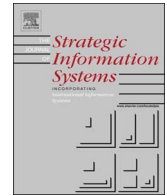




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Achieving benefits with enterprise architecture

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ABSTRACT

There is strong anecdotal evidence that Enterprise Architecture (EA) brings benefits to organisations and that organisations are investing significantly in EA initiatives. However, demonstrating the business value of EA has proven elusive. Many of the benefits of EA are intangible and value is achieved indirectly within business change projects. Furthermore, it is not the EA itself that provides benefits, it is the ability to provide advisory services enabled by the EA that is important. In this paper we focus on EA service capability and develop and test a new research model that explains how EA service brings benefits to organisations. Our findings highlight the importance of EA service capability and dynamic capabilities in creating benefits from EA.

1. Introduction

Enterprise Architecture (EA) defines the current and desirable future states of an organisation's processes, capabilities, application systems, data, and IT infrastructure and provides a roadmap for achieving this target from the current state (Ross et al., 2006; Tamm et al., 2011; Zachman, 1987). Enterprise Architecture Services (EAS) enact business strategy by guiding the building of the digitized processes, business capabilities, application systems and databases that support or automate an organisation's core business processes (Ross et al., 2006). Organisations world-wide are on track to spend \$3.49 trillion in 2016 on IT (Gartner, 2016). EAS play an important role in ensuring that such IT investments deliver value in alignment with business strategy (Gartner, 2014).

Organisations use EAS for a variety of purposes including corporate strategic transformation (Tamm et al., 2015), fostering business innovation (Winter et al., 2014), corporate acquisitions (Toppenberg et al., 2015), technology interoperability (Winter et al., 2014), compliance assessment (Foorthuis et al., 2012), business-IT alignment (Ross et al., 2006) and technology standards management (Boh and Yellin, 2007). There is strong anecdotal evidence that EA provides value to organisations. For example, the EA group of a large bank delivered cost savings in excess of \$200 million (1.4% of the company's operating expenditure) through IT asset rationalisation and reuse (Burns et al., 2009). In a large-scale IT-enabled business transformation, the EA group helped the organisation to avoid more than \$20 million in costs in the first year of the program (about 2% of the total cost of the five-year program) through the identification of synergies and reuse opportunities (Tamm et al., 2015).

Despite these examples of the organisational importance and impact of EA, many organisations view EA as an abstract concept that requires significant investment with benefits that are difficult to demonstrate (Lange et al., 2016). Despite the potential for value creation offered by EA, many organisations view EA as an organisational "black hole" into which money is poured but where the value proposition is often ambiguous (De Vries and Van Rensburg, 2008). This is particularly the case with demonstrating the

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business value of EA, as the “payoffs” relating to EA may take years to emerge (Lesley and Efrom, 2014). Although this has led to an interest in modelling EA value creation (Singh et al., 2014; De Vries and Van Rensburg, 2008), a clear understanding of the project and organisational benefits for EAS is still required.

While there is work that defines the benefits that can accrue from EA (Boucharas et al., 2010; Plessius et al., 2014; Tamm et al., 2011) and the success factors related to EA benefits (Schmidt and Buxmann, 2011; Weiss et al., 2013), much of the existing research focuses on explaining how EA benefits are achieved (Lange et al., 2016; Niemi and Pekkola, 2016; Tamm et al., 2015; Toppenberg et al., 2015). In particular, there is a strong focus on EA artefacts and their management (Lange et al., 2016), project compliance with the EA artefacts (Foorhuis et al., 2016) and EA governance (Foorhuis et al., 2016). Some recent work has highlighted the importance of EA service provision (Frampton et al., 2015; Lange et al., 2016; Niemi and Pekkola, 2016; Tamm et al., 2015). We seek to extend this work by focusing on how EA service provision complements EA governance and explains how EA project and organisational benefits are realised. This is important, as EA is often perceived as an artefact while it also has process and service dimensions (Lange et al., 2016; Ross et al., 2006). The service provision perspective of EA reflects the EA group’s broader role not only as the producer of EA documentation but also as the provider of internal advisory services related to the formulation and implementation of IT-enabled business strategies (Frampton et al., 2015).

Our research question is: *How do EA advisory services lead to organisational benefits?* We argue that EA services lead to benefits through business-driven and IT-driven change opportunities. We base our work in the resource-based theory (Barney, 1991; Wade and Hulland, 2004) and dynamic capabilities (Teece, 1998; Wheeler, 2002).

There are three main contributions from our work. First, on a theoretical level, we develop a research model that explains how EA service capability leads to organisational benefits, using the ‘process view’ of resource-based theory. We argue that EA service capability is related to organisational benefits indirectly through other organisational processes (Pang et al., 2014). In particular, the study focuses on the ways in which EA enables business-driven and IT-driven change opportunities. Each of these organisational change processes lead to project benefits, which in turn result in organisational benefits. Second, on an empirical level, we have developed measurement instruments for testing the hypotheses developed from our review of relevant literature and interviews with senior EA and business professionals. Using a cross-sectional survey, we tested the research model, targeting Chief Information Officers (CIOs) in large American organisations. Finally, on a practical level, we demonstrate the importance of EA as service rather than EA as artefact (Tamm et al., 2015). Furthermore we provide managers with evidence that investing in EA services will enable both business-driven and IT-driven change opportunities to be identified and realised, leading to project and organisational benefits.

The paper is organised as follows. We first discuss the background context of the study. This is followed by a discussion about the theoretical foundation of the study and the research model. Next, we present the survey research approach used in the study and the development of the measurement instrument. Following that we discuss the empirical evaluation of the research model. We then present our findings and contributions to research and practice, and conclude with a discussion about directions for future research.

2. Background

Our aim is to explain how EA service provision leads to organisational benefits. To do so, we first discuss EA and its purpose and value proposition. We then review empirical research on EA, its use and outcomes. Finally, we identify and discuss three trends within this stream of research, including the increasing focus on EA service provision and its importance to achieving benefits from EA.

2.1. EA purpose and value proposition

EA has been traditionally conceptualised as a collection of artefacts that represent an organisation’s business systems and IT systems, together with a planning process for documenting these systems (Ross et al., 2006). EA includes details about an organisation’s processes, capabilities, data, application systems and IT infrastructure using a variety of standardised representation techniques (Kaisler et al., 2005; Lankhorst, 2013). Enterprise architects typically define the current and future states of an organisation’s business systems and IT systems, and provide a roadmap for achieving the transformation between them (Tamm et al., 2011). EA enables the alignment of an organisation’s business strategy with its IT strategy and plays an important role in business and IS planning in large organisations globally (Ross et al., 2006; Tamm et al., 2011; Zachman, 1987).

2.2. Empirical research on EA

Early EA research was often conceptual and prescriptive in nature and focused on the various models, notations, and processes used to define the content of the EA within an IT context (e.g. Spewak and Hill, 1993; Zachman, 1987). More recent work has been empirical involving expert interviews, case studies and surveys, evolving to a broader focus on the management of EA within organisations across both business and IT contexts (see Table 1). This has contributed to a deeper understanding of how EA is used within organisations and the benefits it brings, from the perspectives of both business and IT stakeholders.

Three observations may be made in relation to recent empirical work on EA. First, there is an increasing trend from studies of EA primarily within an IT context to broader studies of EA within the business context. This trend is exemplified by early work focusing on how EA is used within IT infrastructure management (Boh and Yellin, 2007) and IT project success (Foorhuis et al., 2010). More recent work focuses on how EA can be successfully managed and anchored within organisations (Lange et al., 2016) and how EA can help business transformation (Tamm et al., 2015) and corporate acquisition projects (Toppenberg et al., 2015).

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