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The Process Architect: The Smart Role in Business Process Management

This IBM® Redpaper™ publication is about business process management and encouraging process architects to model, analyze, deploy, monitor, and continuously improve business processes.

Introduction

Today, more organizations that are facing aggressive market challenges share the same opinion: To be more agile in reacting to market changes, companies have to understand their business processes better and in more detail, and also have to be able to change them quicker. Business processes represent the organization's key assets. The way a company invents, provides, and controls its core products and services depends on its core business processes, and how well these can be managed and adapted to market changes is critical. Therefore, the management of business processes on a large scale is more important than ever. The key question however is: How can we get a quick handle on all these processes to understand them, and to be able to faster adapt them to changing market conditions?

Today business process management (BPM) is combined with service-oriented architecture (SOA), reusing new and existing services during automated process execution (see Figure 1 on page 2).

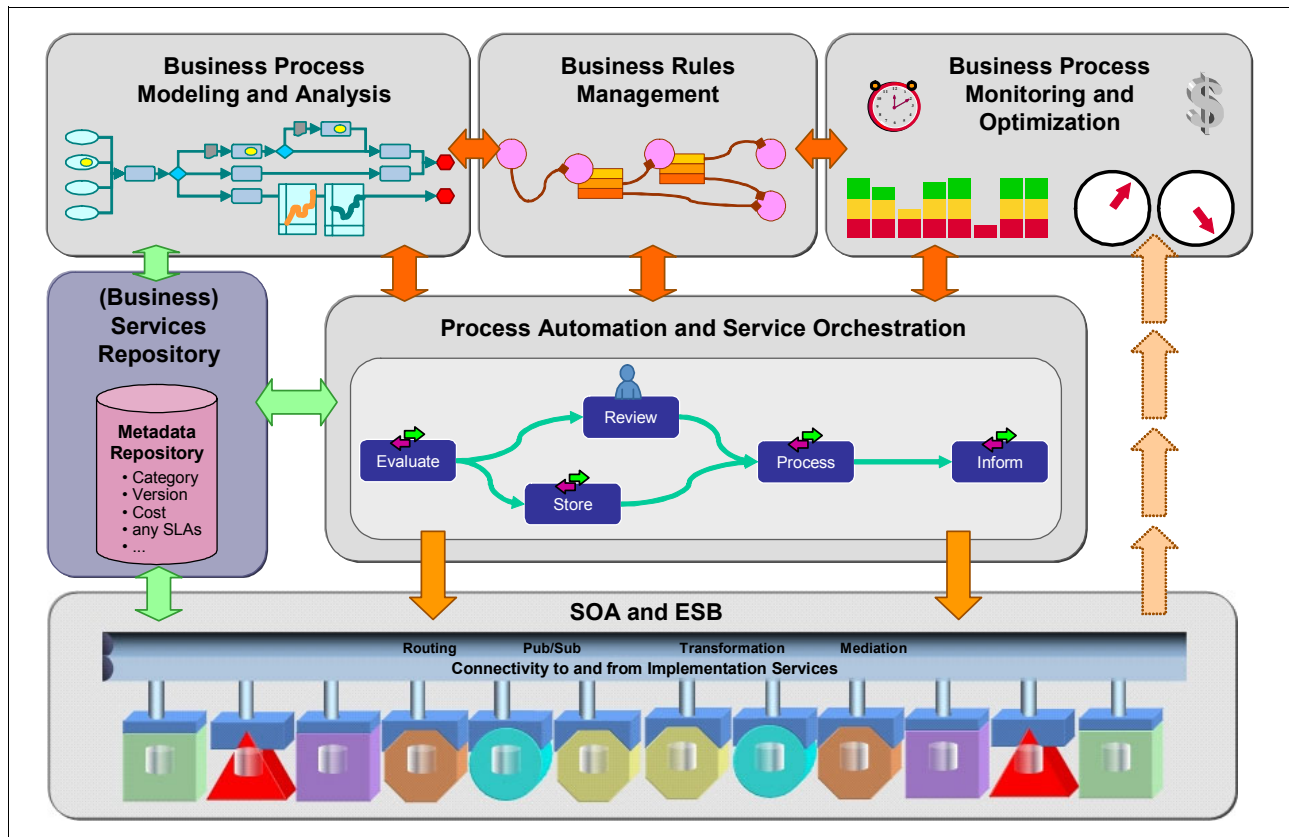


Figure 1 Business process management and SOA

Business processes are owned by business units, line-of-business (LOB) executives and managers, or at best, by business process owners. In most enterprises, these business processes are implemented across various IT systems and applications. Business-oriented process owners want to be able to adapt and change their business processes quickly and without having to follow cumbersome requirement procedures with their IT departments. They are seeking more power and capabilities to have a direct handle on their business processes. The question is: Is BPM able to deliver more power to business people, or not?

What is BPM

Business process management (BPM) is a discipline combining software capabilities and business expertise to accelerate business process improvement and to facilitate business innovation. BPM governs an organization's cross-functional, core business processes. It helps to achieve strategic business objectives by directing the deployment of resources from across the organization into efficient processes that create customer value. This focus on driving overall top- and bottom-line success, by integrating verticals and optimizing core work, differentiates BPM from traditional, functional-management disciplines. Another aspect of BPM is having continuous process improvements, perpetually increasing value generation and sustaining the market competitiveness (or dominance) of an organization.

Now, with all that in mind, many companies refocus on BPM, seeking significant business process optimization, which is normally done by what many companies refer to as *following the disciplines of BPM*.

The disciplines are illustrated in Figure 1 on page 2, and briefly explained here:

- **Business Process Modeling and Analysis**

Business processes must first be documented to a level of detail that allows people to understand the details about implementation. When done, business analysts might have to further analyze the process model to understand business process optimization potentials.

- **Business Rules Management**

Business process decision rules should be mostly externalized in business rules systems so that the rules may be flexibly changed without affecting business process implementations.

- **Business Process Monitoring and Optimization**

Business processes in execution are monitored by IT systems and people in order to detect process failure or bad performance and to be able to take action quickly. Here, process owners and business analysts are keen on understanding the key performance indicators (KPIs) that are presented in business process dashboards.

- **Process Automation and Service Orchestration**

In BPM, *process engines* navigate through business process models to invoke the tasks that have to be executed as defined in business process models. In service-oriented architectures (SOA), all these tasks are implemented by services that follow the concepts of SOA.

- **(Business) Services Repository**

A repository is required for maintaining all services created and available in an SOA. The repository comes with meta service information to handle service-level agreements (SLAs), handle the service life cycle management, and allow services to be reused for various aspects in SOA and BPM.

- **SOA and ESB**

The enterprise service bus (ESB) is the physical layer that allows for binding service requesters with service providers to invoke services as requested. In BPM, a process engine invokes services as implementations of its process tasks, and the process engine hands over service requests to the ESB. After the service completes, and if the process engine expects an answer, the ESB sends the service's answer back to the process engine, and the process engine then continues to the next tasks, as defined in the process model.

From a conceptual point of view, BPM on SOA is simple. However, in the real world, many people are involved with BPM and SOA, shown in Figure 2 on page 4, for organizational or technical issues. Many business processes are complex, difficult to understand, and difficult to change, whether or not the change is supported by technology. So, when looking at an organization, in order to find a target BPM project, a specific business process has to be identified; various people might have to collaborate throughout the six disciplines of BPM.

Figure 2 identifies the key groups in an organization that have to work together on BPM projects. Each group has a number of roles, which might be named differently in different organizations. Although this figure might show more an abundance of roles, or might miss certain roles, it shows that all these people who have different interests, goals, and measurements, all have to agree on the business processes they are sharing.

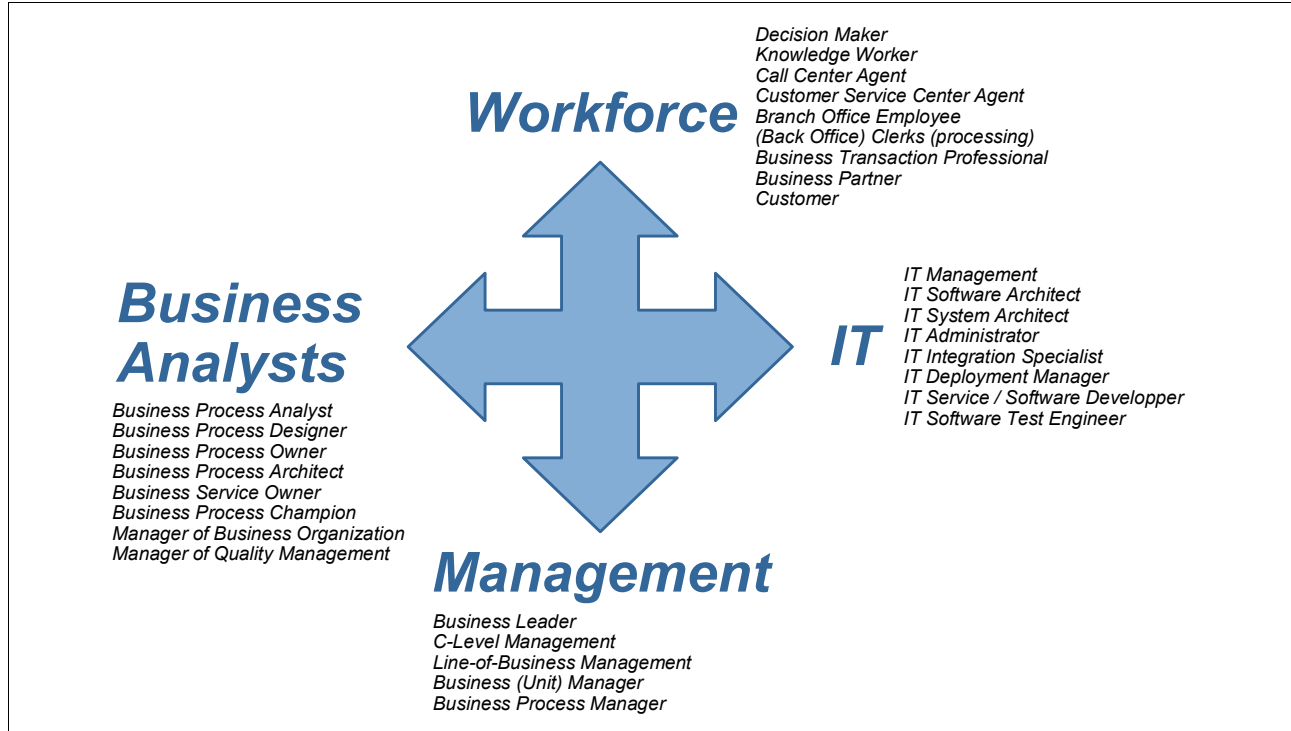


Figure 2 Key groups in BPM

In BPM however, these business process changes can be accomplished faster and simpler with technology. How can this be achieved? And who can best drive BPM within an organization? These questions are discussed in this paper.

Challenges in BPM today

As shown in Figure 1 on page 2 and in Figure 2, the BPM disciplines 1 - 6 require intense teamwork between people from the business analyst community, the workforce, and management and the IT community. All parties have to work together, with different levels of intensity.

But, as though this was too easy, BPM has another dimension: the dimension of business modeling and business process modeling. To illustrate what we mean by this, see Figure 3 on page 5.

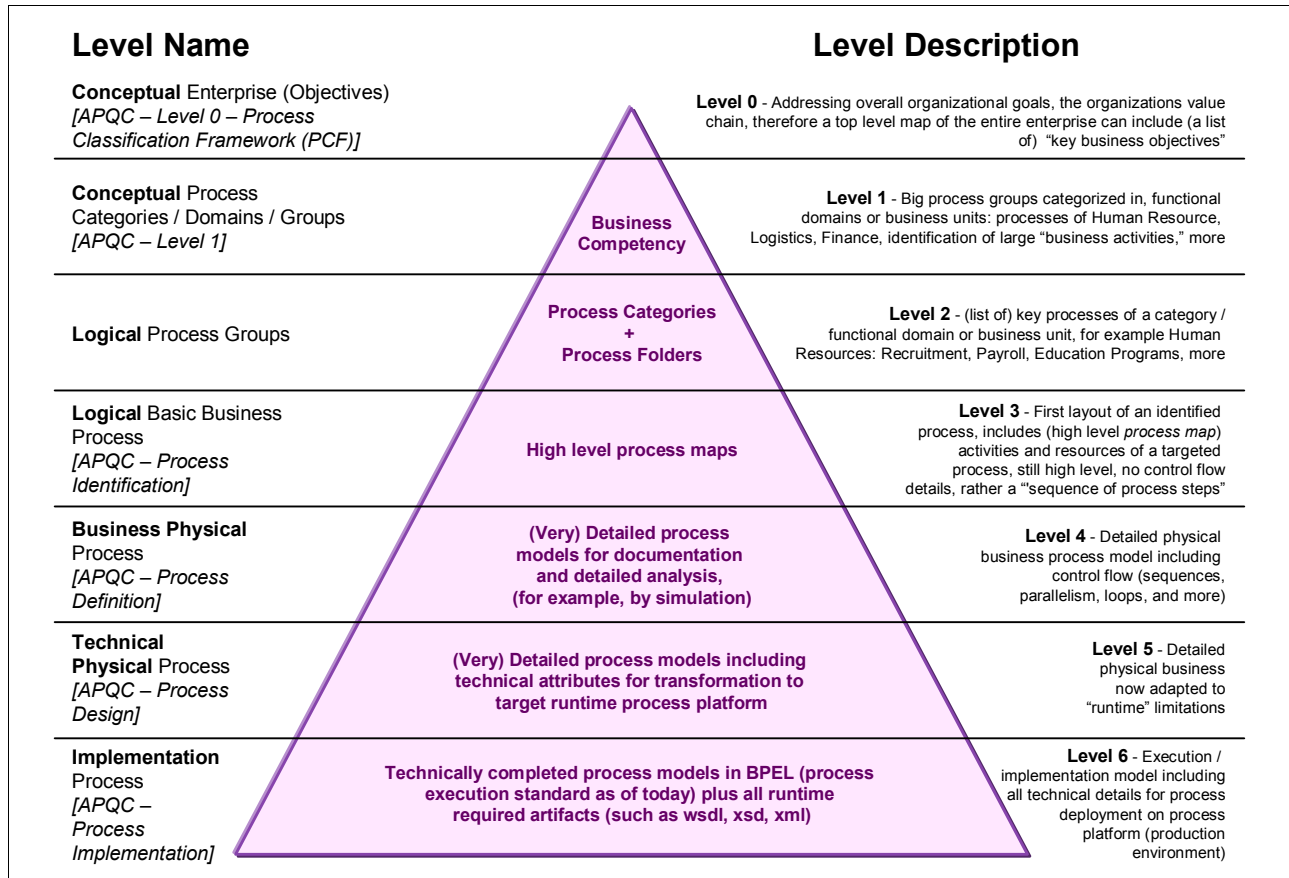


Figure 3 Process modeling levels

Beginning from the top, this pyramid describes various levels of details that apply when modeling business processes. The process modeling levels beginning at Level 2 require increasing detail down to Level 6 (and possibly further down) to specify the executable business process model used by a process engine. Different people within the organization have different expectations when looking at business process models, and certainly different requirements, whether for business process documentation, analysis, monitoring, or automation.

The pyramid of process modeling levels indicates that business process models are becoming more detailed, depending on the purpose of modeling. If you look at the left side of Figure 3, you see that the models move from the conceptual and logical level to the business physical level, and from there to the technical physical level. This transition is challenging, because it is done by different people. Business strategists work on the highest level, not knowing much detail about the business processes underneath. A wide range of business analysts can take over the business goals and address business process modeling with various details, using various tools, if any. Finally, when following BPM, and therefore automated process execution, some IT personnel have to transform the business requirements (which could be described in the business processes) into IT projects and most often into application integration scenarios (details are discussed later and illustrated in Figure 4 on page 9).

In detail, the gaps between the identified modeling levels are:

► Gap between Level 0 and Level 1

Overall business goals are described in Level 0 including what business units are responsible for certain goals, and how these business units are related to each other. There are no business process categories, or specific business processes identified here.

► Gap between Level 1 and Level 2

First-time introduction of process categories are in Level 1. They are related to the business units that are in charge of them, providing services to the business unit customers, whether customers are internal or external.

► Gap between Level 2 and Level 3

In Level 2, specific business processes are identified for each process category; process landscapes identify how business processes relate to each other, and how they are bound to business units in charge. Overall business process performance indicators are described in general. However, the processes have no further details in terms of process steps and such.

► Gap between Level 3 and Level 4

In Level 3, we see the first high-level business process maps, identifying coarse grain process activities, normally too coarse to attach reasonable cost, time, or resource attributes. Further refinement is required for detailed process documentation, and business process analysis.

► Gap between Level 4 and Level 5

In Level 4, as much business detail is added to the process model as was created in Level 3 for detailed business process documentation, and business process analysis. Now, processes are composed of fine-grained activities, all activities have their attributes specified (with respect to the modeling purpose in terms of cost, time, resources, organizational belongings, customized classifiers, and so on). For business process analysis, simulation scenarios are defined, and business processes are simulated with various resource assignments, simulation volumes, and so on, in order to identify the best future business process alternative optimized to best address business requirements. However, adding any details to allow for process automation with IT support is not yet required.

► Gap between Level 5 and Level 6

In Level 5, technical attributes are added to allow for process automation using a process engine provided by IT. Depending on the process engine provided, the technical requirements to be added to the business process model vary. People must have the technical skills to complete the process model in that respect, and tools must support further deployment of the process model to the production environment.

► Gap between Level 6 and the production environment

Further technical specifications might have to be added for error-handling, runtime-compensation, security, transactional-execution (conform to ACID), and so on.

The levels do not have to be strictly separated from each other, and transitioning between the levels should not be limited artificially.

From a business process point of view, two master gaps have to be bridged:

- Master Gap 1

Understanding what specific business goals are implemented to what extent by what business processes.

- Master Gap 2

Understanding what technical integration work has to be done with respect to existing and new IT application or IT system to enable these business processes for automated execution.

Closing these master gaps is the biggest challenge in BPM. And closing them is not a technical challenge in the first run, it requires two important ingredients:

- *People* working together

- *Tools* to foster team work between business and IT, bridging various expectations, goals, and requirements

Although tools are helpful, ultimately, it is the people using the tools, and whether they use the tools effectively. In BPM, the business processes are key, and therefore to know as much as possible about them with a specific purpose in mind is absolutely important to all people outlined in Figure 2 on page 4.

However, all these people have different interests and requirements when looking at and working with business process models:

- Workforce

The workforce wants to understand the flow of the tasks in order to understand how the processes work from a procedures point of view. People in the workforce are using the process models for their own education, to know how work proceeds (if this is not automated by a process engine), and they might have to know process state when interacting with customers or business partners in a phone call.

- Business analysts

The interest of business analysts is in business process optimization. This interest requires detailed process understanding in the beginning, then performing what analysis, seeking process optimization. Business analysts might optimize the process in terms of cost-reduction, cycle-time reductions, or optimized resource utilization. If parts of the processes are implemented in IT systems, they have to talk to IT to understand how the process knowledge is captured in applications, and what data is required, created, or used to complete the processes. When looking at business process implementations (with or without IT systems), they want to see the current business process performance in terms of KPIs and other business measures.

- Management

Management requires insights in business processes for better decision-making. If people in management agree to perform a change, they want to know, at the beginning, what the impact of the change is most likely to be: Will it save costs? Will it increase customer satisfaction? Does it lead to more product or services sales? Will it help to have the workforce work more efficient? After deciding, they strive to understand the overall business process performance by looking at KPIs, and to take action if required.

- IT

Implementing business requirements means understanding those requirements as best as possible. The implementation of new requirements in newly written applications, or in integrating existing applications with each other, can be done in multiple ways, with or without process knowledge explicitly visible. Every IT project supports a business process

to various extents. However, in a perfect situation, IT could immediately see the process flow, the process data, the resources required, how the resources work together, and dedicated runtime requirements (in terms of overall process and system performance), expected volumes and work loads, and so on. A very detailed business process model that also provides technical information would be a perfect start for IT to implement new business solutions requested by its business units.

All this information can be captured in business process models, and made available to the various groups of people. This paper answers the following important three questions:

- ▶ What tools are required to provide business process models with all that information?
- ▶ Who is able to deliver all these details?
- ▶ What has to be specified in detail to finally provide these business processes?

The power of business process models

Let us begin this section by again looking at Figure 3 on page 5. At the left side of the figure, you can see that we are moving from a high-level conceptual business (process) model down to a business process implementation model, which finally does physically exist (in BPM and always for automated business process execution). This movement means that somehow we have managed to transform a high-level model into something executable! There is only one chance to achieve this: It is the right people using the right tools!

Here is an analogy: Twenty-five years ago, probably no one would have imagined that you can easily transform some technical blueprint or paper-based engineering drawing into its physical representation, which for example would have been a smaller part of a bigger machine. However, today and for quite a few years now, by using computer-aided design (CAD) software tools, engineers are *modeling* new parts. In a single tool, engineers are completing all the details required to physically *create* these parts on Computer Numerically Controlled (CNC) machines that do not even have to be installed in the same building. CAD enables engineers to *design* new parts for creation on CNC machines, not to produce them immediately in big numbers, but to create the first prototypes that can be produced in high volumes after testing and further technical refinements. During the evolution of the CAD tools, as the tools improved, the engineers using the tools became more educated, and they have helped to further improve the CAD tools according to their business requirements. As a result, the whole integration with the CNC machines improved also. Today, using CAD blueprints to *deploy* engineering drawings directly on CNC machines is state-of-the-art in many industries producing goods. This improvement led to a real revolution in various industries with respect to many objectives, including (but not limited to):

- ▶ Product development cycle time of new products is significantly reduced.
- ▶ Products can be tested virtually based only on model data before taking them into production. As example is virtual crash tests of cars).
- ▶ More product variants are possible by simply creating alternatives to existing products (based in product model data).
- ▶ New products can be produced and assembled more quickly by using model data to create additional tools and by setting up the production line.
- ▶ Product documentation can be created quickly by reusing model data.

Figure 4 on page 9 shows again the pyramid of business process modeling levels, but this time we have outlined IBM tools that support business process modeling and the people's (user) roles that are working with the tools at various modeling levels.

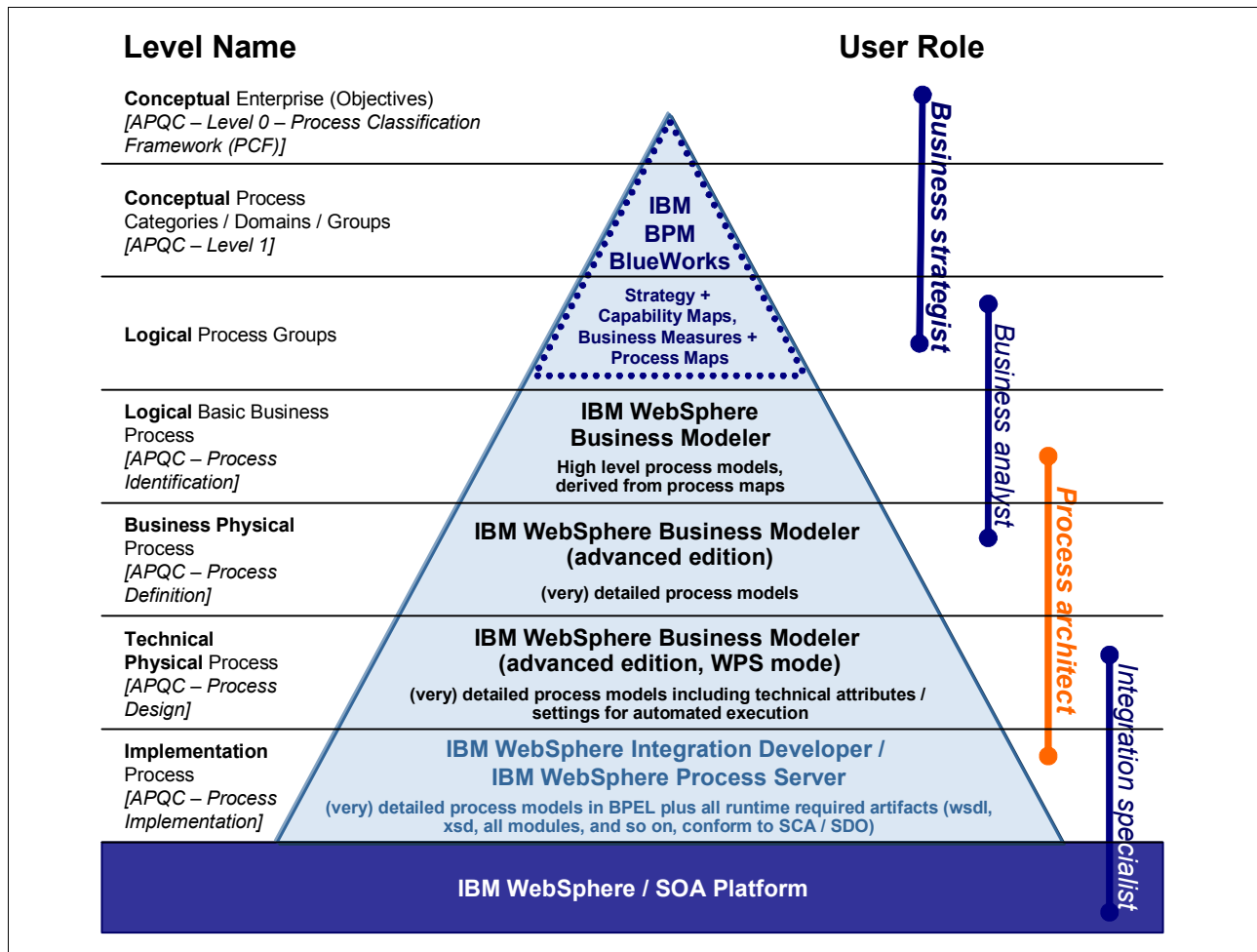


Figure 4 Business process modeling levels and IBM tools

The CAD evolution that took place in the manufacturing industry (and others) can be brought forward to BPM; we see the same evolution for business processes simply by bringing together people with tools. Figure 4 shows the BPM tools offered by IBM, and introduces a new role, the *process architect*, which is the key role that closes the gap between high-level conceptual business design and the required technical process implementation model.

But, the process architect is not the only role required when modeling business processes; other roles apply also. The following list describes the roles that are illustrated in Figure 4:

- Business strategist (BS)

The BS captures the business strategy that guides the operations and actions of the business throughout the organization. The strategic intent and motivation of the business is further refined into operational capabilities to identify transformation opportunities. The BS lays out the first high-level process maps in BPMN and therefore links an organization's operational capabilities to business processes that will be modeled in more detail further down the pyramid. When using tools from IBM, the BS uses IBM BPM BlueWorks. Although IBM BPM BlueWorks is not discussed in detail in this paper, it is a free offering from IBM available from:

<https://apps.lotuslive.com/bpmbpblueworks/>

- Business analyst (BA)

The BA takes over the process maps that are provided by the BS and adds more details by using a business process modeling tool. If the BA uses an IBM tool, it is the IBM WebSphere® Business Modeler. In Level 3, the BA adds more detail in terms of finer grained process steps (tasks). The BA might also add resources that are required for the tasks, or add simplified business data objects showing what data is used by the tasks.

- Process architect (PA)

The PA now adds as much detail as is required to meet the purpose of business process modeling. This detail could be time and cost information necessary for business process modeling and analysis, and technical information to speed up the transformation for automated business process execution. It is important to understand that what the PA adds to the business process model is based on what is already provided (for example, that the BA is using the same business process modeling tool, namely IBM WebSphere Business Modeler). Because the PA is the key role addressed in this paper, we discuss more about the work of the PA in subsequent sections of this paper.

- Integration specialist (IS)

The IS takes what business process model specification comes from IBM WebSphere Business Modeler and adds all required data that is relevant to runtime and Business Process Execution Language (BPEL) to allow the business process model for automated execution with IBM WebSphere Process Server. The tool that the IS uses is IBM WebSphere Integration Developer, the business process execution definition tool following Service Component Architecture (SCA) programming model and BPEL standards.

This discussion shows a very well structured way for how various roles work together to specify detailed executable business processes, starting from high-level business strategies. In reality, we have BAs that might provide more data (for example, information about business process performance indicators, insights of cost or time behavior, and so on). However if the BA does not provide the data, or if the data is not sufficient or accurate enough, the PA will have to take care.

If we compare this discussion with the CAD analogy, you notice that a transformation occurs from the business process model, which is modeled in IBM WebSphere Business Modeler (WBM), to the technical executable business process model that is defined in IBM WebSphere Integration Developer (WID), and deployed in IBM WebSphere Process Server (WPS) to automatically execute the business processes based on their BPEL representation. Compared to the CAD analogy, we would not require WID to support certain technical model transformations; we would be able to immediately deploy a business process model that is modeled in WBM to WPS, without the help of the integration specialist. We can immediately deploy business processes in BPM today to some extent, but it requires the process architect to provide technical details about the business process model we have not yet discussed, and it requires WBM to allow the process architect to perform these tasks.

Process architect introduction

The challenging aspect of the process architect role is that it spans the scope from high-level business process design down to technically correct process models, which allow for immediate deployment on a process platform. In this paper, process platform is IBM WebSphere Process Server (WPS).

If you have ever modeled business processes, you know that normally business processes owned by line-of-business people do not come with much technical information. And, if you have ever seen a BPEL process model, you might agree that not much relevant business information is explicitly outlined here. The glue, therefore, is to bring both business and technical business process modeling closer together.

Let us first discuss the minimum requirements¹ that an executable business process model must have to be ready for automation by WPS:

- ▶ The process flow has to be syntactically and semantically correct, following the specifications as outlined in the BPEL standard specifications.
- ▶ The final process-centric application, as a composite business applications (CBA), must also be syntactically correct, following the specifications outlined in the Service Component Architecture (SCA) standard proposal and allowing for deployment in a J2EE™ runtime environment (in terms of IBM: IBM WebSphere Application Server).
- ▶ The task implementations must be available to allow for task execution after the process engine invokes the tasks. This includes manual tasks (requiring people for tasks completion, called *human task*) and fully automated tasks (requiring *pieces* of software for task completion).
- ▶ For all human tasks, a graphical user interface (GUI) is used and allows people to interact with the tasks they were assigned to.
- ▶ Basic data operations must provide data for the tasks as input information, and handle data as task output, which might or might not include data manipulation capabilities based on the data used among various tasks.

With a basic business process model, possibly made available from a business strategist, or a business analyst as a rather high-level process map, the process architect has to meet the requirements to bridge the gap between the business process model and business process execution model.

Now, let us look at such a high-level business process model to follow the steps that the process architect has to perform in order to complete the business process model for direct deployment on a process platform.

Figure 5 on page 12 presents a high-level process map in BPMN, created by a business strategist in IBM BPM BlueWorks. The business strategist might have linked this process map with a strategy map and various operational capability maps. The process map itself contains only large-grained tasks, and some control flow information, nothing more.

¹ Other requirements identified in Figure 1 on page 2 (such as a service registry, an ESB, or business rules management, and more) are not further discussed here, but are important when applying BPM on a larger scale.

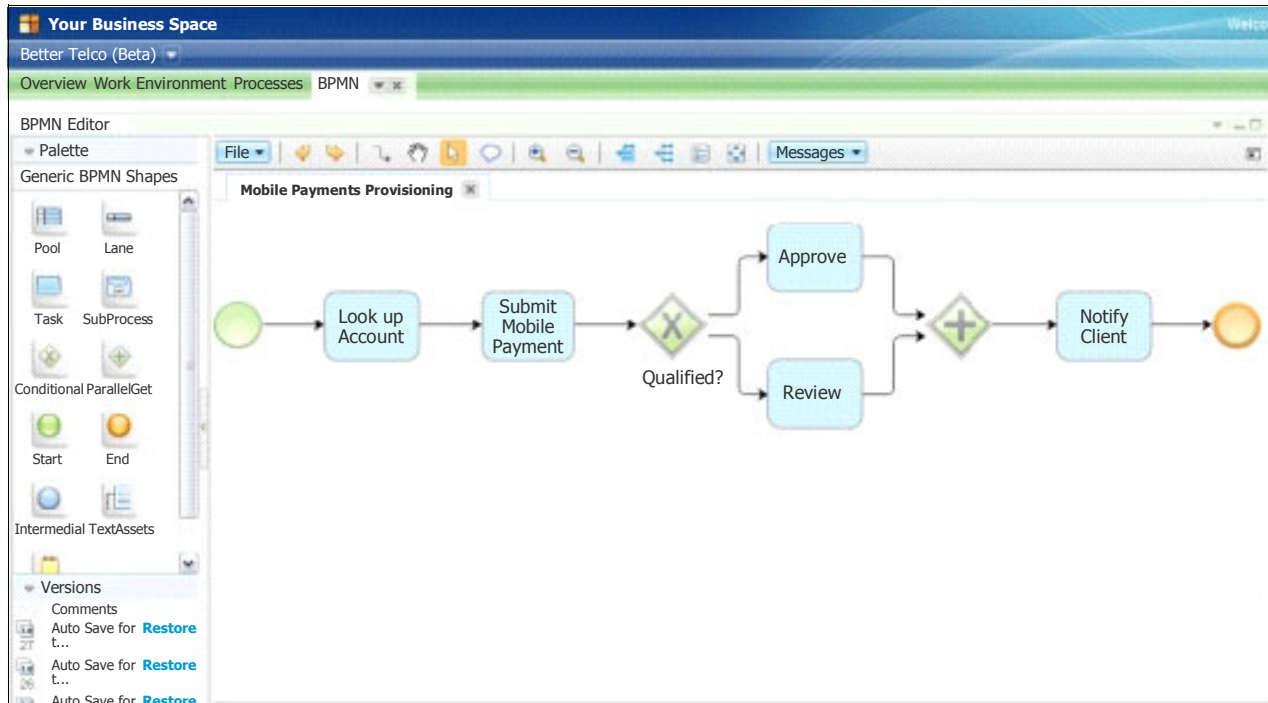


Figure 5 High-level process map

The process diagram shown in Figure 5 includes the following objects:

- ▶ A start node (green circle on the left side) indicates where the process begins.
- ▶ A stop node (red circle on the right side) indicates where the process ends.
- ▶ Five tasks (blue rectangles) describe the process steps.
- ▶ A decision / merge control construct indicates that either the task *Approve* or the task *Review* is done, depending on the conditional *Qualified?* evaluation.

This business process is quite simple, and very unlikely to go into production exactly like that. However, it is the beginning of all the work to fully qualify the process by adding all the details required for execution. The BA might add more information to perform. For example, a business process analysis, or in our case, a process architect takes over the process map from the BS or BA to complete it in IBM WebSphere Business Modeler.

Vision

Similar to CAD, what we want to achieve in the long run in BPM is to fully close the gap between business-like process modeling and transforming this business process model into its executable process definition. Today, with the help of IT, the business process model is enhanced and completed to be deployed in a target runtime environment, while using a second process definition tool that allows for adding all technical information (IBM WebSphere Integration Developer), which, according to the BPM concepts, comes after the business process was modeled in IBM WebSphere Business Modeler. This approach requires model transformation, various people using different tools, and ongoing communication between these people to clearly state who owns what modeling level (Figure 3 on page 5 and Figure 4 on page 9), and how the business process model has to be translated into its execution model in detail. Today, this span is over a technical and an organizational gap.

Therefore, closing this gap simply means that someone, we name the *process architect*, should be able to complete and deploy the business process model in a single business-level process modeling tool with no further engagement of the IT team helping to create the execution model. In contrast, the IT team *only* has to provide a process platform, also named a process runtime environment, to allow expert business people, or skilled process architects to deploy their business processes directly to that process platform.

Until today, line-of-business and IT personnel could not have imagined that a single business process modeling tool supporting all of that would ever be possible, from the perspectives of tools, personal skills, or organizational. Nevertheless, this is the future of BPM, and IBM has taken the first steps toward that direction, while providing tools to allow for what IBM has named *interactive process design*. Although this journey is not yet completed, but we have steps in that direction. Therefore, interactive process design currently works for rather small and simple business processes. The deployment should be done for test and prototyping purposes only; it is not recommended for deploying mission-critical business processes in BPM production environments.

However, look for interactive process design in the future.

Technically, the first steps are done. Three things are important to move in a future direction:

- ▶ The role of the process architect has to be described and established in today's organizations (which is gradually happening).
- ▶ The process architects will have to broaden and grow their capabilities in terms of being able to complete a rather high-level process map for direct deployment (this is explained in the next sections).
- ▶ The tools have to be further enhanced to accelerate today's interactive process design experience into what we can refer to as the *Business Process Modeling for Immediate Production*.

Today we see the first steps into that direction, however, more will come tomorrow.

Today's role definition

After our introduction of BPM concepts, you should have a clearer idea of what the process architect characteristics have to be in terms of skills, goals, tasks and tools:

- ▶ Skills and education of the process architect:
 - Is promoted from within the company to this role, either brought in from IT to learn the business side, or brought in from business to learn about IT
 - Is familiar with BPM, SOA, or both technologies and practices, which includes a broad knowledge and understanding of the enterprise IT environment
 - From a technology background, should have a mix of system and IT architecture concepts, software development skills, system administration aspects, and more
 - From a business background, should be familiar with industry specific business processes, process design methodologies, industry specific terminology, and more
- ▶ Goals of the process architect:
 - Creates an accurate model of the existing business processes, in a form that can be consumed by an integration specialist, or can directly be deployed for test purposes as described in the *interactive process design* scenario

- Is the key IBM WebSphere Business Modeler user architecting business processes from high-level process maps down to executable business processes. However, deep technical skills have to be provided by the integration specialist, enhancing business processes (following BPEL, SCA, and other standards) for deployment to production environments (for example IBM WebSphere Process Server).
- Talks to IT in detail to understand the nature of the required technical artifacts (provided by IT) that are linked to the business processes for automated execution
- Might extend work down to the assembly level in IBM WebSphere Integration Developer, understand business processes in its BPEL representation, and understand the SCA programming model helping to author the core business objects and their interfaces, closely teaming with the integration specialists
- Tasks of the process architect:
 - Meets with (business and IT) subject matter experts (SME) to analyze the existing business processes while capturing key use cases
 - Builds large scale frameworks or process landscapes for classes of business processes (in large organizations), teaming with business analysts and business strategists
 - Models and further refines business processes in IBM WebSphere Business Modeler with enough granularity and discipline so that the integration specialist can implement them in IBM WebSphere Integration Developer. Process architect therefore has a key role when transforming the business process model into its IT implementation model
 - Teams with IT to determine which services (in terms of SOA) exist, which services can be consumed, and which services have to be implemented from scratch
 - Presents business process models to business sponsors, LOB clients and SMEs (business and IT), including the IT development team, so that IT understands what is necessary to implement regarding process automation
 - Provides further guidance to the development team when the team has questions about the business requirements of the business processes to automate
 - Teams with development teams and integration specialist helping to decide on the use of dedicated service implementation technologies to ensure that the process execution models meet business process performance expectations
 - Works with the test team to prepare reasonable business scenarios, business use cases for process test scenarios, including user acceptance testing when development nears completion
 - Incorporates new business requirements into the business process implementation as they emerge and acts as a focal point for cross-communication and round-tripping with business analysts and LOB business consumers
- Tools of the process architect:
 - Takes over process maps from IBM BPM BlueWorks, or Microsoft® Visio®, or any other high-level process modeling tool
 - Completes the business process models in IBM WebSphere Business Modeler exploiting the tool's capabilities to a maximum
 - Handles business process model transformation *down* to IBM WebSphere Integration Developer
 - Exploits (if required) IBM WebSphere Business Modeler integration capabilities with all other tools, teaming with IBM WebSphere Business Modeler.

The process architect is driving the required mediation between business and IT in terms of addressing organizational communication and teaming challenges. With business process models, the process architect drives the model transformation from business process models down to IT process implementation models.

However, apart from providing an IT process platform that is required for process automation, there is work still to be performed e by IT specialists and that is not addressed by the process architect. This work can include (but is not limited to) for example complex error or fault handling, transactional process compensation, further data mediation that goes beyond basic data mapping, connecting (technical) services to business activities if the process architect cannot use services tasks, additional steps to create or generate all the artifacts required to allow for deployment to the production environment, and more.²

The process architect role is the focal point in BPM and BPM projects, addressing almost all BPM issues based on business process models, and beyond. This role is so vital that BPM projects might not be successful without process architects in place.

Today's work and tasks overview

The process architect takes over the basic process map as provided in IBM BPM BlueWorks and then imports it into IBM WebSphere Business Modeler (WBM). Figure 6 shows the GUI of the IBM WebSphere Business Modeler. Here, business analysts and process architects complete business processes, for example for documentation, analysis, or execution.

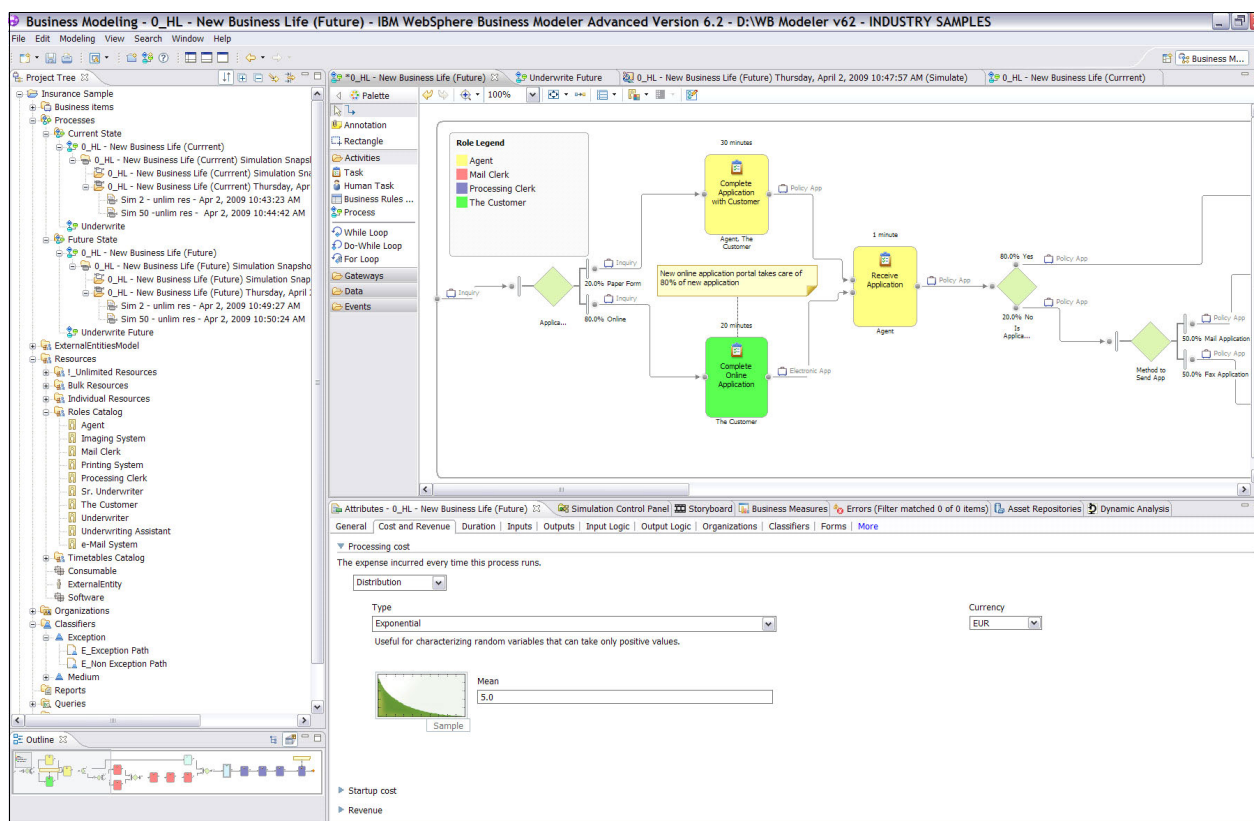


Figure 6 WebSphere Business Modeler

² Providing a process platform for process automation does require a skilled IT team to handle many more technical requirements and challenges. What they are in detail is not within the scope of this paper.

In short, WBM offers business process modeling, simulation, and analysis capabilities to help business users to understand, document, and deploy business processes for continuous improvement.

Business processes taken over from IBM BPM BlueWorks require details for business process completion in various aspects; business process completion always depends on the purpose of business process modeling and also on very specific customer expectations.

This paper, however, *only* discuss what must be done to bridge the gap from the (high-level) business process model down to a business process model that allows for immediate deployment on IBM WebSphere Process Server (WPS). Briefly, this means that:

- ▶ The business process is correct to be understood by IBM WPS.
- ▶ Every task requires an implementation that is invoked when the process engine navigates through the business process during execution.

To quickly summarize the next pages of this paper, which describe in more detail how to work with the IBM Tools, here is a brief overview of the process architect's work to complete a process map for deployment:

- ▶ Completing the data flow

The process architect adds business data objects to define the input and output data for the process and all process tasks. If required, the process architect performs data mapping between different business data objects.

- ▶ Completing the task implementations

Every task requires an implementation during execution. The process architect defines the task implementation, or reuses services provided in a business service repository.

- ▶ Completing the control flow

The process engine requires a semantically correct process model to navigate through it, expressions are required for decision nodes to branch correctly, and loops require expressions for exit conditions during process execution. The process architect takes care that the process logic is completely specified.

- ▶ Defining KPIs

If the process architect wants to see a business dashboard, visualizing key performance indicators (KPIs), KPIs and business measures have to be defined. Initial input for KPIs can be given by the BA, however might have to be further clarified and refined.

- ▶ Validating the process model

The process model can only be deployed if WBM does not report any errors in the *WebSphere Process Server* modeling mode. WBM comes with automatic validation functions, and identified errors have to be handled by the process architect.

- ▶ Deploying the process model

IT has to provide a process platform, which is used by the process architect. After creating a WPS server definition in WBM, the process architect can deploy error-free process models on that server.

The following sections describe in more detail the tasks that the process architect has to perform to complete the business process for *interactive process design* in WBM, how this is done in WBM, and how the completed process model is deployed for automated execution by WPS.

Working with IBM tools

Before describing in more detail what the process architect does, we first take a quick look at the IBM BPM tools required for *interactive process design*. Tools are illustrated in Figure 7.

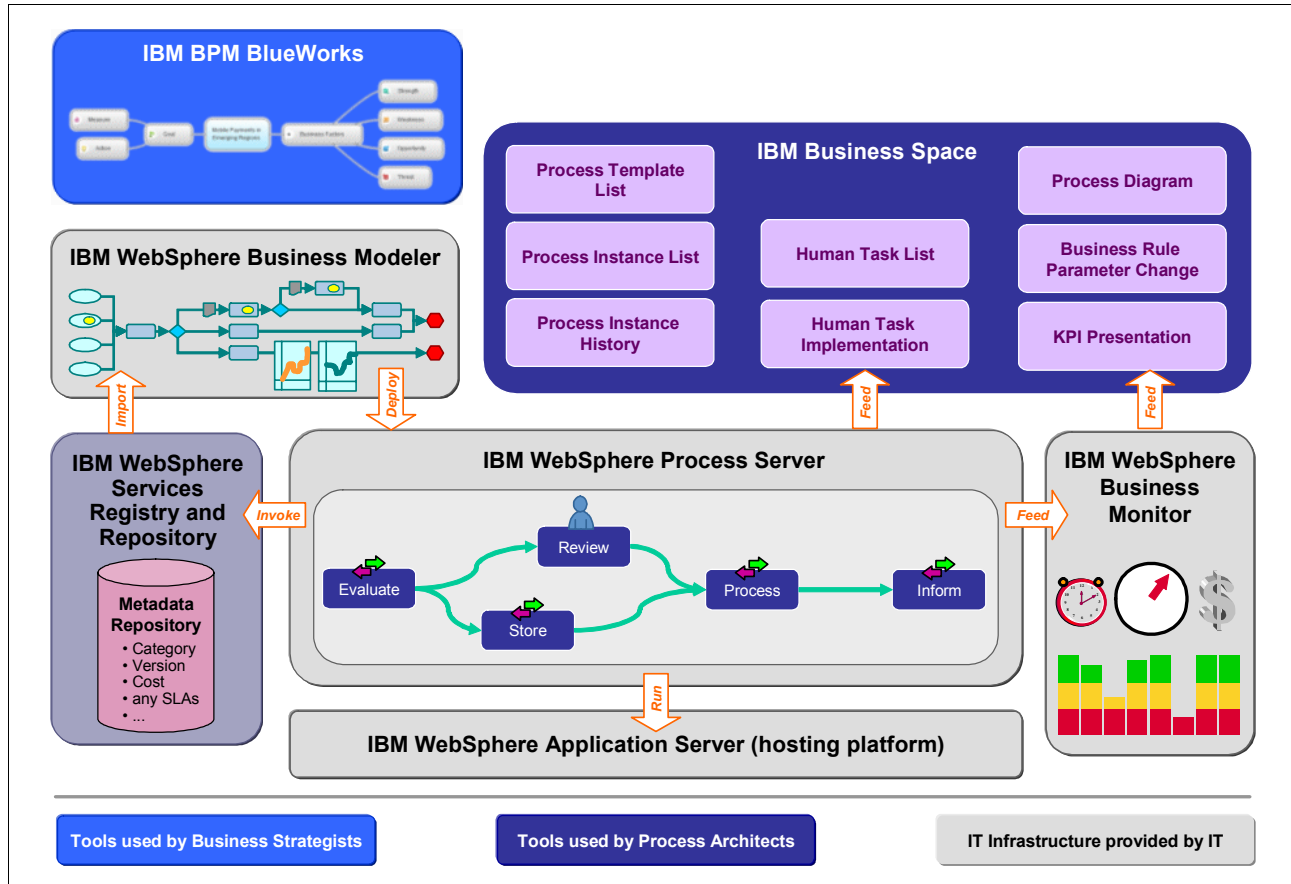


Figure 7 Products for interactive process design

The figure shows the IBM products used for interactive process design, and full blown productive BPM. The process architect does not see much from the underlying IT infrastructure and runtime products provided by IT. The process architect completes and deploys the business processes in IBM WebSphere Business Modeler; all tests are done in IBM Business Space.

Refer to Figure 7 as you read through the following description of products:

- ▶ **IBM BPM BlueWorks**
High-level business strategy, business capability and process map tool used by business strategists
- ▶ **IBM WebSphere Business Modeler (WBM)**
Business process modeling tool for business process documentation, analysis, and completion for execution (simplified business processes) used by business analysts and process architects.

- ▶ IBM WebSphere Process Server (WPS)
Process engine that is compliant to Business Process Execution Language (BPEL) and Service Component Architecture (SCA), automating business processes by invoking services, creating human tasks, and creating events for KPI monitoring.
- ▶ IBM WebSphere Services Registry and Repository (WSRR)
Business services repository to foster services life cycle management and reuse
- ▶ IBM WebSphere Application Server (WAS)
WPS hosting platform
- ▶ IBM WebSphere Business Monitor
Calculation and aggregation of KPIs and business measures as defined in business process monitor models
- ▶ IBM Business Space
GUI to allow process participants and process architects to run, test, and interact with business processes. IBM Business Space is fully customizable by composing the required set of widgets provided by the IBM BPM tools.

An important point to understand is that IT has to provide and manage an IT infrastructure that allows the process architect to work as described in this paper. For interactive process design, IT sets up the infrastructure tools described in Figure 7 on page 17, allowing the process architect to use IBM WebSphere Business Modeler and IBM Business Space.

Completing the data flow

We previously mentioned that data is important for the business process. In the high-level process model, there might not be much information about the data provided for the business process input, the business process output, and for the tasks that compose the business process.

The first step, therefore, is to provide the correct data at each process stage, and for the process itself. In WBM, fully qualified business data objects (for example, imported from a business data object repository) can be managed and assigned to the business process and its tasks. Assigning data is simple; a more challenging effort is to identify what data is required at what task. In this paper, we assume that this challenge is addressed.

Figure 8 on page 19 shows a fully qualified business data object (Travel Request 1) as presented and used in IBM WebSphere Business Modeler. Here, the process architect has to understand data element types and other attributes to complete the business process for automated execution.

Travel Request 1

Parent template:

Business item attributes

Attributes are properties or significant features. Inherited attributes can only be edited in the parent template.

Name	Type	Minimum	Maximum	Read o...	Static
CustomerFirstName	Text	0	1	False	False
CustomerLastName	Text	0	1	False	False
CustomerStatus	Text	0	1	False	False
CustomerHomeCountry	Text	0	1	False	False
TravelEstimatedCost	Integer (long)	0	1	False	False
TravelRequestType	Text	0	1	False	False
TravelStartDate	DateTime	0	1	False	False
TravelEndDate	DateTime	0	1	False	False
TravelPromotionOfferRequired	Boolean	0	1	False	False
TravelConfirmedByCustomer	Boolean	0	1	False	False
FlightRequired	Boolean	0	1	False	False
FlightAvailable	Boolean	0	1	False	False
FlightCost	Integer (long)	0	1	False	False
HotelAvailable	Boolean	0	1	False	False
HotelRequired	Boolean	0	1	False	False
HotelCost	Integer (long)	0	1	False	False
RentalCarRequired	Boolean	0	1	False	False
RentalCarAvailable	Boolean	0	1	False	False
RentalCarCost	Integer (long)	0	1	False	False

Attributes Rules Documentation States

Figure 8 Business data object in WebSphere Business Modeler

Normally, process architects can import these business data objects which are typically provided and owned by the corresponding IT department.

In a next step, business data objects are assigned to the business process input and output, and to the task inputs and outputs. Different tasks might require different business data objects to operate, and if for example the business data object specified at a task output does not match the next task's input business data object, the process architect has to map the correct business data object elements to each other. This data mapping is required when, for example, multiple business data objects have to be mapped to only one business data object.

Figure 9 on page 20 shows the data mapping dialog in IBM WebSphere Business Modeler. Here, business data object elements have to be mapped from various input business data objects to only one output business data object. The process architect has to know how to map business data object elements correctly.

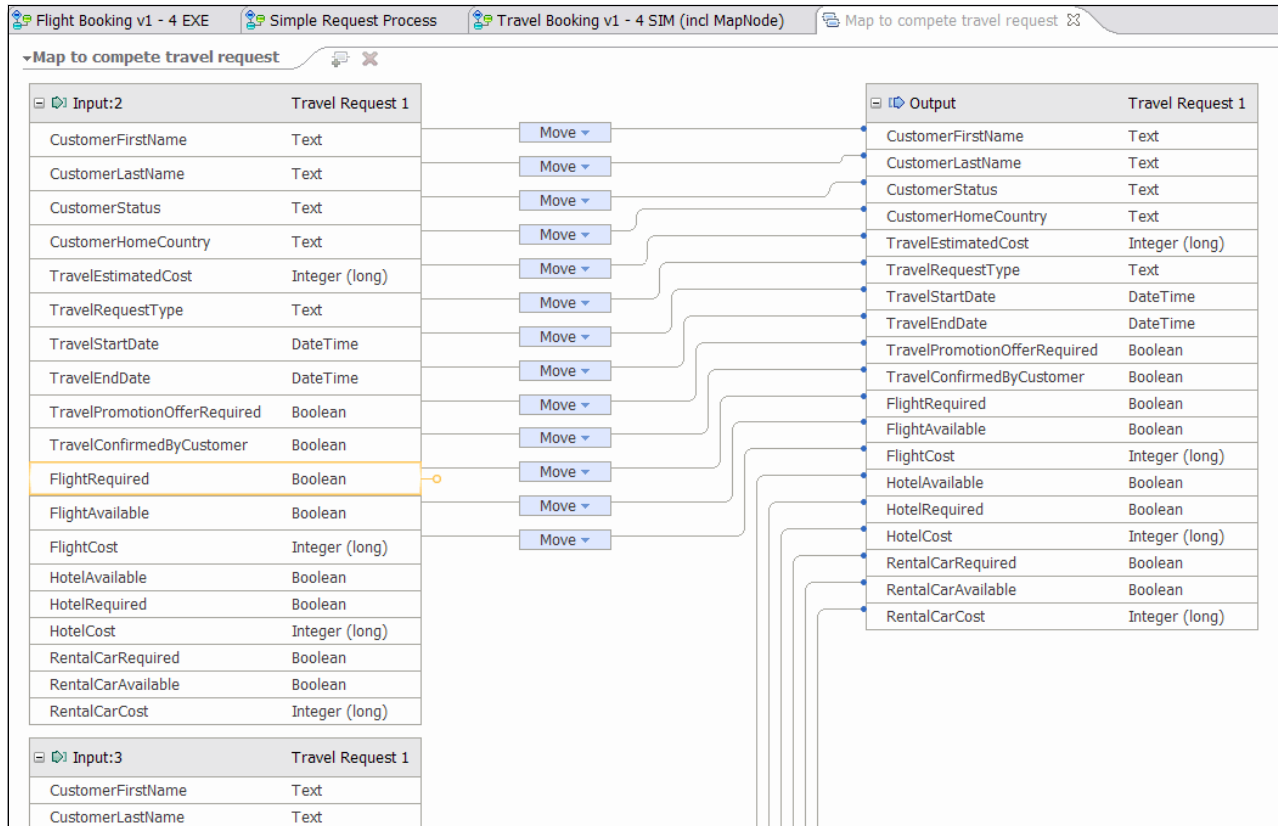


Figure 9 Data mapping dialog in WebSphere Business Modeler

After all business data object assignments are done, and after all required business data object mappings are done, the business process data flow is completed.

Completing the task implementations

The first step, with respect to the task implementation, is done by specifying the input and output business data objects, and to ensure the correct data mapping between the tasks, as described previously.

The second step ensures that, during process execution, every task has some kind of implementation. The process architect however does not write code (for example in Java™) to program the task's implementation. A better approach is for the process architect either to use existing implementations or to convert tasks to specific task types that can be completely specified in WBM.

WBM does offer four task types that provide a task implementation:

- ▶ Human tasks
- ▶ Business rules tasks
- ▶ Services tasks
- ▶ Subprocess tasks

By looking at all tasks of the process model, the process architect has to decide what type of task implementation fits best during process execution. Tasks modeled in the business process that are not further specified, have to be converted to task types that can be

completed for business process execution by the process architect. In the case shown in Figure 10, as a role is specified, the process architect converts the task to a local human task.

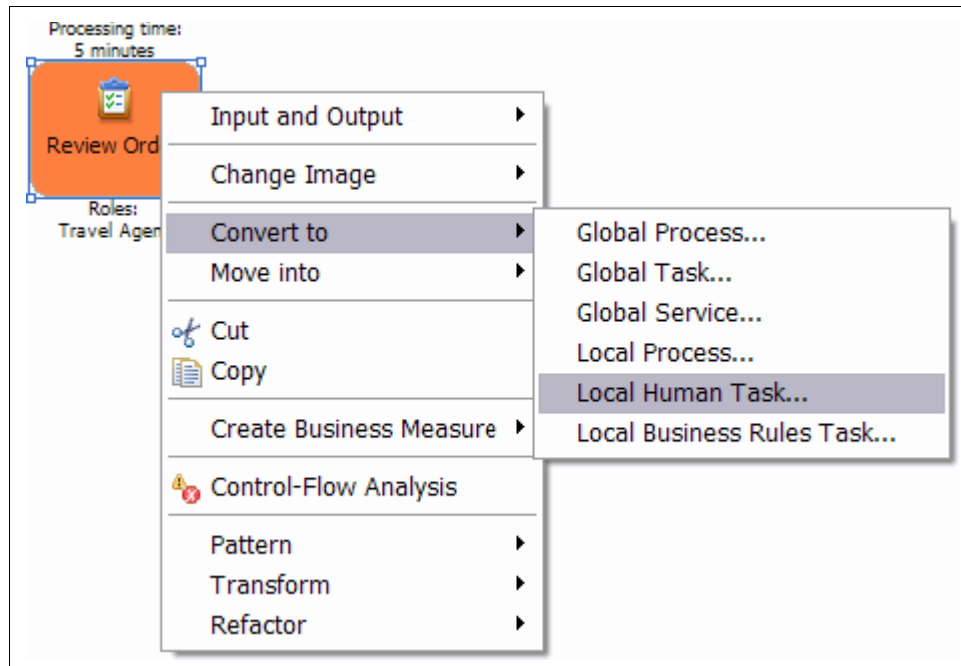


Figure 10 Converting a task to a human process

The conversion of basic tasks to specific tasks as shown in the figure does have some impact during process execution, simply because the task implementations differ from each other. Details of that are explained in the next sections.

Specifying human tasks

During process execution, at least two attributes must be specified by answering the following questions:

- ▶ Who is the performer of the human task?
- ▶ How should the task present itself to the performer during execution time?

To specify these attributes, the process architect first defines who is allowed to perform the human task, which is set on the Primary Owner tab for the human task, as shown in Figure 11 on page 22. In the example, this human task can be performed during process execution by every individual that has the role Travel Agent.

General
Cost and Revenue
Duration
Inputs
Outputs
Forms
Primary Owner
Additional Resources
Escalation

This section displays the primary owner (the resources or staff role that will perform the task).

Description

☐ Individual resource definition

☒ Role

Time required
Days
Hours
Minutes
Seconds
Milliseconds

You can specify an individual to be assigned this task at run time, or you can specify a person with a particular role

Name

Attribute name	Attribute value
*Name	Travel Agent
Name of alternative role 1	
Name of alternative role 2	

Figure 11 Human task primary owner properties

Either this role has to be found in the staff directory, used by WPS to look for all user IDs of people who have the role Travel Agent, or (for test or prototype reasons) a work item is generated for the admin user ID, which will be logged in the IBM Business Space when this business process is executed. (Role definitions as shown here can be used also, but then normally IT has to take care that these roles are defined in the staff directory accessed by WPS. If this is set up correctly, IT provides a test environment granting this.) In addition, escalations and role availabilities can be defined using calendars.

Next, the process architect has to assign a form that is presented to the user when the user starts this task. WBM allows for direct creation of IBM Lotus® Form forms based on, for example, the human task's business data object input and output definition. This generated form might not follow an organization's design guidelines, but from an operational point of view presents what has to be presented and also enables adding the missing data, for example missing travel information gathered from a travel agent while calling the customer. WBM has the IBM Lotus Forms Viewer to enable viewing the generated form in the WBM business process modeling environment. If the form has to be reworked from a form's design point of view, the process architect or anyone else within the organization may re-design the generated form by editing it in the Lotus Forms Editor.

The human task shown in Figure 12 uses the form “Travel Request 1 Form” to present the input and output business data object to the user who is working on the task’s completeness.

General | Cost and Revenue | Duration | Inputs | Outputs | Forms | Primary Owner | Additional Resources |

You can associate a form with a human task as the task input, the task output, or both the task input and output. If the human task inputs or outputs do not match the form data, they will be replaced by the form data.

☒ Use the input form as the output form

Input form

New... Browse... Edit... Disassociate

Field name	Type
Input	Travel Request 1

Output form

New... Browse... Edit... Disassociate

Field name	Type
Input	Travel Request 1

Figure 12 Human task using the “Travel Request 1 Form”

Figure 13 shows how the “Travel Request 1 Form” looks just after its creation in WBM.

CustomerFirstName	<input type="text"/>
CustomerLastName	<input type="text"/>
CustomerStatus	<input type="text"/>
CustomerHomeCountry	<input type="text"/>
TravelEstimatedCost	<input type="text"/>
TravelRequestType	<input type="text"/>
TravelStartDate	<input type="text"/>
TravelEndDate	<input type="text"/>
TravelPromotionOfferRequired	<input type="checkbox"/>
TravelConfirmedByCustomer	<input type="checkbox"/>
FlightRequired	<input type="checkbox"/>
FlightAvailable	<input type="checkbox"/>
FlightCost	<input type="text"/>
HotelAvailable	<input type="checkbox"/>
HotelRequired	<input type="checkbox"/>
HotelCost	<input type="text"/>
RentalCarRequired	<input type="checkbox"/>
RentalCarAvailable	<input type="checkbox"/>
RentalCarCost	<input type="text"/>

Figure 13 Travel Request 1 Form

With that, the process architect has specified all that is required to allow humans to work with human tasks.

Specifying business rules tasks

Another task implementation type ready for execution with WPS is the business rules task. Again, if appropriate, the process architect converts a normal task to a business rule task. Then, WBM allows the business rules to be fully defined, as shown in Figure 14 on page 25.

Business rules are often used when externalizing business decision conditions, which are otherwise defined as expressions at business process decision nodes. With business rules tasks, at runtime, authorized users are allowed to change business rule values by using, for example, a Web interface.

The IBM WebSphere Business Modeler, in Figure 14 on page 25, shows the dialog in which to specify business rules operating on the business rules task business data object input. The process architect can define various business rules that are executed at runtime.

Define Business Rule

Specify the rule logic as a set of if-then rules

Create or modify one or more if-then rules that define the logic of the business rule. To create rule conditions and actions, the business rules task must have inputs and outputs defined.

Name

Description

Important

To reuse rule conditions and actions or allow their parameter values to be changed in an application at run time, create a rule template.

Rule Templates
If-Then Rules

If-Then Rules

Select a rule template or define an if-then rule. To create rule conditions and actions, ensure that the business rules task has inputs and outputs defined.

Rule name	Template name	Rule condition	Rule action	Rule description
GOLD Customer	GOLD Customer	'Calculate Final Offer Price.Input.CustomerStatus'	'Calculate Final Offer Price.Input.TravelEstimate...	
SILVER Custo...	SILVER Customer	'Calculate Final Offer Price.Input.CustomerStatus'	'Calculate Final Offer Price.Input.TravelEstimate...	
IRON Customer	IRON Customer	'Calculate Final Offer Price.Input.CustomerStatus'	'Calculate Final Offer Price.Input.TravelEstimate...	

Add Rule
Remove Rule
Move Up
Move Down

Rule parameter values

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

Parameter name	Type	Value	Description

Rule presentation

Determine how the if-then rule is presented to users in an application at run time.

☒ Automatically generate the text for the rule presentation
☐ Customize the text for the rule presentation

If 'Calculate Final Offer Price.Input.CustomerStatus' is equal to "GOLD",
then 'Calculate Final Offer Price.Input.TravelEstimatedCost' is set to 'Calculate Final Offer Price.Input.TravelEstimatedCost' - 500

OK

Cancel

Figure 14 Business rule dialog in WebSphere Business Modeler

Although specifying business rules evaluated at runtime requires some deeper modeling skills, no programming skills are required. After this is done, the business rules will be evaluated at runtime based on the business data object input data. The rule actions also will be executed, which normally leads to business data object output data changes.

Specifying services tasks

Services tasks during process automation invoke the service which is linked to that services task. (Services have to be understood as IBM SOA defines services.) In WBM, the two ways to integrate existing services are:

- Connect WBM to a business services repository (as shown in Figure 1 on page 2). When using IBM software, this repository is IBM WSRR). Browse the repository and import all services of interest into the WBM workspace. The services and their required service data objects will be available as business services and business services data objects listed in the WebSphere Business Modeler project tree for immediate reuse. Now, the process architect simply replaces the tasks with the Global Services tasks imported from the business services repository. When completed, further data mapping work might have to be performed.

Important: If imported at the beginning, these Global Services could be directly used for business process modeling by simply dragging and dropping the Global Services into the business process diagram, and by linking the services tasks with other tasks in the business process.

- Similar to human tasks or business rules tasks, a basic task can be converted into a global service task, as shown in Figure 9 on page 20. Then, the process architect specifies further attributes for business process documentation and analysis (if appropriate). Note that technical attributes have to be specified to allow the services to be invoked during execution. This method normally requires communication with IT departments because IT provides these services, and IT knows the technical attributes (such as the service's interface, request, response, and implementation) that the process architect has to complete at services task level to fully specify the Global Service. Otherwise, at runtime, WPS would not be able to invoke the service.

This feature (of directly making use of whatever business services) is powerful because it basically means that a process architect, and anyone else modeling business processes, can access a business service repository (if it is based on IBM WSRR today), import the services of interest into WBM, and use these services just like basic tasks.

If we envision this, one day, business process modeling simply is reduced to connecting services tasks with each other. The services are provided by IT and published in a business services repository.

We might certainly encounter new challenges such as addressing requirements for life cycle management of certain overall services, which could affect the business processes choreographing these services. However, from a modeling point of view, process architects are working with existing services that are ready for invocation and execution as assigned to these services tasks. The services task in WBM might have additional attributes to further specify details that allow the use of these services and for business process documentation and analysis purposes.

From a technical point of view, this approach works fine today. However, today's organizations have not yet identified a large number of services that can be used in that manner.

Specifying subprocess tasks

Subprocess tasks are used to further detail a basic task into a set of more tasks. After the converting a basic task into a local or global subprocess task, the process architect can model the subprocess by using all the features for business process modeling offered by WBM.

The subprocess is composed of human tasks, business rule tasks, and global services tasks. The data flow must be modeled, data mappings have to be done, and so on.

After deployed, at runtime, WPS invokes the completed subprocess and navigates through that subprocess in the same way that it navigates through the parent process.

All tasks have implementations that can be executed by WPS after the business processes are deployed.

Completing the control flow

So far, the data flow is correct, and all tasks have their task implementations. However, the process architect now is concerned about the correct control flow logic of the business process, which basically means three things:

- ▶ The control flow itself has to be error-free, which results in the correct pairing of the control flow objects, named *gateways* in WBM.
- ▶ All decision and fork gateways must have their expressions specified.
- ▶ If loops are used, loop exit conditions have to be specified.

To ensure that the gateways are paired correctly, the process architect must check that all decision nodes are paired with merge nodes, and that all fork nodes are paired with join nodes, as shown in Figure 15. The process architect therefore has to understand how the gateways work and what happens if they are not paired correctly. This task is often not considered by the BA, and is not normally of interest in the modeling Levels 0 - 3.

Figure 15 shows the correct pairing of the control flow gateways. If this is not done correctly, during execution, the business process will either run into a deadlock or lack of synchronization situation. This problem must be corrected also for proper business process simulation.

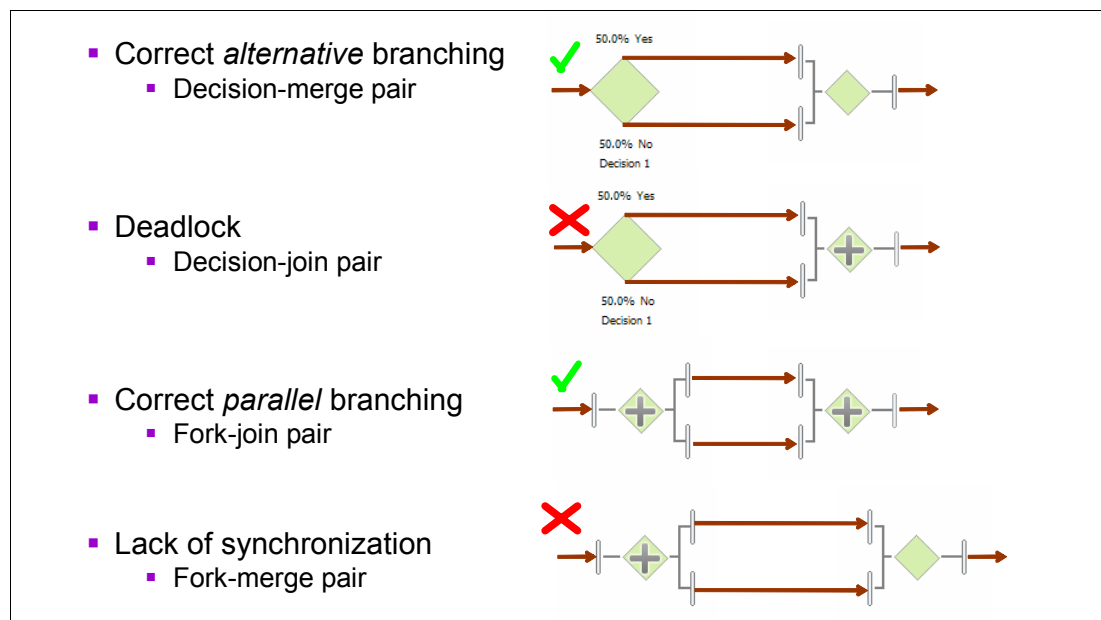


Figure 15 Pairing flow control nodes

After the gateway pairing is corrected, the process architect specifies the branch conditions for the decision and fork nodes, and the exit conditions for loops. WBM allows you to do this by offering Expression Builder dialogs that can look into the business data object input data. From there, expressions are built in a similar manner as defining business rules. Figure 16 on page 28 shows how an expression is built to be used as a decision output branch condition, evaluated during process execution by WPS.

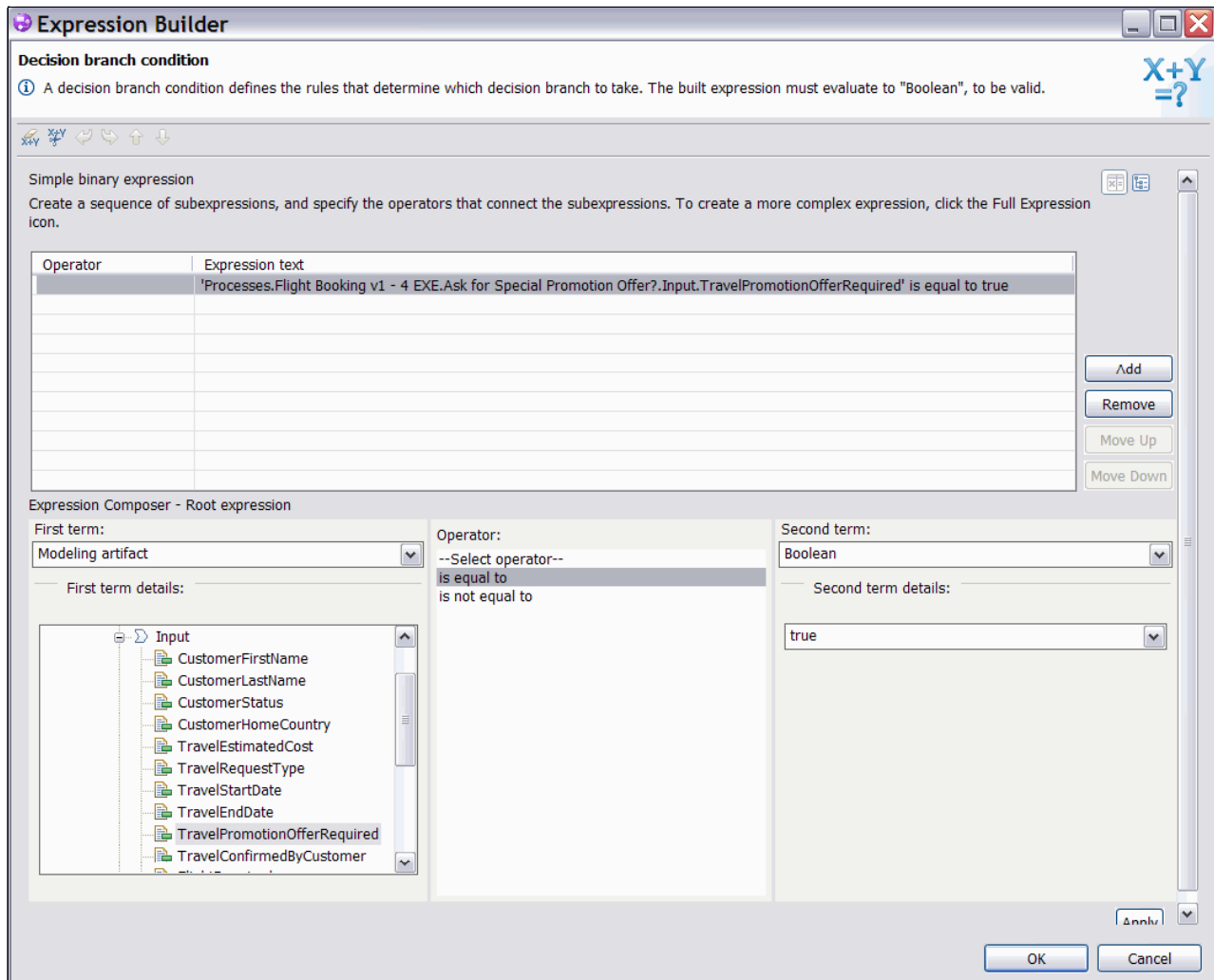


Figure 16 Expression Builder

If expressions have been built for all gateways, the process architect has completed all steps required to enhance the business process model for deployment.

Defining KPIs

The process architect can specify business measures and define key performance indicators (KPIs) in WBM (Figure 17 on page 29). In addition to the built-in capabilities, WBM also allows connecting to the KPI Library, which is linked to about 800 common KPIs that are identified by APQC at the following Web site:

<http://www.apqc.org>

These business measures are deployed to WPS and IBM WebSphere Business Monitor for interactive process design also. When executing the business processes in the runtime environment, these KPIs are calculated and presented in various representations.

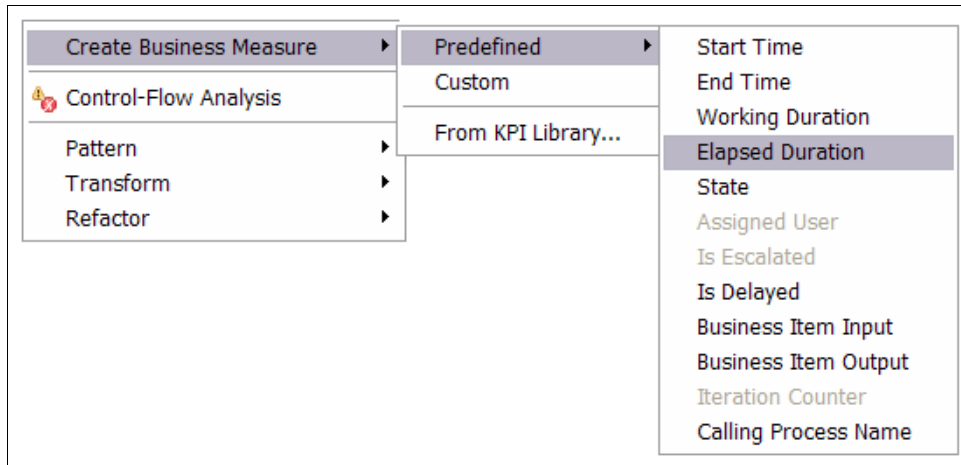


Figure 17 Creating business measures in WebSphere Business Modeler

Certain basic KPIs are predefined in WBM and can be used by the process architect immediately, with no further refinement from IT. During deployment, WBM creates the monitor model that is used by IBM WebSphere Business Monitor to calculate the KPI values.

Validating the process model

All of this work performed by the process architect is done in WBM WebSphere Process Server modeling mode, because WPS is the target process platform for deployment and execution. WBM comes with a number of validation functions to check for model correctness before the process model can be deployed to WPS. WBM also offers an error view that allows checking for all errors, which then have to be fixed by the process architect.

If the process model is error-free, the process model can be deployed.

Important: At the time of this writing, deploying business processes by the process architect is done for test reasons. For deploying processes for production, IT specialists have to be engaged to further enhance the processes for production readiness.

Deploying the process model

The completed, validated, and error-free business process can now be deployed into a WPS runtime environment, also referred to as the process platform. This runtime environment has to be set up and provided by IT, and IT has to give the process architect the WPS server information. If KPIs are to be calculated and displayed, IT has to provide an IBM WebSphere Business Monitor installation also. In a test environment, as described here, IT installs the monitor server together with WPS.

In WBM, the process architect creates a new server with the server specifications as provided by IT. Only basic settings are required for this server, as shown in Figure 18 on page 30.

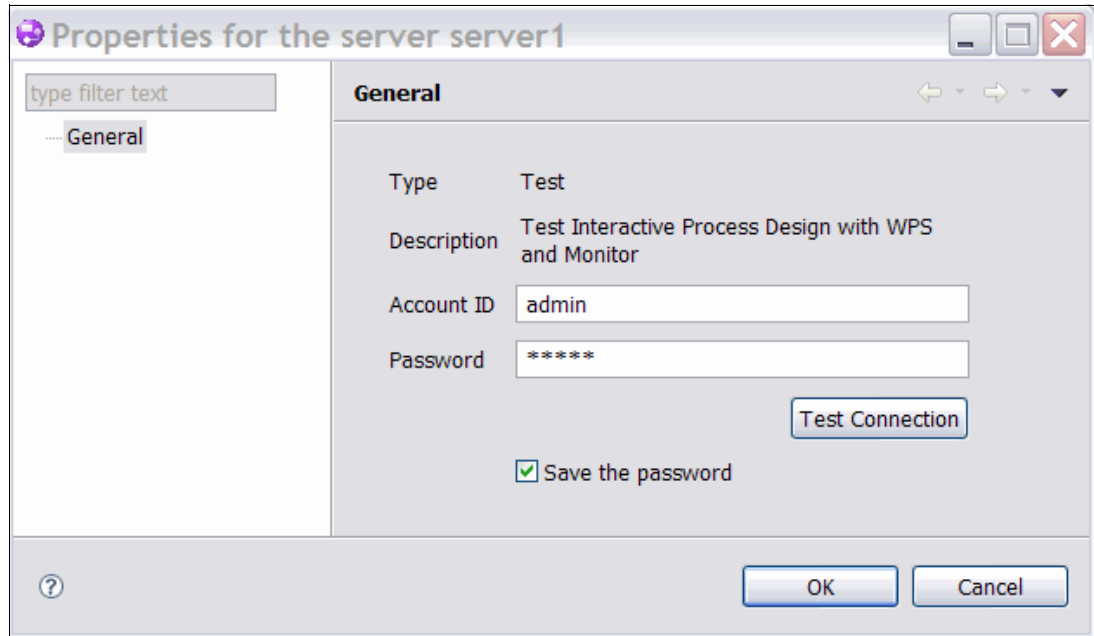


Figure 18 Basic application server settings for WebSphere Process Server

The WPS server has to be up and running to allow WBM to deploy the business process. To test the process on the running server, the process architect simply selects the **Test on Server** command from the business process menu, as shown in Figure 19.

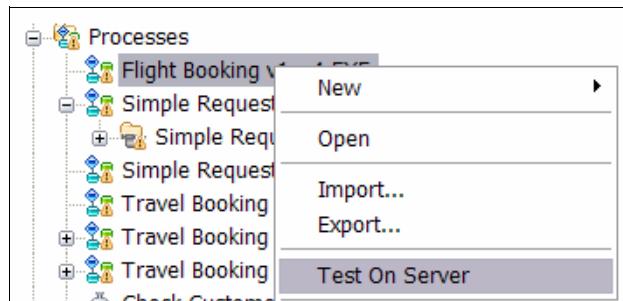


Figure 19 Starting the WPS test server

After the deployment completes (after having created all required runtime artifacts, which can take a while and is not further described in this paper), the business process template is ready for instantiation. Business process instantiation, and interacting with human and business rules tasks is done in IBM Business Space, which provides a test environment for the deployed business process.

Testing the process model

Now that the business process model (and its monitor model if specified) is deployed in WPS, the process architect can start testing the business process.

The test environment is presented in IBM Business Space. IBM Business Space powered by IBM WebSphere is a browser-based GUI that allows various types of users interact with business processes and BPM applications, whether in test or production environments. IBM Business Space leverages mashup technology to allow business users to create and share

their own customized user experiences without IT involvement. IBM Business Space also enables IT (developers) to leverage mashup technology to achieve faster time-to-value when developing new user interfaces, through better reuse of out-of-the-box product content and simplified user interface assembly tooling.

For interactive process design, and therefore for the process architect, it is the perfect GUI to view the deployed process. One step of the process deployment includes launching a preconfigured business space template that comes with all the widgets provided from the IBM BPM tools, to allow for:

- ▶ Working with business process instances:
 - Starting new business process instances
 - Looking at business process (instance) diagrams
 - Looking at process instances history
 - Tracing business process instances execution to gain more insights into process instance execution
- ▶ Working with business process tasks:
 - Editing and changing business rules at any time, to alter business process instances execution behavior
 - Working with human tasks to complete manual process steps exploiting IBM Lotus Forms
- ▶ Working with KPIs:
 - Looking at KPIs based on single business process instances and aggregated KPIs across multiple business process instances
 - Looking further into the details that are defined in the KPI's dimensions
 - Creating new KPIs or changing KPI representations at any time

This business process test environment presented in IBM Business Space is the ideal place to see business processes in execution. However, it is a test environment; processes and their forms deployed here are unlikely to go into production at customer sites, often because customers have existing client implementations that are normally used to also present content relevant to BPM.

Nevertheless, to give an impression what IBM Business Space looks like, we have added a few screen captures to this paper. The sample used here in IBM Business Space, and in most of the other screen captures used in this paper, is a simple travel request process. It asks to book a flight, which does require a travel agent to manually complete several process steps after the requester has instantiated a travel request process instance.

Figure 20 shows the first set of widgets presented in IBM Business Space.

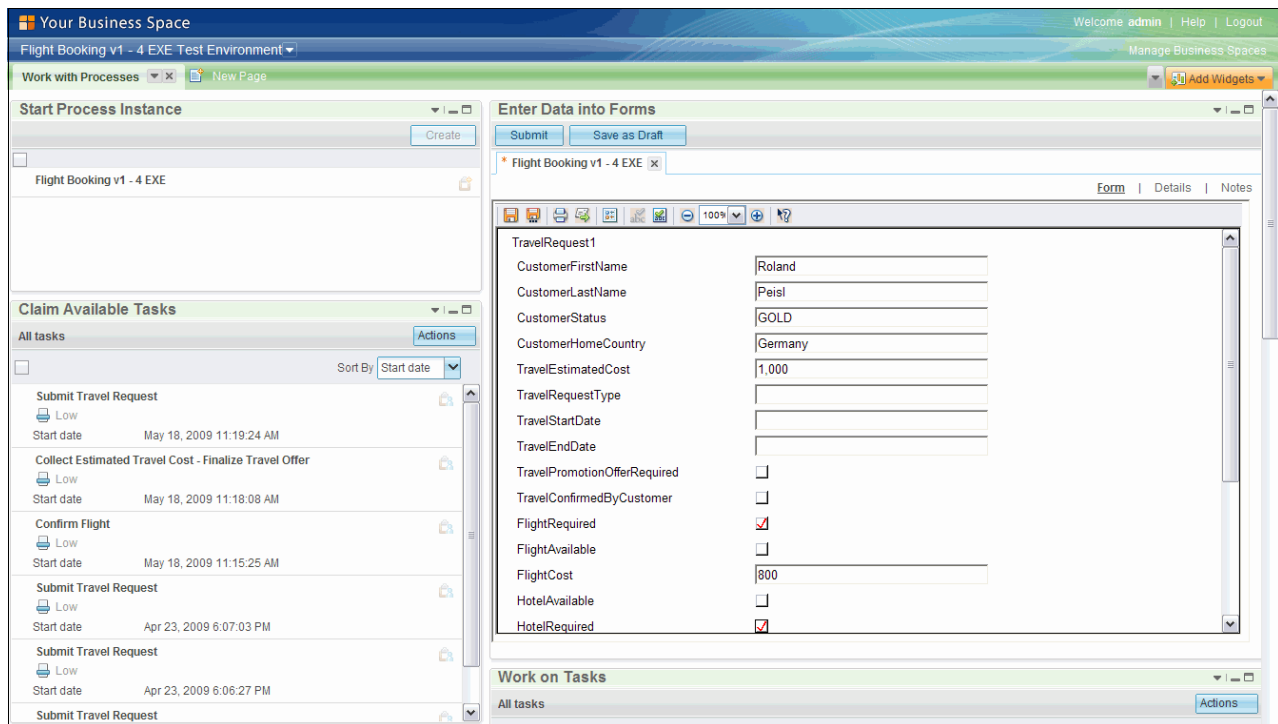


Figure 20 First set of widgets presented in IBM Business Space

These widgets are:

- **Start Process Instance widget**

The process architect starts a new flight booking request, playing the role of the travel customer.

- **Enter Data Into Forms widget**

The process input business data object is presented using the assigned form to allow the process architect to specify detailed travel information handed over and used by the subsequent tasks of the business process. Part of this data is also used in expressions defined for process decisions. Here, the process architect takes over the role of the process starter, which again would be the travel customer.

- **Claim Available Tasks widget**

This widget presents all the human tasks that are waiting for completion, created from all currently running process instances (filtering human tasks is possible but not done here). The process architect takes over the role of the travel agent to work on the tasks. To start a task, the process architect simply clicks on a task. If the task is started, the task implementation is again shown in the Enter Data Into Forms widget, and the form is presented to add or change data.

These three widgets allow the creation of new business process instances, and allow working on human tasks required for process completion.

Figure 21 shows the next set of widgets presented in IBM Business Space.

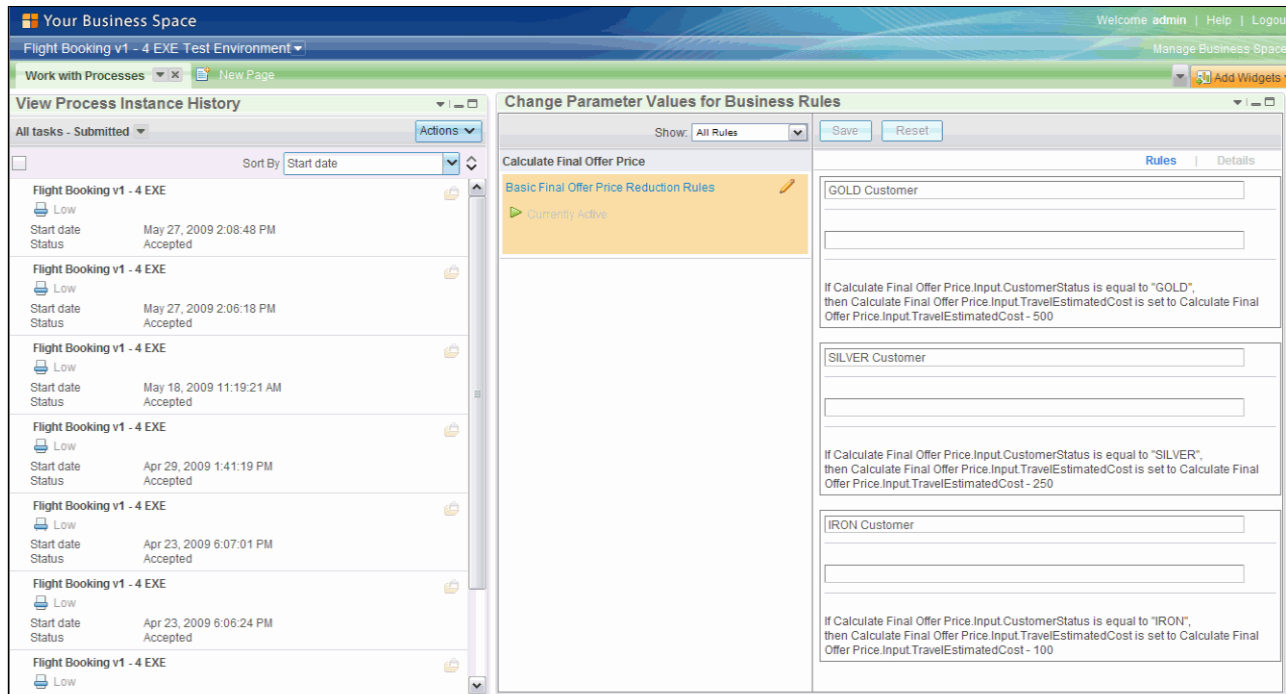


Figure 21 Next set of widgets presented in IBM Business Space

These widgets are:

- ▶ View Process Instance History widget

This widget presents the history of each process instance that is currently running. The process architect takes over the role of a process owner or process administrator to check the process instances states.

- ▶ Change Parameter Values for Business Rules widget

The process architect can look at the business rules as specified in WBM and perform changes. This task is normally done by either process owners or business power users who have the appropriate authorizations to change business rule values.

The first widget allows us to look at the business process instances currently in execution to understand how they were navigated in the past. The second widget allows us to change business rules values. These business rules values are evaluated whenever the process engine navigates to a business rules task required for certain business process instances to complete. The outcome of the business rules task always uses the current business rules values definitions; these business rules values can be changed totally independent from the business process models. A good practice is to use business rules tasks to add more flexibility to business processes. Therefore, by intention, the execution of various business process instances might differ simply because business rules values have changed.

Figure 22 on page 34 shows the next set of widgets.

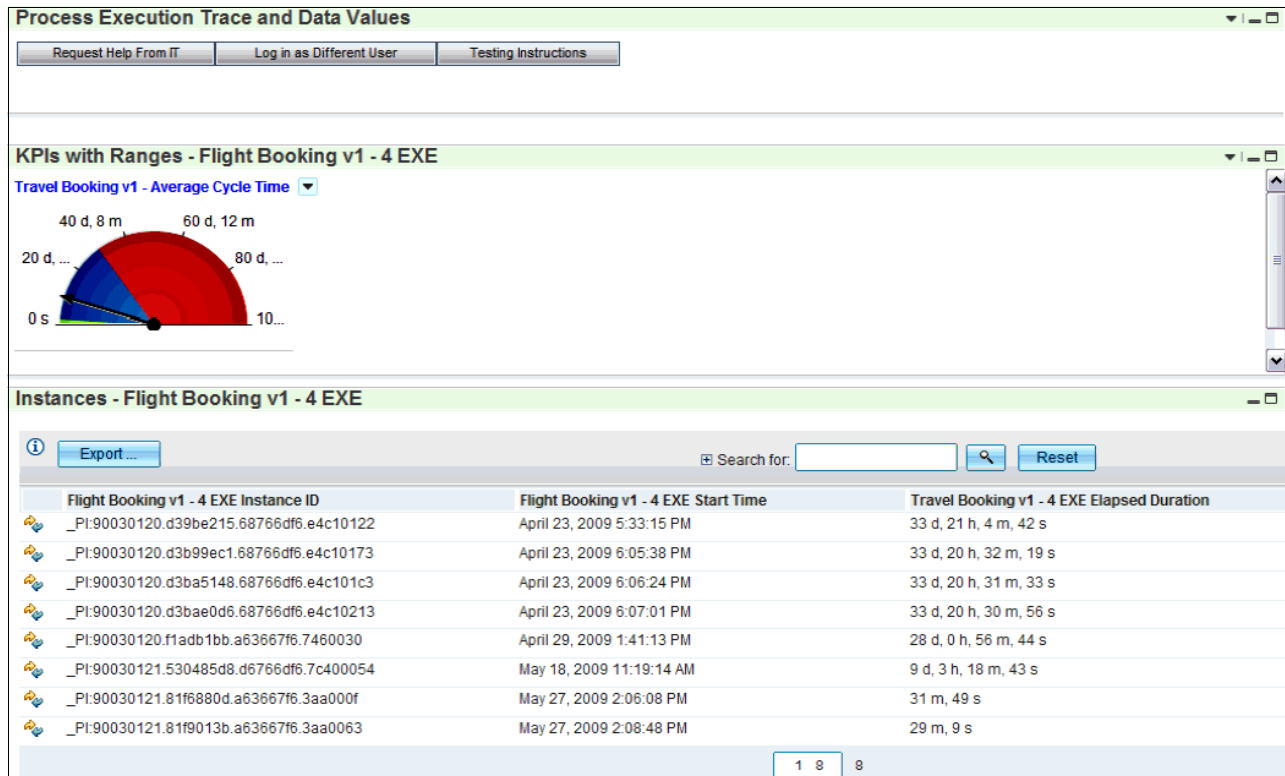


Figure 22 The next set of widgets presented in IBM Business Space

These widgets include:

- ▶ Process Execution Trace and Data Values widget

One aspect of this widget is to communicate findings to the IT department. Remember, the process architect is testing the business processes; deploying the business processes into real production environments is not yet recommended. However, the more detail the process architect is able to specify, including technical attributes and relevant execution information, the better is the communication and process model exchange between the business and IT community. Today, that is the idea here, IT does receive a complete business process model from the process architect, and then IT deploys the process model to the production environment. The other aspect of the widget is to check data values as they were given to and received from every single task of a selected business process instance. It can therefore be used for business process instances debugging; the process architect takes over the role of a more technical business process tester.

- ▶ KPI with Ranges widget

Here the process architect looks at the KPIs specified in WBM. The KPIs are immediately calculated every time a task is completed (for example human task), or when any other task completes during process execution. Over time, the process architect becomes more familiar with the IBM Business Space and widgets offered. For example, in the KPI widget the process architect could change the KPI ranges and other settings for this KPI, or create new KPIs, and so on.

- ▶ Instance widget

The widget again shows all currently running and completed business process instances and offers capabilities to export the presented data to an application, for example Microsoft Excel®, for further investigations.

Finally, the business process diagram itself is shown (Figure 23). The process diagram looks just as modeled in WBM, but is now flagged with process execution data, and linked to the process execution trace and data values widget. This simply means that when selecting a task in the process diagram, this widget presents the data of the selected task, and the process architect can therefore follow changes of the input and output data values.

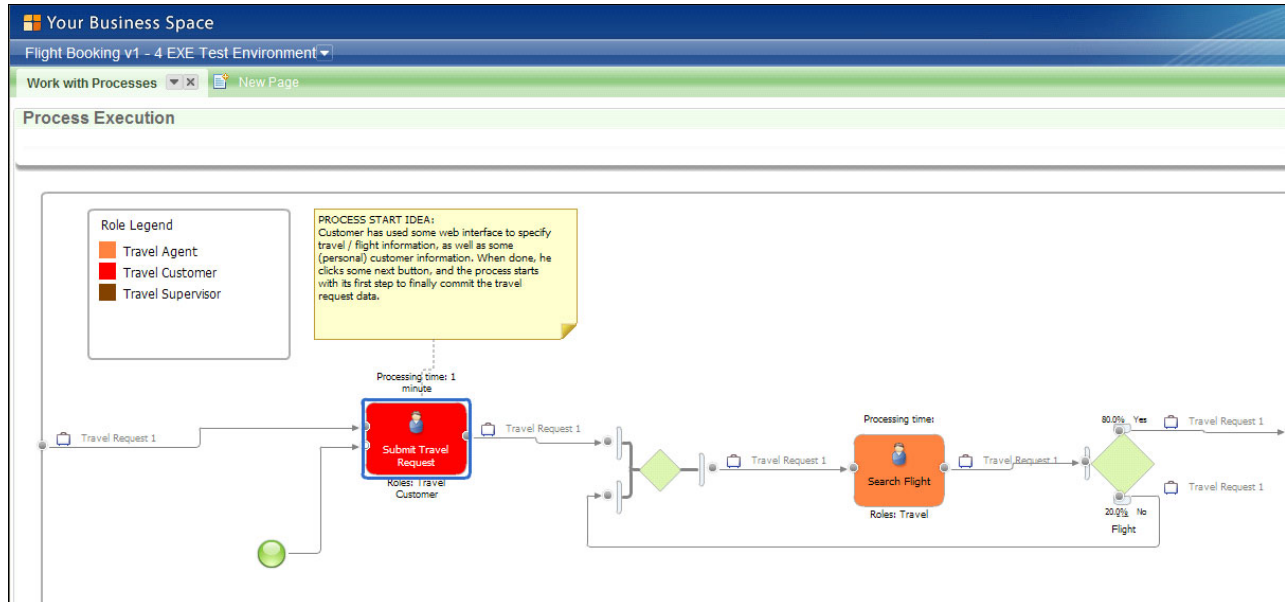


Figure 23 Process Execution widget presenting the process model (as modeled in WBM) in the BM Business Space

Similar to this, some of the other widgets we described are interconnected also, and are sensitive to selections, which leads to updates in the connected widgets.

To summarize, IBM Business Space is a production-ready test environment, which is preconfigured to allow the process architect to test business processes. Furthermore, as the process architect becomes more familiar with IBM Business Space over time, he or she can configure the provided business space template and add more widgets to the test environment, to run even more sophisticated test scenarios. All the widgets that are preconfigured in this business space template, and all other widgets that might be added to it later, can be further configured to address specific process architect needs. This approach allows the process architect to investigate as much as possible before handing over the process model to IT, which finally takes it into production (after any further technical changes have been applied).

Remember: What we see here in terms of business process completion for automated execution, in terms of deployment and test, is just the beginning. We need more process architects within today's organizations, and we must further improve the BPM tools we have today to be able to empower the process architect further. Both will happen over time, process architects will find new requirements and report those to us (IBM), helping to further improve the products.

Process architect conclusions

Before concluding the information about the process architect, consider again the BPM master gaps we have identified in the very beginning of the paper:

- Master Gap 1

Understanding what specific business goals are implemented, to what extent, and by what business processes

- Master Gap 2

Understanding what technical integration work has to be done with respect to existing and new IT application or IT system to allow these business processes for automated execution

Closing these master gaps today is the biggest challenge in BPM. Closing these gaps is not a technical challenge in the first run, but it requires two important ingredients:

- People working together

- Tools to foster team work between Business and IT bridging different expectations, goals and needs

This paper has addressed the fact that the request for people has to be answered by the introduction of a dedicated role, which we have named *process architect*. It does not matter if the role is exactly named process architect, or if people with that role are more closely related to or originate from business or IT organizations. The role might even span more capabilities as mentioned here. All that really matters is to finally have this role mediating between business and IT. This job should be done by process architects to better and faster transform business (process) requirements into technical (process) implementations, leading to flexible and manageable automated business processes, running on process platforms on top of existing IT infrastructures.

We have outlined that the IBM WebSphere BPM Suite has powerful tools to transform high-level process maps into executable business processes. We have also outlined that certain skilled and process-oriented business analysts, or certain business process-aware IT persons, could become process architects over time. They must have tools available to enhance any process map with all the details required to:

- Perform detailed business process analysis.

- Directly deploy a process model for automated execution to a process platform provided by an organization's IT staff (currently, for testing purposes).

Although we are still at the beginning, a good practice is to follow the ideas for interactive process design for rather simple and non-mission critical business processes. The first steps are done, but tomorrow, with the future evolution of the tools, and the growing number of process architects, sooner or later process architects will be able to deploy their business processes directly to production environments, similar to what we see in other industries, for example when looking at the CAD analogy.

Combining this approach with other concepts of the IBM WebSphere BPM Suite products (such as IBM WebSphere Business Services Fabric, IBM WebSphere Business Events, IBM ILOG JRules, and others), plus future directions planned for IBM Business Space, process architects and relevant BPM business roles will gain more power to deal with business processes in the future.

BPM conclusions about the future

In the past, much was said about the future of BPM. Several published articles have indicated what many people have named BPM 2.0.

BPM 2.0 describes the important future aspects of BPM, which you can read about by referring to an article at BPM Institute: *BPMS Watch: Make Way for BPM 2.0* by Bruce Silver, March 2006. It is available at:

<http://www.bpminstitute.org>

These BPM 2.0 aspects are well-supported by the IBM BPM Suite that is used by the process architect. The process architect is a combined role of process designer and analyst, and is not required to write code.

Based on our discussion in this paper, the process architect addresses BPM 2.0 as follows:

- ▶ IBM BPM BlueWorks addresses the requirement of connecting business strategies and business capabilities with process maps. Information that is laid out at the highest level (Figure 3 on page 5 and Figure 4 on page 9) is taken over by business analysts and process architects, depending on the level and purpose of business process modeling.
- ▶ The process architect uses IBM WebSphere Business Modeler for detailed process documentation and analysis. During business process analysis, the process architect runs detailed simulations to identify and improve cost, cycle time and resource allocation characteristics. Also, by defining KPIs and business measures, IBM WebSphere Business Monitor calculates and presents KPIs to process architects and process owners, providing insights into business process performance for further improvements.
- ▶ The required BPMS³ for BPM 2.0 is the IBM WebSphere BPM Suite. It included business process modeling, analysis, execution, monitoring and management. The IBM WebSphere BPM Suite does choreograph fully automated services (conforming to the concepts of SOA), and creates human tasks if people interaction is required. The suite has many additional features and functions for BPM that are not discussed in this paper.
- ▶ The process architect is able to fully specify business processes in IBM WebSphere Business Modeler for interactive process design and direct deployment to a BPEL process engine without having to write a single line of code.
- ▶ The IBM WebSphere BPM Suite is completely based on process-relevant standards (BPMN, BPEL) and SOA standards (J2EE, XML, WSDL, and more).
- ▶ Outlining business strategies and business capabilities leading to high-level process maps is the beginning. The barrier is extremely low when beginning with IBM BPM BlueWorks. More skills and expert skills are required to enhance process maps to executable business processes. However, the support of tools to meet BPM 2.0 functions can accelerate the process of deploying business processes on a production process platform.

Now, with IBM WebSphere Business Modeler v6.2 and IBM Business Space, IBM has widely opened the door to BPM 2.0. The number of process architects will grow, BPM tools are ready, and will offer more support in the future. Smart people at IBM think about further concepts such as business process as a service, dynamic business processes, and finally the IBM Smarter Planet™.

³ Business process management system (BPMS)

About the author



Roland Peisl is a long-term player in IBM Business Process Management (BPM) arena; he started his career in BPM in 1998. In BPM, Roland has held various roles including Software Development, Technical Marketing, Product Management, and now Business and Technical consulting.

Starting in 2004, Roland has worked as a Conceptual and Technical Consultant worldwide in the IBM Business Process Management Competency Center (BPM CC), located in Boeblingen, Germany, focusing on the IBM WebSphere Business Process Management Suite v6.

In addition to BPM concepts and methodologies, Roland's focused products these days are IBM WebSphere Business Modeler, IBM WebSphere Process Server, IBM WebSphere Business Monitor, and IBM Business Space.

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