Understanding the Value of Enterprise Architecture for Organizations: A Grounded Theory Approach

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Understanding the Value of Enterprise Architecture for Organizations: A

Grounded Theory Approach

by

Edwin Nassiff

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for the degree of Doctor of Philosophy
in
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There is a high rate of information system implementation failures attributed to the lack of alignment between business and information technology strategy. Although enterprise architecture (EA) is a means to correct alignment problems and executives highly rate the importance of EA, it is still not used in most organizations today. Current literature only gives anecdotal reasons why EA is not more widely adopted. This study explores the problem of EA underutilization by analyzing and understanding how organizational executives value EA.

This research used the grounded theory methodology to obtain the EA perspectives of organizational executives responsible for EA. Seventeen executives were selected using theoretical sampling and interviewed using a semi-structured interview approach. The interview data was recorded and coded, and interviewing continued until theoretical saturation was reached.

The executives identified four distinct meanings of EA, i.e., business and IT alignment, a holistic representation of the enterprise, a planned vision of the enterprise, and a process, methodology, or framework enhancing enterprise decision making. In addition, they identified 16 unique benefits that EA provided. Depending on their meaning of EA, it was possible to predict what benefits they expected. For example, if the meaning of EA was a holistic representation of the enterprise, then the benefits of increased operational effectiveness, planning, product selection, and speaking a common language were expected. However, regardless of which of the four meanings of EA was selected, executives expected EA to facilitate the alignment of business and IT, the decision making process, and the simplification of system and architecture management. Based on the findings, an analytic story and a theoretical model were produced. The model depicted the influencers on the meaning of EA; and, based on the meaning, the expected benefits of using EA.

The understanding of executives’ perceptions of EA is critical because they are the most influential leaders within organizations. Without their understanding, it becomes less likely that EA initiatives would meet organizational expectations and have favorable outcomes. Furthermore, it is hoped that this study raises the level of understanding of EA so that future EA initiatives become more aligned with organizational goals and the views of the executives who are responsible for them.
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Chapter 1

Introduction

1.1 Background

There are serious concerns with the implementation of information systems (IS). According to the Standish Group, a challenged and/or failed IS implementation occurs when the IS is delivered late, or over budget, or with less functions or features than originally documented (Standish, 2009). Other scholars questioned the criteria and the research process used by Standish to assess IS projects and found, for example, that project leadership, project team motivation, unstable user requirements, poor project risk management, underestimation of project costs, inadequate change control procedures, and unrealistic customer expectations significantly contributed to the outcome of IS projects (Brooks, 1995; Cerpa & Verner, 2009; Pressman, 1998). Nonetheless, there is an alarming rate of IS developments that are not considered successful. For example, the Standish Group reported that 44% of IS implementations were challenged and another 24% completely failed (Standish). Goldfinch (2007) found that when IS development costs were under $750,000, only 55% of IS were fully functional and that there were no successes for IS costing over $10 million. Charette (2005) estimated that, over the period from 1999 to 2004, software project failures cost the U.S. economy between $25 - $75 billion; and Chiasson and Willis (2007) reported that the functionality of many ERP systems implementations did not align with organizational practices.
Henderson and Venkatraman (1993) asserted that one of the major problems of realizing any benefits from information technology (IT) investments was due to lack of alignment between business and IT strategies. Reich and Benbasat (1996) found that to build a more successful IS there must be a better understanding of current objectives and a shared vision. Enterprise architecture (EA) is defined as a set of artifacts that describe the objects of an organization or an enterprise which include IT alignment documentation, organizational models, reusable components, architectural patterns, and principles guiding the design and evolution of its objects (Jonkers et al., 2006; Zachman). When EA is continuously applied to align business strategies with IT strategies, it leads to business-IT alignment (Sage, 2006; Schekkerman, 2004).

Chen and Clothier (2003) found that, by using EA, the integration of an entire organization’s business planning, IT architecture, and IT strategic plans was possible. Likewise, Gregor, Hart, and Martin (2007) determined that EA not only facilitated the alignment of an organization’s IT strategy with its business strategy but also its integration. Sidorova and Kappelman (2011) used the Actor-Network Theory to explain the role of EA in achieving business-IT alignment. Rathnam, Johnsen, and Wen (2004) concluded that the alignment between business strategy and IT strategy continued to be a major difficulty and that business architecture was one way to overcome it.

Morden (1997) indicated that EA helped support the preservation of organizational knowledge and competence, the creation and sustainment of experience, flexibility in response to changes, open interchange of information, and an organizational culture of motivation, quality, and control. However, several authors brought forward the belief that the complexity of EA is one of its most unfavorable characteristics (Bucher, Fischer,
Kurpjuweit, & Winter, 2006; Chen & Clothier; 2003; Ring, 2005; Tanigawa, 2004; Zachman, 1987).

Zachman (1997) summarized the overall importance of EA by equating it to “the very survival of every Enterprise of any substance” (p. 12). Nevertheless, when looking at the value proposition of EA, Ross and Petley (2006) concluded that most organizations failed to see the real benefit of EA. Versey (2001) pointed out several popular managerial misgivings about EA. One dealt with the belief that EA was a scientific/engineering method whereas management was more of an art than a science; therefore, EA was not suited as a management practice (Versey). Furthermore, Versey claimed that management felt there would be a loss of managerial power because EA would not allow a natural selection of overlapping projects so that the best of several competing projects could emerge as the best overall enterprise solution. Bernard (2005) said that most general management regarded EA as part of the IT domain; thus, it disregarded most important business alignment aspects. Others identified the necessity to view EA equally from a technology and business perspective (Boster, Liu, & Thomas, 2000; Winter & Schelp, 2008). According to Boster et al., the real benefit of EA was heavily skewed towards the technical perspective compared to the business perspective because “most organizations fail to see that the architecting process has a business part at all” (p. 45).

Despite the apparent capability of EA to solve several IT issues such as alignment, integration, and complexity; current literature indicated a wide range of both favorable and unfavorable perspectives about it. Jonkers et al. (2006) emphasized the need to have business and IT alignment in order to reduce the complexity of any large organization or system and stated that a good architectural practice facilitated innovation and change. On
the other hand, Zachman (1987) alluded to the general complexity of EA by stating that people had difficulty in communicating architecture. Notwithstanding the unfavorable perceptions of EA, there were many documented cases where EA proved to be successful in meeting business objectives. Veasey (2001) provided examples of British government and private sector organizations that effectively used EA to manage strategic change. Ross (2003) referenced 40 case studies of firms which benefitted significantly by developing a competency in creating and evolving their EA. Nonetheless, in a recent survey of 374 organizations, Ambler (2010) found that only 47% of the organizations implemented EA where approximately 67% of the survey respondents were from North America, 21% from Europe, and 10% from Asia. Twenty-eight percent of the respondents represented organizations that had over 500 IT personnel (Ambler).

IS implementation failures continue to plague businesses and a leading cause of them is the lack of alignment between business and IT strategies. EA provides a means for ensuring the alignment between business and IT strategies, even though literature points out that EA continues to exist in a shroud of both favorable and unfavorable perceptions. Despite its many successes, numerous stakeholders and organizations continue to doubt EA’s overall effectiveness.

1.2 Problem Statement

Notwithstanding the apparent benefits, EA is not widely accepted or adopted by most organizations (Ambler, 2010; Chen & Clothier, 2003; Gregor et al., 2007; Rathnam et al., 2004; Reich & Benbasat, 1996). EA is a means to solve the critical problem of business and IT strategic alignment; however, it is not utilized by most organizations. In fact,
many organizations and their leaders found little benefit in using EA (Bernard, 2005; Ellis, 2001; Kamogawa & Okada, 2005; Ring, 2005; Zachman, 1987). Ross and Petley (2006) established that some organizations did not employ EA because they viewed it as an abstract concept that had little benefit.

The problem investigated in this research is the underutilization of EA. Literature contains both favorable as well as unfavorable observations about EA derived from a broad range of stakeholders. Sage (2006) found in several surveys performed over the past 25 years that executives highly rated the importance of EA. Even though executives have highly rated the importance of EA for over two decades, it is still not broadly adopted today. This suggests that EA does not accomplish the expected benefits of organizational executives. Since executives are the most influential leaders within any organization, it is critical that EA fulfills their expectations in order to be successful. This research focuses on the meanings and expected benefits that organizational executives give to EA in order that EA practitioners and researchers can better understand what EA means to executives and what executives expect from it. Without understanding executives’ meanings and expected organizational benefits of EA, any new or on-going EA initiative is less likely to meet organizational expectations or have a favorable organizational impact; and EA will keep on producing mixed results. Without sustained EA successes, EA will continue to be underutilized.

One of the most significant objectives of this research is to understand the value that organizational executives give to EA. To understand executive values, it is necessary to understand what EA means to them. Roth (2004) stated that early definitions of the term meaning were closely related to understanding and interpreted to be “something that
connects with something deeply embodied in our being” (p. 75). Roth further stated that the embodiment meant understanding how things are and the know-how to do things. The Speech Act Theory described *meaning* in the context of sentence properties or signs and used a conceptual framework of theories of meaning and communications (Carassa & Colombetti, 2009). *Meaning* was a function of the speaker’s mental states including personal beliefs, personal intentions, and communicative intentions; however, Herbert Clark refuted this claim and proposed the Signal Recognition Principle that recognized the communicative acts were between two parties, i.e., both the speaker and the hearer (Carassa & Colombetti). Carassa and Colombetti cleared up any vagueness found in Clark ‘s Signal Recognition Principle by stipulating that what a speaker meant was his or her intentions which were independent of what the hearer understood; and that, when successful communication occurred, the resulting *meaning* was understood by both the speaker and hearer (called joint meaning).

### 1.3 Dissertation Goals

The main goal of this research was to understand how executives value EA for their organizations. This main goal included two sub-goals. By understanding how executives valued EA, the first sub-goal was to determine the concepts that executives used when assessing the value of EA, as well as the specific properties and dimensions attributed to those concepts. The second sub-goal of this research was to link the concepts, properties, and dimensions emerging from the data into a coherent framework of categories and subcategories in order to develop a plausible explanatory framework of how executives valued EA.
These goals were considered important because EA lacked a strong theoretical basis (Balabko & Wegmann, 2006; Kappelman, McGinnis, Pettit, Salmans, & Sidorova, 2010; Sage, 2006; Tanigawa, 2004). Balabko and Wegmann pointed out that “Enterprise Architecture (EA) is a relatively new domain that is rapidly developing” (p. 155). According to Sage, EA research has been largely ignored; thus, it has little theoretical basis. Kappelman et al. stated “it is important to get a deeper understanding of how EA may lead to the desired organizational outcomes” (p. 106).

1.4 Research Questions

This dissertation addressed the research problem of why EA was underutilized. In exploring this problem, this research attempted to understand the meanings and expected organizational benefits that executives assigned to EA. The research questions were:

• What were the meanings executives attached to EA?

• What benefits did executives expect to achieve from EA?

• What important internal and external influences shaped an executive’s meanings and expected benefits of EA?

The first research question aimed to understand the meanings that executives had about EA. In so doing, it also examined executives’ meanings of enterprise and architecture as separate terms in order to derive their meaning of EA. This question assessed the personal beliefs, personal intentions, and communicative intentions that executives had about EA.

The second research question attempted to determine the benefits that executives expected to receive from EA. As such, it ascertained any monetary benefits as well as
intrinsic benefits, such as high personal significance or favorable organizational consequences, which executives expected by performing EA.

The third research question explored the external and internal influences that shaped executive meanings and benefits of EA. External organizational influences could have included a changing market place, impressions about EA from outside colleagues, or the need to innovate in order to remain competitive. Examples of internal organizational influences may have been an outdated manufacturing system, inability to optimize processes, or a proposed merger or acquisition.

1.5 Definition of Terms

Since a goal of this study was to determine executives’ or senior managements’ meaning and value of EA, it was necessary to define those terms. Vallabhaneni (2008) and Fettke and Loos (2007) considered executives to be those that have the word chief in their titles (e.g., Chief Executive Officer (CEO), Chief Operating Officer (COO), Chief Information Officer (CIO), Chief Financial Officer (CFO)), in addition to Executive Vice Presidents (EVP), Senior Vice Presidents (SVP), and Vice Presidents (VP). For the purposes of this research, the designation of senior management and executives was used interchangeably.

According to Kendall & Kendall (2008) the term information system meant any computerized system that supports business processes by providing information in an organizational context. However, Stowell (2008) took a more generalized view of an information system to mean all of the components required to create a system of information for a set of clients; therefore, not restricting an information system to a
computerized system of hardware and software but also to management science and business practices. This dissertation used a hybrid of these two definitions by referring to an information system as any system that supported business processes by providing information in an organizational context.

Information technology referred to the retrieval, storage, and transmission of information via computers and telecommunications (WordNet, 2011). However, according to Stowell (2008), information technology was concerned with the management of data as opposed to the management of information. For the purposes of this study, information technology meant the retrieval, storage, and transmission of data and all of its associated technology.

Zachman (1997) stated that architecture was a set of artifacts that described an object to the extent that it could be produced to a set of requirements and maintained over time. Therefore, enterprise architecture was a set of artifacts that described the objects of an organization or an enterprise; and, together, these artifacts gave a comprehensive, holistic view of an enterprise (Jonkers et al., 2006; Pereira & Sousa; 2004; Rico, 2006; Zachman). However, there was a multiplicity of EA definitions and these definitions more than likely contained terms not agreed upon by all executives. As pointed out in Kappelman et al. (2010), different stakeholders may view and comprehend EA through different perspectives such as a planning tool, a blueprint of the enterprise’s future, a means to strategically align IT with the business, an enterprise process and modeling capability, or a shared language across the enterprise to document and communicate about important business aspects.
As referenced in Kappelman (2010), John Zachman defined architecture as “the set of
descriptive representations about an object” (p. 246) and the Society for Information
Management Enterprise Architecture Working Group defined EA as “the holistic set of
descriptions about the enterprise over time” (p. 252). These two definitions were used to
frame this research because they were broadly based and holistic; and, therefore, they
could accommodate the different perspectives executives had concerning their specific
meanings of EA.
Chapter 2

Review of the Literature

2.1 Introduction

The purpose of this section was to briefly examine the body of knowledge surrounding EA in order to obtain a better foundation for this research. A primary emphasis of this review was to understand current meanings and expected benefits of EA so that the researcher had a broad background of the subject matter in order to effectively focus the data gathering interviews and relate the concepts that emerged from the analysis phase of this dissertation. There already existed limited research which encompassed the organizational impacts of EA such as the process of making early architecture decisions, the role of EA in the alignment and requirements definition phases in the IS development cycle, and the use of EA as a management tool for the enterprise (Jonkers et al., 2006; Salmans, 2009; Tanigawa, 2004). However, there existed some research that looked specifically at senior managements’ meanings and expected benefits of EA. The fact that minimal research existed may not be unusual. As pointed out in Kappelman (2007), EA is an emerging discipline; and, like other new business and technical concepts, it may take several generations for EA to gain full maturity. However, this could be achieved by creating a link between EA strategy and EA implementation (Kappelman).

Besides this introductory section, there are five other sections in this chapter. Section 2.2 examines traditional issues with IS implementations that point to the relevancy of EA.
Section 2.3 analyzes the meaning of EA by reviewing definitions found in literature. Both favorable and unfavorable perceptions about EA are addressed in sections 2.4 and 2.5 respectively. Finally, Section 2.6 summarizes this chapter.

2.2 The Relevancy of EA to Current IS Issues

IS implementations continue to fail at an alarming rate (Standish, 2009). A reason often stated for such failures is the poor alignment between business and IT strategies; however, a major benefit of EA is to view the organization holistically by bonding the integration of both business and IT strategies (Chen & Clothier, 2003; Gregor et al., 2007; Rathnam et al., 2004; Reich & Benbasat, 1996; Venkatraman, 1993). Notwithstanding the above, many organizations doubt the wisdom of using EA (Bucher et al., 2006; Kamogawa & Okada, 2005). Kappelman et al. (2010) stated “it is important to get a deeper understanding of how EA may lead to the desired organizational outcomes” (p. 106).

The majority of information systems are unsuccessful. In fact, the larger the development effort, the greater is the probability of failure (Goldfinch, 2007). According to the Standish Group, an IS development is successful when it is delivered on time and within budget; and it provides the functionality and features as originally specified (Standish, 2009). For IS developments costing under $750,000, only 55% were successful; and there were no successes for those costing over $10 million (Goldfinch). Charette (2005) estimated that, over the period from 1999 to 2004, software projects failures cost the U.S. economy at least $25 billion and, possibly, as much as $75 billion. O’Sullivan (2002) reported that 73% of all information technology (IT) projects failed,
and “the cost of business in terms of inefficiency and lost potential is significant” (p. 78). Based on a Gartner Group report, Gargeya and Brady (2005) pointed out that “70 percent of all enterprise resource planning (ERP) projects failed to be fully implemented, even after three years” (p. 501). In addition, Chiasson and Willis (2007) reported that many ERP system implementations “fail to achieve a fit between the software functionality and organizational practices” (p. 213).

There are problems in aligning business and IT strategies. Henderson and Venkatraman (1993) asserted, “the inability to realize value from I/T investments is, in part, due to lack of alignment between the business and IT/strategies of organizations” (p. 4) and Reich and Benbasat (1996) found that “understanding of current objectives and shared vision” (p. 56) were two of the most promising ways to build better systems. As an indication of the severity of the problem, Wilkinson (2006) reported that, in the allocation of IT budgets, only 10 percent went to finding innovative ways to improve how IT supports the business, while the rest went into operations and maintenance (65 percent) and upgrades and migrations (25 percent).

However, EA is recognized as an enabler in solving business and IT alignment problems. In a case study on EA, Gregor et al. (2007) found that it enabled the integration and alignment of an organization’s IT strategy with its business strategy. In order to help build better IS, Gregor et al. posited that it was “possible to combine business and IS/IT using an internally developed enterprise architecture” (p. 115), and Veasey (2001) pointed out that EA provided rationality in the implementation of business strategy. Rathnam et al. (2004) concluded that business architecture was one way to overcome the alignment problems between business strategy and IT strategy. Zachman (1997)
expressed the importance of EA by equating it to “the very survival of every Enterprise of any substance” (p. 12) and claimed that now was the time for everyone to advocate the wisdom of applying EA. Literature contended that the failure of IS systems could be significantly reduced by aligning business with IT strategies using an EA because system designs based on a set of organizationally accepted requirements would provide for the basic arrangement and connectivity of the organization (Gregor et al.; Reich & Benbasat, 1996). Even though the failure of IS to meet basic business objectives is widespread and costly and EA is a means to curb such failures, the role of EA had yet to be widely agreed upon.

Bucher et al. (2006) concluded that EA was not widely used and far from being accepted as a mature process. In 2005, Kamogawa and Okada (2005) stated that, even though the practice of EA was nearly 10 years old, it still lacked effectiveness and remained highly uncertain.

There are several reasons attributed to the current state of EA. In a paper on managing strategic change, Ellis (2001) established that EA often fell short of producing expected profits. In terms of a value proposition for EA, Ross and Petley (2006) found that most organizations viewed it as an abstract concept and found little benefit in using it. In a study on critical EA problems, Kaisler, Armour, and Valivullah (2005) concluded that most organizations considered EA as an overhead expense without much expectation of a return on investment; and Veasey (2001) cautioned that because of these perceptions about EA, most organizations resisted using it. In addition, Harris, Rothwell, and Loyd (1999) implied that one of the most significant advantages of EA was reuse but it seldom
occurred in practice. These unfavorable perceptions and others contribute to the uncertain state of EA.

2.3 The Meaning of EA

Literature provides a varied number of different, but related meanings of EA (Jonkers et al., 2006; Pereira & Sousa, 2004; Rico, 2006; Zachman, 1997). This section looked at several EA definitions and found that context usage was a major factor contributing to multiple uses of the term EA. In some cases, EA was a process; and, in other cases, it was a set of artifacts.

Current literature points out that there are many reasons why it is difficult to understand the meaning of EA. In Bernard (2005), John Zachman stated that general management generally did not understand EA because they saw “Enterprise Architecture as just an I/S or IT issue” (p. 9) as opposed to a business solution. Greefhorst, Koning, and Vliet (2006) found that it was difficult to define architecture because the robust number of architecture frameworks created a quagmire of contradicting terminology. In 1987, John Zachman, one of the first authorities to write about information system architectures, stated that architecture was a relative term and difficult to define because it depended on what one was doing at the time (Zachman, 1987). Nonetheless, current literature contains many formal definitions of EA.

Zachman (1997) defined architecture as a “set of design artifacts, or descriptive representations, that are relevant for describing an object such that could be produced to requirements (quality) as well as maintained over the period of its useful life (change)” (p. 5). Rico (2006) viewed EA as “a comprehensive framework or taxonomy of systems
Pereira and Sousa (2004) framed the meaning of EA as a practice and stated that it “refers to that group of people responsible for modeling and then documenting the architecture” (p. 1367). Besides a practice, Pereira and Sousa defined it as the processes used in performing EA, which resulted in models, documents, and reusable components. In addition, Pereira and Sousa summarized EA as a framework of how an enterprise achieved its business objectives.

Jonkers et al. (2006) referenced the commonly used IEEE Standard 1471-2000 definition for architecture, “Architecture is the fundamental organization of a system embodied in its components, their relationships to each other, and to the environment, and the principle guiding its design and evolution” (p. 63). Jonkers et al. went on to say that architecture is a “structure with a vision” (p. 63) that gave a comprehensive, integrated view of the enterprise. Furthermore, Jonkers et al. defined EA as “a coherent whole of principles, methods and models that are used in the design and realisation of the enterprise’s organizational structure, business processes, information systems, and infrastructure” (p. 64). As referenced in Kappelman (2010), John Zachman defined architecture as “the set of descriptive representations about an object” (p. 246) and the Society for Information Management Enterprise Architecture Working Group defined EA as “the holistic set of descriptions about the enterprise over time” (p. 252).

2.4 Review of Favorable Perceptions of EA

As one of mankind’s most complicated creations, enterprises are naturally complex; and the inability to manage their complexity often leads to failure (Kappelman, 2010;
Zachman, 2010). Because of this high degree of organizational complexity, Kappelman warned against underestimating the difficulty in architecting the enterprise. One major reason for this is that organizations were in a constant state of flux (Kappelman). Notwithstanding, EA was the only known mechanism to handle such complexity (Zachman). In addition, Deboever, Paras, and Westbrook (2010) stated that EA was most meaningful when it reduced the complexity of IT and processes.

By simplifying complex relationships, EA aids the decision making process. In describing an enterprise information technology architecture, Armour, Kaisler, and Liu (1999) claimed “multiple views help manage complexity, separate concerns, and address the different life spans of the architecture’s elements” (p. 39) as well as assisted in understanding the integration of information. In an EA survey of Swedish electric power companies, Ekstedt (2004) believed that, as in other scientific disciplines, EA models were a prime instrument to reduce complexity. Raadt, Soetendal, Perdeck, and Vliet (2004) said that one favorable benefit of architecture was to produce abstraction as a means of simplification. According to Jonkers et al. (2006), EA had the capability to reduce the complexity of any large organization or system.

EA facilitates greater business and IT strategy alignment. According to Wilkinson (2006), the benefits of an effective EA resolved the business concerns of alignment between business and IT strategy. Similarly, Jonkers et al. (2006) emphasized the need for business and IT alignment and claimed that EA made possible its accomplishment. Sidorova and Kappelman (2011) used the Actor-Network Theory to explain the role of EA in achieving business-IT alignment and found that EA helped inscribe agreements found in “artifacts such as logical and physical design diagrams, budgets, plans, user
requirements, as well as contracts, purchase agreements, system code, user
documentation, and so on” (p. 43). Veasey (2001) presented examples of architectures
employed with the Axum framework to implement business strategy; and, according to
Rathnam et al. (2004), alignment between business strategy and IT strategy was a major
problem solved through the use of business architecture. In addition, Tyree and Akerman
(2005) insinuated that closer alignment permitted better stakeholder buy-in.

Besides alignment, EA allows for better integration. According to Jonkers et al.
(2006), EA was important to ensure “an integrated approach to business and IT” (p. 63).
In a case study of the Australian Bureau of Statistics’ Enterprise Architecture (EA),
Gregor et al. (2007) found that EA facilitated not only alignment but also “the integration
… of business strategy and IS/IT” (p. 100). Likewise, Goethals et al. (2007) found that
organizations that had an EA practice also achieved greater business integration. Armour
et al. (1999) brought forth the idea that multiple architectural views addressed different
life spans, which fostered an understanding of integration. On a broader scale,
Richardson et al. (1990) described a principles-based process for EA “that provides a
direction for the deployment and integration of future technological and managerial
developments” (p. 386).

EA facilitates the development of an organization’s vision, strategies, and plans.
Veasey (2001) brought forth the role of EA in the strategic development process and
pointed out that the creation of a vision and strategy preceded the definition and
implementation of projects. In addition, Veasey found that EA could help drive strategic
change because it provided consistency in the implementation of strategy. Smolander
(2002) stated that architecture created a blueprint for everyone in the enterprise to follow.
Likewise, Ross and Petley (2006) concluded that EA provided “the blueprint of the current state … and then sets up a blueprint to transition to the future state” (p. 56). By using their Enterprise Systems Engineering process, Chen and Clothier (2003) addressed the capability of EA to span an entire organization in the development of business and IT plans. Brown (2006) stated that, upon achieving architectural competency, it was possible for IT capabilities to shape the business strategy.

Another favorable perception of EA is improved agility, innovation, and creation across the organization. Goethals et al. (2007) stated that an EA practice was crucial in order for an organization to realize agility. EA allowed organizations to react more rapidly to change while taking advantage of new business opportunities (Ross & Petley, 2006); and Wilkinson (2006) stated that EA directly supported business innovation. Similarly, Jonkers et al. (2006) acknowledged, “a good architectural practice helps a company innovate and change by providing both stability and flexibility” (p. 64). In addition, according to Morden (1997), EA supported an organizational culture of motivation and control and provided flexibility in response to changes.

A major benefit of EA is enhanced communications. Zachman (1987) posited that architecture could improve the communications among the professional IT community; and Veasey (2001) explained that EA provided rationality in communications. Ross and Petley (2006) addressed architecture as a communications tool in order to explain the impact of change. Tyree and Akerman (2005) focused on the importance of architecture, not only as a communications component for change, but also as a means of documenting final decisions. Such documentation was critical to maintain in order to explain the rationale for technical alternatives selected and provide a historical account of actions.
taken (Tyree & Akerman). Smolander (2002) outlined the usefulness of architecture through four metaphors in which two of them stressed the importance of architecture as a means of communications, i.e., as a language which everyone could understand and as literature that documented the system. According to Raadt et al. (2004), architecture served as a means of communications. Kappelman (2007) declared that EA bridges the chasm between strategy and implementation and has “a shared “language” of words, graphics, and other depictions to discuss, document, and manage every important aspect of the enterprise” (p. 28).

Architecture reuse is a major benefit of EA. Harris et al. (1999) found that reuse of architectures was a main goal of using EA which in turn reduced delivery time, saved costs, and mitigated risks. In a survey of over 200 companies, Ross and Petley (2006) asserted that EA led to process and system reuse.

EA also produces a number of advantages that directly benefit organizations. Morden (1997) and Veasey (2001) found that EA helped manage change while allowing flexibility and permitted the sustainment of organizational knowledge. Zachman (1987) stated that EA helped understand architectural risks, and Smolander (2002) stated that architecture was useful for the decision making process involving IT systems. Richardson et al. (1990) found that, by using principles-based information technology architecture, organizations realized a reduction of support costs and more data sharing. In addition, Zachman (1997) expressed the criticality of EA by stating that every organization, regardless of size, depended upon it for its survival.

EA helps advance certain high level management outcomes. Jonkers et al. (2006) listed several components of an integrated architecture and said that, by combining them,
it was possible to have a holistic view of the enterprise. In an exploratory study of 27 large European organizations with diverse thought levels regarding architecture issues and IT business alignment, Raadt et al. (2004) concluded that EA served as a positive management instrument. In supporting practitioners and management, Zachman (1987) declared that architecture gave architects a wide variety of tools to use, developed improved approaches for alignment, and provided the opportunity to rethink “the nature of the classic ‘application development process’ as we know it today” (p. 292). Ross and Petley (2006) found that EA facilitated change management by making it easier to articulate changes. When employing information technology architecture, Richardson et al. (1990) stated that it helped create more data sharing across the organization. Veasey (2001) stressed the importance of creating sound architectures to manage IT change and stated that, even though they may take years to establish, architectures “can often expect to be useful for ten years or more – the Open Systems Interconnect seven layer model being a good example” (p. 420). Morden (1997) summarized the organizational importance of EA in facilitating the sustainment of organizational knowledge and competence, the creation and maintenance of experience, the flexibility in response to changes, the open interchange of information, and the promotion of an organizational culture of motivation, quality, and control.

2.5 Review of Unfavorable Perceptions of EA

There are questions concerning the overall effectiveness and benefits of EA. Kamogawa and Okada (2005) found that many firms doubted its usefulness. In a paper on managing strategic change, Ellis (2001) determined, “enterprise architectures seldom
deliver expected profits” (p. 427). According to Ross and Petley (2006), “In most organizations, the enterprise architecture is viewed as an abstract concept that has little value” (p. 56). Using case studies in Japan and the U.S to propose an EA effectiveness framework, Kamogawa and Okada (2005) stated that even though firms applied EA for nearly 10 years, its effectiveness still remained highly uncertain.

EA reduces any expected profits because its costs are excessively high. Ellis (2001) determined, “enterprise architectures seldom deliver expected profits” (p. 427). In a study on critical EA problems, Kaisler et al. (2005) found that executives saw EA as a non-revenue producing cost including the expenses associated in the employment of system architects. John Zachman wrote in the forward to Bernard (2005) that general management perceived EA as an excessively time-consuming process resulting in excessive costs. In addition, Harris et al. (1999) stated the following about cost savings in regards to architecture: “shorter delivery times, cost reductions, risk mitigation –has seldom been realized in practice” (p. 98).

The complexity of EA is an unfavorable characteristic. In an EA research study of systems-of-systems engineering, Chen and Clothier (2003) asserted that complicated relations existed in architecture approaches, frameworks, and artifacts resulting in a high degree of architecture context complexity. In specifying metrics for EA scenarios, Bucher et al. (2006) proposed the use of EA complexity measurements based on the number of architectural components and dependencies contained in architecture models. Tanigawa (2004) pointed out that EA decisions frequently tended to be difficult since they often occurred in a complex environment of technology innovations and changing market conditions. In addressing self-efficacy aspects of EA, Ring (2005) stated, “Most
enterprise leaders do not possess the ability to treat enterprises as systems nor to transform complicatedness into beneficial complexity” (p. 446). Zachman (1987) reaffirmed the complexity of EA by stating people had difficulty in communicating architecture because there was no single architecture but a set of additive and complementary architectures.

The large number of architecture frameworks and views also contribute to the intricacy of EA. Based on an analysis of 24 architecture frameworks, Greefhorst et al. (2006) asserted that, due to inconsistency found across multiple frameworks, it was necessary “to tell someone which framework you use when talking about architecture” (p. 108). In addition, Greefhorst et al. found that there was widespread use of “different terms for similar aspects, and similar terms for different aspects” (p. 107). In assessing organizational impacts of process improvement, Presley et al. (2001) used object-oriented modeling in terms of autonomous agents and ontology while suggesting that EA required multiple views.

Another unfavorable aspect of EA is that there was no single process for accomplishing EA. For example, Nolan (1997) described a multi-step architecture process beginning with a business vision followed by the definition of a business strategy, strategic vectors, and a finite set of projects that supported the vision. Using findings from a study of the U.S. Government Accounting Office, Kaisler et al. (2005) proposed a systematic process for EA beginning with baseline architecture, followed by target architecture, an architecture transition plan, an implementation plan, and concluding with the development of individual systems. Still yet, Richardson et al. (1990) described a principles-based process as a means to accomplish EA.
There were certain organizational resources required to implement EA. Jonkers et al. (2006) identified the need for specific managerial tools to integrate EA’s functionality including tools for architects to manage the architecture lifecycle and for developers to support system implementations. According to Kamogawa and Okada (2005), organizations also needed a governance structure in order to attain a successful EA practice and emphasized this by stating, “the more Governance that is established and penetrated into the IT community…the more beneficial Enterprise Architecture will be” (p. 742). In describing four learning stages of EA competency, Ross and Petley (2006) addressed the necessity for IT governance to play a key role within organizations.

Besides an IT governance structure, Ross (2003) emphasized the importance for organizations to obtain and maintain a high level of architecture competency in order to learn how to evolve and benefit from IT. In addition, Ross identified a four stage EA maturity model along with specific competencies required to generate a strategic IT architecture. While describing the use of EA in 11 public sector initiatives in the Netherlands, Janssen and Kuk (2006) recognized a need for organizations to develop EA competencies prior to expecting non-trained personnel to interpret the EA models. In an analysis of best practices for EA, Kaisler et al. (2005) concluded that the transfer of knowledge resulting from EA required trained employees.

Several significant management issues surround the use of EA. Veasey (2001) cautioned that organizations resisted doing EA because of distrust in using an analytical approach towards a management issue that was more art than science. Furthermore, Veasey stated the possibility of management losing power due to architectural restrictions imposed on plans and policies. In addressing experiences with EA, Harris et al. (1999)
noted that it was particularly hard to convince management of the benefits of EA because they generally held strong opinions. In an EA survey, 373 IT professionals responded that EA benefited more the goals and objectives of the IT department rather than those of the entire organization (Salmans & Kappelman, 2010). Although architecture descriptions were important, Goethals et al. (2007) asserted that even more important was “not knowing … how to get buy-in for the architecture effort” (p. 67). However, Nolan (1997) brought the level of EA commitment a step further by implying the need for senior management to understand and become directly involved in the architecture process, and Veasey emphasized this point by stating the importance of managers to own and understand the EA process.

The roles and responsibilities of EA stakeholders present other managerial challenges. Based on studies using an IBM architecture framework, Tyree and Akerman (2005) concluded that system developers needed clear guidance in order to proceed with the design; and customers wanted to understand the implied business changes while having the assurance that the architecture met their needs. In addition, Tyree and Akerman determined that architects across the organization wanted to understand the architectural alternatives considered as well as the rationale for the choices made and other salient aspects of the architecture. Additionally, Veasey (2001) questioned the loss of management power by claiming that EA often forced implementation decisions that were not always the best solution.
2.6 Conclusion

This chapter introduced the role of EA as a catalyst in solving the problem of the high rate of failed IS implementations. A review of EA definitions indicated that there is a broad range of meanings and definitions. Scholars stated that the current state of EA research was not mature and EA needed to have a greater theoretical base (Balabko & Wegmann, 2006; Bucher et al., 2006; Sage, 2006). In order to understand executives’ meanings and expected benefits about EA, it was necessary to understand their beliefs and attitudes that form their perspectives of EA. Current literature contained a broad range of favorable and unfavorable perceptions of EA based on a wide cross-section of stakeholders.
Chapter 3

Methodology

3.1 Introduction

The purpose of this section was to establish the research methodology and explain the rationale for the choices made regarding the methodology employed in the study. In particular, this section considered the research type (quantitative versus qualitative), the kinds of methodologies available for the research type selected, and the rationale for the methodology that was chosen.

Clark-Carter (2004) stated that “quantitative research methods involve some form of numerical measurement while qualitative methods involve verbal description” (p. 3). According to Leedy and Ormrod (2005), quantitative research dealt with understanding a phenomenon by investigating its relationships among measured variables. Creswell (2009) listed the following characteristics of quantitative research methods: pre-defined, instrument based questions, performance data, attitude data, observational data, census data, statistical data, and statistical interpretation.

Qualitative research allowed the researcher to unveil the inner experience of people, to understand how meanings were formed, and to find out what the variables were rather than test certain variables (Corbin & Strauss, 2008). Maxwell (2005) listed five goals for performing qualitative research: understanding study participants’ meanings of events, situations, experiences, and actions; identifying the context of a situation and its influence on actions; recognizing unanticipated phenomena and its influences; understanding the
process related to events and actions; and generating causal relationships. In addition, as Leedy and Ormrod pointed out, a qualitative research approach lent itself to “describing and understanding the phenomena from the participants’ point of view” (p. 94). By using qualitative analysis processes, data was analyzed to extract meaning and understanding in order to develop empirical knowledge (Corbin & Strauss). Often times, the choice between quantitative and qualitative methods depended on the use of a predefined instrument to measure known variables found in collected data (quantitative), or if the data emerged directly from the subjects involved in the study (qualitative) (Creswell, 2009). This study fit into the realm of qualitative analysis where the variables needed to be discovered from senior managements’ meanings, context, experiences, interpretations, influences, expectations, and attitudes about EA as well as their outlook about the value of EA.

Leedy and Ormrod (2005) defined five types of qualitative methodologies that included the case study, ethnography, phenomenological study, content analysis, and grounded theory. Similarly, Creswell (2009) delineated the same methodologies as Leedy and Ormrod; but, instead of the content analysis methodology, Creswell defined another type, the narrative research. The following paragraph reviews the methodology types espoused by Creswell and Leedy and Ormrod.

Both Creswell (2009) and Leedy and Ormrod (2005) described the case study as research about a particular event, program, individual, or process over a prolonged, fixed period of time. A case study usually focused on a single case or compared two cases that were different in similar ways and was most useful “for learning more about a little known or poorly understood situation” (Leedy & Ormrod, p. 135). An ethnography study
generally occurred over a lengthy period of time and investigated a particular cultural
group in their natural setting in order to comprehend their behaviors and beliefs
(Creswell, 2009; Leedy & Ormrod). An ethnography study was most useful in
understanding the customs, language, norms, beliefs, social patterns, or social structures
of a unique culture (Leedy & Ormrod). A phenomenological study described the actual
experience of a group of individuals by garnering their perceptions, perspectives, and
understanding of a certain concept, situation, or phenomenon (Creswell, 1998; Creswell,
2009; Leedy & Ormrod). A phenomenological study attempted to answer what it was like
to experience a certain phenomenon (Leedy & Ormrod). According to Leedy and
Ormrod, content analysis examined a body of material, normally involving human
communications, to identify any patterns, themes, or biases. All forms of human
communications may be considered in a content analysis including video, memos, tape
recordings, books, music, and art (Leedy & Ormrod). Narrative research studied the lives
of people by asking them to chronologically recount episodes about their life which were
documented as a narrative (Creswell, 2009). In a chronological narrative, the researcher
sometimes created a collaborative narrative by combining “the views from the
participant’s life with those of the researcher’s…” (Creswell, 2009, p. 13). Creswell
(2009) defined the grounded theory methodology as a strategy that researchers used to
derive “a general, abstract theory of a process, action, or interaction grounded in the
views of the participants” (p. 13). In addition, Corbin and Strauss (2008) defined
grounded theory as creating theory from data but also emphasized that grounded theory
was a generic process of building theoretic constructs from qualitative analysis of data.
In conducting the research, this dissertation process interviewed and analyzed responses from executives across the industry to find out what values they give to EA. Specific questions about executives’ viewpoints, positions, opinions, attitudes, beliefs, perceptions, and expectations of EA were analyzed to determine how executives value EA. The expectation was that these findings would provide the basis for the development of a theory to understand executives’ processes and interactions in determining their values about EA. By using the guidelines given by Glaser and Strauss (1999) of systematically collecting, coding, and analyzing qualitative data, the aim of this research was to understand how organizations value EA. According to Corbin and Strauss (2008), creating theory required the abridgment of raw data into concepts and “arranging the concepts into a logical, systematic explanatory scheme” (p. 56). This research lent itself to a grounded theory study since it was seeking to describe how organizations value EA by understanding how organizational leaders (executives) derived value from EA. For the purpose of this study, the grounded theory methodology was adopted to guide data collection, analysis, and emerging theory.

### 3.2 The Grounded Theory Approach

The intent of a grounded theory approach is to develop a theory through multiple iterations of data gathering and interpretation (Leedy & Ormrod 2005). According to Creswell (1998), theory was “an abstract analytical schema of a phenomenon” (p. 56). The term *grounded* referred to the concept that any new theory should be based (grounded) in data gathered from the field as established by the actions, interactions, and other social processes of the human subjects involved with the phenomenon (Creswell).
A grounded theory was obtained through social research where concepts were developed through constant data collection and analysis (Matavire & Brown, 2008).

The grounded theory approach is based on the principles of emergence and constant comparative analysis (Matavire & Brown, 2008). Emergence refers to the identification of concepts and theory arising from the data; constant comparative analysis is the process where the data was viewed as experiences and compared for similarities and differences with other experiences to discover concepts (Matavire & Brown). The development of a grounded theory requires systematic investigation of empirical data by using flexible strategies for data collection and analysis such as multiple iterations of both data gathering and interpretation (Charmaz, 2004; Leedy & Ormrod, 2005). Empirical data from interviews, memos, and other documentation provided by senior management was gathered and analyzed (Corbin & Strauss, 2008; Creswell, 1998). In this research, the phenomenon was EA and the process in which executives derived value from EA was investigated and examined.

When using the grounded theory methodology, the researcher becomes the principal instrument in collecting and interpreting the data; therefore, to be objective, it is necessary that the researcher not impose his or her interpretations over those of the interviewees (Leedy & Ormrod, 2005; Maxwell, 2005; Selvaraj & Fields, 2009). Furthermore, the researcher needs to realize that it could become difficult to bracket out personal experiences (Creswell, 1998). In the same manner, it becomes essential that the researcher view the world through the eyes of the participants even though the researcher may not agree with them (Charmaz, 2006). Since the grounded theory approach is a
systematic approach that utilizes specific data analysis steps, it is important for the researcher to forego any theoretical ideas or notions so that the theory can emerge from the data (Creswell).

3.3 Specific Research Procedures

3.3.1 Introduction

This section specifies the specific research methodology employed in this study. Figure 1, Process Steps and Products Produced Using the Grounded Theory Methodology shows a flowchart outlining the specific research steps that were followed in this research and the products expected from each process step (Charmaz, 2006; Corbin & Strauss, 2008; Creswell, 1998; Glaser, 1992; Glaser & Strauss, 1999; Hansen & Kautz, 2005; Leedy & Ormrod, 2005; Maxwell, 2005; Sarker et al., 2000a; Selvaraj & Fields, 2009; Strauss & Corbin, 1990).
Figure 1. Process Steps and Products Produced Using the Grounded Theory Methodology
3.3.2 Conducting Theoretical Sampling

The intention of sampling in grounded theory is to build “precision, density, and complexity into the emerging theoretical statements” and to ensure that the statements are grounded by the data (Charmaz, 2004, p. 6398). Corbin and Strauss (2008) described the frequently used method of gathering data for grounded theory studies as theoretical sampling, collecting “data from places, people, and events that will maximize opportunities to develop concepts in terms of their properties and dimensions, uncover variations, and identify relationships between concepts” (p. 143). During the data analysis, concepts were derived and further questions about the concepts guided additional questioning (Corbin & Strauss). Often times, the researcher must encounter the reasons why and when certain conditions arise in order to explain the depth and breadth of the phenomenon and clarify the relationships among the categories (Corbin & Strauss). This can occur recursively as new data is analyzed and fresh concepts emerge that, when evaluated, generate additional questions, more interviews, and new data until all concepts are well identified and explained (Corbin & Strauss).

Because the data analysis often leads to new questions that require further investigation, the researcher needs to find the best sources to focus future data collection in order to answer all pertinent questions (Corbin & Strauss, 2008). To find new candidates, purposeful sampling is used, i.e., interviewees are selected based on their ability to provide information about the emerging concepts and answer the research questions (Corbin & Strauss, 2008; Leedy & Ormrod, 2005; Maxwell, 2005).
According to Creswell (1998), normally a sample size of 20 to 30 purposeful interviewees would be required for a typical grounded theory study. However, the actual number of interviews would be determined by theoretical saturation, a point when further analysis does not lead to any new concepts and all categories are fully developed (Creswell; Corbin & Strauss, 2008). Therefore, it is not possible to plan beforehand how many interviewees would be needed (Corbin & Strauss). However, in order to estimate an approximate number of interviewees required for this study, a survey of grounded theory research papers from leading IS journals and conference proceedings was performed and summarized in Appendix A, Table of Reviewed Journal Articles on Grounded Theory, and Appendix B, Table of Reviewed Conference Proceedings on Grounded Theory. Of the 25 papers surveyed, the range of interviewees was between 2 and 159.

This research used theoretical sampling where the population consisted of executives or senior management from a variety of private or government sector organizations that possessed knowledge about EA and who directly or indirectly lead or led an EA initiative. For the purposes of this research, executives or senior management included those organizational officials who have the word chief (e.g., CEO, CFO, CIO, COO) in their titles as well as vice presidents (e.g., executive and senior) (Fettke & Loos, 2007; Vallabhaneni, 2008).

3.3.3 Performing Interviews

The objective of the interview process is to ask questions that “are sufficiently general to cover a wide range of experiences and narrow enough to elicit and elaborate the
participant’s specific experience” (Charmaz, 2006, p. 29). The researcher needed to keep in mind that the purpose of the interview was to explore the topic as opposed to interrogate the interviewee (Charmaz).

When possible, interviews were performed face-to-face in the interviewee’s natural setting because it allowed the interviewer to directly observe other informational content such as body language and voice inflections (Corbin & Strauss, 2008). That way, the researcher’s eyes and ears could become tools used in the information gathering process (Maxwell, 2005). In addition, Maxwell stressed the importance of casual conversations and incidental observations as key elements in the information gathering process.

For qualitative studies, Maxwell (2005) emphasized the importance of using an unstructured approach to interviewing versus a structured approach because an unstructured approach generally yields a greater amount of information. Leedy and Ormrod (2005) agreed that a more unstructured approach was desirable but also suggested a semi-structured approach, where a few pre-structured questions (normally five to seven) were asked in the beginning of the interview to help focus the topic. In addition, the semi-structured approach facilitated free flowing conversations, guided the course of the interview, and became more effective as the researcher had a clear idea of the questions that needed to be asked (Clark-Carter, 2004). As Clark-Carter, Leedy and Ormrod, and Maxwell recommended, this research used a semi-structured approach. The specific semi-structured questions that were used are found in Appendix C, Semi-Structured Interview Questions.

In addition to the semi-structured interview questions, the interviewees were asked to provide demographic information about themselves and their EA practices. The specific
demographic and organization questions are found in Appendix D, Demographic and Organizational Questions. Besides the interview data, Corbin and Strauss (2008), Leedy and Ormrod (2005), and Selvaraj and Fields (2009) suggested using secondary sources of data such as documentation (e.g., memos, manuals, and policy statements) when available. One of the questions in the Demographic and Organizational Questions solicited interviewees for any pertinent documentation regarding EA in their organizations.

After an interview candidate was indentified, the researcher contacted the candidate, either in person or electronically, to explain the research purpose and the candidate’s role in the study. The candidate was encouraged to ask any questions he or she had about the interview or the study. If the candidate agreed to the interview, the consent form was given to the candidate in person or sent via email. Furthermore, the consent form was reviewed with the candidate. The form had the option for the interview to be recorded or not depending on the willingness of the candidate. The candidate was asked to sign the consent form with a longhand signature and initials where indicated; and, if done remotely, to email the scanned form back to the researcher. Once completed, the candidate was designated as an interviewee.

The interview was subsequently scheduled. The interviews were performed face-to-face when possible or else performed remotely using a video and/or a telephonic link. The first part of the interview (approximately 10 minutes) was used to complete the Demographic and Organizational Questions (Appendix D) and orient the interviewee on the interview process. The remainder of the interview was spent addressing the questions found in the Semi-Structured Interview Questions (Appendix C). The entire interview
process lasted approximately 45 - 60 minutes per interviewee; and, if agreed to beforehand by the interviewee, the interview was captured using a digital recorder.

3.3.4 Performing Coding

An important aspect of grounded theory coding is the bottom up discovery of categories, themes, concepts, properties, and dimensions of the phenomenon under study that emerge from the interview data (Charmaz, 2006; Corbin & Strauss, 2008). This discovery is important because it allows the researcher to abstract the data to a higher level and relate meanings derived from other data in order to better understand the phenomenon under study (Corbin & Strauss). Early on, the main purpose of coding revolves around the idea of not necessarily finding order, but unveiling an explication, organization, and presentation of the data (Charmaz).

Creswell (1998) defined a category as “a unit of information composed of events, happenings, and instances” (p. 56). After analyzing the raw data, the researcher established a concept by deciding on the essence of what the data meant and then assigned a code or conceptual name to the concept (Corbin & Strauss, 2008). Concepts had various levels of abstraction and, as such, became a component of a broader construct called categories or themes that had shared properties (Corbin & Strauss). Charmaz (2006) addressed the importance of establishing the relationship between concepts and categories and stated that such a relationship offered “theoretical reach, incisiveness, generic power, and relationship to other categories” (p. 139). Properties were perspectives about the categories and played a predominant role in characterizing a category and describing a concept by giving it meaning (Corbin and Strauss, 2008;
Dimensions were variations that occurred within the properties and allowed for specificity by defining the extent to which a property varied (Corbin and Strauss).

When performing coding, the researcher attached codes or labels to segments of collected data in order to define what was happening and begin to understand what it meant (Charmaz, 2006). Often times, the attached codes were *in vivo*, meaning that they were the same terms used by the interviewees (Charmaz; Corbin & Strauss; Maxwell, 2005). *In vivo* codes enhanced the research since they were “analytical markers of the participants’ speech and meanings” (Charmaz, p. 55). The coding of data continued until the development of categories was complete (Selvaraj & Fields, 2009).

Coding used certain techniques in order to analyze the data (Charmaz, 2006; Corbin & Strauss, 2008). Corbin and Strauss stated that questioning, i.e., asking the right questions about the data, was one of the most important techniques used in the grounded theory methodology. Questioning allowed the researcher to probe, become familiar with the data, think out of the box, and develop interim answers in order to “better understand the problem from the participants’ perspective” (Corbin & Strauss, p. 70). Furthermore, Charmaz (2006) opined that during initial coding, questions about what the data suggested and from whose point of view it emanated were essential in order to permit new ideas to emerge. Questioning occurs in every stage of the analysis (Corbin & Strauss).

Comparing is another important technique used by grounded theory researchers. One comparing technique is constant comparison, a process of comparing incidents found in the data and identifying patterns that could become a part of a category or theme.
(Selvaraj & Fields, 2009). Similarly, Creswell (1998) called constant comparison a method of data analysis where information gained from the interviews was compared to the emerging categories. By using constant comparison to classify the interview data, the researcher compared one experience with another experience by looking for similarities and differences (Corbin & Strauss, 2008). This type of analysis allowed for the reduction and combination of data and resulted in a classification where conceptually similar incidents were grouped together so that basic categories or themes emerged (Corbin & Strauss). Comparing data with data as well as data with codes, allowed for the emergence of theory (Charmaz, 2006).

Another type of comparison technique espoused by Corbin and Strauss (2008) is called theoretical comparison, where the use of familiar metaphors and similes help the researcher simplify and define an incident in terms of its properties and dimensions. Theoretical comparisons are important, especially when the researcher has difficulty in comprehending the meaning of data because the comparisons can relate the data to experiences that are familiar to the researcher (Corbin & Strauss).

Glaser and Strauss (1999) suggested that, after inspecting the data, the researcher should begin writing memos about the properties found from the emergent theoretical categories. Memo writing is equivalent to writing analytical notes about the segments of coded data and writing generally occurs throughout the coding process (Charmaz, 2006). Memos reflect the researcher’s thoughts and include ascribed meanings, theoretical explanations of relationships, ideas on the development and identification of properties and dimensions, questions concerning comparisons, and the development of a story line (Corbin & Strauss, 2008; Selvaraj & Fields, 2009). In addition, memo writing assists the
researcher to identify new categories and properties, delineate the relationship between
categories, and discover gaps in the emerging theory (Charmaz). Memo writing
continued throughout the entire research process (Charmaz, Corbin & Strauss).

The grounded theory approach uses three specific coding techniques: open coding (to
develop the categories of information), axial coding (to interconnect the categories), and
selective coding (to explain the interconnected categories) (Creswell, 1998). Corbin and
Strauss (2008) used the term concepts as a lower level of abstraction of categories. In
addition, Corbin and Strauss used the term categories interchangeably with the term
themes. Other authors of grounded theory used the term categories to include the Corbin
and Strauss lower level abstraction of concepts (Creswell; Glaser, 1992). This research
employed coding. The following sections explain three specific coding techniques that
were used.

3.3.4.1 Open Coding

The first analysis step is called open coding where the data is scrutinized line-by-line
to develop categories as well as the properties and dimensions about the phenomenon
under study (Creswell, 1998; Selvaraj & Fields, 2009). Open coding is performed
immediately after the collection of each interview data in order to determine the
emerging themes as it “makes the analysis easier in later stages because there exists a
strong foundation and less need to go back to find the missing links” (Corbin & Strauss,

During a study, the researcher must assign codes to the raw data, define concepts to
blocks of data, and determine appropriate properties and dimensions of the concepts
Glaser (1992) advised that open coding should be performed by asking basic questions about the recorded interview data, such as: what the data indicated the study to be about, what categories and properties were indicated, and what was actually occurring in the data. Furthermore, the coding should be performed using the voices (*in vivo* codes) and perspectives of the people involved in the study (Sarker, Lau, & Sahay, 2000a). After the data analysis, it was suggested that the researcher document the analysis in the form of a memo in order to describe the notion of what was being said (Corbin & Strauss; Creswell, 1998).

The result of open coding analysis included a range of codes and concepts about the meanings and ideas found in the interview data (Hansen & Kautz, 2005). In addition, according to Corbin and Strauss (2008), this coding includes not only a list of codes and concepts but also the emerging categories or themes.

As soon as possible after the completion of each interview, Corbin and Strauss (2008) suggested that the researcher transcribe the interviews and begin open coding. The researcher analyzed the line-by-line data and assigned an existing or new code that corresponded to the meaning of the data. The assignment of codes continued until the entire interview data had been scrutinized and coded.

After or during the assignment of codes, the researcher created one or more analytical memos to describe emerging concepts as indicated by the data and its corresponding codes. The memos questioned and compared the captured data, explained the context of the data, identified any relationships among the concepts, described any emerging properties and concepts, and/or provided an indication as to what questions should be addressed in future interviews. In addition to written text, the researcher included
interactive diagrams within the memos to further augment the meaning and understanding of the data.

3.3.4.2 Axial Coding

The next step of analysis was axial coding which finds all the categories and classifies the discovered codes and concepts (Hansen & Kautz, 2005). Axial coding entailed the process of relating concepts to each other and connecting them to categories (Corbin & Strauss, 2008; Sarker et al., 2000a). Creswell (1998) described the axial coding process as relating the categories by finding a central phenomenon, determining what caused the phenomenon, and identifying the strategies, actions, context, and consequences in response to and resulting from the phenomenon. Corbin and Strauss pointed out that open and axial coding were not necessarily sequential processes since the analysis from open coding often resulted in the linking and elaboration of categories, a feature of the end state of axial coding. Nonetheless, Creswell emphasized the importance of axial coding as a means to view the data in new ways as a result of sorting, organizing, and synthesizing the data from open coding. Charmaz (2006) pointed out the following objective “axial coding aims to link categories to subcategories, and asks how they are related” (p. 63).

In this study, the researcher began axial coding after the completion of each open coding session. Axial coding was performed to indicate the discovery of new categories or themes based on one or more concepts resulting from open coding. When this occurred, the researcher created new memos to describe the emerging categories and to explain each category by its associated properties and dimensions. In addition, the
researcher created new memos to further elaborate any existing categories and to link together one or more categories. Axial coding was repetitive and continued throughout the coding process.

The processes of interviewing for more data, open coding, and axial coding were iterative and continued until the point of theoretical saturation (Corbin & Strauss, 2008). Corbin and Strauss referred to theoretical saturation as the end result of axial coding which occurred when the collection and analysis of data was sufficient enough to describe each category or theme in terms of its properties and dimensions to the extent that a theoretical scheme and logical explanatory story emerged.

This research repetitively performed the processes of conducting theoretical sampling, performing interviews, open coding, and axial coding until theoretical saturation was achieved. Theoretical saturation was evident when additional interview data did not reveal any new concepts, categories, properties, or dimensions. When this occurred, this research proceeded to the selective coding/integration process.

3.3.4.3 Selective Coding/Integration

According to Creswell (1998), selective coding is the final coding process and it allows the researcher to establish the central theme of the research and document it by writing “a story that integrates the categories in the axial coding model” (p. 57). Likewise, Hansen and Kautz (2005) stated that the purpose of selective coding was to explain relationships and give context while explaining a coherent picture in terms of a framework or explanation of the main categories of the study. Corbin and Strauss (2008) referred to selective coding as integration which was “the process of linking categories
around a core category and refining and trimming the resulting theoretical construction” (p. 263). Furthermore, Corbin and Strauss stressed that the phenomenon under study and its resultant theory may contain embedded processes that help explain it.

The result of selective coding or integration is an analytic story that uses the categories and subcategories to explain the phenomenon under study (Corbin & Strauss, 2008). Similarly, Creswell (1998) emphasized that the researcher systematically relates the central phenomenon to categories and develops a story to relate and show the interrelationships of the categories. Charmaz (2006) referred to the resultant product as a substantive theory which was “a theoretical interpretation or explanation of a delimited problem in a particular area” (p. 189).

This research continued into selective coding after theoretical saturation was achieved. As the study proceeded, the theoretical memos written in the later coding steps became more abstract and began to unify concepts and relate categories (Corbin & Strauss, 2008). In conducting selective coding, the researcher began by sorting the theoretical memos into categories and subcategories looking for any core categories, well-defined properties and dimensions, as well as any unifying strategies. The sorting of memos occurred several times until a logical theoretical scheme emerged. The final step of selective coding entailed the verification of the theoretical scheme. This was done by comparing the scheme to the raw data to ensure that the data could explain most cases. However, Corbin and Strauss pointed out that it was not unusual to find some cases that cannot be explained because there was usually some degree of variation found in every process.
3.3.5 Reporting the Results

An important step in using the grounded theory methodology is the creation of a narrative report. Glaser and Strauss (1999) advocated the collating of analytical memos into categories for analysis and summarization while applying insights gained from the study in order to create a final report. Creswell (1998) stated that the final report may include a narrative statement, a visual picture, or propositions and hypotheses. Leedy and Ormrod (2005) opined that the final report should present the theory and may include a visual or verbal rendition of it coupled with the use of actual interview data to illustrate the theory.

Charmaz (2006) recommended that the reporting process begins by ordering the analytical memos by the most compelling diagram or clustering and writing a draft report. The draft report is then checked for completeness by ensuring the fullness of category definitions, concepts, theoretical links among categories, and substantive knowledge (Charmaz). The next step involved writing the introduction and conclusion sections which normally required multiple revisions (Charmaz). The final step was to create the grounded theory analysis ensuring it had an explicit purpose with associated arguments (Charmaz).

Corbin and Strauss (2008) proposed several general guidelines to report the findings of a grounded theory study which included the development of an analytic story written at the conceptual level, giving the relationship among the categories, and specifying the variations, conditions, and consequences that related the various categories. This study used the specific guidelines outlined by Corbin and Strauss as well as some of the
recommendations given by Glaser and Strauss, Creswell, Leedy and Ormrod, and Charmaz.

After selective coding, the researcher started to report the study results. Key components of the report included the memos, the explanatory framework, and a theoretical scheme developed in selective coding. Based on these key components, the researcher developed a detailed outline of the analytical story which combined and related the categories and described its properties and dimensions. By using the outline and pertinent analytical memos, the researcher wrote the analytical story at the conceptual level while integrating the logic used. Once the analytical story was complete, the researcher developed a theoretical model.

3.3.6 Validating the Results

The purpose of validation is to ensure that the study was accurate, believable, and correct (Creswell, 1998). The burden of responsibility to prove the validation rests with the researcher (Creswell). Creswell stated that validation occurs at two distinct stages during a grounded theory study: once during the active part of the research, for example, when the researcher “poses questions and then returns to the data and looks for evidence, incidents, and events that support or refute the questions, thereby verifying the data” (p. 209) and, subsequently, after the researcher writes the theoretical (analytical) story. The latter validation occurred by referencing the literature to ensure the accuracy of the findings and allowing outside reviewers to judge the validity, reliability, and credibility of the data (Creswell). This is also called discriminant sampling (Corbin & Strauss, 2008;
Leedy & Ormrod, 2005). In addition, Corbin and Strauss recommended that important memos from the study be reexamined to ensure the “scheme held up to scrutiny” (p. 273).

Charmaz (2006) offered four criteria for judging grounded theory studies: credibility, originality, resonance, and usefulness. Charmaz associated credibility with the completeness of the data and sound evidence, originality with new insights and challenges to current ideas or practices, resonance with insights that those who share similar circumstances can identify, and usefulness with meaningful interpretations and the creation of new knowledge.

Strauss and Corbin (1990) specified criteria that can be used to judge the quality of a grounded theory research process including the grounds on which the original sample was selected, review of the emerged categories to verify that the events, incidents, actions, or other indicators supported them, determination that theoretical sampling was employed properly, substantiation of the grounds that supported the hypotheses concerning the relationship of categories, review of any cases where the hypotheses did not hold up and how they were mitigated, and evaluation of the grounds supporting the selection of the core category. In addition, Strauss and Corbin (1998) listed eight criteria to validate the grounding of a study including evidence to support the generation of concepts, systematic relationship of the concepts, well developed conceptual links, theory variation, explanations containing broadened conditions, and accounting of process changes.

To validate the results, this study used discriminant sampling and reexamination of memos. In addition, it used the criterion set forth by Chamaz (2006) and Strauss and Corbin (1998).
3.4 Summary

Section 3.1 introduced the considerations in choosing qualitative research over quantitative research, explained five qualitative methodologies, and determined that the grounded theory methodology was most appropriate for this research. Section 3.2 addressed the grounded theory approach which included a general overview of the meaning of *grounded*, the principles of emergence and constant comparative analysis, and the role of the researcher. Section 3.3 gave the specific research methods that guided this study. Each essential step was identified and explained which included conducting theoretical sampling, carrying out interviews, performing coding, reporting the results, and validating the results.
Chapter 4

Results

4.1 Introduction

In this chapter, section 4.2, Profile of the Interview Sample, outlined the sample population used for this study. Section 4.3, Open and Axial Coding Analysis, provided the basis for the selection of the codes, concepts, and categories/themes used in this research based on the descriptive analysis of the interview data such as the context of statements made, frequency counts of responses, and rankings. In some cases, examples were used to clarify how the codes, concepts, and categories/themes were derived and used. In Section 4.4, Selective Coding Analysis used interview responses from different concepts and categories to determine if any patterns existed among them. For example, it looked at each meaning of EA to see if there were any expected benefits associated with a given meaning. By using selective coding analysis, it was possible to reach more extensive and informative conclusions about the data.

After the coding analysis, Corbin and Strauss (2008) recommended the formation of an analytic story as a way to move from description to conceptualization. An analytical story and an associated theoretical framework are presented in section 4.5, Conceptual Data Analysis and Findings. Section 4.6 addresses how the study was validated and section 4.7 gives a summary of this chapter.
4.2 Profile of the Interview Sample

This research used the grounded theory approach in order to discover the value that executives expect or expected to receive by using EA. The researcher found interview candidates either directly from professional contacts or indirectly through referrals. In addition, requests were made at professional meetings and conferences, such as at the Society for Information Management (SIM) annual conference. Each interviewee candidate was matched against the interviewee criteria to ensure that they were qualified.

Of the 17 executives interviewed, seven had the title of Chief Information Officer, four had the title of Vice President (e.g., Engineering, Information Management), three were Chief Strategy Officers or VPs of Strategy, one was a Chief Financial Officer, one was a General Manager, and one was a Partner. Twelve executives represented the services sectors (e.g., government, health care, financial, IT, insurance, consulting), three were from manufacturing, one was from transportation, and one was from distribution. In terms of actual EA experience, five executives had participated as direct members of an EA team, 13 had led an EA team, and 12 had managed an organization that had an EA team. All interviewees are currently active in EA. Five stated that they directly participate in EA efforts, 11 confirmed that they advise EA efforts, and 12 affirmed that they are leaders of EA.

All interviewees, with the exception of two of them, agreed to be digitally recorded which enhanced the coding since it allowed the captured data to be transcribed verbatim. In total, 17 interviews were conducted either in person or telephonically over a period of four months. The interviews lasted from 45 to 60 minutes and were guided by a set of semi-structured questions found in Appendix C, Semi-Structured Interview Questions.
Data was collected until the point of theoretical saturation was reached, i.e., each additional interview did not reveal any significant new information about the organizational value of EA. Theoretical sampling was used to identify the next candidate to interview; therefore, interviewees were selected on the basis of who was best qualified to answer any new interrogatives the researcher had about the study.

4.3 Open and Axial Coding Analysis

4.3.1 Generation of Codes, Concepts, and Categories/Themes

The main purpose of open coding was to identify all of the codes associated with the organizational value of EA as presented by each of the executives. Every interview transcription was used as raw data into the open coding process and each line of data was analyzed. One or more lines of data were assigned a code that described the meaning based on the context of the interviewee. If a code had already been used to describe the same basic meaning, the code was reused; however, if a code did not exist, a new one was created that described its meaning. Appendix E, Example of Multiple Codes Generated from a Single Interviewee’s Response, provides an example of how a single interviewee’s response to a single question generated several codes and Appendix F, Example of a Single Code Assigned from Multiple Interviews, gives an example of how responses from 11 different interviewees were mapped to a single code.

During the initial assignment of the meanings of the codes, there were 42 codes generated. However, after further analysis, there were two codes (Pattern identification and Determine the workforce) that lacked density by having only one source and one reference. Each of these two codes was compared to other codes that had similar and/or
broader meanings to see if they could be consolidated. Because Pattern identification, as
described by the interviewee, could be considered a subset of Simplification of system
and architecture management, Pattern identification was consolidated and eliminated.
Similarly, the code Determine the workforce was consolidated as part of the Planning
code because the process of identifying future workforce was an integral part of planning.
Other codes that only had a few sources and references were also considered for
consolidation, e.g., Organizational leadership and EA and Product selection, but were
not consolidated because they did not logically map into any other existing codes.

In total, 40 codes (Appendix G, Table of Codes, Meanings, and Response
Frequencies) were generated and assigned during the open coding based on the 17
interviews. Since coding involved taking the raw interview data and converting it to a
conceptual level, the 40 codes became the concepts that were brought forward into axial
coding (Corbin & Strauss, 2008).

Axial coding was utilized to find the categories or themes that were related to the
central phenomenon (Creswell, 1998; Hansen & Kautz, 2005). By using axial coding, the
discovered concepts were analyzed and related to each other in order to develop a list of
categories that were supported by the concepts (Charmaz, 2006; Corbin & Strauss, 2008).
During axial coding, concepts were analyzed to determine if they contributed to the
meaning of a particular category (Corbin & Strauss, 2008; Sarker et al., 2000a).

As Corbin and Strauss (2008) indicated, much of the analysis leading to the discovery
of categories often requires the use of interim results obtained from both open and axial
coding sessions. In this study, axial coding was performed intermittently, i.e., before all
of the open coding was complete. In addition, much of the analysis was captured in a set
of coding memos and diagrams as the categories began to emerge. The coding memos also helped organize the researcher’s approach and provided coding continuity from one interview to another.

In an effort to identify the emerging categories, the axial coding step concentrated on the 40 codes and concepts that arose from the open coding sessions; see Appendix G, Table of Codes, Meanings, and Response Frequencies. This was done by reviewing the concepts and looking for higher level abstractions through the use of such tools as questioning, constant comparisons, and theoretical comparisons (Chamaz, 2006; Corbin & Strauss, 2008; Creswell, 1998).

The analysis led to the identification of categories/themes. This was performed after each interview, as the researcher attempted to determine the emerging themes and their corresponding concepts. Eventually, as Appendix G, Table of Codes, Meanings, and Response Frequencies began to mature, it became the source document used to identify several of the higher level abstractions that became the categories. One or more concepts supported each category. The six categories identified are listed in Table 1. Subsequent subsections outline the rationale for the selection of each of the six categories/themes.
<table>
<thead>
<tr>
<th>Category</th>
<th>Concepts</th>
</tr>
</thead>
</table>
| 1. EA Grounding | External EA influencers  
Internal EA influencers  
Self influenced EA |
| 2. Characteristics of an EA | Artifacts are a part of EA  
Business processes are in EA  
Buy-in is important to EA  
EA orientation between business and IT  
Governance as a part of EA  
Inputs to EA  
Multiple architectures and EA  
Multiple frameworks and EA  
Organizational leadership and EA  
Organizational strategy and EA  
People who perform EA  
Scope of an EA  
When EA is performed |
| 3. Negative perceptions about EA | Negative perceptions which exist about EA |
| 4. Benefits of EA | Adaptability and agility  
Alignment of business and IT  
Competitive advantage  
Consensus and trust  
Enterprise visibility  
Increase operational effectiveness  
Increase revenues and cost reduction  
Make better decisions  
Move the organization forward  
Planning  
Process improvement  
Product selection  
Simplification of system and architecture management  
Speak a common language  
Standardization and consistency  
Win new business |
| 5. Meaning of EA | EA means a business and IT alignment  
EA means a holistic representation of the enterprise  
EA means a planned vision of the enterprise  
EA means a process, methodology, or framework enhancing enterprise decision making |
| 6. Process of Describing the Value of EA | Process used by the interviewees to describe the value of EA |
4.3.2 EA Grounding

The EA Grounding category addressed the source of the executives’ knowledge about EA. Concepts that supported this grounding were external and internal influencers, as well as self influencing.

External influencers include people, papers, events, literature, training, and education that one received outside of his/her organization. One executive gave the following as an external influencer: “I understand the literature in this area pretty well; and, also, over the years I have read probably a hundred different case studies and all the obstacles that got in the way of this”. Still another stated, “I have a very, very strong external network having come out of finance. I have a lot of contact in that space like in …” and yet another said, “Early on, obviously, John Zachman who was of course the father of our industry influenced me”.

Like external influencers, internal influencers were the same, except the origin of the influencers were internal to their own organization. One interviewee gave this internal influencer: “Besides, in the workplace we had learned EA because it is a method and technique to find and document information as a notional approach for business”. One executive attributed his indoctrination to a subordinate, “Fortunately, I hired a guy who could show me his vision and how to execute on it”. Another executive stated that his exposure came from his former employer who did EA work for many of the nation’s largest entities.

Initially, it was thought that external and internal influencers were the only two factors that indoctrinated an executive in EA. However, in soliciting this input from the executives and after analyzing their responses, it became necessary to broaden the scope
of the influencers to self-influenced. Self-influenced referred to knowledge gained about EA through one’s own experience or initiative. One’s self-influenced acquisition of EA knowledge was expressed when one interviewee stated: “Most of it was self generated. I was a former … when I realized the value of EA and saw the advantage of it as a blueprint while living in a business environment of uncertainty” and another said “… let me get educated on it, let me find what is applicable in other companies, best practices, how are other people doing it”. Therefore, a third self-influencing concept was added because many interviewees felt that they acquired their perceptions about EA based on their own experiences, training, or through other knowledge gained on their own.

Fourteen of the 17 executives indicated that part of their grounding was self-influenced. Eleven attributed their grounding to internal influencers (within their own organization) and nine to external influencers (outside their own organization). See Appendix H, Table of Categories, Concepts, and Meanings under the category of EA grounding for the associated concepts and meanings. As might have been expected, there was overlap in how each one received their grounding. Generally, executives attributed their grounding to at least two different types of influencers.

4.3.3 The Characteristics of an EA

The analysis revealed that the way one characterized EA was indicative of the organizational value one expected from it; therefore, the characteristics of EA became a category. This category was populated by 13 concepts as identified during the interviews as interviewees described the many components of EA. For example, when interviewees addressed the characteristics of EA team members, it was mapped into the concept called
People who perform EA. See Table 1, Emerging Categories and Related Concepts, under Characteristics of EA for the complete list of concepts supporting the Characteristics of an EA category.

After the first four interviews, a list of the most mentioned characteristics was compiled and used by the researcher to ask subsequent interviewees about them. As an interviewee identified a characteristic that had not been previously mentioned, it was added to the list of characteristics. The Characteristics of EA category became pivotal because it often projected a lens into the interviewees’ own personal perceptions and beliefs, both positive and negative, regarding the benefits, meanings, and values of EA. In many cases, it added context to the beliefs that executives held about EA.

One executive expressed the following about EA, “Governance plays a huge part in EA and business leaders must be a part of any governance board. They must be involved in any decision making in order for them to take some ownership of it”. This statement is an indication of how important governance is to EA and how important it is for business leaders to take ownership of EA. Therefore, this response mapped into the two concepts of EA characteristics, i.e., Governance as a part of EA and Organizational leadership and EA.

When asked about the importance of business processes in EA, another interviewee responded, “Absolutely, you need business processes because without them you are only solving problems for IT sake instead of solving real world business problems”. In this case, there was importance given to business processes as well as ensuring that EA solved not only IT problems but, more importantly, business problems, meaning business and IT alignment.
One executive addressed the kind of people who typically do EA work, “They are the big thinkers in the organization and have a sense of the breadth of the enterprise and its architecture. Besides, they coordinate and communicate very well with the rest of the organization”. This statement produced the perspective that enterprise architects not only have to be broad thinkers and good communicators, but it is important that the EA itself be known and adopted by the entire organization.

When asked about the use of multiple EA frameworks in a single organization, one respondent stated, “… pick one. Don’t spend a lot of money. They’ll all do basically the same thing and nobody follows them with 100% compliance either”. This quote was interpreted as meaning that all frameworks do basically the same thing; therefore, in the interest to hold EA costs to a minimum, it was better to pick one framework and use it for all EA activities. In addition, this statement implied that a particular framework did not have to be rigidly adopted in order for the EA to be successful.

4.3.4 Negative Perceptions about EA

Often times, interviewees addressed negative aspects about EA. These included opinions, such as, EA was too expensive, people who performed EA lived in an ivory tower, EA was too complex for most managers to understand, architects do not want to be bothered with implementation and just want to move onto the new things, and EA could not be cost justified. As these emerged, they were coded as Negative Perceptions about EA.

One interviewee’s perception about EA was that “it is too detail oriented and management does not have a lot of tolerance or time for it”. Another executive stated the
following about EA, “I do believe it is a struggle for people to communicate the value. I believe it is one of the biggest issues right now”. The loss of management control and choice were stated as issues with EA when one interviewee expressed the following, “they think it is all about control, losing their autonomy, maybe not meeting their requirements, or all of the above”. When one executive was asked if the lingo of EA was focused too much on technical terms, he replied, “I totally agree with that. I think people start to talk the technical jargon too much and they lose the business people”. Finally, another executive simply stated the following negative opinion about EA, “It is hard to do because it requires dedicated resources”. Even though executives interviewed were EA leaders in their organizations, they acknowledged that there were various shortcomings in EA which needed to be addressed.

4.3.5 The Benefits of EA

Every time an interviewee talked about a benefit resulting from the use of EA, it was coded into one of the concepts listed in the Benefits of EA category. In total, there were 16 concepts identified that were considered to be EA benefits. They included such notions as speaking a common organizational language, an aid to the decision making process, winning new business, increasing revenues and cost reduction, and developing consensus and trust. See Table 1, Emerging Categories and Related Concepts for a complete listing of the 16 concepts of benefits.

There were a couple of ways that benefits were solicited from the executives. The first technique was to ask each one what they believed to be common characteristics of EA.
Invariably, when discussing them, the interviewees would mention some benefit they had received or expected to receive from EA.

When one executive was asked if EA artifacts were an important part of an EA, the response was affirmative and the following point was emphasized, “especially in regards to variances, the artifacts allow you to understand why you issued or allowed a certain variance and what the conditions of that variance were”. In this case, the benefit of *Simplification of system or architecture management* was coded from this quote because tracking architectural variances was a benefit that the executive identified while addressing the *Artifacts are a part of EA* characteristic.

The second technique was to specifically ask the executives what benefits they expected to receive from performing EA as well as what organizational outcomes resulted from EA. For example, one interviewee expressed “improved operational efficiency of the existing business” as an important EA benefit. Another stated the following: “I would say EA brings agility to organizations by bringing things under control in a centralized manner”. Yet another interviewee said that EA “helps you to decide how you deal with new technologies and new products”, while another expressed that with EA “I don’t have to completely restart from scratch. I just plug in a few existing pieces and I need to add a few new pieces, but I have my foundation built and that is where EA comes in”.

The *benefits of EA* were ranked by summing the frequency of sources (number of interviewees who mentioned the benefit) with the references (total number of times the benefit was mentioned during the interviews) and ordered from high to low. Table 2 contains the summary of the ranking.
Table 2. Ranked Benefits of EA

<table>
<thead>
<tr>
<th>Benefit of EA</th>
<th>Sources</th>
<th>References</th>
<th>Sum of Sources and References</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Make better decisions</td>
<td>12</td>
<td>27</td>
<td>39</td>
</tr>
<tr>
<td>2. Simplification of system or architecture management</td>
<td>11</td>
<td>21</td>
<td>32</td>
</tr>
<tr>
<td>3. Adaptability &amp; Agility</td>
<td>9</td>
<td>22</td>
<td>31</td>
</tr>
<tr>
<td>4. Increase operational effectiveness</td>
<td>10</td>
<td>19</td>
<td>29</td>
</tr>
<tr>
<td>5. Alignment of business and IT</td>
<td>11</td>
<td>13</td>
<td>24</td>
</tr>
<tr>
<td>6. Increase revenues and cost reduction</td>
<td>9</td>
<td>14</td>
<td>23</td>
</tr>
<tr>
<td>7. Standardization and consistency</td>
<td>9</td>
<td>12</td>
<td>21</td>
</tr>
<tr>
<td>8. Speak a common language</td>
<td>8</td>
<td>13</td>
<td>21</td>
</tr>
<tr>
<td>9. Move the organization forward</td>
<td>8</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>10. Planning</td>
<td>6</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>11. Process improvement</td>
<td>5</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>12. Competitive advantage</td>
<td>6</td>
<td>8</td>
<td>14</td>
</tr>
<tr>
<td>13. Enterprise visibility</td>
<td>6</td>
<td>8</td>
<td>14</td>
</tr>
<tr>
<td>14. Product selection</td>
<td>5</td>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td>15. Win new business</td>
<td>5</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td>16. Consensus and trust</td>
<td>4</td>
<td>8</td>
<td>12</td>
</tr>
</tbody>
</table>

The top ranked benefit that executives expected from EA was to make better decisions which closely aligned to one of their four previously determined meanings of EA, i.e., a process, methodology, or framework for enhancing enterprise decision making. In addition, the fifth ranked benefit, alignment of business and IT, was also one of the four identified meanings of EA.

A comparison was made of the EA benefits cited in the interviews to the benefits given in Chapter 2, Literature Review, 2.4 Review of Favorable Perceptions of EA. All of the benefits listed by the executives were found in the literature review except for standardization and consistency, process improvement, product selection, and consensus and trust. Although the literature review did not represent an exhaustive list of benefits
and some of the above exceptions could have been implied from several of the literature review benefits, it was still worthy to note that most of the executive benefits were a subset of the ones given in the literature review.

4.3.6 The Meaning of EA

During the interviews, the executives were initially asked about their demographics, organization, and how they became grounded in EA. After that, the interview turned to questions regarding the meaning of EA. As indicated in Table 1, Emerging Categories and Related Concepts, there were four broad meanings of EA that respondents gave: (1) Business and IT alignment, (2) A holistic representation of the enterprise, (3) A planned vision of the enterprise, and (4) A process, methodology, or framework for enhancing decision making. Their responses were coded and conceptualized under the category of EA Meaning.

Most interviewees expressed the meaning of EA to be one of the four meanings. While equating EA to the business and IT alignment meaning, one interviewee stated: “My definition of EA is the alignment of business and IT to get business and IT to speak the same language, to break the barriers, and get to a common language of collaboration between the business and IT”. A proponent of the holistic representation of the enterprise expressed: “It is a way of showing causal relationships of the entire organization, not just the technical framework. Notionally, it depicts the scope and complexity of the relationship across the organization”. An executive who believed EA was more of a planning function posited that “It is a planning function first and foremost. At the same time, we have rigorous tools to support analysis, to drive facilitation, to bring people
together to make effective decisions”, whereas an advocate of the definition that EA was a process that supports decision making stated: “EA is a capability that supports the organization to make better IT decisions; better decisions period - all kinds of decisions”.

To a certain extent, all four meanings were generalized in order to accommodate all of the descriptions provided by the executives. In some cases, their meanings had to be thoroughly analyzed from the interview data in order to fully comprehend its context. Generally, two of the four definitions of the meaning of EA were assigned to an executive’s explanation.

The definition most described by the executives was (1) A holistic representation of the enterprise followed by (2) A process, methodology, or framework for enhancing enterprise decision making, (3) A planned vision of the enterprise, and (4) Business and IT alignment. There was no unanimous consensus among executives as to the meaning of EA.

The executives did not cite the meaning adopted for this study which originated from the Society for Information Management’s Enterprise Architecture Working Group. In that definition, EA was described as a holistic set of enterprise descriptions over time (Kappelman, 2010). In fact, none of the executives gave a meaning of EA that was completely in line with the peer-reviewed definitions as found in the literature review (Jonkers et al., 2006; Kappelman; Pereira & Sousa, 2004; Rico, 2006; Zachman, 1997). This revealed that a gap existed between academia and the professional practice of EA.

The research definition of EA defined EA as a continuous process, i.e., a holistic set of enterprise descriptions over time. When asked about this characteristic of EA, three of the 15 executives who addressed it did not see EA as an ongoing process. Although most
executives acknowledged the long term effect of EA, it was unexpected to find that a few of them viewed EA as a one-time, start-stop event.

Kappelman et al. (2010) pointed out that different stakeholders might have varied perspectives about the meaning of EA. The perspectives given by Kappelman et al. included a planning tool, a blueprint of the enterprise’s future, a means to strategically align IT with the business, an enterprise process, a modeling capability, and a shared language across the enterprise to document and communicate important business aspects. Of interest is that all of the Kappelman et al. meanings were cited during the interviews except a shared language across the enterprise.

Another aspect affecting the meaning of EA was the interpretation given by the executives of the word enterprise. To determine what enterprise meant to the interviewees, the researcher asked them to define the scope of an EA study. If an executive wanted to know what was meant by “scope” or failed to completely answer the question, the question was rephrased by the interviewer to explicitly ask if an EA study had to include the entire organization or if it could be performed over just a segment of it (e.g., a business unit) or enterprise process (e.g., supply chain management). Of the 13 respondents who addressed the scope of an EA, six thought that EA had to include the entire organization; three felt it was better if it did include the entire organization but felt it was not completely necessary; and four did not mention any scope restrictions or particular benefit in performing an EA study across the entire enterprise. Only 70 percent of the executives found it necessary and/or desirable to practice EA across the entire organization. There was no agreement among executives as to what constituted the scope
of an EA study, thus, indicating there was a lack of comprehension about the meaning of
EA in terms of its scope across the enterprise.

Of the nine executives who chose the meaning of EA to be *A holistic representation of
the enterprise* and who opined about the *scope of EA*, only one felt that there were no
restrictions on the scope of EA while the other eight stated that the scope of EA should be
the entire enterprise. However, only four of the eight felt that it was entirely necessary to
perform EA across all of the enterprise. Nonetheless, those executives who chose this
meaning were generally more cognizant than the others about the enterprise-wide scope
of EA.

4.3.7 The Process of Describing the Value of EA

The process of how interviewees described the value of EA provided insight as to how
they valued EA for their organization. After the first interviews, the researcher began to
ask each interviewee how he or she would sell the value of EA to a superior within their
own organization. This question often provided a unique insight into how executives
valued EA for their organizations and helped fill in gaps in the research. Their
descriptions were classified under the category of Process of Describing the Value of EA.

One executive stated that the value of EA could be explained as follows: “I would
present a business problem, demonstrate a solution based on EA, make a commitment,
and then deliver on the commitment. I would use this example as reinforcement to move
into other areas ripe for EA”. In this case, the executive found value in successfully
deploying EA as a means to gain support for using EA in other initiatives. Another
executive stated: “It is a hard concept to articulate, but I think people need to look at it in
terms of opportunity costs. Because, if you don’t do it and you continue to develop systems in a hodgepodge fashion, then what is the cost of the enterprise for doing it that way? ” In this case, the executive implied that the choice of not doing EA led to a hodgepodge system development which resulted in costly outcomes.

4.3.8 Normalization of Concepts and Categories/Themes

The main purpose of selective coding/integration was to create a central theme and document it into a storyline (Creswell, 1998). In addition, Corbin and Strauss (2008) stated that the main objective of this coding stage was to link the categories around a main category or central theme in order to create a theoretical construction.

Of the six categories discovered in the axial coding stage, the researcher proceeded to create a series of diagrams with EA Organizational Value as the core category or theme. This core category was chosen because this research centered on the organizational value of EA as expressed by executives who were responsible for EA in their own organization.

Using diagrams, the researcher tried to construct the relationships where the six categories defined in Table 1, Emerging Categories and Related Concepts, explained the core category, EA Organizational Value. After creating a series of diagrams, the category Negative Perceptions about EA did not fit into the emerging storyline; therefore, it became necessary to further analyze it.

In a closer look at the data supporting the Negative Perceptions about EA category, it became apparent that each of these perceptions could fit into the category of Characteristics of an EA category. This was possible if negative perceptions were treated as a dimension (i.e., a point on a range of variations describing a given property) for the
concepts that made up the category *Characteristics of an EA*. However, by doing this, there were two negative concepts of EA (the complexity and costliness of performing EA) that were not yet concepts defined under the *Characteristics of an EA*. By conceptualizing the two negative concepts as the *Complexity of EA* and the *Feasibility of EA* and placing them under the *Characteristics of an EA* category, all of the data that was previously coded under the category of *Negative Perception about EA* was transferred to the *Characteristics of an EA* category and the category *Negative Perception about EA* was eliminated. This is indicated in Table 3 which is a normalized view of the categories and concepts.

Table 3. Normalized Categories and Concepts

<table>
<thead>
<tr>
<th>Category</th>
<th>Concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. EA Grounding</td>
<td>External EA influencers&lt;br&gt;Internal EA influencers&lt;br&gt;Self influenced EA</td>
</tr>
<tr>
<td>2. Characteristics of an EA</td>
<td>Artifacts are a part of EA&lt;br&gt;Business processes are in EA&lt;br&gt;Buy-in is important to EA&lt;br&gt;Complexity of EA&lt;br&gt;EA orientation between business and IT&lt;br&gt;Feasibility of EA&lt;br&gt;Governance as a part of EA&lt;br&gt;Inputs to EA&lt;br&gt;Multiple architectures and EA&lt;br&gt;Multiple frameworks and EA&lt;br&gt;Organizational leadership and EA&lt;br&gt;Organizational strategy and EA&lt;br&gt;People who perform EA&lt;br&gt;Scope of an EA&lt;br&gt;When EA is performed</td>
</tr>
</tbody>
</table>
Table 3. Normalized Categories and Concepts (continued)

<table>
<thead>
<tr>
<th>Category</th>
<th>Concepts</th>
</tr>
</thead>
</table>
| 3. Benefits of EA                  | Adaptability and agility  
  Alignment of business and IT  
  Competitive advantage  
  Consensus and trust  
  Enterprise visibility  
  Increase operational effectiveness  
  Increase revenues and cost reduction  
  Make better decisions  
  Move the organization forward  
  Planning  
  Process improvement  
  Product selection  
  Simplification of system and architecture management  
  Speak a common language  
  Standardization and consistency  
  Win new business |
| 4. Meaning of EA                   | EA means a business and IT alignment  
  EA means a holistic representation of the enterprise  
  EA means a planned vision of the enterprise  
  EA means a process, methodology, or framework enhancing enterprise decision making |
| 5. Process of Describing the Value of EA | Process used by the interviewees to describe the value of EA |

4.4 Selective Coding Analysis

The open and axial coding analysis thus far helped determine the normalized codes, concepts, and categories/themes emerging from the data. However, by using selective coding analysis, i.e., analysis across multiple concepts and categories, it was possible to develop meaningful relationships among the categories in order to establish a central theme and begin to determine an explanatory framework for the organizational value of EA.
4.4.1 EA Meanings in Relationship to EA Benefits

As mentioned previously, there were four general concepts that emerged from the data when the interviewees were asked to explain what EA meant. Their meanings mapped into at least one of the following four concepts: (1) Business and IT alignment, (2) A holistic representation of the enterprise, (3) A planned vision of the enterprise, and (4) A process, methodology, or framework for enhancing enterprise decision making. In addition, there were 16 benefits of EA that emerged from the interviews. Each of the four meanings of EA were analyzed against the benefits of EA to determine if there were any significant benefits that one expected based on their meaning of EA. For the purposes of this analysis, a significant benefit occurred when 50 percent or more of the interviewees for any given meaning of EA listed the same benefit. Table 4, Analysis of EA Meaning and Benefits of EA provides a summary of the results as well as the frequency counts in parenthesis for each source occurrence of the meanings and the benefits. Three of the 16 benefits (Competitive advantage, Consensus and trust, and Enterprise visibility) were not considered significant (did not meet the 50 percent threshold for any of the four meanings of EA); therefore, they are not listed in Table 4. However, the other 13 benefits are found at least once in Table 4 which indicates a strong mapping (greater than 80 percent) of the benefits to at least one meaning of EA.
Table 4. Analysis of EA Meaning and Benefits of EA

<table>
<thead>
<tr>
<th>When the Meaning of EA was:</th>
<th>Expected EA Benefits were:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business and IT alignment (3)</td>
<td>Adaptability and agility (3)</td>
</tr>
<tr>
<td></td>
<td>Alignment of business and IT (3)</td>
</tr>
<tr>
<td></td>
<td>Increase operational effectiveness (3)</td>
</tr>
<tr>
<td></td>
<td>Increase revenues and cost reduction (2)</td>
</tr>
<tr>
<td></td>
<td>Make better decisions (2)</td>
</tr>
<tr>
<td></td>
<td>Process improvement (2)</td>
</tr>
<tr>
<td></td>
<td>Simplification of system or architecture management (2)</td>
</tr>
<tr>
<td></td>
<td>Standardization and consistency (2)</td>
</tr>
<tr>
<td></td>
<td>Win new business (3)</td>
</tr>
<tr>
<td>A holistic representation of the enterprise (11)</td>
<td>Adaptability and agility (6)</td>
</tr>
<tr>
<td></td>
<td>Alignment of business and IT (6)</td>
</tr>
<tr>
<td></td>
<td>Increase revenues and cost reduction (7)</td>
</tr>
<tr>
<td></td>
<td>Make better decisions (8)</td>
</tr>
<tr>
<td></td>
<td>Simplification of system or architecture management (7)</td>
</tr>
<tr>
<td>A planned vision of the enterprise (5)</td>
<td>Alignment of business and IT (3)</td>
</tr>
<tr>
<td></td>
<td>Increase operational effectiveness (4)</td>
</tr>
<tr>
<td></td>
<td>Make better decisions (5)</td>
</tr>
<tr>
<td></td>
<td>Planning (3)</td>
</tr>
<tr>
<td></td>
<td>Product selection (3)</td>
</tr>
<tr>
<td></td>
<td>Simplification of system or architecture management (3)</td>
</tr>
<tr>
<td></td>
<td>Speak a common language (4)</td>
</tr>
<tr>
<td>A process, methodology, or framework for enhancing</td>
<td>Adaptability and agility (4)</td>
</tr>
<tr>
<td>enterprise decision making (8)</td>
<td>Alignment of business and IT (4)</td>
</tr>
<tr>
<td></td>
<td>Increase revenues and cost reduction (5)</td>
</tr>
<tr>
<td></td>
<td>Make better decisions (8)</td>
</tr>
<tr>
<td></td>
<td>Move the organization forward (4)</td>
</tr>
<tr>
<td></td>
<td>Simplification of system or architecture management (4)</td>
</tr>
<tr>
<td></td>
<td>Standardization and consistency (4)</td>
</tr>
</tbody>
</table>

Several conclusions were drawn from the observations made in Table 4, Analysis of EA Meaning and EA Benefits. For all four meanings of EA, the majority of executives expected the following common EA benefits: *Alignment of business and IT*, *Make better decisions*, and *Simplification of system or architecture management*. A probable storyline from this observation could have read: EA facilitated the alignment of business and IT by
reducing complex system and architecture concepts to simpler ones in order to help make better enterprise decisions.

In addition, Adaptable and agile and Increase operational effectiveness were common benefits across three of the four meanings. Based on this observation, the previous storyline could be expanded to read: EA facilitated the alignment of business and IT by reducing complex system and architecture concepts to simpler ones in order to help make better enterprise decisions and increase operational effectiveness, adaptability, and agility.

Not surprisingly, when executives stated that EA meant Business and IT alignment, all of them chose the EA benefits of Alignment of business and IT as well as Adaptable and agile and Increase operational effectiveness. When executives gave the meaning of EA to be A process, methodology, or framework for enhancing enterprise decision making, they all chose the EA benefit of Make better decisions.

Some benefits of EA were unique to only one of the four meanings of EA. For example, when executives found the meaning of EA to be Business and IT alignment, then the majority of them expected the EA benefit of Win new business. Similarly, when the meaning of EA was A planned vision of the enterprise, the benefits of Planning and Product selection were unique benefits to only that meaning. There did not appear to be any significant conclusions reached by these observations.

4.4.2 EA Meanings in Relationship to EA Grounding

EA grounding addressed the source of one’s indoctrination into EA which fell into the three concepts of internal, external, and self-influencing. The purpose of this analysis was
to determine if there was a strong relationship between a grounding concept and a particular meaning of EA. A strong relationship existed if at least 50 percent of the respondents to a particular meaning of EA were grounded using the same grounding concept. With the frequency of responses in parenthesis, Table 5, Analysis of EA Grounding and EA Meanings offers the results of this study.

Table 5. Analysis of EA Grounding and EA Meanings

<table>
<thead>
<tr>
<th>When EA Grounding was:</th>
<th>EA Meanings were:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self influenced EA (14)</td>
<td>A holistic representation of the enterprise (9)</td>
</tr>
<tr>
<td></td>
<td>A process, methodology, or framework for enhancing enterprise decision making (7)</td>
</tr>
<tr>
<td>Internal EA influencers (11)</td>
<td>A holistic representation of the enterprise (8)</td>
</tr>
<tr>
<td></td>
<td>A process, methodology, or framework for enhancing enterprise decision making (6)</td>
</tr>
<tr>
<td>External EA influencers (9)</td>
<td>A holistic representation of the enterprise (5)</td>
</tr>
<tr>
<td></td>
<td>A process, methodology, or framework for enhancing enterprise decision making (5)</td>
</tr>
</tbody>
</table>

The results indicated that the same two meanings of EA (*A holistic representation of the enterprise*; and *A process, methodology, or framework for enhancing enterprise decision making*) established strong relationships with each of the three concepts that made up EA groundings, i.e., Self influenced EA, Internal EA influencers, and External EA influencers. The other two meanings of EA (*A planned vision of the enterprise* and *Business and IT alignment*) did not garner enough responses to show a strong relationship to any of the EA grounding concepts. Therefore, since EA Grounding only substantiated in two of the four meanings of EA, EA Grounding was not considered a good indicator of EA Meanings.
4.4.3 EA Meanings in Relationship to Executive Experience, Executive Authority, and Organizational EA Maturity

The purpose of this analysis was to determine if any of the executive or organizational information was an indicator of any of the four meanings of EA. The executives were asked to indicate their past or present experience with EA, current authority over EA, as well as their organization’s EA maturity level. For the experience category, they had the option to respond to one or more of the following indicating their current or past experience: member of an EA team, EA team leader, and leader of an organization with an EA team. For current authority over EA, they could have indicated one or more of the following: direct participant, leader, and/or advisor.

This analysis took into account the executives’ experience and current authority over EA. In addition, from an organizational standpoint, the executives were asked to numerically rate the maturity of their organization’s EA practice on a scale from 1 to 10 with 1 being the lowest level and 10 being the highest level. The range of EA maturity ratings was from 2 to 9 with an average of 6.7.

Interview answers from the executives were reviewed. For each of the four meanings of EA, the executives’ responses for experience, current authority, and the maturity of their EA practice were analyzed. Table 6, Analysis of the Meaning of EA and Executive Experience, Executive Authority, and Organizational EA Maturity shows the results for each EA meaning where L means low significance and H means high significance.
Table 6. Analysis of the Meaning of EA and Executive Experience, Executive Authority, and Organizational EA Maturity

<table>
<thead>
<tr>
<th>When the Meaning of EA was:</th>
<th>EA Experience</th>
<th>EA Current Authority</th>
<th>Average EA Maturity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business and IT alignment</td>
<td>L</td>
<td>-</td>
<td>L</td>
</tr>
<tr>
<td>A planned vision of the enterprise</td>
<td>H</td>
<td>L</td>
<td>-</td>
</tr>
<tr>
<td>A holistic representation of the enterprise</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>A process, methodology, or framework for enhancing enterprise decision making</td>
<td>-</td>
<td>H</td>
<td>-</td>
</tr>
</tbody>
</table>

The analysis revealed that executives who had the least amount of EA experience and/or who came from the least mature EA organizations gave their meaning of EA as Business and IT alignment. This was an indication that business and IT alignment was the first order of business for executives with the lowest EA experience and/or the lowest EA mature organizations. Executives with the greatest amount of EA experience and/or those with the least amount of current authority over EA tended to have A planned vision of the enterprise as their meaning of EA. This suggested that these executives had the broadest experience in EA, but tended to have a more distant relationship with current EA activities.

Executives with the highest current authority over EA described their meaning of EA as A process, methodology, or framework for enhancing enterprise decision making. A high current authority implies that the executives in this group were more directly involved in their organizations’ EA activities. This analysis did not show any of these three factors informed the EA meaning of A holistic representation of the enterprise.
4.4.4 EA Meanings in Relationship to EA Orientation between Business and IT

Each interviewee was asked, on a scale where at one end was business and on the other end was IT, where would EA fit on that scale. A one was assigned to the business end of the scale and a ten was assigned to the IT end of the scale. Although most executives realized the need to treat EA more from a business perspective, the average EA orientation response from the 17 executives was 6.4, indicating an orientation towards IT. Table 7, Analysis of the Meaning of EA and EA Orientation between Business and IT contains the analysis of the meaning of EA compared to the EA Orientation between Business and IT.

Table 7. Analysis of the Meaning of EA and EA Orientation between Business and IT

<table>
<thead>
<tr>
<th>When the Meaning of EA was:</th>
<th>EA Orientation between Business and IT:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business and IT alignment</td>
<td>4.7</td>
</tr>
<tr>
<td>A planned vision of the enterprise</td>
<td>7.0</td>
</tr>
<tr>
<td>A holistic representation of the enterprise</td>
<td>6.5</td>
</tr>
<tr>
<td>A process, methodology, or framework for enhancing enterprise decision making</td>
<td>6.8</td>
</tr>
</tbody>
</table>

The analysis pointed out that when the meaning of EA was Business and IT alignment, the respondents felt that EA was more oriented towards business than IT. However, the average for the other three meanings was oriented towards IT. This result suggested that those executives who chose the Business and IT alignment meaning of EA were more inclined to ensure that EA focused on business needs.
4.4.5 EA Benefits in Relationship to the Maturity of EA

The purpose of this analysis was to determine if the maturity of an organization’s EA practice informed EA benefits. In this analysis, a significant benefit occurred when 50 percent or more of the interviewees within the same maturity level expected the same EA benefit. As mentioned previously, the maturity of an organization’s EA practice was established during the interviews. The reported maturity levels were clustered into three groups (low, medium, high) based on the maturity scores. If the maturity score was three or less, the organization was classified in the low EA maturity group. If the maturity score was greater than three and less than seven, the organization was placed in the medium maturity group. If the maturity score was equal to or greater than seven, the organization was classified in the high maturity group. Of the 17 interviewees, two of the EA practices rated as low maturity, five as medium maturity, and ten as high maturity. Since there were only two organizations rated as low maturity, a significant benefit for this category required unanimous agreement.

Table 8, Analysis of EA Maturity and EA Benefits summarizes the analysis of EA maturity and expected EA benefits with the frequency counts in parenthesis for each source occurrence of the EA maturity level and expected benefits. The analysis revealed that *Increase operational effectiveness* was the only common benefit across all three EA maturity levels; and it implied that, regardless of the EA maturity level of the organization, executives felt that their enterprise would become more effective with EA. In addition, the number of expected benefits for organizations with low and medium EA maturity practices was less than half the total number of expected benefits for
organizations with high EA maturity practices. The implication of this finding is that when the EA maturity level is high, organizations expect to obtain more EA benefits.

Table 8. Analysis of EA Maturity and EA Benefits

<table>
<thead>
<tr>
<th>EA Maturity Level:</th>
<th>Expected EA Benefits were:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low (2)</td>
<td>Adaptability and agility (2)</td>
</tr>
<tr>
<td></td>
<td>Alignment of business and IT (2)</td>
</tr>
<tr>
<td></td>
<td>Increase operational effectiveness (2)</td>
</tr>
<tr>
<td></td>
<td>Win new business (2)</td>
</tr>
<tr>
<td>Medium (5)</td>
<td>Increase operational effectiveness (3)</td>
</tr>
<tr>
<td></td>
<td>Make better decisions (4)</td>
</tr>
<tr>
<td></td>
<td>Simplification of system or architecture management (3)</td>
</tr>
<tr>
<td>High (10)</td>
<td>Adaptability and agility (5)</td>
</tr>
<tr>
<td></td>
<td>Alignment of business and IT (8)</td>
</tr>
<tr>
<td></td>
<td>Increase operational effectiveness (5)</td>
</tr>
<tr>
<td></td>
<td>Increase revenues and cost reduction (5)</td>
</tr>
<tr>
<td></td>
<td>Make better decisions (6)</td>
</tr>
<tr>
<td></td>
<td>Simplification of system or architecture management (5)</td>
</tr>
<tr>
<td></td>
<td>Speak a common language (6)</td>
</tr>
<tr>
<td></td>
<td>Standardization and consistency (6)</td>
</tr>
</tbody>
</table>

4.4.6 EA Benefits in Relationship to EA Grounding

The EA benefits were compared to the three EA grounding concepts to determine if there was a relationship between a grounding concept and a specific EA benefit. A strong relationship existed if at least 50 percent of the respondents to a particular EA benefit were grounded in the same grounding concept. Table 9, Analysis of EA Benefits and EA Grounding provides the results of this analysis with the frequencies of responses in parentheses.
Table 9. Analysis of EA Benefits and EA Grounding

<table>
<thead>
<tr>
<th>When EA Grounding was:</th>
<th>EA Benefits were:</th>
</tr>
</thead>
</table>
| Self influenced EA (14) | Adaptability and agility (8)  
Alignment of business and IT (9)  
Increase operational effectiveness (9)  
Increase revenues and cost reduction (8)  
Make better decisions (9)  
Move the organization forward (8)  
Simplification of system and architecture management (10)  
Speak a common language (7)  
Standardization and consistency (8) |
| Internal EA influencers (11) | Adaptability and agility (7)  
Alignment of business and IT (6)  
Increase revenues and cost reduction (6)  
Make better decisions (9)  
Simplification of system and architecture management (6) |
| External EA influencers (9) | Alignment of business and IT (8)  
Increase operational effectiveness (5)  
Make better decisions (8)  
Simplification of system and architecture management (5)  
Standardization and consistency (5) |

Those executives whose EA grounding was self-influenced identified with nine different EA benefits, while those who reported either internal or external influencers identified with only five different benefits. This suggested that self-influencers had a broader perspective of what benefits could be achieved using EA. In fact, all of the EA benefits that were identified in either the internal or external influencer concepts were a subset of the benefits that were identified under the self-influencer concept. In terms of EA benefits, this implies that executives were more influenced by what they learned on
their own compared to what they garnered about EA from either internal or external sources.

4.4.7 Process of Describing the Value of EA

Fifteen of the interviewees were asked specifically how they would describe the value of EA to one of their superiors in their organization. To encourage further discussion, some of the executives were also asked how they would sell EA to their organizations.

The researcher first analyzed the relationship between how broad of a scope the executives would have used (single initiative to enterprise-wide) as well as the terminology they would have used (IT terms versus business terms) in explaining the value of EA. In referring to scope one executive stated, “That overall big picture discussion, you can’t really put an ROI on it…you have a big picture here”. From a terminology perspective, one interviewee expressed, “… you need to put it in their words and in the context of their business” and another executive stated, “People at that level are not going to understand the different byte sizes, but they do understand, for example, a better view of the customer relationship”. All of the executives preferred using business terms as opposed to IT terms to describe the value of EA. Furthermore, there was no overwhelming preference as to describing the value of EA from either the enterprise-wide or the single initiative perspective.

The researcher then analyzed how broad of a scope the executives used (single initiative versus enterprise-wide) to explain the value of EA and the measures (intangibles versus tangibles) used to describe the value. The use of tangible measures was preferred over intangible measures. As one executive stated, “…how does this
support the business goals? What are the metrics that you are going to get out of this that are going to help drive you to make the right decisions?”

This analysis indicated that most executives when explaining the value of EA preferred using business terminology over IT terminology and preferred that the values be tangibles as opposed to intangibles. This analysis did reveal a credible level of consistency in the importance of scope, measurable benefits, and terminology used, implying that these properties were most useful in explaining the value of EA.

4.5 Conceptual Data Analysis and Key Findings

Based on the descriptive data analysis, a story line emerged that helped explain the organizational value of EA. With EA Organizational Value as the core category, being informed by the five emerging categories identified from the data and concepts (EA Grounding, Characteristics of an EA, Benefits of EA, Meaning of EA, and Process of Describing the Value of EA), it was possible to create a theoretical framework.

4.5.1 The Analytic Story for the Value of EA for Organizations

In order to understand the value of EA for organizations from the executives’ viewpoints, it was necessary to learn about their particular world of EA. Their world included not only their demographic and organizational information, but also the EA maturity level of their organization, the meaning of EA that they espoused, their future expectations in using EA, their past results in using EA, their grounding into the EA field, how they viewed EA in terms of a business versus an IT function, and if they thought EA was complex or not.
Executives were eager to share what EA meant to them. For them, this was a way to establish a baseline for what they had to say about EA. In addition, it helped ensure their opinions and perceptions about EA were not misconstrued. Although many of them had varying views about *the meaning of EA*, their view was paramount because their meaning of EA was not only what it meant to them but also to their organizations. After all, their meaning counted the most because, as executives, they were in the best position to influence the rest of the organization’s hierarchy, either below or above them.

Much of what influenced an executive to define EA one way or the other had to do with several factors. One factor was the executive’s experience with EA which included whether they were ever a member of an EA team, a leader of an EA team, or managed an organization that had an EA team. Another factor was their current authority over EA which included their direct participation in EA, as a leader of EA, or as an advisor of EA. Also of importance was the executive’s ranking of the EA maturity level for his/her organization. These three factors, along with the executive’s belief that EA was complex or not and whether EA was more business or IT oriented, helped determine which one of the four meanings of EA the executive chose.

The most common *meaning of EA* that executives chose was *A holistic representation of the enterprise*. Executives who chose this meaning used examples of EA that were more comprehensive in scope, such as an integrated set of business models, end-to-end representation of the entire organization, the current and future state of the organization, the set of processes for the organization, and the classifying logic of all information assets. Since these executives viewed EA holistically, they were more cognizant about the enterprise-wide scope of EA.
The next most common meaning of EA held by the executives was *A process, methodology, or framework for enhancing enterprise decision making*. Unlike the previous meaning, this meaning of EA focused on the single goal of decision making. Executives felt that EA was an instrument that allowed the entire organization to make the best decisions. To accomplish this goal, it was necessary to have a process or methodology to follow which operated within a framework of rules and governance. Not surprisingly, people who worked for or directly supported the Government found this definition the most appropriate.

The third most common meaning of EA was *A planned vision of the enterprise*. This definition had as a prerequisite that EA at least created a vision, strategy, blueprint, or plan of the organization’s future state. Although there were elements of the first two meanings of EA found in this definition, this meaning supported the notion that EA was a strong planning process including ancillary functions of defining an organization’s vision, strategy, and goals.

The fourth meaning of EA that executives described was *Business and IT alignment*. This meaning was a single goal-oriented outcome that could be verified only after performing EA. Although this meaning was also one of the benefits of EA, it showed the importance of some executives to ensure that IT supported the business. Unlike the other meanings of EA, this meaning was simply a measure to see if EA accomplished what it was intended to do. Some of the least experienced executives in EA chose this meaning because business and IT alignment became a yardstick for them to prove that EA produced positive results.
When the executives were asked what EA meant to them, almost all their responses corresponded to one of the four meanings. However, there were times, like in discussing some benefit of EA, that executives implied an alternate meaning of EA that also matched another one of the four meanings of EA. This occurred because most executives struggled to fully comprehend what EA meant to them and their organizations.

Irrespective of the meaning an executive gave for EA, there was a common set of benefits that were expected from every application of EA, i.e., Alignment of business and IT, Make better decisions, and Simplification of system or architecture management. The common benefits in union with the specific EA meaning benefits made up an instance of the Value of EA for Organizations.

4.5.2 Theoretical Model Informing the Value of EA for Organizations

A goal of this research was to create an explanatory framework that informs the value of EA for organizations. Initially, it was thought that all five categories (EA Grounding, Meaning of EA, Benefits of EA, Characteristics of an EA, and Process of Describing the Value of EA) directly informed the central theme, the Value of EA for Organizations. However, the analysis indicated that EA Grounding, Characteristics of an EA, and the Process of Describing the Value of EA did not directly add to the core theme, but were instrumental in facilitating interview discussions that allowed for the emergence of an explanatory framework.

The codes, concepts, core theme, and categories were instrumental in the descriptive analysis which helped establish the emerging explanatory framework. The explanatory framework became the basis of the analytic story. From the analytic story, a theoretical
model was created that described how the value of EA for organizations was determined. Figure 2, Theoretical Model Informing the Value of EA for Organizations, contains the theoretical model. The model has four sections which include (1) the factors informing the meaning of EA, (2) the meanings of EA, (3) the common benefits of EA, and (4) the specific benefits of EA. The factors informing the meaning of EA can help determine a specific organizational meaning of EA. Once determined, the common benefits of EA and the specific benefits of EA for the specific EA meaning are added together in order to create the value of EA for the organization.

Figure 2. Theoretical Model Informing the Value of EA for Organizations
4.6 Validation of Results

The validation of results occurred in several stages. The first stage used the criteria set forth by Charmaz (2006) which included credibility, originality, resonance, and usefulness. In terms of credibility, the study interviewed 17 executives who had the responsibility for EA in their organizations. It was a diverse group of executives (including CIOs, a CFO, VPs, Chief Strategy Officers, etc.) representing the private and public sectors. Each interview lasted approximately 45 to 60 minutes and the interviews continued until theoretical saturation was reached. With regards to originality, no known studies have concentrated in the area of EA from the perspective of the executive. In addition, no known theoretical model existed that explained the value of EA for organizations. Charmaz also stated that it was important for the study to resonate with others familiar with the subject area. This study used discriminant sampling to validate the model. Finally, the last criterion dealt with the usefulness of the study, i.e., whether or not the study produced any meaningful interpretations and new knowledge. Although this criterion cannot be completely judged until after the study has been made public and other EA professionals and academia have had a chance to analyze it, the researcher is confident that it will satisfy this standard.

Besides Charmaz’s validation, the eight criteria given by Strauss and Corbin (1990) were used to test the empirical grounding of the study. As Strauss and Corbin pointed out, their criteria were meant as a guideline and not as hard and fast rules to judge the grounding of a study. Their first criterion considered how the concepts were generated, i.e., to make sure that they were generated from data and coding or some other source
like common usage. All of this study’s 39 concepts emerged from the interview data and were generated through the axial coding process. Another question of interest was whether the concepts were systematically related and could have been validated by reviewing the text. The text of this study did have highly related concepts such as the various meanings of EA and the benefits of EA. The next criterion addressed whether the categories were tightly linked as well as supported by the concepts. In this study, the categories of meanings of EA, benefits of EA, and the core category (the value of EA for organizations) were tightly linked and supported by numerous concepts (refer to Figure 2, Theoretical Model Informing the Value of EA for Organizations). Also of interest in validating a study’s grounding was whether variation was built into the theory. Even though variation in this study was accounted for in several areas, it was at the forefront when considering the four conceptual meanings of EA which were expanded in scope to accommodate more variation. Additionally, when variation occurred, it was explained using identifiable conditions such as when and why executives ascribed to one meaning of EA over another. Another criterion dealt with the use of processes to help explain actions under changing conditions. For example, in this study, most of the executives were asked to explain the process of explaining the value of EA to a superior. Another test of grounding analyzed the theoretical findings to see if they were significant enough. Understanding the value of EA for organizations is a key concern among many business and government entities today. The theoretical model was significant because it helped create understanding and predictability concerning the value of EA for organizations. The last criterion of grounding had to do with the theoretical model and whether it would
stand up over time and whether this research would become a meaningful part of the exchange of ideas concerning EA. This criterion cannot yet be evaluated.

As a final step in the validation, key research memos were reread to ensure that the analytical story and the theoretical model held up to scrutiny. This reexamination looked at all of the memos and closely scrutinized the memos concerning the four meanings of EA. This was critical to make certain that all meanings of EA were ample enough to foster the specific meanings that executives brought forward. In addition, the researcher compared the analytical story against published literature to ensure that concepts found in the analytical story were upheld or new concepts were logically established.

4.7 Summary of Results

This study found that the value of EA for organizations was directly influenced by the meaning an organization gives to EA. There were four meanings of EA identified during the interviews with executives; i.e., *Business and IT alignment, A holistic representation of the enterprise, A planned vision of the enterprise, and A process, methodology, or framework enhancing decision making*. Although knowing the meaning of EA is all that is necessary to determine the organizational value of EA, this study also produced some factors that informed the organizational meaning of EA, which were (1) how the executive viewed the orientation of EA (IT versus business), (2) the organization’s EA maturity, (3) the executive’s EA experience, (4) the authority the executive has over EA, and (5) the executive’s assessment of EA complexity.

Regardless of the organizational meaning of EA, there were three common benefits that executives expected from EA, (1) alignment between business and IT, (2) make
better decisions, and (3) the simplification of system or architecture management. The
common benefits plus the specific benefits for the selected meaning of EA are to be
considered collectively; so that for any given organizational meaning of EA, it is possible
to predict the value of EA. This is depicted in Figure 2, Theoretical Model Informing the
Value of EA for Organizations.
Chapter 5

Conclusions

5.1 Introduction

In the conclusions section of this chapter, the study’s three research questions, the goals of the dissertation, and the core theme (the Value of EA for Organizations) are reviewed and addressed. In addition, the strengths, weaknesses, and limitations of this study are examined. The implications section brings forward the significance of this study on EA both from an academic as well as a professional practice point of view. In addition, several recommendations were given concerning new areas of academic inquiry and research regarding EA. The section on recommendations addresses the grounded theory research methodology employed in this study with regard to future research. Furthermore, several recommendations are given that could potentially help the development of the EA field. The last section of this chapter provides a summary of the entire research effort.

5.2 Conclusions

5.2.1 Conclusions Regarding the Research Questions

There were three research questions addressed by this study. The first one (What were the meanings executives attached to EA?) examined the definitions that executives gave to EA. The second one (What benefits did executives expect to achieve from EA?) concentrated on the benefits that executives realized by performing EA. The last one
(What important internal and external influences shaped an executive’s meanings and expected benefits of EA?) dealt with the influencers that shaped an executive’s perspectives about EA.

In terms of the first question, there were four distinct definitions that executives offered to explain EA. These were (1) Business and IT alignment, (2) A holistic representation of the enterprise, (3) A planned vision of the enterprise, and (4) A process, methodology, or framework for enhancing decision making. From the analysis, it was concluded that the executives had several meanings of EA. Some executives required more than one meaning to describe their own definition, none of the executives provided meanings that matched peer-reviewed definitions, a few of them did not recognize the lasting nature of EA, and some of them did not agree on the scope of an EA study. It was apparent that EA is still a maturing field, especially from the perspective of claiming a common meaning among the executives who are organizationally responsible for EA.

The second research question dealt with the benefits that executives expected to receive by performing EA. The study uncovered 16 benefits which were rank-listed by the frequency in which they were referenced during the interviews (see Table 2, Ranked Benefits of EA). Even though there were three common benefits of EA that were generally agreed on by all executives, there were specific benefits that were expected dependent on each of the four meanings of EA.

The third research question dealt with the source of indoctrination that shaped the executives’ views about EA. There were three distinct influencers that shaped the executives’ viewpoints about EA; i.e., influencers that were external or internal to the executive’s own organization or self-influenced, meaning the executive acquired
knowledge about EA stemming from his/her own initiatives. See Appendix H, Table of Categories, Concepts, and Meanings under the category of \textit{EA grounding} for the three associated concepts and meanings.

5.2.2 \textit{Conclusions Regarding the Goals of the Study}

The main goal of this research was to understand how executives valued EA for their organizations. This goal was divided into two sub-goals. The first sub-goal was to understand how executives valued EA by determining the themes and concepts that executives used when assessing the value of EA. Besides understanding the themes and concepts, the second sub-goal required the determination of a core theme and conceptually connecting the categories and concepts to create a coherent analytical story and a theoretical framework to explain how executives valued EA for their organizations.

The first sub-goal was demonstrated by the emergence of the five categories and 39 concepts that emanated from the axial and selective coding stages. These were depicted in Table 3, Normalized Categories and Concepts. Through the use of conceptual analysis, a core category was determined and an analytical story and a theoretical model were created that satisfied the objectives of the second sub-goal of this research.

5.2.3 \textit{Strengths}

The qualitative research and, specifically, the grounded theory approach were strong points of this study. Without this research methodology, it would have been difficult, if not impossible, to understand the experiences and inner thoughts of the executives and organize the findings into a theoretical scheme. Of paramount importance to this
A qualitative study was the use of the grounded theory methodology which allowed for the discovery of variables as opposed to the testing of variables.

A major strength of this study was the group of interviewees who provided their input into this research. All seventeen executives of this group were highly qualified, allowed about an hour of their time to be taken out of their busy schedules for the interviews, and openly shared their thoughts, perceptions, and ideas. Collectively, they provided a considerable amount of intellectual capital in order to mold a solid body of knowledge grounded in the everyday experiences of those who lead or have led EA in their own organizations.

5.2.4 Weaknesses

Although it was not necessary to interview foreign executives to reach the conclusions of this research, the mere fact that only one international executive agreed to be interviewed suggested that this study is applicable mostly to U.S. organizational entities. Future studies should test this model with international executives.

One premise of theoretical sampling was to find the best next candidate to interview, i.e., someone who was in a position to answer open questions from the previous interview. This was difficult to achieve because, without knowing the specific experiences of all the interview candidates, it was not possible to determine which ones were well suited to answer the open questions. That meant that some questions were carried forward until they were answered.
5.2.5 Limitations

Candidates for this research needed to have had executive level credentials, experience leading EA in their organizations, and been available during the timeframe of this study. Due to the strict qualifications of the interview candidates, it was challenging to have a ready list of available candidates to interview. This limitation meant that the interview cycle took twice as long as initially anticipated.

5.3 Implications

This research addressed the organizational value of EA as viewed by the executives who led EA practices for their organizations and the study revealed several areas of inconsistency. For example, the mere fact that four broadly crafted meanings of EA had to be conceptualized in order to accommodate the meaning perceptions held by the executives suggested that there is no widespread agreement on what EA meant.

During the interviews, executives did not give any of the peer-reviewed definitions of EA. This suggested that there was either a lack of communication or even a more severe split between academia and the executive practitioner.

In addition, there was not consensus among the executives as to what constituted the scope of an EA study; and, even though most executives acknowledged the long term effect of EA, it was unexpected to find that a few executives viewed EA as a one-time, start-stop event. This was a clear indication that there was a lack of comprehension about the scope of EA in terms of its application across the entire enterprise as well as the recognition of the need to have a process that allows continuous EA updates.
The study brought forward not only the concepts of what EA meant to executives but also what organizational benefits could be realized from each meaning. There were 16 unique benefits that arose from the executive interviews, but no attempt was made to see if non-executive EA practitioners held the same views as their executive counterparts. In addition, there was no attempt to assess any of the current EA frameworks to see if they were capable of delivering the benefits that executives expected. Research into frameworks seems like a worthy endeavor to not only assess the adequacy of current frameworks but also to explore the creation of new ones.

Irrespective of the four meanings of EA, the majority of executives expected the following benefits from EA: alignment of business and IT, make better decisions, and simplification of system or architecture management. A probable storyline from this observation could have read: EA facilitated the alignment of business and IT by reducing complex system and architecture concepts to simpler ones in order to help make better enterprise decisions. In three of the four meanings of EA, the EA benefits of adaptability and agility as well as increase operational effectiveness were common. The previous storyline could have read: EA facilitated the alignment of business and IT by reducing complex system and architecture concepts to simpler ones in order to help make better enterprise decisions and increase operational effectiveness, adaptability, and agility. Is it possible to build a semantic web application based on this kind of analysis in order to automatically recommend a preferred framework and a set of artifacts that satisfies the overall requirements?

In several parts of the analysis, there were clear indications that the first order of business for low EA maturity level organizations and the least experienced EA executives
was the alignment between business and IT. In fact, executives who met these criteria also chose their meaning of EA to be alignment between business and IT. In addition, they felt that EA was aligned more towards business as opposed to IT. On the other hand, executives from high EA maturity level organizations and whose past experience with EA was more extensive chose the meaning of EA to be a *holistic representation of the enterprise*. There appears to be a natural progression from one meaning of EA to another. Research that created an understanding of such progression would help prepare organizations for changes in their EA programs.

Executives who claimed grounding into EA as self-influencing believed that EA could deliver nearly twice as many more benefits as those who were influenced in one of the other two ways; i.e., internal or external. This suggested that the best way to gain an appreciation for the benefits of EA was to learn about them on your own and through your own experiences. However, EA executives of more mature EA practices had been exposed to a greater number of grounding concepts and they addressed the grounding concepts more frequently during their interviews. This implied that their overall knowledge of EA was broadly influenced.

5.4 Recommendations

There needs to be a greater understanding of what EA means. It may be acceptable to have several meanings of EA, but to have them without more precise definitions leads to imprecision in the EA world. It seems that it would be difficult to mature the EA field without establishing precise meanings of EA.
It appears that a critical first step before employing EA in any organization is to know what meaning of EA is being applied because, as this study has shown, each meaning has its own expected set of specific benefits. Knowing the meaning and its associated benefits prior to deploying EA has several advantages. It helps establish realistic expectations and ensures that everyone has the same level of understanding. Both of these should make EA studies more successful, because they will meet well known expectations.

The grounded theory methodology seems appropriate for IS studies especially in areas where little theoretical basis exists, like in EA. The grounded theory methodology also seems like an ideal approach to use for descriptive analysis within IS areas, for example, in understanding the relationship between technology and users, in describing the interactions between system designers and customers, and in comprehending the needs to implement a disruptive technology.

Specific areas of future research were mentioned in the previous section, but there are other areas worthy of consideration. Many executives expressed that explaining the value of EA was difficult because many of the benefits of EA were intangible and not measureable. Some of these included establishing a common language across the enterprise or improving operational effectiveness. Besides, the long term benefits of EA can be even more obscure such as effective planning or moving the organization forward. Research that addresses the value propositions of EA and presents it using precise business terms would help EA gain more credibility and should advance the practice of EA in most organizations.

There are a number of EA frameworks in existence today; and, even though most executives in the study stated that they had no qualms about using more than one of them,
it appears that it may be time to analyze existing frameworks and to determine if they are equipped to satisfy the expected benefits outlined in this study. With either a consolidation of frameworks or the development of universally accepted ones, there could be a larger pool of trained architects as well as widespread knowledge and new theories supporting EA.

5.5 Summary

It is well documented in the last couple of decades that information system implementation failures continue to plague IT organizations and the enterprises they support (Brooks, 1995; Cerpa & Verner, 2009; Charette 2005; Goldfinch 2007; Pressman, 1998; Standish, 2009). These problems were often attributed to the poor alignment between business and information technology strategy (Henderson & Venkatraman, 1993; Reich & Benbasat, 1996). However, by continuously applying EA to align business strategies with IT strategies, it led to better business-IT alignment (Sage, 2006; Schekkerman, 2004). Although enterprise architecture (EA) is a means to correct alignment problems and executives highly rate the importance of EA, it is still not used by most organizations today. In fact, in an on-line survey of 374 organizations, Ambler (2010) found that only 47% of organizations implemented EA.

Current literature only gave anecdotal reasons why EA was not more widely adopted and minimally addressed its underutilization. This research focused on the problem of EA underutilization by analyzing and creating an understanding of how executives who were responsible for EA in their organizations gave value to it.
Even though executives have highly rated the importance of EA for over two decades, it is still not broadly adopted today (Ambler, 2010; Sage, 2006). This suggested that EA did not accomplish the expected benefits of organizational executives. Since executives are the most influential leaders within any organization, it is critical that EA fulfills their expectations in order to be successful. This research focused on the meanings and expected benefits that organizational executives gave to EA, so that EA practitioners and researchers could better understand what EA meant to executives and what executives expected from it. To understand executive values, it is necessary to understand what EA meant to them. There were three research questions that were addressed:

- What were the meanings executives attached to EA?
- What benefits did executives expect to achieve from EA?
- What important internal and external influences shaped an executive’s meanings and expected benefits of EA?

This dissertation has widespread relevance and significance. The understanding of executives’ perceptions of EA is critical because, without understanding their values of EA, it becomes less likely that any new or ongoing EA initiative would fully meet organizational expectations or have a favorable organizational impact; thus, EA would continue to produce mixed results. Without sustained EA successes, EA would continue to be underutilized.

This research used the grounded theory methodology to obtain the EA perspectives and assessments of seventeen organizational executives responsible for EA. To qualify for the study, an executive needed to be at the C-level (e.g., CIO, CFO, Chief Strategy Officer, etc.) or a VP and had to have led an EA team or managed an organization that
had an EA team. The executives were selected using theoretical sampling and interviewed for approximately one hour using a semi-structured interview approach. The interview data was recorded digitally or in long-hand, transcribed, and coded using the open, axial, and selective coding techniques. In addition, analytical memos were written to describe the meaning of the data and the emerging concepts, properties, and dimensions evolving from the data. The interviewing, coding, and memo writing continued until theoretical saturation was achieved.

In total, there were five categories/themes (EA grounding, characteristics of EA, benefits of EA, meaning of EA, and the process of describing the value of EA) developed around the central theme of the value of EA for organizations. The executives identified four meanings of EA (Business and IT alignment, A holistic representation of the enterprise, A planned vision of the enterprise, and A process, methodology, or framework enhancing enterprise decision making). In addition, 16 benefits of EA were identified (see Table 3, Normalized Categories and Concepts) in which three were common benefits across all four meanings of EA. Other benefits were identified as being specific to one or more of the four meanings of EA. Depending on the specific meaning of EA, the common benefits combined with the specific benefits create the value of EA to an organization.

Since the selection of the meaning of EA was crucial to determining the organizational value of EA, this study considered the factors that led one executive to choose one meaning over another. It was determined that the Complexity of EA as well as the EA Orientation between Business and IT influenced two of the four meanings of EA. In
addition and more importantly, it was established that the demographical and
organizational information influences all four meanings of EA.

Based on the findings of this research, an analytical story was written to describe the
EA world of the executives interviewed. The analytical story is the narrative of the
explanatory framework that delineates how executives determine the value of EA for
their organizations. A theoretical model was created from the analytical story (see
Figure 2, Theoretical Model Informing the Value of EA for Organizations). The model
shows how the Factors Informing the Meaning of EA determine the Meaning of EA that
an organization adopts. Based on the adopted Meaning of EA, the Common Benefits of
EA are added to the Specific Benefits associated with the adopted meaning. The
combination of the Common Benefits of EA plus the Specific Benefits of EA creates the
Value of EA for Organizations.

It is anticipated that this research will contribute understanding to the EA body of
knowledge and will help solve the problem of EA underutilization. The ability to
understand the value of EA should better prepare EA practitioners to focus on those goals
that are most important to their organizations. In addition, EA researchers should be able
to improve upon the established EA frameworks and tools used in EA studies.
# Appendix A

## Table of Reviewed Journal Articles on Grounded Theory

<table>
<thead>
<tr>
<th>Citation</th>
<th>Title of Article</th>
<th>Purpose of Study</th>
<th>Number of People Interviewed</th>
<th>Journal Name</th>
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<tbody>
<tr>
<td>Sarker, Lau, &amp; Sahay, 2000b</td>
<td>Using an adapted grounded theory approach for inductive theory building about virtual team development</td>
<td>To develop theory about new forms of IT-enabled organizations such as &quot;virtual teams&quot; and associated phenomena in a systematic fashion</td>
<td>Twelve virtual teams consisting of 8-10 students per team</td>
<td>ACM SIGMIS Database</td>
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<tr>
<td>Linderman, Schroeder, &amp; Sanders, 2010</td>
<td>A Knowledge Framework Underlying Process Management</td>
<td>To study the underlying framework and factors of a process management system that lead to organizational knowledge creation</td>
<td>Twenty-two corporate officers in charge of Six sigma efforts at the VP and director level</td>
<td>Decision Sciences</td>
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<td>Galal, 2001</td>
<td>From contexts to constructs: the use of grounded theory in operationalising contingent process models</td>
<td>To operational variables for the Grounded Systems Engineering Methodology (GSEM)</td>
<td>Ten interviews with systems analysts</td>
<td>European Journal of Information Systems</td>
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<tr>
<td>Smolander, Rossi, &amp; Purao, 2008</td>
<td>Software architectures: Blueprint, literature, language or decision?</td>
<td>To understand how different stakeholders generated, represented, used, and shared knowledge regarding software architectures</td>
<td>Nineteen interviews of stakeholders in the software architecture process</td>
<td>European Journal of Information Systems</td>
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<td>Blodgett &amp; Tapia, 2011</td>
<td>Do avatars dream of electronic picket lines?: The blurring of work and play in virtual environments</td>
<td>To address how technologies have enabled boundaries to become more permeable</td>
<td>Ten interviews, comprised of two case studies of virtual protests</td>
<td>Information Technology &amp; People</td>
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<tr>
<td>Citation</td>
<td>Title of Article</td>
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<td>Number of People Interviewed</td>
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<td>Day, 2009</td>
<td>Strangers on the train: The relationship of the IT department with the rest of the business</td>
<td>To provide and develop a comprehensive and holistic understanding of the working relationship between the in-house IT department and other parts of the business</td>
<td>Twenty-four interviews with business executives, users of IT, and IT professionals</td>
<td>Information Technology &amp; People</td>
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<td>Feller, Finnegan, Hayes, &amp; O'Reilly, 2009</td>
<td>Institutionalising information asymmetry: governance structures for open innovation</td>
<td>To explore the ways in which firms utilize hierarchical relationships and the market system to supply and acquire intellectual property (IP) and/or innovation capabilities from sources external to the firm</td>
<td>Two: one CEO and one VP of Market Development and Strategy</td>
<td>Information Technology &amp; People</td>
</tr>
<tr>
<td>Smolander &amp; Rossi, 2009</td>
<td>Conflicts, compromises, and political decisions: Methodological challenges of enterprise-wide e-business architecture creation</td>
<td>To understand the issues involved in architecture development of e-business systems</td>
<td>Nineteen interviews with six system architects, five enterprise system managers, three project managers, two software development managers, one project leader, one system analyst, and one marketing manager</td>
<td>International Journal of Enterprise Information Systems</td>
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<tr>
<td>Chang &amp; Lewis, 2011</td>
<td>Towards a framework for Web 2.0 community success: A case of YouTube</td>
<td>To create a conceptual framework for online YouTube community success based on a dual approach consisting of content analysis and grounded theory interviews</td>
<td>Twenty interviews with YouTube users who share or view videos on a frequent basis</td>
<td>Journal of Electronic Commerce in Organizations</td>
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<td>Citation</td>
<td>Title of Article</td>
<td>Purpose of Study</td>
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<td>Scott, 2000</td>
<td>Facilitating interorganizational learning with information technology</td>
<td>To determine how and why information technology facilitates interorganizational learning</td>
<td>Sixty-nine executive interviews: CEOs, CFOs, COOs, CIOs, and engineering, marketing, manufacturing, and other managers</td>
<td>Journal of Management Information Systems</td>
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<td>Earl, Sampler, &amp; Short, 1995</td>
<td>Strategies for business process reengineering: Evidence from field studies</td>
<td>To understand the relationship among business strategy planning, IS planning, and process reengineering projects</td>
<td>Twenty-four senior executives and process reengineering managers in strategic business planning, IS planning, and process engineering</td>
<td>Journal of Management Information Systems</td>
</tr>
<tr>
<td>Orlikowski, 1993</td>
<td>CASE tools as organizational change: Investigating incremental and radical changes in systems development</td>
<td>To develop a theoretical framework using grounded theory to conceptualize issues around the use of CASE tools</td>
<td>Two organizations, 159 interviews with managers, and analysts using CASE tools</td>
<td>MIS Quarterly</td>
</tr>
<tr>
<td>Levina &amp; Vaast, 2005</td>
<td>The emergence of boundary spanning competence in practice: Implications for implementation and use of information systems</td>
<td>To examine how stakeholders exercise control and why control choices change across project phases</td>
<td>Twenty – CIO, senior and mid-level managers, and other stakeholders from two different projects</td>
<td>MIS Quarterly</td>
</tr>
<tr>
<td>Garud &amp; Kumaraswamy, 2005</td>
<td>Vicious and virtuous circles in the management of knowledge: The case of Infosys Technologies</td>
<td>To gain an understanding of the micro-processes that lead to successful Knowledge Management</td>
<td>Fifty-six senior executives and mid-level managers</td>
<td>MIS Quarterly</td>
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</tbody>
</table>
## Appendix B

### Table of Reviewed Conference Proceedings on Grounded Theory

<table>
<thead>
<tr>
<th>Citation</th>
<th>Title of Paper</th>
<th>Purpose of Study</th>
<th>Number of People Interviewed</th>
<th>Conference Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selvaraj &amp; Fields, 2009</td>
<td>A grounded theory approach towards conceptualizing CIS for heterogeneous work communities</td>
<td>To explore the Common Information Space (CIS) of an air traffic control tower in regards to the field of Computer Supported Cooperative Work (CSCW)</td>
<td>Six personal: two - Ground Controllers, two - Tower Controllers, and two Assistants</td>
<td>The 23rd British HCI Group Annual Conference on People and Computers: Celebrating People and Technology (BCS-HCI '09)</td>
</tr>
<tr>
<td>Razavi &amp; Iverson, 2006</td>
<td>A grounded theory of information sharing behavior in a personal learning space</td>
<td>To develop a grounded theory of information sharing behavior of the users of a personal learning space</td>
<td>Twelve high school students enrolled in a special program for gifted kids</td>
<td>The 2006 20th Anniversary Conference on Computer Supported Cooperative Work (CSCW '06)</td>
</tr>
<tr>
<td>Dorairaj, Noble, &amp; Malik, 2011</td>
<td>Bridging cultural differences: a grounded theory perspective</td>
<td>To uncover the strategies adopted by Agile practitioners to overcome the cultural differences in distributed software development</td>
<td>Eighteen agile practitioners in 10 different software organizations in the USA and India.</td>
<td>The 4th India Software Engineering Conference (ISEC '11)</td>
</tr>
<tr>
<td>Razavi &amp; Iverson, 2007</td>
<td>A framework for privacy support in group information management systems</td>
<td>To develop a framework for designing usable privacy management mechanisms in group information management systems (GIM) context</td>
<td>Twelve participants who were using a GIM system with integrated blog, wiki, social bookmarking, and social networking functionality</td>
<td>ACM 2007 International Conference on Supporting Group Work (Group '07)</td>
</tr>
<tr>
<td>Citation</td>
<td>Title of Paper</td>
<td>Purpose of Study</td>
<td>Number of People Interviewed</td>
<td>Conference Name</td>
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<td>---------------------------</td>
<td>-------------------------------------------------------------------------------</td>
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<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Montoni &amp; Rocha, 2010</td>
<td>Applying Grounded Theory to understand Software Process Improvement implementation</td>
<td>To investigate Software Process Improvement (SPI) implementation initiatives in the perspective of consultants of SPI consultancy organizations</td>
<td>Six experienced SPI consultants divided into three groups: coordinator of the consultancy organization, SPI project managers, and SPI implementation team members</td>
<td>2010 Seventh International Conference on the Quality of Information and Communications Technology</td>
</tr>
<tr>
<td>Crabtree, Seaman, &amp; Norcio, 2009</td>
<td>Exploring language in software process elicitation: A grounded theory approach</td>
<td>To understand how humans perceive real world software processes and to investigate the factors that affect process interpretation by those involved in creating a representation of the process model</td>
<td>Four process engineers</td>
<td>2009 3rd International Symposium on Empirical Software Engineering and Measurement</td>
</tr>
<tr>
<td>Hansen &amp; Kautz, 2005</td>
<td>Grounded Theory Applied - Studying Information Systems Development Methodologies in Practice</td>
<td>To study whether and how system developers use Information Systems Development methodologies in practice</td>
<td>Twelve semi-structured interviews of systems developers, project managers, and staff in charge of method development and training</td>
<td>The 38th Annual Hawaii International Conference on System Sciences (HICSS'05)</td>
</tr>
<tr>
<td>Qureshi, Liu, &amp; Vogel, 2005</td>
<td>A Grounded Theory Analysis of E-Collaboration Effects for Distributed Project Management</td>
<td>To analyze data on virtual teams and the effects” in the way distributed projects are managed</td>
<td>Twenty-one distributed virtual teams comprising of students the Netherlands and Hong Kong</td>
<td>The 38th Annual Hawaii International Conference on System Sciences (HICSS'05)</td>
</tr>
<tr>
<td>Sarker, Lau, &amp; Sahay, 2000a</td>
<td>Building an Inductive Theory of Collaboration in Virtual Teams: An Adapted Grounded Theory Approach</td>
<td>To develop a theory of collaboration in virtual teams.</td>
<td>Twelve virtual teams consisting of students from universities in Canada and the U.S.</td>
<td>The 33rd Hawaii International Conference on System Sciences - 2000</td>
</tr>
<tr>
<td>Citation</td>
<td>Title of Paper</td>
<td>Purpose of Study</td>
<td>Number of People Interviewed</td>
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<td>--------------------------------------------------------------------------------</td>
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<tr>
<td>Hekkala, Newman, Urquhart, &amp; Heiskanen, 2011</td>
<td>Emotions in Leadership in an IOIS Project</td>
<td>To describe and analyze emotions in leadership in a Nordic inter-organizational information system (IOIS) project</td>
<td>Fourteen active project members including managers from the steering group, representatives of suppliers, members of the research organization, and users active in the project</td>
<td>The 44th Hawaii International Conference on System Sciences - 2011</td>
</tr>
<tr>
<td>Ashry &amp; Taylor, 2000</td>
<td>Requirements Analysis as Innovation Diffusion: A Proposed Requirements Analysis Strategy for the Development of an Integrated Hospital Information Support System</td>
<td>To examined the possibility of using Grounded Theory as a means of requirements analysis strategy</td>
<td>Seventeen semi-structured interviews of IS personnel and administrative and clinical staff</td>
<td>The 33rd Hawaii International Conference on System Sciences - 2000</td>
</tr>
</tbody>
</table>
Appendix C

Semi-Structured Interview Questions

1. What is EA?

2. What do you consider to be the main characteristics of EA?

3. In your opinion, what is the value of EA?

4. What outcomes result from performing EA?

5. What does EA mean to your organization?

6. Who or what influences your perception or opinion about EA?
Appendix D
Demographic and Organizational Questions

Executive Interviewee _________________________
Organization Name ___________________________
Title _____________________________

1. What kind of business or activity does your organization perform?

2. What is your position within your organization with regards to EA?

3. Which best describes your current experience with EA (responsibility and frequency)?
   a. Member of an organization that had an EA team
   b. Member of an EA team
   c. Led an EA team
   d. Led an organization that had an EA team

4. Which best describes your past experience with EA (responsibility and frequency)?
   a. Member of an organization that had an EA team
   b. Member of an EA team
   c. Led an EA team
   d. Led an organization that had an EA team

5. Which best describes your current authority over EA?
   a. None
   b. Advisor
   c. Direct participant
   d. Leader

6. How mature is EA in your organization?
Appendix E

Example of Multiple Codes Generated from a Single Interviewee’s Response

One interviewee was asked: “Are there any direct business values that you see by using EA?” The interviewee responded:

Yeah, but let me flip the question over. Let us say that we don’t have an EA, you don’t have some view of where you are trying to go and then what you are typically doing is implementing a hodge-podge of systems that are not integrated or not necessarily very supportable. What you end up with, without any kind of guideline, are people doing different things without understanding how it should relate to the whole. So, you lose the opportunity to achieve integration and the environment is not supportable. What the real value of it is, what you achieve is a guide as to how to optimize your capital investment of business and technology; because, at the end of the day, if you are going to move forward in IT, you are going to be making capital investments and really need to guide those investments in order to get the biggest bang for the dollar. It is also a tool, as we talked before, as a way to achieve consensus on where we should be going.

In the preceding paragraph, there were six codes that were either generated or reused and populated based on the interviewee’s response to this one question. The following interview statements generated the population of the corresponding codes.

<table>
<thead>
<tr>
<th>Interviewee Statement:</th>
<th>Code Selected:</th>
</tr>
</thead>
<tbody>
<tr>
<td>…you don’t have some view of where you are trying to go…</td>
<td>Planning</td>
</tr>
<tr>
<td>… what you are typically doing is implementing a hodge-podge of systems…</td>
<td>Standardization and consistency</td>
</tr>
<tr>
<td>… that are not integrated or not necessarily very supportable…</td>
<td>Simplification of system or architecture management</td>
</tr>
<tr>
<td>What the real value of it is, what you achieve is a guide as to how to optimize your capital investment of business and technology…</td>
<td>Make better decisions</td>
</tr>
<tr>
<td>Interviewee Statement</td>
<td>Code Selected</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>…because, at the end of the day, if you are going to move forward in IT, you are going to be making capital investments and really need to guide those investments in order to get the biggest bang for the dollar.</td>
<td>Product selection</td>
</tr>
<tr>
<td>It is also a tool, as we talked before, as a way to achieve consensus on where we should be going.</td>
<td>Consensus and trust</td>
</tr>
</tbody>
</table>
Appendix F

Example of a Single Code Assigned from Multiple Interviews

The code “Alignment of Business and IT” had high density as it was referenced by 11 different interviewees. Two of the interviewees mentioned it twice; so, in total, there were 13 references made to this code.

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Interviewee Passage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>There’s not really a technology differentiator, it is more aligning IT to the business needs and not necessarily for standardization.</td>
</tr>
<tr>
<td>B</td>
<td>If you are doing EA and it has no business outcome, then why are you doing it?</td>
</tr>
<tr>
<td>B</td>
<td>Because if they don’t see the value, they are not going to come with you on the journey. It is all about what is in it for me as far as business is concerned.</td>
</tr>
<tr>
<td>C</td>
<td>…because it is the IT infrastructure that reflects the operational model of that organization.</td>
</tr>
<tr>
<td>D</td>
<td>Whenever I use the term alignment, it is not just effective planning; but it ensures that, whatever the outcomes are, they meet the business needs.</td>
</tr>
<tr>
<td>D</td>
<td>What is interesting is when people ask if it is more business thing or more technology thing. I think the answer should be that that is irrelevant; you need both people in the room.</td>
</tr>
<tr>
<td>E</td>
<td>Invariably, one of the top three issues is business and IT alignment. It is always, for as many years as I have been around, a key heartburn; and I think EA is a way to help try to achieve that. It doesn’t necessarily do it by itself but it is a way that helps achieve business and IT alignment.</td>
</tr>
<tr>
<td>F</td>
<td>I would sit down and have a conversation and try to explain in terms of business and how you connect applications to your scope, to your three year plan and how you want to make that flexible …</td>
</tr>
<tr>
<td>G</td>
<td>We are doing it to align IT to where the business is going</td>
</tr>
<tr>
<td>Interviewee</td>
<td>Interviewee Passage</td>
</tr>
<tr>
<td>-------------</td>
<td>---------------------</td>
</tr>
</tbody>
</table>
| **H**       | **Question.** So it is basically aligning it up with business objectives?  
Right, it would be here is our “as is”, here are the business processes, I mean when we look at our “to be” state or where we want to be or where the business wants to go, can we get there from here with that solution or is there another way to do it? That’s what you got to do in order to get the business buy-in. |
| **I**       | **Question.** So alignment to business is definitely a value of EA?  
Yes. |
| **J**       | It is the connection to the technology; overarching, quick, accurate, precise connection to the technology to the business. |
| **K**       | I spent a great deal of time building out business capability and defining business capability maps and translating those; you know, sitting there with business people talking about strategy and how to map out IT enablement of that strategy, so it goes beyond IT. |
Appendix G

Table of Codes, Meanings, and Response Frequencies

<table>
<thead>
<tr>
<th>Ref</th>
<th>Code</th>
<th>Definition</th>
<th>Sources</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Adaptability and agility</td>
<td>EA facilitated an organization’s adaptability and agility</td>
<td>9</td>
<td>22</td>
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<tr>
<td>2.</td>
<td>Alignment of business and IT</td>
<td>Alignment of business and IT was achieved using EA</td>
<td>1</td>
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<tr>
<td>3.</td>
<td>Artifacts are a part of EA</td>
<td>An EA contains artifacts</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>4.</td>
<td>Business processes are in EA</td>
<td>The business processes of an organization should be a part of the EA</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>5.</td>
<td>Buy-in is important to EA</td>
<td>It is necessary to get organization buy-in in order to perform EA successfully</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>6.</td>
<td>Competitive advantage</td>
<td>EA provided a competitive advantage</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>7.</td>
<td>Complexity of EA</td>
<td>The difficulty or easiness of doing EA</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>8.</td>
<td>Consensus and trust</td>
<td>Consensus and trust resulted from doing an EA</td>
<td>4</td>
<td>8</td>
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<tr>
<td>9.</td>
<td>Describing the value of EA</td>
<td>How the interviewee would have explained the value of EA to an executive</td>
<td>8</td>
<td>22</td>
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<tr>
<td>10.</td>
<td>EA means a business and IT alignment</td>
<td>EA defined with an emphasis on achieving alignment between business and IT</td>
<td>4</td>
<td>4</td>
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<tr>
<td>11.</td>
<td>EA means a holistic representation of the enterprise</td>
<td>EA defined with an emphasis on a holistic representation of the enterprise</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>12.</td>
<td>EA means a planned vision of the enterprise</td>
<td>EA defined with an emphasis on a planned vision of the enterprise</td>
<td>5</td>
<td>5</td>
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<tr>
<td>13.</td>
<td>EA means a process, methodology, or framework for enhancing enterprise decision making</td>
<td>EA defined with an emphasis on supporting decision making</td>
<td>8</td>
<td>8</td>
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<td>14.</td>
<td>EA orientation between business and IT</td>
<td>Where did EA fit on the spectrum between business and IT</td>
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<td>26</td>
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<tr>
<td>15.</td>
<td>Enterprise visibility</td>
<td>EA provided a broad view of the enterprise</td>
<td>6</td>
<td>8</td>
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<td>16.</td>
<td>External EA influencers</td>
<td>External factors not directly attributable to the interviewee’s organization that influenced his/her perceptions about EA</td>
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<td>12</td>
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<tr>
<td>17.</td>
<td>Feasibility of EA</td>
<td>The worthiness of doing EA</td>
<td>7</td>
<td>11</td>
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<td>18.</td>
<td>Governance as a part of EA</td>
<td>Governance was a component of EA</td>
<td>15</td>
<td>19</td>
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<td>19.</td>
<td>Increase operational effectiveness</td>
<td>The enterprise becomes more effective with EA</td>
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<td>19</td>
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<tr>
<td>20.</td>
<td>Increase revenues and cost reduction</td>
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<td>Ref</td>
<td>Code</td>
<td>Definition</td>
<td>Sources</td>
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<td>14</td>
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<td>23.</td>
<td>Make better decisions</td>
<td>The decision making process benefited from EA</td>
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<td>24.</td>
<td>Move the organization forward</td>
<td>EA benefited organizations in reaching their goals</td>
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<td>25.</td>
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<tr>
<td>26.</td>
<td>Multiple frameworks and EA</td>
<td>Opinions about multiple frameworks in an EA</td>
<td>16</td>
<td>20</td>
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<tr>
<td>27.</td>
<td>Organizational leadership and EA</td>
<td>Viewpoints on the importance of having business leaders involved in EA</td>
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<td>28.</td>
<td>Organizational strategy and EA</td>
<td>Importance of the role between organizational strategy and EA</td>
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<td>29.</td>
<td>People who perform EA</td>
<td>Characteristics of people who perform EA</td>
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<td>27</td>
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<td>30.</td>
<td>Planning</td>
<td>EA helped organizations to plan better</td>
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<td>9</td>
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<td>31.</td>
<td>Process improvement</td>
<td>Enhancing current processes was a benefit of EA</td>
<td>5</td>
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<td>32.</td>
<td>Process of Describing the Value of EA</td>
<td>How the interviewee would have explained the value of EA to an executive</td>
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<td>33.</td>
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<td>EA helped in the product selection process</td>
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<tr>
<td>34.</td>
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<td>Opinions about how much of the enterprise should be included in an EA</td>
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<td>16</td>
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<tr>
<td>35.</td>
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<td>36.</td>
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<td>37.</td>
<td>Speak a common language</td>
<td>EA allowed an organization to speak a common language</td>
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<td>From an organizational standpoint, what were the appropriate times that EA should be performed</td>
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<td>18</td>
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<td>Win new business</td>
<td>EA helped organizations win new business</td>
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## Appendix H

### Table of Categories, Concepts, and Meanings

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<th>Category</th>
<th>Concepts</th>
<th>Meanings</th>
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<td><strong>Internal EA influencers</strong></td>
<td>Internal factors directly attributable to the interviewee’s organization that influenced his/her perceptions about EA</td>
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<td>Judgments gained from self development and experience that influenced the interviewee’s perceptions about EA</td>
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<td><strong>2. Characteristics of an EA</strong></td>
<td><strong>Artifacts are a part of EA</strong></td>
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<td><strong>Complexity of EA</strong></td>
<td>The difficulty or easiness of doing EA</td>
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<td><strong>EA orientation between business and IT</strong></td>
<td>Where did EA fit on the spectrum between business and IT</td>
</tr>
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<td></td>
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<td>The worthiness of doing EA</td>
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<tr>
<td></td>
<td><strong>Governance as a part of EA</strong></td>
<td>Governance was a component of EA</td>
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<td><strong>Inputs to EA</strong></td>
<td>Inputs required to conduct an EA study</td>
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<tr>
<td></td>
<td><strong>Multiple architectures and EA</strong></td>
<td>Perspectives about multiple architectures in an EA</td>
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<td><strong>Multiple frameworks and EA</strong></td>
<td>Opinions about multiple frameworks in an EA</td>
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<td>Viewpoints on the importance of having business leaders involved in EA</td>
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<td><strong>Organizational strategy and EA</strong></td>
<td>Importance of the role between organizational strategy and EA</td>
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<td><strong>People who perform EA</strong></td>
<td>Characteristics of people who perform EA</td>
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<td><strong>Scope of an EA</strong></td>
<td>Opinions about how much of the enterprise should be included in an EA</td>
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<td></td>
<td><strong>When EA is performed</strong></td>
<td>From an organizational standpoint, what were the appropriate times that EA should be performed</td>
</tr>
<tr>
<td>Category</td>
<td>Concepts</td>
<td>Meanings</td>
</tr>
<tr>
<td>------------------</td>
<td>-----------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>3. Benefits of EA</td>
<td>Adaptability and agility</td>
<td>EA facilitated an organization’s adaptability and agility</td>
</tr>
<tr>
<td></td>
<td>Alignment of business and IT</td>
<td>Alignment of business and IT was achieved using EA</td>
</tr>
<tr>
<td></td>
<td>Competitive advantage</td>
<td>EA provided a competitive advantage</td>
</tr>
<tr>
<td></td>
<td>Consensus and trust</td>
<td>Consensus and trust resulted from doing an EA</td>
</tr>
<tr>
<td></td>
<td>Enterprise visibility</td>
<td>EA provided a broad view of the enterprise</td>
</tr>
<tr>
<td></td>
<td>Increase operational effectiveness</td>
<td>The enterprise becomes more effective with EA</td>
</tr>
<tr>
<td></td>
<td>Increase revenues and cost reduction</td>
<td>EA resulted in increased revenues and cost reduction</td>
</tr>
<tr>
<td></td>
<td>Make better decisions</td>
<td>The decision making process benefited from EA</td>
</tr>
<tr>
<td></td>
<td>Move the organization forward</td>
<td>EA benefited organizations in reaching their goals</td>
</tr>
<tr>
<td></td>
<td>Planning</td>
<td>EA helped organizations to plan better</td>
</tr>
<tr>
<td></td>
<td>Process improvement</td>
<td>Organizational process improvement was a benefit of EA</td>
</tr>
<tr>
<td></td>
<td>Product selection</td>
<td>EA helped in the product selection process</td>
</tr>
<tr>
<td></td>
<td>Simplification of system and architecture management</td>
<td>EA reduced complexity in system and architecture management</td>
</tr>
<tr>
<td></td>
<td>Speak a common language</td>
<td>EA allowed an organization to speak a common language</td>
</tr>
<tr>
<td></td>
<td>Standardization and consistency</td>
<td>Standardization and consistency were benefits of EA</td>
</tr>
<tr>
<td></td>
<td>Win new business</td>
<td>EA helped organizations win new business</td>
</tr>
<tr>
<td>Category</td>
<td>Concepts</td>
<td>Meanings</td>
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<td>--------------------------------</td>
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<tr>
<td>4. Meaning of EA</td>
<td>EA means a business and IT alignment</td>
<td>EA defined with an emphasis on achieving alignment between business and IT</td>
</tr>
<tr>
<td></td>
<td>EA means a holistic representation of the enterprise</td>
<td>EA defined with an emphasis on a holistic representation of the enterprise</td>
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<td></td>
<td>EA means a planned vision of the enterprise</td>
<td>EA defined with an emphasis on a planned vision of the enterprise</td>
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<tr>
<td></td>
<td>EA means a process, methodology, or framework for enhancing enterprise decision making</td>
<td>EA defined with an emphasis on supporting decision making</td>
</tr>
<tr>
<td>5. Process of Describing the Value of EA</td>
<td>Process used by the interviewees to describe the value of EA</td>
<td>How the interviewee would have explained the value of EA to an executive</td>
</tr>
</tbody>
</table>
Reference List


