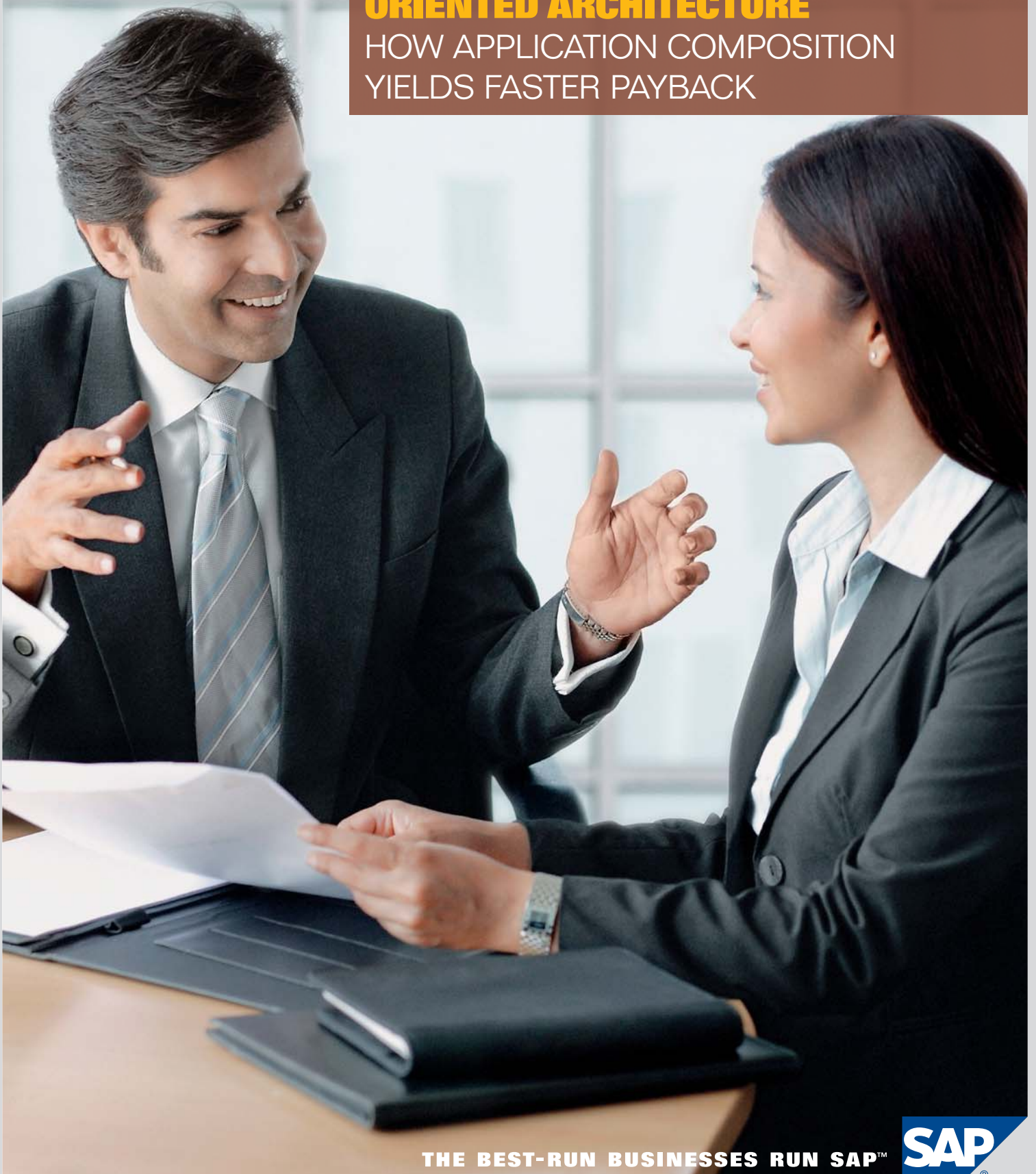


SAP NetWeaver Composition Environment

ACCELERATE YOUR ROI IN SERVICE-ORIENTED ARCHITECTURE

HOW APPLICATION COMPOSITION
YIELDS FASTER PAYBACK



THE BEST-RUN BUSINESSES RUN SAP™



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ACHIEVING THE BENEFITS OF SERVICE-ORIENTED ARCHITECTURE

APPLICATION COMPOSITION CAN SPEED TIME TO VALUE

Many IT architects envision evolving their IT platform to a service-oriented architecture (SOA) but find their plans stymied by the inability to demonstrate immediate business value for SOA projects. Yes, SOA can yield significant business value by simplifying integration projects, boosting productivity, increasing flexibility, lowering cost of ownership, and better aligning IT operations with business objectives. But the key to achieving these business benefits in the near term lies in leveraging existing software functionality in new ways. For custom development projects, this means reusing software functions and components, assembling these pieces in different ways, and mapping them more closely to business activities. It also means minimizing the amount of manually written new code with its associated maintenance cost.

Today's tough economic times and intense competition are forcing companies to make more careful funding decisions. Businesses are scrutinizing every investment to help ensure the ability to bring rapid benefits and a compelling ROI. Many SOA adopters are struggling to maintain a sound justification for continued backing because of the time and skill level required to deliver effective SOA-based solutions. For SOA initiatives to succeed, companies like yours must find ways to deliver the required business applications as productively and effectively as possible, while minimizing cost and risk.

A key weapon in achieving these goals is a comprehensive application composition environment that can speed up project delivery while reducing training needs. A best-of-breed composition environment must offer:

- Effective and flexible reuse of existing applications and services
- A productive development environment

- Role-based customization to optimize the productivity of business users
- Business process orientation to align IT operations with business activities

The SAP NetWeaver® Composition Environment (SAP NetWeaver CE) offering has been designed specifically with these needs in mind.



Service-oriented architecture can yield significant business value by simplifying integration projects, boosting productivity, increasing flexibility, lowering cost of ownership, and better aligning IT operations with business objectives. But the key to achieving these business benefits in the near term lies in leveraging existing software functionality in new ways.

LEVERAGING SAP'S FASTER ROUTE TO SOA

PROVEN SOLUTIONS STREAMLINE THE ADOPTION OF SOA

Before investigating SAP NetWeaver CE in more detail, it is useful to understand where it fits into the portfolio of SOA solutions from SAP. SAP makes the adoption of SOA more rapid and affordable by delivering SOA-enabled applications, the SAP NetWeaver technology platform, and enterprise services that IT can use to integrate existing processes or compose new ones. Figure 1 depicts the implementation of SOA based on the SAP® portfolio.

Service-enabled for greater flexibility, the SAP Business Suite software provides best-of-breed functionality for running core business processes that are easily adaptable via reusable enterprise services. SAP NetWeaver provides the development tools and infrastructure to deploy a mature service-oriented architecture through three main compo-

nents: SAP NetWeaver CE, the SAP NetWeaver Process Integration (SAP NetWeaver PI) offering, and Enterprise Services Repository (ES Repository).

SAP NetWeaver CE provides all the tools you need to compose business processes and applications and orchestrate them with services. It also includes tools for filling gaps in services by enabling the model-driven development of new custom Web services, business objects, and user interfaces. Finally, it offers development life-cycle management tools for building, versioning, and deploying enterprise services and composite applications.

SAP NetWeaver PI enables connectivity and integration between your SAP software, legacy applications, and business partner solutions through a wide array of

available adapters, prepackaged integration templates, and support of industry standards. It also offers enterprise-grade support for running an effective SOA by providing an enterprise services bus and orchestration functionality that supports transactions, mediation of services, caching, and availability.

ES Repository, delivered as part of SAP NetWeaver CE and SAP NetWeaver PI, provides centralized management of development components, including service definitions, business objects, user interface definitions, and models. It features a look-up service compliant with the Universal Description, Discovery, and Integration (UDDI) standard and allows discovery of published Web services that can be consumed by composite applications. ES Repository also enables you to maintain governance over SOA development by encouraging reuse of published services and correct versions of development components and models.

The services that reside in ES Repository come from a variety of sources, such as SAP NetWeaver PI and enterprise services bundles delivered as part of enhancement packages for SAP Business Suite. Many services delivered in enterprise services bundles are developed in collaboration with SAP customers and partners through industry design groups that are part of the Enterprise Services Community program.

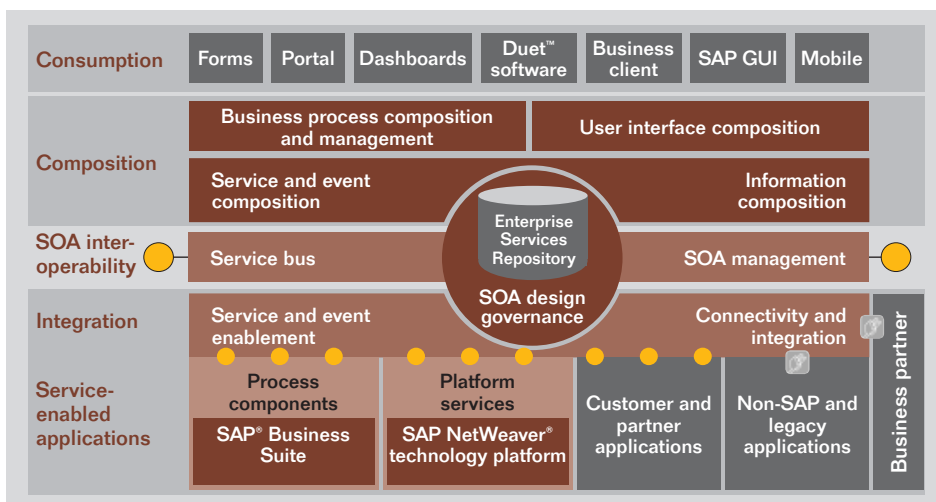


Figure 1: Service-Oriented Architecture (SOA) Based on the SAP Portfolio

REALIZING BOTTOM-LINE BUSINESS VALUE FROM SOA

SOA SUCCESS IMPROVES EFFICIENCY, FLEXIBILITY, AND INSIGHT

SOA adoption is no longer a question of “if” but “when” for most companies. According to a Gartner Inc. report titled *Findings: SOA Survey Highlights Strong SOL Uptake* by Teresa Jones published June 25, 2008, “Forty-nine percent of respondents claim to be using SOA already, with a further 17% planning to do so in the next 12 months.” IT departments know SOA is the architecture that must power their future. However, many IT organizations are unsure how to get there or take on only small projects of limited value due to fear of uncertain ROI and payback times for larger projects. Such uncertainty is always an issue when starting out with new technology such as SOA. But in today’s tougher economic times, ROI has become the subject of laser-beam focus.

What does it take to achieve the SOA-enabled vision of flexible business processes and rapid process innovation? Leveraging the IT systems that underpin business operations, your company needs the agility to quickly change its existing business processes and construct new ones. To do this, you need to service-enable these processes and their related applications. You also need to build and deploy processes in a simple, modular way to maximize reusability. An ad hoc approach to custom-building processes without governance or proper methodology can lead to a chaotic architecture that fosters expensive duplication and redundancy and raises governance problems (see Figure 2). The key to success is to assemble your SOA based on a clear, standardized

methodology that encompasses the appropriate governance procedures and tools (see Figure 3). Such an architecture enhances reusability, reduces development time, and lowers maintenance costs.

For SOA initiatives to succeed, companies like yours must find ways to deliver the required business applications as productively and effectively as possible, while minimizing cost and risk. A comprehensive application composition environment can help you speed up project delivery while reducing training needs.

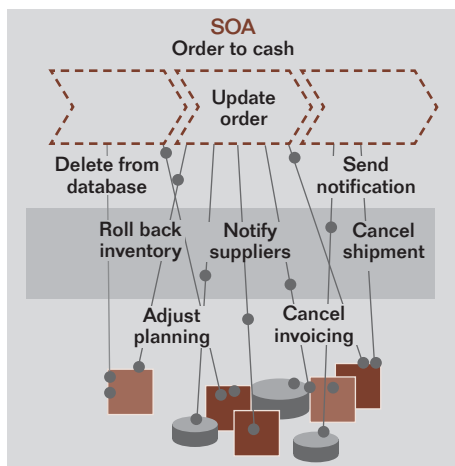


Figure 2: Chaotic Architecture Due to a Lack of Governance or Proper Methodology

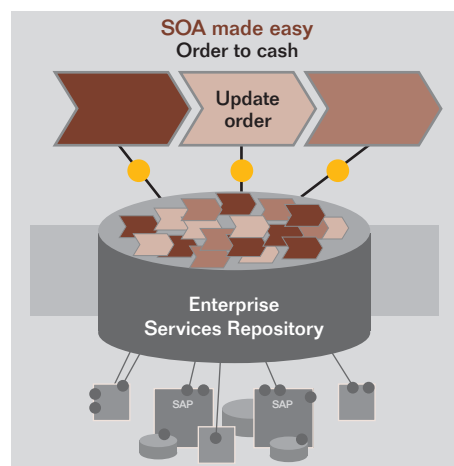


Figure 3: SOA Infrastructure Built with Methodology and Governance in Mind

Once you develop a critical mass of services-based business functionality, the reuse of these services lets you readily adapt existing applications to new requirements and rapidly compose new applications, all with minimal new coding. The results are faster deployment, improved quality, increased flexibility, lower costs, closer business alignment, and a greater enterprise-wide standardization.

Targeting the “Sweet Spot” for Application Composition

While an application composition environment promises a powerful range of benefits that extract more value from SOA, some use cases represent particularly fruitful prospects for this technology. These “sweet spots,” summarized in Figure 4, represent the types of projects that offer the fastest payback and greatest ROI when coupled with application composition functionality.

These four SOA use cases are ideally suited to leverage the major benefits of a best-of-breed application composition environment: efficiency, flexibility, and insight (see the table to the left). The following sections examine each of these benefit areas, showing how they help drive faster and greater ROI from SOA.

Benefits of an Application Composition Environment

Application Composition Benefits	Feature	Return
Efficiency	Single development environment	Development productivity
	Model-based design	Development productivity Lower skills requirement
	Reuse of services and processes	Development productivity Improved quality
	Role-based user interface design	User productivity Lower training costs
Flexibility	Reuse of services and processes	Faster time to market Lower skills requirement
	Clarity in IT implementation	Development productivity Faster time to market
	Opportunity to innovate	Faster time to market Improved business agility
Insight	Ability to monitor process execution in business terms	Continual process improvement
	Opportunity for management by exception	Better customer service Improved performance
	Improved compliance and governance	Risk mitigation Improved performance

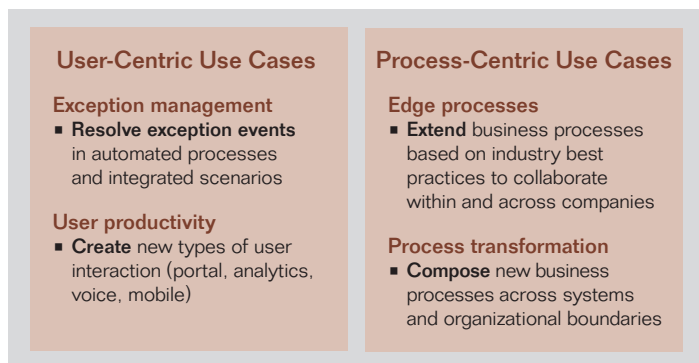


Figure 4: SOA Projects Best Suited to Benefit from Application Composition Environment

Increasing the Efficiency of Developers and Business Users

For developers, a smart application composition environment creates many opportunities to heighten efficiency. For starters, developers can address the different architectural layers of composite applications (such as user interfaces, business processes, business logic, and data) in a single environment. This eliminates the need to keep switching tools and consolidates the components of the solution in one place. A model-based approach brings added efficiency by allowing developers to extract implementation knowledge from individual programs and build it into standard components, enabling even less-experienced developers to reuse functionality. And of course, reusing existing building blocks and applications to deliver new business functionality avoids extra development and testing effort.

At the business user level, higher productivity is easy to achieve by developing role-based composite applications. Business users are more productive with a targeted interface that asks for key pieces of input instead of a one-size-fits-all screen with unnecessary fields. For example, a field service engineer only needs a customer's address and telephone number prior to a repair visit; the customer's trading history and contracts are irrelevant. However, a sales



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person needs access to a wider range of customer information for sales tracking and analysis. With a new interface tuned to their needs, business users make fewer mistakes, while you eliminate the need for expensive and time-consuming employee training.

Improving the Flexibility of IT Solutions

From a business perspective, flexible IT systems are quick to handle new challenges, swiftly delivering high-quality services to business users as needs

change. Application composition strongly supports this goal in two ways. First, it enables developers to assemble new solutions from the optimal combination of existing components and newly developed or modified ones. Second, it allows applications to be expressed in business process terms, making it easier for business users to understand how an automated business process works and explain any changes they need.

As an example, consider a bank that offers homeowner's insurance to customers. To facilitate this process, the IT team has already composed an application to check an applicant's credit, track interest rates, and identify risk factors based on property address. But what if the bank decides to expand into a new market by offering insurance for yachts? IT can quickly compose a new application by reusing the first three steps of the homeowner's insurance composite and developing a new step to assess risk factors for yachts, such as mooring location. In this way, application composition enables the bank to be as flexible as possible in addressing the new business opportunity. Now imagine that the bank wants to tighten up on the governance of its insurance business. Because the audit department can see each step in the existing process at a business level (rather than at a technical level), it can identify where

new audit steps are required in the process flow. As a result, it quickly realizes the need to add a step when any insurance proposal covering assets greater than \$1 million is requested.

The ability to create composite applications quickly only comes with SOA maturity. Prior to application composition, you need more than available component services. You also need the methodology and governance to develop services effectively and an infrastructure to support the development and deployment of SOA applications. Many SOA infrastructure vendors with so-called "best-of-breed" products only provide toolkits and infrastructure for service building. In essence, they say, "Here are some tools; now use our professional services to create the components you need." At SAP, we take a different approach. We offer a complete solution with standards-compliant development tools and an SOA infrastructure. We also provide a large array of industry-relevant enterprise services that are inherently part of existing SAP applications.

Gaining Greater Business Insight

The power to align IT closely with business objectives is a key contributor to driving increased returns from SOA. Because application composition enables clear business process implementations, it allows greater business visibility into

IT operations. That means your business users can more quickly understand existing processes and how business operations are performing. For example, application composition facilitates the development of an executive dashboard, offering a real-time, high-level view of the performance of key business processes against targets and identifying issues needing attention. With this insight, business users get the information they need to optimize processes by adapting them quickly and effectively. This insight also enables business users to manage by exception – that is, to focus on the 1% of business operations that require attention instead of the 99% that are running smoothly.

"Software applications represent abstractions of business processes. The best practices for creating and maintaining these applications are shifting from development to composition, using new model-driven tools and technologies designed to help business and IT users understand, change, and optimize the performance of their processes."

Daryl C. Plummer and Janelle B. Hill,
Three Types of Model-Driven Composition: What's Lost in Translation?
Gartner Inc., August 4, 2008



A smart application composition environment creates numerous opportunities to heighten efficiency, improve flexibility, and gain greater business insight.

In support of this point, research from John Hagel, business strategist with Deloitte Touche USA LLP, and John Seeley Brown, cochairman of the Deloitte Center for Edge Innovation

reveals that 95% of IT investment is directed at business processes intended to drive down costs. Yet the majority of employee time is spent on the exceptions to these processes, such as blocked

orders, back orders, and the like. By examining and clarifying business processes, you can identify the exceptions that bog down productivity and drive up cost. Monitoring tools can now watch for these exceptions and take action automatically when they occur, resulting in efficiency gains and higher user satisfaction.

Greater insight also enables companies like yours to implement compliance and governance policies more effectively. An application composition environment allows you to introduce a level of standardization across development activities enterprise-wide, leveraging the power of model-based development and utilizing a common repository for storing all enterprise-related definitions and specifications. By enabling a process-oriented approach and the power to monitor processes step-by-step as your IT systems execute them, an application composition environment can also alert your compliance officers to out-of-line situations when they occur.

WORKING WITH THE SAP NETWEAVER COMPOSITION ENVIRONMENT

INTEGRATED BEST-OF-BREED TOOLS DRIVE A RAPID ROI IN SOA

The SAP NetWeaver Composition Environment has evolved from SAP's proven application development technologies. SAP NetWeaver CE integrates established SAP tools that allow you to create your Java-based composite applications using a standard Eclipse-* based development environment. With its integrated development infrastructure, SAP NetWeaver CE provides project build, versioning, and deployment functionality for managing your composite development projects in an efficient manner, whether local or globally based.

Applications composed with SAP NetWeaver CE are deployed on its lightweight Java EE 5-compliant application server. Figure 5 represents the development tools and technologies available with SAP NetWeaver CE and their relationship to the composite application layers they help author.

With SAP NetWeaver CE, modeling replaces coding as the fundamental development technique. Models are supported at all levels, from business process down to the definition of busi-

ness objects. Based on the models your developers build, SAP NetWeaver CE generates a high percentage of the Java code, resulting in dramatic gains in developer productivity and application quality. This automatic code generation supports the modification of existing models, enabling developers to quickly change business processes, user interface components, and component services. In addition, ES Repository enables rapid productivity gains for developers because it is prepopulated with models of industry-standard business processes, user interfaces, and enterprise services that can be used immediately to compose new applications.

Proven Tools and Technologies for Application Composition

SAP NetWeaver CE builds upon the following integrated software tools and technologies.

The **SAP NetWeaver Application Server** component is a robust, enterprise-class, Java EE 5 application server.

The **SAP NetWeaver Developer Studio** tool offers an Eclipse-based development environment enhanced with comprehensive design, construction, and maintenance functionality. A range of perspectives allows your developers to work with each architectural layer of a composite application: the business process level, user interface level, services level, and back-end connectivity level. Developers can view perspectives at all levels or switch quickly between perspectives to work on different tasks.

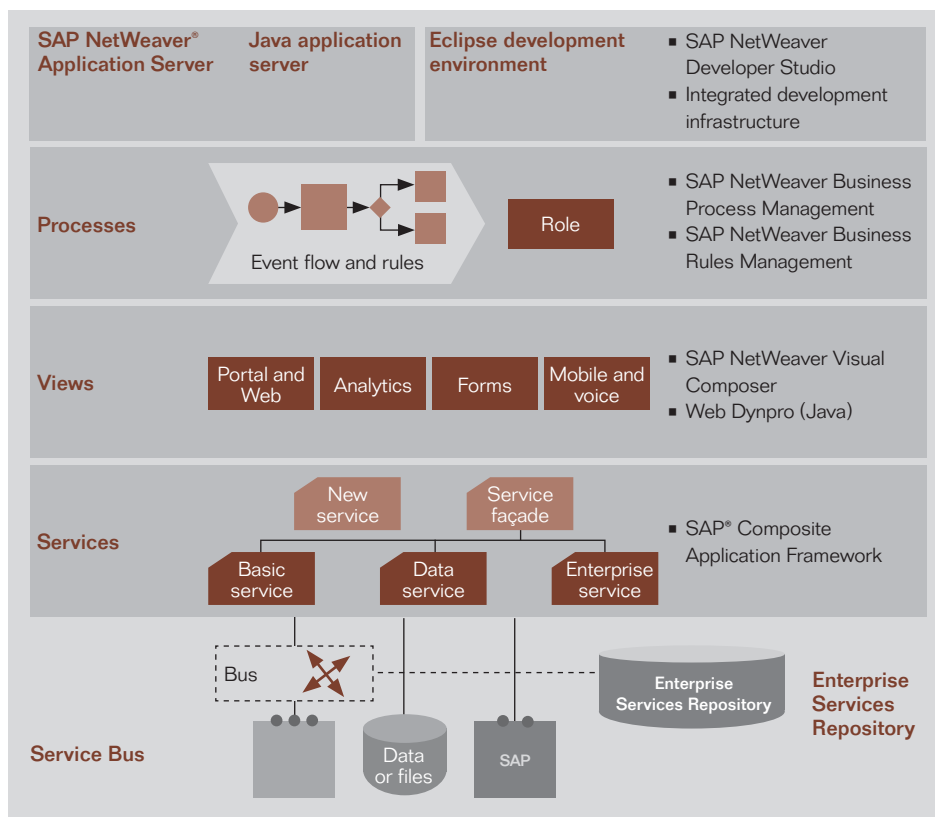


Figure 5: Eclipse-Based Application Composition Environment Using SAP NetWeaver Composition Environment

* Written primarily in Java, Eclipse is an open-source software platform. It comprises extensible application frameworks, tools, and a runtime library for building, deploying, and managing applications across their life cycle – providing software developers and administrators with an integrated development environment.

This development environment also enables you to organize individual development teams that can focus their skills on specific levels.

An **integrated development infrastructure** supports the complete life-cycle management of your composite application. It offers a versioning system and a component-based build and transport infrastructure.

The **SAP NetWeaver Business Process Management (SAP NetWeaver BPM)** component enables collaborative modeling of composite business processes

The **SAP NetWeaver Composition Environment** integrates all the tools needed to develop Java-based composite applications in a standard Eclipse-based development environment.

based on a single, directly executable process model. SAP NetWeaver BPM covers process composition in the SAP blueprint for SOA, allowing your company to build business processes that reuse packaged or custom-built enterprise services.

The **SAP NetWeaver Business Rules Management** component provides the agility to quickly embed and enforce business rules in processes and applications. It also allows business users with no coding skills to create and modify rules via decision tables.

Guided procedures serve as flexible mechanisms to express process flow for collaborative processes. Like application wizards for business processes, these guided procedures walk business users through a process step-by-step.

The **SAP Composite Application Framework** tool is a business object modeling and service composition tool.

The **SAP NetWeaver Visual Composer** tool, which provides model-driven user interface development, enables devel-

opers to create and adapt user interfaces and analytical dashboards quickly.

The **Web Dynpro** development environment is ideal for building complex user interfaces and data-driven applications. Its graphical tools and automatic code generation functionality accelerate the development process.

Enterprise Services Repository (ES Repository) is the central location for modeling service interfaces and enterprise services and storing their metadata. It includes thousands of services provided by SAP, as well as others that you add to it. The enterprise services in ES Repository adhere to a coherent and consistent set of semantics designed for business process automation and built on open standards.

RELYING ON SAP'S PROVEN APPROACH TO SOA

SOA-BASED APPLICATION COMPOSITION YIELDS A RAPID RETURN

At SAP, we offer a uniquely powerful approach to service-oriented architecture. Our approach combines the service-enabled, comprehensive, and adaptive business applications in SAP Business Suite with the SAP NetWeaver technology platform to deliver SOA-based application composition. Using this approach, your company can rapidly transform IT assets into a pool of reusable services. You gain the development environment and infrastructure to drive new levels of efficiency, greater flexibility, and a closer alignment of IT with business strategies through improved oversight of IT operations. The end result is better agility, higher productivity, and lower cost of ownership – all of which combine to deliver the improved ROI with shorter payback times that all businesses demand.

Find Out More

To learn more about how SAP NetWeaver CE can accelerate your company's ROI in SOA, call your SAP representative today or visit us on the Web at www.sap.com/platform/netweaver/components/ce/index.epx.



With its integrated development infrastructure, the SAP NetWeaver Composition Environment provides project build, versioning, and deployment functionality for managing composite development projects efficiently.

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