

Enterprise Architects as Enablers for Achieving IT-Business Alignment: A Theoretical Perspective"

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Abstract:

For many years, people have acknowledged the importance of IT architecture in strategic planning. However, both in theory and practice, the significance of IT architects and their contribution to IT-business alignment has been undervalued. Our research paper reviews existing literature categorizes the different roles played by IT architects and explains how they impact IT-business alignment. The primary goal of IT architects is to select and integrate IT components/services effectively and efficiently that align with business requirements. They do this by providing guidance and adhering to standards. We identified eight types of IT architects who operate at either the strategy/business level or the project/solution level. Enterprise architects are critical in achieving IT-business alignment; they can shape an organization's IT landscape in a way that promotes business flexibility or standardization, enabling the organization to differentiate itself in the marketplace or lead on costs.

keywords: IT strategy, Business strategy, Business process modeling, Enterprise transformation.

Introduction:

IT architecture is a crucial element of an organization's strategy, and it can provide a competitive advantage [1, 2]. It is a critical component of strategic alignment along with IT strategy, business strategy, and the organization itself [3]. Despite its importance, there is no agreed-upon definition for IT architecture, and the term is not widely understood outside the construction industry [4, 6, 7]. As a result, the role of the IT architect remains unclear both in the literature and in practice [8, 9, 10]. Few studies have explored the role of IT architects, leaving a significant knowledge gap regarding their importance in achieving IT-business alignment [11].

The primary objective of our research is to address this gap by exploring the roles of IT architects and their impact on IT-business alignment. Our study aims to answer two research questions: first, what are the different types of IT architects, and which of these are relevant to IT-business alignment? Second, how can IT architects align their work with the organization's business strategy?

To answer these questions, we conducted a theoretical review [12]. Our analysis focused on the existing literature to identify various types of IT architects based on their tasks, responsibilities, and outcomes. We found that enterprise architects play a vital role in shaping an organization's IT landscape and significantly impacting IT-business alignment. Business architects or business analysts can support enterprise architects by eliciting business requirements more accurately. In the following sections, we describe the role of IT architects in general, categorize them into different types, and explain how they align with the organization's business strategy. We also discuss the importance of IT-business alignment and the impact of enterprise architects on achieving it. Finally, we summarize our key findings and suggest future research directions.

The role of the IT architect in general:

IT architecture is fundamental to an organization's IT and deals with IT planning [4, 5]. IT architects, a concept that describes the position in charge of developing IT architecture, are frequently used to refer to those who design IT architectures [13, 14]. Together with a competitive advantage, IT resource management, and IT-business alignment, the development of IT architecture is a crucial subject in strategic IT planning [1]. IT architectures are created by specifying IT capabilities in line with policies and technical considerations to meet an organization's strategic goals [6]. Yet, there is no agreed, all-encompassing definition of IT architecture [4, 6]. On occasion, an organization's technology standards or IT infrastructure are referred to as the organization's "IT architecture" [6]. Enterprise architecture, a related concept, can also be perplexing [15]. The functions of IT/enterprise architects in practice will likewise be hazy and inconsistent if the terms IT architecture and enterprise architecture are not defined clearly in academia.

Seminal works addressing IT architecture serve as an indicator of successful and efficient IT integration. The IT architecture was described by Zachman [16] as a conceptual construct for defining interfaces and integrating all parts of an IT system. Similar to this, Earl [4] saw IT architecture as a framework for long-term IT decisions and IT integration (systems, interfaces, and compatibilities). To integrate all IT resources, Keen [17] underlined the necessity to strike a balance between the competing objectives of maintaining alternatives for new IT resources, accommodating standards, and safeguarding investments. Efficiency and efficiency are essential requirements for the design and implementation of architectural structures as well as selection criteria for IT resources [17, 18]. IT architects must do tradeoff assessments before choosing IT resources [19]. To ensure that IT components and services are in line with the scope, capabilities, and governance of the IT strategy, IT architects must efficiently and effectively design and deploy them [18].

The literature already in existence offers a variety of descriptions for IT architects that go beyond the aforementioned essential IT architectural characteristics. Standards, business requirements, and advice are crucial elements of IT architecture. The IT architecture establishes standards for the creation of IT applications, unifies open systems from various vendors,

controls networks, and gives the business access, security, and control over its data [20]. The study, planning, and implementation of an organization's IT infrastructure to meet evolving IT and business requirements is also guided by IT architecture [4]. It must offer the frameworks necessary to successfully implement the business's requirements [4].

IT architecture is a design that includes high-level long-term organizational requirements for IT as well as a specific strategy for combining IT and non-IT resources and skills into a single, functional unit [21]. As the IT infrastructure evolves, architectural policies and standards (i.e., rules, protocols, and specifications shared by many business entities) become more developed [21]. An organization's IT architecture includes physical resources for data processing, storing, and transmission as well as IT applications [22]. The IT architecture was split into three categories by Henderson and Venkatraman [18]: data architecture, IT application portfolio, and configurations of hardware, software, and communication tools. In general, IT architecture contributes to the development of IT infrastructure, IT applications, and business standardization [23]. The term "IT architecture" is used in this essay to refer to all architectural actions and results. The IT architecture includes a range of levels, functions, and responsibilities (such as enterprise architects and solution architects). Because there is no standard vocabulary for IT architecture, the subordinated terms are likewise varied and oftentimes unclear. IT architecture tasks are assigned by organizations to distinct positions with different titles [14]. A few categories of IT architects are described in the literature, but these also vary, despite the paucity of research on the subject [14].

Different types of IT architects perform at two main levels:

According to Martin, Dmitrieva, and Akeroyd [24], IT architects have different levels of operation with varying roles and responsibilities based on the organization's requirements. Their literature review found that there are two primary levels of IT architecture: the enterprise level, which focuses on integration, flexibility, and reuse, and the solution or project level, which concentrates on creating individual systems. Akenine [25] further categorized IT architecture roles into three levels, including the strategic level aligned with the business, the technical level that handles solution design, and the intermediate level that connects business and technology.

Table 1. Sources 14, 25, and 26 discuss the different categories of IT architects, their key duties, and the common deliverables they produce:

IT architect type	Tasks and responsibilities	Typical artifacts
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Enterprise architect	wider IT strategy IT-based business strategy Cost-effectiveness of the organization's IT architecture (i.e., IT investments that are in line with its business goals) Governance. international technical norms.	IT techniques maps of capability urban plans Integration techniques Analyzes as-is/to-be principles of architecture, etc.
Business architect	Analysis of requirements (organisation, business, procedures, technical answer) process development Process simulation Realization of project benefits	Process diagrams use examples Knowledge-based models
Solution architect	Adapting a solution to the requirements Balance between requirements that are useful and those that are not (trade-offs, priorities) Integration of solutions Reusing current features and services Solution alignment with standards. Project alignment with architectural principles. Reusing current resources in projects.	Application flowcharts map systems UIs for services technical connections Integration techniques
Software architect	Design and structure of software systems. Flexibility, performance, reusability, testability, and usability are considered functional criteria. on-going project assistance. Duties could resemble those assigned by solution architects.	Frameworks Class models Patterns Aspects

To identify consistent roles for IT architects, Akenine [25] conducted qualitative research with a focus group of experts from different industries. Based on their findings from workshops and reviews of 40 artifacts and architectural deliverables, Akenine [25] suggested four roles of IT architects, which provided typical artifacts. These roles were later examined by Figueiredo et al. [14, 26], who confirmed Akenine's typology but suggested eliminating the business architect role. According to Figueiredo et al. [14, 26], the tasks of business architects are performed by enterprise architects or solution architects, depending on availability.

Foorthuis and Brinkkemper [27] distinguished two IT architecture levels in a governmental organization in the Netherlands: the enterprise/domain level and the project level. They defined enterprise architecture as a high-level set of views and prescriptions that guide the coherent

design and implementation of processes, organizational structures, information provision, and technology within an organization. Domain architecture is optional and relates to specific groups of products/services, processes, or functions, while project architectures refer to single projects.

IT architects are classified into three types by The Open Group Architecture Framework (TOGAF) [28]: enterprise architects, segment architects, and solution architects. The segment architect from TOGAF [28] corresponds to the domain architect from Foorthuis and Brinkkemper [27], while the solution architect is comparable to the solution architect from Akenine [25]. Large companies may also employ IT architects on an intermediate business-unit level, focusing on business-unit strategies and coordinating with enterprise architects at the corporate strategy level and architects at the project level [29].

IT architect roles have also been examined based on activities demanded in the human resources market [30]. Manual content analysis of job advertisements identified three main types of IT architects: enterprise architects, solution architects, and software architects, with emerging types such as e-commerce and digital architects. In a viewpoint article, Unde [31] suggested three types of IT architects: the enterprise architect, the technical architect, and the hybrid solution architect positioned between the other types at a program level

Table 2: Different IT architect types from various sources:

Level	IT architect type	[14]	[25]	[27]	[28]	[29]	[30]	[31]
Strategy/ Business	Enterprise	X	X	X	X	X	X	X
	Business		X*			X**		
	Segment				X			
	Domain			X				
Project/ Solution	Solution	X	X		X		X	X
	Software	X	X				X	
	Project			X		X		
	Technical							X
* Business analysis					** Bus. unit			

Although there is no generally accepted definition for enterprise architecture [32], it is widely recognized in the literature as representing the highest IT-architectural view of an organization, connecting IT strategy and business strategy [15, 33]. Enterprise architecture involves the integration and standardization of an organization's IT resources and capabilities, organized logically through principles, methods, and models [35]. Because of its strategic nature, enterprise architecture adopts a long-term perspective and is essential for IT-business alignment, making the enterprise architect the most obvious IT-architect type.

The meaning of IT-business alignment:

IT-business alignment is a well-studied topic in the field of IT research, with the key objective being to improve business performance by lowering costs, increasing revenues, and achieving higher returns on investment, as well as gaining competitive advantages through IT. Other goals may include improving quality or reacting to new opportunities. The concept of IT-business alignment is referred to by various terms, such as strategic alignment of IT, business-IT alignment, strategic IT alignment, and alignment of IT. However, these terms all imply the same thing: that there is a correspondence between the objectives of the business and IT strategies so that IT applications are consistent with the business strategies. This means that the mission statements and objectives of both the business and IT strategies must match and be suitable for both business and IT environments. Consistency is important because IT decisions can have an impact on the business, and vice versa. For example, IT designs can either support or hinder subsequent business decisions. A recent definition of IT-business alignment states that it is "the extent to which a firm's relative investments in different IT areas (e.g., hardware, application software, maintenance) is consistent with the firm's business strategy" [39, p. 454]. Alignment refers to the process of harmonizing IT capabilities, priorities, decisions, and actions with the business strategies of the organization.

IT-business alignment by enterprise architects:

The central component of a firm's IT strategy is IT architecture, which combines business strategy, IT capabilities, and human resources. It plays a critical role in IT-business alignment by assessing the impact of IT on business processes and ensuring that IT solutions are aligned with the business. IT architecture is crucial in determining the IT resources needed to provide an integrated platform, selecting appropriate IT platforms, and planning IT solutions aligned with the business.

Academic publications have increasingly recognized IT architecture as a way to achieve IT-business alignment since the beginning of the millennium. Some studies have shown that investing in IT architecture can improve IT-business alignment, and the maturity of IT architecture can bring a positive impact on IT-business alignment and IT value. Enterprise architecture is often seen as an effective means to achieve IT-business alignment and IT-value

creation. However, different researchers express the strength of the need for enterprise architecture to IT-business alignment differently.

Enterprise architecture can be viewed as an "enabler," "tool," or "ability" for IT-business alignment. It can also be seen as a necessary "purpose," "method," "framework," "construction," or "representation of the organization." However, little is known about how alignment is realized. Kettinger, Marchand, and Davis describe global business approaches that reflect how enterprise architects can align with a firm's business. Firms can decide on more or less business flexibility and standardization, and enterprise architects can build corresponding IT solutions to generate the highest profits for the firm.

IT applications may be aligned with one of Porter's generic strategies, and the applicable strategy can be displayed in Table 3. The multinational approach concerns few countries and pursues a focus/differentiation strategy, while global approaches (over 100 countries) require high standardization of all processes, IT infrastructures, and IT applications. International and transnational approaches lie somewhere in between and must weigh business flexibility and standardization. The enterprise architect may adjust in favor of flexibility or standardization, but the point of differentiation or the cost leadership position can suffer, and the risk of being "stuck in the middle" increases. However, "stuck in the middle" can also be seen as an opportunity.

Table 3: Achieving alignment between IT and business can be accomplished by utilizing IT architecture, as suggested in sources 23, 24, and 25.

Global business approach	Business flexibility	Business standardization	Enterprise architecture		Generic strategy
			IT infrastructure	IT applications	
Multinational (e.g., 2...8 countries)	High	—	Locally customized	Locally customized	Differentiation (focus on a geographic market segment)
International (e.g., 9...25 countries)	Medium	Low	Regionally standardized	Locally customized	"Stuck in the middle"
Transnational (e.g., 26...100 countries)	Low	Medium	Globally standardized	Regionally customized	"Stuck in the middle"

Global (> 100 countries) — High Globally standardized Globally standardized Overall leadership cost

Conclusions and future research:

IT architecture and IT-business alignment are critical for gaining a competitive edge and creating value, but there has been little focus on the specific role of IT architects in achieving IT-business alignment. The prime responsibilities of IT architects are to effectively and efficiently select and integrate IT components and services to meet business needs while providing guidance and standards. Eight different types of IT architects are identified, operating at two key levels: the strategy/business level and the project/solution level. All examined papers indicate the strategic importance of enterprise architects and the need for their alignment with the business. Enterprise architects can receive assistance from business architects or business analysts to improve alignment.

Using global business approaches, the article demonstrates how enterprise architects can align with the business to achieve competitive advantage through differentiation or cost efficiency. The study concludes that enterprise architects are crucial for achieving IT-business alignment and can shape an organization's IT landscape to facilitate either business flexibility or standardization.

To validate the hypothesis that "enterprise architects are fundamental for accomplishing IT business alignment," further research may be conducted through structured interviews and surveys. Additional studies are necessary to gain a better understanding of the activities, techniques, and tools of enterprise architects to attain alignment goals. Future investigations can also explore the strategic roles of business architects and business analysts and their collaboration with enterprise architects to enhance IT-business alignment. Finally, the article suggests that the functions of IT architects in digital environments, such as big data, machine learning, and artificial intelligence, need further examination.

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