SOA Governance – Management of Opportunities and Risks

SERVICE-ORIENTED ARCHITECTURES ARE AN EMERGING PARADIGM, BUT THE MANAGEMENT IMPLICATIONS ARE NOT WELL UNDERSTOOD.

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SOA as a new architectural Paradigm

The global economic environment of today is confronting companies with market conditions of so far unknown dynamic change. A critical success factor for staying competitive is the ability to react quickly, flexibly, and efficiently. Strategic alignment and adaptive business processes are key requirements to achieve a short "time to market". Further pressure is applied by the need to integrate more and more external

Figure 1: SOA Governance

partners into the value chain. We expect this new economic environment to introduce substantial change also to business models of companies doing software production and software allocation. This will allow new service sourcing models.

Obviously, cost efficient and flexible modifications of business processes can only be achieved by an adaptive IT-architecture. However, the IT-environment in industrial enterprises and in the public sector is far away from being able to respond to these demands. A typical IT landscape of today consists of application blocks which are more or less connected to each other. The resulting application systems are fairly fixed structures and do not allow for the flexibility needed in future.

Opportunities

A Service-oriented Architecture (SOA) is offering a favorable exit strategy. SOAs are based on services as basic elements for developing applications/solutions. Services itself are self-describing, platform independent computational elements that support rapid, low-cost

composition of distributed applications and processes. A SOA is characterized by a component like composition of reusable services forming repeatable steps in business processes. To achieve more flexibility, services can be replaced by other services at runtime.

SOAs promise a variety of advantages:

- The combination of services facilitates an easy creation of new products supporting business processes and an easy modification of existing processes.
- The reusability of services in various contexts offers economic advantages (e.g. cost savings and protection of investment).
- Business processes may composed out of internally available and/or externally offered services. Sourcing decisions now can be made on that level with a much finer granularity.
- The SOA paradigm with its underlying independent architectural concept offers a flexible combination of several solutions offered by different providers.
- Furthermore, SOA allows the successive migration from contemporary monolithic application software systems to a highly modular pool of services.

Challenges and Risks

The realization of these advantages comes along with an increase of complexity due to new requirements and changed responsibilities of the IT-department. Development and operation of applications will not longer be the centre of IT-departments work. Instead, a holistic management of services (technology, pro-

cesses and organization) in conjunction with the management of business processes replaces the aforementioned tasks.

The management of services features both, a technical dimension and a business dimension. Each single service and each service composition has to be managed with regard to a variety of functional and non-functional requirements (e.g. business-orientation, value contribution, compliance, availability, efficiency, integrity, and confidentiality).

We expect a SOA to comprise a relative large number of services in different stages of their individual life cycle. An increase in complexity should also be expected if sourcing services from different internal or external suppliers applying different Service Level Agreements for services and suppliers.

Obviously, SOA is introducing a paradigm shift in production, procurement, and usage of software. Required investments are significant and have to be justified by sound business cases throughout the industry. Computational models for analyzing value contributions of services are still in an early stage.

SOA's impact goes far beyond the user side. The business models of software developers and service providers will also experience a dramatic change. Users respectively their IT departments will no longer buy software systems, applications or new releases. Rather they will demand a certain type and number of services which are running on an internal system or on external systems provided by specialized service providers.

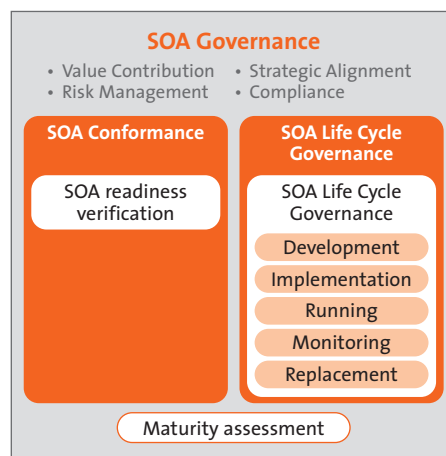These new operating environments ask for considering the related risks.

Maturity Level	Characteristics		
	Technology	Processes	Organization
1 SOA-Initial Knowledge build up on an individual basis.	SOA knowledge build-up is in progress.	SOA knowledge available via individual competence and engagement of experts.	No SOA specific organizational occurrence.
2 SOA-Managed Strategic SOA direction defined.	**SOA Conformance** SOA Readiness Check executed • SOA Conformance (current/future) checked • SOA planned	**SOA Conformance** Modeling of business processes with service components implemented. First reusable processes implemented on a project basis.	**SOA Conformance** • Strategic implications (SWOT) of a SOA implementation are analyzed (SOA Readiness). • Responsibilities for planning and integration are assigned. • Alignment (requirements, prioritization) with business areas is established.
3 SOA-Defined Management of processes and operational processes standardized.	**SOA Conformance** SOA implemented	**SOA Conformance** Modeling, documentation, and implementation of business processes based on SOA components across business areas and organizational units.	**SOA Life Cycle Management** Responsibilities assigned for • Governance • Operations and maintenance • Planning and development • Purchasing and sourcing • Monitoring of service supply/delivery (e.g. based on SLAs)
4 SOA-Quantitatively Managed Performance monitored and managed.	**SOA Conformance** • Monitoring • Performance measurement	**SOA Life Cycle Management** SOA framework and service components are systematically and proactively managed across individual service life cycles.	**SOA Life Cycle Management** Performance metrics defined. Business processes and service components monitored (e.g. performance, alignment, risk, and compliance).
5 SOA-Optimizing Continuous improvement process.	**SOA Life Cycle Management** SOA (performance, alignment, risk, compliance) integrated into continuously improvement process.	**SOA Life Cycle Management** Systematic approach established for identifying new requirements and detecting gaps (with respect to service components and their interrelationship within and across business processes).	**SOA Life Cycle Management** Responsibilities and accountability measures assigned and defined.

Figure 2: SOA Maturity Model (SOAMM)

SOA Governance:
Requirements and Research Issues

We choose the term "SOA Governance" to point out the new challenges and requirements in management. As the term "IT-Governance" reveals an extended responsibility (in comparison with "IT-Management"), "SOA Governance" comprises all activities dealing with the introduction, usage, and retirement of services in an enterprise. This broader perspective also incorporates aspects as strategic alignment, value contribution and compliance. We distinguish two major subject areas of SOA Governance, "SOA Conformance" on the one hand and "SOA Life Cycle Governance" on the other hand (Figure 1):

• *SOA Conformance* deals with the verification of the readiness of an organization to implement SOA. The objective is to verify the maturity of enterprises with respect to organizational, procedural, and technical issues.

• *SOA Life Cycle Governance* aims at the efficient and effective operation of a SOA. It covers the whole service life cycle that is develop, implement, run, monitor, and replace/retire services.

Both tasks include, among others, an exercise to analyze the organization maturity with respect to SOA.

Goals of Governance

To structure the main goals of a SOA Governance we map the focus areas of the CObIT 4.0 Framework for IT-Governance, thereby anticipating Governance requirements of SOA. CObIT provides a framework to analyze alignment, value contribution, risk management, and effective usage of resources by relating the tasks of an IT Organization to generic IT processes. We interpret these tasks in the context of SOA Governance as follows:

• Value delivery focuses on the value proposition of each service throughout the life cycle, ensuring that services support business goals.

• Strategic alignment should ensure that services and the whole SOA are in line with business strategies and goals.

• Management of resources deals with the optimal investment and management of IT-resources relevant to a SOA (services, information, infrastructure, and people).

• Risk management in SOA Governance is the understanding of the "risk appetite" of an enterprise and the implementation of strategies for risk avoidance and risk reduction. Given the comparable high degree of complexity of a SOA, risk management is becoming a potentially stronger challenge, too. In this context, compliance und regulative issues also have to be considered.

• Performance management focuses on measuring and optimizing the contribution of services to the goals of a specific business process and by that to the business goals of the enterprise.

SOA Maturity

The SOA Maturity Model (SOAMM) is based on the main ideas of the Capability Maturity Model Integration (CMMI) of SEI. We distinguish five stages of maturity and three main categories. These categories are to capture the main building blocks of existing business architecture and/or a SOA already in place. The SOA Maturity Model, proposed by us (see Figure 2), supports the introduction of a SOA in both stages, the SOA Conformance analysis and the SOA Life Cycle Management. Profiled characteristics for technology, processes, and technology for each stage provide a holistic insight of the situation an organization finds itself regarding SOA. SOA Life Cycle Management starts with organizational matters, progresses to business processes and finally becomes a technological issue. For organizations, this approach helps to avoid significant risks in case an introduced technology hits an unprepared organization.

References

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