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# JOURNAL OF INFORMATION SYSTEMS APPLIED RESEARCH

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# Enterprise Architecture Transformation Process from a Federal Government Perspective

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## ABSTRACT

The need for information technology organizations to transform enterprise architecture is driven by federal government mandates and information technology budget constraints. This qualitative case study aimed to identify factors that hinder federal government agencies from driving enterprise architecture transformation processes from a compliancy to a flexible process. Common themes in interviewee responses were identified, coded, and summarized. Critical recommendations for future best practices, including further research, were also presented.

**Keywords:** enterprise architecture (E.A.), qualitative study, the federal government, E.A. frameworks

## 1. INTRODUCTION

Federal government agencies use enterprise architecture (E.A.) to enable I.T. planning and I.T. decision-making. E.A. also guides federal government agencies on reducing wasteful I.T. spending, increasing shared I.T. services, closing performance gaps, and promoting engagement among government, industry, and citizens (Common Approach to Federal Enterprise Architecture, 2012). Federal government agencies need E.A. guidelines that leverage other federal, state, local, tribal, and international experiences and have to conform to technology-related policies and guidelines from the Office of Management, Budget, and Federal Enterprise Architecture before making any E.A. decisions (Common Approach to Federal Enterprise Architecture, 2012). In federal government agencies, E.A. plays a vital role and is a challenging task for enterprise architects, senior leadership, I.T. professionals, and the domain teams tasked with ensuring

that the E.A. transformation process aligns with the I.T. business goals and objectives. Further, E.A. methodology debates have been targets for E.A. practitioners to argue over; rather than focusing upon their key stakeholders' needs, many have become enamored with completing a transformation process (Gotze, 2011).

There has been limited research on addressing how government agencies are using E.A. concepts to make I.T. decisions, explore the obstacles that interface with the E.A. transformation process and make the transformation process meaningful and measurable.

This study examined how federal government agencies transform from a compliance process to a practical implementation approach. The national government enterprise guides using E.A. to help federal government agencies to eliminate information technology duplication, increase shared services, and close

performance gaps (Common Approach to Federal Enterprise Architecture, 2012). The four researched questions are as follows: RQ1: What are the perceived obstacles that I.T. organizations encounter with driving the E.A. transformation process from a compliancy process to a more practical implementation process

RQ2: What are the perceived obstacles (i.e., mindsets, challenges, compliancy guidelines) I.T. organizations experience in executing an E.A. practical framework? RQ3: How can I.T. organizations make the transformation process meaningful and measurable? And RQ4: How is E.A. perceived to address the challenges on how to educate the mindsets of the stakeholders within the organization?

## **2. ENTERPRISE ARCHITECTURE & FRAMEWORKS PERSPECTIVE**

E.A. is a discipline described as aspiring to improve enterprise coherence; however, E.A. is still an evolving discipline that is still relatively immature. The Chief Information Officer Council (2001) defined enterprise architecture as a strategic information asset, which describes the mission and I.T. best practices necessary to perform the mission. Additionally, the Chief Information Officer Council (2001) stated the transformation processes for implementing new technologies in response to the changing mission needs. Thus, organizations are confused about the meaning, purpose, scope, and role of the overall E.A. architecture function. Further, current literature on E.A. is not clear on whether the author refers to the knowledge base, the process and practice, or the stakeholders (Bean, 2011). Research has illustrated that 70 percent of senior management found it necessary and desirable to practice E.A. across the organization (Nassiff, 2012). Nassiff indicated through his research that there was a lack of comprehension of the meaning of E.A. in terms of its scope across the enterprise.

Conversely, E.A. provides a blueprint for the information technology organization's existing I.T. infrastructure, which consists of the as-is state and the vision of practical and modernized infrastructure and the to-be state (Perera, 2010). Furthermore, Spewak (1993) noted that E.A. promotes the organization's needs for an incorporated I.T. strategy, permitting the possible neighboring synergy across the extended enterprise (Spewak, 1993). Rabaey (2014) indicated that enterprise architecture is described as being the link between strategy and execution. E.A. provides the means for

addressing the many facets of the enterprise's holistic approach to executing the overall strategy coherently in an efficient way.

A framework in enterprise architecture is described as the fundamental structuring mechanism that defines and separates concerns that may lead to a logical sequence of discovery and discourse on E.A. concepts. The most common frameworks the federal government uses are the Zachman framework, Federal Enterprise Architecture Framework (FEAF), and the United States

Department of Defense Architecture Framework (DoDAF). The Open Group Architecture Framework (TOGAF) and Enterprise Planning (EAP) are more methodology focused frameworks (Newman, 2014). The three structures that will be briefly addressed from a high-level approach are the Zachman framework, the United States Department of Defense Architecture Framework, and the United States Department of Defense Architecture Framework. Strategic planning plays a vital role in the synergy of an enterprise architecture framework. It is a reasonable step one; a strategic plan is also an essential best practice in the enterprise architecture frameworks process.

## **3. ENTERPRISE ARCHITECT'S ROLE IN THE ENTERPRISE ARCHITECTURE TRANSFORMATION PROCESS**

An enterprise architect is a person who provides effective communication to the stakeholders about the enterprise architecture initiatives and forms active teams that develop and implement enterprise architecture content (Nakakawa et al., 2010). Enterprise architects, along with other stakeholders, are accountable for implementing the E.A. initiatives (Asfaw et al., 2009). Enterprise architects experience difficulty understanding and communicating with other stakeholders (senior leadership, I.T. professionals, and domain teams).

## **4. STRATEGIC ALIGNMENT MODEL PERSPECTIVE.**

The strategic alignment model (SAM) is used to provide and conceptualize a visual of an organization's I.T. environment and business goals (Ullah & Lai, 2011). The strategic alignment model of Henderson and Venkatraman (1994) considers information technology (I.T.) alignment as occurring amongst the business strategy and business process, focusing on internal and external areas

for both I.S. strategy and I.S. infrastructure and governance. Further, SAM can illustrate views across the domain and suggest that neither strategic nor functional integration provides the alignment of an organization's business objectives effectively (Henderson & Venkatraman, 1994).

## 5. METHODOLOGY

An exploratory case study design was used to allow the researcher to explore and identify the factors that hinder federal government agencies from driving the E.A. transformation process. The federal government encompasses over 300 organizational entities of differing size, scope, and complexity, including departments, administrations, bureaus, commissions, agencies, and boards (The Common Approach to Federal Enterprise Architecture, 2012). Additionally, the organizational entities employ approximately 2.6 million people (The Common Approach to Federal Enterprise Architecture, 2012). The participant recruitment focused on a population of senior managers, I.T. professionals, and enterprise architecture professionals within the LinkedIn community.

The point of data saturation was reached at 11 participants. The participants were full-time employees with at least two years or more experience. Triangulation of the data provided a means to ensure the validity and reliability of confirming the findings captured within the case study in a sound manner (Miles et al., 2014). Further, the triangulation of sources was used to examine the consistency of the different patterns and views of the findings retrieved from the interviews. Interviews were used to explain how agencies are dealing with the barriers of transforming E.A. from a compliance process to a practical implementation approach. Further, interviews were conducted via Skype or telephone. The participants were asked to answer questions that focused on the perceived obstacles that Information Technology organizations encounter with driving the E.A. transformation process from an E.A. compliance process, the obstacles Information Technology organizations experience in executing an E.A. practical framework, and how E.A. is perceived to address the challenges of how to educate the mindsets of the stakeholders within the organization.

The coding process was used to analyze and retrieve meaningful data (Miles, Huberman, & Saldana, 2014). The interview responses were analyzed using Microsoft Excel software to code

the data collected from the interviews. The interview questions were evaluated by a panel of three I.T. professionals (known as field testers) that have experience with the E.A. transformation process. The three field testers that participated in the field test study knew E.A. and worked in E.A. and I.T. organizations.

The feedback received from the field test study provided recommendations on clarifying who the stakeholders were that are part of the E.A. process and provided suggestions on updating the interview questions, so the questions were more focused.

## 6. RESULTS

Demographic information collected from each participant included the participant's role, job title, years of experience, and geographic region. The years of experience of the participants ranged from 5 to 20+ years. The majority of the participants were located in the Washington DC geographical area. Two of the participants indicated they had performed in both the enterprise architect and management roles. The majority of participants, eight altogether (P1, P2, P3, P4, P5 P6, P8, & P9), indicated that they worked as I.T. specialists or I.T. managers.

### Themes from the Analysis of Interview Data and Research Questions, RQ1

This question included topics relating to obstacles that affect the E.A. transformation process. Participants were asked four interview questions. The analysis revealed three main themes relating to the challenges that emerged in response to RQ1.

#### RQ1.Theme1: Definition of Requirements and Communications Objectives

Four of the 11 participants (P1, P2, P9, & P10) noted that understanding the requirements and having unclear requirements were obstacles. Six of the 11 participants (P1, P4, P7, P8, P9, & P11) believed that a communication process among users and stakeholders aids the E.A. transformation process.

#### RQ1. Theme 2: Gaining Buy-In

Five participants (P2, P4, P7, P9, & P11) had strong views about obtaining buy-in from management because users and stakeholders were obstacles that hindered the E.A. transformation process. P2 explained that it is

essential to get user buy-in before the E.A. transformation process is implemented.

**RQ1. Theme 3: Resistance to Change.**

Three of the 11 participants (P4, P5, & P6) expressed views about why resistance to change impedes the E.A. transformation process. P4 stated that one of the main obstacles is "people's resistance to the change.

**RQ2**

This question included topics relating to obstacles. RQ2 revealed three main themes relating to the perceived barriers: (a) Planning the execution, (b) compliance guidelines, and (c) I.T. security challenges.

**RQ2. Theme 1: Planning the Execution**

Five of the 11 participants (P1, P2, P5, P10, & P11) believed planning plays a crucial role in executing an E.A. practical framework.

**RQ2. Theme 2: Compliancy Guidelines**

Three of the 11 participants (P3, P7, & P11) provided insight into the Office of Management and Budget (OMB) guidelines that I.T. organizations apply when implementing an E.A. framework.

**RQ2. Theme 3: I.T. Security Challenges**

Several common themes emerged among three of the 11 participants (P1, P8, & P11) concerning I.T. security challenges that I.T. organizations face when executing an E.A. practical framework.

**RQ3**

This question involved topics related to making the transformation process meaningful and measurable. Participants were asked four interview questions. The analysis revealed three main themes relating to making the transformation process significant and quantifiable.

**RQ3. Theme 1: Focusing on the Target State**

Two of the 11 participants (P7 & P11) provided helpful comments about making the E.A. transformation process meaningful and measurable. P7 stated that E.A. should be approached "from an end-to-end view of your operating environment." P11 suggested that I.T. organizations need to "keep the big picture" in mind when aligning the target state. The two participants both stated that the target state should be defined clearly. Further, the participants suggested the biggest challenge is

prioritizing the target state of the E.A. transformation process.

**RQ3. Theme 2: Budget and Cost-Benefit Analyses**

Three of the 11 participants (P6, P8 & P10) provided views on how to budget, and cost-benefit analysis approaches should be considered when attempting to make the E.A. transformation process meaningful and measurable.

**RQ3. Theme 3: Incorporating a Plan**

Four participants (P4, P6, P8, & P11) provided sound suggestions as to why incorporating a plan is essential for making the E.A.'s process is meaningful and measurable.

**RQ4**

This question included topics related to addressing challenges concerning how to educate the stakeholders' mindsets within the organization. Participants were asked four interview questions. The analysis revealed three main themes for addressing the challenges shown in response to RQ4: (a) Face-to-face (F2F) meeting with stakeholders, (b) training the stakeholders, and (c) inviting stakeholders early in the process.

**RQ4. Theme 1: F2F Meeting with Stakeholders**

Four of the 11 participants (P1, P4, P5, & P9) expressed that formal communication approaches, such as F2F meetings and discussions, are ways to address the challenges within an I.T. organization.

**RQ4. Theme 2: Training the Stakeholders**

Training the organization's stakeholders was a common theme was among three (P2, P9, & P11) of the 11 participants. P2 explained that "various methods of training" that entailed "formal and informal classes, hands-on training, instructor-led training sessions, and online, self-service portals" about E.A. initiatives would serve to provide insight into and for users and stakeholders. P9 stated, "Mindset change starts with providing upfront training" at the beginning of a new process. P11 likewise suggested that the first task is to create awareness to provide training and show videos about the E.A. transformation process.

**RQ4. Theme 3: Invite the Stakeholders Early**

Inviting stakeholders early in the process was a unique theme communicated by two of the 11 participants (P5 & P6).

## 7. EVALUATION OF FINDINGS

Three findings related to the themes identified in response to RQ1 have empirical support in the literature reviewed.

### Finding 1

The importance of balancing E.A. transformation process requirements within different levels within the organization and maintaining continuous communication with and among users and leadership was confirmed. Madison (2010) suggested that communication best practices are achieved best when the E.A. practice is centralized and the E.A. process formalized. The findings in this study supported Simon et al. 's (2013) perspective about why communication is the foundation for a common understanding of business and I.T. stakeholders. Besides, the findings in this study were consistent with Buckl et al. 's (2010) ideas about how proper management of E.A. fosters communication between stakeholders, such as enterprise architects, senior leadership, I.T. professionals, and domain teams, that are part of the E.A. transformation process and the E.A. review process.

### Finding 2

Gaining buy-in from management, users, and leadership was a fundamental theme. Participants considered gaining buy-in from management as one of the most crucial elements for executing an E.A. transformation process. The finding is supported by Godoe and Johansen's (2012) perspective about why buy-in from users is necessary to initiate successful E.A. implementation and a more effective E.A. transformation process. In previous research, it has been suggested that gaining the feedback and input of users during the early stages of an E.A. transformation process is a critical component (Wax, 2011). Wax (2011) analyzed how user buy-in is increased when users take ownership roles in organizational changes. Increased user buy in allows for a decreased level of resistance during the change process, which increases the probability of successful implementation (Wax, 2011).

### Finding 3

Resistance to change was another finding. Many participants communicated their views on how resistance to change hinders the E.A. transformation process. In

general, the E.A. transformation process's implementation can result in users resisting the process due to uncertainties and fears of the unknown. The findings from this study confirm Hess's (2006) premise that resistance to change is a critical barrier that hinders the transformation of the E.A. in the federal government. Merely understanding that users' resistance to change is familiar will not provide management with any value if they fail to understand the methods and techniques used to minimize that resistance (Goodeve, 2009). Understanding why users resist change is necessary to understand ways to combat the act of resistance.

Three findings that contributed to answering RQ2 were found to have support in previous research.

### They are finding 1

Planning the E.A. framework's execution plays a critical role in achieving an E.A. practical framework that was revealed in this study. Previous researchers have explained how the lack of proactive planning is one factor that hinders the execution of E.A. practical frameworks (Asfaw et al., 2009). The findings from this study also supported Meyers (2011) theory that planning E.A. objectives aids in the creation of an enterprise mission, vision, and strategic business plan. The planning process requires building relationships with crucial E.A. leadership to execute the E.A. framework process successfully. Besides, planning is a reasonable step that is a vital best practice in the E.A. frameworks process. Research by Rollings (2010) indicated that more effort needs to be invested in streamlining the connection between E.A. and organizations' strategic planning needs.

### Finding 2

The compliance guidelines that I.T. organizations apply when trying to achieve an E.A. framework were also themes identified in this study. The analysis reveals that compliancy mandates do not provide practical guidance about E.A. transformation best practices.

The analysis disclosed that some participants felt frustrated with the compliance guidelines set by departments because the instructions can affect the workflow of the metric process; moreover, compliancy guidelines affect the CPIC process and can affect the amount of funding for I.T. and E.A. initiatives. Previous

research indicated that the OMB mandates that federal agencies document and submit their E.A. initiatives to the OMB for review, along with any significant changes that may occur to the E.A. process (Grasso, 2011). The OMB also uses various studies to evaluate the adequacy and efficiency of each agency's E.A. compliance. For instance, Powner et al.'s (2014) examination indicated that PortfolioStat requires federal government agencies to conduct annual reviews of their I.T. portfolios (e.g., E.A.) as part of an effort to reduce commodity I.T. spending. Agencies are expected to demonstrate how their I.T. investments align with their missions and business objectives. Several federal government agencies have experienced limitations in implementing the PortfolioStat initiative, for example, the Chief Information Officers' authority constraints. This study's findings reveal that the best practices of meeting mandates and compliance guidelines are not followed when making I.T. decisions. The compliancy process does not provide practical guidance about E.A. transformation best practices.

### **Finding 3**

Findings in this study reveal that I.T. security challenges exist for I.T. organizations when executing an E.A. practical framework. Participants emphasized their concerns about how I.T. security guidelines, such as Cybersecurity and firewall policies, can impede EA-related initiatives. Limited research exists on the I.T. security challenges organizations face with the implementation of EA-related initiatives. A great deal of research has been focused on how security is an integral part of the E.A. process and on how the synergy of security and E.A. working together save the organization money and time (Madewell, 2014; Minoli, 2008), but little research is focused on the challenges and I.T. security constraints that I.T. organizations face when implementing EA-related initiatives.

### **Finding 1**

Participants offered practical advice about how organizations can implement E.A. initiatives from a target state perspective to ensure E.A. transformation processes more meaningful and measurable. The approach to delivering enterprise initiatives requires broader thinking and maintaining a streamlined focus on the current state and future state outcomes. Previous researchers have indicated that E.A. has the means to guide enterprise initiatives

toward enterprises' transformation (Krishnamurthy, 2014), and E.A. provides a blueprint for the as-is state and the vision of practical and modernized infrastructure and the to-be state (Pereira, 2010). Schekkerman and Hendricks (2002) and Op't Land et al. (2008) discussed how governance ensures conformity to the E.A. transformation process when defining the current state's goals and the desired state of the E.A. process. The governance approach provides a way to efficiently and adequately govern the E.A. transformation process (Gotze, 2011). Previous research cited by Sidorova and Kappelman (2011) found that stakeholders consider E.A. an aspect of the status quo. Some leadership subscribes to the view that E.A. is a set of mandates, standards, or blueprints for the enterprise's future. In contrast, other directions include both the current state and desired state and the transformation plan between those present and future states.

### **Finding 2**

Conducting budget and cost-benefit analyses was revealed as an approach that needs to be incorporated and managed correctly in the E.A. implementation process. This finding supports that of Wagter et al. (2014), which is that maintaining the E.A. governance process with cost-benefit analyses would ensure that the contribution of E.A. is known continuously. The finding also coincides with the study by Grasso (2011), who indicated that management efforts should be focused on unnecessary cost avoidance; for example, enterprise software-license agreements consolidation efforts assisted the Department of the Interior with saving approximately \$80 million. Further, the Department of Health and Human Services achieved budget and avoided costs by leveraging E.A. governance best practices in improving its telecommunications infrastructure (Grasso, 2011).

### **Finding 3**

Incorporating a plan was revealed is an approach that would include roadmap objectives to assist with making the E.A. transformation more efficient and making E.A. transformation decisions. This finding confirmed Niemi and Pekkola (2013) view that having an initial plan in place before any acquisition and E.A. initiative decisions are made is critical. Incorporating a plan can help make architectural decisions when guiding I.T. initiatives to comply with the overall E.A. process. Outcomes from this study concerning incorporating a project plan that included

information about the target architecture, priorities, and roadmap objectives (i.e., investments) were consistent with Khadem's (2007) theory that combining and engaging I.T. units, such as plans and investments, are needed to support the overall functionality and purpose of the organization.

Three findings that contributed to answering RQ4 were found to have support in previous research.

### **Finding 1**

F2F meetings with stakeholders (i.e., leadership) can assist with addressing the E.A. transformation process challenges was a finding that was revealed in this study. Davis et al. (1989) developed an abstract style for providing insight into individual behaviors when addressing I.T. implementation challenges by meeting with I.T. user groups. The finding supports Davis et al. (1989). They indicated that the problems presented by user behavior could be addressed with meetings with users to gain clarity on users' attitudes and subjective norms as well as gain insight into the perceived usefulness and ease of use.

### **Finding 2**

Training stakeholders about E.A. objectives (i.e., the E.A. transformation process) creates awareness and understanding about E.A. objectives and aids in addressing E.A. transformation challenges. This finding concurs with research conducted by Lapalme and de Guerre (2014). They suggested that ongoing training and development are proactive ways to tackle the complexities of turbulent E.A. environments and are necessary for organizational sustainability and adaptation. Besides, the findings are supported with literature that indicated the implementation of E.A. transformation processes face challenges because of the lack of knowledge and understanding of how to execute the enterprise transformation process in a practical way (Asfaw et al., 2009).

Nassiff (2012) indicated through his research that a lack of comprehension of the meaning of E.A. in terms of its scope across enterprises exists. Niemann (2006) explained that knowledge offers a competitive advantage for enterprises in today's ever-changing market environment. Further, the power of knowledge not only originates from competitors, future trends, and technologies, but also derived from the internal makeup and processes of an enterprise (Buckl et al., 2010). Locke et al.

(2010) indicated that building an understanding of the E.A. transformation process from a humanistic viewpoint is vital for learning about the transformation process.

### **Finding 3**

The findings revealed that inviting the stakeholders (i.e., management) to participate early in the process would assist with gaining support and providing direction before the execution of E.A. initiatives. Based on previous related research, this approach's success would depend on the ability to transform the beliefs of management about control and design opportunities that inspire a productive dialogue amongst managers and users (Lapalme & de Guerre, 2014). According to Op't Land et al. (2008) and Wagter (2009), E.A. offers a means for stakeholders to obtain insight about the organizational structure and make decisions early on the direction of the E.A. transformation process. As a result, the E.A. can provide a means to guide the E.A. transformation process and enable senior management to govern the enterprise coherently (Wagter et al., 2014).

An essential proactive approach would be to discuss E.A.'s goals and objectives with the stakeholders (i.e., management) before introducing and describing how to measure payback (Rico, 2006). Further, Rico (2006) indicated that understanding the goals and objectives of E.A. is a necessary approach for the stakeholders (i.e., management) to measure return on investment, apply E.A. successfully, and receive benefits of the E.A. process. Several recommendations for the E.A. transformation process were identified based on this qualitative case study.

### **Practical recommendation 1**

I.T. organizations must use different communication approaches within I.T. and business organizations. Communication will assist with clarifying confusion about constructs about the management of E.A. as well as achieve a common understanding of the overall E.A. initiatives (Simon et al., 2013). Communication should be simple, fluid, and ongoing with leadership and users of the I.T. organization and the business organization. The interface will provide a foundation for common understanding for both business and I.T. stakeholders (Simon et al., 2013). Based on the research findings, communication should not be

a one-time approach; discussion should be ongoing.

### **Practical recommendation 2**

The proposal is that more research is conducted about the usefulness of obtaining support from stakeholders before implementing the E.A. transformation process. Support from the stakeholders (e.g., users and leadership) at all levels of the E.A. transformation process should be obtained. Obtaining assistance from users is necessary to initiate a successful I.T. implementation process (Godoe & Johansen, 2012). The findings revealed that gaining buy-in from stakeholders is essential in the E.A. transformation process's practical execution. Obtaining support from stakeholders will minimize the challenges of executing the E.A. transformation process and assist with influencing the stakeholders' views.

### **Practical recommendation 3**

The proposal is to incorporate a plan during all stages of the E.A. transformation process. Based on the findings, including a project is a means for tracking the current state's components and the target state of the E.A. transformation process. The research results of this study highlighted that a plan (i.e., E.A. plan) is necessary for making the E.A. transformation process more efficient. Research participants agreed that putting together an action plan, a project plan, and a deployment plan and creating a timeline for the E.A. plan should be presented to the stakeholders before the I.T. infrastructure changes occur. Doing so may ensure that the E.A. transformation process is executed in a more agile fashion. Strategically, incorporating a plan plays a vital role in the synergy of the E.A. transformation process stages. Further, a program may aid in creating an enterprise mission, vision, and strategic business plan. Previous research suggested that building relationships with crucial E.A. stakeholders may be required if the E.A. transformation process is to be executed successfully (Meyers, 2011).

## **8. CONCLUSIONS**

This qualitative case study focused on the challenges facing the execution of an E.A. transformation process within the federal government. This topic has not been researched qualitatively. The study's goal was to fill the gap in scholarly research about the barriers that affect the transformation process and focus on how to apply strategic approaches for driving the E.A. transformation process toward a

practical approach. In general, E.A. is an emerging discipline, and like other maturing business processes and technical concepts, E.A. provides a foundation for both organizational transformation and I.T. management. The effective use of E.A. is a recognized hallmark of successful public and private organizations (U.S. GAO, 2010).

The study confirmed that several of the E.A. transformation process challenges were congruent with findings from previous studies and uncovered additional findings that could drive future research and theory building.

This qualitative study's results make a significant contribution to the E.A. transformation process area of research by further refining the E.A. transformation process phenomenon. The insightful information and understanding gained from participants in this study highlighted factors that hinder federal government agencies from driving the E.A. transformation process from a compliance process to a more efficient implementation process that is flexible enough to accommodate the change.

The study has contributed to the scholarly research by further refining the E.A. transformation process phenomenon within the federal government and identified obstacles that interfere with the E.A. transformation process. The latter entails understanding how to make the transformation process meaningful and measurable while addressing the challenges that the federal government faces on how to influence the views of the stakeholders.

## **9. REFERENCES**

- Asfaw, T. (2009). *Enablers and challenges in using enterprise architecture concepts to drive transformation: Perspectives from private organizations and government agencies*. (Ph.D. dissertation). Available from ProQuest Dissertations & Theses Global database. (UMI No. 304881864)
- Bean, S. (2011). Rethinking enterprise architecture using systems and complexity approaches. *Journal of Enterprise Architecture*, 6(4), 7-13. Retrieved from [http://www.irmuk.co.uk/articles/s\\_bean\\_re\\_thinking\\_enterprise\\_architecture.pdf](http://www.irmuk.co.uk/articles/s_bean_re_thinking_enterprise_architecture.pdf)
- Buckl, S., Dierl, T., Matthes, F., & Schweda, C. M. (2010). Building blocks for enterprise architecture management solutions. *Practice-Driven Research on Enterprise*

- Transformation*, 69, 17-46.  
doi:10.1007/978-3-642-16770-6\_2
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 35(8), 982-1003. doi:10.1287/mnsc.35.8.982
- Common Approach to Federal Enterprise Architecture. (2012). Retrieved from [http://www.whitehouse.gov/sites/default/files/omb/assets/egov\\_docs/common\\_approach\\_to\\_federal\\_ea.pdf](http://www.whitehouse.gov/sites/default/files/omb/assets/egov_docs/common_approach_to_federal_ea.pdf)
- Grasso, T. (2011). Auditing the implementation of enterprise architecture at the federal railroad administration. *Journal of Enterprise Architecture*, 7(1), 57-62. Retrieved from <http://iucontent.iu.edu.sa/Scholars/Information%20Technology/Enterprise%20Architecture.pdf>
- Godoe, P., & Johansen, T. S. (2012). Understanding adoption of new technologies: Technology readiness and technology acceptance as an integrated concept. *Journal of European Psychology Students*, 3, 38-52. doi:10.5334/jeps.aq
- Goodeve, S. (2009). Leadership success—How to get employees to accept changes. *EzineArticles*. Retrieved from <http://ezinearticles.com/?Leadership-Success---How-to-Get-Employees-to-Accept-Change&id=2227549>
- Henderson, J. C., & Venkatraman N. (1994). Strategic alignment: A model for organizational transformation via information technology. In T. Allen & M. Morton (Eds.), *Information technology and the corporation of the 1990s* (pp. 202-220). New York, NY: Oxford University Press.
- Hess, M. (2006). *Enterprise architectures: If we build it, will they come?* Retrieved from <http://links.enterprisearchitecture.dk/links/files/EnterpriseArchitecturesWhitePaper.doc>
- Khadem, K. N. (2007). *Aligning enterprise and information technology strategy: A study of the correlation between strategic alignment and adaptation of enterprise-wide strategy formulation processes*. (Ph.D. dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 304722267)
- Krishnamurthy, R. (2014). Architecture leadership and systems thinking. In P. Saha (Ed.), *A systemic perspective to managing complexity with enterprise architecture* (pp. 192-215). Singapore, Malaysia: National University of Singapore Press. doi:10.4018/978-1-4666-4518-9.ch007
- Lapalme, J. S., & de Guerre, D. W. (2014). Enterprise-in-environment adaptation: Enterprise architecture and complexity management. In P. Saha (Ed.), *A systemic perspective to managing complexity with enterprise architecture* (pp. 237-254). Singapore, Malaysia: National University of Singapore Press. doi:10.4018/978-1-4666-4518-9.ch006
- Locke, L. F., Silverman, S. J., & Spirduso, W. W. (2010). *Reading and understanding research*. (3rd ed.). Los Angeles, CA: Sage.
- Madison, J. (2010). Agile architecture interactions. *Software, IEEE*, 27(2), 41-48. doi:10.1109/
- Madewell, D. C. (2014). *Security implementation in enterprise architecture*. Retrieved from [http://www.academia.edu/9891443/Security\\_Implementation\\_in\\_Enterprise\\_Architecture](http://www.academia.edu/9891443/Security_Implementation_in_Enterprise_Architecture)
- Meyers, M. P. (2011). The frugal enterprise architect. *Enterprise Architecture Journal*, 7(1), 48-56. Retrieved from <http://eapj.org/>
- Miles, M. B., Huberman, A. M., & Saldana, J. (2013). *Qualitative data analysis: A methods sourcebook*. Thousand Oaks, CA: Sage.
- Minoli, D. (2008). *Enterprise architecture A to Z: Frameworks, business process modeling, SOA, and infrastructure technology*. Boca Raton, Florida: Auerbach.
- Nakakawa, A., Bommel, P. V., & Proper, H. A. (2010). Challenges of involving stakeholders when creating enterprise architecture. In *5th SIKS/BENAIIS Conference on Enterprise Information Systems*, 43-55. doi:10.1007/978-3-642-16770-6\_7
- Nassiff, E. (2012). *Understanding the value of enterprise architecture for organizations: A grounded theory approach* (Doctoral Dissertations). Available from ProQuest Dissertations & Theses Global database. (UMI No. 1047342243)

- Newman, E. M. (2014). Federated enterprise architecture: Meaning, benefits, and risks. In P. Saha (Ed.), *A systemic perspective to managing complexity with enterprise architecture* (pp. 331-360). Singapore, Malaysia: National University of Singapore Press. doi:10.4018/978-1-4666-4518-9.ch006
- Niemann, A. (2006). Beyond problem-solving and bargaining: genuine debate in E.U. external trade negotiations. *International Negotiation*, 11(3), 467-497. doi:10.1163/157180606779155246
- Op't Land, M., Proper, E., Waage, M., Cloo, J., & Steghuis, C. (2008). *Enterprise architecture: Creating value by informed governance*. Springer, Berlin: Springer Science & Business Media.
- Perera, D. (2010). *GAO issues new E.A. maturity framework*. Retrieved from <http://www.fiercegovernmentit.com/story/gao-issues-new-ea-maturity-framework/2010-08-09>
- Powner, D. A., Hinchman, D., Eyler, R., & Walsh, K. (2014). *Information Technology: Leveraging best practices and reform initiatives can help defense manage major investments* (No. GAO-14-400T). Retrieved from <http://www.appropriations.senate.gov/sites/default/files/hearings/GAO-14-568T.pdf>
- Rico, D. F. (2006). A framework for measuring ROI of enterprise architecture. *Journal of Organizational and End User Computing*, 18(2), 1-12. Retrieved from <http://www.igi-global.com/journal/journal-organizational-end-user-computing/1071>
- Rollings M. (2010). Challenged by relevance? Make E.A. disappear. Gartner Blog Network. [Web log comment]. Retrieved from <http://blogs.gartner.com/mike-rollings/2010/05/24/challenged-by-relevance-make-ea-disappear/>
- Sidorova, A., & Kappelman, L. (2011). Better business-IT alignment through enterprise architecture: An actor-network theory perspective. *Journal of Enterprise Architecture*, 7(1), 39-47. doi:10.1007/978-3-642-25203-7\_23
- Simon, D., Fischbach, K., & Schoder, D. (2013). An exploration of enterprise architecture research. *Communications of the Association for Information Systems*, 32(1). Retrieved from <http://aisel.aisnet.org/cgi/viewcontent.cgi?article=3684&context=cais>
- Spewak, S. H., & Hill, S. C. (1993). *Enterprise architecture planning: Developing a blueprint for data, applications, and technology*. New York, NY: John Wiley.
- Perera, D. (2010). *GAO issues new E.A. maturity framework*. Retrieved from <http://www.fiercegovernmentit.com/story/gao-issues-new-ea-maturity-framework/2010-08-09>
- Rabaey, M. (2014). Complex adaptive systems thinking approach to enterprise architecture. In P. Saha (Ed.), *A systemic perspective to managing complexity with enterprise architecture* (pp. 331-360). Singapore, Malaysia: National University of Singapore Press. doi:10.4018/978-1-4666-4518-9.ch006
- Ullah, A., & Lai, R. (2011). A requirements engineering approach to improving IT-Business alignment. *Information Systems Development*, 771-779. doi:10.1007/978-1-4419-9790-6\_62
- U.S. General Accounting Office. (2010). *A framework for assessing and improving enterprise architecture management* (GAO-10-846G). Retrieved from <http://www.gao.gov/assets/80/77233.pdf>
- Wagter, R., Proper, H. A., & Witte, D. (2014). A Theory for enterprise coherence governance. In P. Saha (Ed.), *A systemic perspective to managing complexity with enterprise architecture* (pp. 150-191). Singapore, Malaysia: National University of Singapore Press. doi:10.4018/978-1-4666-4518-9.ch006
- Wax, D. (2011). How to lead change in your organization. *Stepcase Lifehack*. Retrieved from <http://www.lifehack.org/articles/featured/how-to-lead-change-in-your-organization.html>