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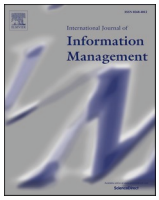

Research Article

How enterprise architecture leads to organisational benefits

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ABSTRACT

Enterprise architecture (EA) is an important IS management capability that has attracted much practitioner interest and has many claimed benefits. However, the mechanisms underpinning EA benefit realisation are not fully understood and have only relatively recently begun to receive research attention. Based on twenty-two expert interviews and two in-depth case studies, this theory building paper develops a new EA Benefit Mechanisms Model (the EABMM). It argues that EA benefits depend on the quality of EA service provision and are realised through three key mechanisms. First, EA helps improve IS decision-making by creating a transparent and structured decision process, by providing objective information to inform decisions, and by educating decision makers on good IS investment practices. Second, EA services help improve IS project delivery by improving project coordination through contextual awareness and by accelerating projects through guiding standards. Finally, EA services help an organisation to improve its IS platform by increasing platform alignment with business needs, platform flexibility, IS resource utilisation, and IS resource complementarity. Each of these three benefit mechanisms ultimately contributes to organisational benefits from EA, including higher return on IT investment, increased organisational agility, and competitive differentiation. The paper also highlights a conundrum in demonstrating value from EA.

1. Introduction

Enterprise architecture (EA) is the definition and representation of a high-level view of an enterprise's current business processes and IT systems, their interrelationships, the extent to which these processes and systems are shared by different parts of the enterprise, and plans for the future enhancement of those processes and systems. EA does not focus only on technology. Rather, it seeks to create an IS platform, i.e., "an integrated set of electronic business processes and the technologies, applications and data supporting those processes" (Weill & Ross, 2009, p. 4). Enterprise architects define what this IS platform should look like in order to support the organisation's strategic goals and provide a roadmap for moving towards this vision.

Large organisations today are heavily reliant on these increasingly complex and sophisticated IS platforms, which continue to be shaped by changing organisational requirements (e.g., due to mergers, takeovers, and business model changes) and new technologies (e.g., cloud computing and artificial intelligence). Thus, effective EA-guided planning of these platforms is likely to be an important factor in many organisations' success. However, despite strong practitioner interest in EA (e.g., CIO Council, 2008; Lankhorst, 2013; The Open Group, 2018), justifying investment in EA has been a challenge (Aziz & Obitz, 2007; Obitz & Babu, 2009).

Until recently, there has been little academic research examining the casual mechanisms that explain how and why EA leads to organisational benefits. Although research shedding light on some aspects of EA benefits realisation began to emerge over the last decade (e.g., Foorthuis et al., 2016; Lux et al., 2010; van den Berg et al., 2019; Weiss et al., 2013), there are only a handful of empirical studies that aim to provide a comprehensive explanation of EA benefit mechanisms (Ahlemann et al., 2021; Niemi & Pekkola, 2016; Shanks et al., 2018). However, comparison, reconciliation, and integration of theoretical models from these various studies is difficult because different research teams have focussed on different concepts and different aspects of the EA-enabled benefit realisation process, guided by different reference theories. Overall, this state of EA literature means that insights into how and why EA leads to these benefits remain fragmented (Ahlemann et al., 2021; Tamm et al., 2011) and while a wide list of potential benefits from EA

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have been identified (e.g., Boucharas et al., 2010; Tamm et al., 2011), there is less clarity around *how* organisations should go about achieving these benefits.

Therefore, in an effort to improve the understanding of EA benefit realisation, we focus on the following research question in this paper:

How does enterprise architecture lead to organisational benefits?

To address this question, we decided to go back to first principles through a qualitative theory building approach (Eisenhardt, 1989a; Neuman, 2005) based on three complementary data streams (including nine EA consultant interviews, twelve EA vignettes, and two in-depth case studies). This allowed us to identify first-hand the key mechanisms (Mingers, 2000; Wynn & Williams, 2012) through which EA delivers organisational benefits. Following our primary data analysis, we were then in an empirically-grounded position to integrate insights from prior research where appropriate to refine and enrich our empirical findings (Eisenhardt, 1989b). The result of our study is a model that identifies three distinct mechanisms through which EA contributes to organisational benefits, which we refer to as the Enterprise Architecture Benefit Mechanisms Model (EABMM). We believe the EABMM provides a rich, yet parsimonious, explanation of EA benefit realisation.

The remainder of this paper is structured as follows. First, we review the current state of the related literature and explain the positioning of our study in this context. Second, we describe and explain the choice of our research method. Third, we present the insights that emerged from our theory building efforts and present the resultant EABMM. Finally, we reflect on our key findings, discuss the study's contribution, and highlight three issues for future research.

2. Literature review

In our literature review we examined the three main themes summarised in Fig. 1. Theme 1 in Fig. 1 involves understanding what EA activities entail and what EA deliverables are; Theme 2 involves understanding what organisational benefits from EA are; and Theme 3 concerns the identification of causal relationships between the two, i.e., how and why does EA lead to organisational benefits? In other words, the literature on Theme 1 concerns the "quest for the independent variables" (Petter et al., 2013), the literature on Theme 2 concerns the "quest for the dependent variables" (DeLone & McLean, 1992), and the literature on Theme 3—the key theme of interest in this study—concerns identification of causal mechanisms that explain the link between Theme 1 and Theme 2.[1]

Our literature review began with a search for the term "enterprise architecture" on Google Scholar and Scopus databases. This led to the identification of 61 studies relevant to EA benefit realisation for an initial detailed analysis. We then used this initial pool of papers to identify others citing or cited by these papers. Over the course of the study, we periodically repeated this citation-based search and also scanned the list of recently published articles in the top IS journals (Senior Scholars Consortium, 2011) to update our literature-based insights.

The first publications on EA emerged about three decades ago, with Zachman (1987) often regarded as the seminal publication in the field. In the first decade of EA research (1990s), the EA literature predominantly focused on Theme 1 in Fig. 1, with many influential publications practice-focused and centred on EA processes (Spewak & Hill, 1993) or EA products/artefacts (Lankhorst, 2005; Zachman, 1987). While many of these publications contain EA benefit claims, most of these claims were not supported by justification or empirical evidence (Tamm et al., 2011). EA benefit realisation studies remained limited in 2000s, with just a few empirical studies on Theme 2 (organisational benefits from EA) (Boh & Yellin, 2006; Ross et al., 2006). However, over the past decade (2010s), research on the different facets of EA benefit realisation has begun to appear. First, with regards to Theme 1, there has been an increase in studies examining the quality dimensions of EA processes and deliverables, which are a key prerequisite for benefit realisation (Cram et al., 2015; Kluge et al., 2006; Lange et al., 2016; Shanks et al., 2018). Second, there has been a growing number of empirical studies addressing Theme 2 (Lange et al., 2016; Schmidt & Buxmann, 2011; Weiss et al., 2013). Third, and of most relevance for this paper, researchers have also begun investigating Theme 3, i.e., the causal mechanisms that explain how and why EA leads to organisational benefits.

The first studies addressing Theme 3 (see Table 1 for an overview) were mostly conceptual (Boucharas et al., 2010; Tamm et al., 2011), but more recently there has been increasing emphasis on empirical work. Some of these studies focus only on one specific EA benefit mechanism, e.g., IT resource exploitation (Lux et al., 2010), EA institutionalisation (Weiss et al., 2013), project compliance with EA (Foorthuis et al., 2016), or impact of EA maturity on IT investment decision outcomes (van den Berg et al., 2019). However, three studies share the aim of our study—which is to provide an integrated explanation of the key mechanisms for EA benefits realisation (Ahlemann et al., 2021; Niemi & Pekkola, 2016; Shanks et al., 2018). The theoretical models from these three studies (two case studies and one survey) are presented in Fig. 2 and discussed below.

The first model in Fig. 2 (panel a), by Niemi and Pekkola (2016), used the IS Success Model as its primary theoretical lens to explore how EA leads to organisational benefits through several stages. Their study is based on 14 semi-structured interviews from a single exploratory case study. Their study identified three EA quality dimensions (process, product, and service quality), 16 first-order benefits, five second-order benefits, and one third-order benefit. While Niemi and Pekkola (2016) refer to all of these as benefits, their first-order and second-order benefits are consistent with our definition of benefit mechanisms, as the higher-order benefits emerge from the lower-order benefits. Due to the many benefit dimensions involved, cause-and-effect relationships are not always fully discussed, however, leaving open the possibility of construct overlaps and some questions about the direction of causality. For example, the first-order benefit "Provide standards" is very close in essence to the second-order benefit "Provide requirements and restrictions". As another example, "Reduce duplication" is identified as a first-order benefit and "Provide requirements and restrictions" as a second-order benefit. However, requirements and restrictions could be considered a direct EA deliverable (i.e., a first-order benefit) while reduced duplication may be a consequence of such standards (i.e., a second-order benefit). The study identifies reduced IT costs as the ultimate EA benefit, but does not consider other strategic benefits.

The second model in Fig. 2 (panel b), by Shanks et al. (2018), used a dynamic capabilities theoretical lens to explore the role of EA as an enabler of organisational change. The model was empirically evaluated using data from a survey of 192 CIOs of US private sector organisations, and all hypotheses were significantly supported. The independent variable focuses on EA services (as opposed to EA artefacts) as the key driver of organisational benefits from EA. Their study also considers EA quality dimensions, though not quite as in-depth as Niemi and Pekkola (2016). Three key EA benefit mechanisms were identified: (1) enabling IT change and (2) enabling business change, leading to (3) project benefits that, in turn, lead to organisational benefits. Shanks et al. (2018) define project benefits as "improved decision-making, project management effectiveness, improved business capabilities and improved IT platform and systems". The latter two outcomes could

[1] In the spirit of DeLone and McLean (1992) and Petter et al. (2013), we use the terms "independent variable" and "dependent variable" throughout this paper as a simple and familiar way to refer to the left-most and right-most constructs of interest in a research model (using more precise language, "concepts" would be a more accurate term considering the complexity of the underlying phenomenon).

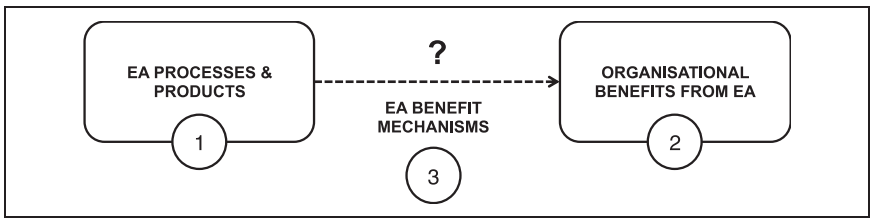

Fig. 1. Three themes in the EA benefit realisation literature.

Table 1
Prior research on EA benefit mechanisms.

Study	Independent Variable (s)	EA Benefit Mechanism(s)	EA Benefit(s)	Theoretical Lens(es)	Empirical Analysis	
					Theory Building	Theory Testing
Boucharas et al. (2010)	EA standardsEA models	100 EA outcomes or benefits and 65 relationships between them		Synthesis of prior EA literature	–	–
Lux et al. (2010)	EA management capability	IT resource exploitation; business process performance	Cost reduction; productivity enhancements	Resource-based theory (Barney, 1991; Bharadwaj, 2000; Melville et al., 2004)	Case study (1 case, 3 interviews)	–
Schmidt and Buxmann (2011)	EA management approach	–	IT flexibility; IT efficiency	City planning metaphor of IS (Longépé, 2003; Namba, 2005)	Expert interviews (14 org.-s)	Survey (85 responses)
Tamm et al. (2011)	EA quality	Organisational alignment; information availability; resource portfolio optimisation; resource complementarity	Lower costs; competitive differentiation; strategic agility	Synthesis of prior EA literature	–	–
Weiss et al. (2013)	EA stakeholder response; EA consistency	–	Project coordination; cost reduction; risk reduction; process standardisation; business strategy realisation	Institutional theory (DiMaggio & Powell, 1983; Meyer & Rowan, 1977)	–	Survey (105 responses)
Foorthuis et al. (2016)	EA approach	Project compliance with EA; EA-induced organisational knowledge; project performance	Controlling costs; organisational agility	Synthesis of prior EA literature	Survey (293 responses)	–
Lange et al. (2016)	EA management quality	–	Organisational and project efficiency, effectiveness and flexibility	IS success model (DeLone & McLean, 1992, 2003)	–	Survey (133 responses)
Niemi and Pekkola (2016)	EA process quality; EA product quality; EA service quality	16 first-order mechanisms; 5 second-order mechanisms	IT cost reduction	IS success model (DeLone & McLean, 1992, 2003)	Case study (1 case, 14 interviews)	–
Shanks et al. (2018)	EA service capability; EA governance	EA-guided IT change; EA-guided business change; project benefits	Agility; competitive advantage; increased value	Resource-based theory (Barney, 1991; Wade & Hulland, 2004); Dynamic capabilities (Teece et al., 1997; Wheeler, 2002)	–	Survey (192 responses)
van den Berg (2019)	EA maturity	–	Improved IT investment decision outcomes	Dynamic Architecture Maturity Matrix (van Steenbergen et al., 2010; van Steenbergen et al., 2008)	Survey (142 responses)	–
Ahlemann et al. (2021)	EA planning; EA implementation	IS planning and change management; IS business partnerships	Market responsiveness; cost effective IS operations	Resource-based theory (Barney, 1991; Wernerfelt, 1984)	Case studies (8 cases, 32 interviews)	–

potentially be viewed as higher-order, organisation-level benefits, somewhat blurring the boundary between the project and organisational benefit constructs. Finally, Shanks et al. (2018) identify three organisational benefits from EA: agility, competitive advantage, and increased value. Unlike Niemi and Pekkola (2016), all of these benefits are highly strategic in nature (with cost efficiency treated as part of competitive advantage).

The third model in Fig. 2 (panel c), by Ahlemann et al. (2021), used the resource-based theory lens to explore the interrelationship between EA resources, EA capabilities and IS capabilities. The model is based on interviews with a total of 32 interviewees in eight case-study organisations. Unlike Niemi and Pekkola (2016) and Shanks et al. (2018), Ahlemann et al. (2021) provide limited consideration of EA quality dimensions and their model does not explicitly focus on quality. The two key EA benefit mechanisms identified are (1) IT planning and change management and (2) IT-business partnerships. These, in turn, lead to market responsiveness and cost-effective IT operations. While Ahlemann et al. (2021) classify the latter constructs as IS capabilities, these outcomes are consistent with our definition of organisational benefits from EA. There are also some potential construct overlaps. For example, EA modelling is treated as a separate construct to EA planning, while other EA research often treats modelling as an integral part of EA planning. A similar issue applies to the delineation between the constructs "EA planning" and "IS planning and change management", with the latter defined as the "ability to 'plan, manage, and use *appropriate technology architectures and standards*'" (Ahlemann et al., 2021, p. 8). Based on this definition, EA planning could be considered an integral part of, rather than distinct from, IS planning.

In summary, the current EA literature provides valuable, and probably complementary, perspectives on various aspects of EA benefit

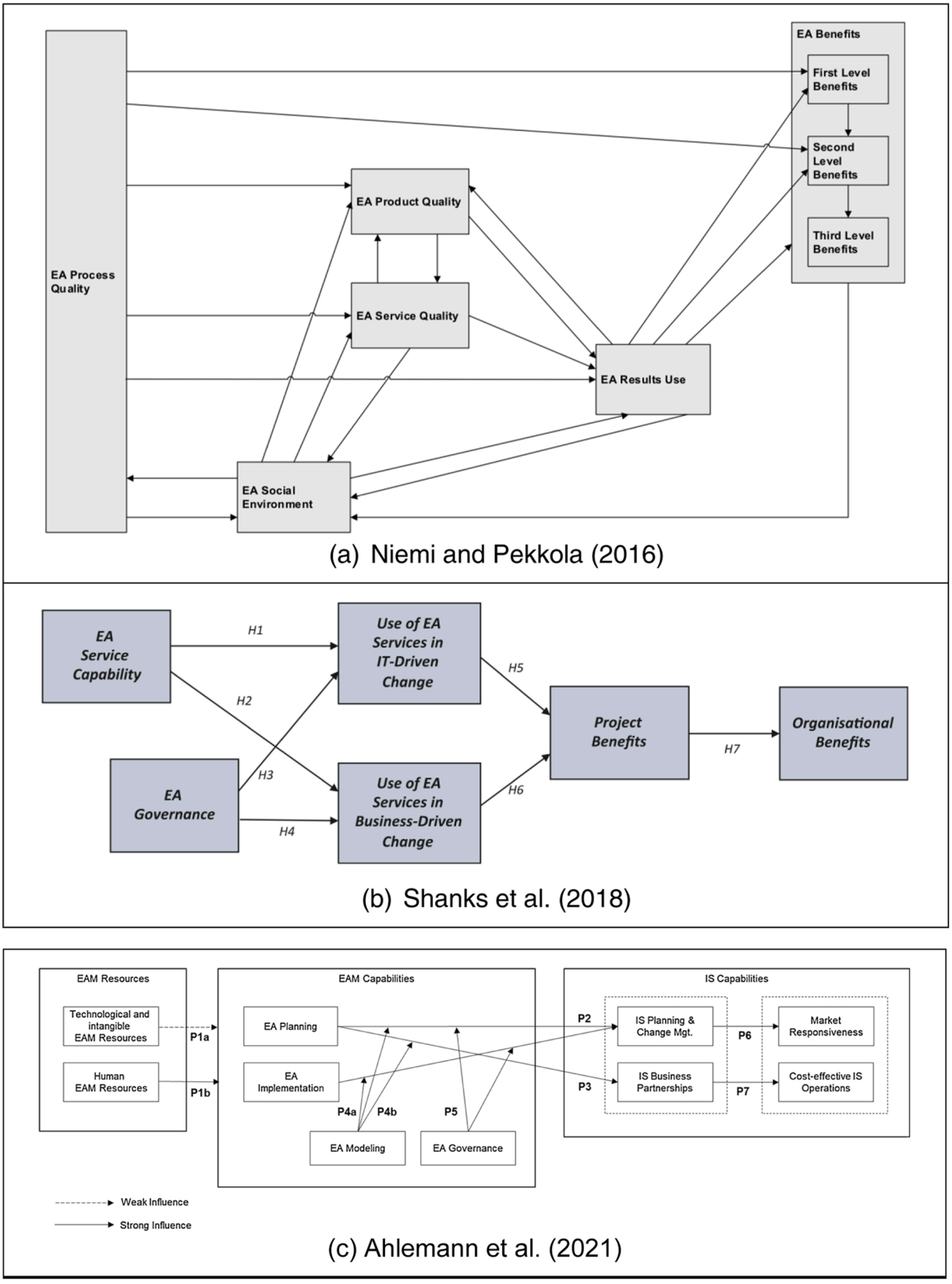

Fig. 2. Three EA benefit mechanism models.[21]

realisation. However, there are three important limitations when it comes to a comprehensive understanding of EA benefit mechanisms. First, as is evident from the examples of the three closely relevant studies discussed above and other studies summarised in Table 1, existing benefit models have adopted various foundational theories which, in turn, have led to different choices around both the key constructs, benefit mechanisms, and the overall structure of these models. This makes it difficult to reconcile and integrate their theoretical insights,

and raises the possibility that the choice of the theoretical lens may perhaps to some extent have constrained the interpretation of the empirical findings. Second, very few qualitative studies have been published on EA benefit realisation (Ahlemann et al., 2021; Niemi & Pekkola, 2016), and most existing research is based on quantitative surveys (Foorthuis et al., 2016; Lange et al., 2016; Schmidt & Buxmann, 2011; Shanks et al., 2018; Weiss et al., 2013) which are good for exploring correlation, but not causality. Third, and closely related to the previous issue, existing EA benefit realisation models tend to identify benefit mechanisms at a very high level of abstraction, and usually do not explicitly identify the inner workings (i.e., sub-mechanisms) that explain how the high-level mechanisms operate.

To address the first of the above limitations, a fresh, empirically-grounded look at EA benefit realisation would be useful. Going back to first principles and being guided by data would enable us to (a) consider several foundational theories (where appropriate) and (b) provide a comprehensive explanation of the phenomenon that is not constrained by any one lens—at least not initially. To address the second and third limitation, further qualitative work that focuses on examining causality by identifying and describing in greater detail the EA benefit mechanisms would be valuable. In this study, we have endeavoured to achieve all of these objectives.

3. Research method

Consistent with the current state of the literature, and as explained in the Introduction, we embarked on a back-to-first-principles study of EA benefits realisation to identify first-hand empirically the key concepts and mechanisms through which EA contributes to realisation of organisational benefits. More specifically, we chose a qualitative theory building approach (Eisenhardt, 1989a; Neuman, 2005). Qualitative research methods enable researchers to address how and why questions (Myers, 1997; Neuman, 2005; Yin, 2008) and to study causal mechanisms (Mingers, 2000; Wynn & Williams, 2012), which are the central focus in this study. To guide our data collection, we followed Walsham (1995) recommendations and used insights from our early review of the EA literature (Tamm et al., 2011) to provide "an initial theoretical framework which takes account of previous knowledge, and which creates a sensible theoretical basis to inform the topics and approach of the early empirical work" (Walsham, 1995, p. 76). However, during our interviews and analysis we also paid careful attention to maintaining "openness to the field data, and a willingness to modify initial assumptions and theories" (Walsham, 1995, p. 76). In other words, while our data collection was informed by our early reading of the literature, it was not constrained by it.

3.1. Data collection

Data collection took place in Australia in three distinct streams: (1) interviews with nine highly experienced EA consultants, (2) interviews with thirteen senior managers in twelve EA-user organisations, and (3) two in-depth case studies (InfraCo, a major public infrastructure organisation and RetailCo, one of Australia's largest retail firms). Key features of these three data streams, including the strengths and weaknesses of each, are summarised in Table 2.

The goal in collecting data through these three streams was to achieve a balance between breadth (supporting generalisability claims) and depth (supporting understanding of the underlying mechanisms). In Stream 1, our focus was on breadth, with the extensive experience of the EA consultants enabling us to capture lessons learnt from tens, if not hundreds, of client organisations. The key trade-offs were the "pre-synthesised" nature of these insights and the special nature of consulting projects potentially influencing the consultants' perspective on EA benefits realisation (see Table 2). Stream 2 sought more contextually grounded insights while still covering a variety of organisational settings. We therefore adopted a sampling strategy of maximum variation (Patton, 1990). The key limitation of this data stream was limited triangulation, as in each organisation we relied on a single key informant (Huber & Power, 1985).

In Stream 3, our focus shifted to depth of contextual understanding through two in-depth case studies at large Australian organisations. InfraCo is a public sector organisation responsible for the planning, implementation, and maintenance of core public infrastructure in the state of Victoria, Australia. It also provides regulatory and certification services around the use of this infrastructure. RetailCo is one of Australia's largest retailers and has a diverse portfolio of business divisions. Key attributes of both organisations are summarised in Table 4. Both case studies examined the role of EA in a five-year period following the announcement of organisational restructures. The RetailCo case focused on 2002–2007, and the InfraCo case on 2007–2011. In both cases, the data was collected retrospectively and relied on the interviewees' reconstruction of the events. A broad range of EA stakeholders were interviewed and an extensive amount of supporting documentation was reviewed, presenting us with an intimate, in-depth understanding of the role, value proposition, and challenges of EA. In contrast to the two preceding streams, the key trade-off in this stream was the limited number of organisations covered.

Details of interviewee and organisation backgrounds are presented in Table 3 and Table 4. The guiding questionnaire used in all these interviews is presented in the appendix. However, the interviews were semi-structured and the questions and focus of each interview were tailored based on the background of the interviewee (Myers & Newman, 2007). Names of individuals and organisations are not disclosed because all interviewees were promised anonymity. Therefore, in what follows we refer to interviewees simply by their interviewee identifier (ID), e.g., "I4". For the EA vignettes and case studies, the organisation's pseudonym reflects the industry. To improve opportunities for later data analysis, all but one interview were audio-recorded and transcribed (one interviewee preferred not to be recorded, so we took hand-written notes). In total, the interviews resulted in over 43 h of recordings.

3.2. Data analysis

The first step in data analysis was normally taken right after each interview in the form of a debriefing session (Carson et al., 2001) between the authors (most interviews were conducted by two authors). The key messages from the interview were discussed while still fresh and where our interpretations differed, the potential reasons for this were also considered. The second step in data analysis came in the form of preliminary memos, summaries, and drafts that were written at various phases of the study and provided useful initial understanding of emerging insights and themes (Walsham, 2006). The third step was systematic coding of the transcripts and documents, broadly following the open, axial, and selective coding phases (Neuman, 2005).

As part of the systematic coding, the interview transcripts were coded by the first author, with frequent discussion and input from the co-authors. Although themes from our preliminary, literature-based model informed our initial coding categories, we used open coding to look for other potentially important benefit mechanisms and for better ways to conceptualise and organise the benefit mechanisms. An Excel spreadsheet was used during the coding to organise—and reorganise—codes and relevant empirical insights from the interviews. We initially recorded in the spreadsheet any benefit mechanisms mentioned or implied in an interview. We maintained separate columns for recording insights relating to (1) the independent variable (initially EA quality), (2) preliminary, literature-based benefit mechanisms, (3) new,

[2] Fig. 2(a) reprinted from Fig. 3 in Niemi and Pekkola (2016) with permission from the authors. Fig. 2(b) reprinted from Fig. 1 in Shanks et al. (2018) with permission from Elsevier. Fig. 2(c) reprinted from Fig. 1 in Ahlemann et al. (2021) with permission from Elsevier.

Table 2
Comparison of the three data streams.

	Data Stream 1	Data Stream 2	Data Stream 3
Overview	9 interviews with EA consultants, focusing on general opinions and experiences	12 organisational EA vignettes, based on 13 interviews and some document analysis	2 in-depth case studies, each based on 6–7 interviews and extensive document analysis
Purpose	Gain a *broad perspective* on EA benefit realisation (common benefits, challenges, good practices)	Explore EA benefit realisation *in a variety* of organisational *contexts*	Explore EA benefit realisation *in-depth* in an organisational context
Unit of Analysis	Interviewee (personal experiences)	Organisation	Organisation
Sampling Strategy: Individuals	• Focus on breadth of experience and expertise • All but one interviewee with at least 10 years of EA experience, and three working in EA since the discipline's inception • Balanced mix of business and IT backgrounds	• Following key informant selection principles (Huber & Power, 1985) • Sought the most senior person in charge of EA (usually the Chief Enterprise Architect or Chief Information Officer), and achieved this goal in all but two organisations (see Table 3). • All interviewees with well over 10 years of IT experience, often in senior leadership roles	A variety of EA stakeholders were interviewed (see Table 3): (a) the leader of EA, (b) other EA team members (to better understand the EA processes), (c) senior IT executives (as the main "customers" of EA services), and (d) representatives of major projects (as "customers" of EA services, but also to explore the tension between EA and project objectives).
Sampling Strategy: Organis-ation	N/A	• Maximum variation (Patton, 1990), on three dimensions: (1) industry sector, (2) level of data and process sharing between business units (Ross et al., 2006), and (3) rate of organisational change (Spewak & Hill, 1993). • All large organisations, as more likely to have a dedicated EA practice (min. 1 billion AUD revenue). • All Australian-based firms, for ease of access.	
Strengths	• Captured collective lessons learnt from a very broad variety of client organisations • Insights from senior and highly experienced EA practitioners • Such a broad coverage of insights from many organisational settings would otherwise not have been feasible	• Provided a first-hand view into EA in a range of different organisational contexts • The organisationally-grounded perspectives share some features of case studies (Perry, 1998)	• Provided an intimate, in-depth understanding of the role, value proposition, and challenges of EA service provision. • Case studies are considered the method of choice to gain a rich and deep understanding of phenomenon in its natural context (Yin, 2008).
Limitations	• Data in a pre-synthesised form (in-terviewees' interpretations), not possible to examine first-hand the contexts from which these opinions emerged • Due to project-based nature of work, consultants may have a somewhat short-term view of EA benefits realisation • Consultants may overestimate benefits in their expertise area (Ernst & Kieser, 2002)	• We use the term "vignettes", as despite being organisationally grounded and richer in contextual information, they lack the triangulation and depth of case studies. • In the absence of multiple informants, our interpretation of supporting documentation could also be coloured to a considerable extent by the single informant.	Two organisational contexts, meaning limited breadth
Key Insights	• Strong emphasis on mechanisms related to IS decision-making and IS platform. • Pointed to the need to include IS project delivery as a third benefit mechanism.	• Highest emphasis on IS platform, particularly the resource utilisation dimension. • Strong emphasis on IS decision-making. • Very limited mention of IS project-related benefits, raising doubts about the mechanism emerging from Stream 1	• Strong support for EA benefit mechanisms related to IS decision-making and IS platform. • Compelling evidence for IS project delivery as an EA benefit mechanism (e.g., RetailCo's transformation coupled with strong EA-project relationships)

previously unidentified benefit mechanisms, and (4) the dependent variable. We used the spreadsheet cells to also carefully capture the explanations and insights from the interviews about how and why each mechanism leads to EA benefits. The coding scheme was revised several times, as our understanding of the emerging themes, but also of the phenomenon in general, improved. Analysis iterated between the broad picture and the detail, similarly to the hermeneutic circle (Ramberg & Gjesdal, 2009; Walsham, 2006).

Each of our three data streams played an equally important role in the data analysis and provided different insights into EA benefit realisation (see Table 2). Due to the different nature of the data and backgrounds of the interviewees in the three data streams, analysis and synthesis of findings was performed at two levels. First, each data stream was analysed separately and sub-conclusions were drawn from each. Second, the findings were synthesised across the three streams. This resembles the multi-method approach (Morse, 2003), in that it could be viewed as a research program of three semi-independent studies with a fourth, overarching one to integrate the findings.

The benefits of this analysis approach were two-fold. First, from a process perspective, it helped approach the data within each stream using an appropriate depth and unit of analysis. In Stream 1, the unit of analysis was the interviewee and their extensive professional experience with EA. In Streams 2 and 3, the unit of analysis was the organisation. In these two streams (and particularly in Stream 3), data triangulation (Yin, 2008) was used whenever possible and insights from the interviews were complemented with relevant available documents such as annual reports, strategy and EA plans, presentations, press releases, and newspaper articles. In Stream 3, case study narratives were also developed for a deeper understanding of the organisational context, processes, and practices surrounding EA activity.

Second, from a content perspective, instead of averaging out discrepancies between the three data streams, any differences could be clearly identified. This provided opportunities for further reflection and additional insights (e.g., see the discussion at the end of Section 4.3.2 and the EA value conundrum discussed in Section 5.3). Reasons for cross-stream differences were carefully considered, and the final synthesis was informed by balancing the strengths and weaknesses of each stream. For example, we were mindful that the key informant approach used for interviewee selection in Streams 1 and 2 meant the samples in these two streams were skewed towards individuals with a close relationship to EA. Potentially, these informants might have had a positive bias towards EA. This methodological risk was largely overcome through our use of Stream 3, analysis of the literature, and the focus of our study being on how EA benefits are realised (as opposed to making claims about the extent of the benefits or likelihood of their realisation).

Table 5 illustrates how the qualitative data was coded with example excerpts from the transcripts presented in the middle column and the coding rationale shown in the right-most column (many of these and other illustrative quotations from the coding spreadsheet are presented in the theory development sections that follow). Relevant documents such as annual reports, strategy and EA plans, presentations, press releases, and newspaper articles were also reviewed. These provided additional context for understanding interviewees' remarks.

By the end of the analysis, after various causal mechanisms and sub-

Table 3
Interviewee profiles.

ID	Interviewee	Organisation	Tenure[a]	Background
Data Stream 1: EA Consultants (9 interviewees)				
I1	Enterprise Architect	Global IT consultancy 1	5	IT
I2	Principal	Global IT consultancy 2	10+	Business
I3	CEO	Specialist EA consultancy	10+	Business
I4	Director, Consulting	Specialist EA consultancy	15	IT
I5	Chief Architect	Specialist EA consultancy	15	Business
I6	Consultant	Self-employed	20+	IT
I7	Consultant	Self-employed	20+	IT
I8	Principal	Global management consultancy	10+	IT
I9	Research Director, EA	Global IT research firm	20+	Business
Data Stream 2: EA Vignettes (13 interviewees)				
I10	Lead Architect, Business Unit	BankCo	2	IT
I11	Manager, IT Architecture	EduCo	3	IT
I12	Senior IS Planner	GovCo	?[b]	?
I13	Chief Architect	InsuranceCo	20	Business
I14	CIO, Business Unit	LeisureCo	6	IT
I15	Chief Architect, Business Unit		20	IT
I16	Chief Architect	MetalCo	9	IT
I17	Chief Architect	MiningCo	5	Business
I18	CIO	PaperCo	8	IT
I19	Chief Enterprise Architect	ShopCo	20	IT
I20	CIO	StaffCo	3	IT
I21	Solution Architect	TelCo	9	IT
I22	General Manager, ICT	UtilityCo	1	Business
Data Stream 3: EA Case Studies (InfraCo 7, RetailCo 6 interviewees)				
I23	Executive Director, Tech. & Inf.	InfraCo	10	Business
I24	CIO		3	IT
I25	Manager, IT Strat. & Planning		2	?
I26	Manager, Information Services		8	IT
I27	Manager, IT Program Office		33	IT
I28	Deputy Program Director,Major Business Project		4	Business
I29	Technology Manager, Major Business Unit		16	Business
I30	CIO	RetailCo	6	Business
I31	Manager, EA		4	IT
I32	Manager, IT Strategy[c]		6	?
I33	Manager, Emerging Tech.[c]		9	IT
I34	General Manager, eBusiness[c]		4	IT
I35	Program Director, EDW		4	IT
Total: 35 interviewees				

[a] For Stream 1, the Tenure column reflects the duration of their career in EA (as the focus in these interviews was on the consultants' general experience). For Streams 2 and 3 the column reflects the interviewees' tenure with the organisation.

[b] "?" indicates that the tenure or background data was not obtained for the interviewee.

[c] These three interviews at RetailCo were conducted as part of as part of another research project on IT management. The data was highly relevant and re-analysed for the purposes of this study.

Table 4
Organisation profiles.

Organisation	Revenue (AUD)	NPAT (AUD)	Employees	Countries
EA Vignettes				
BankCo	$10–25 billion	$1000–5,000 million	25,000–50,000	5–10
EduCo	$1–5 billion	$50–100 million	5000–10,000	1
GovCo	$5–10 billion	$500–1000 million	10,000–25,000	1
InsuranceCo	$5–10 billion	$50–100 million	10,000–25,000	5–10
LeisureCo	$1–5 billion	$100–500 million	10,000–25,000	1
MetalCo	$5–10 billion	$100–500 million	10,000–25,000	>10
MiningCo	$1–5 billion	$500–1000 million	5,000–10,000	5–10
PaperCo	$5–10 billion	$ < 0	5000–10,000	>10
ShopCo	$1–5 billion	$100–500 million	10,000–25,000	1
StaffCo	$1–5 billion	$10–50 million	1000–5000	5–10
TelCo	$10–25 billion	$1000–5,000 million	25,000–50,000	5–10
UtilityCo	$1–5 billion	$100–500 million	1000–5000	1
EA Case Studies				
InfraCo	$1–5 billion	$100–500 million	1000–5000	1
RetailCo	$25–50 billion	$500–1000 million	100,000–200,000	1
Total: 14 organisations				

*The pseudonyms indicate the industry of each organisation. In order to ensure anonymity, the annual revenue (Column 2), net profit after tax (3), the number of employees (4), and the number of countries in which the organisation operates (5) are provided as ranges.

mechanisms had been considered, integrated or rejected, we had grouped those mechanisms into three key categories: (1) *Improved IS Decision Making*, (2) *Guiding IS Project Delivery*, and (3) *Building a Better IS Platform*. Our analysis also led us to the conclusion that access to high-quality EA service provision was required for all three mechanisms to produce desirable outcomes.

3.3. Integration of insights

In the final step of our theory-building process, we shifted our focus to refining our empirical findings with insights from the literature. In other words, we used insights from the literature to "sharpen the insights yielded by the inductive process" (Eisenhardt, 1989b, p. 548) of our empirical data analysis. We also used this as an opportunity to leverage the latest studies that had emerged since our data collection. In particular, we decided that the resource-based theory (Barney, 1991; Wernerfelt, 1984) that has guided a few recent EA benefit studies (Ahlemann et al., 2021; Shanks et al., 2018), provides valuable insights for explaining the role of EA as one of an organisation's dynamic capabilities (Eisenhardt & Martin, 2000; Teece, 2007). For example, EA improves an organisation's dynamic capabilities by guiding the transformation of its IT assets and resources into a valuable and complementary IS platform that helps the organisation achieve higher performance and, ultimately, an advantage over its competitors.

The final result of our iterative theory building process was the Enterprise Architecture Benefit Mechanisms Model (EABMM), which is presented in Fig. 3 and the details of the analysis that led to the model are discussed in the Findings section below. This new theoretical model is the result of our effort to infer to the best available explanation based on both our data and prior literature (Lipton, 2004).

Table 5
Five examples of data and analysis in the three data streams.

Data Stream	Quotation from Transcript	Interpretation
1	"[Without EA] there is collective wisdom. [But] in order to make a decision I need to get five people in a room and we all argue and we're trying to rationalise a view. One will go: "But I think it's a fabulous asset!" Another will go: "Well, I think it's complete junk!" Well, now what? What does that mean?" (I4)	Here, I4, the Director of Consulting in a leading specialised EA consultancy, is explaining how in the absence of EA, decision-makers often lack objective criteria to lean on in formulating their opinions. The interviewee also later explicitly mentioned the typically prolonged nature of such arguments. I4′s views were classed as consistent with Benefit Mechanism 1 (presented in the next section).
	"[…] enterprise architecture team that gets invited to lots and lots of discussions, that is functioning as a trusted advisor. Mostly between business and IT because that's still a major rift in most enterprises but they can also be asked into discussions between business units, for instance to give a holistic perspective on what each business unit can see only from their own, limited point of view." (I9)	Here, the Research Director of a leading global IT research firm (I9) describes the key features of a successful EA team. Having first mentioned that the very best EA teams are ones which are able to provide evidence and measures around their results, the interviewee turned to the second key characteristic—acting as a trusted advisor that facilitates cross-functional discussions. Not only is this view consistent with Benefit Mechanism 1, but it also increased our confidence in conceptualising EA as an advisory service.
2	"A lot of it was about education to be honest. Even re-use before buy, before build—a lot of people have never actually [...] done large-scale development, they just don't get it. Or they haven't had the experience to understand how difficult it is to actually build software or how difficult it is to integrate software." (I13)	Here, I13, the Chief Architect of InsuranceCo, is discussing his team's involvement in guiding IT delivery. The interviewee's focus is on guiding project decisions by educating members of the project team. This example is consistent with the education dimension for Benefit Mechanism 1.
3	"A major cost of all of these projects are the different environments: development, integrated testing, user acceptance testing, system testing, pre-production, and production environments. This costs a lot of money. [...] We created a common environment management group that could book projects into their environment." (I31)	Here, I31, the EA Manager of RetailCo, explains how the creation of a common development and testing environment provided substantial savings across RetailCo's project portfolio. This had a direct impact on project costs, and through that, provided cumulative savings to the organisation. This example is consistent with Benefit Mechanism 2 (i.e., *how* IS capability is delivered), rather than Benefit Mechanism 3 (i.e., *what* IS capability is delivered).
	"There were classic examples of how we avoided multiple different projects trying to do different things and leveraging the one. [...] A good example is SAP implementations. We did two major ones for Financials and HR. We leveraged a lot of capability we had built." (I31)	Here, I31, the EA Manager of RetailCo discusses the theme of capability sharing. However, the key focus in this comment is on leveraging the existing IS platform and minimising the duplication of capability in the IS platform that disparate projects would introduce. Therefore, unlike the prior example, this example provides support for Benefit Mechanism 3, not Benefit Mechanism 2.

4. Findings

Our empirical findings are organised following the three key themes required to explain EA benefits realisation that were also used to structure our literature review (see Fig. 1). Consistent with our theory building approach, and similarly to Eisenhardt (1989b) and Graebner (2004), we complement our empirical data with relevant literature-based insights where appropriate to refine our empirical findings. First, we discuss our findings related to the independent "variable", resulting in the creation of a new construct termed *Quality of EA Service Provision*. Second, we discuss the findings related to the dependent "variable", *Organisational Benefits from EA*. Third, we turn to the causal relationships linking the two and identify three key mechanisms through which *Quality of EA Service Provision* leads to *Organisational Benefits from EA,* i.e*., Quality of IS Decision-making, Quality of IS Project Delivery, and Quality of the IS Platform*. Finally, we capture all these key findings in the Enterprise Architecture Benefit Mechanisms Model (EABMM), presented in Fig. 3.

4.1. The independent variable: quality of EA service provision

Most of the work that enterprise architects do is focused on helping an organisation adjust its resource base to align with changes to the business environment and/or technology opportunities. In this regard, EA exhibits all three key dimensions of a dynamic capability, i.e., the ability to (1) sense such changes, (2) identify ways in which to seize the resultant opportunities, and (3) help the organisation find an optimal transformation path (Eisenhardt & Martin, 2000; Teece, 2007).

EA has traditionally been conceptualised as either a planning process (Spewak & Hill, 1993) or a collection of artefacts (Zachman, 1987). However, our data suggest that neither of these conceptualisations emphasises sufficiently that a key purpose of EA is to provide *advice* to IT and business decision-makers. This is consistent with more recent studies, which have started to draw attention to the need to also consider EA service quality (e.g., Cram et al., 2015; Kluge et al., 2006; Lange et al., 2016; Niemi & Pekkola, 2016; Shanks et al., 2018).

Based on careful analysis of and reflection on our empirical data (discussed in more detail below), *adopting a service mindset* appeared to be the key to realising organisational benefits from EA. Therefore, we

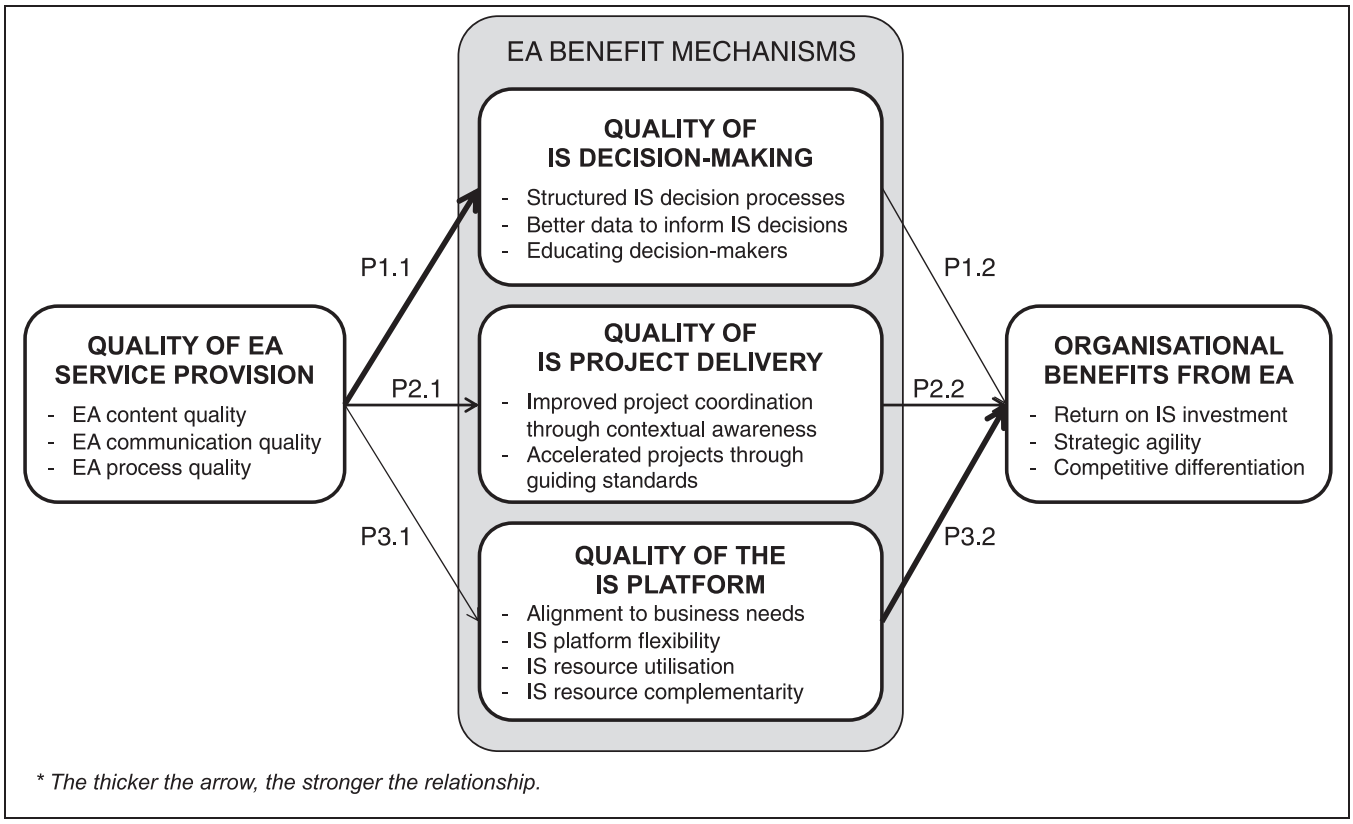

Fig. 3. The Enterprise Architecture Benefit Mechanisms Model (EABMM).

have gone a step further than prior studies (summarised in Table 1) and created a new construct, *Quality of EA Service Provision*, as the independent variable for explaining EA benefits realisation. *Quality of EA Service Provision* is conceptualized as subsuming three key EA quality dimensions identified in prior research, i.e., (1) EA content quality, (2) EA communication quality, and (3) EA process quality (Niemi & Pekkola, 2016).

4.1.1. The importance of a service mindset to EA

A common criticism of EA is that the approach is document-heavy, rigid and/or unresponsive, and EA teams have sometimes been described as an "ivory tower" function (e.g., McGovern et al., 2003; Rehkopf & Wybolt, 2003; van der Raadt, Schouten, & van Vliet, 2008). This is particularly problematic as the enterprise architects rarely have the mandate to decide which major IT investments their organisation makes, and even the level of control they have over project execution varies greatly from organisation to organisation. Therefore, in practice the primary way in which enterprise architects can drive business value or organisational benefits is by informing and positively influencing decisions taken by others (van den Berg et al., 2019).

Many of our interviewees emphasised the need to communicate EA-related information tailored to the understanding and information needs of specific stakeholders. This suggests a need for a more personalised, interactive approach for conveying this information. Lack of engagement and relevance (also referred to as an "ivory tower" approach) were among the most frequently mentioned failures of less-effective EA teams, reflecting a mindset where producing EA artefacts, rather than providing advice to decision-makers, had become the end-game. Interviewees I4 and I9 suggested that the strongest indicator of EA success is when the EA team becomes an integral part of key decision processes and when the decision-makers themselves start proactively turning to the EA team for advice. These observations were also consistent with our findings from the RetailCo case, whose highly effective EA team worked closely with both IT executives and project teams to provide relevant and timely advice.

> *Your only relevance [as an enterprise architect] will come from informing decisions that others make and being relevant in key processes. […] Success is that they come to you looking for stuff—because it informs their decision-making or it's critical to the way that they manage their investment cycle. (I4)*

> *The first sign that the [EA team is] doing something right is that they are being invited to lots of discussions, that they are trusted adviser on many issues. The second attribute I would say […] that they don't stand out as something separate but that they are a natural part of the process of creating plans, turning those plans into projects, tracing the progress of those projects all the way to implementation and actually measuring the expected benefits. So good enterprise architecture efforts embed themselves into the governance structure. That's very important in my view. (I9)*

Based on the insights from across our interviews and case studies, we believe that high-quality EA service provision is key to maximising organisational benefits from EA. It may be useful to think of the EA team as *an internal advisory service function* focused on guiding organisational IS decision-making. Although high-quality EA service *provision* does not necessarily guarantee service *use*, it is likely to be a strong driver of service use (and reuse) through its positive impact on customer satisfaction and service value perceptions (Niemi & Pekkola, 2016), just as IS service quality is a driver of IS service reuse (Kettinger et al., 2009).

This service view of EA is broader than the prevalent "product" view and can subsume the latter. EA advice can be conveyed through documentation, e.g., diagrams, reports or slide decks, but it can also be conveyed through other means, e.g., formal or informal conversations and meetings. The key, we argue, is to choose the most appropriate service-delivery mechanisms depending on the specific issue, context, and stakeholder(s) in question (Armour et al., 1999; Aziz & Obitz, 2007;

Bernus et al., 1996; van den Berg et al., 2019).

This perspective also aligns with the service-dominant logic (Vargo & Lusch, 2004), i.e., the macro-trend of moving from goods to services. Although the service-dominant logic applies to economic exchange between an organisation and its customers, it has several useful parallels with the EA value creation context. In order to illustrate the key differences between the EA-as-product and EA-as-service view, in Table 6 we have adapted the comparison of goods- and service-centred views (Vargo & Lusch, 2004, p. 7, table 2) to the EA context.

Based on these findings, we define our independent variable as follows:

Quality of EA Service Provision is the extent to which the EA team effectively and efficiently produces and provides IT decision-makers with relevant, timely, high-quality information and advice pertaining to the EA vision, current state, and/or roadmap.

4.1.2. Three dimensions of EA service provision quality

What constitutes the *Quality of EA Service Provision*? Building on the work of Lange et al. (2016) and Niemi and Pekkola (2016), we differentiate between three key sub-dimensions of *Quality of EA Service Provision*: (1) *EA Communication Quality* (how the information and advice is *conveyed*), (2) *EA Content Quality* (what information and advice is conveyed), and (3) *EA Process Quality* (how the information and advice is *created*).

First, *EA Communication Quality* refers to the ability of the EA team to effectively convey and communicate EA-related advice to relevant decision-makers (Lange et al., 2016; Niemi & Pekkola, 2016). While EA artefacts are one important vehicle for the delivery of EA services, the most appropriate means of communication (e.g., documentation, dialogue, presentations, etc.) depends on the task at hand. Therefore, this quality dimension encompasses the extent to which EA advice is delivered in a format aligned with the decision task and stakeholder preferences, EA team's efforts to raise awareness of EA services (Niemi & Pekkola, 2016) relevant to various decision scenarios, and their proactiveness in engaging with relevant stakeholders.

Second, *EA Content Quality* refers to the EA vision being well-aligned with the organisation's strategic goals, the content pertaining to the current IS platform accurately reflecting this platform at an appropriate level of detail, and the EA roadmap suggesting an optimal path for moving from the current state to the desired future state (Lange et al., 2016). *EA Content Quality* is closely related to EA product quality (Lange et al., 2016; Niemi & Pekkola, 2016), but rather than view the EA vision, EA current state, and EA roadmap as documents, artefacts, or "products", we propose that these are best thought of as the key content domains for EA service provision (Shanks et al., 2018). As noted above, EA content need not necessarily be conveyed through documents.

Third, *EA Process Quality* refers to the extent to which the EA team operates effectively and efficiently. While the focus of the communication and content quality dimensions is on the customer-facing aspects of the EA team (i.e., the quality of the advice and how effectively it is communicated), this quality dimension considers the processes internal to the EA team. It encompasses appropriate EA roles and skills, work routines, tools and frameworks (e.g., Jallow et al., 2017; Lankhorst, 2013; Lnenicka & Komarkova, 2019; The Open Group, 2018; Zachman, 1987), and a clear mandate (Lange et al., 2016; Niemi & Pekkola, 2016). Although *EA Process Quality* can impact service and content quality (Niemi & Pekkola, 2016), it is also possible for an EA team to provide good-quality services through inefficient processes. This could reduce, or even marginalise, the return on investment in EA.

Table 6
From product to service logic (adapted from Vargo & Lusch, 2004).

Dimension	Goods-Centred Dominant Logic	Service-Centred Dominant Logic	Implications for the EA Context
Primary unit of exchange	Goods	Specialised competences (knowledge and skills) or services	Specialist competencies (knowledge and advice) of the EA team as opposed to EA "goods" (artefacts) become the primary unit for EA knowledge exchange.
Role of goods	Goods as end products.	Goods as transmitters of knowledge and as intermediate "products" used by customers for value creation.	EA "goods" (artefacts) only carry value if they are relevant, meaningful, and accessible to "customers" (organisational decision-makers).
Role of customer	The customer as goods recipient. Organisations do things *to* customers.	The customer as service coproducer. Organisations do things *with* customers.	EA "customers" (organisational decision-makers) should be active participants in EA services rather than passive recipients of EA "goods" (artefacts).
Determination and meaning of value	Value is determined by the producer and embedded in the goods.	Value is perceived and determined by the consumer based on "value in use".	The value of EA "goods" (artefacts) and services is determined by the extent to which these are used by and useful to "customers" (organisational decision-makers).

4.2. The dependent variable: organisational benefits from EA

The dependent variable in our study is *Organisational Benefits from EA*, which we define as positive EA-related outcomes that are directly related to organisational performance. This variable captures the highest-order positive organisational outcomes from EA, while the benefit mechanisms discussed in the following section focus on the intermediate EA-driven outcomes that explain *how* EA leads to these benefits.

A broad variety of positive EA outcomes have been identified in prior research, ranging from micro-level to macro-level and from quantifiable to largely qualitative, e.g., improved communication, identification of system and/or project dependencies, improved alignment, faster problem-solving, higher agility, cost reduction (for projects, IT and/or operations), risk reduction, reduced duplication of effort and/or systems, and many others (Boucharas et al., 2010; Gong & Janssen, 2019; Lange et al., 2016; Niemi & Pekkola, 2016; Tamm et al., 2011). Many of these studies also classify these outcomes, e.g., using the dimensions of Kaplan and Norton (1992) Balanced Scorecard (Boucharas et al., 2010), value categories such as strategic, communication, and economic benefits (Gong & Janssen, 2019), or differentiating between lower and higher order EA benefits (Niemi & Pekkola, 2016).

As per our definition, in this study *Organisational Benefits from EA* refers to the highest-order positive organisational outcomes from EA (some of the lower-order benefits identified in prior studies are more relevant to the causal EA benefit mechanisms discussed in the following section). Based on a careful analysis of EA outcomes discussed in the prior literature and our empirical data, most valuable EA outcomes ultimately revolve around one of three types of organisational benefits: (1) better return on IS investment, (2) improved strategic agility, and (3) competitive differentiation.

The first type of organisational benefit relates to better return on IS investment (Obitz & Babu, 2009; Salmans & Kappelman, 2010). Examples of lower-order benefits that contribute to this higher-order

benefit from EA include cost reduction in IS projects and/or operations (Gong & Janssen, 2019), reduced IS resource duplication (Niemi & Pekkola, 2016), and more efficient utilisation of existing IS resources (Niemi & Pekkola, 2016).

The second type of organisational benefit relates to improved strategic agility, i.e., the ability to better sense and respond to change (Fallmyr & Bygstad, 2014; Salmans & Kappelman, 2010; Shanks et al., 2018). Examples of lower-order benefits that contribute to this higher-order benefit from EA include increased IT flexibility (Gong & Janssen, 2019), faster project execution (Niemi & Pekkola, 2016), and better organisational transformation capabilities (Gong & Janssen, 2019; Tamm, Seddon, Shanks, Reynolds, & Frampton, 2015).

The third type of organisational benefit relates to competitive differentiation (Shanks et al., 2018). Examples of lower-order benefits that contribute to this higher-order benefit from EA include better alignment between business and IT and/or strategy and execution (Gong & Janssen, 2019; Shanks et al., 2018), greater client satisfaction (Gong & Janssen, 2019), and improved acquisition management (Gong & Janssen, 2019).

4.3. Three EA benefit mechanisms

The key goal of our study is to identify and examine the underlying mechanisms (Mingers, 2004) through which EA leads to organisational benefits. We have identified three such EA benefit mechanisms: (1) *Improving IS Decision-making*, (2) *Guiding IS Project Delivery*, and (3) *Building a Better IS Platform*. All three benefit mechanisms are clearly attributable to and triggered by the *Quality of EA Service Provision* (the independent variable in this study) and, in turn, have the potential to deliver *Organisational Benefits from EA* (the dependent variable in this study).

Table 7 presents a summary of which of our interviews provided insights concerning each of the three EA benefit mechanisms. A tick "✓" in a cell of Table 7 indicates that the specific interview or case provided evidence of the importance of the given benefit mechanism. Each of the three mechanisms is defined and discussed in detail in the following three sub-sections.

Table 7
Three EA benefit mechanisms emerging from the data.

Interview / Case	Mechanism 1: IS Decision-Making	Mechanism 2: IS Projects	Mechanism 3: IS Platform
Data Stream 1: 9 EA Consultant Perspectives			
I1	✓	–	✓
I2	✓	✓	✓
I3	✓	✓	✓
I4	✓	✓	✓
I5	✓	✓	✓
I6	–	✓	–
I7	✓	–	✓
I8	✓	–	✓
I9	✓	✓	✓
Data Stream 2: 12 EA Vignettes			
I10 (BankCo)	✓	–	✓
I11 (EduCo)	✓	–	✓
I12 (GovCo)	–	–	–
I13 (InsuranceCo)	✓	✓	✓
I14 & I15 (LeisureCo)	✓	–	✓
I16 (MetalCo)	✓	✓	✓
I17 (MiningCo)	✓	–	✓
I18 (PaperCo)	✓	–	✓
I19 (ShopCo)	✓	–	✓
I20 (StaffCo)	✓	–	✓
I21 (TelCo)	✓	–	✓
I22 (UtilityCo)	✓	–	✓
Data Stream 3: 2 EA Case Studies			
InfraCo[a]	✓	✓	✓[a]
RetailCo	✓	✓	✓

[a] InfraCo was still at early stages of its EA-driven IS planning. The reported IS platform-related benefits were expected, but not yet realised.

4.3.1. Benefit mechanism 1: improving IS decision-making

> *Better decision-making, faster decision-making, more responsive decision-making to me are the sort of high-level benefits of the work that we do in enterprise architecture. (I8)*

The first key mechanism through which EA leads to the realisation of organisational benefits, is improving the *Quality of IS Decision-Making*, i.e., the extent to which the organisational IS decision-making processes are effective and efficient, both at the strategy level (e.g., large IT investment or sourcing decisions) and the project level (i.e., decisions relating to the IT programs and projects that follow from these strategic investment decisions). EA acts as a complementary and reinforcing capability to strategic decision-making, which is an essential organisational dynamic capability (Eisenhardt & Martin, 2000; Eisenhardt, 1999), and helps improve strategic IS decision-making in three ways: (1) creating a transparent, structured process for IS decision-making, (2) providing objective information to inform these decisions, and (3) educating decision makers on good IT investment practices. Each of these three ways is discussed in turn below.

4.3.1.1. A structured process for IS decision-making. EA is by its nature an evidence-based approach to IS decision-making (Johnson et al., 2007; Spewak & Hill, 1993). It facilitates the identification of all major stakeholders who may be affected by, and should be consulted about, a given process or technology change and ensures these stakeholders are involved in the decision process (Bernard, 2005).

At both our case organisations, InfraCo and RetailCo, EA led to the introduction of a more transparent, inclusive, and objective decision process around IT investments. The decisions were guided by the EA principles and deviations had to have a clear business reason. Stakeholders contributing to the decisions were selected based on a clearer understanding of who should be involved. This also improved dialogue between business divisions.

> *Some of the decisions that the project managers wanted to take would have a great impact on the support teams—they would not be able to support them. So we had people who actually run the shop in the Architecture Review Groups. (I31, RetailCo)*

Involving the relevant stakeholders early in the decision-making process allows for potential conflicts to be identified and resolved early, improving collaboration and dialogue between different parts of the organisation (Richardson et al., 1990). In some organisations that we spoke with, enterprise architects took an active role in mediating this dialogue, whereas in others their job was to establish the foundations to empower this dialogue.

> *The supply chain team and the merchandising team on the business side weren't talking to each other. […] We had to get the head people in supply chain, merchandise, in a room and facilitate a discussion that said: You want to do all this stuff? Now hang on, let's put a plan together that combines it. (I31, RetailCo)*

> *Before, I think the architects were go-betweens between a lot of the business units. So now we've put the responsibility back into the [business] unit heads to communicate directly and to make sure that they are working together. (I20)*

4.3.1.2. Providing the data to inform IS decisions. Many EA planning activities are aimed at capturing or finding the relevant facts to underpin future IS decisions (Niemi & Pekkola, 2016; van den Berg et al., 2019), e.g., documenting existing systems, or defining EA principles to set a clear basis for evaluating software or IT service providers. At both InfraCo and

RetailCo, EA helped managers to understand better their existing IS platform, including the IT assets and interdependencies between the business units, providing a foundation for better-informed decision-making.

> *[We didn't] have that view of what dependencies there might be, what opportunities or synergies there are. So we're also looking for this architectural program to help better inform, hopefully make better decisions with our ICT investments.* (I26, InfraCo)

> *It was a struggle at the beginning [...] understanding really what is it we had. It took a while*. (I30, RetailCo)

Some of our interviews also suggested that EA can help save a substantial amount of time and resources in reaching decisions by defining and documenting the guiding principles and decision processes up-front. There are likely to be fewer prolonged arguments (e.g., which software solution or service provider to select) and fewer misunderstandings about how or why a given investment decision was made (due to greater transparency of the process and principles).

> *[Without EA] there is collective wisdom. [But] in order to make a decision, I need to get five people in a room and we all argue and we're trying to rationalise a view. One will go: "But I think it's a fabulous asset!" Another will go: "Well, I think it's complete junk!" Well, now what? What does that mean?* (I4)

4.3.1.3. Educating decision-makers. A third aspect relating to IS decision-making that emerged from our interviews was EA teams' role as an educator, assisting both IT and business stakeholders by sharing knowledge and good practices for better IT-related decisions. This advice was of a more general nature and different from the specific guidance relating to concrete applications or technologies (that is usually captured in EA content). Rather, it related to sharing broader experience and general good practices that the stakeholders could later apply to similar contexts or decisions.

> *[I] educate where I have to. So I don't want to try and isolate either the technology or the business from the other side's language. What I try to do is where there is clearly a misunderstanding about something—educate*. (I10)

> *A lot of it was about education to be honest. Even re-use before buy, before build—a lot of people have never actually [...] done large-scale development, they just don't get it. Or they haven't had the experience to understand how difficult it is to actually build software or how difficult it is to integrate software*. (I13)

4.3.1.4. Summary of benefit mechanism 1. In summary, the findings discussed throughout Section 4.3.1 suggest that high-quality EA services improve the quality of the organisation's IS decision-making by (1) creating a transparent, structured process for IS decision-making, (2) providing objective information to inform these decisions, and (3) educating decision makers on good IT investment practices, resulting in greater organisational benefits.

It is important to keep in mind that while high-quality EA services have the *potential* to lead to organisational benefits through improved decision-making as per Benefit Mechanism 1, they *do not guarantee* these outcomes. Even high-quality EA services and advice may be overlooked or ignored by organisational decision-makers for a variety of reasons, e.g., organisational constraints for action and/or politics (Smith et al., 2012).

4.3.2. Benefit mechanism 2: guiding IS project delivery

> *I have a particular client here in Australia that measured, for instance, that the initiation phase of projects was shortened by 30–60 % [by introducing EA]*. (I9)

The second key mechanism through which EA leads to the realisation of organisational benefits is improving the *Quality of IS Project Delivery*, i.e., the extent to which the cost, effort, time, and risk across the organisation's project portfolio is optimised. EA can enhance an organisation's dynamic capabilities through an improved ability to seize and transform (Teece, 2007), by improving IS project delivery in two key ways: (1) better coordination and (2) guiding standards. Each of these two ways is discussed in turn below.

4.3.2.1. Improving project coordination through contextual awareness. EA helps improve the division and sequencing of work across and within projects by providing information about the current and planned IS projects and, most importantly, the interdependencies between the systems and processes that these projects are going to affect (Lange et al., 2012).

At both InfraCo and RetailCo, EA helped better sequence projects at a program level. Projects delivering foundational or reusable capabilities could be prioritised, avoiding duplicated investment. At RetailCo, during a major transformation program this understanding of project interdependencies also helped to reduce risk and unanticipated delays in related projects, as well as identify opportunities for projects to leverage existing resources, thereby reducing cost across the project portfolio.

> *The architects suggested: 'why don't you run this as one program, there are so many project synergies and synergies of the infrastructure.' And they actually then restructured the program because the architecture was so common*. (I31, RetailCo)

> *There was an enterprise data warehouse program, which was broken up into releases. Those releases aligned with the key change pieces in the other parts of the transformation. So release management strategy was absolutely critical to the success of implementing this enterprise platform*. (I35, RetailCo)

Similarly, work can be better coordinated within individual projects. Although project managers are primarily concerned with the scope and deliverables of their project, project managers at both InfraCo and RetailCo pointed out that EA helped them understand how their work fitted into the broader picture.

> *When you pick a project up you like to be told—here's the environment you're working in. [...] If we're not enterprise architects and we're trying to do enterprise architecture, then we may get it wrong*. (I27, InfraCo)

Our interviews also suggested that awareness of other projects helps project managers anticipate and avoid delays and risks, e.g., requiring subject matter experts who are preoccupied with other projects or attempting to modify a system concurrently with another project.

> *Quite often if you look back at the project audits and go: "Why was it over time, over budget?", [the reply is]: "Oh, we had a surprise." "What was the surprise?"—"We had a dependency on a system we didn't realise was being turned off."* (I4)

4.3.2.2. Accelerating projects through guiding standards. The standards and guidelines established as part of EA planning are not only useful for organisation-wide consistency, but can also act as valuable catalysts for project execution (Wagter et al., 2005), particularly in the project initiation phase (Foorthuis et al., 2016). Guidelines help narrow down the number of solutions to be evaluated in-depth, allowing project managers to complete the solution selection phase quicker (Foorthuis et al., 2016). This can provide significant savings in cost and time from

the project perspective.

> *For the initiation phase of the project, projects usually go out and do their own discovery. If they do it under the guidance of enterprise architecture, there is far less to discover.* (I9)

At InfraCo, EA guidelines were seen to be valuable in guiding selection and procurement of the IT systems in the project initiation phase.

> *When we went out with our expression of interest, we had no constraints. […] If we had had an enterprise architecture group, we might have specified [criteria] like Service Oriented Architecture or something, just to narrow it down.* (I28, InfraCo)

Our interviews also suggested that in addition to the EA standards and guidelines, the whole-of-enterprise view enables the EA team to point out useful practices, use cases, and prototypes elsewhere in the organisation that a project may be able to leverage. This may also include architecture good practices beyond the organisation's EA standards. At RetailCo, an example of this was solution architects within the EA team engaging closely with the projects throughout implementation to provide guidance on architectural issues.

4.3.2.3. Summary of benefit mechanism 2. In summary, the findings discussed throughout Section 4.3.2 suggest that high-quality EA services improve the quality of the organisation's IS project delivery by (1) improving project coordination through contextual awareness and (2) accelerating projects through guiding standards, resulting in greater organisational benefits.

As with Benefit Mechanism 1, high-quality EA services are a necessary but insufficient condition for realising organisational benefits through EA-enabled improvement to IS project delivery. There are numerous other factors beyond EA service provision that are important for successful IS project delivery (e.g., strong project leadership, stakeholder involvement, change management, and many others (Fortune & White, 2006; Schmidt et al., 2001)).

It is also important to note that our empirical data provided somewhat mixed messages regarding this benefit mechanism. While the EA Consultant Perspectives and the two case studies provided strong basis for Benefit Mechanism 2, only two of the twelve EA Vignette interviews provided support for the importance of this benefit mechanism and some interviewees expressed the view that seeking to provide project benefits should not be a key objective for enterprise architects, e.g., I19 stated that "enterprise architecture is not about the project, enterprise architecture is about the supportability down the line." Prior to making the decision to include Benefit Mechanism 2, we carefully considered potential reasons for this discrepancy (explained in detail in Section 5.3, "The EA Value Conundrum").

4.3.3. Benefit mechanism 3: building a better IS platform

> *You get an enterprise that is as a whole more effective than it is if you just look at the parts. And the important role that enterprise architecture plays is preventing local sub-optimisation, where you improve the parts to a point that it's actually impeding the function of the parts around it.* (I9)

The third key mechanism through which EA leads to the realisation of organisational benefits, is improving the *Quality of the IS Platform*, i.e., the extent to which an organisation's IS resources support its current and future business needs and are cost effective. Whereas the first benefit mechanism relates to *how* IS decisions are made, and the second to *how* organisational IS capabilities are delivered, this third and final benefit mechanism focuses on EA's impact on *what* IS capabilities are ultimately delivered.

An IS platform includes the IT infrastructure and digitised business processes that support the execution of an organisation's strategies and operations (Ross et al., 2006), including applications, data, and physical infrastructure. EA can have a beneficial impact on an organisation's IS platform by improving: (1) the alignment of the IS platform to business needs, (2) IS platform flexibility, (3) IS resource utilisation, and (4) IS resource complementarity. Each of these four ways for EA-enabled IS platform improvement is discussed in turn below.

4.3.3.1. Alignment to business needs. An IS platform is aligned with business needs if the platform supports the organisation's strategic and operational objectives (Henderson & Venkatraman, 1993; Reynolds & Yetton, 2015). EA has been found to have a positive impact on alignment (Gregor et al., 2007; Ross, 2003), and business-IT alignment is among the top reasons why organisations invest in EA (Aziz & Obitz, 2007; Obitz & Babu, 2009).

EA facilitates alignment of the IS platform through an organisation-wide consideration of both corporate and business unit needs and the required digitised business processes and enabling IS to support these needs. In the absence of this organisation-wide approach, the business units may be unaware of (or sometimes uninterested in) their role or impact to shared capabilities or processes, potentially leading to a poor fit of local systems in meeting corporate process and/or information needs.

> *Previously a general manager would say: "I've been to a symposium, I've seen other paper companies and they're all running this thing called [AppName]. I'm going to have [AppName]!" You go well, hang on, how does that fit within our strategy? And we're not going to buy it for one business, we need to look at it across all businesses. So we started thinking of the business holistically rather than business by business.* (I18)

4.3.3.2. Flexibility of the IS platform. A flexible IS platform is one that can be quickly and easily adapted to organisational change (Chanopas et al., 2006). EA helps improve flexibility by promoting the decoupling of monolithic systems to smaller components. These smaller components are easier to reconfigure or replace as required (Janssen & Hjort-Madsen, 2007; Ross et al., 2006). Carefully planned modularisation through EA also provides the flexibility for local customisations at the business unit level, without compromising the pursuit of standardisation-related benefits on the organisation-wide level (Kettinger et al., 2010). Improved knowledge about the interdependencies of the components captured in EA documentation can make changes considerably easier and less risky (Iyer & Gottlieb, 2004). Finally, EA contributes to IS platform flexibility through the avoidance of the "complexity trap" (Murer et al., 2010, pp. 17–18), i.e., the pursuit of business value through point-solutions in the short term that leads to a complex, inflexible, and costly IS platform in the long-term.

Improved flexibility of the IS platform contributes to greater strategic agility (Murer et al., 2010). While the organisational benefits from strategic agility may be difficult to quantify, the ability to respond to environmental forces quicker than competitors may be a source of (temporary) competitive advantage (Sambamurthy et al., 2003; Weill et al., 2002) or help minimise competitive disadvantage through the ability to respond faster to competitors. In the words of I18, good EA helps an organisation keep as many doors open as possible in responding to change:

> *When you're putting an enterprise architecture together it's actually looking at saying how do I keep as many doors open as I can. So how do I put a flexible architecture in that can take account of other businesses we buy, what we do with our business, how it changes. If I want to chop a piece of the business off and sell it, if I want to acquire another piece, or if one of our business partners in the space fails.* (I18)

4.3.3.3. IS resource utilisation. EA helps improve the extent to which an organisation leverages its IS resources. The whole-of-enterprise view provided by EA helps organisations to identify areas where resource gaps or duplication occur, and provide recommendations on how to

improve on the existing state (Bernard, 2005; Boh & Yellin, 2006; Pereira & Sousa, 2004). This includes prioritising investment into capability gaps and ageing system replacements, while maximising the use of existing capabilities.

> *The ability to communicate the functional capability of assets that are not actually enabled is actually also a powerful thing. Because often the business will [say]: I had no idea that we already had that capability, so I bought it.* (I4)

> *I can make more effective use of the capabilities I have within the organisation by understanding what I have and how I can better leverage it.* (I8)

At both InfraCo and RetailCo, EA had an important role in reducing system and process duplication. First, EA helped to reveal duplication of existing IT assets, business impact (e.g., high maintenance costs, data redundancy), and opportunities for improvement. Second, EA helped avoid further duplication by identifying opportunities for capability sharing and reuse in future business initiatives.

> *Based on the normal evolution of IT we've got ten of [these systems]. So a key thing about enterprise architecture is to ensure that as we move from the ten now, that we don't make another ten.* (I25, InfraCo)

> *There were classic examples of how we avoided multiple different projects trying to do different things and leveraging the one.* (I31, RetailCo)

In terms of preventing undesirable investment in duplicated or legacy IT resources, the interviewees cautioned though that although important, its value is often difficult to measure and get credit for.

> *We stopped undesirable investment in assets that we know have been sunsetted. Great! Measure the value. What, dollar value? You know it is right. It is like saying—what is the value of speed tickets, speed cameras?* (I4)

> *The difficulty lies in the fact that a lot of what enterprise architects do is preventing bad things from happening. And it's very hard to get credit for things that didn't happen.* (I9)

Reduced duplication, in turn, leads to a more standardised IS platform with fewer disparate applications, technologies, and interfaces. This not only improves resource utilisation (Kappelman et al., 2008), but can also contribute towards higher system reliability and availability (Pereira & Sousa, 2004; Ross et al., 2006), reduce maintenance and support costs, and sourcing costs through a better contract negotiation position (Boh & Yellin, 2006; Hjort-Madsen, 2006; Richardson et al., 1990; Ross et al., 2006; Spewak & Hill, 1993; Venkatesh et al., 2007). At RetailCo, in the first year of the transformation program EA was estimated to have already helped avoid around 20 million dollars in costs, most of this through the reuse of existing capabilities.

> *Certainly the common [benefits] I've seen are a reduction in IT complexity, a reduction in duplication of costs.* (I7)

> *We have got too many [applications and] that's costing us money because I've got to resource it, to have people to sit there and look after them.* (I29, InfraCo)

4.3.3.4. IS resource complementarity. EA enables an organisation to increase the complementarity of its IS resources (Kohli & Grover, 2008; Nevo & Wade, 2010, 2011). Complementary or synergistic resources are those that "mutually reinforce each other, leading to outcomes greater than the additive effect of the individual resources" (Someh & Shanks, 2013).

EA can help improve compatibility, integration, and interoperability between IT systems (Boh & Yellin, 2006; Kappelman et al., 2008; Venkatesh et al., 2007). At both InfraCo and RetailCo, EA had an important role in increasing compatibility, integration, and sharing of IT systems across business units. For example, at RetailCo elements of an advanced finance management solution built for the Finance department were also provided to the Human Resource Management department to support their business processes.

> *I'm hoping at a technical level [the EA] will be able to help us too. So that we are buying equipment that fits together.* (I23, InfraCo)

> *[During the merger] a lot of the decisions made were based on asset value [rather than EA]. You know this is worth more than that so we'll use that one. And we had a hell of a job trying to piece it all together.* (I15)

Further, EA assists in the identification of potential enterprise-wide synergies, and how to leverage them. While a project-focused IT investment approach tends to deliver individual resources (e.g., an application), EA shifts the focus to resource bundles by considering all the elements that need to be in place to fully leverage the new resource (King, 1995) and helps build complementary resources and capabilities (Prahalad & Hamel, 1990).

> *As an enterprise architect I want the solution, I don't just want one component.* (I17)

For example, at RetailCo, EA helped first identify and build solid enterprise-wide foundations that provided the enabling capabilities for subsequently implemented business applications:

> *We had to identify the IT projects that were foundational or mandatory for the business projects to land on. This is where the architects come back to the picture. You can't just land all these business projects on quicksand. You have to land them on solid foundations.* (I31, RetailCo)

According to resource-based theory, the sources of a firm's competitive advantage are rare, valuable, inimitable, difficult to substitute, and relatively immobile resources (Barney, 1991). Unique combinations of mutually reinforcing, complementary resources embedded in organisational processes and routines are more likely to exhibit these features than individual resources (Brynjolfsson & Saunders, 2009; Grant, 1996). A major difficulty in imitating or replicating these complex resource configurations stems from causal ambiguity, i.e., it may not be clear which components or interactions underpin the organisation's success (Lippman & Rumelt, 1982; Reed & DeFillippi, 1990). Therefore, EA has not only the potential to focus organisational efforts on building more valuable IS resources, but also to help the organisation build an IS platform that serves as a competitive differentiator.

4.3.3.5. Summary of benefit mechanism 3. In summary, the findings discussed throughout Section 4.3.3 suggest that high-quality EA services improve the quality of the organisation's IS platform by increasing (1) the alignment of the IS platform with the business needs, (2) IS platform flexibility, (3) IS resource utilisation, and (4) IS resource complementarity, resulting in greater organisational benefits.

As with the preceding benefit mechanisms, high-quality EA services nevertheless cannot guarantee these outcomes. IS platform improvements depend on the success of a series of IS projects and programs, project compliance with the EA (Ross et al., 2006; Segars & Grover, 1996), and many other factors.

4.3.4. The EA value conundrum

Consistent with prior studies (e.g., Obitz & Babu, 2009), a recurring theme throughout the interviews was the challenge of demonstrating and explaining the value of EA. This challenge may stem from an inherent conundrum in the causal links between EA service provision and value realisation. That conundrum is as follows.

The direct impact of EA is likely to be the strongest on the first benefit mechanism (IS decision-making), as enterprise architects provide a direct input into these decision processes. Some organisational benefits may flow directly from these improvements. For example, by expediting

decision-making, EA can help to save top management time and free it up for other strategic activities. EA can also contribute to strategic agility by helping an organisation to sense and decide on how to respond to changes in its environment (Fallmyr & Bygstad, 2014). However, such benefits are likely to be difficult to assess and quantify, and most benefits only flow if the decisions are successfully implemented.

The direct impact of EA on the second benefit mechanism (IS project delivery) is likely to be weaker than on IS decision-making. There are many other factors beyond EA service provision that contribute to IS project success, e.g., strong project leadership, stakeholder involvement, and change management (Fortune & White, 2006; Schmidt et al., 2001). However, this benefit mechanism is likely to generate more *tangible* benefits. EA-enabled improvements to project delivery can provide cost savings, faster project execution, and reduced project risk (Foorthuis et al., 2016; Lange et al., 2012). Although the impact from each individual project may be not very significant from an organisation-wide perspective, the cumulative effects across the project portfolio could be substantial.

Finally, the contribution of EA to the third benefit mechanism (IS platform) is likely to be even more challenging to gauge. IS platform improvements depend on the success of a series of major and minor IS projects over many years, appropriate IT governance mechanisms to ensure project compliance with the EA plans (Ross et al., 2006; Segars & Grover, 1996), the stability of the organisation's strategic direction, and many other factors. However, as discussed above, the potential organisational benefits from EA-guided IS platform improvements are the most substantial, including IT cost reduction, greater strategic agility, and potential competitive differentiation.

This points to a conundrum in demonstrating and convincing stakeholders of EA value. Where the impact of EA services is likely to be the clearest, the directly resultant organisational benefits are likely to be relatively modest. Conversely, where the impact of EA services is likely to be the most difficult to establish, the resultant benefits are likely to have the greatest organisational impact. Therefore, perhaps the best middle ground for *demonstrating* EA value is by improving IS project delivery. The reason is that the impact of EA services on IS projects is likely to be more easily measurable than its impact on the IS platform. There are fewer confounding factors and shorter lead times between cause and effect. However, the related benefits are tangible and more readily quantifiable (e.g., cost savings, faster execution) than those flowing from the improvements to IS decision-making.

It is important to be mindful that this *does not* imply that improving project delivery is the most *important* source of EA-driven benefits. However, this might be the place where *demonstrating* value is *the easiest* and could give the EA team an opportunity to demonstrate "quick wins" while simultaneously working towards the long-term "big wins" related to the IS platform. Furthermore, as these IS platform improvements can only be implemented through projects, establishing a strong collegial relationship between EA and project teams may have a positive impact on realising the "big wins" as well.

4.4. The Enterprise Architecture Benefit Mechanisms Model

The purpose of this section is to assemble the insights from the prior section into a new theoretical model, the Enterprise Architecture Benefit Mechanisms Model (EABMM), depicted in Fig. 3. The EABMM is framed as a variance model (Langley, 1999; Mohr, 1982), meaning all five constructs are measurable as variables, and the six arrows in Fig. 3 (Propositions 1.1–3.2) define variance relationships between the constructs. These constructs, which emerged from the data analysis discussed in the previous section, are defined in Table 8. The EABMM propositions, summarised in Table 9, capture the implications of the three benefit mechanisms identified in the previous section.

Benefit Mechanism 1, Improving IS Decision-making (discussed in detail in Section 4.3.1), says that higher *Quality of EA Service Provision* results in greater *Organisational Benefits from EA* through (1) more transparent, structured processes for IS decision-making (see Section 4.3.1.1), (2) greater reliance on objective information to inform IS decisions (see Section 4.3.1.2), and (3) better educated decision makers on good IT investment practices (see Section 4.3.1.3). The implications of Benefit Mechanism 1 are captured in the EABMM through proposition 1.1 (i.e., the higher the *Quality of EA Service Provision*, the higher the *Quality of IS Decision-Making*) and proposition 1.2 (i.e., the higher the *Quality of IS Decision-Making*, the greater the *Organisational Benefits from EA*).

Table 8
Definitions of the constructs in the EABMM.

Construct	Definition
Quality of EA Service Provision	Quality of EA Service Provision is the extent to which the EA team effectively and efficiently produces and provides IT decision-makers with relevant, timely, high-quality information and advice pertaining to the EA vision, current state, and/or roadmap. Quality of EA Service Provision comprises (1) EA content quality (quality of the information provided), (2) EA communication quality (how well the information is conveyed), and (3) EA process quality (how the information is obtained or created).
Quality of IS Decision-Making	Quality of IS Decision-Making is the extent to which the organisational IS decision-making processes are effective and efficient.
Quality of IS Project Delivery	Quality of IS Project Delivery refers to the extent to which the cost, effort, time, and risk across the organisation's project portfolio is optimised.
Quality of the IS Platform	Quality of the IS Platform is the extent to which an organisation's IS resources support its current and future business needs and are cost effective.
Organisational Benefits from EA	Organisational Benefits from EA are the EA-related outcomes that are directly and positively related to organisational performance. These include better return on IS investment, higher strategic agility, and greater competitive differentiation.

Benefit Mechanism 2, Guiding IS Project Delivery (discussed in detail in Section 4.3.2), says that higher *Quality of EA Service Provision* results in greater *Organisational Benefits from EA* through (1) improved project coordination through contextual awareness (see Section 4.3.2.1) and (2) accelerated project completion through guiding standards (see Section 4.3.2.2). The implications of Benefit Mechanism 2 are captured in the EABMM through proposition 2.1 (i.e., the higher the *Quality of EA Service Provision*, the higher the *Quality of IS Project Delivery*) and proposition 2.2 (i.e., the higher the *Quality of IS Project Delivery*, the greater the *Organisational Benefits from EA*).

Benefit Mechanism 3, Building a Better IS Platform (discussed in detail in Section 4.3.3), says that higher *Quality of EA Service Provision* results in greater *Organisational Benefits from EA* through (1) IS platform alignment to business needs (see Section 4.3.3.1), (2) IS platform flexibility (see Section 4.3.3.2), (3) IS resource utilisation (see Section 4.3.3.3), and (4) IS resource complementarity (see Section 4.3.3.4). The implications of Benefit Mechanism 3 are captured in the EABMM through proposition 3.1 (i.e., the higher the *Quality of EA Service Provision*, the greater the *Quality of the IS Platform*) and proposition 3.2 (i.e., the higher the *Quality of the IS Platform*, the greater the *Organisational Benefits from EA*).

While the EABMM posits that *Quality of EA Service Provision* is the *primary* driver of *Organisational Benefits from EA*, it is important to be mindful that it is not the *only* driver or determinant of EA value. In other words, the presence of high-quality EA services is a necessary but insufficient condition for the realisation of EA-related benefits.

The EABMM also captures the EA value conundrum identified in the previous section. The vertical sequence of benefit mechanisms in Fig. 3 reflects both (a) increasing lead times and a growing number of contingencies in benefit realisation, and (b) growing potential resultant benefits. To depict the different strengths of these relationships, the arrows on the left of Fig. 3 (P1.1, P2.1 and P3.1) are represented with

Table 9
The EABMM propositions.

P1.1	The higher the *Quality of EA Service Provision*, the higher the *Quality of IS Decision-Making*. **Causal mechanisms**: High-quality IS decision-making relies on sound decision processes and access to comprehensive relevant information. High quality EA service provision leads to a more transparent decision-making process where major stakeholders are clearly identified, and decisions are guided by EA principles. EA also provides relevant facts to help decision-makers better understand existing IS and their interdependencies and future IS requirements. EA service provision acts as an educator for stakeholders by sharing knowledge and good practices for better IT-related decisions. *Quality of EA Service Provision* is therefore posited to be an important driver of the *Quality of IS Decision-Making*.
P1.2	The higher the *Quality of IS Decision-Making*, the greater the *Organisational Benefits from EA*. **Causal mechanisms**: EA-supported improvements to IS decision-making lead to more efficient and effective decisions around IT investments, leading to cost reductions and better use of IT resources. It also improves strategic decision-making, enabling organisations to better sense and respond to change. This is an important dynamic capability that leads to increased IT flexibility and better organisational transformation capabilities. Improved IS decision-making also enables organisations to better differentiate from their competitors and gain competitive advantage by making both faster and more objective decisions. EA-supported *Quality of IS Decision Making* is therefore posited to be an important driver of *Organisational Benefits from EA*.
P2.1	The higher the *Quality of EA Service Provision*, the higher the *Quality of IS Project Delivery*. **Causal mechanisms**: High-quality IS project delivery relies on the organisation's ability to manage project cost, effort, time, and risk. High quality EA service provision leads to improved division and sequencing of work across and within projects and better understanding of the interdependencies between projects. EA also provides standards and guidelines that act as valuable catalysts for project execution and are useful for organisation-wide project consistency. The whole-of-enterprise perspective provided by EA also enables good practices, use cases, and prototypes to be shared between projects. *Quality of EA Service Provision* is therefore posited to be an important driver of the *Quality of IS Project Delivery*.
P2.2	The higher the *Quality of IS Project Delivery*, the greater the *Organisational Benefits from EA*. **Causal mechanisms**: EA-supported improvements to IS project delivery lead to reduced project risk, less duplication of effort, and more efficient utilisation of existing resources across IS projects. This contributes to cost reductions in IS projects leading, in turn, to better overall return on IS investment. Furthermore, improved IS project delivery leads to faster project execution enabling better ability to respond to change and therefore higher strategic agility. High-quality IS project delivery can also provide competitive differentiation when it is consistently more reliable, faster, or lower cost than competitor's project delivery. EA-supported *Quality of IS Project Delivery* is therefore posited to be an important driver of *Organisational Benefits from EA*.
P3.1	The higher the *Quality of EA Service Provision*, the greater the *Quality of the IS Platform*. **Causal mechanisms**: High-quality IS platform relies on the organisation's ability to retain and adjust a consistent set of IS resources in alignment with current and future business needs. EA facilitates the alignment of the IS platform and business needs using an organisation-wide consideration of strategic and operational objectives for IS resources. EA also improves flexibility in the IS platform by decoupling of monolithic systems to smaller components that are easier to reconfigure or replace. EA assists organisations to identify duplicated IT assets and opportunities for sharing and/or standardising IT assets. Furthermore, EA identifies complementarities and potential synergies between IT assets, enabling organisations to improve compatibility, integration, and interoperability between IT systems. *Quality of EA Service Provision* is therefore posited to be an important driver of the *Quality of the IS Platform*.
P3.2	The higher the *Quality of the IS Platform*, the greater the *Organisational Benefits from EA*. **Causal mechanisms**: EA-supported improvements to the IS platform lead to better strategic alignment, enhanced ability to modify the platform, and better utilisation of IT assets. When the IS platform is aligned to business needs it closely supports the organisation's strategic and operational processes, leading in turn to better return on IT investment and potential competitive advantage. Improved flexibility of the IS platform leads to a better ability to sense and respond to change and therefore better organisational transformation capabilities and overall strategic agility. More efficient utilisation and reduced duplication of IS resources leads to better return on IS investment. Furthermore, increased complementarity and synergies between IS resources can act as an important competitive differentiator, as such mutually reinforcing resources can be very difficult to imitate. EA-supported *Quality of the IS Platform* is therefore posited to be an important driver of *Organisational Benefits from EA*.

diminishing thickness, and the arrows on the right (P1.2, P2.2 and P3.2) are represented with increasing thickness. In other words, as one moves vertically down Fig. 3, one gets increasing potential organisational impact, but such impact is also increasingly contingent on factors beyond the scope and control of the EA team.

4.5. Boundary conditions (generalisability)

In all social science theories and models, it is important to specify their boundary conditions (Rivard, 2021; Shepherd & Suddaby, 2017). With respect to the EABMM, all organisations included in this study were large (at least one billion AUD annual revenue) Australian organisations. We would expect the EABMM to apply in similarly large organisations in similar cultures. This is also supported by the findings of our study being broadly consistent with the reviewed literature, which mostly originates from Europe and the USA. We are less confident that the EABMM is generalisable to small and medium organisations or to organisations in cultures different from the regions mentioned above, as organisation size, culture, business traditions, and economic factors may change the scale and nature of EA activity.

Considering the rapid evolution of digital technologies (e.g., social, mobile, analytics, cloud, and internet of things technologies) and IT management practices (e.g., the increasing prominence of agile approaches and design thinking), a salient question is whether the EABMM is generalisable over time. The data used in this paper was collected between 2010 and 2011. Despite profound changes to organisational IT use, we expect the EABMM's three EA benefit mechanisms to hold over time. This is because the mechanisms operate at a higher level of abstraction and are largely technology agnostic. For example, although agile practices may speed up EA-related planning and implementation cycles, they do not change the fundamental underlying benefit mechanisms such as project coordination (which continues to be highly relevant) and the need for digital platforms (which only continue to grow in importance). However, the enabling practices at a micro-level are more likely to change and may benefit from periodic re-examination.

5. Discussion

As explained in our Literature Review, the three key limitations of the existing literature on EA benefits realisations are that (1) knowledge on the topic is fragmented and difficult to integrate due to the different concepts and theories used, (2) there is limited qualitative research on the topic to explain causation, and (3) the causal mechanisms and how they operate would benefit from being described in greater detail. In this study, we have endeavoured to address these issues through a comprehensive, qualitative theory building study of *how* EA leads to organisational benefits.

More specifically, this study makes three key contributions to furthering the understanding of EA benefit realisation: (1) identification and explanation of three distinct EA benefit mechanisms, their nine subdimensions, and both cost-related and strategic benefits of EA, (2) highlighting the importance of EA service provision quality and defining this construct, and (3) explaining the difficulties in demonstrating organisational EA value through the EA value conundrum. Through these three contributions, the EABMM (Fig. 3) provides novel insights into EA benefit realisation and improves on existing key EA benefit mechanism models (summarised in Table 10, also compare Fig. 2 and Fig. 3). Each of these three key contributions of our study is discussed in further detail below.

Table 10
Comparing the EABMM benefit mechanisms to prior research.

Study	Independent Variables	EA Benefit Mechanisms	Organisational Benefits
EABMM	EA services as the key independent variable. Three EA quality dimensions.	Three benefit mechanisms and 9 sub-dimensions. All mechanisms clearly delineated. Distinguishes between project and platform outcomes.	Both cost benefits (return on IS investment) and strategic benefits (strategic agility; competitive differentiation)
Niemi and Pekkola (2016)	EA processes as the key independent variable. Three EA quality dimensions.	16 first-order and 5 s-order benefit mechanisms. Some mechanisms have potential overlaps. Direction of causal relationships not always clear. Does not distinguish between project and platform outcomes.	Cost benefits (IT cost reduction)
Shanks et al. (2018)	EA services and governance as the key independent variables. Limited consideration of EA quality dimensions.	Three benefit mechanisms. Project and platform outcomes not clearly delineated.	Strategic benefits (agility; competitive advantage; increased value)
Ahlemann et al. (2021)	EA planning and implementation as the key independent variables. Limited consideration of EA quality dimensions.	Two benefit mechanisms. Some potential construct overlap (e.g., "EA planning" and "IS planning and change management"). Does not distinguish between project and platform outcomes.	Cost benefits (cost effective IS operations) and limited strategic benefits (market responsiveness)

5.1. Three EA benefit mechanisms

The first and most important contribution of this study is its empirically-grounded identification and explanation of three key EA benefit mechanisms and their sub-dimensions. Identification of mechanisms is important, as "discovering a mechanism is the gold standard for establishing and explaining causal connections" (Glennan, 2009, p. 315), and identifying causal connections is often the primary objective when theory building (Illari et al., 2011).

With respect to prior EA-benefits research, our study complements and extends studies such as Lange et al. (2016), Niemi and Pekkola (2016), and Shanks et al. (2018) by unpacking the mechanisms driving EA benefit realisation and explaining how these mechanisms operate. Each of the EABMM benefit mechanism constructs is also carefully delineated to avoid potential construct overlaps (see Table 10). The three EA benefit mechanisms identified in this study—which have not been examined in as much depth in any prior study—are as follows:

(a) *Improving IS decision-making* is the first, least tangible, but nevertheless important, EA benefit mechanism. This finding is consistent with van den Berg et al. (2019), who focused specifically on the role of EA in decision making in their study.
(b) *Guiding IS Project Delivery* is the second mechanism that results in organisational benefits from EA. This finding is consistent with Foorthuis et al. (2016), who were one of the first to emphasise the need to distinguish between project and organisation-wide benefits. While project benefits also feature in Lange et al. (2016), Niemi and Pekkola (2016), and Shanks et al. (2018), the latter three studies all combine some or all project and platform-related outcomes within the same benefits construct. We highlight and clearly delineate the role of project-level and organisation-wide IS platform outcomes as the second and third mechanism that both contribute to organisational benefits, but in different ways.
(c) *Building a Better IS Platform* is the third mechanism that contributes to organisational benefits from EA. This mechanism is likely to be the major driver of organisational benefits from both EA and IT. While platform-related outcomes are touched on in some earlier studies (e.g., Shanks et al., 2018 discuss it as one of the project benefits), no other EA benefit model has identified it as an independent benefit mechanism.

Our study also contributes to a more nuanced understanding of how these three benefit mechanisms operate through the nine sub-dimensions identified in this paper (summarised as the dot-points in each benefit mechanism construct in Fig. 3). For example, with respect to the first benefit mechanism, the EA team's role as educator in decision-making has not received much attention in prior studies.

Finally, with regards to the organisational benefits that unfold as a result (i.e., the "quest for the dependent variable" (DeLone & McLean, 1992)), our organisational benefits construct includes both cost-related and strategic benefits of EA, whereas prior models have tended to focus on one or the other (cf. Table 10 and Fig. 2).

Overall, the EABMM in Fig. 3 provides a comprehensive yet parsimonious explanation of mechanisms through which EA yields organisational benefits. Although a number of *quantitative* studies on EA benefits have emerged in recent years (e.g., Foorthuis et al., 2016; Lange et al., 2016; Schmidt & Buxmann, 2011; Shanks et al., 2018; Weiss et al., 2013), *qualitative* studies on the topic (Ahlemann et al., 2021; Niemi & Pekkola, 2016) remain scarce. The analysis of our three qualitative data streams has enabled us to identify empirically and examine in detail these three different and important EA benefit mechanisms.

5.2. EA as service provision

The second contribution of this study relates to the "quest for the independent variable" (Petter et al., 2013) by highlighting the importance of EA service provision to realisation of organisational benefits from EA. Building on the DeLone and McLean (1992, 2003) IS success model, two other recent studies have drawn attention to service as one of the three key quality dimensions of EA (Lange et al., 2016; Niemi & Pekkola, 2016) and one has used EA service capability as a key independent variable (Shanks et al., 2018). The EABMM presented in this paper goes beyond these earlier studies by (1) developing the *Quality of EA Service Provision* construct which subsumes three key EA quality dimensions (i.e., content, communication, and process quality), (2) unpacking the detailed quality sub-dimensions and explaining their significance, (3) providing further empirical insights into the importance of viewing EA from a service perspective, and (4) explaining its theoretical foundations through parallels with the service-dominant logic (Vargo & Lusch, 2004).

Our claim is not that EA service quality is more important than EA content (or product) quality—both are essential. For example, Lange et al. (2016) found EA product quality to be directly associated with organisational benefits, while EA service quality affected benefits indirectly through its strong, positive impact on top management commitment to EA, and stakeholder awareness of EA. However, our findings suggest that adopting *a service provision mind-set* can enable an EA team to *improve both* EA content and service quality. Seeing the ultimate focus as service provision, as opposed to documentation production, helps the EA team to focus on activities that truly provide value and can improve the relevance and uptake of EA recommendations through stronger relationships with EA stakeholders. These relationships, including stakeholder participation and trust in EA (C. Schmidt & Buxmann, 2011; Weiss et al., 2013), are important prerequisites for realising EA value and for institutionalising EA in organisational processes (Lange et al., 2016; Weiss et al., 2013).

The risk with a product-centric or process-centric view of EA is that it can invite disconnectedness from the decision-makers, i.e., there is a risk of creating architecture for the sake of architects. Conceptualising EA as a service should help to address this problem—it is difficult to imagine providing a service without having an interested client, while it is quite possible to produce documents in the absence of an interested reader. The interested clients, in this case, are IS decision-makers on both the strategic and project level, in both the business and the IT function.

It is important to acknowledge though that high-quality EA services are an essential, but not necessarily sufficient, precondition for EA service use. Other factors, such as organisational politics and vested interests, mean that relying solely on service quality, trust, and goodwill for uptake of EA advice is not always possible. At the same time, our findings suggest that when EA teams apply formal power to achieve compliance, they can undermine the trust and goodwill that is critical for effectively engaging in and influencing business decisions in the long-term. Therefore, under which circumstances should EA teams apply formal power to ensure compliance is an interesting issue for future research. Also, there may be ways of designing and implementing formal EA governance controls that do not undermine goodwill, or even help build it. For example, many of the good practices for EA controls identified by Cram et al. (2015) could potentially serve both purposes (e.g., formal EA stakeholder reviews, expedited low-risk EA decisions, and co-ownership of EA initiatives).

5.3. The EA value conundrum

The third contribution of this study is providing an explanation for the difficulties that many EA teams face in demonstrating and convincing top management of EA value. Recent studies have shown there is a correlation between good EA practice and organisational performance (Foorthuis et al., 2016). However, the issue of causation remains more challenging to ascertain. We believe the explanation may be found in what we refer to as the "EA value conundrum". Our findings suggest that the organisational benefits from the outcomes that follow most immediately from EA activity are largely intangible and difficult to measure. Conversely, the EA-related outcomes that have the clearest, tangible organisational impact have long lead times and depend on so many other factors that the role of EA in delivering these benefits becomes confounded and difficult to establish.

Our study also draws attention to project support as a potential area where EA teams may find a good balance in demonstrating value. This does not mean that project support is the main source of EA benefits nor that it should be their primary focus area. We concur with Foorthuis et al.'s (2016) findings in that, ultimately, the primary EA benefits stem from supporting organisation-wide objectives. However, project support appears to be a valuable but often overlooked opportunity for *demonstrating* value and building the relationships and trust that can later be a powerful enabler for achieving the organisation-wide outcomes.

This potentially missed opportunity is evidenced by the mixed messages regarding the importance of Benefit Mechanism 2 across our three data streams (see Table 7), with strong support from the EA Consultant Perspectives and the two case studies and very limited support from the EA Vignettes. One possible explanation is that, due to the short-term nature of consulting engagements, EA consultants may need to focus more on the project-related "quick wins" whereas for organisational enterprise architects providing project-level advice is an undesirable distraction from working on "big picture" issues. An alternative explanation is that supporting projects is an important benefit mechanism that is not leveraged by organisational enterprise architects to its full potential.

A critical analysis of the views and explanations across our three data streams is more consistent with the latter view. In particular, the RetailCo case clearly illustrated that close collaboration between the EA and project teams can be very powerful (but is contingent on the right working culture and sufficient resourcing of the EA team to handle both strategy and project work). This viewpoint also converges with the findings of Niemi and Pekkola (2016), whose interviewees pointed out project support as a desirable, yet lacking, EA service.

Therefore, we believe project support is an important but often overlooked mechanism for providing—and demonstrating—EA value. That said, there is also some inherent tension between the short-term goals of projects and long-term goals of EA. Therefore, a delicate balance needs to be sought in the pursuit of project-related EA benefits through Benefit Mechanism 2 and organisation-wide IS platform benefits through Benefit Mechanism 3.

5.4. Implications for practice

Building on the above three key contributions of this paper, we now offer three practical recommendations to EA teams and their key stakeholders for maximising value from EA.

The first recommendation—for IT executives and EA teams—is to position EA as an internal advisory service function. EA teams are often criticised for being "document heavy" or aloof to the daily realities of "keeping the lights on" and delivering successful and cost-effective projects quickly. Taking a service view helps address these issues. More specifically, successful advisory service provision requires effective communication with target stakeholders and careful consideration of their information needs. Although EA advice may in some instances be most effectively conveyed through various documents (e.g., diagrams, reports, or slide decks), it may also be conveyed through other means (e.g., formal or informal conversations and meetings). In other words, the service view shifts the focus from EA products/artefacts towards utilising appropriate communication mechanisms. It emphasises that in addition to EA content, the way in which this content is communicated to stakeholders is also very important. To effectively inform decisions, EA teams should choose the most appropriate service-delivery mechanisms depending on the specific issue, context, and stakeholder(s) in question.

The second recommendation—for EA teams and project managers—is to acknowledge the shared goals and the mutual interdependence of EA and projects in enabling each other's success. The different timeframes and scope of EA and project work sometimes cause tensions between the two. However, the common goal of both EA and project work is to deliver valuable organisational capabilities to support the fulfilment of organisational strategy and mission. Further, any capabilities envisioned in EA plans typically require successful project execution for realisation, and successful project execution requires understanding project interdependencies with other systems and capabilities that is captured through EA. In short, EA and project teams are interdependent; each supports the other's success. In addition, as explained in relation to the EA value conundrum, the extent of EA support for projects may also provide a useful avenue for demonstrating shorter-term benefits ("quick wins") from EA.

The third recommendation—for top management and IT executives—is to acknowledge the long-term nature of EA benefit realisation through platform-building, which is the source of the "big wins" from EA work. As noted in the empirical findings, most of the work that enterprise architects do is ultimately intended to help organisations adjust their resource bases to align with changes to the business environment and/or technology opportunities. The ability to do so is clearly of strategic importance. However, due to long lead times in EA benefit realisation and many confounding factors, it may be difficult to demonstrate EA's contribution to the business. In some organisations, this can even lead to the need for an EA function being called into question. Therefore, if doubts arise about the value of the EA function, top management and IT executives need to ask themselves long-term questions such as: (1) "How well does our current IS platform support our strategic needs?"; (2) "What is the desired strength and flexibility of the IS platform?"; and (3) "How much, and what sort of, contribution from EA is required to achieve that desired future state?". Answers to such long-term, platform-

related questions are likely to be one of the most reliable indicators of the value of the organisation's current and future EA function.

In combination, the above three recommendations should assist in maximising the benefits realised from EA efforts, clearer demonstration of these benefits, and stronger working relationships between the EA team and all its key stakeholder groups.

5.5. Limitations and issues for future research

In light of the findings as well as the limitations of our study, we would like to highlight three important avenues for future research on EA benefits realisation.

First, since this is a theory building study, further independent testing of the EABMM is necessary. For example, as explained in the Research Method section, two of our data streams relied on the key informant approach. While this helped maximise insights from each interview, key informants are inevitably individuals close to EA and may have a more positive view on EA value. This limitation in our study was addressed through the case studies in the third data stream, analysis of the literature, and focusing on the mechanisms for (rather than the magnitude of) benefits realisation. However, future studies could seek out even more diverse and negative perspectives on EA value. Benefit mechanism interrelationships may also be useful to investigate further. While each of the three benefit mechanisms in the EABMM appears to be an independent and distinct contributor to organisational benefits, there could be interaction effects between them. Finally, testing the explanatory power of the EABMM in different contexts as compared to other current and emerging EA benefit models would be most valuable. From a research methods perspective, future large cross-sectional surveys would be useful for testing the generalisability of the EABMM and longitudinal studies would be highly valuable in further examining how EA benefit mechanisms operate over time (as there is often a long lead time between EA service provision and benefits realisation).

Second, an area requiring further empirical examination is how to strike an appropriate balance between the advisory and compliance roles of EA. Positioning EA as a service, as we have proposed in this study, may help address some of the most common issues in EA benefits realisation. However, it may also have some negative implications and, at times, taking a compliance approach may be necessary. Studies on trust and formal controls in the management (e.g., Das & Teng, 1999; Inkpen & Currall, 2004; Poppo & Zenger, 2002) and IS literatures (e.g., Gallivan & Depledge, 2003; Heiskanen et al., 2008; Langfield-Smith & Smith, 2003) could provide a useful foundation for future research on this issue.

Third, another delicate yet essential balancing act is between EA and project delivery. This issue—closely linked to our EA value conundrum—has received surprisingly little attention. What is the relative importance and organisational impact of EA-enabled project benefits versus IS platform benefits? How can organisations improve the often-strained relationship between EA and project teams? Under what circumstances should the pursuit of EA-enabled project benefits take precedence over EA-enabled platform benefits, and vice versa? As the realisation of IS platform benefits is contingent on projects, future research on how these benefit mechanisms may interact would likely help organisations to more effectively leverage both of these benefit mechanisms.

6. Conclusion

The past decade has witnessed growing research interest in EA benefits and ways to achieve them. Various studies now provide a range of differing, though complementary, insights into EA benefits realisation. However, EA benefits realisation processes remain relatively under-explored, particularly with respect to how and why EA benefits are realised. In this study, we sought a first-principles-based understanding of EA benefit mechanisms, based on three streams of qualitative interviews with EA experts and stakeholders. The resultant Enterprise Architecture Benefit Mechanisms Model (EABMM) proposed in this study suggests that *Quality of EA Service Provision* is the key driver of EA benefits realisation, and that a service-oriented mindset may help overcome issues with EA activity sometimes being disengaged from its key stakeholders. With respect to how EA leads to organisational benefits, the EABMM suggests that researchers and organisations have three key benefit mechanisms to consider: (1) improved IS decision-making, (2) guiding IS project delivery, and (3) improved IS platform. Finally, the EABMM highlights an EA value conundrum, i.e., the EA outcomes which can be realised quickly and are easiest to demonstrate have relatively limited tangible value, while EA outcomes that have the highest tangible value take a long time to realise and are complex to demonstrate and quantify. Organisations need to be mindful of this conundrum and balance the pursuit of both EA "quick wins" and "big wins".

We hope that the insights captured in the EABMM will help organisations achieve better outcomes from their EA activity and provide researchers a useful steppingstone on the journey towards deeper understanding of EA benefit realisation!

CRediT authorship contribution statement

Toomas Tamm: Conceptualization, Data curation, Formal analysis, Methodology, Investigation, Project administration, Writing – original draft, Writing – review & editing. **Peter B. Seddon:** Conceptualization, Investigation, Methodology, Project administration, Supervision, Writing – review & editing. **Graeme Shanks:** Conceptualization, Investigation, Methodology, Project administration,Supervision, Writing – review & editing.

Appendix A. : Interview Guide

This appendix presents the questionnaire that was used to guide the semi-structured interviews. Please note that this questionnaire was a guide only, and its purpose was to encourage the interviewees to reflect on the research themes, rather than constrain this discussion. The phrasing of the questions varied based on the role of the interviewee and the organisational context. Depending on the interviewee's role and experience (e.g., enterprise architect, CIO, project manager), the focal themes also varied from interview to interview. Not all questions were necessarily covered in every interview, and some themes were covered in greater depth than others depending on the interviewee's background.

Interviewee Background

Please describe your background and current role in the organisation (incl. educational and professional background, EA-related experience, current role, reporting line, key deliverables).

Theme 1: Organisational Context

1. What is the current and desired level of process and data sharing between the business units?
2. How do you decide what should be shared between different business units?
3. How much change is the organisation currently going through in terms of business and IT?
4. What are the current key drivers and directions of business change?

Theme 2: Current and Future EA

5. Does the organisation have a good overview of its existing process and application portfolio?

6. What are the key processes and IT systems that support the business (i.e., the current EA)?
7. How diverse is the organisations IT portfolio (e.g., can you give an approximate estimate about the number of systems and interfaces that the portfolio is comprised of)?
8. What is the future vision for the organisation's processes and IT systems? How is this vision expected to improve on the current state?
9. What are the high-level principles that guide this future vision?
10. Does a pre-defined project roadmap exist for moving towards the EA vision? If yes, what is the general approach used and/or the key phases of the roadmap? If not, why is the roadmap considered to be unnecessary?

Theme 3: EA Approach

11. Who is responsible for EA planning in the organisation? How many people are involved and how are the responsibilities distributed?
12. What level of detail and which timeframes do you consider in your EA?

- What do you plan up-front, and what is developed "on-the-go"?
- How do you accommodate for the rapid technology and business changes?

13. What processes and/or governance structures link EA planning with business planning on the one hand and project delivery on the other?
14. How are the EA plans produced and updated?

- Who are the key contributors to the vision?
- How often are the plans reviewed and updated?

Theme 4: Deriving Benefits from EA

15. What are the characteristics of a good EA? What do these characteristics depend on?
16. To what extent do the on-going IT and business projects adhere to the EA vision and principles (e.g., can you suggest percentages)? Does this accurately reflect the potential of EA and if not what is the reason for the discrepancy?
17. What have been the key benefits of EA for your organisation?

- Can you give some specific examples on how certain architectural decisions (or lack thereof) have affected your organisation?
- Can you give any approximate figures on the extent of EA-related impacts (e.g. $ saved/lost, time saved/wasted, etc.)?

18. What have been the key success factors for EA planning and implementation?
19. What have been the main challenges relating to EA planning and implementation?
20. Is EA more important for some organisations than others? Why or why not?

Thank you for finding the time to contribute to this research project!.

Appendix B. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.ijinfomgt.2022.102554.

References

Ahlemann, F., Legner, C., & Lux, J. (2021). A resource-based perspective of value generation through enterprise architecture management. *Information & Management, 58*(1), Article 103266. https://doi.org/10.1016/j.im.2020.103266

Armour, F. J., Kaisler, S. H., & Liu, S. Y. (1999). A big-picture look at enterprise architectures. *IT Professional, 1*(1), 35–42. https://doi.org/10.1109/6294.774792

Aziz, S., & Obitz, T. (2007). Enterprise architecture is maturing: infosys enterprise. *Architecture Survey, 2007*.

Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99–120. https://doi.org/10.1177/014920639101700108

Bernard, S. A. (2005). *An introduction to enterprise architecture* (2nd ed.). AuthorHouse.

Bernus, P., Nemes, L., & Williams, T. J. (1996). *Architectures for enterprise integration*. Chapman & Hall.

Bharadwaj, A. S. (2000). A resource-based perspective on information technology capability and firm performance: an empirical investigation. *MIS Quarterly, 24*, 169–196.

Boh, W. F., & Yellin, D. (2006). Using enterprise architecture standards in managing information technology. *Journal of Management Information Systems, 23*(3), 163–207. https://doi.org/10.2753/MIS0742-1222230307

Boucharas, V., van Steenbergen, M., Jansen, S., & Brinkkemper, S. (2010). *The contribution of enterprise architecture to the achievement of organizational goals: establishing the enterprise architecture benefits framework technical report* UU-CS-2010-2014. Utrecht University.

Brynjolfsson, E., & Saunders, A. (2009). *Wired for innovation*. The MIT Press.

Carson, D., Gilmore, A., Perry, C., & Gronhaug, K. (2001). *Qualitative marketing research*. Sage Publications.

Chanopas, A., Krairit, D., & Khang, D. B. (2006). Managing information technology infrastructure: A new flexibility framework. *Management Research News, 29*(10), 632–651. https://doi.org/10.1108/01409170610712335

CIO Council. (2008). *A practical guide to federal service oriented architecture*.

Cram, W. A., Brohman, M. K., & Gallupe, R. B. (2015). Addressing the control challenges of the enterprise architecture process. *Journal of Information Systems, 29*(2), 161–182. https://doi.org/10.2308/isys-50913

Das, T. K., & Teng, B.-S. (1999). Cognitive biases and strategic decision processes: an integrative perspective. *Journal of Management Studies, 36*(6), 757–778. https://doi.org/10.1111/1467-6486.00157

DeLone, W. H., & McLean, E. R. (1992). Information systems success: the quest for the dependent variable. *Information Systems Research, 3*(1), 60–95. https://doi.org/10.1287/isre.3.1.60

DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems, 19*(4), 9–30.

DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional Isomorphism and collective rationality in organizational fields. *American Sociological Review, 48*(2), 147–160. https://doi.org/10.2307/2095101

Eisenhardt, K. M. (1989aaa). Building theories from case study research. *Academy of Management Review, 14*(4), 532–550.

Eisenhardt, K. M. (1989bbb). Making fast strategic decisions in high-velocity environments. *Academy of Management Journal, 32*(3), 543–576. https://doi.org/10.2307/256434

Eisenhardt, K. M. (1999). Strategy as strategic decision making. *Sloan Management Review, 40*, 65–72.

Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: What are they? *Strategic Management Journal, 21*(10/11), 1105–1121. https://doi.org/10.1002/1097-0266(200010/11)21:10/11%3C1105::AID-SMJ133%3E3.0.CO;2-E

Ernst, B., & Kieser, A. (2002). Consultants as agents of anxiety and providers of managerial control. *Academy of Management Proceedings, 2002*(1), C1–C6. https://doi.org/10.5465/APB.7516889

Fallmyr, T., & Bygstad, B. (2014). Enterprise architecture practice and organizational agility: An exploratory study. In *Proceedings of the forty seventh Hawaii international conference on system sciences (HICSS)* (pp. 3788–3797). Retrieved from ⟨https://doi.org/10.1109/HICSS.2014.471⟩.

Foorthuis, R., van Steenbergen, M., Brinkkemper, S., & Bruls, W. A. G. (2016). A theory building study of enterprise architecture practices and benefits. *Information Systems Frontiers, 18*(3), 541–564. https://doi.org/10.1007/s10796-014-9542-1

Fortune, J., & White, D. (2006). Framing of project critical success factors by a systems model. *International Journal of Project Management, 24*(1), 53–65. https://doi.org/10.1016/j.ijproman.2005.07.004

Gallivan, M. J., & Depledge, G. (2003). Trust, control and the role of interorganizational systems in electronic partnerships. *Information Systems Journal, 13*(2), 159–190. https://doi.org/10.1046/j.1365-2575.2003.00146.x

Glennan, S. (2009). Mechanisms. In H. Beebee, C. Hitchcock, & P. C. Menzies (Eds.), *The Oxford handbook of causation*. Oxford University Press.

Gong, Y., & Janssen, M. (2019). The value of and myths about enterprise architecture. *International Journal of Information Management, 46*, 1–9. https://doi.org/10.1016/j.ijinfomgt.2018.11.006

Graebner, M. E. (2004). Momentum and serendipity: How acquired leaders create value in the integration of technology firms. *Strategic Management Journal, 25*(8–9), 751–777. https://doi.org/10.1002/smj.419

Grant, R. M. (1996). Toward a knowledge-based theory of the firm. *Strategic Management Journal, 17 (Special Issue: Knowledge and the Firm)*, 109–122.

Gregor, S., Hart, D., & Martin, N. J. (2007). Enterprise architectures: Enablers of business strategy and IS/IT alignment in government. *Information Technology & People, 20*(2), 96–120.

Heiskanen, A., Newman, M., & Eklin, M. (2008). Control, trust, power, and the dynamics of information system outsourcing relationships: A process study of contractual software development. *The Journal of Strategic Information Systems, 17*(4), 268–286. https://doi.org/10.1016/j.jsis.2008.10.001

Henderson, J. C., & Venkatraman, N. (1993). Strategic alignment: Leveraging information technology for transforming organisations. *IBM Systems Journal, 32*(1), 4–16.

Hjort-Madsen, K. (2006). Enterprise architecture implementation and management: A case study on interoperability. In *Proceedings of the thirty ninth Hawaii international conference on system sciences*.Retrieved from ⟨https://doi.org/10.1109/HICSS.2006.154⟩.

Huber, G. P., & Power, D. J. (1985). Retrospective reports of strategic-level managers: Guidelines for increasing their accuracy. *Strategic Management Journal, 6*(2), 171–180. https://doi.org/10.1002/smj.4250060206

Illari, P., Russo, F., & Williamson, J. (Eds.). (2011). *Causality in the sciences*. Oxford University Press.

Inkpen, A. C., & Currall, S. C. (2004). The coevolution of trust, control, and learning in joint ventures. *Organization Science, 15*(5), 586–599. https://doi.org/10.1287/orsc.1040.0079

Iyer, B., & Gottlieb, R. M. (2004). The four-domain architecture: an approach to support enterprise architecture design. *IBM Systems Journal, 43*(3), 587–597.

Jallow, A. K., Demian, P., Anumba, C. J., & Baldwin, A. N. (2017). An enterprise architecture framework for electronic requirements information management. *International Journal of Information Management, 37*(5), 455–472. https://doi.org/10.1016/j.ijinfomgt.2017.04.005

Janssen, M., & Hjort-Madsen, K. (2007). Analyzing enterprise architecture in national governments: The cases of Denmark and the Netherlands. In *Proceedings of the fortieth Hawaii international conference on system sciences*.

Johnson, P., Lagerström, R., Närman, P., & Simonsson, M. (2007). Enterprise architecture analysis with extended influence diagrams. *Information Systems Frontiers, 9*(2–3), 163–180. https://doi.org/10.1007/s10796-007-9030-y

Kaplan, R. S., & Norton, D. P. (1992). The balanced scorecard: Measures that drive performance. *Harvard Business Review, 83*, 172–180.

Kappelman, L., McGinnis, T., Pettite, A., & Sidorova, A. (2008, August 14). Enterprise architecture: Charting the territory for academic research. In *Proceedings of the fourteenth Americas conference on information systems*. Retrieved from ⟨http://aisel.aisnet.org/amcis2008/162/⟩.

Kettinger, W. J., Marchand, D. A., & Davis, J. M. (2010). Designing enterprise IT architectures to optimize flexibility and standardization in global business. *MIS Quarterly Executive, 9*(2), 95–113.

Kettinger, W. J., Park, S.-H."S., & Smith, J. (2009). Understanding the consequences of information systems service quality on IS service reuse. *Information & Management, 46*(6), 335–341. https://doi.org/10.1016/j.im.2009.03.004

King, W. R. (1995). Creating a strategic capabilities architecture. *Information Systems Management, 12*(1), 67–69.

Kluge, C., Dietzsch, A., & Rosemann, M. (2006). How To realise corporate value from enterprise architecture. In *Proceedings of the fourteenth European conference on information systems* (pp.1572–1581).

Kohli, R., & Grover, V. (2008). Business value of IT: An essay on expanding research directions to keep up with the times. *Journal of the Association for Information Systems, 9*(1), 23–39.

Lange, M., Mendling, J., & Recker, J. (2012). A comprehensive EA benefits realization model—an exploratory study. In Proceedings of the Forty fifth Hawaii international conference on systems sciences (pp. 4230–4239). Retrieved from ⟨https://doi.org/10.1109/HICSS.2012.50⟩.

Lange, M., Mendling, J., & Recker, J. (2016). An empirical analysis of the factors and measures of enterprise architecture management success. *European Journal of Information Systems, 25*(5), 411–431. https://doi.org/10.1057/ejis.2014.39

Langfield-Smith, K., & Smith, D. (2003). Management control systems and trust in outsourcing relationships. *Management Accounting Research, 14*(3), 281–307. https://doi.org/10.1016/S1044-5005(03)00046-5

Langley, A. (1999). Strategies for theorizing from process data. *The Academy of Management Review, 24*(4), 691–710. https://doi.org/10.2307/259349

Lankhorst, M. M. (2005). *Enterprise architecture at work: Modelling, communication and analysis*. Springer-Verlag.

Lankhorst, M. M. (2013). *Enterprise architecture at work: Modelling, communication and analysis* (3rd ed.). Springer.

Lippman, S. A., & Rumelt, R. P. (1982). Uncertain imitability: An analysis of interfirm differences in efficiency under competition. *The Bell Journal of Economics, 13*(2), 418–438.

Lipton, P. (2004). *Inference to the best explanation* (2nd ed.). Routledge.

Lnenicka, M., & Komarkova, J. (2019). Developing a government enterprise architecture framework to support the requirements of big and open linked data with the use of cloud computing. *International Journal of Information Management, 46*, 124–141. https://doi.org/10.1016/j.ijinfomgt.2018.12.003

Longépé, C. (2003). *The enterprise architecture IT project: The urbanisation paradigm* (1st ed.). Butterworth-Heinemann.

Lux, J., Riempp, G., & Urbach, N. (2010). Understanding the performance impact of enterprise architecture management. In *AMCIS 2010 Proceedings*. Retrieved from ⟨http://aisel.aisnet.org/amcis2010/403⟩.

McGovern, J., Ambler, S. W., Stevens, M. E., Linn, J., Sharan, V., & Jo, E. K. (2003). *A practical guide to enterprise architecture*. Prentice Hall PTR.

Melville, N., Kraemer, K., & Gurbaxani, V. (2004). Information technology and organizational performance: An integrative model of IT business value. *MIS Quarterly, 28*(2), 283–322.

Meyer, J. W., & Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. *American Journal of Sociology, 83*(2), 340–363.

Mingers, J. (2000). The contribution of critical realism as an underpinning philosophy for OR/MS and systems. *Journal of the Operational Research Society, 51*(11), 1256–1270.

Mingers, J. (2004). Real-izing information systems: Critical realism as an underpinning philosophy for information systems. *Information and Organization, 14*(2), 87–103. https://doi.org/10.1016/j.infoandorg.2003.06.001

Mohr, L. B. (1982). *Explaining organizational behavior* (1st ed.). San Francisco: Jossey-Bass.

Morse, J. M. (2003). *Principles of mixed methods and multimethod research design* (pp. 189–208). Sage Publications.

Murer, S., Bonati, B., & Furrer, F. J. (2010). *Managed evolution: A strategy for very large information systems*. Berlin Heidelberg: Springer.

Myers, M. D. (1997). Qualitative research in information systems. *MIS Quarterly, 21*(2), 241–242.

Myers, M. D., & Newman, M. (2007). The qualitative interview in IS research: Examining the craft. *Information and Organization, 17*(1), 2–26. https://doi.org/10.1016/j.infoandorg.2006.11.001

Namba, Y. (2005). *City planning approach for rebuilding enterprise information systems* (Ph. D. thesis). Tokyo Institute of Technology.

Neuman, W. L. (2005). *Social research methods: Qualitative and quantitative approaches (sixth)*. Pearson Education.

Nevo, S., & Wade, M. R. (2010). The formation and value of IT-enabled resources: antecedents and consequences of synergistic relationships. *MIS Quarterly, 34*(1), 163–183.

Nevo, S., & Wade, M. R. (2011). Firm-level benefits of IT-enabled resources: A conceptual extension and an empirical assessment. *Journal of Strategic Information Systems, 20*(4), 403–418. https://doi.org/10.1016/j.jsis.2011.08.001

Niemi, E. I., & Pekkola, S. (2016). Enterprise architecture benefit realization: Review of the models and a case study of a public organization. *SIGMIS Database, 47*(3), 55–80. https://doi.org/10.1145/2980783.2980787

Obitz, T., & Babu K, M. (2009). *Enterprise architecture expands its role in strategic business transformation: Infosys enterprise architecture survey 2008/2009*.

Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2nd ed.). Sage Publications, Inc.

Pereira, C.M. & Sousa, P. (2004). A method to define an enterprise architecture using the Zachman framework. In *Proceedings of the 2004 ACM symposium on applied computing* (pp. 1366–1371).

Perry, C. (1998). Processes of a case study methodology for postgraduate research in marketing. *European Journal of Marketing, 32*(9), 785–802. https://doi.org/10.1108/03090569810232237

Petter, S., DeLone, W., & McLean, E. R. (2013). Information systems success: The quest for the independent variables. *Journal of Management Information Systems, 29*(4), 7–62. https://doi.org/10.2753/MIS0742-1222290401

Poppo, L., & Zenger, T. (2002). Do formal contracts and relational governance function as substitutes or complements? *Strategic Management Journal, 23*(8), 707–725.

Prahalad, C. K., & Hamel, G. (1990). The core competence of the corporation. *Harvard Business Review, 68*(3), 79–91.

Ramberg, B., & Gjesdal, K. (2009). Hermeneutics. *In The Stanford encyclopedia of philosophy*. Summer. ⟨https://plato.stanford.edu/archives/sum2009/entries/hermeneutics/⟩.

Reed, R., & DeFillippi, R. J. (1990). Causal ambiguity, barriers to imitation, and sustainable competitive advantage. *Academy of Management Review, 15*(1), 88–102. https://doi.org/10.5465/AMR.1990.4308277

Rehkopf, T. W., & Wybolt, N. (2003). Top 10 architecture land mines. *IT Professional, 5*(6), 36–43. https://doi.org/10.1109/MITP.2003.1254967

Reynolds, P., & Yetton, P. (2015). Aligning business and IT strategies in multi-business organizations. *Journal of Information Technology, 30*(2), 101–118. https://doi.org/10.1057/jit.2015.1

Richardson, G. L., Jackson, B. M., & Dickson, G. W. (1990). A principles-based enterprise architecture: Lessons from Texaco and star enterprise. *MIS Quarterly, 14*(4), 385–403.

Rivard, S. (2021). Theory building is neither an art nor a science. It is a craft. *Journal of Information Technology, 36*(3), 316–328. https://doi.org/10.1177/0268396220911938

Ross, J. W. (2003). Creating a strategic IT architecture competency: Learning in stages. *MIS Quarterly Executive, 2*(1), 31–43.

Ross, J. W., Weill, P., & Robertson, D. C. (2006). *Enterprise architecture as strategy: Creating a foundation for business execution*. Harvard Business School Press.

Salmans, B., & Kappelman, L. A. (2010). *The state of EA: Progress, not perfection* (pp. 165–217). CRC Press.

Sambamurthy, V., Bharadwaj, A. S., & Grover, V. (2003). Shaping agility through digital options: Reconceptualizing the role of information technology in contemporary firms. *MIS Quarterly, 27*(2), 237–263.

Schmidt, C., & Buxmann, P. (2011). Outcomes and success factors of enterprise IT architecture management: Empirical insight from the international financial services industry. *European Journal of Information Systems, 20*(2), 168–185. https://doi.org/10.1057/ejis.2010.68

Schmidt, R. C., Lyytinen, K. J., Keil, M., & Cule, P. E. (2001). Identifying software project risks: An international Delphi study. *Journal of Management Information Systems, 17*(4), 5–36.

Segars, A. H., & Grover, V. (1996). Designing company-wide information systems: Risk factors and coping strategies. *Longest Range Planning, 29*(3), 381–392.

Senior Scholars Consortium. (2011). *Senior scholars' basket of journals*. Association for Information Systems. ⟨http://aisnet.org/?SeniorScholarBasket⟩.

Shanks, G., Gloet, M., Asadi Someh, I., Frampton, K., & Tamm, T. (2018). Achieving benefits with enterprise architecture. *The Journal of Strategic Information Systems, 27* (2), 139–156. https://doi.org/10.1016/j.jsis.2018.03.001

Shepherd, D. A., & Suddaby, R. (2017). Theory building: A review and integration. *Journal of Management, 43*(1), 59–86. https://doi.org/10.1177/0149206316647102

Smith, H. A., Watson, R. T., & Sullivan, P. (2012). Delivering an effective enterprise architecture at Chubb insurance. *MIS Quarterly Executive, 11*(2), 75–85.

Someh, I.A., & Shanks, G. (2013, December 15). The role of synergy in achieving value from business analytics systems. In *Proceedings of the thirty fourth international conference on information systems*.

Spewak, S. H., & Hill, S. C. (1993). *Enterprise architecture planning: Developing a blueprint for data, applications, and technology*. John Wiley & Sons.

van den Berg, M., Slot, R., van Steenbergen, M., Faasse, P., & van Vliet, H. (2019). How enterprise architecture improves the quality of IT investment decisions. *Journal of Systems and Software, 152*, 134–150. https://doi.org/10.1016/j.jss.2019.02.053

van der Raadt, B., Schouten, S., & van Vliet, H. (2008). *Stakeholder perception of enterprise architecture* (pp. 19–34). Springer. https://doi.org/10.1007/978-3-540-88030-1_4

van Steenbergen, M., Schipper, J., Bos, R., & Brinkkemper, S. (2010). The dynamic architecture maturity matrix: instrument analysis and refinement. In A. Dan, F. Gittler, & F. Toumani (Eds.), *Service-oriented computing. ICSOC/ServiceWave 2009 workshops* (pp. 48–61). Springer. Retrieved from ⟨https://doi.org/10.1007/978–3-642–16132-2_5⟩.

van Steenbergen, M., van den Berg, M., & Brinkkemper, S. (2008). A balanced approach to developing the enterprise architecture practice. In J. Filipe, J. Cordeiro, & J. Cardoso (Eds.), *Enterprise Information Systems* (pp. 240–253). Springer. https://doi.org/10.1007/978-3-540-88710-2_19.

Tamm, T., Seddon, P. B., Shanks, G., & Reynolds, P. J. (2011). How does enterprise architecture add value to organisations? *Communications of the Association for Information Systems, 28*(1), 141–168. https://doi.org/10.17705/1CAIS.02810

Tamm, T., Seddon, P. B., Shanks, G., Reynolds, P. J., & Frampton, K. M. (2015). How an Australian retailer enabled business transformation through EA. *MIS Quarterly Executive, 14*(4), 181–193.

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal, 28*, 1319–1350. https://doi.org/10.1002/smj.640

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal, 18*, 509–533.

The Open Group. (2018). *The TOGAF standard, Version 9 .2*.

Vargo, S. L., & Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing, 68*(1), 1–17. https://doi.org/10.1509/jmkg.68.1.1.24036

Venkatesh, V., Bala, H., Venkatraman, S., & Bates, J. (2007). Enterprise architecture maturity: The story of the veterans health administration. *MIS Quarterly Executive, 6* (2), 79–90.

Wade, M. R., & Hulland, J. (2004). Review: The resource-based view and information systems research: Review, extension, and suggestions for future research. *MIS Quarterly, 28*(1), 107–142.

Wagter, R., van den Berg, M., Luijpers, J., & van Steenbergen, M. (2005). *Dynamic enterprise architecture: How to make it work*. John Wiley & Sons.

Walsham, G. (1995). Interpretive case studies in IS research: Nature and method. *European Journal of Information Systems, 4*(2), 74–81. https://doi.org/10.1057/ejis.1995.9

Walsham, G. (2006). Doing interpretive research. *European Journal of Information Systems, 15*(3), 320–330. https://doi.org/10.1057/palgrave.ejis.3000589

Weill, P., & Ross, J. W. (2009). *IT savvy: What top executives must know to go from pain to gain*. Harvard Business School Press.

Weill, P., Subramani, M., & Broadbent, M. (2002). Building IT infrastructure for strategic agility. *Mitosz Sloan Management Review, 44*, 57–65.

Weiss, S., Aier, S., & Winter, R. (2013). Institutionalization and the effectiveness of enterprise architecture management. In *Proceedings of the thirty fourh international conference on information systems*.

Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal, 5*, 171–180.

Wheeler, B. C. (2002). NEBIC: A dynamic capabilities theory for assessing net-enablement. *Information Systems Research, 13*, 125–146. https://doi.org/10.1287/isre.13.2.125.89

Wynn, D., Jr, & Williams, C. K. (2012). Principles for conducting critical realist case study research in information systems. *MIS Quarterly, 36*(3), 787–810.

Yin, R. K. (2008). *Case study research: Design and methods* (4th ed.). Sage Publications.

Zachman, J. A. (1987). A framework for information systems architecture. *IBM Systems Journal, 26*(3), 276–292.