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# Factors influencing the alignment of SOA development with business objectives

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# FACTORS INFLUENCING THE ALIGNMENT OF SOA DEVELOPMENT WITH BUSINESS OBJECTIVES

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## Abstract

*Service-Oriented Architecture (SOA) has gained focus as a driver for bridging and aligning business and IT-oriented views in information system development. The critical aspect of successful SOA is aligning technology and business; without proper alignment, the full potential of SOA will not be achieved. The current academic literature includes only few empirical studies on business-IT alignment aspects related to SOA adoption. In this exploratory study we explore factors influencing successful SOA implementation. We interview IT and business people from nine organisations appearing as SOA forerunners in Finland. Our findings indicate that successful SOA adoption is affected by several factors varying from organisation culture to processes and methods, communication and technology. The findings form a basis for future SOA research and a set of guidelines for practitioners.*

## 1 INTRODUCTION

Aligning information technology (IT) with business, i.e. “applying IT in an appropriate and timely way, in harmony with business strategies, goals and needs” (Luftman & McLean 2004, p. 90) has been the main objective of IT executives for years (Luftman & McLean 2004, Luftman & Kempaiah 2008). This is not surprising as IT has been considered as a means of gaining competitive advantage – if used appropriately (c.f. Ragowsky & Gefen 2008; Yoon & Carter 2007). However, as Luftman & Kempaiah (2007) argue, achieving appropriate alignment is not straightforward but involves consideration of interrelated components such as communication, value, governance, partnership, scope and architecture and skills.

Business-IT alignment has often been seen as a strategic asset (Bergeron et al. 2004; Peppard & Breu 2003; Cumps et al. 2007). Under these circumstances, it is evidently interpreted as a duty and as an obligation by IT executives (Silva et al. 2007). Alignment is consequently every day business for organisations (Cumps et al. 2006). Because of dissimilar strategies, processes, practices and cultures alignment is perceived as the unique, inimitable competence of an organisation where learning from others and exploiting their experiences, models or practices is difficult. As Silva et al. (2007) pointed out, this emergent phenomenon indicates that different alignment models and methods are not necessarily known by IT executives.

However, service-oriented architecture (SOA) has gained a lot of interest lately (c.f. Ren & Lyytinen 2008; Baskerville et al. 2005) since service oriented organisations and SOA are seen as revolutionising methods for managing information and streamlining operations (Vitharana et al. 2007). Yet SOA architecture itself seldom provides significant benefits. Baskerville et al. (2005) stated that SOA is a means for attaining organisational agility. In other words, SOA development is a continuous process where business-IT alignment needs to be invariably ensured. In their words: “SOA is only one ingredient in a recipe for a much larger meal” (ibid.). Although SOA is usually perceived as technical component (Antikainen et al. 2009), other non-technical stakeholder groups also have to be involved for successful business-IT alignment. This necessitates shared knowledge and mutual understanding about the dimensions of alignment between IT unit and business department (Beimborn et al. 2007). Achieving this kind of reciprocal understanding is difficult indeed. Silva et al. (2007; see also Ciborra 1997) even showed that there is no mutual understanding about the alignment concept between IT executives and IS researchers.

Understanding business-IT alignment in organisations is our focus. We try to identify the main factors influencing SOA development from the business-IT alignment viewpoint. Understanding these factors provides a basis for further research and theory building, and helps researchers to articulate their findings to (IT) executives and practitioners in SOA development initiatives. The data for the case study on SOA development and deployment was derived through twelve interviews conducted in nine large organisations. Next we take a tour of related business-IT alignment research from several perspectives. Then we present our research methods and the findings. The paper ends with discussion and concluding chapters.

## 2 RELATED RESEARCH AND THEORETICAL BACKGROUND

Business-IT alignment has been defined as the degree to which the mission, objectives and plans articulated in business strategy are shared and supported by IT strategy (Reich & Benbasat 1996). Henderson and Venkatraman (1993) follow this by stating that alignment is the degree of fit and integration among business strategy, IT strategy, business infrastructure, and IT infrastructure. These definitions claim that alignment is static. Campbell (2005) took a different approach by defining alignment as business and IT working together to reach a common goal. Yet this approach does not explicitly point out the strategic aspect of alignment. Chan and Reich (2007) identified several dimensions of alignment apparent in the IS literature: strategic and intellectual dimensions, structural dimensions,

informal structure, social dimension and cultural dimension. These dimensions emphasise the need for alignment on several levels: organisational, system, project and individual and cognitive. Alignment is correspondingly a multidimensional subject ranging from strategies to practices, from processes to activities bridging business to IT, and vice versa.

Business-IT alignment has been studied extensively in the IS literature. Some recent studies discuss the strategic level of alignment (Bergeron et al. 2004; Griffiths & Finlay 2004), the evolution of strategic alignment (Peppard & Breu 2003), business process alignment (Cragg et al. 2007; Beimborn et al. 2007), cultural aspects of alignment (Silvius 2008, Bieberstain et al. 2005), aligning users, organisations and IT goals (Singh et al. 2008), the role of informal networks (Haried & Ramamurthy 2006), measuring the success of alignment (Denford & Chan 2007) and several models and methods (e.g. Mueller et al. 2007; Griffiths & Finlay 2004; Chen 2007; Dertzi 2008; Klose et al. 2007; Henderson & Venkatraman 1993). Yet these studies do not correspond with the call by Chan & Reich (2007) to examine the *practical* processes of alignment; i.e. how alignment really takes place, what factors frame it, and how managers may benefit from these studies.

Different factors of alignment have been studied. Henderson and Venkatraman (1993) argued that an organisation's external fit is influenced by IT scope and system characteristics (reliability, flexibility and IT governance), and internal fit by the IS architecture, IS processes and skills required to manage and operate information systems. Chan and Reich (2007) reviewed the challenges in attaining alignment as being related to knowledge (unknown corporate strategy, lack of awareness or belief of the value of alignment, lack of industry or business knowledge), related to locus of control or the status of IT, and related to organisational change (see also Ciborra 1997). An influential study by Sabherwal & Chan (2001) discussed the dynamics of alignment. Although they identified several factors and challenges, their focus was rather on organisation level issues and not on the process or operation level factors. In fact, this kind of focus on theoretical issues is common in the IS literature (Gutierrez et al. 2008). Baskerville et al. (2005) took analysis to the SOA context. They identified the challenges of alignment as application integration, value reconfiguration, value preservation and meagre use of agile development approaches.

Individual factors influencing business-IT alignment have also been examined. The role of management and their commitment and involvement has been recognised as a key factor for successful alignment (e.g. Cumps et al. 2007; Henderson & Venkatraman 1993; Brown & Magill 1994; Benson et al. 2004; Earl 1989; Kean 1993). Yet management's involvement is not enough. Communication and knowledge sharing have also been identified (e.g. Reich & Benbasat 2000; Chan et al. 2006; Luftman et al. 1999; Campbell 2005; Sledgianowski and Luftman 2005). These studies usually emphasise a close relationship and continuous cooperation between business departments and IT unit. The influence of IS architecture, its governance and technology, and social skills have also been acknowledged (c.f. Henderson & Venkatraman 1992; Brown & Magill 1994, Luftman 2000) in addition to the ability to justify up-front ICT investments as they inevitably have an impact on alignment (Cumps et al. 2006; Mueller et al. 2007).

SOA has been considered as a means for alignment although it has been approached widely, ranging from technical solution and implementation methods to enterprise architecture and IT governance tools (Lyytinen & Rens 2008). Legner and Heutschi (2007) argued that SOA adoption can most beneficially be targeted as standardised integration infrastructure, for decoupling application domains, or for flexible user/business process integration. Yoon and Carter (2007) perceive SOA as IT strategy, where it requires extremely high levels of business-IT alignment to achieve benefits. Other key factors to successful SOA implementations include SOA registries, governance, effective pilot projects, top management support, trust among business units, personnel training and change management (ibid.). Chen's (2007) BITAM-SOA framework attempts to consider all these aspects by combining SOA, engineering alignment methods, enterprise architecture, and business performance management. She suggested that the impact of SOA adoption can be divided into three different factors: communication, architecture and governance, each being a critical success factor for alignment. Alignment via architecture is influenced by architectural adaptivity, misalignment detection, misalignment prevention,

enterprise modelling, and integration (of workflow management application portfolio management). Alignment via governance necessitates regulatory compliance. Alignment via communication stresses management asking for support and implemented vision.

The studies merely focusing on SOA success do not provide adequate results that would explain how business-IT alignment is realised in SOA development. From a technological perspective, a successful SOA project may not fulfil the business objectives while still being successful in technical excellence. In such a situation, proper alignment is not achieved. Bridging the business-IT gap requires 1) a structured view of a business that facilitates its strategic and operational analysis and is a familiar representation to IT professionals, 2) a rigorous method to translate this structured business view to the appropriate (service-oriented) IT layer, and 3) new build and runtime technologies suited to the new IT layer (Cherbakov et al. 2005). Shiskov et al. (2006) argued that adequate business-application alignment can be achieved only if the initial business model is a valid reflection of the real world, and provides a suitable basis for future models. As bridging the gap between business and IT is not trivial, both the architecture style and development approach should facilitate the alignment. Particularly the architecture approach emphasises the importance of service-orientation in establishing enterprise-wide perspectives on organisational resources (Nuffel 2007). This way SOA adoption improves architectural agility, which further positively impacts on IT's abilities to align with the changing business environment. Shiskov et al. (2007) summarised three properties for desirable SOA development. First, application architecture must allow the usage of SOA infrastructure, second, 'loose coupling' should be enforced and third, application architecture must fit within the business context. This is in line with Klose et al. (2007) and Yoon and Carter (2007), who supplemented the list by the need for systematic identification of IS functions to be implemented as SOA services.

### 3 RESEARCH METHOD

This case study is based on a set of semi-structured theme interviews, where the interviewees' interpretations of different SOA related issues were discussed. The questions were developed by the authors according to their interests. After a pilot interview in an organisation, unclear or incorrectly understood questions (3 out of 20) were reformulated. The results from the pilot interview were not included in the study. Four groups of questions were used. First, background information about the interviewee, his/her organisation, and the project where SOA was applied was gathered. The second set focused on the expectations and challenges to SOA adaptation in general. The third set was about a certain SOA adoption project, while the last set was about business process modelling and its role in SOA projects.

Case	Branch of industry	Interviewee	Job title	IT/Business
Case A	Public administration	I1	CIO	Business
Case B	Metal industry	I2	Portal manager	IT
Case C	Telecom industry	I3	Account manager	Business
		I4	ICT architect	IT
Case D	Financial industry	I5	Development manager	Business
		I6	CIO	IT
Case E	Financial industry	I7	IT architect	IT
		I8	Project manager	Business
Case F	Logistics	I9	Integration architect	IT
Case G	Public administration	I10	Director	IT
Case H	Public administration	I11	Chief Architect	IT
Case I	Retail trade	I12	Chief IT-architect	IT

Table 1. Interviewees and their background

We decided to focus on multiple organisations instead of one. This approach was believed to provide a broader understanding of the phenomenon and more generalisable results. Potential organisations for

the study were identified according to their public presentations in several national practitioner-oriented SOA conferences where they presented themselves as having a significant amount of SOA experience. SOA consultation houses and tool vendors were excluded as we wanted to avoid their market speech, and tool and supplier dependence. After potential organisations (12) were identified, they were contacted for two sets of interviews<sup>1</sup>: one from the business side, the other from the IT side. This follows the suggestion by Silva et al. (2007) that in order to gain insights both stakeholder groups need to be involved. Unfortunately not all organisations responded or granted two interviews. The set of organisations, persons interviewed and their backgrounds are presented in Table 1.

Each interview followed the same order of questions, which were sent in advance to the interviewees' by email. The interviews, each lasting 60 to 90 minutes, were audio recorded and transcribed. Data analysis was conducted according to the principles of grounded theory methodology (Urquhart 2001). First, without collaborating with any of the other four members of the research team, each researcher made preliminary coding using varying coding schemes. The coding process continued until theoretical saturation of the data was considered to have been achieved. Next, the researchers held two workshops where the results of the first round of analysis were discussed and refined into a final result set containing harmonised presentation of the previous results. Finally, the final outcome was reflected against the findings of a literature review and the sample data to ensure the validity of study.

## 4 FINDINGS

The analysis of empirical data revealed 11 factors related to the business-IT alignment of SOA development. These are discussed in detail.

### *Organisation culture*

Organisation culture has various impacts on the business alignment of SOA development. For example, when business and IT had traditionally operated in a close cooperation, SOA development seemed to be better aligned with IT objectives (as expected) than in organisations where such cooperation was not a part of organisational culture. A developer manager described this as follows: *"Traditionally we have had strong IT and business. They have never been that much separated... In our organisation business-IT collaboration is happening on a daily basis."*<sup>2</sup>[I5]

Furthermore, business unit oriented organisational structures had an inhibiting influence on the realisation of business-IT alignment in SOA development. The existence of business silos facilitates a culture where individual business units have to take ownership of specific data, processes and even IT systems. In such situations services, data sharing and open interfaces are not favoured. This was believed to be due to the fear of losing power and influence within the organisation. A CIO from the same finance industry organisation also described their successful SOA process as an outcome of good business-IT alignment. Yet he emphasised organisation culture, not only good alignment. *"Our way of working has been on a common good basis for a long time. Our organisation structure also supports it. We have organisation wide services like finance, human resources, Internet services and customer interface services."* [I6]. As each service unit was producing services to others, the transformation to SOA thinking was minimal.

Another problematic area was data confidentiality. A public sector interviewee demonstrated that business unit people consider the data in their IT systems to be so confidential that it could not be exposed even within the organisation. *"[Data confidentiality was] the biggest problems. It was caused by change resistance... For example, a few people from [unit X] had realised that the data in their systems was secret and valuable that it could not be shared with others."* [I1]

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<sup>1</sup> The questions were the same for both business and IT personnel.

<sup>2</sup> Translations from original Finnish data by the authors.

A similar phenomenon was also identified on the IT side. Openness and the sharing of data and IT services were perceived to decrease the importance of the IT unit making them “replaceable”. The same interviewee continued that *“in the IT department the valuable asset was the technology. They felt that along with more open communication environment, their power would be taken away... For some, for this reason, information sharing is really difficult.”* [I1]

### **Competences**

The skills needed in the design phase, such as business process modelling and service design, were considered particularly important for SOA application development. This was underlined, especially in the business process oriented projects. An architect argued for the importance of the business process modelling in SOA development for all participants. However, he emphasised that this was critical for business people as it is the main competence they bring into the project. *“They [business people] should be totally unaware of the technical aspects related to information systems but they should have an understanding of processes and process development in general.”* [I11].

Yet business process modelling is not only the business people’s responsibility. A director from a public sector organisation described the shift in thinking that *“in the past, it was good enough that the one who made the specification got something out of it. Now, the IT must focus on business services and understanding processes.”* [I10] This view, shared with the other interviewees, points out that the focus in SOA development should be on understanding business services and processes. According to the interviewees’ experiences, putting focus on services and processes is not easily achieved.

Service identification and finding the right level of service granularity were identified in several case organisations. Service design was recognised by many organisations to be one of the most challenging parts in SOA development process. Several interviewees stated that understanding the essence of business services, what they really are, and then finding a suitable balance between abstraction, modularity and reusability required skills and knowledge beyond what the organisation currently had. The need for technical, domain specific skills was pointed out by several IT side interviewees. This is in line with Shiskov et al. (2006).

### **SOA teams**

Multidisciplinary teams, with members from both IT and business domains, were seen as crucial for SOA development. In all cases it was common that the main role of SOA team was to endorse cooperation between business and IT, and furthermore to act as a centralised steering body for the organisation’s SOA development projects.

*“An SOA team was established. It had a few people from business and few people from IT. The business people were working in positions where they were able to gain a holistic view to the customers. They had the capabilities to think what services would be needed.”* [I6].

Following Baskerville et al. (2005), SOA development is rather a means than an end. Such thinking as acknowledged governance of SOA compatibility was seen to be a part of the SOA team’s responsibilities:

*“There were participants from business units, the CIO’s office and the IT. The purpose was to establish SOA policies and practices. There we looked at things from the exploiter point of view... That way we started to develop our SOA platform and the governance process.”* [I5]

### **Business driven SOA development**

It seems that the business driven SOA projects yield better business-IT alignment than other projects. The fundamental difference between the approaches was that the requirements were based on real business cases in business driven projects, while in non-business driven projects the requirements typically originate from a technical viewpoint without clear links to business objectives. Business driven projects were using a process-oriented development approach with intensive use of business

process modelling for capturing functional requirements. Interestingly, this led to a heightened awareness of SOA in general in comparison to IT driven projects.

### ***Governance***

In the five case organisations, SOA development was directed by defined policies and practices. This improved the quality of the SOA implementation by enabling a better fit with business needs. Yet SOA governance was not initially considered but necessitated some degree of adoption and use. Moreover, SOA applications had to be business critical. This implies that the role of SOA governance is emphasised in an organisation where SOA is used in applications that have a direct impact on the organisation's business. There SOA is needed as a value adding component that can be further invested in.

The following quotes emphasise SOA governance in the organisational context:

*"[Now] we [IT] can challenge business to start thinking things in a new way... Now we get all development needs from the business units to our [IT] headquarters, where we [the business solutions team] analyse them before any development takes place."* [I2]

*"It was hard to set up a governance infrastructure. The job is still ongoing, but we have already taken some parts into production... Governance with a wider scope, when [service] reuse will happen, services will be located and everything running smoothly [that's still to happen]"* [I7]

### ***Business stakeholder participation***

Having a common forum for business and IT people is an important factor in achieving business-IT alignment through SOA development. In addition to organisation level SOA teams, business domain stakeholder participation in SOA development was also identified as a key factor, having a positive influence on alignment on the project team level. Business domain knowledge and expertise in certain business cases and business requirements were considered beneficial for SOA development projects. Further, although business process modelling was used to specify and illustrate the project's business requirements, business people had an important role in interpreting and clarifying the models to the IT developers.

*"We have business people participating in development projects. Those who can do business process modelling, their role is really important because they can interpret and read these kinds of generic models."* [I6]

Moreover, business stakeholder participation had a positive influence on project execution and outcome as both change management and exception management were jointly handled. For example, an IT architect from finance industry explained the benefits of having business people participating in the development project: *"Business has their own developers, who are creating these processes. After they have finished their work, the focus shifts to the IT side. These business people are still taking part in project implementation, and monitoring it as members of a steering group, and, if necessary, giving support to the project team."* [I7]

### ***Common language***

Mutual understanding between business and IT people is achieved through continuous communication. SOA provided several means for this. First, SOA terminology and concepts formed a basis for IT people to comprehend the current system architecture and articulate it through common language.

*"The greatest benefit of SOA has been that our own understanding of how things should be done is improved. Our [IT] vision has been improved, and our competence to communicate with business about IT as a dynamic enabler has been gently enhanced."* [I2]

However, the business people disagreed. They did not consider that SOA had improved their communication capabilities or increased understanding about the systems and architecture, because "every-



*body has heard about SOA. To really understand what it means, that's difficult because it gets so technical so fast" [I3]*

These quotations indicate that SOA is mostly a technical concept. To understand SOA terminology requires an in-depth understanding of the technical concepts. This implies that SOA, as a software architectural style, does not provide an adequate base for business-IT communication.

Second, using business process modelling was seen to be useful in gaining a common understanding of the business requirements. An ICT architect described how business process models contributed business-IT cooperation: *"A common language was established when process flow diagrams were walked through together [with business people]" [I4].*

Third, business process models were also seen to be useful in validating the implementation of the development project. The concepts and terminology provided a common language for business and IT. Process-oriented design approach, combined with SOA development, thus seems to be able to enable an appropriate environment for business-IT alignment.

However, there was a major problem in communication. Business people and IT people have a tendency to conceive of the concept of service differently: both groups comprehend service from their own perspectives. *"The problem is that in business, we have difficulties to identify what is really a service. The level of abstraction is either too high or too low. Even in our IT unit they are not able to identify services properly or to support business units in identifying services. IT people focus too much on technical details."* [I6]

This gap is because of the ambiguity of the terminology. From the business process viewpoint the service is simply a business service. Similarly, from the technical perspective, the same service is perceived as a technical, application-level service.

### **Strategy**

Strategy level alignment was identified in only two interviews with the IT people, the business people did not address it at all. This may be because the development projects were still only discrete applications or aggregates of applications rather than organisation-wide systems. Yet SOA was recognised as a long-term business plan, valuable for IT development. Knowledge about business strategy was seen as a useful input for designing reusable services and architectures that would fit future business needs without major re-implementation efforts. Two architects explained their problems when evaluating whether to develop reusable services.

*"It [potential for service reuse] should be interpreted from the business perspective. To be able to do it, business should have a future vision that reaches far enough" [I4].*

### **Enterprise architecture framework**

The utilisation of enterprise architecture framework was considered to improve business-IT alignment. With the framework, IT's capability to involve business people in systems development was increased. On the other hand, business people were able to gain a better awareness of the organisation architecture and of SOA in the system architecture landscape at large. However, enterprise architecture frameworks originated from IT as *"we, in the IT unit, came the conclusion that we need a [language] for communicating to the business side people what sort of development process we should have in order to identify architectural requirements from the business point of view" [I11]. "Even in practice, the business people may like the report [that describes what systems are related to certain business processes]... We get onto the right level in the discussion faster... The idea was that modelling is done so that IT and business are already aligned there in the models."* [I12]

### **Rapid development tools**

Baskerville et al. (2005) argued for agile development methods in SOA development. Our findings concur, and indicate that the utilisation of such methods for SOA development enabled faster delivery

cycles by increasing development efficiency and enabling agility in adjusting to changes in requirements.

### ***Process automation***

The process engines technology was scarcely used in the production of SOA services. They were only used for process automation purposes, yielding additional business value for the existing SOA implementation. The biggest challenges in process engine utilisation were claimed to be immature tools and technologies, and interoperability issues.

## **5 DISCUSSION**

In this paper, we explored the potential and realised benefits of SOA utilisation in an organisational context. The interviews with key SOA people provided us with an understanding of the factors essential for SOA development for achieving business objectives. We categorise eleven factors into the 4 themes, discussed in below.

*Organisational culture and human resources.* Resistance to change and siloed organisation structures are creating barriers to SOA utilisation (c.f. Bieberstein et al. 2005). This impedes the achievement of alignment objectives. Yet, by creating common ground and shared understanding, it is possible to overcome cultural barriers. A close relationship with business and IT was found to be an indicator for a positive organisational culture. This positive atmosphere is essential for fruitful business-IT alignment. To achieve it, the importance of continuous communication between IT and business needs to be acknowledged, as this has been one of the main reasons for numerous project failures (e.g. Chen 2007). The solution is to have an SOA team, composing of members from IT and from business domains, and to use shared models and terminologies. Business process modelling and service identification contribute to organisations' capabilities to develop business process driven SOA projects.

*Processes and methodologies.* Business driven SOA projects seemed to yield better results in terms of business-IT alignment than IT driven projects. We believe this is because business driven SOA projects meet mutual needs better. There business process modelling is used as a means to capture functional requirements. Yet translating the models into application layer artefacts is very difficult. Although it is claimed that business process modelling is suitable for both IT and business users, current modelling notations are still too complex to be efficiently used by average business users. To correctly comprehend the models, business stakeholder participation is needed throughout the SOA projects in order to achieve the business goals. Business stakeholders may contribute to this by interpreting and clarifying the models for the IT developers, participation in the project's change management and exception control, and ensuring the congruence of SOA implementation in the long run. This emphasises the importance of accommodating SOA development with pre-defined rules and policies, which further improve the quality of the SOA implementation and enable better alignment with business needs in a sustainable manner.

*Communication and artefacts.* The importance of communication for business-IT alignment has been identified (e.g. Reich & Benbasat 2000; Chan et al. 2006; Luftman et al. 1999; Campbell 2005; Sledgianowski and Luftman 2005). Our findings show that earlier findings are also applicable in SOA development. The greatest difference is with SOA terminology, which is comprehensible only to people with a technical background. It can thus be argued that SOA is a technical concept requiring an in-depth understanding. This implies that SOA, as a software architectural style, does not provide a feasible terminology for business-IT communication.

Another significant finding is the tendency to comprehend services differently. This could be explained by the duality of the service concept. Although the concepts and process model terminology offer a basis for a common language between business and IT, they value strategies differently. While business people do not seem to evaluate SOA implementation from the business strategic viewpoint,

IT people perceive it to be valuable as a basis for technical advancement. The business strategy knowledge is thus a useful input for service and architecture design.

*Technology.* Lyytinen and Ren (2008) and Baskerville et al. (2005) discuss the importance of rapid development methods for SOA development. Our findings confirm this. The methods shorten delivery cycles and increase development efficiency, thus enabling a better fit with changing requirements.

These factors influence SOA development from the business-IT alignment viewpoint. Their identification provides us with a better understanding of the complex nature of SOA development. Although many of the findings are already recognised in the literature, the factors provide a complete, practically oriented approach to business-IT alignment. In other words, we try to respond to Chan & Reich's (2007) call for *practical* studies on how alignment really takes place, what factors frame it, and how managers may benefit from these studies. Researchers may utilise our findings as follows. First, the factors provide a basis for understanding different factors and their causalities regarding successful SOA development. Second, this study complements earlier studies by producing empirical evidence on the phenomena. Third, new research themes are introduced to the landscape of service-oriented systems research e.g. Kontogiannis (2007). Practitioners and managers may benefit from the list of factors by using it as a checklist in their SOA initiatives. By so doing, practitioners may be able to increase the business value obtained from SOA utilisation. Therefore, we suggest that managers should evaluate their current SOA development environment in the light of our results.

The study has several limitations. First, the small number of organisations and interviews is an obvious limitation. Having more organisations would have enabled better generalisations of the results. Second, although we collected the data using key informants at each organisation, a wider set of stakeholders might have provided additional insights to the research theme. Third, only one person per organisation was interviewed in most cases. Taking these weaknesses into consideration, we argue that we have been able to gain an in-depth understanding of the phenomenon in general. We acknowledge that the findings do not provide an exhaustive or widely generalisable explanation for SOA development, but, following the tradition of qualitative and exploratory research, we hope such a defect is pardonable. All in all, we believe that these findings provide a basis to understand the complexity of the phenomenon.

## 6 SUMMARY

In this paper we gained a better understanding of factors influencing SOA development from the business-IT alignment viewpoint. We illustrated how business-related SOA projects are carried out in organisations and what main factors affect their success. We used a qualitative empirical research approach in the study. Data was collected through semi-structured theme interviews and the data analysis was made by applying the grounded theory method. Our findings can be summarised as follows. We identified four themes, including altogether 11 different factors that are related to business-IT alignment of SOA development. The themes and factors are: Organisation culture and human resources: organisational maturity, competences and SOA team. Processes and methodologies: business driven development, governance and business stakeholder participation. Communication and artefacts: common language, strategy and EA framework. Technology: rapid development tools and process automation. These results can be used as a starting point for new research avenues and as guidelines for practitioners.

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