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## Investigating Adoption Determinants of Service-Oriented Architectures (SOA)

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### Abstract

Service-Oriented Architectures (SOA) gain an increasing focus in the academic literature as well as in practice. According to Forrester Research at least 63% of the North-American, European and Asian-Pacific enterprises have adopted SOA by the end of 2008 (Heffner 2008). However, there is still a lack of a coherent picture of why firms adopt SOA. As Vitharana et al. point out "future research should investigate organizational and industry characteristics that influence adoption of the service paradigm" (2007). Thus, the aim of this research is to investigate different proposed drivers of SOA adoption, such as technological advantages such as reduced costs due to modularity and reuse, business advantages such as increased business flexibility, or environmental determinants, such as management fashion.

**Keywords:** SOA, Service-Oriented Architectures, Adoption, determinants

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## INVESTIGATING ADOPTION DETERMINANTS OF SERVICE-ORIENTED ARCHITECTURES (SOA)

Service-Oriented Architectures (SOA) gain an increasing focus in the academic literature (e.g., Demirkan et al. 2006; Hirschheim et al. 2010; Ren et al. 2008; Viering et al. 2009; Vitharana et al. 2007; Zhao et al. 2008) as well as in practice. According to Forrester Research at least 63% of the North-American, European and Asian-Pacific enterprises have adopted SOA by the end of 2008 (Heffner 2008). However, there is still a lack of a coherent picture of *why* firms adopt SOA. As Vitharana et al. point out “future research should investigate organizational and industry characteristics that influence adoption of the service paradigm” (2007). Thus, the aim of this research is to investigate different proposed drivers of SOA adoption, such as technological advantages such as reduced costs due to modularity and reuse, business advantages such as increased business flexibility, or environmental determinants, such as management fashion.

In order to shed light into why firms adopt SOA, we first develop a multi-dimensional SOA adoption construct, which allows us to make the degree of SOA adoption measureable and comparable between different organizations. Therefore, we assess software servitization as well as organizational servitization with five complementary sub-dimensions: Two for assessing the technologies used for software and organizational servitization, two for assessing the architectural layer for each servitization concept, and one for unifying software and organizational servitization in order to measure the involvement of software servitization in organizational servitization.

Drawing on this multi-dimensional SOA adoption construct we can consequently investigate why firms do actually adopt SOA and what are important enablers to achieve a high degree of SOA adoption. As we are interested in the adoption of SOA by organizations, we will draw on the technology-organization-environment (TOE) framework from DePietro et al. (1990), which allows us to structure the possible influencing determinants, with respect to the three dimensions. The TOE framework was often applied in the context of adopting inter-organizational systems (E-Business, EDI and E-procurement) (e.g., Chau et al. 1997; Kuan et al. 2001; Mishra et al. 2007; Teo et al. 2009; Thong 1999; Zhu et al. 2005; Zhu et al. 2003). While the determinants of SOA adoption seem to be very comparable to previous studies using the TOE framework with respect to technological as well as organizational determinants, SOA is different with respect to the environmental context. As the adoption of interorganizational systems (IOS) strongly depends on the adoption behavior of the environment (potential and actual business partners, in particular), the adoption SOA seems to be relatively unaffected by external pressures, partner readiness, support from suppliers or customers, etc. Thus we will focus on investigating management fad and fashion (Abrahamson 1991; Fichman 2004) as important environmental drivers of SOA adoption, which basically means that firms will adopt SOA because analyst reports or consultants have reported success stories regarding SOA, or they imitate the adoption behavior of their peer-group.

Evaluating the developed research model using PLS, reveals the following results. Overall, the research model explains very substantial parts of the degree of SOA adoption. In the technological context, relative advantage and compatibility are important drivers of the degree of SOA adoption, while the costs associated with adopting SOA hamper the adoption. Of the organizational determinants SOA-related expertise of IT employees, organizational size, and support from top management are all important determinants, while experience is by far the single most important influencing factor in the entire model. With respect to the environment the

results show that in fact competition does not show a significant influence on the degree of SOA adoption. However, management fad has an impact on the degree of SOA adoption, which means that an organization is also influenced by the adoption decisions of competitors.

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