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OPERATIONS, INFORMATION & TECHNOLOGY | RESEARCH ARTICLE

A proposed model to measure the impact of business architecture

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Abstract: The business architecture of an enterprise offers a combination of services in operating and modeling business activities. It helps to drive the business operation, integration of multiple systems, an allocation of information technology (IT) and other resources in an efficient manner. This paper discusses the business architecture's standing in an enterprise, demonstrating the working and importance of business architecture in an organization. Furthermore, collaboration and relationships between key components of business architecture are a major point of discussion in this paper. A conceptual framework is presented that composes and enhances the idea of business architecture by extending it through the identification of benefits, thereby enabling an enterprise to achieve based on three models: strategic, operational, and IT. The extraction of parameter and developing the proposed model is based on published literature review. Ultimately, this study enhances the purpose of implementing business architecture and its key dimensions. Moreover, identifying benefits using different measuring factors presented in the model (i.e. strategic, operational, IT infrastructure) can help the business organizations and decision-makers evaluate the potential benefits of business architecture in an enterprise.

Subjects: Management of IT; Information & Communication Technology (ICT); Information Technology

Keywords: business architecture; strategy model; IT model; operating model; benefits

1. Introduction

Business architecture can be defined as the integration of business strategy, business processes, and IT resources to support all business activities (Harishankar & Daley, 2011). A more constructive relationship between the models of business architecture means that the organization can perform

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PUBLIC INTEREST STATEMENT

This paper is talking about standing of business architecture's in an enterprise, demonstrating the working and importance of business architecture in an organization. It further elaborate the relationship between the IT resources and business objective. Currently, due to competitive market complex environment, businesses are more depending on IT resources. Therefore, business are investing vast amount on building IT infrastructure in their organization. This research is highlight the importance of IT resources in business and further how to measure the list of non-financial benefits IT resources generate for the organizations.



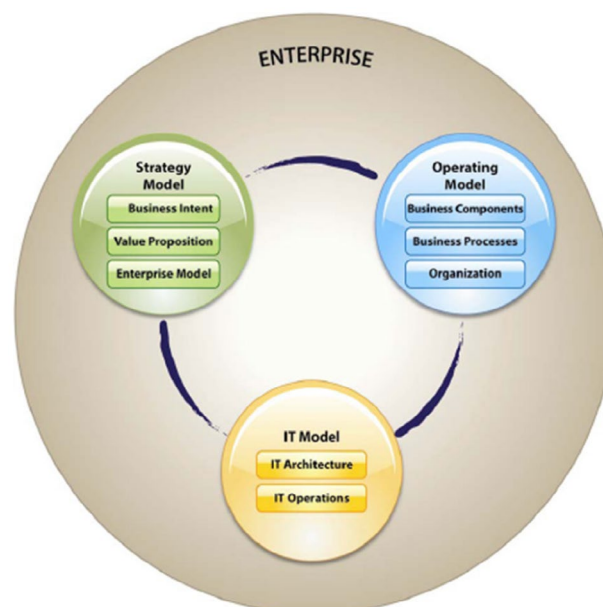
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tasks more efficiently and achieve its business goals (The Open Group, 2009). Business architecture is the core element of an organization that connects and supports internal stakeholders to perform their tasks and business operations appropriately. Whereas customers are the kind of external stakeholders, which are indirectly connected with the business architecture while performing tasks and querying to the organization. In addition, managers, employees and customers are the major stakeholder which can be helpful to measure the performance of business architecture (Alshammari, 2015). The proper development of business architecture includes the business models, integration of an enterprise's application, implementation of strategies, allocation of IT resources, and business operation management (Al-Ghamdi & Saleem, 2016). Previously, the concept of business architecture has been improved by aligning information and strategic support (Malta & Sousa, 2016), aligning IT resources (Vargas Chevez, 2010), sustaining and improving business and IT alignment (Li, 2010), and integrating operational processes by IT resources (Brynjolfsson & Hitt, 1995).

The idea of actionable business architecture was presented by Harishankar and Daley (2011), which integrated the strategic, operating, and IT model to support business activities of an enterprise as shown in Figure 1. The author further explained the architecture by explaining the strategic model (i.e. strategy and transformation), operating model (i.e. business process management), and IT model (service-oriented architecture) (Harishankar & Daley, 2011). The main purpose of this study is to enhance the idea of business architecture in the same way as integrating three models (strategy, operating, and IT); thus, we proposed a framework highlighting the generation of benefits or impact of business architecture's model on organizational business values. This paper followed the idea of business architecture presented by Harishankar and Daley (2011) where the author in that paper integrate three models; strategy, operating, and IT. The work presented in this paper enhanced the framework by measuring business architecture's and its key element's impact (strategic, operational, and IT) over organization. The aim of this paper is to highlight the list of benefits an organization can achieve through business architecture. Therefore, the enhanced models shows the list of business values an organization can obtain using proper business architecture.

Currently, organizations are more dependent on IT resources (Saleem, Salim, AL-Ghamdi, & Ullah, 2015), whereas business architecture is the combination of different types of IT resources an organization uses to implement business strategies, restructure business processes, build business models, and operate business processes effectively. Different well-known business architecture frameworks have already been proposed and supported by different organizations based on IT

Figure 1. Business architecture and its key elements (Harishankar & Daley, 2011).



architecture (I. 15704, 1999; Zachman, 1987), suggesting that IT architecture plays a significant role in supporting an enterprise's business architecture. The combination of information systems, hardware resources, and network and communication facilities largely supports an organization's internal and external business activities.

The business architecture consists of models, methods, metrics, and tools to support enterprises in planning and executing their tasks. The architecture helps the organization manage the data, generate business models, integrate data, scale system architecture, and create a bridge between different applications and stakeholders. IBM® presented the components business model, which is a kind of a business architecture, to support enterprises by providing different kinds of services, such as component business models, business process models, business and technical services, information/data model (Jensen et al., 2008). In addition, Saleem et al. (2017) proposed and validated the similar kind of model for measuring business values generated using IT architecture. That paper highlighted the seven different types of dimensions, using those factors; organization can elaborate and measure the several kinds of IT and business benefits.

The methodology of building the framework in this paper is based on the literature review. The parameters of the models are extracted from literature review as cited in figures and explanation of that figures. This work integrated the model of business architecture with its key benefits. The business architecture is the combination of IT and business objectives. The list of business objectives has been discussed in this paper, whereas those business objectives create several benefits (strategic, operational, and IT) to the organizations.

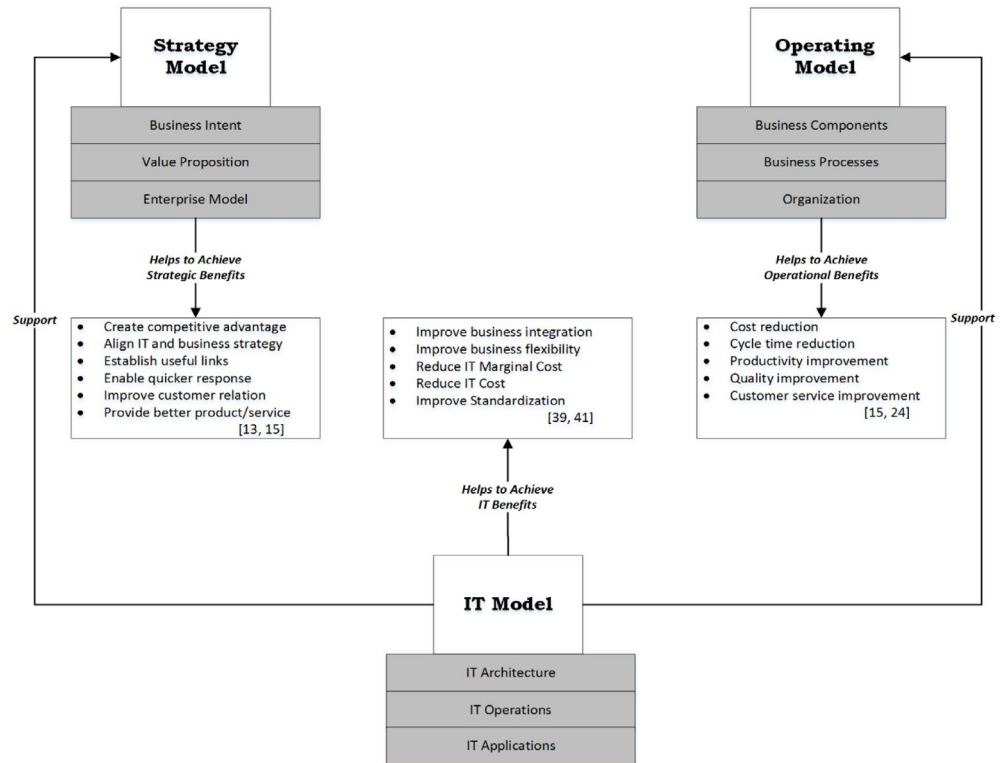
Keeping this in mind, the business architecture facilitates organizational activities to perform in better form. Therefore, this research highlights the major functionalities, perspectives, and placement of business architecture in an enterprise. In addition, this study identifies the potential benefits and impact of business architecture's model on organizational values as discussed in the proposed framework. The framework can provide help to business and IT decision-makers, which can ultimately lead to the positive implementation of the business architecture and its model.

2. Discussion of proposed model for measuring impact of business architecture

As discussed earlier in this paper, the business architecture is the integration of business strategy (i.e. business intents, value proposition, enterprise model), operating activities (i.e. business components, business processes, organization), and IT resources (i.e. IT architecture, IT operations). This research further enhanced the idea presented by Harishankar and Daley (2011), which highlights the standing of business architecture in an enterprise and its key dimensions. This study extended the idea by taking into consideration the potential benefits that could be achieved through each model connected within the business architecture.

To identify the list of benefits enterprise can achieve using IT and business resources, several researchers described and proposed framework. Shang and Seddon (2000) identified five kinds of benefits enterprise can achieve which are: operational, managerial, strategic, IT infrastructure, and organizational. In addition, Maçada and Beltrame (2012) proposed and validated another five kinds of benefits enterprise can obtain using IT and business resources. Mainly those benefits are identified, as non-financial benefits due to their measuring process are not based on financial parameters. Saleem et al. (2017) proposed the model which further validated in that paper using real world case study, highlighted that how those list of benefits are identified and its measuring process. The same procedure is applied in this paper in identifying the key elements of business architecture (Harishankar & Daley, 2011) and the list of benefits can achieve using those key elements (strategy, IT, and operational). The model is helpful for the organizations where they are investing much amount on IT and business resources. Therefore, the model can provide the way of evaluating the list of values generated using the proposed model. The following sections further explain each component presented in the proposed framework, as shown in Figure 2.

Figure 2. Proposed framework for measuring benefits of business architecture.



2.1. Strategy model

Business strategies are an integral part of enterprises that play a significant role in attaining multiple business goals, such as potential growth, competitive advantage, better products, customer service (Han & Mithas, 2013; Maçada & Beltrame, 2012). The main purpose of the strategy model in this framework is to highlight the importance and placement of business strategies in enterprise architecture. The strategy model helps generate multiple values to the business, such as organizational and employee capabilities to perform better (Shang & Seddon, 2002), improve the business model, restructure the business processes (Gregor, Martin, Fernandez, Stern, & Vitale, 2006). Overall, the strategy model defines the basic rules and principles for doing business efficiently, and creating business models, process descriptions, and business goals are the major factors that need to be implemented through the strategy model. Finally, it assists the basic requirements (objectives, planning and execution) of doing business to accomplish the prospective milestones. Business strategies are plans of action designed based on business objectives, which further help to plan and execute in an efficient manner. Researchers have highlighted several direct and indirect benefits that can be achieved through the strategy model. Alshammari (2015) further discussed the relationship between business processes and firm performance can evaluate using many factors such as strategies based on corporate social responsibility and stakeholders. The integration of strategy with operational activities and IT resources ultimately generates multiple financial and non-financial values to the organization. The list of benefits is discussed in Section 3.

2.2. Operating model

The operating model is responsible for dealing with the business processes and activities that actually help transform the business strategies into successful efforts. The collaboration of the strategy model and the positive integration with the operating model help business managers realize the business goals in an efficient manner. Furthermore, through business process management, as explained by Harishankar and Daley (2011), the operating model is responsible for giving the proper space and allocation of resources to all business processes. In business architecture the operating model is a major source of implementing and integrating different types of information

systems, such as customer relationship management (Al-Mudimigh, Saleem, & Ullah, 2009; Altalhi, AL-Malaise AL-Ghamdi, Ullah, & Saleem, 2016) and enterprise resource planning (Al-Ghamdi & Saleem, 2014; Ullah, Al-Mudimigh, Al-Ghamdi, & Saleem, 2013), decision support systems (Saleem & AL-Malaise AL-Ghamdi, 2012), enterprise applications (Al-Ghamdi & Saleem, 2014). The operating model supports the business architecture of an enterprise while dealing with productivity processes, quality control processes, customer service processes and cost processes (Irani & Love, 2001; Shang & Seddon, 2002). The integration of the operating model with strategies and IT architecture is presented in the proposed framework, while the list of benefits is discussed in Section 3.

2.3. IT model

The IT model is an important part of the business architecture to support business activities; however, it is considered a main requirement of almost every organization (Al-Ghamdi & Saleem, 2016). The IT model combines different types of resources, such as hardware, software, network resources, data and communication resources (Saleem, Salim, Fayoumi, Alghamdi, & Ullah, 2013). The integration of IT resources with a strategic and operating model creates a significant amount of collaboration and arrangement toward achieving the business goals. Several discussions have highlighted the positive relationship between IT resources and productivity growth (Dehning, Richardson, & Zmud, 2003; Lee & Bose, 2002; Saleem et al., 2016; Services, Kraemer, Gurbaxani, & Dunkle, 1996). The implementation of an IT model has been notably discussed with the combination of different industry- and market-based organizations that demonstrate the influence of IT in different organizations, such as the tourism industry (Torrent-Sellens, Ficapal-Cusí, Boada-Grau, & Vigil-Colet, 2016), higher education (Alshehri, Drew, & Alfarraj, 2012), teachers' education (Ongaki & Musa, 2015), hotel industries (Bilgihan & Okumus, 2011; Manuel & Pérez, 2015). IT resources support the operating model in allocating the IT resources for the completion of business tasks. For example, the execution of online services, network services, database availability, gateway to different e-portals, integration of information systems, and building of business model using decision support systems. Several researchers have proposed ways to increase the performance of business applications using different computing techniques (Al-Mudimigh, Saleem, Ullah, & Al-Aboud, 2009; Mudimigh, Saleem, & Ullah, 2009). The integration of the IT infrastructure model with strategies and operating models is presented in the proposed framework, while the list of benefits is discussed in Section 3.

3. Benefits of business architecture's key elements

The idea of benefits identification has been realized in different studies about the potential financial and non-financial benefits an organization can achieve through business and IT investments (Dadayan, 2006). Gartner described five measureable items an organization can achieve; this list of non-financial benefits is also known as value on investment (VOI) (Hurley, 2001):

- Business process invention and innovation.
- Cultivation, management, and leveraging of knowledge assets.
- Collaboration and increased capabilities to learn and develop communities.
- Individual and organizational competencies.
- New kinds and levels of leadership.

Benefits generation and the evaluation of non-financial benefits an organization can achieve from business and enterprise architecture using IT resources and business strategies can also be found in several studies (Al-Ghamdi & Saleem, 2016; Saleem et al., 2013, 2015, 2016).

3.1. Strategic benefits

Within the business architecture, the strategy model is responsible for creating innovating business through the implementation of multiple business plans. Its main purpose is to generate value proposition that every new approach can provide to the enterprise. A strategy model generates different kinds of benefits that can positively impact the organizational values. An example is assisting in allocating IT resources based on business strategy (Maçada & Beltrame, 2012). Improving customer

relations, creating useful links, and providing better products/services are some other strategic benefits that can be achieved using different enterprise systems in an organization (Shang & Seddon, 2002). In a customer-oriented organization, response time to asked queries regarding products and services is critical and can ultimately increase customers' loyalty. A quicker response time (Maçada & Beltrame, 2012) is one of the benefits of the strategy model, as mentioned in the proposed framework.

3.2. Operational benefits

The proposed framework presented the extraction of benefits that can be achieved through an operating model in the business architecture. The list of operational benefits presented by Shang and Seddon (2002) was actually proposed for enterprise systems. Business architecture is the combination of enterprise architecture, information systems, and IT infrastructure. On the whole, the operating model is useful in business architecture to support activities and routines of different enterprise systems. Therefore, the idea has been integrated in the proposed framework to get a list of operational benefits from business architecture as well as enterprise systems.

The operating model in business architecture is mainly responsible for the smooth running of business processes, components, and other operational activities, as mentioned by Harishankar and Daley (2011). The impacts an organization can achieve from business architecture include cycle time and the cost reduction of processes (Irani & Love, 2001). It also helps improve the quality of the products and services (Shang & Seddon, 2000) by integrating a quicker response time to execute the processes. Improvement in customer services and productivity improvement per employee (Irani & Love, 2001) are some other operational benefits business architecture can provide as well.

3.3. IT Infrastructure benefits

Business integration and flexibility are the major motives of an IT model in business architecture. Researchers have described IT models from different perspectives; for example, Melville, Gurbaxani, and Kraemer (2007) explained that computers, mainframes, storage devices, and databases are part of an IT infrastructure. An IT infrastructure also helps the organization reduce the marginal costs of IT units and overall IT spending of the organization (Shang & Seddon, 2002). Some scholars have suggested that information systems and other enterprise systems are part of the IT model as well (Maçada & Beltrame, 2012). Operating systems, printers, scanners, and other personal equipment specifically fall under the category of IT infrastructure (Weill & Broadbent, 2000).

Previous researchers have discussed several organizational benefits largely supported by the IT infrastructure model. The technological integrations of business models using enterprise systems and hardware equipment, reducing IT costs, and properly aligning IT budgets with business strategies are the kinds of benefits that can be achieved through an IT infrastructure (Sabherwal & Jeyaraj, 2003).

4. Conclusion

Business architecture offers multiple services to the organization in order to run business processes smoothly. This paper discusses the basic models of business architecture—namely, strategy, IT, and operating models. The positive collaboration between these models can provide several benefits to organizations, as discussed in this paper. Therefore, the framework proposed in this research elaborates the major elements of business architecture in an enterprise and lists the benefits as mentioned in the framework. The impact items were extracted and categorized from each model of business architecture, with the impacts characterized as strategic benefits, IT infrastructure benefits, and operating benefits. The proposed framework can be useful for helping organizations and decision-makers understand the overall impact of business architecture and its model. The model is useful for the organizations where they are investing much amount on IT and business resources. Therefore, the model can provide the way of evaluating the list of values generated using the proposed model. These impacts should be evaluated in a future work using a real case study to understand the evaluation process of business architecture.

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