EA and enterprise SOA: Relationship – Part 2

Applies to:
Enterprise Architecture (EA) and Enterprise Services Oriented Architecture.

Summary
This is the second part in the two part article, where we look into the Services modeling methods prescribed by SAP EAF and enterprise SOA based approach and how they complement each other.

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Executive Summary

In Part 1 of this article, we looked at the background of EA and enterprise SOA and the relationship between these two key SAP initiatives. In this part, we will look into the Services modeling exercise prescribed by two complementary approaches provided by SAP namely, Enterprise Architecture discipline (utilizing SAP EA Framework) and Enterprise Services Oriented Architecture.

Background

It is important to note that this article neither goes into the details of SAP EAF modeling nor enterprise SOA Services modeling, but only identifies the touch points between the two approaches. The objective is to highlight the complementary nature of EA Framework & enterprise SOA methodology and how the two approaches can be synthesized and employed to address customer’s needs effectively. To obtain details of the methods, please see “Related Content” section for details.

EA Based Approach

Enterprise Architecture facilitates the understanding of the entire enterprise by analyzing both the architectural and non-architectural elements of an enterprise. Gartner Research(1), defines Enterprise Architecture as “the process of describing, and the description of, the desired future state of an organization's business process, technology and information to best support the organization's business strategy”. Therefore the primary output of developing enterprise architecture is to establish a roadmap to transform from a current state to a future state by defining

- a set of initiatives
- the priority & sequence of execution of those initiatives
- the necessary governance during the implementation of those initiatives

SAP EA Framework (EAF) provides a well defined process with a structured approach to define the business context that forms the basis for the subsequent development of the Enterprise Architecture. SAP EAF also offers a structured and easily traceable representation of how enterprise’s business processes & its various architectural assets support the enterprise’s vision and strategy.

One of the main components of SAP EAF is an Architecture Development Method (ADM), depicted in figure 1.0 below, which is patterned on TOGAF ADM and is made up of multiple phases organized in four different iteration cycles. The Architecture Context iteration deals with the initial mobilization of architecture activity by establishing the architecture approach, principles, scope and vision. In the context iteration, one of the key artifacts is the definition of Architecture Vision which includes analyzing the enterprise’s business & technology capability and defining the target Operating Model for the business. The next iteration, Architecture Development, addresses the creation of architecture content by cycling through Business, Information Systems and Technology architecture phases.
The Architecture definition iteration comprise distinct phases B, C & D for business, information system and technology architectures. Within the business architecture phase, EAF defines key terms such as Function, Service and Process. These three business entities can be considered to represent a continuum with clear distinctions described as follows.

On one end of the continuum, Functions deliver business capabilities closely aligned to an organization, but not explicitly governed by the organization. Services support functions, encapsulate functions, have an explicit interface, a defined boundary and can be governed. On the other end of the continuum, Process represents the flow of functions or services. All these three entities can be decomposed into their sub-level entities to enable better analysis of the enterprise.

What is a Business Service? - A business service in simple terms represents what an enterprise does. It characterizes a unit of business capability supported by a combination of people, process and/or technology. A business service may be internal to the business, exposed externally to a customer, partner, supplier etc. or may be something that the business consumes from an external party. A business service may be

- Fulfilled by manual processes, or may be fully automated
- Fulfilled within an organization, or outsourced to a partner
- Exposed to any combination of employees, customers, partners and suppliers
- Fulfilled at the point of use, at a divisional level, or as a corporate competency center
How to Model Business Services – EAF Method

Within the Business Architecture Phase, SAP EAF prescribes the development of business architecture with a top-down approach utilizing structured modeling and well-proven hierarchical decomposition techniques to decompose business functions and processes. In addition, the framework also prescribes defining the boundaries of a Service and setting its granularity to facilitate its effective governance. In other words, the focus is to define the business services without emphasizing on how they will be fulfilled or consumed within the enterprise. The overarching purpose of this modeling is to identify business capabilities and express them in terms of business services thereby facilitating the representation of the enterprise as “Service-Oriented Enterprise”.

The business services thus defined can be realized or fulfilled by a combination of People, Process and Information Systems that provide enterprise services or web services built using SOA architectural style. In theory any function or a process can be defined as a business service. At the highest level an enterprise can be considered as made up of macro level functions which comprises of multiple end to end business processes or business services. Each of these functions or business processes can be further decomposed and can be thought of orchestrating lower level Services and/or processes.

The granularity of business services is dependent on the focus and emphasis of the business, as reflected in its drivers, goals and objectives. Hence, the decomposition is not solely driven by business functionality but also considers other non-functional characteristics of the business such as security, availability, latency and loose coupling of these Services.

The structured approach prescribed in SAP EAF will help identify and define business services that

- Facilitate re-use of the Service within the enterprise
- Determine how these Services need to be fulfilled thereby enabling their sourcing decisions (in-source or out-source)
- Enable defining common capabilities across the enterprise as “Shared Services”

In addition to the overall modeling of business architecture, this phase also requires creating a set of catalogs, matrices and views. Among them “Goal/Objective/Service view, “Process catalog” and “Business Interaction matrix” enhance the enterprise SOA based Services modeling approach. The relevance of each one of these deliverables is briefly explained below.

- Goal/Objective/Service View - Defines ways in which a business service contributes to similar aspects of business performance and also to the achievement of a business vision or strategy.
- Process catalog – Provides a hierarchy of processes, events that trigger processes, outputs from processes and controls applied to the execution of processes.
- Business interaction” Matrix – Depicts the relationship between consuming and providing business services.

Following the Phase B, the next phase in SAP EAF is the “Information System Architecture” covering both application and data architectures. Similar to Phase B, this phase also requires developing an overall model of the enterprise’s application architecture and prescribes the development of a set of matrices depicting the relationships between applications and business service, applications to business functions and application to business process respectively across the enterprise. This ensures that applications in the landscape are clearly identified and mapped to the business services/processes they support. This is very critical in step 2 of enterprise SOA modeling approach.

Enterprise SOA Based Approach

Much like EAF being a collection of methods, methodologies, techniques and tools, SAP enterprise SOA is also a process, rather than a product, with its own set of methods and methodologies. In this section, let us
look at the enterprise SOA based approach and focus on two methods offered by SAP Consulting. The first is an overarching methodology to develop an enterprise SOA Roadmap for a specific customer; the second one is the “Services modeling, design and Implementation” method which can be thought as another method within the overall Roadmap methodology.

Enterprise SOA Roadmap development is a 5 step method starting with conducting an enterprise SOA Pulse Check to developing detailed Recommendations for transforming customer’s current architecture to be enterprise SOA compliant. Following the initial Pulse Check, two subsequent steps include the following

- Defining enterprise SOA relevant scenarios – This step comprises of in depth analysis of the processes to identify which ones have high potential for Service enablement and followed by a detailed analysis to identify the Services that cover specific segments of the overall process.
- Building enterprise SOA based Architecture – This step includes mapping business processes and Services, identified in the previous step, to the application architecture and building out the “to-be” application architecture.

How to Model Services – enterprise SOA Method

Once the potential processes that are relevant for enterprise SOA scenario and Service enablement are identified, the modeling method in enterprise SOA based approach prescribes a top-down method to identify all the Services from a “consumer” perspective. The key activities in this modeling approach are as follows;

1. Identify the Services from the “consumer” viewpoint agnostic to the availability of the service within the enterprise.
2. Identify backend application or process components from the “provider” viewpoint that will deliver the Services identified in step 1.
3. Allocate Services identified in step 1, to the application or process components identified in step 2.
4. Determine how to implement and fulfill the Service, “buy” or “build”

If the decision from step 4 is to buy the Service from SAP, then the customer can select from a few hundred Enterprise Services already published by SAP. Or alternatively communicate the specifications of the Service to the SAP Enterprise Services (ES) community who can develop the service and make it available as a productized service. If the decision is to build the Service, then the enterprise SOA modeling approach provides a detailed approach to (i) design those services starting from how to define the process component, the business objects and extend the global data types that meet the specific requirements of the Service and (ii) implement & deploy those Services.

Conclusion

Both EAF and enterprise SOA based approaches attempt to align business with IT and in a way represent a blueprint to the future state of the enterprise or a specific segment of it. SAP EAF can serve as an organizing logic, produces a strategic architecture that will help the enterprise transform to the desired target state and in turn can guide the development of enterprise SOA roadmap. At a high level, EA architecture models prescribed within EAF will establish a clear traceability of the enterprise’s architectural assets to its business goals, objectives & strategy.

During the development of EA, the artifacts produced

- Provide a better structure and context for the architects to work with
- Facilitate a better understanding about the relationships among various architectural assets of the enterprise namely (i) business processes (ii) applications that automate those processes (iii) data entities that are exchanged between the application components and (iv) finally the technology that support the deployment of those application components
This better understanding can serve as good basis to carry out enterprise SOA modeling and eventually the development of enterprise SOA roadmaps. It is very important to align the approaches of EA & enterprise SOA on a common path and clearly understand when to employ the specific modeling effort. Also it is critically important to correlate EA and enterprise SOA such that redundancy in the work effort across the enterprise eliminated.

Related Content

1. Gartner Research
2. Enterprise Services - How to guide
3. SAP EA Framework (available free of licensing fee from SAP Roadmap Composer or SAP Solution Manager).