

Research Report

Readiness and Maturity of Service-oriented Architectures in the German Banking Industry – A Multi-Participant Case Study

SOA REMAINS AN IMPORTANT AND CURRENT TOPIC, BUT THE AMOUNT OF SERVICE-BASED PROCESSES IN GERMAN BANKS VARIES. IN THIS CASE STUDY, FOUR GERMAN BANKS ARE EXAMINED IN ORDER TO DETERMINE THE STATUS QUO OF THEIR SOA READINESS AND MATURITY AND TO COMPARE THE FINDINGS.

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Introduction

Service-oriented Architectures (SOAs) have emerged as a major topic in various kinds of businesses. The suspicion that SOA just represents a hype, could not be verified and the topic remains important and current. In addition to its many advantages, the SOA paradigm poses significant functional and technological challenges, i.e., the assessment and reduction of issues during the adoption of a SOA in an organization (Bieberstein et al., 2008). Thus, measuring both the readiness for implementing a SOA and the maturity of existing SOA solutions becomes a crucial point.

In order to evaluate the importance of SOA for

the banking industry, the E-Finance Lab in cooperation with IBM Global Business Services GmbH has conducted a case study regarding SOA readiness and maturity in German banks.

The three major research questions in the case study were determined as follows:

1. How are SOA adoptions in the German banking industry realized?
2. How appropriate are SOA operations in the German banking industry?
3. Which consequences does the adoption of SOA imply during mergers and acquisitions (M&A)?

In the following, major findings of the case study will be presented.

Organization of the Study

The study is based on the results of personal interviews with four Chief IT architects. Questionnaires have been created which could be used as guidelines during the interviews.

Figure 1 shows how the interview results were evaluated, which consists of the interview analysis, key aspect identification, case composition, and the findings evaluation. This last activity comprises the development of new propositions derived from the previous findings, which facilitates the development of new perceptions on the SOA topic. Therefore, this may trigger a reaction on both theoretical foundations and current focus areas.

Case Study Findings

Although the number of already implemented services and SOA-supported processes varies, the findings of the different cases are not contradictory to each other, but the single cases complement one another. Therefore, it is possible to give a generalized overview of the SOA maturity and readiness of the German banking industry, which is presented in the following.

SOA Adoption – The first aspect under investigation is *SOA Adoption*. An initial finding is that the basic technical platform has already been developed for each bank. However, only few processes are completely implemented using services. Instead, services are often implemented as single, separate “islands”, where

communication is restricted to some legacy applications which are enhanced by service functionalities. In addition, services are mostly used in parts of the architecture intended for interaction with the customer, i.e., supporting sales processes with service-based web applications.

The general motivation for implementing a SOA was always driven by the bank itself and not by external consultants or vendors. However, in the actual SOA implementation phase, external consultants have often been involved.

Differences emerge with regard to both the Enterprise Service Bus (ESB) and the Service Registry. Only one of the interviewed institutions can offer both of them, while the others cannot. This is exactly the institution which integrated an off-the-shelf-product. In contrast to that, the SOAs of the other banks are self-developed solutions.

When buying standard SOA technology, the ESB and the Service Registry are mostly included. By contrast, in self-developed SOAs, the development objective is rather the creation and enhancement of single services than the implementation of appropriate tools for organizations. Therefore, often no standard-based ESB is available in self-developed SOAs and the services are mostly organized in simple sheets, e.g., using MS-Excel. However, all technical issues could be solved appropriately.

Another important aspect is the conformance of processes. Our study shows that process

documentations have partially been created. However, a holistic process documentation – triggered by the SOA adoption – has never been made. Documentation was created for single projects or single divisions only.

With regard to the organization, only in one case the entire organization has been involved in the SOA implementation, so that each employee could gain the required SOA awareness. In the three other cases, only the divisions of the banks responsible for SOA adoption were involved, while SOA awareness of other employees – which are potential end-users – is missing. In these cases, SOA is regarded as a technical topic only.

SOA Operations – The second focus of our research is on already established SOAs, which is the so-called *SOA Operations* phase. Since SOA adoption in the examined German banks is nearly completed, the next step is to check the SOA Life Cycle Management as well as competitive advantages and challenges.

In order to guarantee a high level of security, external services are used only for special cases like SCHUFA requests. However, in all other cases, if an external service is involved, the provider is also part of the bank group or the service is specified together with the provider. A registry based on the common UDDI-standard is used in none of the cases while also no services are included in a flexible and loosely coupled manner.

Although none of the interviewees assumes that SOA represents a general security issue,

they state that it must be ensured that the used SOA does not lead to any security issues as it evolves. According to the interviewees, keeping track of security issues as the SOA grows is critical. Further issues are the poor reusability of services, the change to newer versions, and low performance of services in the core banking functionality. Performance monitoring is seen by the interviewees as an appropriate method to check and enhance the value of the SOA. However, in practice this is done rarely since either no monitoring components exist or they are not in use yet. Reusability is almost always the only metric which exists in a SOA and which is measured.

Another objective was to investigate competitive advantages. Concerning this matter an often mentioned argument is that SOA makes the outsourcing of processes easier. In fact, all interviewed banks agreed on this argument. As explained by one of the participating banks, process orientation is a key objective for adopting SOA, thus, process outsourcing represents rather a requirement than solely an advantage. Another bank could already achieve a reduction of complexity due to the outsourcing of SOA-supported processes. In spite of its high potential, process outsourcing with SOA is used to a low extend in practice. The most important issue in this context is the coordination and the definition of standardized services in the banking industry, which are actually accepted by all German banks.

All in all, in the initial phases, a SOA incurs a lot of costs, thus, SOA should be seen as an investment for the long-term. Since the observed SOAs

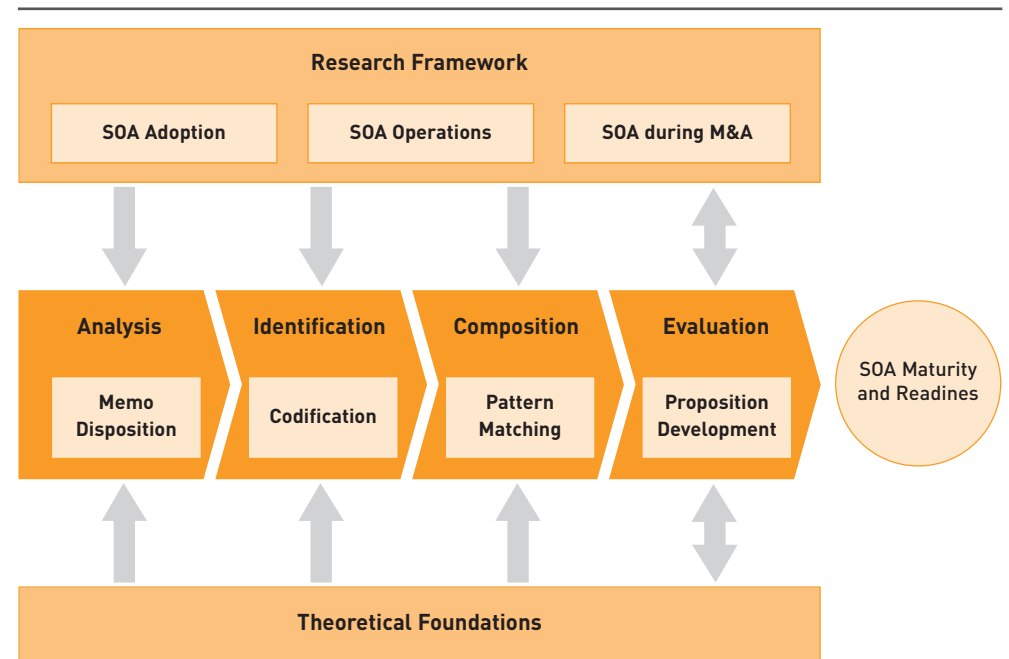


Figure 1: Evaluation Process

have not been in operation long enough, competitive advantages could not be proven yet.

SOA during M&A phases – The third focus of our research is *SOA during M&A phases*. The investigation has shown that the motivation for involving SOAs during such phases is almost always driven by aspects of cost reduction. Especially, when both the buyer and the acquired company can offer a well established SOA, the actual conduction of the M&A becomes easier from a technical perspective and the cost reduction becomes significant.

An often mentioned motivation for SOA adop-

tion is that in phases of M&A a best-of-breed approach can be used. However, such an approach was used by none of the interviewed banks. The interviewees argue that it is too difficult, time-consuming, and expensive in practice to decide which of the available services offers the highest value contribution. Additionally, the already existing services ensure a higher level of compatibility to the existing architecture of the buyer than the others. Often, these issues result in choosing poorer services instead of superior ones.

Currently, the observed German banks prefer to keep only the architecture of the buyer and

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SOA-State	B1	T	O	P	B2	T	O	P	B3	T	O	P	B4	T	O	P
Initial	1	+	+	+	1	+	+	+	1	+	+	+	1	+	+	+
Managed	2	+	+	+	2	+	+	+	2	+	+	+	2	+	+	+
Defined	3	+	0	0	3	+	0	0	3	+	+	0	3	+	0	0
Quantitatively Defined	4	0	-	-	4	0	-	-	4	0	0	-	4	0	-	-
Optimizing	5	-	-	0	5	-	-	-	5	-	-	-	5	-	-	-

+ = Already achieved
0 = In progress
- = Not achievable soon

Table 1: SOA TOP-View (TOP = Technical, Organizational, and Procedural Aspects)

to import all required data of the IT architecture from the acquired company. As a consequence, most parts of the IT architecture from the acquired company will be discarded.

While no best-of-breed approach is used in practice, a SOA could offer some other advantages in M&A phases. Prior to the M&A phase, organizing the SOA adoption results in a good high-level overview of the bank's IT architecture. The interviewees argue that this overview enables the bank to make decisions easier regarding the merger of both IT architectures. However, this advantage is just a subjective perception of the interviewees and could not be quantified in practice.

Determination of the SOA Maturity Level

To sum up the findings of the case study and to offer a high-level overview, the SOAs of the investigated German banks have been rated

using the SOA Maturity Model from Johannsen and Goeken (2007).

Table 1 depicts the results of the maturity levels visualized as SOA TOP-Views (*Technical, Organizational, and Procedural Aspects*). This kind of visualization enables the reader to get a quick high-level overview of the SOA maturity in the examined German banks. The rows are very similar to the common Capability Maturity Model Integration (CMMI) model. "Initial" means that no SOA exists. In level "Managed" some processes are already implemented in a service-oriented way. The SOA is "Defined" as soon as the entire enterprise is covered by the SOA. "Quantitatively Defined" means that performance measuring tools are commonly integrated and used. Finally, when the level "Optimizing" is achieved, the SOA is getting refined continuously.

Fields containing a plus (+) display already achieved levels, fields marked with a zero (0) denote levels which are not yet achieved, since they are still in progress, and the sign minus (-) means that this level of maturity probably cannot be achieved in the short-term.

The results from the investigated banks are very similar to each other. Although the technical aspect can always offer the highest level of maturity, all in all the investigated banks can be assigned to maturity level two.

A special case represents the first bank (B1) and its procedural aspect. This is due to B1 having an institution for optimizing IT and SOA. These are exactly the requirements for reaching level five for the process aspect. However, since level four has not been achieved yet, the overall maturity of B1 cannot reach the next level.

Conclusions and Outlook

This article presents the findings of the SOA readiness and maturity case study for the German banking industry. It builds on an already established research framework regarding SOA maturity and SOA readiness. The evaluation of the conducted interviews has shown that SOA readiness is already present in the German banking industry. On the other hand, the maturity levels of SOAs in the observed German banks are very similar to each other: a basic technical platform is established, but a holistic and mature enterprise SOA including a well established SOA Life Cycle Management could not be found – therefore, all investigated banks are assigned to maturity level two, making progress towards level three.

The case study shows that SOA in German banks has some room for further improvements. Therefore, it would offer interesting insights to conduct a longitudinal analysis by repeating this investigation again in a few years in order to compare the findings and to observe the improvements over time.

References

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