

SAP Solution in Detail
SAP NetWeaver



BUILDING STANDARDS-BASED BUSINESS APPLICATIONS

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EXECUTIVE SUMMARY

For more than 30 years, many of the world's largest companies have depended on SAP® solutions to support their business-critical functions and processes. SAP has used its extensive experience with them to create a reliable, secure, and scalable platform – SAP NetWeaver® – that leverages industry standards to provide portability and interoperability with other systems. Built on Java, Web services, and XML technology standards, this platform employs the principles of service-oriented architecture. It enables users to leverage their existing systems and application resources to build mission-critical standards-based business applications that support new business processes. The result is a more responsive and profitable business.

In today's competitive environment, companies are looking for the flexibility to adopt business processes that meet their changing market needs. Building applications to support these processes requires a new architecture that is service based – an architecture that allows business applications to be built from software components predefined as independent services. With this service-oriented architecture, companies can emphasize reuse by developing composite applications on platforms that use Web services and XML technologies. This approach allows some software components to be built from local resources while other components are provided by partners and third parties.

By combining an open architecture with a platform that leverages industry standards, companies can facilitate component interoperability and greatly simplify the process of building composite applications. This significantly reduces development time and effort.

Although industry standards are important, they do not guarantee the development of successful business solutions. Companies also need:

- Definitions of the semantics or meaning of the business processes and data that are used – based, where possible, on standard semantic definitions to enable increased interoperability
- Service enablement of existing solutions and applications so that their functions can be easily leveraged when building new business applications.

The platform on which the business applications are built must also be reliable, secure, robust, scalable, and manageable, providing an effective development environment in which business problems can be solved rapidly.

The SAP NetWeaver® platform, combined with Enterprise Services Architecture (the SAP® blueprint for an enterprise-level service-oriented architecture), provides this solution. SAP NetWeaver is unique in several ways:

- It represents SAP's more than 30 years' experience and success in building business solutions on robust platforms for most Global 2000 companies. SAP leveraged this knowledge to make SAP NetWeaver the most reliable, secure, robust, and scalable platform for building business applications.
- It is the basis for SAP's next-generation solutions. Thousands of SAP developers are proving that SAP NetWeaver standards-based technology is the ideal platform and development environment for building business applications.
- It is designed to make service enablement of applications easy. The platform enables any application, whether SAP based or not, to be easily exposed as a Web service.
- By combining SAP NetWeaver with Enterprise Services Architecture, SAP can deliver existing business solutions (such as mySAP™ ERP) as enterprise services. Thus SAP users will not need to service-enable any SAP solution.

These factors, combined with comprehensive support for industry standards, ensure that SAP NetWeaver is the ideal platform for independent software vendors (ISVs) and developers, allowing them to build applications to support business processes even

if no existing SAP solutions are involved. Through its extended ecosystem, SAP is building a community where developers and ISVs can share their experiences and ideas as well as guide the future evolution of Enterprise Services Architecture.

A platform that can easily build and integrate both SAP and non-SAP solutions must be standards based to minimize costs and speed implementation. So what is SAP doing with industry standards?

SAP is building industry-standard support into SAP NetWeaver in three ways:

- **Portability standards**

SAP NetWeaver is database and operating-system independent. For example, it runs on Windows as well as several versions of UNIX, Linux, and other operating systems. The platform can be used to build applications that can work with any of five different databases including Microsoft SQL Server, DB2, and Oracle.

- **Technology standards**

SAP NetWeaver is Java 2 Platform, Enterprise Edition (J2EE) compliant and supports a comprehensive stack of the Web service standards needed to develop business applications. Its model-driven development environment makes heavy use of application metadata. By using Eclipse, SAP has adopted the de facto industry standard development environment. SAP's Eclipse developer community is the second largest in the world.

- **Semantic standards**

SAP NetWeaver comes preloaded with a comprehensive set of standards-based semantic definitions for business documents covering a wide range of vertical industries.

SAP is using its 30 years of experience to lead and influence standards groups, helping ensure the standards they develop work well for building business applications. SAP participates in many of the technology standards groups in the World Wide Web Consortium (W3C) and the Organization for the Advancement of Structural Information Standards (OASIS) and takes leadership positions in organizations such as W3C, OASIS, Java Community Process, Eclipse, and Web Services Interoperability

Organization (WS-I). SAP then makes sure that solutions built using these standards interoperate by leading the WS-I Sample Applications activity as well as conducting interoperability tests with other platform vendors such as Microsoft and IBM.

It is also using its unquestioned industry-focused leadership status to address semantic standards through its involvement in:

- **Cross-industry semantic standards**

SAP leads the development of cross-industry business semantic standards in the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) Technologies and Methodologies Group (TMG). This will lead eventually to the development of interoperable cross-industry business documents that will significantly reduce the cost and complexity of business integration.

- **Vertical industry semantic standards**

SAP works closely with a diverse range of vertical industry standards groups to develop effective semantic standards and make sure they are built into SAP solutions. These groups cover the following industries: aerospace, agriculture, automotive, chemical, consumer goods, high technology, manufacturing, oil and gas, and mill products—paper.

SAP recognizes that companies must preserve investments in existing technology and systems while at the same time leveraging business opportunities by building solutions based on service-oriented architecture and industry standards.

SAP makes this happen through:

- **Enterprise services** that expose the core functionality of mySAP ERP systems and other SAP solutions as standards-based Web services that can more easily be used as components in a composite application
- **SAP NetWeaver**, the open standards platform designed for building next-generation business applications that can interoperate with solutions from other vendors and provide the reliable, resilient, scalable, manageable solutions that SAP customers have come to expect

In summary, SAP is creating a path to the future technology used to develop, build, and manage new standards-based business applications.

INTRODUCTION

Over the past 30 years, SAP has delivered industry-leading business solutions on which world-class businesses depend. Because these solutions are critical to each customer’s business success, they have to work – and work well.

SAP provides both the applications that run a company’s business and, through the SAP NetWeaver platform, an open technology platform that helps companies become more responsive and profitable by supporting innovation and standardization.

Making Businesses More Responsive and Profitable

To remain competitive, companies must invent new solutions or services to generate revenue and growth while standardizing non-differentiating business processes to reduce costs. By understanding the business process life cycle (see Figure 1), companies can increase rewards from new innovative processes while reducing risks when managing mission-critical processes.

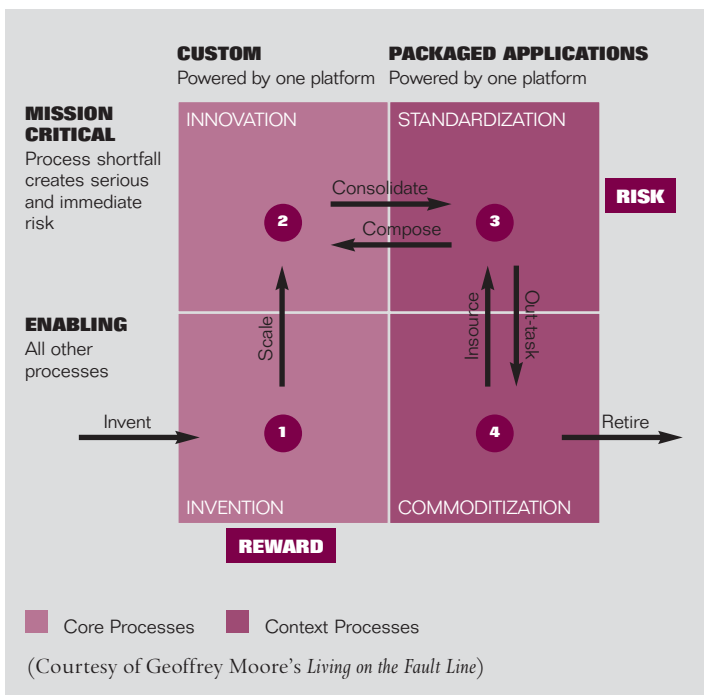


Figure 1: The Business Process Life Cycle

Initially, companies invest in new business processes by inventing a new product or service. Once customers adopt this product or service, the processes that support it help differentiate the company, rewarding it with new revenue and growth. At this point, these “core” processes become “mission critical.” During both these phases in the life of the business process, technology support is often provided through custom application development. Since the process is new, packaged applications are not always available to support it.

Once competitors take note, they begin to offer similar products or services. This is when a product or service loses its competitive differentiation and becomes “context.” To get the most value from such non-differentiating processes, a company needs to standardize them by consolidating them into its existing packaged solutions, thus gaining efficiency at the lowest possible cost. Eventually some context processes cease to be mission critical, and further cost reduction may be possible (through out-tasking, for example).

Here is a case in point: In 1999 some airlines developed kiosks for self-check-in at airports. At the time, these innovative kiosks, well liked by customers, were only deployed at a few airports, so they were not yet mission critical. By 2002, as kiosks became more widely deployed by airlines, they became very popular with customers. At this point they became a core, mission-critical process that offered competitive differentiation. But by 2004, most airlines were using kiosks for check-in, so the kiosks offered little competitive advantage. They became a context process, benefiting only those airlines who operate them at lower cost as part of a packaged or out-tasked solution. In Las Vegas, for example, the operator of McCarran airport provides the check-in kiosks for multiple airlines – reducing costs by removing the need for airlines to operate their own.

Surprisingly, innovative processes do not always rely on invention. At times, business processes that are standardized can be recomposed to deliver more value; in other words, what was once

“context” becomes “core.” In addition, core processes often need to use components from context processes to be successful, as in the following real-life example.

A high-tech company had a set of existing systems covering procure-to-pay, order-to-cash, and manufacture-to-inventory processes. They worked well; however, the company wanted to find a way of reusing them to become more competitive. This is what they did: At the start of each week the company asked its suppliers what components they were selling at low prices. The company then ran its advanced planner and optimizer (APO) system to work out what it could make with those low-cost components. Once the company knew what products it could make, it ran an electronic auction for those products to maximize the selling price. When the auction resulted in an order, the company bought the components it needed (at low cost) from its suppliers and ran its manufacturing system to plan production for and then build the finished products. As a result, the company significantly increased its profit by minimizing component costs and maximizing the selling price – just by reusing existing systems reconfigured into a new business process.

The impact on a major competitor of the high-tech company was significant. It took the competitor a year to work out what was going on, during which it lost 10% market share. The competitor also estimated it might take 18 more months to reconfigure its business processes in a similar way, resulting in a total of three years before it could become competitive again – even though it had a similar set of systems. This example demonstrates that the ability to **quickly** and **easily** recompose existing systems to support innovative business processes results in significant competitive advantage.

Building solutions such as these, solutions that support innovation and standardization, requires an open architecture and a platform that:

- **Enables new core applications to be built quickly and easily** from context processes that are exposed as services

- **Uses services that are based on industry standards** – to lower the cost of integrating both locally run and partner systems
- **Fully meets all operational needs** by being reliable, secure, robust, scalable, and manageable

The problem is that most IT infrastructures have not been set up this way. They are often built from an assortment of applications that were never designed to work together. Not surprisingly, stitching new business processes together is increasingly costly and inefficient.

This is why an open architecture and platform are so important. They reduce the time and effort required to build connections, leaving more resources available for the creation of new applications to support new core business processes.

But what should this platform look like?

Providing a Platform for Flexibility and Growth

The platform on which the business applications are built must provide both an effective development environment for rapidly solving business problems and an effective run-time environment that meets all operational needs. In addition to enabling flexibility and growth, this platform should support:

- **Service-oriented architecture**, an approach to building applications (usually called composite applications) that combines components from existing local and partner systems, both SAP and non-SAP, with new components within an efficient, effective development environment
- **Web services**, which provide the “plumbing” that connects components together; the standards, such as WSDL and SOAP, that allow companies to expose business functionality using standard interfaces; and the ability to transport data securely between local and external systems
- **XML and semantic definitions**, that define the structure and semantics of business documents such as orders and invoices (Note: Without these definitions, it is hard to develop a correctly functioning composite application. Take, for example, the term “shipping date.” This could mean a

planned shipping date, a required shipping date, or an actual shipping date. Without well-structured business documents, well-defined business processes, and precise semantics there can be confusion that leads to unexpected results.)

Effective adoption of a service-oriented architecture requires that the functions inside existing applications and solutions be made available as Web services so that they can be composed into composite applications that support a new business process. For example, you could have Web-service-based components in an existing mySAP ERP system that allow you to create a requisition, search vendors, and create an order. In addition you could have Web services operated by suppliers that allow you to check their catalogs for products and place orders. You could then use these functions to create a composite application as part

of a new “demand aggregation” business process (see Figure 2) that allows a user to aggregate demand from multiple divisional ERP systems to create a single order for a larger quantity with one supplier and so maximize supplier discounts that had been previously agreed upon.

As with business documents, these Web services must also have precise semantics associated with them so that they can be used in the correct way when building composite applications.

However, the true power of service-oriented architecture, Web services, XML, and well-defined semantic definitions will only be unlocked when companies can use them to address enterprise business requirements.

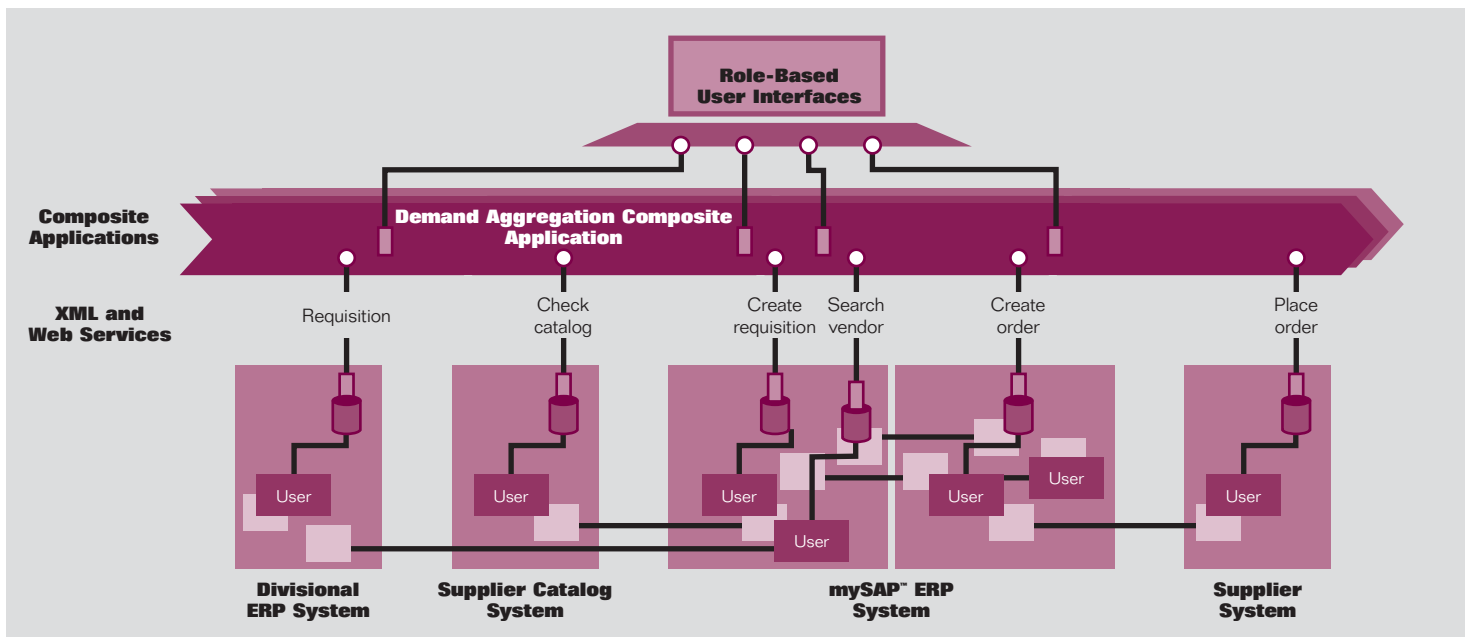


Figure 2: Building Composite Applications – Demand Aggregation

AN OPEN ARCHITECTURE AND PLATFORM FOR YOUR ENTERPRISE

Companies that want to provide a single, comprehensive architecture to govern their IT landscapes and a single open technology to enable change within their enterprise are turning to SAP. With Enterprise Services Architecture and the SAP NetWeaver platform, organizations can achieve sustainable, profitable growth through innovative solutions while lowering their total cost of ownership (TCO) through standard operations.

Enterprise Services Architecture

Enterprise Services Architecture is the SAP blueprint for next-generation software. It elevates the design, composition, and deployment of Web services to an enterprise level, creating enterprise services that address enterprise business-level requirements. An enterprise service is typically a series of Web services combined with simple business logic that can be accessed and used repeatedly to support a particular business process such as demand aggregation, described earlier.

Composing Web services into business-level enterprise services provides more meaningful building blocks for the task of automating enterprise-scale business scenarios and allows IT organizations to develop composite applications efficiently. But enterprise services must communicate using Web services standards and be described in a central repository so that their interfaces, including semantics, can be rigorously defined and then reused when building composite applications.

Enterprise services, like Web services, need a technology platform on which to run. SAP NetWeaver provides this platform.

SAP NetWeaver

SAP NetWeaver is an open integration and application platform that aligns people, information, and business processes across technologies and organizations – ensuring that mission-critical processes are secure, reliable, and scalable. (See Figure 3.) It is the technical foundation for Enterprise Services Architecture, enabling companies to obtain more business value from existing IT investments by quickly developing new solutions that increase revenue and growth.

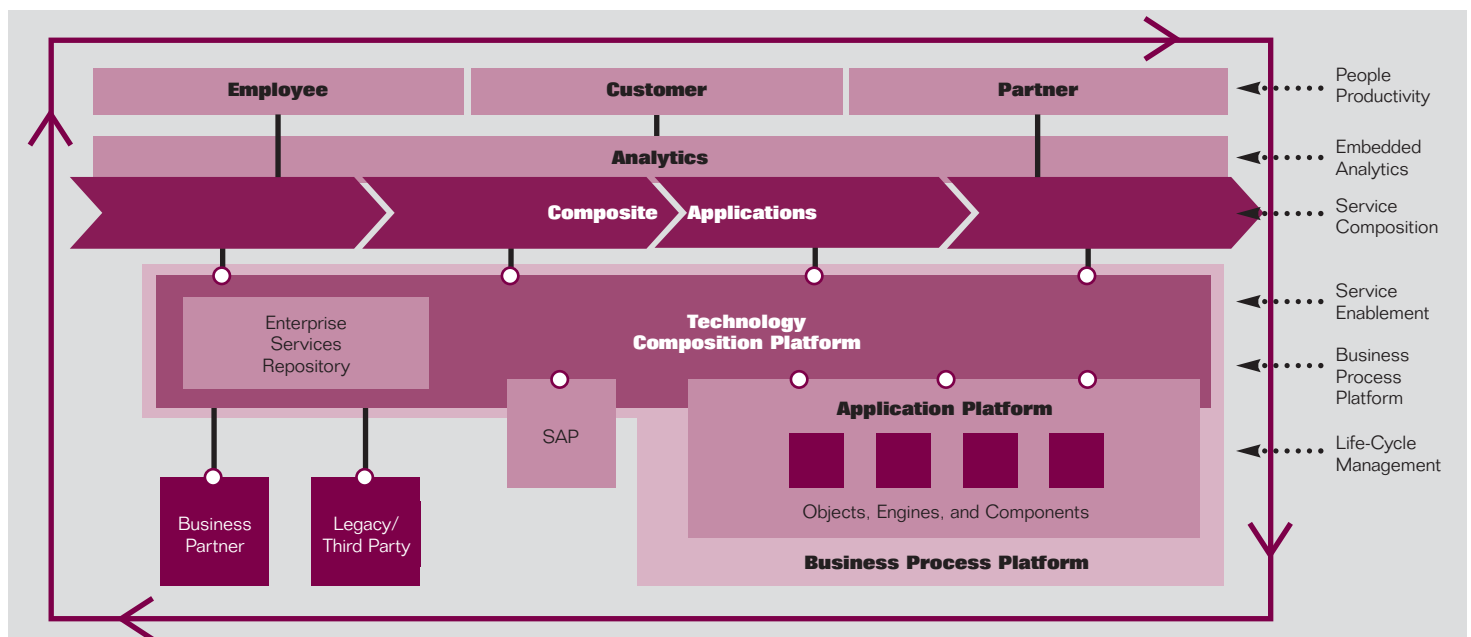


Figure 3: The SAP NetWeaver® Platform

Leveraging 30 Years of Experience

SAP NetWeaver is the unique product of a company with extensive experience in business technology. For example:

- **SAP is not just a technology company;** for more than 30 years it has built successful business solutions on robust technology platforms for Global 2000 companies.
- **SAP is proving its technology platform works well** by using SAP NetWeaver to build its next-generation business applications in a service-oriented way using industry standards.
- **SAP is providing the most comprehensive set of business-level enterprise services** for service-enabling its existing solutions – all built by the developers of those solutions.

Building Business Solutions

SAP NetWeaver is the ideal platform for developing new business solutions using composite applications, since:

- **SAP and its customers have very stringent requirements.** SAP has thousands of customers, each with thousands of users in many different industries and countries. So systems built on SAP NetWeaver must be highly configurable, reliable, robust, scalable – and have a low TCO.
- **SAP's core business is building business solutions.** As thousands of its developers use SAP NetWeaver to build SAP business solutions, SAP is acquiring the practical, hands-on experience that ensures the platform works – and works well.
- **SAP builds composite applications based on standards.** The only way to ensure that standards work is to use them for the development of mission-critical business solutions.
- **SAP tests for interoperability.** SAP tests that SAP NetWeaver interoperates with technology solutions from companies such as Microsoft, IBM, Sun Microsystems, and other key vendors.
- **SAP is a leader in standards development.** SAP places as much importance on semantic standards as technology standards by participating or leading activities in both business and vertical industry groups such as the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT), the Automotive Industry Action Group (AIAG),

Odette, the Chemistry Industry Data Exchange (CIDX), RAPID, RosettaNet, PapiNet, the Petroleum Industry Data Exchange (PIDX), and Spec2000 as well as major technology standards groups such as the World Wide Web Consortium (W3C), the Organization for the Advancement of Structural Information Standards (OASIS), the Object Management Group (OMG), and the Web Services Interoperability Organization (WS-I).

SAP NetWeaver's scalability and robustness make it the ideal platform for developing business applications whether or not SAP solutions are involved. If you are an SAP user, however, you can more easily leverage your existing investments in SAP solutions by using the enterprise services SAP has developed.

In addition, the SAP ecosystem provides a sustainable, scalable community of independent software vendors (ISVs) and third-party developers to guide the evolution of its Enterprise Services Architecture and provide a support forum for the development of business solutions on SAP NetWeaver.

OPEN INDUSTRY STANDARDS AND SAP SOLUTIONS

Industry standards ensure that SAP NetWeaver can integrate with other vendor solutions as well as align people, information, and business processes. These standards are important because they:

- **Ensure accurate information sharing**
 When businesses integrate their own systems or collaborate with others, information is often exchanged. This information might be business documents such as orders and invoices; service definitions, such as the WSDL (part of W3C) definition for a Web service; or digital certificates used to digitally sign and encrypt messages. Without standards that define what the information looks like and means, it is very hard to understand and correctly process the information.
- **Improve technology reuse**
 When standards exist, the technology required to process shared information only needs to be developed once. Moreover, software vendors such as SAP will develop technology to support the standard so that users do not have to.
- **Improve developer productivity**
 When standards exist, people acquire reusable skills that can be applied more easily to new projects.

- **Lower TCO**
 By achieving a higher level of integration and interoperability, standards help lower the total costs of an IT system's life cycle by eliminating the need for implementing and maintaining custom-built interfaces.

For these reasons, SAP is committed to supporting industry standards in SAP NetWeaver in a way that makes sense for building business applications.

SAP is working on three types of standards (see Figure 4):

- **Portability standards** that make it easier to move solutions between different operating systems and database software
- **Technology standards** that are required for building composite applications that rely on fast and easy use of Web services
- **Semantic standards** (often called business standards) that define what things mean in terms of business documents and collaborative business processes

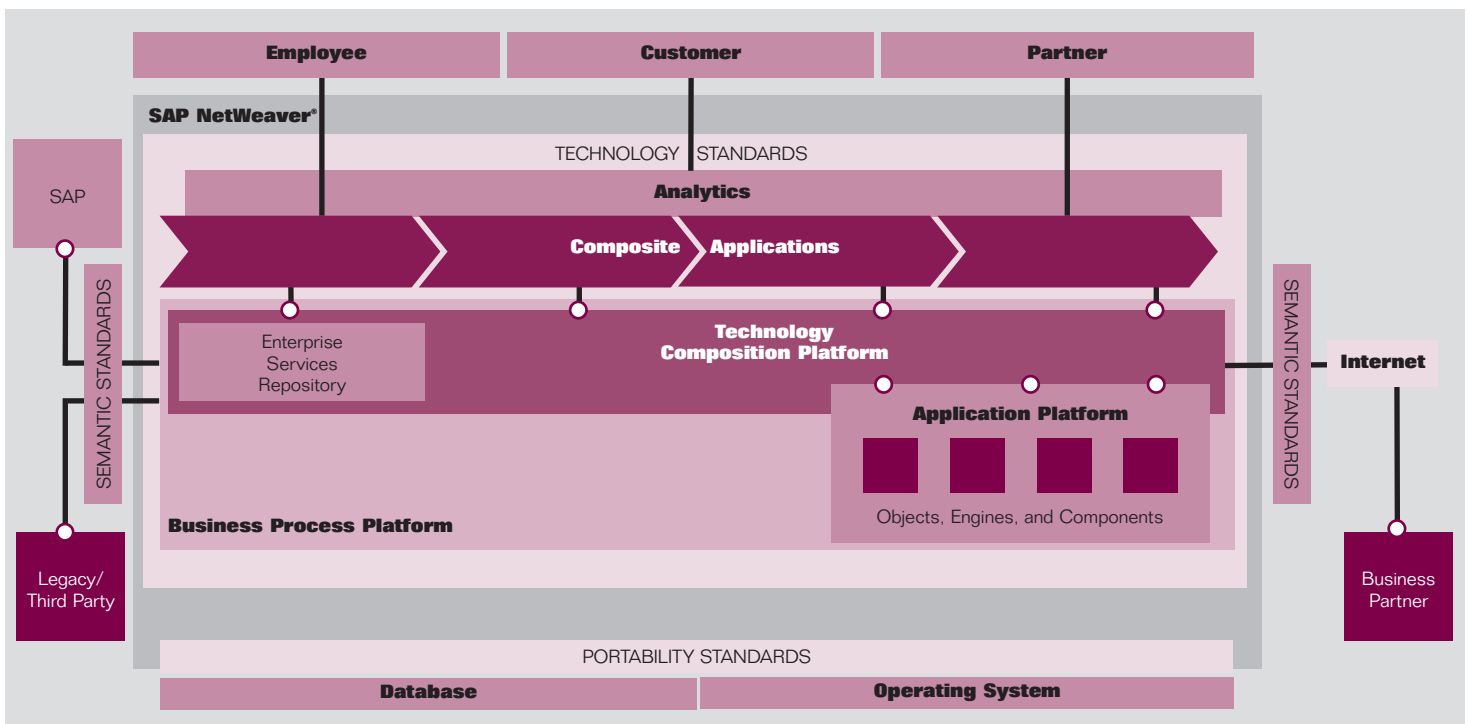


Figure 4: Portability, Technology, and Semantic Standards

Portability Standards

Portability between operating systems and databases helps protect investments by making it easier to move solutions between different technology environments. Since its early days, SAP has supported portability standards.

One of the strong features of all SAP applications is the ability to run on many different types of technology. SAP R/3® (functionality now found in mySAP ERP), for example, has always been able to run on multiple platforms.

This ability has been carried through to SAP NetWeaver. For example, SAP NetWeaver is certified to run on 32- and 64-bit versions of Microsoft Windows as well as on Linux, IBM's AIX, OS/400 and z/OS, HP's UX and Tru64, and Solaris.

SAP NetWeaver also can be used to build applications that will work with any of the following databases: DB2, Microsoft SQL Server, Oracle, Informix, and MaxDB.

Technology Standards

SAP supports technology standards such as Java, Web services, and XML.

For example, the SAP Web Application Server, a component of SAP NetWeaver, is a fully J2EE-compliant application server supporting the J2EE 1.3 standard. The next version of SAP NetWeaver will support J2EE 1.4. The platform also supports all the major Java technologies including Enterprise JavaBeans (EJB), J2EE Connector Architecture (JCA), Java Naming and Directory Interface (JNDI), Java Database Connectivity (JDBC), and more. In addition, SAP has been a member of the Java Community Process since 2001 and, since 2002, a member of the J2EE/J2SE Executive Committee that guides the whole Java development process. (Note: For more details on SAP Java Technology support, see the paper SAP Web Application Server: Support for Open Standards, available at www.sap.com/solutions/netweaver/pdf/BWP_TB_Web_App_Server.pdf.)

The SAP NetWeaver development environment is built on open-source Eclipse. By using Eclipse, SAP has adopted the de facto industry standard development environment and so benefits from the large Eclipse ecosystem. SAP's development community on Eclipse is the second largest in the world. SAP is also a board member of the Eclipse Foundation and takes an active role in Eclipse evolution and development.

SAP NetWeaver uses a model-driven approach to development that makes heavy use of application metadata to simplify and expedite the development process. This declarative, model-driven environment significantly reduces the development effort and makes it easier for business analysts to develop business solutions.

The platform builds upon existing service-oriented architecture and Web services standards, providing a comprehensive stack of all the standards that are important for developing business solutions. This stack will be extended gradually as standards become stable enough for production use. Currently it includes:

- **Basic Web services** such as SOAP, WSDL, UDDI, and the WS-I Basic Profile
- **Security standards** such as XML Digital Signature, XML Encryption, SAML, and WS Security
- **Reliable messaging standards** such as WS Reliable Messaging
- **Process definition standards** such as WS BPEL
- **XML standards** including XML Schema and XSLT
- **Service management standards** such as the Distributed Management Task Force (DMTF) Common Information Model (CIM)

SAP also actively participates in many of the standards groups that develop these and other standards including:

- **W3C** – develops XML, XML Schema, XSLT, WSDL, and more (Note: SAP is a gold-level sponsor of the Web Accessibility Initiative [WAI] and a member of the W3C Advisory Board that provides strategy-level guidance to the W3C management team.)
- **OASIS** – develops standards such as WS BPEL and WS Notification (Note: SAP is a member of the OASIS Board that directs OASIS activities.)
- **WS-I** – develops profiles of how Web services standards should be used together
- **Java Community Process** – controls the development of the Java Language
- **Eclipse Foundation** – manages the development of the Eclipse development environment
- **Object Management Group (OMG)** – develops the Model Driven Architecture (MDA), the Unified Modelling Language (UML), the MetaObject Facility (MOF), and the XML Metadata Interchange (XMI)
- **Liberty Alliance** – develops standards for managing identity on the Web
- **DMTF** – develops management standards for integration technology and Internet environments

See the Appendix for more details on the technology standards that are important for building business solutions that SAP NetWeaver currently supports or plans to support.

Finally, remember that SAP is building many service-oriented, standards-based business applications using its own SAP NetWeaver platform. Developers can be confident that SAP NetWeaver will implement all the standards needed for service-oriented architecture, Web services, and XML.

Semantic Standards

Semantic or business standards enable collaboration by defining what things mean. They include:

- **Data definitions**, which define the format, structure, and semantics of the data exchanged between businesses (for example, on orders and invoices) as well as information exchanged between and stored by applications
- **Collaborative process definitions** (sometimes called choreography standards), which define how two or more businesses collaborate by defining the sequence in which documents are exchanged; for example, an order sent to a supplier usually results in the return of an order response

SAP is helping make semantic standards better by applying its knowledge and experience in developing the business solutions on which the leading businesses and industries of the world depend. For example, SAP works closely with UN/CEFACT, which developed UN/EDIFACT, the definitive international EDI standard; it also chairs the UN/CEFACT Technologies and Methodologies Group (TMG), which is developing next-generation business information and collaborative process standards through activities such as:

- **Core Components Technical Specification (CCTS)**, which provides precise semantic definitions for business documents and processes
- **Naming and Design Rules (NDR)** that specify how the core components developed by CCTS (such as address, full name, line item) can be mapped to XML in a consistent way

There is wide interest in and adoption of core components by vertical industry standards groups. This means that eventually the work of TMG will significantly reduce the semantic complexity and effort required for business integration.

For example, studies have shown that 95% of the cost of building connections between systems is spent on understanding the semantics and business logic involved. If the semantics are standardized, then integration costs will be reduced significantly.

The enterprise services that SAP is creating are also based on core components. As a result, business applications built on SAP NetWeaver will be able to map more easily to the semantic standards being developed by vertical industry standards groups.

SAP also has a team, IndustrySpeak, that develops industry solutions and participates actively in many vertical standards groups for aerospace (Spec2000), agriculture (RAPID), automotive (AIAG, Star Standard, and Odette), chemical (CIDX), consumer goods (GS1), high-tech (RosettaNet), manufacturing (S95, OPC, MIMOSA), oil and gas (PIDX), and mill products—paper (PapiNet) industries.

SAP is using what it learns from this participation to help ensure that technology standards initiatives in the W3C, OASIS, and WS-I — as well as SAP NetWeaver — reflect the needs of different vertical industries. SAP also makes its practical development experience (with service-oriented, industry-standard business applications) available as a resource to vertical industry standards groups that are looking to adopt core components for semantic standards and service-oriented architecture, Web services, and XML for technology standards.

Interoperability Testing

Once standards are developed, they must be tested to make sure interoperability occurs between solutions from different vendors. To ensure that SAP NetWeaver and SAP business solutions interoperate with solutions from other vendors, SAP runs tests with other major platform vendors such as Microsoft and IBM. (Note: For more information on interoperability tests with Microsoft .NET and IBM WebSphere see

www.sap.com/solutions/netweaver/pdf/BWP_Interoperability.pdf.)

In addition, SAP is a board member of WS-I, which includes companies such as IBM, Microsoft, Sun, BEA, Oracle, and others. The WS-I develops profiles that describe how service-oriented architecture, XML, and Web services specifications should be used together. SAP is also chair of the WS-I Sample Applications Working Group, which builds applications that prove solutions from different vendors can interoperate.

Industry Standards and Enterprise Services Architecture

Enterprise Services Architecture provides a blueprint for developing composite applications from components in a service-oriented way. Some components, such as mySAP ERP, come from local resources and systems while others are provided by partners and third parties.

In the short term, connections to services operated by partners and third parties require adapters that support existing industry standards such as RosettaNet, CIDX, and PIDX. These adapters enable partner and third-party services to appear as enterprise services in the same way that the enterprise services SAP is developing provide access to SAP systems such as mySAP ERP. The adapters will provide mappings of business documents to the format required by the standard as well as support non-Web service-based security and reliable messaging protocols such as RosettaNet RNIF.

However, the trend for industry standards groups is to adopt core components as the basis for their business documents and Web services for security and reliable messaging. This means that in the longer term, the mapping required between SAP solutions and industry standards should be greatly reduced. By participating actively in both technology and semantic standards groups, SAP is helping expedite this transition.

As a result, SAP NetWeaver provides the best solution for building standards-based business applications. These applications combine human interaction with services running on local systems and services operated by business partners.

SUMMARY

Companies are seeking to adopt business processes that meet rapidly changing business needs. To help make this happen, they are using a service-oriented architecture approach with an XML or Web services platform to build business applications that allow them to rapidly develop composite applications through reuse of solutions, products, and applications.

Making this work well requires:

- **A service-oriented, industry-standards-based platform** that simplifies the building of solutions that reuse both SAP and non-SAP solutions
- **Service-enabling of existing systems and solutions** so that they can be used easily and rapidly to build applications

SAP NetWeaver provides the needed platform and leverages SAP's 30 years of experience in building reliable, robust, scalable technology platforms and solutions for the world's leading companies. SAP NetWeaver is the ideal platform for building business applications for a variety of reasons:

- SAP's thousands of developers are using it to build next-generation business applications. It incorporates industry standards and approaches such as Java, Eclipse, service-oriented architecture, XML, and Web services as well as vertical industry standards such as RosettaNet, PIDX, and CIDX.
- SAP is leading and influencing both technology and semantic standards groups.

To be successful in today's competitive environment, companies must preserve their existing technology investments while leveraging the opportunities that service-oriented architecture, XML, Web services, and a Java or Eclipse development environment present. SAP helps achieve these goals through Enterprise Services Architecture, which exposes the core functions of mySAP ERP and other SAP solutions as standards-based Web services.

With SAP NetWeaver and Enterprise Services Architecture, SAP is building a path to the future where companies develop, build, and manage standards-based business applications that help deliver a more responsive and profitable business.

APPENDIX

Technology standards that are supported or will be supported in SAP NetWeaver:

Name	Description	Link
DMTF	Distributed Management Task Force	www.dmtf.org
▪ CIM	Common Information Model	www.dmtf.org/standards/standard_cim.php
Eclipse	Eclipse Foundation	www.eclipse.org/
ICE	Information and Content Exchange	www.icestandard.org
IETF	Internet Engineering Task Force	www.ietf.org
▪ HTTP	Hypertext Transfer Protocol	ietf.org/rfc/rfc2616.txt?number=2616
Java	Java Language	java.sun.com/
▪ JCP	Java Community Process	www.jcp.org/
▪ J2EE 1.3 and 1.4	Java 2 Platform, Enterprise Edition	java.sun.com/j2ee/
OASIS	Organization for the Advancement of Structured Information Standards	www.oasis-open.org
▪ WS-BPEL 1.1 & 2.0	Business Process Execution Language for Web services	www.oasis-open.org/committees/wsbpel/
▪ SAML 1.1	Security Assertion Markup Language	www.oasis-open.org/committees/security/
▪ SPML 1.0	Service Provisioning Markup Language	www.oasis-open.org/committees/provision/
▪ UDDI 2.0 & 3.0	Universal Description Discovery and Integration	www.uddi.org/
▪ WSDM	Web Services Distributed Management	www.oasis-open.org/committees/wsdm/
▪ WSRP 1.0	Web Services for Remote Portlets	www.oasis-open.org/committees/wsrp/
▪ WS-Reliable Messaging	Web Services Reliable Messaging Exchange	www.oasis-open.org/committees/ws-rx/
▪ WS-Security 1.0	Web Services Security	www.oasis-open.org/committees/wss/
OMG	Object Management Group	www.omg.org
▪ CWM	Common Warehouse Metamodel	www.cwmforum.org/
▪ XMI	XML Metadata Interchange	www.omg.org/technology/documents/formal/xmi.htm

Links were correct at the time of publication

Name	Description	Link
UN/CEFACT	United Nations Centre for Trade Facilitation and Electronic Business	www.unece.org/cefact/
▪ TMG/CCTS	Core Components Technical Specification	www.untmg.org/
▪ ATG/XML NDR for CCTS	XML Naming and Design Rules for Core Component Technical Specification	www.disa.org/cefact-groups/atg/downloads/index.cfm
W3C	World Wide Web Consortium	www.w3.org
▪ SOAP 1.1	Simple Object Access Protocol	www.w3.org/2000/xp/Group/
▪ Voice XML	Voice Browser Activity	www.w3.org/Voice/
▪ WS-Addressing	Web Services Addressing	www.w3.org/2002/ws/addr/
▪ WSDL 1.1	Web Services Description Language	www.w3.org/TR/wsdl
▪ XML Encryption	XML Encryption	www.w3.org/Encryption/2001/
▪ XML Schema 1.0	XML Schema	www.w3.org/XML/Schema
▪ XML Signature	XML Signature	www.w3.org/Signature/
▪ XSL	Extensible Stylesheet Language	www.w3.org/Style/XSL/
Wf-XML		
▪ Wf-XML 1.0 & 1.1	Workflow XML (Workflow Management Coalition)	www.wfmc.org/
WS-I	Web Services Interoperability Organization	www.ws-i.org/
▪ Basic Profile 1.0	WS-I Basic Profile	www.ws-i.org/Profiles/BasicProfile-1.0-2004-04-16.html
XMLA	XML for Analysis	www.xmla.org/
Other standards		
▪ WS-Management	Web Services for Management	www.intel.com/technology/manage/downloads/ws_management.pdf
▪ WS-Policy	Web Services Policy Framework	ifr.sap.com/ws-policy/ws-policy.pdf
▪ WS-Policy Attachment	Web Services Policy Attachment	ifr.sap.com/ws-policy/ws-policyattachment.pdf
▪ WS-RM Policy Assertion	Web Services Reliable Messaging Policy Assertion	msdn.microsoft.com/library/en-us/dnglobspec/html/WS-RMPolicy.pdf
▪ WS-Security Policy	Web Services Security Policy Language	www-128.ibm.com/developerworks/library/specification/ws-secpol

Links were correct at the time of publication

www.sap.com/contactsap