IBM Software Group

IBM Business Process Management
WebSphere® Process Server V6.0.2
WebSphere Integration Developer V6.0.2

Business Process Management Introduction

This presentation provides an introduction to Business Process Management.

Goals

- Goal of this presentation
  - ▶ Introduce Business Process Management (BPM)

- You will learn:
  - ▶ Definition of a Service Oriented Architecture (SOA)
  - ▶ The basics about IBM SOA Foundation
    - SOA life cycle
    - SOA reference architecture
    - SOA scenarios
  - ▶ The Business Process Management scenario
    - Relationship to the SOA life cycle
    - Core products used in the Business Process Management scenario
    - Roles of participants in Business Process Management

The goal is to introduce the concepts of Business Process Management (BPM). You will start out by learning the definition of a service oriented architecture (SOA), a term commonly used throughout the IT industry. IBM provides its interpretation of what a service oriented architecture embodies through definition of the IBM SOA Foundation. You will learn about the essential elements of IBM SOA Foundation, specifically the SOA life cycle, SOA reference architecture and the SOA scenarios. One of the SOA scenarios is Business Process Management (BPM) and you will learn how BPM relates to the SOA life cycle, the core IBM products used with the Business Process Management scenario and the various user roles associated with participants in the SOA life cycle for BPM.

Service oriented architecture (SOA)

- Definition of some key terms

... a service?

A **repeatable business task**. For example, check customer credit; open a new account.
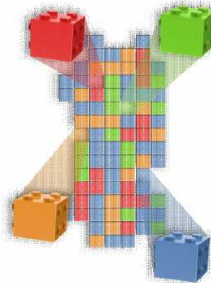
... service orientation?

A way of integrating your **business as linked services** and the outcomes that they bring.

... service oriented architecture (SOA)?

An IT **architectural style** that supports service orientation.

... a composition application?

A set of **related and integrated** services that support a business process built on an SOA.

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This slide highlights the key terms used to describe a service oriented architecture.

A *service* is representative of a repeatable business task. Services are used to encapsulate the functional units of an application by providing an interface that is well defined and implementation independent. Services can be invoked by other services or client applications.

Service orientation defines a method of integrating business applications and processes as linked services.

Service oriented architecture can be different things to different people, depending on the persons role and whether their view is from a business, architectural, implementation or operational perspective.

From a business perspective, SOA defines a set of business services composed to capture the business design that the enterprise wants to expose internally and externally to its customers and partners.

From an architectural perspective, SOA is an architectural style that supports service orientation.

At an implementation level, SOA is fulfilled using a standards based infrastructure, programming model and technologies such as Web services.

From an operational perspective, SOA includes a set of agreements between service consumers and providers that specify the quality of service, as well as reporting on the key business and IT metrics.

In summary, a service oriented architecture is an architectural style for creating an enterprise IT architecture that exploits the principals of service orientation to achieve a tighter relationship between the business and the information systems that support the business.

Finally, a *composite application* is a set of related and integrated services that support a business process built on an SOA.

Section

IBM SOA Foundation

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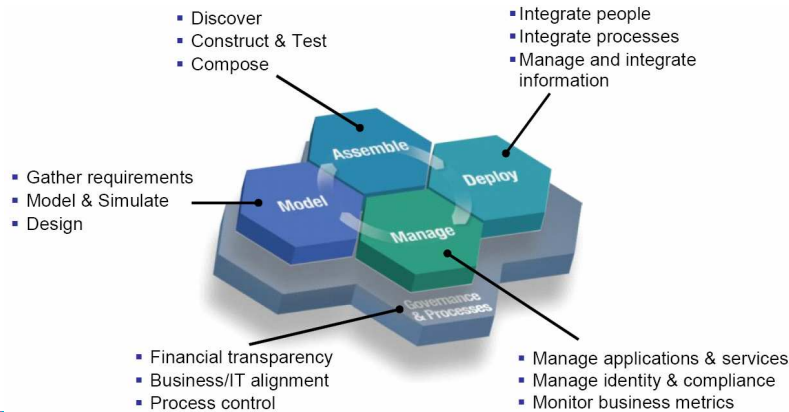This section covers the IBM SOA Foundation.

What is IBM SOA Foundation?

- IBM SOA Foundation
  - ▶ A set of integrated standards based software offerings
  - ▶ Best practices
  - ▶ Patterns
  - ▶ Designed to help you get started with SOA
- Key elements of IBM SOA Foundation
  - ▶ SOA life cycle
  - ▶ SOA reference architecture
  - ▶ SOA scenarios

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The IBM SOA Foundation is an integrated, open standards based set of IBM software, best practices and patterns designed to provide everything you need to get started with service oriented architecture from an architectural perspective. The key elements of the IBM SOA Foundation are the SOA life cycle, reference architecture, and scenarios. You will learn about these key elements in subsequent slides.

SOA life cycle

- SOA life cycle stages
  - Model, Assemble, Deploy, Manage
- SOA life cycle governance

- Discover
- Construct & Test
- Compose

- Integrate people
- Integrate processes
- Manage and integrate information

- Gather requirements
- Model & Simulate
- Design

Assemble

Deploy

Model

Manage

Governance & Processes

- Financial transparency
- Business/IT alignment
- Process control

- Manage applications & services
- Manage identity & compliance
- Monitor business metrics

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The SOA life cycle is composed of four stages, model, assemble, deploy and manage.

In the *model* stage, business requirements are translated into a specification of business processes for creating a model of the business. Along with the specification of the business processes, goals for the business can be used to define key performance indicators by which the business can be measured. Assumptions can then be used to drive a simulation of the business model to see if it meets business objectives. If not, appropriate adjustments can be made to the model.

The *assemble* stage involves translating the design defined in the business model into a composite application implementing the defined processes. This involves some combination of determining if there are existing services that can be reused, building and testing new services and finally composing and testing the composite application.
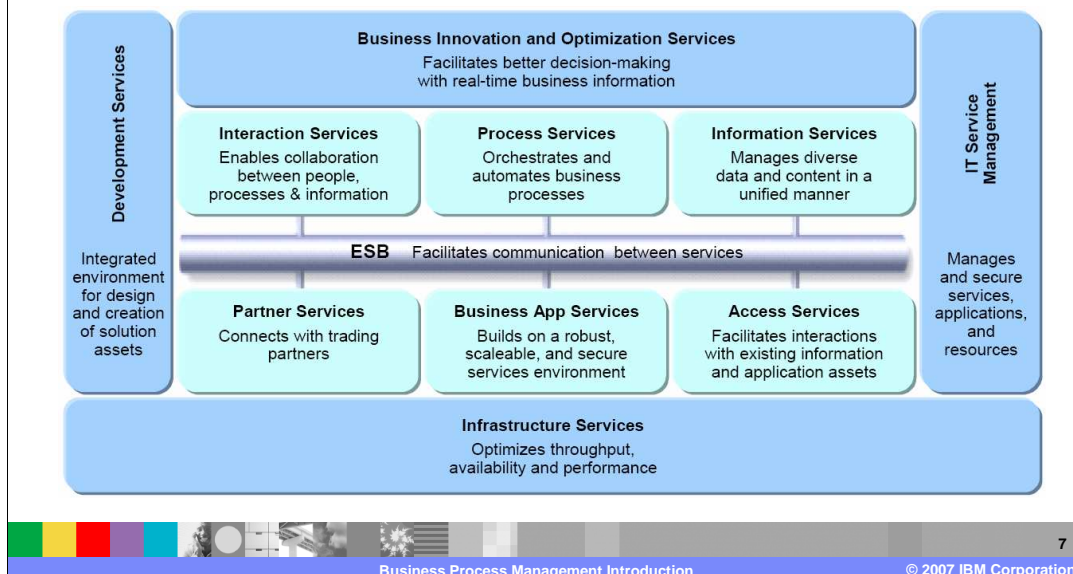
The *deploy* stage starts with ensuring that the hosting environment has the required resources, capacity and qualities of service needed to run the composite application in production. It then involves the actual deployment and operation of the composite application to provide the implemented business processes. Training of IT and business personnel in the operation and use of the business processes may also be required.

The *manage* stage involves all of the things typically associated with the operation of a runtime environment. The IT systems must be monitored to ensure they are up and running, system components must be monitored for problems, maintenance must be applied as appropriate, and security authorizations must be managed. However, in addition, this stage also includes the managing of the business model, which includes utilizing the key performance indicators to measure the success or failure in meeting the objectives of the business as defined in the business model. The operational environment may need tuning to address objectives that are not being met. Also, feedback to the model stage may be needed if it appears the business model needs improvement.

SOA governance applies to all stages of the SOA life cycle. The use of SOA makes your systems much more flexible and dynamic, which increases the risks of business processes being changed in some detrimental way. Governance means establishing who has the authority to make changes and controlling the processes they use to make those changes.

SOA reference architecture

- The SOA logical architecture model

Development Services
Integrated environment for design and creation of solution assets

Business Innovation and Optimization Services
Facilitates better decision-making with real-time business information

Interaction Services
Enables collaboration between people, processes & information

Process Services
Orchestrates and automates business processes

Information Services
Manages diverse data and content in a unified manner

ESB Facilitates communication between services

Partner Services
Connects with trading partners

Business App Services
Builds on a robust, scaleable, and secure services environment

Access Services
Facilitates interactions with existing information and application assets

IT Service Management
Manages and secure services, applications, and resources

Infrastructure Services
Optimizes throughput, availability and performance

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This diagram depicts the SOA reference architecture, which provides a logical architectural model for SOA. The core services used by applications at runtime are in the center of the diagram while the outer edge has services used in support of the core services, which can be described as follows:

Interaction services provide the required capabilities for users to interact with the system.

Process services provide the capabilities for managing the flow and interactions of multiple services in ways that implement business processes.

Business application services provide the core business logic and are the basic building blocks of the business design. These services are not further decomposable within the business model.

Information services federate, replicate and transform disparate data sources so that they can be handled in a unified manner.

Access services provide bridging capabilities that enable existing applications that are not SOA based to be delivered as services within a service oriented architecture.

Partner services provide the document, protocol and partner management capabilities required to interact with outside business partners.

At the very center of the diagram is the Enterprise Service Bus (*ESB),* which provides the capabilities needed to allow service consumers and providers to be loosely coupled. This avoids the use of point-to-point connections which can quickly lead to a high level of complexity and inflexibility within the overall SOA environment.

The supporting services around the outside of the diagram can be described as follows:

Business innovation and optimization services represent the tools and metadata for encoding the business design, policies and objectives.

Development services represent the entire suite of tools, methodologies and repositories needed to construct a SOA application.

IT service management represents the tools needed to manage your service flows, system utilization, enforcement of policies and other runtime management of the system.

Infrastructure services represent the core of the runtime environment which hosts the SOA applications, providing capabilities for high availability, performance and management of the environment.

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SOA scenarios

- SOA scenarios:
  - ▶ Represent common scenarios for using IBM products
  - ▶ Communicate business value and architecture for SOA
  - ▶ Are a starting point to accelerate SOA implementation
    - Can be used in combination
    - Can be incrementally adopted

- Scenarios
  - ▶ Service Creation
  - ▶ Service Connectivity
  - ▶ Interaction and Collaboration Services
  - ▶ Information as a Service
  - ▶ Business Process Management

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Business Process Management Introduction

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The SOA scenarios provide a representative view of how IBM products and solutions can be used to implement SOA environments and serve as a vehicle for communicating both the business value of SOA and the SOA architecture. You can select a SOA scenario that illustrates your adoption goals for SOA and use the scenario as a reference architecture to provide the starting point for your implementation. SOA scenarios can be incrementally adopted and used in combination with one another. Each scenario identifies the IBM products that are appropriate for use for implementation of that scenario.

A short description of each of the scenarios follows:

The *Service Creation* scenario is used to demonstrate reuse by exposing as services the application functionality of existing applications or new business logic.

The *Service Connectivity* scenario is used to demonstrate the integration of service providers and consumers where loose coupling is required to allow changes to be made to providers or consumers independent of each other.

The *Interaction and Collaboration Services* scenario is used to consolidate access to information and applications within an enterprise, allowing personalization based on user role.

The *Information as a Service* scenario demonstrates unified information available from multiple data sources through just in time integration.

The *Business Process Management* scenario provides for business innovation and optimization by enabling the implementation of business strategy through modeling, developing, deploying and managing business processes throughout the entire life cycle. This scenario will be the focus of the remainder of this presentation.

Section

Business Process Management (BPM) Scenario

This section provides a closer look at the Business Process Management scenario.

IBM

BPM Overview

- Business Process Management:
  - ▶ Aligns core assets onto a single integrated view
    - People, Information, IT resources, Processes
  - ▶ Enables flexibility and responsiveness to changing business requirements
  - ▶ Enables monitoring and evaluation of:
    - Business measurements
    - IT system performance
  - ▶ Provides powerful management tools for both:
    - Business executives
    - IT executives

Business Process Management combines business processes, information and IT resources to create a single integrated view of the business. This view enables the alignment of an organization's core assets, including people, information, IT resources and processes. The optimization and automation of business processes allows a new level of flexibility and responsiveness to the changing requirements inherent in an on demand business environment. Through monitoring of the automated business processes, both IT performance and business goals can be measured, providing a rich capability for both the business executives and the IT executives to understand, evaluate and improve the organization's capability to deliver business function that satisfies business requirements.

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BPM – Product alignment with SOA life cycle

- SOA life cycle stages and core BPM products
  - ▸ Model
    - WebSphere Business Modeler
  - ▸ Assemble
    - WebSphere Integration Developer
  - ▸ Deploy
    - WebSphere Process Server
  - ▸ Manage
    - WebSphere Business Monitor
    - Tivoli Composite Application Manager for SOA

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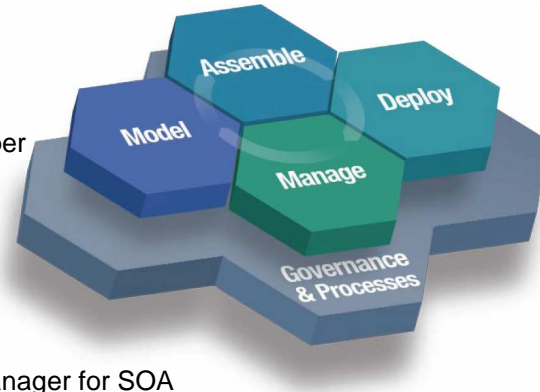
In the previous section you learned that the SOA life cycle consists of several stages and that the SOA scenarios define the appropriate IBM products to be used to implement a scenario. The Business Process Management scenario is very closely aligned with the SOA life cycle, with specific products associated with each stage of the life cycle.

The Model stage is associated with WebSphere Business Modeler

The Assemble stage is associated with WebSphere Integration Developer
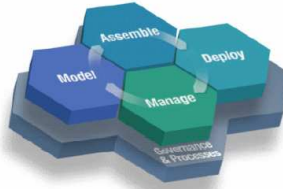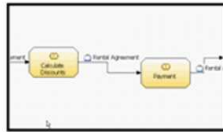
The Deploy stage is associated with WebSphere Process Server

The Manage stage is associated with WebSphere Business Monitor and Tivoli Composite Application Manager for SOA

The following slides will cover each of these stages and products in more detail.

BPM – SOA life cycle Model stage

**WebSphere Business Modeler**

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The Model stage of the life cycle is done using WebSphere Business Modeler and is used by business analysts to help capture business design. WebSphere Business Modeler can be used for documentation and compliance purposes, providing a visual and textual representation of processes, information, organization, resources, classifiers, and business measurements that can be shared across an organization. WebSphere Business Modeler includes a simulation tool that enables analysis of processes and testing of how well processes perform under different operating assumptions. You can use this analysis to refine and optimize business design. WebSphere Business Modeler is an Eclipse-based tool, which makes it easy to share information about your business design with other parts of your organization and tools. In particular, you can export a design into WebSphere Integration Developer and Rational Software Architect so that application developers can use it as a blueprint for designing process flows for automating business design.
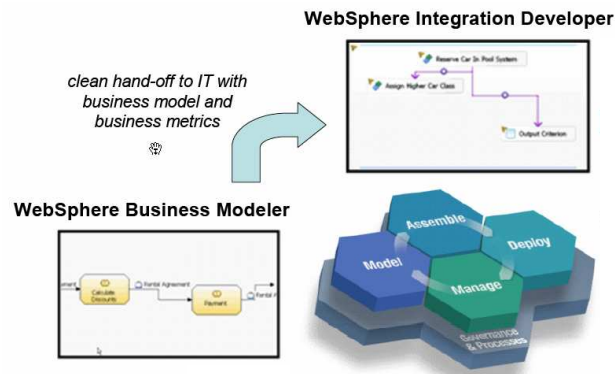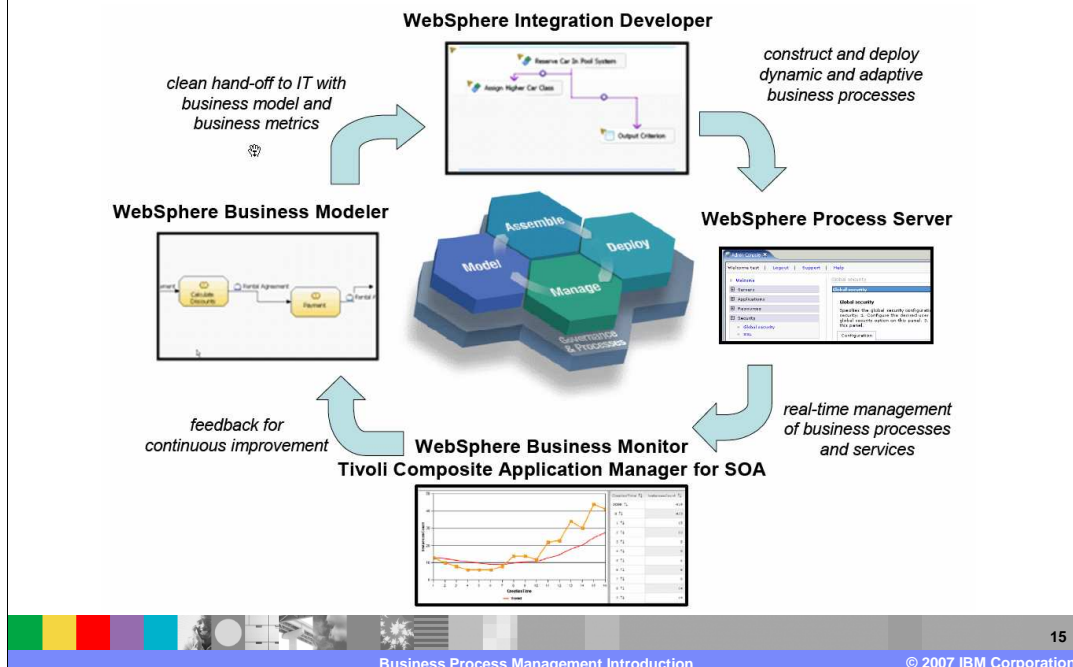
The Assemble stage of the life cycle begins when the design is exported from WebSphere Business Modeler and imported into WebSphere Integration Developer. WebSphere Integration Developer is an Eclipse-based tool designed to help create SOA enabled composite applications. A key building block of the composite applications are business process flows defined using Business Process Execution Language (BPEL). The other key building block is Service Component Architecture, which enables the definition and invocation of services using a variety of implementation approaches and protocols. The services and business processes defined using WebSphere Integration Developer can then be exported and run using WebSphere Process Server.
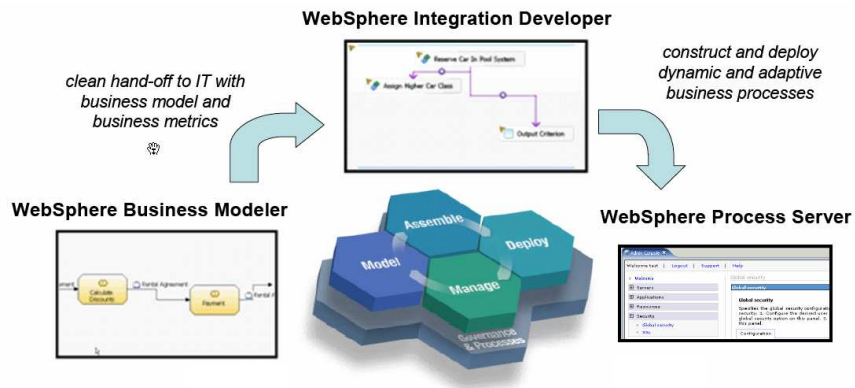
The Deploy stage of the life cycle begins when one or more modules are exported from WebSphere Integration Developer and installed into WebSphere Process Server, which is the primary hosting environment for SOA based composite applications. WebSphere Process Server provides a variety of administrative capabilities required to configure the environment for the composite applications that are installed. It is a secure, robust and scaleable environment in which mission critical business processes can be deployed and run.
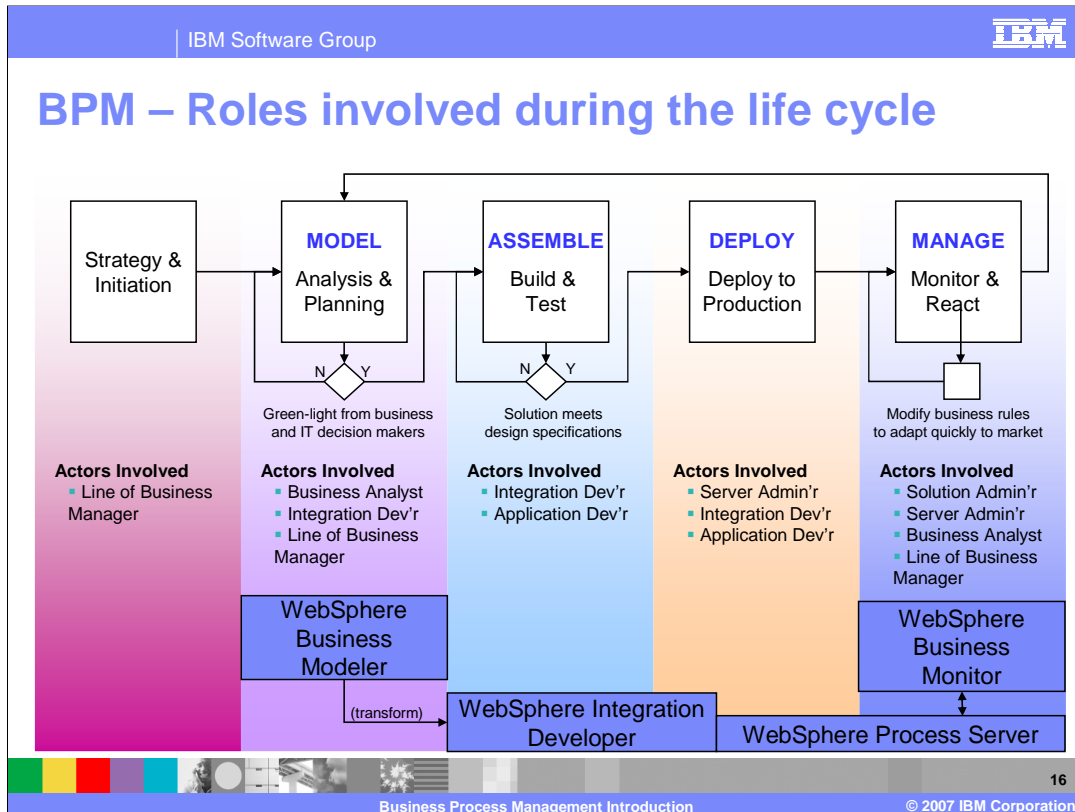
The Manage stage begins once the composite applications are running within WebSphere Process Server. Real time information is generated by WebSphere Process Server that can be used for monitoring both business processes and interactions between services. WebSphere Business Monitor enables you to monitor business processes in real time, providing a visual display of business process status. WebSphere Business Monitor complements WebSphere Business Modeler and helps in creating dashboards for visualizing the performance of a business, based on the key performance indicators that are identified in a business design. You can use this to track time, cost, and resources used in processes. WebSphere Business Monitor provides tools that enable you to set situational triggers and notifications of potential bottlenecks or workload imbalances. Ultimately WebSphere Business Monitor helps you better understand how your business design achieves your business objectives, and provides guidance about how to refine and optimize that business design if goals are not being met. Tivoli Composite Application Manager is designed specifically to enable IT service management by understanding the unique semantics and loosely coupled characteristics of SOA-based services. Tivoli Composite Application Manager has three editions that are relevant directly to the SOA Foundation, namely the IBM Tivoli Composite Application Manager for WebSphere, the IBM Tivoli Composite Application Manager for SOA, and the IBM Tivoli Composite Application Manager for Response Time Tracking. These cover a wide range of monitoring capabilities such as application server monitoring and resource consumption, the correlation of service invocations as they cascade across multiple systems, service-level response times and problem isolation.

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BPM – Roles involved during the life cycle

Strategy & Initiation	MODEL Analysis & Planning	ASSEMBLE Build & Test	DEPLOY Deploy to Production	MANAGE Monitor & React

N Y
N Y

Green-light from business and IT decision makers

Solution meets design specifications

Modify business rules to adapt quickly to market

Actors Involved
- Line of Business Manager

Actors Involved
- Business Analyst
- Integration Dev'r
- Line of Business Manager

Actors Involved
- Integration Dev'r
- Application Dev'r

Actors Involved
- Server Admin'r
- Integration Dev'r
- Application Dev'r

Actors Involved
- Solution Admin'r
- Server Admin'r
- Business Analyst
- Line of Business Manager

WebSphere Business Modeler

(transform)

WebSphere Integration Developer

WebSphere Process Server

WebSphere Business Monitor

This slide presents several user roles involved during the business process management life cycle.

The line of business manager is responsible for developing the business and the strategy that will be used to make the business successful. They define the products and services that the business provides and the strategy for how to market, sell and manage those products and services.

The line of business manager works with people in the Business Analyst role to define new products and services. The business analyst understands the business but also understands how to define and model the processes needed to implement the strategy defined by the line of business manager. The Integration Developer, who understands how to take a business model and implement it, may also be involved at this stage. The combination of the line of business manager, business analyst and integration developer working together yields a business process model that addresses the business strategy and can be implemented. This analysis and planning activity is done using the WebSphere Business Modeler during the Model phase of the life cycle.

Once the model is complete it can be exported in a form that can be consumed by WebSphere Integration Developer. In this phase the Integration Developer completes the implementation of the business processes according to the model. There could be a need for new application function to be developed in order to have all the services needed by the business process, which would be done by a person assuming the Application Developer role. During the Assemble phase of the life cycle, the implementation goes through an iterative build and test cycle until it is ready to be deployed to production.

The Integration Developer and the Application Developer now work with the Server Administrator to deploy the business process to the production environment. The deployable business processes are exported from the WebSphere Integration Developer and installed into WebSphere Process Server. Once the Server Administrator is satisfied that all the requirements for production deployment have been met, the business processes will go into production. This is the deploy stage of the life cycle.

Once the business process is running in production, WebSphere Business Monitor is used to monitor the business process. The Server Administrator continues to be involved in ensuring the business processes are properly installed and configured. In addition, the Solution Administrator now becomes involved to monitor the business process and ensure that it is operating properly from a business perspective. This is the Manage stage of the life cycle.

Over time some amount of historical data about the business process is collected. The solution administrator works with the business analyst and the line of business manager to analyze this data. Together, they can determine if improvements can be made to the model and implementation of the business processes. This is the feedback loop which completes the Business Process Management life cycle.

Section

Summary and References

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A summary of the presentation follows along with some references for further study.

Summary

- Definition of a Service Oriented Architecture (SOA)

- The basics about IBM SOA Foundation
  - ▸ SOA life cycle
  - ▸ SOA reference architecture
  - ▸ SOA scenarios

- The Business Process Management scenario
  - ▸ Relationship to the SOA life cycle
  - ▸ Core products used in the Business Process Management scenario
  - ▸ Roles of participants in Business Process Management

This presentation introduced a basic definition of a service oriented architecture and the IBM SOA Foundation. The essential elements of IBM SOA Foundation are the SOA life cycle, SOA reference architecture and the SOA scenarios. The primary purpose of this presentation was to introduce one of the SOA scenarios, specifically the Business Process Management scenario. You learned how Business Process Management relates to the SOA life cycle, which IBM products are fundamental to the Business Process Management scenario and the various user roles associated with participants in the SOA life cycle for BPM.

References for further study

- IBM SOA Foundation white papers
  - Executive overview
    - ftp://ftp.software.ibm.com/software/solutions/pdfs/SOA_g224-7540-00_WP_final.pdf
  - Architectural introduction
    - http://download.boulder.ibm.com/ibmdl/pub/software/dw/webservices/ws-soa-whitepaper.pdf
- Business Process Management Redbook
  - http://www.redbooks.ibm.com/abstracts/sg247234.html

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There are many resources available for further study. These are listed as good starting points for your study and through them you will discover references to many other resources.

The first two are white papers that introduce the IBM SOA Foundation. The executive overview is 11 pages and provides information similar to what has been presented in this presentation. The architectural introduction is 68 pages and provides a very detailed look at SOA and the IBM SOA Foundation, including a description of the various products that play a role in the IBM SOA Foundation. The Business Process Management Redbook is over 500 pages, a large portion of which walks you through an end to end scenario of the SOA life cycle for a fictional car rental company. Do not let the size of these resources discourage you from making use of them. They can be very valuable for reading selected sections and to use as a reference.

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