

EA and SOA: Integrating Services, Governance and Strategy

By Anders Østergaard Jensen, Consultant, Leonardo Consulting

Executive Summary

Enterprise Architecture (EA) and Service Oriented Architecture (SOA) ultimately seek to provide better business value and thus increased profitability through a holistic and integrated approach to management and technology investments. The proposed idea is to view and design the enterprise architecture as composed of enterprise service building blocks. Integrating EA and SOA can lead to a increased service reuse and improved control of corporate IT spend and assets.

Foundations

There is no single, authoritative definition of SOA or EA.

Antony Reynolds has published a business-oriented definition of SOA with a focus on solving actual business problems. Reynolds writes:

“Service oriented architecture is all about enabling a business to build flexible solutions to business problems from a set of services. [...] Services are the crucial pieces of business function that are needed to run the business. These services may be provided by applications within the business, or by external suppliers.”(Reynolds, 2005)

Here, Reynolds hits the nail on the -head: by viewing the business as consisting of separate pieces, each of which provides a certain business function or process, it becomes easier to comprehend applications and systems and calculate its impact on IT spend.

Similarly, Scott Bernard has provided a business-centric definition of EA:

“The analysis and documentation of an enterprise in its current and future states from a strategy, business, and technology perspective.” (Gotze & Jensen, 2009; Bernard, 2005)

Or in other words: EA aims to link strategy, business, and technology into an integrated whole – a blueprint of the enterprise – whereas SOA strives to deliver better business performance by encapsulating business operations and applications in reusable components known as services. In the next chapter I will integrate these two concepts by **framing enterprise architecture as composed of enterprise service building blocks.**

EA and SOA: Not just Technology

It may seem paradoxical to suggest that EA and SOA are not about technology in a paper on IT. Just as good process management practice or efficient, well-aligned processes do not emerge out the blue by investing in a business process management system (BPMS) (Harmon, 2007), nor does a useful enterprise or service architecture arise from purchasing advanced enterprise application integration (EAI) technology. No tool, no matter how intelligent, service-oriented, or flexible it is, will

provide any value if the enterprise and its problems and deficiencies are not understood by the managers.

Viewing your business as a shared set of reusable services (SOA) with linkages to corporate strategy does not involve any tech-speak. It is about understanding, communicating, and improving your business in a *coherent, aligned, and measurable fashion* (Harmon, 2007). A systematic, architecture-driven approach to designing, developing, and managing an organisation in order to respond to increased competition and changing business constraints (IFIP-IFAC, 1999) is enabled by EA and SOA, but it does not necessarily include new technology.

Two Modes of Integration

This paper proposes two modes of EA and SOA integration (see Figure 1). The diagram depicts an enterprise architecture consisting of three layers – strategy, business, and technology (Bernard, 2005). The strategy layer describes all strategic initiatives. The business layer¹ describes how the strategy is realised through the actual business operations – what the enterprise does. This is expressed as a set of business processes exposed as *services*. Business services are not only IT based processed – as the BPM discipline tells us (Harmon, 2007), it may also be manual or semi-automated workflows. The common denominator is that they have a uniform interface (specifying how to use the process) and contain a certain business process (e.g. *Bill Customers* or *Process Monthly Payroll*). Finally, the technology layer describes the IT systems running the enterprise services and processes.

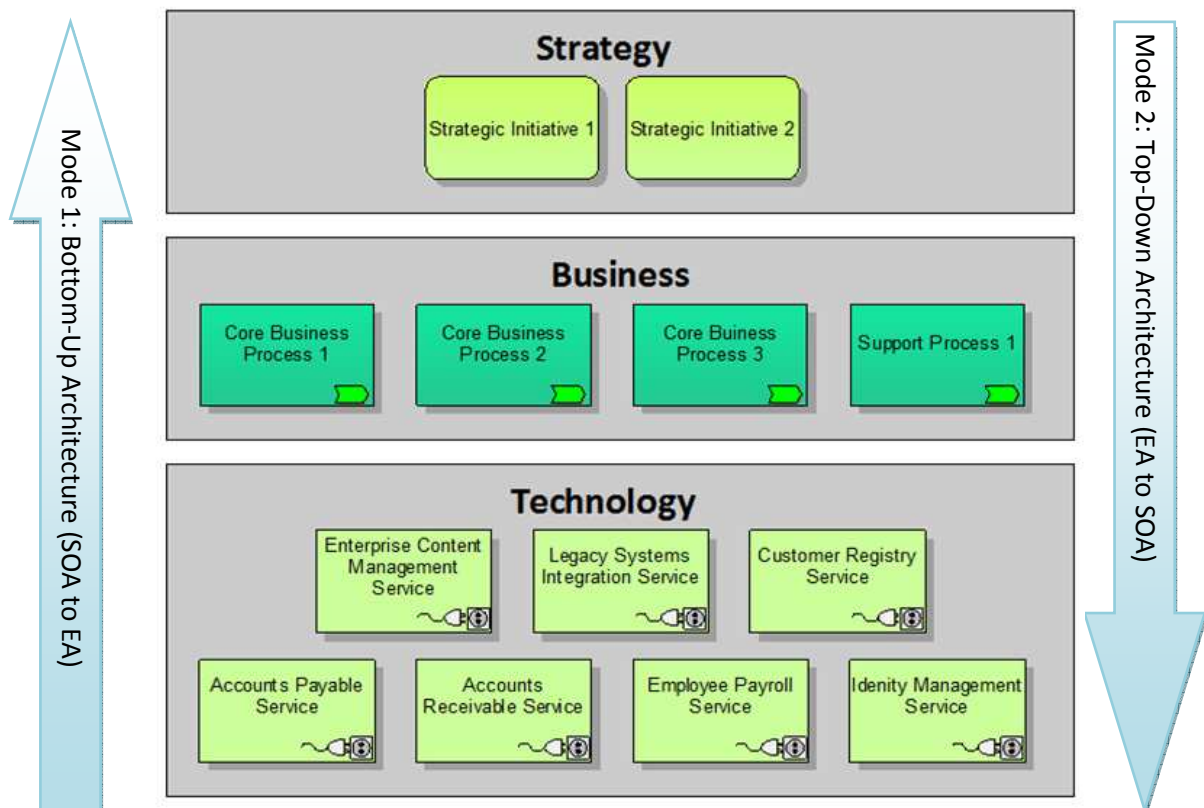


Figure 1: An architectural blueprint mapping strategy, business, and technology. The business and technology layer is composed of reusable business and IT services.

¹ This layer corresponds to the Process layer in the BPTrends BPM Pyramid.

Bottom-up Architecture: from SOA to EA

Imagine the following scenario: you are the newly employed IT architect for a large corporation. Management have decided that SOA is the future method for IT systems and integration, and you have been put in charge to make this happen. The initial step is to build a sound and coherent architecture for integrating systems; an IT landscape of all systems and services. Linking your application services to business processes means crossing the line between the technology and business layer in Figure 1, and you can start deciding which services and systems that can be consolidated or retired.

The next step is to frame and design your business processes as reusable business services with a well-defined interface. This doesn't suggest or require a major redesign effort of all processes, but some automated processes may already exist as services. The crucial point is to *view* your processes as services and determine how they link to your IT services. Ultimately, what you gain is a much better overview of the interdependency between the processes and systems, and how major business transformation will impact on the enterprise. Another major progress is that processes *and* systems can now be uniformly linked to the IT budget, which helps controlling IT spend.

As the landscape of your business and technology layers grow, its strategic relevance rises as well. Adapting the enterprise to changes in the environment is now strengthened by knowing what services and processes are available, how each service impacts on the overall operational budget, and how they can be remodelled to fit and support business transformations. Informed decisions can be made, since we will be able to predict how a major business change will affect both system or process infrastructure and financial planning. Ultimately, the SOA project has evolved from a systems integration effort to an actual decision making tool spanning from IT system through process thinking and modelling to strategic management and decision making in the board room with SOA as the overarching philosophy for structuring and designing open, reusable, agile business services and processes.

Top-Down Architecture: from EA to SOA

The right-most arrow on Figure 1 demonstrates the opposite mode of integration: from EA to SOA, from strategic management to service buses. Imagine the following scenario: you have been hired as an enterprise architect for a large transnational enterprise with multiple business units. The board of directors is confused and concerned with the annual increasing sum of IT spending, especially since several strategic IT projects have either exceeded the budget significantly or delivered solutions of unacceptable quality. Each business unit manages its own IT projects and spend, resulting in point-to-point systems integration and application silos. The CIO has chosen EA as a management framework to 1) align business operations and IT on a strategic level and 2) plan and support business transformation efforts.

As you move into the vast amount of processes and services, it requires systematic analysis to build a useful blueprint of the enterprise. Documentation and reference models should be informative and support informed decision-making. In order to prevent vendor lock-in and legacy systems, it is crucial to promote open IT standards, so that services can be refined and rebuilt to sustain competitive advantage. Finally, all layers need alignment with the overall corporate strategy through common KPI's. Here, EA provides the overarching framework for aligning all enterprise layers, whilst SOA provides the *specific* methodology for integrating systems and processes within the EA.

Departing from a top-down view, this involves three efforts:

1. Identifying and describing the end-to-end business processes and their strategic purpose (in the business layer). Each business process can be mapped into the architecture as a process service with a uniform interface.
2. Identifying, building, and integrating applications and systems services resulting in a SOA landscape. Services are in turn mapped back to 1) the relevant business processes that rely on the services and 2) the corporate strategy, so that services can be prioritised on the basis of strategic relevance (and if an application or system has no strategic justification at all, it is probably a good reason for service retirement).
3. Reorganise the systems and processes in a layered, service-oriented fashion, for instance through the use of process automation, federated service orchestration, and service buses.

In this mode, SOA is the enabler for EA: it supports organising and managing systems and processes in a coherent fashion. Ultimately, this enables transparency and linkages to corporate strategy.

The relationship between SOA and EA is presented in the diagrams below. Figure 2 shows the prototypical relationship between processes and IT systems in a non-architected enterprise. The superior processes depend on both IT systems *and* a subordinate process, which in turn depends directly on three other IT systems. Also, all IT systems are integrated using point-to-point integration with integration logic residing inside each application. The result is a tightly coupled, inflexible architecture that is difficult to understand or modify.

Figure 3 shows the same scenario after the EA/SOA combination has been applied. EA provides the management framework for organising, layering and connecting business and services, whereas SOA provides the actual tools and methods for designing processes and systems as reusable components. The architectural dependency clutter has also been substituted with a layered design. As long as the service interfaces are upheld and maintained, services can be redesigned or replaced without impacting on the rest of the architecture.

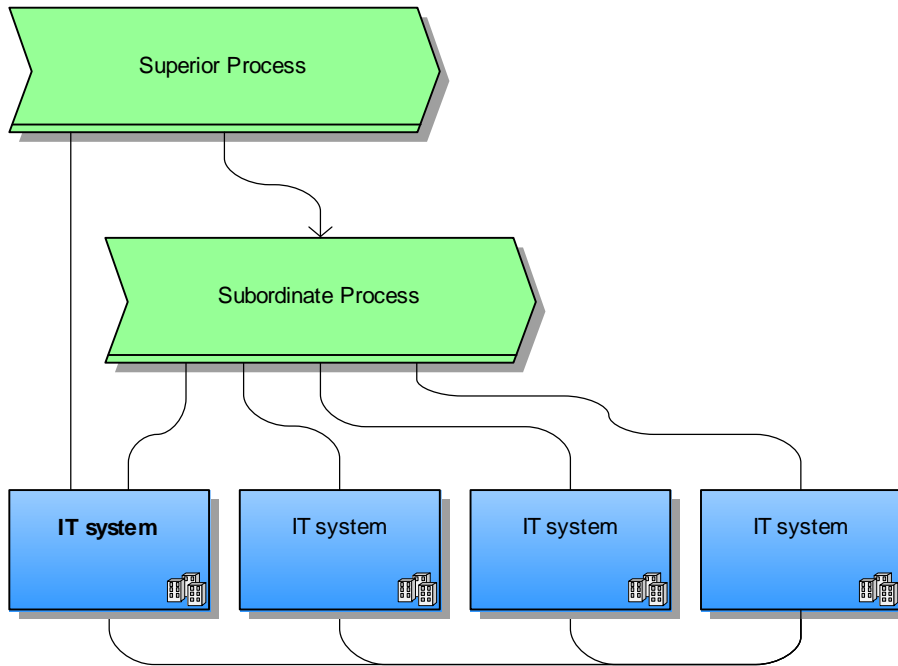


Figure 2: A prototypical unmanaged relationship between processes and IT systems (“spaghetti architecture”) prior to EA/SOA management.

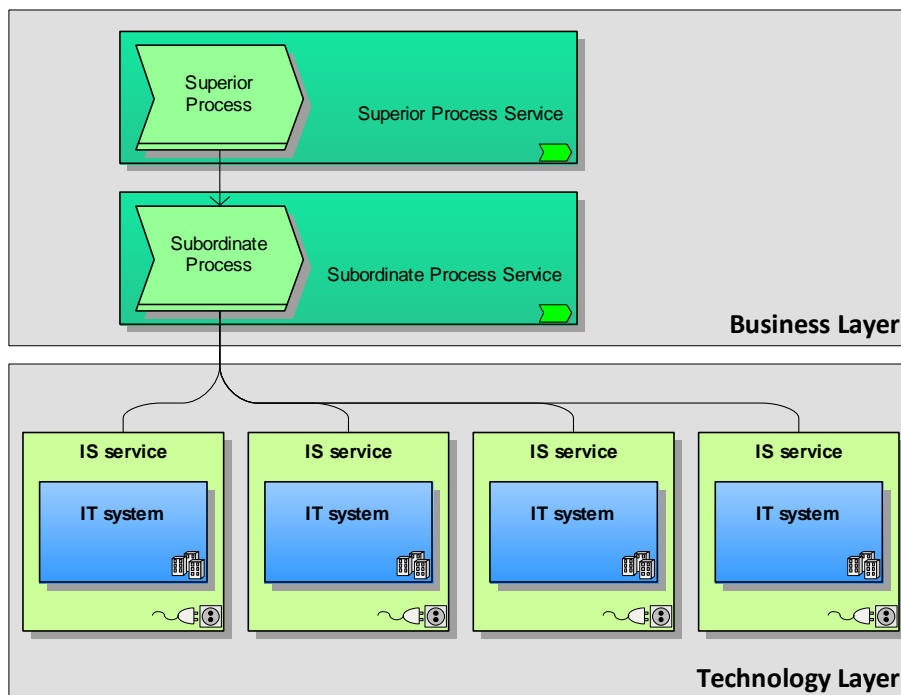


Figure 3: Capturing and modelling business processes as business services and IT systems as IS services embedded in an EA approach can lead to more flexible and coherent business operations. SOA prescribes a methodology for capturing and reusing processes and systems as services. EA provides the overall framework for systematically linking and aligning strategy, business and technology.

The Importance of Governance

As both EA and SOA can bring significant changes to an organisation (Hjort-Madsen, 2009), both disciplines demand a proper governance framework for introducing, managing and monitoring change. These changes are not only technical, but also involve to management and finance.

The Open Group (2009) has published governance guidelines for both EA and SOA, where the former is defined as

“Enterprise Architecture governance is the practice and orientation by which enterprise architectures are managed and controlled at an enterprise-wide level.”

EA governance thus represents the overarching management and control mechanism across the entire enterprise, whereas SOA governance extends the EA governance practice into the service-oriented domain (The Open Group, 2009):

“SOA Governance should be viewed as the application of Corporate Governance, IT Governance, and EA Governance to Service Oriented Architecture. In effect, SOA Governance extends IT and EA Governance ensuring that the benefits that SOA extols are met. This requires governing not only the execution aspect of SOA but also the strategic planning activities.”

Again, the importance of linking strategy, architecture and governance mechanisms into an integrated whole is stressed. For business transformation efforts involving both SOA and EA, it is crucial to have both EA and SOA governance controls in place integrated into management practice.

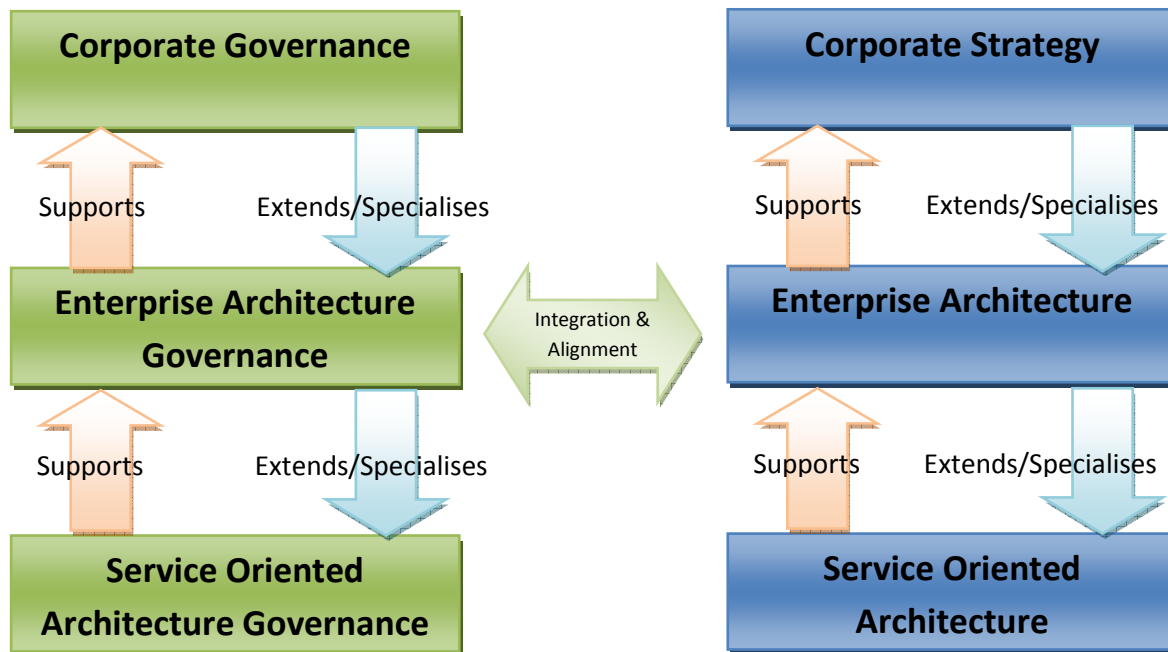


Figure 4: Defining the relationships between Corporate Governance, EA Governance and SOA Governance and its alignment with Corporate Strategy, EA, and SOA.

Figure 4 suggests an integration model of governance and architecture practice, which emphasises the need for alignment between governance and strategic-architectural decisions. EA governance supports, realises, and extends the overall corporate governance model, while SOA governance extends and specialises the EA governance into the service oriented domain. On the contrary, SOA governance supports the governance of EA, which in turn supports the corporate governance.

Finally, Figure 4 suggests the proposed relationship between strategy, EA and SOA as previously discussed. EA maps the corporate strategy into an actionable blueprint of processes and technology, which in turn is realised as business and IT services in the SOA layer. Similarly to the governance model, each layer also supports the above layer, as the development of SOA supports the EA, which in turn supports realising and achieving corporate goals and objectives.

However, this model should *not* be interpreted as separating architecture management and governance. Governance is an inherent part of architecture practice on each level of the model, and this is illustrated by the dual-headed arrow in the centre. Governance initiatives and architecture development needs alignment, just as corporate strategy demands integration with the overarching governance of the enterprise.

Recommendations for EA/SOA Integration Practice

Finally, a practical guide for integrating EA and SOA is presented in this chapter.

Practical Steps for Bottom-Up Integration (SOA to EA)

1. Evaluate the current state and maturity of the service oriented architecture.
2. Identify and gather relevant stakeholders for a strategy discussion on EA/SOA integration.
3. Establish a SOA governance framework (including methodology and controls).
4. Identify and analyse core business processes and systems that can be exposed as services.

5. Redefine and expose the identified business processes as business and IT services.
6. Ensure that corporate strategy is thoroughly defined in terms of strategic objectives and KPI's.
7. Prepare the corporate IT budget for cost integration with processes and services.
8. Link IT, business, and process services to strategic initiatives and IT budget. Ensure that relationships, ownership, and purpose are clearly documented and traced back across the architecture to systems, applications, and processes.
9. Establish an EA governance framework on the basis of the existing SOA governance framework.

Practical Steps for Top-Down Integration (EA to SOA)

1. Identify and gather relevant stakeholders for a strategy discussion on establishing the EA program, from strategy over processes, to systems and applications.
2. Design and agree on EA program including goals, scope, and budget.
3. Establish an EA governance framework (including methodology and controls).
4. Ensure that corporate strategy is thoroughly defined in terms of strategic objectives and KPI's.
5. Prepare the corporate IT budget for cost integration with processes and services.
6. Identify all business processes that can be exposed as services.
7. Identify all systems and applications that can be exposed as services.
8. Redefine and expose the identified business processes and IT systems as business and IT services. Ensure that relationships, ownership, and purpose are clearly documented and traced back across the architecture to systems, applications, and processes.
9. Establish a SOA governance framework as a service domain-specific extension to the EA governance framework.

About the Author

Anders Østergaard Jensen is a consultant and Enterprise Architecture professional with Leonardo Consulting in Sydney, Australia. Leonardo Consulting specialises in delivering EA, BPM and SOA services to corporate and government clients in different industries. Anders is currently finishing his thesis on developing enterprise architecture into a strategic management discipline. He is also a researcher with the academic Working Group 5.12 'Architectures for Enterprise Integration' as part of the International Federation for Information Processing ICEIMT conference series on next generation EA.

Anders can be contacted at a.jensen@leonardo.com.au or by tel. +61 424 136 139.

References

Bernard, S. A. (2005). An Introduction to Enterprise Architecture (2nd Ed.). Falls Church, VA: Authorhouse.

Gotze, J., Jensen, A. Ø. (2009). Management Enabled by Enterprise Architecture: A Systemic Approach. Presentation given on ICEIMT Conference 2009, Bled, Slovenia.

Harmon, P. (2007). Business process change (2nd ed.). Morgan Kaufmann Publishers.

Hjort-Madsen, K. (2009). Architecting Government: Understanding Enterprise Architecture Adoption in the Public Sector. PhD doctorate.

IFIP-IFAC. (1999). GERAM: Generalised Enterprise Reference Architecture and Methodology version 1.6.3.

Organization for the Advancement of Structured Information Standards (2006). OASIS Reference Model for Service Oriented Architecture 1.0. Oct. 12, 2006. <http://docs.oasis-open.org/soa-rm/v1.0/soa-rm.pdf> (accessed on May 25 2010).

The Open Group (2009): SOA Governance Framework v2.4. https://www.opengroup.org/projects/soa-governance/uploads/40/19263/SOA_Governance_Architecture_v2.4.pdf (accessed on June 11 2010).

Reynolds, A. (2005). What is SOA? Blog entry on June 28 2005. http://blogs.oracle.com/reynolds/2005/06/what_is_soa.html (accessed on May 25 2010).