Balancing ESA Adoption With SOA Best Practices

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Introduction

Agility and cost-effectiveness are key strategic issues facing most IT organizations in today's competitive marketplace. Both attempt to better align business goals with IT investments. The IT industry as a whole is investing heavily in promoting Service-Oriented Architecture (SOA) based solutions to address these needs. SOA is an architectural model designed from the ground up to enable business agility. Its open, standards-based nature and focus on reusable services promise to make SOA a valuable, cost-effective means to design, develop, and deploy applications. All major application platform and infrastructure products are including varying degrees of SOA support, and most leading business applications vendors are working to expose their solutions in a service-oriented model

SAP has led the market in terms of establishing a business context for SOA. The company's Enterprise Services Architecture (ESA) roadmap is an excellent blueprint for how SOA technologies can be combined with business applications to enable flexible, services-based, enterprise business solutions. The SAP NetWeaver Platform is the set of tools, technologies and infrastructure for realizing ESA.

Today SAP NetWeaver can be used in conjunction with SAP R/3 for service-oriented integration. It also powers the latest editions of mySAP Business Suite applications and off-the-shelf composite applications available from both SAP and partners. As the ESA roadmap unfolds, SAP will deliver enhancements to SAP NetWeaver, including a comprehensive out-of-the-box inventory of Enterprise Services and platform components for extending and customizing core business processes. SAP will also provide a full suite of model driven development tools for end-to-end lifecycle management of business processes and the creation of new SOA based composites. In effect the SAP infrastructure and applications will become fully SOA enabled.

Many SAP customers interested in pursuing SOA today face an interesting adoption dilemma. Depending on your overall IT architecture strategy you are likely asking one of the following questions:

- **What if I take a vendor-neutral, SOA-centric approach…** My organization is pursuing a vendor neutral "best practices" SOA strategy so how do I incorporate ESA into the plan?
- **What if I take an ESA-Centric approach…** My SOA strategy is largely ESA based, but what can I do today while waiting for SAP NetWeaver to deliver the full ESA Business Process Platform?
- **What if I take a hybrid approach…** My SOA strategy needs to be a hybrid between ESA and other application platform solutions we have standardized on. Where should the lines be drawn?

This paper is a guide to helping you address these types of questions. Your ability to plan for ESA adoption within the context of an overall SOA program is vital to getting the benefits SOA can provide.

Foundations

In order to even begin to tackle SOA and ESA adoption there are a few key concepts which your organization must understand. These are described below.

SOA Basics

If you ask 10 architects to define SOA you are likely to get 10 different answers many of which will be tied to their specific use of tools, technologies and the business domains they are supporting. Here is MomentumSI's simple definition:

SOA is an architectural style whose goal is to achieve loose coupling among interacting software agents

The key point is SOA is an architectural model of computing just like client/server and n-tier models. In fact SOA builds upon those themes and addresses some of their shortcomings which we have all encountered. This means SOA is not something you can just buy off the shelf. SOA is something you do, a way in which you build and deploy applications.

What is unique about SOA is that a service becomes the new unit of measure for organizing software solutions. If you are used to thinking in terms of front-end applications (clients) and back-end applications (servers), this is a really new approach. Services can come in many shapes and sizes, from simple function calls or APIs wrapped as Web services, to composite multi-step business processes like order-to-cash. **A key to successful SOA adoption is being able to manage your unique services inventory effectively.**

There are three basic elements in a service-oriented architecture: services, clients and service infrastructure (see Figure 1 below):

- **Services** are existing software assets (data, functions, processes) that are exposed and made available for use and reuse. There are different types of services such as composite or business services, application services, data services, and infrastructure services.
- **Clients** are the software elements that use services. They could be anything from portal-based user interfaces, business process applications, mobile clients, and so on.
- **Service Infrastructure** is the communications and runtime infrastructure that ensures that services and clients can interoperate in a scalable and reliable fashion. What happens within the service infrastructure is one of the most distinguishing characteristics of SOA compared to previous computing models.

In essence, the ability to expose business and technical functions as modular services, assemble them into applications, reuse them, and make sure everything happens reliably and securely is what SOA enables.

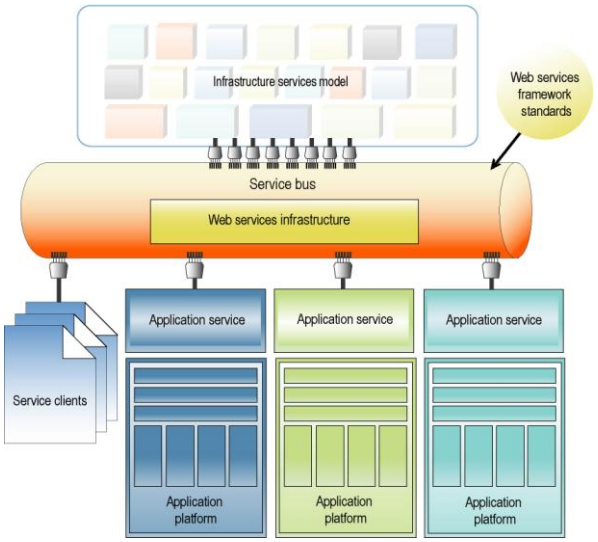

Figure 1: Elements of SOA: Clients, Services, and Service Infrastructure
Source: Burton Group

Web Services

Web services are a set of technology standards for enabling loose coupling in language and platform neutral ways. The core standards were developed and agreed upon by the largest software companies in the world including SAP because this level of interoperability is a must for SOA to become a reality.

Using web services to integrate applications is not the same as adopting SOA. And although some may debate this point you can implement SOA without relying exclusively on web services. However, we at MomentumSI believe web services technologies are the ideal foundation for SOA because of their ubiquity, complete language and platform neutrality, and a number of other technical aspects including the value and extensibility of their metadata as a means for moving up the technology stack to support business process and down the stack to enable intelligent, application-aware networks.

The industry is now working on a variety of extensions to the basic web services standards to enable them to operate in enterprise class computing environments. These are generally known as WS-* extensions because most of them are named with that prefix such as WS-Security. Today most vendors support core web services standards and then enhance them with proprietary infrastructure to provide security, management, scalability, transactional control and so forth. As the more advanced WS-* standards become established, vendor infrastructures will evolve to support them.

Enterprise Services Architecture (ESA)

SAP's ESA strategy takes SOA technology and design principles and combines them with the company's vast amount of business process and application content into a unified platform for enterprise computing. A simple analogy is to think of SOA as your television and cable or satellite tuner: ESA as the combination of the TV and tuner with all the programs themselves and the TV-Guide which is the guide to everything.

The full scope of the ESA strategy goes far beyond what can be covered in this paper. The key is to recognize the combination of an SOA platform with business applications delivers not only the agility and TCO benefits of SOA, but also applications that are considerably more useful in improving user productivity and efficient execution of business processes.

As SAP's ESA roadmap unfolds the company will be delivering the following in terms of SOA technologies and content:

- **Enterprise Services Infrastructure -** A communications and runtime infrastructure for SOA as described above.

- **Enterprise Services Repository and Inventory –** A set of reusable models spanning processes, business objects, global data types, service interfaces and so forth. These models will be shared across SAP, partner and customer developed applications, and they will provide the abstraction layer on top of the components which implement them. Enterprise Services are web services from a technical perspective but they have two defining characteristics. First, they are carefully modeled in terms of the business context they provide which comes out of an extensive governance process run by SAP and third parties. This means are usually more coarse grained. Secondly they are supported with capabilities to ensure they can meet the same enterprise class non-functional requirements that SAP infrastructure provides for today's applications.

- **SOA Based Model Driven Development Tools –** a full suite of standards-based business process modeling and application development environments for creating composite applications and other solutions in an SOA manner.

The combination of these capabilities plus much more is realized by the SAP NetWeaver platform. In effect SAP NetWeaver is the infrastructure that makes ESA a reality.

The mySAP Business Suite applications and future versions of SAP products will be built on top of this infrastructure. You can see this today with the various xApps which SAP sells that run on SAP NetWeaver. SAP will also be building a partner ecosystem to deliver business solutions and infrastructure extensions using the same approach. Therefore under ESA, SAP, partners and customers can all use the same SOA based models and tools to build applications on the same architecture.

The Value of ESA and SOA

Both SOA and ESA have the same fundamental objectives. Again the difference is that ESA gives you a lot of the value added implementation and capabilities from a business solutions perspective "out of the box" within SAP NetWeaver.

Below are three of the main reasons organizations are pursuing SOA today. All represent areas where SOA will save you money. The last one is an area where SOA can make you money.

- **Faster, Better and Cheaper Development & Integration** – SOA changes the economics of application design, deployment and integration. With a well-constructed, mature SOA, developers become application assemblers – re-using existing services to create or change applications – regardless of which platform or in what physical location these services reside. In addition, the tools for building composite applications and process driven solutions are much friendly and more model based because of the standards. This greatly reduces coding time. Finally, under SOA development and integration activities essentially become one.

- **Consolidating Your Landscape -** SOA makes it easier to consolidate application platform vendors, making it less expensive to run your infrastructure. SOA also makes it much easier to outsource certain IT functions or elements of entire processes in a way that is tightly integrated and governed. Finally SOA enables you to take advantage of on-demand services, all of which can lead to cost savings.

- **Enabling Business Process Management –** The holy grail of SOA is ultimately to provide standards-based business process management. SOA liberates data and business processes that are today mostly stuck in siloed, monolithic applications. With SOA, and in particular ESA, your logical business process models can be digitally linked to the actual execution models. This type of alignment between IT and the business can turn IT into an enabler of business innovation. However realizing the benefits of service-oriented BPM requires much more than just SOA technology. It requires a cultural change in how IT gets done.

Reality Check: ESA Today

ESA is a multi-year effort to fundamentally re-architect SAP from the core – to move it from a client/server based platform, to an open, modular set of reusable and standardized services. There is no question that SAP is taking ESA very seriously, and placing major resources behind it.

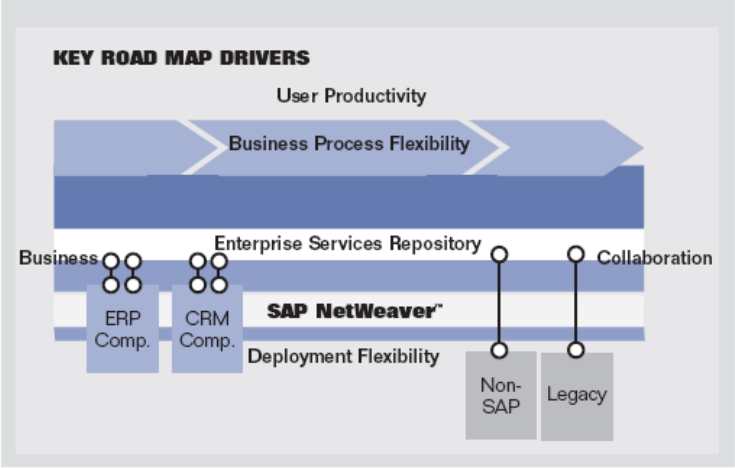

Figure 2: SAP Roadmap for Enterprise Services Architecture
Source: SAP

But not all of ESA is available today. SAP's roadmap runs through 2007, which means adoption of the final versions will not hit mainstream until 2008 and beyond. Today, NetWeaver is a mature Java-based application and integration platform. However many mySAP functions are not yet exposed as Enterprise Services. There are relatively few xApps being marketed, the Enterprise Services Repository is not yet commercially available. Plus, SOA itself is immature and adoption is still in its early days. However, there is much that can be done with ESA components today – such as creating service-based applications that are built using SAP and non-SAP services.

Paths to SOA and ESA Adoption

The saying nothing good ever comes easy is accurate when it comes to SOA and ESA adoption. The reason for this is quite simple. The major top and bottom-line benefits of SOA come from an organization-wide adoption approach. That is because the real value is through:

1. **Service Reuse** across departments, business units and even other companies;
2. **Application and Infrastructure Consolidation**, lessening the number of supported platforms; and
3. **Cross-functional Business Process Management**, spanning both internal and external processes.

Unfortunately most enterprises do not usually have organizational structures, budgeting models, or incentive systems tied to any of those things. For example, most IT budgeting occurs around project-level ROI. This means very few sponsors want to incur the costs of infrastructure or ensuring services are reusable in some other project down the road.

Naturally this varies by organization and industry, but generally speaking most organizations tend to fall into a bottom-up approach to SOA and ESA adoption. That is not necessarily bad since realizing the bigger benefits of SOA requires a level of maturity to ensure good decision making, investments, and especially organization-wide execution.

As you can see in Figure 3, “grass roots” level efforts usually involve using service-oriented technologies to integrate applications, building new applications using composite development techniques, or leveraging standards-based BPM capabilities to implement a solution to a high ROI business process issue. In short, you are solving existing problems and projects using new techniques.

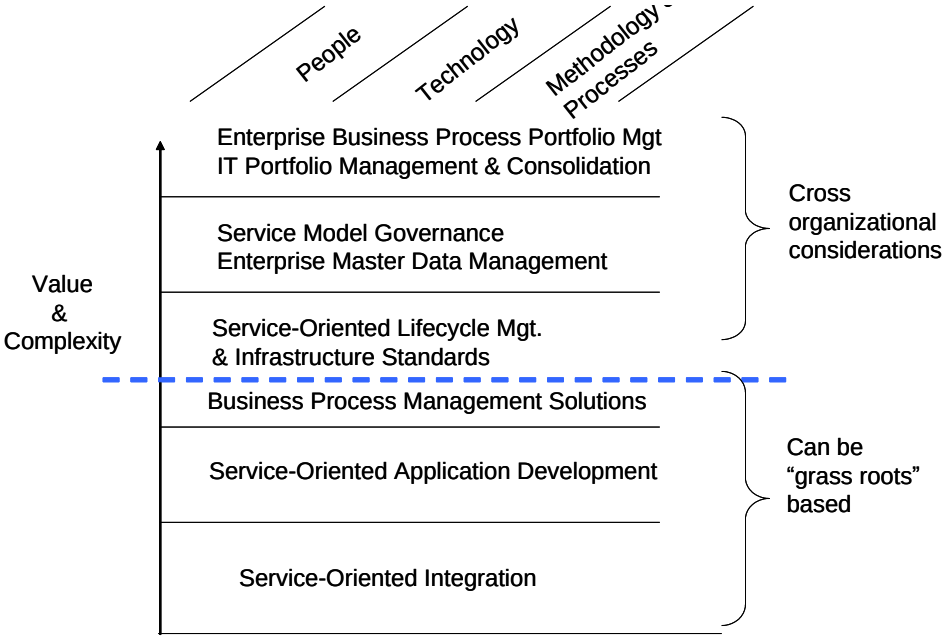

Figure 3: SOA Adoption Guide
Source: MomentumSI

The value threshold is crossed when decisions start being made that impact multiple projects or organizational units. At that point you are making shared infrastructure investments, developing models to share services and master data across the enterprise, and taking a conscious approach to managing the IT Portfolio around business process contributions and value.

Naturally some organizations do begin with the top-down approach by performing strategy and process portfolio analysis and then mapping the results into an SOA-based view of their future state IT portfolio. This can be done quite successfully provided there is the right level of senior sponsorship. More importantly, MomentumSI’s experience shows it is still vital to be able to demonstrate value early and often through early project wins that become ideal for SOA and ESA pilot programs. Remember business people do not care about SOA or technology infrastructure, they want business results.

Regardless of your approach, every activity requires a plan for:

People – Ensuring they are equipped not only to use the tools and technologies associated with SOA and ESA, but that the new roles and organizational models that are needed for effective SOA adoption are created and encouraged.

Methodology & Processes – Traditional software development methodologies become obsolete in the more-model driven BPM environments enabled by SOA and ESA. Focus shifts away from "bits-and-bytes" to application assembly and process engineering.

Technology – As mentioned above adoption will require new tools and technologies for service-oriented infrastructure, governance, integration, and development.

The next section will describe some of the areas that vary between ESA adoption and a more SOA-centric approach. Those decisions will have a big impact on your people, methodology and technology plans.

Balancing SOA and ESA Adoption

As mentioned, organizations usually fall into one of three camps when it comes to SOA versus ESA adoption. Note these are generalization based on MomentumSI's field experience. Ultimately, every organization's approach to ESA and SOA is as unique as its IT landscape, organizational structure, and level of business alignment. The lines between these approaches can certainly blur.

- **ESA-Centric Approach –** The decision has been made to largely standardize on SAP's adoption approach, tools and infrastructure solutions for SOA; and consolidation plans are in place. Third party solutions will usually be acquired from companies that are actively participating in the SAP ecosystem and have worked with SAP to deliver certified solutions that complement the SAP NetWeaver platform.

  Other tool and technology choices may be made to fill in short-term gaps while waiting on SAP to deliver the next generation of the SAP NetWeaver platform and your organization to complete its implementation. There will be a conscious plan that these investments are tactical and will be retired when SAP capabilities are made available. Examples here might be a pure-play BPM product, or enhanced metadata repositories.

- **Vendor Neutral SOA Approach –** Organizations taking this approach have chosen to build an SOA infrastructure that will support multi-vendor platforms. They tend to have very heterogeneous environments and many legacy applications vital to the SOA solution. These companies also tend to be very strong in managing custom application and integration efforts, and supporting high-availability infrastructures.

  Their ESA adoption efforts are generally limited to using the SOA-based interfaces provided by SAP into the business applications. Their goal is to

build an enterprise-wide SOA model of the business that abstracts out packaged applications, and they generally treat their SAP systems no differently than any other existing IT asset.

- **Hybrid Approach –** The hybrid approach is usually adopted by organizations that have large SAP footprints which they have traditionally complemented with another vendor's platform such as IBM WebSphere, BEA WebLogic, or Microsoft .Net. They tend to have two development camps today with clear lines between what gets done inside of SAP versus within another platform.

  As they extend to SOA and ESA adoption this model persists in the short run, with both camps relying more on service oriented integration and intermediaries to communicate between them. Typically, politics play a large role in the attempt to standardize on one platform or the other for areas like portal and BPM. As SAP NetWeaver and competing platforms continue to mature making these decisions will become more important.

Let's look at three areas and how these choices regarding ESA can impact your roadmap.

Services

The value you get from your SOA efforts will be severely capped if you are not able to properly manage a coherent set of services that get reused across projects within the company. In fact many SOA programs stalled or failed altogether when they got beyond a critical number of services because the organization did not adopt a governance strategy. Consider the following diagram which defines what makes a service valuable.

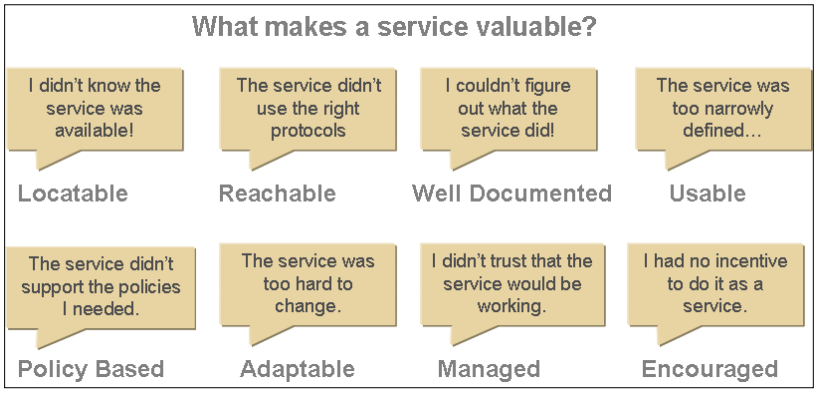

Figure 4: What Makes a Service Valuable
Source: MomentumSI

SAP has mapped out a strong governance model along with the tools and technology to support these value objectives. Unfortunately, the implementations do not yet fully exist in SAP NetWeaver, so choices need to be made if your SOA efforts start expanding beyond a minimal number of services.

Another challenge occurs in organizations that have multiple packaged applications in addition to those from SAP. Since virtually all vendors are working to service enable their business solutions, these companies are faced with trying to integrate multiple service libraries from different vendors. Of course, the level of granularity, required metadata and semantics varies between them leaving it to the organization to resolve the differences.

The following table highlights some of the considerations regarding managing your services meta-model under the different approaches:

ESA-Centric Approach	SOA-Centric Approach	Hybrid Approach
▪ Use SAP NetWeaver as a platform to create services out of existing assets and evolve from XI integration Directory to the ESR ▪ Extend from SAP's base of published Enterprise Services ▪ Participate in SAP ecosystem efforts as reviewer or proposer of new services ▪ Acquire services from third parties working closely with SAP ecosystem ▪ Consider use of third party repository in short run.	▪ Select a primary repository ▪ Develop a governance process for your preferred service model ▪ Expose third party applications like SAP's according to your internal model and in your preferred repository	▪ Develop strategies for working with multiple repositories ▪ Rationalize the ESA services inventory with other existing assets into a hybrid repository ▪ Determine criteria for which platform will be used to create and control which services ▪ Acquire services from third parties working closely with SAP ecosystem where it makes sense

Client Implementations

SAP NetWeaver offers a number of tools and technologies for creating user interfaces or applications which consume ESA services. Below is a brief list.

- **NetWeaver Portal** for role-based user productivity interfaces
- **WebDynpro** for model driven UIs which can be deployed in a variety of formats
- **Visual Composer** for business and systems analysts to quickly assemble
- **Composite Application Framework** for building rich composite applications that can include Guides Procedures functionality
- **Process integration** and **application server** capabilities which can consume services in multi-step A2A and B2B scenarios

Since SAP NetWeaver is an SOA platform this list barely scratches the surface in terms of what you can do with the tools in terms of creating service-oriented clients. Obviously other platforms like Microsoft .Net, IBM WebSphere and a number of "best of breed" composite application development and BPM tools exist that provide similar functionality and can work with the SAP services.

Your approach to ESA versus SOA adoption will largely determine which Client development technologies you focus on. The table below contains a summary of deciding where to train people, build methodologies and implement infrastructure for creating SOA-based client applications.

ESA-Centric Approach	SOA-Centric Approach	Hybrid Approach
▪ Use SAP NetWeaver to build and deploy service-based applications ▪ Leverage SAP's xApps and third party Certified Packaged Composites as they are released. ▪ Make interim decisions on importance of BPM tools while waiting for next generation from SAP	▪ Where appropriate, select best-of-breed SOA based composition and BPM tools ▪ Enable developers to create clients that call SAP services on their platform of choice (e.g., Microsoft Visual Studio)	▪ Joint training and support for multiple platforms ▪ SAP centric development focuses on SAP NetWeaver ▪ Non-SAP centric development has a defined toolset of choice that you are probably already using

SOA Runtime Infrastructure

Of all the areas where balancing SOA and ESA adoption considerations takes place, the area of SOA Infrastructure selection is probably the most difficult. Standards are moving very quickly in this area. More importantly, vendor capabilities vary widely, as do the overall architectural models.

You can attribute this to the fact that the market is immature for robust SOA infrastructure. And as mentioned previously, the WS-* standards are still limited such that the majority of enterprise class support for non-functional requirements is non-standard. This means that vendor design and runtime infrastructures are very dependent upon one another. Obviously in SAP's case, using SAP NetWeaver for client implementations requires SAP's infrastructure platform be used in production. The same is true with most of the other leading application vendor development platforms as well as best of breed products.

Below is a list of some of the capabilities associated with an SOA runtime infrastructure:

- Messaging and service intermediation, including ESB
- Runtime registry, repository and policy management

- Legacy enablement
- Service network monitoring
- Functional load and integration testing
- Orchestration engine
- Composite application lifecycle management engine
- XML transformation and acceleration

An example of how interesting the debates can get in this area is clear in terms of the Enterprise Service Bus (ESB) "category". There is great debate around whether an ESB is any product that implements a specific set of service intermediation functionality, or whether the product has to also adhere to very strict implementation principles. For instance does an ESB need to be loosely coupled with messaging infrastructures, and must it be able to be deployed in a distributed fashion near service endpoints?

In SAP's case, the SAP NetWeaver intermediary is currently Exchange Infrastructure which is architected much like an EAI broker. In some organizations that has conflicted with their SOA reference architecture plans and they have chosen to augment their environment with some "best of breed" SOA infrastructure.

The problem you face in this area is that some of the choices are expensive to implement and carry a high switching cost. This has kept some organizations from moving beyond the "grass roots" level of SOA adoption.

The following table summarizes some considerations associated with SOA runtime infrastructure decisions taking place in many organizations.

ESA-Centric Approach	SOA-Centric Approach	Hybrid Approach
▪ Use SAP NetWeaver as service infrastructure within or between SAP deployments ▪ Use SAP's Enterprise Services Repository as it is released for SAP-based enterprise services and xApps ▪ Augment with third party "best of breed" products in short run with plans to retire when SAP or ecosystem partner product becomes available	▪ Use lightweight service infrastructure for communication between platforms/ESBs ▪ Implement enterprise-wide strategy to effectively handle multiple service repositories at run time (SAP and non-SAP) ▪ Design and implement enterprise-wide service infrastructure strategy optimized to your business	▪ Develop specific case-by-case scenarios in your reference architecture ▪ Augment SAP NetWeaver with infrastructure with infrastructure from other client implementation tools you have selected

SOA Adoption Best Practices

The Business Driven Architecture model is MomentumSI's conceptual framework for aligning business and IT. As Figure 6 shows, when business strategy drives processes, the ideal service model for the organization can be determined from

identifying the functionality needed to support those critical processes. The service model itself should be implemented on a standards-based technology platform which supports composition and enables consolidation as opposed to proprietary solutions that come with many of today's BPM oriented suites.

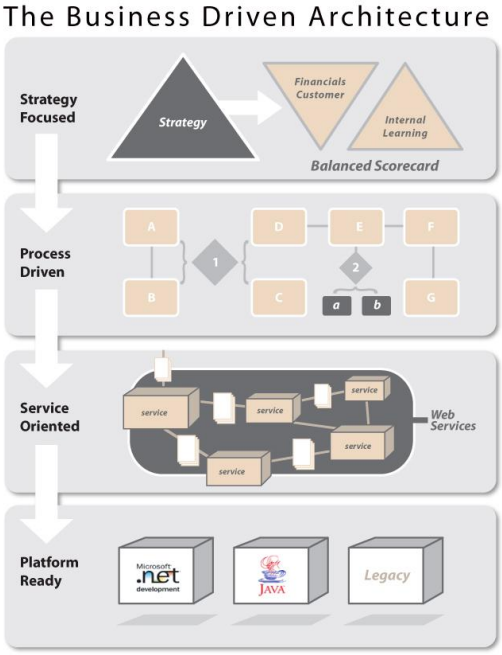

Figure 6: Business Driven Architecture
Source: MomentumSI

MomentumSI is trained in and uses a modified version of SAP's ESA Adoption Program for companies pursuing a very SAP-centric approach to SOA adoption (see . For those organizations choosing a more SOA centric model or hybrid approach, we believe there are six fundamental areas to consider along the path to becoming a Service-Oriented Enterprise:

Strategic Concerns
SO-Strategy
SO-Architecture
SO-Methodology

Implementation Concerns
SO-Integration
SO-Enablement
SO-Construction

Of course there is no one path towards SOA. And companies need not go through each of the six areas of concern to fully

SOA Adoption in the Trenches

A quick snapshot of three Global 1000 companies' SOA adoption demonstrates that successful adopters take similar paths:

- **Electronics Manufacturer:** Currently has 180 services in production, several based on SAP. They are using third-party registry and ESB products, and taking a hybrid approach with their reference architecture to include SAP and a second strategic application platform.
- **Consumer Products Company:** Currently has 28 services in production shared by multiple business units. Using third party intermediary. Timing their ESA adoption in conjunction with a future mySAP upgrade.
- **Pharmaceuticals Conglomerate:** They have 112 services in production, across multiple business units. Adopted a pure SOA strategy. Building service model on top of SAP for own internal enterprise service definitions. Will use service-oriented integration with SAP, and rely primarily on their internally developed WSDLs.

Each company embarked on strategic SOA initiatives based on three main principles:

1. **Plan strategically, adopt pragmatically:** Each took an architecture-first approach towards planning its SOA – separating the architecture into logical layers and ensuring that the architecture was loosely coupled and truly platform-independent. Each also created some simple services early on to demonstrate success in the infrastructure and with reuse.
2. **Commit to SAP:** Each company utilized SAP NetWeaver Application Server and Enterprise Portal today where appropriate; and planned their long-term reference architecture in alignment with SAP's Enterprise Services Architecture.
3. **Balance SAP commitment with 3rd party technology investments**: Each company has invested in technology that augments SAP's ESA roadmap, and filled in some of the short term gaps within the reference architecture. This included "best of breed" service infrastructure intermediaries, custom composite application development tools, service registries and hardware-based application integration appliances.

realize SOA. However, a clear understanding of these concerns, and effective planning to address them (today or in the future) is critical towards achieving long-term success.

What follows are pragmatic steps that you can take in each area.

SO-Strategy

Done properly, SOA is a strategic shift in how Business and IT collaborate together to leverage technology for competitive advantage. SO-Strategy is designed to leverage classic business strategy techniques and map out I.T. goals, objectives and tactics.

Here are some actions you can take to drive your organization's SO-Strategy forward:

- **Form an expert team**: SOA adoption is ideally a cross-functional task, with representation from central and distributed IT, from business as well as technical people. Make sure that your SOA Core Team is well represented by architects, developers, business users, IT operations, and consider involving key partners.
- **Develop an SOA strategy and vision for your company**: The primary role of the expert team should be to develop an SOA vision, strategy, and roadmap and then to seek executive sponsorship and leadership. This vision should have clear goals, objectives and measurements, along with a baseline assessment. Remember the best sources of value are through consolidation for cost reduction and solving high ROI business process issues using SOA techniques.
- **Identify pilots to test your strategy:** Trying to boil the ocean with SOA is a sure strategy for failure. Your strategic planning exercise should identify some important but not mission-critical candidates for an SOA pilot. For more information on selecting and running an SOA pilot see our article at http://webservices.sys-con.com/read/79261.htm.
- **Allocate budget for evangelism and education:** While your expert team will soon become SOA veterans, it is important that key people throughout the organization understand SOA and are bought into what you are doing early in the process. Spend some time and money sharing the SOA vision and sponsoring key leaders throughout the organization through SOA *Basic Training*.

SO-Architecture

SOA is a new architectural approach, and therefore developing and implementing the proper architecture is critical for success. To achieve that, you should:

- **Develop your SOA reference architecture:** As described above there is no single architectural approach that is right for all companies. It is critical that you develop an architectural profile that fits your company's unique environment and requirements.

At the core of any SOA should be an infrastructure that de-couples common concerns and delivers them through the network (see Figure 7 below).

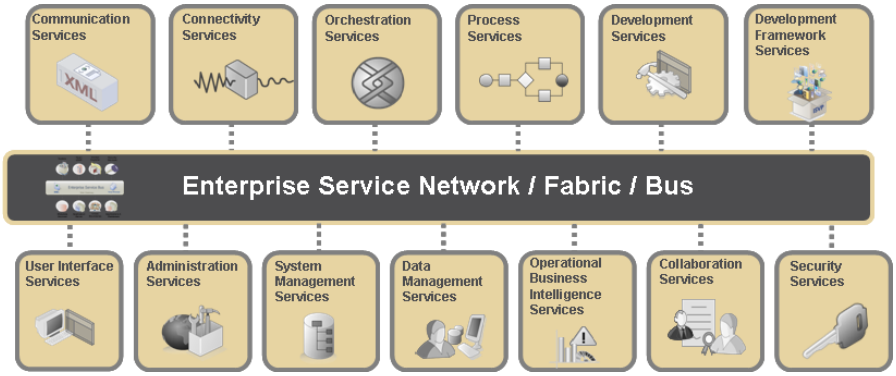

Figure 7: Roles of Service-Oriented Infrastructure
Source: MomentumSI

- **Address governance concerns**: Without the proper planning and governance structure – your SOA initiative will not scale beyond a few applications, and will introduce the same technical and organizational challenges your current systems have, but likely on a much larger scale. Fundamentally, you cannot turn services into reusable assets if your developers don't know how to find them, or how to access them at runtime. Before you go too far down the path of creating and deploying new service-based applications, it is important to enforce your SOA and encourage use through a proper governance structure.
- **Ensure alignment from vendors and partners**: Although it should be your organization's – and not your vendor's – SOA, it is still critical to ensure that your choice of tooling, standards, and implementation patterns are in sync with your vendors' vision and roadmaps. SOA is a great opportunity to leverage your existing investments in vendors and systems.
- **Model planned changes in your reference architecture**: This is especially important in terms of ESA adoption. As described earlier there are several areas where you may choose to implement some near term SOA infrastructure components or tools that will be retired as SAP NetWeaver implements more of the ESA strategy. Knowing how your reference architecture will change over time and having a plan for consolidation is vital.

SO-Methodology

The method for developing services and service-based applications is likely different from today's model of application development. Modern methodologies must extend beyond the technical nuts and bolts. They must provide the fabric that weaves business strategy, processes and technology together.

- **Update your development methodology**: The goal of your new methodology should be to create repeatable processes that inherently move your SOA projects from an art to a science, lower the risks and increase the rate of success.
- **Put up a services portal:** You don't need a fully deployed registry or 100 Web services to put up a basic developer's portal. Make it easy for your

developers to find valuable internal services, encourage best practices and information sharing, and build a sense of community.
- **Break down cultural barriers:** SOA changes organizational norms and boundaries, and forces new people to work together – architects and developers, managers from competing business units, etc. Sponsor a brown-bag lunch, or even better an SOA *mixer*, to encourage SOA participants to break down these barriers.

SO-Integration & SO-Enablement & SO-Construction

Integration, Enablement and Construction are the three SOA implementation concerns. Integration transforms messaging middleware towards a more ubiquitous, standard-based model; enablement unlocks existing assets as services; and construction enables you to build well-designed services and service-based applications. Some tips here include regardless of whether you use SAP NetWeaver or other tools:

- **Market your early project wins**: You probably already have one or two Web services-based projects built – with a partner, or in a simple internal use case. Polish those applications up and demonstrate that you are already moving down the SOA path.
- **Adopt SOA pragmatically:** While designing the right architecture is important, create some simple Web services that could be shared globally – common utilities that are used in many applications like customer account look-ups. This will drive immediate value as opposed to ongoing architecture work that never goes live.

Conclusion

SOA has emerged as the industry architectural model most likely to solve the issues of added business process agility and lower TCO in IT landscapes. Because of the unprecedented levels of vendor support and cooperation it is only a matter of time before service-oriented computing becomes a mature part of many IT environments.

SAP's commitment to SOA through ESA is broad and visionary, and the company's roadmap will address a number of key questions surrounding how enterprise applications change in an SOA world. Even though some aspects and infrastructure components of the ESA roadmap are not yet available, there are plenty of ways to get started on adoption today. That's because many advantages of service-oriented computing can be realized at a local level on a project-by-project basis. Just keep in mind that ultimately the value proposition requires larger organizational or enterprise level cooperation to deliver the greatest benefits. The good news is starting small is actually the safer and more impactful approach.

Whether you are taking a vendor neutral approach to SOA adoption and limiting the use of SAP development and infrastructure technologies, or are seeking an ESA centric model that can be augmented some short term bridges while SAP NetWeaver matures, there are plenty of options for you to get started with SOA. With careful planning whatever approach you take can be future proofed to maximize future SAP ESA solutions that you might adopt.

Once you have a good grasp of SAP's ESA vision and how it maps to your SAP landscape plans the final challenge becomes adoption. This paper outlines some basic considerations and actions that can help with your roadmap. Since every company's path to SOA and ESA adoption is ultimately unique there are plenty of processes and best practices that you can apply specifically to your environment to make the best choices in your plans, reference architecture and pilot programs. Each step requires balancing the people, methodology and technology choices to be successful.

About MomentumSI

MomentumSI is a pioneer in service oriented architecture, integration, and application development for the enterprise. Since 1997, the company has built a reputation as a leader in Web services, Java, and .NET application development for top software vendors and corporate IT organizations. MomentumSI's project managers, architects, and developers come from extensive backgrounds in industry and corporate work. We built the first Web service orchestration server for .NET and have been an active member of Web services standards groups, such as OASIS. Our founders are luminaries in the industry with contributions including the first book on Java Enterprise Edition (J2EE).

MomentumSI's Service-Oriented Enterprise and SAP NetWeaver & ESA practice areas can help your company effective balance your adoption:

Service-Oriented Enterprise Solutions
MomentumSI's *Service Oriented Enterprise* is a conceptual framework for aligning business and technology via business services, and is at the core of our practice area. The SOE successfully integrates: strategy, people, process, technology and maturity.

- SO-Strategy
- SO-Architecture
- SO-Methodology
- SO-Integration
- SO-Enablement
- SO-Construction

SAP NetWeaver and ESA Solutions
Realizing the complete Enterprise Services Architecture (ESA) vision requires an understanding of the strategic elements of SAP's vision for ESA, and more broadly, an understanding of Service Oriented Architecture (SOA) best practices. It also requires the ability to properly select and implement the right toolsets, including NetWeaver components as well as non-SAP solutions. MomentumSI's suite of service offerings is designed to work with your team to streamline the adoption process and maximize the value that the ESA and NetWeaver transitions offer. MomentumSI offerings include:

- Fast-Path Enablement
- ESA and Service-Oriented Education
- ESA and Service-Oriented Adoption Roadmap
- ESA Implementation
- ESA Application Enablement and Non-SAP Integration
- NetWeaver Development for Business Process Management, SAP NetWeaver Portal, WebDynpro, and Exchange Infrastructure Integration