



IBM Software Group

# SAP integration workshop

## *IBM SOA and SAP enterprise services oriented architecture*



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This is the IBM SOA and SAP enterprise services oriented architecture presentation as part of the SAP integration workshop. This presentation will give you an overview of SOA and the differences in the common vision from IBM and SAP.

## Agenda

- Service oriented architectures - Introduction
- Ways to service oriented architectures with SAP
- The IBM SOA reference architecture



This section will introduce the general concept of a service oriented architecture.

## The IT-related problems facing business today

- Drive down cost
  - ▶ Eliminate duplicate applications and systems
  - ▶ Re-use, do not re-build
  - ▶ Simplify skills base
- Reduce cycle time and costs for external business processes
  - ▶ Move from manual supplier transactions to automated transactions
  - ▶ Facilitate flexible dealings with partners with minimal process or IT impact
- Support an agile business model
  - ▶ The marketplace is changing - businesses need to change too
  - ▶ Many existing IT systems are inhibitors to change: complex and inflexible
  - ▶ Existing integrations can be inhibitors to change: multiple technologies, point-to-point integration, inflexible models
- Integrate across the enterprise – end-to-end
  - ▶ Integrate historically separate systems
  - ▶ Completion of mergers and acquisitions
  - ▶ Across physical and technology barriers

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IBM SOA and SAP Enterprise Services Oriented Architecture

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Many IT departments face multiple challenges today. They have to reduce costs and shorten cycle times while supporting an agile business model all over the company. These challenges seem incredibly difficult, but some opportunities are listed in this slide. The costs can be reduced by eliminating duplicate applications or systems - just reuse what you already have.

Connect with your suppliers using automated transactions in the process to reduce cycle times.

Optimize what you already have, because point-to-point integrations are not flexible enough for future work.

Enhance your integration by integrating more systems across the enterprise.

## IT must follow three key paradigms

- The need for flexibility, innovation and forces increased componentization of the overall business and its processes
- Applications evolve on a parallel path—becoming increasingly modular
- Simplification of the underlying IT infrastructure is required to support the changes in the business

**IBM** follows this strategy with On-demand Business and SOA

**SAP** follows the strategy with Adaptive Business Solutions and ESA



There are three key paradigms in IT.

First, the need for flexibility and innovation is forcing organizations to become more “componentized” – that is, to break down the overall business into the pieces or components that make it up. This allows an organization to stop looking at itself from the viewpoint of organization, geography, product or customer segment – and start looking at what is actually being done.

Second, applications are evolving on a similar path and becoming increasingly modular. So instead of focusing on big monolithic applications that are made up of millions of lines of code, organizations are beginning to think about discrete modular elements of application functionality that can more easily be modified as the needs of the business change.

The third point has to do with the infrastructure that is required. Today’s infrastructure is complex and rigid. Too often the way it is implemented imposes limitations that force the business to compromise its approach to solving problems. That has to change. The business pressures forcing increased componentization of the business and its processes, the applications that support them, are going to force you to rethink your infrastructure and simplify it.

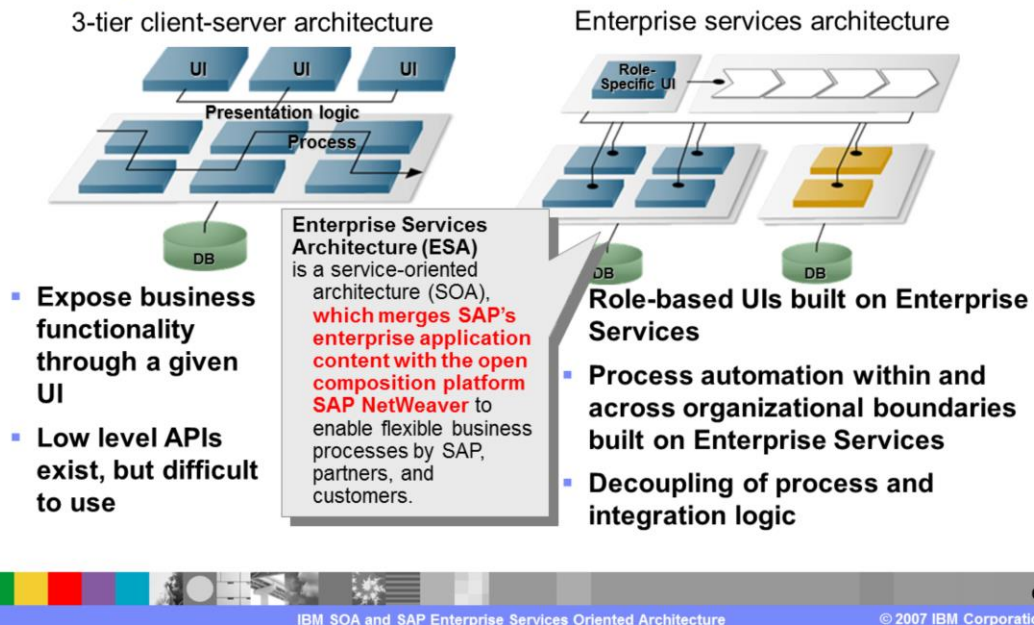
## Section

# ***Service oriented architectures with SAP***



This section covers some of the ways to get an SOA landscape involving SAP.

## SAP's eSOA Strategy – From 3-tier C/S to Enterprise services

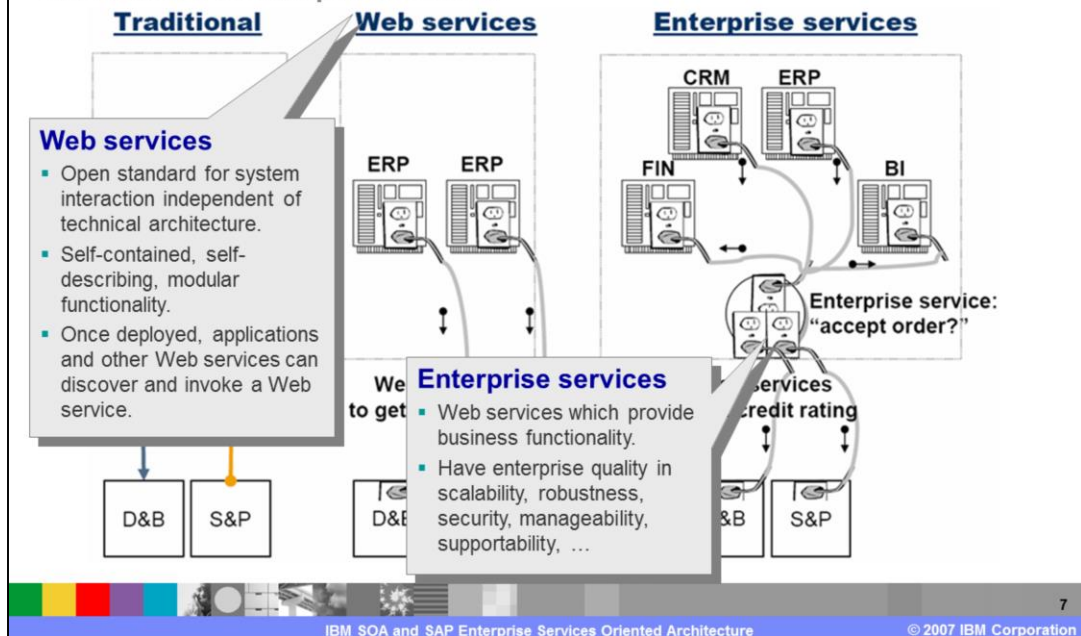


The newest SAP NetWeaver releases help to expose SAP applications as SOA components. These components are reusable from the outside world.

The ESA is defined as an implementation of SOA that merges SAP's enterprise application content with the open composition platform SAP NetWeaver to enable flexible business processes.

## SAP's eSOA strategy

The evolution to enterprise services



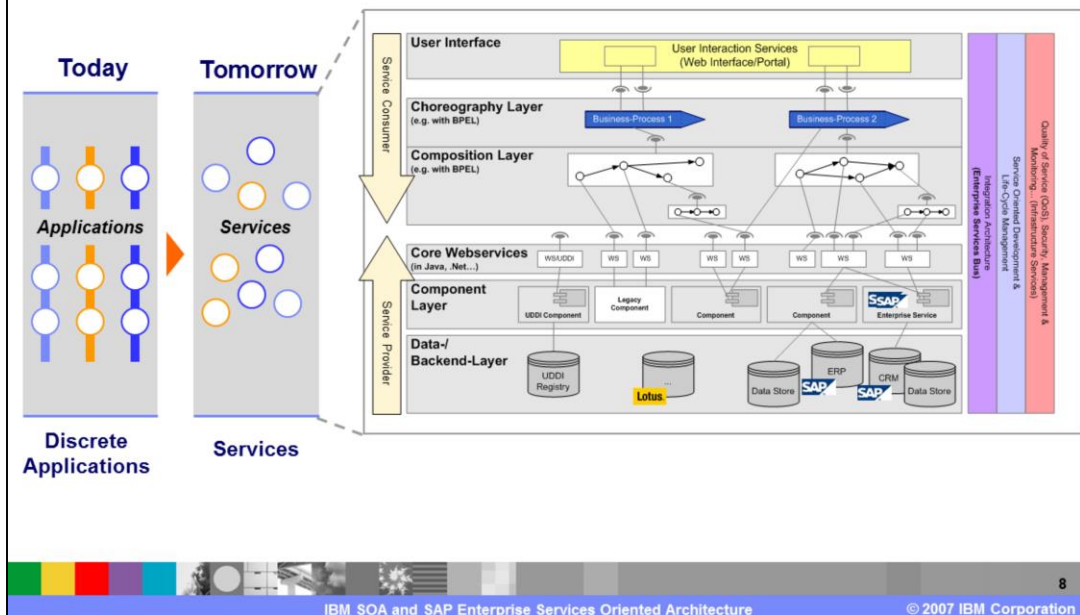
SAP sees the enterprise services in a different way than Web services.

Web services are built upon an open standard and are self contained.

Enterprise services are Web services, but they are providing business content with much better qualities of service.

# The vision of a service oriented architecture

Loosely coupled, process driven services and components



To move to an SOA-ready world, the move from monolithic applications to service collaborations is necessary.

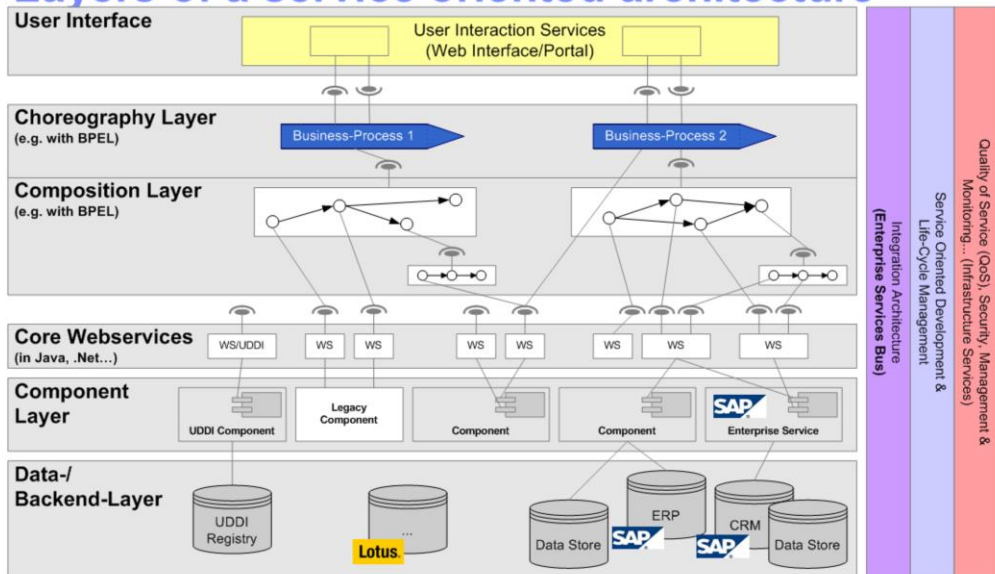
And SAP is going this way to expose its business functionality as services.

The service consumer can be IBM SOA for automated BPM, with user control based on a component model, while the service provider is still SAP through NetWeaver.

The integration of applications and information sources through the exchange of information is based on common semantics or a vocabulary used to define the structure of such information exchange.



## Layers of a service oriented architecture



In general, every SOA architecture is based on different layers.

Beginning on the lowest level there are back-end systems containing the data.

Some interactions with them for a special cause are built in components.

These components can be exposed as Web service to other parties.

Then there is a composite layer in which the single services get aggregated to fulfill a higher mission. These composites get built to business processes.

In the end there is a user interface building the bridge from human to process.

## The journey - monolith to component services

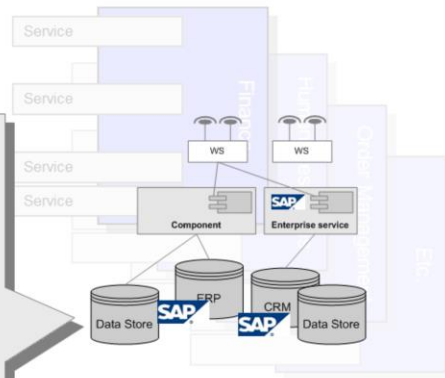
### Current monolithic systems

CO: Controlling
EC: Enterprise Controlling
FI: Financial Accounting
IM: Capital Investment Management
TR: Treasury
LO: General Ledger
MM: Materials Management
PM: Plant Maintenance
PP: Production Planning & Control
PS: Project System
QM: Quality Management
SD: Sales & Distribution
PA: Personal Administration
PD: Personal Planning & Development

### Coexistence of "old" and "new"!

- IBM's SOA approach let customers the **freedom of choice**. The possibility of the **coexistence of "older"** (R/3 Systems) **and "newer"** (mySAP / NetWeaver) **technology**.
- The **independency of application- and infra-structure components** results in more flexibility

### Application Components "Enterprise services"



So the journey to SOA starts with the first step: the change from monolithic systems to service based application components.

The benefit of IBM SOA is that you have the freedom of choice and the possibility of the coexistence of older and newer systems.

This supports a seamless move to the new technology without a complete new roll out all at one time.

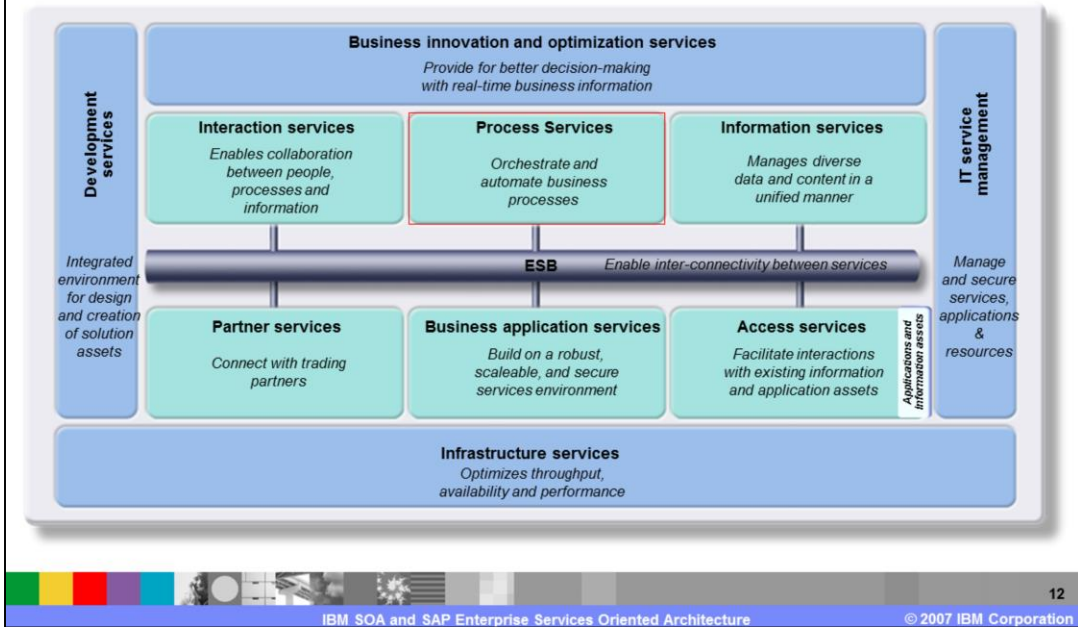
## Section

# ***The IBM SOA reference architecture***



This section explains the IBM SOA reference architecture.

## The SOA reference architecture: Model of the logical architecture

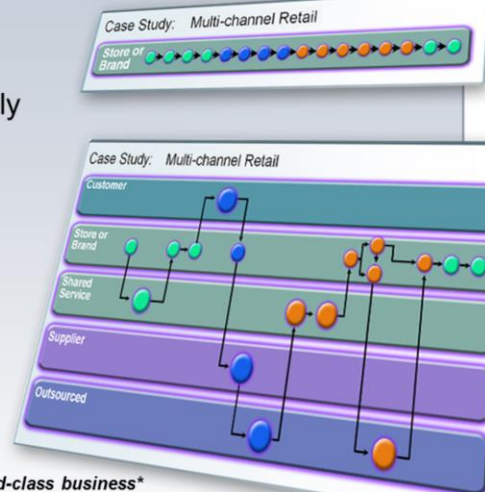


The SOA reference architecture is a way of looking at the set of services that go into building an SOA. These capabilities can be implemented on a build-as-you-go basis allowing capabilities and project level solutions to be easily added as new requirements are addressed over time. Looking at the colors in the graphic, you can see that these services represent the entire life cycle, from building and assembly in green to deployment and management in blue. An enterprise service bus is the backbone of the reference architecture, facilitating communication between services. The reference architecture is a great tool for laying out roadmaps for pursuing SOA.

## Why SOA for business flexibility and reuse?

- **Economics:** globalization demands flexibility
- **Business processes:** changing quickly and sometimes outsourced
- **Growth:** at the top of the CEO agenda
- **Reusable assets:** can cut costs
- **Information:** greater availability
- **Crucial for flexibility and becoming an On Demand Business**

### Traditional business\*



### Today's world-class business\*

\*Sources: CBDi

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Economic forces and accelerating change are driving the need for flexibility and re-use. SOA makes this possible.

The graphic on this slide depicts a sample multi-channel retail business process in a traditional business compared to today's world-class businesses. In the past, linear business processes were handled by an individual department within a company. As sophistication increased, the same business processes was broken up and pieces of it were being performed in different places.

This kind of dispersion takes a lot of flexibility to establish and even more to change once it has been established. It is important to remember that nearly every business process in today's companies is very dependent on the information technology systems that supports it.

Several forces are driving the need for this kind of flexibility.

As the marketplace globalizes, new markets, new workforces, and new competitors are making companies look for ways to adapt more quickly.

Cycle time between changes in business processes is shrinking. While companies may have made significant changes yearly in the past, you now see the same level of change on a monthly or even weekly basis.

Focus on cost-containment has been replaced by growth as the top item of the today's CEO's agenda. That growth demands the flexibility to be more nimble than competitors.

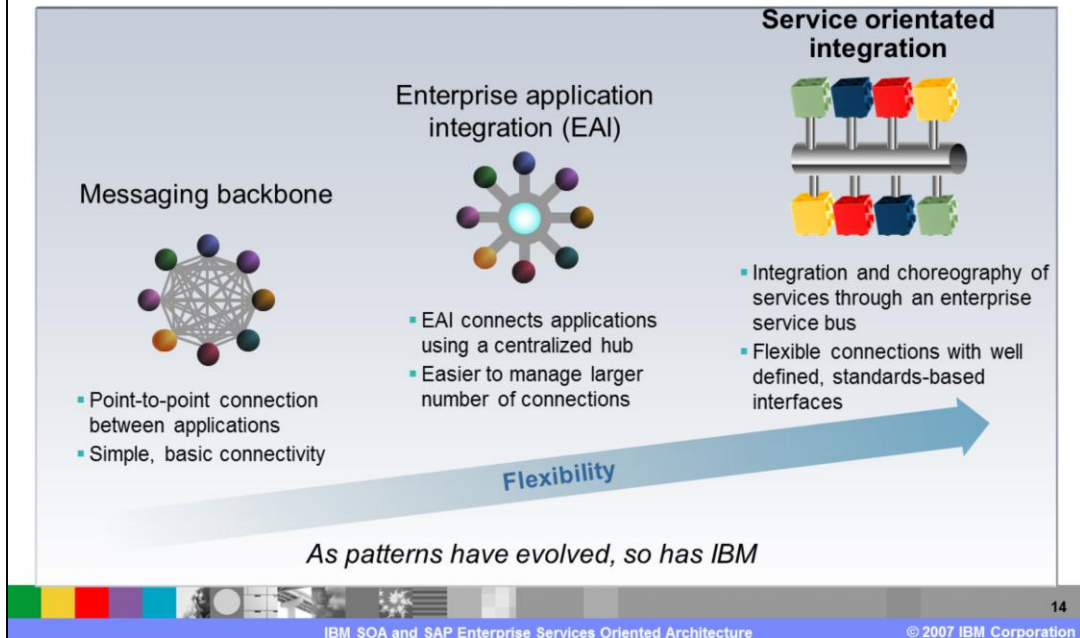
Cost reduction has not lost its importance; businesses are looking for ways to make better use of the investments that they already have. Re-use fosters cost reduction.

More information is available than ever before. Companies need a way to make sense of this information regardless of its location, format, or type.

And finally SOA and the flexibility it brings is crucial for becoming an On Demand Business. An On Demand Business is an enterprise whose business processes — integrated end-to-end across the company and with key partners, suppliers and customers — can respond with speed to any customer demand, market opportunity or external threat.

## SOA builds flexibility on your current investments

*The next stage of integration*



SOA builds upon previous integration techniques but does not replace them.

The need to make IT more flexible is not new. Each of these integration techniques has its place and is appropriate for handling certain situations. IBM has experience and history in all of these steps.

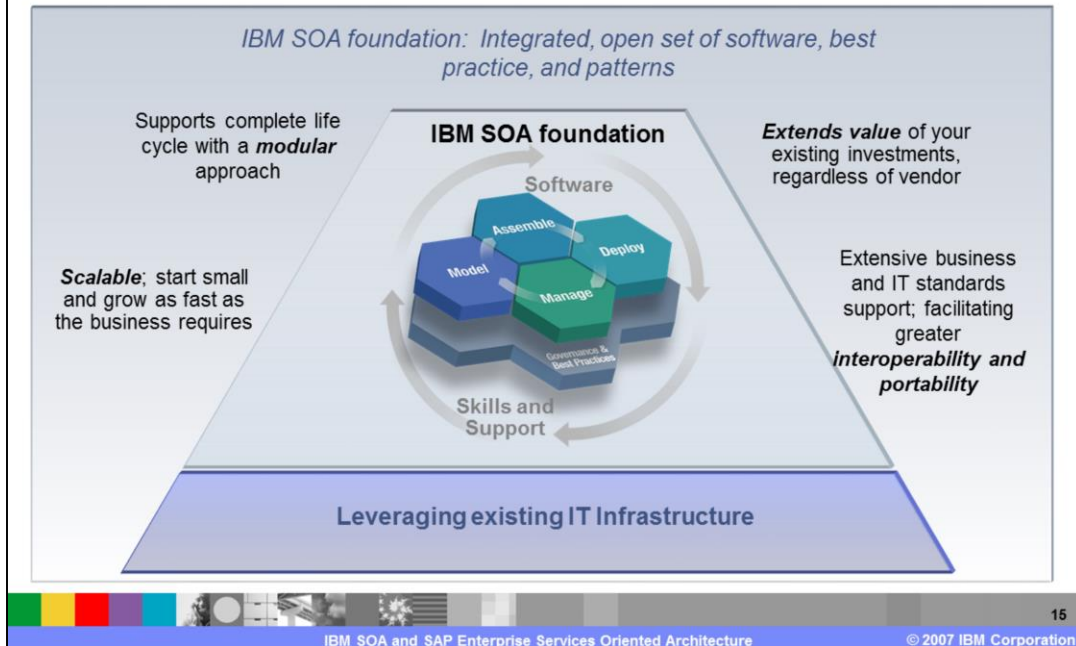
Messaging backbones and point-to-point connectivity work great for direct application-to-application connection. They support high throughput and are comparatively simple to create and deploy. But they work best when you have a fairly small number of connection points that do not change very much if at all.

Enterprise Application Integration is a hub-and-spoke integration design. This kind of system relies on adapters to connect applications and data sources to a central hub. This kind of design works well when you have a larger number of end-points and when they change more frequently. When you add an endpoint or change how the endpoint connects, all you need to do is change one of the adapters rather than the connections to all the other endpoints. The downside of this is that this does not support high throughput very well and the communications standards are often proprietary and less interoperable.

SOA blends the best of all these concepts into one new architecture giving businesses capabilities that they have never had before. But it is important to recognize that SOA is not the end of the road either; it is the next step in the evolution of flexible infrastructures. This evolution will continue into the future.

## Introducing the IBM SOA foundation

*Provides what you need to get started with SOA*



The IBM SOA foundation is an integrated, open set of software, best practices, and patterns that provides what you need to get started with SOA. The software that makes up the SOA foundation has been carefully selected from the broader IBM software portfolio to support each stage of the SOA life cycle. This software provides a single focal-point to support your SOA Infrastructure with a common tool framework, runtime, infrastructure, and common administration.

The SOA foundation is designed to help you extend the value of the applications and business processes that are already running the business today. It is not a replacement for your existing infrastructure or investments.

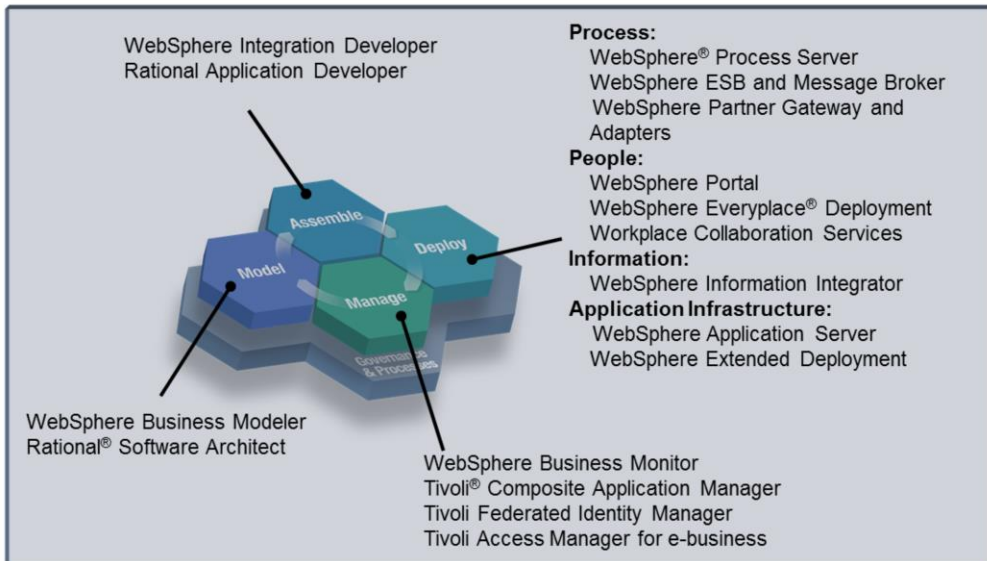
The SOA foundation is interoperable and fully modular allowing you to select components on a build-as-you-go basis adding components as new requirements are addressed over time. The SOA foundation can also be readily enhanced with software from the broader IBM Software portfolio to provide additional functionality where it is needed.

The SOA foundation is scaleable, allowing you to start small and grow as fast as the business requires.

Finally, the SOA foundation provides extensive support for business and IT standards, facilitating greater interoperability and portability between applications.

## SOA foundation

Part of a broader portfolio



The SOA foundation is built with software to support the SOA life cycle that was carefully selected from a broader software portfolio.

These are the specific, targeted software products that support each stage of the SOA life cycle. They are interoperable and fully modular so you can select just what you need today with the comfort that it will work well with other additions you may want to make in the future.

Two things to note: First, nobody in the industry comes close to IBM's modeling capabilities. This is not just modeling a business process like you would do with pen and paper. It is modeling, simulation, optimization and direct deployment into a run-time environment.

Second, IBM has the right product for the right need regardless of whether it is integration of process, people, information or application infrastructure. It is not necessary to purchase all of these products to pursue an SOA and achieve real value. Know that the right product is there to meet your particular need, and everything works together so that you can build as you go.



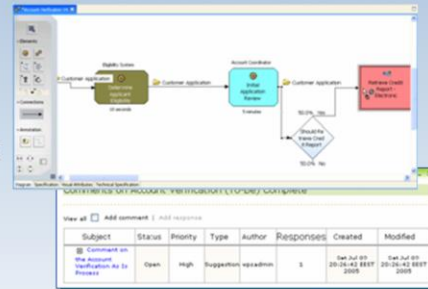
## Model – For the business analyst

*Design business processes for SOA roll-out*



### **Enhanced! WebSphere Business Modeler**

- Expanded user experience and analytical capabilities
  - More granular and precise modeling of activities
- Collaborative modeling to enable team work
  - Ability to publish, share and comment on models through the web
- Business performance modeling
  - Ability to identify, generate and receive feedback on key performance indicators
- Microsoft Visio® importing



WebSphere Business Modeler has been enhanced to provide an intuitive, powerful tool that models, simulates, and optimizes business processes yielding an insightful operational view.

A business measures editor now permits the business analyst to define key performance indicators, a scorecard of how your business is performing against established goals. The Business Modeler publishing server allows collaboration on business models; subject matter experts can view and comment upon models using a Web browser.

Simulation capabilities in WebSphere Business Modeler can be fed data from the WebSphere Business Monitor, and allow business users to model changes relative to cost, time and resources before the model gets deployed. Simulation before deployment yields higher return on investment, in that effects of the changes are first simulated to understand all of the effects.

WebSphere Business Modeler V6 is enhanced with new functionality around the business analyst's modeling experience, collaborative modeling, and capturing performance metrics. Within the new modeler, the business analyst can create and edit diagrams by roles. The simulation engine has been enhanced to generate multiple resources based on roles and to use a table format for defining attributes to the various process elements. Attributes may be set up at a granular level, to closely reflect the way your business operates.

The new collaborative modeling allows you to share your work across a team in a Web-based environment. Business performance modeling is the set up for real-time business monitoring. You can create observation models that define and calculate the key performance indicators for monitoring the processes after they are deployed. The observation models are auto-generated for the run-time environment.

# Assemble

Create composite applications with ease



## New! WebSphere Integration Developer

### Streamlining process design hand-off between business and IT

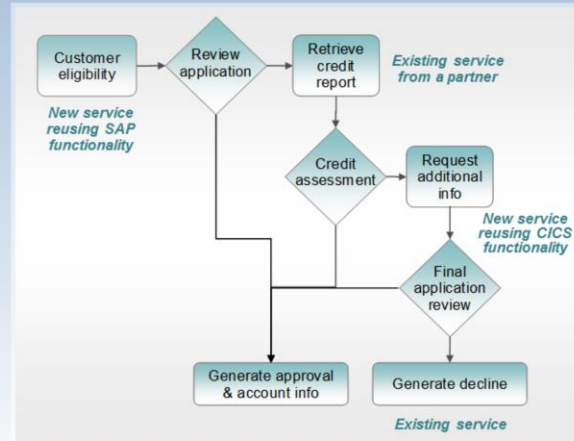
- Import and work with business process models directly from the business analyst (WebSphere Modeler)

### Simplifying and speeding development

- Easy to use tools where everything can be done through the GUI

### Maximizing re-use

- Ability to leverage existing services and save components for future service reuse



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WebSphere Integration Developer is a powerful, graphical tool for composite application development that requires minimal programming skills and accepts models from WebSphere Business Modeler for a smooth transition.

As you streamline your business processes with new and efficient models, it is important that the business analysts clearly communicate the models to developers for faster, error-free implementation. WebSphere Integration Developer seamlessly works with WebSphere Business Modeler to transform business models to implementable IT flows facilitating clean hand-off from business.

WebSphere Integration Developer's rich GUI lets you not only create and deploy business processes, but also change and manage business processes on the fly after they have been deployed. You can modify the business rules to meet any emerging business event. You can change an underlying IT module with minimal or no changes to your process. You can intervene in a business process with human decision makers for On-Demand response.

Using WebSphere Integration Developer, you can maximize reuse. Its unique internal methodology allows reuse of every service. You have increased visibility of these services with the ability to browse and view.

## Deploy with an enterprise service bus

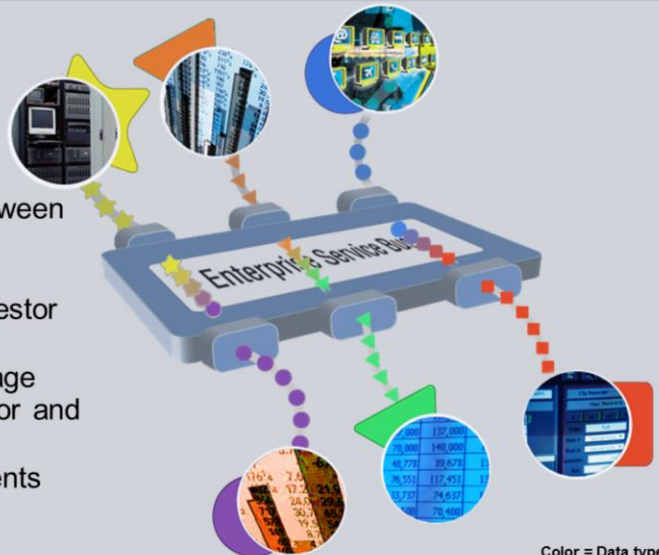
**Flexible connectivity infrastructure for integrating applications and services to power your SOA**

**ROUTING** messages between services

**CONVERTING** transport protocols between requestor and service

**TRANSFORMING** message format between requestor and service

**HANDLING** business events from disparate sources



Color = Data type  
Shape = Protocol

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An enterprise service bus gives you the flexible connectivity infrastructure you need for integrating applications and services to power your SOA. It handles routing of messages between services, converting transport protocols between requestor and service. Different transport protocols are illustrated here with the different shapes. The bus transforms message formats between requestor and service. The different data formats are illustrated here with the different colors. It also handles business events from disparate sources

Building and maintaining application interfaces is difficult and expensive. An ESB addresses this pain point with three benefits:

An ESB enables IT to be more responsive and flexible to the changing demands of the business -- making it more simple to add, remove, and change applications as required.

An ESB reduces the time and cost of projects to integrate applications by reducing and simplifying the interfaces for each application.

An ESB increase use of existing assets: ensure you can integrate assets spanning environments which could be a mix of pure Web services and assets that do not comply with standards.

## Deploying processes within BPM enhances your SOA project

**New!** WebSphere Process Server V6



### Simple, flexible deployment of processes

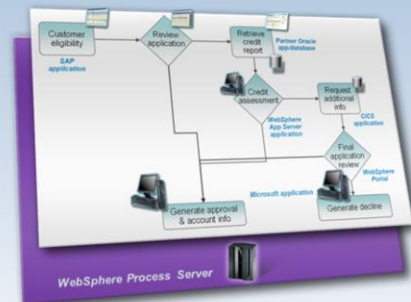
- Built and optimized on the market leading application server, IBM WebSphere Application Server

### Powered by Enterprise Service Bus (ESB)

- Built on top of an open standards based ESB
- Flexible connectivity infrastructure for integrating applications, data, and services to power your SOA

### Dynamically modify deployed processes

- Making plug-and-play of process components a reality
- Change business rules quickly and easily



WebSphere Process Server is IBM's comprehensive, flagship deployment environment for business processes based on SOA.

WebSphere Process Server gives users a single, robust, secure, and scalable deployment platform for business processes across the enterprise. It is built upon WebSphere Application Server and Business Integration technologies. Never before has such a flexible, cost-effective, and easy-to-use process server been available from IBM or any other company.

WebSphere Process Server can extend the reach into your IT environment. It is built on and powered by a standards-based enterprise service bus to provide connectivity to every extent of your enterprise. Process Server gives you the power of an ESB without having to purchase or deploy anything else. It also lets you plug in a wide variety of commercial applications, data sources, and standards-based technology assets with a broad assortment of adapters that provide connectivity.

WebSphere Process Server lets you dynamically modify processes that you already have deployed. Now you can add components with minimal impact or disruption to your IT processes. This helps you better adapt to emerging and evolving business requirements.

Going forward, WebSphere Process Server is the only server that not only leverages your existing IT, but helps transform it to a more service-oriented environment.

# Manage - For business

Monitoring business performance across your SOA



## Enhanced! WebSphere Business Monitor

### Real-time visibility into process execution

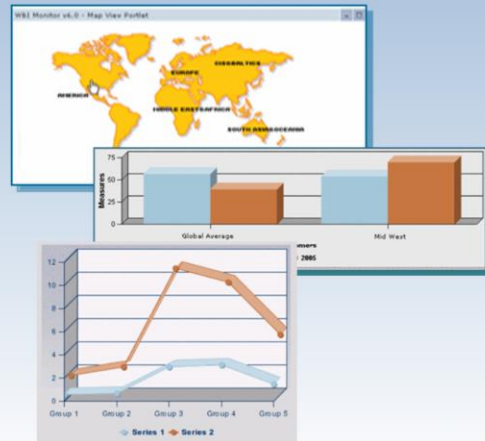
- Management dashboards and reporting capabilities, including trending information
- Event alerts tailored to various types of users

### Active intervention in process execution

- Action Manager – supporting real-time response and action as performance data is received

### Supporting continuous process improvement

- Ability to export data to WebSphere Business Modeler for analysis and process improvement



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WebSphere Business Monitor gives you the ability to monitor business processes in real-time, providing a visual display of business process status, together with alerts and notifications to key users that enables continuous improvement of your business processes.

New features set triggers, notifications and responses in the pinpoint process locations that you choose to monitor. These are situations which are not handled directly by the process, but are exception conditions requiring special handling. This functionality allows you to intervene and change the course of the business based on events and trends as they emerge.

You can monitor those KPIs that were set in the Modeler. This provides real time feedback for continuous process improvements. IBM WebSphere Business Monitor measures the *actual* performance time of every process.

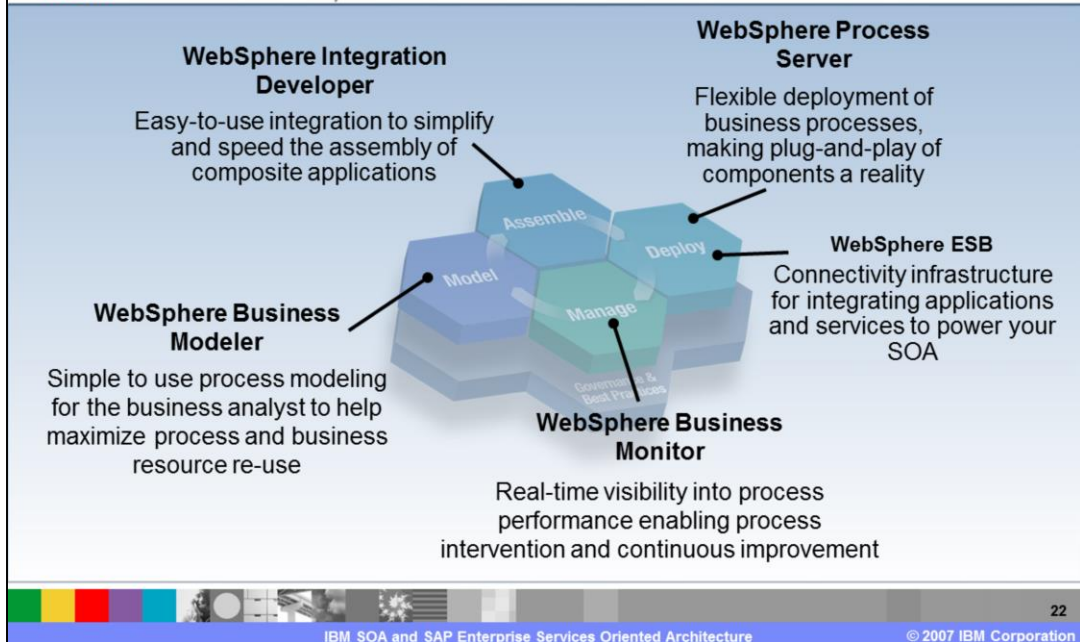
This gives the people responsible for the operation of specific processes accurate information about how the process is run. It gives them the knowledge they need to design the site, up the capacity or otherwise make changes that will benefit the majority of the users.

Executives can use these analyses to tune the site application and the environment based on actual performance information. Furthermore, because the information is dynamic, anything of interest –like a group of users having really long response times—can be investigated on the spot by clicking and drilling down on the data. The answers are presented in graphical form or in columns and text.

The real power with the Business Monitor is the ability to take your real time data and load it back into the Business Modeler for analysis. The only way to optimize your processes is to run simulations and 'what-if' scenarios using your real business data.

## End-to-end process capabilities for your SOA

*New! From IBM WebSphere software*



IBM is introducing new and enhanced business process management products to facilitate every step of the SOA life cycle for unmatched support of SOA.

**WebSphere Business Modeler** brings you simple-to-use process modeling, simulation, and optimization for the business analyst to help maximize process and business resource re-use before further IT resources are expended.

**WebSphere Integration Developer** provides for integration to simplify and speed the assembly of composite applications. These tools link directly with Modeler for seamless interaction between steps.

**WebSphere Process Server** is for deploying business processes. Process Server gives you the secure, robust and scalable environment you need to deploy your mission-critical business processes.

**WebSphere Business Monitor** gives you real-time visibility into process performance enabling process intervention and continuous improvement. Modeler lets you view key performance indicators so you can keep track of the health of your business and pinpoint any problems that arise so you can handle them immediately.

All of these elements are connected through an enterprise service bus which provides connectivity infrastructure for integrating applications and services to power your SOA. IBM has two separate ESB offerings depending on your needs.

# Model driven development by IBM and SAP

**IBM Industry CBM**

**SAP Industry Solution**

The component business model  
The component business model is a logical representation, or map, of a business that reveals its essential building blocks.

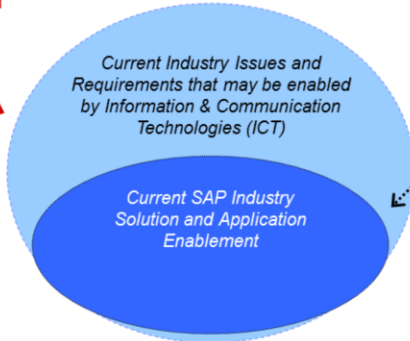
Business	Product	Customer	Supplier	Channel	Partner	Competitor	Government	Financial	Physical
Market	Product	Customer	Supplier	Channel	Partner	Competitor	Government	Financial	Physical
Order	Product	Customer	Supplier	Channel	Partner	Competitor	Government	Financial	Physical
Process	Product	Customer	Supplier	Channel	Partner	Competitor	Government	Financial	Physical



**Potential for developing client differentiating ESA/SOA Composite Applications**

IBM's perspective on Industry and Application Solutions

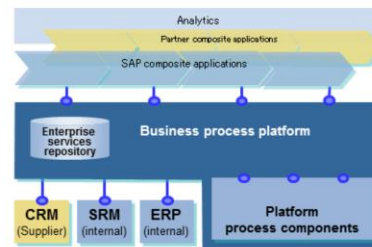
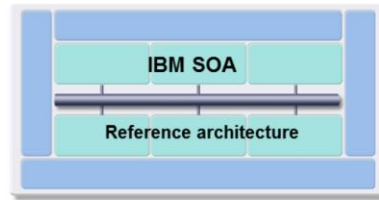
SAP's perspective on Industry and Application Solutions



So both IBM and SAP have their perspective on solutions for customers. It is possible to combine them for optimum functionality.

## SAP and IBM share a common vision and technology base

- Common vision
  - ▶ Services based
  - ▶ Delivering on demand
  - ▶ Adaptive to changing business requirements
  - ▶ Business Process oriented
- Common technologies
  - ▶ J2EE (**not** .Net)
  - ▶ Web services
  - ▶ Open standards
  - ▶ SOAP, UDDI, XML
  - ▶ Eclipse based

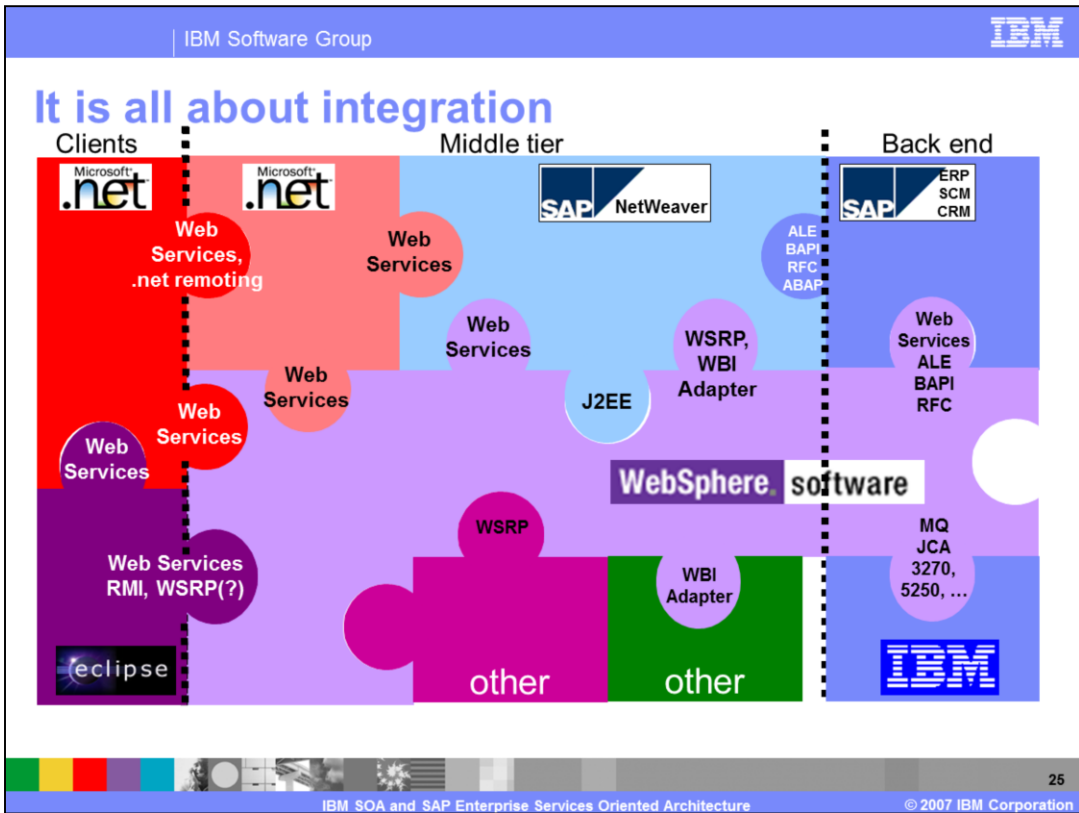


And there are good ways to work together in this space.

Because both vendors have a common vision of a service based world that is business process oriented.

And both vendors support J2EE and Eclipse as a way to build this world.





In a standard based world an integration picture like this could be possible. All vendors focus on their main competencies and open standards build the interface to build a solution.

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Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. All customer examples described are presented as illustrations of how those customers have used IBM products and the results they may have achieved. The actual throughput or performance that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput or performance improvements equivalent to the ratios stated here.

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