experience or on assumptions. KPI’s in the Manage phase will give the possibility to determine what the real value is.

Change “Able to select provider?” ratios from originally 50%, 50% to now 10% and 90%. Figure 3-53 shows the ratio for “Able to select provider?”. Change this ratio to 10% “No” and and 90% “Yes”.

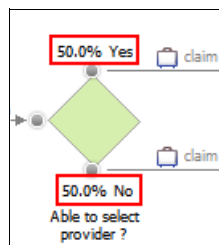


Figure 3-53 Change “Able to select provider” ratios

Change “Adjudication for?” and adapt the ratio’s of the condition to 22.5%, 22.5%, 25% and 30% as shown in Figure 3-54. These ratios are based on estimations. Only execution will show the reality.

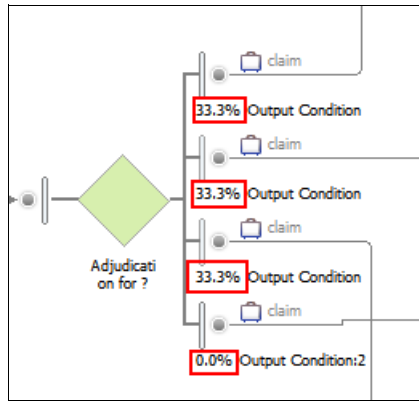


Figure 3-54 Change “Adjudication for?” ratios

### 3.5.6 Run final simulation for validation purposes

The goal of this final simulation is to measure the overall impact the changes made to the improved process. The last series of changes resulted in a simulation result with an average cost of \$120.07, as shown in Figure 3-55.

Simulation complete				
Time that simulation has been running: 00:00:10				
Processes   Tasks   Connections   Forms				
	Simulation start time	Instances created	Average duration	Average cost
Claim Process Tuesday, June 23, 2009 1:53:48 ...	Tuesday, June 23, 200...	100	2 hours 6 minutes 6 sec...	120.07 USD

Figure 3-55 Results from the latest simulation

Next, rerun a Process Cost Comparison for the Claim Process. You will see a cost improvement of 27.37%. See Figure 3-56 for results. This cost improvement is compared to the last comparison done in 3.4.4, “Changes to cost table and second simulation” on page 59.

Processes Cost Comparison   Simulation result Tuesday, June 23, 2009 1:54:33 PM   Claim Process Tuesday, June 23, 2009 1:53:48 PM   1:56:45 PM						
	Simulation Result Name	Process Name	Average Revenue	Average Run Cost	Average Delay Cost	Average Cost
	Simulation result Tuesday, June 23, 2009 1:54:33 PM	Claim Process	USD0.00	USD68.07	USD0.00	USD 120.07
	Simulation result Sunday, June 21, 2009 11:40:27 PM	Claim Process	USD0.00	USD99.73	USD0.00	USD 152.93
Difference			USD0.00	(USD31.66)	USD0.00	(USD32.86)
Percentage Change			undefined	-46.51%	undefined	-27.37%

Figure 3-56 Simulation analysis

Figure 3-57 shows a second comparison done with the baseline simulation executed in 3.4.1, “Baseline Simulation” on page 53. We can see an overall improvement of ABC.

Processes Cost Comparison   Simulation result Tuesday, June 23, 2009 1:54:33 PM		Claim Process Tuesday, June 2...		Processes Cost Comparison   Simulati	
	Simulation Result Name	Process Name	Average Run Cost	Average Cost	Average Profit
	Simulation result Tuesday, June 23, 2009 1:54:33 PM	Claim Process	USD68.07	USD120.07	(USD120.07)
	Simulation result Sunday, June 21, 2009 12:09:44 AM	Claim Process	USD100.75	USD184.37	(USD184.37)
Difference			(USD32.68)	(USD64.30)	USD64.30
Percentage Change			-48.01%	-53.55%	-53.55%

Figure 3-57 Baseline comparison

### 3.5.7 Future improved business process

Figure 3-58 through Figure 3-62 on page 73 give an overview of the improved processes. WebServices are still marked with annotations. WebServices will actually be completed with operational characteristics in Chapter 4, “Experience” on page 81.

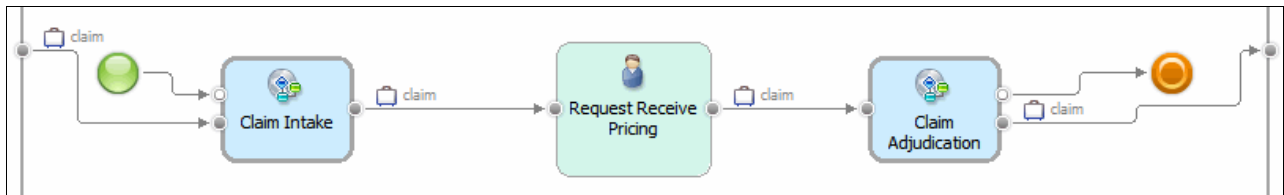


Figure 3-58 Claim process parent process (no improvements)

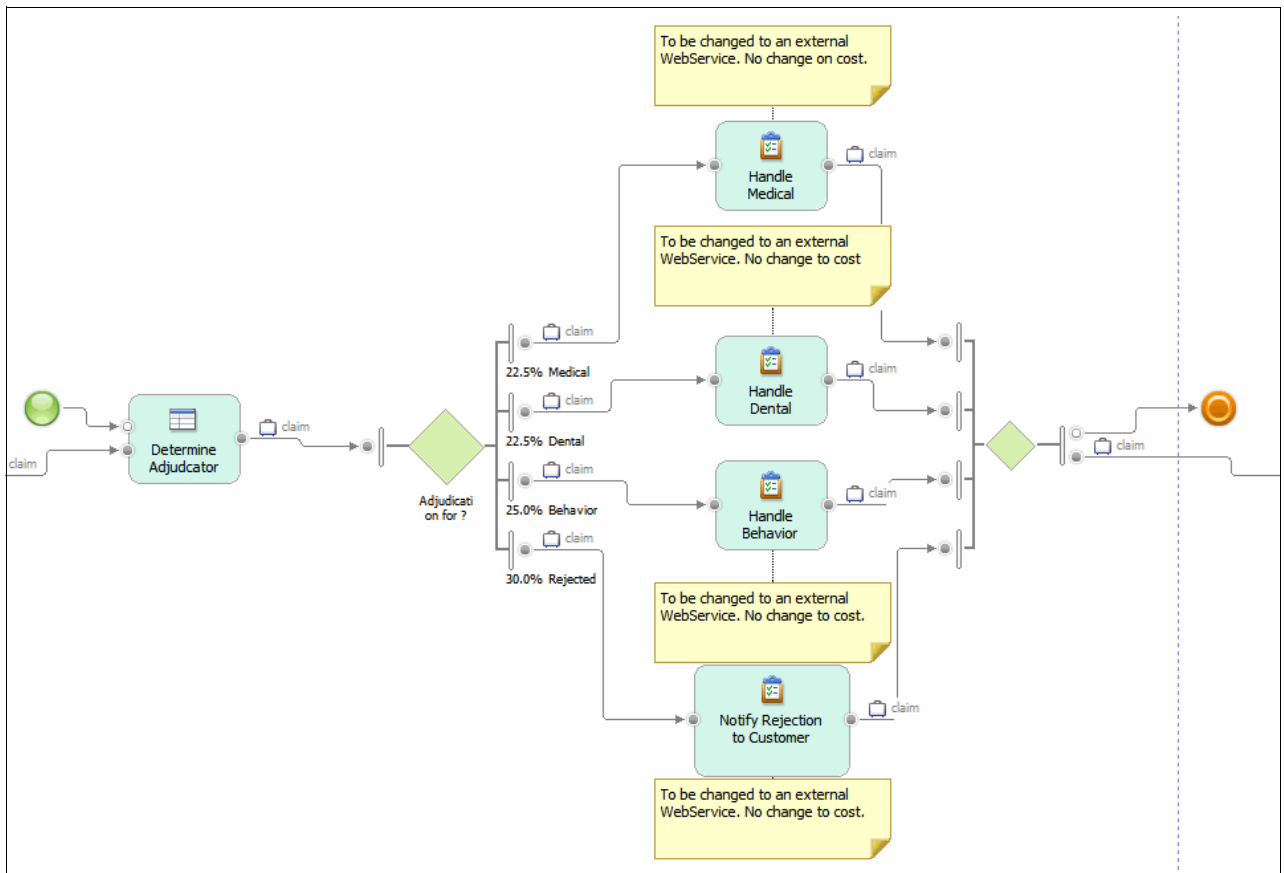


Figure 3-59 Claim adjudication process with improvements



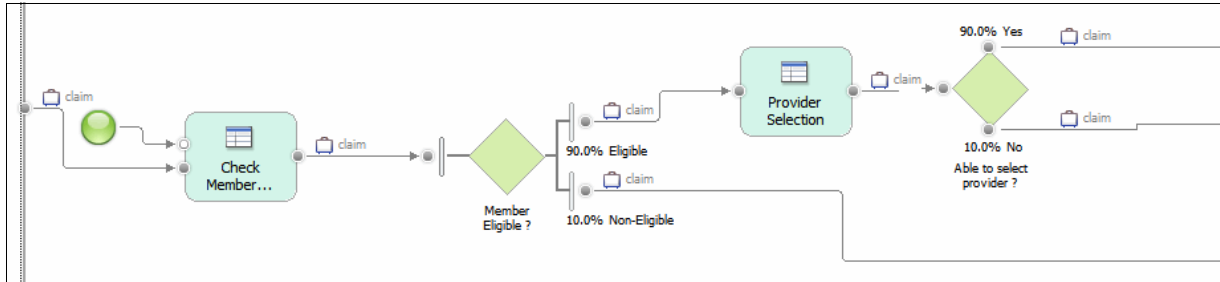


Figure 3-60 Improved claim intake process

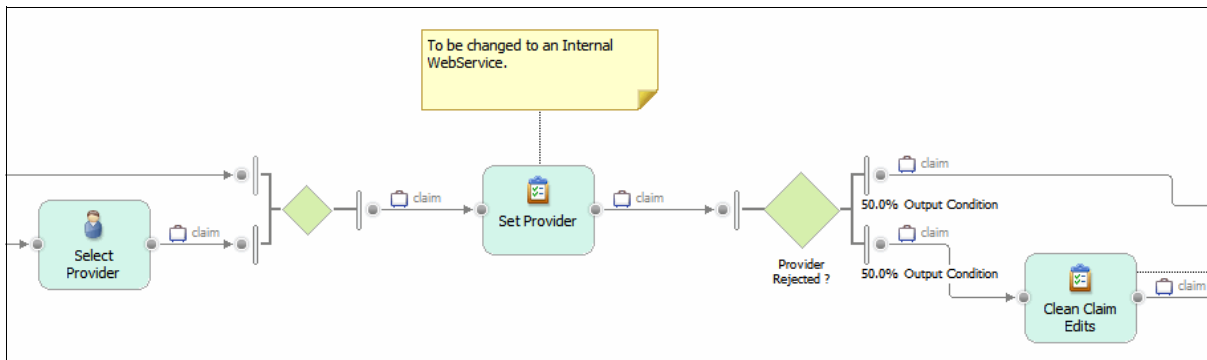


Figure 3-61 Improved claim intake process

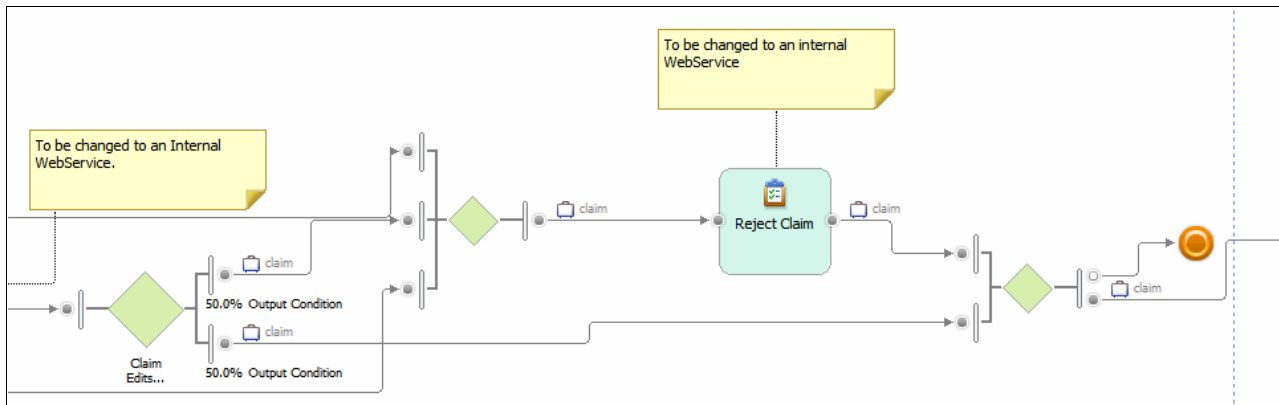


Figure 3-62 Improved claim intake process

### 3.6 Identify business rules content

The goal of this section is to identify individual rules to be included into business rules tasks. These implementation rules are summarized in annotations and then collaborated with the team implementing the business rules within the Experience stage. This section does not convert tasks into business rules tasks. It specifies the content of these business rules tasks.

Figure 3-63 on page 74 illustrates the current focus of this section within the context of the overall Storyboarding phase.

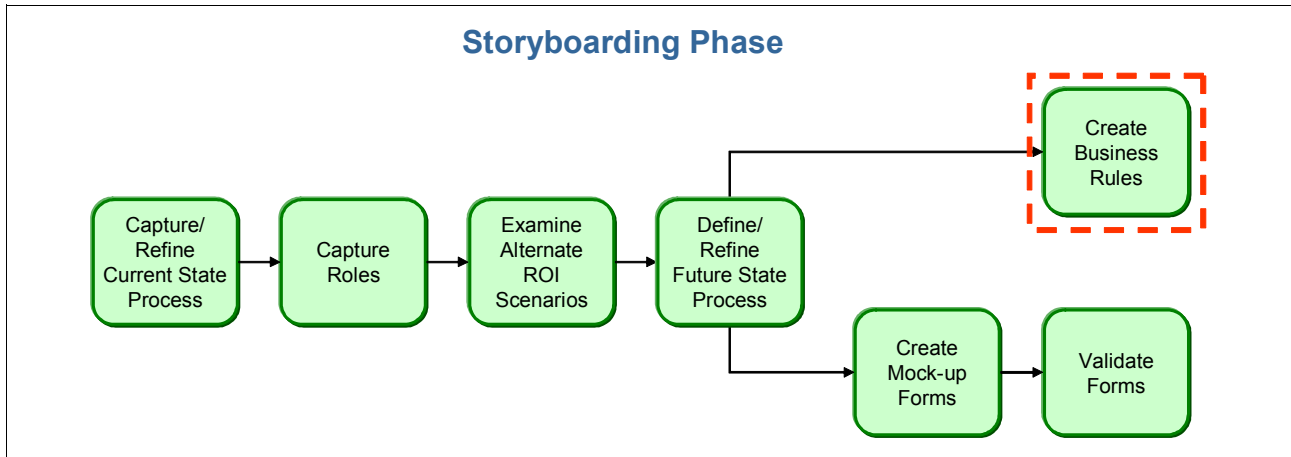


Figure 3-63 Identify steps to be implemented as business rules

Often, human activity can be replaced by business rules. This is usually the case when the outcome is easily computable based on rules. Usually business rules apply whenever a task plays the role of a question in the process. Other examples are as follows:

- ▶ Business calculations
- ▶ Input validation
- ▶ Request classification

Answers to questions are implementable as decision tables or decision trees.

Business rules candidates are as shown in Table 3-7. These rules will be implemented in Chapter 4, “Experience” on page 81. As of now they are only marked as business rules within 3.5.3, “Implementation of business rules tasks” on page 67. There is no indication on the content of these business rules tasks. The purpose of this section is to define the content of business rules.

Table 3-7 Business rules content

Activity	Question	Description
Check Member Eligibility	Is the member eligible?	This can be either implemented as a decision table or as a decision tree. The idea is to make a couple of checks (such as the citizenship, place of living, years of membership) and give these answers to the caller of the business rule.
Claim Adjudication	Which adjudicator is valid for the claim?	This is typically a request classification. It can be implemented as a decision table.
Provider Selection	Which provider is valid for this claim?	This is typically a request classification. It can be implemented as a decision table.

### 3.7 Generation and validation of mockup forms

The goal of this section is to generate simple form mockups using forms designer, based on the inputs and outputs for the tasks.

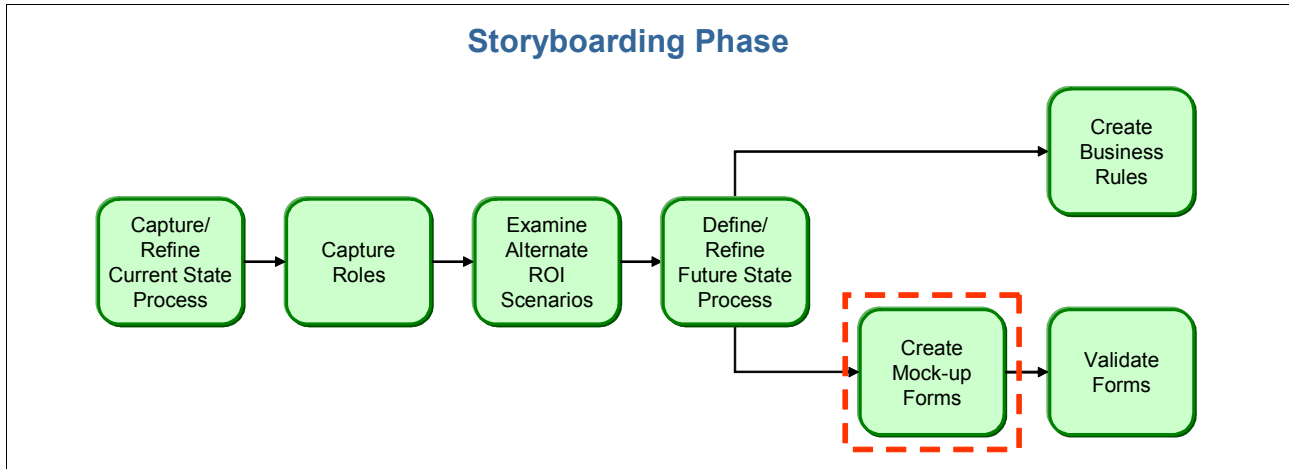


Figure 3-64 Generate mockup forms

- ▶ If the human task has identical inputs and outputs, only one form will be generated and associated with the task as both the input and output form.
- ▶ If you have forms already created for the human tasks, you can associate forms with human task and process inputs and outputs on the Forms tab in the Attributes view.

To generate a new mockup form for the “Select Provider” task, right-click **Generate Form** (Figure 3-65) and wait for form generation to complete.

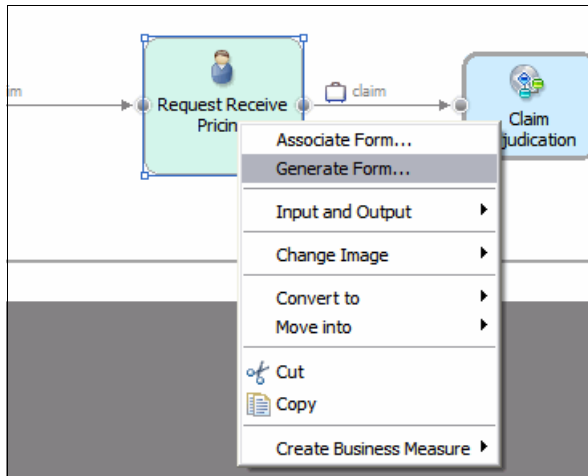


Figure 3-65 Generate mockup forms

**Important:** When you associate a form with a human task, if the inputs or outputs of the human task do not match the form data, the inputs and outputs of the human task will be replaced with the form data.

### 3.8 Validation of mockup forms

Create storyboards using simulation to validate with process owners the flow and content of the human steps within the process. Obtain sign off and approval to move to the experience phase. See Figure 3-66.

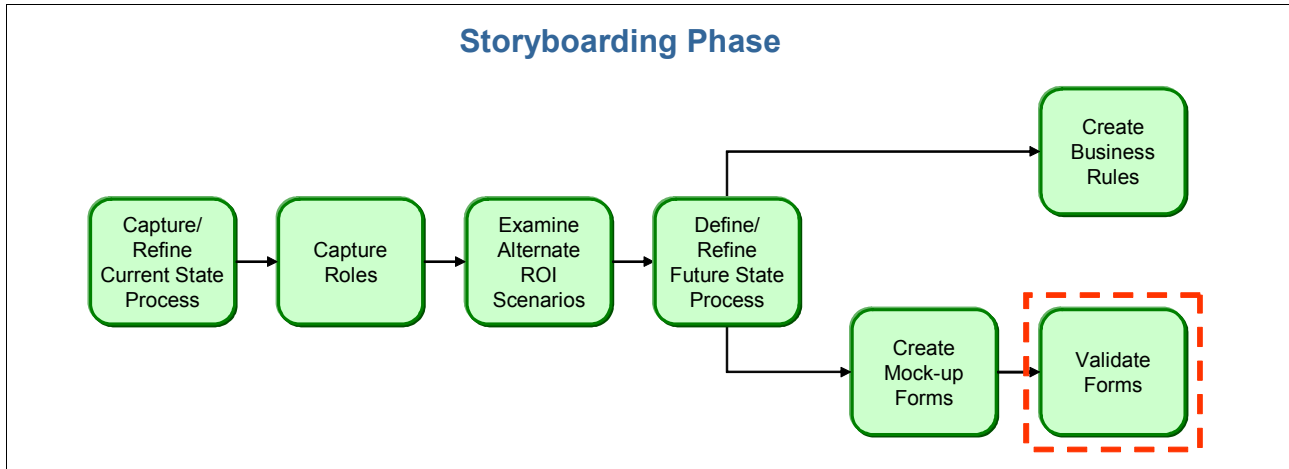


Figure 3-66 Validate the forms

You can create storyboards to step through sequences of human tasks in a process (for example, to demonstrate the flow of a new human-centric process and provide stakeholders with a preview of the forms that are involved in the completion of each human task).

**Important:** Storyboards in a simulation offer a powerful possibility to test the look and feel and usability of forms to be used within a business process. Storyboards can be used to get the signoff prior to going into the Experience and Production phases.

Storyboards allow you to view the forms associated with a human task side-by-side with the process diagram, mimicking the task owner's interaction with the form. Figure 3-67 on page 77 illustrates the form used for the human interaction at this specific step within the overall process.

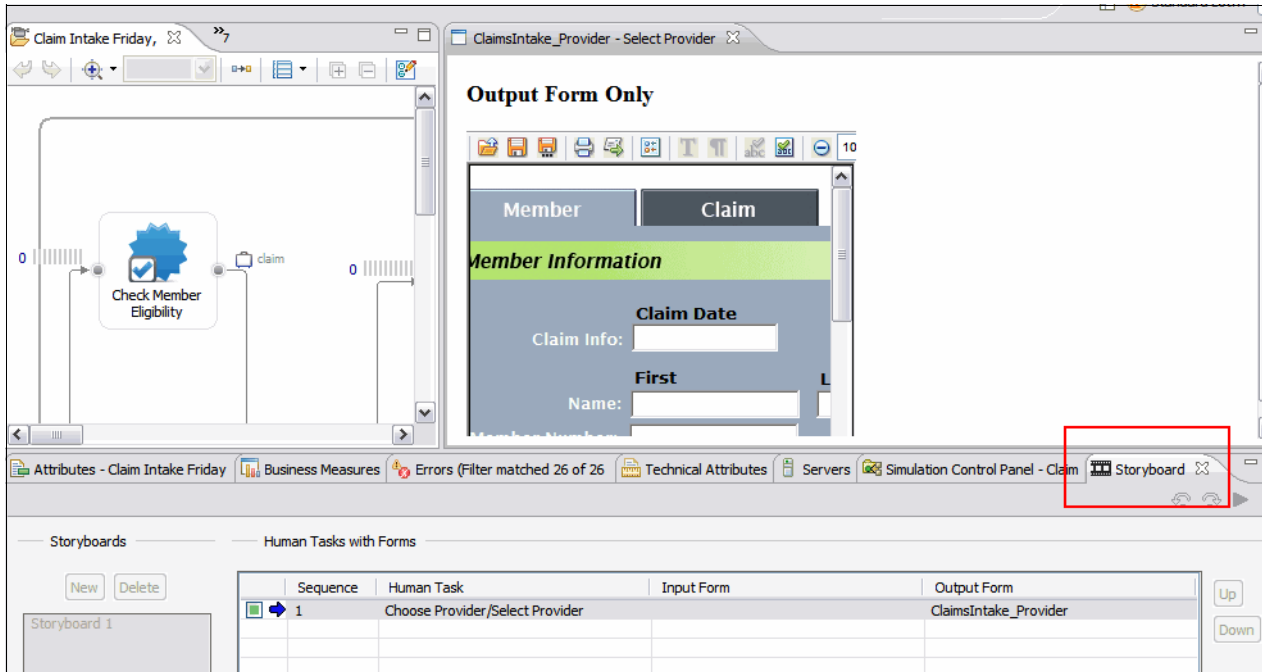


Figure 3-67 Storyboards of human task forms

Using a Storyboard provides an excellent opportunity to validate generated forms. After defining the storyboard of each of the human tasks, the user can storyboard through the human tasks and try out the forms. Tasks can be added or removed.

**Note:** More details about Storyboards can be obtained on the following Web page:

<http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp?topic=/com.ibm.btools.modeler.advanced.help.doc/doc/tasks/simulating/creatingstoryboardsforhumantaskswithforms.html>

### 3.9 Definition of control points to prepare experience

Simulation is important and gives a deep understanding of the process behavior. However, real-time data is much more valuable. At this stage, the business analyst would like to define KPI's that will later appear on a Dashboard and be visible to the business leaders.

We have selected the KPI's in Table 3-8 for performance measurements and monitoring of Health Care Insurance Co. ABC.

Table 3-8 Suggestions for KPI's

Activity	Type of Activity	Type of Measurement
Request Receive Pricing	Human Task	Key Performance Indicator on Duration. Average duration should remain < 3 hours.
Select Provider	Human Task	Key Performance Indicator on Duration. Average duration should remain < 1 hour.

Activity	Type of Activity	Type of Measurement
Handle Medical	Automatic Task	should remain around 22.5%. Needs to be monitored
Handle Dental	Automatic Task	should remain around 22.5%. Needs to be monitored
Handle Behavior	Automatic Task	should remain around 30%. Needs to be monitored
Notify Rejection to Customer	Automatic Task	<25% (to guarantee satisfaction)

KPI's described in Table 3-8 on page 77 follow the "Input, Output, Process and Outcome Model."

Table 3-9 KPI's for Health Care Insurance Co. ABC

Organization	Input	Output	Process	Outcome
Health Care Insurance Co. ABC Claims Process	Total Processing Time (Total Amount of time spent on Process) Amount of claims arriving to Health Care Insurance Co. ABC	Number of Handle Dental Number of Handle Medical Number of Handle Behavior	Average duration of Request Receive Pricing Average duration of Select Provider Average duration of Determine Adjudicators	Number of rejected claims Number of customers not notified by the Health Care Insurance Co. ABC after rejection.

Overall, the choice of performance measurement points has to follow both the strategy and vision of Health Care Insurance Co. ABC, and it has to be aligned with the metrics of processes.

### 3.9.1 The Balanced Scorecard approach to ensure strategical alignment

The Balanced Scorecard (BSC) is a performance management tool for measuring whether the smaller-scale operational activities of a company are aligned with its larger-scale objectives in terms of vision and strategy. Figure 3-68 on page 79 illustrates the different focal points within the Balanced Scorecard approach and shows how they work together. In the following paragraphs we explain each perspective in greater detail.

The financial perspective examines if the company's implementation and execution of its strategy are contributing to the bottom-line improvement of the company. It represents the long-term strategic objectives of the organization and thus it incorporates the tangible outcomes of the strategy in traditional financial terms.

The customer perspective defines the value proposition that the organization will apply to satisfy customers and generate more sales to the most desired (for example, the most profitable) customer groups. The measures that are selected for the customer perspective should measure both the value that is delivered to the customer (value proposition), which can involve time, quality, performance and service, and cost, and the outcomes that come as a result of this value proposition (for example, customer satisfaction, market share). The value proposition can be centered on one of the following three areas while maintaining threshold levels at the other two:

- ▶ Operational excellence

- ▶ Customer intimacy
- ▶ Product leadership

The internal process perspective “Business Processes” is concerned with the processes that create and deliver the customer value proposition. It focuses on all the activities and key processes required for the company to excel at providing the value expected by the customers both productively and efficiently. These can include both short-term and long-term objectives as well as incorporating innovative process development to stimulate improvement.

The innovation and learning perspective “Organizational Learning” is the foundation of any strategy and focuses on the intangible assets of an organization, mainly on the internal skills and capabilities that are required to support the value-creating internal processes.

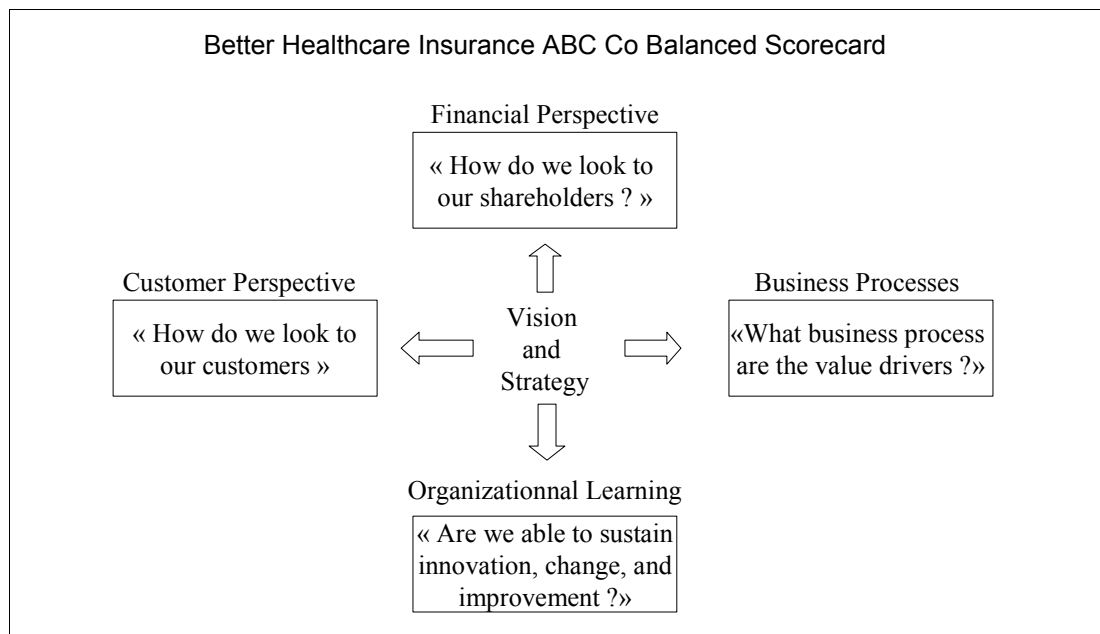


Figure 3-68 Balanced scorecard for Health Care Insurance Co. ABC

Vision and strategy are located at the core of the diagram shown in Figure 3-68, as these are integral to determining the optimal performance measures of a company.

**Note:** Business leader widgets can be used to define capability and strategical maps of your organization. The recommendation is to use a framework, such as the Balanced Scorecard, as an orientation when defining your strategical maps.

### 3.9.2 The Input, Output, Process, Outcome Model to cover process life cycle

The Input, Output, Process and Outcome Model is used to ensure measurement completeness for processes. This model is common in quality management and logistics, as it allows you to measure the impact of process changes within an organization and define KPI's which are meaningful. Using this model in conjunction with the strategical orientation of an organization can be very beneficial.

Categories of the Input, Output, Process and Outcome Model are as follows:

- ▶ Input KPIs measure assets and resources invested in or used to generate business results.

Examples include "Dollars spent on research and development," "Funding for employee training," "New hires' knowledge and skills," and "Quality of raw materials."

- ▶ Output KPIs measure the financial and non-financial results of business activities.

Examples include "Revenues," "Number of new customers acquired," and "Percentage increase in full-time employees."

- ▶ Process KPIs measure the efficiency or productivity of a business process.

Examples include "Product-repair cycle time," "Days to deliver an order," "Number of rings before a customer phone call is answered," "Number of employees graduating from training programs," and "Weeks required to fill vacant positions."

- ▶ Outcome KPI's measure the customer value impact as the result of an activity (for example, the number of incidents occurred).

They measure what the customer values as the result of the activity. Outcome KPI's focus on customer value.

### 3.10 Summary

In this chapter we captured the current state process imported from BPM Blueworks high-level process diagrams. We enriched the imported information by specifying decisions. Figure 3-69 is a summary overview of the major steps performed within the Storyboarding phase. The imported business process was separated into domain-specific sub-processes named Claim Intake and Claim Adjudication. We captured and described the roles.

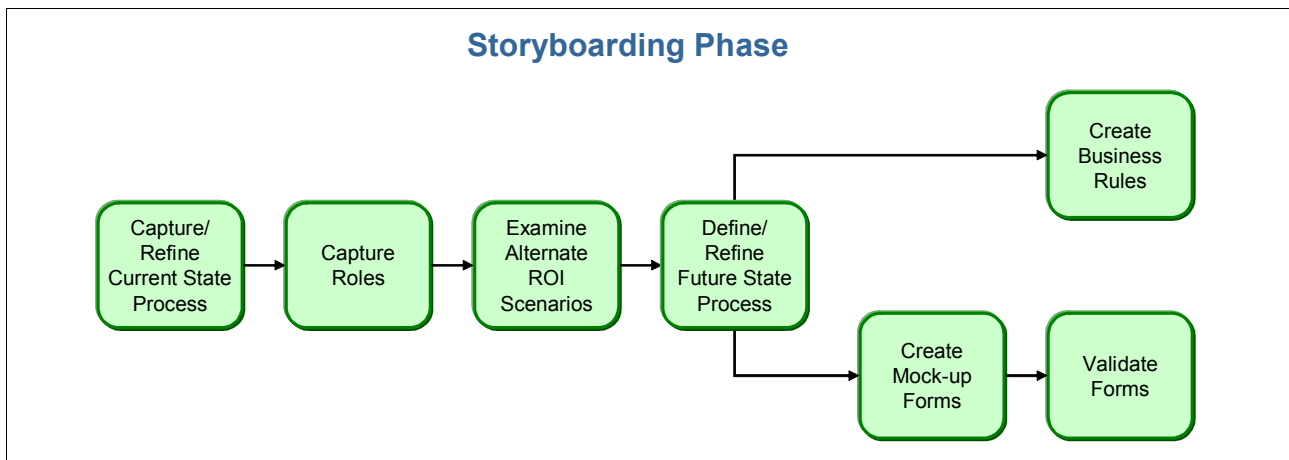


Figure 3-69 End of Storyboarding

We concentrated on examining alternate ROI scenarios. Therefore, a detailed simulation was necessary, which concentrated on finding all possibilities for improvement. Four issues were discussed and remedies for these issues were applied. The business process was basically automated by converting tasks into human tasks, business rules and Web services. An analysis was made to determine the cost improvement between the various improvements. We determined an overall improvement of about 56% after automatization and process improvements.

We detailed business rules and created validated mockup forms. The effort of storyboarding results into a fully improved and simulated future business process.





# Experience

After you have modeled the basic flow of your process and verified that the flow and activities in the flow work as expected in Chapter 3, “Storyboarding” on page 35, you are now ready to refine your process to make it easier for people who will use the application to perform their assigned tasks.

This chapter introduces the “Experience” phase outlined in the *IBM Business Process Management Prescriptive Guide to Solution Implementation*. This is the third phase in the approach. It has the goal of capturing the business intent through documenting and creating basic models for the business goals, objectives, and strategy. Within the chapter, we review the steps of the Experience phase using the specific context from the Health Care Scenario demo introduced in 1.6, “Introduction to the health care demo scenario” on page 15.

## 4.1 Objective of the Experience phase

Experience is the third phase in the approach described in *IBM Business Process Management Prescriptive Guide to Solution Implementation*. This is the phase in which the business analysts can begin to experience the solution through visualization and true hands-on iterative testing. The goal of this phase is to refine the solution. This is done while still working with sets of realistic data, but before the solution has been deployed into a larger scale production environment. As we discuss in this chapter, much of this is made possible through the Interactive Process Design (IPD) capability within WebSphere Business Modeler. (For example, in 4.8.2, “Testing with the real life scenario” on page 122). We illustrate how to modify business rules and review the impact on the process.)

Based on the experience results during this iterative, hands on, refinement phase, you can be confident that the final solution, when deployed in a larger scale environment, will be the solution that most effectively meets your needs.

## 4.2 Overview of steps in the Experience process

The steps to be accomplished in this phase are as follows:

1. Add operational characteristics (attributes) to the future state process
2. Define Constructs for execution on future state process
3. Elaboration of performance measures, KPIs, and business SLAs
4. Refine Forms
5. Interactively validate elaborated process in IT sandbox

In the upcoming sections, we discuss how we performed these specific tasks within the context of Health Care Scenario demo introduced in 1.6, “Introduction to the health care demo scenario” on page 15.

Figure 4-1 illustrates an overview of these tasks from a visual model perspective.

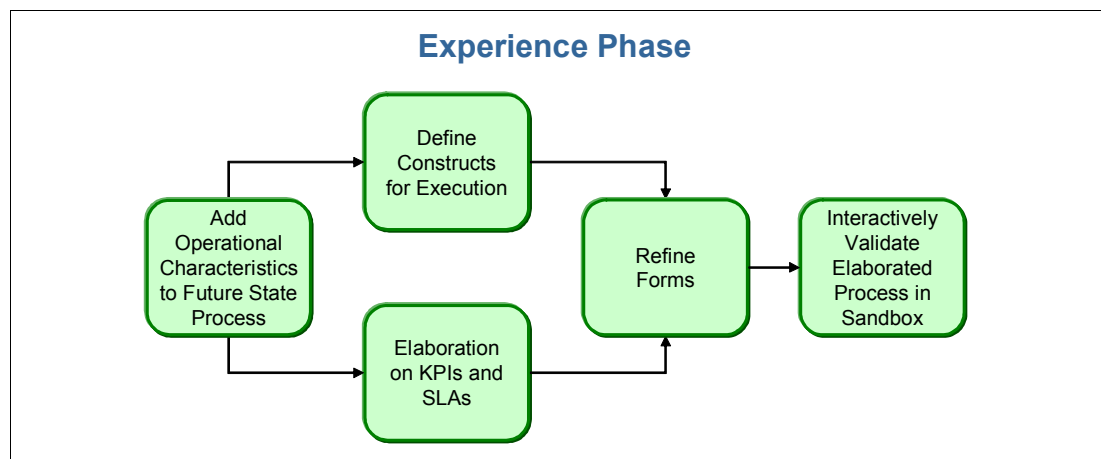


Figure 4-1 Visualization of the steps performed within the Experience phase

## 4.2.1 Activities within each task

This section details the activities to be accomplished within each task.

### 1. Add operational characteristics to future state process.

Refine and fill in high level process steps, process logic, error handling, and data flow to support process execution.

**Note:** Process data should reflect the fields & content needed to support the process from storyboarding

### 2. Define Constructs for execution on future state process.

- All process control flow (for example, gateways) should be refined to reflect decision logic based on process data.
- Define Business Object Model look for reuse opportunities.
- Business roles for human tasks should be mapped to the organizational directory.
- Technical attributes should be added to the process model to prepare for runtime deployment.
- Publish models to repository.

### 3. Elaboration of performance measures, KPIs, and business SLAs.

- Introduce additional measures of process performance against the expanded operational process. This includes adding measures for activities, process branches, and other aggregated measures introduced during process refinement.
- Task escalations should be added in accordance to business SLAs.

### 4. Refine forms.

- Working with user interface development, the form mockups are built out as a fully functional user experience.
- Forms are typically exported separate from the process for the hand-off. The end result is a collection of fully functional forms that can be handed in a single web-ready (WAR) package to IT.
- Publish forms to repository.

### 5. Interactively validate elaborated process in IT sandbox.

- After adding operational characteristics for the first time or for subsequent iterations, the process model can be deployed directly to a test environment for user interaction and validation.
- A mockup of an appropriate business space can be created for interacting with the process, which can provide guidance for IT.

## 4.3 Reviewing the goals of Experience within the context of the health care scenario

In the introductory sections, we defined the overall steps and activities within the Experience phase. Now, we illustrate how to perform several of these specific tasks and activities using the context of the Health Care scenario. Specifically, we discuss the following topics:

- ▶ Within the activity of adding operational characteristics (attributes) to the future state process, we show where and how to define specific tasks as either of the following tasks:
  - Business rule task
  - Human task
  - An option for incorporating a service task (Web service) potentially to replace a human task
- ▶ Within the activity of elaborating on KPI's and SLA's, we discuss the following procedures:
  - How to define the task duration KPI, using the example of the request/ receive pricing human task. After this KPI is defined, it gives the analyst a specific metric for measuring and comparing the duration of this task.
  - Define a KPI which measures total claim by claim type. With the creation of this KPI, the business analyst can have a much better understanding of where the majority of claims exists.
- ▶ Within the activity for refining forms, we give an illustrative example of how a refined form could look using Lotus Forms Designer, after you have created a basic form which maps the inputs required for claim.

**Note:** Discussing the step-by step approach of using Lotus Forms Designer and working with a user interface/graphics specialist is beyond the scope of this IBM Redpaper publication, but we do provide an overview of the process and illustrate how a completed form will look.

- ▶ We discuss how to deploy the model using the IPD to have a view of the working model within the context of the business space. We introduce the business space and show how an analyst can review the process flow iterations and where appropriate, adjust specific KPI values to better monitor results.

Now that we have set the stage with the steps from the *IBM Business Process Management Prescriptive Guide to Solution Implementation*, we begin by adding operational attributes in the process and defining business rules, human tasks, and potential service tasks.

## 4.4 Add operational characteristics

In the Storyboarding phase, we defined the future state process. (See 3.5, “Define the future state scenario” on page 64) This process will not yet deploy through the IPD until we add specific operational characteristics to future state process. Figure 4-2 illustrates the current focus of this section within the context of the overall Experience phase.

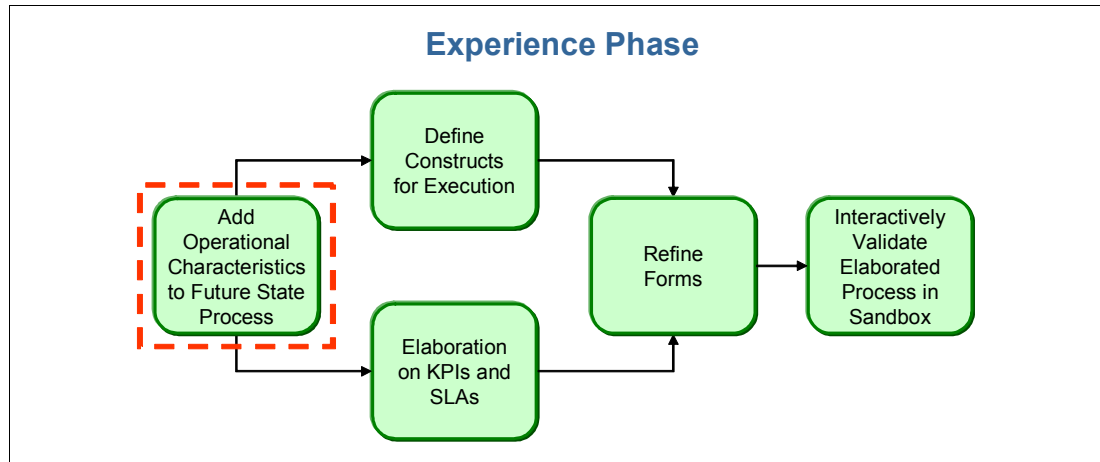


Figure 4-2 Visualization of the steps performed within the Experience phase

In this section, we review the process and determine for each task what kind of task this should be:

- ▶ Business rule task
- ▶ Human task
- ▶ Service call (Web service) based task
- ▶ Refine and fill in high level process steps, process logic, error handling, and data flow to support process execution.
- ▶ Process data should reflect the fields and content needed to support the process from storyboarding

### 4.4.1 Defining business rule tasks

A business rule task is a specialized type of task that helps you, as a business analyst, define business policies. You can expose your business policies as business rules in your process and if the rules are based on rule templates with parameters, the parameter values are configurable in your process at runtime. While you are testing your application, you can view the associated business rules and update rule parameter values to test the effect of different values on the execution path. This rule is viewable and configurable by Business Space users after the application is deployed.

The following list details key concepts for business rules:

- ▶ **Rule**

A rule is a condition that must evaluate as true to perform a specific action. For example, if the claim type is “Medical” and the claim amount is less than \$1000, set the billing provider to “Internal Billing”.
- ▶ **Rule template**

A rule template is a parameterized template that simplifies the definition of many rules and can enforce the structure if there are several rules that have the same structure. For example, the previous rule example can be turned into a template using the Claim Amount parameter instead of the actual amount value \$1000.
- ▶ **Rule set**

A rule set is a group of rules (and an associated template), with which you can manage related rules together. A rule set typically covers all eventualities so that you are certain that one rule will run, regardless of the input value. For example, Gold, Silver, and Bronze rules with the rule template constitute a rule set.
- ▶ **Business rules task**

A business rules task is a task that can contain multiple rule sets and allows multiple rule sets to run concurrently.
- ▶ **Rule presentation**

A rules presentation is the text representation for your business rule. When you create a business rule, a default rule presentation is generated for you. Because the rule presentation that you set up in WebSphere Business Modeler is the same string that is presented to users for configuration in the Business Space interface, it is important to customize the text into a clear and readable format so that the Business Space user can understand the rule logic and identify which parameters to modify.

Although this business logic can be represented with a multi-branch decision and parallel task flows, business rules provide a consolidated way to encapsulate the policy.

#### **4.4.2 Identifying business rule candidates from the scenario process**

Figure 4-3 on page 87 illustrates which specific tasks in the process are candidates as business rule tasks:

- ▶ Check Member Eligibility
- ▶ Provider Selection
- ▶ Determine Adjudicator

Resource description	Type of resource
Claims Analyst	Role (Human Being)
Pricing Specialist	Role (Human Being)
Determine Adjudicator	Business Rule
Handle Medical	Service (WebService)
Handle Dental	Service (WebService)
Handle Behaviour	Service (WebService)
Check Member Eligibility	Business Rule
Provider Selection	Business Rule
Select Provider	Human Task
Set Provider	Service (WebService)
Clean Claim Edits	Service (WebService)
Reject Claim	Service (WebService)
Request Receive Pricing	Human Task

Figure 4-3 Activities for business rule from storyboard

In our Claim Intake sub-process where a claim is matched with a provider, we decided that we want to use a business rule for provider selection. Figure 4-4 illustrates the step within the Claim Intake process which can be defined as a business rule

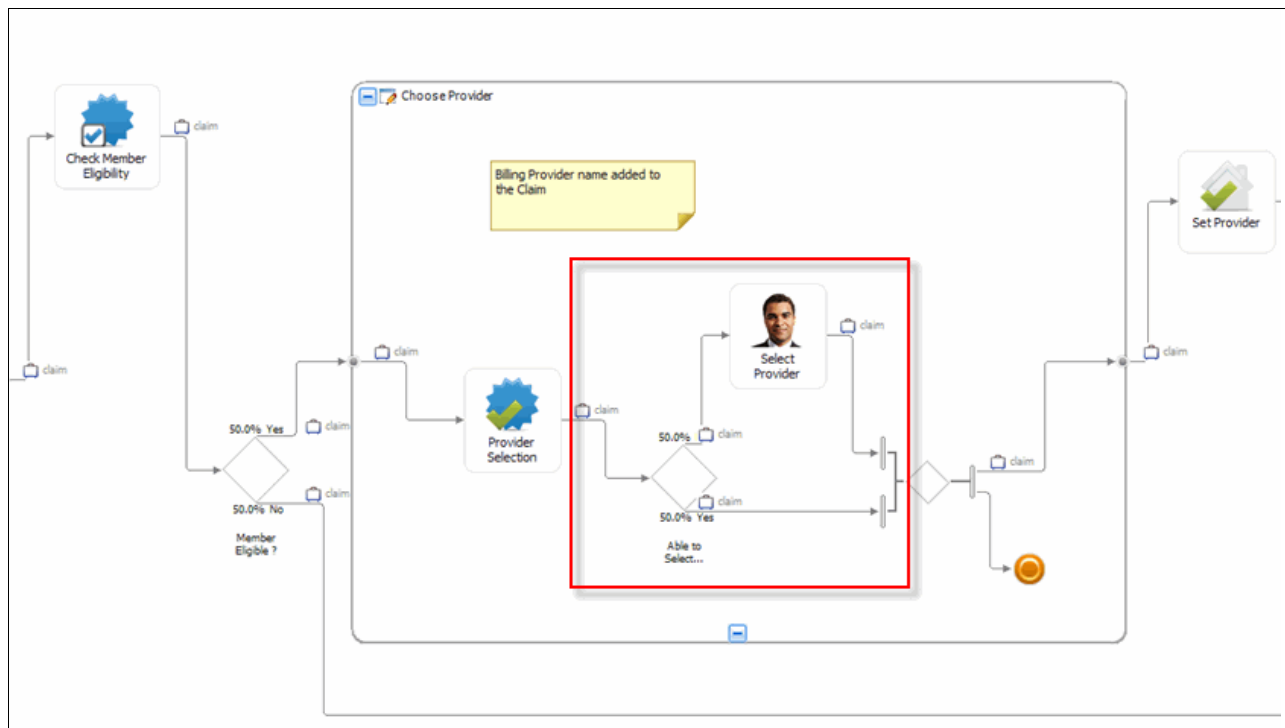


Figure 4-4 Step within the Claim Intake Process which can become a business rule

In this business rule scenario, we provide a filter for determining which claim amounts need to be routed to the Select Provider human task. We can decide whether we automatically select the internal billing provider based on a predefined claim amount or send to a human task to select another billing provider. Also, because we are using a business rule template, we can dynamically change this predefined claim amount during runtime in business space to adapt to changing business environments. This will reduce the claim processing cost by reducing the select provider human task activity.

**The business value of converting a manual task to a business rule:** This business rule acts as a filter for the human task so that only high amount claim goes to the human task for selecting billing provider and the business rule (this filter) assigns the billing provider if the claim amount is low. Automating the manual task of provider selection as a business rule reduces human error and labor cost.

### 4.4.3 Steps to create a business rule (Provider Selection)

In this section, we discuss the steps to create the Provider Selection business rule that we are going to use to decide either of the following tasks:

- ▶ Assign the internal billing provider
- ▶ Send the selection task to the claims analyst for the human task

We are going to replace the current provider selection activity with the new rule task on the process editor for Claim Intake process. Figure 4-5 illustrates this step in the process flow.

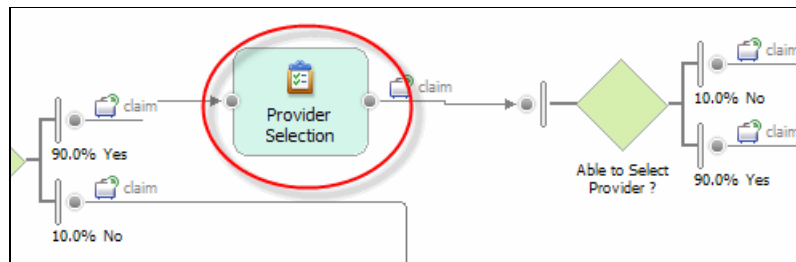


Figure 4-5 Current provider selection activity

To create this business rule, perform the following steps:

1. Drag a business rules task from the palette to the process editor. See Figure 4-6 on page 89.



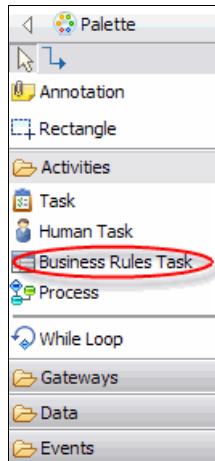


Figure 4-6 Business rule task

2. Change the name of this new rule task to Use Internal Billing and replace the Provider Selection Activity by moving the input and output wiring from the Provider Selection Activity to Use Internal Billing Activity.
3. Delete the Provider Selection Activity.
4. Click the **Attributes - Attributes- XXXX** Tab for the business rule task and then select the Business Rules tab. (Figure 4-7)

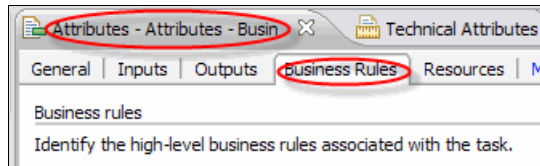


Figure 4-7 Business Rules tab

5. In the Business Rules tab of the task, click **Add** to create a new business rule.

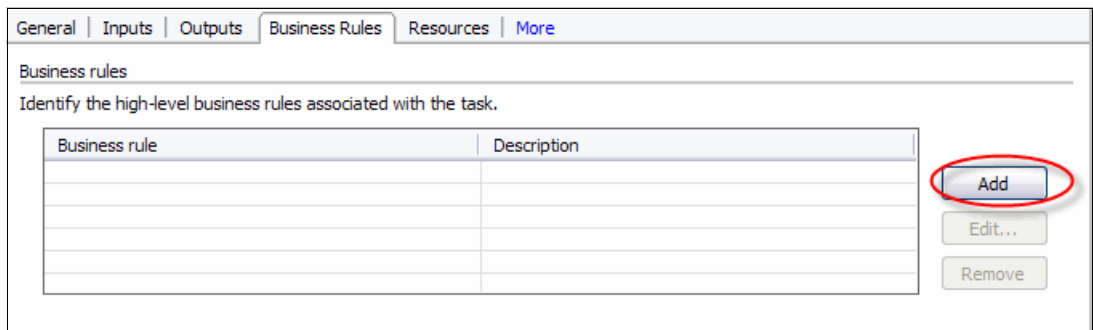


Figure 4-8 Add new business rule

6. Define the business rule. In the new “Define Business Rule” window, define:

- Rule parameter (Claim Amount)
- Rule template (Internal Template)

With the parameter (Claim Amount), we can dynamically change the value in the business space during the runtime at a later time.

a. Enter Use Internal Billing for the Name field, as shown in Figure 4-9.

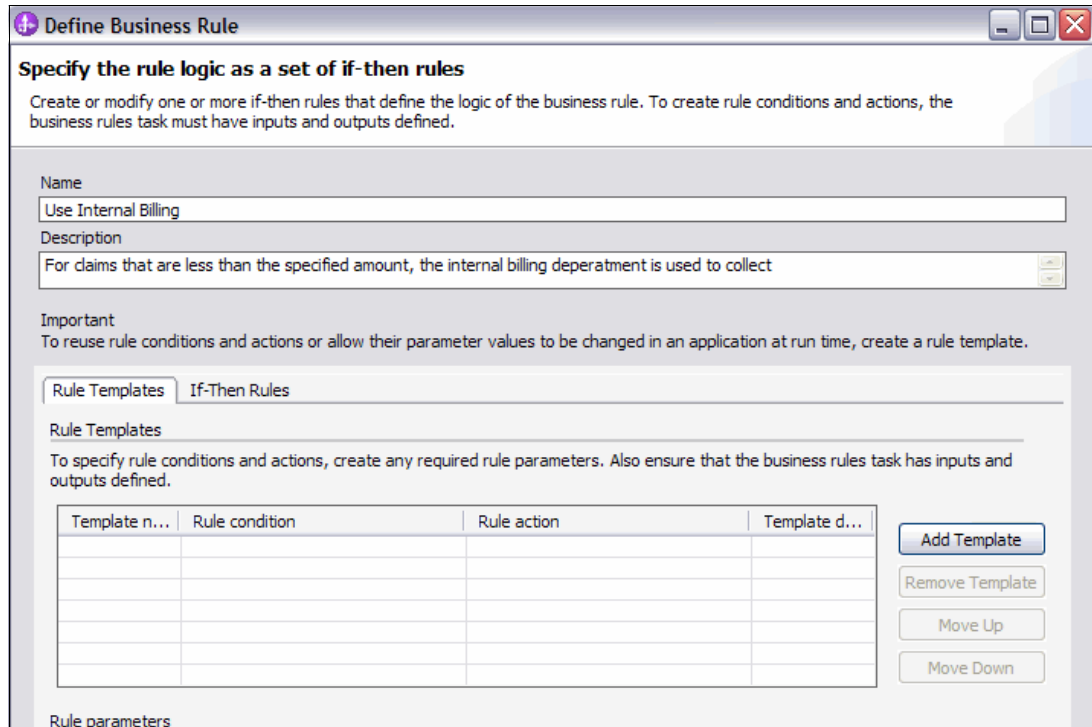


Figure 4-9 Define Business Rule window

b. Click **Add Template** and click **Add** in the Rule parameters section.

A new row will appear for you to create a new parameter.

c. Enter Claim Amount for Parameter Name and select **Decimal (double-precision)** for Type. (Figure 4-10)

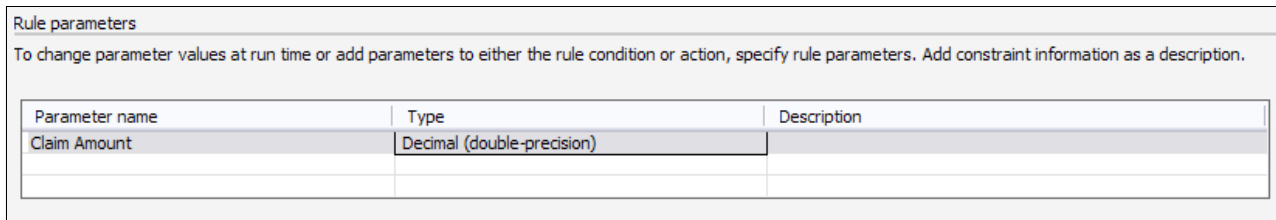


Figure 4-10 New parameter

7. Create a template that compares the Claim Amount parameter we defined with Amount in the input field of this business rule task. If the Amount is less than 'Claim Amount' (Condition), then it will set the Assign Provider field in output to False and also assign the Billing Provider field in the output to Internal Billing'(Rule Action).
  - a. Change the Template Name to Internal Template and click **Rule condition** to create a condition template, as shown Figure 4-11.

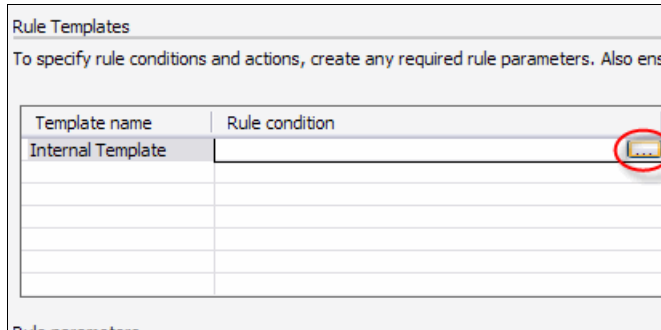


Figure 4-11 New rule template

The “New Expression Builder” window displays.

- b. Click **Add** to define a new condition.
- c. Using the Expression Composer, create a new condition as shown in Figure 4-12. Click **Apply**, then click **OK**.

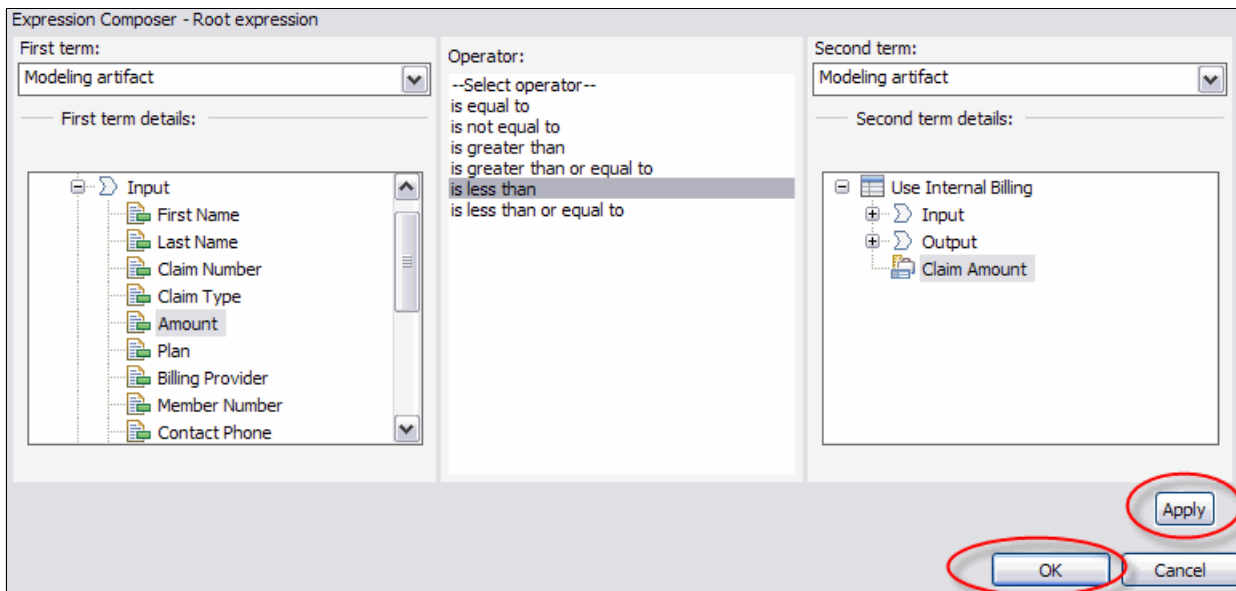


Figure 4-12 New rule condition

8. Create a new Rule Action that will be executed if the new Rule Condition is true.
  - a. Click **Rule Action** as in Figure 4-13.

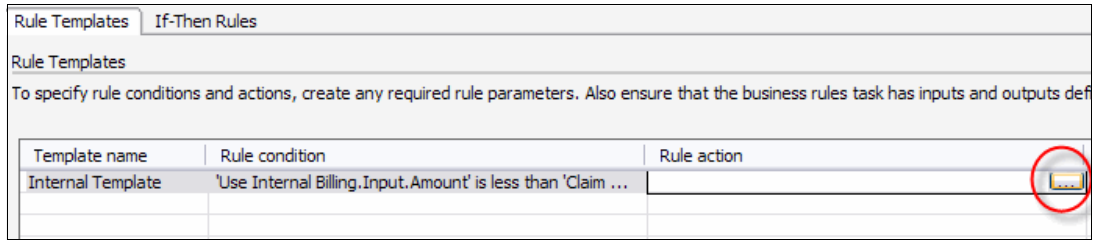


Figure 4-13 Rule Action button

- b. Create a new Rule Action that assigns Internal Billing to the Billing Provider field in output. Set the Provider output field to False, as shown in Figure 4-14. Click **OK**.

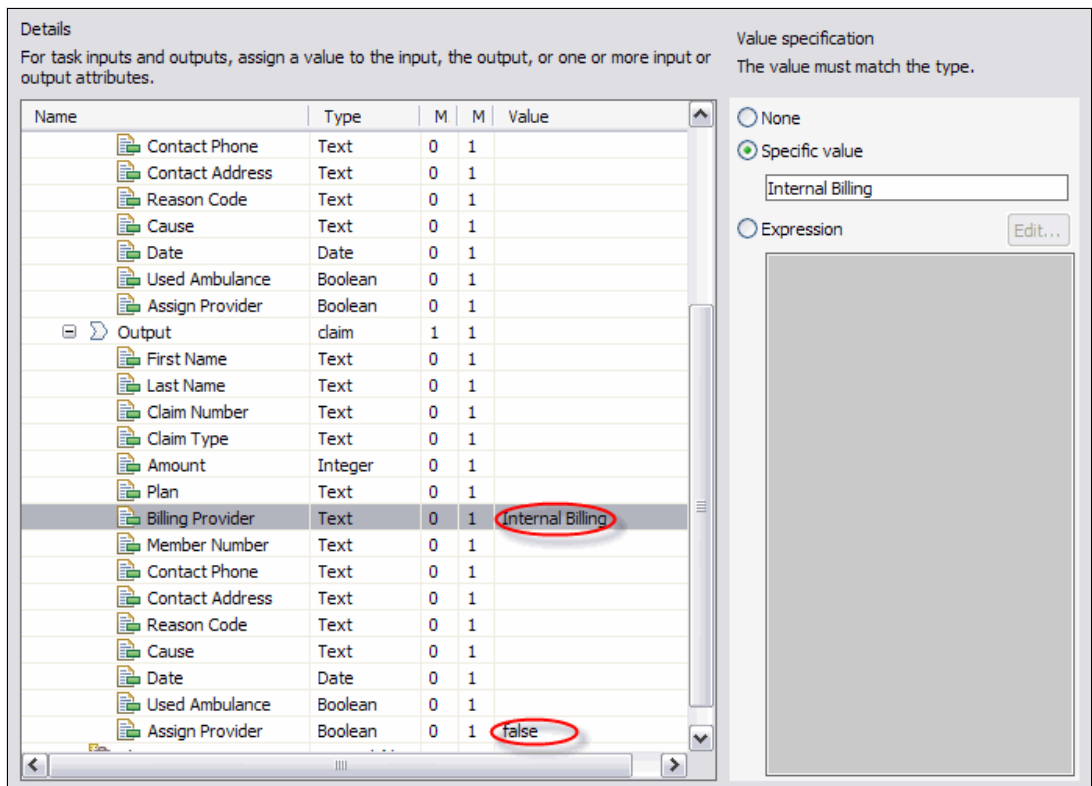


Figure 4-14 Rule action

9. In order for Business Space users to configure parameter values in runtime, you must include the configurable parameters in the rule presentation. You can customize the text that shows up in Business space during runtime for dynamic change of the parameter. (Figure 4-15 on page 93)

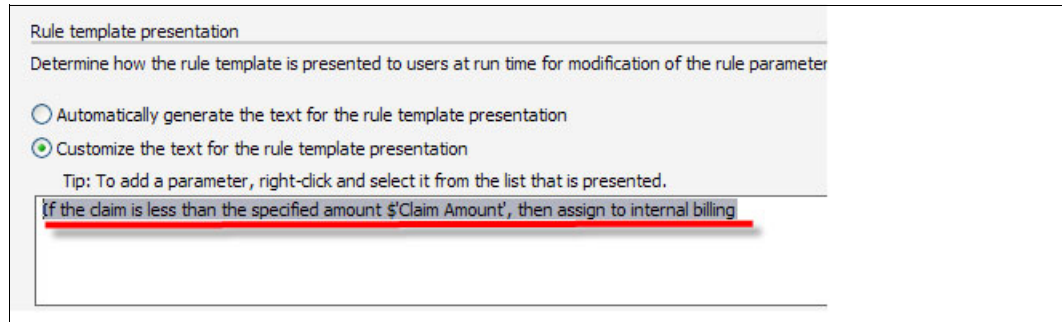


Figure 4-15 Rule presentation

10. Click the **If-then rules** tab and we create three rules (Figure 4-16):

- Rule for Initialization (copying input to output)
- Default Rule (setting 'Assign Provider' field in output to True)
- Rule for using the Internal Template we just created

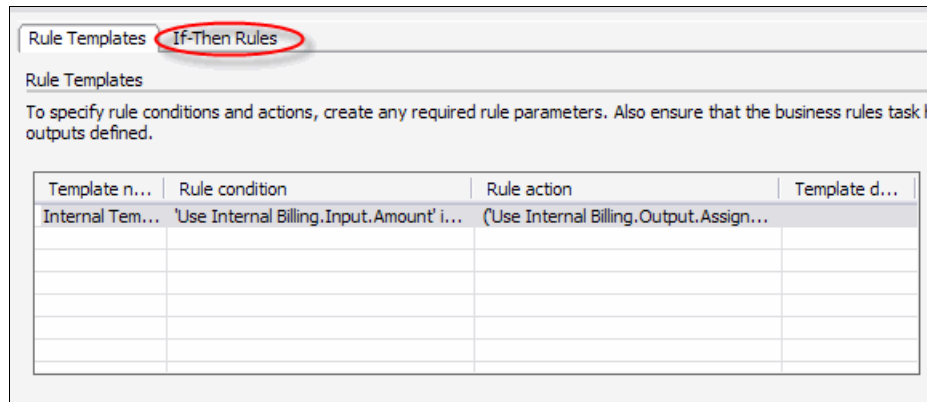


Figure 4-16 If-Then Rules tab

- a. Click **Add Rule** to add Rule for Initialization
- b. Enter Initialize for the rule name and click **Rule Condition**.
- c. In the “Expression Builder” window, create a condition that will be always true, as shown in Figure 4-17.

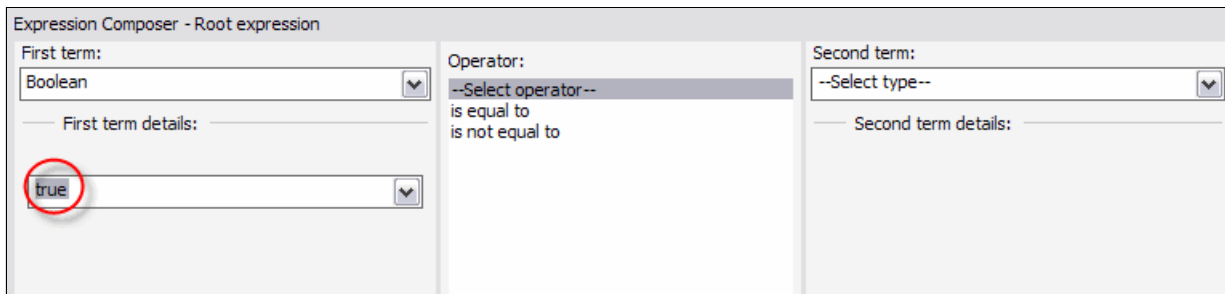


Figure 4-17 true condition

- d. Click **Rule Action** and the “Specify Rule Action” window displays.
- e. Highlight the output and click **Expression**, and then click **Edit** as shown in Figure 4-18.

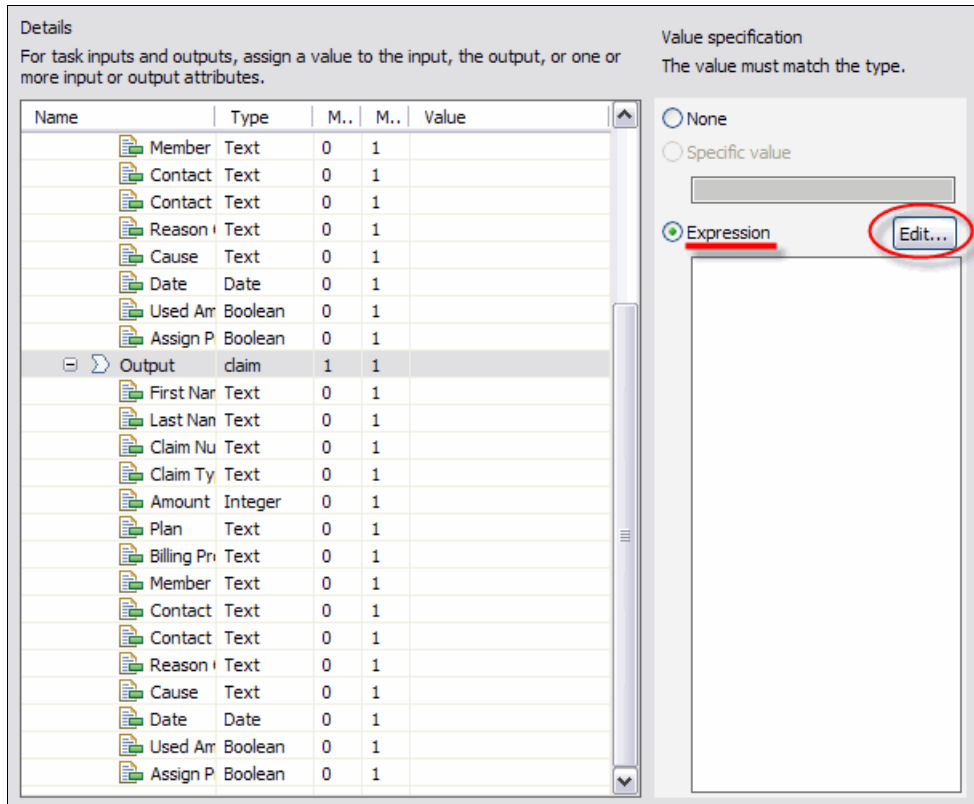


Figure 4-18 Initialization action rule

- f. In the “Expression Builder” window, select **Input** as shown in Figure 4-19, and click **Apply**, and then click **OK**.

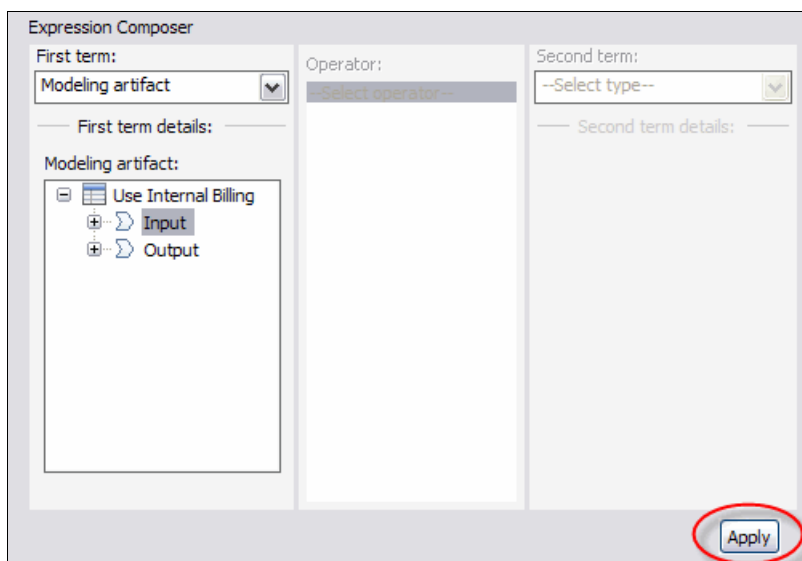


Figure 4-19 Initialization action rule Composer

11. The Initialization Rule is created. We will now create the second rule (Default Path) that sets Assign Provider field in output to True.
  - a. Click **Add Rule**, change the rule name to Default Path, and click **Rule Condition**.
  - b. Make the condition True.
  - c. Click **Rule Action** and in the “Specify Rule Action” window, set the Assign Provider output field to True, as shown in Figure 4-20. Click **OK** to save.

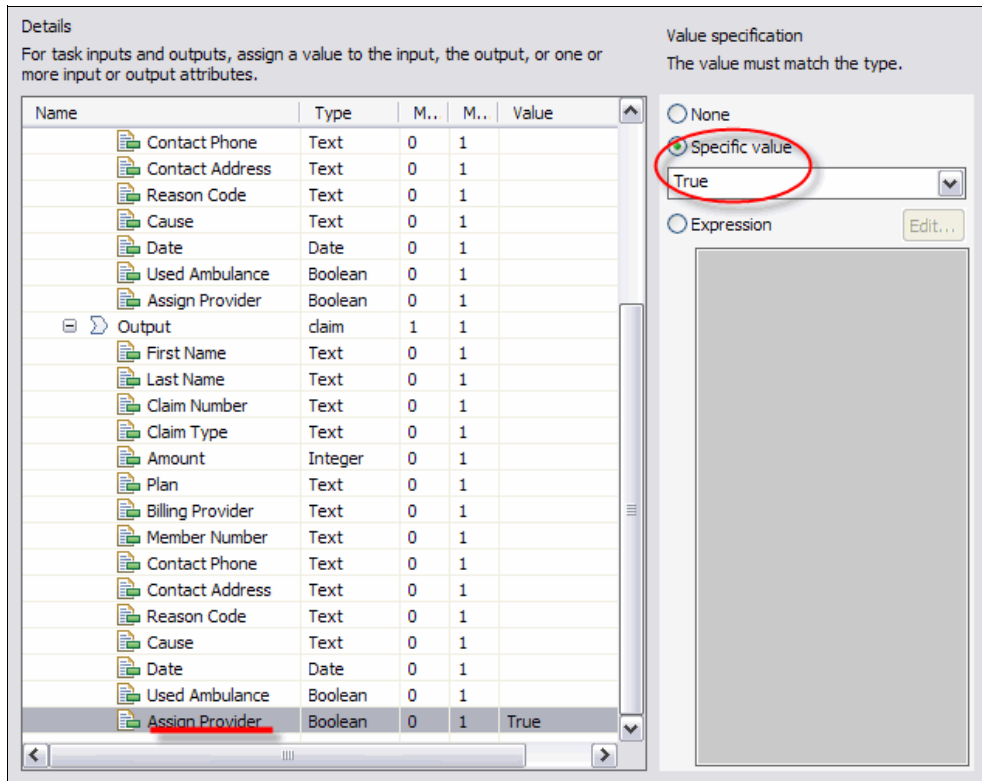


Figure 4-20 Default path rule composer

12. Create the third that uses the Internal Template we created before.
  - a. Click **Add Rule** and change the rule name to Internal Billing.
  - b. Click the template name and select the Internal Template. This populates the rule condition and action field with the templates.
  - c. Highlight the **Internal Billing** rule as shown in Figure 4-21.

Rule name	Template name	Rule condition	Rule action
Initialize	None	true	'Use Internal Billing.Output' is set to 'Use Internal Billing.Input'
Default Path	None	true	'Use Internal Billing.Output.Assign Provider' is set to True
Internal Billing	Internal Template	'Use Internal Billing.Input....	('Use Internal Billing.Output.Assign Provider' is set to False), ('Use Internal Billi...

Figure 4-21 Complete If-Then rules

- d. The internal billing rule includes the parameter (Claim Amount) that can be changed in runtime.
- e. Set the initial parameter value to the value of 1000, as in Figure 4-22.

Rule parameter values

Specify the value of each parameter used in the rule condition and action.

Parameter name	Type	Value	Description
Claim Amount	Decimal (double-precision)	1000.0	Use the internal depart...

Figure 4-22 Claim Amount value

13. Set this new rule (Use Internal Billing) as the default business rule in the scheduling section of the Business Rules tab (Figure 4-23).

Business rules

Identify the high-level business rules associated with the task.

Business rule	Description
Use Internal Billing	For claims that are less than the sp...

Scheduling

Specify which business rule should be used by default and which business rules are in effect on specific dates. Dates are set in local time zones, so the scheduling of business rules in an application at run time occurs in the local time zone.

Default business rule

Figure 4-23 Default business rule

We implemented rest of the business rules for resource type Business Rule in Figure 4-3 on page 87 following the same approach outlined in the above steps.

#### 4.4.4 Defining human tasks

In the previous section, we added a set of operational characteristics by defining which steps in the overall process could be defined and implemented as business rules. The next step is to define which steps in the process can be defined and implemented as human tasks. The two candidate steps for this are as follows:

- ▶ Select provider task
- ▶ Request/receive pricing task

For this scenario we focus on the Request/receive pricing task and illustrate how we can assign escalation attributes to create alerts if the duration of this task is taking too long. Figure 4-24 on page 97 shows a list of resources within the process and highlights the ones which will be assigned as a human task.



Resource description	Type of resource
Claims Analyst	Role (Human Being)
Pricing Specialist	Role (Human Being)
Determine Adjudicator	Business Rule
Handle Medical	Service (WebService)
Handle Dental	Service (WebService)
Handle Behaviour	Service (WebService)
Check Member Eligibility	Business Rule
Provider Selection	Business Rule
Select Provider	Human Task
Set Provider	Service (WebService)
Clean Claim Edits	Service (WebService)
Reject Claim	Service (WebService)
Request Receive Pricing	Human Task

Figure 4-24 Activities for human task from storyboard

## Business considerations for a human task

Complex process flows are often a combination of automated tasks and human tasks. In our solution, users can assign a human role or specific individual to a task. In addition, they can use a first-class process element called a human task, which enables an interaction between a person and a business process or service.

To ensure that human tasks do not delay a running process, you can define the escalation logic that takes effect after a specified interval.

**Important:** Business roles for human tasks should be mapped to the organizational directory and task escalations should be added in accordance to business SLAs.

## Escalation

In a human task, we can assign the task to a specific group of people based on their role and create escalation if the task is not performed or claimed for a specified duration.

For the sake of illustration in our scenario, we implement escalation within the Request/Receive Pricing human task activity in the Claim Process to meet our SLAs for customer satisfaction. Figure 4-25 is the icon used in the overall process to indicate that Request / Receive pricing is a Human Task activity.

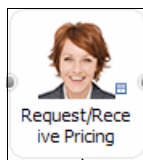


Figure 4-25 Request/receive pricing human task

## Implementing escalation attributes to the human task

Perform the following steps to implement escalation attributes to the human task.

Click the **Attributes - Request/Receive Pricing** tab of the Request/Receive Pricing human task, and then click the **Escalation** tab. Click **Add**.

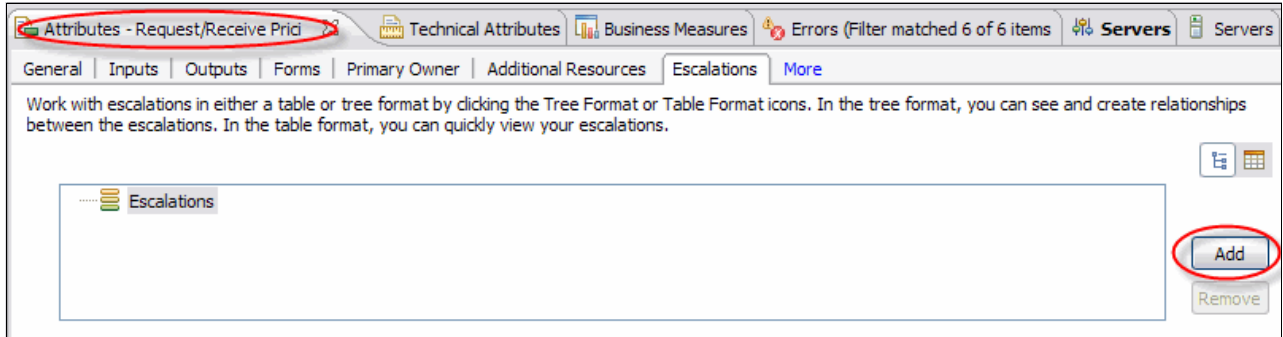


Figure 4-26 Add escalations

It will populate with default escalation settings and we modify some of the settings so that if the task is not claimed by users within two minutes after it is ready, the user with ID “admin” will be notified by posting the escalation work item on the work list for the admin user. The changes are shown in Figure 4-27.

A screenshot of a 'Details' form for a new escalation. The form is titled 'Specify the escalation details and action.' and contains the following fields:

- Name: Pend
- Description: If the service level for claiming a task is not achieved
- If task is: Ready
- Task is not: Claimed
- After: Days (0), Hours (2), Minutes (2), Seconds (0), with a 'Clear' button.
- After escalation: No previous escalation
- Notify: Person by person ID ("admin"), with a 'Select...' button.
- Notification type: E-mail (unselected), Item on work list (selected).
- E-mail message: (empty), with an 'Edit...' button.

Figure 4-27 New escalation

## 4.5 Define Constructs for execution

The next step within the Experience phase is to define constructs and prepare the process model for runtime deployment. For the sake of illustration in our scenario, we review the process and consider how existing Web services already defined by the organization could be used to make steps in the process more efficient.

The goal for defining constructs for execution on future state process are as follows:

- ▶ All process control flow (for example, gateways) should be refined to reflect decision logic based on process data.
- ▶ Define Business Object Model look for reuse opportunities
- ▶ Business roles for human tasks should be mapped to the organizational directory.
- ▶ Technical attributes should be added to the process model to prepare for runtime deployment
- ▶ Publish models to repository

Figure 4-28 illustrates the current focus of this section within the context of the overall Experience phase.

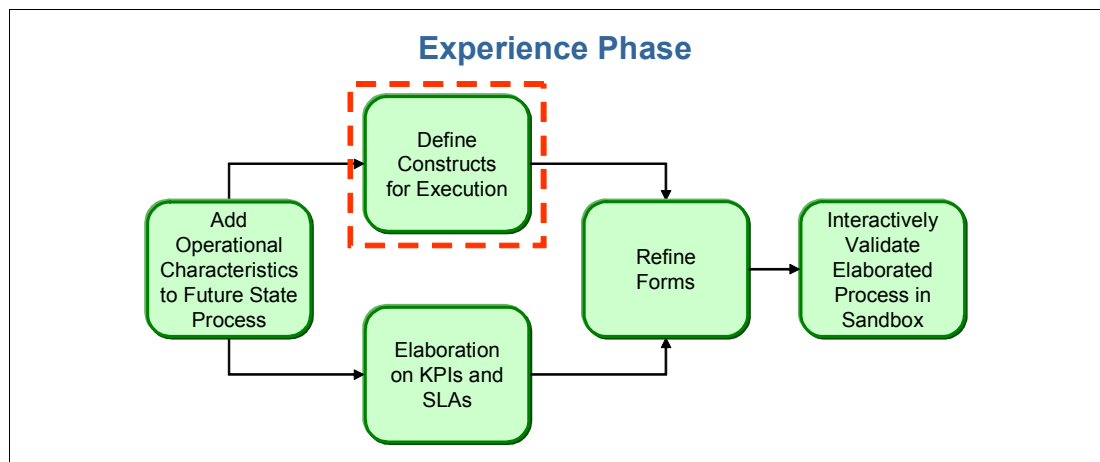


Figure 4-28 Visualization of the steps performed within the Experience phase

### 4.5.1 Adding services to deployable applications

Services are external processes outside the organization that can be used within the organization's processes. Services either provide input to the organization or receive output from the organization. Services have well-defined inputs and outputs, but their internal processes are unknown to the organization and cannot be changed.

As we review the claim handling process, the steps that could be ultimately implemented as a service are as follows:

- ▶ Handle Medical
- ▶ Handle Dental
- ▶ Set Provider
- ▶ Clean Claim Edits
- ▶ Reject Claim

**Note:** For the sake of this scenario, we are assuming that Web services containing the functionality required either already exist, or have already been created by the IT organization for Health Care Insurance Co. ABC.

The goal is to illustrate why and how Web services could be used here.

As you are modeling your deployable business process, you might identify certain activities that can be automated. Figure 4-29 identifies some resources that can be implemented as automated services.

Resource description	Type of resource
Claims Analyst	Role (Human Being)
Pricing Specialist	Role (Human Being)
Determine Adjudicator	Business Rule
Handle Medical	Service (WebService)
Handle Dental	Service (WebService)
Handle Behaviour	Service (WebService)
Check Member Eligibility	Business Rule
Provider Selection	Business Rule
Select Provider	Human Task
Set Provider	Service (WebService)
Clean Claim Edits	Service (WebService)
Reject Claim	Service (WebService)
Request Receive Pricing	Human Task

Figure 4-29 Activities for services from storyboard

Although services are outside the control of the organization, they are essential to modeling the realities of business-to-business integration. For example, in our scenario, Health Insurance Co. ABC can use the services of a Set Provider as part of a claim application process. You can represent the Set Provider task as a service when modeling that process. Figure 4-30 illustrates how you can right-click a task and begin the process of converting this to a service.

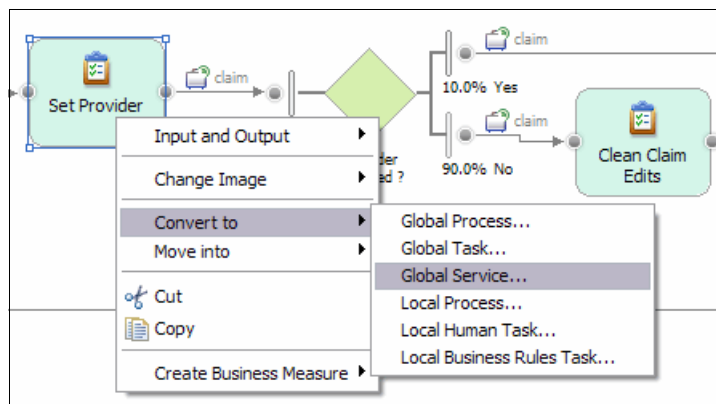


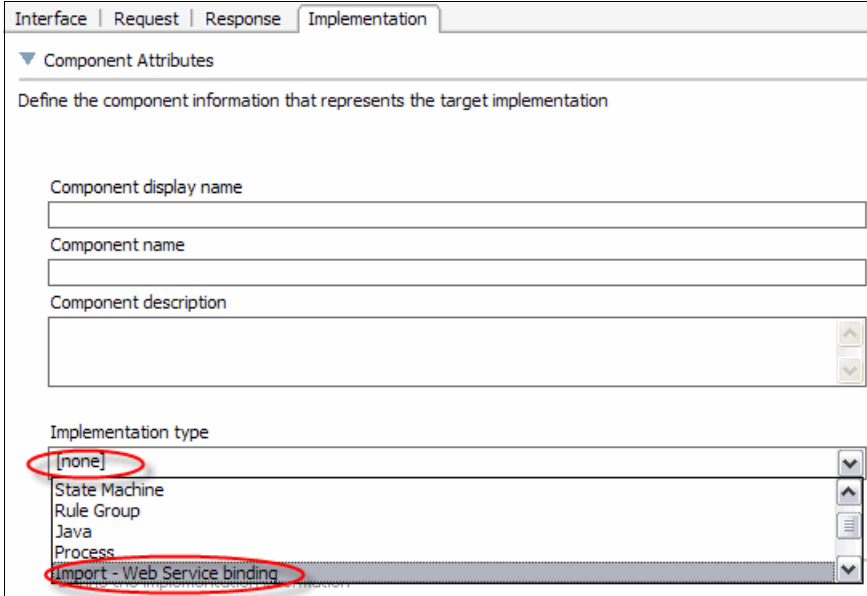
Figure 4-30 Service activity

## Considerations for activities modelled as a service

These activities can be modeled in your process as services or business services, depending on whether or not they have already been implemented as a service and exist on your WebSphere Service Registry and Repository server.

If the business service already exists on your WebSphere Service Registry and Repository server, you can import the business service and related business service objects for inclusion within your process model. For example, if there is already an implemented service that selects a billing provider for a claim in our scenario, you could replace the select provider human task in your process model with this service.

If your service has not yet been implemented, you can model the type of service that you would like to have implemented, including the types of input and output data and a description of the operations performed by the service, and pass the service specification to your IT developer to implement the service. The supported implementation types for tasks and global tasks in deployable processes are 'none' or "Import - Web Service binding". See Figure 4-31.



The screenshot shows a software development tool interface with four tabs: Interface, Request, Response, and Implementation. The Implementation tab is active. Below the tabs is a section titled "Component Attributes" with a sub-header "Define the component information that represents the target implementation". This section contains three text input fields: "Component display name", "Component name", and "Component description". Below these fields is a dropdown menu labeled "Implementation type". The dropdown menu is open, showing a list of options: "[none]", "State Machine", "Rule Group", "Java", "Process", and "Import - Web Service binding". The "[none]" and "Import - Web Service binding" options are circled in red.

Figure 4-31 Implementation type for services

After the developer has implemented the service and published the endpoint to the WebSphere Service Registry and Repository server, you should be able to test your service within your deployable process. IT should make the default WSRR connection from your test server through WebSphere Administrative Console, as shown in Figure 4-32.

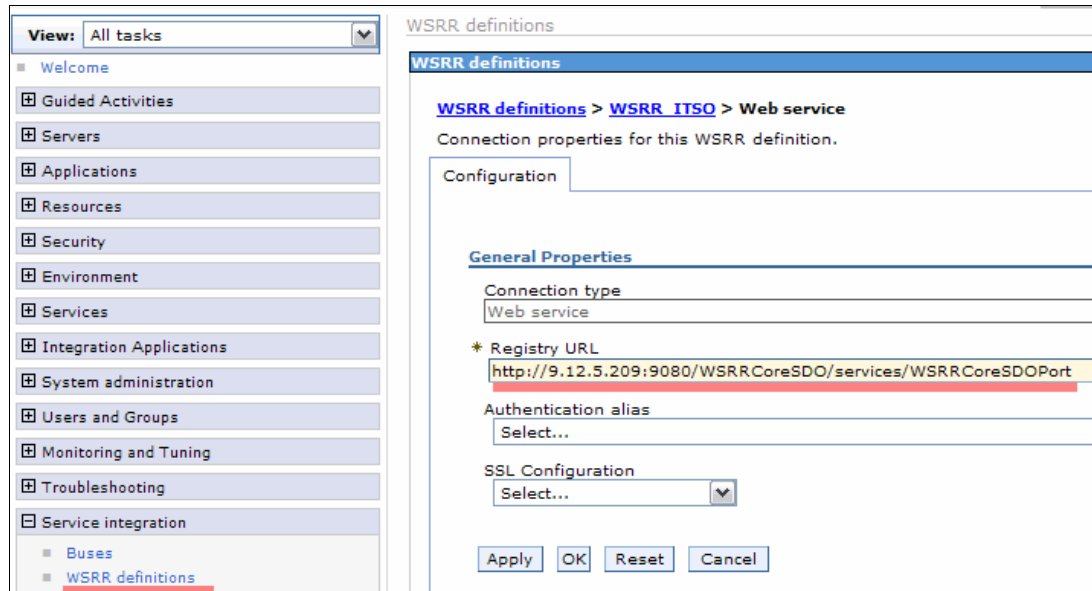


Figure 4-32 WSRR settings in IT sandbox

**Note:** You can still include services in your deployable process even if you are not using a WebSphere Service Registry and Repository server. If the WSDL you imported into WebSphere Business Modeler is a single WSDL that includes the PortType as well as the endpoint information, a WebServices Import will be generated that is bound to the mediation component as the default port. This means that if no WebSphere Service Registry and Repository server is configured, the WebServices Import will be triggered, using the endpoint that is defined in the original WSDL object.

**Optional:** You can improve the efficiency of how your service is located at runtime by using a classification system that is defined for services in your WebSphere Service Registry and Repository server. Such a classification system might include, for example, values that distinguish services used by one geographic region from another. For example, there can be one claim service that is specific to California and one for rest of the states. When modeling the claim process, you might want to ensure that the service for California is invoked and therefore tag the service invocation in your process model with the appropriate classifier.

## 4.6 Elaboration on KPIs and SLAs

With KPIs, you can analyze data to gain business insight into what might not be known or realized. As the business environment changes, KPI thresholds often need to change too. In the Business Space, you can modify KPI thresholds so that you can move your success targets and evaluate various scenarios without asking IT to update and redeploy the model.

Figure 4-33 illustrates the current focus of this section within the Experience phase.

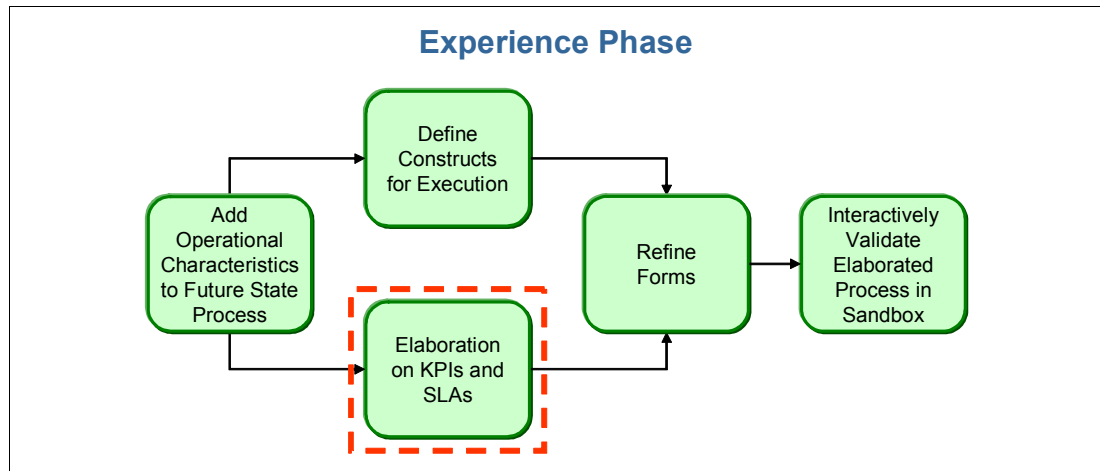


Figure 4-33 Visualization of the steps performed within the Experience phase

**Note:** In addition to this section, in which we introduce KPIs and illustrate how to define a specific KPI, refer to Chapter 5, “Manage” on page 135 for more information about creating, monitoring, and managing KPI performance.

#### 4.6.1 Setting the context within the scenario for Health Care Insurance Co. ABC

To bring this into the context of our scenario, the business analysts, working together with the management team of Health Insurance Co. ABC deem that the claim rejection totals threshold for the Medical claim type is too high. The analyst lowers the threshold value for determining a rejection and assesses how well the business might perform given the same incoming claims. If this real-time simulation shows that the threshold has been exceeded, the management team can then ask the business analysts to determine how the process can be improved given this new goal.

As you assess the state of the business using the dashboard, you might realize that a new, yet-to-be-defined KPI might be helpful and one that correlates data in a new way. In the Business Space, you can dynamically create a new KPI without modifying the original process. Additionally, in the Business Space, you can use one or more KPIs and modify the display mode (Table view, Gauge view, and so forth.) and the visual characteristics (color range spectrums, sizes, layout format, and so on). Then you can save this personal configuration so that it is applied to the most current deployed model. (See 5.6.2, “Setting up the KPI widget report” on page 151)

#### 4.6.2 Steps to define the task duration KPI

As part of our overall cost reduction effort, we would like to measure the duration of human tasks (request/receive pricing and select provider tasks). In the following sections, we describe how to do this.

Before you start creating this KPI, you need to enable monitored values for this task’s processing time.

## Enabling the monitored values

Perform the following steps to enable the monitored values.

1. In the process editor, click the **Request/Receive Pricing human task** in the Claim Process and then click the **Business Measures** tab. See Figure 4-34

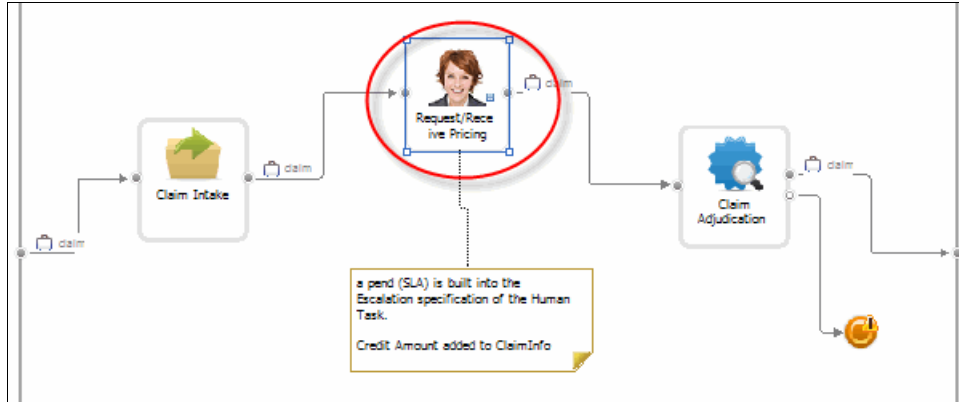


Figure 4-34 Request/Receiving Pricing activity

2. Click the **Monitored Values** tab in Business Measures and select **Average Request/Receive Pricing Processing time** as shown Figure 4-35.

Business Performance Indicators		Monitored Values	
Monitored values			
This section indicates which values you want returned from WebSphere Business Monitor after the process has been monitored.			
Process Element	Processing Time	Processing Cost	Startup Cost
Claim Process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Request/Receive Pricing	<input checked="" type="checkbox"/> Average Request/Receive Pricing Processing Time	<input type="checkbox"/>	<input type="checkbox"/>

Figure 4-35 Average Request/Receive Pricing Processing Time

3. If you go to **Business Performance Indicators** tab, you will see a new instance metric and an aggregate metric that you can use to create a new KPI. (Figure 4-36)

Business Performance Indicators		Monitored Values	
Business measures summary			
This section provides information about business measures such as n			
Name			
+ KPIs			
- Instance Metrics			
- Claim Number			
- Claim Type			
- Request/Receive Pricing Processing Time			
- Aggregate Metrics			
- Dimensions			
- Average Request/Receive Pricing Processing Time			
- Unspecified Metrics			

Figure 4-36 New metrics



## Creating the KPI for Avg Duration of Request/Receive Pricing

Perform the following steps to create the KPI for Avg Duration of Request/Receive Pricing.

1. Click **Add** to create the KPI that measures the task duration.

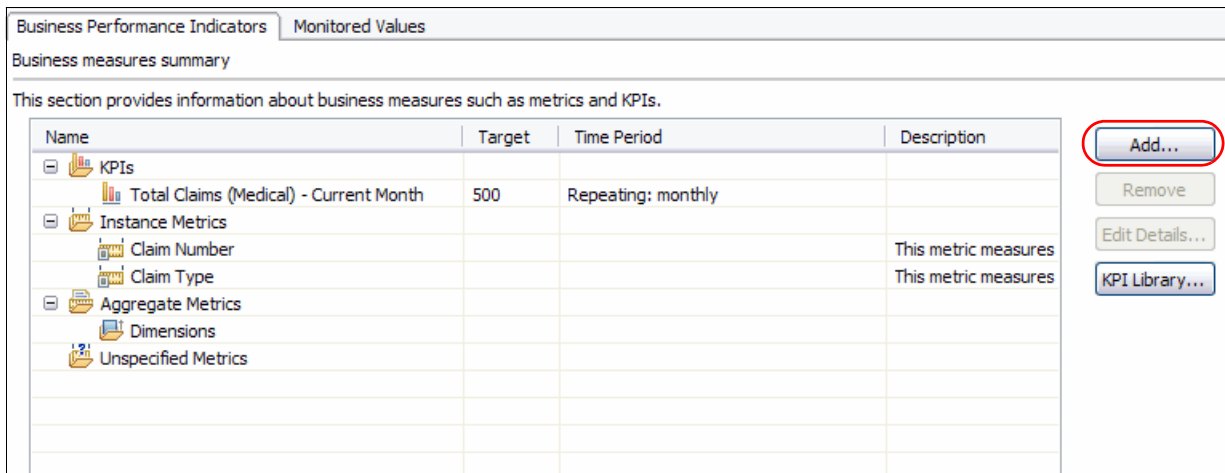


Figure 4-37 Add KPI

2. Enter the name, Avg Duration of Request/Receive Pricing, and select the **KPI** radio button as type, as shown in Figure 4-38.

The screenshot shows the 'Business Measure Information' form. The 'Name' field contains 'Avg Duration of Request/Receive Pricing'. The 'Type' field has radio buttons for 'KPI', 'Instance metric', 'Aggregate metric', and 'Unspecified', with 'KPI' selected. The 'Description' field is empty.

Figure 4-38 KPI as Type

3. Specify target type (**Duration**) and Target Value (**2 hours**) as shown in Figure 4-39.

The screenshot shows the 'Business Measure Details' form. The 'Target Type and Value' section shows 'Duration' selected for the target type. The target value is set to 2 hours.

Figure 4-39 Target Type and Value

- Specify three ranges (Low, Medium, and High) using a percentage of target value, as shown in Figure 4-40.

**Ranges**

Specify range details:

Ranges can be defined as percentages of the target value or as fixed, actual values.

Percentage of target value (target value = 100%)

Actual value

Specify ranges

A range is a set of values, such as allowable margins or lower and upper limits, against which to track your KPI.

Range Name	Start Value	End Value
Low	0 %	< 37 %
Medium	37 %	< 67 %
High	67 %	100 %

Add Remove Sort

Figure 4-40 Target Ranges

- Specify how it should calculate the KPI by selecting the instance metric (Request/Receive Pricing Processing Time) and **Average** for Aggregation function

**KPI Calculation Details**

Specify the method used to calculate this KPI. If you choose to calculate the KPI based on an instance metric, you will also be able to specify the time period and data filters for use with the KPI.

Specify how to calculate this KPI

Based on an instance metric and an aggregation function

Instance metric to aggregate: Request/Receive Pricing Processing Time

Aggregation function: Average

Using an expression involving other KPIs

<Click the Edit... button to enter an expression>

Figure 4-41 KPI calculation

- Click **OK** to save.

To create additional KPIs (namely for task average duration KPI for Select Provider human task Activity in the Claim Intake process), repeat the same steps in this section.

### 4.6.3 Steps to Define the Total Claim KPI

In our claim process, we would like to see how many claims are processed by claim type (for example, Medical, Dental, Behavioral) for the current month to measure the cost as part of our overall effort to reduce claim processing cost.

This KPI will automatically show up in the Business Space dashboard after we deploy the process. You can design this KPI using the Business Measures editor in the modeler. The process for defining the Total Claim KPI is described in this section.

1. Select the process (Claim Process) where you monitor this KPI and click the **Business Measures** tab (Figure 4-42).

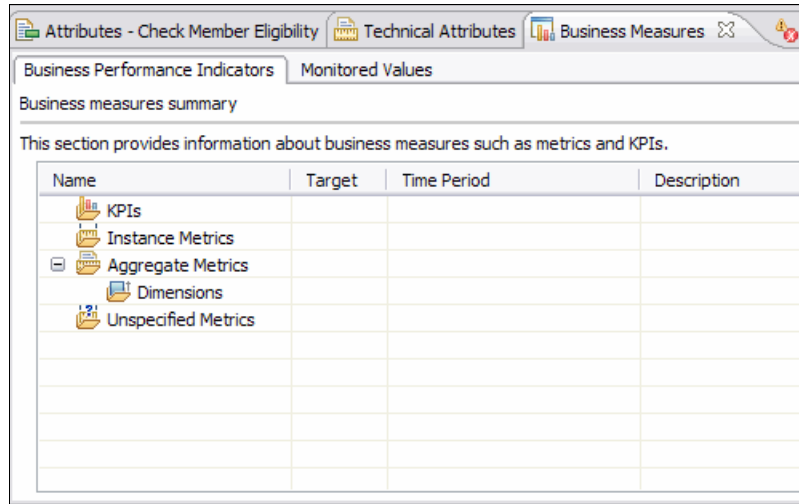


Figure 4-42 Business measures

2. To define this KPI, create a metric (Aggregate, Instance, or unspecified).
  - a. Create the Claim Number instance metric by clicking **Add**. Enter Claim Number for Name and select the **Instance metric** radio button for Type. See Figure 4-43.

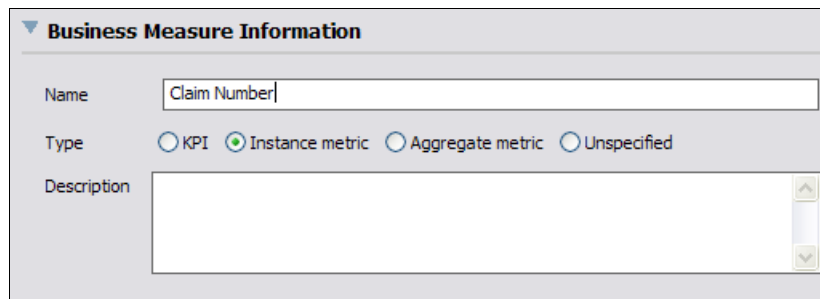


Figure 4-43 Claim Number instance metric

- b. Select **text** for default type. See Figure 4-44

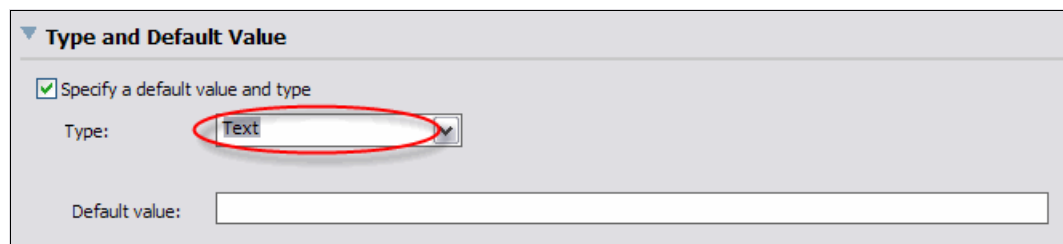


Figure 4-44 Default type

- c. Specify how to calculate this instance metric by selecting Template (**Business Item Input**), Process element (**Claim Process**) and Attribute (**Claim Number**). See Figure 4-45.

Figure 4-45 Instance Metric Calculation

- d. Click **OK** to save.
3. Repeat the steps above for another Instance Metric Claim type. See Figure 4-46.

Figure 4-46 Claim Type Instance Metric

4. Create a KPI using these metrics.
  - We create a KPI, Total Claims, with a Medical claim type for current month.
  - To create the metric, perform the following steps:
    - a. Click **Add** on the **Business Measures** tab.

- b. Enter a name for this KPI and select **KPI** for type. In Figure 4-47, we are calling this Total Claims Medical - Current Month.

**Business Measure Information**

Name: Total Claims (Medical) - Current Month

Type:  KPI  Instance metric  Aggregate metric  Unspecified

Description: [Empty text area]

Figure 4-47 KPI Type

- c. Specify target type and value. In our example, we are targeting 500 claims in total claim numbers, as shown in Figure 4-48.

**Target Type and Value**

The target is an exact value that the KPI should achieve.

Specify a target type and value

Type: Number

Target value: 500

Figure 4-48 Target Type Number

- d. Specify ranges of your KPI for low, average and above average ranges using percentages of the target value as in Figure 4-49.

**Ranges**

Specify range details:

Ranges can be defined as percentages of the target value or as fixed, actual values.

Percentage of target value (target value = 100%)

Actual value

Specify ranges

A range is a set of values, such as allowable margins or lower and upper limits, against which to track your KPI.

Range Name	Start Value	End Value
Low	0 %	< 33 %
Average	33 %	< 67 %
Above Average	67 %	100 %

Add Remove Sort

Figure 4-49 KPI Ranges

- e. Specify how to calculate the KPI. For example, Figure 4-50 on page 110 shows that we are going to aggregate the claim number (the instance metric you just created in the beginning of this section) using the count function to get claim totals.

**KPI Calculation Details**

Specify the method used to calculate this KPI. If you choose to calculate the KPI based on an instance metric, you will also be able to specify the time period and data filters for use with the KPI.

Specify how to calculate this KPI

Based on an instance metric and an aggregation function

Instance metric to aggregate: Claim Number

Aggregation function: Count

Using an expression involving other KPIs

<Click the Edit... button to enter an expression>

Figure 4-50 KPI calculation

- f. Specify the time period that you will measure this KPI. In Figure 4-51, we measure during the current month and repeat every month.

**Time Period for Data Collection**

Specify a time period over which the business measure will be monitored

Repeating  Rolling  Fixed

Period type: Monthly

Last: 30 days

Start date:

End date:

Time zone: GMT-5

Base period on:

Last full period  Period in progress

Time zone: GMT-5

Figure 4-51 KPI Time Period

- g. Specify a KPI data filter so that we only calculate claims that include claim type Medical, as shown in Figure 4-52.

**KPI Data Filter**

You can restrict the information that will be included in the calculation of the KPI. For example, for your Sales In London KPI, you could set the data filter name to City and the value to London.

Specify data filters to limit the values included in the calculation of this KPI

Data Filter Name	Instance Metric	Operator	Values to Include
Type filter	Claim Type	equal to	Medical

Figure 4-52 KPI Data Filter

- h. Click **OK** to save.

This KPI is ready. When you deploy the process to the server, it will show up automatically on the dashboard of your business space panel.

Repeat these steps to create another KPIs. For example, Total Claims for Claim Type Dental type during current month. You will change KPI Data Filter to 'Claim type is equal to Dental'.

**Note:** While we have discussed how to define and configure a few example KPIs, Chapter 5, “Manage” on page 135 provides much greater detail on how to use the Business Space to monitor and view KPI performance.

## 4.7 Refine forms

Just as human tasks help you define the manual aspects of a process, forms help you (the business analyst) define how business users interact with in-flight process information. In fact, forms in our solution can be associated with human tasks only. The relationship between forms, business items, and human tasks is natural.

- ▶ Forms define the user interface.
- ▶ Business items define the data being acted on throughout the process.
- ▶ Human tasks bring data and the user interface together.

One of the ways that you can make your application easier to use is to create custom forms for your human tasks. If you already have forms created using Lotus Forms Designer, you can import these forms into your workspace and associate them with a human task. You can also customize forms that you create in WebSphere Business Modeler and update these forms in your process model. A custom form designed in Lotus Forms Designer can provide a more user-friendly and attractive interface for reviewing and entering the data associated with a human task.

**Note:** When you associate a form with a human task, if the inputs or outputs of the human task do not match the form data, the inputs and outputs of the human task will be replaced with the form data.

Figure 4-53 illustrates the current focus of this section within the context of the overall Experience phase.

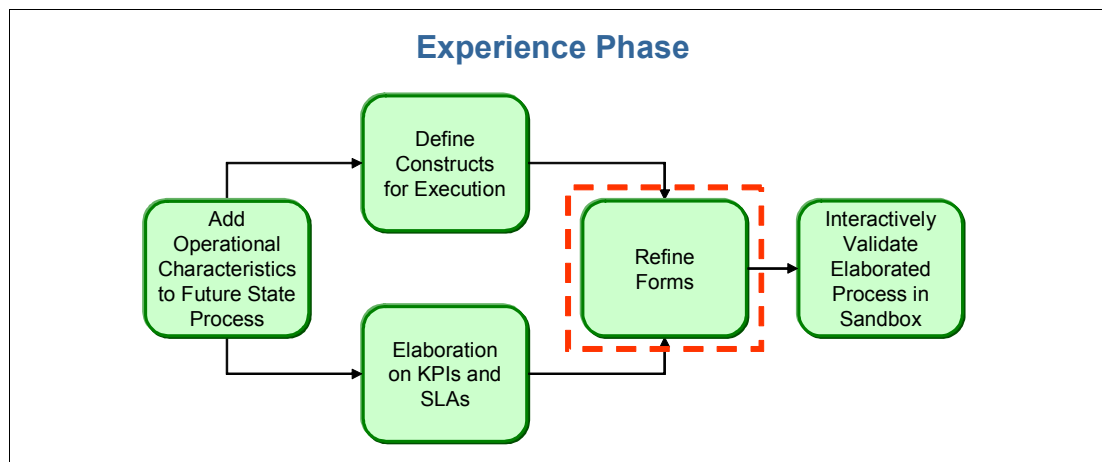


Figure 4-53 Visualization of the steps performed within the Experience phase

## 4.7.1 Automatic generation of forms for human tasks

This section discusses how to generate a basic form for a human task. You can generate input or output forms for a human task just by clicking the menu, as shown in Figure 4-54.

If the human task has identical inputs and outputs, only one form will be generated and associated with the task as both the input and output form.

If you have forms already created for the human tasks, you can associate forms with human task and process inputs and outputs on the Forms tab in the Attributes view.

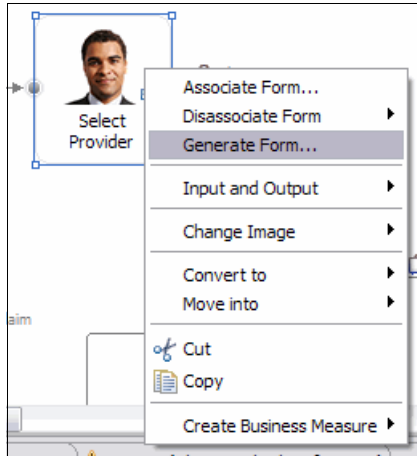


Figure 4-54 Generate Form



## 4.7.2 Customizing the appearance of the form

A plain input or output form using the input or output business item for the activity will be generated. Using the Claim Intake process for our example, if we use the default form generated from the claim business item for the human task, the user will enter data in a form that contains the following inputs shown in Figure 4-55.

The form is titled "Input" and contains the following fields:

- First Name
- Last Name
- Claim Number
- Claim Type
- Amount
- Plan
- Billing Provider
- Member Number
- Contact Phone
- Contact Address
- Reason Code
- Cause
- Date (with a calendar icon)
- Used Ambulance (checkbox)
- Assign Provider (checkbox)

Figure 4-55 Plain form from automatic generation

Figure 4-55 on page 113 illustrates only the generic, generated form. You can proceed to customize the form using palette in the Lotus Forms Editor (Figure 4-56) by changing colors, rearranging the fields and inserting graphics into the form.

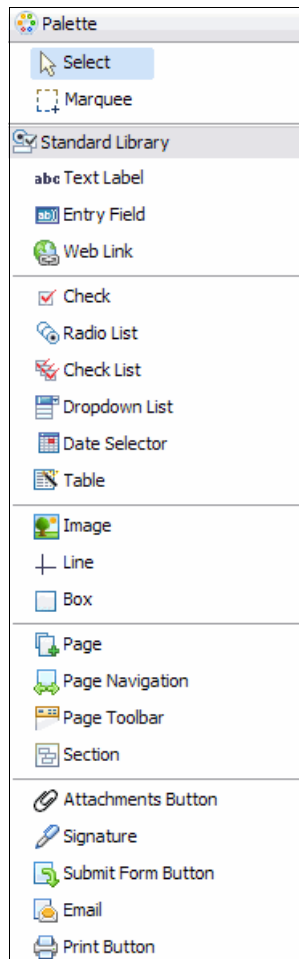


Figure 4-56 Lotus Form Editor Palette

If we customize a form based on the claim business item, we can present users with a better form layout and format, allowing users at each step of the process to find the fields in the form that are relevant to the current task. This will save users time in data entry.

**Note:** Detailed information about how to customize a form using Lotus Forms Designer is beyond the scope of this paper. Instead, we illustrate a more customized form to give the readers a sense of what is possible when the business analyst works with members of the graphics/design team using Forms Designer.

Figure 4-57 on page 115 illustrates an example of our custom form after it is modified using the editor.

Member	Claim	<i>Billing Provider Selection</i>
<b>Member Information</b>		
Claim Info:	<b>Claim Date</b> <input type="text"/>	
Name:	<b>First</b> <input type="text"/> <b>Last</b> <input type="text"/>	
Member Number:	<input type="text"/>	
Plan:	<input type="text"/>	
Contact's Info:	<b>Phone</b> <input type="text"/> <b>Address</b> <input type="text"/>	

Figure 4-57 Customized new form

**Important:** After a form is associated with a human task or process, you or your form designer can move fields to improve the form layout, add headings and graphics, format fonts, and make other visual enhancements to the form. However, it is recommended that you do not add, delete, or re-create form data in the form editor (Lotus Forms Designer). To add or change form data fields, update the attributes of the relevant business items.

## 4.8 Refine the process

After you have modeled your business process for deployment, you can test it iteratively on a managed deployment environment server set up for you by the IT department. This will allow you to further experience the process and continue to make refinements to the process where needed before a larger scale deployment. If you include business measures in your process, monitoring dashboards are automatically generated that you can also test. The testing function is enabled when your business process is free of errors.

**Note:** Ensure that your business process shows no errors in the WebSphere Process Server mode from within Business Modeller. You can test a business process if warnings are still displayed in the Errors view. However, any business measures with warnings that they require further editing to be monitored will not be deployed to the test server.

Figure 4-58 illustrates the current focus of this section within the context of the overall Experience phase.

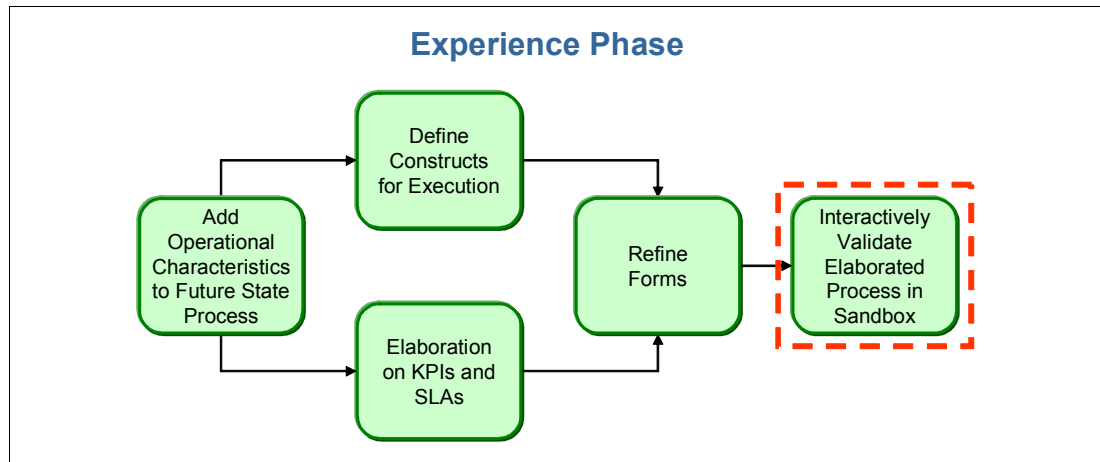


Figure 4-58 Visualization of the steps performed within the Experience phase

### 4.8.1 Interactive process design (IPD)

In this next section, we discuss how to put the solution into action using the Interactive Process Design (IPD) feature in WebSphere Business Modeler 6.2. Taking advantage of this feature allows you to accelerate your time to value by creating business process applications on your timeline to exactly match your line of business (LOB) requirements.

**Note:** The section below describes the process for deploying the model through the IPD process, a step which is primarily handled by IT.

**Important:** IT level activities happen in parallel with business activities in this stage.

#### Steps to deploy the model through IPD.

Perform the following steps to deploy a model through IPD.

1. After you have completed the previous steps in this chapter, (Adding operational characteristics, defining constructs for execution, elaborating on KPIs & SLAs, and refining forms, and so forth) you are ready to deploy the model directly to the test server environment that IT has prepared for you.
2. IT will create a XML file that points to the test server for your testing. Example 4-1 is an example of this XML file.

*Example 4-1 Test server configuration XML file example*

```

<?xml version="1.0" encoding="UTF-8"?>
<rest:serverConfiguration xmlns:rest="http://rest.dtd.btools.ibm.com"
  name="Test Server with Monitor" test="true" secured="true"
  memberMapping="Claims-Model.rmf">
  <description>
    Test MDE with WPS with Monitor
  </description>
  <serverComponent
    name="WebSphere Process Server"
  
```

```

configuration="https://bpmsol04.itso.ibm.com:9444/rest/serverComponent/componentCo
nfiguration">
  </serverComponent>
  <serverComponent
    name="WebSphere Monitor Server"

```

```

configuration="https://bpmsol04.itso.ibm.com:9444/monitorServerComponent/component
Configuration">
  </serverComponent>
  <serverComponent
    name="WebSphere Business Space"

```

```

configuration="https://bpmsol04.itso.ibm.com:9444/BusinessSpace/services/request/d
eployConfig">
  </serverComponent>
</rest:serverConfiguration>

```

3. IT also needs to create a mapping file that maps roles in your model to runtime WebSphere group definitions. This file is referred as Claims-Model.rmf and is shown in Example 4-1 on page 116.

Example 4-2 illustrates the content of Claims-Model.rmf that describes user role mapping.

*Example 4-2 Test Server Configuration xml file example containing mapping*

```

<?xml version="1.0" encoding="UTF-8"?>
<logicalMapping:LogicalEntityRoot
xmlns:logicalMapping="http://www.ibm.com/logicalMapping"
peopleDirectory="bpe/staff/samplevmmconfiguration">
<role name="Resources/Claims Analyst" uniqueName="cn=Claims
Analyst,o=defaultWIMFileBasedRealm" uid="BLM-d4d0c3677dc3828d70797439a9019443"
description="" groupName="Claims Analyst"/>
<role name="Resources/Pricing Specialist" uniqueName="cn=Pricing
Specialist,o=defaultWIMFileBasedRealm" uid="BLM-70808a7cdd51d9e1ac6209284295c3d4"
description="" groupName="Pricing Specialist"/>
</logicalMapping:LogicalEntityRoot>

```

In this XML file (Example 4-2), **role name** and **uid** are from your process model and uniqueName and groupName are from your test server environment that IT sets up for you.

Now you are ready to run your model on the server. Make sure you are in the WebSphere Process Server Mode (Figure 4-59).

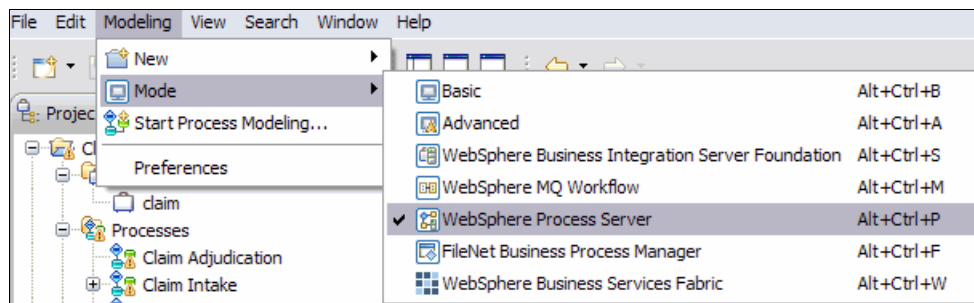


Figure 4-59 WebSphere Process Server Mode in Modeler

4. Click your process and select **Test On Server** (Figure 4-60).

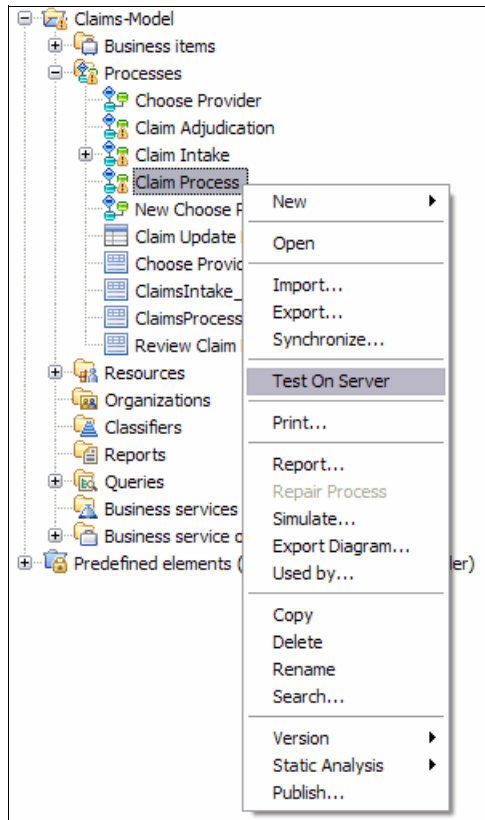


Figure 4-60 Test on server

You will be prompted for the server configuration file (Figure 4-61) and user ID and password for the test server login, which you should get from IT.

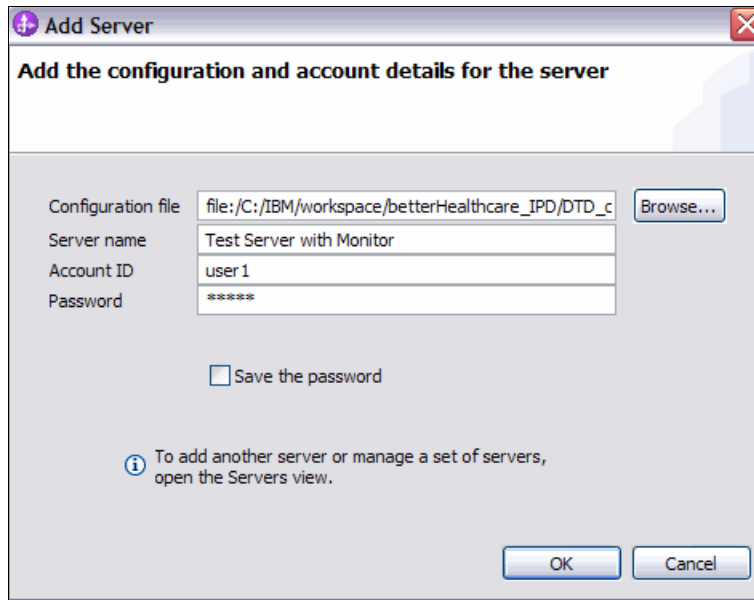


Figure 4-61 Select server configuration file

5. Click **OK** to deploy your model to the server (Figure 4-62). This can take several minutes.

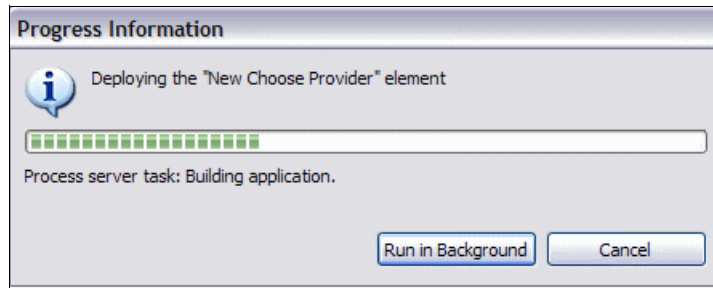


Figure 4-62 IPD in progress

## Introduction to the Business Space

1. After the model deploys successfully, it will display the login window of Business Space (Figure 4-63).



Figure 4-63 Business Space login

2. Log in to Business Space with the user ID and password you received from IT. This puts you in the Business Space where you can run and test your process you designed.

3. Change the theme of your space to the corporate theme that IT designed. Click **Manage Business Spaces** on the upper right corner of your page, as shown in Figure 4-64.

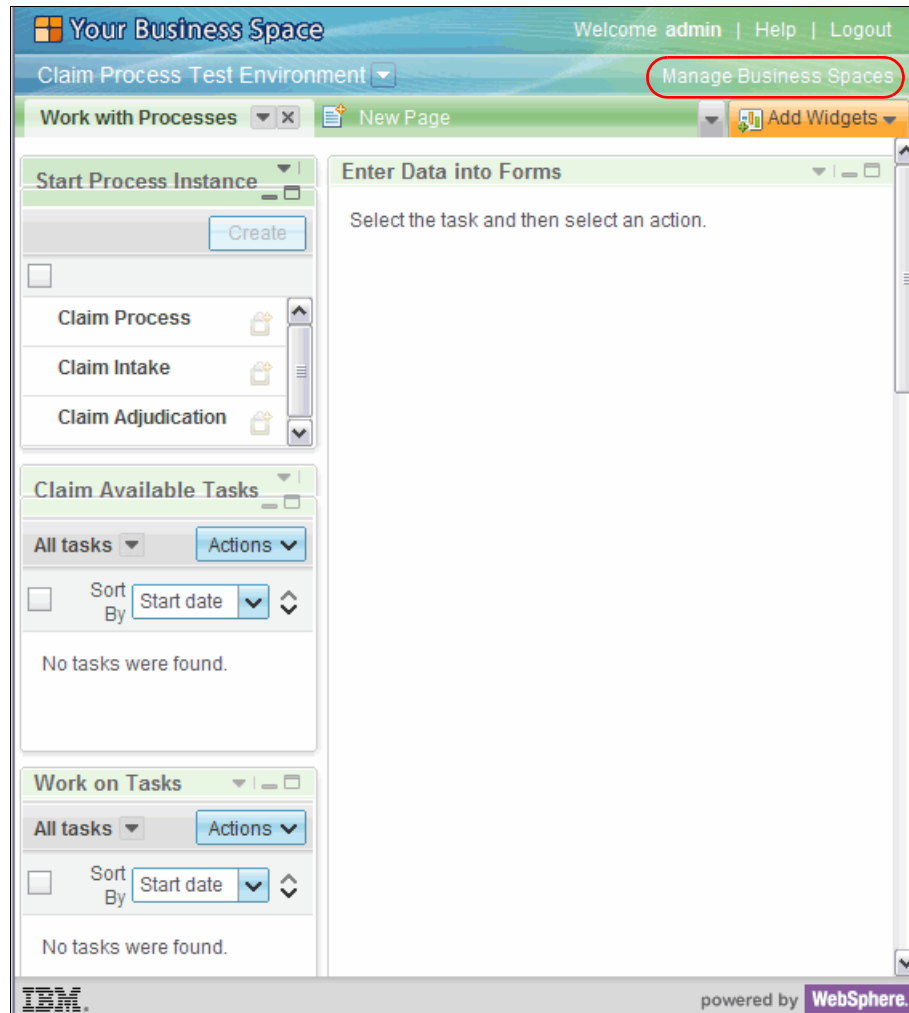


Figure 4-64 Manage Business Space

4. Click **Change** in the Theme box of the manage space page (Figure 4-65 on page 121) and then click **Save**.



**Business Space Name**

**Business Space Description**

**Owner**  
 admin admin

**Theme**  
 Claims Processing

---

Share this Business Space

**Viewers** **Editors**

Figure 4-65 Change the theme in Business Space

The customized theme for ABC Health co. ABC is displayed (Figure 4-66).

HEALTH INSURANCE COMPANY ABC

Claim Process Test Environment

Work with Processes | New Page

Start Process Instance

<input type="checkbox"/>	Claim Process	
	Claim Adjudication	
	Claim Intake	

Figure 4-66 Customized theme

## 4.8.2 Testing with the real life scenario

The first step in testing your process should be to test the overall flow of your process, to make sure that your activities execute in the correct order, and that your gateways and connections work as expected. You should also make sure that the correct data is passed from node to node as your process executes.

After the process has completed its execution, you can perform the following tasks:

- ▶ See the path of the process execution in the Process Execution area. The execution path is highlighted in the diagram.
- ▶ See the list of activities that were completed during the process execution in the Process Execution Trace widget.
- ▶ View the data associated with each executed activity in the execution path by selecting an activity in the Process Execution Trace and Data Values widget, and examining the associated output data.
- ▶ Return to the Start Process Instance widget and start another process instance for testing, potentially modifying the process inputs or the values of configurable business rules to verify that the process runs as expected

**Note:** If you encounter errors in the process testing environment at any point during your testing, click **Request Help From IT** button in the Process Execution Trace and Data Values widget. When this button is clicked, the log files from your testing session are packaged up for you to pass off to your IT developer for problem determination

We can now test the claim process that we created in the modeler with the Business Space without receiving any help from IT.

1. Select the process you want to run. In our example, Claim Process, and click **Create**.

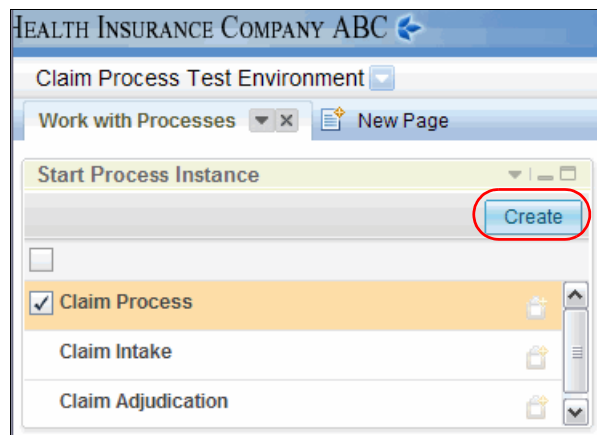


Figure 4-67 Create a new Instance

2. TNext, the claim form will appear to be filled in to start the claim process. Enter the data as you want to test and click **Submit**. (Figure 4-68)

Enter Data into Forms

**Submit** Save as Draft

\* Claim Process x

Output

First Name	John
Last Name	Smith
Claim Number	A-8642
Claim Type	Medical
Amount	2,000
Plan	Gold
Billing Provider	
Member Number	B012
Contact Phone	1236530002
Contact Address	CA
Reason Code	98323
Cause	Heart
Date	21 May 2009

Figure 4-68 Claim data

- The Process Execution widget displays the process diagram that you are testing. After you create a process instance for testing, the execution path through the process is highlighted in the diagram.

As each activity is completed, it is added to the Process Execution Trace and Data Values widget. The name of the completed activity and the output data from the activity is displayed in this widget.

You can view the data associated with different points in the execution path by selecting an activity from the list of completed activities in the Process Execution Trace and Data Values widget. When you select an activity from the list, the output data for the selected activity is displayed. Figure 4-69 shows the output data of Use Internal Billing activity in the execution path list.

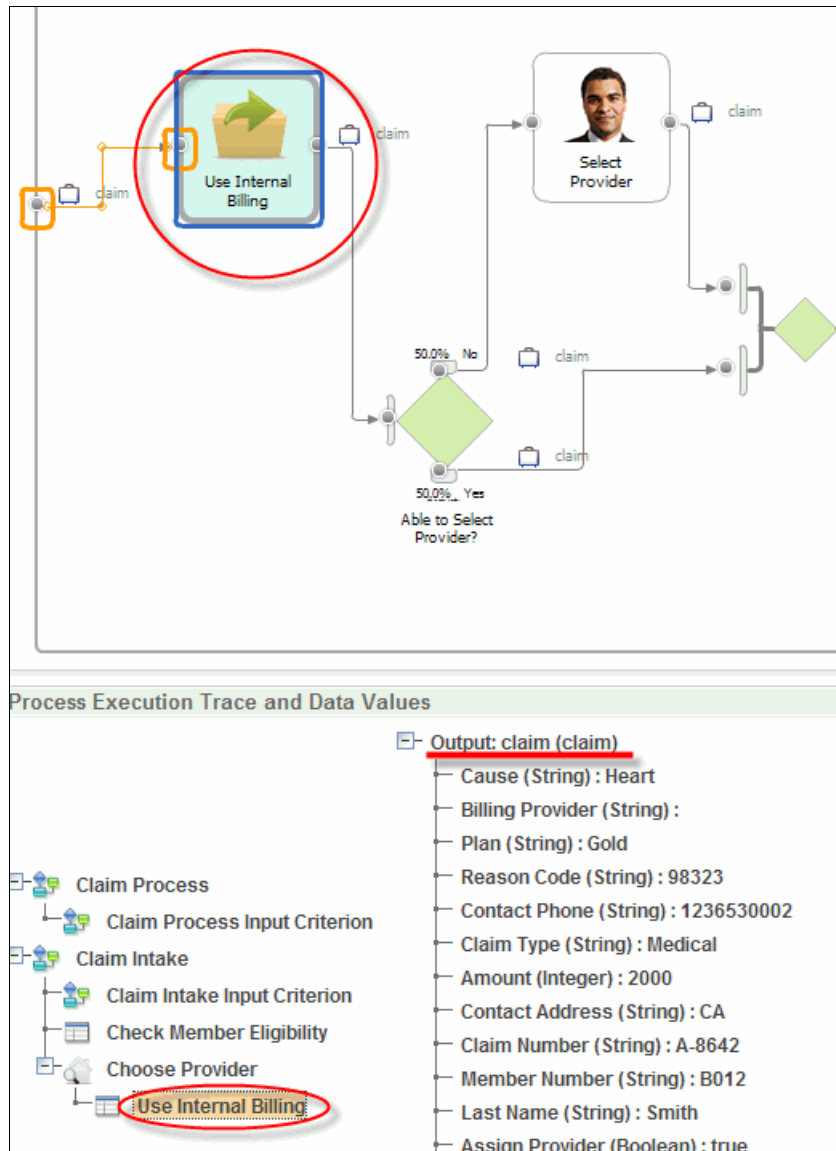


Figure 4-69 Execution Trace and Data

- After you submit the claim, you can see the process is moving through the activities in your process execution diagram and stops where it is waiting for human task. In our example, because we entered a claim amount of \$2000, our provider selection business rule will send this claim to the human task where a billing provider is selected by a claim analyst. See Figure 4-70.

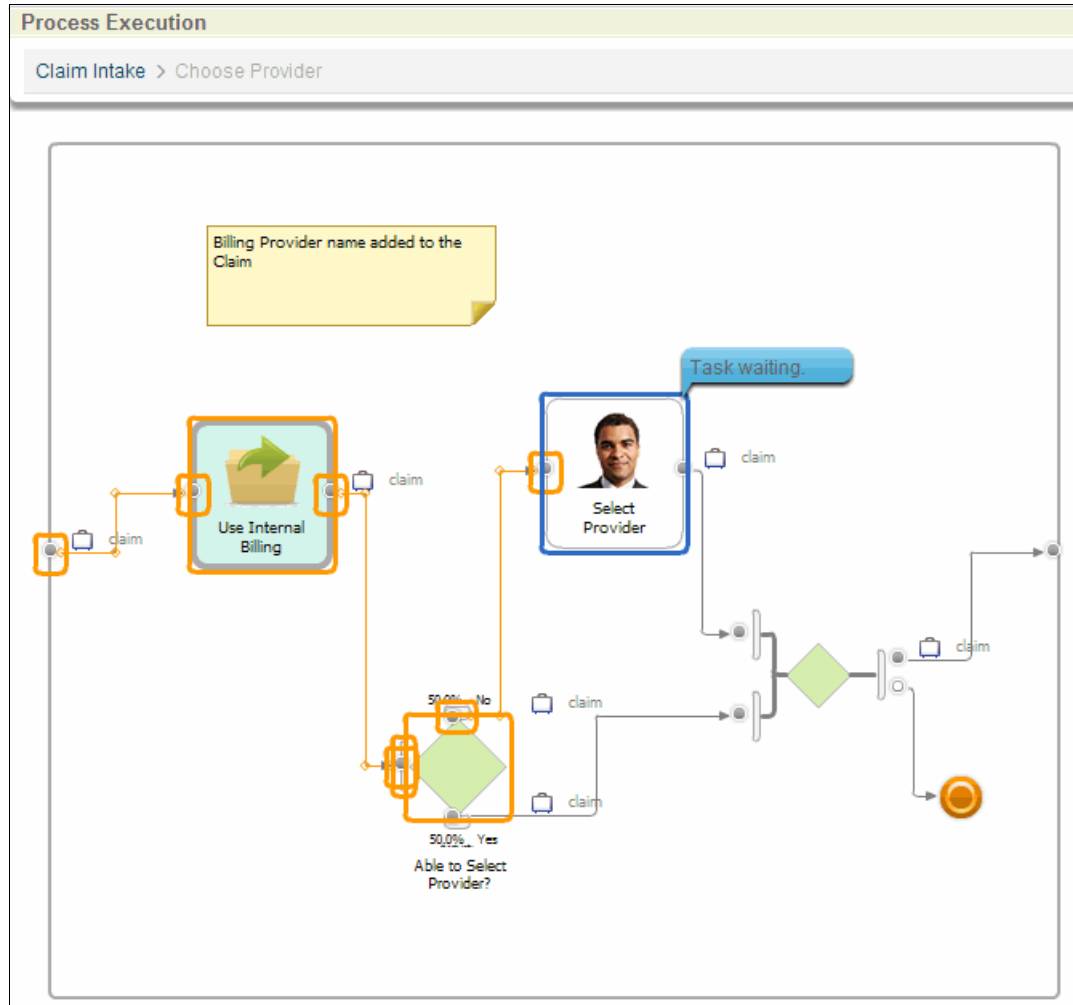


Figure 4-70 Claim process execution

- In the available task section (Figure 4-71), the select provider task is waiting to be claimed. Accept the task.

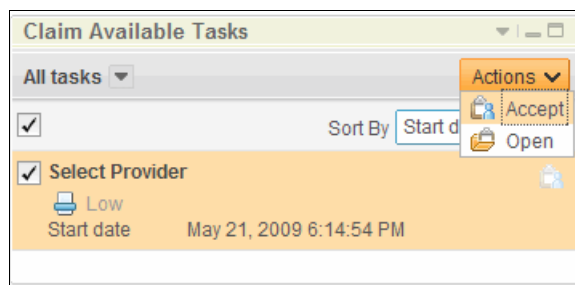


Figure 4-71 Accept a Task

After you claim this task, the “Billing Provider Selection” form (Figure 4-72) will appear. Enter a billing provider as below and click **Submit**.

Enter Data into Forms

Submit Save Actions

\* Select Provider x

Form | Details | Notes | Related Task

Claim Info: Claim Date: 21 May 2009 Claim Type: Medical  
 Claim No.: A-8642 Claim Amount (\$): 2,000  
 Reason Code: 98323 Cause of Claim: Heart  
 Name: First: John Last: Smith  
 Member Number: B012 Used Ambulance?   
 Plan: Gold  
 Contact's Info: Phone: (123) 653-0002 Address: CA  
 Billing Provider: ABC billing Co.

Figure 4-72 Select Billing Provider

After you submit the form with a billing provider, the process will move again and stop at the next human task for checking the pricing (Figure 4-73).

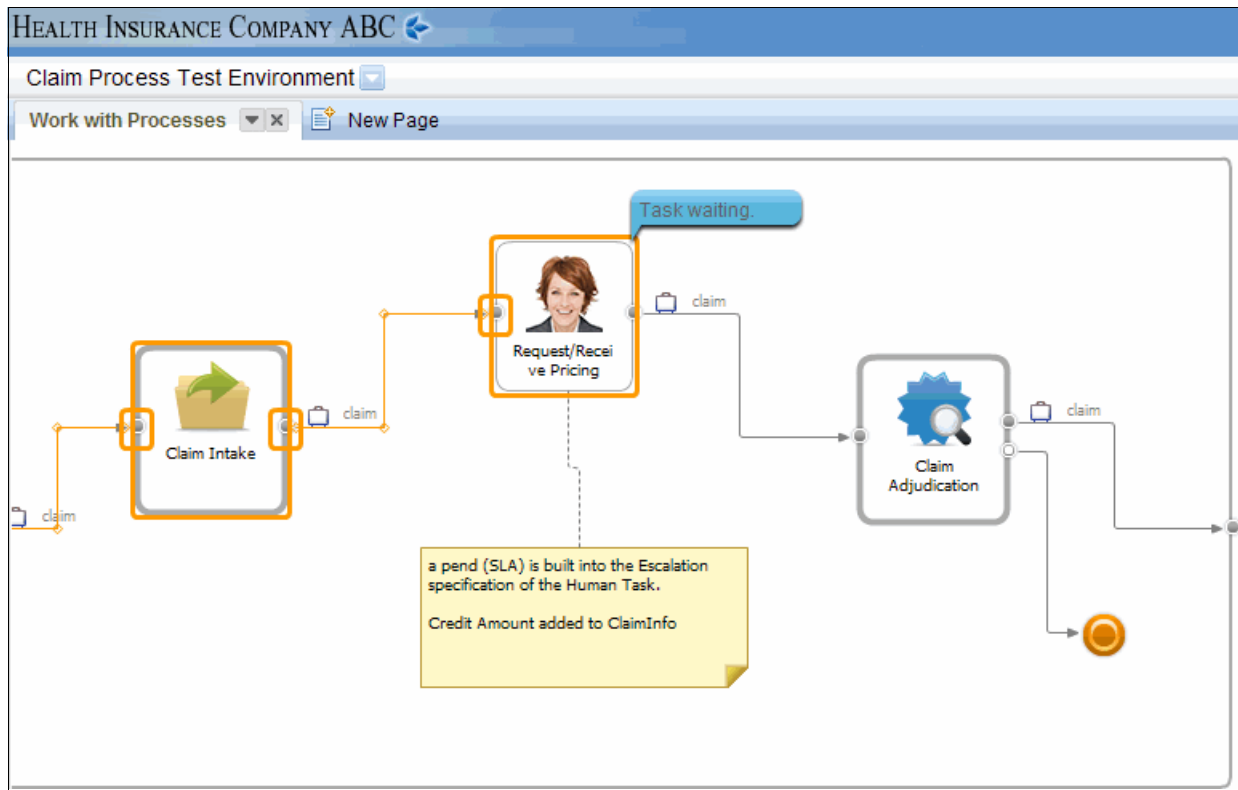


Figure 4-73 Claim Process Execution

- In available task section (Figure 4-74), this pricing task is waiting to be claimed. Accept this task.

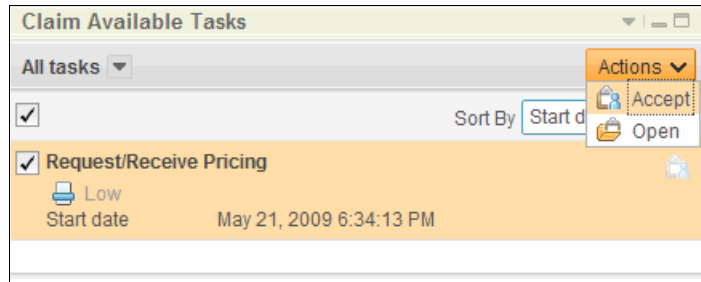


Figure 4-74 Accept a Task

- The "Verify Claim Pricing" form displays (Figure 4-75). Examine the claim and click **Submit**.

The screenshot shows a web form titled "Verify Claim Pricing". At the top, there are "Submit" and "Save" buttons, with "Submit" circled in red. Below the buttons, there is a tabbed interface with "Member" and "Claim" tabs. The "Claim" tab is active, showing "Claim Details". The form contains the following fields:

Claim Info:	<b>Claim Date</b> 21 May 2009	<b>Claim Type</b> Medical
	<b>Claim No.</b> A-8642	<b>Claim Amount (\$)</b> 2,000
	<b>Reason Code</b> 98323	<b>Cause of Claim</b> Heart
Name:	<b>First</b> John	<b>Last</b> Smith
Member Number:	B012	<b>Used Ambulance?</b> <input type="checkbox"/>
Plan:	Gold	
Contact's Info:	<b>Phone</b> (123) 653-0002	<b>Address</b> CA

On the right side of the form, there is a large image of a stethoscope over a map of the United States.

Figure 4-75 Verify Claim Pricing form

After you submit the form, you can now see that all the activities in your process have successfully finished in your process execution diagram and that the process has reached an endpoint. See Figure 4-76.

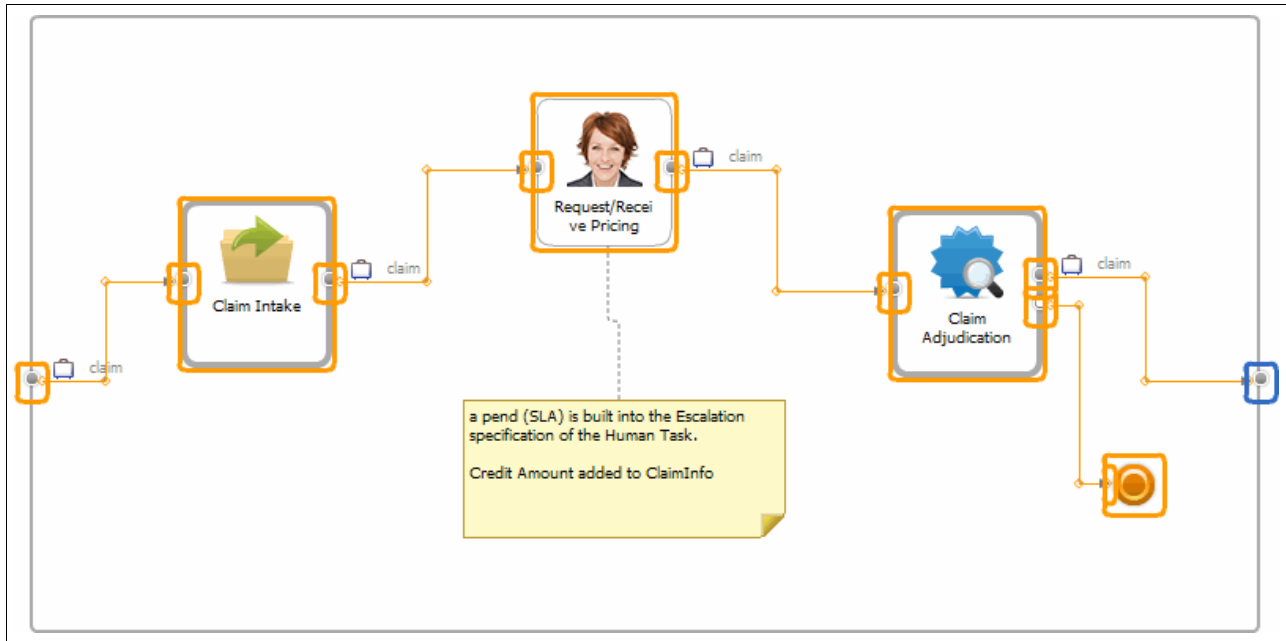


Figure 4-76 Completed claim process

## Reviewing initial KPIs from the scenario test

Next, we turn our attention to the KPIs that we created to monitor the process.

**Note:** While this section provides an introduction to monitoring the KPIs, also refer to 5.6, “Manage in real-time using KPIs” on page 149.

1. You can see the total number of claims for Medical type and Average Duration time for Request/Receive Pricing human task in Figure 4-77.

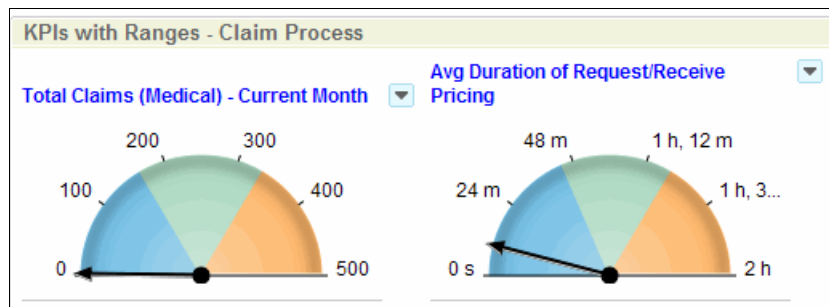


Figure 4-77 Predefined KPIs

2. You can also see this in the Instances view as shown in Figure 4-78 on page 129, displaying both the total number of claims of type Medical, and the average duration for Request / Receive Pricing processing time.



Claim Process Instance ID	Claim Process Start Time	Claim Number	Claim Type	Request/Receive Pricing Processing Time
_PI:90030121.651e820e.fef5f5f5.51c3009d	May 21, 2009 5:40:49 PM	11111	Medical	6 m, 40.734 s
_PI:90030121.653db05b.fef5f5f5.51c301ea	May 21, 2009 6:14:50 PM	A-8642	Medical	12 m, 35.391 s

Figure 4-78 Process Instance view

### Example of modifying the business rule parameter

We can run a different scenario by changing the value of the parameter in the business rule. In our example, we modify the claim amount value, which is currently set to \$1000. (For a review of how we set up the initial business rule to a value of \$1000, refer to 4.4.2, “Identifying business rule candidates from the scenario process” on page 86.)

By increasing the value from \$1000 (as it was initially set) to \$2000, we can change the behavior of our process. Now claims over \$1000 and below \$2000 will also be automatically assigned to internal billing provider.

To modify the business rule parameter through the Business Space, perform the following steps:

1. Click **Add widgets** and drag the Business Rules widget.

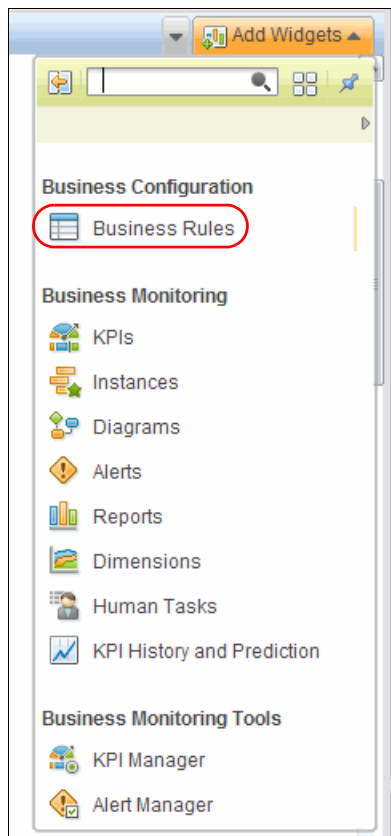


Figure 4-79 Business Rules widget

2. Within the “Business Rules” window, you will see the name of the business rule and the value initially set. You can edit this value, then click **Save** (Figure 4-80).

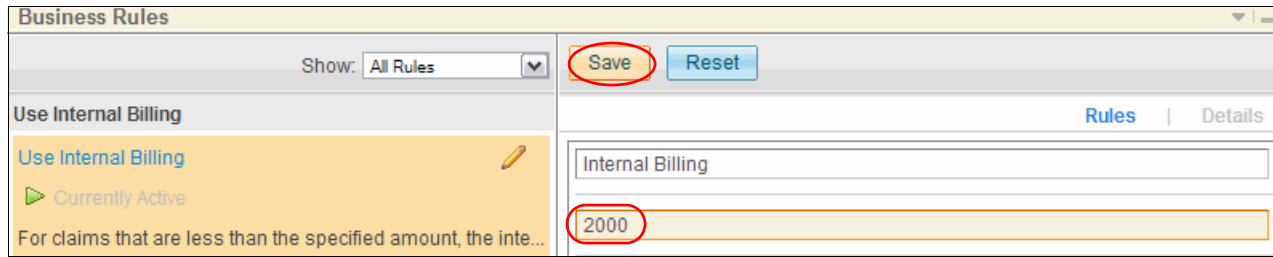


Figure 4-80 Business rule change in runtime

3. Rerun the claim process with the modified business rule and observe the change by submitting a claim amount between \$1000 and \$2000.
4. Click **Claim Process** and click **Create** to start a new instance of the process (Figure 4-81).

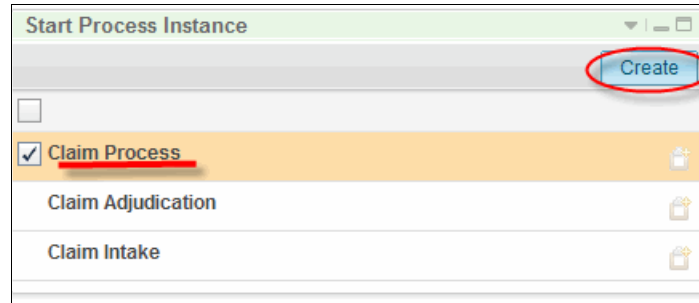


Figure 4-81 Start a new Instance

5. Enter the same claim information, except increase the claim amount to a level between \$1000 and \$2000. In our example, (Figure 4-82), we use \$1800.

The screenshot shows a web browser window with a tab titled '\* Claim Process'. The browser's address bar shows 'Form'. The browser's toolbar includes icons for file operations, a search bar, and a zoom level of 100%. The main content area is titled 'Output' and displays a list of claim data fields with their corresponding values:

Field	Value
First Name	John
Last Name	Smith
Claim Number	A-8642
Claim Type	Medical
Amount	1,800
Plan	Gold
Billing Provider	
Member Number	B012
Contact Phone	1236530002
Contact Address	CA
Reason Code	98323
Cause	Heart
Date	21 May 2009
Used Ambulance	<input type="checkbox"/>
Assign Provider	<input type="checkbox"/>

Figure 4-82 Claim data

6. Click **Submit** and watch the process execution path for the process flow.

In Figure 4-83, we can see that this time the process didn't go to the Select Provider human task due to our changed business rule. Instead, because the claim amount is less than \$2000, the claim is automatically assigned to internal billing to a billing provider without first invoking the Select Provider human task.

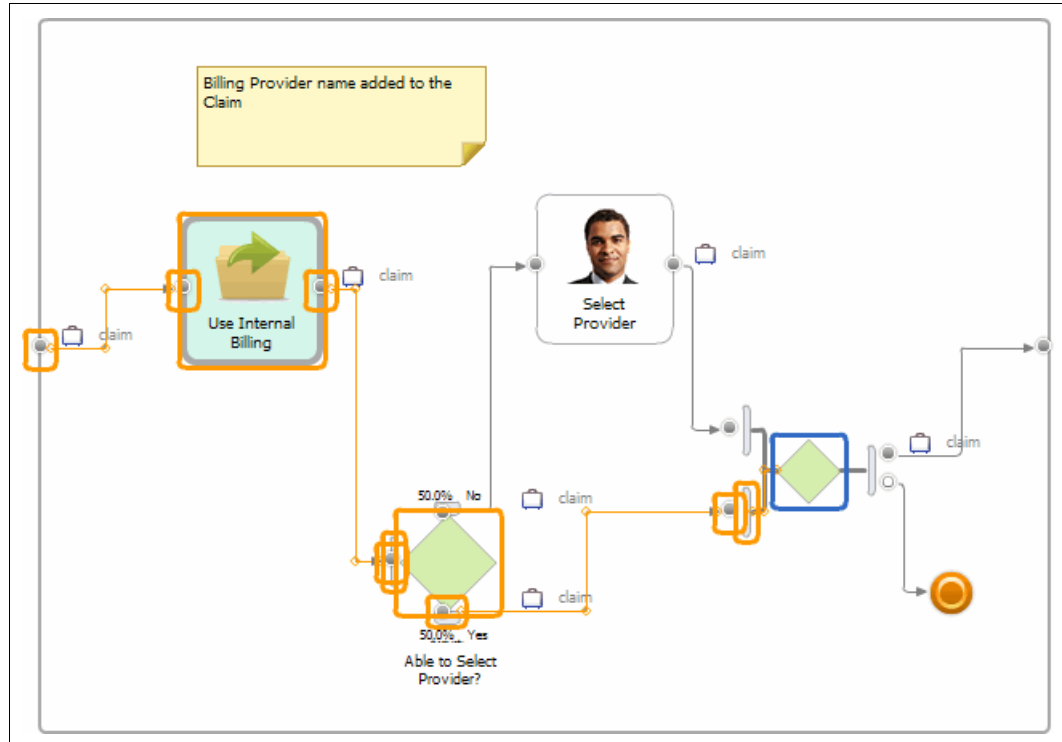


Figure 4-83 Different process execution path

7. Finish your scenario test by completing the remaining tasks (for example, Request/Receive Pricing) available on the task list.

## 4.9 Summary

This chapter has provided specific context to the Experience phase outlined in the *IBM Business Process Management Prescriptive Guide to Solution Implementation*. This is the third phase in the approach with the goal of capturing the business intent through documenting and creating basic models for the business goals, objectives, and strategy.

Within the chapter, we reviewed the steps of the Experience phase using the specific context from the Health Care Scenario demo introduced in 1.6, "Introduction to the health care demo scenario" on page 15.

Specifically, we have discussed and illustrated how to accomplish the following steps within the experience phase:

- ▶ We have discussed which tasks could be best defined as a business rule to improve process efficiency. See 4.4.1, “Defining business rule tasks” on page 85.
- ▶ Building upon our rationale of which task step to implement as a business rule, we show the reader how to create the business rule. See 4.4.3, “Steps to create a business rule (Provider Selection)” on page 88.
- ▶ We review the process to determine which process steps are defined as human tasks and discuss the advantages of this. See 4.4.4, “Defining human tasks” on page 96.
- ▶ We discuss which steps in the process would be good candidates to be implemented as a service. Although they do not actually go into detail on how to implement these tasks as services, we discuss the advantages of having these functions as a service. See “Adding services to deployable applications” on page 99.
- ▶ Within the context of refining forms for input into the system, we illustrate how to create a basic form from the business object in the claim process. We then also discuss how the forms can be customized using Lotus Forms Designer. See 4.7.2, “Customizing the appearance of the form” on page 113.
- ▶ Moving forward, we discuss how you can use the feature within WebSphere Business Modeler to deploy the process in a test environment and further experience testing with the process. See 4.8.1, “Interactive process design (IPD)” on page 116.
- ▶ Finally, we introduce the Business Space and discuss how to perform some basic scenario testing for further refining the process. See 4.8.2, “Testing with the real life scenario” on page 122.





## Manage

This chapter discusses activities you perform after the completion of the Experience phase of your model process. This phase is referred to as the Manage phase. The emphasis in this phase is the management of your business model process and its optimization. When satisfied that your model process has met all your IPD cycle requirements, proceed to deploy it into your Q/A or pre-production and then production environment. It is in this environment that you can observe and record its production-like behaviors due to the availability of real-time data. Based on the results of the analysis using real-time data, you can also make improvements to optimize your business process.

In this chapter, we first review the objectives and goals of the Manage phase as outlined in the *IBM Business Process Management Prescriptive Guide to Solution Implementation*. Next, we introduce the Business Space and show you how to build and use a monitoring dashboard to view, analyze, and act upon the real-time data results.

## 5.1 Goals of the Manage phase

As we discuss in this chapter, the objective of this phase is to now pro-actively empower users to monitor and manage real-time business performance using key performance indicators (KPIs) and alerts based on changing business conditions. You can then take corrective actions against process instances where the process is not executing as efficiently as needed.

During this phase, you can empower business users and system administrators by providing customized, role-based access to their own Business Space.

Following the approach outlined in *IBM Business Process Management Prescriptive Guide to Solution Implementation*, the high level tasks and activities within this phase are as follows:

- ▶ (Optional) Empower business users to customize user experience by providing their own Business Space

**Note:** This step is optional and not appropriate for business environments where the user environment is locked down and strictly regulated.

- ▶ Assign access rights for system capability
- ▶ Optimize work assignments
- ▶ Govern change
- ▶ Manage real-time business performance
- ▶ Manage KPIs and alerts based on changing business conditions
- ▶ Take corrective action against process instances

Figure 5-1 illustrates a visual representation of the tasks, highlighting that many of these tasks are done in parallel, while the ability to take corrective action based on the results of real-time data is an ongoing, iterative process.

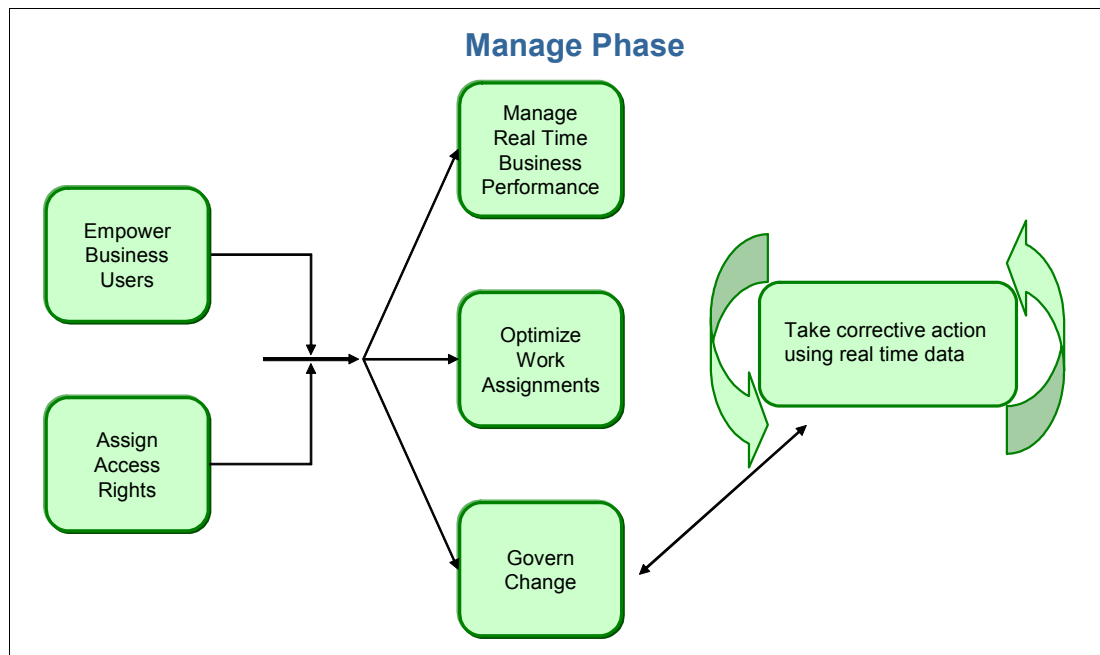


Figure 5-1 Representation of the steps in the manage phase



**Note:** We will continuously refer back to this diagram throughout the chapter, using it as a road map to highlight which specific objective and task we are addressing, based on the activities outlined in the *IBM Business Process Management Prescriptive Guide to Solution Implementation*.

### 5.1.1 Identifying the overlap between the Experience phase and the Manage phase

As you proceed from the Experience phase into the Manage phase, and eventually into your enterprise deployment, it is common to question where one phase ends and the other begins. Figure 5-2 depicts the overlapping of the Manage and Deployment phases, because it is fairly frequent and realistic that the two phases coexist. This reflects that the Manage phase includes iterative improvements being conducted during the Deployment phase. Also, there are no hard rules about when the Experience phase stops and when a Manage phase begins in this iterative approach of continuous refinement.

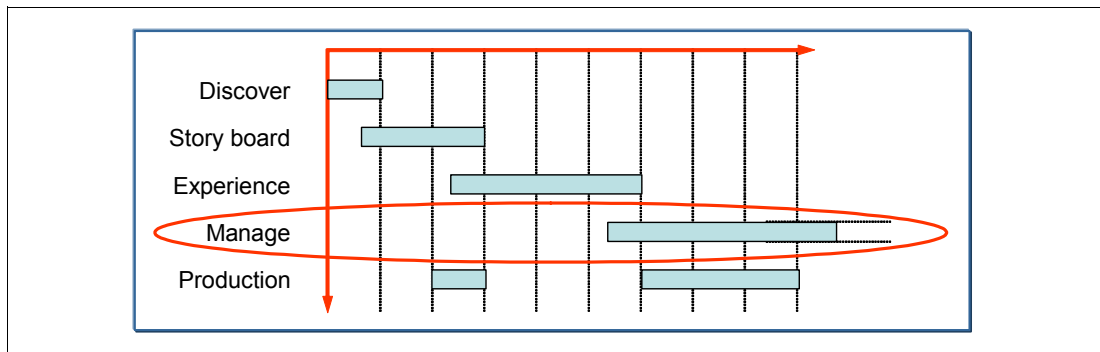


Figure 5-2 Manage and Production

In this chapter we describe the detailed activities of the Manage phase and how you can use the results of your analysis to enhance your business process. As a starting point, we review what you want to manage.

## 5.2 What to manage

In the introduction sections of this chapter, we discussed the objectives of the Manage phase, namely to pro-actively empower users to monitor and manage real-time business performance. This is the goal. We now address the question of what measurement criteria you can use to determine your efficiency. You can do this using status overviews of human task processes, KPIs, and alerts based on changing business conditions.

A typical performance management dashboard will have a set of KPIs that measure process performance against business targets, durations for key activities (for example, human steps) in the process, and dimensional analysis that allows for analysis by different business attributes of the process (such as channels, customer type, and so forth).

Dashboards also typically incorporates some drill down, enabling users to locate business transactions of interest. Drill down can start from high level views or data analysis, to visualizing a process flow, to locating individual human tasks in the process and taking action to reallocate work.

You will want to have a baseline measurement with basic KPI expectations set and some basic measures abstracted. Assuming you have been following the approach outlined in the *IBM Business Process Management Prescriptive Guide to Solution Implementation*, and modelled in this IBM Redpaper publication, you should have identified the base KPIs and reports initially during the Storyboarding phase, and then have refined these in the Experience phase. (See Chapter 3, “Storyboarding” on page 35, and Chapter 4, “Experience” on page 81.)

As we discuss in this chapter, (5.6, “Manage in real-time using KPIs” on page 149) you begin to optimize the process by making incremental changes, reviewing and tuning your KPIs, and eventually, acquiring additional measures for your analysis.

For the purpose of this scenario, we assume that the monitoring model, based off of the live working demo from the fictitious Health Care Insurance Co, (See 1.6, “Introduction to the health care demo scenario” on page 15) provides this data and that you have used this information to set up an initiating process improvements space and to configure the widgets within it. We also assume that you have made each member of your team a viewer of the space.

## 5.3 Introduction to the Business Space

The core piece used to enable real-time management of your business efficiency is the WebSphere Business Monitor component. The tool itself is a framework that acquires measures and metrics based on data that your business process model carries called events and renders them into various graphic displays and reports in a Web-based browser called the Business Space dashboard.

Using the new Web 2.0 Business Space interface, users can create a personal business space that combines business data from multiple sources. Each business space consists of custom pages that display content in one or more views on each page. The views on a page are enabled by widgets that are tailored for different types of dynamic and static content, such as business process information, human task activities, process diagrams, KPIs, dimensional views, and documents (such as spreadsheets and presentations). The content sources can be local or remote. Each user can create multiple business spaces. The reports within the Business Space are highly customizable to suit your needs.

Figure 5-3 on page 139 illustrates an sample dashboard with human task overviews, KPIs, and other metrics. We will be discussing how to build this specific dashboard in subsequent sections of this chapter.

**Note:** If you have been following the chapters of this paper in sequence, then you have already seen an introduction to the Business Space from the Experience phase and the Interactive Process Design (IPD) step in which you first deployed your process model. (See 4.8.1, “Interactive process design (IPD)” on page 116).

The environment provided through the IPD step gives you a good idea of what the Business Space is. It is especially beneficial in that it allows you to deploy your process model, largely independent on IT involvement. This allows you to experience the Business Space and refine your monitoring goals and metrics, while still being outside of the true production environment. This keeps costs for changes and initial Business Space/KPI tuning to a minimum, because it will require only minimal IT involvement and is handled primarily by the line of business users. More importantly, your initial work in the IPD environment ensures that after you eventually deploy the model into a production environment, it should have a strong foundation for measuring KPIs accurately.

Keep in mind however that IPD is a limited environment. Therefore, you might not have all the real-time data that you acquire through the production environment.

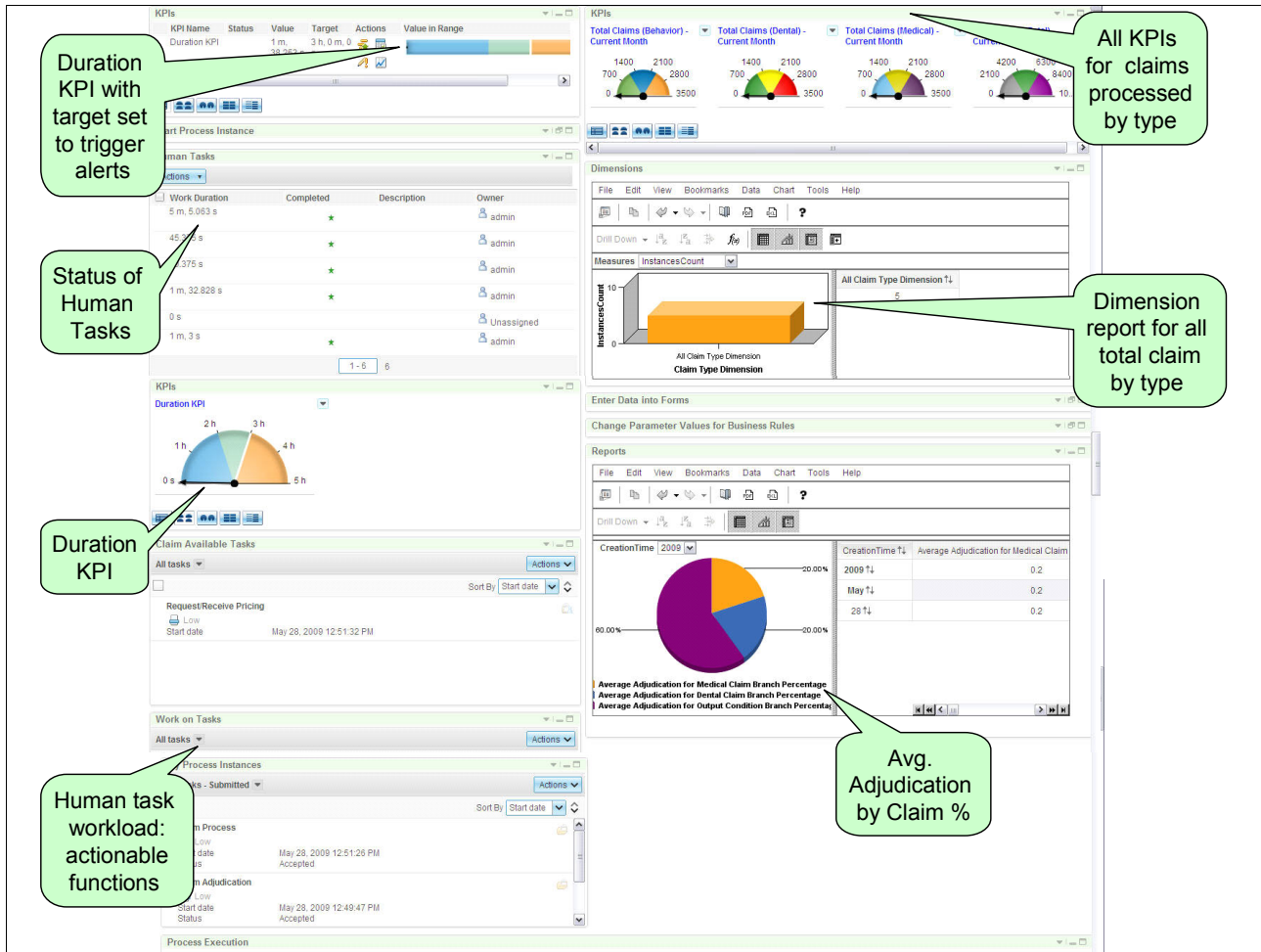


Figure 5-3 Preview of the dashboard used for monitoring and managing

Now that we have introduced the Business Space, we next activate and set the runtime functions that you perform to configure your business space to monitor the specifics applied to model process.

**Note:** For additional information about Business Activity Monitoring (BAM) using WebSphere Business Monitor, refer to the *IBM Business Process Management Reviewer's Guide*, REDP-4433.

## 5.4 Empowering the user

An essential component of Business Process Management (BPM) is to enable the line of business (LOB) to play an active role in defining how the business processes should be managed. The scope of this role includes the ability to define the high-level business metrics (with WebSphere Business Modeler), view operational and strategic business activity using dashboards, be alerted to key situations, and use real-time data to improve business process definitions (also working with WebSphere Business Modeler).

WebSphere Business Monitor raises the bar of empowerment so that business users can customize the monitoring solution and dashboard to react to these changes rapidly, without requiring IT to re-implement, test, and re-deploy the monitoring solution, as defined by a monitor model. Business users can modify what is displayed, add new KPIs, or change the thresholds on existing ones, and define alert situations and determine which alerts business users want to be alerted to, without discussing changes with a developer or portal administrator. This customization not only provides flexibility to the business, but it relaxes the need for IT to define all KPIs and alerts up front, enabling businesses to react quickly to changing conditions. At the same time, the routine workload on IT is reduced, enabling them to focus on more strategic projects.

In the following two sections, we discuss how to customize the user LOB experience, and assign specific roles and perspectives into the Business Space.

### 5.4.1 Customizing the user experience

In this section we transition into using the context scenario for Health Care Insurance Co. ABC, and show you how to begin building a custom Business Space.

**Note:** For all subsequent sections in this chapter, we are following the outlined activities and tasks from *IBM Business Process Management Prescriptive Guide to Solution Implementation*, but using the specific data and context from the model of the fictitious company Health Care Insurance Provider, ABC. See 1.6, "Introduction to the health care demo scenario" on page 15 for details on the scenario.

Figure 5-4 on page 141 illustrates where we are in the overall flow of tasks within the Manage phase.

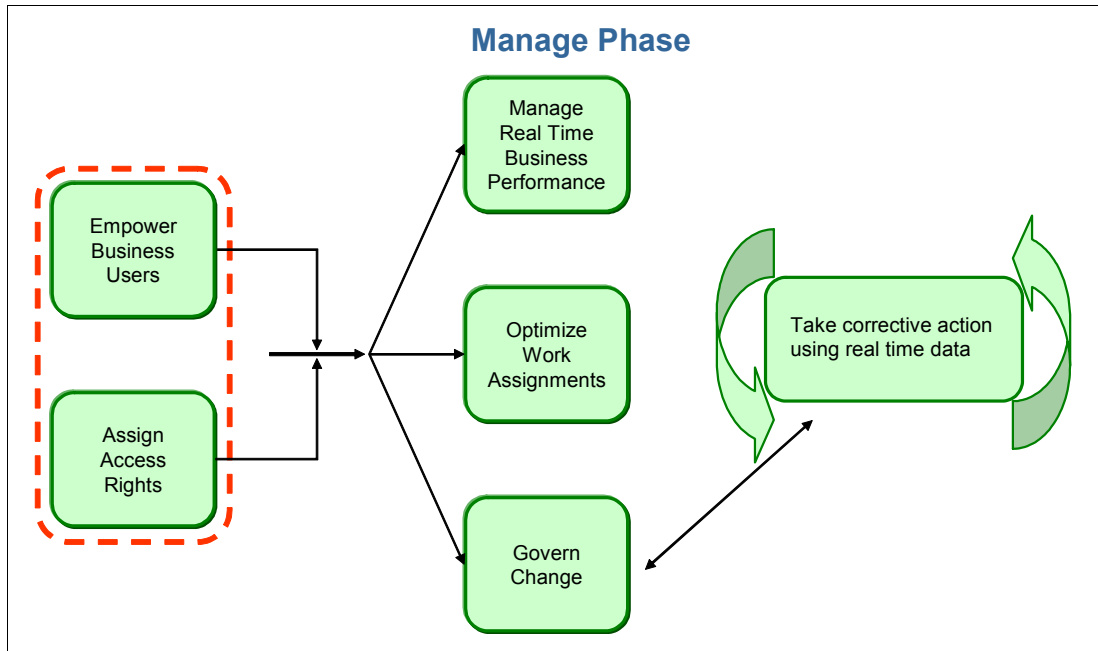


Figure 5-4 This section is focusing on these tasks

WebSphere Business Monitor Business Space framework is a highly extensible framework for monitoring your business performance.

- ▶ The Business Space dashboard is easy to use and graphics-rich to augment the user experience.
- ▶ You can easily perform custom branding to match your corporate identity. Not only can you customize its look and feel to make it tailored for a specific group of users based on access level and their perspective of the business, but you can easily brand and customize the business space with graphics matching your corporate identity.

In the upcoming example, we brand the space for the fictitious scenario, “Health Care Insurance Company ABC”. We have branded the log on panel and top frame banner, but other options for customization exist.

- ▶ Business space widgets from other components can be integrated to provide an end-to-end monitoring solution across the enterprise. You can bring in data company-wide from sources outside of Monitor and still be able to present it on the Business Space as one place to look at.
- ▶ There are predefined templates and themes to use and reuse so you do not have to make up your own.
- ▶ Easily collaborate between departments within enterprise and possibly outside.
- ▶ A complete typical graphical business space configuration as shown in Figure 5-5 on page 142 takes less than five minutes.

Figure 5-5 illustrates an example of a customized Business Space, using the data from the scenario used throughout this paper, Health Care Insurance Co. ABC.

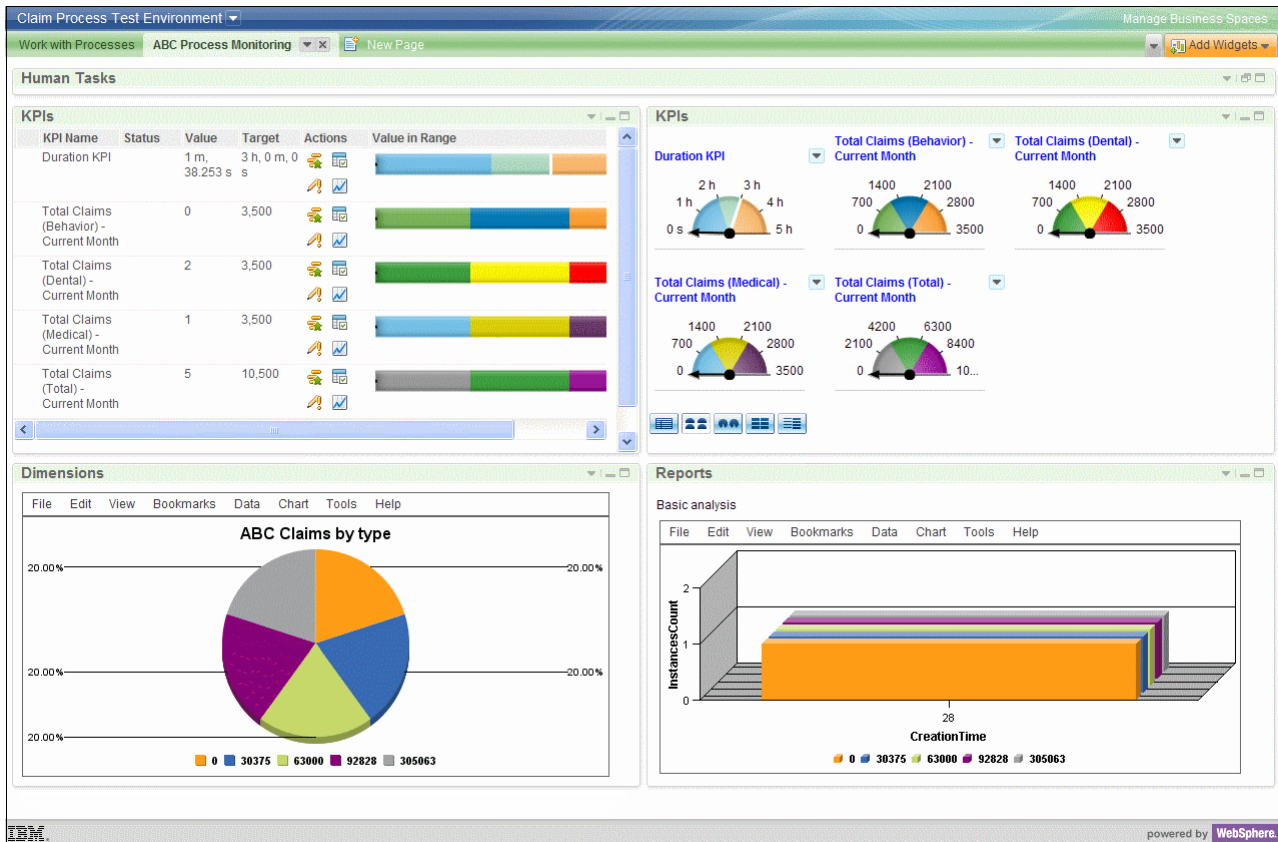


Figure 5-5 This business space report with all widgets for a at-a-glance look take a few minutes to configure

## 5.4.2 Assigning Access Rights: Why they are beneficial and how to assign them

For collaborative business environments, you can configure role-based access in Business Space to enable business users to create, modify, improve, or personalize their BPM experience as business needs evolve. Customer-specific templates can replace out-of-the-box templates in Business Space to simplify the creation of new spaces by users.

**Note:** Assigning access rights is an optional step in the process and is not appropriate for business environments where the user environment is locked down and strictly regulated. In these environment a collaboration with the IT infrastructure security resource administrator is needed to get the access rights implemented.

## Assigning access rights to the hosting environment

This section provides specific guidance on how to assign access rights for the Business Space within the runtime environment.

1. Ensure that your user ID has the role and authority to administer and manage your models. This can be quickly activated by the WebSphere Monitor Security administrator. It is a business role as opposed to an IT role.

This function can be performed by a Monitor administrator through the WebSphere Application administrative console under the Monitor Security function. Select the models you want to allow a role to administer and below it, you assign that role to the User ID.

2. Go to the WebSphere Admin console and select **Monitor Data Security Administration**.
3. Select **Claims\_Processing\_HL**, and **Claims Processing\_LL**, as shown in Figure 5-6.



Figure 5-6 Model to administer

4. Select the role you want this user ID to have.
5. Click **Users**, then **Search**, as shown in Figure 5-7.

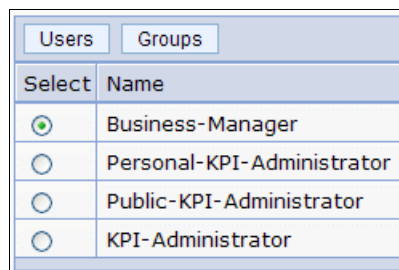


Figure 5-7 Select role

6. In the search result list, add all applicable users to the window on the right

Figure 5-8 shows the different user IDs that are assigned to different roles for them to administer the models for Health Care Insurance Co. ABC. This takes care of the infrastructure security. It is allowing a user ID to access what model running on an application server infrastructure.

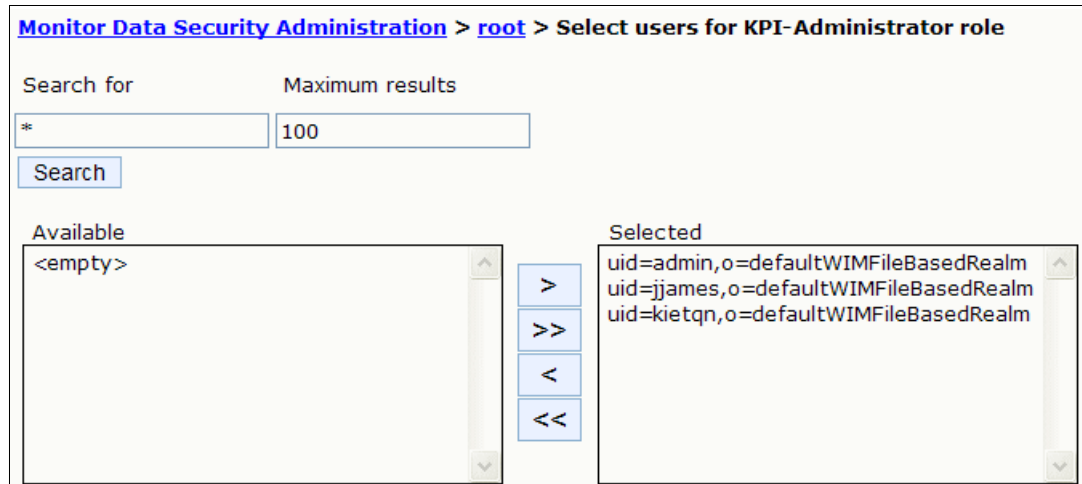


Figure 5-8 Assigning role to user IDs

### Assigning access rights for system capability

You now have access rights to the production environment infrastructure where the Health Care Insurance Co. ABC process model is executing. As the administrator of the modeling process for this workflow, you can decide with whom on your team you wish to share access to your business space so that they can view your reports.

1. Configure role-based access control to process and system function and data according to the business organization structure. This configuration should reflect the separation of concerns in the business. That is, who needs access to what data and what actions those users can take on the data. Access rights should be fine-tuned along the following high-level areas:
  - Process configuration and decision making, such as business rules and calendars
  - Visibility into data about the process, such as monitor models & process administration
  - Interactions with the process managed by the BPM system, such as human task roles
2. Define the realm of possibility for what process users are allowed to do by sharing your business space.
  - After user IDs are assigned to role groups above you can share your business space reports with them. This sharing can eliminate the need to set up separate business space report groups for each class of users or groups.
  - In the Manage Business Space window, you can share your business space with other users. You can let them view or edit the configuration settings of your business space if desired.
3. To share your business space, go into the Business Space and click **Manage Business Spaces** (Figure 5-9 on page 145).



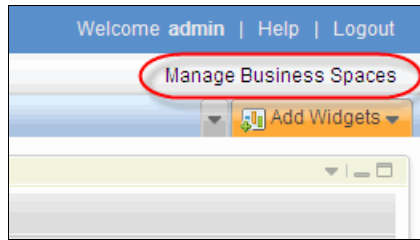


Figure 5-9 Manage Business Spaces

4. Select the **Share this Business Space** check box to share it with User IDs you enter as the viewers or editors, as shown in Figure 5-10.

A screenshot of a web application form for sharing business spaces. The header shows "Welcome admin | Help | Logout" and a link "Return to 'Health Insurance Co. ABC'". The form has several sections: "Business Space Name" with the value "Health Insurance Co. ABC"; "Business Space Description" with an empty text area; "Owner" with the value "admin admin" and a "Change..." button; "Theme" with the value "Claims Processing" and a "Change..." button. Below these is a section titled "Share this Business Space" with a checked checkbox. Underneath are two columns: "Viewers" and "Editors", each with a list box. At the bottom are buttons for "Export", "Save", and "Cancel". A red arrow points to the "Share this Business Space" checkbox.

Figure 5-10 Sharing business spaces

5. A search window facilitates the adding of user IDs if you do not have the exact ID. See Figure 5-11.

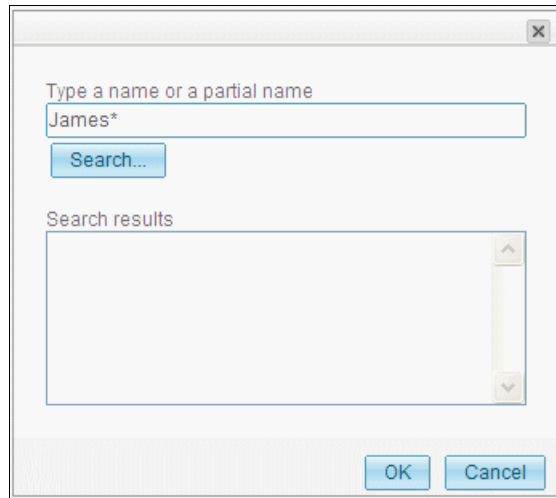


Figure 5-11 Search for User IDs if you do not know the exact ID

6. In our example, we share the Business Space with John James. Figure 5-12 shows a shared business space owned by User ID 'admin' sharing to User ID 'jjames'.

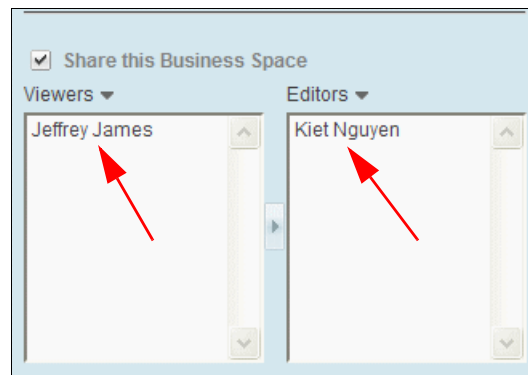


Figure 5-12 Allowed user ID can either edit or view your Business Space

7. Figure 5-13 on page 147 shows a shared business space owned by User ID 'admin', sharing to User ID 'jjames'. Because that User ID is only allowed to view a shared business space, it cannot modify any of modifiable features the configuration. Notice how there is no **Change** button next to the Claims Processing Theme, when compared to the image shown in Figure 5-13 on page 147.

Welcome jjames | Help | Logout

Return to 'ABC Health Insurance'

Business Space Name  
ABC Health Insurance

Business Space Description  
ABC Health Insurance Claim reports

Owner  
admin admin

Theme  
Claims Processing

Share this Business Space

Figure 5-13 View mode of sharing

8. If your User ID is allowed to edit a shared business space's configuration, its context sensitive controls will be exposed, as shown in Figure 5-14.

Welcome admin | Help | Logout

Return to 'Health Insurance Co. ABC'

Business Space Name  
Health Insurance Co. ABC

Business Space Description

Owner  
admin admin [Change...](#)

Theme  
Claims Processing [Change...](#)

Figure 5-14 Edit mode of sharing

In the next section, we set up the all the necessary widget views in to monitor the human task activities for the Health Care Insurance Co. ABC process model.

## 5.5 Monitoring the Health Insurance Claim Process

The objective of monitoring a business process is to acquire insight into its current performance and, if applicable, look at possible improvements for any or all the activities in the process. The goal is to validate the efficiency of the process, identify potential bottlenecks, and where possible, fine-tune the process to reach higher efficiency.

In a real-time monitoring environment, your Business Space provides a single inclusive dashboard that lets you see everything that is going on in your process through the service of its reporting widgets. You use the widget reports on the Business Space to alert you of any impending situation that you need to be aware of and might possibly need to act upon.

The progression of activities that we are following throughout this chapter is as follows:

1. Monitor the overall process and sub-processes.
2. Identify process bottlenecks and diagnose the cause of inefficiencies.
3. Remedy and fix.
4. Implement permanent changes.

Figure 5-15 illustrates a configured Monitor business space, based on the fictitious scenario for Health Care Insurance Co. ABC. This shows all the KPIs to make anomalies stand out within the Business Space.

In the following sections, we show you how to add widgets to your Business space and create a dashboard similar to the one shown here for the scenario based on Health Insurance Co. ABC.

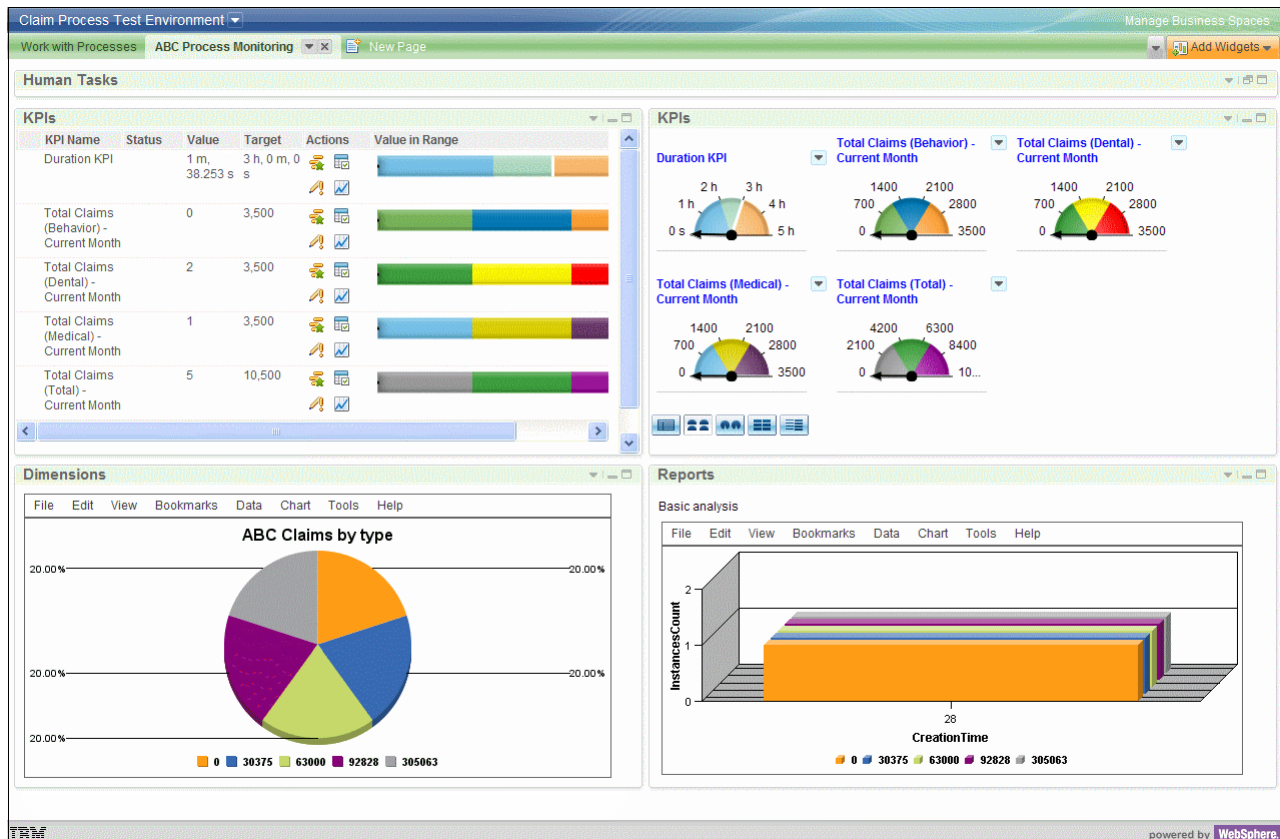


Figure 5-15 A typically configured business space dashboard shows all important KPIs views at a glance

## 5.6 Manage in real-time using KPIs

Based on our work in the Storyboarding phase (Chapter 3, “Storyboarding” on page 35), and further refined in the Experience phase (Chapter 4, “Experience” on page 81), we have a solid understanding of KPI guidelines to help anchor a baseline monitoring scenario for Health Care Insurance Co. ABC. In this section, we discuss how you can monitor these KPIs and determine how your initially simulated data results are comparing to your real-time data results. The objective is to analyze and monitor these KPIs in real-time with production volume to get a feel of whether the targets from results of your simulation are in-line with the real picture.

Figure 5-16 illustrates the focus of this section within the overall steps of the Manage phase.

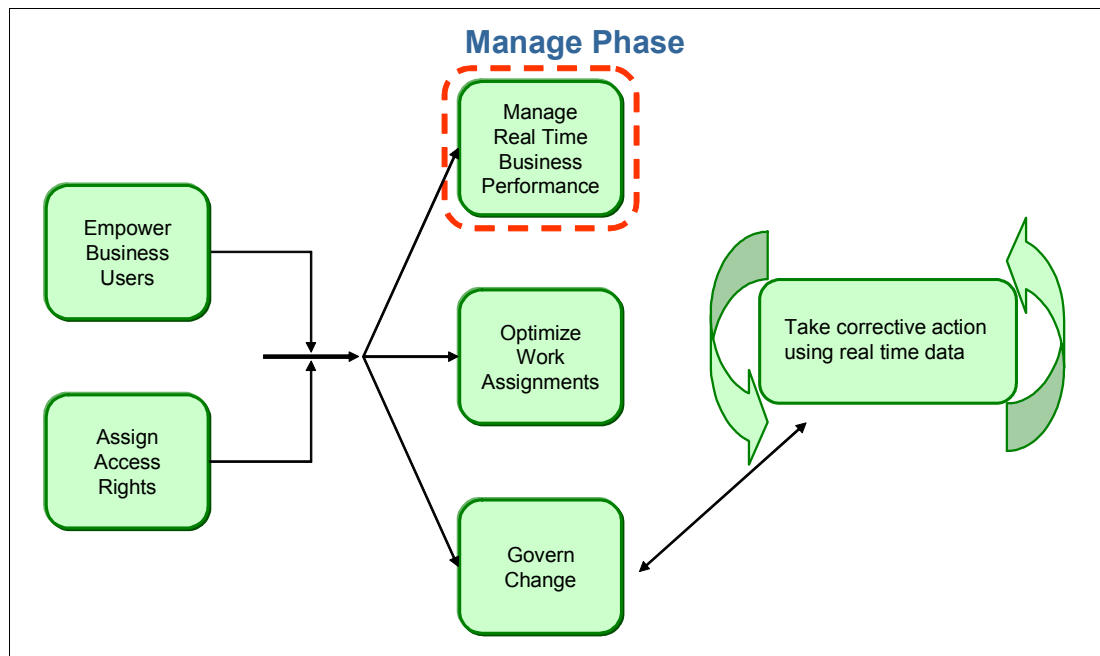


Figure 5-16 Managing real-time business performance

### 5.6.1 Review of the KPIs to be monitored

**Note:** The KPIs shown here correspond with the KPIs introduced and analyzed in 3.9, “Definition of control points to prepare experience” on page 77.

To better understand a breakdown of the effort among the various claim types, we are looking at the percentage of claims processing by type. We also wish to monitor the duration of some human task processing, being the two primary goals of improvements.

You will setup the KPIs widget report to view the real-time results of the KPIs shown in Table 5-1 on page 150.

Table 5-1 KPI measurements for reporting

Claim Type	Activity Type	Measurements
Handle Medical	Automatic	KPI < 22.5%
Handle Dental	Automatic	KPI < 22.5%
Handle Behavioral	Automatic	KPI < 30%
Notify Rejection	Automatic	KPI < 25%
Request/Receive	Human task	duration < 3 hours
Select Provider	Human task	duration < 1 hour

The KPIs in Table 5-1 are predefined in the model for Health Care Insurance Co. ABC claim process. These are baseline KPIs. If, after the course of monitoring these, you have found that they are inadequate to harness an improvement plan, you can add more KPIs or change the target values at runtime.

## 5.6.2 Setting up the KPI widget report

For this example, we set it up as a KPI to measure the duration of how long our Request for Pricing human task would take on the average.

The following steps describe how to set up the widget report:

1. From within your Business Space, add a KPI widget from the **Add Widgets** icon. This is found in the upper right corner of the Business Space panel (Figure 5-17). Select **KPIs** then drag this on to the Business Space.

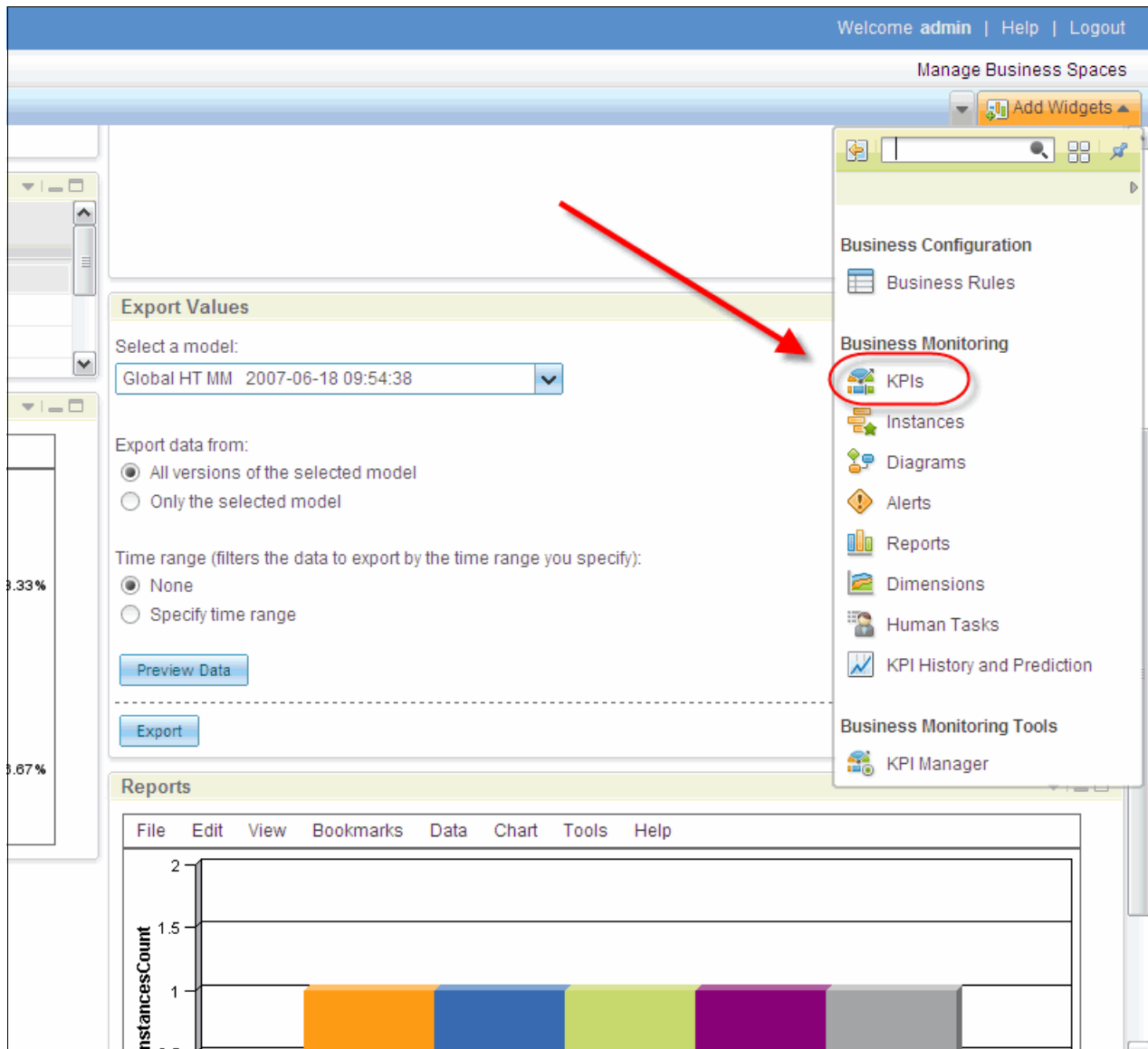


Figure 5-17 Drag to add a KPI widget

When dragged onto the Business Space, this creates a KPI widget window. The base widget still needs configuration (Figure 5-18 on page 152).

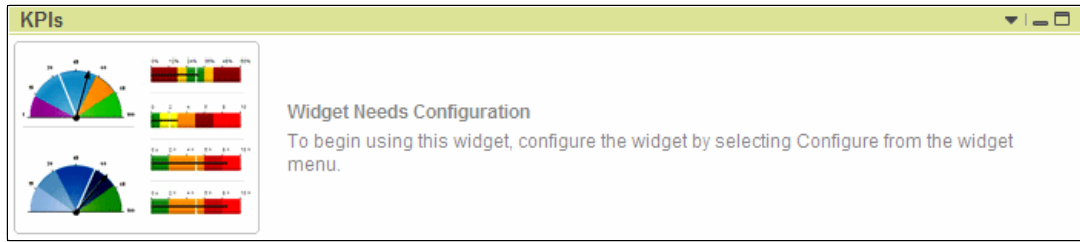


Figure 5-18 KPI widget window

2. Select **Configure** (Figure 5-19).

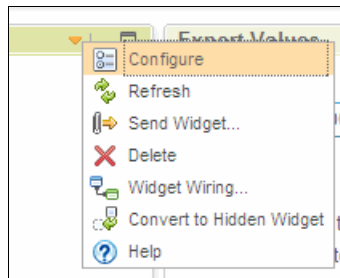


Figure 5-19 Configure the widget window



3. This opens and displays your available deployed claim process model with its defined KPIs (Figure 5-20). Expand and select the Duration KPI for your model.

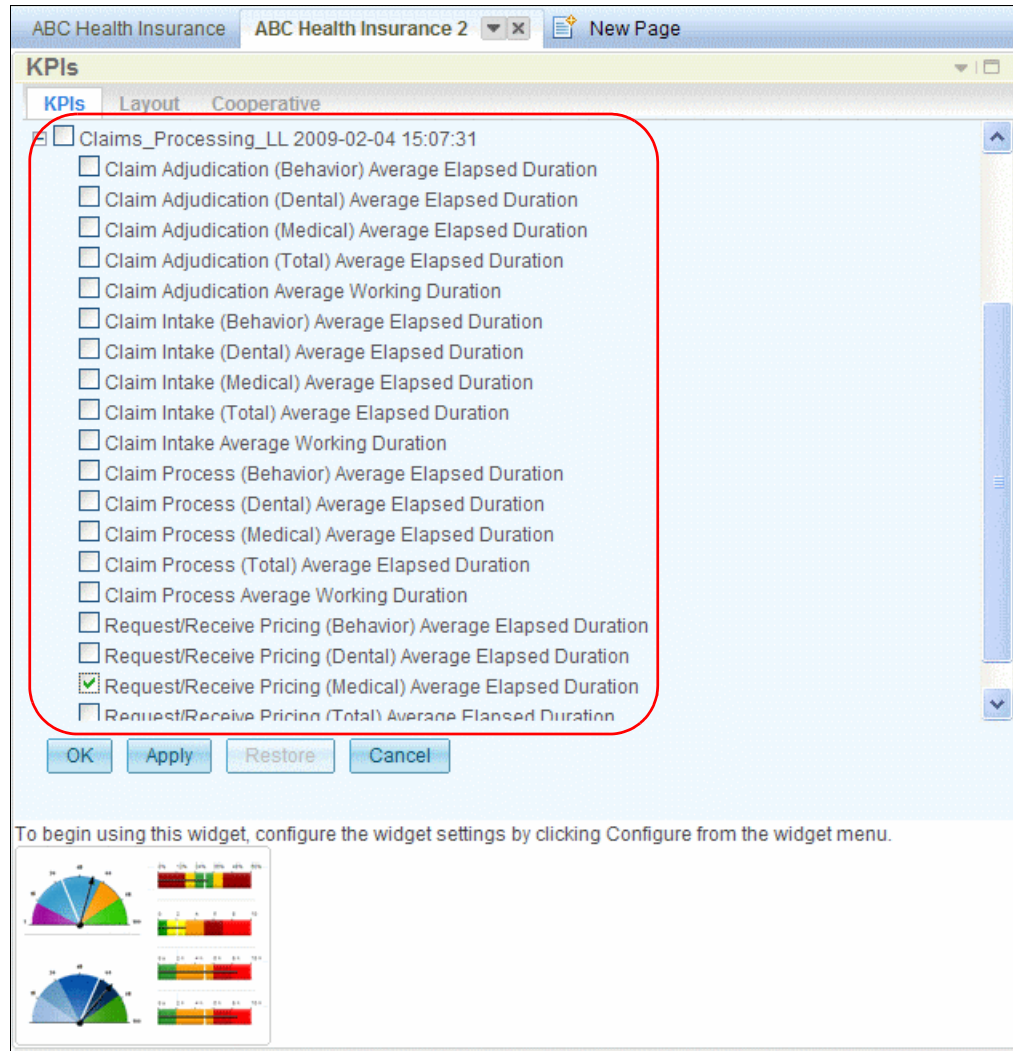


Figure 5-20 Select and add predefined KPI from model to your Business Space

**Note:** The Mortgage Lending Showcase comes out-of-the-box as a sample for experiencing with Monitor. You can use it KPI examples for reference as needed.

- After selecting the KPI, click the **Layout** tab at the top of the window (Figure 5-21) to define the layout. By default, the layout of a KPI widget is in table form. You can choose a different layout if so desired.

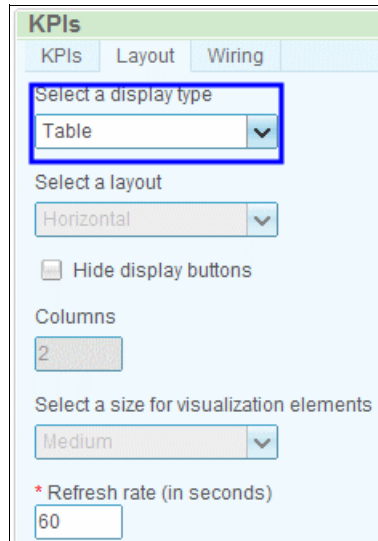


Figure 5-21 Default KPI layout display is table form

- After you click **OK**, the KPI widget will display within your Business Space (Figure 5-22).

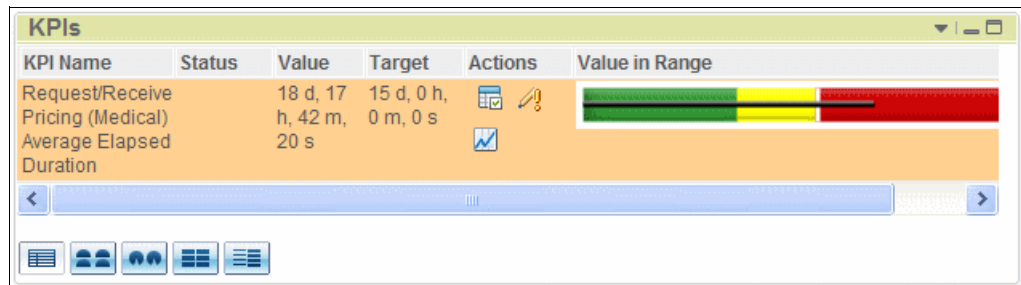


Figure 5-22 Initial display of the Duration KPI

With a different layout, the same KPI widget can be graphically displayed differently. Figure 5-23 is an example of how the Duration KPI would appear if displayed as a Half Gauge layout.

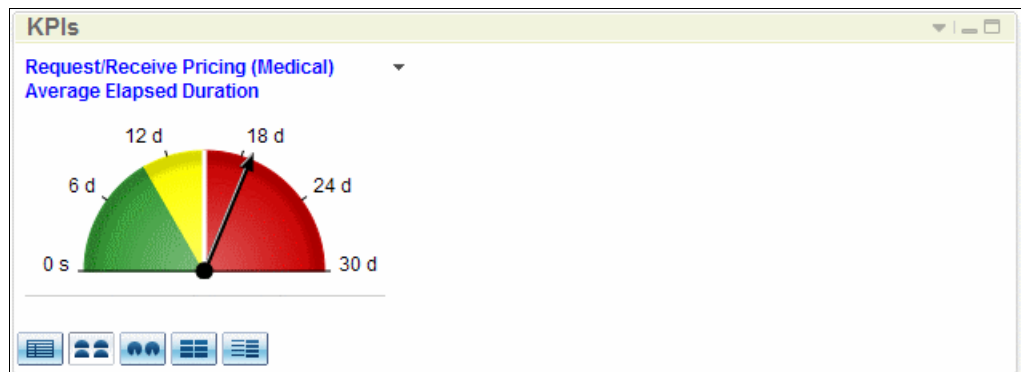


Figure 5-23 Half gauge layout of duration KPI for Health Care Insurance Co. ABC claim process

You can also use the quick layout change icons to change layouts for KPIs (Figure 5-24).

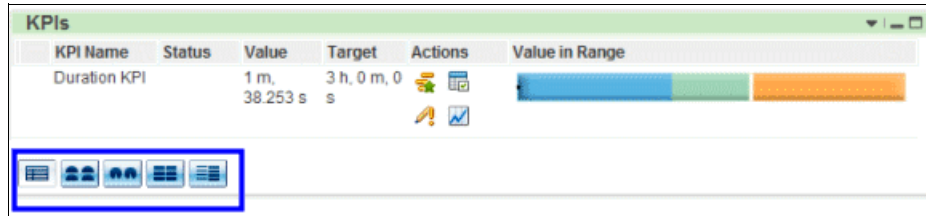


Figure 5-24 Quick access to change KPI layout

- Click the KPI range color band to get a range definition quickview (Figure 5-25). The range shows the duration target set for this KPI in the claim process model.

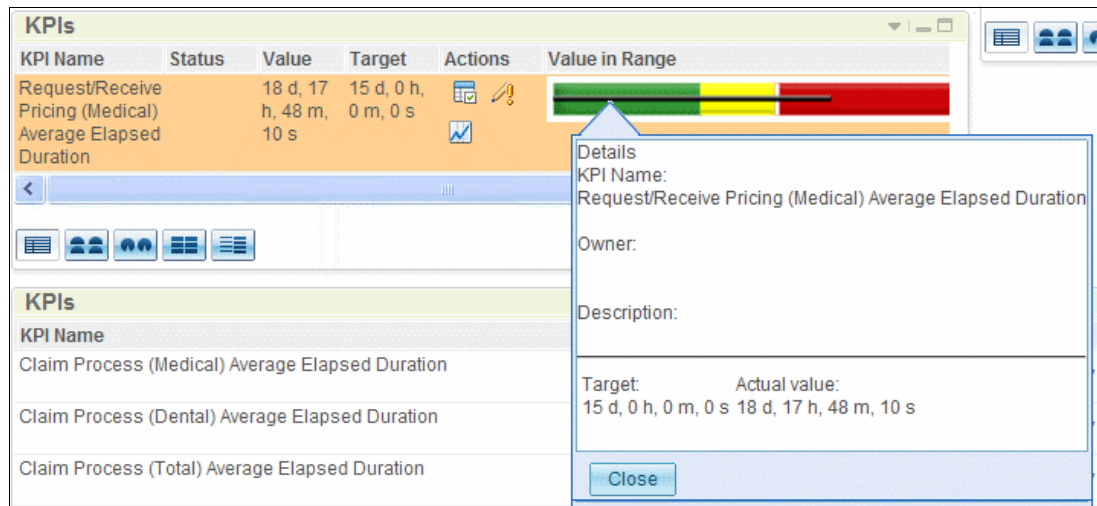


Figure 5-25 Click color range to view KPI range value

- To edit the KPI properties, click **KPI Properties Action** (Figure 5-26) to edit the properties for this KPI.

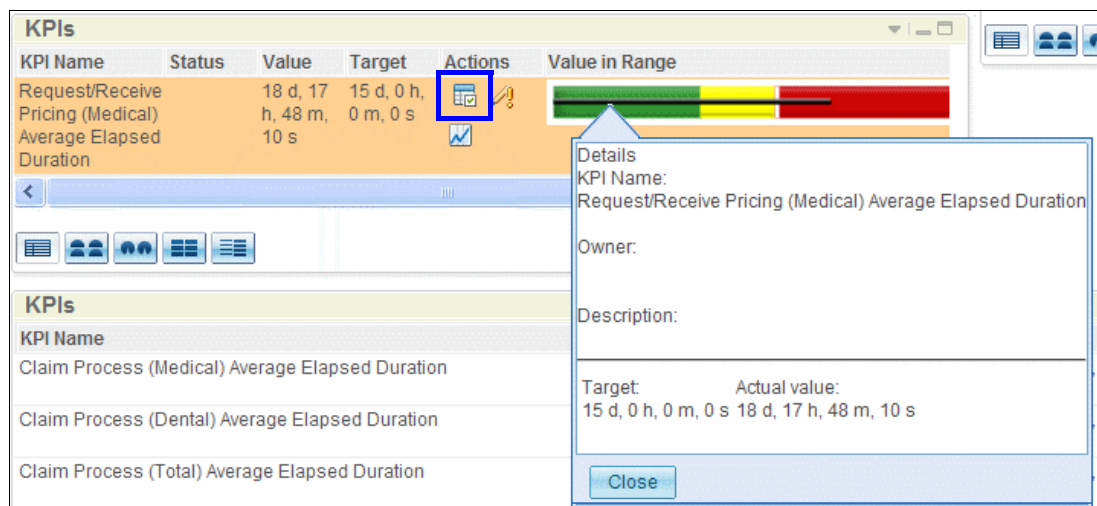


Figure 5-26 Click **Edit Properties** to change KPI properties

- a. A window displays, letting you change different properties for the KPI at runtime. There are five tabs: **Name**, **Definition**, **Range**, **Other**, and **Preview**.
- b. Figure 5-27 lists the things you can change in the **Name** tab. A modeled KPI name marked with an asterisk (\*) cannot be changed at runtime.

KPI Properties

Name Definition Range Other Preview

\* KPI name:  
Duration KPI

Description:  
[Empty]

Model associated with KPI:  
Claim Process

Access:  
 Personal  
 Shared

Figure 5-27 Things you can change in Name tab

- c. The most common changes made to KPIs are under the **Range** tab. You can change target, range values, and color properties (Figure 5-28).

KPI Properties

Name Definition Range Other Preview

Target:  
0 d 3 h 0 m 0 s

Range definition:  
 Numerical  
 Percentage

Range Name	Start Value	End Value	Color	Icon	Delete
Low	= 0 d 0 h 0 m 0 s	< 0 d 2 h 0 m 0 s	Blue	-	[Delete]
Medium	= 0 d 2 h 0 m 0 s	< 0 d 3 h 0 m 0 s	Green	-	[Delete]
High	= 0 d 3 h 0 m 0 s	< 0 d 5 h 0 m 0 s	Orange	-	[Delete]

Add row Copy from template

Figure 5-28 Changing range value and colors for KPI

8. Add additional KPI widgets for Medical, Dental, Behavioral, and Rejection by following the same procedure outlined above. You can add these by either adding new KPI widgets, or modifying the widget configuration (Figure 5-29 on page 157).

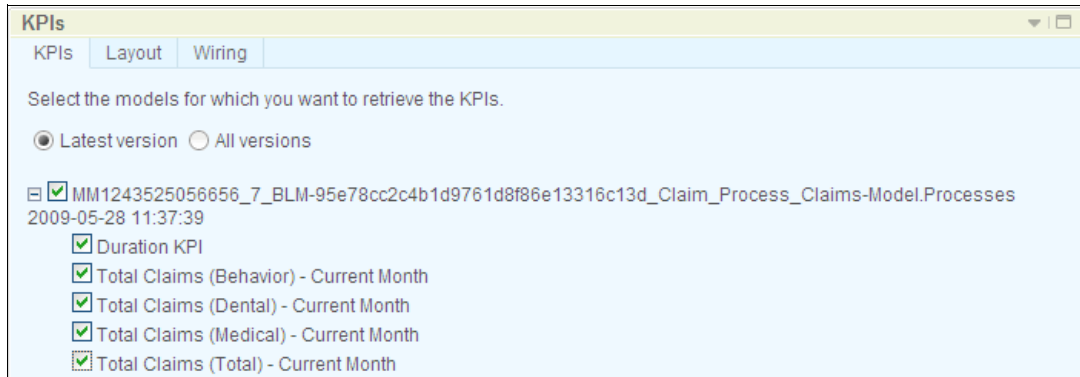


Figure 5-29 Modifying widget configuration

9. After adding and positioning the KPI widgets within the Business Space near each other, you can arrange to have a report view like Figure 5-30.

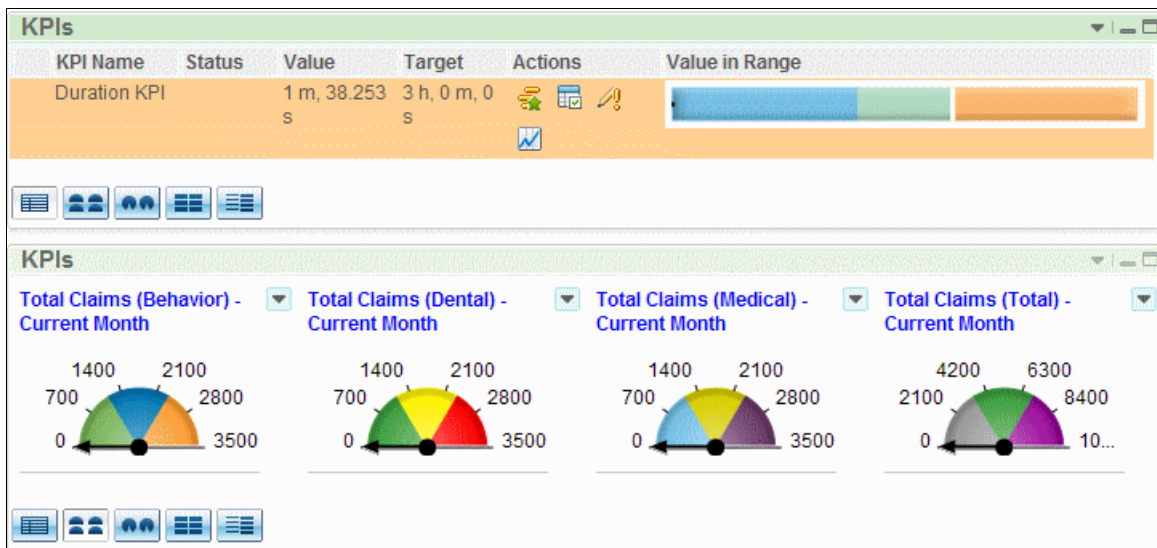


Figure 5-30 Changing color for individual half gauges

With some focus on how and where you place the widget reports within the Business Space page, you can fit several widgets to gain an overview of KPIs and process status for Health Care Insurance Co. ABC Claim Process, similar to the Business Space example shown in Figure 5-31. In this example, we have added the following widgets:

- KPIs - including Duration, Total Claims Behavior (Current Month), Total Claims Dental (Current Month), Total Claims Medical (Current Month)

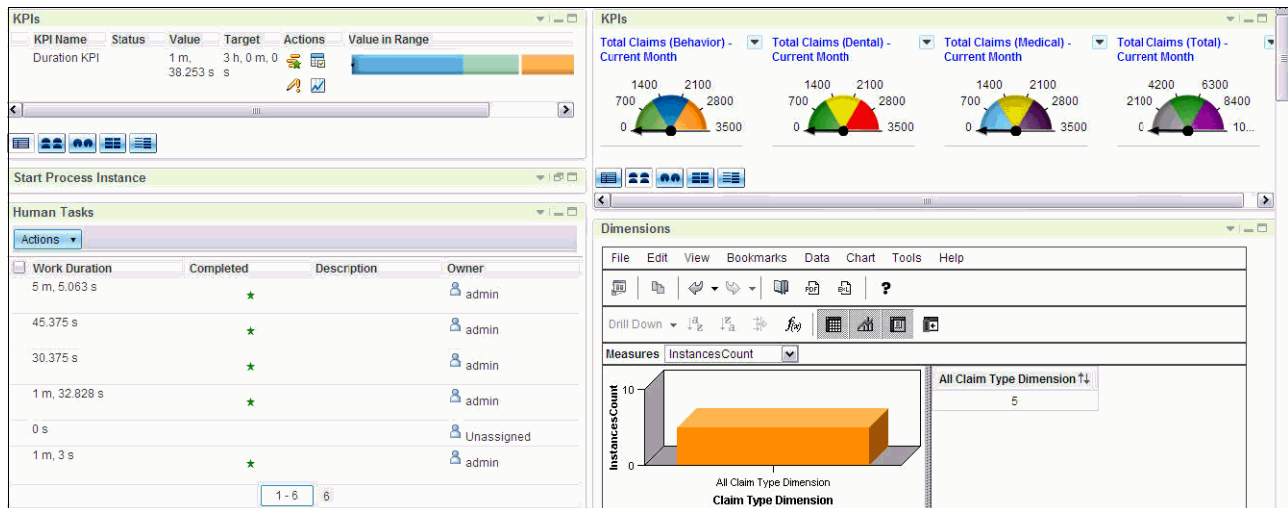


Figure 5-31 Combining different KPI widgets for a total overview of Health Care Insurance Co. ABC process

In a later section, we configure additional advanced widgets for your reports (such as dimension for further analysis). But now, we return to the basic KPIs report that you have just set up and learn to use it to look at situations.

### 5.6.3 Setting thresholds and spotting bottlenecks in KPI Reports

Keep in mind that the objective of monitoring your KPI data is to identify inefficiencies and bottlenecks in the process, so that if needed, you can take corrective action to remedy the situation. After you have decided on a set measurement for a threshold, you can use this baseline as the standard threshold to use the different alert modes of the Monitor framework to notify you when a situation requires attention.

**Note:** The definition of a process bottleneck is as follows:<sup>a</sup>

- ▶ An activity within an organization which has a lower capacity than preceding or subsequent activities, thereby limiting throughput. Bottlenecks are often the cause of a build-up of work in progress and of idle time.
- ▶ A limiting factor on the rate of an operation.

a. <http://dictionary.bnet.com/definition/bottleneck.html>

### 5.6.4 Using the KPI widget reports to identify bottlenecks

The most common widget report to use for spotting bottlenecks is the KPI widget view. We illustrate this using the sample data and process from the fictitious scenario based on Health Care Insurance Co. ABC claim process. Figure 5-32 on page 159 illustrates the report you configured according to the KPI target table (Table 5-1 on page 150) at the beginning of this chapter.

Looking at the KPI report you just configured on the Business Space (Figure 5-32), you can see that the first duration KPI for the human task has spiked up into the red zone.

**Note:** For illustration purpose we arbitrarily set the duration target for these KPIs to be in minutes. This is to show that your target threshold has been reached and that there might be a situation that need your focus in handling performance of some human tasks.

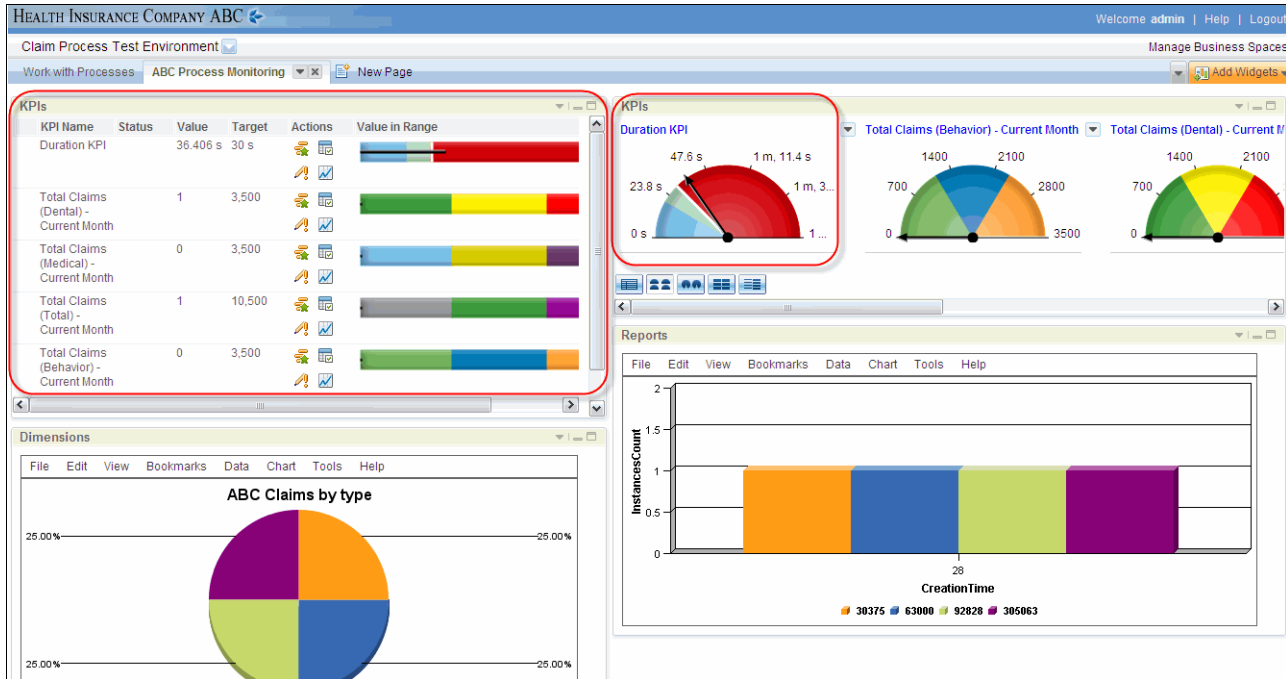


Figure 5-32 KPI Duration Report from Business Space

The meter has indicated that the target has been exceeded (Figure 5-33). Looking closer you see that the human task average duration is too long per our measurement standards. The target range is 30 seconds, and the actual value captured is 36 seconds, exceeding the target range.

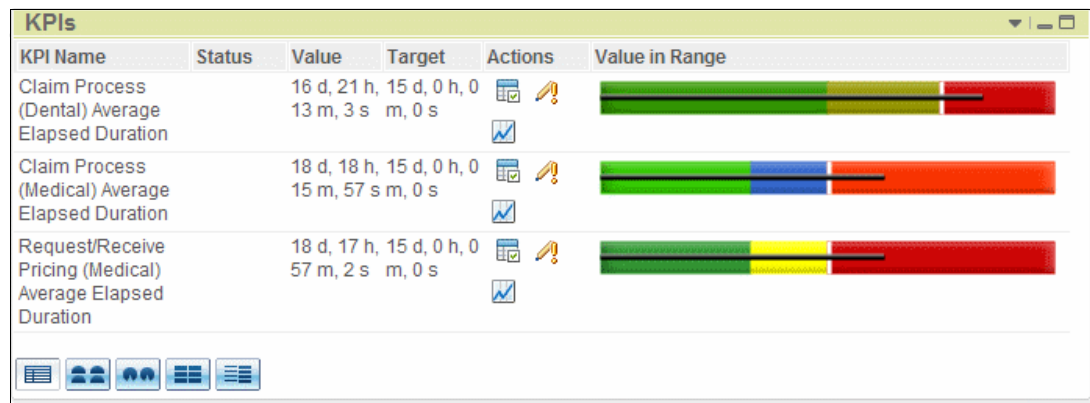


Figure 5-33 Duration KPI reporting target exceeded

## 5.6.5 Reviewing the human task widget to analyze bottlenecks

Following on from the KPI report widget, the next report widget you want to look at is the human tasks widgets to identify a delay in processing of human tasks. As we illustrate in the screenshots, we are assuming that you have a completely configured business space that includes both KPI widget reports and human task widget reports. Figure 5-34 illustrates a listing of the human tasks and their status

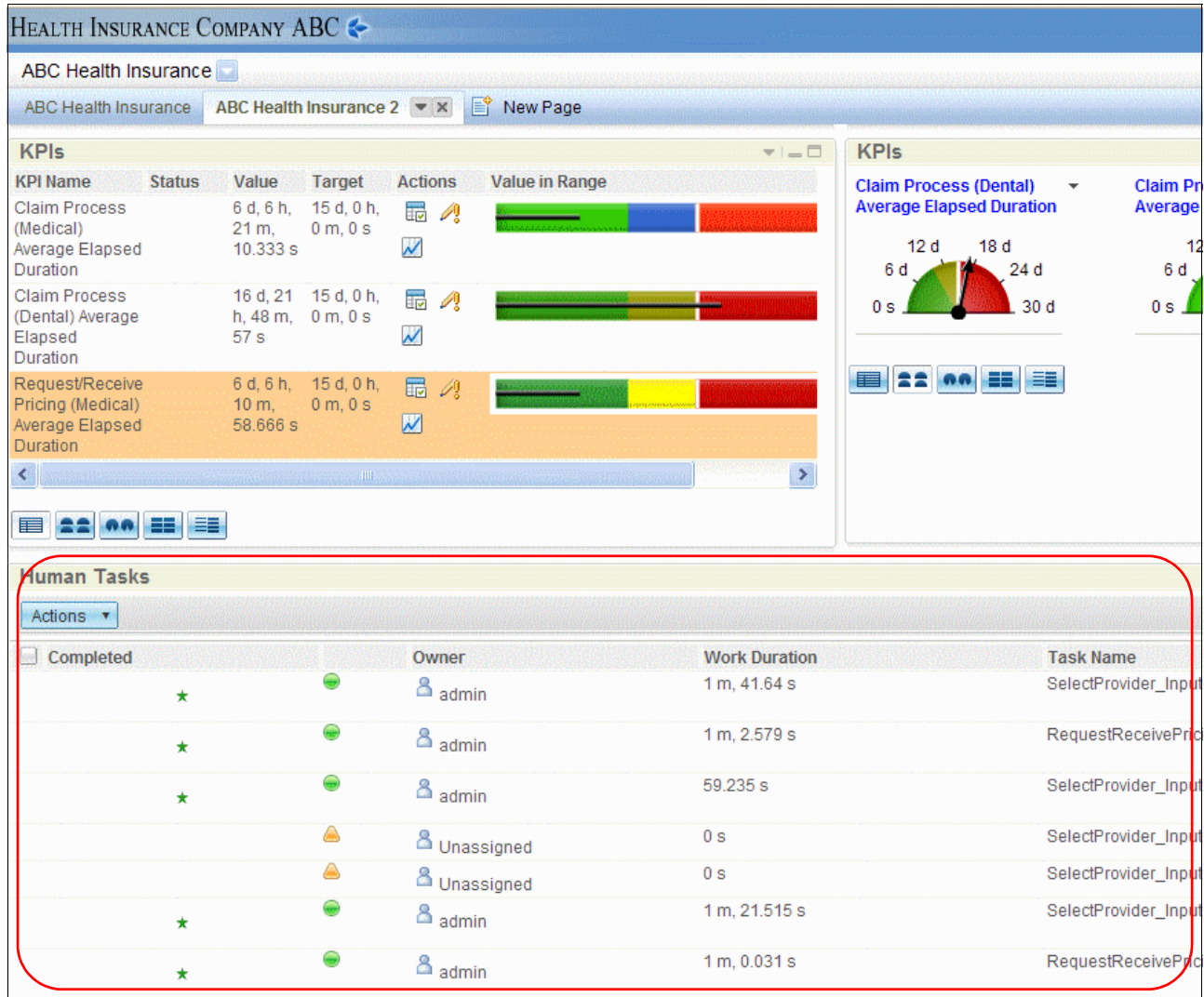


Figure 5-34 The human task report from the Business Space

- ▶ In the human task widget report, pay special attention to the tasks with a status of unassigned. Normally, the reason for an increase in the duration of human tasks is that they are backed up.
- ▶ Based on the information listed in this widget report, you can count the tasks with a status of unassigned, or tasks in the pending state. Figure 5-35 on page 161 illustrates a listing of these unassigned tasks.



Human Tasks				
Actions ▾				
Completed		Owner	Work Duration	Task Name
<input type="checkbox"/>	★	admin	1 m, 41.64 s	SelectProvider_Input
<input type="checkbox"/>	★	admin	1 m, 2.579 s	RequestReceivePric
	★	admin	59.235 s	SelectProvider_Input
		Unassigned	0 s	SelectProvider_Input
		Unassigned	0 s	SelectProvider_Input
		Unassigned	0 s	SelectProvider_Input
	★	admin	1 m, 21.515 s	SelectProvider_Input
	★	admin	1 m, 0.031 s	RequestReceivePric

Figure 5-35 Human task widget

Figure 5-36 indicates how you can select a specific unassigned task and the take action on this task.

Human Tasks			
Actions ▾			
Completed	Owner		Task Name
★	admin	●	RequestReceivePricing_InputCriterion
★	admin	●	SelectProvider_InputCriterion
★	admin	●	RequestReceivePricing_InputCriterion
★	admin	●	RequestReceivePricing_InputCriterion
<input type="checkbox"/>	Unassigned	▲	RequestReceivePricing_InputCriterion
★	admin	●	RequestReceivePricing_InputCriterion

Figure 5-36 Spotting unassigned human tasks

- ▶ After you have acquired enough information about the root cause of a delay or excessive duration in the processing of human tasks you can take action accordingly.
- ▶ By clicking the **Actions** button, you are presented with several choices that you can perform on these human tasks, with the most logical one being to re-assign it another resource to work on. Or, you can contact the owners of those human tasks and have them claimed.
- ▶ For specific approaches on how better to manage human tasks based on the results from the human tasks reporting, see 5.7, “Optimize workload assignments” on page 175. We discuss how to how to administer and manage human tasks and ultimately reach the goal of optimizing workload.

## 5.6.6 Dimension reports

Dimension reports are powerful tools for business intelligence work. Dimension reports provide ways to divide your data and summarize it in a structured way, based on the specific dimensions you select. This allows you to look at measures by more than one grouping (dimension) at a time. For example, a dimension report could report the average of profit - measured both by business unit, and by country in a single report. In our upcoming example, we illustrate a simple example of measuring duration, reported in terms of claim type (Medical, Dental, or Behavioral.)

Dimension reports can be added as a widget report to your Business Space, giving you the capability to look at your data in different levels of granularity and analyze them according to your specifications. You can also choose from a full library of chart templates to support your reporting requirements. This capability is made possible through Alphablox, which is the component and data repository underneath all the business dimension functionalities.

### Steps to add a Dimension report

To add a Dimension report to your business space page, perform the following steps:

1. From within your Business Space, add a Dimension widget from the **Add Widgets** icon, found in the upper right corner of Business Space. (For reference, refer to Step 1 on page 151, and Figure 5-17 on page 151).
2. Select **Dimension** (Figure 5-37), then drag this widget out onto the Business Space page.

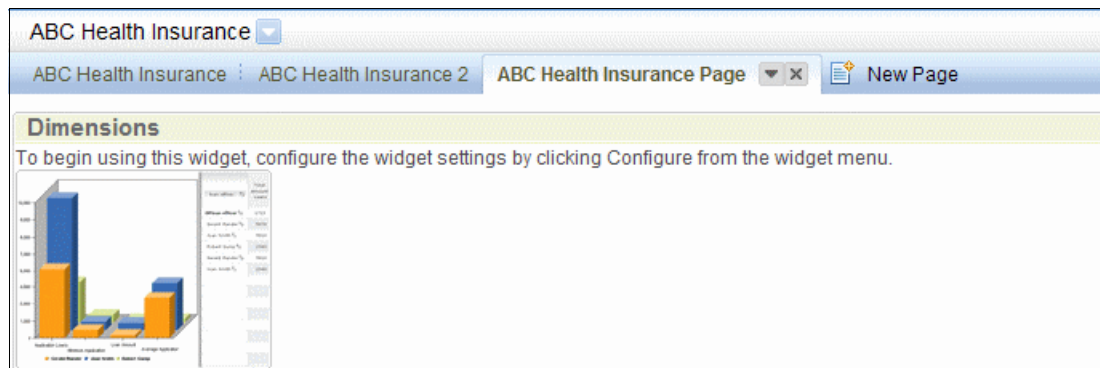


Figure 5-37 Select Dimension Report widget

3. Click **Configure** to start configuring the report. See Figure 5-38 on page 163 for visual reference on configuring the parameters.
  - a. For **Monitoring Model**, select the Claim Process model name. After this is selected, the available monitoring context and measures available will become visible.
  - b. Select the **Monitoring Context**. In this case, we wish to drill down within the context of Claim Type.
  - c. Select the **Dimensions** and **Measures** on which you want to report.

#### Note:

- ▶ The instance count measure is selected by default, you can configure to use it if desired.
- ▶ Be sure to adjust the Frequency to monthly if you want your data range to be beyond a daily cycle.

HEALTH INSURANCE COMPANY ABC

ABC Health Insurance

ABC Health Insurance ABC Health Insurance 2 ABC Health Insurance Page New Page

### Reports

Report Options Cooperative

Model:  
Claims Processing High-Level (All Versions)

Monitoring context:  
Claim Process

Dimension:  
None

Analysis type:  
Basic

Weighing factor:  
0.18

Time range (filters the data to report by the time range you specify)

From:  
Monday, June 15, 2009

To:  
Monday, June 15, 2009

Year to Date Month to Date

Frequency:  
Daily

Measures

- Reports View Measures
  - Sum of new items
  - Sum of resolved items
- Modeled Measures
  - InstancesCount

Figure 5-38 Add model name and measures for Dimension report

4. Click **Apply** and **Save**.

Your default base report will appear. An example base report is shown in Figure 5-39.

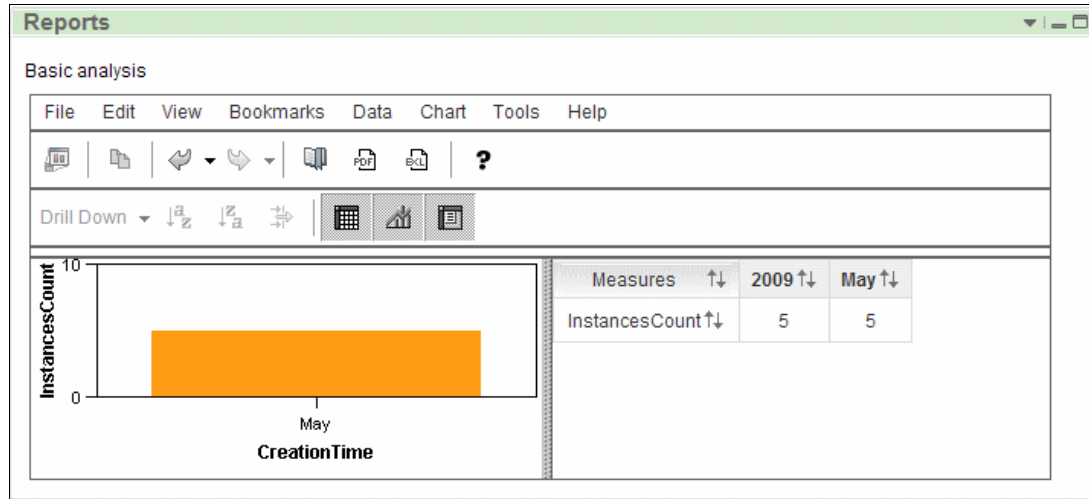


Figure 5-39 Default base dimension report

To make your report more meaningful, you might need to set the chart type and data color. The common things to change would be the chart type and color of the graph elements. For example, in the example for Health Care Insurance Co. ABC, we want to have this data displayed in the form of a pie chart.

5. To change chart type, click **Chart** from the menu (Figure 5-40), and select the chart type from the drop-down menu.

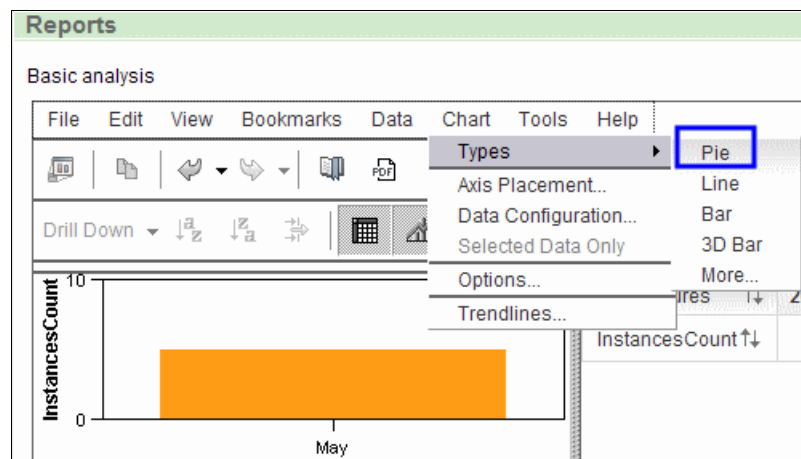


Figure 5-40 Changing chart type

After changing the chart type to **pie**, the chart updates the report, as shown in Figure 5-41 on page 165.

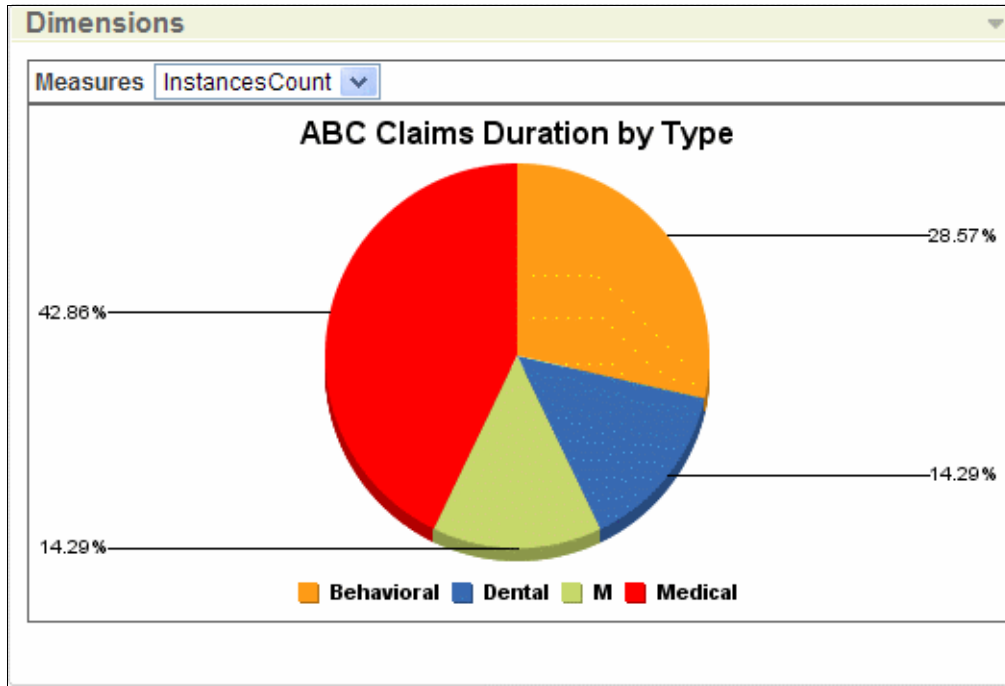


Figure 5-41 Pie chart for Health Care Insurance Co. ABC claim intake by type

### What does this Dimension report tell us?

In the example above, we can see that the Claims by Type % are different and exceeding the range of our set baseline KPI parameters. For example, in Table 5-1 on page 150, we have set the target percentage of total intake for medical claim types for Health Care Insurance Co. ABC to a target level of < 22.5%. According to this report however, the actual value is currently above 42%.

Assuming that the report was configured using multiple-dimensions (for example, we would configure the report such that row dimensions are set for one parameter, column dimensions are set for another, and finally, page dimensions are set for a different parameter,) then you could click specific quadrants within the chart to see the values of the other dimension.

**Note:** Dimension reporting offers many features and options. Most of the configuration work can easily be done at runtime and can be modified as the line of business uses the report and further refines their requirements. In this section we have just shown you the most common widget features to configure your business space so you can be up and running quickly and using your report productively.

## 5.6.7 KPI administration

As the real-time monitor results give you a better sense of the accuracy of your existing KPI baselines, you will most likely need to make fine-tuning adjustments to parameters going forward. WebSphere Monitor Business Space allows for you to make these modifications, adding and adjusting KPIs at runtime. The necessary changes can be across the end-to-end solution or can be simple adjustments to the runtime business space setting. The most common changes are changes to the range or target of the KPI to tune it.

In the upcoming section, we discuss the following two topics in detail:

- ▶ Adding a KPI at runtime directly from within the Business Space
- ▶ Setting KPI alerts

### Adding KPI at runtime

A handy feature in WebSphere Business Monitor business space is the ability to add more KPIs directly at runtime through the Business Space. This is much more flexible than requiring you to re-deploy the model for each additional KPI you wish to track. One important assumption however, is that you have already defined the metrics within your model to base the KPI aggregation on. In other words, think of these as predefined columns in the table, which you might want to use and display in certain situations.

#### Why is the feature beneficial?

The flexibility gives you the ability to mix and match all the metrics at runtime and see which combinations work best and which ones you do not need before you decide on a permanent model-based implementation. This feature is used frequently in first or second stage of production deployment, as some metrics, when revealed within production context, cannot need to be measured as a KPI as frequently as originally predicted.

This feature is helpful for temporary situations in production. For example, if your organization wanted to monitor seasonal inventory (for example, snowboards in the winter) and get alerts on these, then remove it for the rest of the year.

#### Adding a new KPI at runtime through the Business Space

To add a new KPI, decide on the metric and function that the KPI will be using, then perform the following steps:

1. From the **Add widget** icon, pull down the widgets menu and invoke the **KPI Manager** widget
2. Drag the selected widget into an open space on the Business Space page (Figure 5-42).

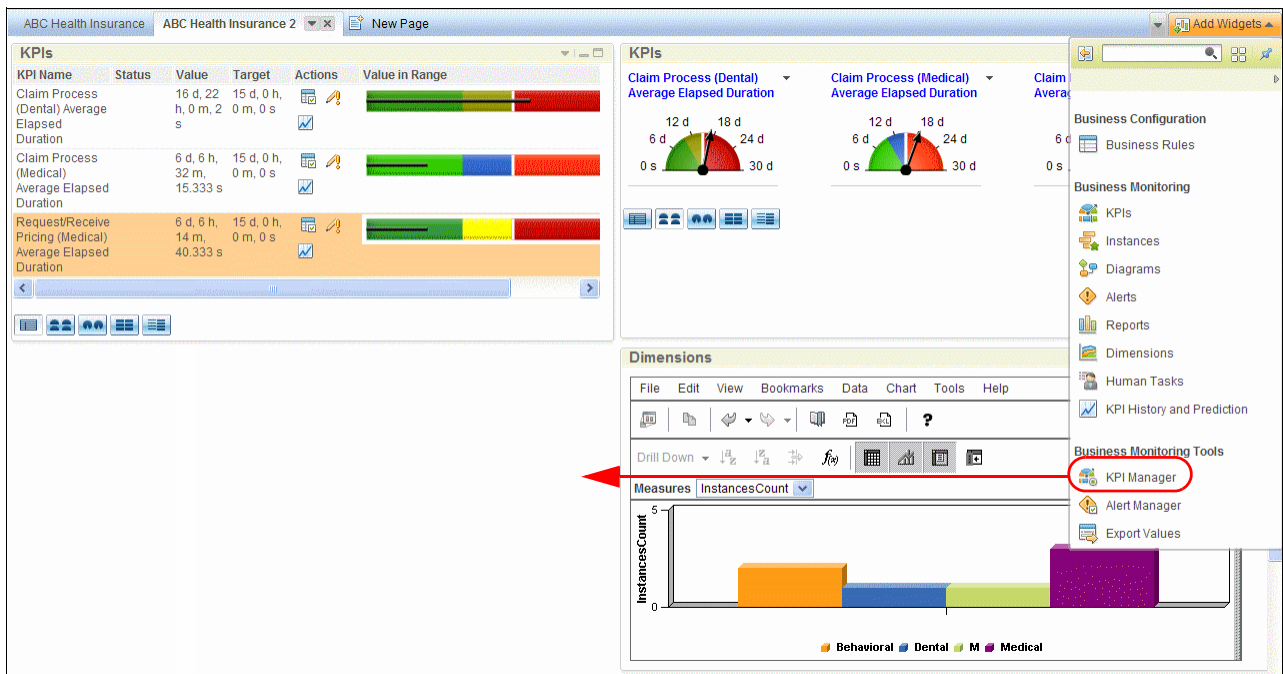


Figure 5-42 Configuring KPI at runtime-

- From the Model dropdown list, select your model name to expose its KPIs (Figure 5-43).

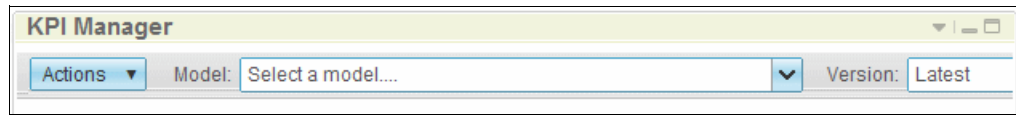


Figure 5-43 Select the model to add your KPI

- The window shows all the KPIs currently associated with your Health Care Insurance Co. ABC model. (Figure 5-44)

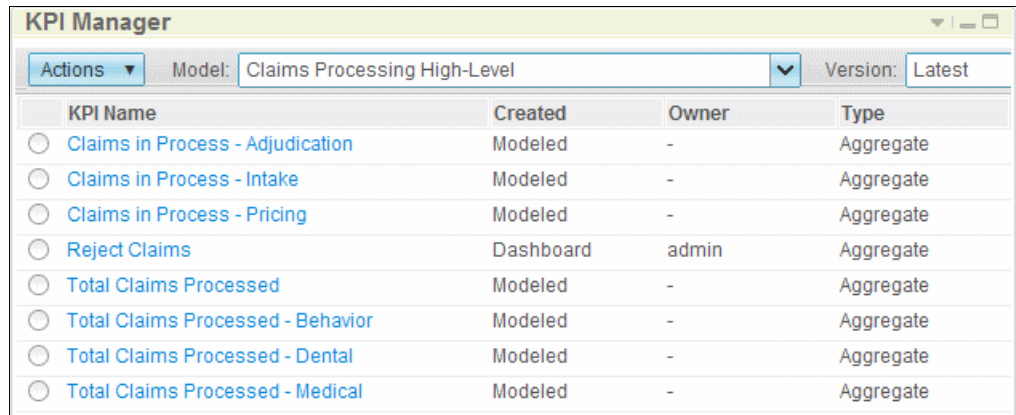


Figure 5-44 KPIs for a model listed

- Click **Action** to select the type of KPI you are going to add.
- Enter the KPI name and the process that contains the metrics that you want the KPI to be based on (Figure 5-45).

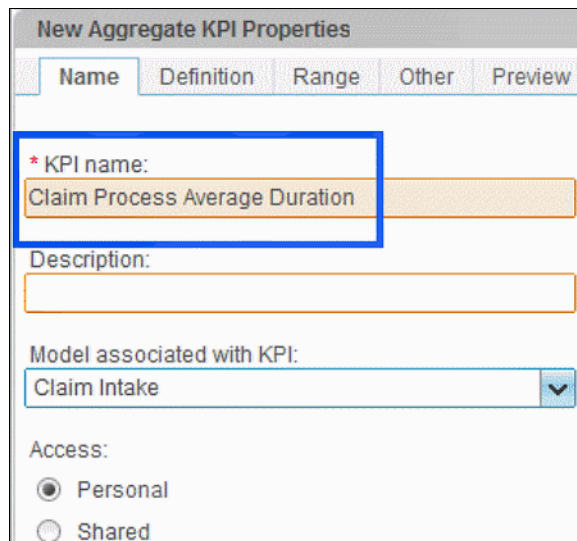


Figure 5-45 Adding a KPI at runtime

7. Click the **Definition** tab and enter the operator and the metrics for the KPI. (Figure 5-46)

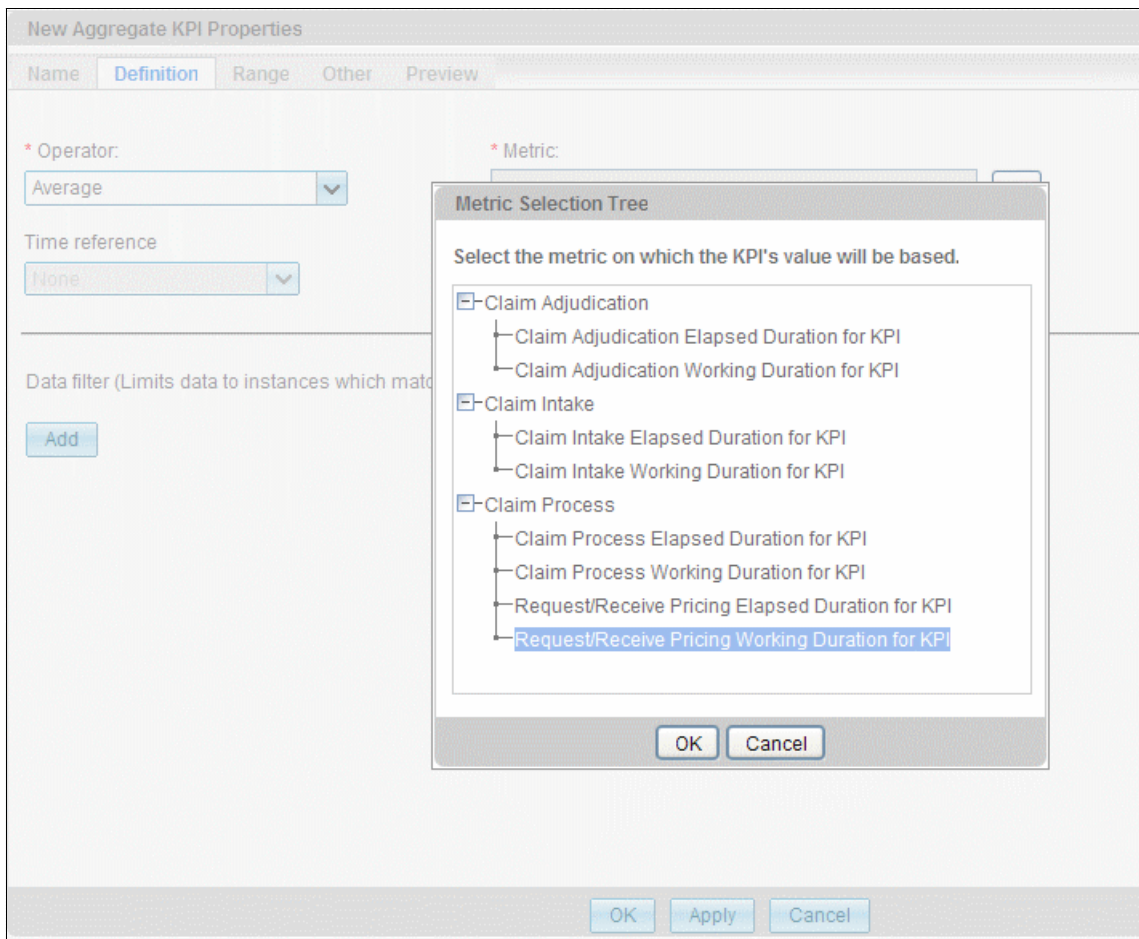


Figure 5-46 Definition of KPI

8. Select the **Range** tab to enter the target, range values and color properties for the duration KPI (Figure 5-47 on page 169).



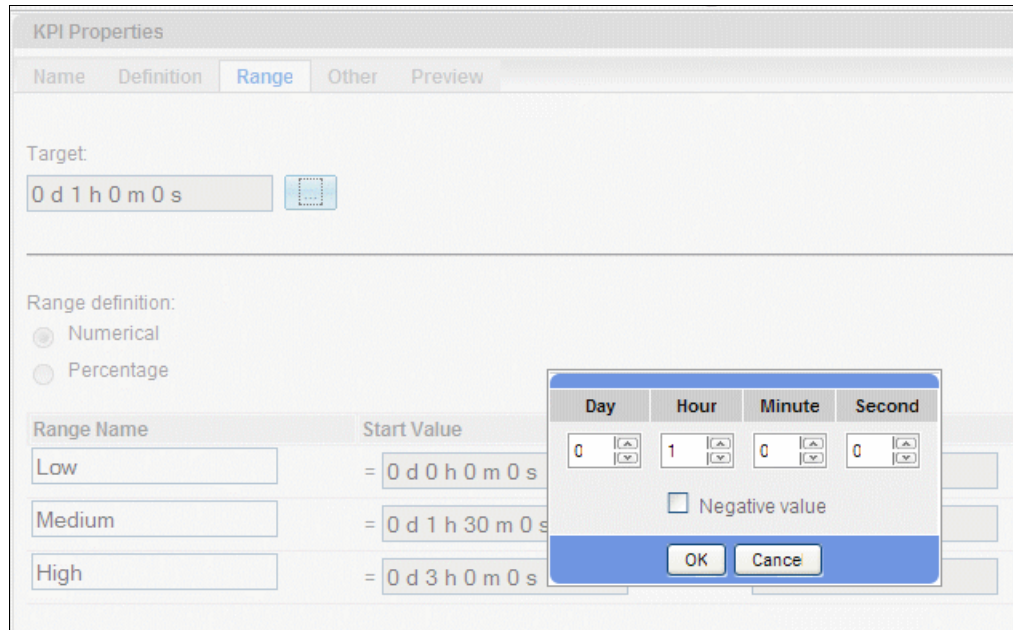


Figure 5-47 Adding KPI duration

9. Add the range definition values and color as shown in Figure 5-48.

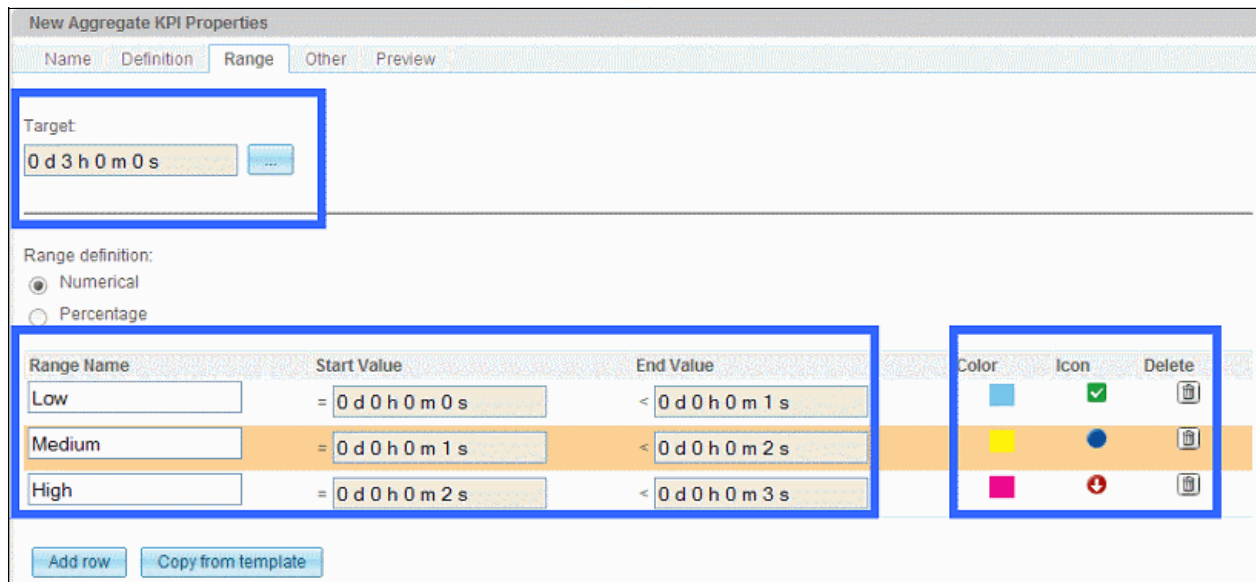


Figure 5-48 Adding KPI target, range values and colors for the Claim Processing model

After you have completed the previous steps, you will see the new KPI added in the **KPI Manager** panel for the Claim Intake process (Figure 5-49).

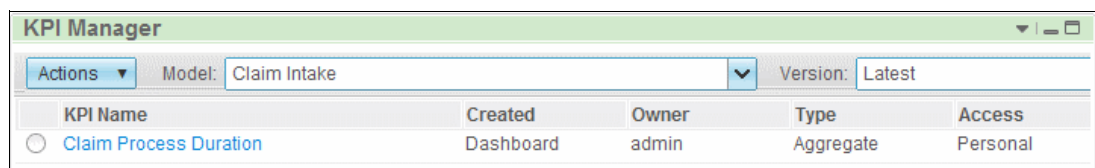


Figure 5-49 New KPI added at runtime for Health Care Insurance Co. ABC Claim Process

After adding the new KPI at runtime and incorporating it into the KPI widget of the monitoring business space for Health Care Insurance Co. ABC, you come up with something like Figure 5-50.

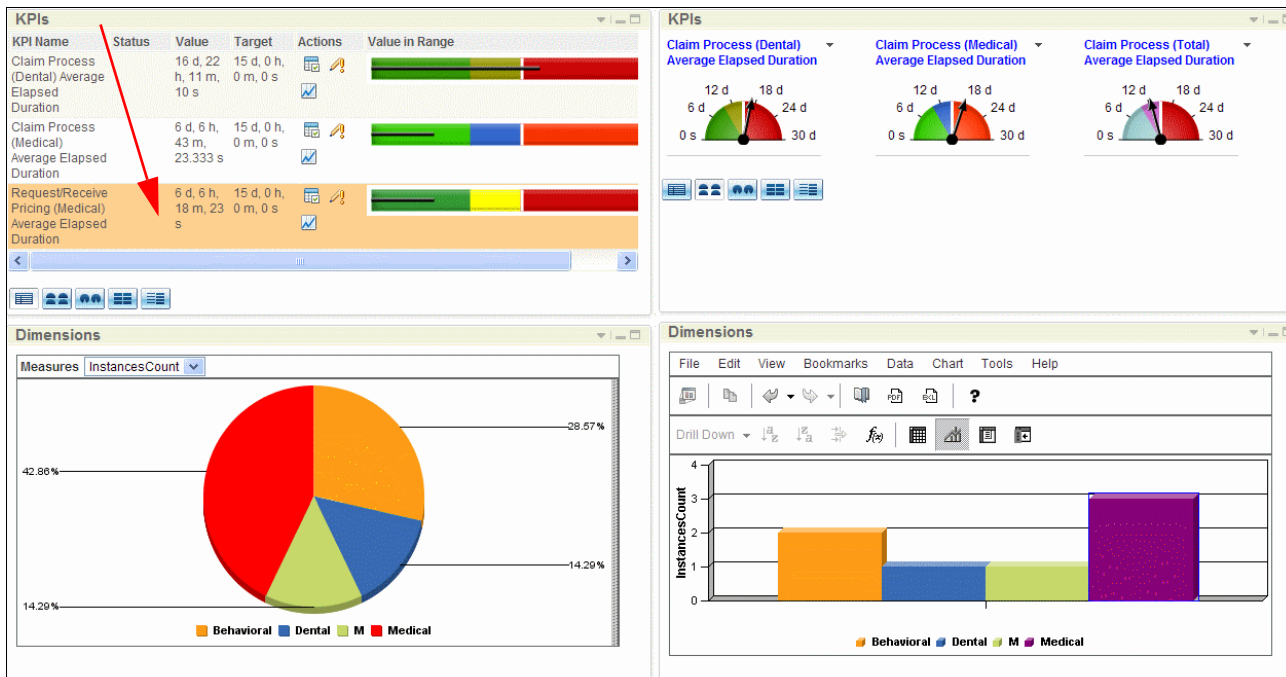


Figure 5-50 Business space with new KPI duration added at runtime

## KPI modifications in runtime versus manipulating in the business model

The question remains about when to make KPI adjustments in the runtime environment through the Business Space versus when to go back and make the changes in the original model, then re-deploy the model. The following section highlights some guidelines for when and where to best make these changes.

### When to use modeled KPIs versus dashboard KPIs

You can define KPIs either in the Monitor Model editor or on the WebSphere Business Monitor dashboards. If you model the KPIs in the Monitor Model editor, there are some restrictions on the changes you can make in the dashboards.

You create KPIs in the model for any of the following reasons:

- ▶ KPIs created in the model (modeled KPIs) represent the intent of the organization that authored the model. These KPIs can come from WebSphere Business Modeler and can carry the intent of the business owner. The KPIs that are created in the dashboards, although they can be used for the same purpose, can also be defined as needed for personal or temporary what-if analysis.
- ▶ Modeled KPIs are portable, making it simpler to deploy models with KPIs across environments.
- ▶ Modeled KPIs reduce the amount of configuration that is required after deploying a monitor model.
- ▶ The Monitor Model editor provides access to a KPI library of typically used KPIs, categorized according to the type of process to which they apply. Selecting a KPI from the library creates a KPI with that name in the monitor model. The KPI library is based on APQC's Process Classification Framework (PCF). APQC is a member-based nonprofit organization that provides benchmarking and best practices for approximately 500

organizations worldwide in all industries. PCF organizes operating and management processes into twelve enterprise-level categories and more than 1,500 processes and associated activities. PCF provides organizations with a shared language for communicating with each other.

KPIs that you model in the Monitor Model editor can be personalized in the dashboards but are restricted: The number of ranges and the IDs of those ranges cannot be changed because the trigger conditions of triggers in the model might refer to them. However, the ranges are still configurable at run time. The target and range values are treated as initial values so that they can be changed to reflect changes in business conditions.

A target cannot be set to null at run time, again because the trigger conditions of triggers in the model might refer to it.

### KPI alerts

There are situations where you might want to set an alert based on a KPI threshold for when there is claims processing backlog.

Within WebSphere Business Monitor, you can set dynamic alerts based on the KPIs you have configured for a process, such as the example shown for the Health Care Insurance Co. ABC claim process. You can have alerts sent to different recipients' e-mail, pagers, cell phones, or sent as a visual cue right on their dashboards. The PDA, pager, and cell phone options empower the users with the flexibility to monitor business processes and address situations without requiring direct access to a computer.

In the next section, we illustrate how to set up an alert report within the Business Space.

### Steps to set an alert on a KPI

To set alerts on a KPI, follow these steps:

1. Click **Alert Manager** in the KPI widget as shown in Figure 5-51.

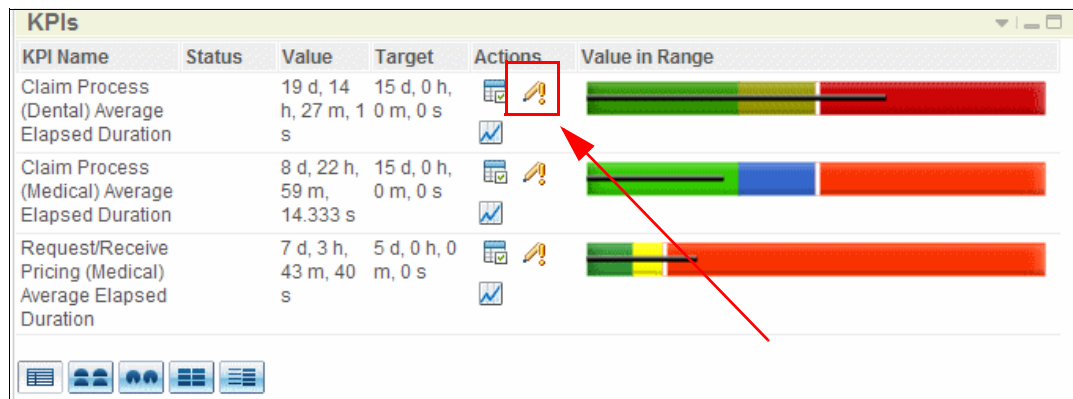


Figure 5-51 Alert Manager button to configure alerts

2. After clicking **Action**, the Alert configuration panel displays. (Figure 5-52) Click **New Alert**.

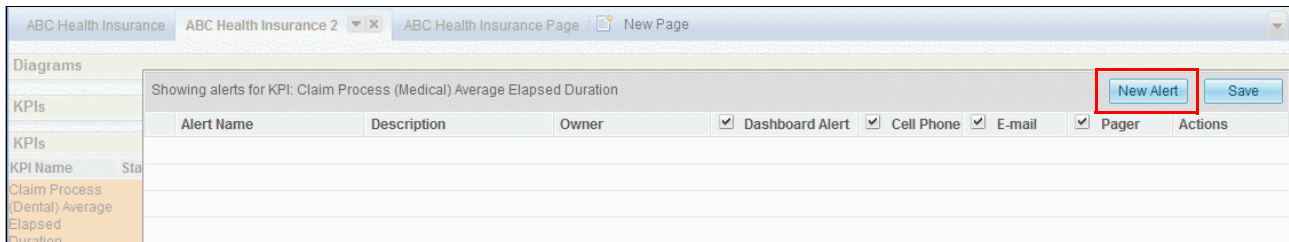


Figure 5-52 Adding KPI alert

3. Enter the condition for the alert to be sent and other properties. You can choose to define your own content or use the default template. See Figure 5-53.

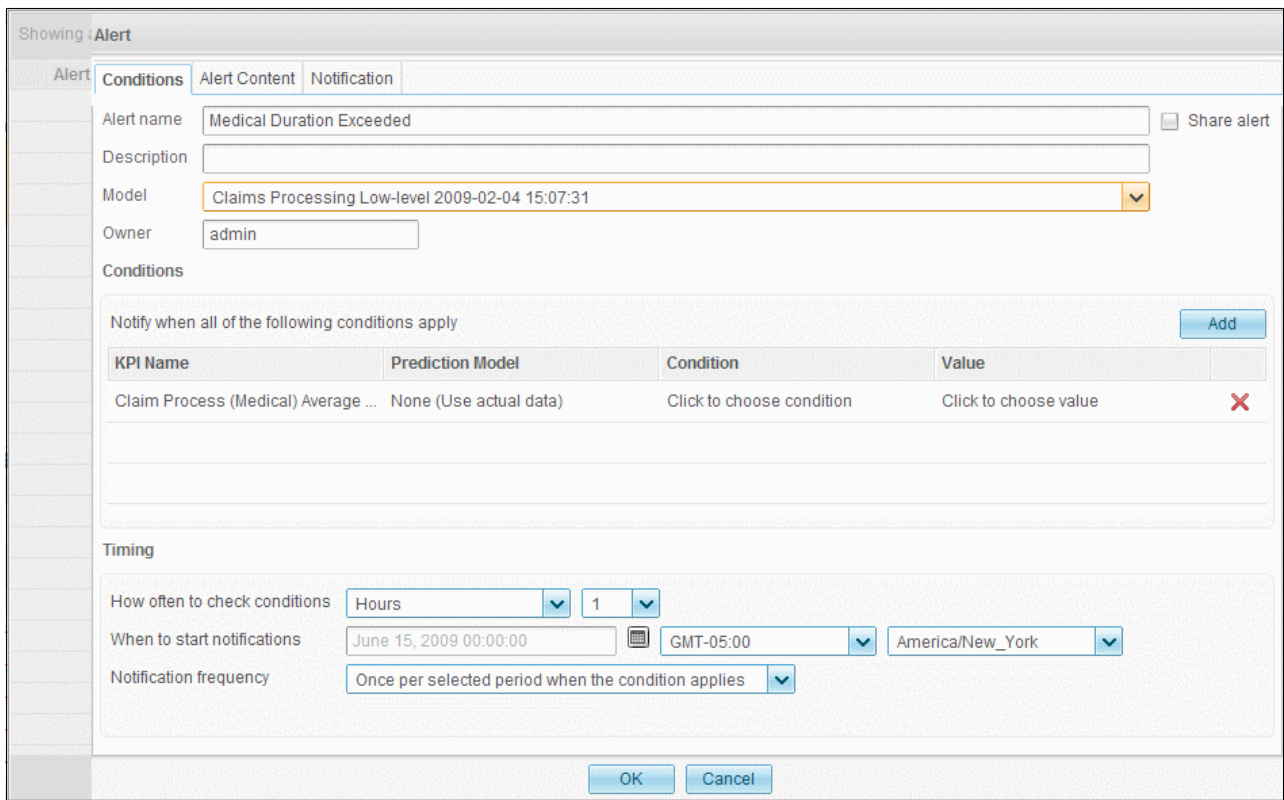


Figure 5-53 Add content for Alert

4. Select the recipient of the alert and the medium for delivery. In this scenario, we send the alert as a dashboard alert, to appear directly in the Business Space (Figure 5-54).

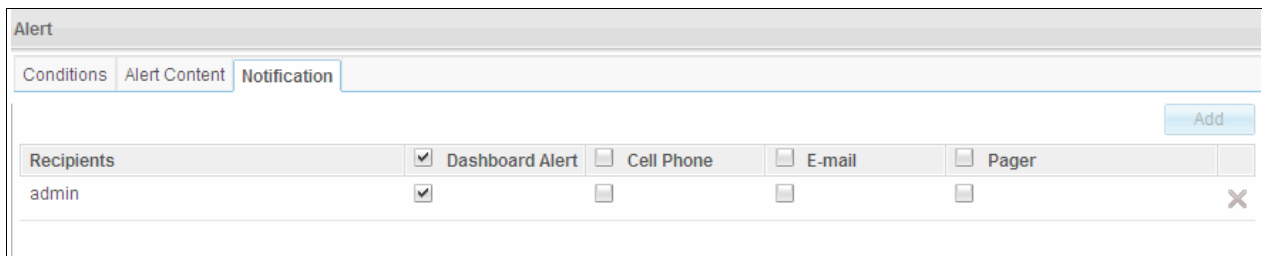


Figure 5-54 Define recipient and medium for alert

Upon completion, you get the confirmation that the alert was created (Figure 5-55).

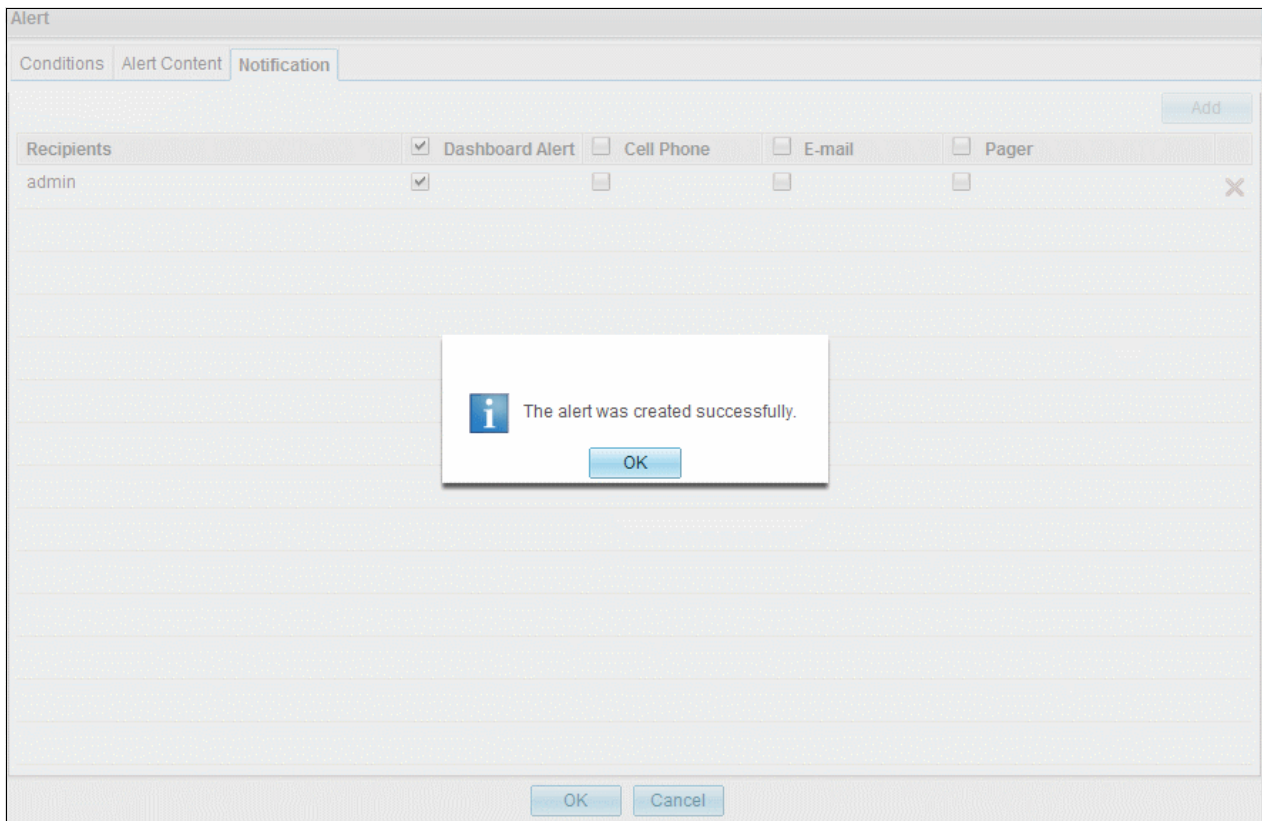


Figure 5-55 KPI Alert creation confirmation

5. Add an Alert widget view onto your business space, following the same procedure for adding a report, such as the KPI Reports in 5.6.2, “Setting up the KPI widget report” on page 151.
6. After the Alert widget is added, you will see the alert view showing your alert. This happens on the business space because we chose to receive dashboard (business space) alerts, and the condition for the alert has already happened because the KPI target has been exceeded. This is shown in Figure 5-56.

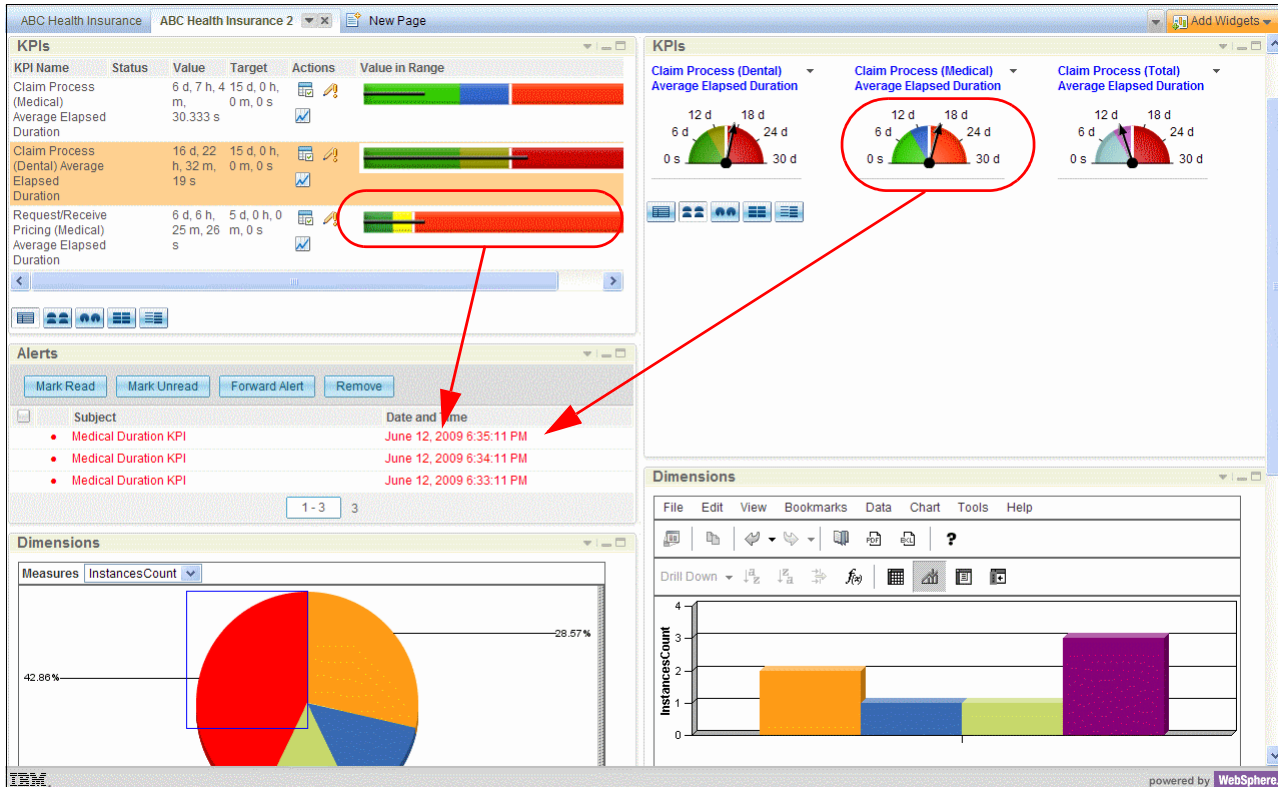


Figure 5-56 Alert view showing alert triggered by KPI target being exceeded condition. Click the alert to view the content

For each alert, the user can click the alert to see details about why the alert was triggered, as shown in Figure 5-57.

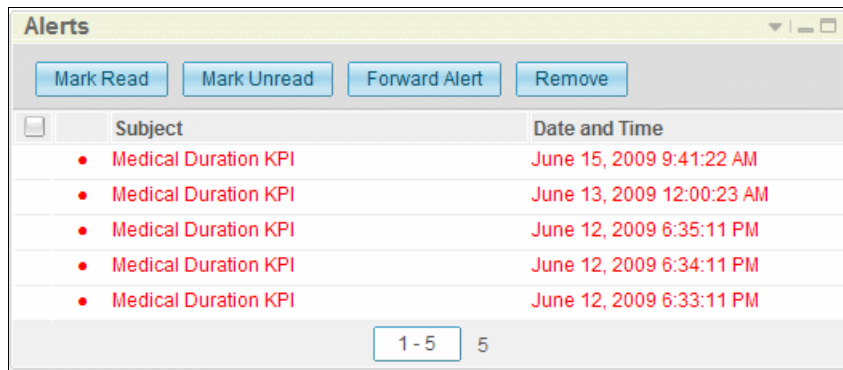


Figure 5-57 Click alert to view content

As shown in Figure 5-58, when you click an alert, the content of the alert displays the results of the duration, illustrating details of the situation that we have set up to notify us when the average duration for a human task in the Health Care Insurance Co. ABC claim processing has exceeded the target threshold.

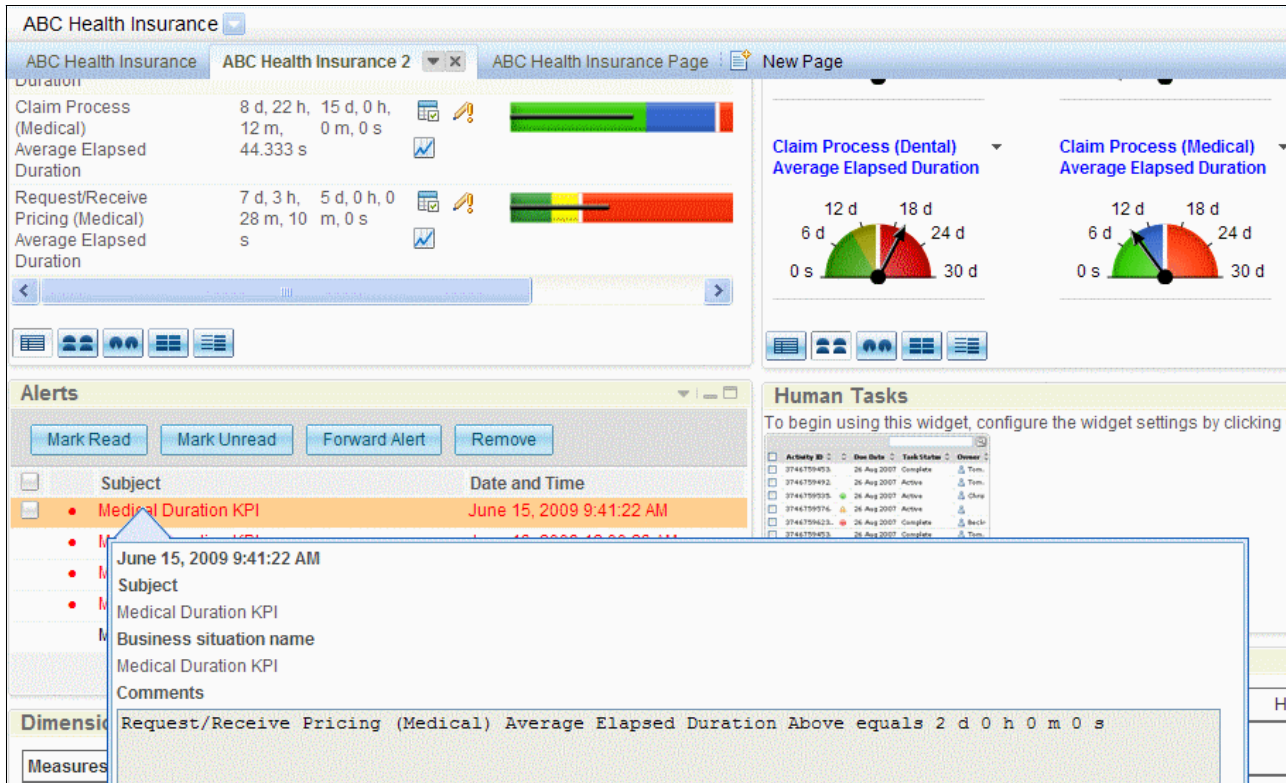


Figure 5-58 Alert content displayed

There are many more features of the WebSphere Business Monitor framework that can be used to optimize and manage the Health Care Insurance Co. ABC claim process activities workload. We have discussed the common way of using KPIs for monitoring, alerts triggering, and usage of business human task administration to spot and resolve bottlenecks, and streamline your day-to-day workflows.

**Note:** Refer to “Related publications” on page 251 for additional resources on using WebSphere Business Monitor to manage your business processes.

## 5.7 Optimize workload assignments

In the remaining sections of this chapter, we discuss how you can use the information from your analysis to both optimize workload assignments, and govern changes in monitoring and optimizing your business process.

**Key Point:** This is a key value add from WebSphere Business Monitor. You can have a better understanding of the data and efficiency of your process, so that your organization can act accordingly to improve it.

You monitor and optimize workload assignments to reach maximum efficiency in your process and to meet Service Level Agreements with the stakeholders and customers.

Figure 5-59 illustrates the focus of this section within the overall Manage phase.

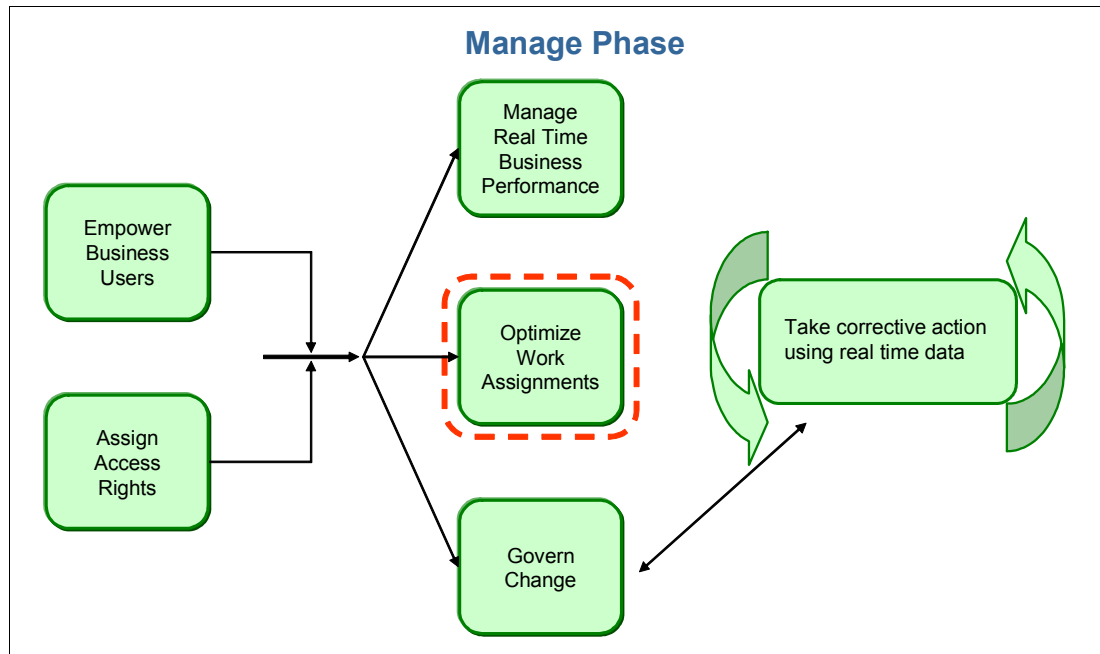


Figure 5-59 We are in Optimize Work Assignments section of chapter

### 5.7.1 Objective of optimizing workload assignments

Let us clarify what we mean by optimizing workload assignments as it pertains to the *IBM Prescriptive Guide for Business Process Management*. Optimizing workload assignments consists of the following tasks:

- ▶ An ongoing process of looking across the allocation of human tasks among organizational team members to shuffle work around and respond to changing business conditions.
- ▶ Insight into work allocation can be achieved through a combination of team-based task views and monitor visualizations that can optimization decisions.
- ▶ Efforts to optimize work can be performed by a business user playing a supervisory role or as part of a empowered peer organizational structure.

#### Optimizing workload within the context of Health Insurance Co. ABC

During the Storyboarding phase (See Chapter 3, “Storyboarding” on page 35), you performed initial simulations that provided insight into the benefits of improving the as-is business process. During the Experience phase (See Chapter 4, “Experience” on page 81), and the Manage phase, you analyze the KPI results to determine the bottlenecks within the human tasks and determine how to best re-allocate the work.

For optimizing workload, we focus primarily on monitoring the human task activities. We are working with the KPIs defined in Table 5-1 on page 150. To monitor all the human task activities for the Health Care Insurance Co. ABC claims process, you start by setting up a human task widget report on your new page of the Business Space.



### ***Adding the human task report widget***

Perform the following steps to add the human task widget:

1. In your new page, click the **Add Widgets** icon (Figure 5-60).

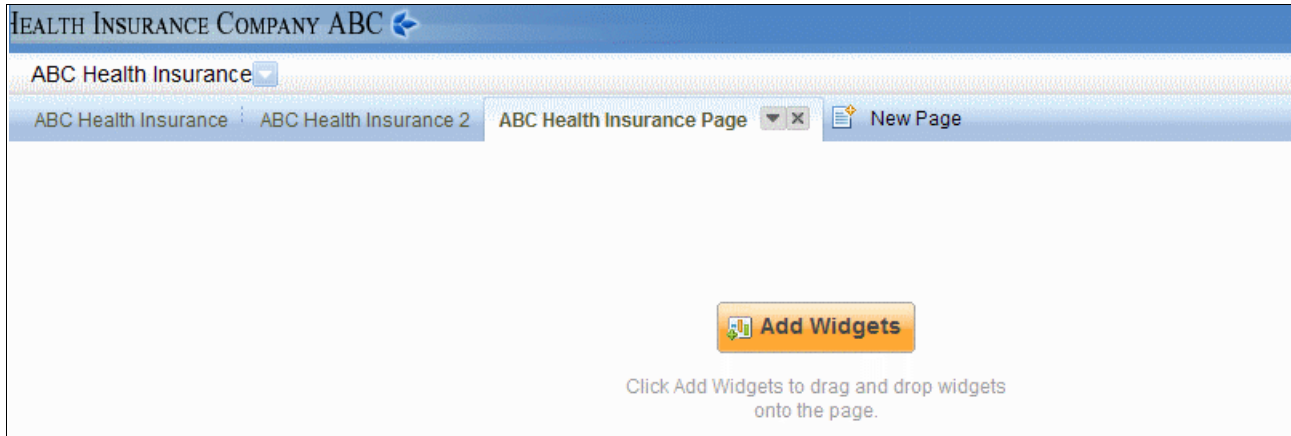


Figure 5-60 Adding a widget to the page

2. The widget icon will be positioned in the open space. Select the human task icon (Figure 5-61).

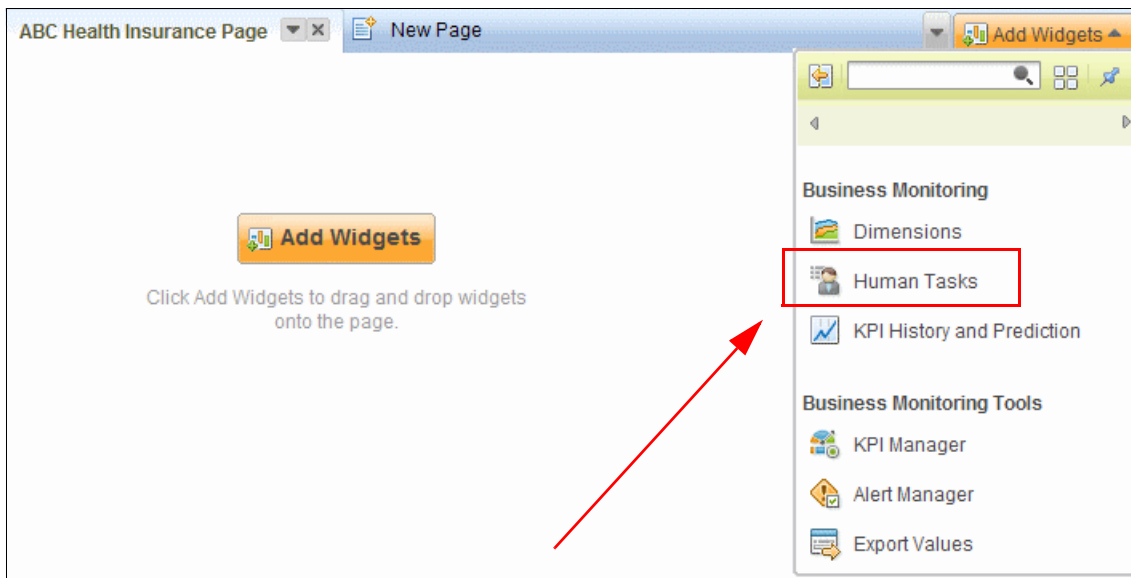


Figure 5-61 Human task widget added: To be configured

3. Click **Configure** on the top right corner as shown in Figure 5-62, to configure your human task report.

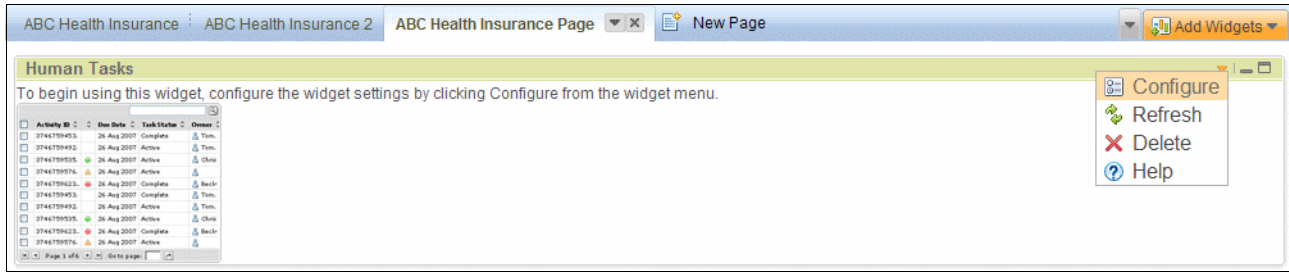


Figure 5-62 Click **Configure** button

4. The human task widget will display a window with all the variables available for you to select for your report. You can use the **Add All**, **Add One**, **Remove All**, **Remove One** and **Sort** fields. Click **OK** when done (Figure 5-63).

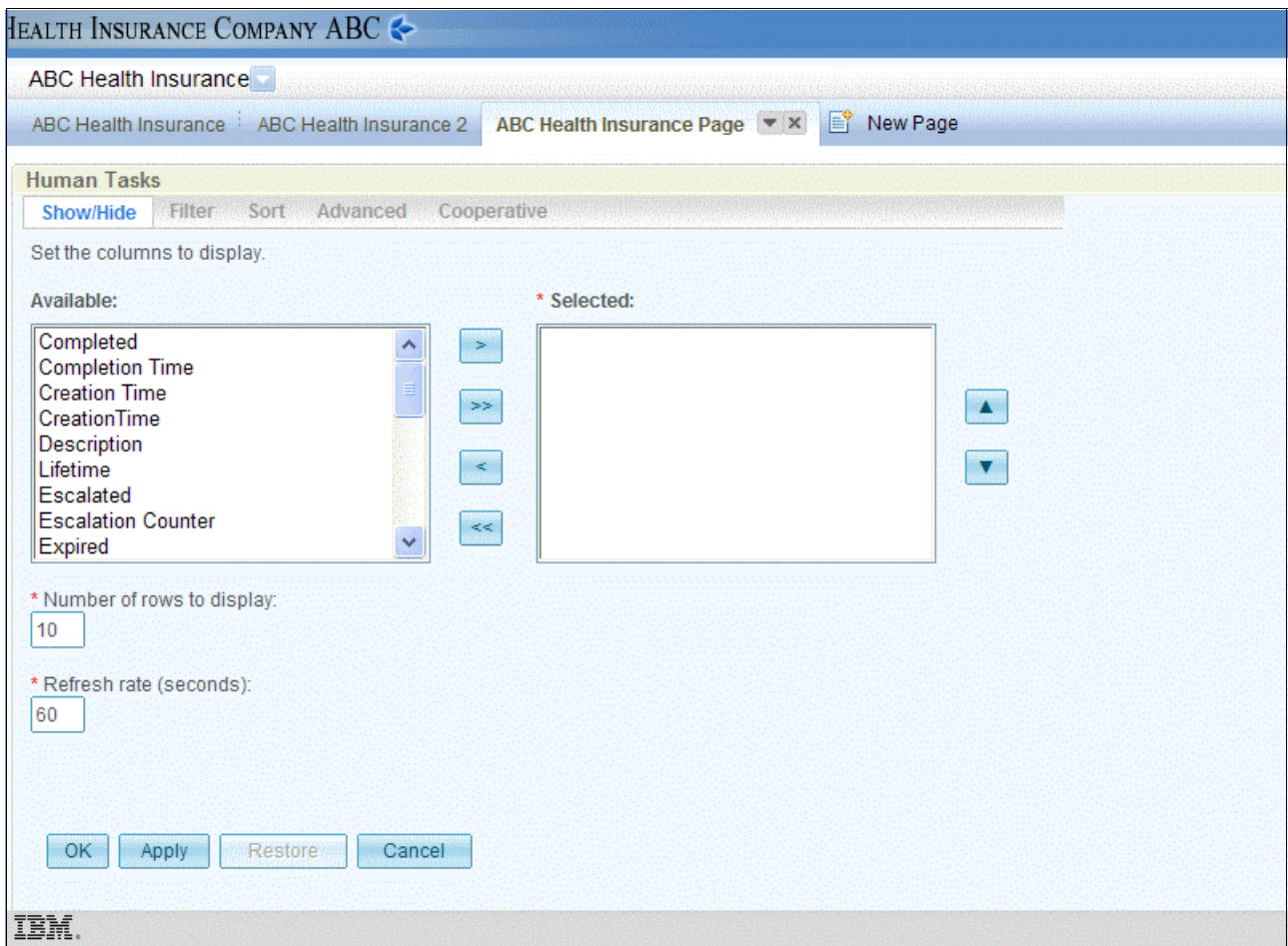


Figure 5-63 Select and add variables to your human task report

5. After configuring the human task widget, you should see an overview of the activities, similar to that shown in Figure 5-64 on page 179. Note that you have a clear indication of which tasks have been completed, and any which might still be in a pending state.

ABC Health Insurance								
ABC Health Insurance 2		ABC Health Insurance Page			New Page			
Human Tasks								
Actions								
Completed	Completion Time	Creation Time	CreationTime	Description	Lifetime	Escalated	Escalation Counter	Expired
★	April 17, 2009 5:57:14 PM	January 3, 2009 10:09:29 PM	January 3, 2009 10:09:29 PM		103 d, 19 h, 47 m, 45.392 s	false	0	false
★	May 22, 2009 6:16:26 AM	January 3, 2009 10:35:19 PM	January 3, 2009 10:35:19 PM		138 d, 7 h, 41 m, 7.053 s	false	0	false
★	May 24, 2009 10:07:28 PM	May 22, 2009 6:19:58 AM	May 22, 2009 6:19:58 AM	Select provider for claim #001	2 d, 15 h, 47 m, 30.141 s	false	0	false
★	May 24, 2009 11:17:58 PM	May 24, 2009 11:03:09 PM	May 24, 2009 11:03:09 PM	Select provider for claim #CP003	14 m, 49.844 s	false	0	false
★	May 25, 2009 12:00:49 AM	May 24, 2009 11:20:00 PM	May 24, 2009 11:20:00 PM	Request pricing for claim # CP003	40 m, 49.422 s	false	1	false
		May 26, 2009 8:06:25 PM	May 26, 2009 8:06:25 PM	Select provider for claim #CP006	16 d, 22 h, 47 m, 37 s	false	0	false
★	June 12, 2009 1:11:55 PM	June 12, 2009 1:07:47 PM	June 12, 2009 1:07:47 PM	Select provider for claim #CP020	4 m, 7.328 s	false	0	false
★	June 12, 2009 1:19:22 PM	June 12, 2009 1:13:56 PM	June 12, 2009 1:13:56 PM	Request pricing for claim # CP020	5 m, 26.094 s	false	1	false

Figure 5-64 Human Task activities at a glance: all instances

**Note:** This is where you look to spot bottlenecks in the human task activities for the Health Care Insurance Co. ABC process. Any activity that is incomplete (has a status still of pending) and does not have an owner assigned should be verified and that it is in pending state for a valid reason.

As shown in Figure 5-65, the final task is not yet completed, nor does it have an assigned owner.

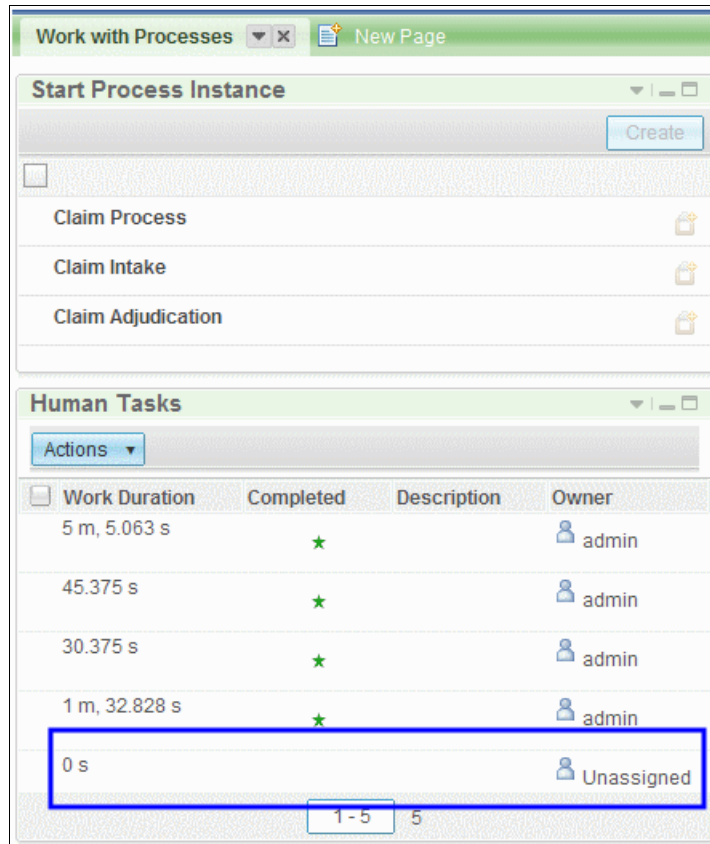


Figure 5-65 Unassigned human tasks should have a valid reason

6. From this list you can take action on the task yourself by claiming it and working on it, or you can choose to transfer it to someone else (Figure 5-66).

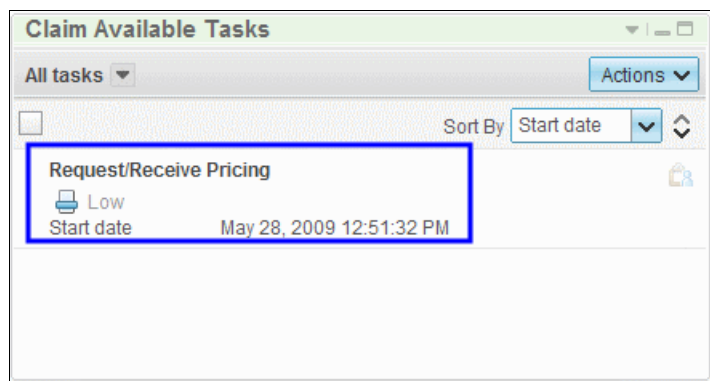


Figure 5-66 Claim a task to work on it

7. Figure 5-67 illustrates the other actions you can perform on a specific task:

- Assign the task to a User ID
- Claim the task,
- Release the task,
- Transfer the task

Additionally, you can change the status to Active, Complete, or On Hold.

Start Time	Creation Time	CreationTime	Description	Lifetime	Escalated	Escalation Counter	Expired
09	January 3, 2009 10:09:29 PM	January 3, 2009 10:09:29 PM		103 d, 19 h, 47 m, 45.392 s	false	0	false
09 6:16:26	January 3, 2009 10:35:19 PM	January 3, 2009 10:35:19 PM		138 d, 7 h, 41 m, 7.053 s	false	0	false
09	May 22, 2009 6:19:58 AM	May 22, 2009 6:19:58 AM	Select provider for claim #001	2 d, 15 h, 47 m, 30.141 s	false	0	false
★	May 24, 2009 11:17:58 PM	May 24, 2009 11:03:09 PM	Select provider for claim #CP003	14 m, 49.844 s	false	0	false
★	May 25, 2009 12:00:49 AM	May 24, 2009 11:20:00 PM	Request pricing for claim # CP003	40 m, 49.422 s	false	1	false
	May 26, 2009 8:06:25 PM	May 26, 2009 8:06:25 PM	Select provider for claim #CP006	16 d, 22 h, 49 m, 41 s	false	0	false
★	June 12, 2009 1:11:55 PM	June 12, 2009 1:07:47 PM	Select provider for claim #CP020	4 m, 7.328 s	false	0	false
★	June 12, 2009 1:19:22 PM	June 12, 2009 1:13:56 PM	Request pricing for claim # CP020	5 m, 26.094 s	false	1	false

Figure 5-67 Available actions for administering human tasks

8. After a task is claimed it will move to the next state.

**Note:** In working with a business model processes, a flow diagram can be helpful to visually help tell you where you are in the process and which activity is in a pending state for you to monitor.

- To add a flow diagram, follow the procedure mentioned in earlier steps to add a widget onto a page view. In this case, you are adding a Diagram widget depicting the Health Care Insurance Co. ABC claims processing flow. When set up, you will see the flow diagram (Figure 5-68).

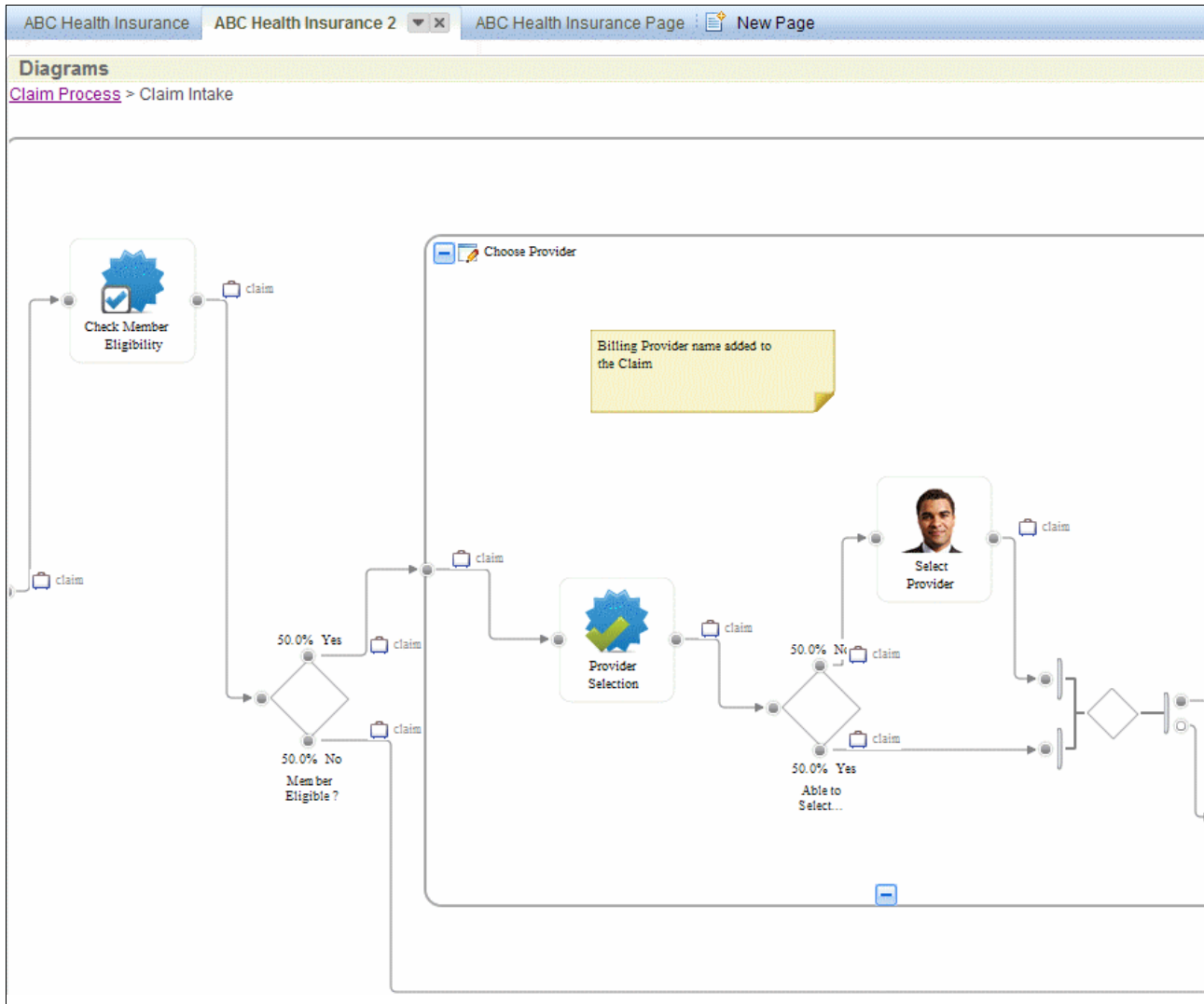


Figure 5-68 Flow diagram for Health Care Insurance Co. ABC claim process

- From within the flow diagram, you can further drill down on a process activity (Figure 5-69 on page 183). If there is a sub-process diagram, you can see what state an activity is in under the main process.

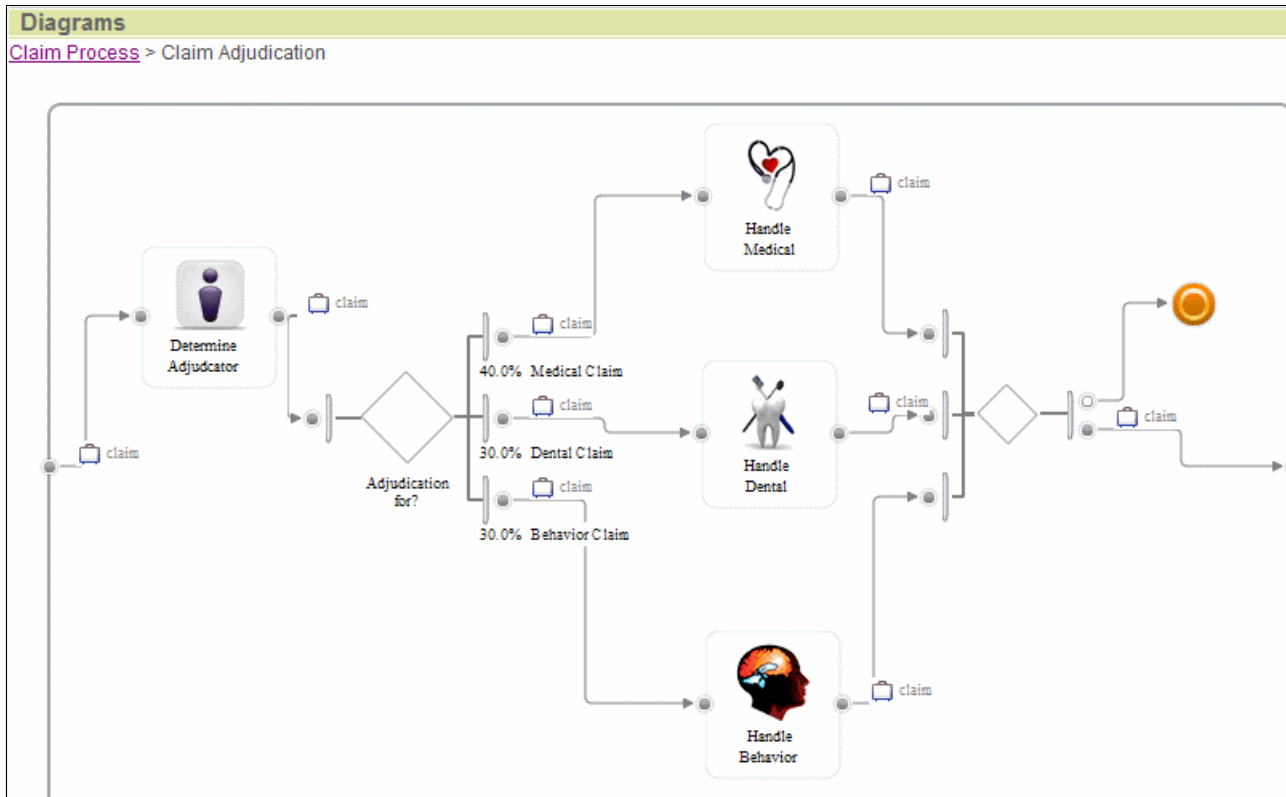


Figure 5-69 Drilling down on subprocess

In conclusion, optimizing workload is based on inspecting the queues and monitoring the counts of the tasks being backed up and remaining in a pending state. You can decide when and what to reassign or how best and to whom to redistribute the workload. The unassigned tasks and the pending state tasks are what you want to pay attention to.

## 5.8 Govern changes

As you manage your business process using the data, the analytical tools, and the KPI adjustment capabilities from WebSphere Business Monitor, you will eventually need to manage change in the business process. While change is inevitable going forward, your ability to manage and control the change in an organized way will be critical to success.

Change might be the result of the following circumstances:

- ▶ Improvements which your organization implements to become more efficient
- ▶ Changes required to adapt to varying market and competitive conditions.

As you adapt and make changes to the process, you need to maintain traceability for changes in the process. According *IBM Prescriptive Guide for Business Process Management*, the key factors for governing change are as follows:

- ▶ Artifacts should be stored and managed in a common repository in order preserve traceability across tools and changes being made.
- ▶ Key stakeholders should be identified and a review process put in place to govern change.

Figure 5-70 illustrates the focus on governing change within the greater context of the Manage phase.

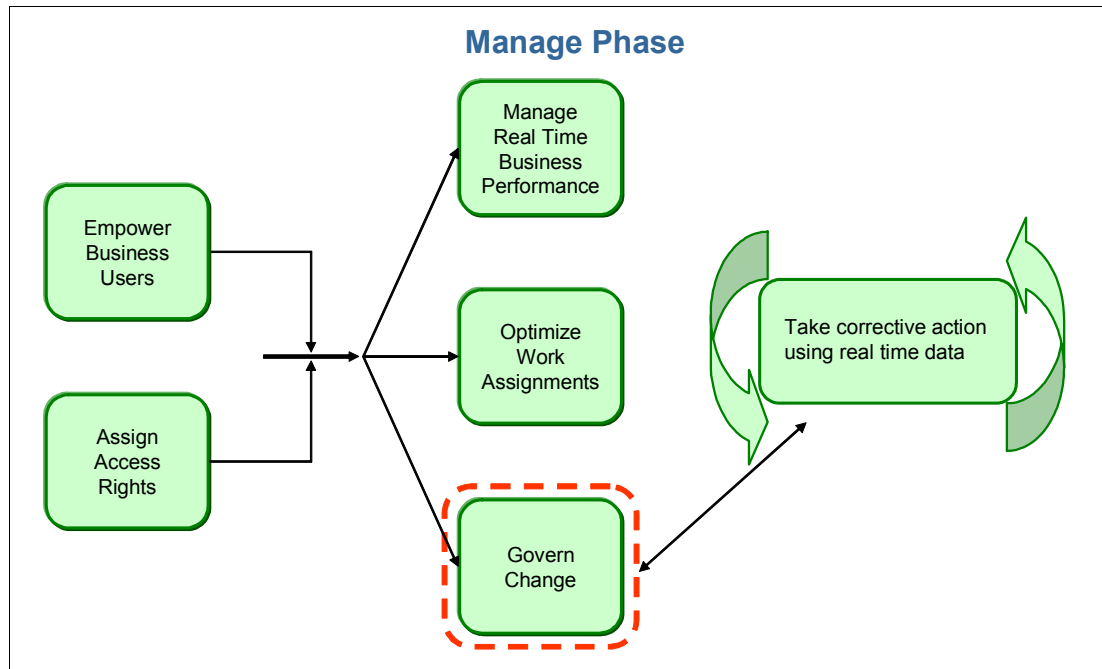


Figure 5-70 Representation of the steps in the manage phase

### 5.8.1 Governing change within the context of Health Insurance ABC. Co.

You have implemented your first stage of monitoring capabilities. The KPIs you have defined will need periodic refinements as the dynamics of your line of business change.

- ▶ The exporting functionality of Monitor business space can be used to unload the real measurements acquired during the course of your monitoring periods. This data can be fed back into the front-end modeling process for re-simulation.
- ▶ This continuous cycle can help hardening your optimization of the Health Care Insurance Co. ABC process.
- ▶ This data can also be warehoused for future business intelligence purposes. Going forward, you can conduct, periodic, regular analyses of running process results to institute additional measures or even more monitor models to the greater enterprise.

#### Exporting monitoring data

You can export monitoring data to capture a specific point in time for the process, then archive this information to use it for future reference or comparison.

To export monitoring data to an XML file that can be used in WebSphere Business Modeler, use the Export Values page widget. Add the widget to an empty space on the Business Space page as has been described in earlier sections of this chapter.



To export monitoring data to an XML file, perform the following steps:

1. Select the model you want to export.
2. Choose either **All versions of the selected model** or **Only the selected model**. (See Figure 5-71)
  - a. (Optional) To view the data, click **Preview Data**.
3. To export the XML file, click **Export**.

**Export Values**

Select a model:  
Claim Process 2009-05-28 11:37:39

Export data from:  
 All versions of the selected model  
 Only the selected model

Time range (filters the data to export by the time range you specify):  
 None  
 Specify time range

Preview Data

Name	Value
InstancesCount	6
InstancesCount	3
InstancesCount	4

Export

Figure 5-71 Export Values widget of Monitor business space

## 5.9 Chapter summary

In this chapter, we have first defined what is covered in the *Manage* Phase and discussed the value provided by giving you the ability to monitor and adjust your KPIs, set alerts, and manage real time business performance.

**Key value point:** During the *Manage* phase, you pro-actively empower users to *monitor* and *manage* real time business performance using KPIs and alerts based on changing business conditions. You can then take corrective actions against process instances where the process is not executing as efficiently as needed.

This chapter provides specific examples on how to configure the Business Space specific to your monitoring needs, using the context and business process from Health Care Insurance Co. ABC for specific examples.

Note that business processes will not remain static, but will need to continually be adjusted and improved to continuously adapt to market conditions. Accordingly, this will be an iterative process of analyzing the data, then taking corrective action using real-time data.

Figure 5-72 shows all of the tasks involved in the Manage phase, with the ultimate goal to be taking corrective action based on the actual data from process execution.

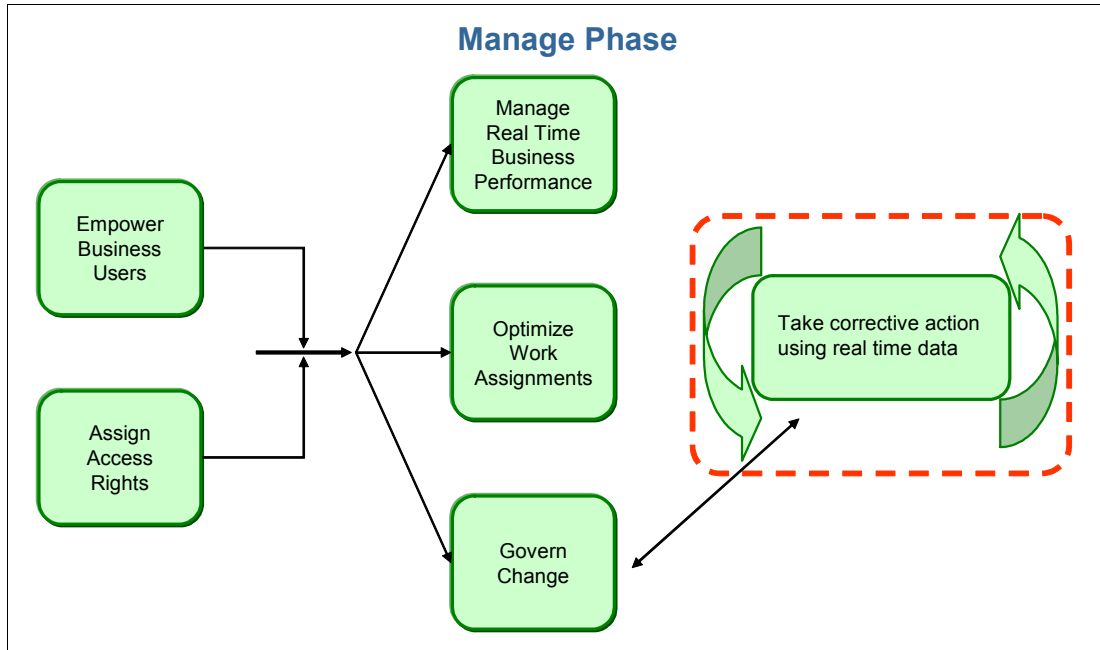


Figure 5-72 Representation of the steps in the manage phase

For further details on the manage aspect of BPM refer to the references listed in “Related publications” on page 251.



## Deployment

The previous chapters in this IBM Redpaper publication focused on the business phases of business process management (BPM), targeting a fundamental re-thinking of companies' processes to achieve both efficiency and most effectively realize their business goals. The work in the earlier phases, namely, Discovery, Storyboarding, Experience and Manage, allows the business leaders and business analysts to review, re-engineer, and streamline their business goals within BPM. Their focus is as follows:

- ▶ Concentrate on the processes that really matter to the organization's business goals.
- ▶ Be customer oriented, by putting both external customers and internal peers into the center of all change considerations.
- ▶ Re-examine and possibly change the old way of working.
- ▶ Change existing structures to match the new processes.

With this chapter, we focus on working with the IT team to implement the BPM solution. To make BPM a success, it is fundamental and highly important to involve IT. The full strength of BPM is only realized if and when the documented and simulated model finally is also executed, monitored, and then delivers real data to be improved. A BPM approach must use all possible and efficient information technologies to ensure a successful implementation of the new core business processes.

This leads to the fifth point of the BPM prescriptive guide approach, *Deployment*. Deployment requires IT to offer all possibilities to make the business processes executable and automatized across the company.

We begin with discussing an approach to thinking about Deployment, namely what needs to be done where and by whom. We begin with the foundation of service-oriented architecture (SOA) and how this fits with BPM. We then proceed to outline the specific deployment steps necessary to arrive at a complete solution in a production environment.

## 6.1 Objectives of the steps of the deployment phase

The objective of the Deployment phase is to put the solution into production. More specifically, it focuses on the following tasks:

- ▶ Design BPM solution architecture
- ▶ Set up IT environments
- ▶ Prepare and deploy production artifacts
- ▶ Unit test solution
- ▶ Monitor health of your solution to ensure process integrity

IT focuses on Deployment. The objective of Deployment is to transform the outcome of the Interactive Process Design (IPD) into a production ready executable application. Concretely, this means that a responsible IT team will have the following responsibilities:

- ▶ A capability to assemble and deploy business processes. This relates to the transformation, packaging, distribution, and installation of the models created during the modeling activity in the Discovery, Storyboarding, Experience and Manage phases. The transformation involves applying a model-driven architecture (MDA) approach to transform platform-independent models to technology-specific implementations. The packaging and distribution is driven by the logical system topology for the running of the models.
- ▶ An infrastructure to be used to run a process and provide possibilities to monitor the processes.

Business processes are accompanying the whole development of a product and going horizontally through the company. They easily spawn different IT systems from different departments using different protocols. Nobody can afford a “Big Bang” approach. It is important to rely on existing IT systems and departments. This presents an IT department with a huge amount of technical integration challenges, as shown on Figure 6-1.

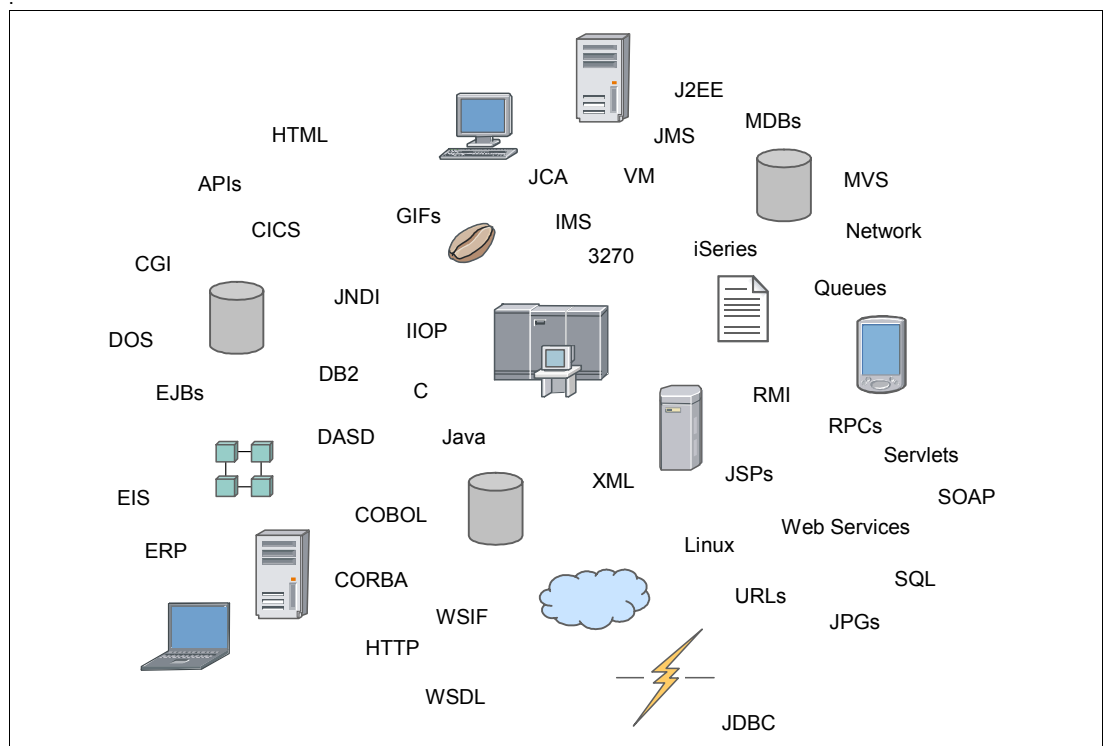


Figure 6-1 Common integration challenges

It is not recommended to integrate all possible protocols from scratch. Rather, we recommend using a strong integration tooling and infrastructure such as WebSphere Integration Developer.

We selected the following approach during the Deployment chapter. It is oriented on the approach of the *IBM Business Process Management Prescriptive Guide to Solution Implementation*. Figure 6-2 illustrates these tasks from a visual model perspective.

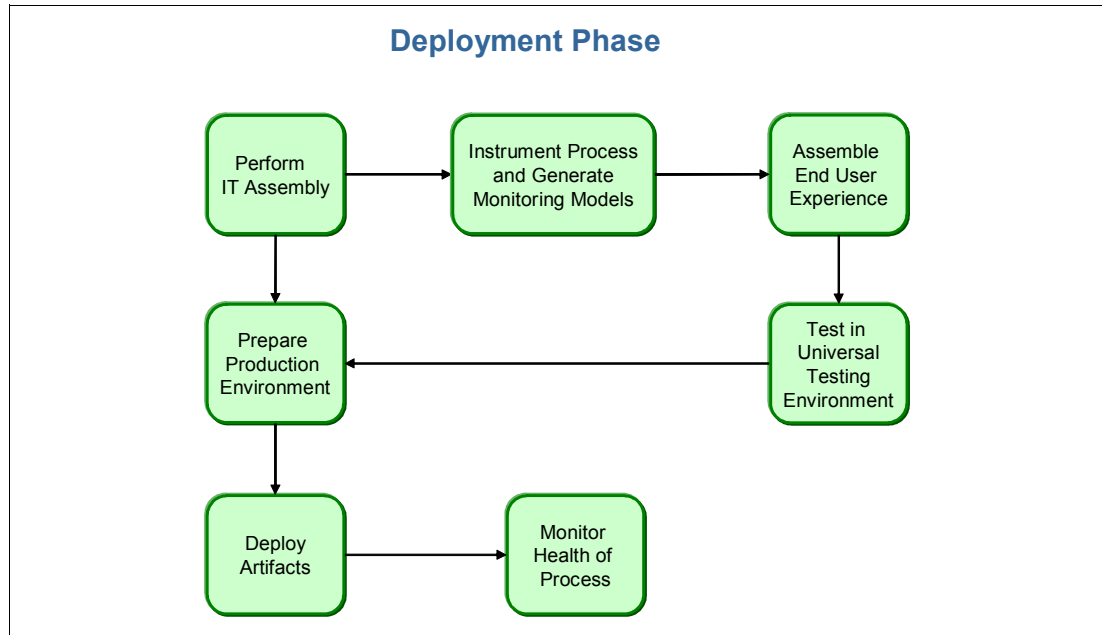


Figure 6-2 Visualization of the steps performed in the Deployment phase

The steps outlined within this chapter are as follows:

- ▶ Perform IT assembly
- ▶ Instrument process for monitoring and generate monitoring models
- ▶ Assemble user experience
- ▶ Test in universal test environment
- ▶ Prepare production environment
- ▶ Deploy artifacts
- ▶ Monitor health of processes

Throughout this chapter, we use WebSphere Integration Developer to assemble the solution. In addition to steps above, we recommend spending time on choosing your reference architecture and creating your target architecture. A well-chosen approach for an integration architecture is crucial for BPM to be deployable in all its strength. This paper, however, does not cover architecture topics.

**Note:** More details on WebSphere Integration Developer, can be obtained in the IBM BPM Information Center, at the following Web page:

[http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp?topic=/com.ibm.websphere.wps.620.doc/welcome\\_wps\\_dev.html](http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp?topic=/com.ibm.websphere.wps.620.doc/welcome_wps_dev.html)

## 6.2 Perform IT assembly

Figure 6-3 illustrates the current focus of this section within the context of the overall Deployment phase.

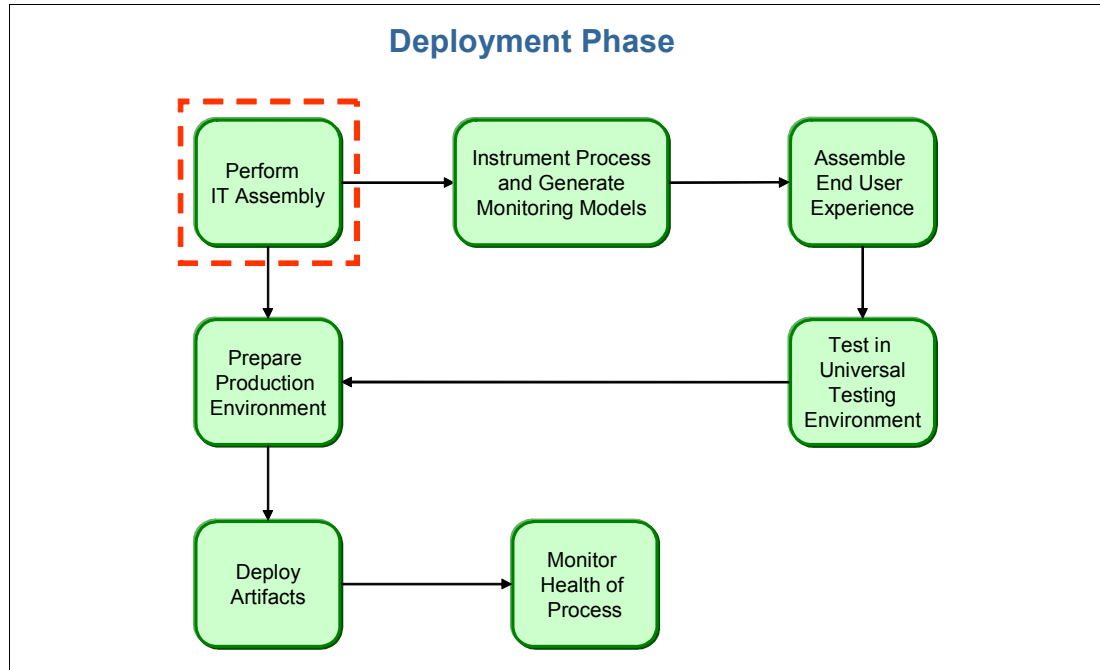


Figure 6-3 Perform IT assembly

### 6.2.1 Prepare export

To use the maximum generation capabilities of WebSphere Business Modeler, the following steps must be performed on every automatic Web service invocation. If the steps are not performed, adaptations to namespace and porttype might be necessary in further steps. Figure 6-4 illustrates defining the interface for the WSDL in preparation for the export by defining the namespace and porttype information.

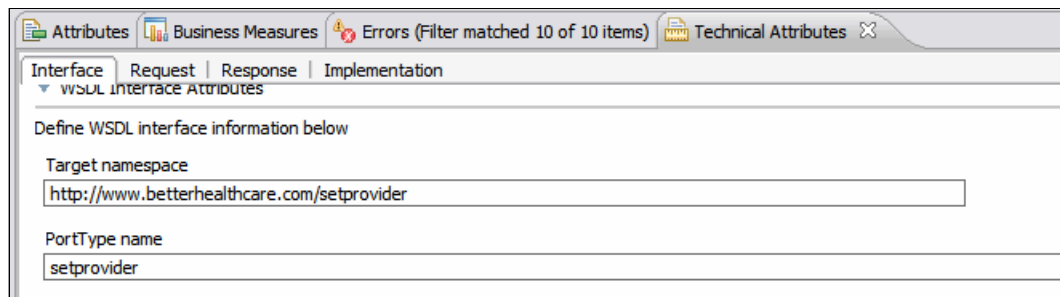


Figure 6-4 Add namespace and porttype information

Figure 6-5 on page 191 illustrates adding the component type and selecting the binding type.

Interface | Request | Response | Implementation

Component display name  
Set Provider

Component name  
SetProvider

Component description

Implementation type  
Import - Web Service binding

Figure 6-5 Add component information and select binding type

**Note:** Currently, only the “Web Service binding” implementation type is supported.

## 6.2.2 Exporting WebSphere Business Modeler artifacts

The next steps perform an export of artifacts from WebSphere Business Modeler. A Project Interchange, also known as PI, is an archive file that can be easily exchanged between WebSphere Integration Developer environments. A PI can also be used as input for manual commandline build named “ServiceDeploy”.

1. Click **File** → **Export** (Figure 6-6). A dialog box will display.

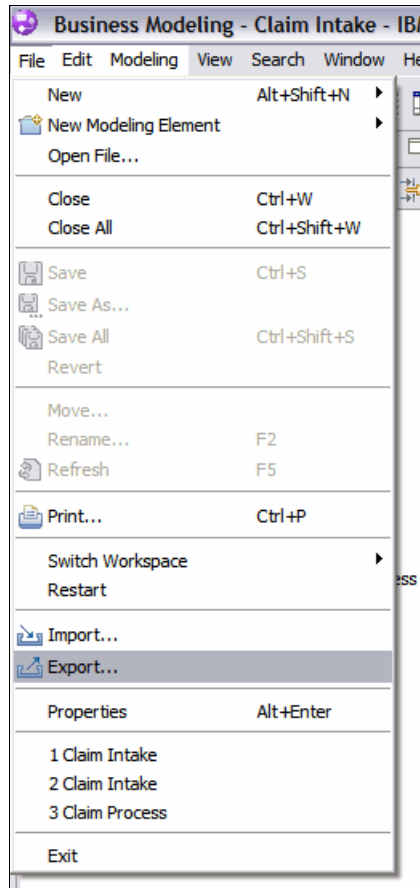


Figure 6-6 Select Export from the Menu



2. Select “WebSphere Integration Developer” as the format or product to which you want to export. This is depicted in Figure 6-7.

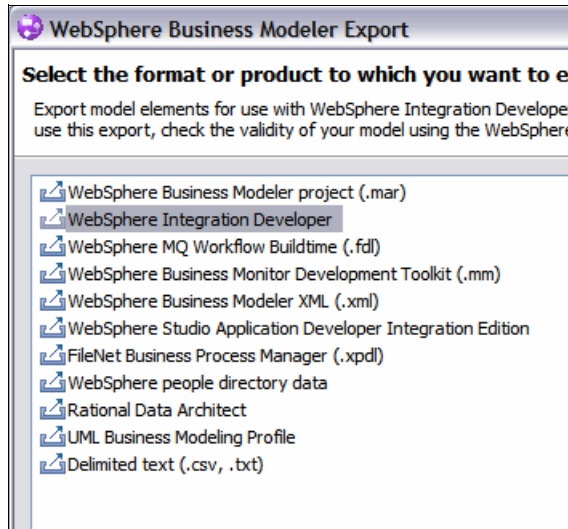


Figure 6-7 WebSphere Integration Developer as Export format

3. Type a directory to which to export (Figure 6-8). Click **Next** to continue.
4. Select the “Export entire project and related projects” radio button (Figure 6-8). Click **Next** to continue.

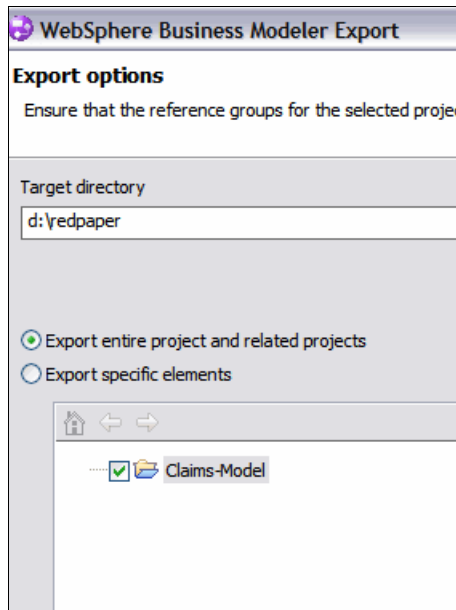


Figure 6-8 Type directory

**WebSphere Business Modeler Export**

**WebSphere Integration Developer export details**

Specify export details, then click Finish to export. Use the recommended export option for interoperability between Websphere Business Modeler and WebSphere Integration Developer.

Select the export option

Recommended Export Option ▼

This option creates three related projects. It separates the business logic from the implementation details. Choose this option for best interoperability when you are working iteratively between WebSphere Business Modeler and WebSphere Integration Developer.

Export using the standard project interchange format for other environments

Project Interchange Name

Claims-Model

Append timestamp to project interchange name

Target Project Names

Modeler Project Name	Business Logic Module Name	Implementation Module Name	Library Name
Claims-Model	Claims-Model	Claims-Model_impl	Claims-Model_lib

Figure 6-9 WebSphere Integration Developer export details

5. Leave defaults and click **Next** to continue (Figure 6-10).
6. Select the **Export business measures as a monitor model or models** check box (Figure 6-10). Click **Next** to continue, as shown in Figure 6-11 on page 195.

**WebSphere Business Modeler Export**

**WebSphere Integration Developer business measures export**

To export your business measures as a monitor model, select the check box and specify the kind of export.

Export business measures as a monitor model or models

Export to a single monitor model, which combines the business measures with the events from WebSphere Integration Developer

Export to two monitor models, one containing the business measures and the other containing the events from WebSphere Integration Developer

Export Options

Export using the standard project interchange format for other environments

Project Interchange Name

Claims-Model\_Monitor

Append timestamp to project interchange name

Target Project Names

Modeler Project Name	Monitor Project Names
Claims-Model	Claims-Model_Monitor

Figure 6-10 WebSphere Integration Developer business measures export

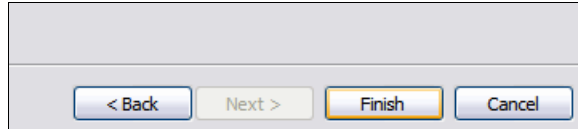


Figure 6-11 Click Finish to end export

Figure 6-12 shows the exported PI files.

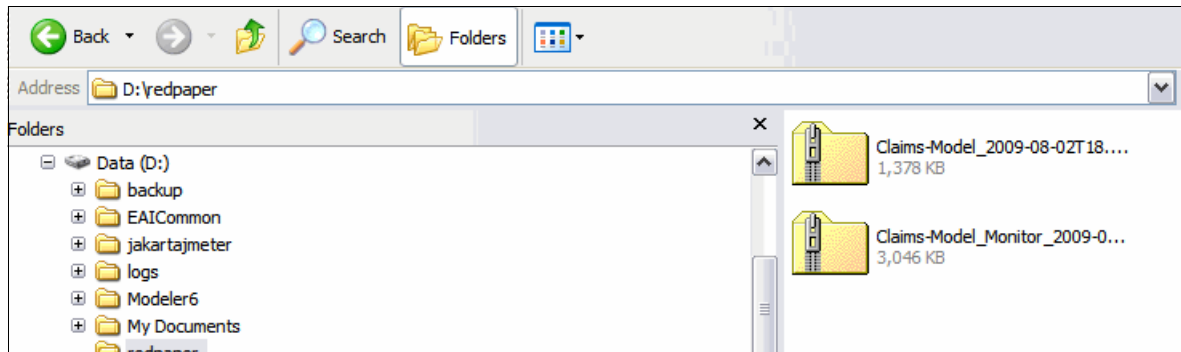


Figure 6-12 Exported project interchange files

**Note:** More information about exporting from WebSphere Business Modeler Advanced to WebSphere Integration Developer can be obtained at the following Web page:

<http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp?topic=/com.ibm.btools.modeler.advanced.help.doc/doc/tasks/transforming/exportingtowid.html>

## 6.2.3 Importing Project Interchange into WebSphere Integration Developer

Perform the following steps to edit the generated business process model and monitor model in WebSphere Integration Developer and WebSphere Business Monitor toolkit.

The following steps are going to lead through an import of a PI into WebSphere Integration Developer:

1. After having started WebSphere Integration Developer using a new Workspace, select **File** → **Import** from the main menu (Figure 6-13).

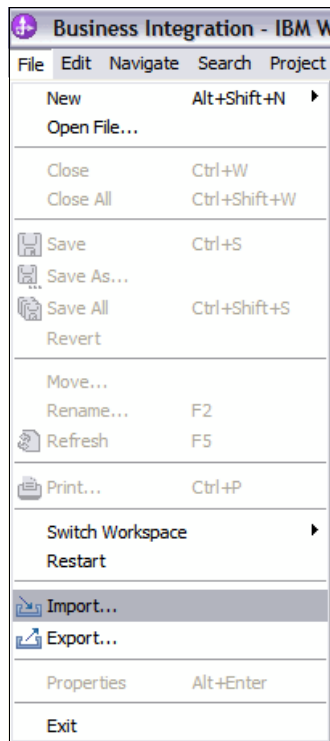


Figure 6-13 Select **Import** from the menu

2. Import Claims-Model Project Interchange (Figure 6-14).

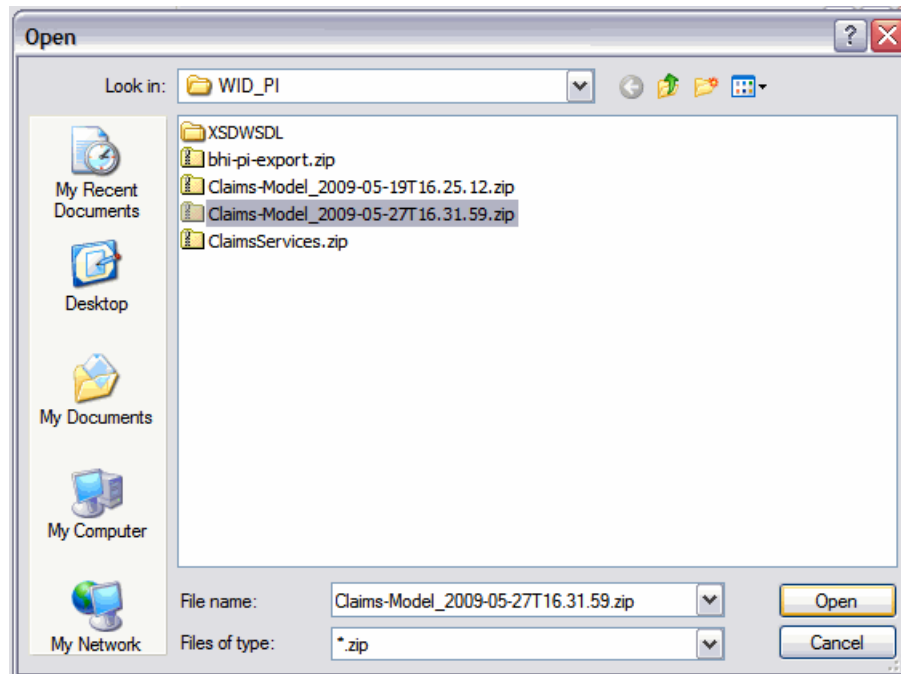


Figure 6-14 Import Claims-Model Project Interchange

3. Make sure to select the correct content in the PI file. In this case the whole content is necessary. Refer to Figure 6-15 for details. Click **Finish** to end the import process.

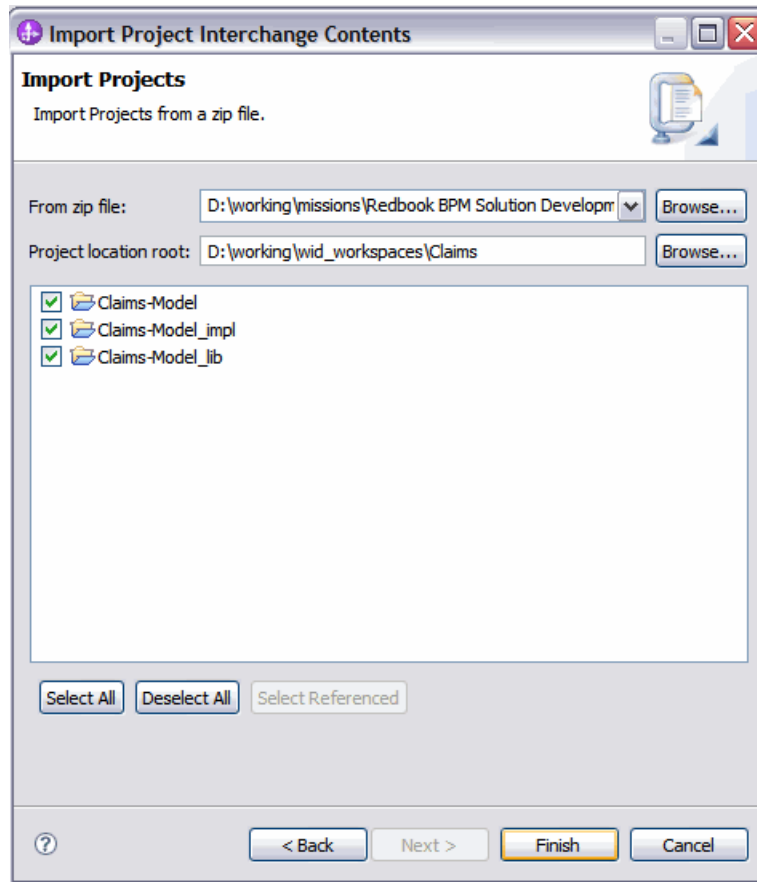


Figure 6-15 Project Interchange Contents

Figure 6-16 illustrates the hierarchy tree which becomes visible inside of WebSphere Business Modeler once the import is complete.

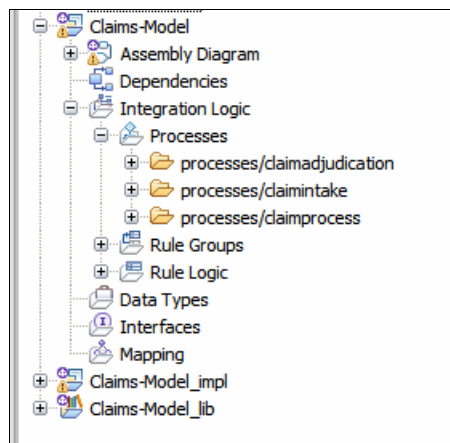


Figure 6-16 Explore imported artifacts

The following three artifacts have been imported:

- Claims-Model

This artifact contains the exported BPMN flow translated to BPEL. The flow can be opened within WebSphere Integration Developer and customized.

- Claims-Model\_impl

This artifact contains a series of mediation modules (dynamic service gateways), which are guaranteeing the connectivity between the BPEL process module and underlying services. Figure 6-17 shows the assembly diagram of the module in question.

**Note:** Each of these mediation modules contains a mediation flow with a Dynamic Endpoint Lookup Primitive. Using this technology, the real endpoint can be determined through a lookup into the WebSphere Service Registry and Repository.

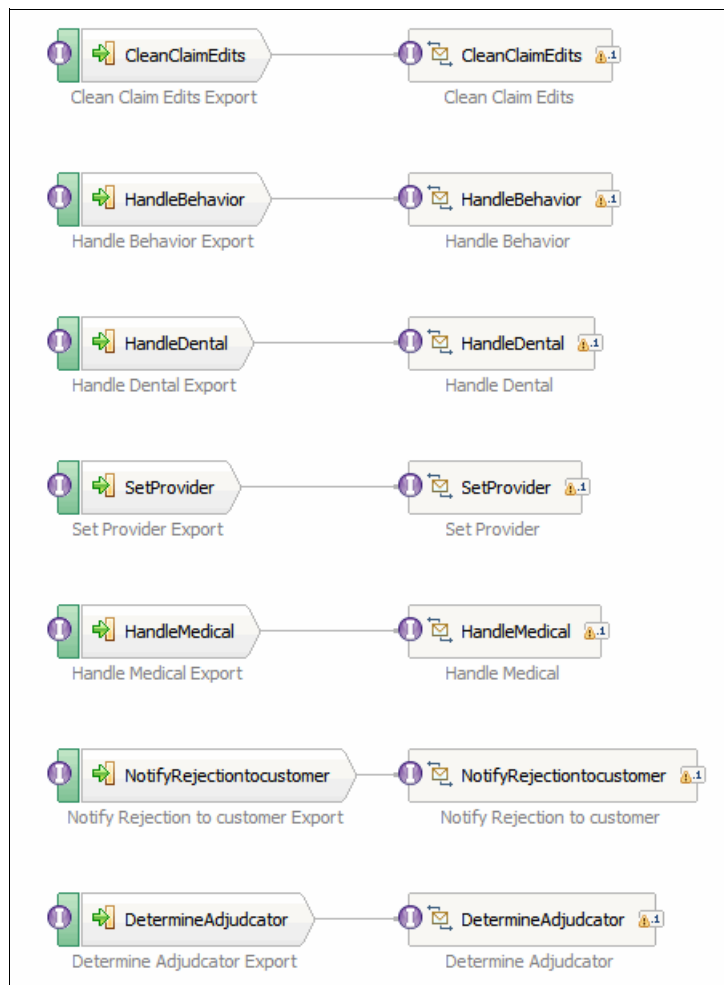


Figure 6-17 Mediation modules (service gateways) mediating between business process and underlying services

- Claim-Model\_lib

This artifact contains all interfaces and xsd's from the business process layer. It also contains interfaces of outbound Web services.

**Note:** The service interfaces need to be implemented to enable the connectivity of the BPEL process to underlying services. Typically, these services can be implemented as mediations negotiating between the generated mediations (Claims-Model\_impl) and the corporate service layer. These services are included in a module named “Claims Services.”

To make the further steps easier and more meaningful, and to permit execution at an early stage, we implemented these services as stub services. These stub services simulate real services. Stub services are depicted on Figure 6-18.



Figure 6-18 Implemented dummy Web services

- ▶ Each of the service interfaces referenced by the initial WebSphere Business Modeler Project has been implemented by a dummy Web service.
- ▶ We explicitly generated exports with Web services bindings.
- ▶ When generating a Web service binding automatically an endpoint and port will be generated. When deployed, each of the components below are accessible as Web services.



The next steps explained within section below are going to show how these Web services can be published in the WSRR with goal that they are found out of the Mediation Modules generated during the export to WebSphere Integration Developer.

**Note:** The following article explains in detail how to implement service gateways with endpoints in WSRR:

[http://www.ibm.com/developerworks/websphere/library/techarticles/0906\\_jackson2/0906\\_jackson2.html](http://www.ibm.com/developerworks/websphere/library/techarticles/0906_jackson2/0906_jackson2.html)

## 6.2.4 Loading interface files into WebSphere Service Registry and Repository

The following steps show how to load interface files into WebSphere Service Registry and Repository. The generated WSDL files, including their service endpoint information, needs to be exported to the file system. It is advised to export these WSDLs directly using the Archive Wizard within the export menu. The next steps show how to export WSDL files to a zip archive and import these files into WSRR.

1. Right-click “Claims-Model\_lib” to obtain the context menu. Select **Export** from the menu. This is depicted on Figure 6-19.

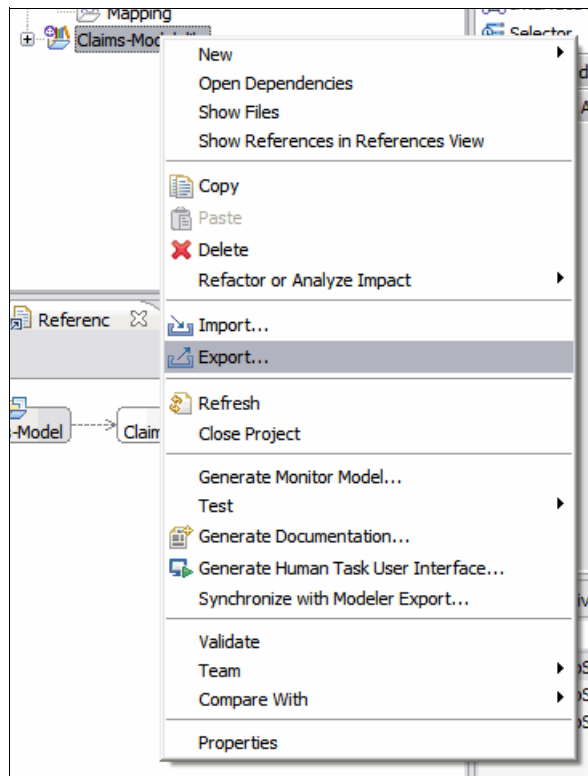


Figure 6-19 Select **Export** from the context menu

2. Select **General** → **Archive File** (Figure 6-20).

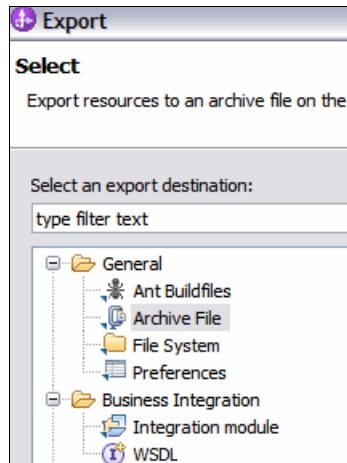


Figure 6-20 Select archive file

3. In the Export dialog box, clear all files other than WSDL or XSD (Figure 6-21). Only these files are to be imported into the WebSphere Registry and Repository. Click **Finish** to complete.

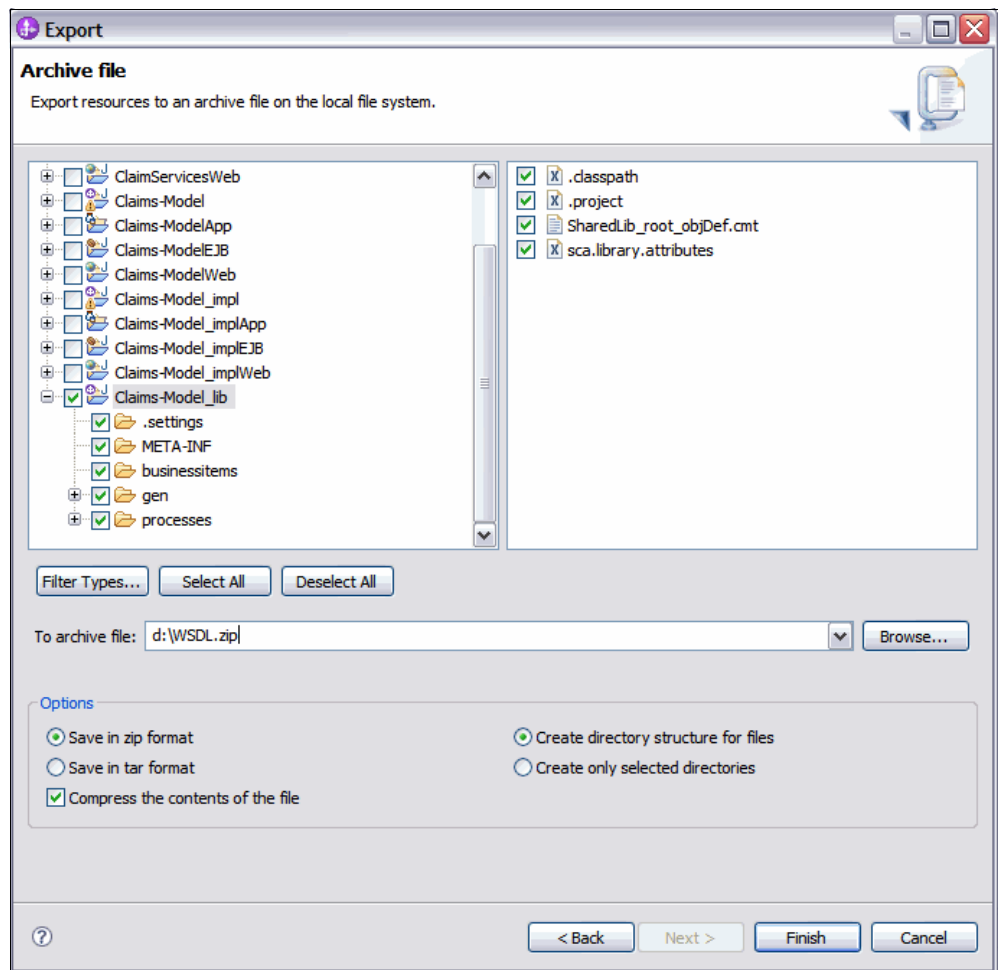


Figure 6-21 Select WSDL and XSD files and click finish

4. Open a Web browser and access the following URL:  
http://localhost:<your\_port>/ServiceRegistry
5. Log on to the page and select **Service Documents** → **WSDL Documents** (Figure 6-22).

**Load Documents**

This facility enables you to load one or more documents, with the option to save their type and, optionally, enter a description and a version.

**Path to the Document**

Local file system  
Specify path  
D:\wsdl.zip

Remote file location  
Specify URL

Document type   
ZIP/JAR file

Enter document namespace:

Enter document description:

Enter document version:

Figure 6-22 Selecting the path and proper document type

6. Browse to the ZIP file (In this case WSDL.zip), select ZIP/JAR as a document type and click **OK** to continue.
7. Click **Finish** and wait until documents successfully uploaded (Figure 6-23).

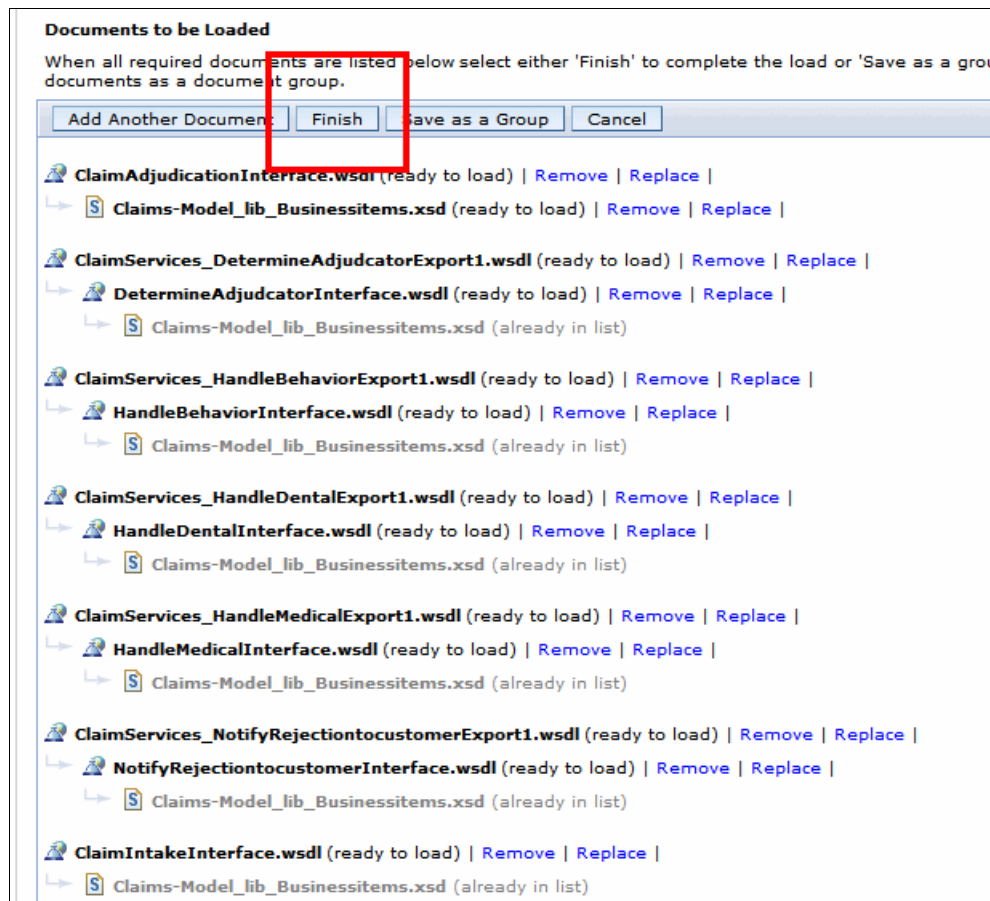


Figure 6-23 Review service documents to import (WSDL's)

**Note:** The information center for WebSphere Service Registry and Repository Information Center is an ideal place to explore usage of the tool:  
[http://publib.boulder.ibm.com/infocenter/sr/v6r2/index.jsp?topic=/com.ibm.help\\_swg.ic.doc/wsrr\\_homepage.htm](http://publib.boulder.ibm.com/infocenter/sr/v6r2/index.jsp?topic=/com.ibm.help_swg.ic.doc/wsrr_homepage.htm)

If required, the endpoint can now be changed within the WebSphere Service Registry and Repository console. Figure 6-24 on page 205 depicts this. It can be obtained after navigating to **WSDL Documents** → **ClaimServices\_HandleBehaviorExport1.wsdl** → **HandleBehaviorExport1\_HandleBehaviorHttpService** → **HandleBehaviorExport1\_HandleBehaviorHttpPort** → **HandleBehaviorExport1\_HandleBehaviorHttpPort\_SOAPAddress** → **Edit Relationships**.

**Note:** WebService Endpoints can be changed using the WebSphere Service Registry and Repository console. This makes dynamic change easy, and guarantees services remain loosely coupled.

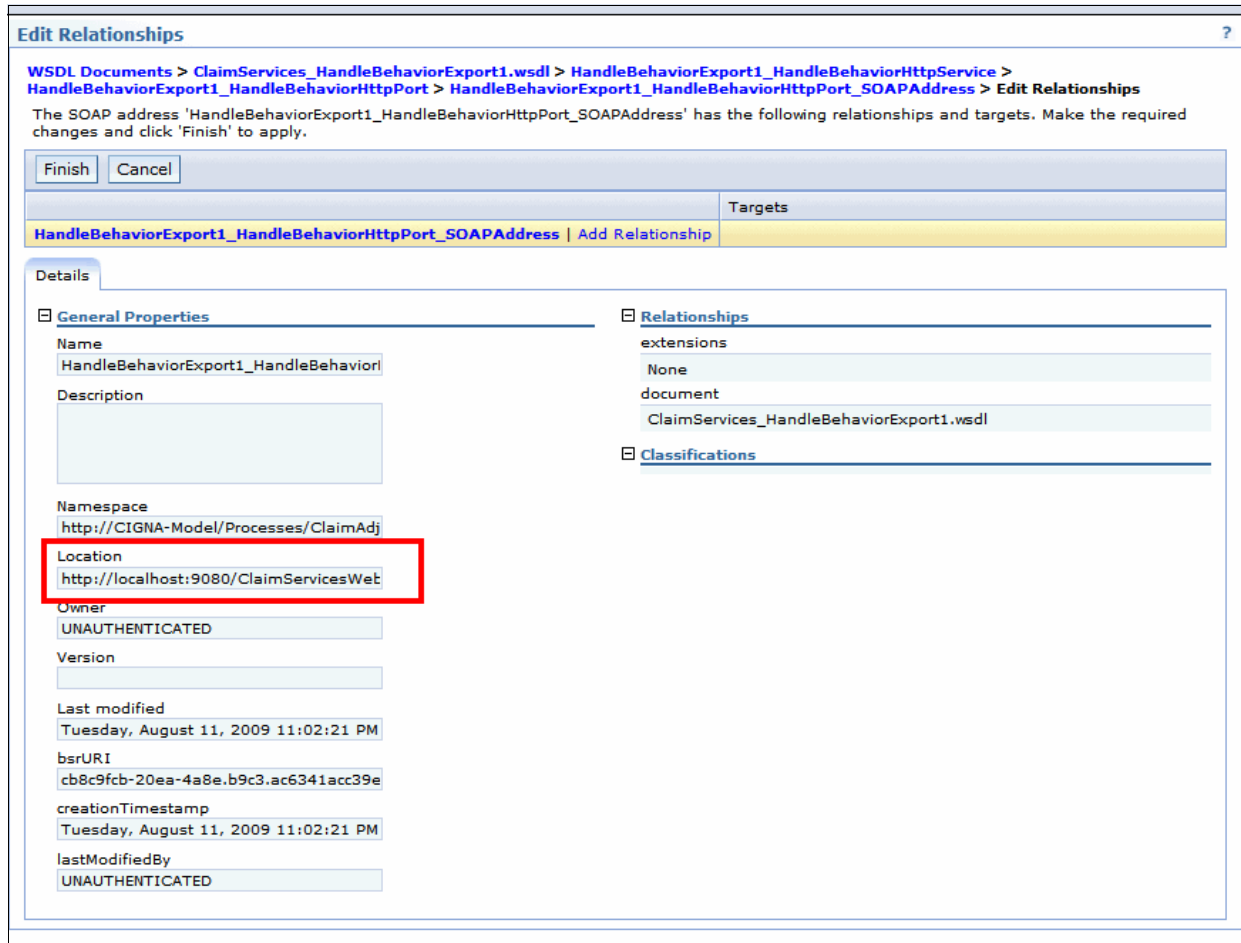


Figure 6-24 Change Web service endpoint

## 6.2.5 Mediation modules and business integration modules

A module is a unit of deployment that determines which artifacts are packaged together in an enterprise archive (EAR) file. Components within a module are collocated for performance, and can pass their data by reference. A module can be seen as a scoping mechanism, that is, it sets an organizational boundary for artifacts.

A module is a composite of service components, imports, and exports. The service components, imports, and exports reside in the same project and root folder, which also contains the wiring that links the components and the bindings needed for the imports and exports. A module can also contain the implementations and interfaces referenced by its components, imports, and exports, or these can be placed in other projects, such as a library project.

There are two types of modules:

- ▶ Business integration modules

Business integration modules contain a choice of many component types, often used to support a business process.

- ▶ Mediation modules

Mediation modules contain up to one component, one or more mediation flow components, plus zero or more Java™ components that augment the mediation flow component.

Before entering into details we would recommend exploring the various components we obtain after exporting the WebSphere Business Modeler workspace into WebSphere Integration Developer. A good practice consists of generating an integration solution out of the imported artifacts which gives a good overview of all the artifacts from the Workspace. The following steps show how to create a new integration solution.

1. Click **New** in the upper-right corner of the Business Solutions Project view (Figure 6-25).

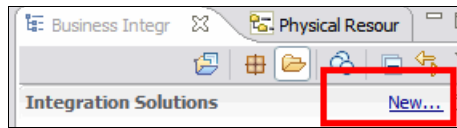


Figure 6-25 Create new Integration Solution

2. The “New Integration Solution” dialog box (Figure 6-26) displays. Enter a name such as Better Healthcare. Click **Next** to continue.

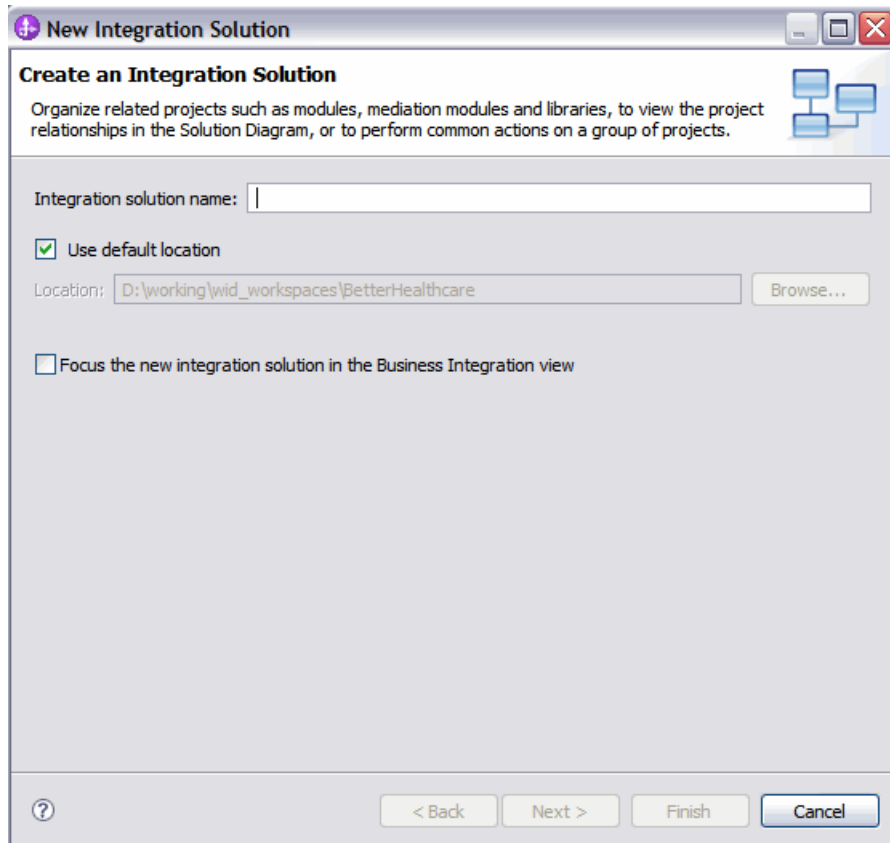


Figure 6-26 Type Integration solution name

3. Select artifacts to be included in the integration solution (Figure 6-27), and click **Next** to continue.

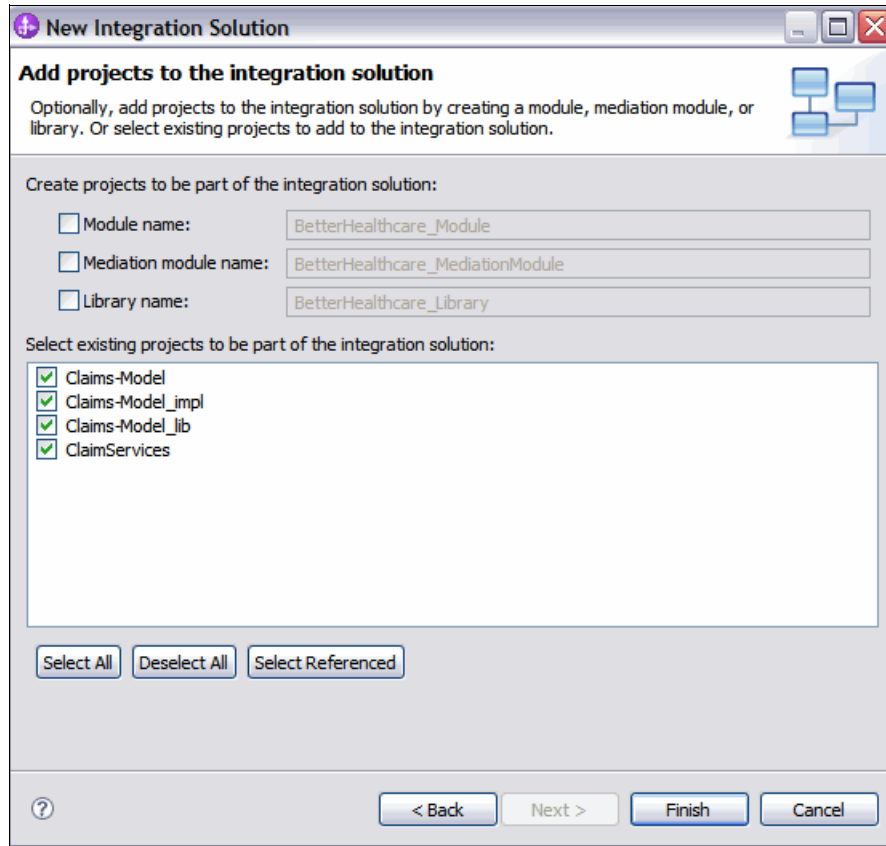


Figure 6-27 Select modules to be included in an integration solution

**Note:** The existing artifacts include a project named Claims Services, which is basically a dummy service, of which creation is beyond the scope of this paper. More on the dummy services can be found in 6.2.3, “Importing Project Interchange into WebSphere Integration Developer” on page 196.

- Open the integration solution and review content. The integration solution is depicted in Figure 6-28.

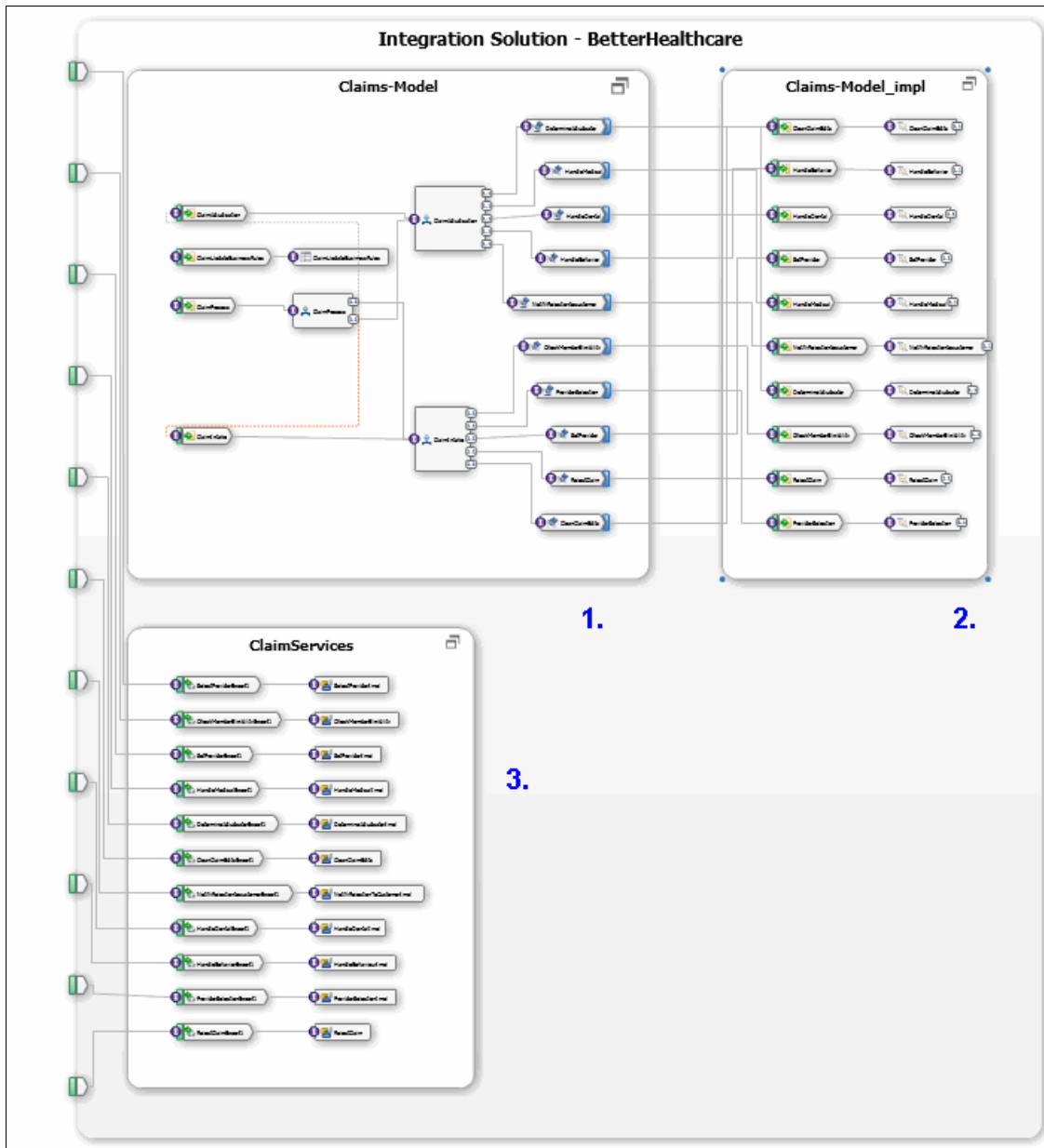


Figure 6-28 Review Better Healthcare Integration Solution

- ▶ (1) shows a module named Claims-Model. It includes the generated BPEL business process, generated forms, and maps associated to the BPEL process.
- ▶ (2) shows a module named Claims-Model\_impl. It includes the generated mediation modules which guarantee dynamic lookup to the services (which are dummy services for the moment and will really be implemented in the following section of this paper).
- ▶ (3) shows a module named Claims Services. It includes the dummy Java services implemented as Web services with SOAP/HTTP bindings.

**Note:** As of version 6.2.0.1 only Web services bindings are supported in IPD. Future versions will also implement other bindings such as JMS or SCA.



Why are there two module types?

- ▶ A business integration module is primarily designed for business processes.
- ▶ A mediation module is like a gateway to existing external services, which is common in enterprise service bus architectures.

Mediation modules included mediation flows and are responsible to intercept and modify messages that are passed between existing services (providers) and customers (requesters) that want to use those services. They are most commonly used for transforming data and accessing header information, such as JMS, MQ or SOAP headers. Mediation modules can be deployed on the WebSphere Enterprise Service Bus or the WebSphere Process Server.

Introducing mediation flows between services enables you to process the messages that are being passed between these services. A message is a communication sent from one application or service to another application or service. Mediation flows provide the logic that processes the messages. For example, mediation flows can be used to find services with specific characteristics that a requester is seeking and to resolve interface differences between requesters and providers. For complex interactions, mediation primitives can be linked sequentially. Typical mediations include the following processes:

- ▶ Transforming a message from one format to another so that the receiving service can accept the message
- ▶ Conditionally routing a message to one or more target services based on the contents of the message
- ▶ Augmenting a message by adding data from a data source

**Note:** More details on mediations can be obtained in the IBM Information Center at the following Web page:

<http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp?topic=/com.ibm.wbit.620.help.sib.mediation.ui.doc/topics/cmediations.html>

Business integration modules include service components that can be implemented according to a variety of service implementation types:

- ▶ Java  
An implementation of a component in Java is referred to as a Java object.
- ▶ BPEL4WS  
A BPEL process component implements a business process.
- ▶ Selector  
Integrated applications contain many ways to interact. A selector is used to route an operation from a customer application to one of several possible components for implementation.
- ▶ Human task  
A human task component implements a task done by a person. It represents the involvement of a person in a business process.
- ▶ State machine  
state machine is an alternative way of creating a business process. A state machine is suited for processes related to changing states rather than a flow of control. A state defines what an artifact can do at a point in time. A state machine is an implementation of this set of states. A state machine is implemented as BPEL.

- ▶ Interface map  
An interface map resolves differences between the interfaces of interacting components.
- ▶ Human task  
A human task component implements a task done by a person. It represents the involvement of a person in a business process.
- ▶ Business rule  
Business rules complement business processes and state machines. If there is condition with a variable, for example, a business rule can change the value in that variable at run time. Created by a visual programming language, a business rule makes a decision based on context. The decision can be simple or complex. Business rules are nonprocedural and the rules can be changed independently of an application.
- ▶ Standalone reference  
Stand-alone references are references to applications that are not defined as Service Component Architecture components (for example, JavaServer Pages or servlets). Stand-alone references permit these applications to interact with Service Component Architecture components.

**Note:** More details about the Service Component Architecture, included in WebSphere Process Server and WebSphere Enterprise Service Bus can be found in the IBM Information Center at the following Web page:

<http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/topic/com.ibm.wbit.620.help.prodovr.doc/topics/csrvcmparch.html>

## 6.2.6 Assembling a Web service

The goal of this section consists to replace an existing Dummy Service named “Select Provider Impl” by a call to an existing WebService. As depicted in Figure 6-29 on page 211 the situation after export from Modeler to WID is as described in (1). IPD generates a process and a gateway permitting to call underlying process services. These process services however are usually decoupled from the underlying corporate service layer, meaning that a gateway and maps respectively logic needs to be written to permit the communication to occur successfully. This is shown under (2).

**Note:** This section shows how to couple IPD generated processes to the underlying corporate Web services, without creating dependencies between the process services datamodel and the corporate datamodel. The process services datamodel needs to be capable to evolve freely and regenerated without that underlying maps have to be changed. The same counts for the corporate services datamodel which needs to be capable to evolve freely without that the process is impacted.

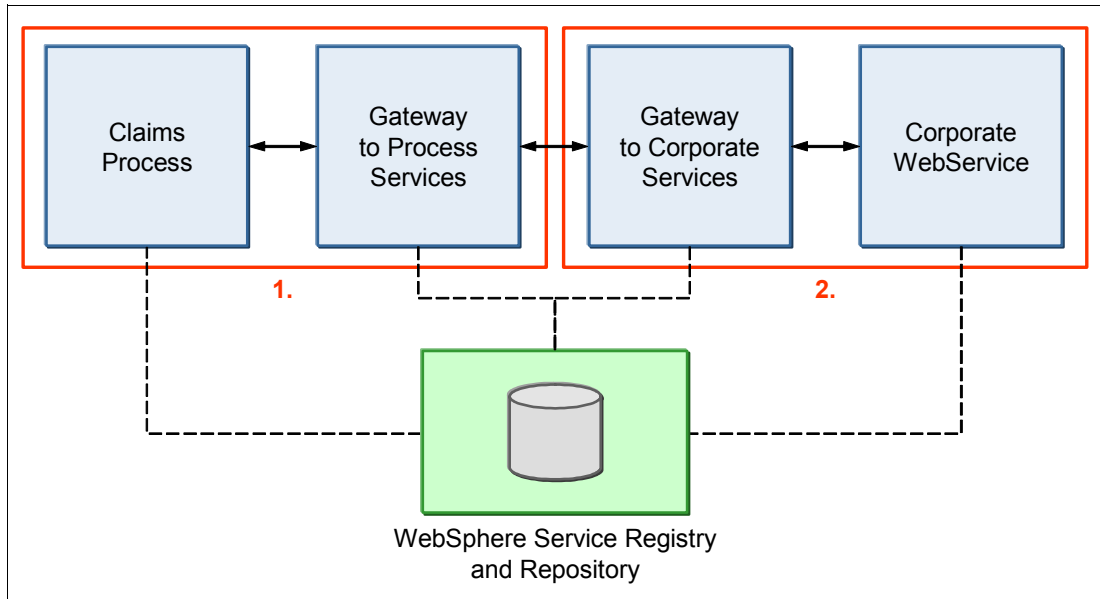


Figure 6-29 Situation after export

Figure 6-30 shows Java components exposed as Web services. These Java components need to be individually linked to Web service exports.

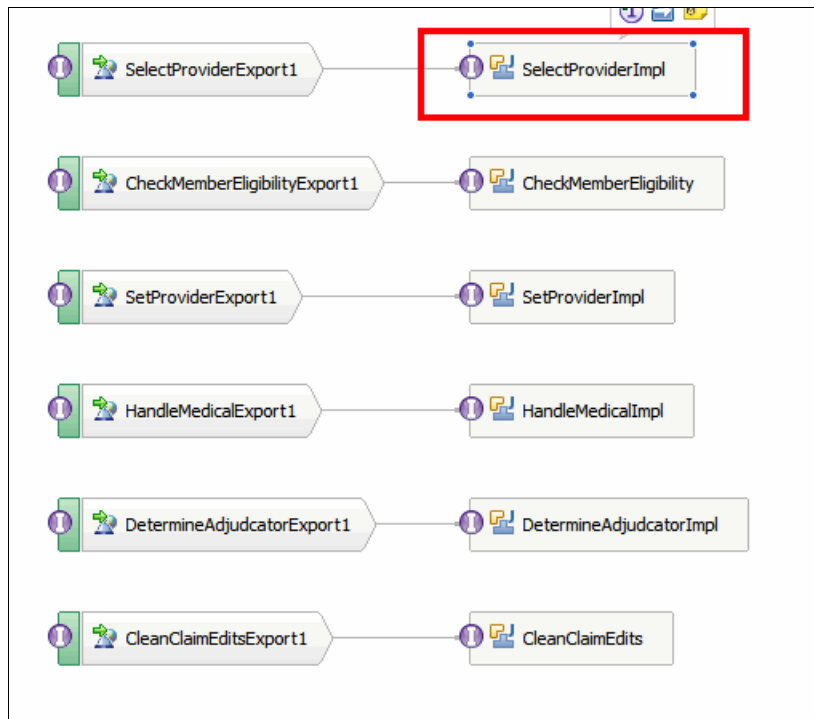


Figure 6-30 Java components exported as Web services

**Note:** More information about integrating services with Web Services Bindings can be obtained in the IBM WebSphere Enterprise Service Bus Information Center at the following Web page:

<http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/topic/com.ibm.wbit.620.help.basics.doc/topics/cgenwsbnd.html>

## 6.2.7 Integrate with WebSphere MQ

IBM WebSphere MQ is a popular middleware set of products that provide a well-known set of messaging communications between applications, which can be on many dissimilar systems.

Integration with WebSphere MQ is important whenever data needed in the business process needs to be called from services invocable through MQ. The Web page in the note below describes how a WMQ message maps to service component architecture (SCA) artifacts. That is, how a message maps to a business object and how input and output from a WebSphere MQ client maps to an interface's operations. Data bindings and an important function called the *function selector* as applied to WebSphere MQ are discussed. You are then led through the generation of an MQ import and export binding.

A detailed description on how to use imports and exports with MQ bindings are beyond the scope of this paper.

**Note:** More information about MQ Bindings can be obtained in the WebSphere Enterprise Service Bus Information center. at the following Web page:

<http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp?topic=/com.ibm.wbit.620.help.messaging.doc/topics/tgenmqbnd.html>

## 6.2.8 Integrate with JMS

JMS is a standard API for sending and receiving messages. It allows components based on the Java 2 Platform, Enterprise Edition (J2EE) to create, send, receive, and read messages.

Integration with JMS is important when a service (for example, a Message Driven Bean) is only callable through JMS queues. The Web page in the note below shows how a JMS message maps to SCA artifacts. That is, how a message maps to a business object and how input and output from a JMS client maps to an interface's operations. Data bindings and the function selector are discussed. You are then led through the generation of a JMS import and export binding and presented with some standard applications that make use of the JMS binding.

**Note:** More information about JMS bindings can be found in the WebSphere Enterprise Service Bus Information Center. at the following Web page:

<http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/topic/com.ibm.wbit.620.help.messaging.doc/topics/cjms.html>

## 6.2.9 Integrate with JCA adapters

IBM adapters allow you to integrate enterprise applications, and data storage facilities, in a service-oriented way. Adapters expose low-level EIS functions, or events, in the form of a service.

Adapters are sometimes referred to as resource adapters, and provide a standard interface to proprietary systems. Using standard interfaces avoids the maintenance issues associated with nonstandard solutions.

Some adapters come with WebSphere Integration Developer and are licensed for production use, others are only for development purposes. That is, they can be used to develop and test an application. Generally, after you deploy your application to WebSphere ESB, or WebSphere Process Server, you will need a licensed runtime resource adapter.

There are two types of IBM adapters:

- ▶ WebSphere adapters, also referred to as JCA adapters.

**Note:** WebSphere Adapters are based on Java 2 Platform, Enterprise Edition (J2EE) Connector architecture (JCA), and are the recommended adapters to use with WebSphere ESB and WebSphere Process Server.

- ▶ WebSphere Business Integration adapters.

**Note:** WebSphere Business Integration adapters reside outside of WebSphere ESB or WebSphere Process Server. The run time communicates with this type of adapter through a Java Message Service (JMS) transport layer.

Both types of adapter can be split into two classes:

- ▶ Technology adapters

Technology adapters let you integrate files, FTP, databases, and e-mail. These adapters come with WebSphere Integration Developer and are licensed for production use with WebSphere ESB and WebSphere Process Server.

- ▶ Application adapters

Application adapters let you integrate enterprise application suites, such as SAP Exchange Infrastructure (XI).

WebSphere Process Server and WebSphere Integration Developer supports a variety of Adapters:

- ▶ IBM CICS® ECI Resource Adapter version 7.1.0.2
- ▶ IBM IMS™ TM Resource Adapter version 9.1.0.2
- ▶ IBM WebSphere Adapter for E-mail version 6.2.0
- ▶ IBM WebSphere Adapter for FTP version 6.2.0
- ▶ IBM WebSphere Adapter for Flat Files version 6.2.0
- ▶ IBM WebSphere Adapter for IBM i version 6.2.0
- ▶ IBM WebSphere Adapter for JDBC version 6.2.0
- ▶ IBM WebSphere Adapter for JD Edwards EnterpriseOne version 6.2.0
- ▶ IBM WebSphere Adapter for Oracle E-Business Suite version 6.2.0
- ▶ IBM WebSphere Adapter for PeopleSoft Enterprise version 6.2.0
- ▶ IBM WebSphere Adapter for SAP Software version 6.2.0
- ▶ IBM WebSphere Adapter for Siebel Business Applications Version 6.2.0

**Note:** More information about working with adapters can be obtained in the IBM WebSphere Enterprise Service Bus Information Center at the following Web page:

<http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/topic/com.ibm.wbit.620.help.adapter.emd.ui.doc/topics/timpexpapps.html>

**Important:** Adapter patterns provide a quick and easy way of creating a service with an adapter. The adapter patterns wizard can save you time in creating a service. In a few pages containing a few fields, you can generate a service. In many cases, a service generated from an adapter pattern meets the requirements for the service you want to create.

The adapter patterns wizard can be used with the following adapters:

- ▶ WebSphere Adapter for E-mail
- ▶ WebSphere Adapter for FTP
- ▶ WebSphere Adapter for Flat Files.

## 6.3 Generate and customize monitor models

The next step in the Prescriptive Guide Approach is to generate and customize monitor models. It includes the following processes:

- ▶ Export of a monitor model to WebSphere Integration Developer
- ▶ Customization of the monitor model
- ▶ Generation of Monitor EJB projects
- ▶ Deployment to the runtime for testing purposes

Figure 6-31 illustrates the current focus of this section within the context of the overall Deployment phase.

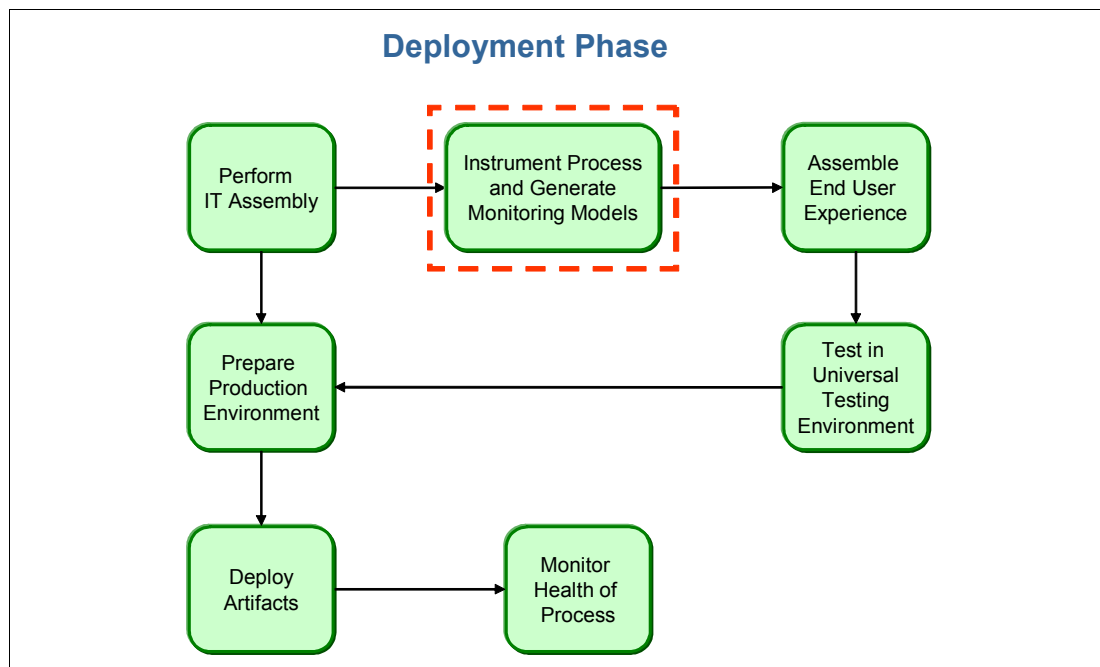


Figure 6-31 Instrument process and generate monitoring models

Generate the J2EE EARs necessary for all of the business measures. It is possible to test in the iterative development environment prior to this step, but deployment requires that these artifacts be generated. This allows for the KPIs and other data to be collected, and for the business space widgets to be configured properly. After you have a satisfactory baseline model from the IPD environment you can export the model from Modeler into the WebSphere Integration Developer Toolkit to generate the J2EE monitoring model EAR.

The model you have from the Experience phase is all that is necessary for you to deploy into the production environment. There are cases where you might want to augment the model created from Modeler with some more features and metrics beyond what the Directly Deployed (D2D) environment gives you. You can do so easily in the WebSphere Integration Developer Toolkit.

We describe how you can import the model from modeler into WebSphere Integration Developer Toolkit, select the events you want emitted for monitoring and how to generate a J2EE monitoring EAR to all of the Business Measures. It is also possible to test in the WebSphere Integration Developer Toolkit environment prior to deployment as well. The WebSphere Integration Developer Toolkit environment is a full-fledge development and test environment.

To generate an EAR from the modeler ZIP file you receive as a project interchange format, you first import it into your WebSphere Integration Developer Toolkit, activate the events for monitoring, and generate a J2EE artifacts from the project to be deployed to production.

These are the steps:

1. Import the project interchange artifact from modeler. It must be exported in WebSphere Business Monitor Development Toolkit format (Figure 6-32).

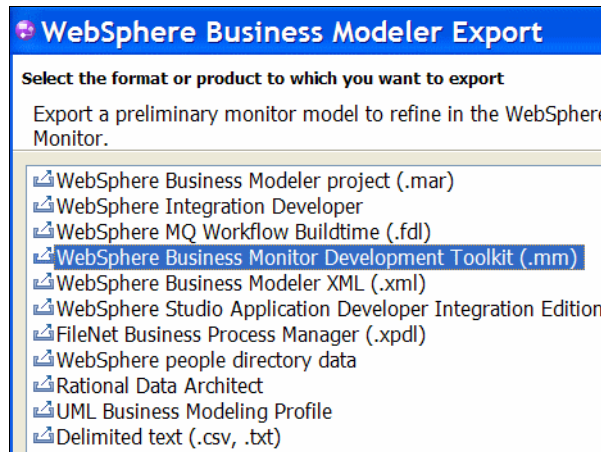


Figure 6-32 Export model in toolkit format to generate monitor model

2. Open your WebSphere Integration Developer Toolkit workspace and import the project interchange (Figure 6-33).

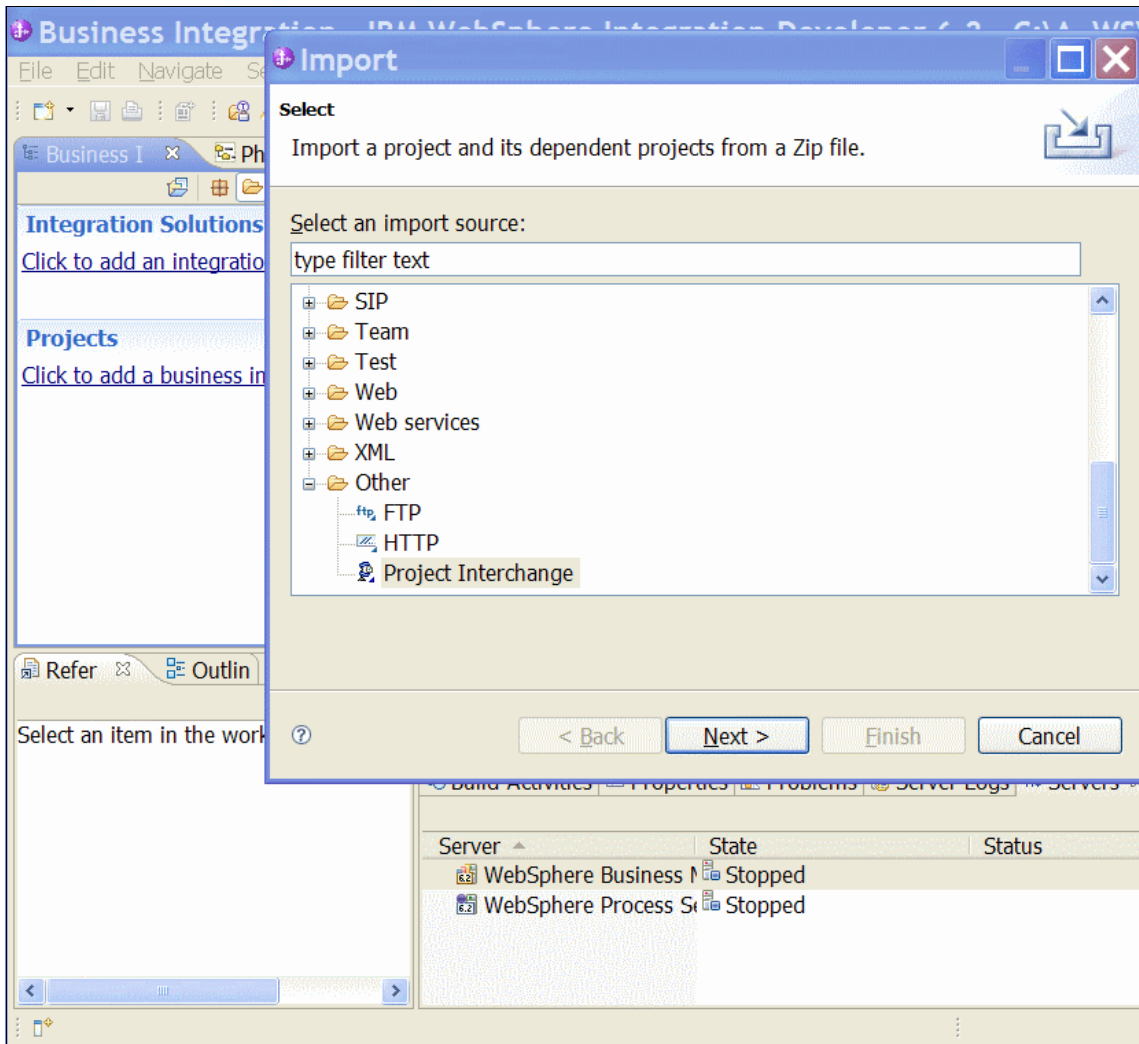


Figure 6-33 Import the PI into your WebSphere Integration Developer Toolkit workspace

3. Select the project to import as shown in Figure 6-34 on page 217.



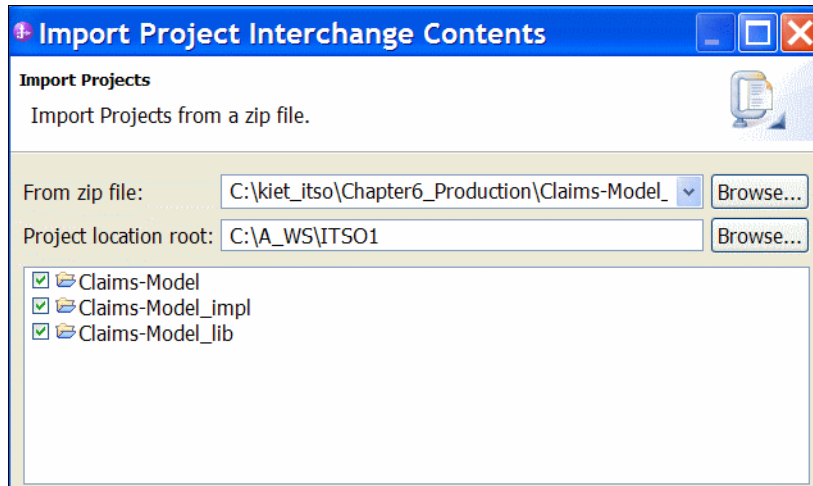


Figure 6-34 Import all modules of project

4. After the build your project will be displayed in the workspace in the business integration perspective, as shown in Figure 6-35.

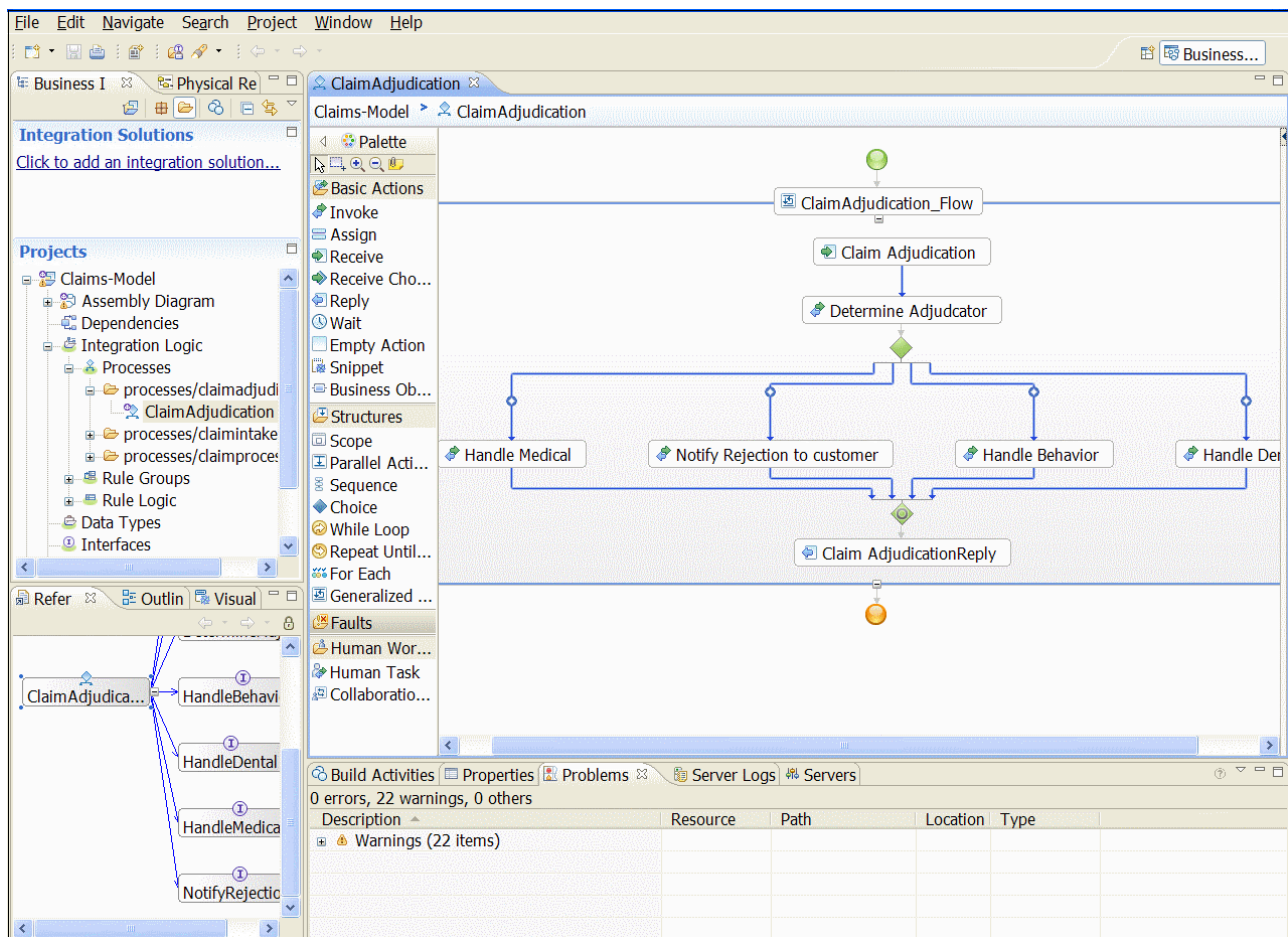


Figure 6-35 Default business integration layout

5. Verify that there is no errors from the import. Warnings are permissible.

Though the model you instrumented in modeler Directly Deployed (D2D) has all events turned on to support the metrics and KPIs defined, it is a good practice to verify them after the model project is being imported into the WebSphere Integration Developer Toolkit environment.

You can refine and implement additional events for monitoring if you chose too beyond what you have specified in the Directly Deployed (D2D). If you did so however make sure that you remember to propagate the additional changes back to your model in modeler.

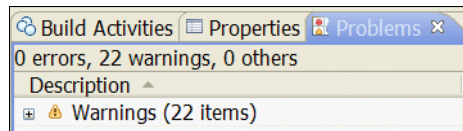


Figure 6-36 Verify there is no errors after import

6. For every process and every activity within a model that you want monitored, you must ensure that their event emission setting is turned on (Figure 6-37).

In this sample that we use throughout this paper, the three processes are as follows:

- ClaimAdjudication
- ClaimIntake
- ClaimProcess

7. Select the process (green) in Figure 6-37 or activity (orange) in Figure 6-38 on page 219 from the business integration canvas editor that you want to set to emit events for monitoring.
  - a. Select the process or activity.
  - b. Expose its properties through the Properties tab.
  - c. Select Event Monitor.
  - d. Select All for all event type and click **Save**.
  - e. Notice the Flag icon indicating that the activity or process is being wired to emit events for monitoring.
  - f. Save the settings.

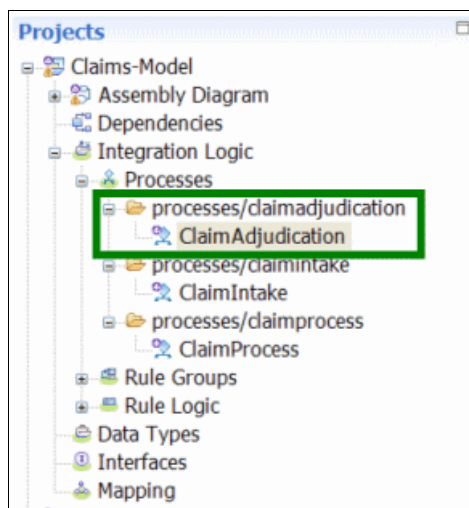


Figure 6-37 Decide on which process to monitor

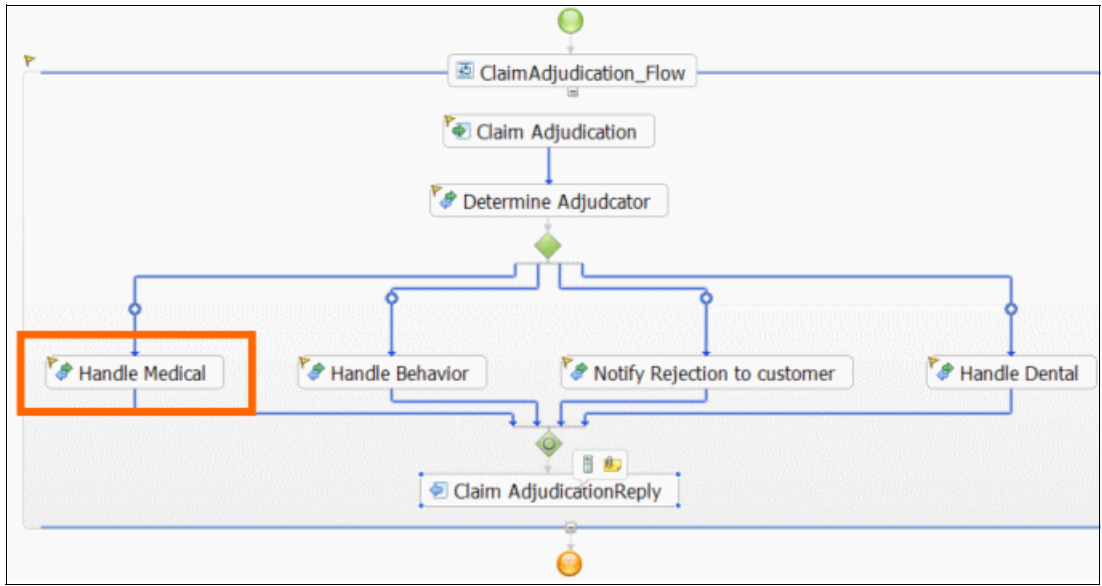


Figure 6-38 Decide which activity in a process to monitor

Figure 6-39 illustrates how the monitoring focus will be on the Claim Adjudication, setting the properties to all for Invoke - Handle Medical claims.

**Invoke - Handle Medical**

Monitor	Event Content	On	Transaction	Label
<input type="radio"/> None	Full	<input checked="" type="checkbox"/>	Existing	
<input checked="" type="radio"/> All	Empty	<input type="checkbox"/>	Existing	
<input type="radio"/> Selected	Full	<input type="checkbox"/>	Existing	

Figure 6-39 Activate process or activity to emit events for monitoring

8. Now that you have wired your business process model for monitoring, generate J2EE artifacts so that it can be deployed into the production environment. To do so, perform the following steps:
  - a. Select your monitor model project.
  - b. Right-click for the drop-down options.
  - c. Select **Monitor Tools**.
  - d. Select **Generate Monitor Model**.
9. When the generate functions starts, enter the monitor project and model module name. If the names already exist, you must specify new names (Figure 6-40).

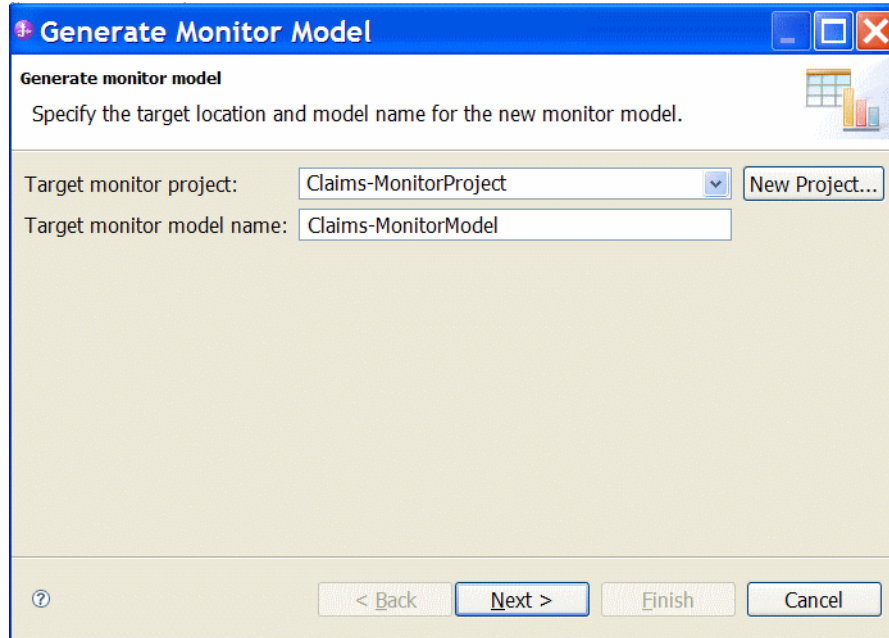


Figure 6-40 Enter project and model name to generate

10. Follow through by clicking **Next**. Keep all default options and include all reference projects (Figure 6-41 on page 221).

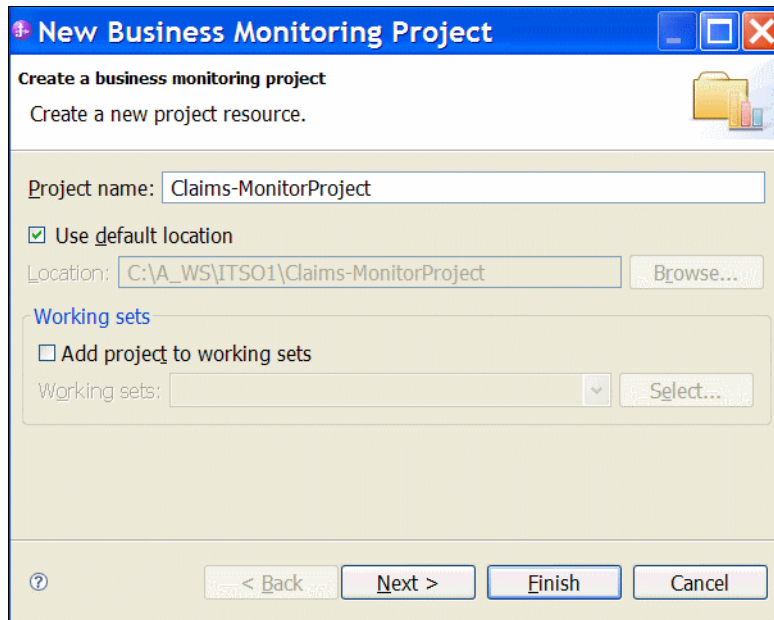


Figure 6-41 Verify project name

- The next panel lets you select what event you wanted to monitor. Do so by selecting the default metrics from the template or by specific event selection for more granularity (Figure 6-42).

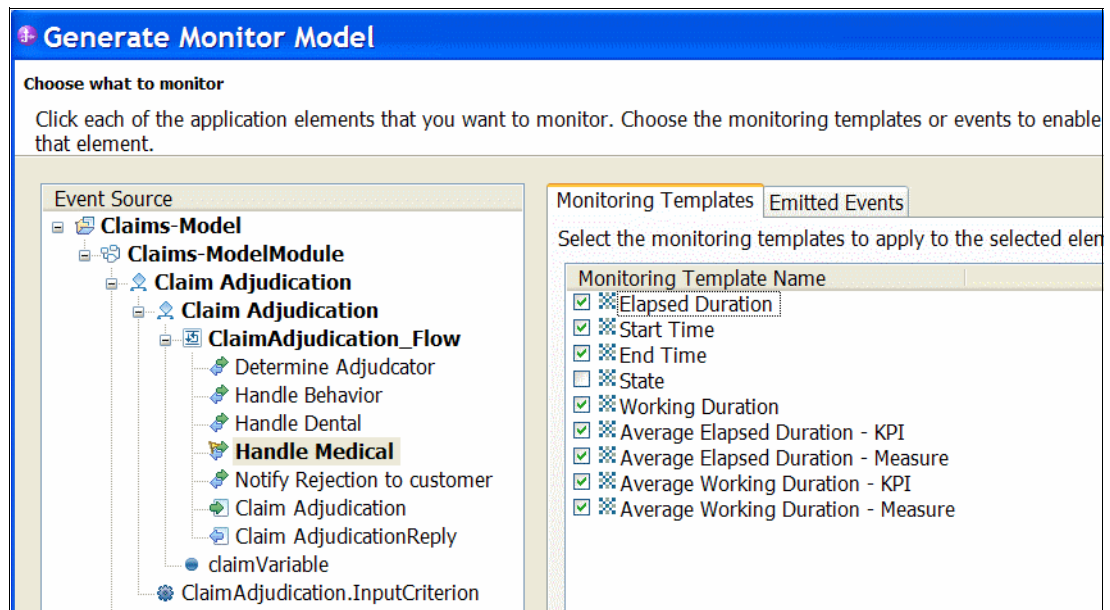


Figure 6-42 Select the metrics to monitor from default template

You can also further refine by the exact event type you want to select (Figure 6-43).

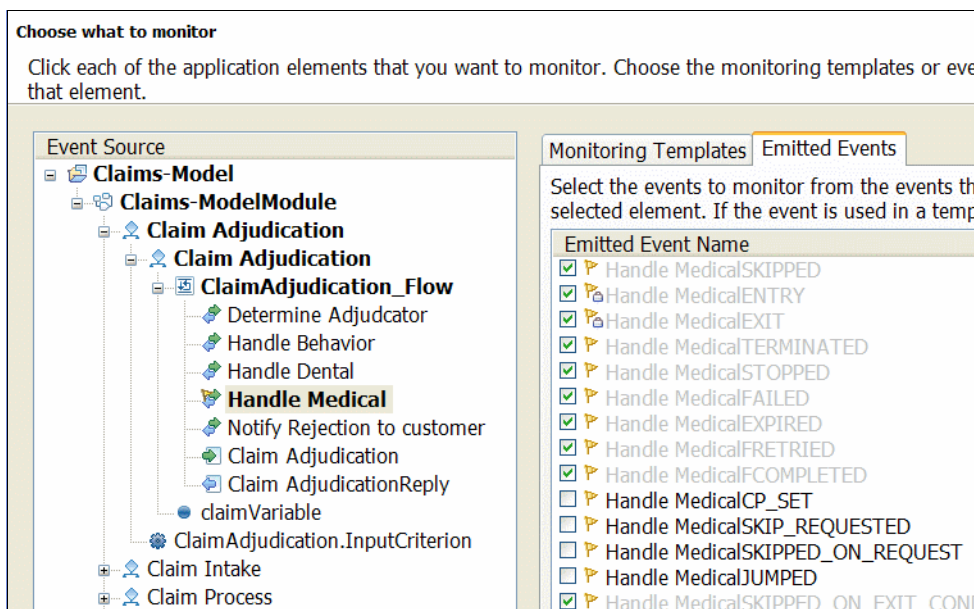


Figure 6-43 Refine selection by exact event type

12. If you wanted to monitor the value of variables' changes, you must also select them (Figure 6-44).

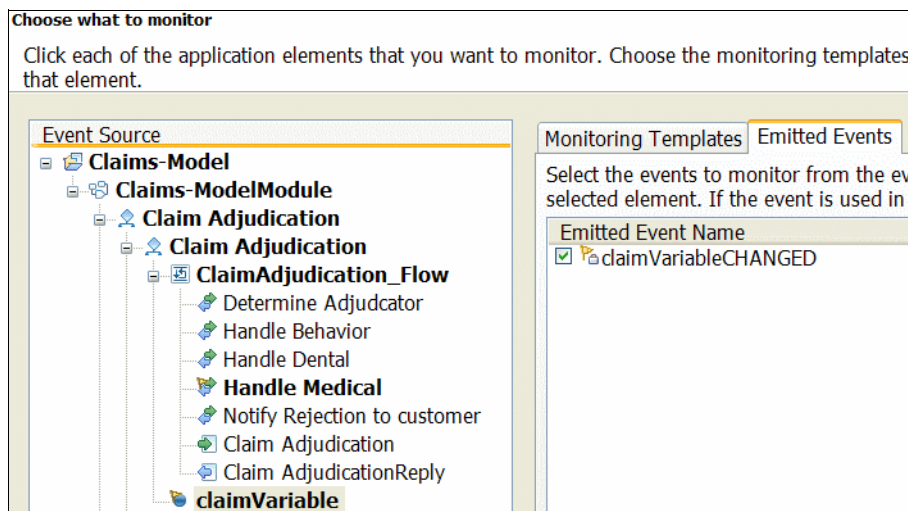


Figure 6-44 Select variable values for monitoring as applicable

13. You can also choose the quick option of just select what was turned on in the application as shown in step 12 (Figure 6-45).

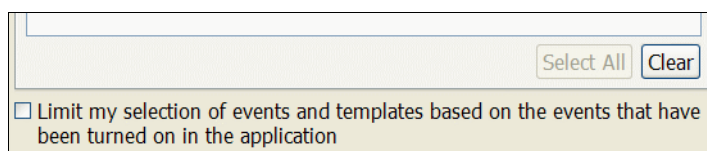


Figure 6-45 Select default events turned on in application

14. When satisfied with your selection, click **Next** to proceed to generate the monitor model.
15. You will receive two more summary windows. The first summary window shows your selection of what event types you turned on for monitoring (Figure 6-46). The second summary window previews (Figure 6-47) what would transpire in your monitor model in terms of metrics and KPIs.

Event Source	Implementation
Claims-Model	--
Claims-ModelModule	None
Claim Adjudication	None
Claim Adjudication	Monitoring context
ClaimAdjudication_Flow	None
Handle Medical	Monitoring context
claimVariable	Event group

Figure 6-46 Review panel for events selected

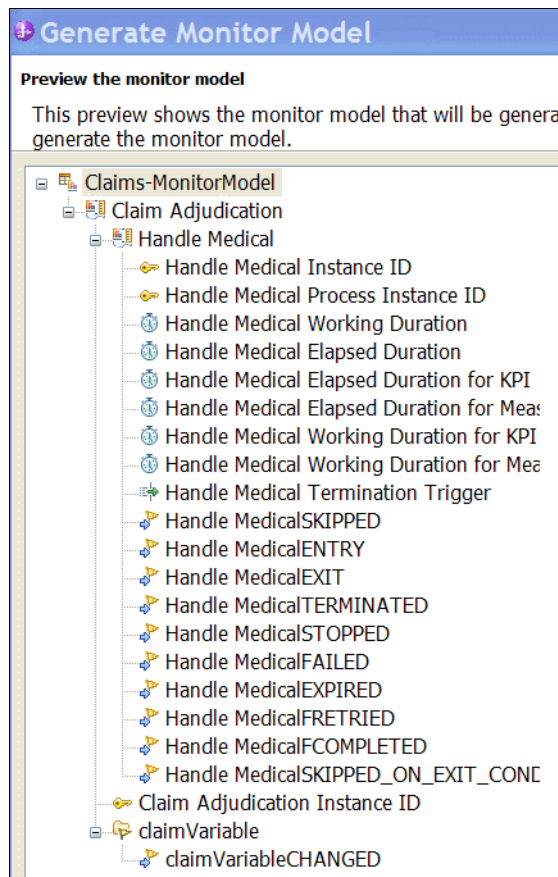


Figure 6-47 Model metrics and KPIs preview

16. Click **Finish** to generate the monitor model.

17. After the monitor model gets generated, it is displayed in the monitor model editor perspective. Verify that there are no errors in the model (Figure 6-48). Warnings are permissible.

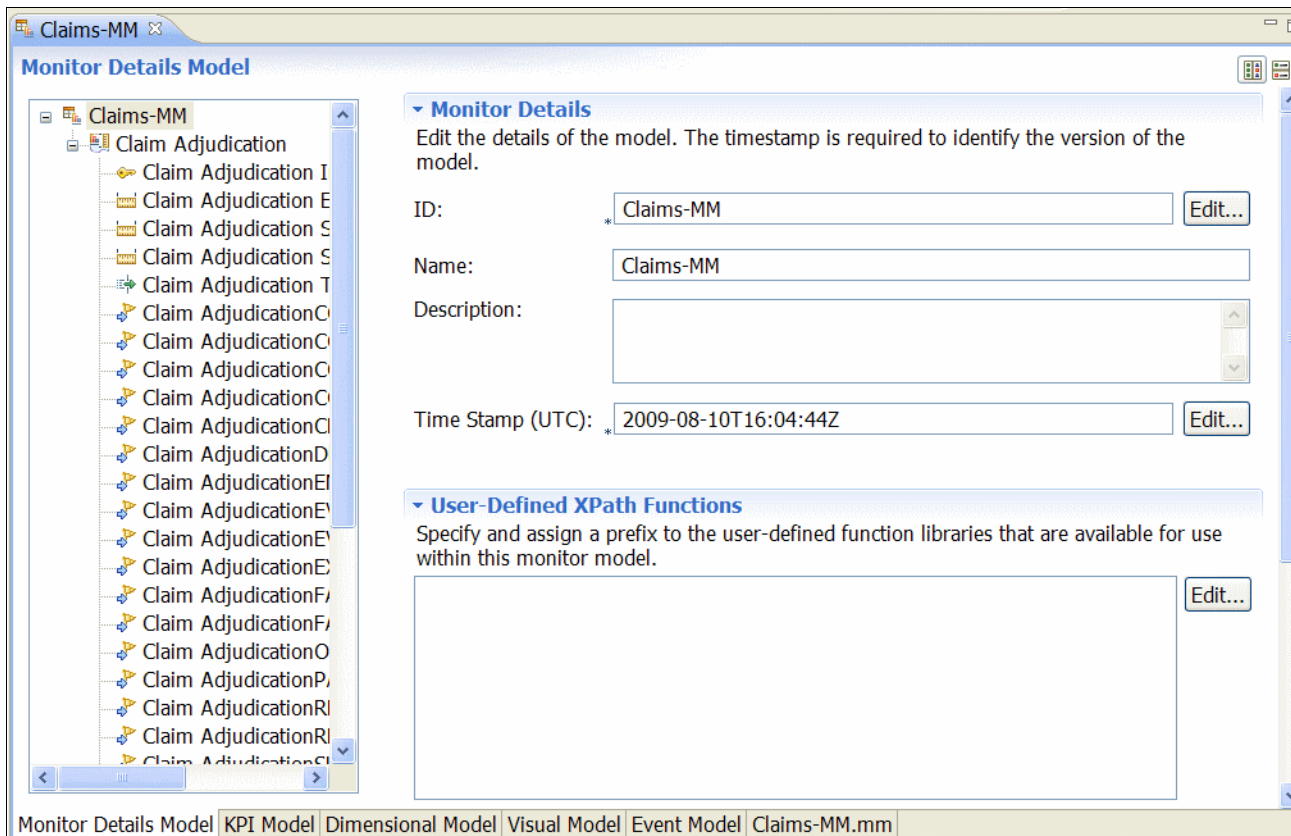


Figure 6-48 Verify monitor model after generation

**Note:** The WebSphere Integration Developer Toolkit environment is a full extension of the Modeler IPD environment that you are already familiar within your Experience phase. If you choose to, the WebSphere Integration Developer Toolkit can be used to augment your monitor model with additional monitoring rich features that the IPD environment doesn't offer.

You can also do iteration testing of your model here in this environment.

After your monitor model is deemed production ready, you can export it in the format of a J2EE artifact to be deployed.



To do this, perform the following steps:

1. Select your monitor model project, right click and click **Export**.
2. Select **Option** to export EAR file (Figure 6-49).

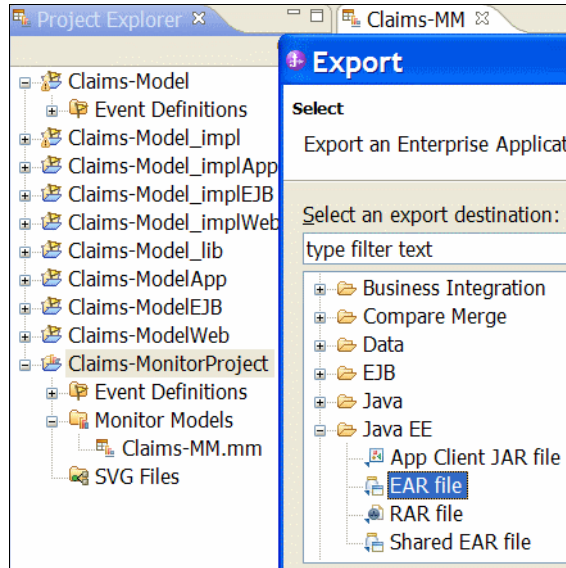


Figure 6-49 Select to export project as a J2EE EAR

3. Enter the external name for the EAR file and specify folder location (Figure 6-50).

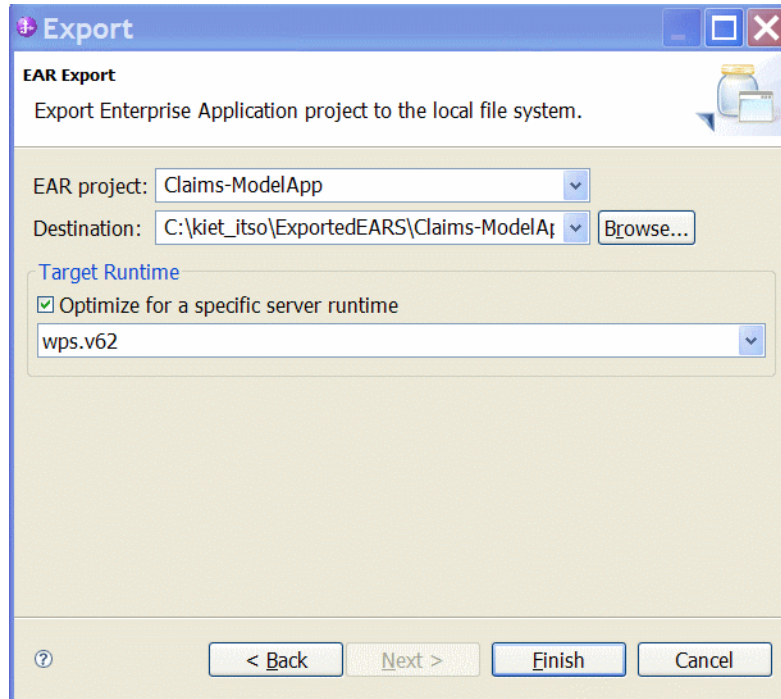


Figure 6-50 Export EAR file

You can now hand off your Monitor model EAR file to be deployed to production.

**Note:** The process of exporting your emitting BPEL application as an EAR file for deployment is exactly the same as the process for exporting a monitor EAR file because they follow one standard specification.

## 6.4 Assemble user experience

The next step in the Prescriptive Guide Approach is “Assemble user experience”. It includes the following tasks:

- ▶ Automatic generation of lotus forms
- ▶ Customization of lotus forms
- ▶ Recommendations for advanced forms creation customization

Figure 6-51 illustrates the current focus of this section within the context of the overall Deployment phase.

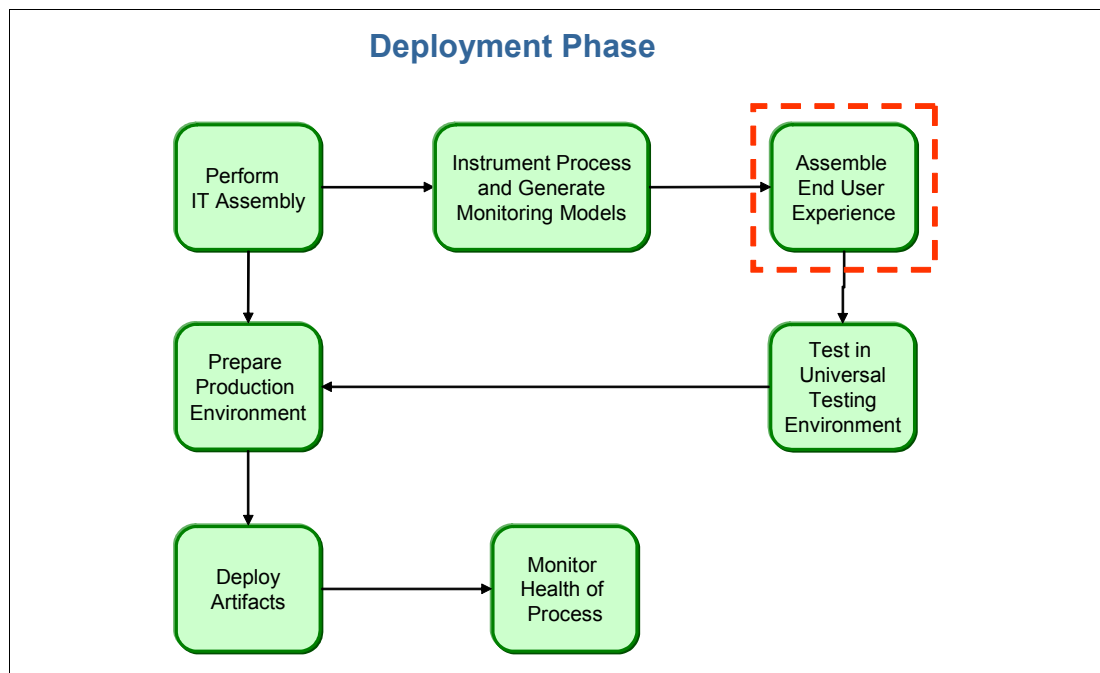


Figure 6-51 Assemble user experience

Forms allow you (the business analyst) to define how business users interact with real-time process information. Forms in our solution can be associated with human tasks only. The relationship between forms, business items, and human tasks is natural:

- ▶ Forms define the user interface.
- ▶ Business items define the data being acted on throughout the process.
- ▶ Human tasks bring data and the user interface together.

One of the ways that you can make your application easier to use is to create custom forms for your human tasks. If you already have forms created using Lotus Forms Designer, you can import these forms into your workspace and associate them with a human task. You can also customize forms that you create in WebSphere Business Modeler and update these forms in

your process model. A custom form designed in Lotus Forms Designer can provide a user-friendly and attractive interface for reviewing and entering the data associated with a human task.

**Note:** When you associate a form with a human task, if the inputs or outputs of the human task do not match the form data, then the inputs and outputs of the human task will be replaced with the form data.

### 6.4.1 Automatic generation of forms for human tasks

This section discusses how to generate a basic form for a human task. You can generate input or output forms for human task by clicking the menu, as shown in Figure 6-52

If the human task has identical inputs and outputs, only one form will be generated and associated with the task as both the input and output form.

If you have forms already created for the human tasks, you can associate forms with human task and process inputs and outputs on the Forms tab in the Attributes view.

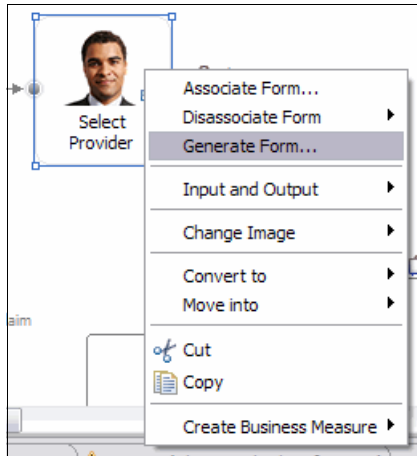


Figure 6-52 Generate Form

## 6.4.2 Customizing the appearance of the form

A plain input or output form using the input or output business item for the activity will be generated. Using the claim intake process for our example, if we use the default form generated from the claim business item for the human task, the user will enter data in a form that contains the inputs shown in Figure 6-53.

The image shows a screenshot of a form titled "Input" on a dotted grid background. The form contains the following fields:

- First Name
- Last Name
- Claim Number
- Claim Type
- Amount
- Plan
- Billing Provider
- Member Number
- Contact Phone
- Contact Address
- Reason Code
- Cause
- Date (with a calendar icon)
- Used Ambulance (checkbox)
- Assign Provider (checkbox)

Figure 6-53 Plain form from automatic generation

Figure 6-53 illustrates only the generic, generated form. You can customize the form by changing colors, rearranging the fields, and inserting graphics into the form using the palette in the Lotus Forms Editor (Figure 6-54 on page 229).

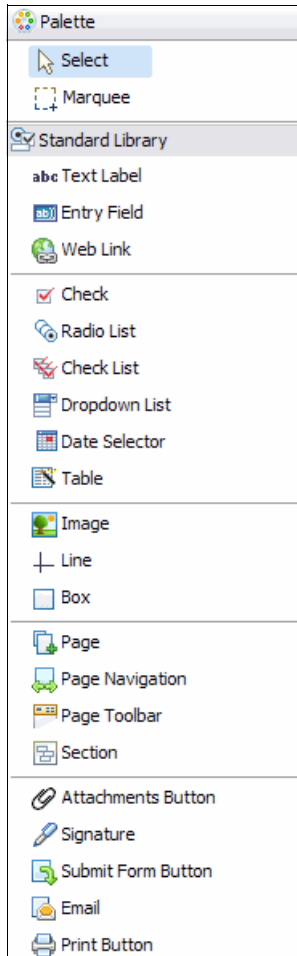


Figure 6-54 Lotus Form Editor Palette

If we customize a form based on the claim business item, then we can present users with a better form layout and format, allowing users to find the fields in the form that are relevant to the current task. This will save users time in data entry.

**Note:** Detailed information about how to customize a form using Lotus Forms Designer is beyond the scope of this paper. Instead, we illustrate a more customized form to give the readers a sense of what is possible when the business analyst works with members of the graphics/design team using Forms Designer.

Figure 6-55 is an example of our custom form after it is modified using the editor.

The screenshot shows a web form interface. At the top, there are two tabs: 'Member' and 'Claim', with 'Claim' being the active tab. To the right of the tabs is the title 'Billing Provider Selection'. Below the tabs is a green header bar with the text 'Member Information'. The main form area contains several input fields: 'Claim Date' with a calendar icon, 'Name' split into 'First' and 'Last', 'Member Number', 'Plan', and 'Contact's Info' split into 'Phone' and 'Address'. To the right of the form is a graphic of a stethoscope over a world map.

Figure 6-55 Customized new form

**Important:** After a form is associated with a human task or process, you or your form designer can move fields to improve the form layout, add headings and graphics, format fonts, and make other visual enhancements to the form. However, it is recommended that you do not add, delete, or re-create form data in the form editor (Lotus Forms Designer). To add or change form data fields, update the attributes of the relevant business items.

### 6.4.3 Advanced Lotus forms editing

In this paper, our objective is to convey the importance and flexibility of creating and designing forms as the user interaction with the system. Fortunately, other resources exist that go into more depth on how to use Lotus Forms and Lotus Forms Designer for advanced editing of Lotus Forms. For more information about using Lotus Forms for advanced design of Forms, consult the following resources:

- ▶ IBM Workplace Forms 2.6: Guide to Building and Integrating a Sample Workplace Forms Application  
<http://www.redbooks.ibm.com/abstracts/sg247388.html?Open>
- ▶ The library for Lotus Forms documentation  
<http://www-01.ibm.com/software/lotus/forms/library.html>

## 6.5 Test applications in Universal Test Environment

This section is the next phase of Deployment within the *Prescriptive Guide Approach*. It focuses mainly on testing the application prior to deploying it to the production environment. Two different types of testing are possible:

- ▶ Unit testing using the Integration Test Client.
- ▶ Automated and batch processed testing using the component testing capabilities

The following sections explain these capabilities in more detail and provides examples on how to go through it. The intention is to give the reader a good overview of the capabilities and, where appropriate, to allow the reader to become educated on specific topics by following links that cover specific topics in greater detail.

Figure 6-56 illustrates the current focus of this section within the context of the overall Deployment phase.

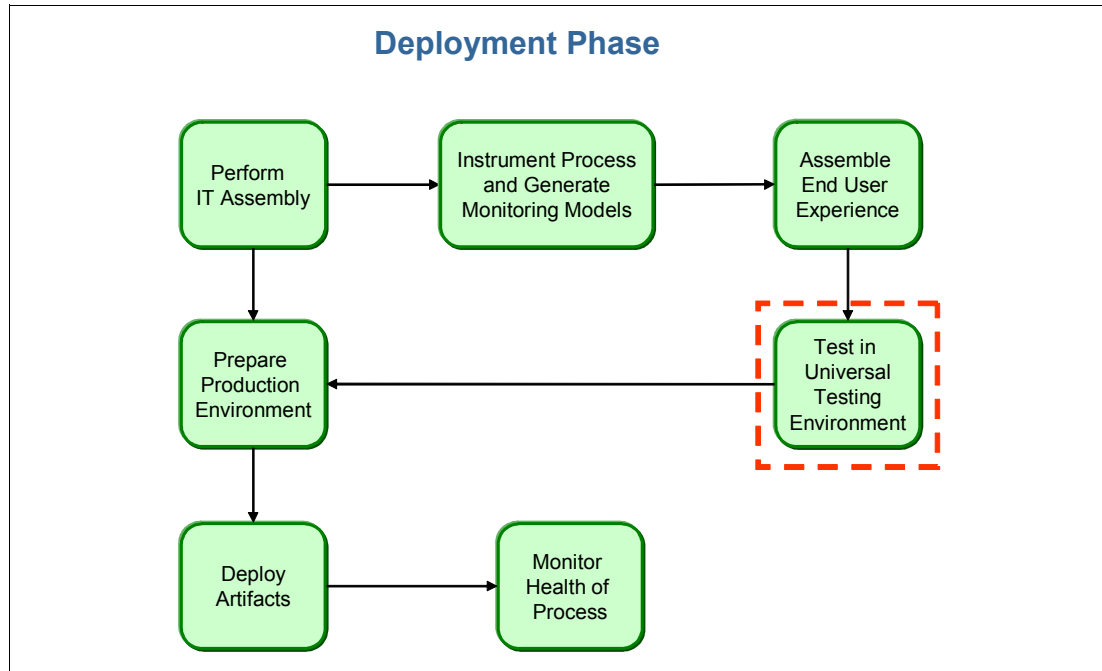


Figure 6-56 Test in Universal Test Environment

The amount and kind of testing performed depends on whether the effort can be completed using the IPD capability. If not, then one can use the component testing capability in the WebSphere Integration Developer environment

### 6.5.1 Using the integration test client

In WebSphere Integration Developer, the integration test client is the designated tool for testing modules and components. The test client features a sophisticated user interface that enables you to manage and precisely control your tests.

The following steps give an overview on how to use the integration test client based on a unit test on the freshly implemented Mediation “Select Provider”.

1. Select **Test Component** from the context menu (Figure 6-57). This triggers a full end-to-end test. Testing the component in isolation permits testing the component without actually calling towards outgoing services.

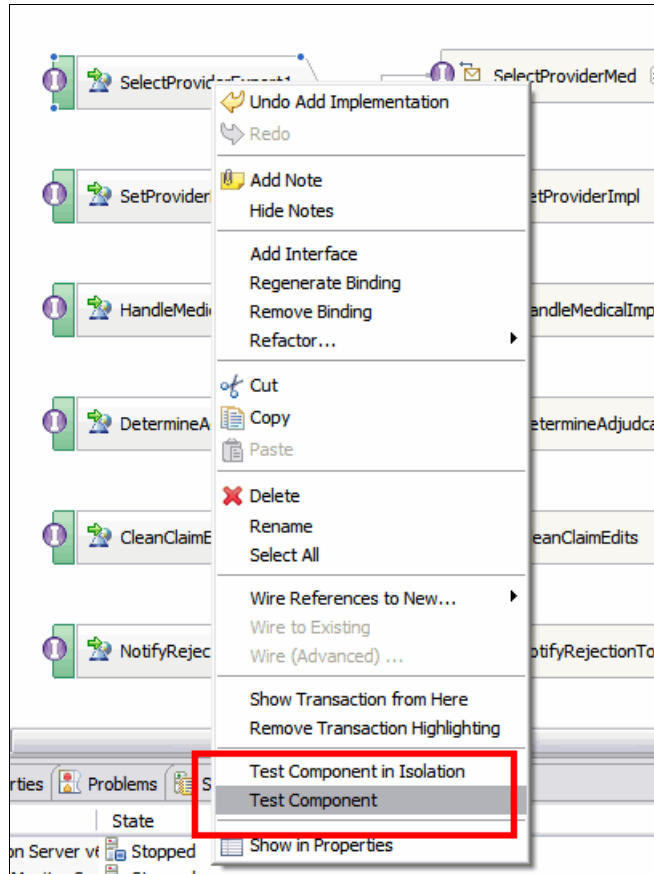


Figure 6-57 Select Test Component from the context menu

2. The integration test client will appear (Figure 6-58 on page 233).

In Figure 6-58 on page 233, (1) permits to start a new unit test, and (2) permits to select values to be send to the service.



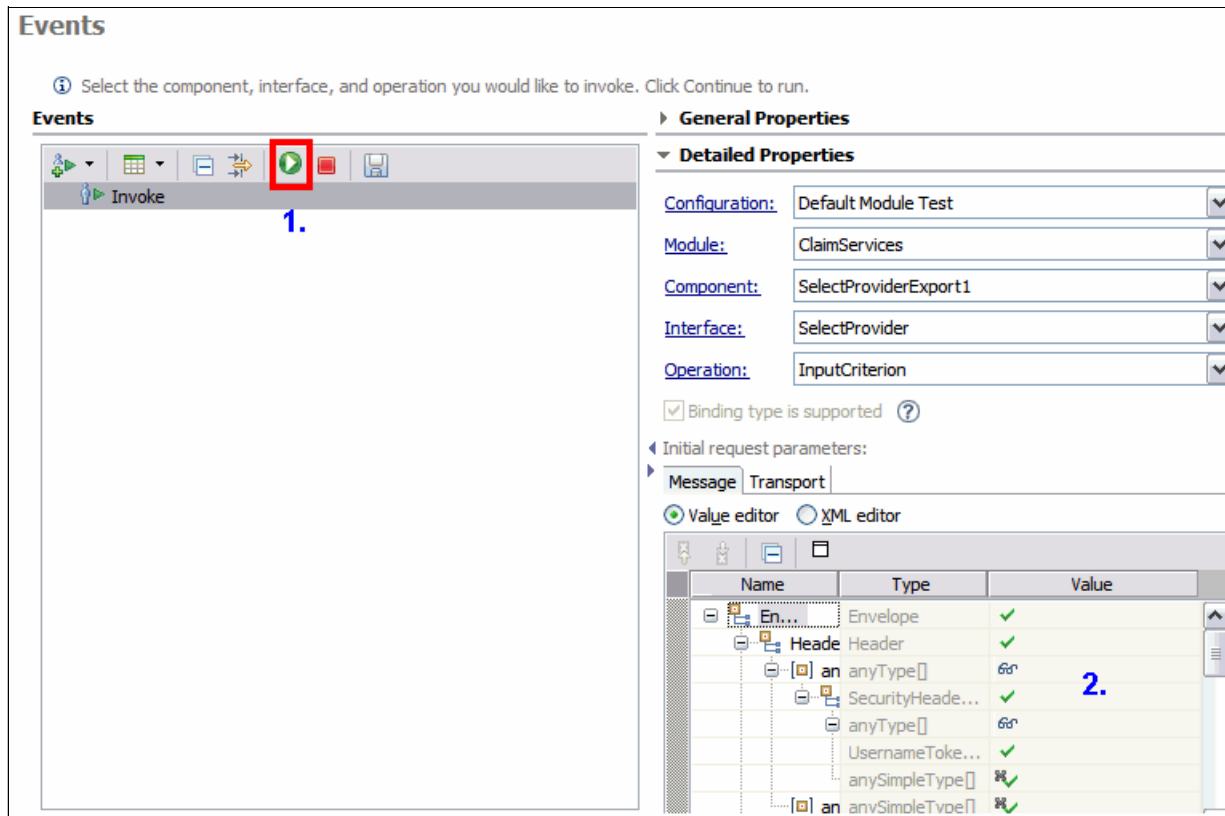


Figure 6-58 Integration test client for Select Provider

The integration test client is rich in functionality. It supports the following features:

- ▶ Events page of the integration test client

In the Events page of the integration test client, you can perform numerous test activities that enable you to interact with your module during testing, such as selecting an operation to test, specifying values for the operation, and invoking the operation.

- ▶ Value and data pool editors

In the Events page of the integration test client, a value editor is provided that enables you to specify, view, edit, and pass values for operations, manual emulations, and event definitions. The value editor also enables you to save values to a data pool, where you can view and edit the values using the data pool editor and later reuse them in the value editor.

- ▶ Configurations page of the integration test client

In the Configurations page of the integration test client, you can edit the default test configuration or you can create and edit new test configurations. This enables you to add modules to your test configurations, or add emulators and monitors to your test configuration modules, to more precisely control your tests.

- ▶ Icons and symbols for the integration test client

In the integration test client and other WebSphere Integration Developer tools, icons are images that are used to invoke actions. Symbols, by comparison, are images that simply represent workbench elements and they are not used to invoke actions.

- ▶ Keyboard shortcuts for the integration test client

In the integration test client, you can perform many of the available test actions by using keyboard shortcuts.

**Note:** More information about the Integration test client can be found within the WebSphere Process Server Information Center at the following Web page:

<http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/topic/com.ibm.wbit.620.help.comptest.ui.doc/topics/rtestui.html>

## 6.5.2 Using component testing

In component testing, you use the new test suite editor and associated wizards to create and define test cases that are comprised of one or more operations. This enables you to sequentially test multiple operations as a group in the integration test client. You can also perform batch component testing on either a test environment server or a stand-alone server by using test scripts or the user interface of the Web-based Component Test Explorer.

The test suite editor is fully integrated into the workbench, which enables you to navigate through the Business Integration view and other views while using the editor. It is also closely integrated with the assembly editor. You can open the assembly editor from the test suite editor. The primary launch point for the test suite editor is the Business Integration view. You can open multiple instances of the test suite editor and use them to define your test suites and test cases.

**Note:** More information about component testing can be obtained within the WebSphere Process Server Information Center at the following Web page:

<http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/topic/com.ibm.wbit.620.help.comptest.ui.doc/topics/ccomptestovw.html>

## 6.6 Prepare production environment

Create a staging environment for testing on the full topology. This environment will be created with a production topology as close as possible to the actual topology. The same topologies, database configurations, messaging resources, and repositories should be used as for production.

The product stack to install includes the following items:

- ▶ WebSphere Process Server
- ▶ WebSphere Business Monitor
- ▶ WebSphere Services Registry and Repository

After testing is complete, perform any installation needed on the production topology.

Figure 6-59 on page 235 illustrates the current focus of this section within the context of the overall Deployment phase.

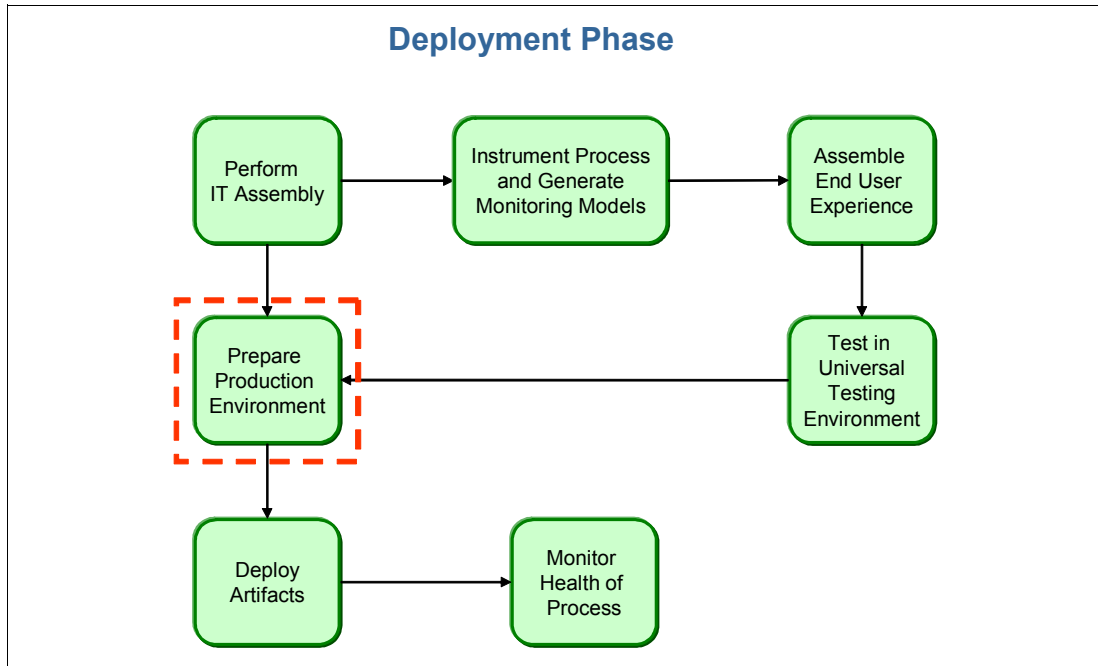


Figure 6-59 Prepare production environment

In general, a variety of topologies are possible and a decision on the best solution depends on the appropriate customer needs. In this paper, a topology has been chosen that has an average complexity and is suitable for showing the various configuration steps.

The selected topology for BPM is named *BPM Golden Topology* (Figure 6-60 on page 236). It includes the following features:

- ▶ **Application Deployment Cluster**  
This cluster contains the business process applications (For example, BPEL Processes).
- ▶ **Web Tools Cluster**  
This cluster contains the Web based administration tools, such as the Business Space.
- ▶ **Messaging Cluster and Support Cluster**  
This cluster contains internal BPM components, such as the Registry, messaging engines, as well as the Business Rules Engine.

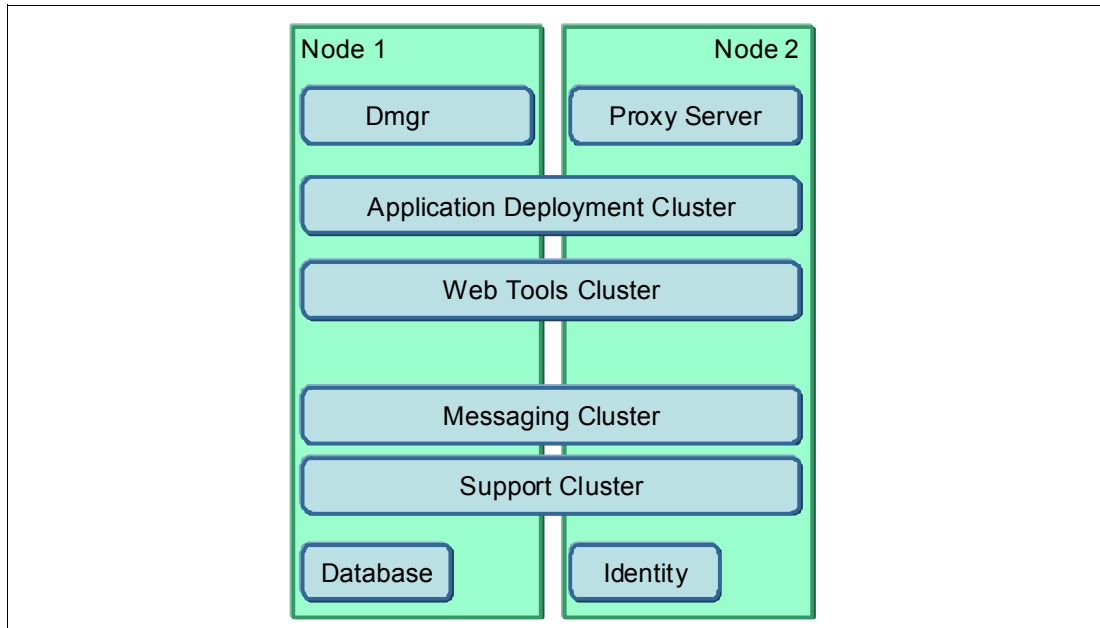


Figure 6-60 Example production topology

The clustered environment is installed on two dedicated logical or physical machines.

**Note:** The two nodes should have at least five gigabytes of available memory each, and be running on a modern CPU architecture.

For scalability reasons and for further high availability specific requirements, it might be necessary to add additional LPARs such as for duplication of the database, but also duplication of the HTTP server and duplication of identity servers (LDAP).

A detailed click-by-click installation of such an environment is out of scope of this paper. However, the link in the following note gives detailed information about how to set up a BPM topology within a clustered environment.

**Note:** The IBM Redbooks publication “WebSphere Business Process Management V6.2 Production Topologies” can be found at the following Web page:

<http://www.redbooks.ibm.com/abstracts/sg247732.html>

It gives in-depth explanations on how to set up a production environment for a business process management environment.

## 6.7 Deploy applications

Deploying applications is the next step in the Deployment Phase part of the *Prescriptive Guide Approach*. The following sections give a high-level overview of the following capabilities:

- ▶ Manually generate applications within WebSphere Integration Developer
- ▶ Automatically generate applications using command line tools and ANT support.
- ▶ Manually deploy applications to the server environment
- ▶ Automatically deploy applications to the server environment

Figure 6-61 illustrates the current focus of this section within the context of the overall Deployment phase

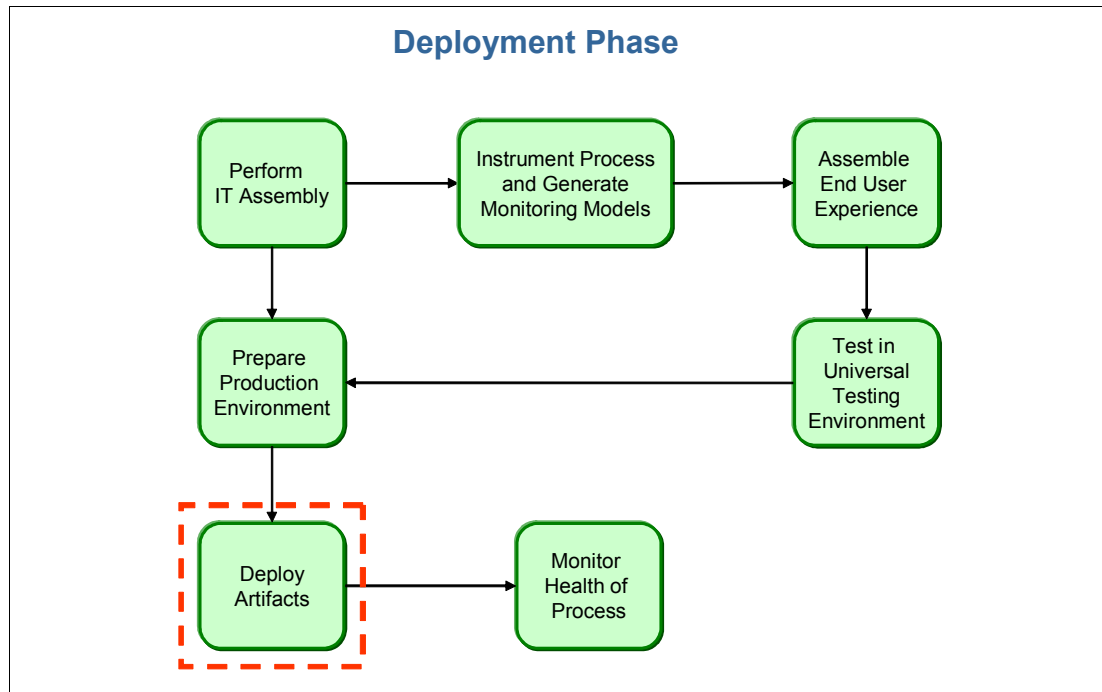


Figure 6-61 Generate and deploy applications to server

### 6.7.1 Generate applications in WebSphere Integration Developer

This section shows how to generate applications within WebSphere Integration Developer. The section shows in an overview how the modules created in the previous steps can be packaged as EAR files and saved to the disk.

The following steps illustrate how to perform these actions.

1. Select **File** → **Export** from the menu (Figure 6-62).

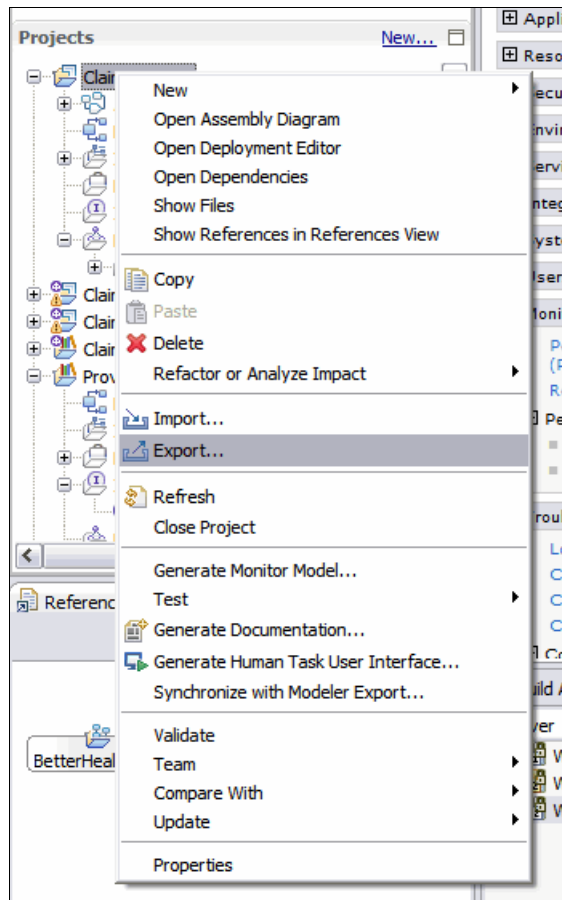


Figure 6-62 Export Module as an EAR file

2. The “Integration Module Export” dialog box in Figure 6-63 displays. Select **EAR files for server deployment** and select which EARs to deploy.

**Important:** The modules will have versioning enabled, in which case you can only export these as a Command Line service deployment. The user will have to use the service deployment command line tool to generate the EAR file to deploy to the server. More details can be found within WebSphere Process Server Information Center at the following Web page:

[http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp?topic=/com.ibm.websphere.wps.620.doc/doc/tadm\\_installversionedsca.html](http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp?topic=/com.ibm.websphere.wps.620.doc/doc/tadm_installversionedsca.html)

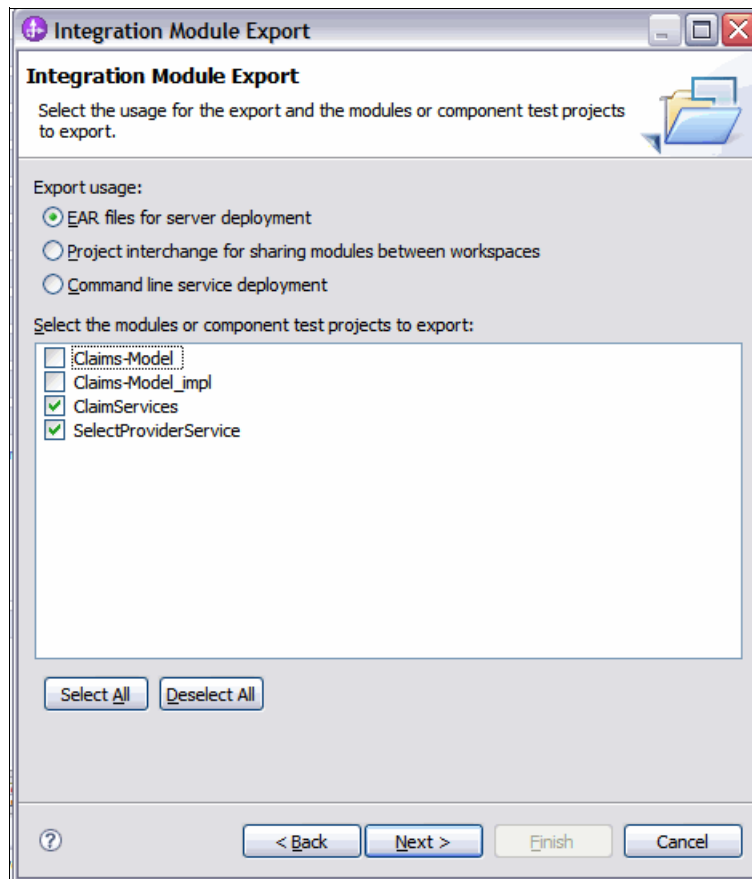


Figure 6-63 Integration Module Export - Select export usage

3. Select a directory (Figure 6-64) and click **Finish** to continue.

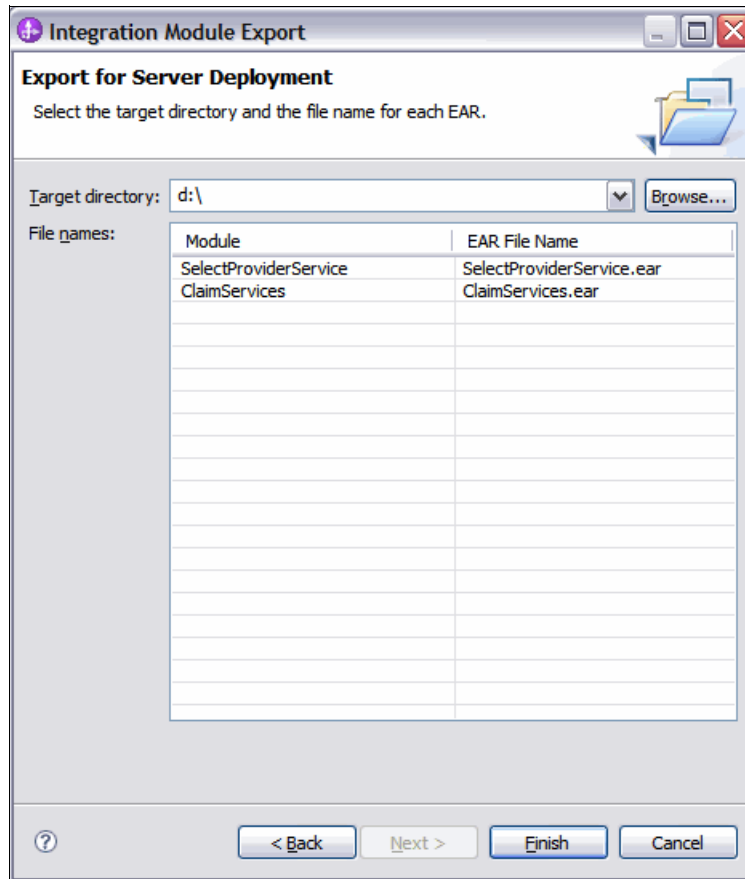


Figure 6-64 Select target directory

Exporting the modules as Service Deploy archives occurs in a similar manner. Instead of selecting **EAR files for server deployment**, the user selects command-line service deployment.

**Note:** More details on deploying modules can be found within the WebSphere Process Server Information Center at the following Web page:  
[http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/topic/com.ibm.websphere.wps.620.doc/doc/tdep\\_depprodserver.html](http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/topic/com.ibm.websphere.wps.620.doc/doc/tdep_depprodserver.html)

## 6.7.2 Implementation of an automated build

WebSphere Process Server does not offer out-of-the-box scripts to build and deploy application modules. However, the artifacts and script languages to write such a script do exist. We recommend Apache ANT to write the build script. WebSphere Process Server offers ANT tasks for the following purposes:

- ▶ ServiceDeploy Build of Module using ServiceDeploy
- ▶ EJB Deploy Generation of EJB deployment code

For application deployment to the server we recommend the usage of Jython or JACL. This is documented as example scripts within the various Information Centers. See the note box on the next page for links to relevant resources.



**Note:** Information about creating a deployable application module using the ServiceDeploy command line tool can be found at the following Web page:

[http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp?topic=/com.ibm.websphere.wps.z.620.doc/doc/rdev\\_servicedeploy.html](http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp?topic=/com.ibm.websphere.wps.z.620.doc/doc/rdev_servicedeploy.html)

Information about the ServiceDeploy command line tool also available as a specific Apache Ant task. Refer to the following Web page:

[http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp?topic=/com.ibm.websphere.wps.620.doc/doc/tdep\\_usingant.html](http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp?topic=/com.ibm.websphere.wps.620.doc/doc/tdep_usingant.html)

### 6.7.3 Deployment of applications

After the EAR files are produced, they can be deployed to the WebSphere Process Server and WebSphere Business Monitor environments. Detailed deployment is out of scope of this paper.

Additionally, deployment can also be executed through the use of Jython or JACL, executed using the wsadmin tool. The wsadmin tool is a command-line version of the administrative console and can be used to script any activity executed in the administrative console. More information about this topic as well as the WebSphere Process Server and WebSphere Business Monitor Information Center at the following Web page:

[http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/topic/com.ibm.websphere.wps.620.doc/doc/tdep\\_depprodserver.html](http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/topic/com.ibm.websphere.wps.620.doc/doc/tdep_depprodserver.html)

## 6.8 Monitor health of process

After the application is deployed, a user might want to monitor the health of the processes contained in these applications. Monitoring the health of the process is the next step in the Deployment phase.

The tools and components that are part of the WebSphere BPM suite allow a variety of possibilities. In this section we selected four major capabilities and explain the capabilities briefly in the sections that follow. Note that detailed descriptions of these capabilities are not in the scope of this paper. We indicate links and references we think are useful to give more details.

Figure 6-65 illustrates the current focus of this section within the context of the overall Deployment phase.

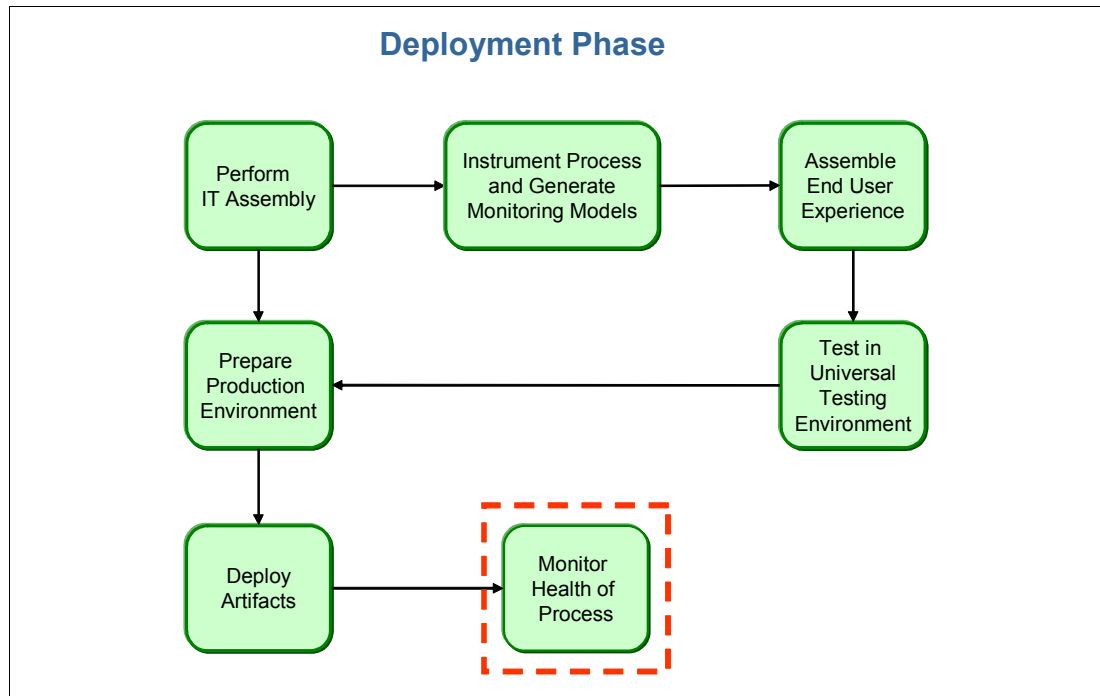


Figure 6-65 Monitor health of the process

If you look for throughput and performance problems, or if you look to adjust your system to provide scalability and reliability, the following four capabilities within WebSphere Process Server permit to monitor health and debug your system.

► Failed Event Manager

Failed Event Manager is used to monitor errors in asynchronous communication. If, for example, a message could not be delivered to a target component, the user can use the Failed Event Manager to resubmit this message after either correcting message payload or after correcting the error.

► Service Integration Bus Browser

Service Integration Bus Browser is used to monitor and administer the Service Integration Bus topology underneath WebSphere Process Server. It delivers details about messaging engines, publishing points and also queue depth. Additionally, it can be used to manage messages in a queue including to browse the content of messages.

► Business Space Health Monitor

The Business Space Health Monitor is part of the Business Space. It gives an aggregated and high level view on application and component health which are part of WebSphere Process Server.

► Tivoli® Performance Viewer

Tivoli Performance Viewer can be used to do performance tuning of a business process Management Production Environment.

First-failure data capture support (FFDC), logs, and trace can be used to track down issues: FFDC persists records of failures and significant software incidents that occur during runtime in WebSphere Process Server or WebSphere Enterprise Service Bus. Additionally WebSphere provides logs and trace settings which can be used to debug and trace a problem to the deepest level.

**Note:** Refer to WebSphere Application Server 6.1 Information Center for more detailed information about how to troubleshoot WebSphere, at the following Web page:

[http://publib.boulder.ibm.com/infocenter/wasinfo/v6r1/topic/com.ibm.websphere.nd.multiplatform.doc/info/ae/ae/ttrb\\_diagfix.html](http://publib.boulder.ibm.com/infocenter/wasinfo/v6r1/topic/com.ibm.websphere.nd.multiplatform.doc/info/ae/ae/ttrb_diagfix.html)

## 6.8.1 Failed event manager

The failed event manager is a Web-based client for working with and resubmitting the failed invocations. It is an integration application and is available in the administrative console. It displays the number of failed events and provides a number of search capabilities.

You can query for failed events using a variety of criteria such as date, last successful or failed event, by exception text, or a combination of these.

Figure 6-66 provides a high-level illustration of WebSphere Process Server exception processing and its relationship to the failed event manager. Explanations of the numbered steps follow the illustration.

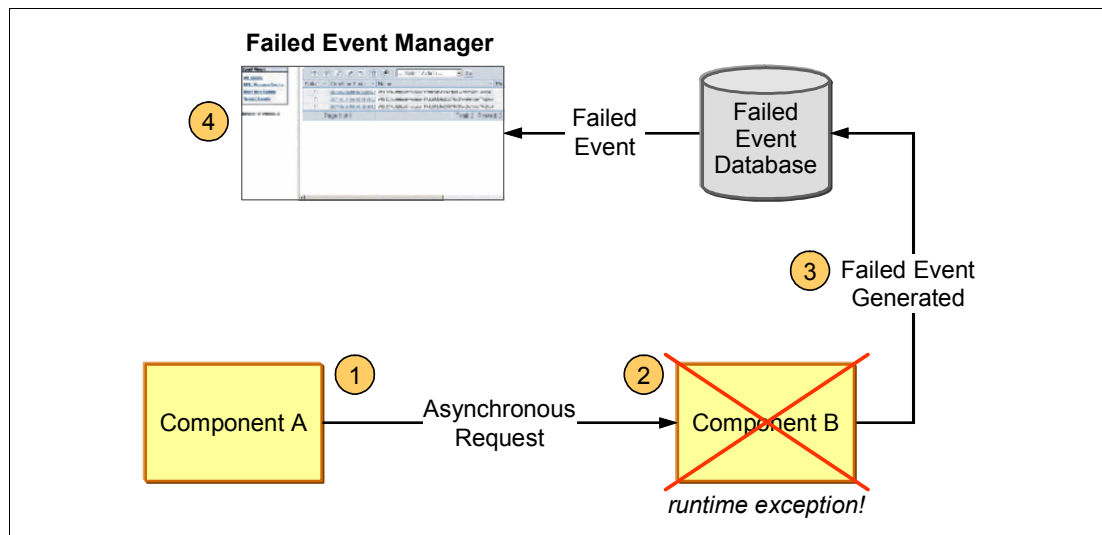


Figure 6-66 Failed event manager

1. Component A calls component B in an asynchronous manner.
2. Component B encounters a runtime exception and a failed event record is generated.
3. The failure recovery service captures this failure and stores it in the failed event database.
4. The system administrator opens the failed event manager to investigate the problem.

**Note:** The WebSphere Process Server Information Center gives more details on the Failed Event Manager. Consult the following Web page for more information:

[http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp?topic=/com.ibm.websphere.wps.620.doc/doc/ctroub\\_howto\\_submitt\\_failed\\_events.html](http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp?topic=/com.ibm.websphere.wps.620.doc/doc/ctroub_howto_submitt_failed_events.html)

Additionally the following Web page gives a detailed explanation based on a use case on recovery from an error situation using the failed event handler:

[http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp?topic=/com.ibm.websphere.wps.620.doc/doc/ctroub\\_howto\\_submitt\\_failed\\_events.html](http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp?topic=/com.ibm.websphere.wps.620.doc/doc/ctroub_howto_submitt_failed_events.html)

## 6.8.2 Service Integration Bus Browser

The Service Integration Bus Browser provides a single location for browsing and performing day-to-day operational tasks on service integration buses. The Service Integration Bus Browser is noted for debugging asynchronous communication. Application errors can cause messages not to be picked up. Using the SIB Explorer, the user can check where his messages remain.

Examples of day-to-day operations include browsing service integration buses, viewing runtime properties for messaging engines, or managing messages on message points. The browser is not intended as a bus configuration tool. Figure 6-67 shows the Service Integration Bus Browser which is embedded in the Administrative Console.

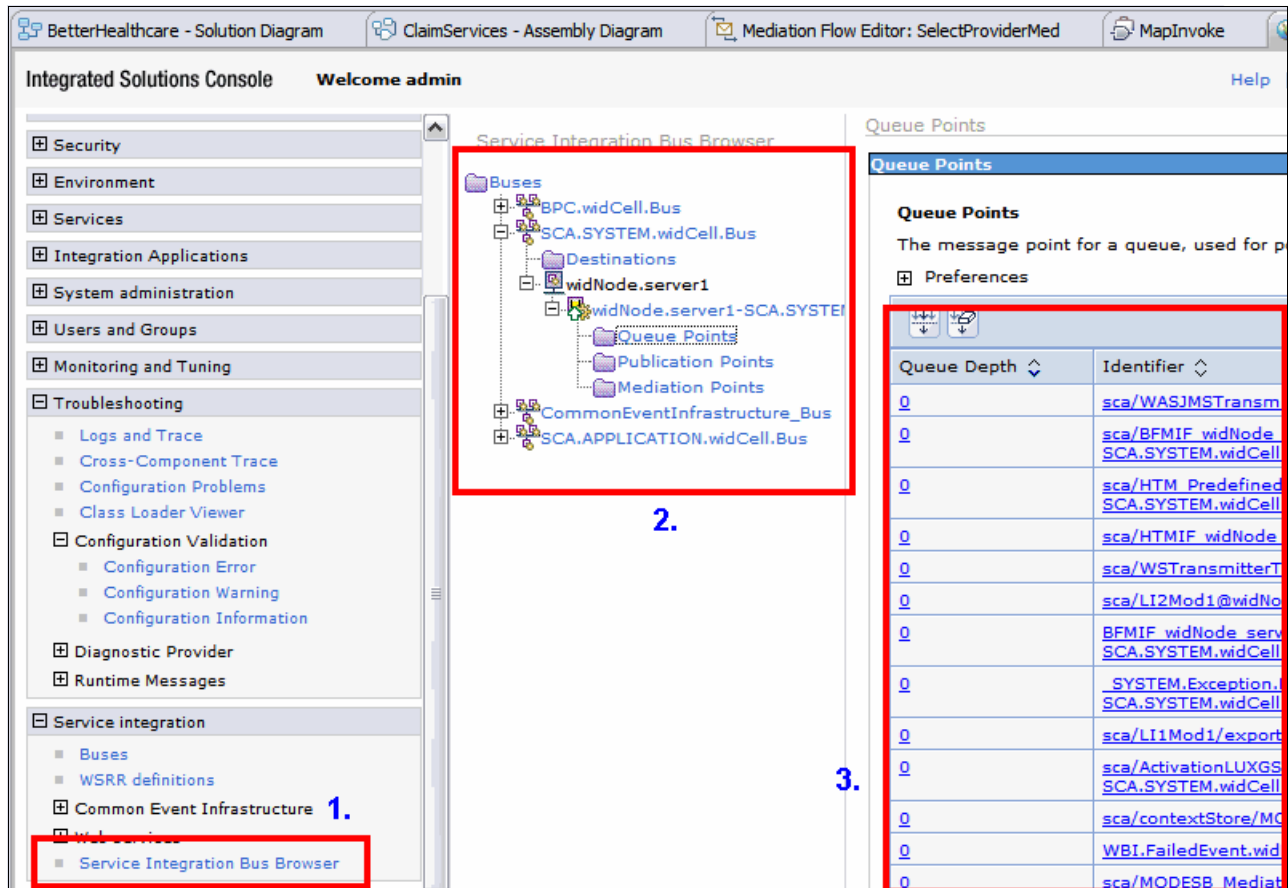


Figure 6-67 Service Integration Bus Browser within the administrative console

1. From within the Administrative Console the SIB Browser can be accessed by navigating to **Service Integration** → **Service Integration Bus Browser**.
2. A panel shows the Bus topology including messaging engines, queue points, publication points, and mediation points.
3. A panel shows actual content of Queue Points. In this case we selected the queue points from the SCA System Bus.

**Note:** The Service Integration Bus Browser gives you the ability to monitor queue content and browse messages on the queue. It is a useful tool for debugging. More information about the Service Integration Bus Browser can be found within the IBM WebSphere BPM Information Center at the following Web page:

[http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp?topic=/com.ibm.websphere.wps.620.doc/doc/cadm\\_sibbrowser.html](http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp?topic=/com.ibm.websphere.wps.620.doc/doc/cadm_sibbrowser.html)

### 6.8.3 Business Space health widgets

The Business Space health widgets, also known as the Health Monitor (Figure 6-68), are used to view a snapshot of the overall system health of your business solution. These widgets provide a single place from which you can quickly assess the status of application servers, nodes, clusters, deployment environments, messaging engines and their queues, databases, system applications, and failed events.

Queue Name ^	Messaging Engine Name	SI Bus Name	Depth
BFMIF_widNode_server1.com.ibm.bpe.api.sca.BFMJMS_FAILEDEVENT_D_SIB	widNode.server1-SCA.SYSTEM.widCell.Bus	SCA.SYSTEM.widCell.Bus	0
BFMJMSAPIQueue_widNode_server1	widNode.server1-BPC.widCell.Bus	BPC.widCell.Bus	0
BFMJMSCallbackQueue_widNode_server1	widNode.server1-BPC.widCell.Bus	BPC.widCell.Bus	0
BFMJMSReplyQueue_widNode_server1	widNode.server1-BPC.widCell.Bus	BPC.widCell.Bus	0
BPCCEIConsumerQueueDestination_widNode_server1	widNode.server1-CommonEventInfrastructure_Bus	CommonEventInfrastructure_Bus	0
BPCTransformerQueueDestination_widNode_server1	widNode.server1-CommonEventInfrastructure_Bus	CommonEventInfrastructure_Bus	0
BPEHIdQueue_widNode_server1	widNode.server1-BPC.widCell.Bus	BPC.widCell.Bus	0
BPEIntQueue_widNode_server1	widNode.server1-BPC.widCell.Bus	BPC.widCell.Bus	0
BPERetQueue_widNode_server1	widNode.server1-BPC.widCell.Bus	BPC.widCell.Bus	0

Figure 6-68 Health Monitor

In Health Monitor, you can perform the following actions:

- ▶ Customize the widget to provide status on a desired subset of system components. Click **Configure** from the widget menu to access the list of item types available in Health Monitor. By default, all item types are selected. Clear any that you do not want to monitor. You can update this configuration at any time to change the types of system components you are currently monitoring. In addition, you can use the text boxes under certain system components (clusters, servers, deployment environments, applications, and system databases) to further filter the monitoring results. Enter the full text or use partial text with a wild card character. The text fields support two types of wild cards:
  - Question mark (?) is a single-character wild card
  - Asterisk (\*) is a multi-character wild card.

You can enter multiple values delimited by a comma (,) or a carriage return.

- ▶ Specify the rate at which the widget refreshes the information. You can specify any positive value in the **Refresh every numberOfSeconds** field. Set it to 0 (zero) to prevent Health Monitor from refreshing.
- ▶ Specify the number of rows to show per page. For each system component you are monitoring, Health Monitor displays only the number of rows you specify. All other rows are placed into tabbed pages. Use the forward arrow (>) and back arrow (<) to navigate through the data. When you have configured Health Monitor to display a large number of system component types, use a smaller value for the **Rows per page** field to prevent the need for excessive scrolling.
- ▶ Specify the maximum number of query results sent from the server to the client. You can specify any positive value in the **Maximum query result** field.

**Note:** More details about the Health Monitor can be obtained from the WebSphere Process Server Information Center at the following Web page:

[http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp?topic=/com.ibm.bspace.620.help.widgets.doc/doc/help\\_healthwidget/help\\_healthmonitor.html](http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp?topic=/com.ibm.bspace.620.help.widgets.doc/doc/help_healthwidget/help_healthmonitor.html)

A more concrete scenario is shown at the following Web page:

[http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp?topic=/com.ibm.bspace.620.help.framework.doc/scenarios/solution\\_management/solutionmanagementscenario2.html](http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp?topic=/com.ibm.bspace.620.help.framework.doc/scenarios/solution_management/solutionmanagementscenario2.html)

## 6.8.4 Tivoli Performance Viewer

The Tivoli Performance Viewer (TPV) is a powerful application that allows you view a variety of details of about the performance of your server. The performance viewer enables administrators and programmers to monitor the current health of WebSphere Process Server. Because the collection and viewing of data occurs on the process server, performance is affected. To minimize performance impacts, monitor only those servers whose activity you want to monitor.

The following steps show how to use the Tivoli Performance Viewer:

1. Activate the Performance Monitoring Infrastructure (PMI) on the server, as depicted in Figure 6-69.

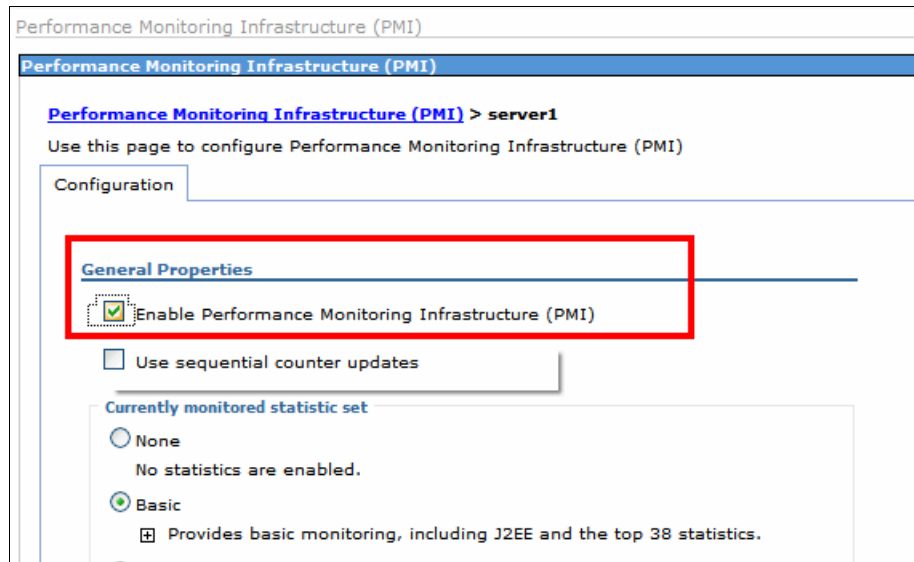


Figure 6-69 Activate Performance Monitoring Infrastructure

2. Select **Monitoring and Tuning** → **Performance Viewer** → **Current Activity** from the menu.
3. Figure 6-70 shows the Tivoli Performance Viewer details.
  - (1) shall be used to select a Performance Module (such as a JDBC Datasource).
  - (2) permits to actually display the content in the right pane
  - (3) view can be toggled between a graphical overview and a table overview. In this case it is a table overview.

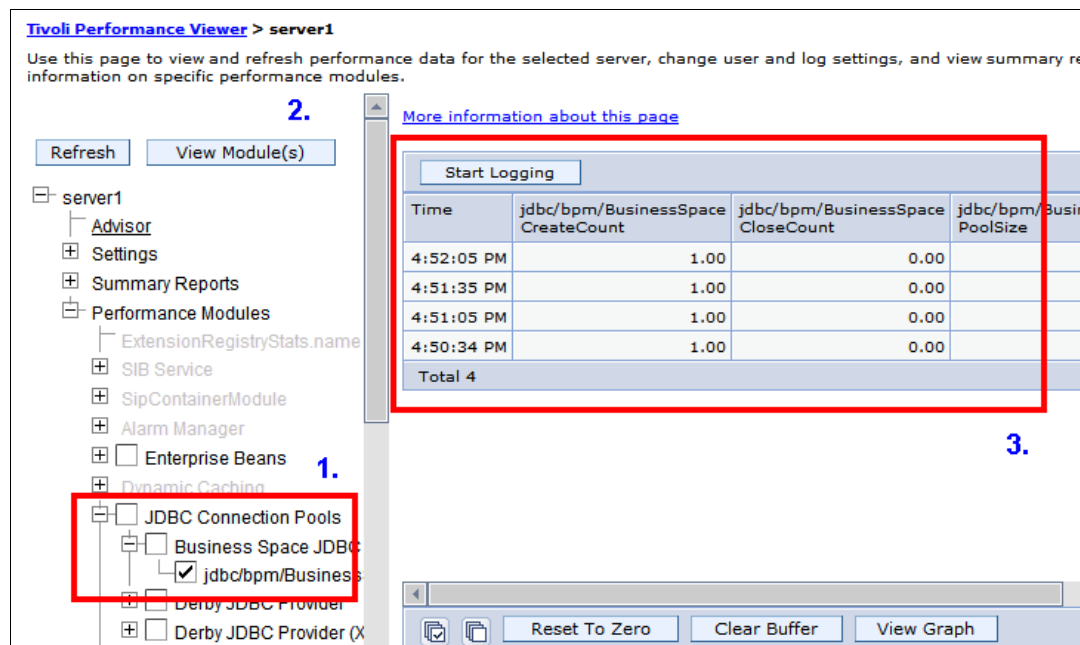


Figure 6-70 Tivoli Performance Viewer

**Note:** The WebSphere Process Server 6.2 Information Center provides more details about using Tivoli Performance Viewer within WebSphere BPM products. Refer to the following Web page:

[http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp?topic=/com.ibm.websphere.wps.620.doc/doc/tmon\\_viewing\\_pmi.html](http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp?topic=/com.ibm.websphere.wps.620.doc/doc/tmon_viewing_pmi.html)

Additional information can be obtained within the WebSphere Application Server V6.1 Information Center at the following Web page:

[http://publib.boulder.ibm.com/infocenter/wasinfo/v6r1/index.jsp?topic=/com.ibm.websphere.nd.multiplatform.doc/info/ae/ae/tprf\\_tpvmonitor.html](http://publib.boulder.ibm.com/infocenter/wasinfo/v6r1/index.jsp?topic=/com.ibm.websphere.nd.multiplatform.doc/info/ae/ae/tprf_tpvmonitor.html)

**Note:** For performance monitoring going beyond the usage of Tivoli Performance Viewer, including for example alerts, notification or a more advanced Dashboard, we strongly recommend the usage of Tivoli Composite Manager for SOA. More info on ITCAM for SOA can be obtained at the following Web page:

<http://www-01.ibm.com/software/tivoli/products/composite-application-mgr-soa/>





# A

## Additional material

This paper refers to additional material that can be downloaded from the Internet as described below.

### Locating the Web material

The Web material associated with this paper is available in softcopy on the Internet from the IBM Redbooks Web server. Point your Web browser at:

<ftp://www.redbooks.ibm.com/redbooks/REDP4543>

Alternatively, you can go to the IBM Redbooks Web site at:

[ibm.com/redbooks](http://ibm.com/redbooks)

Select the **Additional materials** and open the directory that corresponds with the IBM Redpaper form number, REDP4543.

### Using the Web material

The additional Web material that accompanies this paper includes the files shown in Table A-1 on page 250.

Table A-1 Materials available for download

Filename	Description
IBM Business Process Management Prescriptive Guide to Solution Implementation	Prescriptive guidance that is simple and usable on how to use BPM products to deliver a solution into production within 60 days.
ArchitectureGuide.pdf	Appendix - Architecture Guide: Includes material on selecting and implementing a BPM SOA Architecture
ImplementWebServices.pdf	ImplementWebServices: Includes additional material on how to link existing webservices to the Business Processes
Claims-Model_2009-05-27T16.31.59.zip	Contain WID Projects used as an example in this IBM Redpaper publication
ClaimsServices.zip	Contain WID Projects used as an example in this paper
Claims-Model_Final.mar	Contains the modeler Projects

## How to use the Web material

Create a subdirectory (folder) on your workstation, and unzip the contents of the Web material zip file into this folder.

# Related publications

The publications listed in this section are considered particularly suitable for a more detailed discussion of the topics covered in this paper.

## IBM Redbooks

For information about ordering these publications, see “How to get Redbooks” on page 251. Note that some of the documents referenced here might be available in softcopy only.

- ▶ *Business Process Management Enabled by SOA*  
<http://www.redbooks.ibm.com/abstracts/redp4495.html>

## Online resources

These Web sites are also relevant as further information sources:

- ▶ IBM BPM — Business Process Management Site  
<http://www-01.ibm.com/software/info/bpm/>
- ▶ BPM Blueworks  
<https://apps.lotuslive.com/bpmbblueworks/>

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# BPM Solution Implementation Guide



**Practical approach to rapid BPM solution delivery**

**Business-driven BPM solution implementation**

**Complements existing business partner and customer solution methodologies**

This IBM Redpaper publication provides a practical bridge toward achieving successful BPM solution implementation within 60 days. It is based on an approach using phases and specific activities outlined in the IBM Business Process Management Prescriptive Guide to Solution Implementation.

To provide a realistic context for the solution, we incorporate the process, business model, and specific scenario from a health care provider. The context is based on a live code demo that consists of a fictitious application based on a customer scenario, using the approach in the IBM Business Process Management Prescriptive Guide to Solution Implementation to assemble the solution.

This Redpaper discusses how to analyze, model, and manage the processes within this realistic health care scenario.

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