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## The integration components between enterprise information architecture and business strategy

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### Abstract

In many organizations, enterprise information architecture (EIA) and business strategy (BS) have been developed and implemented separately under a different umbrella. The integration of the two concepts is not in existence. Thus, the integration remains challenging and unexplained in some quarters, owing to the limited capacity to render performative know-how. Drawing on actor-network theory (ANT), a constructivist sociological theory, this article interrogates the challenges that hamper the integration of EIA with BS. Applying the translation tenet of ANT as a lens, three components, constructive, performative, and transformative are synthesized and proposed as the fundamental deterministic factors that influence the integration of EIA with BS in an organization. The components are synergistic from both business and architecture viewpoints. The components are a fresh perspective on the academic and business domains.

**Keywords:** enterprise architecture, enterprise information architecture, business strategy, information integration

### Introduction

Enterprise architecture (EA) is a conceptual blueprint that defines the structure and operation of organizations (Mei & Andry, 2019). The domains of EA are enterprise business architecture (EBA), enterprise information architecture (EIA), enterprise application architecture (EAA), and enterprise technical architecture (ETA) (Iyamu, 2022). This paper focuses on the EIA domain. On the other spectrum of an organization is the business, which relies on its strategy for direction, and planning, and dictates competitiveness. According to Wang et al. (2023), business strategy (BS) generates business value for the organization. Rehman et al. (2023) suggest that BS determines organizational performance. These factors and benefits make BS critical for utmost attention in an organization.

Many organizations develop EIA, however, not every organization is successful in integrating their Information Architecture with their organizational strategy (Razak et al., 2008; Löhe & Legner, 2014). Information System (IS) integration is defined as the process that ensures the interactions between information systems necessary to achieve organizational objectives. IS Integration is imperative to organizational competitiveness; It is a critical aspect as it allows enterprises to maximize their IT investment (Puspitaningrum, 2021).

Some organizations are embracing EA and are obtaining many benefits, while others are faced with an abundance of challenges (Scholtz et al., 2013, Banaeianjahromi & Smolander, 2019). The challenges that

organizations face in terms of service delivery are for the most part non-technical (Chuang & van Loggerenberg, 2010). In their study, Banaeianjahromi and Smolander (2019) found that communication and collaboration is a key aspect that hinders EA initiatives. Communication breakdowns between business stakeholders, and Enterprise Architects can result in non-alignment between “business” and “architecture”. This lack of synergy hinders IS integration, to the detriment of the organization.

On one hand, organizations rely on strategies to define direction, sustainability, and competitiveness. On the other hand, organizations develop EIA as a strategic tool, to govern and manage information flow, exchange, and use, towards enabling and supporting business goals and objectives (Tan & Liu, 2013). Despite the implementation of the two concepts, many organizations continue to struggle in achieving their goals and objectives. The problem is that many organizations develop and implement the two concepts separately. Additionally, it is difficult to find studies that focus on the integration of the concepts. Consequently, processes and activities become fragmented and negatively affect the critical aspect of an organization’s success, which are growth, sustainability, transformation, and competitiveness (Löhe & Legner, 2014). If this challenge is not addressed, organizations will likely continue to lack synergy between their business strategy and EIA, which is detrimental to growth and transformation.

However, efforts have been made in addressing this problem in some quarters, but the challenges persist. Thus, the objective of this paper is to understand the attributing components to the integration between EIA and BS. In achieving the objective, we suggest a different approach by viewing the challenges through a theoretical lens, actor-network theory (ANT), to gain a deeper understanding of why things happen in the way that they persistently do (Iyamu, 2021). ANT is a sociotechnical theory that defines humans and non-humans as actors (Callon, 1986). The theory focuses on shifting negotiation (Law, 1992). In ANT, one of its tenets, translations circumstantially lead to many useful realities.

This paper is structured into six main sections. It begins with an introduction, which is followed by a discussion of the connections between EIA and BS in the context of this study. Thereafter, the theory, actor-network theory that underpins this study is discussed. In the section that follows, the approach that is applied in the study is covered. Next, the findings from the study including a conceptual framework are discussed. Finally, a conclusion is drawn in the last section.

### **The interconnectedness between EIA and BS**

The EIA and BS should be interconnected, to enhance an organization’s performance and transformation toward a desirable state. Thus, the core areas of focus include an understanding of the interconnectedness between the two concepts of BS, EIA, and integration, which are covered in this section.

#### **Business Strategy**

Primarily, organizations develop a business strategy to actualize their mission and vision, periodically. Kitsios and Kamariotou (2019) describe BS as the plan through which an organization intends to integrate its vision in the long term. Thus, the business strategy is often intended to improve efficiency and effectiveness, to enhance competitiveness. Strecker (2009) refers to BS as a plan to address an organization’s goals and objectives. Thus, translations of the organizational plan are crucial. In ANT, translation helps human actors to have a common understanding of entities (Iyamu, 2021; Callon 1986).

BS is essential for achieving a competitive edge and determining an organization’s position within a given market (Uhlig & Remané, 2022). BS represents the fundamentals of an organization, which consists of

known and unknown factors in the development and implementation of drivers, goals, objectives, and key performance indicators (Kotusev et al., 2020). Prasad and Shadnam (2023) argue that in some circumstances, performative relations that contribute to the construction of realities are often hidden factors. Pentland and Feldman (2008) described performative as routinized understandings of deliverables that pertains to actual execution. The factors are effective in a change of transformation through collaboration, by which people relatively construct as they propel ideas and knowledge. Transformative is "having the power to transform". The rapidity of events and complexity in both IT and business units require any organization to be transformative (Schiuma et al., 2022).

BS is intended to have positive impacts on an organization's strategy, from a competitiveness perspective (Abdulwase et al, 2020; Ali & Anwar, 2021). Additionally, BS affords an organization advantage in terms of practices that can be used as a strategic tool for competitive advantage (Distanont & Khongmalai, 2020). Thus, one of the benefits of BS is that it focuses on how value can be created in an organization (Kitsios & Kamariotou, 2019). However, its implementation towards achieving the desired state remains challenging in many organizations, which could be attributed to the translation of its contents and associated artefacts. Consequently, components that the competitive edge such as performative and transformative are difficult to ascertain or measure. Hope, Chew and Sharma (2017) argue that success rests on performative improvisation. This is key to the integration of EIA and BS. From a leadership perspective, Schiuma et al. (2022) affirm that transformative is critical for improvisation that is based on constructivism.

Despite the importance of BS, many challenges are associated with it, in many organizations. The challenges vary from one organization to another. According to Kotusev et al. (2020), the challenges of BS are sometimes vague, not known, absent, unstable, or frequently changed. Thus, some of the fundamental challenges are pinned to components such as performative, and constructive (or constructivism) of the actors and their roles.

Kabeyi (2019) argues that challenges are bound to occur if those who formulated the strategy (BS) are not involved in its implementation. Primarily, this allows translations of entities into multiple realities and perspectives, which affects common goals and focus. Consequently, many organizations' strategy implementation is fragmented (Verweire, 2019). Although translation from the ANT perspective allows multiple realities and viewpoints, it enables a common goal within a network, single-centeredness, and focus (Calhau, Azevedo & Almeida, 2021), which is required for integration of the two concepts, EIA and BS. Due to some of the challenges, it is difficult to find an organization where EIA is integrated with BS.

### **Enterprise Information Architecture**

As presented in the introduction section, enterprise information architecture (EIA) is one of the domains of EA. An organization's information and its management are essential for competitiveness in the modern-day economy (Kotusev et al., 2022), which is the focal point of the EIA. Primarily, the EIA focuses on planning, standardization, and governance, from both strategic and operational perspectives. In addition, EIA describes the structure, defines the usage and management, value chain, and flow of a system including the categorization of organizational systems' artefacts (Lapalme et al., 2016). Another rationale that increases the interest in EIA is because it prescribes guidelines and principles for implementing IT solutions, for business purposes. The relationship between business needs and information design, insights, and governance is considered crucial for decision-making in many enterprises (Godinez et al., 2010). EIA gives organizational stakeholders access to quality information, thereby helping the organization meet goals and objectives (Iyamu, 2011).

The environments of many enterprises often consist of a mixed bag of complexity, sophistication, transformation, and constant change (Banaeianjahromi & Smolander, 2016). Thus, from an information perspective, there are usually gaps between the business and IT units of many enterprises. According to Iyamu (2019), the EIA provides the capability to make strategic use of an organization's information assets by enabling change management in information exchange.

Some organizations employ EIA, to bridge the gaps, and manage the complexity, and the change that is constantly occurring in their environments (Niemi & Pekkola, 2020). The practices and principles of EA are used to guide organizations through successful development, and execution of business strategy (Chuang & van Loggerenberg, 2010). This includes facilitating business-IT integration through appropriate tools, methods, models, and concepts (Vargas et al., 2016; Chuang & van Loggerenberg, 2010).

Despite the many benefits and premises, which inform the growing interest, implementation of EIA can be cumbersome (Iyamu, 2022; Ahmad & Odeh, 2013). Some of the challenges that are increasingly experienced by many organizations include information integration with organizational solutions (Chuang & van Loggerenberg, 2010; Löhe & Legner, 2014; Guo et al., 2019), which can be attributed to a lack of constructive approach. In the context of EIA, the challenges of integration are often caused by disparate and desperate translations of EIA and organizational objectives.

Iyamu (2022) explains how integration has formed a fundamental part of the challenges experienced in the deployment of both IT and business solutions. Some of the challenges have persisted over the years and manifest in the implementation. According to Ssynimaa (2016), some of the challenges hinder an organization's intended goals and objectives. In Razak's et al. (2008) view, EIA implementations are incomplete because of a lack of understanding.

The Performative role of the architects cut across a spectrum of zones within an organization (Kale, 2019), which can include integration with the business units and their artefacts such as strategies. A spectrum of events and activities including processes is enacted through interaction and relationship between the actors. Implicitly, constructive (or constructivism) enables interrelationships between actors, which leads to the realization of the architecture (Niemi & Pekkola, 2020). EIA plays multiple roles such as performative and transformative, in an organization (Kale, 2019). Thus, Oomen, Hoffman and Hajer (2022) argue that the performative should be applied as the power of ideas and visions about the future, in an explainable manner. From the perspective of EA, the architects' performative execution of their deliverables must attain a status of success (Hope, Chew & Sharma, 2017), which can be measured by its integration with business strategy.

### **Integration of Information Technology Solution**

Integration is one of the most strategic investments by modern organizations, primarily because it enables a holistic view that improves internal workflow and exchange with external partners and clients. As a result, there are impositions and reconciliatory factors that occur as transformative efforts importantly improvise change, from current to future (Wessel et al., 2021), which both EIA and BS are envisioned to do, through integration in an organization. Oomen et al. (2022) suggest that various narratives and factors can be employed to understand actors' actions in the state of the performative. It encompasses new ways of thinking and acting in an organization (Schiuma et al., 2022), achievable through the translation of a common goal. Thus, it is necessary to understand the performative relationships between business personnel and information architects in practice (Pankaj & Seetharaman, 2021).

Also, it is important to realize that performative is a routine role of the architecture through which it constitutes attributes in carrying out its deliverables (Kale, 2019) as we continue to emphasize the vital

nature of integration for information flow across enterprise domains. It is possible to connect and manage systems, processes, and approaches heterogeneously (Godinez et al., 2010). According to Kotusev (2020), there is no EA without a business strategy, and we cannot consider EA if we don't consider integration (Kotusev, 2020). Significantly, integration enables the coexistence of heterogeneous technologies across multiple layers, and "provides a long-term view of the organization" (Ahmad et al., 2019:400). EA facilitates the translation of BS and EIA (Fayoumi & Williams, 2021), but despite its importance, many organizations still face challenges with integration. This lack of Integration between BS and EIA is a critical challenge (Rachmaniah et al., 2022).

Solving the issues with EA domain information integration is a challenging undertaking (Santos et al., 2020), with management and control of information flows and exchanges posing a challenge. It is difficult for many IT managers to pinpoint the factors that influence the integration challenges, and if not addressed, could continue to affect some organizations' competitive ability and sustainability (Iyamu, 2022). Moreover, there is not much support in the current literature about integration, as pointed out by Kitsios and Kamariotou (2019:1) "the lack of integration among strategy, business and processes are the most common problems of" many organizations.

From a constructive viewpoint, the multi-phased and complex processes of integration can be addressed through interconnectedness using the architectural principles that must be translated into reality (Niemi & Pekkola, 2020). This includes interaction and relationship, which influence activities of performance and transformation of events, activities, and processes. Pankaj and Seetharaman (2021) suggest that the relationship between the architects and business units can be enacted and reinforced in practice through performative initiative. Cecez-Kecmanovic, Kautz and Abrahall (2014) affirm that 'performative perspective reveals how actor-networks give rise to different agencies of assessment that perform differently'; and van de Wetering, Kurnia and Kotusev (2020) suggest that constructive approach fortifies dynamic capabilities in execution of tasks.

### **The theory underpinning the study**

Theories provide a framework within which social phenomena can be understood through analysis and interpretation (Bryman, 2012). The IS field is a sociotechnical organizational system (Iyamu, 2021), meaning that it is an environment that allows people to work with technology in ways that benefit society and advances organizational goals. Sociotechnical theories are increasingly used to underpin IS studies, increase rigor, and credence and imbibe fresh perspectives into the phenomenon being studied (Iyamu, 2022).

From the many sociotechnical theories, such as activity theory, diffusion of innovation, structuration theory, and technology acceptance model, actor-network theory (ANT) is selected. Increasingly, ANT is used to underpin studies in IS field. In many of the studies, the translation tenet of ANT is employed (Iyamu, 2021). This means that translation, from ANT is applied as a lens to explain and interpret the socio-technological aspects of the studies.

In many of the studies where ANT is the preferred choice, it is primarily because of the following three principal reasons (Heeks & Stanforth, 2015; Lakay & Iyamu, 2022). First, the theory focuses on shifting negotiation (Mike, 2017), which is vital if EIA and business are to be integrated. Second, one of the main strengths of ANT is translation. Individuals or groups often have different interpretations of events, artefacts, and processes, making translation critical for unification and common understanding purposes. Third, ANT integrates both humans and non-humans into a single framework (Blok et al., 2020). According

to Iyamu (2021:78), this helps “to explain and interpret social and technological evolution, using neither technical-material nor social reductionism”, which can be crucial for the integration of two different entities, such as EIA and BS.

Originally conceived for the sociology and anthropology disciplines, ANT has shown a growing interest in software and information systems research (Blok et al., 2020). Increasingly, ANT is used to investigate how both human and non-human actors influence the adoption, implementation, and use of information technology (IT) solutions (Holmström & Robey, 2020).

The three most common tenets of ANT are actor, actor-network, and translation. In an actor-network, actors influence one another and alter each other through their actions (Sein et al., 2019). From ANT perspective, networks are formed based on common interests, which is by consciousness, or unconsciousness. This can help to examine how employees form groups, specifically between IT and business units, in the formulation and implementation of organizational strategies. ANT lends itself well to understanding how people interact with each other and use information systems (Soga et al., 2020).

Another important strength of ANT is that it does not make a distinction between human and non-human entities (Alexander & Silvis, 2014; Mike, 2017), which means that both sets of actors are equal when it comes to associating meanings to entities. Consequently, the issue of superiority is removed which often negatively influence investigation where human and non-human actors are involved, such as IT solution and business strategies. For alliances to occur, a mechanism for one actor to convey meaning to another is needed without superiority influence. This mechanism involves one actor making itself "understandable" to another actor by framing its meaning in terms of the other actor's frame of reference. Within the context of ANT, this process is "Translation" (Iyamu, 2022; Sein et al., 2019). Shim and Shin (2019) explain how translation could help to achieve a stable environment (actor-network) through negotiation.

### **Research approach**

In information systems research, two philosophical assumptions are common, epistemology and ontology (Schultze, et al., 2020; Rowe, 2018). The objective of this study as stated above in section one necessitates that both philosophical assumptions be followed. It is within this context that epistemology and ontology are discussed, and the rationale for following the philosophies is stated.

Ontology refers to what exists and whatever can have many realities associated with it (Ritchie et al., 2013). This is associated with allowing many participants to share views and experiences about the subjects of the study, from an empirical perspective. Thus, in the context of this study, ontologically, EIA and business strategy are adopted by many organizations. Additionally, integration is a concept that some organization employs. However, how these concepts exist or can exist in oneness in an organization is not known, at least, at the empirical level.

Epistemologically, there are things to learn (Babbie, 2013), and identified in the study. Also, epistemology philosophy is referred to as the theory of knowledge. According to Saunders et al. (2019), epistemology refers to the methods of acquiring knowledge, and how knowledge can be communicated. This includes what can be known. This sets out to inquire how the EIA can be integrated with Business Strategy, to enhance an organization's competitiveness.

Related and most relevant literature was gathered using the bibliographic approach. A set of criteria was used to search and select the most relevant literature for the study. Google Scholar, Scopus, Association of

Information, and Web of Science were the academic databases that were explored in the search for articles. Focus area and publication year formed the criteria used in the search of the articles. Based on the criteria, keywords were used in the research, which include information architecture; business strategy; integration of IT solution; integration of business solution; and business and IT strategy. Articles published between 2013 and 2023 were considered most relevant because it helps to create or gain a historical view and balance of the challenges and meanings that have been associated with the concepts, from both business and academic domains' perspectives. Based on the criteria, 76 peer-reviewed articles were gathered.

Translation of ANT is employed as a lens to view the integration of EIA with BS, in the form of analysis. The translation is employed to forge a consensus among involved actors towards achieving a common objective (Ren, Xiong & Wang, 2022), which aligns the business unit and EIA team in pursuit of an organizational goal, to integrate EIA with BS. Thus, translation by actors can lead to changes in the meaning of entities, and relationships (Li et al., 2021). Change during the process of translation may affect performative or transformative activities in the integration of EIA with BS. According to Maurizio and Petroccia (2023), during the process of translation, the actor-network can expand or disintegrate. Along the same viewpoint, Li et al. (2021) suggest that translation influences transformation, distortion, and modification of elements or meanings and guides actions in unexpected directions. Hence, Nehemia-Maletzky, Iyamu and Shaanika (2018) argued that activities, interactions, and relationships that happen between actors in executing activities should be examined through translation.

## A conceptual integration framework

Based on the objective to bridge the gap that exists in integrating EIA with BS, which is underpinned by translation from ANT perspective, a conceptual framework is developed, as shown in Figure 1. The conceptual framework depicts the relationship between the three arms, business strategy, EIA, and integration. The components that can be used to close the gap, identified as fundamental are the constructive approach, performative consequence, and transformative effect on the integration of EIA with BS in an organization.

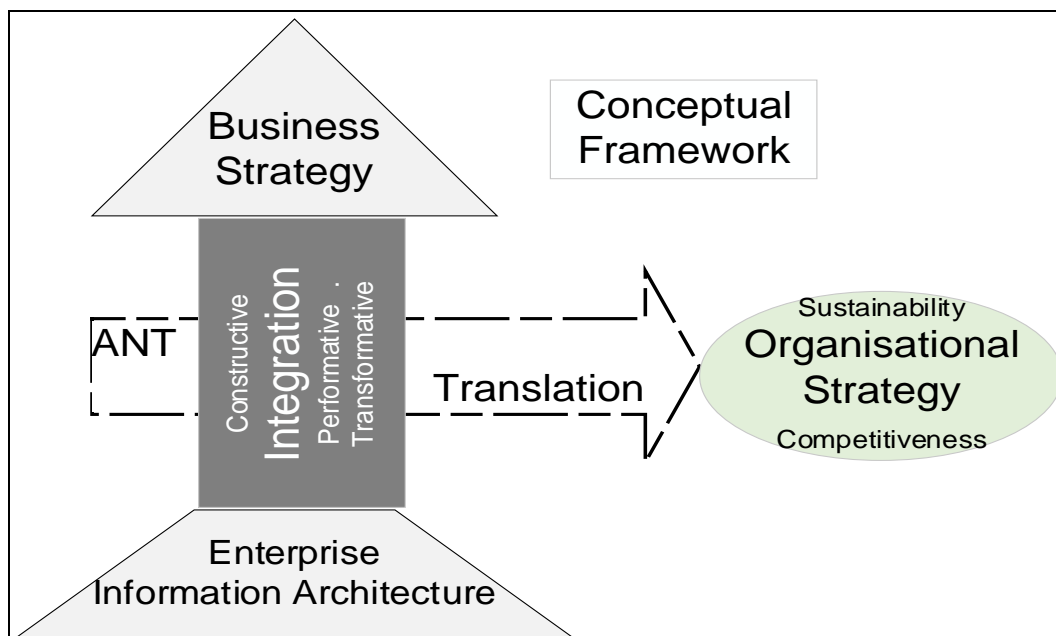


Figure 1: An Integration Conceptual Framework

## **Constructive approach**

From ANT perspective, there is a constant shift in negotiation including relationships (Callon, 1986). ANT posits that nothing exists outside relationships. This helps to build collaboration between the architecture team (information architects) and business unit (personnel), to enable and fortify integration. Constructivism that is based on the interaction between actors can engineer and enable the integration of EIA with BS in an organization. Constructivism to gain a better understanding of the future can be associated with actors' relationships and interactions (Oomen, Hoffman & Hajer, 2022).

Integration of EIA with BS requires a constructive approach, where representations of various entities are built towards a common goal. Also, constructivism enables collaboration and learning from each other's experiences, in the integration of EIA with BS in an organization. Prasad and Shadnam (2023) suggest that constructive can become performative, only if it follows threads of meanings and practices that are beyond the scope and stretches across time and space. Also, constructs that contribute to the required transformative and performative capacities for development (Garcia-Perez et al., 2023), are needed for integration purposes.

## **Performative consequence**

In ANT, translation is responsible for "a definition of roles, a distribution of roles and the delineation of a scenario" (Callon 1986: 26), which helps to explicate the allocation of tasks in the integration of EIA and business strategy. An understanding of each other's language simplifies the complexity of actors' attributes and significantly conceals the power struggles between the units. In the process, actors from both units induce each other to act, which reveals a performative dimension to their roles and responsibilities in the integration of EIA with BS in an organization.

The performativity of visions can be explained through analysis (Oomen, Hoffman & Hajer, 2022), such as the use of the translation of ANT, to gain a better understanding of the practices for the desired state. According to Daliri-Ngametua, Hardy and Creagh (2022), performative can lead to explicatory and more accountability, and, otherwise, reveals alternative practices. van Eck's (2022) performative practices provide possibilities for reproductivity through inscription that promotes legitimacy in an environment. Performative is not only a factual statement but also the enactment of specific action by interaction and relationship of actors.

## **Transformative effect**

From the position of power, a stance necessary to effect change, ANT has proven a useful tool for translation of social system and collaborative practice that involves actors, from a dialectic viewpoint. Transformative is about having the power to transform. The usefulness emanates because actors' participation in activities of a network is not given in the social fabric. It does require the intervention of translation of entities that form the phenomenon. Thus, an effective translation between EIA and BS requires architectural and business languages by both parties, to ensure the transformative of their concepts into oneness. The use of IT solutions is by itself transformative because it leads to how information is dynamically shared and managed (Verhoef et al., 2021).

Human actors (or employees) are entrenched with transformative experience while others are endorsed with transformative power, and together, can bring a fresh and progressive perspective into the integration of EIA with BS in an environment. According to Wessel et al. (2021), there are transformative effects of



technology, which awakes classical discourse in literature. The governance of information is increasingly fundamental including the capability to apply information, because of the transformative approach (Verhoef et al., 2021). The growth of innovations heightens the transformative approach in some quarters (Yuan et al., 2023), which include integration between EIA and BS. Thus, considering the significance of transformative efforts, it requires an inherent construct (Garcia-Perez et al., 2023) that can enable and support the integration of the two concepts in an organization.

The study aims to examine the component of influence in an attempt to integrate the EIA and business strategy, which has been a challenge for many years, in many organizations. Using ANT's translation, the study reviews three fundamental components of influence and a conceptual framework is developed, which is presented above. According to Marshall and Rossman (2016), the need for a conceptual framework is rooted in its importance in providing orientation, and justification for the problematized phenomenon. A conceptual framework articulates the need for the study, the components of the study, and how the components relate to the identified problem that the study is trying to address (Burkholder et al., 2019). As shown in Figure 1, the conceptual framework is set out to guide the integration of EIA with business strategy, which has been achieved through a theoretical lens that is based on translation.

A conceptual framework is an explanation of a phenomenon and the relationship between the entities. It involves prioritizing the most important variables and relationships, which dictates the information relating to an entity (Miles et al., 2018). The conceptual framework (Figure 1) is proposed as a solution for the integration of EIA with business, to enhance organizational competitiveness. The conceptual framework illustrates how the primary entities interconnect with each other, based on which their implications can be interpreted. It, therefore, achieves the specific instance, which is to gain a deeper understanding of the components of influence through a theoretical construct (Marshall & Rossman, 2016). Additionally, the process of developing a conceptual framework adds rigor and fresh perspective in advancing integration between the two concepts (Ravitch & Riggan, 2016).

### Conclusion

The components: constructive, performative, and transformative shift negotiation from descriptions to translation and reality in the integration between EIA and BS in an organization. However, the influence of the components brings about ontology, which offers an opportunity to gain deeper knowledge on how the artefacts of both EIA and BS can form a common front of social and technology determinism towards a successfully integrated unit. In constructive, performative, and transformative perspectives, we show how inherently indeterminate components become determinable and can influence actions and practices, in the integration of EIA and BS in an organization. Thus, this paper demonstrates how the components extend the body of knowledge on business and IS domains, jointly.

Literature on EIA-BS integration is scarce, which makes terms of reference limited. It allows contributing to the understanding of the factors that could affect the integration of EIA with BS in an organization. Thus, the study aims to benefit the IT, Business, and Architects of an organization to gain a better understanding of the factors that influence the integration of EIA with BS in their environments. Also, the components explicitly identified and discussed in the paper can guide EIA-BS managers in developing a oneness strategy and policy for the integration of the concepts. Another important contribution is that the paper lays a foundation for research streams and studies, from both business and IS perspectives.

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