

**SAP Solution in Detail**  
**SAP NetWeaver**



# **SAP NetWeaver® AND ENTERPRISE SERVICES ARCHITECTURE**

**Using IT Practices to Bridge the Worlds of Business and IT**

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## EXECUTIVE SUMMARY

Organizations that can enable complex IT services quickly and cost-effectively have a significant competitive advantage. But this kind of agility requires an IT infrastructure that enables the seamless integration of business processes and information in disparate applications, collaboration among all involved parties, and the rapid management and adaptation of business processes.

Traditional IT infrastructures make the rapid development of flexible IT services nearly impossible. Building business processes that span organizational units means building links between heterogeneous systems – an expensive and time-consuming proposition. And modifying existing functionality can be prohibitively difficult or even impossible.

Web services and service-oriented architectures are huge strides in simplifying application integration. Web services offer a standardized and vendor-agnostic way to cope with heterogeneous systems and to create interoperability. But Web services are insufficient to the task. They are too granular to be efficient building blocks for enterprise business scenarios, and they do not yet provide a way to ensure semantic interoperability. To efficiently develop new business solutions that leverage existing applications, you need business-level building blocks that aggregate the benefits of multiple Web services and that simplify interoperability between them. In other words, you need enterprise services.

Enterprise services architecture (ESA) is a business-driven software architecture for service-based, enterprise-scale solutions that provides the increased adaptability, flexibility, openness, and cost-effectiveness that businesses need today. ESA goes beyond service-oriented architecture fundamentals by elevating the design, composition, and management of Web services to address business requirements through the use of enterprise services.

The SAP NetWeaver® platform is the technical enabler of ESA and enables your IT department to compose and orchestrate enterprise services using model-based development. You can also use the platform to expose information and functionality from existing applications and deploy them as enterprise services to communicate with SAP, third-party, and legacy systems.

As the foundation for ESA, SAP NetWeaver helps you evolve your current IT landscape into a strategic environment that drives business change. Deploying ESA with SAP NetWeaver allows you to decouple business processes from underlying IT systems so you can add, remove, or change steps in a business process – and do so without interrupting daily operations. You can also extend the reach of those processes to new communities inside and outside your organization without adding undue costs to existing investments.

SAP NetWeaver delivers a number of benefits including a lower total cost of ownership, and you can implement it gradually, working toward a full ESA-compliant landscape as your needs dictate. The result is a modular, gradual path toward ESA and all the benefits it provides.

## THE IT ORGANIZATION: ENGINE OF THE MODERN ENTERPRISE

IT organizations play a larger role than ever in driving business success. The systems and solutions they create, manage, and maintain now serve as the engines of the enterprise. And as a result, organizations that can enable complex IT services quickly and cost-effectively have a significant competitive advantage. This kind of agility requires an IT infrastructure that enables the seamless integration of processes and information from disparate applications regardless of where they reside; collaboration between departments, suppliers, partners, and customers; and the management and adaptation of processes at the pace of business change. Equally important, the IT infrastructure must allow businesses to leverage and extend existing systems to support new business needs in a cost-effective way.

But for most companies today, launching new IT services is taking longer and costing more. Increasingly, a competitive advantage requires solutions that involve people, processes, and information across multiple organizations and systems. Traditional IT infrastructures make the rapid development of flexible IT services nearly impossible.

### The Problem with Traditional IT Infrastructures

Traditional IT infrastructures are problematic for a number of reasons. First, businesses have increasingly heterogeneous system landscapes filled with stand-alone and legacy systems. As a result, implementing even simple business processes means cobbling together processes that span different organizational units, different systems, or even external service providers. And second, the backbones of most core business systems are applications built with tightly integrated sets of functionality. Modifying such systems is complex and very costly. Furthermore, because these systems were designed to support highly specific functions, it can be difficult to reuse software functionality as part of future systems required by an organization.

Having a complex IT infrastructure can affect your organization in a variety of ways. Often, your employees are forced to work with multiple systems to find information and accomplish tasks, reducing efficiency and effectiveness. In addition, a complex IT infrastructure increases the time, cost, and difficulty of creating and deploying new IT processes; for example, new processes may require additional investments to unite scattered or hidden information or the development of custom integration by people with scarce and highly costly skills. And perhaps most important, having a complex IT infrastructure impedes your organization's ability to respond to change and leverage new opportunities – the key to competitive advantage.

### Searching for Solutions

Organizations initially used enterprise application integration tools to integrate independent applications required to support new or reengineered business processes. But these proprietary interfaces between applications require staff with specialized skills to both set up and maintain them – a very time-consuming and costly proposition.

The advent of Web services and service-oriented architectures (SOAs) represented huge strides toward simplifying application integration. Web services answered the need for a standardized and vendor-agnostic way to cope with heterogeneity and to create interoperability and compatibility among various applications. They expose the granular functionality of applications, such as “delete order” to remove an order from one particular system and to make this a reusable service for other business processes. Instead of requiring programmers to hard code and maintain links between applications, Web services are loosely coupled, making connections simpler and more flexible. They also allow application architects to more easily find and understand how to reuse services offered by other cooperative

applications. At the same time, Web services provide preliminary answers to the issues of flexibility and reuse. Changes can be made in the underlying implementation or in the program calling the Web service, as long as the behavior of the Web service stays the same.

The innovation of service-oriented architectures makes Web services even more useful. SOA is a technical framework for building software applications that use services that are available from a network, such as the Web. Applications in SOAs are designed to use Web services as the standard way to communicate well-defined information with an array of other applications.

### **The Need for Enterprise Services**

But traditional Web services present their own challenges to organizations seeking to create flexible, new business processes by reusing existing application functionality. Because Web services are largely being used today to expose functionality delivered by single applications, they are too granular to be efficient building blocks for enterprise business scenarios – groups of processes that together provide an end-to-end process. Consider, for example, the directive to cancel an order. While a seemingly simple task, it encompasses several cross-functional and cross-application activities, including sending a confirmation to the customer, removing the order from the production plan, releasing materials allocated to the order, notifying the invoicing department, and changing the order status to “inactive” or deleting it from various systems. Each of these activities may involve Web services offered by different systems. An end-to-end solution for canceling orders, then, is actually a very powerful, enterprise-level business service.

In addition, while Web services are suitable for promoting syntax and protocol-level communications, they do not yet provide a way to ensure semantic interoperability. For example, the way a customer is defined in Siebel Systems software differs from the way it is defined in an SAP® solution. You need a way to resolve the data and process disparities between these different Web services and translate syntax and communications into business constructs that can be reused across different situations.

To efficiently develop new business solutions that leverage existing applications, you need business-level building blocks that aggregate the benefits of multiple Web services and that simplify interoperability between them. In other words, you need enterprise services.

## **ENTERPRISE SERVICES ARCHITECTURE: EXTENDING THE BENEFITS OF WEB SERVICES**

Enterprise services architecture is a business-driven software architecture for service-based, enterprise-scale solutions that provides the increased adaptability, flexibility, openness, and cost-effectiveness that businesses need today. ESA goes beyond service-oriented architecture fundamentals by elevating the design, composition, and management of Web services to address business requirements through the use of enterprise services. Based on open standards, enterprise services encapsulate enterprise functionality and expose it as a reusable service, which can be combined with other services to meet new requirements. (Business activities or events, modeled as enterprise services, are abstracted from the actual functionality of existing enterprise applications.) Because they are enterprise-sized building blocks, you can use enterprise services to automate enterprise-scale business scenarios.

Created by SAP and its partners and customers, enterprise services can be quickly assembled to compose new applications and enable new business processes. You can also use them to communicate business logic between software applications running on disparate platforms. Because they are based on open standards, enterprise services are more flexible than code written using proprietary programming languages and technologies. All enterprise services communicate using Web service standards, can be described in a central repository, and are created and managed by tools provided by SAP NetWeaver, the technical enabler of ESA.

### **Overcoming the Challenges of Traditional IT Infrastructures**

ESA addresses a key business issue that most companies are facing – extending existing IT assets to support business change and innovation while lowering the total cost of ownership (TCO). First, ESA intrinsically supports an incremental development process by providing the abstraction required to make it relatively easy to combine and recombine functionality from different applications as needed (and without having to pull

solutions apart and start over). This significantly lowers costs and speeds the development of new services to meet changing business requirements.

At the same time, the challenges of traditional IT infrastructures no longer stand in the way of business initiatives. Specifically:

- You can see your existing systems not only as powerful business engines for today but also as the building blocks of future business processes.
- Your IT department can respond more quickly to changing business requirements, as well as reduce costs by taking new advantage of existing functionality in its IT landscape.
- You no longer need to address the semantic interoperability between Web services created using different systems; using the mechanisms of semantic leveling and right sizing of individual Web services, ESA resolves the data and process disparities between different Web services and translates syntax and communications into business constructs that can be reused across different situations.
- Your IT department can manage heterogeneity of systems landscapes effectively; the underlying application components that supply the functionality represented by an enterprise service can be altered without impacting applications using the service.

With ESA – whether called upon to free up capital by reducing TCO, enable business change, or support innovation – your organization can now leverage and extend IT assets to support its goals.



## SAP NetWeaver: THE FOUNDATION FOR ESA

To adopt ESA, you first need to define a strategic business and IT plan to help your organization gradually evolve its existing technology landscape to better meet its business needs. You then implement this plan, or road map, using the SAP NetWeaver platform – the technical foundation for ESA.

SAP NetWeaver is a composition platform that enables your IT department to compose and orchestrate enterprise services using model-based development. You can also use the platform to expose information and functionality from existing applications and deploy them as enterprise services to communicate with SAP, third-party, and legacy software systems. With these enterprise services, your organization can rapidly enhance its existing business processes or develop and deploy new business processes.

As the foundation for ESA, SAP NetWeaver helps you evolve your current IT landscape into a strategic environment that drives business change. Deploying ESA with SAP NetWeaver allows you to decouple business processes from underlying IT systems so you can add, remove, or change steps in a business process – and do so without interrupting daily operations. You can also extend the reach of those processes to new communities inside and outside your organization without adding undue costs to existing investments.

### Benefits of SAP NetWeaver

Because SAP NetWeaver unifies integration technologies in a single platform, it reduces the need for custom integration and ensures that mission-critical business processes are reliable, secure, and scalable. But the benefits of SAP NetWeaver impact your organization in other far-reaching ways, including the following:

#### ■ Flexibility in business strategies

SAP NetWeaver supports flexibility and change in the IT infrastructure, including outsourcing, centralization or decentralization, consolidation, and integration of IT following mergers and acquisitions. With SAP NetWeaver,

you have the flexibility, visibility, and control to effectively execute, measure, and refine corporate strategies.

#### ■ Innovative business processes

SAP NetWeaver powers ready-to-go, innovative, industry-specific software and allows you to recompose your existing systems to support innovative business processes.

#### ■ Sustainable cost structure

SAP NetWeaver reduces TCO across the IT landscape and frees resources to focus on growth. It also reduces the cost of change while increasing the flexibility of IT. For example, with SAP NetWeaver, you can leverage all of your existing IT investments, including both SAP and non-SAP software. As an open technology platform based on industry standards, SAP NetWeaver can be extended with commonly used development tools, such as Java 2 Platform, Enterprise Edition (J2EE); Microsoft .NET; and IBM WebSphere. SAP NetWeaver also provides integration knowledge that reduces the need for consulting services.

#### ■ Superior business value

SAP NetWeaver helps you derive more value from your existing IT investments. It provides a business-focused infrastructure that supports the continuous evolution of business processes. And because existing systems remain unchanged, SAP NetWeaver minimizes the risk and cost of introducing new business processes.

#### ■ Improved development

With SAP NetWeaver, you can compose new business processes on top of your existing systems using a service-oriented architecture based on Web services, Java, and other industry standards.

#### ■ Reduced TCO across the entire IT landscape

SAP NetWeaver technology components are integrated into a single technology platform and come preconfigured with business content, which reduces complexity and supports standardization and consolidation in IT. SAP NetWeaver technology components also integrate readily with SAP applications, which reduces the need for custom integration.

- **Improved business performance**

SAP NetWeaver helps you aggregate and analyze information across your organization, enabling you to gain the insights needed to make the right changes. SAP NetWeaver supports all stages – from insight to execution of improved business processes.

- **Unmatched user experience**

With SAP NetWeaver, you can increase the reach of your business processes to include all employees, suppliers, and customers. Solutions built using SAP NetWeaver provide an unmatched user experience through a role-based portal interface.

- **Easy development of extensible best practices**

You can leverage your employees' existing skills to augment current practices or compose new functionality to meet your needs. SAP NetWeaver supports communication, knowledge management, and collaboration across existing corporate systems.

## REALIZING THE BENEFITS OF ESA TODAY

For many IT organizations, the promise of Web services and service-oriented architecture seems ideal but unattainable at this point because of immature vendor technologies and capabilities. With ESA and SAP NetWeaver, SAP is making ESA a reality **today**. And it is developing the technologies, tools, resources, and programs that you need to realize your ESA vision, including the following:

- ESA Adoption Program
- Enterprise services inventory
- SAP NetWeaver–based IT solutions – a modular, cost-effective approach to deploying an ESA

### ESA Adoption Program

SAP provides ESA Adoption Program to assist you develop and implement an ESA road map. This program provides a formalized, yet flexible, method to streamline and simplify the move to ESA. The program helps you through a series of logical steps, or phases. Each step is supported by a portfolio of field-tested tools, templates, samples, and workshops. The program's flexibility allows you to select from the following portfolio of offerings as needed:

- **Discovery:** Tools used during this phase include interactive workshops that help you explore the opportunity, value, and cost of various alternatives for implementing ESA. Your organization's IT and business leaders can work together to brainstorm new ways and areas in which a service-oriented architecture can foster innovation and lower costs.
- **Evaluation:** During this phase, SAP works with you to design a specific road map. Workshop activities focus on identifying the scope of ESA adoption within your organization, the business processes that it might enhance, and corresponding IT projects that are likely to make your business more competitive and responsive.
- **Implementation:** During this phase, SAP works with you to implement SAP NetWeaver in a manner that meets your organization's goals in adopting ESA. A key objective during this phase is to select specific support services that will yield the best results. By matching needs with support services, you can plan a speedy, secure implementation that minimizes risks and costs.

- **Operations:** During this phase, SAP provides tools and information that help you govern your applications and maintain a consistent strategy over time. ROI is a major focus during this phase, with SAP providing tools that help measure results and quantify the benefits derived from ESA and the SAP NetWeaver platform.

### Enterprise Services Inventory

SAP also offers a growing enterprise services inventory – available through the SAP Developer Network site ([www.sdn.com](http://www.sdn.com)) – that enables customers and partners to begin using enterprise services today. SAP currently delivers more than 500 enterprise services that support key business processes, such as procure to pay and order to cash. Hundreds more are planned or in development. Programmers can take the smaller services available in the inventory and link them together to create end-to-end enterprise services that support complete processes. Developer resources explain how to access the inventory and link the existing services together to make an end-to-end business process.

SAP is investing heavily in the enterprise services inventory over the next year. For example, SAP will offer a modeling tool that enables business analysts to link services together to create enterprise services – without the need for programmers. You can also access larger, end-to-end enterprise services built into the mySAP™ Business Suite family of business solutions. At the same time, SAP is actively working to build enterprise services into its own software and to create a repository of enterprise services for use by selected partners and customers. These pre-built, end-to-end enterprise services greatly reduce development times and costs.

### SAP NetWeaver–Based IT Solutions: A Modular, Affordable Path to ESA

In most cases, implementing ESA does not happen overnight. Rather, it requires a corporate commitment to an ESA vision, an ESA road map, and small steps that, over time, result in exponential business value. It also requires a budget for investing in a new infrastructure and creating new enterprise services.

It can be difficult for most IT departments facing multiple, urgent business needs to both commit to – and execute on – an ESA strategy.

Recognizing this challenge, SAP makes it easy for you to implement ESA incrementally using SAP NetWeaver as the technical enabler for common business and IT solutions. You can deploy SAP NetWeaver in a modular fashion to address immediate IT problems and to perform key IT activities required to support your business.

Implementing SAP NetWeaver incrementally to solve immediate business needs is an affordable path to ESA. You can implement just the right solution at the right time and price. And by using SAP NetWeaver as the technical foundation for IT solutions, you not only solve your immediate challenges, but you also – by default – gradually lay down the foundation for ESA. The steps you take toward ESA can be made painlessly and cost-effectively. This approach not only fits with today's IT budgets and minimizes business disruption, but it also ensures that you realize immediate business benefits with each step you take.

### SAP NetWeaver Technology Solution Map and IT Practices

SAP has developed a technology solution map to help you map your business requirements to SAP NetWeaver–based IT solutions. The map groups IT activities that can be performed using SAP NetWeaver into categories called IT practices. IT practices can do the following:

- Make it easy to assess how SAP NetWeaver can address immediate, specific business challenges – while, at the same time, help you transition to ESA for greater flexibility and openness
- Describe IT solutions that take advantage of SAP NetWeaver components and are specifically geared toward individual business processes
- Support end-to-end, user oriented processes that optimally tap the integration potential of SAP NetWeaver

The resulting synergies increase exponentially when you combine several functions of SAP NetWeaver IT practices. Therefore, you should spearhead an overall strategy that helps manage business processes at the strategic, operative, and individual levels. You can combine different integration technologies in such a way that you can develop new applications swiftly, optimize the potential of existing systems, and establish and consolidate new business processes.

**A Multitiered Map**

Figure 1 shows the highest-level technology solution map for SAP NetWeaver, which identifies 10 IT practices. For each IT practice, there are multiple project scenarios – or approaches – that you can use to solve a business problem. For example, the IT practice called “business information management” lists the following project scenarios:

- Enterprise reporting, query, and analysis
- Business planning and analytical services
- Enterprise data warehousing

- Enterprise knowledge management
- Enterprise search

For each of these project scenarios, second- and third-level maps list various IT activities that need to be performed, along with step-by-step tasks for accomplishing each IT activity. You simply use the technology solution map to determine the project scenarios required to address your requirements and then identify the specific IT activities and tasks required to solve your problem. Task-level maps identify the specific SAP NetWeaver components that you must deploy to enable the ESA-based solution.

You can prioritize and select which project scenarios and IT activities to address according to your business needs. Because the implementation of SAP NetWeaver addresses immediate business requirements, you keep time and costs well under control, guaranteeing quick ROI. Leveraging IT practices also helps you identify how you can use SAP NetWeaver to reduce the complexity and increase the homogeneity of your IT landscapes, as well as reduce maintenance and repair costs.

User Productivity Enablement	Running an Enterprise Portal	Enabling User Collaboration	Business Task Management	Mobilizing Business Processes	Enterprise Knowledge Management	Enterprise Search
Data Unification	Master Data Harmonization		Master Data Consolidation		Central Master Data Management	Enterprise Data Warehousing
Business Information Management	Enterprise Reporting, Query, and Analysis	Business Planning and Analytical Services	Enterprise Data Warehousing	Enterprise Knowledge Management	Enterprise Search	
Business Event Management	Business Activity Monitoring			Business Task Management		
End-to-End Process Integration	Enabling Application-to-Application Processes	Enabling Business-to-Business Processes	Business Process Management	Enabling Platform Interoperability	Business Task Management	
Custom Development	Developing, Configuring, and Adapting Applications			Enabling Platform Interoperability		
Unified Life-Cycle Management	Software Life-Cycle Management			SAP NetWeaver® Operations		
Application Governance and Security Management	Authentication and Single Sign-On			Integrated User and Access Management		
Consolidation	Enabling Platform Interoperability	SAP NetWeaver Operations	Master Data Consolidation	Enterprise Knowledge Management	Enterprise Data Warehousing	
ESA Design and Deployment	Enabling Enterprise Services					

Figure 1: SAP NetWeaver Technology Solution Map (Highest Level)

# USING THE SAP NetWeaver TECHNOLOGY SOLUTION MAP TO SOLVE REAL-WORLD CHALLENGES

As discussed previously, the SAP NetWeaver technology solution map provides a coherent, multilayered representation of common IT practices, project scenarios, and IT activities that you may need to perform, support, or enable to solve a business problem. Table 1 summarizes these IT practices. (For a detailed overview of the IT practices and the activities and approaches associated with each, please refer to the appendix of this paper.)

IT Practice	Description
User productivity enablement	Help users and groups improve their productivity through enhanced collaboration, optimized knowledge management, and personalized access to critical applications and data
Data unification	Consolidate, rationalize, synchronize, and manage all master data (customers, suppliers, catalog items, and so on) for improved business processes
Business information management	Increase the visibility, reach, and usefulness of structured and unstructured data
Business event management	Ensure that business events from multiple systems are distributed to the appropriate decision makers in the context of relevant business processes
End-to-end process integration	Make disparate applications and systems work together consistently to perform business processes
Custom development	Rapidly create new enterprise-scale applications to drive your company's unique advantages
Unified life-cycle management	Automate application management processes and optimize all facets of an application's life cycle
Application governance	Maintain an appropriate level of security and quality for your organization's intellectual property and information assets
Consolidation	Deploy a consolidated technology platform with the ability to allocate computing power according to changing business needs
ESA design and deployment	Consolidate and standardize basic processes, while leveraging existing investments to compose, new, distinctive business processes

Table 1: SAP NetWeaver® IT Practices Overview

To illustrate how you can use IT practices to determine ESA-based IT solutions for your business challenges, consider a hypothetical company that just completed an acquisition. Applegate Manufacturing Inc. wants to consolidate the acquired company's product database into its enterprise data warehouse so that it can maintain a complete, updated product list.

Applegate's IT department is called upon to integrate the acquired company's product life-cycle application with its own product life-cycle application. To create a complete product data list, both organizations' product lists must be consolidated into an enterprise data warehouse.

Because Applegate has a vision to evolve toward ESA, it takes advantage of this business change as an opportunity to implement an ESA-based solution. Working with the SAP NetWeaver technology solution map, the IT department identifies the following IT practices and project scenarios relevant to its needs – both of which can be performed using SAP NetWeaver in a flexible, low cost, step-by-step manner:

- **IT practice: end-to-end process integration; project scenario: enabling application-to-application processes**  
To share data and create a master product list, the two product life-cycle applications must be linked and a consistent data structure must be defined.
- **IT practice: data unification; project scenario: master data consolidation**  
Combined data must then be consolidated and checked for duplicates.
- **IT practice: business information management; project scenario: enterprise data warehousing**  
Clean master data must be stored for easy access and updating.

For each project scenario, the IT department selects the IT activities and tasks (specified in additional layers to the solution map) and cross-references the SAP NetWeaver components required to enable them. Following the step-by-step instructions provided in cross-referenced SAP documentation for each task, the IT department uses the required SAP NetWeaver components to solve the business problem. Figure 2 illustrates how the technology solution map guides the Applegate IT department step-by-step through the various levels of detail, dramatically simplifying the process of planning and executing an IT project.

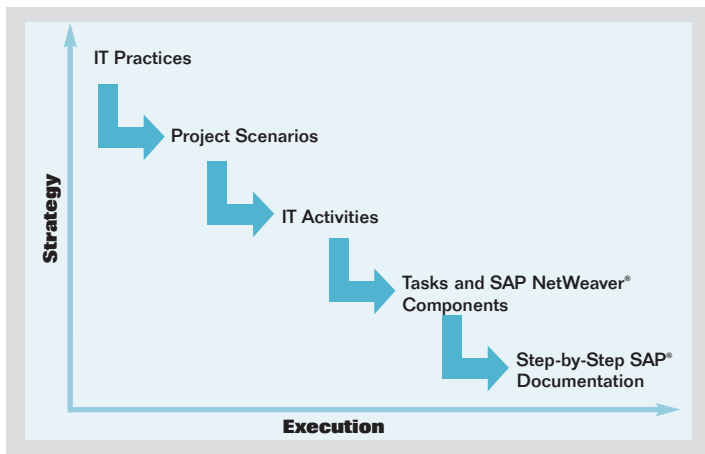


Figure 2: SAP NetWeaver Technology Map Simplifies Deployment of ESA-Based IT Solutions

### Addressing Complex Business Challenges

To further illustrate how the SAP NetWeaver technology solution map and IT practices help you map your business problems to IT solutions enabled by SAP NetWeaver, consider how this simple example can be extrapolated to address a more complex business challenge. Imagine that a national clothing retailer needs to improve inaccurate and slow communications about product availability, features, and pricing with its 500 retail stores and various manufacturing partners. The IT department works with management to determine that the organization needs a technology strategy that allows it to exchange data with different manufacturers, harmonize the data into a cohesive product catalog, and provide secure distribution of product information to the various retailers.

Given that the company has a long-term vision to evolve toward an ESA-based infrastructure, it first checks to see if SAP NetWeaver could be used to implement the technology strategy. Using the SAP NetWeaver technology solution map, the company identifies the following IT practices that are relevant to its plan:

- **End-to-end process integration**  
This IT practice includes activities for enabling business-to-business processes between the company and its manufacturers and retail stores.
- **Data unification**  
This IT practice includes activities for harmonizing and synchronizing global data.
- **User productivity enablement**  
This IT practice includes activities for enabling retailers to be more productive by accessing product information from a personalized enterprise portal.
- **Application governance and security management**  
This IT practice includes activities for ensuring secure data transfer and access of information from the portal.

The IT department then uses the second- and third-level technology solution maps to determine the appropriate project scenarios, or approaches, for performing each IT practice, as well as the related IT activities, tasks, and components of SAP NetWeaver that must be implemented to execute the strategy. In this case, the map specifies the following platform components: SAP NetWeaver Exchange Infrastructure, SAP NetWeaver Master Data Management, SAP NetWeaver Portal, and SAP NetWeaver Application Server. In the process of performing the required tasks and deploying SAP NetWeaver components, organizations deploy IT solutions using enterprise services.

## TAKING THE NEXT STEP

The most cost-effective, efficient way to move toward ESA is to develop an ESA strategy and then use IT practices to identify opportunities to use SAP NetWeaver to solve business and IT challenges. Using the SAP NetWeaver technology solution map and IT practices, you can tap the potential of SAP NetWeaver in the most targeted manner possible, rapidly implement IT strategies step-by-step, and realize immediate business benefits. Simultaneously, you can use IT practices (summarized in the appendix) to further develop your existing system landscape into an ESA landscape. As a result, you can use existing systems more effectively and develop flexible solutions on a consistent basis, with end-to-end process integration across heterogeneous applications and system landscapes. At the same time, you can immediately begin to plan, develop, implement, and use enterprise services.

For more information about ESA and SAP NetWeaver, please visit [www.sap.com](http://www.sap.com) or contact your sales representative.

## APPENDIX: IT PRACTICES IN DETAIL

### IT Practice: User Productivity Enablement

#### Running an Enterprise Portal

You can give your users uniform, role-based, and secure access to any kind of application, service, and information. With the enterprise portal, all members of your company's value chain – employees, customers, partners, and suppliers – have a single, uniform point of access to the applications, services, and information they need to perform for their daily work.

Project Scenario	Overview
Implement a global portal (federated portal)	You can implement and use a federated portal network using SAP NetWeaver to share content between portals. With a federated portal network, you can give users of distributed, SAP and non-SAP portals, a single portal access point. Users gain seamless access to information, services, and applications distributed on portals throughout your entire organizational network.
Implement a multitenant portal	With SAP NetWeaver, you can develop, configure, and operate an enterprise portal that serves as the main management layer for business process outsourcing services. You can manage administration, security, stability, and high availability. You can divide the portal into logical units to serve various tenants, and you can provide a user experience that makes the provider invisible.
Provide uniform content access	You can develop, configure, and operate a knowledge-based, Web-like user interface to give users a consistent environment for accessing content. For example, you can integrate both SAP and non-SAP applications into the enterprise portal using a single, consistent front end.

### Enabling User Collaboration

With SAP NetWeaver, your IT organization can help individuals, teams, and project groups collaborate more efficiently as they perform business processes. SAP NetWeaver makes collaboration and knowledge sharing an integral, natural part of everyday work and enables efficient communication.

Project Scenario	Overview
Collaboration in virtual rooms	With SAP NetWeaver, users can create their own virtual working environments in which the members of teams or project groups can collaborate efficiently across time zones and between geographical locations. People can share relevant information, communicate online in real time, plan with the help of a unified calendar, manage tasks, and access business-relevant information, with all required business applications, services, and information available from a single point of access.
Ad hoc collaboration	Employees can quickly solve problems that emerge by using online communication and collaboration services. They can work together efficiently using integrated groupware and task management, instant-messaging, or application-sharing services, and they can save the results and information of online meetings.

### Business Task Management

Business task management with SAP NetWeaver helps get the right tasks to the right people and provides the means to complete tasks on time and with the best results. SAP NetWeaver helps people coordinate, monitor, and adapt their own tasks and the tasks they assign to coworkers, including forms-based tasks.

Project Scenario	Overview
Central access to tasks	You can decompose tasks into coordinated activities that are then performed by various people. You can support predefined activity patterns and ensure that all tasks, regardless of their origin, are performed using a single, consistent access point and user interface.
Support for offline processes	Offline support for business processes includes development and interaction using forms.

### Mobilizing Business Processes

With SAP NetWeaver, you can extend existing and new business processes into the mobile world. In addition to supporting simple productivity tools, such as e-mail, SAP NetWeaver integrates front-end mobile activities with back-end business processes.

Project Scenario	Overview
Run mobile applications with an online connection	End users with mobile devices that are always connected can access the back-end SAP software in real time. All business logic resides on the server, where the user interface is generated, and is sent to the mobile device.
Enable mobile applications for occasional connection	End users with mobile devices that are occasionally connected can carry out their tasks without being connected to the back-end software. The required business logic and user interface reside on the mobile device, and when the mobile device connects to the back-end software, it exchanges all modified data.

### Enterprise Knowledge Management

SAP NetWeaver provides everything that you need to plan, build, and operate an integrated work environment for information workers. It provides the framework and the tools to integrate, disseminate, and work with distributed, unstructured information and put it into business context for information workers.

Project Scenario	Overview
Content integration and management	SAP NetWeaver provides the infrastructure for integrating repositories, activating services, indexing documents, creating taxonomies, and configuring user interfaces.
Content creation, publication, and access	SAP NetWeaver provides functionality for uploading and creating documents; publishing, classifying, approving, and sharing information; and searching for, navigating to, or being notified about information.
Documentation, manuals, and training materials management	As part of managing the knowledge environment, you can use the context-sensitive help functionality within SAP NetWeaver to enable your applications to create, edit, and manage help content and documentation. You can make the content and documentation available through the application's help panel.



## Enterprise Search

Your IT organization can implement knowledge management and enterprise content management. SAP NetWeaver enables indexing, search, and retrieval of documents like PDFs, semi-structured data like responses to database queries, and structured business objects like sales orders. Enterprise searches can be implemented stand-alone or embedded within other ESA-enabled applications.

Project Scenario	Overview
Enable enterprise search	You can search for any kind of relevant information at the same time using the same user interface. The meta search framework connects to search service providers that deliver business objects, business intelligence information, and knowledge management files as results of the same query. You can also specify the desired result types or drill down in an original search. You can search a variety of materials – such as sales orders, master data, analytics, documents, discussions, manuals and more – from the same user interface.
Provide business object search	Business applications can leverage the search engine service for business objects to index and search specific business objects with the TREX search engine. The search engine service is implemented in ABAP™ and is installed as part of the AS ABAP. The indexed business objects can be retrieved either through a SAP GUI, Web Dynpro, or enterprise portal user interface, or they can be part of an enabled enterprise search.

## IT Practice: Data Unification

### Master Data Harmonization

With SAP NetWeaver, you can consolidate and harmonize master data. You can ensure high quality master data by distributing consolidated data that is globally relevant and augmenting it with locally relevant information.

Project Scenario	Overview
Automate master data harmonization	You can cleanse master data on materials, retail articles, suppliers, customers, and employees in an interactive manner and leverage the results to perform enterprise-wide analytics, such as global spend analyses. Consolidated master data is then distributed to the connected client systems to streamline business operations based on high-quality data. In an initial phase, the procedures are intended for periodic, interactive consolidation, rather than frequent changes with automatic matching. At a later stage, the focus is more on automated consolidation of master data.

## Master Data Consolidation

SAP NetWeaver enables you to search for master data across linked systems, identify identical or similar objects that are spread across local systems, build consolidated master data, and provide ID mapping for unified, company-wide analytics and reporting.

Project Scenario	Overview
Master data consolidation	You can cleanse and consolidate master data on materials, suppliers, customers, and employees in an interactive manner within your enterprise resource planning environment and perform enterprise-wide analytics, such as global spend analyses. In an initial stage, the procedures are intended for periodic, interactive consolidation rather than frequent changes with automatic matching. At a later stage, the focus is more on automated consolidation procedures.

## Central Master Data Management

With SAP NetWeaver, you can consolidate and centrally manage master data. You can support company-wide quality standards by ensuring that central control of master data begins as soon as the data is created.

Project Scenario	Overview
Central master data management	You can ensure quality standards with central control of master data, including maintenance and storage.

## Enterprise Data Warehousing

You can create and operate a data warehouse in an enterprise-wide environment. You can combine strategic analyses and operational reporting, report in real time, integrate heterogeneous systems, and optimize the design time, as well as the runtime of business intelligence models and processes.

Project Scenario	Overview
Model the enterprise data warehouse	You can design an enterprise data warehouse, model data, connect to source systems, integrate or transform data, and distribute data. You can also administer and monitor data and manage the information life cycle.
Run an enterprise data warehouse	With SAP NetWeaver, you can acquire data and make it available very rapidly, with low latency between data acquisition and availability for reporting and analysis.

## IT Practice: Business Information Management

### Enterprise Reporting, Query, and Analysis

You can provide all the necessary processes and services to meet the information needs of business users. You can design and provide applications for formatted reporting, ad hoc queries, interactive analyses, information dashboards, and information broadcasting.

Project Scenario	Overview
Enterprise reporting, query, and analysis	With SAP NetWeaver, power users can design, deploy, and execute queries, formatted reports, and Web applications.
Microsoft Excel integration	Business professionals can use the SAP Business Explorer tool of SAP NetWeaver to design and interact with Microsoft Excel-based business intelligence applications and workbooks.
Ad hoc query	Expert business users can use the Web analyzer tool in SAP NetWeaver to analyze ad hoc queries and create views of information from various data sources.
Information broadcasting	You can design, deploy, and execute information broadcasting, seamlessly integrating business intelligence, knowledge management, and collaboration into a single, blended experience for portal users.
Pattern configuration for embedded business intelligence	You can build seamless access to business intelligence data into the role-based working environments for users within applications.
Model business intelligence data with the SAP NetWeaver Visual Composer tool	Business users can easily configure business intelligence applications in a visual modeling environment and deploy the results in the enterprise portal.

### Business Planning and Analytical Services

SAP NetWeaver supports processes that collect and transform data within the business intelligence infrastructure, such as business planning and simulation or analysis process design.

Project Scenario	Overview
Business planning	SAP NetWeaver provides state-of-the-art planning methods and tools that allow you to predict and react flexibly and quickly to changing market conditions. You can build applications to perform strategic or operational planning in a Microsoft Excel-based or collaborative portal environment, including applications that support collaboration rooms, document integration, broadcasting, and ad hoc workflow.
Analysis process design	You can create analysis processes, including data-mining methods. You can create new levels of information, such as relationships and interdependencies within information delivered by the source systems.

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Your IT organization can implement knowledge management and enterprise content management. SAP NetWeaver enables indexing, search, and retrieval of documents like PDFs, semistructured data like responses to database queries, and structured business objects like sales orders. Enterprise searches can be implemented stand-alone or embedded within other ESA-enabled applications.

Project Scenario	Overview
Enable enterprise search	You can search for any kind of relevant information at the same time using the same user interface. The meta search framework connects to search service providers that deliver business objects, business intelligence information, and knowledge management files as results of the same query. You can also specify the desired result types or drill down in an original search. You can search a variety of materials – sales orders, master data, analytics, documents, discussions, manuals, and more – from the same user interface.
Provide business object search	Business applications can leverage the search engine service for business objects to index and search specific business objects with the TREX search engine. The search engine service is implemented in ABAP and is installed as part of the application server. The indexed business objects can be retrieved either through a SAP GUI, Web Dynpro, or enterprise portal user interface, or they can be part of an enabled enterprise search.

## IT Practice: Business Event Management

### Business Activity Monitoring

SAP NetWeaver enables an event-driven architecture. Business events are propagated from a multitude of systems to the appropriate decision makers in the context of the relevant business processes and are optimally resolved. Business users can act on significant events, take the correct actions in the right work context, and monitor and improve the efficiency of business processes.

Project Scenario	Overview
Event subscription and milestone monitoring	SAP NetWeaver enables individuals to act on significant events or groups of events and to take the correct action in the right business context. Event resolution is performed in a portal-based resolution center that provides alerts, contextual information like reports and documents, and links to resolution methods, such as collaboration rooms and ad hoc workflow.
Business event publishing	SAP NetWeaver posts an alert directly to the alert framework, which sends the alert to the event resolution dashboard.
Application event publishing	The application itself posts an alert directly to the alert framework, which sends the alert to the event resolution dashboard.

### Business Task Management

Business task management with SAP NetWeaver helps get the right tasks to the right people and provides the means to complete tasks on time and with the best results. SAP NetWeaver helps people coordinate, monitor, and adapt their own tasks and the tasks they assign to coworkers, including forms-based tasks.

Project Scenario	Overview
Central access to tasks	You can decompose tasks into coordinated activities that are then performed by various people. You can support predefined activity patterns and ensure that all tasks, regardless of their origin, are performed using a single, consistent access point and user interface.
Support for offline processes	Offline support for business processes includes development and interaction using forms.

## IT Practice: End-to-End Process Integration

### Enabling Application-to-Application Processes

By enabling application-to-application processes, you can seamlessly connect SAP and non-SAP applications within your enterprise, orchestrating the process flow between them using message-based and standards-based methods for process integration. With SAP NetWeaver, a single platform can manage the design, configuration, and execution of all business processes within the heterogeneous system landscape of your enterprise.

Project Scenario	Overview
Application-to-application integration	You can perform message-based and standards-based integration of intracompany business processes by seamlessly connecting SAP as well as non-SAP applications.

### Enabling Business-to-Business Processes

You can seamlessly connect your own business processes with those of your business partners using message-based and standards-based methods for process integration. SAP NetWeaver supports various communication channels, as well as process coordination and surveillance.

Project Scenario	Overview
Business partner integration using industry standards	You can perform message-based and standards-based integration of intercompany processes using various communication channels.
Small business partner and subsidiary integration	You can use SAP Partner Connectivity Kit to conduct business with subsidiaries and small business partners that do not have another integration solution.

### Business Process Management

Business process management with SAP NetWeaver covers business process modeling, configuration, execution, and monitoring, with process models executed by either the business applications or the central integration server. You can use predefined content to configure business processes, and you can relate application-embedded settings to business process models.

Project Scenario	Overview
Use and adapt predefined content	You can use predefined content for business process configuration and tailor it on the execution layer. You can relate application settings to business processes, including both intra-application settings, such as SAP implementation guide settings, and interapplication settings, such as the mapping between interfaces.
Process automation	You can create and execute role-specific processes, performing business process design, software implementation, and interapplication integration, as well as process execution. Process execution models may either be embedded in an application or reside unbounded in the central process integration layer, and they are executed by either the business application or the integration server.
Combine embedded and unbounded processes	You can combine application-embedded processes (workflows) with unbounded, cross-component processes.

### Enabling Platform Interoperability

SAP NetWeaver helps different systems and technologies coexist and interoperate, which helps your organization master the heterogeneity in its landscape. SAP NetWeaver integrates people, information, processes, and applications.

Project Scenario	Overview
Enable the coexistence of several portals	You can combine portals that are based on SAP NetWeaver Portal with those based on non-SAP technology. You can ensure interoperability with single sign-on and user management, including cross-portal authentication and authorization, and you can manage the granularity of access, as well as consistency in basic navigation and the portal experience.
Ensure application-to-application and business-to-business integration	You can extend application-to-application and business-to-business integration across messaging technologies and product boundaries. You can ensure that solutions powered by SAP NetWeaver interoperate with third-party solutions, including those based on Microsoft BizTalk Server and IBM WebSphere, at the messaging and process levels.

Provide Web services interoperability	You can enable a service-oriented solution landscape, with interoperation between your organization's enterprise software and third-party software through Web services. You can develop and employ interfaces for Web services across application platforms.
Manage heterogeneous system landscapes	You can perform crucial system management tasks in a heterogeneous environment, such as identity and access management, monitoring, and scheduling, using market-leading tools that complement SAP NetWeaver.
Develop applications that are compatible with SAP NetWeaver	If your organization has developed applications using Microsoft .NET, you can easily connect them to SAP NetWeaver Portal and to SAP NetWeaver-based applications. You can continue to use your familiar Microsoft development environment to create new portal content and solutions that are compatible with SAP NetWeaver.

### Business Task Management

Business task management with SAP NetWeaver helps get the right tasks to the right people and provides the means to complete tasks on time and with the best results. SAP NetWeaver helps people coordinate, monitor, and adapt their own tasks and the tasks they assign to coworkers, including forms-based tasks.

Project Scenario	Overview
Central access to tasks	You can decompose tasks into coordinated activities that are then performed by various people. You can support predefined activity patterns and ensure that all tasks, regardless of their origin, are performed using a single, consistent access point and user interface.
Support for offline processes	Offline support for business processes includes development and interaction using forms.

## IT Practice: Custom Development

### Developing, Configuring, and Adapting Applications

SAP NetWeaver offers a variety of programming models and tools to extend and enhance SAP applications and to create complementary custom applications. SAP NetWeaver supports popular development processes for the Java and ABAP programming environments. It also provides the SAP NetWeaver Visual Composer tool and a .NET portal development kit for building model-driven and portal-aware applications, respectively.

Project Scenario	Overview
Develop Java applications using Web Dynpro	SAP NetWeaver provides a model-driven and code-driven framework to easily and flexibly develop and configure user interfaces for Web applications. For a J2EE-based application, this framework is called Web Dynpro for Java.
Leverage J2EE standards for porting and adopting applications	SAP NetWeaver delivers the methodology and tools you need to easily develop and deploy applications that conform to the J2EE standard or to port such applications from other J2EE servers to SAP NetWeaver.
Create business applications using ABAP	SAP NetWeaver provides the methodology and tools to create business applications using ABAP and the ABAP workbench.
Develop ABAP applications using Web Dynpro	SAP NetWeaver provides a model-driven and code-driven framework to easily and flexibly develop and configure user interfaces for Web applications. For ABAP-based applications, this framework is called Web Dynpro for ABAP.
Create applications using SAP NetWeaver Visual Composer	You can use the model-driven and code-driven environment in SAP NetWeaver to develop, configure, and adapt ABAP-based applications and to develop, model, and configure custom applications.
Create composite applications	You can build and deploy composite applications that use the service operations provided by components, combining these service operations with new application logic, user interfaces, and functions that orchestrate business processes. Composite applications are loosely coupled to the components on which they are based, resulting in a new logical application tier whose deployment and upgrades can be independent of the underlying components.

### Enabling Platform Interoperability

SAP NetWeaver helps different systems and technologies coexist and interoperate, which helps your organization master the heterogeneity in its landscapes. SAP NetWeaver integrates people, information, processes, and applications.

Project Scenario	Overview
Enable coexistence of several portals	You can combine portals that are based on SAP NetWeaver Portal with those based on non-SAP technology. You can ensure interoperability with single sign-on and user management, including cross-portal authentication and authorization, and you can manage the granularity of access, as well as consistency in basic navigation and the portal experience.
Ensure application-to-application and business-to-business integration	You can extend application-to-application and business-to-business integration across messaging technologies and product boundaries. You can ensure that solutions powered by SAP NetWeaver interoperate with third-party solutions, including those based on Microsoft BizTalk Server and IBM WebSphere, at the messaging and process levels.
Provide Web services interoperability	You can enable a service-oriented solution landscape, with interoperation between your organization's own enterprise software and third-party software through Web services. You can develop and employ interfaces for Web services across application platforms.
Manage heterogeneous system landscapes	You can perform crucial system management tasks in a heterogeneous environment, such as identity and access management, monitoring, and scheduling, using market-leading tools that complement SAP NetWeaver.
Develop applications that are compatible with SAP NetWeaver	If your organization has developed applications using Microsoft .NET, you can easily connect them to SAP NetWeaver Portal and to SAP NetWeaver-based applications. You can continue to use your familiar Microsoft development environment to create new portal content and solutions that are compatible with SAP NetWeaver.

**IT Practice: Unified Life-Cycle Management**

**Software Life-Cycle Management**

You can manage SAP software in your system landscape by performing implementation tasks, such as planning changes, implementing new systems, copying existing systems, or enabling the creation and propagation of changes in the landscape. You can also maintain your software by applying support packages and corrections or by upgrading to new software versions.

Project Scenario	Overview
Implementation support	You can support implementation, including application management; software development life-cycle management; software distribution and management of customer-specific adaptations; software installation and configuration; infrastructure support for change, modification, and extension of SAP data model and application logic; infrastructure support for custom development; configuration and activation of business content; and more.
Software maintenance	You can perform software maintenance, including release management, import of patches, error corrections, upgrades, extension of the solution landscape, and more.

**SAP NetWeaver Operations**

You can set up an optimal environment for administration and data archiving with SAP NetWeaver. You can centrally manage business processes and centrally monitor the underlying SAP NetWeaver components in a highly effective manner.

Project Scenario	Overview
Monitor SAP NetWeaver	You have all the tools and services you need to monitor a single SAP NetWeaver instance, as well as a system landscape based on SAP NetWeaver. You can perform central alert monitoring and problem solving, and you can monitor all online activities.
Administer SAP NetWeaver	You have all the tools and services you need to administer SAP NetWeaver. You can perform system configuration and optimization; manage continuous operations, including daily tasks and checks; and perform service-level reporting. You can also perform central scheduling and printer management.
Data archiving	You can perform data archiving to reduce system load and comply with regulatory requirements. You can manage the analysis and categorization of data, the archiving process itself, and access to archived data.
Adaptive computing	SAP NetWeaver enables adaptive computing, in which hardware, software, and system services can adapt to changing business needs. SAP NetWeaver provides the platform for users to run any service at any time on any server, and it provides a central point of control for flexible computing-resource assignment.

## IT Practice: Application Governance and Security Management

### Authentication and Single Sign-On

SAP NetWeaver helps you implement authentication and integrate different systems into a single sign-on landscape. SAP NetWeaver supports Lightweight Directory Access Protocol (LDAP), Security Assertion Markup Language, and Java Authentication and Authorization Service to ensure interoperability, and it allows you to leverage your existing investments, such as in directory servers.

Project Scenario	Overview
Authentication using a directory with single sign-on integration using SAP logon tickets	You can implement authentication using information stored in an LDAP directory and integrate different SAP software into a single sign-on landscape.

### Integrated User and Access Management

You can manage user information and control user access to data with fine-grained authorization and control, while reducing complexity and redundancy and increasing transparency for better security and governance. SAP NetWeaver supports a number of ways to implement integrated user and access management, including leveraging existing investments by using data already available in an LDAP-based directory server.

Project Scenario	Overview
Integrated user and access management that includes a third-party directory server	Your IT organization can take an integrated approach to user and access management by using the central user administration features and the user management engine of SAP NetWeaver along with a third-party directory server based on the LDAP protocol.
Integrate user management and access management	Your IT organization can take an integrated approach to user and access management with the central user administration features and user management engine of SAP NetWeaver.

## IT Practice: Consolidation

### Enabling Platform Interoperability

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### Master Data Consolidation

SAP NetWeaver enables you to search for master data across linked systems, identify identical or similar objects spread across the local systems, build consolidated master data, and provide ID mapping for unified, company-wide analytics and reporting.

Project Scenario	Overview
Master data consolidation	You can cleanse and consolidate master data on materials, suppliers, customers, and employees in an interactive manner within the ERP environment, and you can perform enterprise-wide analytics, such as global spend analyses. In an initial stage, the procedures are intended for periodic, interactive consolidation rather than frequent changes with automatic matching. At a later stage, the focus is more on automated consolidation procedures.

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### Enterprise Data Warehousing

You can create and operate a data warehouse in an enterprise-wide environment. You can combine strategic analyses and operational reporting, report in real time, integrate heterogeneous systems, and optimize the design time, as well as the runtime of business intelligence models and processes.

Project Scenario	Overview
Model an enterprise data warehouse	You can design an enterprise data warehouse and model data, connect to source systems, integrate or transform data, and distribute data. You can also administer and monitor data and manage the information life cycle.
Run an enterprise data warehouse	With SAP NetWeaver, you can acquire data and make it available very rapidly, with low latency between data acquisition and availability for reporting and analysis.

### IT Practice: ESA Design and Deployment

#### Enabling Enterprise Services

With SAP NetWeaver, you have a single infrastructure for uniform service definition, implementation, and usage based on Web services technology and standards. SAP NetWeaver supports enterprise services for user interaction, as well as application-to-application and business-to-business interactions using synchronous, asynchronous, stateful, and stateless communication models.

Project Scenario	Overview
Point-to-point services-based integration	You can build, configure, and run applications or parts of applications based on enterprise services. You benefit from reusable, standards-based integration with the ability to select particular services according to your needs, rather than having to integrate entire monolithic applications.
Brokered services-based integration	You can build, configure, and run applications or parts of applications based on Web services. You can ensure reuse of a consistent business object taxonomy, with services mediated by an integration broker.



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