

# Governance for Service-oriented Architectures: An Implementation Approach

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**Abstract.** As a matter of fact, SOA-based systems have a huge internal complexity due to plenty of services. On the one hand, this complexity enables and strongly supports the flexible alignment of the enterprise architecture with business processes. On the other hand, it requires a special management and control framework – provided by SOA Governance. For IT Governance, many accepted approaches exist. In many aspects they provide guidance for SOA Governance frameworks. However, in SOA-specific fields like cross-company cooperation or service life cycle management, IT Governance approaches lack applicability. In this short paper, we compare existing SOA Governance models and present an implementation approach.

## 1 Research Problem

Nowadays, companies face constantly changing market conditions, new competitive threats, and new legal regulations. The Service-oriented Architectures (SOA) paradigm provides a promising way to address these challenges at the level of the company's IT infrastructure. It supports flexible and modular modelling of business processes in the IT. Numerous independent and loosely coupled software artefacts can be reused and smoothly combined to form business processes [1]. However, the resulting complexity needs a guiding and regulating policy framework – SOA Governance – that ensures operability as well as conformance to internal, legal, and normative regulations such as, e.g., the Sarbanes Oxley Act. Approaches for IT Governance, e.g., COBIT [2] or ITIL[3], support the design of a governance model for SOA, however, they cannot be completely adopted. Our idea is to develop a SOA Governance framework aligned to the requirements and characteristics of the TEXO platform. This comprises the theoretical background as well as a first implementation – a TEXO Governance Cockpit.

## 2 Related Work

In the research area of SOA Governance, apart from whitepaper publications, few scientific publications can be found. Hence, neither a common definition of SOA

<i>Legend</i> ○ – integrated ● – integrated and specified in detail × – not integrated	Organizational changes	SOA Maturity Model	Specific Roles/ Accountabilities	Best practices	Metrics model	Impact on behavior	SOA Life Cycle	SOA Roadmap	Policy Catalog	Service Life Cycle
Brauer/Kline	×	○	×	×	×	×	×	●	●	●
Bieberstein	●	×	●	●	○	●	×	●	○	×
WebMethods	○	○	×	○	×	×	●	×	●	○
Software AG	●	●	●	●	×	×	×	●	●	●
BEA Systems	×	×	×	×	×	×	●	×	○	●
SAP AG	●	×	×	×	○	×	×	×	●	○
Oracle	●	○	●	●	○	○	●	×	●	○
IBM	○	×	○	●	○	×	●	×	×	●
Marks/Bell	●	×	●	●	●	●	●	○	●	○
Schelp/Stutz	●	×	●	×	×	×	○	×	○	×
Weill/Ross	●	×	●	×	●	●	×	×	○	×

**Fig. 1.** Comparison of SOA Governance approaches (cf. [18])

Governance nor commonly accepted models for SOA Governance frameworks have been defined. An overview of the common concepts of SOA Governance is given in [4].

Several software companies propose different perspectives on SOA Governance, including, e.g., SOA maturity models or service lifecycle management. Ten of the most relevant ones [5–17] are presented and compared in [18] (cf. Fig. 1). The comparison criteria are elements often found as components of SOA Governance frameworks. The last entry shows the IT Governance approach by Weill and Ross [19].

Clearly, the approaches differ by definition and scope. Methods used may be defined differently and comprise different aspects, depending on the single approach. Concerning the scope, the approach by Software AG [8] and the model by Marks/Bell [16] are the most comprehensive ones, while others like Schelp and Stutz [17] or BEA Systems [9] dig deeper into single aspects.

The most frequently mentioned methods to cope with SOA peculiarities in a SOA Governance framework are the particular consideration of the *service lifecycle*, a specific *policy catalog* and *organizational changes*. While the latter is also part of common IT Governance frameworks, the first aspects are typical for SOA Governance approaches. Furthermore, *specific roles and accountabilities*, *best practices*, and a *SOA Lifecycle* are considered important for SOA Governance by most of the investigated models.

Concluding, we see that a number of different perspectives on governance for SOAs exist as well as different ways of realization. However, this survey provides a useful foundation to construct a high level view on SOA Governance.

### 3 Contributions

Based on this comparison, we propose a generic SOA Governance model [18]. It comprises a policy framework, organizational entities, a metrics system, and a catalog of best practices. A SOA Maturity Model as proposed in [21–26] provides the organizational entities with information and feedback concerning the SOA adaptation. These adjust the sets of policies, according to best practice recommendations, to the current needs of the system. Thus, a closed loop governance is established.

Currently, research focuses on modelling governance frameworks as semantic networks. We plan to adjust a concrete implementation of the SOA Governance Model described in [18] to the requirements of the TEXO platform. It is intended to develop a semantic network that represents the coherences and relations within our model, including activities, processes, responsibilities, metrics, and best practices. The combination of a user interface, the semantic governance model for SOA, and the possibility to instantiate this model for usage in practice will form a TEXO Governance Cockpit.

### 4 Future Work

Future contributions will deal with the question how to efficiently provide governance for SOA systems in general. We divide this area into three different parts. A “high level governance” perspective will cope with the generic modelling of governance approaches. Crucial elements of governance models as well as ways to implement them are identified. This is the current focus of our research.

At an “intermediary layer” of governance, we investigate the applicability of alternative paradigms in order to provide SOA Governance, e.g., the potential deployment of multi agent systems.

The “low level” governance addresses policy modelling and automatic policy enforcement. It represents the link to the underlying monitoring layer. The availability of appropriate data as input to decision making is a basic requirement for successful governance. Hence, monitoring data is a valuable input to governance models. In [20] we describe an agent-based monitoring approach.

### Disclaimer

The project was funded by means of the German Federal Ministry of Economy and Technology under the promotional reference 01MQ07012. The authors take the responsibility for the contents.

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