

How to Get Value Now (and in the Future) From SAP's Enterprise SOA

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This research touches on fundamental issues for SAP clients today: What SAP's enterprise SOA is and will be, how much of a real service-oriented-architecture (SOA) SAP's Enterprise SOA is, how far SAP is in delivering its vision, what value it may have, and the main risks associated with it. A basic set of recommendations is included on what to do with SAP's enterprise SOA, depending on an organization's SOA maturity.

Key Findings

- SAP's enterprise SOA is a powerful vision that is bound to deliver most SOA benefits in time.
- SAP's enterprise SOA is an endeavor of incredible complexity – even for SAP – and its benefits need to be carefully weighed against its risks.
- SAP's enterprise service bundles are only for a minority of SAP clients (those running SAP ERP 6.0), but that client base is growing rapidly. All SAP clients will be able take advantage of enterprise SOA components, such as the composition environment and the enterprise service repository, so no SAP client today can ignore SAP's enterprise SOA.

Recommendations

- SAP clients should start, at least, experimenting with SAP's enterprise SOA today and proceed carefully.
- Because of the risks associated with SAP's enterprise SOA ongoing delivery, enterprises that are not Type A (early technology adopter) should not make critical project deliverables dependent on enterprise SOA deadlines.
- Please see the section “What Should You Really Do With Enterprise SOA?” for an articulated set of recommendations on SAP's enterprise SOA use today.

ANALYSIS

1.0 An Introductory Note on Terminology

The notion of a general, wide-encompassing SOA that covers the majority of functionality within a company's IT systems is generally referred to in Gartner research as enterprise (or enterprisewide) SOA. The SAP offering covered in this research is also called enterprise SOA because it aims to be what the Gartner definition states, and more. For the sake of clarity, in this research, the two words “enterprise SOA” will always indicate SAP's offering, unless otherwise stated, and not the general concept of enterprise SOA as per Gartner definition.

SAP's SOA application strategy is articulated in two tracks:

1. Enterprise SOA “by evolution,” which is unfolding through the delivery of enhancement packages (see below), a repository for business services and several NetWeaver components to enable composites

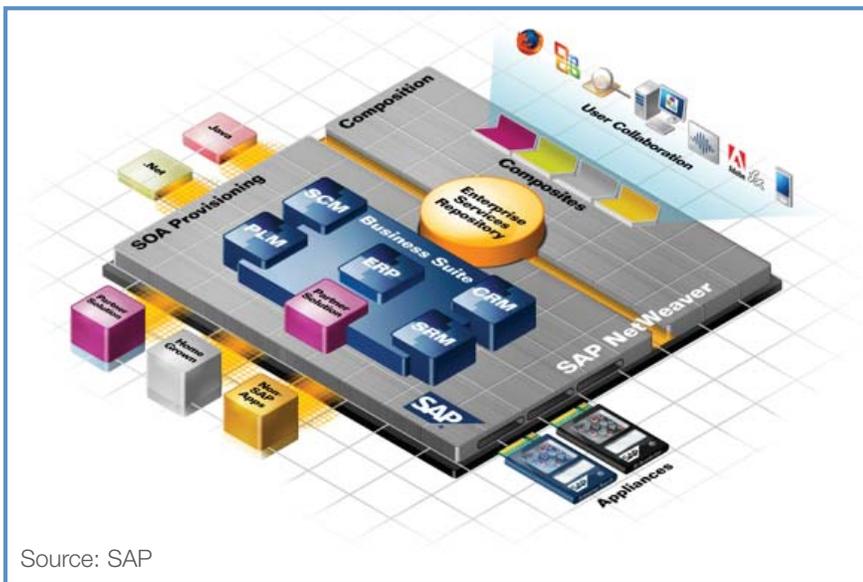
2. Enterprise SOA “by design,” which is a complete redesign of SAP core application functionality according to the SOA principles of modularity, encapsulation, loose coupling and more and is based on the same set of business services

This research is mainly about enterprise SOA by evolution as it affects clients today, because SAP is already delivering that vision. SAP is also working in parallel with SOA by design, but delivery plans will not unfold until 2008. It is also important to note that SAP used to call enterprise SOA a different name – Enterprise Services Architecture (ESA) – but the two are the same thing.

2.0 What SAP's Enterprise SOA Will Be: The Vision

Several books and hundreds of presentation slides have been written on enterprise SOA. Yet, it is very difficult to find a simple definition of it in plain English. SAP suggests “Enterprise SOA enriches industry-standard service-oriented architectures with productized services as well as business semantics in a unified repository to ensure business process integrity for enterprises and deliver advanced business process flexibility.” Expanding on that, Gartner understands that the enterprise SOA is a concept that will turn most of SAP's established applications functionality into a giant SOA. The applications functionality will be chopped up into thousands of enterprise services sets (or bundles, in SAP terminology), partitioning the data into pre-defined but changeable business objects. Enterprise SOA will also feature a wide set of sample business processes across 27 industry vertical industries that SAP clients will be able to modify according to their own business realities and competitive differentiators. This will be accomplished by attaching to process steps prepackaged enterprise services from SAP or modified versions of them, or

Figure 1. Enterprise SOA Blueprint



other services, either available on the Internet in a software-as-a-service fashion or client-defined in a proprietary pre-existing SOA, implementing non-SAP functionality. In one sentence, enterprise SOA is SAP's vision for the business process platform.

3.0 What SAP's Enterprise SOA Is Today

SAP is well on its way to delivering its vision. By examining enterprise SOA's blueprint (see Figure 1), we can see that SAP's plans for enterprise SOA are organized in several different areas. In the following paragraphs, we cover what is available today in the most notable ones.

3.1 Out-of-the-Box Enterprise Services

Figure 2 summarizes which enterprise service bundles are available today.

Users can log into the SAP Developers Network and find up-to-date documentation (in a wiki-style way) about the services bundles, following the path on the bottom of Figure 2. Some of these enterprise services, like some enterprise services bundles for banking, are the result of direct collaboration with customers and partners via the Enterprise Services Community program (see the “Communities, Adoption and Ecosystem” section below). The granularity of enterprise services varies, from full process steps in the areas shown in Figure 2 (with common business semantics, a very useful by-product for users), to lower granularity, Business Application Programming Interface (BAPI)-style technical services.

The number of available bundles is increasing (SAP already has a wider set planned for the end of 2007), covering progressively more SAP core functionality. The decision on which bundles to do next is largely driven by the work of the various communities (see below the “Communities, Adoption and Ecosystem” section) and by what functional areas will be most commonly used while enterprise SOA unfolds. At the moment, SAP ships all the bundles shown in Figure 2 as part of one big enhancement package, where users can activate individual business functions as they wish. Enhancement packages are optional updates to SAP ERP 6.0 that ship roughly twice a year as part of SAP's release strategy announced in 2006. Under this strategy, SAP ERP 6.0 will remain stable until 2010.

3.2 Enterprise Services Repository

Part of the SAP NetWeaver platform (see the “SAP NetWeaver” section below), the enterprise services repository (ESR) is at the center of enterprise SOA. SAP realizes the fundamental role that registries and repositories play in an SOA and in the governance processes associated with service design and life cycle. After all, SAP is going through an enormous SOA project itself and surely had to learn a lot of SOA governance

Figure 2. Enterprise Service Bundles Available Today



lessons along the way. The ESR is made of a metadata repository of all service objects for enterprise SOA and of a Universal Description, Discovery and Integration (UDDI) v.3-compliant service registry that supports publishing, classifying and discovering services. When clients install enterprise service bundles from the enhancement package, the bundles will add new services to the ESR. Most of the current enterprise SOA clients only use SAP-defined services. We expect that clients will also put pre-existing, externally sourced non-SAP services in the ESR in the future. Although the ESR has been designed to allow that, we don't expect it to happen without interoperability issues because of the current shortcomings of SOA and Web services standards.

The ESR is the evolution of the integration repository contained in NetWeaver's Exchange Infrastructure (XI). The ESR is due to be available by the end of 2007. As previously pointed out, preliminary versions of it only contain SAP-provided services. However, we expect that some users will add other non SAP services to that and use the full set of services as the core of their extended enterprise services portfolios. We also expect that as more partners and independent software vendors build to SAP's services and service definitions, they will include their own services in the repository as well.

3.3 User Experience

Duet (built in a service-oriented manner, but its service calls are not available as part of the enterprise service bundles yet) and several new applications are already available. An application composition environment, allowing a business architect to compose/change new/established business processes and attach enterprise services to each process for its execution, has been in beta test (or "ramp-up" in SAP parlance) since May 2007. Additional xApps composite applications are being developed, to show customers how a stand-alone enterprise SOA composition environment would work with their ERP implementations.

3.4 SAP NetWeaver

NetWeaver is the technical foundation of enterprise SOA. Many SAP customers have committed to NetWeaver as the strategic technology platform for their service-oriented environments, but SAP needs to cover a lot of ground in this area because the NetWeaver road map calls for a number of packages to enter ramp-up in 2007 and for the completion of the new NetWeaver platform (formerly known as NetWeaver "New York" and now officially named SAP NetWeaver 7.1) in the first half of 2008. One of the packages is an enterprise service bus (called Enterprise Services Infrastructure [ESI]) component that incorporates many

capabilities of the former XI and in-depth SOA management capabilities; another one is the already-mentioned composition environment.

3.5 Communities, Adoption and Ecosystem

SAP has launched several different community initiatives, designed to assist users in understanding how to make use of enterprise SOA. SAP has launched an enterprise SOA Adoption program (a formalized methodology designed to streamline the move to enterprise SOA), an enterprise Services Workplace site on the Internet (as mentioned previously), an SAP Discovery System for enterprise SOA (a prototyping environment for building composite applications with SAP NetWeaver and SAP ERP), a business process experts community (sometimes simply called Business Process Expert or BPX), Enterprise Services Advisory Groups for building best practices and 27 Enterprise Services Community Definition Groups (for example, banking and radio frequency identification (RFID)), whose members work collaboratively to functionally define enterprise services in a cross-industry or industry-specific context.

The previously mentioned Enterprise Services Communities program has a business equivalent in the Industry Value Networks, where the communities concept is extended to business experts, SAP staff and SAP partners to foster innovation. These initiatives are expected to produce industry-specific xApps during 2007.

Especially in the vertical industries where SAP has been historically strong, such as discrete manufacturing, these structured communities show a great deal of interest among SAP practitioners who recognize that enterprise SOA is the future of SAP and that they must have skills in this area. However, the work of these communities has just started, and there are still relatively few examples of mature use of enterprise services for true composites.

4.0 Is SAP's Enterprise SOA a Real SOA?

The details of what constitutes a real SOA are certainly debatable, but the general concept of SOA is clear and widely accepted in the industry. SAP's enterprise SOA vision is for a real SOA: open, complete with all necessary infrastructure components and able to deliver all SOA benefits. However, as already outlined in the previous paragraph, SAP is in the middle of delivering that vision. SAP is designing and delivering enterprise services, and applications that consume them in a service-oriented fashion, but the underlying NetWeaver-based SOA infrastructure, although used to some extent, is not visible and cannot be extended (see the next paragraph). So if you see the glass as half empty, then what you get from SAP today is not fully a real SOA just yet. If you see the glass as half full, then SAP will deliver a real SOA, and even Gartner believes that, in time, it will.

5.0 Does SAP Have Far to Go to Fully Deliver Enterprise SOA?

In short, yes. Basic infrastructural components such as the ESI, have just been announced and will take time to mature. The whole wave of NetWeaver 7.1-related infrastructural components goes well into 2008. A fundamental component of every SOA delivering business value is a fully functional business process management system, and SAP will have to consolidate a plethora of products in this area (ccBPM, Business Workflow, Universal Worklist and ARIS for SAP NetWeaver XI, to name a few). It will take a long time to divide the sheer amount of functionality in mySAP ERP into thousands of sets of enterprise services, minimizing dependencies. Commercial arrangements for packaging and upgrades will take time to be worked out and to match customers' requirements. So yes, even if, strictly speaking, SOA projects never end (SOA is a journey, not a destination) and the notion of a "fully delivered SOA" is debatable, it will still take at least one and half years before the enterprise SOA dream turns into a reasonably complete, functional, fully usable reality that hits the desk of an average CIO of an average company.

6.0 Things That Enterprise SOA Will Not Deliver

Enterprise SOA will be an SOA. Thus, there is a clear set of challenges associated with it for SAP and for SAP clients. SAP is preparing to ship most of the complexity of enterprise SOA during 2007 and 2008 and faces all the challenges associated in transforming a huge amount of software into thousands of sets of enterprise services, such as getting the service granularity right, governing reuse and updates, or minimizing the dependencies between enterprise service bundles. SAP customers will obviously benefit from all the SOA challenges SAP will have addressed before shipping the code, but will have to face other ones, such as integrating SAP's enterprise services with the non-SAP services they have defined in the meantime.

So the road to the excellent business value described in the previously referenced documents is far from easy, or short, even with SAP's help. In particular, clients should keep in mind that:

- SOA is not a quick fix. Sure, once you cover a specific functional area with SOA, that area is immediately agile, and this generates immediate business value and sometimes cost savings. SOA can be used to address tactical projects too, when they are carefully chosen, and deliver benefits quickly. But the bulk of SOA benefits will be in the medium and long term.
- Good SOAs come with a lot of service reuse. Neither SAP, nor any other IT company, nor any of your IT departments can give you reuse. Reuse of services is typically achieved through tight coordination of SOA project resources and just enough governance on the main SOA project decisions. SAP's service

design methodology and the ESR will be a starting point for SOA governance and its policy management, but you will have to build your own governance processes on top of it.

- There is a lot that is new in enterprise SOA. The challenges of every SOA project, combined with the high degree of new (and as such, not field-proven) technology SAP will inject into enterprise SOA through NetWeaver, obviously compound the risk of failure for an enterprise SOA project for a client organization (see the “Enterprise SOA Risks” section below). Companies should evaluate this risk against the opportunities and the business value each SOA project will deliver back to them. It won’t be an easy call, but it is worth looking into it.

7.0 Enterprise SOA Risks

Gartner advises its clients beginning an SOA journey to start small and grow slowly, to minimize risk of failure, govern the development of the SOA and the design of services more easily, and enforce reuse. In doing enterprise SOA, SAP cannot afford to do that. However, SAP customers have been living with SAP-defined IDOCs and BAPIs for years (the enterprise services are largely built over them), so with the help of the service communities, SAP will ship a reasonable set of service interfaces, and SAP customers are likely to adopt and use them. Services are easier to understand than the BAPIs, and SAP’s or third-parties’ xAPPS will be based on services.

Enterprise SOA is an enormous and challenging task. However, if there is a company that can succeed at it, it is SAP. It has the dedication, the power and the discipline to make it happen. The operational risk associated with the complexity of driving an SOA of this size is likely to slow SAP down in the future, but not to make it fail. Some areas (it’s difficult to say which ones upfront) will struggle for user adoption. After all, enterprise SOA as an initiative really looks like a huge standardization effort – and standards rarely are fully implemented and adopted. Some other areas will uncover complexity SAP did not expect, which will delay the availability of some enterprise services or cause multiple versions of them. That’s normal in the everyday life of an SOA.

The first, early signs of those risks already show: The original SAP plan of delivering enterprise SOA to its users at the end of 2007 is not likely to hold, and the vision will only be partially delivered in 2007 (see “Does SAP Have Far to Go to Fully Deliver Enterprise SOA?” section above). This will compound the risk of several users’ migrations from R/3 to SAP ERP 6.0.

The risk is there, and non-Type A enterprises should not make critical project deliverables dependent on enterprise SOA deadlines, now and in the near future. But the point is that no company using SAP can afford to ignore enterprise SOA either.

8.0 Is Waiting an Option?

The simple answer is “No.” SOA, and enterprise SOA for SAP customers, is part of SAP’s growth path and is inevitable. If you infer from the above that an average CIO of an average company should stay at the window, waiting for enterprise SOA to mature and covering every single functional area the average company uses SAP for, then that is a wrong strategy. SOAs typically don’t cover 100% of a company’s infrastructure anyway, because some parts of it don’t change, and the effort of making them service-oriented is simply not worth the potential benefits. We expect that rule will hold for some of SAP’s application functionality too. The road to any SOA (not only enterprise SOA) is a very long one, and the new skills and organization SOA demands typically take months, if not years, to put in place and get to work. Also, the No. 1 SOA benefit (agility) does turn into competitive advantage very quickly, even with partial SOA implementations, so just sitting and waiting might waste a lot of good chances for improvement and allow your company’s competitors to strengthen their positions (and weaken yours).

Do SAP users need SAP Enterprise SOA to move into SOA? Not necessarily. They can do SOA with different infrastructure components and tools, but enterprise SOA with all of its definitions, pre-designed services, business documents and processes will certainly make their SOA journey easier.

9.0 What Business Value Can I Get Out of Enterprise SOA Now?

Business value is generally perceived by companies as a combination of addressing pressing business needs (such as compliance or the ability to match a competitor’s promotion) and reaping certain benefits (such as lower maintenance costs or an ordered and leaner process to develop new products). The mixture that generates business value varies company by company, even within the same industry vertical.

As enterprise SOA functional coverage increases, it is starting to deliver SAP-related business value (mainly through specific xAPPS and easier/less-expensive/faster integration with SAP core functionality) and the general value associated to SOA projects. Pioneering, SAP-led enterprise SOA implementations in clients such as Burda Media, Valero or Gisa indicate that, although the road to “complete” enterprise SOA is still quite long, it is possible to extract valuable business benefits out of the current status of enterprise SOA, mainly in terms of business agility, increased sales, IT simplification and, ultimately, cost containment. Those business benefits always turn into a competitive advantage and frequently mean survival in today’s competitive, global market. No company can afford not to take that into proper consideration.

10.0 What Should You Do With Enterprise SOA?

It is easy to be dazzled by all the information on enterprise SOA. But taking all the points above into account, Table 1 contains a set of answers to the question above:

Please note that the recommendations contained in Table 1, although generally valid for the companies which match the criteria, might differ slightly depending on technical (for example, particular SOA infrastructure components) or organizational (specific SOA governing processes or ICC/SOA CoE structures) requirements. Also, clients in the center column of Table 1 (SAP covers more than 50% of your application needs), regardless of their SOA maturity, should consider joining the Enterprise Services Community groups that are relevant to their businesses.

Enterprise SOA will mature, together with all other SOAs clients are running across the world. Because the speed at which the various SOAs will mature will not be the same, it is difficult to say at this point how (or even if) Table 1 will change in time. Gartner will closely monitor the evolution of enterprise SOA during the next years. All clients running SAP, or considering it, especially the ones in the center column, should do the same. As SAP's CEO, Henning Kagermann, clarified in his Executive Keynote at the Sapphire 2007 conference, "Enterprise SOA is here to stay."

Table 1. What to Do Today With Enterprise SOA

	SAP Covers More Than 50% of Your Application Needs	SAP Covers Less Than 50% of Your Application Needs
No SOA at all or Stage 1 – Introduction	Start experimenting with enterprise SOA. Look for pilot projects with good business value return, reassess results frequently and consider joining SAP's SOA Adoption program.	Get on the SOA ladder. Look for ways of integrating SAP's enterprise services in whatever SOA infrastructure is best for your company (SAP's or not).
Stage 2 – Spreading	You are in synch with SAP. Carefully monitor the availability of the required NetWeaver infrastructure components and service bundles from SAP. Pilot them carefully and gradually introduce them in production. Consider joining SAP's SOA Adoption program.	Look for ways of integrating your growing SOA with enterprise SOA, possibly adding selected enterprise SOA infrastructure NetWeaver components to your SOA; using new, needed service bundles as they become available; and federating registries and repositories.
Stage 3 – Exploitation	Look for ways of integrating your growing SOA with enterprise SOA, adding enterprise SOA infrastructure NetWeaver components to your SOA as they mature, importing new service bundles as they become available, and federating registries and repositories.	Look for ways of integrating your SOA with enterprise SOA, importing the required service bundles into your SOA infrastructure and actively watching out for duplication of functionality.
Stage 4 – Plateau	Enterprise SOA infrastructure will increasingly look like your established infrastructure. Manage or eliminate infrastructure duplication, importing the required service bundles into your SOA infrastructure and actively watching out for duplication of functionality.	Look for ways of integrating your SOA with enterprise SOA, importing the required service bundles into your SOA infrastructure and resolving duplication of functionality.

Source: Gartner (September 2007)