Challenges Facing Enterprise Architects: a South African Perspective

Cheng-Hui (Jason) Chuang
Department of Informatics
University of Pretoria
jason.chuang@sap.com

Johan van Loggerenberg
Department of Informatics
University of Pretoria
johan.vl@up.ac.za

Abstract

The relationship between enterprise architecture and its service delivery process in an organizational context suggests an interesting view on the role of the enterprise architect. Literature reveals that many of the challenges that enterprise architects encounter are largely non-technical in nature. This points to the need for a non-technical perspective on the role of an enterprise architect in the overall enterprise architecting process but also in the social, organizational context. Interviews were conducted with enterprise architects in South Africa to understand the challenges currently facing them. This study explores the fundamental understanding of the role of the enterprise architect particularly in the South African organizational context which is characterized by complex cultural and other differences. It suggests that for any enterprise architect – but particularly in South Africa - should strongly consider the non-technical perspectives in order to effectively architect the enterprise.

1. Introduction

Over the past three decades, the escalating economic and societal demands, together with the continued mainstreaming of information and communication technologies (ICT), and the growing trend of service emergence [20], set a growing agenda for the architectural development of the organization. The rapidly changing environment constantly challenges organizations’ resource management and the fundamental composition of the value chain. Building an appropriate foundation to support business strategy execution has therefore become an important goal for many information technologists.

Enterprise architecture (EA) offers a fresh approach to support business strategy execution. EA is the blueprint that can direct organizational activities in the technological sense, and supports the business strategy from the lowest level of process [2]. The blueprint helps to facilitate an organization’s business vision by encapsulating multiple views of an enterprise and provides a ‘common understanding’ of what the organization aims to achieve. Moreover, EA views the enterprise from a holistic and more complete architectural point of view.

As more organizations realize the disadvantage of having business silos [22, 25], there has been an increasing adoption of EA to ensure that the desired strategic behavior is achieved from the lowest level of operation to the higher levels of innovative business strategies. However, even though there is increasing adoption of EA to improve the execution of business strategies, many of the organizations are still finding it difficult to appreciate the genuine value of EA [10, 13, 14]. The nature of the challenge is similar to what was pointed out by Spohrer and Maglio [19] that IT often tends to focus on creating technical capabilities and neglect other important aspects such as the business model and organizational change that will make the technology an effective solution to the business challenges. The same has been observed within the enterprise architecting process in South African organizations. This research identified and confirmed a number of challenges leading to a need to re-visit the role of enterprise architect. This is especially applicable in South Africa, a country characterized by a multiplicity of races, languages, ethnic groups and cultures against a backdrop of an often violent and oppressive history. It was therefore considered of high importance to study the implications of the enterprise architecting process towards the overall business environment.

2. Theoretical background

A number of literature sources were consulted to establish the context for the overall study. Related concepts have been studied and are presented in this section.
2.1. Enterprise architecture: architecting the enterprise to align business and ICT

The first recognition of the role and the significance of EA as a contributor to organizational success can be traced back to Zachman [18, 21, 26]. In the early days of the information systems (IS) community in the 1960s, some IS professionals were amazed by the great similarities they found across the domains of aircraft manufacturing and enterprise engineering [25]. The IS professionals were convinced that the principles of aircraft manufacture could be applied to enterprise engineering. As Zachman [25] stated, ‘it [enterprise engineering] was simply a different instance of the same generic, complex, product development and manufacturing processes’. The IS community studied the manufacturing processes used by aircraft manufacturers to reach the level of physical manifestation of such a complex engineering product. In that way EA inherited the functional views of aircraft manufacturing, and enhanced it by means of a deeper understanding of architecture and construction. These disciplines have similar logical concepts and structure to enterprise engineering. Zachman took the generic perspective across the three disciplines, and applied it to the observation and the descriptive abstraction of an enterprise. As a result, the architectural view of an enterprise has come to be known as an organizational blueprint that provides a set of design, artifacts, and descriptive abstractions.

Zachman [25] defines EA as: ‘Descriptive representations that are relevant for describing an enterprise such that it can be produced to business’ requirements and maintained over the period of its useful life (change).’ He identified five different perspectives: Planner, Owner, Designer, Builder, and Sub-Contractor; and six abstractions: What, How, Where, Who, When, and Why [25]. The architecture framework is designed in such a way that it can generate great benefit for the enterprise in dealing with the complexities and dynamics of information age [25].

Other authors also describe EA based on similar principles. According to de Vries and van Rensburg [9], EA is generally understood as a practice that aims at improving the performance of enterprises. ‘EA can be defined as a consistent whole of principles, means, and representations that are used in the design and realization of the organization’s structure, processes, systems, and infrastructure’ [12]. EA provides a high-level, integrated view of the current and/or future organizational configuration. The configuration includes architectural domains consist of business architecture, information architecture, application/system architecture, and technology/infrastructure architecture. Moreover, the integrated view also helps to guide the decision-makers in engineering business processes and systems in a way that is in line with business strategies and objectives. As Jonkers et al. [12] have pointed out that, ‘the effect of EA has reached beyond the boundaries of an IS, and it has become a strategic resource to assist organizations with innovation and change’.

The concepts of EA have evolved since the early days of the 1960s, but the concepts inherited from manufacturing, architecture, and construction remain the elementary perspective of EA. Perspectives such as the logic of building an extremely complex engineering product in a structural, functional manner, and that of viewing enterprise as an instance of a complex engineering product remain the underlying concepts of EA. These elementary perspectives have helped contemporary enterprise architects to approach the organization in architecting the enterprise.

2.2. Enterprise transformation theory

The theory of enterprise transformation looks at the why, how, and what of enterprise transformation. Enterprise transformation, as defined by Rouse [15], views transformational change as the kind of change that involves fundamental more than merely routine change. Routine change can be interpreted as the changes that happen constantly, it is the type of change that is more orderly, and from which a specific pattern can be easily derived. Fundamental change is, on the other hand, any alterations in an organization’s relationship with one or more of its key constituencies, such as the customers, employees, investors, business processes, systems, and policies.

Enterprise transformation is motivated and driven by experienced and/or perceived value deficiencies [16]. The value deficiencies subsequently lead to a decision to consider and examine the current and future state, and make the necessary changes to the work or even create new work in order to achieve the envisaged state of the organization. EA shares a similar characteristic to enterprise transformation in that it involves changes on an enterprise-wide scale. These changes are, for example, the architecting and engineering effort that moves the enterprise from the as-is architecture to the to-be architecture.

As shown in figure 1, value deficiencies [15] motivate and drive the overall transformation process. These deficiencies motivate the organization to initiate some form of change that will consequently lead to the remediation of the deficiency. The underlying belief of value deficiencies is that change will remediate the circumstances and ameliorate the deficiencies.
The ways in which the organization enables transformational change are also important. Typically, organizations would address value deficiencies in three ways [15], namely, to improve the way in which the work is currently executed, to execute current work differently, or to execute different work. The ‘work’ is generally understood to be major work that will ultimately affect the state of an organization [15]. It is characterized in hierarchical terms, namely purpose, objectives, functions, tasks and activities. Although routine changes typically take place at the level of tasks and activities, transformational change is more likely to happen at the level of purpose, objective, and functions. Transformational change does not necessarily concern only the work itself, but involves the relationships among the various levels of work. Typically, changes in an organization’s strategy will affect the function, tasks, and activities of business units. Thus, change at any level or at any part of the organization will have an impact on and even cause further change at one or more levels of the work of an organization.

The transformation process requires two essential inputs, namely, the allocation of attention and the allocation of resources [15, 16]. ‘Allocation of attention’ refers specifically to anticipation of, and adaptation to change. This means that the allocation of attention is relatively significant to how much time and effort an organization spends on anticipating change. This anticipation can also be related to external variables concerning the customers, competitors, demand and supply of the market. The ‘allocation of resources’ indicates the deployment of internal resources such as the financial, human, technological, and physical infrastructure of an organization. Rouse [15] argues that these inputs are necessary for transformational change to happen because the allocation of attention and resources help to cultivate and distribute organizational resources in order to yield the envisaged state of the organization.

Value deficiencies and the work define the actual problem of the change: it recognizes the deficiencies and then redesigns the associated work in order to remediate these deficiencies, [15]. However, one needs to consider more than just the problem dimension of the change. The ‘problem solver’ of the change must also be taken into account. The problem solver is referred to as ‘management decision making’. By management decision making, Rouse [15] means the ways in which managers or problem solvers can address change. These methods may range from tuning to adaptation, to reorientation, to re-creation. The competence of such leadership, in combination with other characteristics, has a major effect on the overall change process. The nature of the problem solvers can make a huge impact on how enterprise transformation is addressed, and how well the desired outcomes are accomplished. In addition, the nature of problem solvers is closely related to the social structure of the organization, and how a specific problem is approached and solved, based on the culture of the organization.

EA essentially requires enterprise-wide development and implementation. Every effort to move an organization from the as-is architecture to the to-be architecture will cause change to happen at various levels. Ultimately, the architecting process is similar to that of the transformational change process, and it can impact on the work, the social structure and the relationship between the key constituencies of an organization.

2.3. IS in organizational context

The social structure and the cultural aspects of the organization are, among many others, some of the most critical and influential factors for the deployment of IS in organizations. Literature conclusively argues that IS developments and implementations too often underestimate the role of organizations’ social structures resulting in failures [3, 5, 11, 24]. This is of particular importance to organizations in South Africa, being comprised of high cultural diversity. This points to higher levels of complexity when addressing the social dimensions of the organization.

The social structure and the cultural aspects of an organization are defined as ‘the pattern of basic assumptions that a given group has invented, discovered, or developed in learning to cope with its problems of external adaptation and internal integration’ [3, 17]. An organization’s social structure also ‘implies superior value and imposes a set of behaviors’ [3]. Other authors such as Walsham [24]
and Biazzo [5] view the organization’s social structure from the perspective of power and politics. As was described by Biazzo [5], IS in organizations often led to an ‘asymmetrical distribution of resources that can be activated to influence behaviors’. Davenport [8] noted decades ago that IS can no longer be separated from organizational politics and power distribution. Hence, it is critical to highlight that the effect of EA on the organization’s social structure should not be underestimated. This underlines the importance of the non-technical aspects for enterprise architects. On the other hand, the non-technical aspect also stresses the effect of organization’s social structure on EA in architecting the organization.

2.4. Related work on enterprise architecting challenges

The research of Kaisler and others systematically describes the challenges on enterprise architecting [13]. Their research led to the notion that most of the challenges are non-technical in nature, and hence require further study on the implications for the enterprise architects. Some of these implications were found by the research of Handler [10] and Burton [6]. Handler [10] found that most EA efforts failed due to inadequately addressing the human aspects of EA. He recommended that enterprise architects should pay more attention to the stakeholders, and more specifically, the ‘human side’ of EA due to the fact that EA is essentially causing organizational change.

Other authors such as Beznosov [4], Kamogawa and Okada [14] also did research to explore the challenges. Although they did not specifically address challenges relating to enterprise architecting, these authors did however, call for a non-functional perspective and a proper business model in the architecture frameworks.

It is generally accepted that EA is valuable to organizations. The challenges identified in the literature provide certain perspectives for a given purpose. These perspectives, combined with empirical evidence, should ultimately be merged to provide a coherent body of knowledge to support and complement EA practices and EA research. This study aims to add to the discourse by providing the empirical evidence.

3. Motivation

In recent years the trend towards services in the economy has been progressing rapidly throughout the world [1, 20]. Organizations as service providers are confronted with the growing trend of service emergence. This trend creates a new arena for the demand and supply of services, and affects the ways in which the organization designs its structures, processes and operations. It also imposes a huge challenge on an organization’s architecture to compete in this trend of service emergence.

Follow on the growing need to compete in the service emergence, the motivation for this research is that EA commonly denotes a notion that ‘the map always changes the landscape’. This means that the technical approaches often dictate the overall architecting process and consequently changes the organizational landscape without taking cognizance of the organizational changes and its implications for the business environment at large. This is because of the dominant technical view EA takes of the business and technology. The challenges that have been identified in this study are largely non-technical in nature. It follows that taking a technical view will result in a sub-optimal solution, and will therefore fail to meet the growing trend of service emergence. Thus, this research examines the non-technical aspects of the role of enterprise architect with the purpose to support and complement the architecting process.

4. Research Design

The study utilizes qualitative data because this research aims to examine the non-technical aspects of the architecting process. The use of qualitative data reveals people’s behavior and their perceptions of a given situation. Thus, qualitative data can allow the researcher sufficient flexibility to present a holistic, over-arching view to the reader.

The research is therefore approached from a non-positivist viewpoint. This viewpoint indicates that the research positions its underlying approach such that the understanding of reality is fundamentally socially constructed [23]. The reason for choosing a non-positivist approach is that this research aims to address the non-technical aspects of the enterprise architecting process. The non-technical aspects described in this study are defined by the organization’s social structure. The need for interpreting and understanding the non-technical implications of the architecting process recognizes the subjective nature of the given situation, and also the challenge to quantify the socially constructed understanding [7]. It inevitably proposes a strong advocate of the qualitative approach rejecting generalization [7]. As a result, the underlying philosophical perspective of the research is interpretivistic in nature.

The interpretivistic paradigm adopted in this research follows a strong qualitative approach with the
purpose of understanding and interpreting the problem. The results of the literature survey, empirical study and interviews are discussed and presented in an interpretive manner. The interpretivist paradigm provides a specific way in which the information gathered is conceptualized.

In this study interviews were conducted to understand the challenges currently confronting enterprise architects in organizations based in South Africa. The primary purpose was to acquire in-depth insight into what the challenges are, and to understand the implications for enterprise architects.

Eight interviews were conducted with enterprise architects working in the relevant EA domains, representing companies across various industry sectors, such as telecommunication, financial services, IT service providers, consulting services, and government-owned enterprises. These are summarized in table 1. The background described in table 1 refers to the qualification and also the category of the past experiences of the interviewee. Each interview lasted from sixty to ninety minutes and was conducted in a semi-structured format. All of the interviewees were found to be highly knowledgeable and highly cooperative.

| 1 | EA (consulting) | Computer science and Information technology |
| 2 | Application architecture | Information Systems |
| 3 | EA | Computer Science |
| 4 | Business architecture | Information Technology |
| 5 | Application and technology architecture | Electrical Engineering and Computer Science |
| 6 | Senior management for EA | Computer science and Information Technology |
| 7 | Information architecture | Computer Science and Informatics |
| 8 | EA (consulting) | Computer Science |

With the permission of the interviewees, the data was collected using a voice-recording device and further transcribed into the text transcript. Key words were identified and compared between the different interviewees. These were used as the organizing logic for the interpretation and the presentation of the data. It is important to note that the interviews did not follow a strict question-and-answer approach. Certain responses or even unexpected responses triggered a number of new questions in order to gain an in-depth understanding of the thoughts of the interviewees. The semi-structured interviews were conducted in such a way to provide the researchers with rich data.

5. Challenges in enterprise architecting

A number of challenges were identified by the interviewees and these were discussed extensively to gain a deep understanding. The following challenges were identified:

- Communication
- Obtaining buy-in from the stakeholders
- Ownership
- Perceptions of the enterprise architect
- Organizational politics.

A sixth category ‘other challenges’ was added to indicate challenges that were mentioned but not considered to be of primary importance by the interviewee.

5.1. Communication

Communication is considered one of the biggest challenges by all of the interviewees. One of the interviewees commented: ‘We are trained to design perfect architectures, so we are technically competent… but we lack the ability to communicate those architectures to the organization’. This statement points to the communication problem in the overall architecting process: the challenge of getting the message across to the stakeholders and the ability to communicate the appropriate purpose and value of EA.

The communication challenge can be subdivided into two categories: internal communication and communication with stakeholders. ‘Internal communication’ refers to communication within and among the EA teams. Interviewees claimed that enterprise architects tend to rigorously focus on their own domains. For example, different architects often communicate independently of each other with the business representatives. This often results in discrepancies in the architectural messages. Moreover, not only is communication between teams poorly articulated, but also communication between the members in a team. This implies that neither the communications within, nor among, the various EA teams are properly articulated or executed. The communication challenge comes from different EA teams who tend to operate, and therefore communicate, in ‘silos’. It was also stated that this challenge is critical to the livelihood of EA, ‘because EA needs different components to interact with each other, and if that doesn’t work, obviously some component will fall flat and the entire EA will be unsuccessful’.

The second communication challenge is communication with stakeholders. The interviewees indicated that many enterprise architects tend to
communicate primarily on a technical level. From the interviews, it seems that they often try to ‘speak architecture’ to the stakeholders, and is doomed to fail. The interviewees claimed that the business really only cares about the results of the EA. What the enterprise architect speaks about are technical architectures and meta-models, while the business is only interested in, for instance, the total cost of ownership (TOC). Consequently, this leads to poor communication, because the enterprise architect and the stakeholders communicate on different levels. While the enterprise architect communicates on a technical level, the business expects a business-oriented discussion that focuses on the benefits and the outcomes of the EA. As a result, mis-communication between enterprise architect and the business often occurs. Moreover, communication is often very difficult because EA is a time-consuming process and involves many stakeholders on an enterprise-wide scale.

There can be no doubt that weak communication is a barrier to effectively delivering enterprise architectural services. The problem of non-alignment of business and EA often occurs because enterprise architects do not properly communicate messages relating to EA to the business and often do not have enough understanding and appreciation of the business.

5.2. Obtaining buy-in from the stakeholders

The second challenge is that enterprise architects often struggle to obtain stakeholders’ buy-in. The interviewees pointed out that introducing EA into an organization is often very time-consuming and it involves the participation of a large number of stakeholders, such as the management, system champions, data owners, policy owners, users, developers, and enterprise architects. As a result, this often creates complexities when there is a conflict of interest among the stakeholders. Furthermore, many stakeholders often expect business benefits to be delivered within a very short timeframe. This puts a lot of pressure on enterprise architects to produce quick results to meet some unrealistic timeframes. This inevitably leads to losing stakeholders’ buy-in when short-term results are not forthcoming.

Another challenge mentioned is that when organizations or individuals have had previous unsuccessful experiences, the stakeholders tend to be quite reluctant to offer their support to the EA initiative. It is often very difficult to overcome such negative perceptions. These perceptions often lead to the conviction that EA is just another expensive, yet unsuccessful IT project, and that the business should rather spend its money elsewhere. There are therefore a number of perceptions that the enterprise architects must understand, appreciate, and effectively address before they can expect buy-in from the stakeholders.

Organizational culture and hierarchy also seem to influence the way stakeholders interact with one another, and may negatively affect buy-in for the EA initiative. Interviewees quoted examples where people simply operate within their own ‘ivory towers’. Some expect architects to behave in ways that are strongly determined by their own community beliefs, values and norms. People’s belief systems seemingly determine how they deal with race, as an example, or with age, language, gender, and the like. The architect may even be seen as a threat either in terms of the integrating nature of EA or simply in terms of a difference in belief systems. Unless the architect is aware of these determinants and is willing to adapt to the other community’s beliefs – albeit temporarily – it may be very difficult to obtain cooperation and buy-in.

5.3. Ownership

Ownership emerged as another strong challenge. Because EA often causes major changes in an organization, stakeholders (such as system champions, data owners and policy owners) often resist the EA initiative because EA affects their status in the business hierarchy. This causes some individuals to behave defensively in order to protect their ownership of that space. Some interviewees pointed out that assigning ownership was found to be problematic due to the ‘shared ownership’ nature of EA. One typically finds plenty of ‘re-usable services’ in SOA, thereby making the issue of ownership potentially controversial. Architects acknowledged that EA must be owned by the business, ‘but the skills required to address this complex issue [of managing ownership] are definitely problematic’.

Interviewees also commented that, because EA is not typically owned by a single stakeholder or business unit, budget implications often arise. In some organizations, EA is budgeted for as an IT initiative, resulting in a business ‘hands-off’ problem. Ownership is therefore a complex issue and, if not explicitly addressed, may affect the quality of the architecting process.

5.4. Perceptions of the enterprise architect

All the interviewees had an IT or engineering background. They confirmed that it seems to be true of most other enterprise architects in their organizations. It seems that architects with an IT or engineering background tend to exhibit worldviews strongly
focused on the technological or engineering perspectives of EA.

The interviewees pointed out that many architects with a technical background expect the business to provide them with a set of functional requirements and this often results in disappointments in the expectations of the business and the architects. Some interviewees blamed the problem on the ‘engineering mindset’ of the architect meaning that many enterprise architects generally are not interested in business concepts to the extent that they ‘simply couldn’t care less about the business benefits of EA’.

5.5. Organizational politics

As a result of organizational politics, enterprise architects are sooner or later turned into ‘politicians’ after being involved in EA for a while. In the opinion of some architects, business executives frequently have made up their minds about a specific solution before the architecture is designed. The result is that they unwilling to be convinced otherwise even if it is to protect their ego’s. It requires architects to be skilled in the arts of negotiation and diplomacy to convince powerful individuals of their convictions. Enterprise architects therefore require the skills to deal with organizational politics if they want to be successful in their EA efforts. EA is being perceived as a political game and unless the architects are skilled in playing the game, their chances of success are seriously jeopardized.

5.6. Other challenges

- **Integration of legacy systems**: Although EA makes sound sense in theory, enterprise architects in the solution domain are still unsure of how EA can be practically applied to integrate a multiplicity of legacy systems.
- **Limited availability of modeling tools**: A wider variety of modeling tools would definitely assist in delivering a better EA service.
- **One single interface that can interact with all data sources**: It was briefly noted that the current architecture of the organization of one of the interviewees is extremely widely distributed. As a result, many varieties of processes and data sources need to be integrated, thereby providing a challenge to the task of the architect.

In summary, whilst there are some technical issues relate to the specific domains of EA (mentioned under ‘other’), one can see that the major challenges are, as described by the interviewees, largely non-technical.

Many of these problems are associated with the social structure of an organization. This is an indication that more attention should be paid to the non-technical side of the overall EA process.

6. Implications for enterprise architects

By looking at the findings (table 2), it becomes clear that the challenges are all closely interrelated. For instance, communication affects and influences the way that the enterprise architect addresses the issue of ownership and organizational politics. Similarly, the communication challenge stems from the fact that many enterprise architects adopt a very narrow worldview by focusing strongly on the technical aspects. This creates complexities when addressing the challenges because one challenge can potentially breed other challenges. It is therefore important to attempt to understand the challenges and its implications for the enterprise architects.

<table>
<thead>
<tr>
<th>Table 2: Summary of challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Communication</strong>: Both internal communication and communication with EA stakeholders are weak, and it consequently becomes a barrier to institutionalize EA.</td>
</tr>
<tr>
<td><strong>Obtaining buy-in from the stakeholders</strong>: Negative perceptions about EA, conflict-of-interest among the stakeholders and inability of enterprise architects to adapt to the community beliefs of different stakeholders all results in difficulties in obtaining buy-in.</td>
</tr>
<tr>
<td><strong>Ownership</strong>: Stakeholders tend to resist the EA initiative because it influences their status of ownership.</td>
</tr>
<tr>
<td><strong>Perceptions of the enterprise architect</strong>: The worldviews of most architects, as confirmed by the interviewees, are largely influenced by their technological or engineering background.</td>
</tr>
<tr>
<td><strong>Organizational politics</strong>: The nature of the EA environment and the associated decision-making seem to be very politically influenced.</td>
</tr>
<tr>
<td><strong>Other challenges</strong>: Integration of legacy systems, limited modeling tools, and a single interface that can interact with all data sources are considered as a few of the technical challenges.</td>
</tr>
</tbody>
</table>

As summarized in figure 2, one needs to realize that EA introduces change into organizations far beyond just a change in functionality. Noting that most of the challenges mentioned in this study relate to the social structure of the organization, it is at no doubt that enterprise architects should give more attention to the ‘human side’ of EA. The findings reveal that the non-technical perspective is seriously lacking, and the
world views of the enterprise architects are largely influenced by their technical backgrounds. Enterprise architects need to be aware that they play an important role in introducing fundamental changes. Such process would need to take cognizance of the effects that EA imposes on the organizational social structure. Hence, the enterprise architect needs to pay more attention to the non-technical side of their role, and particularly on the effect that EA has on the organization’s social structure. Consequently, it raises the question of how these challenges can be addressed.

That enterprise architects lack ‘soft’ skills seems to be one of the common causes of the observed challenges. Soft skills, such as communication skills, people skills, expectations management skills, presentation skills, and leadership skills, are all potential requirements for an enterprise architect. This kind of soft skill training seems to be sorely lacking in the development plans of the architects interviewed. It can be assumed that some enterprise architects lack the will and motivation to attend such training but unless architects become skilled in these kinds of ‘soft skills’, the solutions they suggest may remain sub-optimal.

Enterprise architects often neglect to appropriately address the needs and the expectations of the key stakeholders and tend to communicate outside of the ‘cultural context’ of the business. As it was described in the earlier sections (1.3), in order to introduce change, one must have experienced or, at least have a perception of value deficiencies. Enterprise architects must therefore communicate based on the expectations and the needs of the stakeholders. Instead of exhibiting meta-models and architecture diagrams, important business views such as the investment value of EA and how it can contribute to profitability, TCO perspective, and the various business benefits of EA must be justified. Enterprise architects must address the needs, expectations, and potential value deficiencies of the key stakeholders based on the organizational culture and community belief, in order to direct the organization and stakeholders to foster the positive change.

Managing expectations and perceptions of EA is important, and implies that enterprise architects must match their expectations to those of the business. This requires enterprise architects to first reach consensus on what EA really is and what it can deliver for the business, and, secondly, realize that EA is not merely for the benefit of their individual architectural silos. In that way, EA teams can avoid miscommunication with the business and key stakeholders, and properly demonstrate the business value of EA. However, one must understand that the business value of EA is always perceived and determined in the context of the business – meaning that it is the business who decides on whether EA is valuable for them or not. Hence, an appreciation of EA’s business value also means that an appropriate value proposition needs to be made so that the enterprise architect can work with the business to deliver maximum value.

Last, but definitely not least, leadership is required in guiding the overall EA process. The leadership is essential in ensuring that the overall process is governed and driven firmly by clear objectives, aligned expectations, and appropriate value propositions. The leadership is not necessarily centered in an individual, but rather it can be perceived as a committed collective effort from the key stakeholders and the enterprise architects. Therefore, one should bear in mind that solid leadership is of vital importance to sustaining EA in an organization, and the enterprise architect plays an essential role in facilitating such leadership within the organizational context.

Many EA challenges are encountered because of lack of non-technical views (as summarized in table 3). The effects of which EA imposes on the organization’s
social structure are often neglected, which consequently leads to many non-technical challenges.

The causes of non-technical challenges are related largely to human side of EA. Similarly, the results of the empirical study confirmed the challenges and the implications found by the literature. Table 4 outlines a high-level overview of the correlation with the research done by Kaisler, Armour, and Valivullah [13]. It indicates, on a very high-level, that there exist a definite correlation between the challenges that are found in the South African organizational context, and the studies that are done outside of this context. Thus, it ultimately suggests a need for a non-technical perspective of the role of enterprise architect.

Table 4: A high-level overview of the correlation with Kaisler’s research

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Kaisler et al. research [13]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>- business view representation and alignment</td>
</tr>
<tr>
<td></td>
<td>- stakeholders perspectives</td>
</tr>
<tr>
<td>Obtaining buy-in from the stakeholders</td>
<td>- business view representation and alignment</td>
</tr>
<tr>
<td></td>
<td>- stakeholders perspectives</td>
</tr>
<tr>
<td></td>
<td>- the system architect’s value proposition</td>
</tr>
<tr>
<td>Ownership</td>
<td>-</td>
</tr>
<tr>
<td>Perceptions of the enterprise architect</td>
<td>-</td>
</tr>
<tr>
<td>Organizational politics</td>
<td>-</td>
</tr>
<tr>
<td>Other challenges</td>
<td>- limited modeling tools</td>
</tr>
<tr>
<td></td>
<td>- managing the integrated enterprise life cycle</td>
</tr>
</tbody>
</table>

7. Conclusion

The discussion in this paper highlights the nature of the challenges encountered in enterprise architecting. It is indeed important to note that the enterprise architect needs the non-technical perspectives in order to successfully architect the enterprise. Thus, one can state in brief that there are two essential dimensions to the role of enterprise architect:

- A technical, engineering side which focuses on delivering technically accurate, reliable architecture to deliver the business value of EA
- A non-technical side that focuses on delivering services to remediate the value deficiencies of the stakeholders based on the social structure of the organization

The two aspects are intertwined, and have a symbiotic relationship. Enterprise architects must demonstrate the capacity to effectively fulfill these two dimensions when delivering architectural service. Unfortunately, according to this research, many enterprise architects are stronger in fulfilling the technical aspect, and they tend to neglect the non-technical aspect. It is for this reason that this research proposes that the role of enterprise architect should be re-visited to reflect both the technical and the non-technical perspectives of enterprise architecting.

Although this study used the South African situation as the basis, the conclusions are generally applicable. Any enterprise architect anywhere in the world operates in an organizational context and this context is shaped by organizational culture thereby becoming a social environment. Success of the architecting process is therefore strongly influenced by taking the non-technical aspects into consideration.

8. Recommendation for future research

Owing to the limited nature of the study and its scope, there are still a number of issues that one can investigate in future research:

- The organization’s social structure can be further explored to understand the role and the relationship of the various contextual issues relative to the EA environment. It is therefore recommended that further research should be directed towards understanding how enterprise architecting influences organizational social structure, and even more importantly, how the organization’s social structure shapes the enterprise architecting.
- The limited scope of the study directs the research outcome to provide insight into the non-technical perspective of the architecting process. However, further research should also be done to complete the non-technical perspective such as to identify ways to assess, measure and, if possible, quantify the non-technical aspects.
- Due to the limitations of the interviewees’ environment, issues such as the support and the maintenance of EA have largely been excluded from the study. Hence, it would be valuable to study the role of non-technical perspective on the support and the maintenance side of EA.
9. Acknowledgement

The support of SAP Research CEC Pretoria and SAP Meraka UTD (CSIR) towards this research is hereby acknowledged. Opinions expressed and conclusions arrived at are those of the authors and not necessarily to be attributed to the companies mentioned in this acknowledgement.

10. References


