ESA Adoption: The Role of Enterprise IT Architecture

You should now be familiar with ESA's goals and the impact in IT that a shift to SOA technologies and end-to-end management of business processes can bring about. There are many paths and options for succeeding with ESA. In fact, the road map for every organization will be unique because the details of your specific business drivers, processes, existing IT landscape, and especially your organizational structure and culture will have a huge impact in terms of how you pursue ESA.

Some organizations will include ESA within the framework of larger business process improvement or SOA programs. Others will use ESA as the mechanism to drive these efforts. One thing is certain. The more strategic benefits of the ESA approach cannot be realized from doing business as usual within IT. And simply adopting SAP NetWeaver technologies for implementing individual projects is only part of the process. A successful enterprise IT architecture (EA) program is the best way to deliver better long-term alignment between business and IT organizations, along with the process agility gains discussed in earlier chapters.

Of course, there are tactical benefits from using service-oriented integration and application-development techniques, and this can be a great place to begin piloting ESA adoption, as discussed in Chapter 8. However, those efforts will eventually hit a wall in many organizations if not incorporated into a larger EA initiative.

It should be no surprise to you that the discipline of EA has become increasingly important in recent years. This usually happens with most major technology transitions such as the one business process–driven SOA is bringing about across the industry. In fact, you will likely see a major shift in the entire EA discipline as a result of SOA's impact on business process management.

As a result, people who can play an enterprise architect role are currently in very high demand. At the same time, the understanding of what EA is and the approaches for practicing it are not unanimously understood or implemented. Different organizations see the function's purpose very differently. And the value that business leaders, IT executives, and even implementation teams within IT get from EA initiatives can vary widely.

The purpose of this chapter is to introduce the concepts of EA and explain why they are so important to successful ESA adoption. As a result of reading this chapter, you will be able to:

- See the many areas affected by ESA that are best addressed by EA planning for more strategic adoption.

- Establish a baseline for discussions around defining what EA means within your organization, along with how you go about performing it successfully.

- Understand factors that can make or break an EA initiative including ones associated with ESA adoption.

- Gain exposure to some existing industry frameworks and methods for supporting EA activities.

- See how ESA and end-to-end BPM adoption will ultimately transform the organization and processes within IT.

The Purpose of Enterprise Architecture

As the term "ESA" implies, EA needs to be a key part of the strategy to be successful. How EA gets done varies widely by organization. The size of the enterprise, the way the function is organized, and, most important, the value placed on EA within IT (as well as your business) makes a huge difference.

This section provides you with a baseline on the topic. Its purpose is to define the role of EA and how it applies to ESA adoption. Because the subject of EA is so vast, and its purpose and practice varies widely across organizations, this will certainly not be a definitive reference on the subject.

EA is still a discipline that is more art than science. In fact, you or your team members may find some of the perspectives offered here, as well as many

industry recommended practices, simply don't apply to your specific situation. That is certainly okay. If it triggers discussions in your organization to arrive at the right model for how EA practices will support your ESA adoption efforts, then the chapter has served its purpose.

NOTE **The companion Web site to this book offers a number of links to EA resources, assets, and approaches you might find useful for establishing an EA initiative in support of ESA adoption.**

Classical Enterprise Architecture

Although EA is traditionally a function performed mainly within IT, its purpose is to support the needs of the business. EA provides the strategic context for IT decision making. Think of this as the stewardship plan for IT to manage assets in a way that balances efficiency with maximum business agility.

The City Planning Analogy

A well-known analogy compares the role of EA to the role of city planning. This helps explain the purpose of EA and distinguish it from more project- and application-specific architecture activities. City planning provides things such as the following:

■ A master plan that outlines projected needs and changes in line with the overall city vision

■ Zoning that divides the city into units for specific purposes to meet needs

■ Building requirements that define the safety and material standards that new construction must adhere to

■ Decisions on how major infrastructure (such as roadways, utilities, and public safety) will be provided to citizens and businesses

■ A set of processes and support structure new construction projects must follow to be in line with the city plan, along with ways to track and enforce compliance

Remember, city planners have to do all this with an extremely long-term view and guaranteed uncertainty about changes in infrastructure, technology, social trends, external government mandates, and so forth. This is very much how IT planning works, as business requirements, processes, and technology in general are all guaranteed to change in unpredicted ways.

Within a city, companies, organizations, and individual citizens have a great deal of freedom to develop their property underneath planning guidelines. This is similar to the way in which IT project teams need some freedom to deliver their solutions on time and within budgets. The city plan also accounts for the fact that malls, homes, hospitals, and neighborhood parks all have unique requirements that the plan must support. Likewise, transaction systems, business intelligence capabilities, and integration solutions all have unique roles the IT architecture must enable. Figure 7-1 compares the elements of a city plan to that of an IT EA.

Without city planning, chaos will eventually ensue when change occurs. Individual citizens and companies have no incentive to invest in support of the common good. Without the economies of scale of shared infrastructure, many beneficial projects will be too expensive to pursue. And, as many communities discovered, future expansion to things such as roadways, sewage systems, high-speed communications, and effective zoning are much more difficult to implement when things grow in an ad hoc way. Master planned communities find these changes are much cheaper and easier to bring about.

The same considerations are true in IT. The lack of successful EA functions is often why organizations end up asking questions such as the following:

■ Why are our most important projects far exceeding their schedules and budgets?

■ Why do we have 14 different business intelligence products that don't work together?

■ Why can't we pick an enterprise portal solution for the company?

■ Why can't we change this business process faster?

With an effective EA function, all the parts of the organization work better together and that ultimately shows up in faster, better, more effective IT support for the business.

Ultimately, EA activities serve two purposes, as shown in Figure 7-2. First and foremost they must ensure IT strategic planning and investments (IT supply) is best aligned with business objectives (IT demand). Second, these plans and investments must add real value to implementation teams that are ultimately responsible for delivering IT solutions. In short, EA helps close the gaps related to IT's *efficiency* and *effectiveness* in supporting business innovation.
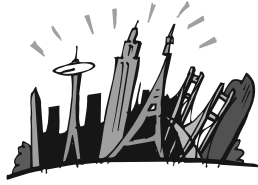
| City Planning		Enterprise IT Architecture
City Master Plan	←——→	IT Strategic Plan
Transportation & Utilities Plans	←——→	Major Technology Infrastructure Plan
Zoning Rules	←——→	Reference Architectures
Building Codes	←——→	Approved Technologies
Regulatory Guidance & Enforcement	←——→	IT Governance
Private Building Programs	←——→	Application and Solution Architecture
Construction Crews	←——→	Development and Integration

Figure 7-1: Comparing the role of EA with city planning

A REAL WORLD CITY PLANNING EXAMPLE

One of the authors actually experienced the power of successful city planning firsthand while living in one of the top ten fastest growing counties in the United States. Some cities in the area grew as much as ten times their size in a decade. And with continued high rate growth projections, major havoc was occurring. Elections brought in new leaders who hired city managers and staff with backgrounds in dealing with this type of growth.

These city managers had the dual challenge of competing to attract business and deliver projects in their own communities, while collaborating in regional planning for major infrastructure. Many planned transportation, public safety, and community projects were halted across the region because they would not have kept up with the growth projections, and did not involve alignment with other cities and counties. These projects were replaced with more suitable coordinated projects in line with the area growth that allowed greater economies of scale, lower tax investment, and better service across the board.

Meanwhile, each city still controlled its own zoning ordinances, economic development initiatives, and streamlined business policies to drive some of the specific rules of its own expansion. None of this would have happened without first committing to mature and responsive city planning efforts across the region. As you can imagine, the authors have seen many fast growing companies go through this same transition in their IT environments. At some point, the shift to coordinated planning must occur.
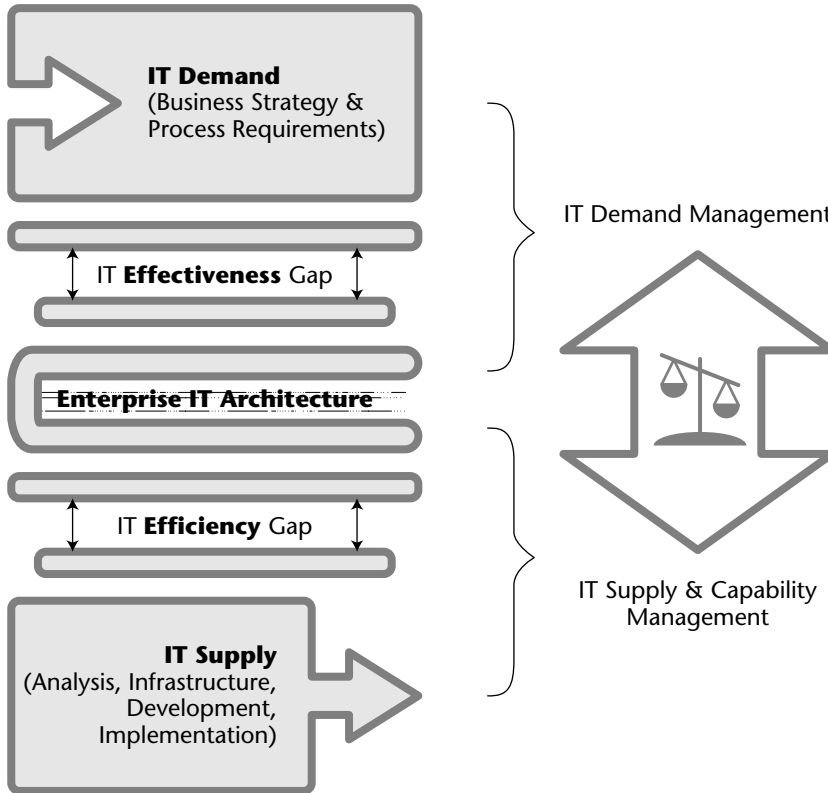
Figure 7-2: EA balances IT supply and demand to make things more efficient and effective.

What Enterprise Architecture Delivers

EA activities result in a number of deliverables, as shown in Figure 7-3. There is no exhaustive list, and different EA approaches have their own view of the outputs. Some of the more traditional EA deliverables along with their purpose are summarized in Table 7-1.

EA is obviously far more than a technology exercise, and is really valuable only if driven by the business. There are two important things to consider when it comes to EA deliverables. First, they should not be static views but ongoing models tied to changing business needs and evolving technology opportunities. Second, they are really only valuable when put into use and support the common good of the business and IT implementation teams.
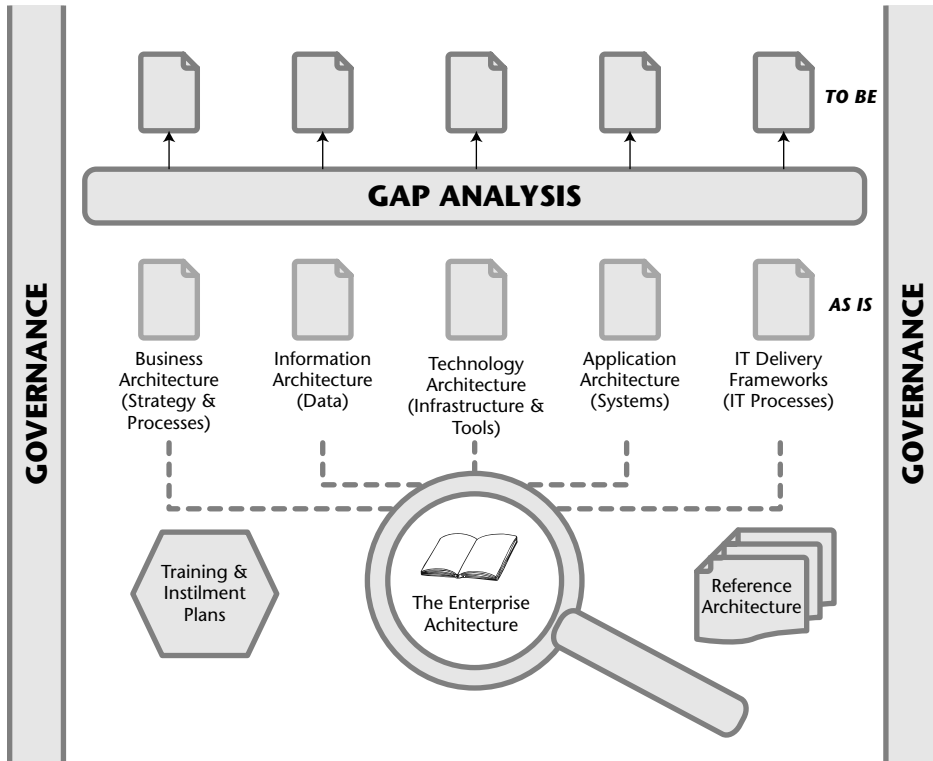
Figure 7-3: Major EA artifacts

Table 7-1: Typical Deliverables of EA Programs

FRAMEWORK	DESCRIPTION
Business Architecture	Critical elements of the organizational strategy and processes and how they drive IT demand, as well as how IT supply is aligned with these needs.
Information Architecture	The critical data and information needs of the organization and how they are delivered and managed logically and physically within the IT assets.
Application Architecture	The portfolio of IT systems and subsystems for supporting the needs of the organization, including their interrelationships and their roles in realizing business processes.
Technology Architecture	The IT infrastructure, security, management, networking, and other capabilities required to support the organization.

(continued)

Table 7-1   *(continued)*

FRAMEWORK	DESCRIPTION
Gap Analysis	Current versus future state analysis of various architecture elements, and plans for transitioning to the future state.
Reference, Template, and Candidate Architectures	Best practices templates, recommendations, decision guides, and models for use by IT implementation teams in delivering business solutions.
IT Delivery Process Frameworks	Best practice recommendations for project solution lifecycles to increase successfully delivery and include and influence elements of the architecture.
Instilment Plans	Method for communicating, training, and supporting the organization in its use of EA.
Governance models and processes	Approach to ensuring EA deliverables are adhered to across the organization, and guidelines for when compliance is and is not required.

How Enterprise Architecture Is Typically Practiced

Although EA activities are supposed to deal with strategic business alignment, the authors have found most organizations use EA to manage their major infrastructure project portfolios and address primarily technology issues. This usually means:

- Working with vendors to select platform infrastructure and tools
- Providing guidelines on which technologies, products, and languages to use, and when to use them
- Establishing hardware, networking, desktop, and security standards
- Evaluating new technologies and looking for areas of benefit to seed adoption
- Trying to resolve the issues in the current EA faced by application and solution architects

All of this is valuable. However, EA is on a more strategic collision course with business needs for one simple reason. Historically, business strategy and process models were fairly static. This meant you really could focus mainly on technology issues when it came to EA. Now, the rate of change in processes is speeding up.

Likewise, IT capabilities themselves can support greater agility through things such as business process–driven ESA adoption. If EA teams are focused only on technology, products, and service-oriented infrastructure activities, the benefits will fall far short of what is possible. New types of thinking are required in today's EA activities. You will see more on this later in the chapter.

At What Level Do Enterprise Architecture Activities Take Place?

While the word "enterprise" implies the entire organization, EA activities are not always performed at that level. Obviously, the scope of EA in a Global 1000 company is much more complex than that of a midsize or small enterprise. There may be dozens of EA initiatives spread throughout the organization. Smaller organizations will have simpler structures for architectural decision-making across the enterprise.

At the other extreme, the term "architect" is often applied to individuals whose scope of work deals with a small number of technologies and applications. For example, Sun offers a "Sun Certified Enterprise Architect" designation that tests expertise with a specific technology platform (J2EE) and how to best apply it to meet individual application needs. Likewise, at last year's SAP TechEd conference, a relatively high percentage of attendees tagged their role as "architects" during registration. It is likely that many of these architects operate at the level of individual applications and projects, dealing more with the "guts" of how a solution is implemented.

Unfortunately, there are no hard-and-fast rules for where to draw the line as to the scope of EA. For the purposes of this book, EA activities can occur at multiple levels within the organization, provided they meet the following minimum level of scope:

- Span a portfolio of applications as opposed to a single system.
- The portfolio is meaningful at a *significant* business level (which could be the whole organization or a specific sector, subsidiary, business unit or department).
- EA decisions affect infrastructure product selection, standards, design patterns, and so on, across this entire portfolio.

Alternatively, the portfolio at which EA activities take place could be tied to a business domain or set of processes such as manufacturing, customer-facing demand management, or supply-chain domains. For the remainder of this book, just remember that the term EA can apply to multiple levels of influence within your organization that meet the criteria of decision-making around a portfolio of applications.

The distinction is relevant when it comes to ESA adoption. Many organizations begin with pilots that involve using an SOA-based platform such as SAP NetWeaver to perform service-oriented integration and application development. Although valuable, this is merely a small part of ESA adoption. The role of EA is to help create and manage the larger vision and plan for the business.

Why Enterprise Architecture Initiatives Are Critical for Successful ESA Adoption

EA tends to go in and out of vogue with major technology transitions. Each new computing wave usually involves heavy investments in infrastructure, as well as new skills and implementation methods. This triggers the desire for more EA activities to plan and execute on these decisions, and to instill the changes across the organization. Once things mature, the desire for EA investments has historically diminished until the next major transition drives a new round of bigger IT investment.

As mentioned, historically, EA activities tend to be more technology adoption-focused as opposed to business-focused. You have probably seen this in your organization.

What Changes with ESA — The Big Picture

First and foremost, the "applistructure" means an SAP landscape is no longer just a standalone business application suite, but also a generic technology platform. This requires a shift in thinking at an EA level to answer questions such as the ones in the following sections.

Where Does SAP NetWeaver Fit In?

In larger organizations, EA groups generally viewed SAP as a business application that was just one piece of the portfolio, and often a proprietary black box at that. SAP teams have historically had little participation in EA decisions around distributed computing models, application and integration platforms, and Web-based technologies.

At the same time, SAP groups built their own EA capabilities for decision-making around the SAP landscape. They focused on things such as upgrades, activating new modules and features, and determining how to best manage the

SAP applications and infrastructure environment. In essence, the interaction between SAP and non-SAP architects took place mainly at the edges, where integration between SAP and the rest of the IT landscape was required.

Even if this model does not change overnight, just by adopting SAP NetWeaver, introducing ESA-enabled mySAP Business Suite applications, and leveraging ISV ecosystem partners and xApps requires a whole new set of EA-style decision-making by SAP teams.

Going forward, SAP teams must have the skills to be able to look further out into the overall EA decision-making process. Likewise, enterprise architects must be able to look inside the SAP landscape, which now includes service-oriented applications, a composition platform, and a library of reusable enterprise services. Together, both sides must develop a whole new set of guidelines within the SAP landscape, as well as across the enterprise. Figure 7-4 summarizes the major ways SAP NetWeaver and ESA adoption influence EA decision-making.
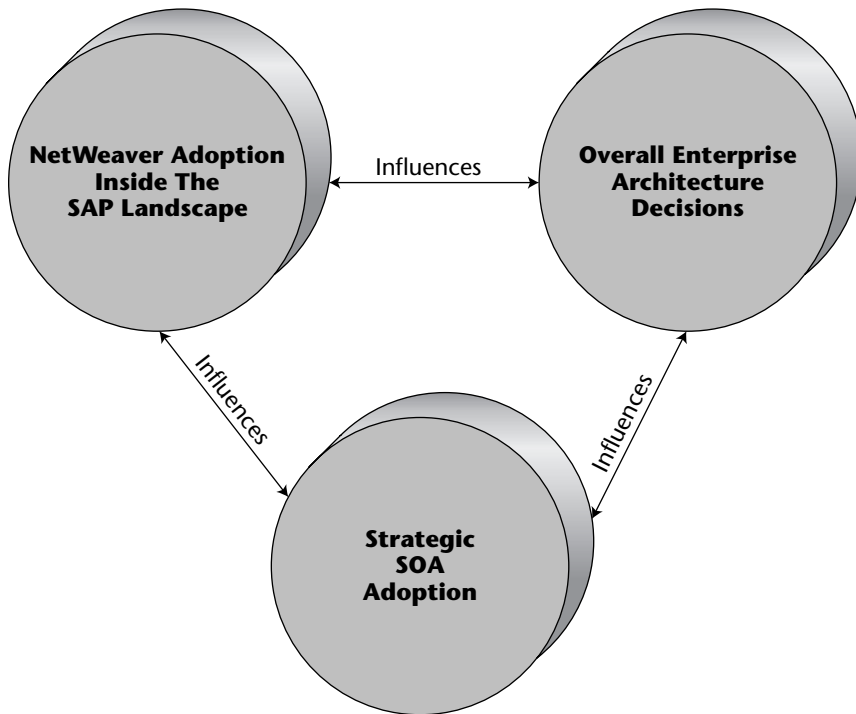
**Figure 7-4:** The cross-EA influences of SAP NetWeaver and ESA adoption

How Does ESA Change the Thinking Around EA?

SAP's ESA approach is one option to bring IT much closer to the business. As discussed in earlier chapters, ESA is based on a number of industry trends that are transforming classical IT processes, technologies, and organizational boundaries. Figure 7-5 shows how just a few of these major IT trends come together under ESA. These include the following:

- Business Process Management (BPM) and integration aligns business process definitions from the strategic value chain all the way through the run-time IT execution components, and includes human workflow and offline activities.

- SOA is based upon composition of shared services running on top of application-intelligent networks.

- Event-Driven Architectures (EDA) that create a different interaction pattern that allows software to dynamically respond to complex business and technical events that occur.

- Model-driven architectural approaches deliver application solutions using less code, reusable design elements, and having the designs themselves directly reflect the run-time elements in a platform-neutral way that the business can understand.

- User centricity is an approach for having applications naturally reflect the business processes of users, and includes concepts such as guided workflow, embedded analytics, rich interfaces, and so on.

- Process-driven lifecycle management and infrastructure services models map the logical and physical environment interdependencies, and interactions, essentially creating a live representation of many architectural elements.

NOTE As service-oriented, process-driven, and model-based approaches to architecture standardize and improve, it becomes possible to create much more dynamic views of your EA that link strategy and process definitions with IT realizations. As all these areas of innovation continue to evolve and converge, classical approaches to EA will need to evolve as well to take advantage of the opportunity, govern the adoption process, and manage risks associated with changing standards and products.

These are obviously *huge shifts* in the IT industry that cannot be adopted haphazardly. EA teams in many organizations are currently working to define how all of these come together in their environments. From an ESA perspective, this is even more interesting when you have a complex landscape that spans both SAP and non-SAP platforms for meeting these needs.
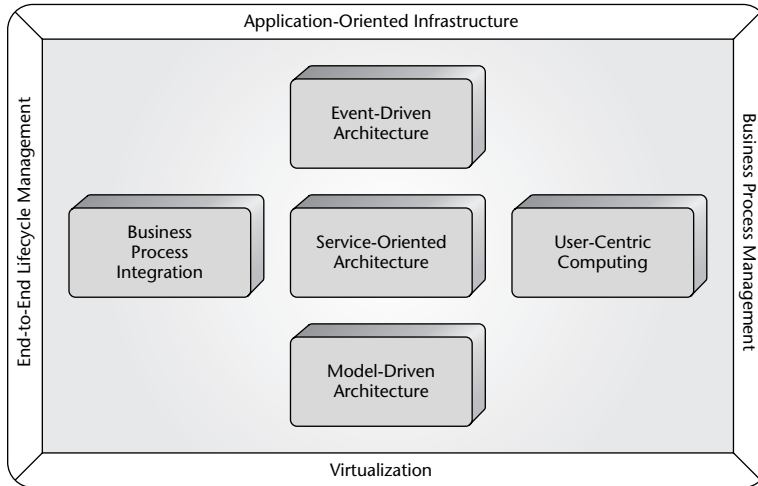
Figure 7-5: ESA represents a convergence of many major IT trends that affect EA decisions.

Each of these areas opens up a whole new class of decisions that expand the role of EA facilitation and enablement. At a minimum, ESA done right raises the bar on the business strategy and process architecture elements of EA. They become much more dynamic than classical EA models accounted for (see the sidebar "The Shift in EA to a Business-Driven Architecture"). Once business owners wake up to these possibilities this will create the ripple effect in IT processes and create a need for more dynamic EA.

The good news is that all of these concepts are actually harder to grasp than they will eventually be to implement. By their very nature, the model-based tools for building applications, establishing EA policies, and managing the infrastructure help automate many classical EA activities and deliverables. It will take time for SAP and other tools vendors to close all the gaps and mature things. But once they do, the speed of EA work, and the ability for the outputs to be actionable, can grow.

The remainder of this chapter deals with EA goals and objectives. Chapter 8 provides more specific details on how ESA adoption is best done by combining program-level EA considerations with pilot- and project-level activities. In either case, starting small and delivering wins early and often are vital.

NOTE Beginning with a strategic end in mind does not mean you need to "boil the ocean." You still want to start small with ESA and build momentum as you go. At the same time, you must recognize where things are heading in the industry, as well as in your organization, to avoid hitting the most likely roadblocks.

THE SHIFT IN EA TO A BUSINESS-DRIVEN ARCHITECTURE

Classical EA usually assumed static process and strategy models. As a result, IT organizational structures and decision making could be more functional and technology-focused. Now that changes in strategy and processes are speeding up, those business alignment gaps are starting to manifest themselves and affect decision making.

For example, the authors worked with a global manufacturer in the healthcare industry that had built a successful "Web team" in its IT organization as a means of adopting that technology for customer and partner interactions. This group made all decisions related to Internet technologies and handled all the development. But now that everything is becoming Web-enabled (including their SAP enterprise systems, their document management applications, their business intelligence environment, and all partner integration tools), there is confusion from an EA perspective on how to consolidate platforms, build a successful reference architecture, and support the business processes.
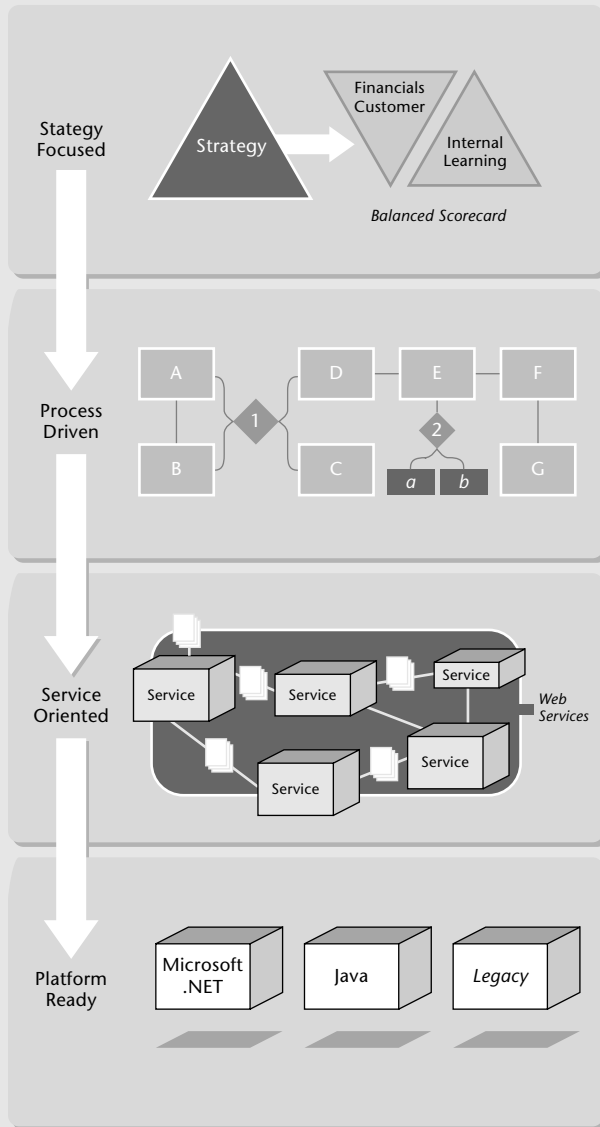
Similarly, many organizations have built integration groups as they adopted EAI tools and standards. With SOA and ESA, integration and application development become unified. Centralized integration organizations and tools no longer fit with the process-oriented model. Unfortunately, changes such as this that affect both technology and IT organizational structure take much longer to accomplish.

Chapter 6 described the "secret sauce" for ESA as the ability to effectively digitize business processes. This allows you to liberate them from underlying, monolithic applications, and replace them with agile, more user-friendly and analytics-driven composites. The change this will have on application architectures cannot be overstated. It is unlike any other transactional, data analysis, or user-presentation technology innovation that has come before. Unfortunately, many organizations have not yet awakened to this fact.

Increasingly, organizations are requiring a business-driven architecture approach for managing this transition. The following figure illustrates the major alignment activities associated with effective, business-driven ESA adoption.

A real and tangible coupling can now exist between strategy, processes, and IT assets. Previous chapters described how SAP's high-level SAP Solution Maps can be traversed through process specifications down to the implementation components and interfaces in the IT landscape. This is one of the main benefits of ESA and the SAP NetWeaver platform strategy. EA initiatives must evolve to address this need.

The Business Driven Architecture

Stategy Focused

Strategy

Financials
Customer

Internal
Learning

Balanced Scorecard

Process Driven

A

B

1

D

C

E

2

a   b

F

G

Service Oriented

Service

Service

Service

Service

Service

Web Services

Platform Ready

Microsoft
.NET

Java

Legacy

Major alignment activities in the business-driven architecture (Source: © 2005–2006, MomentumSI, Inc. All rights reserved.)

Setting Your Perspective on ESA Adoption

Perhaps the easiest place for you to start is to ask yourself a simple question: "Why should your organization tackle ESA in the first place?" There are really only two main places to look to answer this question. Adopting ESA must either make your organization more effective, or save it money. It really is that basic, and ideally, ESA will do a combination of both.

At a high level, there are usually three perspectives organizations take when considering ESA adoption:

- Enabling strategic business transformation and process agility
- Improving IT effectiveness through EA and governance
- Making project delivery more efficient through new tools for service-oriented integration and composite application development

These perspectives vary greatly in terms of scope and potential impact. Ultimately, success with ESA requires a combination of all three. Practically speaking, some organizations are better equipped to tackle the strategic aspects of ESA earlier than others.

How do you know the best place to start? To a large extent, this is driven by a few factors relative to your organization, including the following:

- The overall size of your organization and number of different sectors or business units.
- The speed of change and growth characteristics of your industry and the value business leaders place on IT for meeting strategic objectives. This includes IT's track record and overall credibility with the business.
- How process- and customer-driven your organization has become, versus functional and silo-based.
- The way EA decisions are made, budgeted, and enforced.
- The maturity of EA initiatives.
- Alternative SOA and IT consolidation efforts underway.
- What group or individuals are assigned to lead the effort and why.

By working through an analysis of these factors, the logical way to define your ESA adoption scope, budgets, and approach will emerge. Your organization will have a natural capacity for how much to take on and where to start. Just keep in mind that although tactical, project-oriented approaches can be quite successful, you will eventually hit a wall. At that point, a more strategic

planning and governance-oriented approach will be needed to achieve the next levels in ESA adoption.

How SAP NetWeaver and ESA Affect the Architecture

Adopting SOA or ESA along with a new technology platform such as SAP NetWeaver will obviously have a major impact on your EA. Not only does ESA span the existing elements of an EA, whole new considerations emerge.

The most important areas your EA efforts must address to get the most benefit from ESA adoption include the following:

- Capturing business needs and expanding the role of business process portfolio management in the overall EA.

- Effectively aligning the new technology infrastructure in SAP NetWeaver with your current technology architecture for delivering IT Practices.

- Balancing current platform capabilities with planned evolution by SAP.

- Developing decision trees for when and how to use SAP NetWeaver to solve specific objectives.

- Expanding reference and candidate architectures, providing training, and enhancing processes for solution architecture teams to account for the new capabilities (for example, when to use ABAP versus Java, or when to use SAP NetWeaver Portal instead of a classical Web application).

- Deciding how the SAP ecosystem and third-party NetWeaver certifications and composite applications affect your purchasing decisions.

- Expanding your information management architecture to include enhanced master data management and embedded analytics within new composite applications and processes.

- Managing and governing a whole new portfolio of enterprise services across multiple composite applications.

The last bullet point is perhaps the most significant. One of the biggest advantages of moving to SOA and ESA is the "network effect" that comes from building a portfolio of useful enterprise services. When this portfolio is well-designed, managed, and governed, reuse of the enterprise services is high. Chapter 8 looks at the elements that make an enterprise service useful to others. It is not something that happens by accident. Failure to plan at an EA level for managing and governing your enterprise services is, as the adage goes, planning to fail with ESA.

NOTE Chapter 5 described how SOA technologies can enable more automated governance around services and composite applications. This is possible because using your organization's pre-approved enterprise services means there is already a level of assurance contained in the content and structure of the service itself. Recall that SOA standards also enable explicit descriptions of non-functional policies they support, which allows for ongoing monitoring of design and run-time interaction. Finally, the model-driven aspects of composite application development and Business Process Management enable compliance analysis and monitoring at the solution level.

Of course, you can ignore EA considerations and just begin adopting NetWeaver and pursuing service-oriented application development and integration initiatives. As mentioned earlier, you will eventually hit problems with this approach, not unlike the ones shown in Figure 7-6.
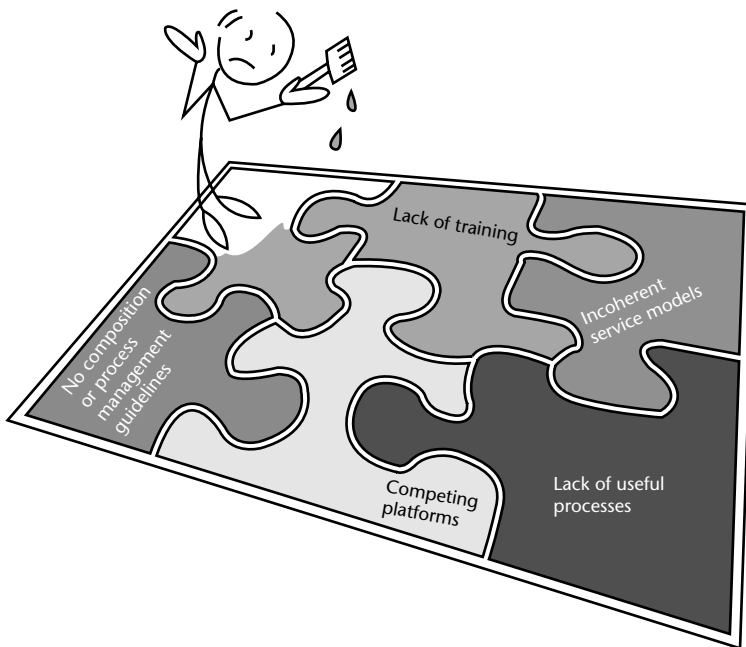
Figure 7-6: Adopting ESA without a plan reaches limits eventually.

ARCHITECTURE DECISIONS AND MANAGEMENT AT SAP

As mentioned in earlier chapters, SAP is creating whole new sets of business processes, objects, services, and other models that must be shared across all mySAP Business Suite and Composite Application (xApp) development teams. In addition, product solution teams must be delivering on the evolving SAP NetWeaver infrastructure using the new development tools that support user-centric computing. Can you imagine the architecture and governance approach required to accomplish this?

Product teams need training and guidelines on how to use the new models. Decisions must be made in terms of what tools and technologies should be used to deliver new functionality on top of the platform. For example, when should the Composite Application Framework (CAF) be used and which scenarios should be developed using Microsoft Office and Duet? All this activity also creates lots of feedback to the groups in charge of the official business object, process, and services models to ensure that they are useful across multiple applications.

Now, take it a step further. Recall that these exact same models and tools are also being shared with customers and partners who can use, influence, and sometimes help change the overall official models and platform capabilities through the ecosystem. Finally, individual customers and partners will be adopting the infrastructure tools and models, and then tailoring everything for their unique needs.

In effect, everyone is shifting to the same development approach within the SAP landscape. When you adopt the SAP NetWeaver platform as the foundation for ESA-based mySAP ERP or other Business Suite applications and composites, your organization will need to make a lot of similar choices.

A good example is what is happening inside of SAP itself. The company is dealing with many of these same challenges in delivering ESA (see the sidebar "Architecture Decisions and Management at SAP").

As mentioned, large organizations with strong EA groups will find it toughest to include SAP teams in the EA function. Traditionally, SAP architects were part of an EA council, but only to the extent that R/3 or mySAP ERP and other business applications played in the landscape. The role of the SAP teams now shifts based on the degree and scope that SAP NetWeaver is bringing to the landscape. The new out-of-the box services, the process management capabilities underlying mySAP ERP, and the SOA-based infrastructure require consideration and alignment with other options.

Why Enterprise Architecture Activities Succeed or Fail and What This Means to ESA Adoption

Whether you have been part of creating an EA or were responsible for using the outputs from an EA program, you have likely seen how difficult it is to perform this function successfully. Even when the deliverables themselves are done right, the EA program often can fail because of other issues.

This section identifies some of the main reasons EA efforts succeed or fail. Many of these are commonsense, but people either don't think about them, underestimate their impact, or simply don't like performing certain aspects of the job.

Understanding the issues can help you better plan for the role of EA in support of your ESA adoption activities. You can also reach out to others in your organization to perform some of the activities that would otherwise have been overlooked.
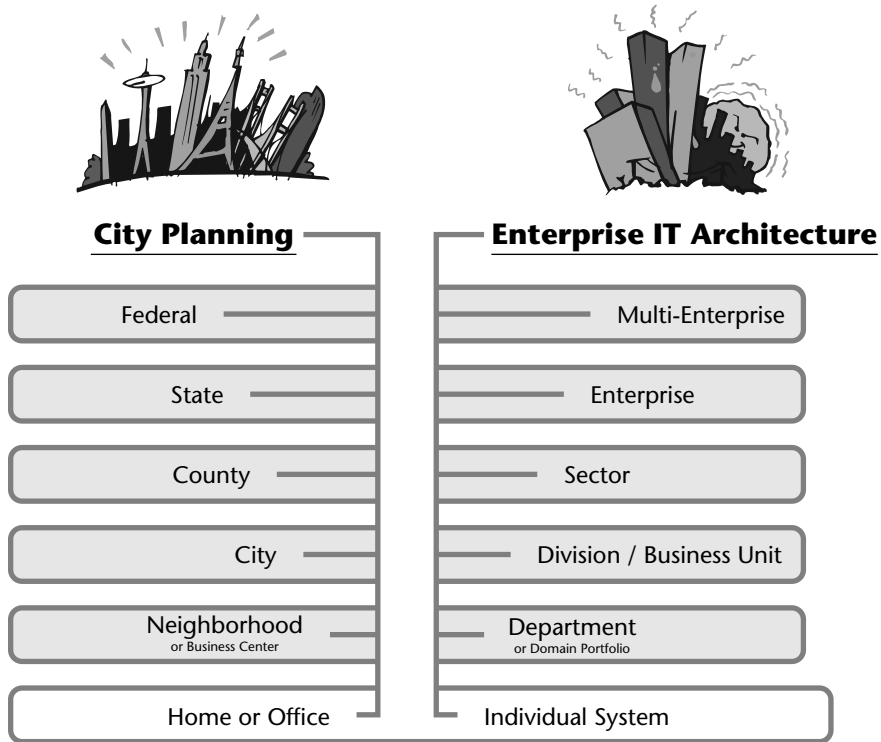
Determining the Right Level for Enterprise Architecture Decisions

One of the biggest challenges with successful EA programs is ensuring that work is performed at the right levels. Often, this means EA decisions should be made that do not span the entire organization. Some guidelines on what sphere of influence an EA program should cover were mentioned earlier.

ESA adoption will likely occur in a manner similar to how you make all EA decisions. The three basic models organizations use for managing EA are as follows:

- Centralized under a Chief Enterprise Architect
- Distributed across business units or domains
- A federated model, where multiple groups collaborate on some architecture decisions and decide which can be left to local levels

Using the city planning analogy again, you can see how decision-making can cascade to multiple levels. Cities themselves must make decisions in accordance with federal, state, and county plans and rules. For example, federal and state conservation and transportation rules must be adhered to at the city level. Likewise, a neighborhood association within the city can make many of its own decisions on how to plan the community, and to which rules homes in the neighborhood must adhere to as well. Finally, the individual homeowner can make decisions on what to build as long as it adheres to the hierarchy of decisions from above. Figure 7-7 illustrates the different levels at which IT architecture decisions are made in an organization.

City Planning — **Enterprise IT Architecture**

City Planning	Enterprise IT Architecture
Federal	Multi-Enterprise
State	Enterprise
County	Sector
City	Division / Business Unit
Neighborhood or Business Center	Department or Domain Portfolio
Home or Office	Individual System

Figure 7-7: Allocating decisions to lower organizational units

A good rule of thumb is to make EA decisions at the *lowest* level possible that makes sense. In other words, if a decision can be made at a lower level in the organization without it affecting any meaningful business objectives, then it should be delegated.

The questions for you are how low should each ESA adoption decision be made in your organization, and how do you go about distributing and assigning this decision making? Getting this right is one of the first steps to successful ESA adoption. It is a decision that can become very complicated in larger organizations that historically are not used to SAP teams participating in platform, SOA, and Business Process Management decision-making. The degree to which classical EA teams work with SAP architects on successfully understanding and scoping the changes brought about by NetWeaver and SAP-based composite applications is critical.

Getting the Right Input to Support Enterprise Architecture Decisions

Even when EA decisions are distributed down to the right level in the organization, many EA programs still fail because they are done in a vacuum. This can lead to EA plans that are too technical, too theoretical, or too incomplete to

be useful. It is also a risk even when the EA team is making good decisions because the users of the EA may not be brought in to the plan.

The first group to actively include is *business owners* who are responsible for the project and process portfolio around which you are performing EA activities. They must see how the results of EA decisions affect the business over the long haul, because they will likely be the ones with influence over the budgets. If they understand why some projects require added time or investment to support longer-term objectives, they are more likely to be supportive. This is especially true as IT and the EA groups have built up credibility through past performance.

Similarly, enterprise architects must solicit input from *project teams,* including solution architects, application architects, and other implementation team members. EA activities that don't take into account these groups are subject to great sabotage. And sometimes what seems sensible at an EA level really isn't when you look at it from the perspective of practical implementation. If *development teams* perceive the EA efforts to be way out of touch with reality, the chances of success are slim. Timely input from trusted *solution teams* can help avoid these mistakes and bridge the gaps between groups.

As you approach ESA adoption, there should be a list of people you plan to include to review and validate decisions before they are made firm. You cannot succeed without understanding what is important to them and addressing their concerns and pain points in your ESA plans.

Ensuring the Enterprise Architecture Deliverables Are Useful, Usable, and Actionable

Sometimes EA teams forget their work is simply a means to an end. The investment is only valuable if it actually gets used. This is much like the city planners. If the city doesn't encourage growth and new development, or has rules that are too difficult to understand and follow, then expansion and compliance will be limited.

Similarly, there is plenty the EA team must take into account beyond getting the input described earlier to ensure value comes from their work.

### *Making Enterprise Architecture Artifacts Actionable*

EA decisions are often easier said than done. The outputs must be created at a level that can influence downstream decisions. This means creating actionable reference architectures and candidate architectures, as well as providing training for adoption teams. For example, the switch to a new architecture based on an integrated platform such as SAP NetWeaver, SOA-based design patterns,

and intelligent infrastructure is a big change that requires guidance to go with the decisions being made. Sometimes this can be as simple as publishing tools such as decision trees, process guides for implementation teams, and sample artifacts. For example, Figure 7-8 shows a highly simplified decision tree for picking the right GUI technology for an application need.

In fact, one of the advantages of the model-driven aspects of the ESA vision for NetWeaver is that the out-of-the-box end-to-end process management models described in Chapter 6 can be tailored into ready-made candidate architectures that are highly reusable. And, because many of these models reflect the physical and logical aspects of your production environment, performing change analysis on portions of the architecture can be done automatically.

Ensuring Enterprise Architecture Artifacts Are Available

One of the common pitfalls the authors see when auditing many EA efforts is that the artifacts are scattered and out of date. This typically comes from thinking EA decisions are static events tied to major technology transitions. Nice binders are published and e-mails are sent. Of course, over time, people, technologies, and processes evolve incrementally and the EA artifacts get lost in the shuffle.
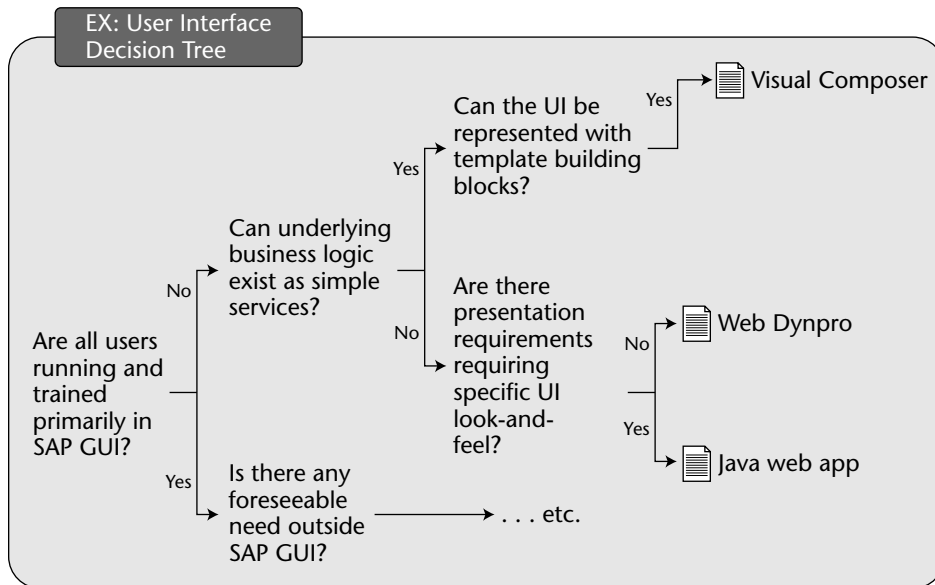
Figure 7-8: Publishing artifacts such as decision trees help make EA decisions more actionable.

The reality is a successful EA effort is ongoing and incremental. By having a publishing plan and process for sharing EA information widely, you provide the method to enable more frequent change. This could be as simple as offering relevant EA portals with appropriate alerting of changes. As mentioned earlier, more modern, model-driven IDEs will include links to repository information, including self-describing architectural policies and guidelines. This means application architects and developers will have certain elements of the EA efforts available directly in the context in which they work.

Of course, there's no sense getting carried away with tools and over-automation. The point is ensuring that the EA information is available to those who need it in whatever format can be sustained. With ESA adoption, this ongoing sharing of information will be vital to dealing with the continued evolution of SAP NetWeaver and the mySAP Business Suite applications, as well as ecosystem partner offerings that become part of your landscape.

Communicating Enterprise Architecture Decisions and Results

Perhaps the most overlooked aspect of EA decisions is having a supporting marketing effort to communicate results. Giving project teams a forum to share successes that were supported by EA initiatives is critical to increasing credibility. Business owners also need to hear successes such as how a commitment to reuse lowered the cost and timeline for subsequent projects, or how new user productivity features improved ROI of a business process by a significant amount.

The communication plan becomes a valuable feedback loop for evolving the architecture, as well as spreading new best practices. The role of a successful communication plan is covered in the discussion on ESA adoption pilot programs found in Chapter 8.

Having the Right People and Collaboration in Enterprise Architecture Roles

Performing EA successfully begins with having the right people involved. Unfortunately, finding those people is very tough in today's market primarily because being good at EA activities requires a broad combination of skills such as the following:

- An understanding of your organization's critical drivers, as well as how to run IT as a business, and use this information to guide decision-making.

- Strategic thinking ability with a pragmatic appreciation of downstream execution concerns.

- Knowledge of technology and active pursuit of new trends such as SOA, Web 2.0, Saas, MDA, application-aware networks, BPM, and so on, with a critical eye.

- Active collaboration with peers inside and outside the company and ability to borrow best practices from others.

- Ability to communicate exceptionally well and facilitate, train, coach, mentor, and especially listen to others.

- Role as consensus builder and influencer, but not afraid to make or enforce unpopular decisions.

- Knowledge of classical and emerging EA frameworks.

- Self-motivation and continuous learner. This means appreciating change and not being invested in yesterday's decisions as the right answer to solve tomorrow's problems.

Unfortunately, there are no generally accepted certifications, training programs, or career backgrounds that guarantee success in an EA role. As one CIO commented, "I just know them when I see them."

Larger organizations often require teams to perform EA work. So, in addition to picking the right individuals, you also must consider the harmony and complementary skill sets of the overall team. Keep this in mind if you are building a new team for ESA adoption that reaches outside your typical EA structure. Its also useful to ensure that key players associated with ESA adoption participate in regularly scheduled EA council meetings if you conduct them.

Many organizations put their architecture decision-making in the infrastructure group because hardware, networking, and security were the areas that traditionally spanned project portfolios and had the clearest benefits for standardization and economies of scale. With ESA, application, process, and business architecture decisions become much more important. You should definitely keep this in mind when beginning to pursue ESA if your organization adopted the infrastructure-centric approach to EA decisions.

Enforcing Enterprise Architecture Decisions

Cities have laws to enforce their planning decisions and specific rules to govern exceptions and changes. At some point, your organization will have to make the hard choices on when and how to enforce EA decisions. This often falls under the domain of governance. If you make too many exceptions to your plan, or leave too many decisions in the hands of application architects and project teams, then you risk undermining the whole process. EA practitioners usually hate the enforcement aspect of the job (who wouldn't?). As

mentioned earlier, it is important to have team members who are skilled at this for when the situation dictates.

Unfortunately, this means that not only do EA efforts require support from senior IT leadership, the IT leaders themselves also must have support from business leaders who may push to overrule decisions in the interests of their local projects. And don't let this slip away when you hand off implementation projects to outsourcing or offshore firms (see the sidebar "The Clash Between EA Governance and Outsourcing").

Obviously, EA decisions are best supported when made using all the best practices described earlier in this chapter. If scoped well, made at the right levels, and properly communicated in an actionable way, then compliance concerns are usually discovered earlier in the project lifecycles when they can be addressed most effectively. New ways to automate governance audits through the modeling environments and management tools in SAP NetWeaver have also been discussed.

Ultimately, your organization must decide whether to put a "consequences model" in place that has teeth to it. Of course, everyone involved has to be pragmatic. Enforcing an EA decision that does not make good business sense in a specific circumstance is silly, but it happens all the time. Sometimes teams can win the battle but lose the war when it comes to successful EA programs by becoming too bureaucratic. This is especially true with ESA adoption. Platforms such as SAP NetWeaver and applications such as mySAP ERP and the Business Suite now cross into new territory beyond the traditional SAP landscape. It will take a while for decision-making to catch up, especially in larger organizations.

And instead of using only "sticks" associated with governance and enforcement, it is even better to have "carrots" in place to encourage compliance. This can include formal efforts such as the way in which you set up cost allocations and recharge models. In many organizations, classical models do not apply well to ESA and SOA adoption. You must invest time to think about how to encourage reuse and process management, not penalize those teams that take advantage of it. Of course, informal recognition and factoring compliance into the HR reviews for application and solution architects are other good ways to encourage cooperation.

Gaining Leadership Support for EA-Related Activities

The previous discussion assumes that EA activities are valued at a meaningful level in your organization. If that is the case, you have a head start on strategic ESA adoption. But, just as some cities can languish because of a lack of leadership and planning, some businesses have not yet awakened to the fact that ESA represents a major transition for IT that requires a new level of EA coordination.

THE CLASH BETWEEN EA GOVERNANCE AND OUTSOURCING

For some reason, organizations seem to more easily overlook governance and enforcement activities when dealing with their implementation partners. This happens for lots of reasons. For one, the decision to outsource certain projects is often made by individual business units outside the scope of IT. Even within IT, the focus on approved vendor lists and procurement is often disconnected from internal EA programs, project implementation processes, and decision-making.

As organizations gain more experience with outsourcing and offshoring of development, they are beginning to reconsider how handing off project outcomes can better work within internal governance models. This includes the following:

◆ Creating a governance handbook for vendors

◆ Having a certification and audit program in place

◆ Defining and implementing a consequences model

◆ Recognizing and rewarding partners for successful compliance and including them in feedback loops

◆ Requiring training and oversight programs for partners as a cost of doing business with your organization

The last bullet is especially interesting. The authors have seen organizations begin to require partner investments into their EA initiatives because, as customers, they should be gaining from ongoing and expanded relationships.

As you outsource or offshore significant portions of your SAP development and maintenance, this is an important consideration for your ESA adoption initiatives. It will either become a great opportunity or a big threat to long-term success. You definitely do not want inconsistent technology platforms, environments, service portfolios, or non-standard model-based development to spread across your organization.

At the end of the day, your business and IT leadership either values EA work at some level, or it does not. You are unlikely to change that fact overnight. But even if it doesn't, there are some things you can do to influence successful ESA adoption. Consider some of the following options, which are all about building momentum for your efforts:
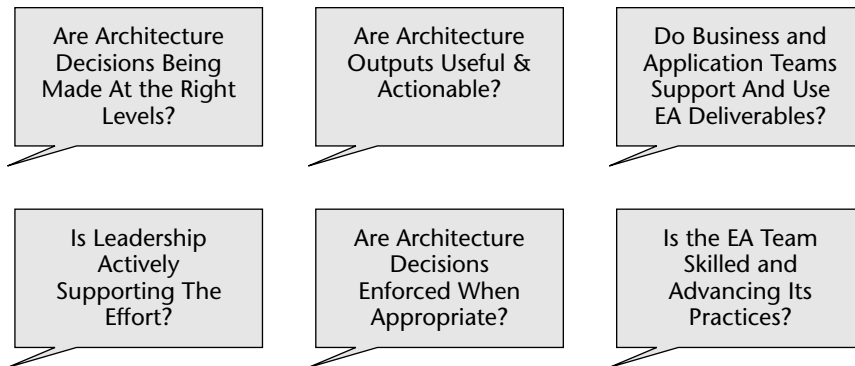
■ Take a minimalist approach and do not try to "boil the ocean" or copy models from organizations with much more mature EA efforts.

■ Get peers in your organization involved and create informal networks of architects who look for common reuse opportunities tied to services or even SAP NetWeaver infrastructure for justification across multiple projects where you lack common platform capabilities.

- Strive toward quantifiable metrics to track. Many EA initiatives struggle because of fuzzy metrics.

- Think strategically while acting tactically to lay some groundwork. There are often ways to embed longer-term benefits in short-term projects without a lot of fanfare if you find the opportunities with high ROI and short payback.

- Actively participate with peers from other organizations (such as the ASUG EA Group and ESA SIG) and communicate what they are doing in your own organization.

Everyone knows a healthy diet and exercise are good things, but not everyone does these things. If the business and IT leadership are not pushing for strategic EA programs to drive ESA adoption, then you can still get the benefits of SAP NetWeaver adoption for end user productivity and embedded analytics in the short run.

Eventually, even those organizations that claim to be "wall-to-wall" SAP and don't think they need EA efforts will hit a barrier in the same way a city cannot grow forever without planning becoming an obvious imperative. If you focus on generating wins early and often, you will begin to see opportunities build. And, when it comes time to allocate resources or enforce decisions tied to EA, you will know if you are making progress.

Figure 7-9 summarizes some of the principles for succeeding with EA activities. A great list of EA anti-patterns (that is, what not to do) was published by Scott Ambler and can be found at `www.agilemodeling.com/essays/enterpriseModelingAntiPatterns.htm`. A link is provided on the book's companion Web site, and the authors highly recommend giving this a look.

Are Architecture Decisions Being Made At the Right Levels?	Are Architecture Outputs Useful & Actionable?	Do Business and Application Teams Support And Use EA Deliverables?
Is Leadership Actively Supporting The Effort?	Are Architecture Decisions Enforced When Appropriate?	Is the EA Team Skilled and Advancing Its Practices?

Figure 7-9: Summary of some of the key success factors for EA initiatives

Enterprise Architecture Frameworks and Related Tools, Methods, and Processes

Classical EA activities have been practiced for decades. Over the last several years, a number of frameworks, methods, and processes for performing the EA functions have been published in the public domain. Some of these have been broadly adopted by many organizations, becoming de facto standards for supporting EA initiatives. In addition, automation tools for managing EA artifacts including ones based on these frameworks have also emerged in recent years. These tools are helpful in helping to ensure that EA deliverables become living resources that are easier to evolve and more useful to stakeholders.

This section will help you understand the purpose of these frameworks, tools, and processes. It will also provide brief introductions to some of the more popular ones available. If your organization is interested in evolving your EA initiatives, you can use this as a launching point for places to seek further information.

If you come from primarily an SAP background, you may discover some of these are in use in your organization today. Understanding your company's overall EA approach will help you better participate from an ESA-adoption perspective. And, if your organization does not use a framework or have mature EA processes, you may want to research some of them further to see if there are portions you want to adopt or use. As mentioned, the companion Web site for this book contains a number of links to resources and additional information on these frameworks.

The Value of EA Frameworks

An EA Framework is simply a set of tools to help you create and manage your EA assets in an organized way. Figure 7-10 identifies some of the major elements for an EA framework.

Obviously, benefiting from best practices and not having to tackle an EA program from scratch is useful. These frameworks make it easier to provide a common set of semantics and training across your organization for performing EA activities. They also make it easier for EA professionals across organizations to work together to advance the discipline. In some cases, these frameworks are serving as a baseline for certification efforts to track the depth and breadth of people working in the EA space underlying methods and tools. They help ensure that you don't leave anything out or accelerate through what can be a complex process.

Popular EA Frameworks and Methods

There are a number of EA frameworks, guides, and methods available to choose from. The good news is they don't require an "all-or-nothing" choice. Most organizations with mature EA programs pick parts from several of them, and build out an approach that makes the most sense internally. Others might use just a few of the processes and templates to get their EA initiatives started.

Obviously, these frameworks and methods are not created equal. The best question for you is to decide how formal your program will be. Some frameworks are designed to be especially agile and simple to use. Others are much more thorough and apply to very large organizations performing extensive EA initiatives. Table 7-2 lists three of the most popular EA frameworks that you may have encountered or wish to review.
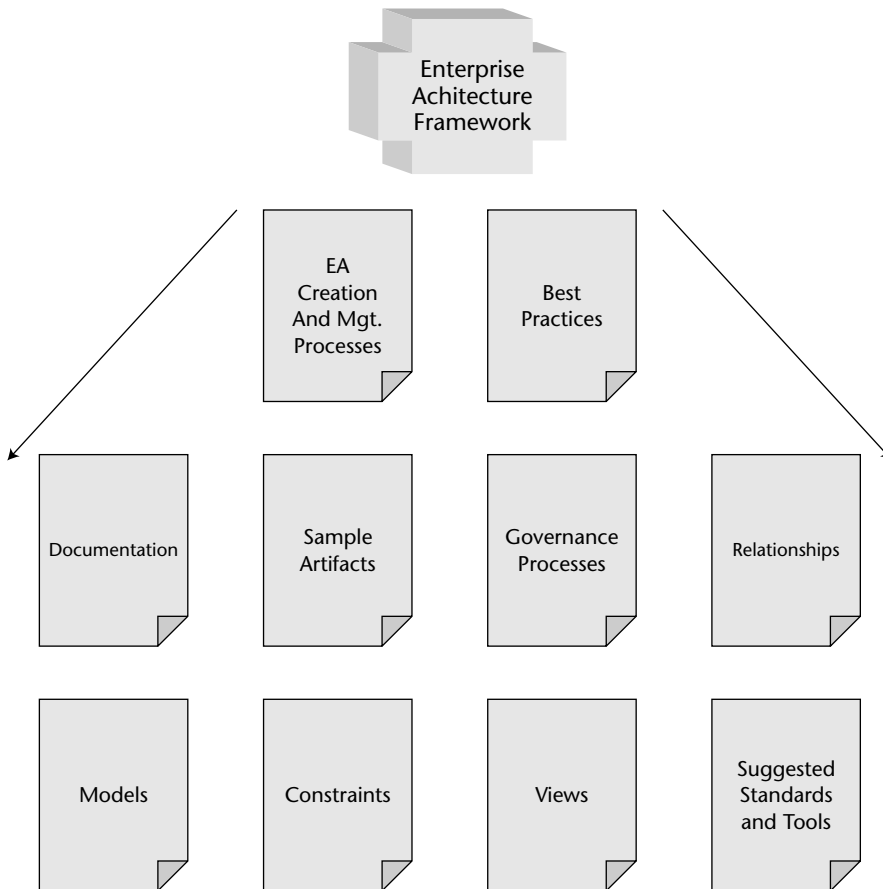

Figure 7-10: Major elements of an EA framework

Table 7-2: Three Widely Adopted EA Frameworks

FRAMEWORK	DESCRIPTION
Zachman	This is a popular EA framework launched in 1987 and now available from the Zachman Institute for Framework Advancement (ZIFA). It organizes analysis according to multiple perspectives (scope, enterprise model, system model, technology model, components, and working system) and six abstractions (data, function, network, people, time, and motivation) for each. These abstractions cover the who, what, when, where, why, and how, resulting in a 37-cell matrix. More information is available at `www.zifa.com`.
TOGAF	The Open Group Architectural Framework (TOGAF) has been available since the mid-1990s and contains three main components. First is an Architecture Development Method (ADM) that explains how to develop an EA for meeting business requirements. Next is the Enterprise Continuum, which is a virtual repository and includes a number of reference models and architectures. Last, there is a Resource Base with guidelines, templates, and other accelerators for using TOGAF. More information (including online documentation) is available from `www.opengroup.org/togaf/`.
FEA	The United States Office of Management and Budget developed the Federal EA (FEA) as a means to create interrelated "reference models" to facilitate investments and increase collaboration within and across federal agencies. It offers a number of useful guidelines, principles, templates, and sample deliverables that apply to both public and private sector EA initiatives. For example, case studies, references, and tools cover areas such as security and privacy, geospatial usage and analysis, and records management. More information can be found at `www.egov.gov`.

Figures 7-11 and 7-12 show the high-level scope covered by TOGAF and FEA, respectively. These classical EA models all have heavy emphasis on business strategy and process modeling. As mentioned previously, the authors have found that in practice many organizations rarely master business strategy and process architectural views, and mainly focus on issues related to data, technology platforms, and infrastructure.
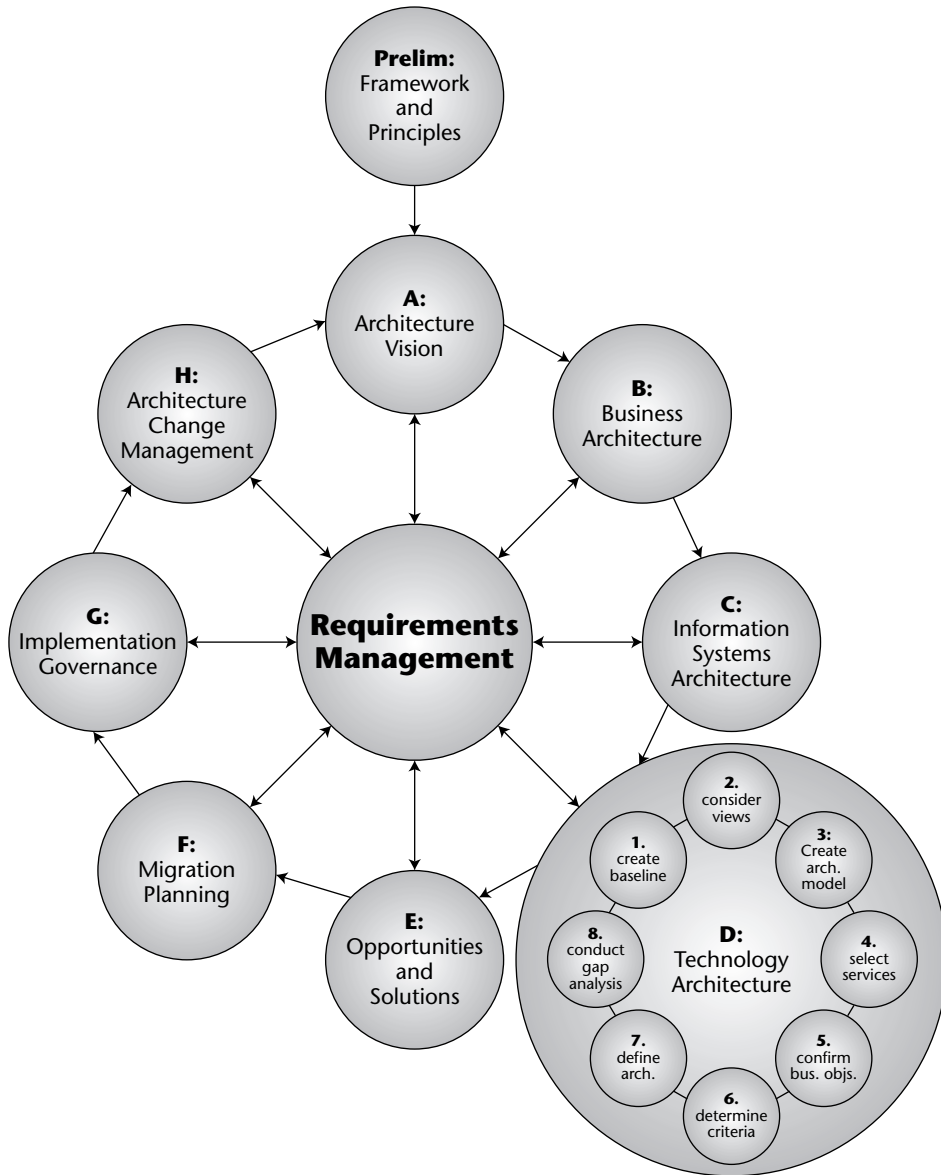
Figure 7-11: The TOGAF EA framework (Source: © 1995–2006, The Open Group. All rights reserved.)
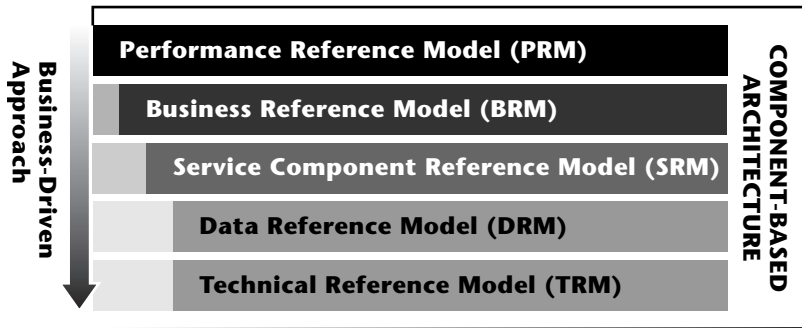
Figure 7-12: The FEA framework references models (Source: Office of Management & Budget. Available from www.whitehouse.gov/omb/egov/a-2-EAModelsNEW2.html.)

Lighter Weight Enterprise Architecture Considerations

The well-established EA frameworks and methods are very extensive. For many small and midsized organizations, it is daunting to think about how to apply them. Similarly, if your EA initiative occurs at lower levels in the organization (such as a departmental or single business unit), these classical approaches can also be tough to apply.

A movement is underway to take a simplified approach to EA activities. The goal is to not ignore EA altogether, but rather to tackle it at "bite-sized" levels that align with the way your organization works.

One example is the Enterprise Unified Process (EUP) created by Scott Ambler of Ambysoft, Inc. EUP is an extension to the popular IBM Rational Unified Process (RUP). RUP became a de facto industry standard methodology to software development that aligned well with the rise of object-oriented and component development technologies. While RUP deals well with best practices surrounding the use of individual projects and applications, EUP *extends* RUP to bring more enterprise-class considerations into the lifecycle. EUP adds two phases to the RUP model. One addresses how to deal with solutions already in production. The other considers processes for retiring a solution when it becomes obsolete. EUP also adds disciplines and workflows related to the following:

- Enterprise business modeling
- Portfolio management
- Enterprise architecture
- Strategic reuse
- People management

- Enterprise administration
- Software process improvement

These elements are all part of classical EA initiatives, but Ambler offers an approach that tackles these initiatives in a more "bottom-up" manner. As you will see in Chapter 8, many similar considerations are key parts of a successful ESA adoption process, especially if you start at more tactical, project-driven levels. You can learn more about lighter weight EA models and the EUP at `http://enterpriseunifiedprocess.com` or by reading some of the books on the topic.[1,2]

Enterprise Architecture Maturity Measurement

One advantage of all the industry focus on EA is that the discipline is moving from art to science. An outgrowth of the standard frameworks has been the shift to finding ways of assessing the maturity of EA programs and efforts. Examples include the following:

- The NASCIO Enterprise Architecture Maturity Model, which state and local governments can download to assess their efforts
- Analyst firms such as Gartner offer valuable guidelines, techniques and benchmarks for evaluating EA initiatives, along with their own EA frameworks and solutions
- The Institute for Enterprise Architecture Developments (IFEAD) Extended Enterprise Architecture Maturity Model (E2AMM)

The purpose of these initiatives is to help you track the impact of your EA investments and suggest options for improving your processes and results. This is a good thing because too often EA initiatives are plagued with fuzzy guidelines where you can claim success without delivering meaningful value. These maturity models focus on areas tied to successful EA adoption. As mentioned earlier, this includes the following areas among others:

- Effectiveness of the IT architecture process itself
- Strategic link to the business
- Senior management involvement
- Actionable use by application teams
- Successful compliance and governance
- Impact on IT investments and acquisition strategy

If you want a quick way to test your EA modeling efforts and get a great look at what does not work, you can check out the anti-patterns mentioned earlier.

Enterprise Architecture Tools

Another advantage of enterprise-wide maturity in EA disciplines is the emergence of automated tools to support the efforts. A number of vendors offer EA modeling capabilities. These tools are rapidly evolving to support the models and processes from Zachman, TOGAF, FEA, and other EA frameworks. The IFEAD offers an excellent guide and evolutions of tools[3] according to their support for:

- EA modeling
- IT portfolio management and business strategy alignment
- Program management
- System architecture
- Software engineering

Having better automation for EA models goes a long way in ensuring that the results are well-communicated. Tool vendors can also seek certification of their products, which allows your organization to trust whether they support any of the popular EA frameworks that you might be interested in adopting.

From an SAP perspective, the company has a strategic alliance in place with IDS Scheer to embed the company's ARIS modeling capabilities within SAP NetWeaver as part of the ESA strategy. ARIS supports a number of popular EA frameworks. It also allows business process models to be extended with IT architectural elements such as organizational units, applications, data, and systems landscape.

When combined with SAP's own modeling capabilities for system landscapes, the business-to-IT Solution Maps, and model-driven application development, a complete end-to-end capability for managing EA models emerges in support of ESA. You can expect to see even tighter integration across these models as the SAP NetWeaver platform evolves.

NOTE The ARIS solution from IDS Scheer supports many popular EA frameworks. You may want to investigate the degree to which these capabilities are supported and licensed in the ARIS modeling environment embedded within SAP NetWeaver for managing process models in the ESR.

Enterprise Architecture Training and Certification

Yet another advantage of emerging standards in the EA community is richer and consistent training based on the most popular frameworks. You can find plenty of sources who provide EA training based upon Zachman, FEA,

TOGAF, and other popular models. All of this leads to a more consistent body of knowledge and improvement in the EA profession.

Recently, a number of industry-leading software vendors and firms have come together with The Open Group to develop certification programs for architects. These certifications are designed to identify people with the skills needed to be effective in contributing to EA programs. They are currently expanding the accreditation of the program to third parties who can offer training and exams.

Another group offering certification and training programs for EA disciplines is the Federal Enterprise Architecture Certification Institute, which trains and certifies firms and individuals in the FEA framework. You can expect SAP to expand its own EA-related training offerings as it relates to creating successful skills for ESA Adoption.

Summary

This chapter described from two perspectives the role EA has on ESA adoption. First is how the many themes related to SOA and ESA dramatically affect the EA of any organization, and second, how just adopting the SAP NetWeaver platform requires change both inside and outside of the traditional SAP landscape and IT organizational boundaries.

Generally speaking, the role of EA is to balance the efficiency and effectiveness of IT against the needs of the business. The discipline of EA has evolved rapidly in the industry. There are several frameworks available that can guide the effort. However, even these classical EA approaches must adapt to the fact that ESA enables business process and strategy models to become much more dynamic.

Whether your organization uses formal EA approaches or prefers more informal, lighter weight techniques, some level of EA decision-making is required for ESA adoption. Some of the most important takeaways from this chapter are:

- SOA, Business Process Management, model-driven architectures, and user-centric computing are major technology themes that are converging. All of them have a big impact on EA.

- ESA brings all these trends together and affects EA decision-making both inside of the SAP landscape and across the organization.

- Enterprise architects must account for the changes ESA and SAP NetWeaver bring about in terms of their overall road map.

- Within the SAP landscape itself, EA skills are needed to successfully adopt SAP NetWeaver and address the many technologies and capabilities the platform offers.

- The discipline of EA is very complex. It requires a commonsense approach and attention to a number of factors that go well beyond technology to be successful.

- A number of generally accepted EA frameworks are available today. As a result, tools, training, and certification programs have evolved to help you grow your organization's EA capabilities based on best practices.

Chapter 8 looks at how to create an ESA adoption program in your organization that builds upon the principles of EA.

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2. James McGovern, Scott Ambler, et al. *The Practical Guide to Enterprise Architecture*, Prentice Hall, November 2003.
3. J. Schekkerman, *Enterprise Architecture Tool Selection Guide, v 3.0*, Institute For Enterprise Architecture Developments. January 2006. Available at `www.enterprise-architecture.info`.