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Air Force users' perceptions of the value of information technology-enabled enterprise business systems

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ABSTRACT

Air Force Users' Perceptions of the Value of Information Technology-Enabled Enterprise Business Systems

by

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B.S., Douglass College, Rutgers University, 1977

Dissertation Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Philosophy
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ABSTRACT

Based on the Government Performance and Results Act, the United States Air Force is transforming its business through e-government, the adoption of information technology enabled enterprise business systems. The problem this research addressed was the lack of theory on implementation success of enterprise business systems, especially when users perceive that organizational mission and the value of the systems differ from the enterprise vision and goals. The purpose of the study was to conceptualize the acceptance of enterprise business systems by internal users. The research was based on theories about the influence and interaction of drivers of technology adoption and user acceptance. The critical research questions involved exploring the internal users' perceptions of the value of the systems, what users need, and how those perceptions align with the vision and goals of their organization and the enterprise business systems. Grounded theory was used to construct a theory of the value and acceptance of the enterprise systems from the users' perspectives and experiences. Data were collected from twelve study participants using open-ended and semi-structured interview questions. The data were analyzed using an iterative comparative process to derive commonalities and differences among user value. The findings demonstrated that when internal users value an enterprise business system, shared understanding of the vision the system will be effective and efficient and will meet organizational goals. These findings can be used to improve the alignment of the Air Force systems' value for the user and the enterprise, increase the transparency in IT transformations, and enhance the effectiveness of enterprise system change initiatives, thus resulting in overall reduced business costs.

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DEDICATION

To Joe

Thank you for helping me through this project.

I could not have done it without your love, patience, and endless support.

Thank you.

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I extend my greatest appreciation to the leaders at Base X for their cooperation and sponsorship, for without them this study would not have been possible. I sincerely hope that the findings from this study provide insight and useful information for Air Force leadership on the development and implementation of transforming IT-enabled enterprise business systems, when and where the human is an essential part of the system.

I give special thanks to the Walden community of support staff, students, teachers, and mentors who started me off on this quest and provided their support through each challenging step. Their constant support and motivation helped in the achievement of this degree. I was fortunate to be guided by a committee with great insight, experience, and knowledge: Dr. Anthony Leisner; Dr. Janet Pershing; and my committee chair, Dr. Dale Swoboda. Your expertise and patience were wonderful, and you will always have a special place in my heart. I could not have done it without you. Thank you so much.

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CHAPTER 1: INTRODUCTION TO THE STUDY

Introduction

Information technology (IT) systems are changing the way the U.S. Air Force (AF) in the Department of Defense (DoD) performs internal business processes. This change originated from citizen pressures and the Government Performance and Results Act of 1993 that called for more efficient and effective government at a reduced cost. The President's Management Agenda (2004) set the vision for transforming government business through expanded electronic services. Change objectives included increased accountability for costs, achievement of results, improved efficiency, effectiveness, and responsiveness to the citizen (Office of Management and Budget [OMB], 2002).

This change has impacted the people, processes, and organizations in the AF and requires the buy-in from employees or the internal users of the systems because they are integral to the business processes. The internal users perform work including budgeting, training, purchasing, and human resource management by using the systems so their acceptance and compliance with the enterprise systems are essential to process transactions, analyze programs, and produce information for management decision making. Their perceptions of the value of the IT systems can influence their decision to adopt and use the technology especially when users believe the systems perform a useful function and were easy to use (Adamson & Shine, 2003; Davis, 1989; Mathieson, 1991). This study sought to understand internal users' perceptions of the value of the enterprise business systems because the business processes rely on their acceptance and use to produce work. If they do not find or see value in the enterprise business systems, they

often find other ways to satisfy their needs, such as purchasing or developing their own nonenterprise solutions (Pilot B). This behavior can result in unaccounted systems which can thwart change efforts, waste resources, and cause conflict for the AF chief information officers (CIOs), who were mandated by the Clinger-Cohen Act of 1996 to account for all IT expenses and implement enterprise-wide systems. AF base-level CIOs often find accounting for systems difficult when internal users create nonaccountable, independent systems and for making IT investments visible (USAF Command X, 2005). The resulting lack of standardization is costly as redundant systems are created which utilize funding and resources that could be applied to more critical needs. When standards within departments are not enforced, and when unauthorized IT purchases are made or alternate systems are used, new and unrecorded support expenses often occur (Holmes, 2001). These unauthorized systems add to the architectural complexity and place additional stress on budgets for operating and maintaining IT services and infrastructure.

The AF change effort, which is called Air Force Smart Operations for the 21st Century, plans further budget reductions by implementing more enterprise business systems. The potential for savings from more effective and efficient systems is great because "in a $2.4 trillion federal budget, each percentage point of overall increased effectiveness and efficiency has a value of $24 billion per year in savings to the taxpayer" (President's Management Agenda, 2004, p. 11) through these type of initiatives. The scope of change and improvement involves a DoD IT budget, including the Air Force, which was almost half of the $65.5 billion request for all federal government agencies in 2008 (OMB, 2007d). It is imperative that the AF implement their enterprise systems in an

environment of expanding global communication needs, high competition for funding and resources, and expectations for greater efficiency and effectiveness so that automation and integration of processes can be accomplished in the most effective and efficient manner (USAF Command X, 2005).

Obstacles to achieving goals in an organization such as the creation of the AF enterprise business system can include a lack of buy-in to the goals and change (Beach, 2006). CIOs need to assess the environment or the implementation buy-in of the enterprise systems by understanding the users' perceived value of IT to make system and policy decisions that meet the users' needs and increase their acceptance of change (Beach, 2006; Bennis, 2003). Creating buy-in and eliminating stand-alone solutions requires CIOs to communicate policies, create a sense of shared purpose, and improve mandated systems through user feedback and involvement (Holmes, 2001).

This study focused on understanding AF internal users' perceptions of the value of IT-enabled enterprise business systems. Finding out what they think about the value of the enterprise business systems may help the CIOs to make the best IT implementation decisions in a resource-constrained environment. Literature and research in technology adoption, customer relations management, organizational change, and leadership vision and shared values have substantiated the need to understand how people impacted by change value the change. A detailed discussion in chapter 2 integrates the literature in these areas to support the concept of the users' perceptions of value derived from this study.

Background of the Study

The inception of government-wide IT enterprise architecture (EA) and governance processes for standardized systems and processes arose from the Government Performance and Results Act and a series of legislative acts, including the E-Government Act of 2002, the Federal Information Security Management Act, the Government Paperwork Elimination Act, the Paperwork Reduction Act, and the Information Technology Management Reform Act of 1996. The Information Technology Management Reform Act, also known as the Clinger-Cohen Act of 1996, established government CIOs with full responsibility and accountability for all IT investments in their agencies (OMB, 2007b). The OMB is responsible for all oversight on federal information resources and e-government practices, and relies on the help of a CIO Council. Jointly, they oversee policy on interoperable systems or system operations between agencies, security, privacy, standards, and best practices, and help agencies achieve legislation goals and mandates (Seifert, 2002).

Circular No. A-130, the Management of Federal Information Resources, established policy for information resources and technology management. The policy included resource planning, investment control, and process reengineering before investing in systems (OMB, 2007a). To accomplish these directions, the OMB developed a Federal Enterprise Architecture (FEA) to provide a common framework for the cross-agency collaboration and development of e-government architectures (OMB 2007b). The FEA set the rules and standards, and it put the governance system in place to ensure interoperability, end-user satisfaction, security, and compliance with the Government

Paperwork Elimination Act (OMB, 2007a). The FEA's business-based framework focuses on citizen-centered improvements that aligns investments to strategic goals, responds to changing mission needs, and identifies common solutions for improved services (Bass & Mabry, 2004; OMB, 2007c). FEA outlines complex relationships and dependencies, which often require organizational redesign and process integration (Cerniglia, 2007). The goals are to create stronger decision making across the federal government as an enterprise, prevent inefficient and inconsistent business processes and technologies, and support enhanced performance.

The OMB integrated multiple management frameworks in a business reference model to improve the delivery of common financial, human resources, health, community, and social services for citizens in 2002. The federated process has tiered accountability, and DoD components, including the AF, are responsible for planning, building their architecture, and certifying compliance with the Business Enterprise Architecture (BEA) framework and priorities (USAF, 2006: DoD, 2007). The DoD aligned its own BEA with OMB and manages IT investments to support their business priorities (DoD, 2007; Wolfowitz, 2004). Decisions on IT investments are based on an integrated architecture, mission goals, risk tolerance, outcomes, and performance (Wolfowitz, 2004).

The AF has been responsible for its own transformation, but it is overseen by a DoD-level investment review board and defense business systems management committee (DoD, 2007). The AF established CIOs to provide centralized IT investment planning and governance to meet the mandates of the FEA. Base-level CIOs help enforce

command-wide standards, define standards for applications and infrastructure, and ensure that network performance goals are met (USAF Command X, 2005). They oversee processes to assist in the life-cycle management of all IT, including planning, programming, budgeting, execution, and disposal. They also ensure that their base-level IT priorities and programs are consistent with AF strategies and plans (USAF Command X, 2005; USAF Base X, 2006).

Implementing large-scale federal redesigns is a complex task as it concerns diverse government agencies from the Department of Education to the Department of Defense that have varied business areas and services for citizens. This results in a wide range of IT architecture needs that involves multiple processes and levels of people in the organization so compliance with the redesign, even with the governing EA, is complicated. The annual assessment of FEA in 2007 indicated that overall, the advances were made; however, the highest scores of EA compliance did not include the DoD (OMB, 2007c). OMB (2007c) attributed these results to the lack of planning and possibly due to the lack of technical expertise in complying with FEA planning solutions. A similar situation was also found in previous efforts to comply with IT architecture guidance (Frank, 2002; Robinson, 2003). Communicating the importance of the FEA vision and goals is a key part of improving compliance, creating a federal-wide transformation, and infusing the goals throughout all agencies to achieve the vision (OMB, 2006). The information technology enterprise architecture vision and goals can be found in documents for federal agencies including the DoD and AF but complete vision infusion throughout all AF organizational levels is questionable.

Progress toward the vision and goals at the AF base level, including test and evaluation bases, has been mixed so processes were put in place to manage IT architecture (USAF Base X, 2006). Users often create nonenterprise solutions for their specific requirements which can frustrate the CIOs' efforts to launch mandated enterprise solutions and account for all IT systems (USAF Base X, 2006). These nonenterprise systems add to the maintenance and operations costs of IT services and infrastructure yet may be valuable to the user. Although enterprise and user are part of the same government entity, their views of the enterprise approach may not be aligned and differences in perception of the value of the enterprise systems exist. There is evidence to suggest that users' perceptions of the enterprise business systems' value may provide insight on ways to mitigate this conflict and assist in meeting goals and expectations jointly (Ajzen. 1999; Davis, 1998; Mathieson, 1991; Venkatesh, Morris, Davis, & Davis, 2003; Adamson & Shine; 2003).

Understanding the value of the IT-enabled enterprise business systems to the user may be necessary for the AF CIO and system owners to understand the consequences of their decisions. Increased understanding could help in developing enterprise goals and standards that will be accepted by the user, communicating, and providing systems that meet user expectations. (Orlikowski & Barley, 2001, p. 154). This study sought to identify the AF users' perceptions of the value of enterprise business systems and their needs in the new e-government solutions without relying on predetermined survey questions that may not have covered topics that provide value to the user. The findings

from this study may help CIOs better understand the users' perception of the value of the systems and the impact of their decisions and actions on the users.

Purpose of the Study

The purpose of this study was to examine the perceptions internal users at an AF test and evaluation base had on the value of enterprise IT-enabled enterprise business systems. A qualitative grounded theory method was used to gain insight on what was necessary and important in the enterprise business systems for the users of the systems. The users' value in this study was conceptualized as the benefit they perceived from IT-enabled enterprise business systems or that users seek in the systems, such as efficiency, effectiveness, accuracy, flexibility, and other capabilities. New knowledge on the value of the enterprise business systems from the internal users' perspective and how users ascertain that knowledge can provid information useful for meaningful assessments of these systems. This knowledge can help the AF CIO improve enterprise-wide IT systems based on the users' feedback. This research contributes to the body of knowledge on e-government and IT-enabled processes and the change it creates in public service by providing insight into the value of the enterprise business systems for the user.

Statement of the Problem

The implementation and adoption of DoD and AF IT-enabled enterprise-wide systems are negatively affected when the users fail to find value in the processes and system solutions and create costly redundant systems to do work that are not managed under the enterprise effort (USAF Base X, 2006). The problem is that base-level CIOs cannot improve the users' buy-in or acceptance of policy and standards because there are

few opportunities for the user to provide indepth feedback on what users value in the enterprise business systems. Limited research has examined internal users' perceptions of the enterprise business systems, and the perceived value that enterprise systems have to improve user needs and enterprise goals.

Past research in the acceptance of public sector e-government processes and systems has focused on the external customers' feedback and requirements rather than the internal users of similar systems (Bertelsmann Foundation, 2001; OMB, 2003). Private sector studies have focused on customers as users of IT-enabled processes and systems and have found a range of influences on system acceptance and success, including providing communication and an understanding of each other's perception of a system (Bennington & Cummane, 1998); expectation management (Lam, Shankar, Erramilli, & Murthy 2004; Petre, Minocha, & Roberts, 2006); customer efficiency in using the system (Chew-Graham, Alexander, & Rogers, 2005; Xue & Harker, 2002); and the value of customers (Fletcher, 2002; Hogan, Lemon, & Rust, 2002; Szablowski, 2000). Similar studies on internal users of federal government enterprise business systems have been lacking as studies on federal e-government programs and barriers to implementation often have focused on the external customers' feedback and requirements (Bertelsmann Foundation, 2001; OMB, 2003), but rarely have they mentioned the internal users of the systems as an essential part of them. This gap in research has hindered the full comprehension of what influences AF employees to accept and value new IT-enabled enterprise business systems.

The alignment of organizational goals and individual perceptions of the goals' value has been identified as instrumental in technology adoption and acceptance in private and public sector studies (Adamson & Shine, 2003; Davis, 1989; Holt, Armenakis, Field, & Harris, 2007). The findings from these studies were derived using predetermined scales for perceived system usefulness (Davis, 1989) and surveys or questionnaires to capture the participants' views and concepts (Adamson & Shine, 2003; Holt et al., 2007). These instruments were deemed appropriate for determining individual readiness to change in relation to overall organizational goals, but they would not be capable of capturing the specific characteristics that determine the value of AF enterprise business systems for the user and how that aligns with the enterprise goals.

The grounded theory method of research has been used to bring together individual experiences into a concept as a whole on changing attitudes toward technology use (Chew-Graham et al., 2005; White & Weatherall, 2000). An investigation using the grounded theory methodology was needed to build a concept of the AF IT-enabled enterprise business systems' value that was derived directly from the users' point of view. This study addressed the information needed to create future system assessments and evaluations so that meaningful information is gathered for decisions on e-government transformations.

Nature of the Study and Research Questions

This study examined the perception of the value of AF IT-enabled enterprise business systems by internal users at an AF test and evaluation base. The overall research

question asked, “What are the internal users’ perceptions of what they value and need from IT-enabled enterprise business processes and systems?”

Questions that contributed to the overall research question were the following:

1. What criteria are considered in determining value of the enterprise business systems?
2. What are the interactions of the criteria considered in determining what is valuable?
3. How do the factors they value relate to the vision and goals of their organization?
4. How do the factors they value relate to the vision and goals of the enterprise systems?

A qualitative grounded theory approach was used to construct a theory on the value of the enterprise systems from the users’ perspectives and experiences. This qualitative tradition of inquiry was appropriate because the goal was to collect and analyze data before generating a theory on how users define the value of IT-enabled enterprise services (Creswell, 1998, 2003). A key process in this method was the comparison of data in a structured manner and the continual reevaluation of commonalities and differences in the data until a concept emerges from the analysis (McNabb, 2002). The data analysis in this study used coding to identify ideas and “facilitate comparison between things in the same category that aid in the development of theoretical concepts” (Maxwell, 1996, p. 96). Constructs from the interviews and those

derived from the literature were used to create a theory of user value of the enterprise systems that was contrasted with existing enterprise vision and goals.

The anticipated problems in this study included obtaining and assessing the data to develop a concept on the value of the systems to the user. It was necessary to develop questions that were open-ended and did not introduce researcher bias by leading the respondents' answers. The questions elicited responses and engaged the participants in discussion or elaboration. The interviews were conducted in a flexible, interactive, conversation-like manner that started with broad awareness questions and expanded to include focused attitude and opinions, and then developed toward more specific questions that followed up on previous questions and comments (Babbie, 2004; McNabb, 2002).

Constructs were developed by assessing data from the interviews and interview notes. An evolving process was used of interviewing, collecting data, and coding that resulted in theorizing that was close to the data Smith (1990). This required the collection of accurate responses so the interviews were recorded and transcribed into documents (McNabb, 2002). Large amounts of data were created so software applications were used to help manage, catalog, and assess the data (Creswell, 1998). This included word processing to document the interview data; spreadsheets to code, organize, and compare the data; and graphics software to diagram or visualize the concepts (Strauss & Corbin, 1998). Personal communications and recent work by Camargo (2005) demonstrated the use of similar applications for the grounded theory method. Camargo assessed and determined that commercially developed products specifically for the grounded theory did not allow simultaneous work in segmented and full-transcript modes in the coding

process. The researcher needed the flexibility of working in both modes and had this capability in the Microsoft Office software tools. The analysis process is discussed in detail in chapter 3.

Conceptual Framework

The conceptual basis for this study focused on the users' perceptions of the value of AF IT-enabled enterprise business systems that can be derived from complex individual and organizational influences and interactions. Private and public sector theories on organizational change, customer relations, and IT adoption provided the basis for understanding these influences and interactions on users' perceptions of the value the enterprise business processes and systems.

Users can be affected by the way change is implemented and by the resulting changes in organizational structure, processes, and culture or way of being. Research suggests that value and vision compatibility between the organization and the individuals in the organization assists in change (Denhardt, Denhardt, & Aristigueta, 2002; Karahanna, Agarwal, & Angst, 2003; Kotter, 1999) The adoption of new e-government processes and systems may benefit from organizational and individual collaboration, communication, and agreement on the goals and value of the change (Bennis, 2003). The relationship between individual acceptance of organizational goals and change success is important for leaders to understand so they make effective decisions during organizational change and conflict (Avey, 1999; Bennis, 2003; Gerzon, 2006; Kotter, 1999; Kouzes & Posner, 1995; Senge, Roberts, Ross, Smith, Roth, & Kleiner, 1999).

Research shows that leaders who communicate and share the vision and goals, learn from mistakes, and make improvements with the people who will be impacted by change help create results that provide value to the people (Bass & Avolio, 1993; Bennis, 2003; Hersey & Blanchard, 1993; Kotter, 1999; Kouzes & Posner, 1995; Senge et al., 1999). Research also suggests that solutions for IT implementation issues must consider a wide range of organizational culture and change variables, including understanding the organizational vision and goals and how they translate into individual needs, perceptions, and willingness to change (Atkinson, 1984; Avery, 1999; Lau, Wong, Chan, & Law (2001); Laudon & Laudon, 2005). Research from the private and public sectors has included concepts of customer value that could apply to understanding the value of AF e-government and enterprise-wide IT processes from the users' perspectives. Factors such as individual support, exposure to knowledge, understanding of the IT's function, formation of a favorable attitude, commitment to IT, and reinforcement of its use led to technology adoption in e-business (Alexander, 2006). Research indicated that differences in perceived value of IT systems and service could be mitigated through customer and provider communication, and understanding of each other's perceptions of the systems' value (Bennington & Cummane, 1998). Identification of the AF users' perspective on the value of the enterprise systems provides useful information for similar communications and understanding.

Private sector studies have provided insight into applicable concepts for e-government efforts based on the people who use and are served by the systems. Studies have included the influence of expectation management on customer value, loyalty, and

retention in e-commerce, customer efficiency in system use, and the value of customers as equity as they are a part of the process and system (Chew-Graham et al., 2005; Fletcher, 2002; Harker, 2002; Hogan et al., 2002; Lam et al., 2004; Petre et al., 2006; Xue & Szablowski, 2000). Studies on relationships, satisfaction, and value for the users demonstrate how focusing on user defined value assists in communicating and evaluating programs and creating long term loyalty (Lam et al., 2004; Moore & Braga, 2004; Szablowski, 2000).

The alignment of organizational goals during change and the individual perceptions of the value of these goals have been instrumental in technology adoption and acceptance (Adamson & Shine, 2003; Davis, 1989; Holt et al., 2007; Venkatesh et al., 2003). The users' perceptions of change, even in mandated situations, can impact the acceptance or use of the new systems, as can perceptions of the technology itself which often changes the structure, roles, and work in the organization (Adamson & Shine, 2003; Venkatesh, et al., 2003). The technology compatibility and adoption theories of Karahanna et al. (2003) increased understanding on how the alignment of individual and organizational culture, expectations, and norms were a direct influence of user acceptance of new IT-enabled systems. The alignment of the users' perceptions of the systems' value affected not only the implementation but also the success of the systems because the users are an integral part of them. Additionally, user acceptance of the system based on the system usability and their efficiency, knowledge, and skills in using IT affect the operation of the system and the human resource management within the organization (Mathieson, 1991; Xue & Harker, 2002). Table 1 captures these and other researchers'

concepts from the perspective of the customers and the value they derive from IT systems used enterprise-wide. These concepts are discussed further in chapter 2.

Table 1

Theories and Concepts in Technology Acceptance and Change

Theory/Concept	Concept focus	Researcher
Success through customers	Understand customer expectations; build business value through them. Communicate strategic change.	Szablowski (2000)
Market maturity model	Marketing or customer centric approach enhances IT business value. Marketing maturity stages views the product, customer, and success in terms of competency, credibility, and commitment.	Hirschheim, Schwarz, & Todd (2006)
Customer efficiency model	Customers are co-producers, not just recipients of service. Efficient delivery of high-quality service requires good performance by employees and customers who use the infrastructure to participate in the delivery of valued service.	Xue and Harker (2002)
Customer efficiency model	Provide equipment, training, education, and third-party assistance to improve confidence, competency, and customer efficiency and enhance system value.	Chew-Graham et al. (2005)
Customer equity management	Customers are strategic assets. Invest in customers and create long-term equity for the business. Service quality links customer lifetime value and outcomes such as retention, trust, and commitment.	Hogan et al. (2002)
Customer value in public service	Collective view of citizen satisfaction determined the value of police service. Value was at the utilitarian, principled, individual, and social levels.	Moore and Braga (2004)
Customer value and loyalty	Customer satisfaction mediates the relationship between customer value and customer loyalty; customer satisfaction and loyalty have significant reciprocal effects on each other.	Lam et al. (2004)
Customer response capability	Competence in satisfying customer needs through effective, quick responses, reduces risk perception; achieves a loyal, sustainable customer base; it satisfies customers' needs.	Jayachandran, Hewett, and Kaufman (2004)
Communication and control	IT changes traditional control and coordination; can result in conflict, changes to structure, processes, and responsibilities.	Finnegan and Longaigh (2002)
Theory of planned behavior	Behavioral intentions are predicted by attitudes toward the behavior, subjective norms or expectations from others, and perceived control over the behavior.	Ajzen (1999)
Technology adoption, Technology	Users will adopt technology based on usefulness and ease of use or how easy or hard it is to get the system to perform those functions. No amount of ease of use compensates for a	Davis (1989)

acceptance	system that does not perform a useful function.	Table 1 Cont'd
Technology acceptance	Model predicts actual system use based on the perceived usefulness and ease of use of the system.	Mathieson (1991)
Unified Theory of Acceptance and Use of Technology	Performance, effort expectancy and social influences were direct determinants of intention to use mandated IT systems. Social influence becomes nonsignificant with sustained usage. Moderators: experience, voluntariness, gender, age.	Venkatesh et al. (2003)
Enhanced Technology Acceptance Model (TAM)	Enhanced TAM extended measurement of end-user satisfaction in a mandatory environment; if they perceive a system as useful and easy to use they are likely to be satisfied. Quality of usefulness and user friendliness was critical.	Adamson and Shine (2003)

This study identified the AF users' perceptions of the value of the IT enabled enterprise business systems and how that aligned with the organizational and enterprise vision and goals for the enterprise business systems. Table 2 shows where the enterprise vision and goals were similar throughout the federal, DoD, and AF levels. Table 2 shows a question mark at the user-defined value level and the findings are discussed in chapter 4. Table 2 was developed from a document review of the vision and goals for change from the FEA practice guidance (OMB, 2006); Force IT Investment Architecture Compliance Guidance (USAF, 2006); E-Gov Web site (OMB, 2007b); EA technical reference model (DoD, n.d.); Defense Business Transformation (DoD, 2007); FEA assessment (OMB, 2007c); policy directive on centralized planning and control of IT investments (Air Force Command X, 2005); and revised Circular No. A-130 on Management of Federal Information Resources (OMB, 2007a). The goals were categorized into eight main themes that described the benefit or value of the enterprise vision and goals:

Theme 1: Deliver value and results that support the mission and decision making.

Theme 2: Unify work across agencies by creating a common framework, sharing assets; and developing integrated, interoperable systems. Create accountability and cross-agency collaboration.

Theme 3: Share a vision of future and align resources to strategic goals to leverage resources and maximize contributions.

Theme 4: Improve effectiveness and efficiency of citizen services and systems. Meet expectations, address concerns, and collaborate with the customer.

Theme 5: Align systems with standards and policy for performance. Guide and control IT investments, implementation, and decision making.

Theme 6: Create technical solutions, scalable, repeatable processes, reuse technology, and component services. Make measurable integrated performance and budget improvements.

Theme 7: Comply with the Clinger Cohen Act, BEA, and financial reporting mandates. Create reliable financial information and information security.

Theme 8: Support continuous improvement, business process engineering, and transformation. Facilitate governance and enterprise e-government.

These themes contributed to the initial codes or ideas for the grounded theory analysis shown in Appendix A. These codes were part of the analytical process described in chapter 3.

Table 2

e-Government Vision, Goals, and Value Themes

Theme	1: Deliver value and results	2: Unify work across agencies	3: Share a vision	4: Improve effectiveness of services and systems	5: Align systems	6: Create solutions	7: Comply with mandates	8: Support continuous improvement
Federal	x	x	x	x	x	x	x	X
DoD	x	x						
AF		x	x	x	x	x	x	X
AF command					x		x	
AF base					x		x	
User-defined value	?	?	?	?	?	?	?	?

Table 3 interprets the themes in Table 2 into what users may define as the value they seek in IT enabled enterprise business system solutions. The value concepts were derived from the enterprise vision and goals and from the literature.

Table 3

User-Defined Value of IT-Enabled Enterprise Business Systems

Theme	User-defined value
1	Timely, accurate information for decisions making
2	Interoperability, collaboration within and outside organization
3	Reduce resource requirements
4	Effective, efficient processes, operable systems
5	Meet current/future mission priorities
6	Integrated services, reduces redundancies
7	Compliant, secure, reliable information
8	Improved business processes

Table 3 assumes that users' perceptions of value and the enterprise e-government vision and goals are well aligned and are shared by the users and communicated to the

users. This relationship is diagrammed in Figure 1, which shows two possibilities, when the individual at the user level in the organization and the enterprise vision and goals are well aligned and when they are poorly aligned. The alignment of the vision and what the users expect and want from the IT-enabled enterprise business systems is the optimal condition for the implementation, adoption, and acceptance of them.

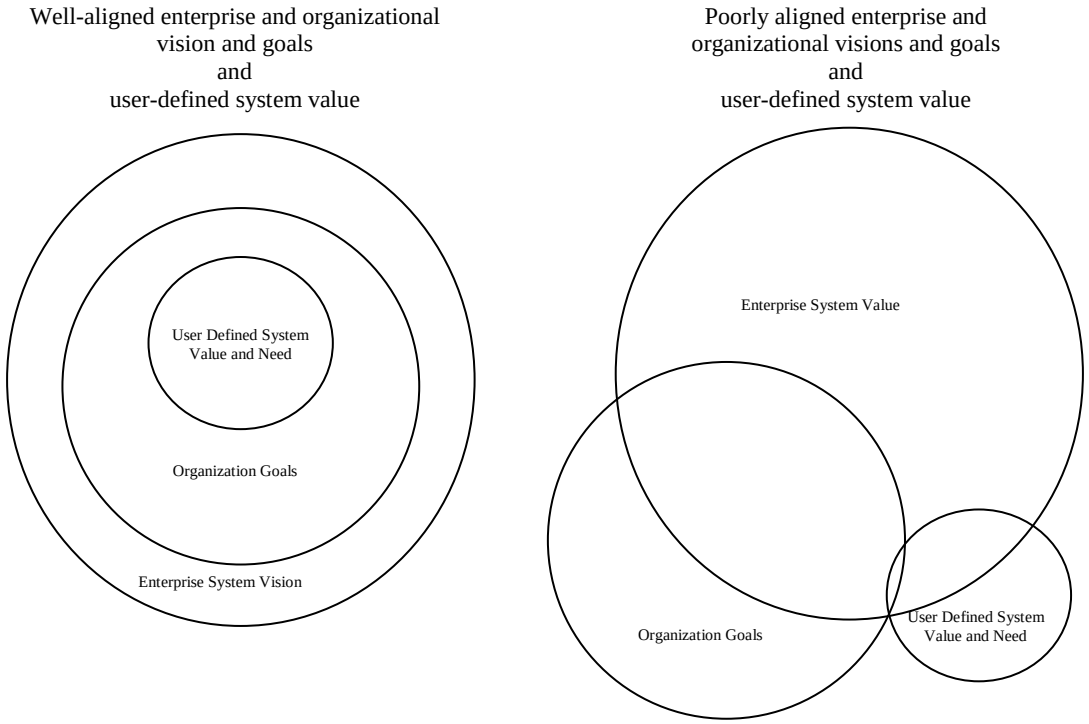


Figure 1. Alignment of IT enterprise vision and goals and user perceived value

Figure 2 shows the alignment of the enterprise systems' vision, what the users expect and want from it, and the various influencers that act on this relationship. The figure shows the relationship between the enterprise vision and goals and the users' perceptions of value when they are aligned, as well as the factors or considerations that may influence that alignment. The arrows indicate the factors and considerations derived

from the literature review that can influence users' perceptions of the value of the systems. An analysis of the data from the interviews validated the user- defined value concepts. The text indicating the user-defined value was supported by the participants' responses to the research questions regarding the users' perception of value of the AF IT-enabled enterprise business systems. The directionality of the arrows was clarified by data collected on the criteria the users considered in determining value. The interaction of their considerations and decisions are discussed in chapter 4. The bottom block of text, namely, enterprise IT system vision and goal themes, provided a way to discern if the interview responses related to or drew from the enterprise vision and goals. The findings in chapter 4 elaborate on these relationships.

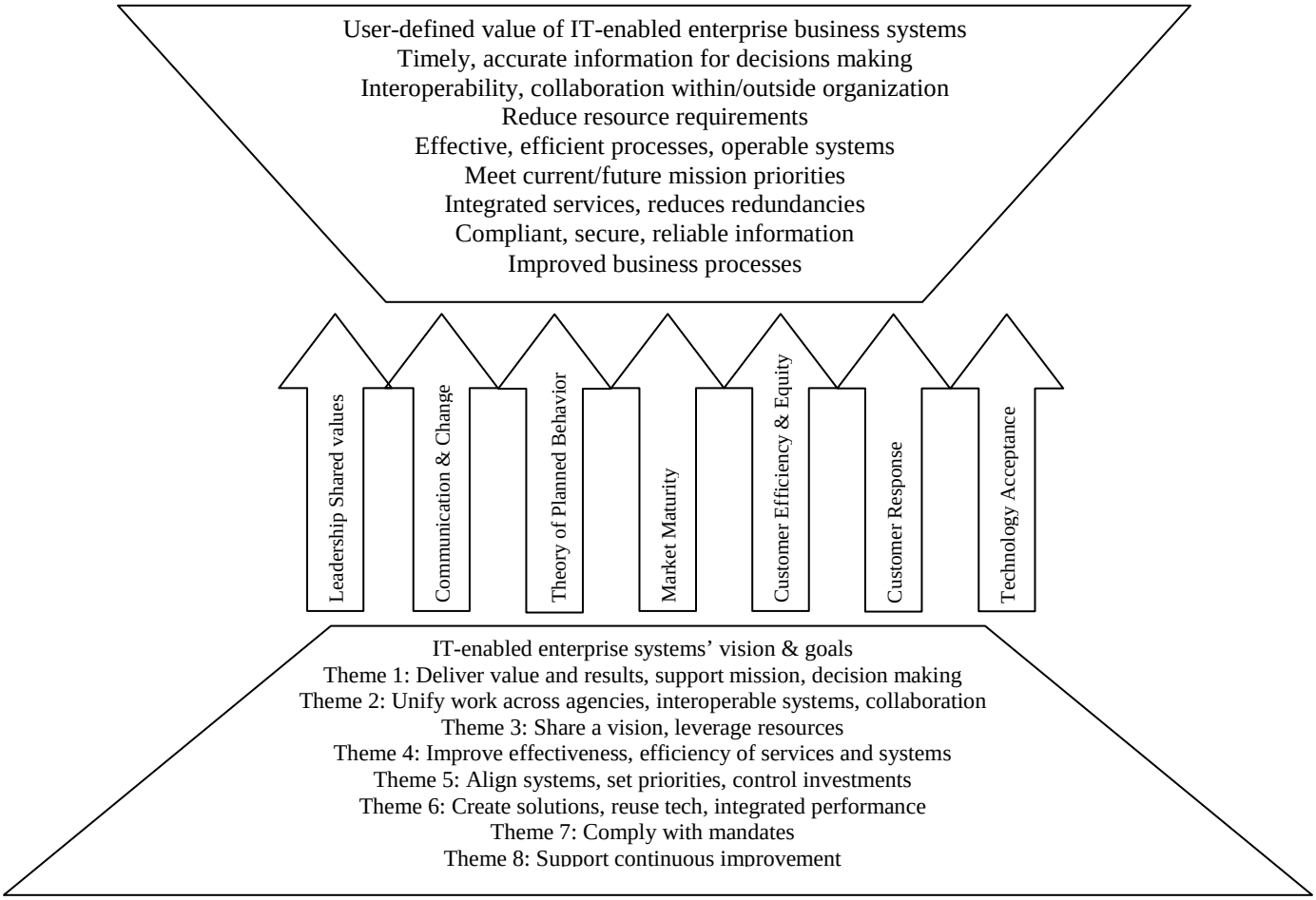


Figure 2. User-focused integration of IT enabled enterprise systems' vision, goals, and value.

Definitions of Terms

Operational definitions were necessary to ensure agreement on the diverse meanings of the concepts in this study and to ensure that applicable data were collected, measured, and analyzed to answer the research questions.

Enterprise business systems: The USAF (2006) defined a business system as an information system, other than a national security system, "used to support business activities, such as acquisition, financial management, logistics, strategic planning and budgeting, installations and environment, and human resource management" (p. 22). The IT-enabled enterprise business systems were developed in some of these areas for joint use across AF and DoD organizations.

E-government: E-government in this study utilized the concepts defined by Dawes (2002) Holmes (2001). Holmes defined it as the "use of information technology, in particular the internet, to deliver public services in a much more convenient, customer-oriented, cost-effective, and altogether different and better way" (p. 2). Dawes added that it includes the delivery of services over the Internet to improve the flow and integration of information. E-government supports government operations within and between agencies, between government and businesses, and between the government and the public (Holmes, 2001). It engages citizens; provides government services; and impacts internal and external customers, including employees, the public, and private sector partners (Holmes, 2001).

Enterprise architecture: EA is a foundation of processes, procedures, and standards that guide and govern the design, development, integration, and implementation of new technology for business functions (Industry Advisory Council, 2003). The USAF (2006) defined enterprise systems as "systems that have been identified to become the standard across the DoD" (p. 22). The systems range from

business to test and evaluation mission specific processes for analysis, communication, and information sharing.

Influencers: The IT influencer "is typically a business-side senior executive, external to the IT organization, who can help develop the vision, marshal resources, influence decisions, and is critical for the success of any project" (Hirschheim et al., 2006, p. 186). They are influential in the organization's perception of success and "can affect senior management's belief about IT value" (Hirschheim et al., 2006, p. 186). The participants in this study were the IT influencers in the organization.

Information technology (IT): The USAF (2006) defined information technology (IT) as "any equipment or interconnected system or subsystem of equipment that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information by an executive agency" (p. 22). It includes IT directly used by contractors to fulfill federal contracts.

Information Technology (IT) System: The USAF (2006) defined IT systems as a "set of information resources organized for the collection, storage, processing, maintenance, use, sharing, dissemination, disposition, display, or transmission of information" (p. 22). The definition includes DoD-wide or joint systems and systems at lower levels in the DoD, including the AF.

Users (internal customers): This study focused on local, base-level users of the IT-enabled enterprise business systems who must use the mandated e-government solutions to conduct business processes for aerospace testing and evaluation. These users

were considered the internal customers to the AF CIOs because they have the resources to purchase hardware and software development that support their specific missions. However, they also are required to use the mandated IT-enabled enterprise business systems. They fit Hirschheim et al.'s (2006) description of internal customers as transactional customers seeking individual service, such as desktop users, longer-term relationship customers with support requirements for new products and services, and IT influencers. The term *users* instead of *internal customers* was the reference for the participants of this study. The term *customers* was used when a specific reference was made by the participants, such as when the focus was on a business sector customer or a person who used the system to do business with the organization (Hirschheim et al., 2006).

Users' value: The users' value or the users' perceived value of IT-enabled enterprise business systems adopted the concept of customers' value described by Lam et al. (2004). It was the perceived benefit that a system provides or the users seek, such as efficiency, effectiveness, accuracy, flexibility, and other capabilities. In the business sector, value can represent the trade-off between what a customer gets, or the benefit, and what the price, or sacrifice, is in terms of costs and risks (Lam et al., 2004). In this study, the value of a system was indicated by the users' willingness to use the system if needs were met. If the value of the system was low to the users, and if there was an increased risk that business work would not be accomplished efficiently or effectively, the users would consider sacrificing their resources to create nonenterprise systems that met their individual needs.

Assumptions, Limitations, Scope, and Delimitations

The assumptions, potential weaknesses, and bounds of this study concerned the availability of knowledgeable participants and the context-specific focus on an AF test and evaluation base. However, the availability of knowledgeable participants was not an issue. This study employed a grounded theory design to develop a concept of the value of the AF IT-enabled enterprise business systems to the users. Analyzing the data from the interview responses rather than testing predetermined theories through experimentation was used and was central to the grounded theory method (McNabb, 2002). The research was limited to gaining an understanding of what the users perceived as the value of the AF IT-enabled enterprise business systems through feedback from organizational influencers. The participants were assumed to be the most knowledgeable on the issues and concerns of system users. The study required intensive interviewing so that data could be collected for the analysis. Many of these influencers were busy decision makers, but their unavailability did not impact the data-gathering process because the interviews were arranged around their schedules.

The study was performed in a specific context consisting of a single AF base with limited generalizations in terms of non-government sectors that will not be expanded until the concepts are tested in follow-up research. The users' perceptions of the value of the systems were difficult to define, understand, and gather, and was a subjective process (Babbie, 2004). In this study, the process involved creating a concept based on observing patterns and analyzing the data from the interviews. This research question required qualitative data to make sense out of an ongoing process and to develop general

conclusions for further observations (Babbie, 2004, p. 282). A qualitative method was more appropriate than a quantitative descriptive method for this study because it facilitated a better understanding of the phenomena (McNabb, 2002). The grounded theory procedure was used not only to develop theory but also to create descriptions, conceptual ordering, and categories that can be used as measurements for future assessments (Strauss & Corbin, 1998, p. 288). A more detailed discussion of the methods is presented in chapter 3.

Significance of the Study

This study was significant because the analysis of e-government transformation through mandated IT enterprise systems and processes is rarely examined from the perspectives of base-level users. Disagreement between user-defined value and enterprise-defined value may result in the creation of stand-alone or non-enterprise IT systems by the users. This disagreement consumes scarce resources, stresses IT budgets and personnel, and creates difficulties in operating and maintaining noncompliant architecture (Holmes, 2001). Decentralized systems can lead to duplicate systems and increase the costs of other resources for maintenance, training, and procurements (Barrett & Greene, 2001). Standardization of systems is necessary to enhance information sharing and limit the use of wasteful resources on duplicate IT solutions. Standard systems also reduce redundant data entry and training on multiple systems, and require less maintenance and support than diverse systems and equipment (Barrett & Greene, 2001).

System adoption and acceptance by users is necessary. Adamson and Shine (2003) recognized the significance of creating conditions in which information systems

can be embraced by everyone within an organization. User acceptance of new technology, even in mandatory environments, may have a great impact on a system's viability as the user is integral to making the process and system work (Xue & Harker, 2002). Research showed that a lack of perceived value and acceptance of IT-enabled enterprise business systems by the users can affect adoption even when these systems are the only way to accomplish work (Adamson & Shine, 2003). Studies that seek to understand these relationships in a mandatory environment are significant because there is a risk that the end user will reject the change and performance improvements or work will not be accomplished (Adamson & Shine, 2003, p. 441).

IT compatibility with user-defined value influences the users' decisions to accept the technology (Karahanna et al., 2003). Understanding the value of the system and improving compatibility can assist in successful system implementation. Understanding the user-defined value of the system also will help to identify training, and education for the user, bridge differences between the enterprise and the user, enhance support from the enterprise, and determine enterprise communication and change strategies. Increased knowledge about the value of IT from the users' perspective could result in improved AF processes and help the AF employees be as effective as possible and achieve results in their line of business as the American people expect from their Government (President's Management Agenda, 2004, p. 1). Achieving results through more efficient use of IT resources to run the business of the AF may allow for the reallocation of funding for higher priority needs and may also instill a sense of greater social responsibility and accountability for results in the federal government.

This study contributes to the social change demanded by citizens for increased transparency in government by uncovering the results of the AF decision to improve business processes and reduce costs through the use of IT-enabled enterprise business systems. It gave AF internal users the opportunity to communicate what they perceived as the value of mandated, IT-enabled enterprise business systems, provided information on the current condition of e-government system implementation. The information from this study increased transparency on the success of business transformations, and may help to prescribe new strategies for the envisioned changes. The information from this study may also be used by AF leaders to transform public administration and the business of government.

Summary

The purpose of this study was to examine internal users' perceptions of the value of the AF IT-enabled enterprise business systems at an AF test and evaluation base. Greater understanding of what these perceptions are and how they relate to the vision and goals for the AF enterprise systems will help to define improvements for system implementation. Insight from this research may contribute to the body of knowledge on IT-enabled services for technology-based public leadership. New knowledge and information may help to steer AF change efforts to make the best use of resources, satisfy internal user needs, enable forward thinking on transformations, and shape enterprise-wide IT systems. Understanding the value that users want from the IT-enabled enterprise business systems provides information for the CIOs regarding change strategies that could help to create more efficient and effective government systems and process.

The background that was explained in chapter 1 demonstrated the importance and significance of understanding system value from the users' perspective in creating lasting change in AF e-government implementation efforts. Transformation through the adoption of enterprise e-government processes and systems is necessary to create effective and efficient processes, services, and support for citizens, and for making best use of taxpayer dollars. It is important to understand internal change issues from the users' perspective to encourage adoption of these systems and policy.

Chapter 2 furthers the understanding of the study questions, objectives, and concepts of this study. It compares and contrasts broad theories and current research on complex social, technical, organizational, and individual factors that influence the perception of the value and adoption of IT. Literature concerning organizational change and leadership, the influence of technology, and user-focused change are explored for concept development. Research in the public sector on customer value, relationship management, and technology adoption further the understanding of the research questions. Chapter 3 details the research methodology used for this study. Chapter 4 presents a grounded theory of the system's users' values and relative acceptance of changes in enterprise business systems. Chapter 5 provides conclusions and recommendations for future research on the theory of implementing enterprise business systems in government.

CHAPTER 2: LITERATURE REVIEW

Introduction

This chapter reviews the literature on the social, technical, and organizational factors that contribute to understanding change and the adoption of IT-enabled systems from a user-level perspective. This chapter begins with a broad review of the meaning of change in organizations and the role of leadership in managing change. This background demonstrates how organizations and leaders tend to prepare people for change and gain their buy-in as the value of change is recognized. A review of change through technology describes the influence IT-enabled transformations have on people, processes, and structures. Studies on the adoption of technology provided insight into what contributes to users' choices and decisions to use technology and a review of private-sector studies provides explanations on user satisfaction with IT systems, perceived value, and adoption. Literature on customer value and customer-focused change in the public sector describes how value perceptions influence organizational change. A review of the federal e-government enterprise IT architecture provides information on the vision, goals, and expected outcomes. A review of research methods provides background on the methodology for this inquiry.

Change in Organizations

Organizational change theory covers a large scope of concerns that transformation efforts such as the federal government enterprise architecture concept requires of people, processes, and organizations. Change in organizations concerns a broad spectrum of considerations that can enhance or detract from change efforts, including organizational

structure, culture, leadership, and politics (Agre, 2002; Chidurala, Kaminskas, Sridhar, & Tsfati, 2001; OMB, 2003); communication (Fountain, 2001; Lau, et al., 2001); and alignment of change visions and goals with employee values, behavior, and beliefs (Denhardt et al., 2002; Mathieson, 1991; Senge et al., 1999). Change through technology adoption has been approached from individual readiness (Holt et al., 2007) to the compatibility of the technology with the organizational culture and envisioned change itself (Laudon & Laudon, 2005). Special interest in the private sector to cultivate customer satisfaction that rewards business with customer loyalty provides insight into developing relationships with internal users to support change (Lam et al., 2004; Szablowski, 2000).

The importance of these concepts lies in the recognition that e-government systems are comprised of technology and human factors that balance and complement each other (Atkinson & Ulevich, 2000). Implementers of IT systems and processes need to recognize the system users as the internal customers who can increase productivity and services to citizens through their efficient and effective use of the systems (Xue & Harker, 2002). The focus on the user is essential in the success of the new systems and processes because the users are ultimately responsible for the accomplishment of work in the organization (Lane, Wolf, & Woodard, 2003). Part of the successful change in organizations is having an appreciation of the importance of value to the users and their acceptance of new technology during times of change and uncertainty (Laudon & Laudon, 2005).

Change and Organizational Culture

Implementation of the enterprise business systems can change the culture of an organization or what people think and believe including the way they believe work is or should be accomplished in the organization (Laudon & Laudon, 2005; Senge et al., 1999). Changing and altering patterns of work at the lowest levels in the organization presents challenges for strategic level change and requires acceptance and commitment by the people who are part of the change (Denhardt et al., 2002). Senge et al. recognized that most management-driven change efforts built on compliance do not result in deep change in how people think, act, and believe; however, commitment can be built through participation, action, and learning that meets the users' goals. Leaders can enable cultural change by focusing on a shared sense of purpose and gain commitment to adopt new technology (Avey, 1999).

Change and Organizational Processes and Structure

Technology has the potential to change organizational processes and structure through the redistribution of power, functional responsibilities, and level of control in the organization (Fountain, 2001). The distribution of information and access to data and information through IT can create more efficient coordination and decision making, and improve relationships, by providing some degree of centralized control and user discretion at the same time (Fountain). Technology changes managerial behavior, cross-organizational communications, and work; it also has the potential to increase or create a network of trust and norms (Fountain, 2001; Landsbergen & Wolken, 2001). However,

the benefits are realized only when there is a commitment to creating adaptable, flexible, and customer-focused processes (Drew & Coulson-Thomas, 1996).

Readiness for Change

Readiness for change has been defined as the "extent to which an individual or individuals are cognitively and emotionally inclined to accept, embrace, and adopt a particular plan to purposefully alter the status quo" (Holt et al., 2007, p. 235). Individual satisfaction and belief that change was necessary, could be implemented, and would be personally and organizationally beneficial plays a key role in readiness for change (Holt et al., 2007). Readiness can result from perceptions about the value of change including the perception that leaders are committed to the change. Leaders who are committed to change can make a difference in readiness (Beach, 2006).

Mahler and Regan (2002b) examined federal agency online activities and identified the conditions that influenced readiness for change, specifically in the adoption of online services. Organizational members who learned from experience and user references and feedback from other people displayed more satisfaction and readiness for change than the members who did not. The members own satisfaction with new ways of doing things influenced their willingness to change.

Leaderships' Role in Change

Leaders who are effective in transforming organizations create a sense of direction for the new organizational culture, motivate others to change, and communicate a shared vision and goals to employees and external stakeholders and customers. Organizational change is an incremental, evolutional process that starts with role

modeling at the top of the organization, communicating through all levels, and recognizing efforts that are in line with the new ways of doing things (B. M. Bass & Avolio, 1993). Balancing individual needs with the organization's overall vision and goals is necessary in enterprise systems efforts where individual use of the supplied technology is a critical part of the system. AF enterprise system leaders set the direction to change behavior and organizational culture by introducing or proposing expectations, ways of doing things, and governing ideas (Senge et al., 1999). Creating cultural and organizational change requires the leaders to communicate an understanding of the value of change at all levels of the organization and gain buy-in on a shared sense of purpose. Emphasis should be placed on clarifying personal values because if change does not mesh with personal values, little value will be perceived (Senge et al., 1999, pp. 202-203)

Shared values and beliefs of an organization guide it, but they also can constrain behavior or change that is accelerated by the introduction of IT (Brewer, Neubauer, & Geiselhart, 2006). The values, culture, structure, politics, and hierarchy of power in the organization impact technology and the organization they are supposed to change (Sassen, 2002).

Leadership can influence the users' decisions to adopt enterprise programs (Holt et al., 2007). Leaders can support the change process by taking risks, allowing learning from mistakes, and showing their commitment to change (Kouzes & Posner, 1995). The users may be more willing to use systems that do not quite meet their needs or expectations if their leaders are willing to take risks that allow everyone in the organization to learn from their mistakes.

Changing or creating organizational culture requires developing and educating people and communicating vision, goals, and expectations. Education can shift perceptions of change because it “transmits and extends corporate values, educates in methodologies and technique, generates the conception of new ideas, and communicates paradigm shifts” (Avey, 1999, p. 25). Allowing for learning, experimenting, making mistakes, mentoring, and communicating ensures success in organizational change (Bennis, 2003).

Effective Change Approaches

Effective change approaches have common themes of actively managing change by communicating and preparing individuals and organizations for new ways of working. Effective change and buy-in to the change requires connecting or aligning people to a set of shared aspirations or vision by creating an environment of trust, open communication, cooperation and collaboration (Drew & Coulson-Thomas, 1996; Senge et al., 1999).

Change requires a joint effort by all level leaders to communicate the vision to the managers and employees who are implementing the changed processes, structure, jobs, and services. Successful change efforts focus on defining and communicating not only the organizational purpose and vision but the employee role and recognizing the importance of the employee, teamwork, and a strong corporate culture (Avey, 1999, p. 25). Proven change strategies have management and implementers working together to improve the change, making improvements for the customer, and planning for and learning from mistakes (Atkinson, 1984).

IT enabled change approaches must consider the environment, structure, culture, politics, leadership style, interest groups, employees, processes, and the work under change (Laudon & Laudon, 2005). Adaptability and learning are essential and people and processes may have to change with the introduction of technology (Terreberry, 1968). New IT systems are change enablers if they provide value through accurate and timely information, communications, and connectivity to people in all organization levels. Planning new IT systems requires a strategy that balances operation standards, efficiency, and customer requirements (Bertelsmann Foundation, 2001). Systems should support decision making at all levels; provide flexible data handling and evaluation; support multilevels of skills and knowledge; and be sensitive to existing conditions because changes to existing standard operating procedures can threaten cultural values and create political problems (Laudon & Laudon, 2005, pp. 81, 94). User feedback on the implementation of new e-government efforts can create a stronger culture of participation rather than resistance stemming from the lack of buy-in to changes to existing work culture (Bertelsmann Foundation, 2001).

Change Through Technology

Research on the influences of technology in organizations has provided insight into how IT changes individual and organizational work processes and structure The introduction of standardized systems can reduce redundancies and wasted resources (Barrett & Greene, 2001), but it requires consideration of the overall compatibility with the organization and individual goals and needs (Laudon & Laudon, 2005). The introduction of change through IT not only modifies the work processes and structure, but

also the way of being in an organization. The social and human aspects of change through technology and the resulting adoption require compatibility with desired goals and the value of the technology itself.

Technological Influence on the Organization

Technological influences on the organization comes from computerization that gives power to the end-user, links users and systems, expands work, and creates new work partners (Haines, 2003). Computerization increases expectations for more technology and creates new competency requirements and expectations of users and systems (Haines, 2003). Process redesign from automation changes how people operate and can shift work roles and responsibilities which can be difficult and unstable (Haines, 2003, p. 463). The work roles of employees and management immediately change, but organizational hierarchy often does not, which results in conflict and a lack of the perceived value of change. IT often replaces routine jobs, creating a narrower but more skilled range of work at the local level which often does not fit into the organizational structure (Haines, 2003, p. 463). Better operational consistency can be obtained if the process or IT-enabled work is the basis for the structure and organization (Haines, 2003; Lau et al., 2001).

Technology can bring local organizations closer to the centralized activities and foster agency-wide culture, mission and identity yet not weaken suborganizational identity (Mahler & Regan, 2002a, p. 10). Gattiker and Goodhue (2002) noted similar effects of centralized processes in their study on the effects of enterprise configuration processes. They stated, “A blanket policy of adopting [enterprise] processes without

considering their fit with subunit task and environmental conditions is not likely to be beneficial" (p. 4811). Unfettered change from EA can impact job roles, relationships, structure, and the perception of positive value. Haines (2003) commented on the potential for serious problems from technology-enabled process changes if the roles of labor and management are not realigned. He contended that "[the] danger is that managers are likely to be overseeing work that they simply do not understand. The inclination to retreat from change can thus be strong" (Haines, 2003, p. 470). These conditions can affect the effectiveness of the IT-enabled systems and processes.

Compatibility with Technology

There are numerous social and organizational challenges in adapting business procedures to new technology, and each requires a different context specific frame of reference for effective communication (Davidson, 2006). Beach (2006) suggested that leaders need to assess the internal and external environments to identify the beliefs of the people as well as the constraints and demands of their planned change on the organization. Assessing the climate facilitates understanding and removing the obstacles to change, and assists in shaping the organization's members interpretations of events (Beach, 2006). These actions can help to create compatibility with technology.

Technology changes can impact and be impacted by the compatibility of organizational users' social identity and expectations. Positive perceptions of the value of IT-enabled change are linked to its ability to protect group member identity (Schwarz & Watson, 2005). IT can balance control and accountability in traditional, hierarchical

organizations by providing the local level with some control over their activities and processes (Shouhong, 1997).

Executive government agencies find it difficult to employ private sector IT transformation strategies to the public sector because the public sector organizations were not necessarily designed for administrative efficiency (Aberbach, 2001). The compatibility of IT solutions the public organization raises concerns that applying market strategies that focus on customer demands raises the question of whose interests should be served (Aberbach, 2001). Likewise, Denhardt (1984) suggested efficient and effective processes that do not uphold democratic principles be rejected. Government activities may not find systems that serve special interests or result in the loss of their decision making and judgment compatible with their organization's purpose.

Compatibility between organizational and individual expectations of the value or benefits of doing things differently is key to understanding resistance to change from technology. A comparison of the compatibility between technological change and the users' preferred work style, existing work practices, prior experience, and beliefs about themselves and the system linked beliefs to the perceived ease of use and usefulness of the technology or the ability to improve job performance (Karahanna et al., 2003). Users who believed that the systems were compatible with their individual values perceived them as compatible with existing practices (Karahanna et al., 2003).

User Acceptance of Technology

Models of user acceptance of technology attempt to measure and explain attitude toward using technology, or an "individual's overall affective reaction to using a system"

(Venkatesh et al., 2003, p. 455). Several models identified the predictors of individual intention to use information systems. They included Ajzen's (1999) work on the theory of planned behavior (TPB), or the factors that influence individual intentions toward a particular behavior; Davis's (1989) work on technology adoption, or the technology acceptance model (TAM); and Mathieson's (1991) comparison of TAM and TPB.

The TPB predicts behavior based on a combination of the attitude toward the behavior, perceived social pressure, degree of control, and experience. The individual's resources, opportunities, and obstacles influence perceived control (Ajzen, 1999). This factor of control in a mandatory use environment, such as the AF enterprise systems, could present a conflict to users who desire to control their processes and systems by using their own resources. The TAM predicts the adoption of systems based on the users' perceived ease of use of the system itself and the likelihood that it will improve the users' performance (Davis, 1989). The difference between the TPB and TAM was that the TAM predicts system use on the perceived usefulness and ease of use of the system, whereas the TPB predicts behavior on beliefs, attitude, norms, and perceived control or choice (Mathieson, 1991). Both models can predict behavior to adopt technology, with the TPB capable of identifying social influences that can act as barriers to use (Mathieson, 1991). These models demonstrated the potential for social and technical interactions to influence perceptions of the value of systems and their likely adoption.

Adamson and Shine (2003) developed a modified TAM that assesses intentions to use IT systems in a mandatory environment. It measures end-user satisfaction based on system usefulness, ease of use, and attitude toward new technology. Attitude formation

uses subjective norms, computer self-efficacy, and system quality as constructs. They defined subjective norms as internalizing or complying with expectations from significant others, peers, and supervisors; computer self-efficacy as the belief in one's computer skill ability; system quality as acceptable standards to the individual; system usefulness as the belief that technology would enhance the user's performance; and ease of use as accessibility, availability, reliability, and system accuracy.

Adamson and Shine (2003) concluded that in a mandatory use environment, there are "significant relationships between subjective norms, system quality and perceptions of the new system usefulness" (p. 453). An increased level of perceived self-efficacy increases the level of performance and willingness to accept and use new applications. Users form attitudes, behaviors, and intentions toward the system based on their perception of how well the system will improve their job performance and if the system provides value. Users are likely to show satisfaction if they perceive the system as high quality, useful, and easy to use; however, perceptions on ease of use do not compensate for a system that does not do its task (Adamson & Shine, 2003). Adamson and Shine deducted that user satisfaction increases system usage because it helps to justify a system's cost by increasing use and improving productivity. Their findings showed the potential interactions of value perceptions and decisions on increased system usage.

Venkatesh et al. (2003) compared user acceptance models, including the TAM and the TPB, and integrated them into one model, namely, the unified theory of acceptance and use of technology model. They found that performance expectancy, effort expectancy, and social influence are the direct determinants of intention to use

technology. Venkatesh et al. also found that social influences mattered more in mandatory settings and "eroded over time and eventually became nonsignificant with sustained usage" (pp. 452, 469).

Focus on Value to the Customer

It is difficult to fully translate private-sector customer value in the public sector because the service provided can often be the only or a mandated source. Moore and Braga (2004) recognized the difficulties in assessing the value of police work. They looked at the value claims made against police departments and determined that citizens identify a combination of utilitarian, principled, individual, and social-level values. As in other government services, policing serves the public at large, where a collectively defined mission determines value. The dimensions of this value are in providing things at an individual or a group perspective that are good for people, regardless if they want them, or not (Moore & Braga, 2004). This collective perception of value provided measures for a total concept of value, which could be expected from the dialog with users of the AF enterprise systems and processes.

Research in the private sector on customer-focused change has provided insight into the importance of the customers in the provision of products and services. These concepts may apply because the users of the AF-mandated enterprise systems are internal customers to the IT activity and the CIO in the organization. Concepts and models on customer satisfaction, customer relationship management, market maturity, customer efficiency, customer equity, customer response capability, and communication provide insight into what influences customers' perceptions of value.

Customer Satisfaction

Research on customer satisfaction was performed by Lam et al. (2004) in a business setting that looked at how customer satisfaction mediated the relationship between customer value and customer loyalty. They used a conceptual framework that considered customer-perceived value, customer satisfaction, and the cost of switching to other service providers and found a positive effect from customer value on customer satisfaction. In other words, customer satisfaction affects loyalty, so the greater the customer value, the greater the satisfaction and loyalty (Lam et al., 2004). The value-satisfaction link suggested that customer satisfaction could be enhanced by improving the value perceived by customers, which could decrease the cost of acquiring customers. The return on the value-satisfaction link and loyalty has applicability to e-government efforts because it could reduce the resources spent on overcoming resistance and convincing others to accept the enterprise system changes.

Customer Relationship Management

Customer relationship management in business and technology disciplines focuses on managing, with the customer in mind and uses "both a that uses information systems to coordinate all of the business processes surrounding the firm's interactions with its customers in sales, marketing, and service" (Laudon & Laudon, 2005, p. 64). Connections and communication with customers are built strategically to create long-term relationships (Szablowski, 2000). The private sector focuses on tailoring business decisions to meet customer value expectations and requires "a heightened relationship with customers—a relationship based on trust, loyalty, shared expectations, and

collaboration" (Szablowski, 2000, p. 13). Building loyalty and customer value is key to sustainable growth in business and starts by understanding customer expectations and tailoring services specifically for them, searching for future transactions, and making efforts to understand and communicate with the customer (Szablowski, 2000). Szablowski suggested that creating customer value begins with understanding the customers' needs and expectations. This knowledge strengthens strategic communication and collaboration with the customer in developing services that meet their requirements.

Market Maturity

Research by Hirschheim et al. (2006) explored the use of a marketing approach in IT management to strengthen the relationship between IT and the entire business organization. The market maturity model approach is customer-centric and focuses on customers' needs and builds relationships that enhance IT business value by viewing the internal organizational functions, structures, and processes at different relationship levels in delivering products to the customers (Hirschheim et al., 2006). The levels of the maturity model start with competency, or the provision of basic systems and services; credibility, or the ability to consultant to achieve business goals and objectives; and full commitment as a strategic business partner (Hirschheim et al., 2006).

Hirschheim et al. (2006) distinguished between internal and external organizational customers, and they recognized that each is different in communication and marketing requirements and that each needs an individual approach because the commitment of internal customers is "critical to the successes of marketing efforts with external customers" (pp. 185-186). Hirschheim et al. found this communication

challenging with both centralized and decentralized IT solutions. Centralized IT solutions benefit from standardization, but they lack responsiveness and control and are decentralized; individualized solutions are expensive and slow to adapt to change. Leadership direction is essential in demonstrating the strategic value of new IT developments, as is the buy-in from the influencers in the organization (Hirschheim et al., 2006).

Customer Efficiency Management

The concept of customer efficiency management (CEM) considers customers the coproducers, not just the recipients, of service. Customers use the infrastructure to participate in the production and delivery of the service and are "crucial for a service firm's success in the short run and in the long run" (Xue & Harker, 2002, p. 254). CEM develops a customer base that is efficient in using IT-integrated services to improve the organization's productivity, profitability, and customer equity simultaneously (Xue & Harker, 2002). System ease of use results in customer efficiency, satisfaction, and lower costs in maintaining the high quality of the service (Xue & Harker, 2002).

The focus on the customers as coproducers rather than just patrons distinguishes CEM from other customer relationship models and is applicable to users of mandated government business enterprise systems (Xue & Harker, 2002). The users have a similar role as private business customers because their ability to use the enterprise business systems efficiently results in effective, streamlined government processes and functions. The profitability in the government sector can be considered the effective use of the IT systems, resources, and associated funding. The potential for the creation of duplicate

systems exists without equipment, training, education, and assistance to improve the users' confidence and competence in using the enterprise system and process (Chew-Graham et al., 2005). Users who lack training may not recognize the full value of the systems, which could impact their buy-in or intent to use the systems.

Customer Equity Management

Customer equity management is an integrated approach to marketing, service quality, and brand equity that manages customers as a strategic asset to the business (Hogan et al., 2002). This approach invests in the customers for long-term value, which creates a type of equity for the business organization. This approach increases the customers' assets by successfully serving and creating new products that are valuable to current and potential customers (Hogan et al., 2002). Similarly, the users of the AF enterprise systems could be recognized as equity because they are mostly long-term, full-time employees. Much effort and many resources are expended on training, developing, and retaining them as a high-functioning workforce. This effort includes providing the right tools so that they can accomplish their work.

Customer Response Capability

Jayachandran et al. (2004) studied how customer response capability through competence in customer knowledge systems and communication sustains business success. Customers see value in this competency and have a reduced perception of risk in their business transactions. Systems that emphasize understanding the customers improve the ability to respond rapidly and accurately. It adds value not only for the customers but

also for the organization providing the service by improving their performance (Jayachandran et al., 2004).

Communication and Control

Private sector theory on the role of communication in control and coordination processes provides insight on what drives value decisions and aligns individuals with organizational goals and change. IT is used in global organizations to leverage control and coordination (Finnegan & Longaigh, 2002). IT also increases the power of headquarters and the responsiveness of individual activities, and transforms the ability to act globally by reducing independence subsidiaries and changing traditional control and coordination processes (Finnegan & Longaigh, 2002). Similar to DoD agencies, the agencies that were studied had high levels of control by their headquarters for operations, funding, information, and decision making. IT was used to gain tighter control, and friction occurred when centralized decisions were made that impacted others without their concurrence or buy-in. The centralization of DoD business services via an EA has resulted in similar experiences that have influenced the users' perceptions of the systems when their requirements are not considered.

Federal e-Government Transformation Through Enterprise Architecture

The studies, models, and theories from the private and pubic sector in the preceding sections provided background information on the factors that may influence the users' perceptions of the value of IT-enabled enterprise business systems. Many of these factors could be essential in AF, DoD, and federal e-government transformation. The federal government adopted the enterprise systems solution and developed an EA to

govern the process of attaining specific vision and goals. A description of the vision, goals, and value of the EA provides a perspective that could be compared to what the users indicate is of value to them.

Vision and Goals

The federal government created an EA to manage and govern IT-enabled business process transformations because technological change is complex and a solution was needed to provide a common language for information technology architectures (Bass & Mabry, 2004, p. 2). The EA system is a hierarchical process that describes and documents the current and desired relationships among business and management processes and information technology and the rules and standards for EA (OMB, 2007a). It is a transition strategy, roadmap, planning, and investment control process with goals to attain interoperability, open systems, public access, compliance with the Government Paperwork Elimination Act, end-user satisfaction, and IT security (OMB, 2007a).

Value of the EA

The value of the FEA and the DoD-derived EA is that shared services across an enterprise will enhance the system (Bass & Mabry, 2004). The value of the DoD EA reference model is useful for planning but is not useful as a governance tool because the systems are too abstract and diverse (Bass & Mabry, 2004). The AF created an Operational Support Enterprise Architecture (AF OSEA) to report, govern, and review the certification of IT investments. The AF OSEA met the mandates of the National Defense Authorization Act of FY 2005, which prohibited investment expenditures unless they complied with the EA (USAF, 2006). It ensured that policies, procedures, data

standards, and system requirements supported enterprise business process reengineering and provided maximum return on investment (USAF, 2006).

As the DoD EA reaches the AF base level, the interpretation is difficult because the detail is low and its focus is on strategic outcomes at a high agency level yet there are details at the business segment level for operational outcomes for users and developers (OMB, 2006). The vision at these levels for performance improvement is based on "improved service to citizens, improved mission performance, cost savings/avoidance, technology standardization, and improved management and use of information" (OMB, 2006, p. 3-3). User and stakeholder feedback is even more essential at these levels to understand the unique requirements that may be needed to make technology the enabling component of the work (Industry Advisory Council, 2003).

The OMB (2006) suggested that agencies develop and maintain an EA and a transition strategy to define and prioritize business and information needs identified from stakeholder feedback and satisfaction surveys. The system will be successful only when there is an alignment of technical solutions with the organizational and user goals and value. This study addressed the users' feedback on the value of the systems that are part of the AF EA strategy.

Studies in IT: A Method Review

Research on IT Value

Research on how users and customers value IT has utilized quantitative as well as qualitative approaches. A description of studies includes examples where data were

collected from interviews and theories were constructed with a grounded theory methodology.

Lam et al. (2004) used a quantitative study method to develop a conceptual framework of customer satisfaction and its relationship between customer value and loyalty. They defined key constructs of the framework and theoretical grounds from the literature, used a questionnaire from previous research, and checked the face validity through business specialist consultation. They measured value with a customer-perceived quality score and a price ratio comparison of competitors.

Bennington and Cummane (1998) used a qualitative data-gathering method in a customer value workshop process to demonstrate how differences in perceived value could be mitigated through customer and service provider communication and an understanding of each other's perceptions and assessments of value. Feedback was gathered using an electronic tool consisting of customer-generated attributes of ideal service, the ranking of the attributes, a questionnaire on issues they encountered, the creation of an ideal process, and a rating of the service providers against this ideal process. The service providers also assessed customers' value and priorities, and that assessment was shared with the customers for feedback on their assessments. The qualitative data from the assessments and responses were converted into quantitative data and presented graphically so that the service providers and customers viewed the information in the same way and saw how each other responded. The comparison of data highlighted the gaps or differences in assessments and provided the basis for discussion (Bennington & Cummane, 1998).

Identifying measurements that fully assess customer value in public service is difficult because defining social or collective value is complex (Moore & Braga, 2004). Interviews proved useful to Moore and Braga in their study on the value of police performance. Findings from a qualitative assessment, an examination of the literature, and individual interviews were characterized, compared, and ordered into social and individual perspectives of value. Hirschheim et al. (2006) also used data from interviews and observations in a study on a for-profit organization. They developed their marking maturity model on the value of the relationship between IT and the business organization as an internal customer.

Grounded Theory Studies

Grounded theory is used in IT and e-government research because it can address wide-ranging topics of complex organizational and individual interactions that "draw together information science and technology, computer science, engineering research and development, and the social sciences" (Cushing & Pardo, 2005, p. 26). Researchers including Camargo (2005), Chew-Graham et al. (2005), McAvey (2004), and White and Weatherall (2000) demonstrated the use of grounded theory in e-government and IT topics from a broad range of disciplines.

Camargo (2005) studied the role of e-mail in high-technology employee burnout using a mixed methods approach, including qualitative grounded theory and a quantitative online survey. The purpose of Camargo's study was to investigate and develop a theoretical model on the role of e-mail on "inducing prolonged job-related stress or burnout among high-technology workers" (p. 7). Camargo followed a process

using open coding to determine central categories of the interview data and to create a theory. The process steps included a review of the literature; the selection of a purposeful and referral sample; the creation of interview protocol; the development of a data entry system; a data analysis using open coding for concepts, axial coding for categories, and selective coding for model building; the verification of emergent concepts and theoretical saturation; and model validity and reliability. Camargo included a literature search to get initial ideas on common issues associated with the phenomenon and only used it for the "purpose of comparisons and as sources of ideas" (p. 47). The researcher used a representative sample and focused on obtaining categories and concepts to develop an exploratory theoretical model. The grounded theory method that Camargo used captured the participants' e-mail experiences, how they perceived interactions, and what "type of changes were perceived as a result of actions/interactions resulting under those conditions" (pp. 79-80).

McAvey (2004) used the grounded theory method to develop a theory on managing IT to generate and deliver business value. The researcher integrated multiple concepts from scholarly research articles, sampled, analyzed, and coded data, developed concepts, and created a theory from the integrated concepts. McAvey used theoretical sampling "to give depth to the research by maximizing the opportunities to compare events and, therefore, to determine how much variation a category presents in terms of properties and dimensions" (p. 102). As Creswell (2003) also suggested, McAvey continued the sampling and "made adjustments throughout the data collection process based on the data content already obtained" (p. 102). The analysis resulted in a

framework of broad and complex organizational and individual behaviors, presumptions, and constraints that was derived from the capabilities of a grounded theory method.

Arbogast de Hubert-Miller and Burnett (2006) identified grounded theory as capable of handling the integration of informal conversations with formal discussion on information architecture topics because it could "bring together content, communication, and context" (p. 11). Chew-Graham et al. (2005) demonstrated this capability in their qualitative study, which identified the "experiences and attitudes of general practitioners about the use of the Internet as an information resource for themselves and for their patients, and their perceptions of the obstacles to using it" (p. 311). They used semistructured interviews with purposeful sampling and modified the interview schedules when themes emerged from the analysis of the initial interviews. They developed thematic categories; made constant comparisons; looked at deviant cases; tested emergent data; and involved other researchers' discussion, interpretation, and agreement.

White and Weatherall (2000) used the flexibility of grounded theory in an analysis of computer use by older adults to gain an understanding of the mechanisms and processes underlying a positive attitude shift in using technology. They used the flexibility of the process and altered, added, or dropped topics as they learned from the initial interviews and data collection. They open coded the information and transcripts, and "notes were taken of emerging codes, the ideas they represented, and relationships between codes" (p. 376). They altered the interview questions to capture emerging patterns from the initial analysis and "uncoded copies of the transcripts were read again to refocus on the participants' views as a whole and to check that the initial codes were

appropriate" (p. 376). They also compared new themes with the transcripts to ensure their validity and that the categories, codes, and relationships were presented diagrammatically.

Summary

This chapter examined the literature to further understanding of the study questions, objectives, and concept. It provided background information on the social, technical, and organizational factors that contribute to understanding change and the adoption of IT-enabled systems from a user-level perspective and what influences the users' perceptions. The literature review identified important concepts, theories, and models on organizational change, change from technology, and technology adoption that have applicability to this examination of user-perceived value of AF IT-enabled enterprise business systems. The findings from private sector research provided insight into how responsive, communicative, and customer-focused system solutions may influence and improve users' perception of the enterprise systems and their willingness to adopt them. This review not only investigated internal organizational change issues but also helped to identify background on the EA process and the research strategies and methods that were used in this study.

Chapter 3 describes the philosophy and practical aspects supporting the decision to use a qualitative method of inquiry. It describes the research model, context of the study, participant selection, role of the researcher, data sources and collection, evidence of quality, treatment of data, and analysis using the grounded theory methodology for this study.

CHAPTER 3: RESEARCH METHOD

Introduction

The purpose of this study was to examine the perception of the value of AF enterprise business systems by internal users at an AF test and evaluation base. The goal of the current study was to understand user-identified values and expectations of the systems, and the corroboration of those user-identified values with the values and expectations of the e-government. The inquiry used a qualitative grounded theory approach described by Creswell (2003), McNabb (2002), and Strauss and Corbin (1998) to construct a theory from different perspectives, experiences, and meanings of value from users of AF IT-enabled enterprise business systems. Chapter 3 describes and justifies the research method, and explains the study sample, the sources of data, the data collection and analysis procedures, and validity issues.

Research Questions

This study examined the perceptions of the value of AF enterprise business systems by internal users at an AF test and evaluation base. The overall question for this study asked: "What are the internal users' perceptions of what they value and need from IT-enabled enterprise business processes and systems?"

Questions that contributed to the overall research question were the following:

1. What criteria are considered in determining value of the enterprise business systems?
2. What are the interactions of the criteria considered in determining what is valuable?

3. How do the factors they value relate to the vision and goals of their organization?
4. How do the factors they value relate to the vision and goals of the enterprise systems?

Before collecting any data, the researcher received permission from Walden University's Institutional Review Board (IRB approval # 07-29-08-0287994) to conduct this study.

Research Model

The researcher used a qualitative grounded theory method to develop a theory of user-defined value of IT-enabled enterprise business systems. This qualitative tradition of inquiry was selected so that the original data from the participant interviews could be used to generate a concept about what was necessary and important to the users in completing business processes through enterprise systems.

Grounded Theory Method

The qualitative grounded theory method was appropriate for this study because it helped to achieve intellectual and practical goals through its inductive, open-ended strategy. It had the capability to increase the understanding of the meaning of the participants' perspectives, the context of their actions, unanticipated phenomena and influences, and the process of events and actions desired in this inquiry on the users' perception of value (Maxwell, 1996). The grounded theory method provided a flexible means of examining an area in its context and was based on a modern frame of reference**,** paradigm, or philosophy that human subjectivity is inevitable (Babbie, 2004).

This method was suitable for this study because it had practical applications for problem solving because the "theory derived from data is more likely to resemble the 'reality' than is theory derived by putting together a series of concepts based on experience or solely through speculation" (Strauss & Corbin, 1998, p. 12). Grounded theory is appropriate for the exploration of undertheorized areas, linking individual experiences on a wider social context, and it requires researcher self-reflexivity that is enhanced by research diary and memo writing (Burck, 2005). The iterative process of using data from initial interviews to expand and explore concepts in more depth "fits well with systemic practice, in which feedback informs and shapes further inquiry" (Burck, 2005, p. 244). Grounded theory is similar to systemic practice because it uses feedback to build the research inquiry by "making connections between categories, and moving between levels" (Burck, 2005, p. 248).

Learning in this inquiry method was pragmatic and involved the acquisition of new information, knowledge, and understanding about the research questions and the research method itself (Creswell, 2003). This study process was based on a constructivist perspective and a process of "collecting open-ended, emerging data with the primary intent of developing themes from the data" (Creswell, 2003, p. 18). It was a process of determining theory out of data that were collected from all possible sources, analyzed, and interpreted (McNabb, 2002). It involved asking open-ended questions, collecting data through interviews and observation, assembling data systematically, developing theory from the data, and relating the theoretical model back to the literature (Creswell, 1998). The grounded theory technique was capable of handling complex communication

experiences and integrating informal conversations with formal discussion (Arbogast de Hubert-Miller & Burnett, 2006).

Semistructured interviews were used to answer the study question because they were an effective way to capture data and consider all aspects "because patterns, relationships and processes at so many different levels of context are considered relevant" information and study data (Burk, 2005, p. 240). The interviews ensured the research questions were covered yet "left room to follow feedback idiosyncratically so as to explore more particular meanings with research participants" (Burck, 2005, p. 240). Determining system value for the users through the use of a survey instrument with preconceived concepts of what value is to customers was contrary to "offering insight, enhancing understanding, and providing a meaningful guide to action" (Strauss & Corbin, 1998, p. 12). The use of Burck's suggestion to "ask participants to reflect on their experiences of the questions and interview process, and any significant absences" (p. 241) strengthened the process, validated the interview, and ensured against researcher bias representation of the interview information.

The grounded theory is based on the principle of change and the method and process facilitated the capturing of responses in changing conditions of the research (Corbin & Strauss, 1990). This method suited this research that sought how users defined the value of Air Force IT-enabled enterprise business systems. The researcher analyzed the criteria that the users considered in determining the value of the enterprise business systems, the interactions of those considerations, and the relationship of what they valued to the vision and goals of their organization and the enterprise as a whole. The researcher

followed the in-depth probing technique suggested by Szablowski (2000) that engaged the participants to set the agenda within open-ended questions rather than through traditional, predetermined questions and answer options. This inquiry used the flexibility of the process to adapt to change and broad boundaries of the interview questions to probe and expose the underlying meanings of the responses. It allowed for refining conversation and altering, adding, or deleting questions as learning occurred from the initial interviews (White & Weatherall, 2000).

The process began with collecting data from the interviews; immediately transcribing the interviews; and then managing, classifying, describing, and analyzing the data (Burck, 2005; Creswell, 1998). A concept of user value was constructed at the end of the process when all of the data were analyzed and looked at as a whole. The concept development followed a method described by Mills, Bonner, and Francis (2006) where "constructivist grounded theory is positioned at the latter end of their methodological spiral, actively repositioning the researcher as the author of a reconstruction of experience and meaning" (p. 2).

Although the process was based on the precept that there were no preconceived ideas to prove or disprove and that the concepts emerged from the interviews, the concepts of user-defined system value were preconstructed from a document and the literature review as a potential starting point. Researchers supported the use of the literature as a way of finding out what is central, important, and relevant to the inquiry (Babbie, 2004; Fereday & Muir-Cochrane, 2006; Hersey & Blanchard, 1993; Maxwell, 1996; Mills et al., 2006). Concepts from the literature were used to identify other factors

that could influence the users' perceptions of value that were not mentioned by the participants' during the interviews. These concepts were used for the negative case analysis, which is further discussed in the Researcher Verifiability section and chapter 4.

A concept of the users' perceptions of the value of enterprise systems was constructed using an overall process of specifying a range of phenomena, identifying who and what it applied to, listing major concepts, determining relationships between them, and providing reasoning for the final concepts (Babbie, 2004). The analysis relied on inductive reasoning consisting of "first observing aspects of social life and then seeking to discover patterns that may point to relatively universal principles" (Babbie, 2004, p. 55). The analysis was accomplished using the grounded theory process steps described by Strauss and Corbin (1998) as open coding the interview narratives to generate concept properties that exposed thoughts, ideas, and meaning; performing a comparative analysis of the data to generate categories of phenomena; axial coding or linking categories based on properties; creating relationship statements between categories; integrating and refining categories with selective coding; and outlining a theory or concept on these relationships. These steps are discussed in detail in the Treatment of Data section. The data analysis resembled Creswell's (1998) spiral where "a researcher engages in the process of moving in analytic circles rather than using a fixed linear approach" (p. 142).

Data were compared by category in a structured manner to allow for the continual analysis and reevaluation of commonalities and differences in the data (McNabb, 2002). The process included fitting new data into constructs or categories, commonalities are compared, and, possible theories and interpretations were contrasted (McNabb, 2002, p.

303). Grounded theory processes developed by Eaves (2001) in a research project on family care giving were similar to those used in this study. Eaves used the method to discover sociopsychological processes simultaneously with data collection and analysis. Eaves coded transcripts line by line with key words denoting ideas and then summarized them into main ideas. Eaves grouped the similarly coded phrases, labeled ideas, and developed concepts. The concepts were grouped into categories that were compared for similarities and relationships, linkages were made, core categories identified, and theory formed. Eaves suggestion on using memos with information on the method and analytical issues as well as getting feedback from mentors was crucial to the process. Details on the research process are described further.

Research Process

Study Sample

A sample of the major test and evaluation organization users participated in the study to meet the inquiry's goals and objectives. A pilot study was conducted with 2 participants, and 10 other participants from AF Base X were interviewed for the main study. Strauss and Corbin (1998) suggested that a sample of this size would provide a sufficient basis for a grounded theory process because the participants represented the largest groups of users of the systems. The representation would maximize the opportunity to collect and compare varied data on the perceptions of the value of the enterprise systems. The participants were from the test and evaluation organizations who were the major users of the enterprise systems. The organizations were identified as the largest populations of user groups who employ business processes to accomplish their

mission. These participants were able to identify a large range of concerns and needs from the users in the organizations they represented.

The researcher selected individuals who were influencers in technology decisions in their organization; that is, people who influenced or made decisions on the use, adoption, or development of IT solutions for their activity. The IT influencers were typically "external to the IT organization, who can help develop the vision, marshal resources, influence decisions, and is critical for the success of any project" (Hirschheim et al., 2006, p. 186). They were influential in the organization's perception of success and "could affect senior management's belief about IT value" (Hirschheim et al., 2006, p. 186). The CIO did not know who was selected to be a participant, which prevented selection bias by the CIO. The participants were not accountable to the CIO and were not in the CIO's chain of command or responsibility which limited the influence of the CIO on their responses and any outcome bias. Diversity of the participants was limited to the fixed number of major organizations on the base and their influencers. Differences in the participants' responses based on diversity or demographics were not investigated.

The participants were contacted by the researcher to find out if they were willing to take part in the study. The researcher provided a letter of introduction signed by the Base X executive director that encouraged their participation in the study. The Base X executive director, CIO, and comptroller identified potential participants because of their knowledge of the systems and organizations. The researcher made the final selection of the participants based on their seniority in the organization to ensure that they had a thorough knowledge of the organizational members and work.

The Base X executive director, CIO, and comptroller did not know who was approached or who agreed to be in the study which mitigated participation coercion and confidentiality concerns. Business relationships were already established with many of the potential participants based on the researcher's organizational affiliation and longevity. The researcher's knowledge of the base organizations and leadership helped in gaining participation consent. The researcher acknowledges that there was the potential for bias "when the sample is prescreened for consent [and] the sample itself is established or negotiated by researcher qualification" (Cycota & Harrison, 2006, p. 147). This potential for bias was mitigated by seeking the broadest representation of participation from the test and evaluation community who were not in the CIO's or the researcher's reporting or supervisory chain.

Sources of Data

Data for the development of a concept of user value were collected from interviews with the internal users of AF enterprise-wide business systems who were influencers in the organization. Data also came from field notes from the interview and researcher memos on the interpretation of the meaning of the dialogue and resulting constructs.

Development and Testing of Interview Instrument

The interview protocol and questions were piloted with a former base-level CIO and an IT influencer who were not among the study participants. They operated in organizations that use the enterprise systems, so they were familiar with the systems and were able to answer as well as test the interview instrument. The pilot study participants

were asked for their feedback on the interview tactics and questions. The interviews were recorded and transcribed to determine if they provided data that could be analyzed with the grounded theory methodology of coding and construct development.

The pilot study participants were asked to provide additional feedback on whether the probing questions gained appropriate levels of depth and if leading questions were being asked. Learning from this analysis facilitated the researcher's modification of the interview protocol and interview techniques. As a result, clarification regarding the meaning of enterprise systems was made before beginning the interview questions, and the first question was divided into two subquestions for greater clarity. The analysis process is discussed further in the Treatment of Data section.

The Interviews

The interviews were conducted following suggestions from Babbie (2004); Creswell (1998, 2003); McNabb (2002); and Strauss and Corbin (1998). The potential participants were contacted initially via e-mail and were asked to participate in the study. A letter from the CIO that supported their participation was provided to them. The potential participants who did not respond to the initial inquiry were called again and reinvited to participate. Declinations were noted, and alternate participants within the same part of the organization who met the selection criteria as the original participants were invited to join the study.

Data for the question on what the participants described or identified as user-perceived value in IT enterprise and e-government systems were collected from 10 interviews. The interviews were scheduled during regular office hours in their offices or

other business location choices. Telephonic interviews were an option, but they were not needed because all the meetings were held in person. The interview guide and the research questions helped to steer the conversations (Strauss & Corbin, 1998). Each interview started with an introductory statement or a high-level overview of the purpose of the research description of what an enterprise system was, and an explanation regarding how the participants' responses would help to answer the research questions.

Each interview began with a broad question to find out the participant's basic knowledge, feelings, and experience with the enterprise system, followed by more specific questions on perceptions of value and supporting evidence. The researcher used probing questions to clarify or elaborate responses. The probes were neutral, so they did not "affect the nature of the subsequent response" (Babbie, 2004, p. 266). As suggested by Babbie, the probe questions started with, "How is that? In what ways? How do you mean that? What would be an example?" (p. 301). In addition, a technique of listening expectantly so that the participant filled in the silence and expanded on the responses was used (Babbie, 2004). The interview protocol for recording information during each interview followed Creswell's (1998, 2003) suggestions and is shown in Appendix B. The protocol included introductory remarks, questions and their rationale, probes for each question, and space to record comments and notes. Each question and its probes were followed for each interview as they were needed (Babbie, 2004). The questions were altered from learning that occurred through the pilot study and main study as described in the section on the Development and Testing of the Interview Instrument. The questions, probing questions, and rationale for the questions follow.

Question 1. What enterprise business systems and processes do you use to accomplish your work or mission? What nonenterprise business systems and processes do you use to accomplish your work or mission? This two-part question acted as a broad warm-up that engaged the participants in discussion about the systems that they use. Probe question(s): Can you name some of the enterprise or nonenterprise systems that you use? Do you have financial tracking, budgeting, human resource management, purchasing, training, inventory, travel, or other systems?

Question 2. What aspects of the enterprise business systems help you accomplish your work or mission? To help answer this question, think of the different type of systems you use. This question engaged the participants in discussion about the benefits of the enterprise systems. The answers provided descriptions of what is valuable in accomplishing the work that the enterprise system provides and envisions. This question related to the overall study question, "What are the internal users' perceptions of what they value and need from IT-enabled enterprise business processes and systems?" It also related to the subquestion of how the identified value relates to the vision and goals of the enterprise systems. Probe question(s): How else would you describe the effective aspects of enterprise systems?

Question 3. What do you think the greatest obstacles are to your mission when you use the enterprise system? This question allowed the participants to comment on the system and provide information on what does not create value. This question related to the subquestion on how the value the users seek and find in the systems align with the

vision and goals of their organization. Probe question(s): Think about what is missing as well as what does not create value. In what way is your work impacted?

Question 4. If you do use a nonenterprise business system, what capabilities does it have that would be the most important for your business processes? This question allowed the participants to express the valued outcomes needed without relating to any constraints of the current enterprise system. This question related to the overall study question. Probe question(s): Are there other examples or anything else in another application or venue that would provide what you need, want, or value?

Question 5. If you could build your own business structure or processes, what would you include*?* This question encouraged the participants to think creatively and look beyond what they currently have. It allowed them to identify factors that create value. Probe question(s): If you built your own business structure or processes, what did you include to add value?

Question 6. What example inside or outside the government can you identify that most nearly depicts the capabilities you need in an IT business system? This question provided a basis for comparison and clarification through examples. This question provided additional information or data that added to the study and findings. Probe question(s): Can you describe a program or process that you have used [or seen/heard about (?)] that could meet your business processes needs? Do you have an example that comes closest to what you think would add value?

Question 7. Is there any other information you would like to share that will help in understanding your perceptions about the value of our existing enterprise business

systems or the additional things you need? This question was the closing question that allowed the participants to express or provide additional information or clarification to any of the interview questions.

The interviews were recorded and complete transcriptions were made so that the participants' answers were documented by the researcher exactly as they were given (Babbie, 2004). The participants received an electronic copy of the interview transcripts and validated the content. The participants also were invited to share other pertinent information to augment or clarify their responses. The participants did not offer any additional materials or information.

Data Collection

Each interview was read and coded to capture initial ideas. Each interview was then reread and recoded with all interviews as a whole again, as White and Weatherall (2000) suggested, and was used to determine whether the initial codes were appropriate or whether new ones appeared. The conceptual themes in the interview transcripts were compared to ensure that new categories, codes, and relationships were captured, as White and Weatherall suggested.

Word-processing and worksheet software were used to manage and analyze the large amounts of data. The automtated documents and worksheets helped the researcher to gain an overall sense of the data, as well as sort, verify, reduce, and display the data and information (Creswell, 1998). The interviews were transcribed into a document format that was coded by line or by paragraph by inserting concept phrases into the text.

The text was transferred to a worksheet format into the fields. Each field had sorting capability for managing and rearranging the data in the analysis.

Pre- and postinterview research field notes were collected (see Appendix C). This format was modified and adapted from a format used by Leisner (2005) to facilitate the collection of the data on the participants' relationship to the organization and users of the enterprise systems; how and why they were selected; what was learned from the interview that changed the interview questions or protocol; and what personal observations were made. The researcher prepared the field notes in a document format as soon as possible after the interviews to capture the researcher's perceptions and other observations during the interviews (Babbie, 2004).

Evidence of Quality

There is no single process or approach for demonstrating or providing evidence of quality in qualitative research. There are always situational and contextual limitations in the research process or in the researcher's interpretations or findings (Richardson, 2000). Research credibility is gained through a combination of factors, including researcher self-reflexivity or self-awareness (Creswell, 1998); verifiability; and the research process itself (Fereday & Muir-Cochrane, 2006; Jacelon & O'Dell, 2005; McNabb, 2002).

Researcher's Self-Reflection

Researchers' understanding of how they are intertwined with the subject is important for credibility as they interpret and document the participants' perceptions, experiences, and worldview (Richardson, 2000). Self-reflexivity brings hidden agendas and truthfulness to a higher level of consciousness and awareness (Richardson, 2000).

The researcher used memos during the analysis process to describe why decisions were made to code and categorize data. Eaves (2001) supported Burck's (2005) assertion that memos provide information "to clarify creative leaps made when linking, merging or splitting categories and to record emerging theoretical reflections, which help make and keep the process of the analysis transparent, and maintain a self-reflexive stance" (p. 245). The documentation of analysis decisions included brief descriptions of what codes mean and why codes were grouped together into categories. The memos were referenced and re-worked throughout the analysis process to challenge decisions made in the analysis.

The researcher's influence in this qualitative study needed to be understood, not eliminated, because it was an integral part of the study (Maxwell, 1996). The researcher took on the role of inquirer seeking to understand the users' descriptions or definitions of the value of the IT systems. The interviewer took care to be neutral and listen more than talk during the interview process (Babbie, 2004). The researcher was as unobtrusive as possible and acted as a "neutral medium through which questions and answers were transmitted" (Babbie, 2004, p. 264). The researcher did not have responsibility or authority over the CIO or the participants that could bias the interpretation of the interview data. The relationships with the participants were on a professional peer level. The researcher strove to maintain objectivity by following the suggestions by Strauss and Corbin (1998) that included (a) giving a voice to the respondents, (b) making comparisons, (c) using other examples and the literature to stimulate thinking and sensitize recognition of other properties, (d) looking for multiple viewpoints, (e) checking

out assumptions with the respondents, (f) stepping back and looking at what was going on in the data, (g) being skeptical, and (h) following systematic procedures.

Research Verifiability

Research verifiability in this qualitative study used suggestions from Creswell (1998) and Richardson (2000). The discussion that follows shows their distinctive views and explains how negative case analysis and participant feedback was used in this study.

Creswell (1998) suggested that standards of quality and verification in qualitative studies rely on "extensive time spent in the field, the detailed thick description, and the closeness to participants in the study" (p. 201). Creswell recommended using at least two means of verification from a list of prolonged engagement and persistent observation in the field: (a) triangulation, or the use of multiple sources and methods to provide corroborating evidence; (b) peer review from an individual who challenges the researcher's meanings and interpretations; (c) negative case analysis; (d) clarification of researcher bias; (e) member checks, where the participants examine and provide feedback on the researcher's work; (f) rich, thick descriptions that enable the transfer of information to other settings because of shared characteristics; and (g) external audits by other raters.

A high level of quality and verification was attained by looking at the data from multiple angles (Richardson, 2000) and including opposite or negative cases and validation from members (Creswell, 1998). Richardson did not fully support the concept of triangulation because this method assumes "that there is a fixed point or object that can be triangulated" (p. 13). Instead, Richardson suggested a concept of crystallization, which

requires infinite angles of approach and a deconstruction of the traditional idea of validity because “there are far more than three sides by which to approach the world” (p. 13). This method of looking at the data from different angles was used because it “provides us with a deepened, complex, thoroughly partial understanding of the topic. Paradoxically, we know more and doubt what we know. Ingeniously, we know there is always more to know” (Richardson, 2000, p. 14). Negative case analysis and participant feedback also were used in this study because they were feasible and helped the researcher to gain a deeper understanding of the topic through different angles of approach rather than predetermined, fixed points of triangulation. Negative case analysis, or looking at opposite cases for significant properties (Strauss & Corbin, 1998), is discussed in the Treatment of Data section. Participant feedback was obtained by following Creswell’s (1998) and Maxwell’s (1996) suggestions to include validation of the transcribed interviews to ensure that the participants’ perceptions were captured accurately. The transcribed interviews were provided to the participants for their feedback regarding the accuracy of the data collected. A few minor changes were subsequently made to the interview transcripts.

Credibility of the Research Process

Credibility of the research process was gained by following the suggestions offered by Creswell (1998), McNabb (2002), Strauss and Corbin (1998), and others, as described in the Data Collection and Treatment of Data sections. Verification, not validity, that the data were captured correctly and analyzed systematically was important “because verification underscores qualitative research as a distinct approach, a legitimate

mode of inquiry in its own right" (Creswell, 1998, p. 201). Adherence to grounded theory procedures ensured that the research was trustworthy, authentic and credible, and provided understanding (Creswell, 1998).

The process included interview questions that were open ended and semistructured so that the data could be collected without hindering the discovery of new ideas and concepts (Strauss & Corbin, 1998). The researcher used Strauss and Corbin's suggestion for validating the data analysis findings by repeatedly comparing them against the raw data. The analysis strove to create "a theory that is grounded in data [that is] recognizable to participants, and although it may not fit every aspect of their cases, the larger concepts should apply" (Strauss & Corbin, 1998, p. 161).

Although Creswell (1998) believed that verification, not validity, was important in qualitative research, face validity, or a relative basis of agreement that the terms and definitions used in the study represented the concepts under study (Babbie, 2004), was demonstrated with supporting literature. The researcher used the literature review to identify complementary and opposite research on the concepts that were considered in the analysis and findings (Fereday & Muir-Cochrane, 2006). The researcher also employed Fereday and Muir-Cochrane's process of supporting the findings of the data analysis with "excerpts from the raw data to ensure that data interpretation remains directly linked to the words of the participants" (p. 3) to ensure verification of the concepts derived from this study.

The external validity, or "looking outward, to assess the potential conclusions that may be drawn from the research and their application within a population" (LaCoursiere,

2003, p. 258), was not expected because this study was limited to the AF base-level target population. Corbin and Strauss (1990) wrote that the grounded theory procedure and analysis should explain, describe, and integrate concepts with "some degree of predictability, but only with regard to specific conditions" (p. 5). This context-specific applicability was relevant to this study.

The researcher's role in the interviews was to act as an observer, encourage open-ended responses, and document and capture all responses for the data analysis. The gathering of accurate data from the participant interviews by a single researcher could have been considered a limitation, which was remedied by the researcher's use of a tape recorder and the transcription of the interviews into a document format. As suggested by Fereday and Muir-Cochrane (2006) and Jacelon and O'Dell (2005), the participants were asked to review and validate the content of the interview transcripts. As Jacelon and O'Dell pointed out, researcher awareness of the participants' perceptions, a clear statement of assumptions, and prolonged engagement in the research ensured the study's trustworthiness.

The researcher demonstrated an awareness of the participants' perceptions during the data collection stage by making field notes before, during, and after the interviews. Memos were written during the data analysis stage to capture the participants' perceptions regarding why and how analysis decisions were made. The memos captured and highlighted the thought process, assumptions made, and resulting decisions and rationale for the analysis. The research process required prolonged engagement, not a cursory review of the data, in the collection and analysis steps. A detailed database for

the analysis of the interview data and written memos, which provided meaning through rich descriptions (Creswell, 1998; Jacelon & O'Dell, 2005), facilitated the confirmability and dependability of the results.

Treatment of the Data

The grounded theory procedure of coding the data for meaning and comparing constructs was used in the treatment of the data on what the participants described as the value they need from enterprise business systems. The process involved an inductive examination of the data from particular codes to more general perspectives or categories of codes (Creswell, 1998). Data were gathered from the interviews and field notes on the value of the enterprise systems. All of the data were "compared to emerging categories in a constant comparative method" (Creswell, 1998, p. 57). The analysis followed the grounded theory process steps described by Strauss and Corbin (1998) and supported by McNabb (2002) and White and Weatherall (2000).

1. Each interview was transcribed into a document format, verified by the participants, and read for meaning. Field notes were made on the impression of the interview.
2. As each interview transcript was obtained, it was be read and coded by sentence or paragraph by inserting key words or phrases bracketed in symbols that indicated or described the system value. These codes were added to the list of codes in Appendix A that were used as a reference for consistent terms. Open coding facilitated the generation of concepts and their properties that exposed thoughts, ideas, and meaning (Strauss &

Corbin, 1998). It helped to generate broad, freewheeling categories and properties that were continuously revised, merged, and compared for variations by the researcher (McNabb, 2002; Strauss & Corbin, 1998). Coding transcripts as they were obtained assisted in accumulating new codes that were checked against each interview and then as a whole. Alternating data collection with analysis allowed for sampling based on emerging concepts, recoding previous coding, validation, and modification or discarding of concepts as they developed (Strauss & Corbin, 1998). Memos were made on what the codes meant and why they were used.

3. The open-coded data were compared after all the interviews were complete to determine whether any ideas or codes could be categorized together. The comparative analysis checked for similarities and differences, and the grouping of ideas into categories or phenomena that were the "important analytical ideas that emerged form the data" (Strauss & Corbin, 1998, p. 114). Memos were written to explain why categories were formed; what they meant, or ideas they represented; the relationships between codes (White & Weatherall, 2000); and what conditions defined or caused the categories (Strauss & Corbin, 1998).
4. Each category was reviewed again to determine whether subcategories could be defined. The addition of subcategories refined the concepts, and notes were made on the reason they were determined necessary.

5. The coded text was reviewed again and axial coded. This process linked and related categories by properties or characteristics along a range or continuum of dimensions. Axial coding created more structure and more fully described what was going on (McNabb, 2002; Strauss & Corbin, 1998). The new coding answered what, why, how come, where, when, and how questions, and it formed more precise and complete explanations on how categories crosscut and linked with each other (Strauss & Corbin, 1998). Memos were made on what these codes meant and how they were determined.
6. The axial coded categories were identified with selective codes that were relationship statements that linked the categories. These statements were reviewed against the categories and subcategories to validate them (Strauss & Corbin, 1998). Memos provided the reasons for identifying the relationship statements.
7. The results were outlined and reviewed for inconsistencies, gaps, contradictions, and negative cases. Negative case analysis was achieved by following a technique of looking at opposite or missing cases for significant properties. It allowed for a systemic comparison, recognition, and investigation of biases, beliefs, and assumptions (Strauss & Corbin, 1998). Interview data were analyzed only for what appeared and for what was missing so that other perspectives and angles were approached. Data for a comparison of opposite cases or for what was missing came from the

participant responses that were opposite to or different from other participant responses or concepts from the eight themes gathered on the enterprise vision and goals that were not present in the participant responses. Saturation was reached when there was no new information and when the resources were exhausted (Strauss & Corbin, 1998).

Figure 3 shows the analysis process steps and an example of how the codes were categorized and recategorized in the iterative process steps.

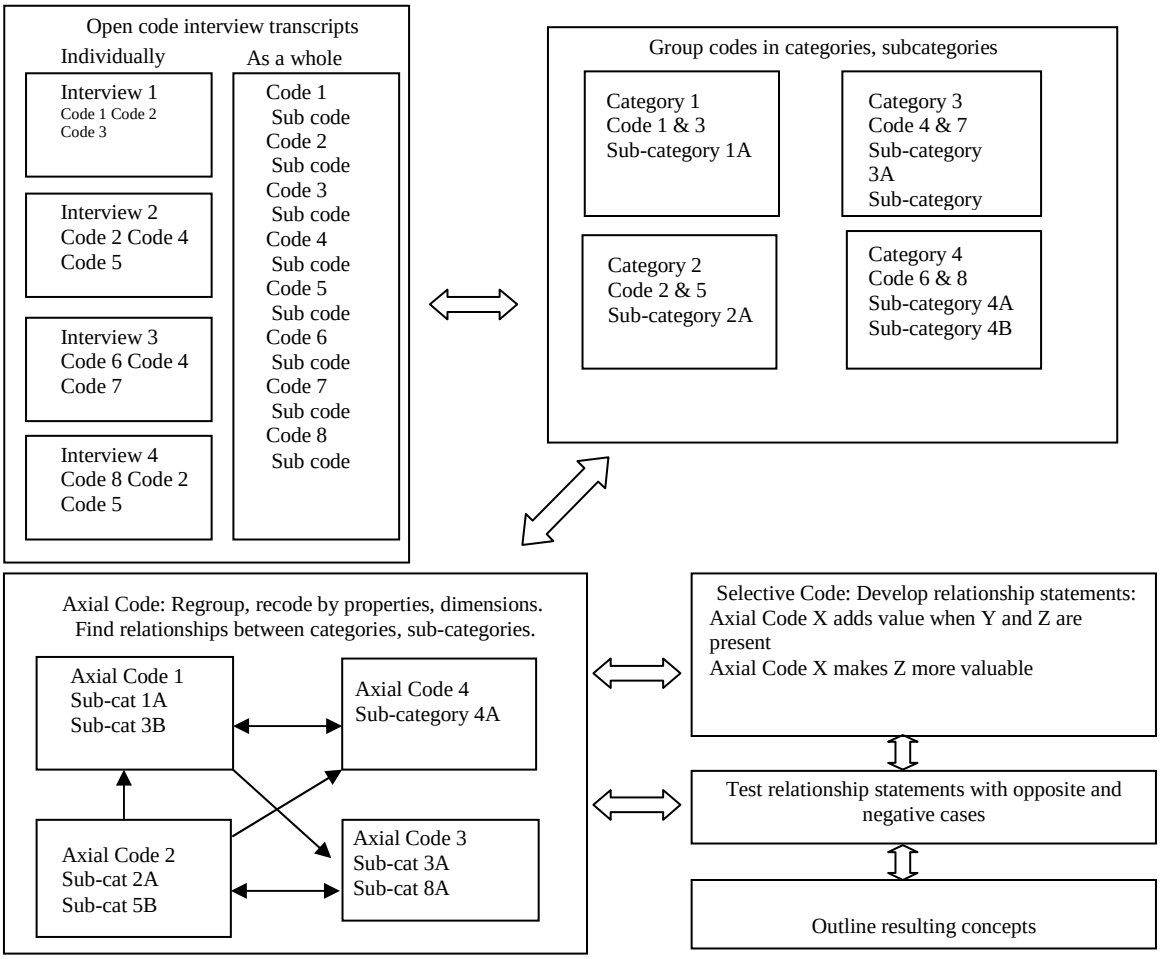
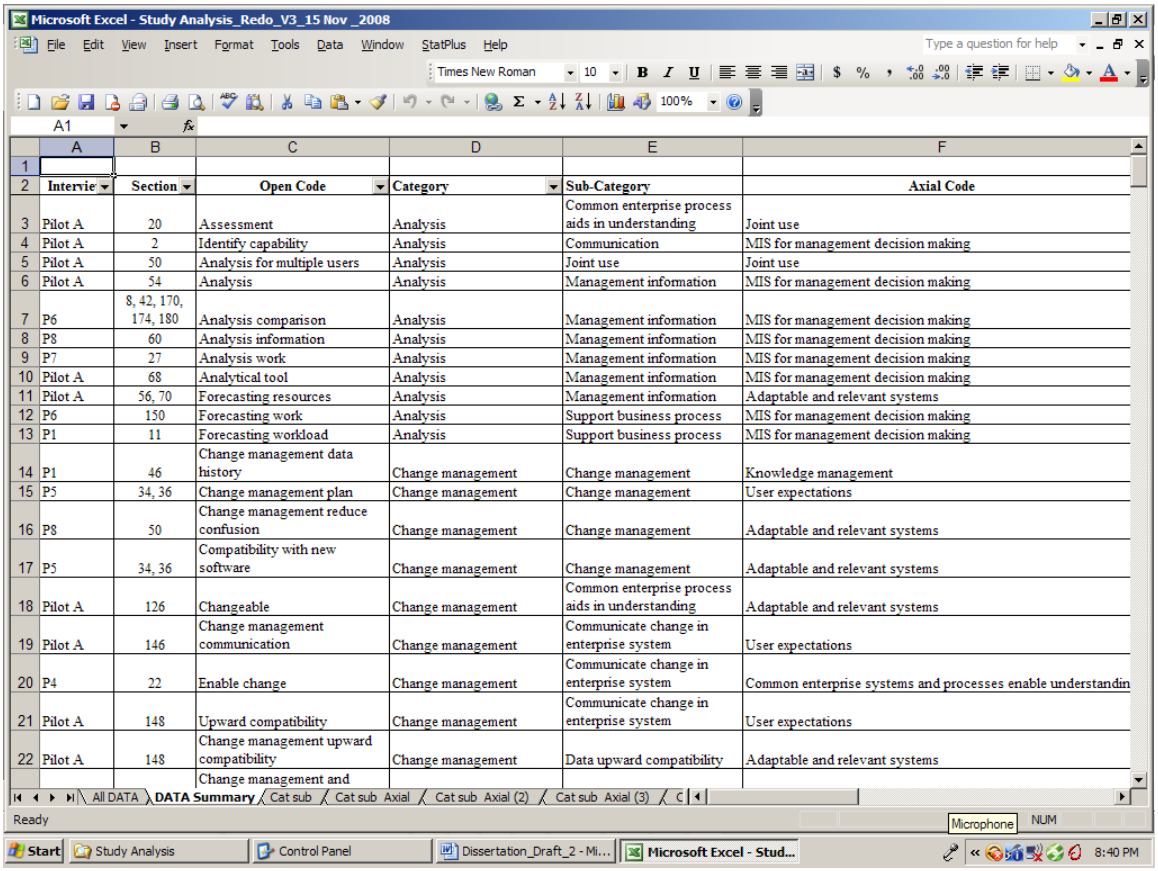


Figure 3. Process steps.

Figures 4 and 5 show examples of the data analysis worksheets used to manage the data. Figure 4 shows how the fields for the analysis were arranged.

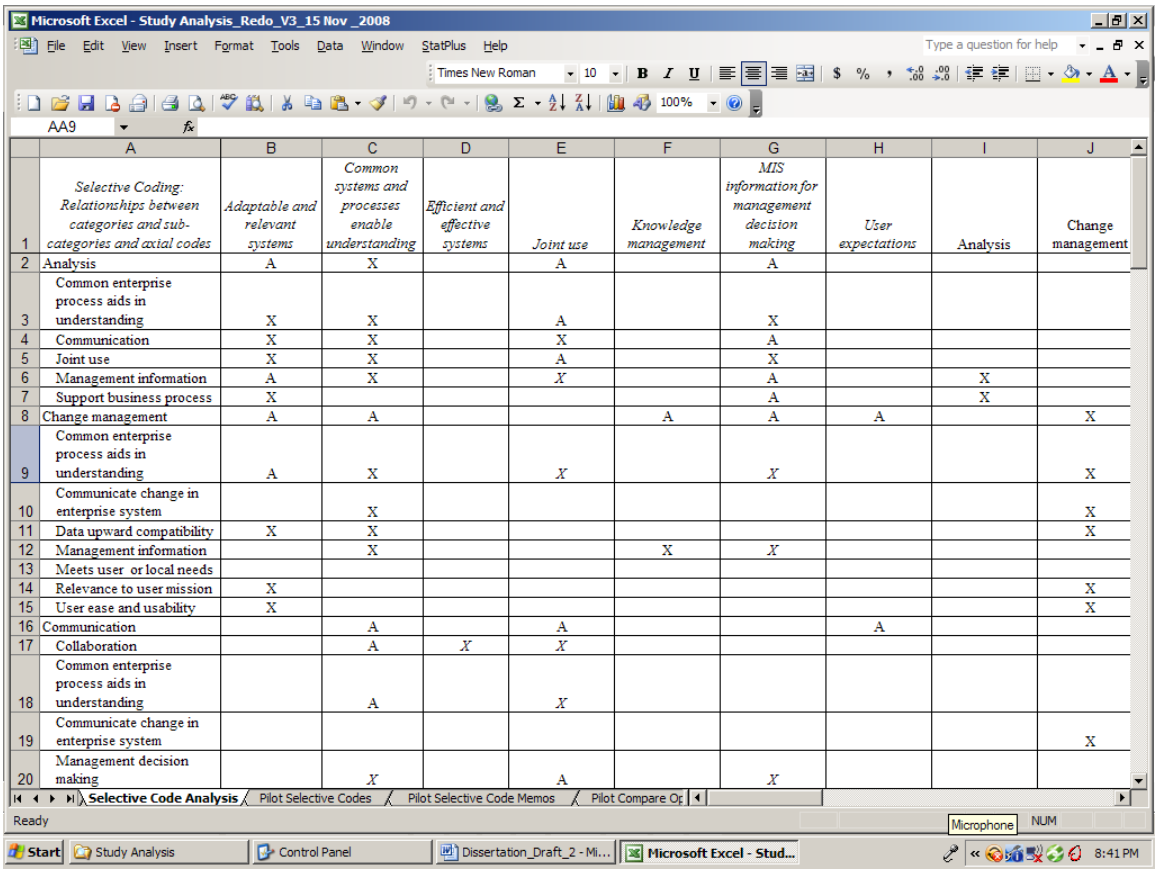


Microsoft Excel - Study Analysis_Redo_V3_15 Nov _2008

	Intervie	Section	Open Code	Category	Sub-Category	Axial Code
3	Pilot A	20	Assessment	Analysis	Common enterprise process aids in understanding	Joint use
4	Pilot A	2	Identify capability	Analysis	Communication	MIS for management decision making
5	Pilot A	50	Analysis for multiple users	Analysis	Joint use	Joint use
6	Pilot A	54	Analysis	Analysis	Management information	MIS for management decision making
7	P6	8, 42, 170, 174, 180	Analysis comparison	Analysis	Management information	MIS for management decision making
8	P8	60	Analysis information	Analysis	Management information	MIS for management decision making
9	P7	27	Analysis work	Analysis	Management information	MIS for management decision making
10	Pilot A	68	Analytical tool	Analysis	Management information	MIS for management decision making
11	Pilot A	56, 70	Forecasting resources	Analysis	Management information	Adaptable and relevant systems
12	P6	150	Forecasting work	Analysis	Support business process	MIS for management decision making
13	P1	11	Forecasting workload	Analysis	Support business process	MIS for management decision making
14	P1	46	Change management data history	Change management	Change management	Knowledge management
15	P5	34, 36	Change management plan	Change management	Change management	User expectations
16	P8	50	Change management reduce confusion	Change management	Change management	Adaptable and relevant systems
17	P5	34, 36	Compatibility with new software	Change management	Change management	Adaptable and relevant systems
18	Pilot A	126	Changeable	Change management	Common enterprise process aids in understanding	Adaptable and relevant systems
19	Pilot A	146	Change management communication	Change management	Communicate change in enterprise system	User expectations
20	P4	22	Enable change	Change management	Communicate change in enterprise system	Common enterprise systems and processes enable understandin
21	Pilot A	148	Upward compatibility	Change management	Communicate change in enterprise system	User expectations
22	Pilot A	148	Change management upward compatibility	Change management	Data upward compatibility	Adaptable and relevant systems
			Change management and			

Figure 4. Analysis worksheet.

Figure 5 shows a sample of the data-sorting capability. In this sample, the concepts in the worksheet are related as shown by the axial coding columns.



	A	B	C	D	E	F	G	H	I	J
1	*Selective Coding: Relationships between categories and sub-categories and axial codes*	*Adaptable and relevant systems*	*Common systems and processes enable understanding*	*Efficient and effective systems*	*Joint use*	*Knowledge management*	*MIS information for management decision making*	*User expectations*	Analysis	Change management
2	Analysis	A	X		A		A			
3	Common enterprise process aids in understanding	X	X		A		X			
4	Communication	X	X		X		A			
5	Joint use	X	X		A		X			
6	Management information	A	X		*X*		A		X	
7	Support business process	X					A		X	
8	Change management	A	A			A	A	A		X
9	Common enterprise process aids in understanding	A	X		*X*		*X*			X
10	Communicate change in enterprise system		X							X
11	Data upward compatibility	X	X							X
12	Management information		X			X	*X*			
13	Meets user or local needs									
14	Relevance to user mission	X								X
15	User ease and usability	X								X
16	Communication		A		A			A		
17	Collaboration		A	*X*	*X*					
18	Common enterprise process aids in understanding		A		*X*					
19	Communicate change in enterprise system									X
20	Management decision making		*X*		A		*X*			

Figure 5. Analysis of worksheet data sort for selective coding relationships.

The data required continual comparison to find pattern variations and comparisons, and to examine assumptions (Strauss & Corbin, 1998). An overall concept on the value of the enterprise system from the users' perspective evolved "when major categories were finally integrated to form a larger theoretical scheme" (Strauss & Corbin, 1998, pp. 143-144). The development of the overall concept was accomplished by determining relationships between categories of constructs and their conditions, outcomes, and consequences (Creswell, 1998). The rigorous, systematic analysis provided information about the users' perceptions of the value of the AF IT-enabled enterprise business systems.

Corbin and Strauss (1990) emphasized that procedural flexibility and inevitable contingencies have to be balanced with the following procedures to give a project rigor. Even though the analysis process was flexible and began with the initial data collection, the process was followed systematically to "capture all potentially relevant aspects of the topic as soon as they are perceived" (Corbin & Strauss, 1990, p. 6). Detailed notes and thick descriptions from the interview transcripts were necessary to determine which concepts showed up repeatedly so that they could be considered significant (Corbin & Strauss, 1990). The process of determining categories or groupings of concepts that pertained to the same phenomenon was based on a comparison of their properties or dimensions and their impact on the phenomenon in question (Corbin & Strauss, 1990). For example, if the users were to identify value in an enterprise system as the business reports they provide, then these properties could include the timeliness and format of the reports.

Variations along the dimensions of format could include the ability to provide a "one-size-fit-all" dimension to highly individualized reports. The impact of this variation could be that the users value a system with the ability to generate individualized reports. Concepts that consistently showed as indicators of the phenomenon became part of the theory, and precision was gained when there was finer "sub-division of an original concept, resulting in two different concepts or variations on the first" (Corbin & Strauss, 1990, p. 9). Concepts that could not be further divided were considered discrete concepts. Saturation was reached when comparisons no longer produced different results.

Protection of Participants' Rights

Walden University's IRB procedures were adhered to in an effort to protect the rights of the participants. An assessment of conflict of interest was completed, and approval from AF Base X to conduct the study was secured. The participants agreed to be in this study on a voluntary basis, and each participant signed a consent form prior to involvement. The participants were able to change their minds about participating at any time. Participant information was kept confidential, and no data were identified with any participant information. Interview data were annotated with an interview case number only. The names of the participants and their organizational affiliation were not attached to any published materials. No information on direct identifiers, such as names, Social Security numbers, addresses, or telephone numbers, was kept. The researcher did not use the participant information for any purpose outside of the study and will not include their names or anything else that could identify them in any future reports on the study. References to specific projects, programs, organizational structure, and affiliations were masked to ensure confidentiality.

Summary

Chapter 3 described the qualitative method and the process used to examine the perception that users at an AF test and evaluation base have on the value they need from enterprise-wide IT-enabled enterprise business systems. The grounded theory method was used to develop a concept of value from the interviews. The method required the researcher to code the interview transcripts, categorize the concepts, and make cross-comparisons until relationships between categories were made. A concept of system

value resulted when the data were reduced from “many cases into concepts and sets of relational statements that can be used to explain, in a general sense, what is going on” (Strauss & Corbin, 1998, p. 145). The analysis results provided information for a better understanding of what AF internal customers at the base level identify as the value they perceive and seek from enterprise IT systems and processes. This information can be used to inform decisions about IT systems and process implementation as well as CIO communications. It increases understanding about the theories and processes that contribute to the adoption of e-government systems.

CHAPTER 4: RESULTS

Introduction

This study was designed to examine the perceptions of the value of AF enterprise business systems by internal users at an AF test and evaluation base. The overall research question was, “What are the internal users’ perceptions of what they value and need from IT-enabled enterprise business processes and systems?” Subquestions that contributed to understanding the users’ perception of the value of the systems were the following:

1. What criteria are considered in determining value of the enterprise business systems?
2. What are the interactions of the criteria considered in determining what is valuable?
3. How do the factors they value relate to the vision and goals of their organization?
4. How do the factors they value relate to the vision and goals of the enterprise systems?

This chapter presents the results from the pilot study and the main study. It begins with a description of the participants; the process by which the data were collected, recorded, and treated; evidence of quality; and the findings.

The Study

The Participants

The data collection process for the study involved in-depth interviews consisting of open-ended questions. The questions and interview protocol were piloted with a

former AF base-level CIO and an IT influencer with deputy CIO experience. The pilot study participants were selected because they had more than 20 years of experience each in leading and managing IT-related developments, infrastructure, services, and support in private and public organizations. They directed activities in AF base-level communications and IT organizations that provided IT services and support to approximately 13,000 users. They had insight into the issues, concerns, and requirements of AF users about the enterprise business systems. Their work experience in other parts of the organization gave them a broad view of the issues associated with the study question and the enterprise business systems concept in the AF. The main study participants were selected because of their roles and experience in AF business processes, their span of influence, and their ability to sway decisions on allocating resources for IT to accomplish work in their organization.

To ensure their confidentiality, the participants are referred to as Pilot A and Pilot B for the pilot study, and Participant 1, Participant 2, and so on, for the main study. All references to the base or recognizable levels in the organization are identified as Base X, Activity X, Organization X, and so on.

The Process

The interviews, which took place between August and September 2008, were recorded, transcribed, and analyzed with the grounded theory methodology of coding and construct development. The research questions were read from a guide to ensure consistency across the interviews. The researcher used probing questions to gain additional depth in the responses, which were recorded and included in the transcript. The

researcher's perceptions from the interviews and learning as it occurred from each discussion were recorded in the field notes.

A pilot study was conducted to confirm that the interview questions would provide data for the analysis. The pilot study participants were asked for feedback that would improve the interview tactics and questions. The pilot study participants did not have any comments on particular questions, but their responses and questions during the interview highlighted the need to clarify the definition of an enterprise system at the beginning of the discussion. The definition of an enterprise system was clarified so that the pilot study participants could focus their responses towards the intent of the questions. The interview questions were read as written, and probes were used to clarify the questions. Additional probes, which were captured in the transcripts, were developed as the conversations evolved. Objectivity was maintained by following systematic procedures, ensuring consistent interview questions, allowing the respondents to articulate their view and ideas, making comparisons to stimulate thinking, and checking out assumptions by asking for clarification.

The pilot study process revealed the importance of reading the introduction to the participants to ensure that they understood what the study was about, phasing questions and their probes to allow for a depth of conversation, and ensuring that the recording equipment was operating properly. These procedures were applied to the remainder of the participant interviews and data collection; they acted as a starting process for coding and analyzing the collected data. Improvements included splitting the first question into two parts to avoid confusion by first asking, "What enterprise business systems and processes

do you use to accomplish your work or mission?" and then, "What nonenterprise business systems and processes do you use to accomplish your work or mission?" A description of an enterprise system also was provided to ensure that the participants' answers would apply to the research questions.

Data Collection, Recording, and Analysis

The researcher used the grounded theory procedure of coding the data to determine what the participants described as the value of enterprise business systems. The process involved an inductive examination of the data from particular codes and subcodes to more general categories of codes. Data were gathered from the interviews, notes, and field memos.

Each interview transcript was individually read for concepts on the value of enterprise systems and coded with key words or phrases as the concepts surfaced. The open coding facilitated the generation of concepts, ideas, and meaning, and they were continuously revised, merged, and compared for variations. The codes were added to the initial list of codes developed from the literature review and was used as the basis for the analysis.

The open-coded data were compared, and categories of concepts were formed. Memos were written on why the categories were formed and what they meant. The text was reviewed again and was axial coded. These codes linked and related categories by properties or characteristics along a range or variation of a concept. This provided more structure and described what was going on and how the categories crosscut and linked with each other. Selective codes or relationship statements linked the axial categories.

The respondents' statements were reviewed against the categories and subcategories to validate them, and memos and notes were written to provide the reason for identifying the selective codes. Lastly, relationship statements were written.

Research Verifiability

Participant feedback and negative case analysis feedback were used in this study to help gain a deeper understanding of the topic, verify the collected data, and look for missing concepts. The researcher provided the transcribed interviews to the participants for their feedback regarding their accuracy. The study participants made a few corrections and confirmed to the researcher that the interview transcripts were accurate reflections of their ideas.

Participant interview responses were compared to other participant responses, the initial list of codes developed from the literature, and concepts from the eight enterprise themes to determine what was missing or different to stimulate thinking. This comparison included a negative case analysis to look at opposite cases for significant properties inconsistencies, gaps, and contradictions. The negative case analysis also helped to answer the research question on how the factors the participants valued related to the vision and goals of the enterprise systems. The codes for these statements were conceptualized as opposite statements. Saturation was reached at 12 interviews and no new information was apparent.

Credibility of the Research Process

Credibility of the research process was gained when the researcher carefully transcribed the interviews, verified that the participants' comments had been captured

correctly, and systematically analyzed the data with the grounded theory procedures. This process was described in chapter 3. Credibility also was enhanced with the use of open-ended and semistructured interview questions that facilitated the discovery of new ideas and concepts. A relative basis of agreement was reached on what the terms and definitions in the study represented. The definition and description of enterprise systems were clarified with the study participants before the interview questioning commenced.

The researcher maintained an understanding of the participants' involvement in the study by writing memos and field notes on perceptions during the data collection and on thoughts before, during, and after the interviews. These memos and notes helped to ensure credibility that the participants' perceptions and experiences were interpreted and documented with a high degree of truthfulness and transparency. Memos written during the data analysis stage described concepts and perceptions on why and how analysis decisions were made. These memos highlighted the thought process, assumptions made, resulting decisions, and rationale for the analysis. The research process required a prolonged engagement in the data collection and analysis. The process consisted of a reiterative examination of the data against each other and against new information that was derived in each step. A detailed database was developed to analyze the concepts, as was shown previously in Figures 4 and 5.

The Findings

This section describes the results of the data analysis and provides answers to the research questions that support a grounded theory model of the AF internal users' perception of the value of the IT-enabled enterprise business systems. This model guides

the findings discussion, starting with the insight that the interviews provided on the criteria the users consider in determining the value of IT-enabled enterprise business systems, the interactions of these considerations, the relationship to their organizations' missions to the enterprise vision and goals, and how influencing theories on technology acceptance and adoption help to explain the phenomenon that affects those perceptions. These findings helped to answer the research questions and resulted in a theoretical model of the users' perception of the value of IT-enabled enterprise business systems.

Theory on Users' Perceptions of Value of IT-Enabled Enterprise Business Systems

Figure 6 depicts a model of the theory of the AF internal users' perceptions of value of IT-enable enterprise business systems. This visual model was developed by identifying what the users value in enterprise systems, the users' value in relation to organizational and enterprise vision and goals, and how this relationship and other concepts in technology acceptance and change influenced the users' perceptions of what the system does and does not provide for them.

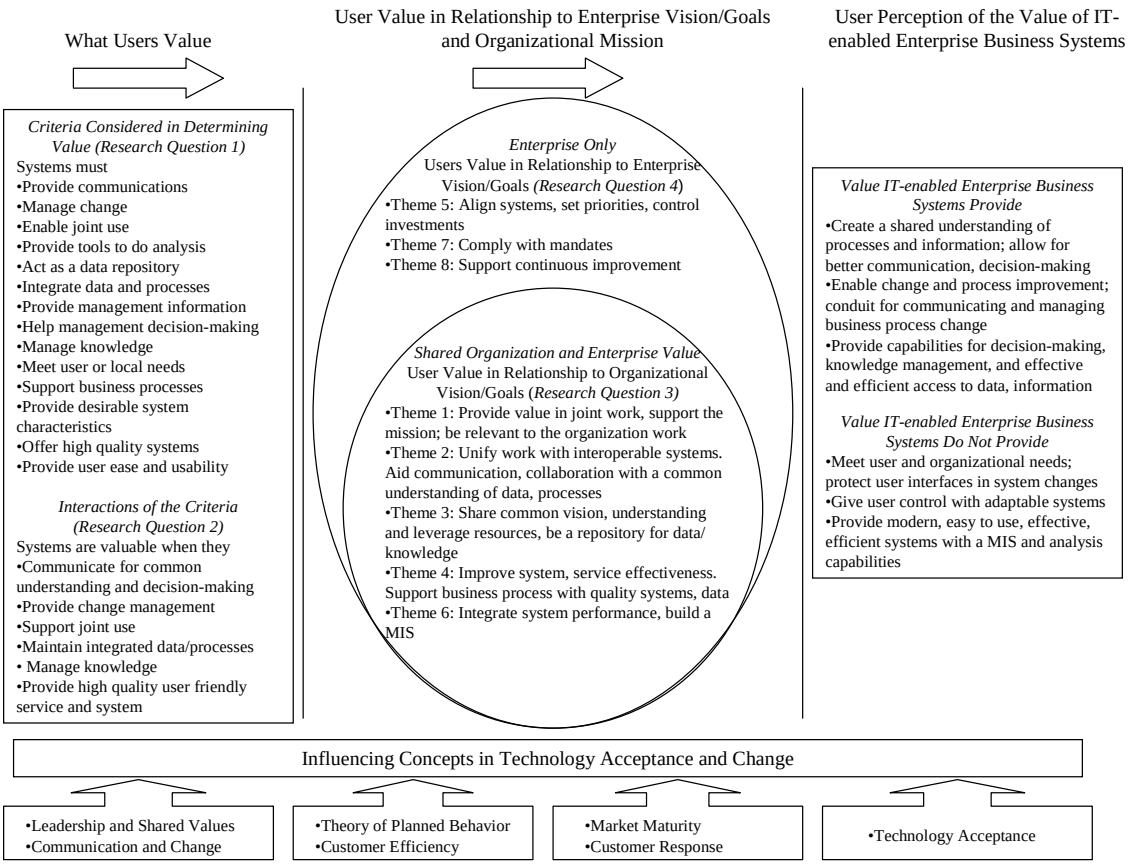


Figure 6. Theoretical model for the internal AF users' perceptions of the value of IT-enabled enterprise business systems

What Users Value

What the users seemed to value was derived from answers to Research Question 1, "What criteria are considered in determining value of the enterprise business systems?" and Research Question 2, "What are the interactions of the criteria considered in determining what is valuable?" The criteria that were considered were uncovered in the analysis through the coding of ideas from the interview transcripts and the categorization of similar concepts. The interactions of the considerations were developed from the

analysis of how these criteria fit together as categories and subcategories or as a range of a concept or axial coding. Descriptions of these criteria and interactions are noted in the following discussion.

Criteria in Determining Value

The common criteria considered in determining value by the participants are shown in the top left-hand block of the model in Figure 6. Brief descriptions of these criteria with the user evaluation that helped to explain the value of IT-enabled enterprise business systems to the user follow. More in-depth data and participant feedback that support these descriptions are included in the discussion on the interactions of these criteria or considerations.

Provide communications. Communication encompassed how the system transferred information and interacted directly with the user. It also included what the system communicated through its standard or common references and how the system could be used to disseminate widespread information and enable collaboration. The users found value in its expediency and ability to enhance common or shared understanding. Enterprise systems that clearly communicated information provided value, such as systems that automatically notified the users when they completed transactions and business process steps or informed them of an impending system upgrade or change. The participants commented on how the enterprise system itself was a mechanism to communicate process and system changes. The users wanted enterprise systems to communicate changes in the system to ensure that expectations were met, custom interfaces were not broken, and data integrity was maintained.

Manage change. Valued systems managed change with their communication capabilities and ability to make wide-sweeping changes to the hardware, software, or the way processes are accomplished. The users found value in the ability of the system to manage change, especially when it did not impact their local interfaces and facilitated data upward compatibility. Systems that managed change and remained relevant to the different data and processes in the organization using the system increased its value. Changes that provide useful tools for developing or finding information for management decision making were valuable to the users in completing their organizational work and mission

Enable joint use. Enterprise systems that provided value unified business processes; had common terms, references, and definitions; and provided consistent process and results that allowed for joint use throughout and between organizations and agencies. The standardization to one set of tools enhanced the ability to exchange data and files. It increased compatibility with other applications and systems, simplified process execution, and provided a streamlined way to communicate throughout the enterprise. The users indicated that they valued joint use for a greater understanding and ability to exchange data and information across organizations.

Provide tools to do analysis. A system that supported the analysis or the manipulation of data to show trends and other statistical results provided value to managers and leaders who need data-supported information for decision making. The outcome of the analysis was information that management or leadership could use to make decisions; answer resource questions; and help others understand the status of

funding, schedules, or projects. The users wanted systems to do analysis to identify trends, gap-analysis, and forecasts of expected results or what-if scenarios for management information and decision making. They indicated that these analysis capabilities were lacking in enterprise systems.

Act as a data repository. The users valued systems that managed information and truth sources and protected them in a centralized repository that was accessible to multiple users. Data in the repositories could be managed to ensure consistency in meaning across the enterprise. The users valued data repositories because they often included configuration control over data and information, and ensured that the data integrity was maintained, even through system changes.

Integrated data and processes. The users perceived value in systems with interconnected data and processes that ensured consistency across the enterprise and provided a way to follow common business rules. It decreased guesswork in what the rules were and could provided a way to integrate data from different systems so that the users could go to one place for information. Some enterprise systems provided this value and eliminated the need to maintain user-made spreadsheets, which subsequently reduced manual work. Integrated data and processes also could help to prevent a loss of information from local systems or unintegrated enterprise systems.

Provide management information. Systems that analyzed and provided timely and relevant management information for decisions were valuable for managers and leaders who needed data-supported analyses and information. The users valued consistent, integrated information and data that could be extracted, sorted, and used to answer vague

management questions. They needed a management information system (MIS) that integrated technical and business information from multiple sources, supported data analysis work, and provided a good way of extracting and sorting data and information. Although the existing systems provided information for analyses and comparisons, they believed that the enterprise system did not provide a true MIS.

Help in management decision making. Systems that helped in management decision making provided timely, accurate, and reliable information from the databases or repositories. The enterprise system and data enabled a shared understanding because of their common terms, definitions, and meaning. There was a belief that the enterprise business systems could provide information for decision making but needed to be more complete, relevant, and timely to be useful.

Manage knowledge. The users valued the storing, accessing, integrating, and maintaining of data and information as a history with assurance that the meaning persisted through time. The users valued full access to the data so that they could be shared or used jointly for decision making. The participants believed that knowledge management efforts could help the prevent a loss of information in local, unintegrated systems, yet enterprise upgrades needed to consider the potential impacts on the users' data and files so that their knowledge was retained. System changes should be upward compatible so that data are not lost.

Meets user or local needs. The users valued systems that met or consider local mission needs, allowed the uploading and downloading of data, included user requirements and feedback, were tested before implementation, and provided flexible

interfaces or custom products. Some users believed that even though enterprise systems could support a common business strategy, they did not meet all users' requirements with their 80% solutions.

Support business process. The users valued systems that supported and enhanced the business processes and provided a common framework or basis for understanding and communication across the organization and the enterprise. They valued systems that were flexible, changed with the business process, delivered information for business decisions, and kept up with dynamic and changing business processes and rules.

Provide desirable system characteristics. The users valued systems with characteristics that helped them accomplish their business work; however, they were concerned that they often lacked in real-time information; fully automated reports; available, accessible, and secure systems; streamlined paperless systems; responsive, timely, and expedient processes; flexible programs; and notification and verification messages to the user. The participants indicated that centralized systems were valuable for their connectivity but also could be a detriment if the system malfunctioned. Systems that integrated desired characteristics such as commercial products and standards increased flexibility and usefulness.

Offer high-quality systems. Quality was indicated when the system did what it was supposed to do; the data in it were available, accurate, consistent, valid, and reliable; and there was professionalism in the system development, operations, service, and support. The users valued quality because it provided confidence that the system and data

were secure and could be used to make management decisions. The users valued high-quality systems with the same look and feel as commercial products.

Provide user ease and usability. User ease and usability focused on the users' perceptions of how easy the system was to use and when it provided queries, reports, searches, electronic signatures, and integrated software/hardware. The users indicated that systems that were easy to use, were handy, and provided options similar to online commercial services provided value. User ease and usability included the ability to understand and use a system with little or no training and ones that had such capabilities as queries, report generation, searches, and electronic signatures.

The descriptions of these criteria began to show relationships between or among categories and the beginning of the interactions of the considerations. For example, systems that provided communications did so with standard or common references that enhanced a common or shared understanding. The users wanted enterprise systems to communicate changes in the systems to ensure that expectations were met, custom interfaces were not broken, and data integrity was maintained, factors that relate to the systems role in change management. Table 4 shows relationships between the criteria. These relationships were drawn from the previous section on the users' evaluations and description of the criteria they considered in determining value. The other criteria were defined in memo descriptions and definitions for categories and subcategories shown in Appendix D.

Table 4

Relationship of Criteria in Determining Value

Relationship to other criteria	Analysis	Change management	Collaboration	Common enterprise process	Communication	Data quality	Data repository	Data upward compatibility	Efficient, effective systems	Integrated data, processes	Joint use	Knowledge management	Management decision making	Management information	MIS	Meets user or local needs	Relevance to user mission	Security	Service, support quality	Support business process	System characteristics	System quality	User ease and usability
Provide communication			x	x	x								x			x				x			
Manage change				x	x			x						x		x	x						x
Enable joint use				x	x						x			x		x	x						
Provide tools to do analysis				x	x						x			x						x			
Act as data repository						x	x																
Integrate data and processes				x						x			x			x	x			x	x		x
Provide management information	x			x	x	x	x			x		x	x	x		x					x		x
Help in management decision making	x			x									x	x							x		x
Manage knowledge		x		x		x	x			x		x	x	x		x				x			x
Meets user or local needs							x		x					x		x	x			x		x	x
Support business process				x	x	x					x		x			x						x	
Provide desirable system characteristics		x		x	x	x	x		x	x			x		x	x	x	x	x	x	x	x	x
Offer high-quality system						x													x			x	x
Offer user ease and usability				x			x		x	x				x		x				x	x	x	x

The relationships between categories were the building blocks for determining the interactions of the criteria the users took into consideration in determining the value of the IT-enabled enterprise business systems.

Interactions of the Criteria Considered

Research Question 2, "What are the interactions of the criteria considered in determining what is valuable?" helped to answer what the users value in the enterprise system. Determination of how the categories and subcategories in Table 4 related or fit together was made along a range of a concept, or axial coding (see Appendix E) which showed how or when these criteria interacted. The criteria were review as a whole and the analysis of cross-cutting relationships or selective coding produced connecting concepts on the interactions of the criteria considered in determining value by the study participants (see Appendix F). These concepts are shown in the bottom left-hand block of the model in Figure 6.

Communicate for a common understanding and decision making. Enterprise systems provided value because they enabled communication and understanding through common processes, terms, and system hardware and software. This commonality enhanced understanding of what the processes and results meant and assisted in decision making. They improved or increased understanding through consistent processes, definitions, data, and terms. In this way, enterprise systems provided a valuable way to communicate and report information to other activities and higher command using clear, understandable, concepts and terms or the "same language" (Participant 3). It was noted that the enterprise business systems added value and aided in communication because

they had “a common reference point, a work breakdown structure so you have a consistent means of capturing and projecting costs or funding requirements” (Pilot A). Enterprise business systems enabled joint use with this shared understanding of the processes and their information. The systems provided value through a common understanding of the data and results that increased not only an understanding of the enterprise business processes but also the meaning of the data and how that may impact policies, decisions, and behavior in the enterprise as a whole.

The AF Community of Practice (CoP) Web sites and enterprise systems were valuable to the users because they had the “ability to communicate and deliver data across a wide audience almost instantaneously” (Participant 4). The users found value in working on specific projects at CoP sites, where information could be shared with a large group of people with a common interest or set of goals. Likewise, they considered the local area network and e-mail part of the enterprise system because the communication and transfer of data and information went all the way up to the DoD (Participant 5). These systems enabled rapid and widespread communication but could also waste time if users replied to “all” in e-mail messages (Participant 4).

The communication capabilities of the systems provided value to the users, and although the participants indicated a need for collaborative systems, few used them. Some of the participants indicated knowing ways to use the system to collaborate, but they did not utilize this capability. Participant 10 indicated making documents available so that people could access them and have the same information.

> I mean, we put things out there and make them available to other [organizations], but we don't like to put things out there and work on them together in that environment. That just hasn't been something that we needed to do.

Others indicated that they valued and needed systems to encourage collaboration rather than impersonal communications sent in e-mails to the person sitting in the next cubicle (Participant 4). The participants indicated that users wanted the ability to conference online with direct links for video and chart viewing. They felt that the enterprise e-mail system was a good way to transfer information but not a good way to explain information (Participant 4). They voiced a need for an interactive means to explain information, but they were not familiar with the tools that can provide this capability to them.

Provide change management through the system and its communications. The participants saw IT-enabled enterprise business systems as change enablers because the systems could communicate and help manage change with their common processes and data. The participants believed users expected and valued enterprise business systems that were capable of managing change and ensured that the data were protected. The IT-enabled enterprise business systems were essential in managing the change so that data, information, and knowledge were retained and accessible in the future. The envisioned changes also should continue to support improvements that are relevant to the users' needs and mission. It requires assurance that user data will be compatible with system changes and that their business process interfaces are supported as the system continues to evolve.

The participants indicated that change management improvements were needed, especially during times of process modifications. Enterprise business system owners must plan and communicate changes in new software so that they do not impact the users or their local systems. The participants believed that the enterprise business system owners did not fully talk to the users to find out whether their changes were impacting the users. It was noted that systems that were not flexible and change without concern for user interfaces often broke user interfaces and made them inoperable. Participant 1 described this experience:

> Recently, we were asked for information for history. We found out that we lost all of our Y history because the headquarters that owned the X system made a change and didn't take our information or our stuff into consideration when they did that. And we actually lost all of our history . . . . If the people using it were asked about to make a change, is this going to affect you in any way; if so, speak now or whatever. The way it works currently, that doesn't happen so, and not everybody uses X exactly the same way, so what is good for one place, they may not even think about the Y model because we are the only base at the moment that uses the Y model. So they can go make a change and not even realize that this is what is going to happen, and they don't even think to test it because it just doesn't seem even reasonable that something might do that. And then, lo and behold, boom, all our Y history is gone. (Participant 1)

Enterprise systems provided more value to the users when they accounted for user interfaces and enabled upward compatibility, much as commercial products do. The participants believed that changes in the enterprise system should not impact the users' files or interfaces; there should be upward compatibility, and data should not be lost.

Enterprise systems that managed the information and data in them during change became valuable knowledge repositories that not only created a shared understanding but also retained a history for the future. This change management role related to the valuable role of enterprise systems in protecting and maintaining information as knowledge for

decision making at all organizational levels, as well as jointly or across multiple organizations and agencies. Enterprise systems were capable of meeting joint and local users' needs, but they faced many change challenges in accomplishing joint and local needs, and they needed greater flexibility and adaptable characteristics built into them.

Support joint use. Enterprise systems provided a framework for consistency in management actions, processes, and data that could be used throughout and between organizations. This framework aids understanding and communication, and it can help to expedite processes across organizations. Many of the participants valued this capability and recognized the overall benefit for the enterprise common processes and references.

The value of enterprise systems was the standardization to one set of tools that enhanced the ability to exchange data and files. It increased compatibility with other applications and systems, simplified process execution, and provided a streamlined way to communicate throughout the enterprise. Participant 6 indicated that standardization was especially valued in integrating work and project schedules within and across organizations. The participants indicated that they wanted interfaces with other systems with common terms and definitions so that the information can be understood intra- and interorganizationally. Yet, some users experienced a reduction in capability in enterprise systems that were developed originally to provide a general solution for all. Participant 9 described a solution to this generalization as having the users develop their own reports.

> Researcher: So, what aspects of the enterprise business systems help you accomplish your work or mission?
>
> Participant 9: Well, DTS [Defense Travel System] helps with travel. I wish I could generate more reports from DTS, but I am not allowed to do that. So that's a weakness, this is a problem, why we developed so many nonenterprise systems

> is the enterprise systems don't do what we need it to do and the effort to change those systems to generate the report and information we need is beyond our capacity, beyond our capabilities.
>
> Researcher: Ok, you said that generate these nonenterprise systems because the enterprise systems do not do what we need. What is "what we need"? How do you define that?
>
> Participant 9: Like in time keeping, X is our main time keeping system, but with X, I was unable to track time charges down to specific [modifications] in specific shops. I was unable to generate reports in a timely manner. I was unable to generate reports in a variety of formats. Report formatting was difficult to do and tough. We were unable to get timely data out of it, so that's why we kind of generated our own system. We were unable to merge Organization X, Organization Y, and Contactor X data into one since we are composed of three entities here.

Participant 1 did not find value in the enterprise business systems that were "locked down" so that the users cannot manipulate or change them. Enterprise business systems often are limiting, and the users did not have the ability to change them or make it do what they needed it to do. They were forced either to build something on their own or live with it and not get what they need done. Some participants believed that enterprise systems provided value and gave the users control to do simple transactions, such as making online travel arrangements. Participant 10 believed that the IT-enabled enterprise business systems gave the user control yet provided improvement suggestions:

> I do want to stress that I value some of the IT enterprise systems such as the PAA tool and DTS, and although it was painful going from kind of having a secretary or somebody that knew travel systems to doing it yourself. Once you can do it yourself, you have a whole lot more control, and it probably doesn't take any more time than putting all the information together and having a secretary do it. So I see the value, but I do want to emphasize that the more you can tie the systems together that do the same information such as the ADLS and ETMS and the more you can make them a little bit faster, easier to access like the PAA tool rather than going through several steps in order to get what you want, I think you can make them even more valuable.

Overall, the enterprise systems were perceived as valuable because of their ability to support joint use with common processes and management information for decision making. Enterprise systems that provided adaptable and flexible MIS and analysis capabilities provided a way to gain information that could be used jointly for decision making. Systems were more likely to be used jointly to communicate a shared understanding of what the data mean if they were adaptable and had qualities and characteristics that supported integrated processes, secure and reliable data, and user-friendly applications. Their adaptability kept them relevant for the users' work even through updates, upgrades, and process changes. In this way, enterprise systems supported not only joint use but also assisted in decision making, communications, and the management of knowledge.

Maintain integrated data and processes that support business needs. The participants voiced that users valued enterprise systems that not only maintained a centralized data repository but also integrated data and processes to ensure that the enterprise business systems were usable and relevant to their business needs. The users valued enterprise business systems that supported the business needs of the enterprise and the users' missions. The users wanted integrated data and systems to reduce the process steps and expedite what they want. Yet, many IT enabled enterprise business systems still required manual processing to get information out of them. The users wanted integrated systems and data or one system with multiple modules and value real-time information, timely reports, online uploads and downloads of data, and automatic updates that linked with other processes. Systems that linked data were valuable because the users did not

have to do manual work to interface data or generate standalone spreadsheets. Enterprise business systems that integrated schedules also could optimize the time in producing a product or service or ensuring that equipment parts were available when needed. Participant 6 described how systems could help to optimize time if they were used to integrate schedules and information:

> We try to integrate that into the heavy maintenance piece of it that so that we minimize the impact to the resources of the airplane. So we have a section that keeps records on every airframe, and every one of those items that has been identified with a calendar or hourly requirement against it, we track on a daily basis. We look at those. Because the other piece of it is, you have to let the supply people know, "Hey, I need an initiator and I will need it in August of next year," so they can go out and do the buys. So you optimize the time.

The participants indicated the value of enterprise systems as data repositories and expressed their desire for end-to-end enterprise business systems that allowed the input of raw data, analysis, and reporting in meaningful ways. The users needed to be able to put individualized front-end programs on enterprise business system databases to satisfy their process, information, and reporting requirements. The systems needed to provide flexibility to create user-defined reports with information that they and others could trust. They needed systems that could help them to manage human and financial resources and value systems for resource modeling, financial planning, requirements identification, resource allocation, and compliance tracking. They often created nonenterprise spreadsheets as way to track and manage business activities, including accounting on spending, budgets, property, equipment, and personnel. They needed an enterprise cost-accounting system that accounted for expending funding and resources, mapped data into categories, and provided visibility so they know where their transactions were in the

financial process. They valued control over their data as well as control over when a system downloaded new applications or patches that could interfere with their work.

The participants indicated that users valued the enterprise business systems because they were a source for data analysis, decision making, and knowledge management. The participants indicated that enterprise business systems that analyzed data were valuable but that the analytical tools and capabilities were lacking. Manual intervention or locally developed systems were often required to do analysis work. Participant 3 described how they had to collect data for reports manually because there was no database:

> We are still at that point where we now developed that X report, but the business leaders have to do it manually. So they have to run the X plan at the end of each month … and then they have to sort it into those categories. So let's just map it. Let's just get those things mapped. Well, I am telling you we have so much work to do that it is way down on the priority list because there are higher things now and we only have so much money, so many programmers. So, I just checked on it yesterday, because, like where are we at with that? Oh it could probably be 2 years before I see it automated. Ridiculous! Absolutely ridiculous!

The participants indicated that users wanted a centralized place to get data and documents because it would ensure configuration control or that someone was in charge of uploading the most current data and documents. The enterprise CoPs ensured configuration control on their sites. It was appreciated, as expressed by Participant 7:

> Well, the beautiful thing about those is you have a centralized place where you can go get data. The other thing is configuration management because there you want to have somebody who is in charge of updating a document and all the rest of us know that's the most current document. It is like the pubs and forms sites. We don't manually take pages and add them to notebooks any more we can go download the whole thing electronically and know that at least if we are downloading it that it is the most current one.

The current enterprise systems acted as a data repository for some cost information, which was valuable, but systems that allow the collection of data by work breakdown categories for documenting work and accounting for resources were needed. The participants pointed out that users wanted a system that is automatic, linked, and able to drill down through information. They considered the enterprise systems as only a collection of records that could be used to do second- and third-order analysis. Enterprise business systems were not sophisticated or mature to do an analysis, so nonenterprise systems were created to fill this gap. These systems often were not transferable between organizations or even individual users. The systems consisted of a proliferation of independent spreadsheets that are not maintained and are constantly recreated with each change in direction. The following dialogue with Participant 2 described this collection of independent spreadsheets, what was in peoples' brains, and knowledge network as an informal enterprise business system that was not enduring with personnel changes.

> Researcher: Do your nonenterprise [systems] capture the information you need?
>
> Participant 2: Not as well as we would like. It is mostly, you know, people are collecting stuff because they either find it curious or, some previous tasking many years ago they started collecting data in a spreadsheet and just they kept it up. So it has some credibility, but it has no pedigree, it is not documented anywhere, and if they depart, or whatever, then that data source is gone. Because there is not credibility, there is no guarantee that their successor will continue keeping the spreadsheet or even understand what he was keeping up.
>
> Researcher: Now is that what you mean about the human or intellectual capital that is in people's brains?
>
> Participant 2: Yea, there are people who know who was keeping what spreadsheet. And if you know all those people or made that network, then you can collect the various bits and pieces to make some sort of intelligent, or provide some sort of intelligent answer to whatever question you are trying to answer.

> Researcher: So what's in the human brain? Is that captured somewhat in these distributed worksheets?
>
> Participant 2: Sometimes it is; other times it isn't. You know, people have this intuition that workload has gone up or gone down in a particular area, but they can't quantify it. They can't show you the data that proves [*sic*] that. So you end up with this very long, laborious chase of data to go find out little bits and pieces that ether confirm or deny what their intuition was.

Enterprise systems support common business processes, but they do not meet all of the users' individualized requirements. The participants raised a concern that enterprise systems only provide an 80% solution and did not meet the needs of the rest of the users. For example, enterprise systems were not perceived as flexible or agile enough to handle dynamic data or situations for the users' work or mission, nor did they facilitate the up- and downloading of data in and from the system. The users needed to be able to manipulate data in a system that kept the data secure yet allowed the users to sort, filter, slice, and dice the data in different ways. They wanted quick access, shared data, and metrics rather than individually generated spreadsheets of historical data that were not linked or accessible to others. Some users wanted information dashboards and charts with linked data that showed measurements for their activities. They did not want to do the manual work of inputting and converting data into graphics, charts, and reports when applications were available to do that work.

Most participants said users valued the data in the enterprise system as a resource that could be used in a MIS. They viewed the system as an enabler that could help them provide management information and data for decision making and joint use. A true MIS that integrated technical and business information from multiple sources, supported data analysis work, provided a good way of extracting and sorting data and information, and

provided information from analyses and comparisons were needed. An MIS that enabled management decision making would provide value to managers and leaders who needed data-supported analyses and information for decision making.

A system that facilitated management decision making provided value to managers and leaders who required information backed by data. Systems with the capability to do data analysis were deemed valuable and essential for their activities by the users. The participants indicated a specific need for management information for decision making that was timely and relevant for resource and scheduling decisions. They needed information to make decisions in dynamic environments, where coordination between multiple organizations' schedules was necessary for an end product or an event to occur. The participants believed that although enterprise systems could provide information for decision making, it must be more complete, relevant, and timely to be useful. In addition, the systems had value only if they did not just support the business processes but accomplish them in an efficient and effective manner.

Manage knowledge. Knowledge management included the storage of data and information so they both can be accessed with the assurance that their meaning has been maintained. The enterprise systems were valuable because they could provide a consistent way to maintain processes, information, and data across time. Systems that provided full access to the data in them provided value to the user so that they could archive data and use the repositories to access and share information for knowledge advancement.

Enterprise systems that had data archives and research tools were valued by the users, who wanted good search capabilities that brought back relevant and quality information easily. Participant 4 described the importance of systems that assisted in finding and accessing information for decision making as “being able to get that information when you need it and without having to try to remember details that were lost over time.” Enterprise systems that provided advanced search tools also added value for the users, who wanted accessible systems that they could access when they required them and could be used to retrieve and extract information, records, and data easily. Some recognized the value of filing e-mails as historical records as long as the search tool was capable of finding what they needed. In addition to these repositories, Participant 7 indicated valuing and needing online library access to easily get reports without going through slow material request processes.

Some participants identified a need for a business intelligence type system in addition to the data history, but they also indicated that enterprise systems did not provide integrated knowledge for business decisions. They perceived the systems as only a data collection system with information that had to be analyzed. Because of this perception, the users created individual spreadsheets for analysis work that often were not transferable to the next individual. Even with these perceptions, some participants felt that the enterprise systems were providing some value in collecting data that makes keeping track of their business more effective.

Plans for enterprise upgrades need to consider the potential impact on the users’ data and files and retention of knowledge. The changes should have upward compatibility

so that data are not lost. Enterprise systems that maintain data over time in one repository were valuable, especially when they were portrayed with the same meaning and were as accurate as when they were first collected. Systems that provide a way of cross-referencing, storing, and displaying consistent data, as well as integrating them from multiple systems or sources, added to their capability and reduced the manual work required to get the data they needed and wanted. The participants believed that knowledge management in enterprise systems could prevent a loss of information in local systems or unintegrated enterprise systems. They stated that they valued share directories and consider them a part of the enterprise system because they were accessible and made information sharing easy.

However, some identified a need to improve cataloging of information so it could be accessed. Some users needed access to information and knowledge on commercial sites to do research without having to request permission to use to each site. They often encountered access denial because sites were blocked or filtered because of security controls. This access denial raised the potential for a lost opportunity to gather important information that would help them in their work (Participant 4). They would find more value in systems that allowed unfiltered access with monitoring rather than having to request access to blocked sites.

Many participants had an awareness of the AF CoP sites that acted as a repository of information and knowledge. They like them because they provided a centralized place where a large amount of up-to-date data, documents, and information could be found on topics of interest. Most users found value in the CoPs and other enterprise systems

because the data were secure and accessible to multiple users simultaneously. They needed systems that provided levels of access to protect their information and were stable so that the data were not lost or compromised. They believe that enterprise systems could increase the accuracy of the data and calculations, as well as save resources with its paperless processes.

Conversely, electronic processes may take more time to accomplish because the nature of the system allowed for greater access to documents and forms, which often increased the number of changes that people can make to them. Participant 6 indicated that this access created a cumbersome process and an environment of zero tolerance for error, which did not always add value. Participant 6 described this phenomenon as going "from tolerance reading or being ok with nuisances in terms of words for the sake of having the clerical pool not type and retype it to zero tolerance for everybody's opinion."

Enterprise systems that were adaptable and relevant performed for the users' needs and mission, were flexible and changed with business rules or process changes, or adapted to different data or situations. They were capable of using customer interfaces or commercial products and standards for business processes. Overall, the enterprise system must be able to adapt to business and policy changes and continue to perform or do what it was intended to do. Outdated systems that impeded the ability to process information or provide decision quality information, no matter how easy to use, were not beneficial. Even though the participants focused on what the users needed to do to accomplish their specific work, they recognized that improving for the overall good of the enterprise was an important goal.

The participants recognized that enterprise systems designed on a more macro- or generic level could apply to a wider user base. Although this generic level provided value to the AF as a whole, the users wanted systems that are able to handle different levels of work. They wanted the enterprise systems to be adaptable and have characteristics that allowed the users to do their work in a timely manner. They found that they had to build local tools because the system was developed at too high a level.

Some participants indicated that users wanted the flexibility to do queries and reports without the assistance of a programmer. They needed products that were relevant to the questions being asked because standard queries and reports did not always meet the users' needs. They wanted more fully automated systems. Some systems were only partially automated and required time-consuming manual work; other work that they needed was not yet automated, such as inventory control and technical report libraries (Participant 7). They recognized that some level of standardization was necessary and important for the joint use of the system and a common reference for decision making. Most participants concurred on the value of enterprise systems as unifying business processes across the organization, but they also indicated that the systems needed to be adaptable to meet local mission requirements.

Provide high-quality, user-friendly service and systems. Most participants expressed that users found value in high-quality service and systems that saved them time and effort. The participants identified quality characteristics such as user friendliness; usability; consistent data and service; adaptability and reliability; and up-to date, modern

systems. However, systems that were high quality but did not do what the users expected or needed them to do were not valued as much.

Some participants indicated that users wanted systems that were modern in appearance and had the same look and feel as commercial software and the Internet. The design of the system needed to be like Web page references, react at the touch of a button, and have information that was easy to find. They needed timely information similar to what commercial systems provided, such as updated cost estimates for work and quick responses to customer questions. Yet, enterprise systems were not always viewed to be as good as Microsoft products because they were old and not up to modern standards (Participant 8).

Some participants indicated that they valued a quality system where the "truth" source of information was secured and maintained with configuration controls (Participant 1). They needed accurate data, detailed information, and reports to help in management decision making, and they valued enterprise systems where the data did not become corrupted. The information needed to be secure and maintained with configuration controls so that when it was accessed by multiple users, it was the same information. The participants spoke about managing and protecting the original sources of data. Participant 1 explained that enterprise systems ensured that the users were getting the same data, the data were secure, and the configuration protected the truth sources:

> And if I pull it and then somebody comes behind me, the answer would hopefully be the same. Because it is each individual truth source is secured, it is maintained, things just don't go in and out willy-nilly. There are people that have the controls, the configurations controls on those individual truth sources, so that you have the ability to pull that.

The participants recognized that even though enterprise systems had some capability to ensure accuracy, they indicated the need for a system that could provide a data entry error check to ensure accuracy. A few participants suggested that enterprise systems could increase the accuracy of the data and calculations by using embedded math in them. Many of the participants felt that most enterprise systems were substandard, did not have complete processes, and made the users do the manual work. They felt that they were forced to use them, so they often resorted to developing their own spreadsheets or systems to do the work they need. These nonenterprise solutions required intensive effort and often employed large spreadsheets with a great deal of manual work that could result in errors and mistakes. The users mentioned that they value enterprise systems that made the process more efficient or resulted in efficiencies rather than just reallocating or pushing work down on them with no true savings to the organization as a whole.

The users wanted enterprise business systems that were developed around the process, provided essential business information, and were a coherent collection of data. They emphasized that the systems should be built to support the business process or question, not the other way around. Participant 2 made a suggestion:

> Find out what decision or what question you are going to answer first, then build the system after it. Right now, we tend to try to answer business questions with existing systems that may or may not support the question at all. In this way, the systems are more flexible and are able to change with the business process.

Some participants indicated that users found value in systems that codified business processes so that the data could be used appropriately and good decisions could be made from the information they contained. Participant 2 voiced that the systems needed to support well-defined business processes:

> It has been said a lot of times that none of us is as smart as all of us, and in these business systems, I said it before, we can feed the monster, but we have to know how to get stuff out of the monster as well. And, too often, I think we build systems that just consume a lot of our time and energy, but we don't actually get any useful data or information out of them. Or if we are, we are not using it appropriately because it has never been codified what that business process is or method by which to make a good decision. That is a sorry state of affairs, but I see evidence every day.

Participant 4 pointed out that systems should not only adapt to policy changes for handling information but that as system capabilities advanced, organizational rules for managing information should use the capabilities. One example was that systems had the capability to archive documents but were restricted in doing so by outdated organizational rules. Participant 4 believed that in some cases, adhering to outdated rules was unwarranted because of new technology that was available to secure the data. The effectiveness and efficiency of the system depended on the organization's understanding and interpretation of the rules and confidence in the system's capabilities.

Many of the participants indicated that the implementation of enterprise systems was not providing value to the users because their requirements were not being met. The users wanted developers to employ systems engineering tenants that included user requirements and ensured that the systems were not implemented before they were ready. They wanted enterprise systems that have been developed on valid requirements so that the users do not have to resort to nonenterprise systems to get it to do "exactly what [they] needed it to do" (Participant 5). The participants mentioned that they often had to revert to developing nonenterprise systems because they provided information at the level of detail they needed.

Enterprise business systems were often the only means to complete a process, and they provided no alternative way of getting work done. The mandated enterprise systems often impacted the users because the tools provided were not efficient or effective or were too generic and did not meet the users' needs. The users wanted systems that helped them produce a quality product and not waste their time, especially when they were accessing a program or waiting for a system to reboot. Participant 4 described the cost of wasted time and lost opportunity to get information when needed in terms of delivering quality results:

> Certainly, nobody tracks the cost of that—the cost of lost opportunity because the communication system wasn't agile enough or the data system wasn't agile. [This lack of agility is] frustrating when you are working on collaborative things for example in the shared directory or CoP, that type of thing, and you try to get on there and download things like Word files and things like that. And let's say you are doing command-wide X review and the system is just bogged down, it takes forever or just simply hangs. You can't do that. What you end up having to do is suspend that whole plan to do that task in that time period, figure out to integrate it into the schedule later on to do that task, and in some cases, you may not get the opportunity to go back and do it with as much quality as you planned on doing it. You end up delivering a lower quality product because you became compressed for time. You are going to get the job done regardless; you may not do it up to your standards because the tools are not supporting you to the degree they need to, but you will get it done.

The products from the system must be easy to comprehend, update, and use. Some participants expressed a desire for systems to save them time and not delay their work when they take too much time to start up. Systems that get bogged down or reboot too slowly caused the users to divert effort, resulting in a lost opportunity to communicate, find information, or produce a quality product. They attributed the slowness to system security that is valued, but they did not appreciate delays when systems had to reboot to apply security software (Participant 4). Participant 4 described

how system nonresponsiveness often caused a lost opportunity to gain or communicate information:

> Basically, as I stated before, the biggest obstacle is, I think, nonresponsiveness. Support tools that don't. You know, basically, you spend more time with the system that it is really worth going and using the system. Systems need to be responsive; they need to be accessible when you need them . . . . I think we are so data driven by our communication systems on the PC that really need to be sensitive to the responsiveness of the system and when they get bogged down. And I think if I spend an extra 3 minutes or whatever doing a particular task, think about that across the whole base of people spending an extra 3 minutes here. Pretty soon, you get hours of lost time. And the other thing you have, a lot of people will not put up with that. They will just say, alright, heck with that, I'm going to not wait for it, I'll go do something else. They get distracted. They don't do what they intended to do. They end up doing something else. There you have a lost opportunity. You had an opportunity for communication to occur, [but] it didn't occur.

Other participants indicated that newer versions of software were making the systems more usable. Most users wanted and valued the characteristics of modern systems, not the old ones that were not user friendly or did not keep up with new tools or policy and process changes, especially with their business work breakdown system. Several participants indicated that adopting business systems already in the private sector could help them. Most of the participants indicated that usres want uncomplicated enterprise business systems that were easy to understand, especially if they did not use them on a daily basis. Some contended that because many systems were developed on an expert level, managers and leaders found them difficult to use. Participant 9 expressed this concern:

> I have a fear that someone above us thinks all our problems can be solved with enterprise solutions. While enterprise solutions can be very effective in the right time, the right place, and the right product there are still going to be uniqueness in our each of our operations that are going to require the capability to do specific, unique aspects. And that is why having a tool that you can modify would be very

> valuable. I mean, DTS would be wonderful if I could go in there, if it had a report form, that I could go in and run reports off. We just sent out a data call to everyone in the engineering group to make sure they have XYZ training. It's documented in ETMS, it is there. And the e-mail asked us to do was everyone, go into ETMS, verify that they've done it, and send the person an e-mail that I have done it. Well, I raised the issue with the person and got my head chewed off, because they said, "Well why don't you just go in and run a report?" And she did not know how to do that. So this was an easier way to do it. Well, easier for her, we have 600 people trying to go through the portal to get to a Web site, run 3 passwords, and set it up and figure out if the data is [*sic*] current or not! That is the kind of stuff that is IT ridiculous. We should be helped by IT, all the data is in there. The biggest problem I have with IT is getting the data out of the systems. Obviously data input is a big issue; we spend a lot of our time in input . . . . And that is what I think the most problem with enterprise systems is, is we treat them at the expert level and not at the user level.

Many participants said users wanted enterprise business systems that integrated with other systems, minimized multiple passwords and logins, and reduced redundant manual work. The users needed a system that recognized them and does not need different passwords and logins to enter each part of the system. They did not want to learn how to use multiple systems that operate differently which they considered a waste of their time. They wanted a system with similar processes so that they could learn how to write reports that would work in any system. They also wanted report generation capabilities that were easy to use and could be done at their desktop.

Some participants identified the need for consolidated sites or one place to go for business transactions or information. They did not like the confusion of using multiple sites required for processing requirements or finding information. Participant 2 suggested that enterprise business systems needed to provide the users' manual for continuity and training, and for educating new business managers. At a minimum, the users needed

descriptions of the data in the enterprise systems so that they could understand what the data were and what information they could provide.

Some enterprise business systems provided an efficient and effective way to process transactions. They could save time and resources for completing transactions, processes, and gaining information. The participants indicated some users wanted adaptable and flexible systems that allowed the generation of reports and information to their own specifications. They wanted to be able to tailor enterprise systems for the output that was important to them. They consider enterprise systems effective when they provided individualized information views or facilitate custom interfaces. They believed that the uniqueness of user processes and requirements would not be resolved by an enterprise solution and "that is why having a tool that you can modify would be very valuable" (Participant 9).

The participants mentioned that users found value in the enterprise business transaction and resource-tracking capabilities for processing travel arrangements, purchasing with credit cards, hiring personnel, processing financial transactions, and acquiring training. Systems were valuable that helped the users assess their programs' progress, collect and report workloads, and provide indicators for future workload and requirements (Participant 3). The users needed enterprise business systems for workload forecasting and found value in enterprise systems that tracked work that could be rated and compared against a standard for compliance (Participant 6). The enterprise systems also added value when they provided information on business performance across organizations.

Some participants thought the tool needed to be useful for the business and the users should not have to input data or “feed the tool” for the sake of the system itself (Participant 2). In addition, users did not find value in the centralization of IT-enabled processes that redistributed work to the users that was previously done by administrative offices. Centralization often added new, unplanned work to the users’ responsibilities and frustrated them because the systems could be difficult to use. Many of these users often were more highly paid than the original staff who accomplished the work, which made the process even more expensive (Participant 4).

Most participants said users found value in systems that were handy, useful, and easy to use because they could save them the time and resources to do other things. Enterprise systems that expedited their business transactions through automated processes, such as the approval and justification for services, increased productivity and reduced the amount of time spent on manual processes. Systems that provided automated reports and full access to the data in them provided value to the users because they could download and upload the data for their use. They described the difficulty in using the enterprise business systems and the frustration they encounter in getting their work done in a timely and efficient manner. They needed enterprise systems that were flexible and had interchangeable and reusable hardware. However, the participants emphasized that the enterprise business systems should be built to support the process and that a system was not valuable it if did not do what it was designed to do, even if it was easy to use.

The skills necessary to use the hardware and the system software should be easily adopted by all employees, and skills required to use one system should be transferable to

other systems. The participants indicated users had to learn how to use different enterprise systems, a process that took time. They felt that they had to compromise their needs when they were required to use the enterprise systems that were not as new, as good, or as friendly as Microsoft products. Many participants voiced their resignation; they had to use the mandated system because it is all that was available. Even though the systems did not meet their all their needs, some felt that they are "better than a piece of paper and pencil" (Participant 1).

Most participants experienced the implementation of enterprise business systems without training. Other participants relayed that user friendliness and usefulness only gradually evolved because of trial and error learning on their part. They felt that this gradual evolution was extremely painful to the user and was "invisible to the people" who developed it (Participant 5). The users wanted a friendly system that was not difficult to use and did not pain, anger, or frustrate them when they used it (Participant 9). These words demonstrated the participants' level of coping with using difficult systems to do their work. They felt that the enterprise systems needed to be like Microsoft in that training to use the system was not a necessity because the systems were intuitive (Participant 10). Others wanted the enterprise business systems to be up to modern standards, which included easy-to-read graphical interfaces, help menus, and online assistance. The systems should be as easy to learn as Microsoft tools and operate like generally accepted systems. Participant 8 commented:

> Yea I am trying to think of things that I [use] personally like…online banking, ordering things online, it is so easy. It seems like the kind of concept that doesn't ever seem to get over to us. I mean, there are some things that work out really well, but it just seems like those really simple concepts that we do in our day-to-

> day life seems so complicated in what we do day to day here. And I know that things have gotten better over the years than they used to be a long time ago, when we did everything manually, but it seems like when we want to do something like that like what we do in our personal lives, it takes so much longer and it is so much more effort. Even when you do get it, like when you get CCAR, it still seems like it is so complicated, when it seems like it could have been so much easier. Even though, like I say, CCAR has its wonderful aspects of it, but some of the other aspects are so complicated, it's like, it seems like somebody in the world out there would have said, "Let's make this easy" and they didn't. They made it complicated.
>
> Researcher: Do you have any ideas how it could have been made easier? What part could have been easier?
>
> Participant 8: A system that is really antiquated, DCPS, which we did not talk about, but DCPS is the civilian personnel, the payroll system that we enter our payroll into, it is like really, if you go into it, it is a really old-fashioned screen. It's not like when you go online to do online banking, [which] is very friendly and easy to work. It is like a very, real old-fashioned screen. You can't like click into the boxes and stuff…. I don't always want to have that fairy tale where it works out, but then hopefully it will. I may be retired by then. It is just those kinds of things where the things in our personal lives are so easy that it seems like they are a decade behind on those easy interfaces. You know the interfaces are just not that easy to being able to just punch a button. You have to do a lot more steps to get to where you want to get . . . . It seems like everything is just a little more complicated. And I know that there are a lot of regulations and rules that you have to follow, so I am realistic. That is why I am still working here, because I know that it is part of what our job is. But it seem like sometimes, things are just a little more complicated than they need to be or people way up at command or Air Force aren't thinking necessarily way down in the muck is how this is going to work.
>
> Researcher: Down in the muck?
>
> Participant 8: How it is going to work with all these other systems we have to deal with or whether we should be considering what other systems it is going to impact. Maybe they do, but they just can't figure out how to make it work. I don't know.

Enterprise business systems that integrated commercial products into the system or allowed user-determined interfaces added flexibility, usefulness, and value in the systems. The users commented that they found value in proven commercial systems with

features such as providing multiple options and the ranking of best options, searches, and transaction histories. Enterprise business systems that integrated user-defined requirements or custom interfaces added flexibility and system usefulness because the users could extract information to do local processes for their organizational business. Although beneficial, these custom interfaces were expensive which made enterprise business systems more valuable when they covered the basic business process functions and pay for the operations and maintenance, and the users did not.

User Value in Relation to Organizational and Enterprise Vision and Goals

The relation between what the users valued and the organizational and the enterprise vision and goals were derived from answers to Research Question 3, "How do the factors they value relate to the vision and goals of their organization?" and Research Question 4, "How do the factors they value relate to the vision and goals of the enterprise systems?" The selective coding statements and criteria from the analysis were compared to the enterprise themes described in chapter 1 for similarities and differences and were portrayed in the center of the model in Figure 2. The overall findings shown in the model indicated that although the users' perceptions of value aligned with the organizational mission, there were differences between that value and the enterprise vision and goals. Areas of alignment and nonalignment are discussed in relation to the following research questions.

How the Factors They Value Relate to Their Organization's Vision and Goals

Answers to Research Question 3 were derived by comparing the participants' responses to what they valued in relation to their organizational goals, vision, and

mission needs. The majority of the responses centered on accomplishing the users' local organizational mission so they could contribute to the larger AF effort. They valued systems that were adaptable and easy to use, and could automate the manual work so that they could reach their organizations' vision and goals of using resources effectively, improving processes, and providing timely business information. The participants indicated that the users valued systems that assisted in maintaining their organizations' data and knowledge, and acquiring information for decision making. They needed efficient and effective enterprise business systems that assisted in communicating program capabilities and resources requirements so that their organizations had what they need to accomplish their missions.

The participants indicated that the users needed knowledge management to advance understanding or to provide background information and data on their business processes and systems to help with their organizations' continuity through leadership changes. Without enterprise business systems, the results were unintegrated nonenterprise systems with different leadership preferences because they were based on subject matter experts' informal and undocumented knowledge and information sources (Participant 2). Some participants indicated the enterprise needs to establish common processes, maintain accurate information and knowledge, educate leaders and users on its meaning, and show how it can be used for decision making. Participant 2 elaborated that new leaders "just get handed the reins [with] no owner's manual" on how to run the organizations' business. There was no way to maintain continuity or a knowledge base of what the systems provide for decision making. Participant 2 commented:

> I think for those people who understand existing systems, both their strengths and limitations, it would be a very useful to quantify that in some readily understood manner with the data dictionary; the data fields; a description of all those available pieces of data; a description of what kind of information those kind of data can provide in forms of tables, plots, and charts; and so forth. And then what kinds of decisions can me made from those tables and plots and charts . . . . People making the business systems need to know what data is [*sic*] readily available, what information is readily available, what information is good.

Most participants indicated that enterprise systems that considered the mission at the local level and interfaced with users' custom products were valuable. However, some felt that enterprise system owners showed no urgency to listened to or meet users' needs because of their distance and separation from the users. Some participants indicated that they valued systems that were developed based on the users' identified requirements and were fully tested before implementation. However, they contended many developers did not consider their feedback (Participant 5). The following dialogue with Participant 5 demonstrated this concern:

> Researcher: So, what aspects of the enterprise business systems help you accomplish your work or mission? What are the qualities or aspects or factors that you would say is effective about them?
>
> Participant 5: Deep breath—Well, hmm. That is a hard question to answer because so many of them are implemented before they are ready. Just to be real blunt, there is no systems engineering. The requirements for the system and what it needs to be able to do, those of us that are beginning users are never asked. The requirements were somehow developed by people that are probably not even in the field; they have a presumption of what the requirements are, what the needs are. They don't appear to talk to anybody in the field, and then they develop these tools and they haven't hardly beta tested them . . . . The X tool was basically developed in a vacuum. It was distributed before it was ready. It had phenomenal problems with it. The, there was almost no training that came with it. It was a trial and error on the part of the user and it is, it has finally, gradually evolved to be much more user friendly and useful. But, it has been extremely painful to those of us in the trenches.

Many participants believed that enterprise business systems could provide value in answering and responding to headquarters from an enterprise perspective or similar level of understanding, and they agreeded with the value of joint use. They believed that enterprise business systems allowed for some data mining to answer management's business questions, even though it was not certain or clear what the information could actually answer. Participant 1 indicated that enterprise business systems with an "intelligence capability" could help to answer vague questions that the organization often received from headquarters. Several participants indicated that a true MIS was lacking and was needed to accomplish their organizations' work. An MIS system would be valuable because it could provide a ready source or archive of information for managers. Enterprise systems can provide a history of data, but the users wanted a system where they could archive other analyses and information just as a knowledge management system can.

How the Factors They Value Relate to the Enterprise Vision and Goals

Answers to Research Question 4 provided data supporting areas of vision and goal alignment as well as lack of alignment. The middle section of the model in Figure 6 showed how the factors they valued related to the enterprise vision and goals. The top circle in the center of model marked as "Enterprise Only" shows the areas where the users' value in relationship to the enterprise vision and goals were not aligned. The bottom nested circle marked as "Shared Organization and Enterprise Value" shows the areas where the enterprise, the users, and the organization shared or were aligned on the

enterprise system value. Discussion follows on the areas of alignment and lack of alignment on the value of the enterprise business systems.

Alignment with Enterprise Vision and Goals

A summary of how user, organization, and enterprise aligned on the value of the enterprise systems in relation to the enterprise vision and goals are show in Table 5. Table 5 presents an update on the vision, goals, and value of enterprise IT systems by theme at the various levels of the organization after the researcher analyzed the participants' feedback. The revisions were made on the line labeled "User-defined value." The findings showed some agreement with the enterprise vision and goals but also areas of deviation. The "x" shows areas of agreement, and the "No" shows areas where the users did not indicate full agreement.

Table 5

Findings Related to e-Government Vision, Goals, and Value Themes

Theme	1: Deliver value and results	2: Unify work across agencies	3: Share a vision	4: Improve effectiveness of services and systems	5: Align systems	6: Create solutions	7: Comply with mandates	8: Support continuous improve-ment
Federal	x	x	x	x	x	x	x	x
DoD	x	x						
AF		x	x	x	x	x	x	x
AF command					x		x	
AF base					x		x	
User-defined value	x	x	x	x	No	No	No	x

Feedback and data on the value perceived by users of the IT-enabled enterprise business systems supported the enterprise vision and goal themes initially discussed in chapter 1 and shown in Figure 2:

1. Theme 1 - Delivering results, support the mission.
2. Theme 2 - Unifying work with interoperable systems.
3. Theme 3 - Sharing a vision, leverage resources.
4. Theme 4 - Improving effectiveness of services and systems.
5. Theme 6 - Creating solutions and integrating performance.

Delivering results and supporting the mission. Enterprise systems with adaptable business processes and systems helped diverse missions and organizations across the AF achieve their mission goals. The users valued the standard systems as a way of meeting the enterprise vision for delivering results and supporting the mission, yet they often built their own custom products to interface with the enterprise to accomplish their work. The enterprise needs to acknowledge these interfaces when upgrades and changes occur so that valuable user and AF information and data are protected. Inflexible management of the enterprise information systems resulted in the creation of nonenterprise solutions by the users because it gave them the configuration control over the data and the tools they needed to do their work. The users required the systems to deliver the results and support the mission as the AF expects, which required that the system owners understand the users' needs and requirements and include them in the system designs. A joint effort between users and system owners is necessary to support the AF mission.

Unifying work with interoperable systems. The value of enterprise business systems was that they allowed for communication using common criteria, definitions, naming conventions, and terms within and across organization and improved decision making throughout the AF. Participant 3 described the advantage of unifying business processes with an enterprise system.

> Researcher: Now you mentioned, you said, "Base Y has some, Base Z has some, we don't." You talked about the frustrations you have in doing your daily business and just getting data out, data that is [*sic*] connected, reports out. What would be the advantage that we have systems like Base Y and Base Z?
>
> Participant 3: Well then we'd all be on the same page.
>
> Researcher: So what?
>
> Participant 3: So when command and Air Force query us and say, "Ok, give me your X, Y, your financial plan, give me this," we'd at least be talking in the same language because we're not today.
>
> Researcher: Ok. And that?
>
> Participant 3: It is even kind of going back to the time where they would say, "aircraft utilization," And we would go, "Well, here's our utilization and here's Base Z's utilization." Well they utilize their aircraft far more than we do and we'd go, "Why is that?" We are flying more test hours, oh, they track their ground hours. Oh, then we should track our ground hours. So then we built a ground rate, and we had our engineers, every time they [did] a ground test, log that time in. Well, we were still far short from them. Then what is it? . . . So, it's all how you account for everything. It's different. You have to make sure your definitions and your criteria and everything are the same.

Unifying work with common systems added value in communication and increases understanding of the meaning of data and information that came from the enterprise system. These systems could support a common work breakdown structure and ways to do financial and resource planning across bases. In addition, interoperable systems encouraged joint use across defense agencies and helped to sustain common

processes such as the financial, acquisition, and travel systems. The unifying, interoperable systems helped to leverage resources and the creation of a shared vision for business in the AF and across the DoD. The business process users also indicated finding value in the enterprise systems because they are centrally managed and system requirements and issues can be worked with the help of the program offices.

Sharing a vision, leverage resources. The feedback indicated that the vision of the enterprise could succeed and create value for the users when there is agreement on the processes and applications that will be used in the enterprise systems. Although most users indicated that they want systems that are applicable to other users, some believed that it was still difficult to get good user-generated nonenterprise systems accepted as common systems because a "not invented here" attitude exists (Participant 9). Instead, some participants suggested that if the users were to build their own systems, they would meet the enterprise requirements so that time and resources were not wasted in the development of these systems.

Most participants indicated that enterprise business systems were advantageous to the users when they were managed and funded centrally because it leveraged resources for users and the enterprise alike. The enterprise systems provided value because the users do not have to fund them, whereas local interfaces or user-developed nonenterprise systems require user funding for development, operations, and maintenance. The centralization also divested duplicate systems and consolidated requirements, which provided value because it reduced the overall cost of the system (Participant 5). The enterprise vision also helped to produce a framework for consistent processes and

decision making information that was applicable enterprise wide and for joint use. Some users understood the trade-off of using a system designed for joint use, but they still wanted the flexibility to build their own interfaces. Pilot B described this tension, where

> The design of the enterprise systems has a tendency to hit the 80% mark; hit what most of the users need and use and so those [other] folks kind of end up on that outlying edges don't necessarily [have] some of critical functionality they need.

Participant 8 described the concern of having to "fit" the system:

> I think it would be good if some of these systems talked to each other, which I've sort of already said that. But also, I also realize that I come from the day when we had boxes of cards that we had to manually key punch, and so I know that we've come a long way. And the systems are way better than they were back then. But, I still think that we, the Air Force maybe, Command, I don't know, are sort of behind on catching up with what the rest of the world is doing. And part of that, I always have to add something on to it, but part of it is that I know that we are all trying to do our own little thing. Base X wants to do it their way, our way, this way, and Base Y wants to do it this way, and try to get all these different bases to talk together and say, "No you can't all do it your way, we are going to do it one way, and we all have to make it fit." And that's part of the problem, is that they are trying to make everybody fit and we don't all necessarily fit which causes problems down to the people who are trying to do day to day execution.

Improving effectiveness of services and systems. Most users agreed with the enterprise vision to improve the effectiveness of services and systems through common consolidated processes and systems. However, most users did not feel that the enterprise business systems were as efficient and effective as they could be, subsequently hindering processes and services. Although the users wanted systems that were jointly used across multiple AF and DoD organizations, they felt that they hadto settle for what the enterprise provided. Many felt they did not have a choice in using the enterprise business systems because their headquarters used the systems and was not always positive in the participants' view. Participant 8 stated:

> I wish we had the old X system again, but I think that sometimes, like our database across the street, you need to have that kind of thing, we wouldn't be able to rely on the information that we have out of the enterprise system. [Program Y] doesn't give us what we need, so we have to have that. But I don't work at a high enough level to be able to say that people would allow us to have our own system, and so you sort of have to settle with what they provide to us, and I don't think we have a choice what system to use.

Improvements are needed, and the users indicated that they wanted standard systems that look and perform like generally accepted systems used by industry because they are more user friendly and useful.

Creating solutions and integrating performance. Integrated performance was considered essential in delivering results and supporting the mission in a joint manner. Integrated performance required a system that provided a framework for consistent data, management decisions, and processes that could be used throughout the organization at different levels. It provided value because it improves understanding and communication, and can expedite processes throughout an organization and across agencies. System solutions that encouraged joint use with common processes, data, and terms created shared meaning and understanding, which the users identified as useful for management decision making. Participant 1 pointed out that the effectiveness of enterprise business systems approach was that other bases were using the same systems so that everyone knows they are getting the same information. Pilot A saw the utility of standard systems because "it allows us to communicate our financial requirements from a strategic level to higher headquarters which then gets rolled up to a higher level AF." Pilot A noted that joint systems solutions for personnel management provided information that could be used to gain insight into how consistently personnel were managed across an

organization. Pilot A also commented that enterprise systems provided a way to follow common business rules because they decreased guesswork in what the processes and rules were. Participant 3 described an experience in seeking a system that could be used across organizations and would help everyone to "talk the same language":

> Participant 3: Yea, I don't know what is out there. It would be nice to know. It would be nice to have somebody that could go gather that for us and tell us. I think we're on the right track by going and having these meetings. They are taking a lot of time, and again, there is no dedicated team doing this . . . . But it is very, very important that we come up with some sort of enterprise system because I think that is where we are headed. And it would be a lot easier if we were all taking the same language.
>
> Researcher: So again, it is about talking the same language.
>
> Participant 3: Yea, comparing apples to apples, and not apples to oranges. And if we get that far it would be helpful. But again, we need to have something for ourselves to be able to operate. Then, get it enterprise wide. But I think, they are light years ahead of us on that stuff, and I don't mind using what it is that they have as long as we can make the same naming conventions and be actually talking about the same things.

Integrated processes and systems provided by an enterprise would help to ensure that the organization can meet its performance goals and mission in a unified manner.

Lack of Alignment with Enterprise Vision and Goals

Answers to Research Question 4 also provided insight into the areas of disagreement or nonalignment between the users' perceptions of value and the enterprise vision and goals. The responses from the participants on the value of the enterprise systems were less about Theme 5 (aligning systems to control investments), part of Theme 6 (creating solutions to reuse technology), or Theme 7 (complying with mandates). The users commented that they valued continuous improvement, as depicted

in Theme 8, but also lamented that the systems were not providing the capability or control they needed to improve as much as they needed and wanted.

Align systems to control investments. Most participants indicated that they wanted system controls for compliance to standards for data as a configuration that management program provides, but they did not show any interest in controlling investments, as Theme 5 indicated. Obtaining the best modern systems that protect information was important to them and not controlling investments because enterprise systems were centralized and the users were not concerned about the cost. Controls for configuration management were important to them because they could help the users trust the information they accessed by ensuring that they have the most up-to-date documents, information, software, upgrades, and data. Enterprise systems needed to have the most current information in them to be useful; in some cases, it was critical to do the work correctly and accomplish the mission. Participant 7 provided an example of a mistake that was made of not looking for the most current inspection checklists on the enterprise site. This action was a costly error, and the organization barely passed an inspection because they ran a self-inspection with outdated checklists.

> Participant 7: Configuration management is really huge. It is hard to overstate the importance of that because it is like [performance reports]. If you are rewriting a [performance report] based on comments from the wing commander, and the one you sent up is not the one you thought you sent up, you can conceivably get something in some guy's records that [was] not what you ultimately intended to write. So configuration management is important, especially when you are doing policy where you are doing checklists for being inspected in something and you really [have to know] . . . I have an actual real world example of that. We had an [inspection team] come out . . . and give us tests. Well the problem [was] the tests we were using were old, and the command tests they brought out were the current one, and we were practicing, we were testing against the wrong test. So we didn't do well, we actually did really poorly, and now, we have another [inspection]

> coming out to help us because we did poorly, in a large part because we used the wrong documents. So we really need to guard against that.
>
> Researcher: Being sure of the source.
>
> Participant 7: Right.
>
> Researcher: The source documents.
>
> Participant 7: And that was brought up before and that was not lost on us when I was having Self-Inspection Program manager meetings and I said, "Don't worry about it, I'll send you all the checklists." And so immediately, there's push back, "I don't want you to send them to me, I want a site where I can go get them and know that those are the most current ones." I said, "You are right, I won't send another checklist out," and now they go directly to the . . . site.

This example emphasized the value of the control that the enterprise systems provided in configuration management over the data they contain. The participants believed that the information source should be the authority and needed to endure changes in leadership and management. Yet, at the same time, the users wanted control over the information they put into and get from the enterprise systems so that they could accomplish their organizations' business.

Create solutions to reuse technology. The participants agreed that creating solutions to integrate performance, processes, and communication was important, but they did not indicate that reusing technology was a high priority, as Theme 6 indicates. However, they identified value in the solutions that used technology to create interoperable systems and communicate with consistent processes and data to support the mission and assist in decision making. Discrepant data uncovered from a negative case analysis indicated that the users did not perceive the enterprise systems as capable of integrating data and business processes. They identified the need for an MIS and systems

built with the latest technology to support the business processes and their requirements. Participant 1 summarized this requirement:

> We don't have what I would consider a good business intelligence system, a good way to extract information or data that's secured, that doesn't get corrupted and things of that nature. What we try, what we are trying to do is, we are trying to use [program X] which is a cost-accounting system. I feel, let me re-phrase this, we are being forced to use this cost-accounting system much the way one would use an MIS system. And that it brings in the data, the actuals, and the estimates, but as far as going and querying that information and putting it in reports, and sorting it this way, that way, upside down, sideways, you know, and that application is not meant to do that; therefore, it doesn't do it very well. And we keep trying to make it do that, yet we don't have the authority to change it, and it is just a vicious circle. So we end up trying to build things outside of it, and then that ends up in a kind of a spiral of we cost too much in IT kind of things. So value, we are back to value again. So that is a system that has value for its purpose. It is a good cost-accounting system. It is not a good business intelligence system, but it [has] the foundation so you could pull the information from it and go do your job. It is difficult to do that and then throw everything into Excel and then make Excel your business intelligence system. Because Excel is easily corruptible, and when you start getting multiple users doing multiple things in the same folder, the same file, it is just yikes! It is a scary thing.

The focus on reusing technology was not identified as important by the participants, but reusing ideas and solutions already in the public sector, such as online commercial sites and applications for travel and banking, were considered valuable.

Comply with mandates. Compliance with mandates, as Theme 7 indicates, was not identified by the participants as a major driver or motivation to use enterprise systems. Other reasons, such as the potential for joint use, process improvement, and communication, were given as reasons to use the enterprise business systems. The users valued the concept of common systems and standards that could be used jointly to improve or increase understanding through its consistent process or data, so complying with a mandate to use enterprise business systems was partially palatable.

Maintaining adaptable and relevant enterprise business systems with integrated data and processes, quality service, and system characteristics that supported the enterprise business and user mission was important to them. Yet, most users stated that they valued a flexible enterprise business system that not only met enterprise needs but also their individual mission and business needs. Inflexible management of information in the enterprise business systems resulted in the creation of nonenterprise systems by the users that gave them the configuration control over the data and the system itself. Nonenterprise systems gave them the ability to change the data, documents, and information in the system, as well as the system itself. Although some saw the benefits for the users, others acknowledged that nonenterprise systems lacked consistent information and configuration control more than the enterprise systems.

Some enterprise systems added value because they facilitated process improvement and the accomplishment of transactions for the users as long as they had the skills to use the system. Enterprise business systems should help to reduce resources and not require that more people with special skill sets do the work. The systems should save costs, and the users should not have to reinvent the wheel to get what they need. The users wanted systems that save them time in doing their work. Enterprise business systems should decrease the time to complete processes or transactions, but many do not, or they cause rework. The users voiced frustration with systems that did not alert them when a process failed or did not inform them about transfers of work or transaction completions. The system should notify the users if data input has not been saved so that delays due to rework or incomplete transactions can be avoided (Pilot A).

Users' Perceptions of the Value of IT-Enabled Enterprise Business Systems

The model in Figure 6 shows the final integration of "What Users Value" and the "User Value in Relationship to the Enterprise Vision/Goals and Organization Mission" in the final block on the right-hand side of the figure. This integration answered the overall research question. The learning from the data analysis and comparisons of user value and enterprise and organizational vision and goals were summarized into relationship statements describing the value that IT-enabled enterprise business systems provide. The relationship statements included concepts on the value of the systems in (a) creating a shared understanding of processes and information; (b) allowing for better communication, decision making; (c) enabling change and process improvement, acting as a conduit for communicating, and managing business process change; and (d) providing capabilities for decision making, knowledge management, and effective and efficient access to data and information. The findings from the analysis and a review for discrepant cases and nonconfirming data provided insight into what value the IT-enabled enterprise business systems do, or do not, provide for the users.

Value That IT-Enabled Enterprise Business Systems Provide

Creating a shared understanding of processes and information. The enterprise systems were valuable because they helped to create a shared understanding of processes and information. The common systems provided a way for better communication and decision making throughout the AF and the DoD because there was a shared understanding of processes, data, information, and knowledge. The commonality of the terms, definitions, and data enabled communication through the system itself and assisted

in understanding what the system processes and results provided as information. The value of these common systems and processes was that they can be used across agencies and organizations in a joint environment.

The value of the common system was not fully recognized because business processes were not fully integrated and the knowledge management process was not mature. The enterprise did not recognize specific user needs and did not always provide the flexibility needed to complete work or acquire data for user-specific mission requirements. Enterprise systems that maintained their relevance to local and enterprise missions enhanced their value, especially if the systems were upgraded and incorporated user-defined requirements.

Enabling change and process improvement. The enterprise systems were valuable because they enabled change and process improvement, and acted as a conduit for communicating and managing business process change. Enterprise systems that adapted to technology and process changes and accommodated the users' local system interfaces remained relevant and useful to accomplish the organizational mission. The enterprise system provided value as a conduit for communicating and managing business process change, as well as providing a consistent level of data, service, and support quality. The users expected the enterprise systems to manage change and ensure that their data and business processes were supported as they evolved. They wanted change that created efficient and effective systems, and leadership that guided the enterprise toward integrated processes, managed knowledge, and a true MIS.

Providing capabilities for decision making and knowledge management. The enterprise systems were valuable when they provided capabilities for decision making, knowledge management, and effective and efficient access to data and information. The users valued enterprise systems that acted as a centralized repository of data for analysis, decision making, and knowledge management. Integrated enterprise data and systems that provided an MIS were valuable because they offered an effective and efficient means to access data, information, and knowledge, and acted as the basis for management decisions. The users noted the value of the data collected in the enterprise systems, but they also identified the need for better tools for analysis and to access data. They needed an MIS to communicate the meaning of data and information and assist in management decision making. An enterprise MIS would provide a way to communicate a common understanding of what the data and analysis mean that are used to support decisions.

The users valued enterprise systems if they are able to meet their local MIS needs and the enterprise goals. They wanted systems that were adaptable and relevant to them and could be used to analyze or develop information for their management decision making. They wanted high-quality, efficient, and effective systems that did what they were supposed to do without intensive manual work. High-quality systems that were easy to use and saved time and effort were expected and valued by the users because they could contribute to the accomplishment of their organizations' work and mission.

Value That IT-Enabled Enterprise Business Systems Do Not Provide

Discrepant cases and nonconfirming data. The findings and the users' criteria considered in determining value were compared and contrasted with the enterprise

concepts in Figure 2 to determine what else was missing or what other negative cases existed (see Appendix G). In addition, areas of what was missing that could add value from the participants' transcripts were noted by the researcher. The results from the analysis indicated that the users perceived value in the goal of creating enterprise systems that could improve the effectiveness efficiency of services and systems. However, the IT-enabled enterprise business systems did not always succeed in delivering the capabilities that could provide value because the systems did not fully (a) meet user and organizational needs; (b) protect user interfaces when systems change; (c) give user control with adaptable systems; and (d) provide modern, easy to use, effective, efficient systems with a MIS and analysis capabilities.

Meet user and organizational needs. The participants shared the enterprise vision of leveraging resources (Theme 3), yet they asserted their belief that the enterprise lacked flexibility and was not meeting user or local level business needs because they were developed originally for the majority of users. Although both the enterprise and the users identified the value of creating solutions to integrate performance (Theme 6), the enterprise focused on centralizing work, which imposed new work on their activity that was previously accomplished by financial and personnel administrative offices. This new work strained resources and caused much rework by personnel who were not familiar with the new workload, which seemed to require a level of expertise that they did not have. Enterprise systems provided more value to the users when they accounted for user interfaces and enabled upward compatibility, much as commercial products do. The participants believed that changes in the enterprise system should not impact the users'

files or interfaces; there should be upward compatibility, and data should not be lost. They wanted the system owners to ask for their requirements and feedback. They wanted to be able to create user-defined interfaces with the assurance that system changes would not break their interfaces or cause data losses.

Give user control with adaptable systems. The enterprise goals focused more on compliance with mandates (Theme 7) to ensure information security, not on how to manage systems and knowledge, as the users wanted. Likewise, the enterprise goals were on aligning systems, setting priorities, and controlling investments (Theme 5), which countered the users' need for custom interfaces and flexible, individualized functionality. Few participants identified using the systems for the good of the enterprise, but they did indicate that they are mandated to use them (Theme 7). The participants voiced the concern that the enterprise business systems developers needed to consider user requirements in developing these mandated systems to make them more useful. Consideration of user requirements could make mandated systems more palatable.

Most of the participants shared the belief that systems that unified work across agencies (Theme 2) and create interoperable systems are valuable. However, they also identified value in systems that provided greater communication through consistent processes, data, and common references, and did not highlight the enterprise goal of creating collaborative tools. The participants indicated that they knew that collaboration capabilities are available, but they had not used them. Some participants acknowledged awareness of other commercial applications and tools that could help them do their work. Not using commercial applications caused frustration from Participant 1, who adamantly

exclaimed, “I know it’s there, I have seen it!” Many were frustrated by the seemingly backwardness of the tools the enterprise offers.

The pilot study participants’ focus was slightly different than the main study participants’ perceptions because their background in CIO work made them more attuned to the larger enterprise perspective than to the users’ position. The main study participants identified more of what was missing than what they perceived as value provided. However, some admitted that they did not fully know what is available throughout the enterprise. The participants focused on accessing data, being able to use it for management decision making, integrating systems and data, and reducing manual work.

Codes from the participants’ responses did not include all the codes developed from the literature review. The missing concepts were on the value of interactive systems and the ability to do concurrent work. The participants focused more on needing and valuing the knowledge management and information repository aspects of the enterprise business systems rather than on concurrent, collaborative, and interactive work such as live chat rooms. Most participants were aware of these capabilities, but they were not interested in pursuing them. They were more interested in face-to-face or telephone conversations with others.

Provide modern, easy to use, effective, efficient systems. Customer knowledge repositories or smart systems that can preload associated information or records from existing sources were identified as a valuable capability. The users wanted modern, easy-to-use systems because it would eliminate the time-consuming manual work of reentering

data that already exist in the system and because the data would be more accurate. The concept of customer knowledge repositories was described as a collection of data that the users need as an MIS or a historical archive. Such a system would give control to the users to access information and data for analysis and decision making. This concept of control was contrary to the enterprise concept of centralized control, yet the enterprise could maintain the configuration management over the system and provide flexible tools for the users.

The quality of the system characteristics needed to be high to provide value to the users. User expectations included aspects such as quality and characteristics of a system, including consistency, meaning that the system did what it is supposed to do; it met their needs, was reliable, and was modern. The users wanted enterprise business systems that were developed around the process, provided essential business information, and had a coherent collection of data. They needed an enterprise business intelligence system with a good way to extract secure information or data with clear definitions of terms and concepts that did not become corrupted. The users wanted accessible enterprise business systems that they could access when they required them, and they needed to able to retrieve and extract information, records, and data easily. Most of the participants indicated that users wanted uncomplicated systems that were easy to understand, especially if they did not use them on a daily basis or at an expert level. Enterprise business systems were perceived as more valuable if they supported the business processes and fully considered the users' requirements. Systems that did not do what the

users expect or need them to do were not valued, even if the quality of the system itself was high.

Influencing Concepts in Technology Acceptance and Change

The users' perceptions about the value of enterprise business systems are a complex interaction of beliefs, experiences, and understanding. It can be influenced and affected by the way change is implemented and impacts the local organizational processes, work, and individual way of being. Theories on organizational change, customer relations, and technology adoption provided the basis for understanding the users' perceptions of value and the change created by the enterprise business processes and systems. The essential information on what users valued in enterprise business systems came from rich discussions with the study participants.

The final grounding for the model on AF internal users' perceptions about the value of IT-enabled enterprise business systems was derived from the concepts and theories explored in chapter 2 and shown on the bottom of the theoretical model in Figure 6. The theories that grounded and supported the findings included leadership and shared values, communication and change, planned behavior, customer efficiency, market maturity, customer response, and technology acceptance. The discussion shows how each was validated by the participants' responses to the research questions.

Theory on leadership and shared values. Theories on leadership and shared values indicated that the acceptance of the organizational vision and goals was influenced by the leaders' ability to create a shared vision and align the people impacted by the change with common goals. The findings from this study indicated that although the

enterprise and the users were part of the same government entity, their views of the enterprise approach were not fully aligned because the users' main concern was to complete work with systems that met their specific organizational needs. Yet, there was much agreement on the value of the enterprise based on vision compatibility as organizational change theorists Denhardt et al. (2002), Karahanna et al. (2003), and Kotter (1999) purported. The users saw enterprise system as a change enabler, and they held the belief that the systems could help to build a shared understanding and manage change through their common processes and far-reaching communications.

The participants were influenced by AF leadership efforts to work toward enterprise business systems that would be valued by the users so that their implementation would result in more efficient and effective ways of doing work. The participants were aware of the powerful ability of the enterprise business systems to communicate change because the system could send consistent messages to a widespread audience. They saw benefit in an enterprise that can manage change and retain learning for future knowledge. They found value in leadership that supports an enterprise with consistent processes and systems so that a shared understanding of the AF business could grow.

Theory on communication and change. The role of communication during times of change was identified by Bass and Avolio (1993), Hersey and Blanchard (1993), Kotter (1999), Kouzes and Posner (1995), and Senge et al. (1999) as important in orienting organizations to a culture of change. The users saw the enterprise business systems as a change enabler because the systems can communicate and help manage

change with their common processes and data. The users found value in the enterprise vision and goals for business process improvement through IT transformation, which demonstrated Bennis's (2003) insight on how shared aspirations, vision, and goals support change.

The suggestion that people may be more willing to use systems that do not quite meet their needs or expectations if their leaders are willing to take risks and allow for mistakes (Kouzes & Posner, 1995) was an issue for the participants. They voiced concern over the accuracy of the data and systems that often lost information when they changed. The risk of making decisions on bad information was real, and ensuring the data and information were accurate, consistent, and the truth source was difficult. The users often had to create applications to minimize the risk of not accomplishing accurate work for the organization.

Communication with users and gaining feedback can play an important role in understanding the difference between the users' and the providers' perceptions of the value of the system, as Bennington and Cummane (1998) demonstrated. This feedback, in conjunction with proven change strategies of working together to improve the change, making improvements for the customer, and planning for, accepting, and correcting mistakes (Atkinson, 1984), can help in times of change. The participants indicated that the users were not being heard and that the developers needed to fix the enterprise systems by working more closely with users to identify and include their requirements. Even when user feedback was provided, the participants indicated they have not seen it used for system improvements (Participant 5).

The users' perceptions about value were not the sole reason for their acceptance of the systems. Karahanna et al. (2003) suggested in their concept that user decisions to accept technology are influenced by the technology's compatibility with user-defined value. The users tried to use the enterprise business systems because they accepted and acknowledged the mandate, but they still needed a better system to realize productivity improvements. The enterprise system goals needed to be balanced with the individual users' needs and their organizational mission because their use of the technology was a critical part of the system. Enterprise business systems owners must create two-way communications with the users for their requirements and feedback.

Theory of planned behavior. The TPB indicated that attitude, norms, and perceived control over a situation were predictors of how people plan to behave (Ajzen, 1999) and had applicability to AF internal users of enterprise systems. The users were mandated to use systems that they felt did not meet their needs and or did not have control over, even though some of the participants indicated that they provided feedback to system developers. With no other option, many went ahead and developed their own systems, even though they were not supported by the enterprise. They made the decision to use their own resources to develop interfaces and systems because they valued being able to do their work, even though this development often led to problems when enterprise systems upgrades were not compatible with their nonenterprise systems. They weighed the risk of noncompatibility and planned their behavior to adopt or create nonenterprise solutions to meet their business needs.

Solutions for IT implementation issues must not only consider the organizational vision and goals but also how they fit with the users' needs and willingness to change. Technology changes the structure, roles, and work in the organization (Adamson & Shine, 2003), and it is not always perceived as better, especially if the centralized systems simply transfer the work to the users. The study findings indicated that the users were willing to change if the tools would do what they were intended to do; they showed reluctance to use systems that did not meet their needs. The users demonstrated their frustration with the way enterprise business systems were implemented without asking what their requirements were and not testing them before deploying them. However, a few identified some benefit in the new systems and felt that they had more control over simple transactions and online processes.

System value perceptions could be influenced by a strong user-centric approach toward change, and user confidence could be gained if their feedback on system development and implementation was considered. Participant 3 described how they tried to get what the users needed to accomplish their work for 10 years. Even through this struggle, the participant saw the value of an enterprise concept to create common systems that would enable shared understanding. This level of acceptance should have outweighed decisions to create nonenterprise systems that tax resources needed for the enterprise systems, but it was not true; they were willing to develop nonenterprise systems because work still needed to be accomplished for the AF mission. Other study participants believed that the development of nonenterprise systems was the only solution in many cases to get the organizational work accomplished.

Theory on customer efficiency and effectiveness. Theories on customer efficiency and effectiveness proposed that customers were coproducers in a system and the efficiency of the system required good performance by people who used the system (Chew-Graham, et al., 2005; Xue & Harker, 2002). Enterprise changes need to consider the total system as an amalgamation of people, processes, hardware, software, data, and information. The alignment of the users' perceptions about the system value affects the success of the system implementation and operation because the users are an integral part of making it work, as shown in market maturity and customer efficiency and effectiveness models where people and their competency in using the system impact acceptance and implementation.

In addition, user acceptance and their efficiency, knowledge, and skills in using IT affect the operation of the system (Xue & Harker, 2002). Knowledge and skill requirements appeared as a concern for the participants, who often faced the problem of being mandated to use enterprise business systems that required training or greater skills and understanding than they had. They voiced a need for systems that are user friendly or provide training so that they can use them more efficiently. Many participants felt that the systems were developed at the expert level and they had to learn how to use each system separately because each one operated differently. The users of the enterprise business systems need to be considered as equity as Hogan et al. (2002) and Szablowski (2000) demonstrated; the users should be trained to be more effective on the systems, or the systems need to be made so common that training is not necessary to use them.

The customer efficiency and effectiveness theory indicated that people are an essential part of a viable system and that competent and trained users contribute to a successful system. Competency appeared as a concern for the users, who often required training or greater skills and understanding than they had to use the enterprise business systems. The users often lacked the skills needed to effortlessly operate the systems, which caused frustration especially since they were the target population for the system. Their efficiency and effectiveness were hindered and impacted not only what they wanted to accomplish but also the efficiency of the systems because the users were an integral part of making the systems work. Training to use the systems was often lacking, and even skilled users were concerned that many systems were not user friendly and required intensive manual work.

Change due to the introduction of IT-enabled business processes creates stress and requires adaptability and learning on new processes (Terreberry, 1968). The frustration of change was voiced: The users want the enterprise business systems to change. They do not want to change. The centralization of routine work with IT solutions has replaced and changed jobs, as Haines (2003) found, and it has created an issue of shifting work to the local level for the users. This centralization added new work that often frustrates them because they often do not understand the systems and processes or they are not easy to use. Their reaction was not a strong inclination to retreat from change, as Haines would predict, but a strong reaction to challenge change. They wanted improved enterprise business systems or a reassessment of the centralization concept because they did not see the value or cost savings in the new processes.

The participants noted that the users needed to change and learn to use the enterprise tools that often decentralize the process and burden the customers to do work that centralized functions did for them in the past. Participant 4 believed that the enterprise is going in the wrong direction and provided a situation they experienced with the DTS.

> DTS was a great idea but the problem is what you have done is you have taken what use to be done by travel personnel, usually in the lower pay range, and allowed people to do their own. So basically, you got executives all the way up to the top executives in the company doing what an administrative assistant used to do. Think about what we are paying for that labor when that person does that. Now a lot of people like it, they say, "Oh, I like to do my own," that is really great. The problem is when you have an issue where the system hangs up or any kind of problem, here you have a top-level executive or someone very expensive, it doesn't have to be an executive, it can be a highly paid technical person, spending time at a DTS terminal, running down issues versus having someone who is an expert at travel. In other words, that person is not an expert on DTS, you have all these amateurs working the system rather than a professional who knows the ins and outs running that stuff down. That is hugely inefficient and very expensive to do that. Now it looks like efficiency because you, oh, got rid of all these people that used to do that task. Well, guess what, all you did was push the work off of those cheaper people's plate and pushed it on to some very expensive people's plate. That to me is not an efficiency, and I think all of those systems like that, that we use that appear to be savings, we really need to look at that to determine whether they are truly savings or not or whether we just moved work off of one plate and put it on another.

Their efficiency and effectiveness were hindered and impacted not only what they wanted to accomplish but also the efficiency of the system itself because the users are an integral part of making the system work. A proliferation of worksheets and nonenterprise solutions to process and track business data and information persisted instead. These independent solutions negated any benefit from viewing the users and their efficiency, effectiveness, and competency in using the system as a strategy toward successful process and system implementation.

Theory of market maturity. The theory of market maturity is a customer-centric approach that focuses on customers' needs and builds relationships that enhance IT business value by viewing the internal organizational relationship and internal commitment as critical to the system success (Hirschheim et al., 2006). The study participants strongly indicated that the enterprise business systems owners need to seek and understand the users' needs and expectations to develop systems that they can and are willing to use. The participants indicated that they had provided feedback on new system developments that were rarely considered in the final implementation. Others believed that their voices should be heard and that the developers need to gather requirements from base-level users who are integral to making the system operate. They indicated that even though systems eventually improve over time, much pain was felt and resources wasted in the premature deployment of critical business systems.

Theory of customer response. The customer response theory indicated that competence in satisfying customers' needs through effective, quick responses reduces the perception of risk, satisfies needs, and builds loyalty (Jayachandran et. al., 2004). The participants indicated that the users valued enterprise business systems with high-quality customer response capability characteristics but lamented that this capability was lacking in many cases. Although a few participants found value in centralized system ownership for the operations aspects of the systems, others were frustrated by the lack of response to their questions, issues, feedback, and requirements, especially in new enterprise business systems developments. The lack of support for their needs impacted their belief that the systems could deliver useful data and information. The risk was real, especially when

there was a need to ensure that the data and the information in the enterprise business systems were accurate and consistent truth sources for their decision making. The result often was a high perception of risk; lack of loyalty to the enterprise business systems; and the proliferation of duplicate, user-generated systems, databases, and worksheets.

Theory of technology acceptance. The participants' comments on valuing systems based on their usefulness and ease of use aligned with Davis (1989) and Mathieson (1991) and their theories on technology adoption and technology acceptance. The technology adoption and acceptance theories postulated that the users will adopt technology based on its usefulness and ease of use or how easy or difficult it is to get the system to perform those functions. Further, as Davis found, the participants indicated that no amount of ease of use could compensate for a system that did not perform a useful function. The participant responses reflected Barrett and Greene's (2001) findings that standardization can enhance information sharing, limit wasting resources on duplicate IT solutions, and require less maintenance and support than diverse systems. However, they indicated that the systems did not always reduce redundant data entry and training on multiple systems.

The participants' responses indicated how technology adoption and acceptance are influenced by the system's user ease and usability (Adamson & Shine, 2003; Davis, 1989; Mathieson, 1991). These factors influenced many users' perceptions about the value of the enterprise business systems, and frequent comments were made on how difficult it was to use most systems because they often require more skills or understanding than the users had or were not up to modern standards. They indicated that

the systems that were easy to use, were handy, and had options similar to online commercial services provided value. Some participants lamented that the systems were not modern in appearance or functions; even with their experience, they found it painful to use the systems. Yet, as the technology acceptance theory suggested, the participants indicated that no amount of ease of use would compensate for a system that did not perform a useful function.

Factors leading to technology adoption that Alexander (2006) described were also at work in this study. Individual support, exposure to knowledge, understanding of the technology's function, formation of a favorable attitude, commitment to technology, and reinforcement of its use were evident in the interview comments. The users supported standardization across the AF, but they wanted better systems that would retain knowledge for making decisions and understanding the processes and their results. They understood how the technology worked, and they indicated that they knew of applications that worked better. They were frustrated by the lack of modern tools. They believed that the enterprise business systems needed to be developed with user-identified requirements that would give them their basic need for an MIS and access to the truth sources of data.

Summary

Chapter 4 described the study findings from the interviews and the grounded theory method, and related them to the research questions and the enterprise goals and themes described in chapter 1 in a model on the internal AF users' perception of the value of IT-enabled business systems. The findings from the interviews indicated that the

interview questions, interview protocol, data collection, and analysis process produced the type of responses and data necessary to conduct this study.

The concept of value was derived from the interview responses regarding what the users perceived as the value of enterprise business systems, the relationship to the organizational and enterprise vision and goals, and how these relationships and other concepts and theories in technology acceptance and change influenced the users' perceptions about the value of the system. What the users valued was derived from their answers to Research Questions 1 and 2.

The analysis of the criteria that the users identified as valuable, along with the interaction of the criteria, produced connecting and cross-cutting relationships indicating that the enterprise systems were valuable when they communicated for a common understanding and decision making; provided change management through the system and its communications; supported joint use; maintained integrated data and processes that supported the business needs of the enterprise and user mission; managed knowledge that supported joint use, decision making, and communications; and provided high-quality, user-friendly service and systems. The responses to Research Question 2 showed that although each criterion was important and added value, the interactions of the criteria considered were more aligned with what the individual users needed to accomplish the organization's work, in contrast to the enterprise goals and direction. Overall, the enterprise system must be able to adapt to business and policy changes and continue to perform or do what it was intended to do.

Answers to Research Questions 3 and 4 provided insight into areas of alignment and nonalignment among the users, the organizations, and the enterprise on the value of the systems. The users' perceptions of value aligned most closely to the organizational goal to accomplish the mission effectively and efficiently, even though most participants recognized that using the systems for the overall good of the enterprise was an important goal. The value perceived by users of the IT-enabled enterprise business systems supported the enterprise vision and goal themes of delivering results jointly and supporting the mission (Theme 1); unifying work with interoperable systems (Theme 2); sharing a vision and leverage resources (Theme 3); improving effectiveness of services and systems (Theme 4); and integrating performance (Theme 6). The responses from the participants aligned less to the value of systems to control investments (Theme 5); creating solutions and reusing technology (Theme 6); or complying with mandates (Theme 7).

Even in areas where they found value, there were shortcomings or matters of disagreement. The users valued continuous improvement (Theme 8), but the systems did not provide the capabilities or control they needed to improve processes. Leveraging resources through standard systems (Theme 3) was important to both, yet the enterprise lacked flexibility to meet user or local level business needs. There was value in creating solutions to integrate performance (Theme 6), but the focus on centralizing work imposed new work on the user. The enterprise focus on compliance to mandates (Theme 7) ensured information security that often prevented the users from getting information in a timely manner. Likewise, the enterprise goals were on aligning systems, setting priorities,

and controlling investments (Theme 5), which countered the users' need for custom interfaces and flexible, individualized functionality. Most of the participants shared the belief that systems that unified work across agencies (Theme 2) and interoperable systems were valuable, but few used the systems for the good of the enterprise. They indicate they were mandated to use them (Theme 7). The participants voiced the concern that enterprise business systems developers need to consider user requirements in developing these mandated systems to make them more useful. Considering user requirements, could make using mandated systems more palatable.

The overall research question was answered by integrating the findings from the analysis, comparisons, and the research subquestions. The value that IT-enabled enterprise business systems provided was summarized into concepts on creating a shared understanding of the processes and information and allowing for better communication and decision making; enabling change and process improvement; acting as a conduit for communicating and managing business process change; and providing capabilities for decision making, knowledge management, and effective and efficient access to data and information. The analysis indicated that the users perceived value in the goal of creating enterprise systems that can improve the effectiveness efficiency of services and systems. However, the IT-enabled enterprise business systems do not always succeed in delivering capabilities that provide value. The systems do not meet user and organizational needs; protect user interfaces when systems change; give user control with adaptable systems; or provide modern, easy-to-use, effective, and efficient systems with an MIS and analysis capabilities.

The concepts and theories on leadership and shared values, communication and change, planned behavior, customer efficiency, market maturity, customer response, and technology acceptance supported the findings and were validated by the responses to the research questions. They showed their concern that the systems were not easy to use, were not modern, and were less responsive to their needs and requirements than they expected. The participant interviews uncovered the meaning and emotions of their responses, that is, the frustration and pain they feel when they use systems that are not user friendly and are inefficient, cumbersome, and not up to modern standards. The questions in the study elicited responses beyond the participants' perceptions about the value in performing their work; they believed that the value is in creating a shared understanding of the processes, data, and information across the enterprise. Chapter 5 interprets the findings from the study and provides implications for practical and social change. Recommendations for further action and study are made for this study.

CHAPTER 5: SUMMARY, CONCLUSION, AND RECOMMENDATIONS

Overview

This study examined the perceptions of the value of AF enterprise business systems by internal users at an AF test and evaluation base. The overall question for this study asked, “What are the internal users’ perceptions of what they value and need from IT-enabled enterprise business processes and systems?”

Subquestions that contributed to the overall research question were the following:

1. What criteria are considered in determining value of the enterprise business systems?
2. What are the interactions of the criteria considered in determining what is valuable?
3. How do the factors they value relate to the vision and goals of their organization?
4. How do the factors they value relate to the vision and goals of the enterprise systems?

The answers to the research questions provided data that were grounded in a theoretical model on the users’ perceptions of the value of the IT enabled enterprise business systems. The criteria they identified were supported by concepts and theories on technology adoption and change. A comparison of the users’ needs to the organizational and enterprise vision and goals indicated that the users’ perceptions of value were closely aligned with the organizational mission needs, but were not fully aligned with the enterprise vision and goals.

The users valued systems that supported their mission and joint work, and they appreciated interoperable systems that unified effort and created a shared understanding of the vision. They needed and wanted improved, effective services and systems, especially ones that could be used as a true MIS. They were less concerned about aligning systems to control investments or creating solutions that reuse technology, but they did appreciate not having to fund the development of the applications. The users did not find value in complying with mandates and found that, although some of the systems were inflexible and difficult to use, they were the only way to accomplish many business processes. They valued the theme and concept of continuous improvement but lamented that the systems did not provide the capability to improve as much as they needed and wanted them to. The users valued the concept of a common system and standards that could be used jointly to improve or increase understanding through consistent processes or data. Having an adaptable and relevant system with integrated data and processes that supported the enterprise business and user mission was important to them. They valued an IT enabled enterprise business system that met not only enterprise goals but also their individual mission and business needs.

Summary

Interpretation of the Findings

The model of the internal AF users' perceptions of the value of IT-enabled enterprise business systems derived from this study has direct implications for AF enterprise CIOs, system owners, and developers. The concept of value of the enterprise business systems derived from the interview responses was partially aligned to the

enterprise vision and goals, but more closely aligned to the organization because it directly impacted the work they must do. Attending to these differences and identifying what is missing may be areas that can create improvements for the enterprise as a whole.

This model has academic and practical applications not only for the AF but also for other public and government sectors. It can be applied to other organizations where their internal users of the system are integral to making the IT-enabled processes work. The model demonstrated how individual users can be affected not only by the system but also how they can impact its success if alternate systems are developed. The total system of people, processes, and technology must agree on the value of the system, and they must collaborate to improve it for the success of the system as a whole as the concepts in technology acceptance and change support.

Following the grounded theory method and process, the steps used in this study have the potential to uncover the perceptions of value in other activities that use IT enabled enterprise business systems. This inquiry was limited to a single AF base study of internal users, but it can be expanded to other populations to test the model further. The interpretation of the participant interview responses was accomplished by a single researcher limited their interpretation. An additional analysis could be done on the data gleaned from the transcripts in other future studies to validate the findings.

Implications for Practical Change

Understanding the value of the system to the internal users is important in developing enterprise goals and standards, improving CIO communications to the users, and evaluating systems development that meets the users' expectations. The study

participants' comments were similar to the findings from the Bertelsmann Foundation (2001), which reported that new IT systems are change enablers if they provide value through accurate and timely information, communications, and connectivity to people in all organization levels. Mahler and Regan (2002a) suggested that technology could bring local organizations closer to the centralized activities and foster an agency-wide culture that encouraging an overarching mission and identity. The participants were encouraged by this possibility and stated that enterprise systems could create common processes and shared knowledge. Yet, the participants voiced that users needed some control over their business processes and analyses and believed, as Shouhoung (1997) suggested, that IT can balance control and accountability in hierarchical organizations by giving the local level some control over activities and processes.

The participants indicated that there often were shortfalls in the enterprise planning for user control and that new enterprise business systems and processes require a strategy that balances operation standards, efficiency, and users' needs. The concept of return from a value-satisfaction link has applicability for the e-government system efforts if balance is achieved because it can reduce the resources that the users spend on nonenterprise systems. The users' requirements and feedback on systems from this study was essential in understanding what they need so that enterprise business systems can be improved and attain this balance. The study showed that the users' perceptions of the value of the enterprise business systems align with their organizational mission, but do not fully align with the enterprise vision and goals, which the AF CIO can focus on and use to assess and improve the implementation decisions regarding these initiatives.

Implications for Social Change

The responses provided insight into the users' perceptions of the value that would help balance the enterprise system strategy. It gave the participants an opportunity to communicate what AF internal users perceive as the value of mandated IT enabled enterprise business systems. New knowledge on the implementation increases transparency on the current condition of e-government system implementation progress and contributes to positive social change for greater accountability for the results and the stewardship of funds in government activities. It adds to the body of knowledge on e-government efforts and improvements that public leadership can make in IT-based transformations. The findings may provide new information and knowledge that AF leaders can act upon to transform public administration and the business of government through the improvement of IT-enabled systems.

Recommendations for Action

The findings and the participants' comments from this study can be used to assess the implementation of IT-enabled enterprise business systems and to improve the systems in place and those for future development. The following are suggested actions that can be taken by system owners, developers, and leaders responsible for the program success as well as other researchers interested in the users' perspective of value in IT-enabled enterprise business systems.

Develop and Improve Systems Based on Users' Requirements and Needs

System owners, developers, and leaders can do the following: (a) solicit requirements from the user for system development; (b) create online or user forums for

feedback on the value of enterprise systems; (c) listen to user feedback to improve systems; (d) include base-level user requirements in the system because they are mandated to use the system and are an integral part of the system; (e) invest in them, train them, and ensure that they can use the systems; (f) improve systems based on user requirements, especially for effective services and systems and ones that integrate data and information; and (g) provide MIS capabilities for effective, data-supported decision making.

Improve Quality and Flexibility of System Applications

Systems need to be developed so that they are easy to use, meaning that a high level of training and expertise is not necessary. The quality of the system needs to reduce the risk of losing data and ensure that the data are accurate, consistent, and maintained. Flexibility needs to be built in for user interfaces because no system meets the needs of all user missions.

Develop Common Knowledge Systems and Repositories

Systems need to be developed so there are common or standard systems that can be used jointly to improve or increase understanding through consistent processes or data. Knowledge systems and repositories should be maintained to minimize redundant work, provide background knowledge and information, and help create a shared understanding in the enterprise on what data mean and how they can be used for decision making.

Focus on Areas Where There Is a Lack of Agreement

The focus should be on areas where there is a lack of agreement between what the users perceive as valuable for their organizational mission needs and what the enterprise

vision and goals are. System owners, developers, and leaders must find ways to support continuous improvement for standard systems yet provide the flexibility that the users need for local interfaces. They must make the enterprise business systems the systems that the users want and choose to use rather than comply and use mandated systems that do not meet their needs.

Recommendations for Further Study

Further study or closer examinations are needed in the areas described in this section.

Extend Feedback From a Broader Range of AF Participants

System owners, developers, leaders, and other researchers can develop an assessment tool based on the study participants' feedback on the value of the enterprise system to determine to determine whether a broader range of participants at the AF base level have the same perceptions. They can use the findings to develop surveys with questions to evaluate areas identified as valuable to the users. In this way the questions would not be based on existing assumptions on what value the systems provide.

Explore the Criteria Missing From the AF Users' Perspectives of Value

System owners, developers, leaders, and other researchers must look for reasons value themes or criteria were missing from the users' perceptions of value. This could include why the users were not as concerned with leveraging and reusing technology or the value of collaborative, concurrent, and interactive work. They might also consider why they were not part of the users' value or needs and what implications it has for the users, the organization, and the enterprise systems as a whole.

Assess AF Implementation of IT-Enabled Enterprise Business Systems

System owners, developers, leaders and other researchers must assess the AF implementation of IT-enabled enterprise business systems resulting from the centralization of activities and the transfer of work to nonexperts. They must determine the true cost savings of the centralization and the use of IT systems as a solution. In addition, they must pay closer attention to adopting modern systems and ensure that they are tested before they are implemented. They can assess current systems and target improvement efforts that will assist base-level users.

Test the Grounded Theory Model in Another Context

System owners, developers, leaders, and other researchers can test the grounded theory model presented on AF internal users' value of the enterprise IT-enabled enterprise business systems in other sectors or contexts. They can determine whether the model is applicable to different contexts and users of enterprise or mandated systems by identifying similar perceptions and needs, or not. They can explain the differences and seek learning that can be applicable to enterprise system implementation in other contexts.

Researcher's Reflections on the Research Process

A critical and essential aspect of this research was the participants' perceptions of the users' value of enterprise systems described through their own experiences. The transcriptions of the interviews were critical in gaining all the information and emotions linked to the participants' responses. They allowed the researcher to code unfiltered concepts; had the researcher relied only on handwritten notes, many data would have

been missed. The emotions and feelings expressed in the interviews added to the meaning of the words and provided a multidimensional description of what the participants valued in the enterprise business systems. They described their frustration and pain in using systems that are unfriendly, inefficient, cumbersome, and not up to modern standards.

The researcher's preconceived ideas on what the participants would identify as valuable were quickly overcome by the participants' own ideas. They had an intense desire to communicate so that others can understand how important well-functioning enterprise systems are to them. The questions in the study elicited responses beyond the participants' perceptions of the value of the enterprise system in accomplishing only their work; they also believed that the system can create a shared understanding of the processes, data, and information across the enterprise.

The iterative review of the data required handling that could not have been accomplished without the use of software that helped the researcher to organize the concepts and categories. Yet, reams of paper were printed, and heavy notes were needed to construct and integrate the final relationships. It was a process of deconstructing the conversations as much as it was reconstructing them back into a whole. The intensive process of looking for differences and similarities in what the participants, all of whom came from diverse backgrounds, had to say opened the researcher's mind to the importance of hearing their stories.

The grounded theory process changed the researcher's thinking about how much can be missing by only listening to a conversation and trying to capture and comprehend what was said. The comments were brought to life after listening repeatedly to the tapes

and meticulously typing the audible words and silent pauses of thought in the conversations. The results read more like a story and allowed for reflection and reverification long after the interviews were over.

Summary

Transparency and insight into what the users perceive valued in the IT-enabled enterprise business systems was necessary to ensure that resources are used effectively to improve systems and that changes are truly better. It is essential that higher level enterprise goals do not overshadow the need for efficient, usable systems. The users need more than transactional processes; they also need a true MIS with data and knowledge that is protected and managed as a resource and provides continuity and knowledge for the AF.

The users' acceptance and compliance in using the enterprise system are essential for successful business processes, but the users will seek workarounds to the system to accomplish their work for the AF if their needs are not met. The identification of the requirements and added system flexibility could improve the value of the existing systems. The CIOs need to understand the users' perspective to make system and policy decisions that increase the value of the systems. The findings from this study can help CIOs to understand the impact on the users of their decisions and actions regarding enterprise systems implementation. The findings will make the results of implementation of IT-enabled systems more transparent and provide direction on where greater value can be obtained from the users' perspectives.

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APPENDIX A: LIST OF CODES

Table A1

Initial List of Codes from the Literature

Accurate	Decreased effort	Latest technology
Adaptable	Distributive	Low maintenance
Adjustable	Ease of Use	Meets schedule
Adjustable	Effective	Performance
Autonomous	Efficient	Records capability
Centralized	Flexible	Reliable
Concurrent	General application	Secure
Cost Control	High quality results	Shared goals
Cross-agency	Improved job performance	Socially acceptable
Cross-communications	Improved productivity	Specific
Customer knowledge repository	Interactive	Supports mission
Customer response capability	Interchangeable	Timely
Data sharing	Knowledge management	Useful

Table A2

List of Codes and Memos from Interviews

Open code	Code memo
Absorb custom products	Systems that absorb or include custom products are useful to users.
Access	Access to records
Access levels	Users want access to information with particular levels of access to protect their information.
Access to commercial sites	Uses need access to commercial sites without having to request access to each one to do research. The impediment raises the potential for a lost opportunity to occur, resulting in not gaining access to the information because the site is blocked or filtered.
Access to data	Systems that provide full access to the data in them provide value to the user so they can download and upload it for their use.
Access to information	Share directories are part of the enterprise system and allow for information access.
Accessible centralized repository	Enterprise system hold data in a centralized repository, ensure accuracy, and are accessible to multiple users.
Accessible data	Data are accessible in enterprise systems.
Accessible system	Users can get to or access the system when they need them.
Accounting data	Enterprise systems contain data on accounting of spending.
Accounting for resources	Need enterprise systems that account for resources used and where the money is going.
Accuracy	Enterprise systems could increase accuracy of data and calculations with embedded math in them.

Open code	Code memo
Accurate central repository	Enterprise systems ensure accuracy because they hold data in a central repository.
Accurate information	OPPOSITE: Users have to ensure information in reports is accurate.
Accurate information for decisions	Enterprise systems need to provide accurate information for decisions.
Accurate truth source	Users need data that are consistently correct, verifiable, is a truth source.
Adaptable interfaces	Enterprise tools need to adapt to accept the interfaces users want and need.
Adaptable systems	Users want adaptable enterprise systems. They have to developed local tools because the system is developed at too high of a level.
Adaptable to business processes	Enterprise tools are needed that keep up with dynamic and changing business processes and rules.
Adaptable to joint business processes	Enterprise tools are needed that keep up with dynamic and changing business processes and rules that are characteristic of a joint environment.
Adaptable to level of work	Systems should be able to handle different levels of work.
Additional information	The systems focus on the information the user needs as well as additional information.
Adopt business systems	Need to adopt business systems that already exist in the private sector.
Adoption	Systems should be easily adopted and used by all aged employees.
Agreement	Enterprise systems are valuable if everyone agrees on what is to be used.
Analysis	Systems that allowed for data analysis are valuable for management information. Analysis included forecasting, what-ifing, and gap analysis.
Analysis comparison	Systems that allow for analysis and comparison are valuable.
Analysis for communication	Systems that allowed for data analysis are valuable for communication for management and decision making.
Analysis for knowledge	Systems that allowed for data analysis are valuable to provide knowledge or the basis for decisions.
Analysis for multiple users	Systems that allowed for data analysis are valuable to multiple users.
Analysis information	Users need systems that they can do analysis with or on the information they contain.
Analysis work	Users want systems that support analysis work.
Analytical tool	Systems that provided tools for data analysis were valuable. Analysis included forecasting, what-ifing, and gap analysis.
Answer vague questions	Could answer vague questions better with a business intelligence capability where data are collected consistently.
Applicability	Give us an enterprise system that others use and can be applicable to other users.
Approval and justification	Systems that automate approval and justification for services and products expedite the process for managerial approval and decisions.
Approval confirmation	Systems that automatically inform the user on the receipt of a transaction provides needed communication.
Archive of information	Systems are valuable that provide a ready source of information for managers who need the information.
Archive of work and data	Users want a system that archives their work, data, and information.
Assessment	Systems used for assessment increase consistency across enterprise processes.

Open code	Code memo
Automate work	Users want a system that automates their work.
Automatic links	Users want a system that automatically links or updates information.
Automatic reports	System that automate reports increase productivity, reduce time spent on manual processes.
Automation	Users want a system that is fully automated. Some systems are only partially automated and require manual work.
Availability	Systems that are available provide user needed service.
Breaks interfaces	OPPOSITE: System that are not flexible and change without concern for user interfaces often break them.
Burdens user	OPPOSITE: Centralized systems burden the customer to do work that centralized functions did for them in the past.
Business decisions	Enterprise systems do not allow for business decisions. They only collect data that have to be analyzed.
Business effectiveness	The tool provides value to the business and makes it more effective.
Business information	Enterprise systems provide information on business performance across organizations.
Business intelligence system	Users need an enterprise system that is a good business intelligence system, a good way to extract information or data that are secured, that don't get corrupted, and where there are clear definitions of terms and concepts.
Business processes	Systems need to codify business process so data can be used appropriately and good decisions can be made from the data or information out of them.
Business tool	The tool needs to be useful for the business and the business needs to use the tool, not feed the tool or run the system for the sake of the system.
Captures information	Enterprise systems capture cost information.
Catalogs	Systems need to allow cataloging of information so it can be accessed.
Categorization	Enterprise systems allow for the collection of data by categorization.
Centralized data repository	Users want a centralized place to get data and documents because there is configuration control and someone is in charge of uploading the most current one. CoPs provide configuration control.
Centralized data repository	Enterprise system hold data in a centralized repository, ensure accuracy, and make it accessible to multiple users.
Centralized repository of information	Enterprise systems allow for access to centralized repositories of information.
Centrally managed	Users find value in the enterprise systems because they are centrally managed and they do not have to manage them.
Change management and management information	Enterprise systems need to manage changes so there is no impact on the user and their files. Data that are essential for management information should not be lost or changed with system changes.
Change management communication	Enterprise upgrades need to be communicated to the user.
Change management data history	Users lost data history when the enterprise system changed. The enterprise managers did not talk to the users to find out if their change would impact the user.
Change management impacts	Local systems are impacted by system upgrades and transformations.
Change management interfaces	Changes in the enterprise system can break the custom interfaces.

Open code	Code memo
Change management plan	Enterprise systems must plan and communicate changes in new software so they do not impact the user.
Change management reduce confusion	Enterprise systems need to reduce complex, convoluted efforts during times of process change.
Change management upward compatibility	Changes in the enterprise system should not have an impact on the user and their files. Should have upward compatibility and data should not be lost.
Changeable	OPPOSITE: Users needs to change to use the tool.
Clear communication	Enterprise systems that clearly communicate information to the user provide value for user actions.
Coherent systems	Users want a system that is developed around the process, provides essential business information, and that is a coherent collection of data.
Collaboration	Need systems that allow communication for collaboration, not impersonal communication sent in an email to the person sitting in the next cube.
Collection of records	Enterprise systems are only a collection of records that can be used to do second and third order analysis. Enterprise business systems are not sophisticated and not mature. Nonenterprise systems are created to fill this gap and are not transferable between bases.
Common architecture	Common architecture provides ability to unite separate systems.
Common business system	Enterprise systems can strengthen and integrate a business system with a common architecture.
Common criteria	Enterprise systems allow for communication using common criteria.
Common definitions	Enterprise systems allow for communication using definitions and terms with the same meaning.
Common reference point	Enterprise systems provide a common reference that can increase understanding and enable joint use.
Common systems	Users want common systems that can be understood by all users in the enterprise.
Common terms communication	Enterprise systems allow for communication using common naming conventions and terms with the same meaning.
Common terms shared meaning	Users want an enterprise system so there is a shared understanding of meaning.
Common work break down structure	Enterprise systems can provide a common work break down structure across bases.
Communication in same language	Enterprise systems allow for communication using the "same language" or concepts, terms with the same meaning and in clear, understandable language.
Communication of changes	Need to communicate changes in enterprise systems to the customers.
Communication of information	Enterprise systems provide a way of communicating information to other activities.
Communication of universal process	Enterprise systems can aid in communication as the tool provides a universal process and means to portray information.
Communication standardization	Enterprise systems provide value that standardize to one set of tools because they create interchangeability, they are compatible with other applications, and provide a way to communicate throughout the enterprise.
Communication with email	Considered email to be part of the enterprise system to communicate.
Community of Practice	Users find value in working specific projects on CoP sites.

Open code	Code memo
Community of Practice central place for data and information	Users like the enterprise system CoP because they can go to a centralized place for data, documents, and information that are the most up to date items.
Comparison	Enterprise systems add value in tracking work that can be rated and compared against a standard for compliance.
Compartmentalized	Some systems do not integrate information and create manual work for the user.
Compatibility with new software	Enterprise systems must be compatible with upward changes in new software.
Compatibility with other applications	Enterprise systems provide value because they are compatible with other applications throughout the enterprise.
Compromise	Uses compromise their needs when they use enterprise systems because they do not meet all their needs.
Conferencing on-line	Users want the ability to conference on-line with direct links for collaboration, video, and chart viewing.
Configuration control in nonenterprise systems	Nonenterprise systems lack configuration control.
Configuration control on user information	Users want configuration control over the information they put into an enterprise system.
Configuration management and trust	Users want configuration management on documents so they are ensured they have the most up to date information, software, upgrades, and data. Configuration management helps the user trust what they are pulling off the internet.
Configuration management and user control in nonenterprise systems	Nonenterprise systems provide the user configuration management.
Connectivity	Enterprise systems provide connectivity but can also be a detriment if the system malfunctions or goes down.
Consistency in data	Enterprise systems provide a framework for consistency in data.
Consistency in management actions	Enterprise systems provide a framework for consistency in management actions.
Consistency in process and results	Enterprise systems provide a framework for consistency in process and results.
Consistency or data accuracy	Enterprise systems provide a way of storing and displaying consistent data and information.
Consistent decision making	Enterprise systems provide a framework for consistent decision making.
Consistent error free data	Users need consistent data that are free from errors.
Consistent process	Enterprise systems provide a framework for consistency in process.
Consistent results	Enterprise systems provide a framework for consistent results each time the system is used.
Consolidated sites	Users want one place to go for transactions such as training. They do not like the confusion of multiple sites.
Continuity	Enterprise systems should provide continuity from one business leader to the next.

Open code	Code memo
Control for user	Enterprise systems give the user control when they do the work, process, or transaction themselves.
Control over applications	User should be able to control when a system downloads new applications or patches that would interfere with work.
Control over data	The system should provide control to the user for their data.
Correlation	Users need products where data correlate with each other and are logical.
Cost reports	Users need a cost accounting system to show the cost of resources used.
Cost saving	Enterprise systems should save costs, users should not have to reinvent the wheel to get what they need.
Create nonenterprise systems	OPPOSITE: Enterprise systems do not allow for enough flexibility and users create their own systems.
Credibility	Users want systems that have credibility and will endure with management changes.
Cross-references	Enterprise systems should integrate business processes and provide cross-referenced information.
Cumbersome changes	The electronic systems allow for multiple changes at multiple levels and create cumbersome processes that do not add value.
Cumbersome processes	Enterprise system processes should not be cumbersome to the user.
Cumbersome system	Users do not want to use a system that is cumbersome.
Current information	Enterprise systems need to have the most current information in them to be useful.
Customized	OPPOSITE: Enterprise systems are not flexible or agile enough to handle different or dynamic data or situations.
Dash boards	Uses want information dashboards that show measurements for their activities.
Data descriptions	Enterprise systems need to describe the data it contains so users understand what the data are and what information they can provide.
Data for decision making	Users need systems with data in them that are useful for decision making.
Data history cohesiveness	Changes in the enterprise system should not have an impact on the data. Should have upward compatibility and data should not be lost or changed.
Data mapped into categories	Users need a cost accounting system that maps data into categories.
Data mining and truth sources	Users need systems that provide the ability to pull data out of databases that are truth sources.
Data mining to answer questions	Enterprise systems allow for some data mining to answer nebulous questions as the critical questions or what information can answer the question is not clear.
Data out of systems	Users need to able to get data out of the enterprise systems.
Data ownership	Systems that provide full access to the data that users own provide value to the users.
Database	Users need databases so they can draw out accurate data for analysis, reports, and management information.
Decentralized process	OPPOSITE: Centralized systems often decentralize the process and burden the customer to do work that centralized functions did for them in the past.
Decision support	A system that enables management decision making will provide value to managers and leaders who need data supported analyses and information for decision making.
Decision making	Users need systems with data in them that are useful for decision making.

Open code	Code memo
Decision making and data- supported analysis	A system that enables management decision making will provide value to managers and leaders who need data supported analyses and information for decision making.
Decision making on schedules and resources	Users need information in the system that is useful for making decisions on schedules and use of resources.
Definitions	Users want a system that interfaces with others and has common definitions of what things mean.
Design	The design of the system needs to be like web page references, work with a touch of a button, information that is easy to find and access.
Designed according to enterprise processes	Business processes can increase their consistency in the enterprise by using the same system. The process needs to drive the system.
Detailed information	Systems need to provide detailed information.
Diverse	OPPOSITE: Enterprise systems are not flexible or agile enough to handle different or dynamic data or situations.
Documentation repository	Systems are valuable that provide users a documentation repository.
Documentation repository	Systems that allow for documenting work, tracking, and accounting for resources are valuable.
Does what it is suppose to do	Quality is indicated if the system does what it is suppose to do, when the data and system are available, accurate, consistent, valid, and reliable, and by the professionalism in the system development, operations, service, and support.
Download information	Systems provide value to the user if they can download information for their use.
Downloadable	Systems that provide full access to the data in them provide value to the users if they can download and upload it for their use.
Drill down of information	Users want a system that allows for an automatic, linked, drill down of information.
Dynamic application of technology	OPPOSITE: Enterprise systems are not flexible or agile enough to handle different or dynamic data or situations.
Ease of use and training	Enterprise systems need to be like Microsoft in that training to use the system is not a necessity to use the system; they are intuitive.
Ease of use and uncomplicated	Uses want an uncomplicated system that is easy to use.
Ease of use for nonexpert	Systems should be easy for the user to use, especially if they do not use them an expert level or on a daily basis. They should be as easy to learn as Microsoft tools and operate like generally accepted systems with GUIs, help menus, and on-line assistance.
Ease of use of system	Systems need to be easy to use.
Ease-of-use saves time	Users find value in systems that are easy to use as it saves them time and resources to do other things.
Easy to use accommodates user needs	Nonenterprise systems accommodate exactly what the user needs so it is easy to use.
Easy to use saves resources	Systems that are easy to use save time and resources to do other things.
Effective	Enterprise systems are effective when they are designed to do what the user needs them to do.

Open code	Code memo
Efficient systems	Users want enterprise systems that make the process more efficient or result in a true savings and not reallocate or push work down on them from another area or organization with no true savings.
Electronic signatures	Electronic signatures are a valuable enterprise process for users.
Enable change	Enterprise systems enable change because they allow a large amount of rapid and repeated communication.
Enablers	Enterprise systems are enablers that help uses provide management information and data.
End-user comfort	Enterprise systems are not as good as Microsoft because they are old but are better than a piece of paper and pencil.
Enterprise pays for operations and maintenance of the system	Users find value that the enterprise pays for the operations and maintenance of the systems and they do not.
Enterprise tool covers critical functions	Users find value that the enterprise systems cover some of the basic business process functions such as travel.
Error checks	Users need a system that provides a data entry error check to ensure accurate data.
Error tolerance	The electronic systems allow for multiple changes at multiple levels that are cumbersome and create an environment of zero tolerance for error, which does not always add value.
Errors	Nonenterprise systems and spreadsheets are error prone.
Errors and mistakes	Nonenterprise systems require intensive effort and manual work and using large spreadsheets with a lot of data often results in errors and mistakes.
Expedite processes	Enterprise systems that expedite their business processes provide the value of time saved.
Extract data	Users need an enterprise system that has a good way of extracting information or data.
Extractions	Systems provide value to the users if they can extract data and use them for their business management.
Feedback	Systems that automatically inform the use on the receipt of a transaction provides needed communication for feedback and decision making.
Filters	Enterprise systems that provide a filtering capability are valuable for the user.
Financial planning	Users need systems for financial planning.
Financial planning common process	Enterprise systems can provide a common way to do financial planning across bases.
Flexibility	Enterprise systems that are flexible or agile enough to handle different or dynamic data or situations are valuable because they provide a useful tool for developing or finding information for management decision making.
Flexibility creates trust	Enterprise systems need to provide the user flexibility to create reports with information they need to build trust with their customers.
Flexibility for reports	Users need the ability to do ad hoc queries, and reports that are relevant to the questions being asked without the assistance of a programmer. Standard queries and reports do not always meet users' needs.
Flexibility for unique needs	Users want flexible systems to meet their unique needs.

Open code	Code memo
Flexible system	Enterprise systems that are flexible or agile enough to handle different or dynamic data or situations are valuable because they provide a useful tool for developing or finding information for management decision making.
Focused	The systems focus on the information the user needs as well as additional information.
Follows business rules	Enterprise systems provide a way to follow common business rules. It decreases guess work in what the process or rules are.
Forecasting	A system that can support forecasting analysis provides value to managers and leaders who need information for decision-\ making.
Forecasting resources	Systems that enable data analysis are valuable and included forecasting for future events and resource requirements based on trend or history data.
Forecasting with integrated systems and data	A system that can support integrated systems and data for forecasting and analysis enables management decision making.
Forecasting work	Users need information in the system to help with forecasting work.
Forecasting workload	Users need a system to do workload forecasting for their activities.
Foundation of information	Enterprise systems provide a foundation of information that could be pulled by the user to do their job.
Front-ends	Need to be able to put individualized front-end programs on enterprise system databases to satisfy user information requirements.
Functionality	OPPOSITE: Enterprise systems provide an 80 percent solution and do not meet the needs of the other users.
Gap analysis	A system that can support gap analysis provides value to managers and leaders who need data supported analyses and information for decision making.
Generic	Enterprise systems that are on a more macro level can become more generic.
Give niche needs attention	OPPOSITE: Enterprise systems provide general business process solutions and do not meet the special or niche needs of others.
Great experience	Users find value in systems that are a great experience to use.
Handy	Users find value in systems that are handy to them so they can do other things.
Historical records	Enterprise systems add value in keeping historical records.
Historical records for management information	Data in enterprise systems can provide a history of data for management information.
Historical records for research	Enterprise systems enable research because the data are maintained in them and there is a history.
Historical records for trends	Users need a history of data to determine trends.
Historical records of emails	Users need a system that allows them to file and maintain emails as historical records.
History	Some historical data are necessary to see how things are evolving.
Human resources	Users need systems for personnel and human resource management.
Identifies resources	Systems that help identify resources needed to do work are valuable.
Identify capability	A system that can support capability analysis provides value for management communication and decision making.
Identify requirements	A system that can support analysis and identify resource requirements enables management decision making and provides value to managers who have to communicate requirements.

Open code	Code memo
Implementation	System implementation is not providing value to the user because their requirements are not being met.
Include commercial products in the enterprise	Enterprise systems should integrate commercial products or allow user determined commercial interfaces to add flexibility and usefulness of the system.
Include user defined improvements	Enterprise systems should integrate user defined requirements to add flexibility and usefulness of the system.
Individualization	Users want a system that will fit their needs.
Individualized reports	Users want a system that allows them to generate reports and information they need with information they need, and when they want it.
Individualized system quality	Enterprise systems can support a common business strategy but will not meet all users individualized needs and required system quality.
Individualized views of information	Systems that allow individualized information views provide value to the user.
Information	Nonenterprise systems provide more information for the user that is based on their specific information and level of detail needs.
Information for decision making	Enterprise systems provide information for decision making.
Information for headquarters	Enterprise systems provide value in responding to headquarters in the same direction.
Information repository	Enterprise systems that maintain information and data over changes and time add value for the user because they can access their data; they are portrayed or have the same meaning, and are accurate as when they were first collected.
Information search	Need ability to find and search for information like the commercial searches.
Information stewardship	Enterprise systems that consider information stewardship as essential to data integrity are necessary.
Information that is clear	Systems need to provide clear, understandable information.
Integrate data	Enterprise systems can provide a way to integrate data from different systems or processes so users can go to one place for information which could help prevent a loss of information from local systems or unintegrated enterprise systems.
Integrate systems	Integrated systems will reduce process steps for the user and make it faster to get what they want.
Integrated data	Enterprise systems can integrate data and eliminate the need to maintain user-made spreadsheets.
Integrated for management information	Users need systems that integrate technical and business information to track technical work accomplishment for management information. They also need integrated data from multiple sources.
Integrated information and processes	Enterprise systems can provide a way to integrate information from different systems or processes.
Integrated information for project management	Users want a collection of tools to use as a management information system including a project management tool that is linked to the financial system.
Integrated schedule	Enterprise systems could help integrate work and project schedules within and across agencies.
Integrated set of tools	Enterprise systems can provide a way to provide tools that are integrated to do business processes.

Open code	Code memo
Integrated systems and data	Integrated systems and data are valuable to the user.
Integrated systems and data reduce work	Users want a system that integrates other systems and "talk to each other" and minimizes redundant work including determining funding status, passwords and logins.
Integration	Enterprise systems need to integrate data from different systems or processes.
Integration of information and knowledge	Enterprise systems can provide a way to integrate data from different systems or processes so users can go to one place for information and knowledge.
Intellectual capital	Nonenterprise systems include what subject matter experts know, what is in the human brain, who can provide that information, and how that all connects. Enterprise systems need to do that.
Interchangeable hardware	Systems must allow for interchangeable hardware. The skills people have should allow them to use the other hardware easily.
Interchangeable software tools	Enterprise systems provide value that standardize to one set of software tools because they are interchangeable, they are compatible with other applications, and they provide a way to communicate throughout the enterprise.
Interface	Users want a system that interfaces with other systems and has common definitions of what things mean. They want a system that interfaces or has automatic updates with other processes so that the user does not have to do manual work.
Interface legacy systems with enterprise system	Enterprise systems can provide a way to integrate data from different systems or processes so users can go to one place for information which helps the users and saves them time in business and analysis processes.
Interface local and enterprise systems	Integrate data from local and enterprise systems or processes are more efficient and effective for users.
Interface with other systems	Interface systems for project management use.
Interfaces with other tools	Enterprise systems that are capable of interfacing with other tools provide value.
Interfaces process modules	Users need a system that interfaces with other systems such as one system with multiple modules.
Intermediate step or other tools to help feed it	Systems that include custom developed interfaces add value because the user can interface or extract information that is useful to them.
Issue resolution	Users find value in the enterprise systems because they are centrally managed where system errors can be worked and issues can be resolved.
Joint use	Enterprise systems meet the need of the organization as a whole and enhance the consistency of business processes.
Knowledge management from integrated data and systems	Enterprise systems can provide a way to integrate data from different systems or processes so users can go to one place for information which could help prevent a loss of information from local systems or unintegrated enterprise systems.
Knowledge management system	Users need the system to help with knowledge management.
Less expensive	Users find value that the enterprise pays for the operations and maintenance of the systems and they do not.
Linked charts	Systems are needed that link data and charts.

Open code	Code memo
Linked records	Enterprise systems can provide a way to integrate data from different systems or processes so users can go to one place for information which could help prevent a loss of information from local systems or unintegrated enterprise systems.
Local area network	The local area network is considered as part of the enterprise system because communication and transfer of data and information goes all the way up to DoD.
Local flexibility	OPPOSITE: Local users may find a loss in capability in enterprise systems that work towards a general solution for all.
Local tools	Users want adaptable enterprise systems. They have to developed local tools so they can use in the high level systems.
Lost capability	Local users may find a loss in capability in enterprise systems that work towards a general solution for all.
Lost opportunity	Systems that get bogged down or reboot too slow cause the user to divert effort and may cause a lost opportunity to communicate, find information, or to provide a quality product because of compressed time to do so.
Management decision information	A system that enables management decision making provides value to managers and leaders.
Management information as proof	Management information and data are needed that proves or disproves intuition.
Management information for decision making	A system that provides management information enables management decision making.
Management information in historical data	Historical data in enterprise systems provide valuable management information.
Management information in systems	Users need systems that provide management information.
Management information system	Uses need an information management system and enterprise systems do not provide that.
Management information system that allows data sorting	Users need a system that allows for sorting data and providing management information.
Management information systems provide value	Users find value in management information systems.
Mandate	Headquarters uses the system so we have to.
Manipulate the data	Users need to be able to manipulate data.
Manipulate the system	Uses see enterprise systems as a downfall because they are locked down and the user cannot manipulate it for their base or any other base.
Manual process	Enterprise systems that do not work or do not do a complete process make the user do manual work.
Manual process for information	The enterprise systems still require manual processes to get information out of them.
Manual work	Enterprise systems require manual work of inputting and converting data into graphics, charts, and reports.
Manual work elimination	Users value a system that eliminates manual work by interfacing with other systems.
Manual work in spreadsheets	Enterprise systems can integrate data and eliminate the need to maintain user made spreadsheets. It eliminates manual work.

Open code	Code memo
Meet enterprise requirement	If users build their own system they should meet the enterprise requirements so time is not wasted in the development.
Meet the needs of the enterprise	Enterprise systems meet the need of the organization as a whole.
Meet user needs	Systems need to be built to meet users' needs.
Meet user unique needs	Enterprise systems need to meet user unique needs.
Meets mission needs	Enterprise systems need to be adaptable to meet the individual user missions.
Minimize work arounds to extract information	Systems that include custom developed interfaces add value because the user can interface or extract information that is useful to them.
Minimize work arounds with interfaces	Systems that include custom developed interfaces add value because the user can interface or extract information that is useful to them easily and without workarounds.
Modern	Users want a system that is modern in appearance and has the same look and feel as commercial software and the Internet.
Modifiable	The uniqueness of user processes and requirements will not be solved by enterprise systems so users need tools they can modify.
Need interfaces between local and enterprise systems	Systems that include custom developed interfaces add value because the user can interface or extract information that is useful to them.
Need to add functionality	Systems that are functional for the user increase their value.
Need to understand user requirements	Systems that include user interfaces and requirements add value because it is useful to them.
No choice	Enterprise systems operate from an enterprise perspective; they emphasize integration and do not give the individual organizations a choice.
Noncorrupt data	Users need an enterprise system where the data do not get corrupted.
Not invented here	Enterprise systems are hard to make common because there is a "not invented here" attitude.
Notification	The system should notify the user if data input by the user was not saved.
Notification of approval	Systems that automate approval and justification for services and products expedite the process.
Notification on transactions	Systems need to record and track transactions. Transfers of work or completion of transactions need to be communicated by notifying users and the people involved in the process.
Old systems	Users want and value new systems, not old ones that are not user friendly or do not keep up with new tools or changes in the business processes such as a common work breakdown system.
One data repository	Enterprise systems provide a way of storing and displaying consistent data and information.
On-line commerce	Users find value in proven commercial systems that save them time and resources to do other things.
On-line reports	Users need reports on-line so they are accessible.
Only means	Enterprise systems that are the only means to complete a process and provide no alternative impacts the user.
Optimize time	Systems that integrate schedules can optimize time.
Order confirmation	Systems that automate approval and justification for services and products expedite the process.
Painful	Systems that are painful are not good.

Open code	Code memo
Paperless	Enterprise systems can increase accuracy of data and calculations and save paper.
Paperless processes	Users want paperless processes.
Paperless transactions	Enterprise systems can reduce the paper needed in business transactions.
Planning	A system that enables management decision making will provide value to managers and leaders who need data supported analyses and information for decision making and planning.
Policies	Need to grow or change policy with new system capabilities.
Preload information	Systems that preload integrated information from multiple systems or sources add to their functionality and reduce manual work for the user to get the data they need for their work.
Prioritization for decisions	A system that enables prioritization of resources provides value and information for management decision making.
Prioritization for headquarters answers	A system that is able to do analyses and provide answers to prioritization of projects and resources is valuable for management information for decision making and can be used across the organization to provide answers for headquarters.
Priority to individual user needs	OPPOSITE: Enterprise systems provide an 80% solution and do not meet the needs of the other users.
Process first	Systems should be developed to support the process first.
Process time	Enterprise systems should decrease time to complete processes or transactions. Many do not.
Professionalism	Users value the professionalism used in the system development, operations, service, and support.
Protect information from loss	Enterprise systems can provide a way to integrate data from different systems or processes to help prevent a loss of information from local systems or unintegrated enterprise systems.
Provides best options	Users find value in systems that help them select the best option for their transactions.
Provides history	Users find value in systems that provide a history of their transactions.
Provides multiple options	Users find value in systems that are a great experience to use and can provide multiple options that they can choose from that meets their needs.
Provides understanding	Enterprise systems can provide data and results that increase understanding of a process or action.
Quality	Quality is indicated by the professionalism used in the system development, operations, service, and support.
Queries for information	Users need a system that enables information queries.
Queries on data	Queries on data in enterprise systems are valuable.
Quick access	Users want quick access to metrics and data, and shared data rather than everyone keeping their own spreadsheets of historical data that are not linked or accessible to others.
Quick process	Enterprise processes can be quicker than manual processes.
Rapid communication	Enterprise systems have the ability to communicate and deliver data across a wide audience instantaneously.
Real-time	Real-time information is valuable to users.
Real-time information	Users want real-time information.
Record current data	Enterprise systems that provide a place or record for information helps prevent a loss of information.

Open code	Code memo
Recording	Enterprise systems can provide a way to integrate data from different systems or processes so users can go to one place for information which could help prevent a loss of information from local systems or unintegrated enterprise systems.
Redistributed work	Enterprise systems and centralization of work caused work to be distributed to other work centers than before. What was done by another office is now done by users and adds new work and costs.
Reduce redundant work	Users find value in systems that are handy or useful as it saves them time and resources to do other things.
Relevant information	Enterprise systems need to provide relevant information for decisions.
Reliability	Quality is indicated when the data and system are available, accurate, consistent, valid, and reliable and can be used to make management decisions and do business transactions.
Reporting	Users can report information to higher command through enterprise systems.
Reports	Users need reports.
Reports from end-to-end process	Users want an end-to-end system with the ability to put in raw data, analyze data within the system, and report data in meaningful ways
Reports from the system	Users need a system that produces reports.
Reports that are easy to use	Uses need systems that have report generation capabilities that are easy to use and can be done on the desk top.
Reports with integrated information	Produce reports for project management with integrated information.
Repository	Users want to be able to file emails so they can be searched for or filed as a historical record.
Requirements and documents	Users need data from the enterprise systems for requirements and documents.
Requirements validation	Users want enterprise systems that are developed on valid user requirements.
Research	Enterprise systems enable research because the data are maintained in them and there is a valuable history.
Research data	Enterprise systems provide a place to research data.
Resource management communication	Systems that aid in communication help resource management.
Resource management information	A system that provides resource management information and data helps in decision making and planning.
Resource modeling	Users want an enterprise resource modeling tool.
Resources	Enterprise systems should help reduce resources, not add a need for more people with specific skills to do the work.
Responsive	Quality is indicated when the data and system are available, accurate, consistent, valid, and reliable. It is responsive in making management decisions and to do business transactions.
Responsive systems	Users want systems that are responsive and boot up quickly without lag time.
Retrievable data	Data in enterprise systems are retrievable.
Retrievable data by user	Users need to be able to retrieve data from systems by themselves.
Retrievable with ease	Users want to get data out of enterprise systems easily.
Rework	Users find value in systems that are handy or useful because it saves them time and resources to do other things.
Same information	The effectiveness of enterprise system for users on the business side is that other bases are using it so we do know if they are getting the same information

Open code	Code memo
	we are getting.
Save money	Users find value in systems that are handy or useful as it saves them financial resources.
Save time in system start-up	Users want systems that save time, not delay work because they take time to boot or start up.
Saves time to do work	Users want systems that save them time in doing their work.
Scheduling	A system that provides information for scheduling informs and enables managers to make decisions.
Search	Enterprise systems that provide a searching capability are valuable for the user.
Search feature on content	Users want systems that provide a search capability on content and that bring back relevant searches with quality information.
Search feature on information	Users find value in systems that has features that allows for searches on information or items they need.
Secure data in system	Users need an enterprise system where the data are secured.
Secure data are ensured	Users need a system that will ensure data are secure.
Secure system	Users need secure systems but do not cause delays in accessing systems when they have to reboot to apply software.
Segregated business system	OPPOSITE: Enterprise systems and data are not integrated, so users cannot go to one place for information.
Self-populating	OPPOSITE: Enterprise systems can self-populate existing information, so they do not have to repeatedly input data or information.
Service wait time	Users find value in systems that are handy or useful as it saves them time and resources to do other things.
Shopping cart feature	Users find value in systems that have a shopping cart feature.
Similar process	Uses want a system where they learn how to write reports that will work in any system. They do not want to learn how to use multiple systems that all operate differently because it wastes their time.
Similar tool	Enterprise systems meet the need of the organization as a whole and enhance the consistency of business processes.
Slice and dice data	Users want a system that keeps data and allows user to slice and dice data in different ways.
Smart system	Users find value in systems that are smart and can provide multiple options, ranking of best options, and have features that allows for searches or history transactions.
Solves problems	Users find value in systems that help them solve problems.
Sort and filter data	Users need a system that allows them to sort and filter data.
Sorting	Enterprise systems that provide a sorting capability are valuable for the user.
Speed	Users find value in systems that save them time and resources to do other things.
Speed improvement	The systems can be slow but can ramp up with new versions.
Spreadsheets	The use of spreadsheets is considered as a nonenterprise system and is a way to track and manage business activities including budgets, property, equipment, and personnel.
Spreadsheets are useful	Users find spreadsheets useful in tracking their resources. They are not enterprise systems.

Open code	Code memo
Stable business process	Enterprise systems meet the need of the organization as a whole and enhance the consistency of business processes.
Stable system	Systems need to be stable so data are not lost.
Standard system	Users want standard systems that look like or perform like generally accepted systems across industry.
Standardization	Enterprise systems provide value of standardizing to one set of tools, which enhances interchangeability, compatibility with other applications, and standard process execution.
Standards	Enterprise systems add value in tracking work that can be rated and compared against a standard for compliance.
Store data	Users need a system that can store and secure data.
Strategy	A system that enables analysis and management decisions on strategies provides value to managers and leaders.
Streamline process	Business processes can increase their consistency in the enterprise by using the same system. The process needs to drive the system.
Substandard	Enterprise systems are substandard and users are forced to use them or develop their own product.
Support business process with the system	Business processes can increase their consistency in the enterprise by using the same system. The process needs to drive the system.
Support business process with same system	Enterprise systems that support business processes can also increase consistency in the process when the same system is used.
System choice	Users feel they have to settle with what the enterprise provides and they do not think they have a choice.
System customization needed by the user	Systems that include custom developed interfaces add value because the user can interface or extract information that is useful to them.
System information capabilities	Enterprise systems need to inform users of what information and reports they can produce.
System notification that something has been changed	Systems that automatically inform the user on the receipt of a transaction or change provides needed communication.
System quality	The quality of the system's hardware and software need to be high to provide value to the user. The products from the system must be easy to read, handle, update, and use.
Systems engineering	Users want enterprise systems developed using systems engineering so that systems are not implemented before they are ready, the user requirements are included, and beta testing is completed.
Tailorability	Users want to be able to tailor enterprise systems for the important output to meet their requirements.
Time consuming	Users do not want systems that are time consuming.
Time consuming manual work	Users want a system that is fully automated. Some systems are only partially automated and require manual work and consume their time.
Timeliness in reports	Uses need systems that have timely report generation capabilities.
Timeliness in systems	Systems are needed with timely information to make decisions in dynamic environments.
Timeliness is lacking	Some systems do not accomplish work for the user quickly.
Timely	Users find value in systems that are handy or useful as it saves them time.
Timely boot-up	Users want systems that boot up quickly without lag time.

Open code	Code memo
Timely information	Users need systems like commercial systems that provide updated cost estimates for work and parts and allow the customer to respond to questions.
Too expensive	Enterprise systems are too expensive.
Too specific	Enterprise systems are too specific and are not always the right kind of tools that are needed. They can be too generic and not meet the users' needs.
Tool supports business process	The enterprise system need to support the business process, the process needs to drive the system to be effective and valuable.
Tools support the user	Users want tools that provide support so the user can produce a quality product. Support was in terms of system responsiveness so the user would not waste time waiting for the system to reboot or access the needed program.
Track progress	Systems are valuable that track user program progress.
Tracking capabilities	Users find value in the tracking capabilities in the enterprise systems.
Tracking for comparisons	Enterprise systems add value in tracking work that can be rated and compared against a standard for compliance.
Tracking resources	Users need enterprise systems that track resources such as logistics tracking.
Tracking transactions	Enterprise systems provide a way to track transactions.
Training	Enterprise systems are implemented without training for the user. User friendliness and usefulness only gradually evolve.
Transaction	Enterprise systems are used for transactions such as financial and travel requirements.
Transaction feedback	Systems that automatically inform the user on the receipt of a transaction or change provides needed communication.
Transactional	Users need enterprise systems to do business transactions including purchasing on credit cards, personnel hiring, financial, and acquisition of training.
Transactions	Users find value in the enterprise systems transactional capabilities.
Transferable information	Most enterprise systems are not providing business decision information so individual spreadsheets are created and are often not transferable to the next individual.
Transferable skills	Skill in using one system should be transferable to another to save resources on training to use the system.
Trend data	Users need trend data.
Truth sources	Users need a system where the truth source of information is stored. It needs to be secure, maintained with configuration controls, and unchanged, so when it is accessed by multiple users it is the same information.
Understanding	Enterprise systems including the email system are good way to transfer information but not a good way to explain information. Need an interactive means to increase understanding.
Unfriendly	Users do not want systems that are unfriendly.
Unmet user needs	The user needs are not met because the system was built for 80 % of the needs.
Upload information	Changes in the enterprise system should not have an impact on the user and their files. They maintain their ability to upload data for user interfaces.
Uploadable	Enterprise systems should be uploaded with user information.
Upward compatibility	Changes in the enterprise system should not have an impact on the user and their files. They should have upward compatibility and data should not be lost.
Urgency	OPPOSITE: The enterprise shows no urgency to listen or meet user needs.
Usability	Usable systems that save time for the user are valuable.

Open code	Code memo
Usability of system	Enterprise systems are not as good as Microsoft because they are old but better than a piece of paper and pencil.
Use commercial applications	Enterprise systems should integrate commercial applications or allow user determined commercial interfaces to add flexibility to the system.
Use common commercial tools	Enterprise systems should integrate commercial tools or allow user determined commercial interfaces to add flexibility and usefulness of the system.
Use industry standards	Enterprise systems should integrate commercial products and standards or allow user determined commercial interfaces to add usefulness of the system.
Useful	CoPs are useful because they have a lot information on them.
Usefulness	The usefulness of enterprise system evolves without training for the user, is based on trial and error on the part of the user.
User control	Enterprise systems are not under the user's control so when they need something unique they are limited by the system because they do not have the ability to change it or make it do what they need it to do. They are forced to build some thing on their own or live with it and not get something they need done.
User ease	Users want a system that is not tough to use and that does not anger and frustrate them when they use it.
User education	Enterprise systems need to provide education to the user on the data and information they contain and how they can be used for decision making.
User friendly	The user friendliness of enterprise system evolves without training for the user, is based on trial and error on the part of the user, is extremely painful to the user, and is invisible to the people who developed it.
User-friendly systems	Enterprise systems are not as user friendly as Microsoft projects
User-funded systems	Nonenterprise systems require user funding that is not always available for programming their system requirements.
User learning	Users have to learn how to use the system which takes time.
User manual	Enterprise systems need to provide a user manual for continuity, training, and educating new business managers.
User need	The user needs are not met because the system was build for 80 percent of the needs.
User needed interfaces are expensive	Custom interfaces that the user needs to the enterprise systems are too expensive.
User needs in nonenterprise systems	Nonenterprise system requirements are developed by the users who are going to be using them so it meets exactly what they need.
User pays for customization	Custom interfaces that the user needs to the enterprise systems are too expensive.
User recognition	Users need a system that recognizes the user and does not need different passwords and logins for each system. They need to be integrated.
User requirements	The enterprise needs to make decisions on what the system will keep based on user requirements.
User specific	Custom interfaces that the user needs to the enterprise systems are too expensive.
User systems	Make the systems at the user level, not the expert level so they are easy to use and understood by the user.
Visibility	Users need to have visibility in the system so they know where their transactions are in the process.

Open code	Code memo
Vision	The vision of the enterprise system is to divest of duplication, and consolidate requirements down to one tool that meets 80% of the needs which will help afford the systems and provides value to the user.
Wastes time	Enterprise systems enable rapid and wide spread communication but can also waste time if users reply to “all” in e-mails.
Well defined processes	Business processes can increase their consistency in the enterprise by using the same process. The process needs to drive the system.
Workload forecasting	Users need systems for workload forecasting.
Workload indicators	Users need enterprise systems that can collect and report workload indicators.
Workload requirements	Users need data for future workload requirements.

APPENDIX B: INTERVIEW QUESTIONS AND PROTOCOL

Interview Code: Date:

Introductory Remarks

Thank you for taking time to participate in this study, the Analysis of the Air Force Users' Perception of the Value in Information Technology (IT)-Enabled Enterprise Business Systems. The purpose of this study is to find out what you and others like you in your organization need, want, and value from enterprise business systems. I will be asking you about what you value and need from systems to accomplish your work and mission. Your answers will be the focus of my doctoral research and can be used to help make our IT-enabled business systems more responsive to your needs.

The interview will take no more than 1 hour of time. I will tape record the interview and will transcribe it into a document for you to review and validate that I captured your thoughts accurately. The interview notes, recording, or transcripts will not have any personal identifiers and the information will be kept confidential. Before we begin I want to clarify that an IT enterprise business system is a DoD or Air Force system that the Air Force uses enterprise-wide to conduct business. Examples include the business systems for travel, finance, project management, personnel, manpower, and training activities. It does not include the mathematical or scientific systems that are used to analyze test data. I will be happy to clarify any questions you have on this study. Do you want to begin?

Interview questions	Notes
Question 1. What enterprise business systems and processes do you use to accomplish your work or mission? What nonenterprise business systems and processes do you use to accomplish your work or mission? Probe question(s): Can you name some of the enterprise or nonenterprise systems that you use? Do you have financial tracking, budgeting, human resource management, purchasing, training, inventory, travel, or other systems?	
Question 2. What aspects of the enterprise business systems help you accomplish your work or mission? To help answer this question, think of the different type of systems you use. Probe question(s): How else would you describe the effective aspects of enterprise systems?	
Question 3. What do you think the greatest obstacles are to your mission when you use the enterprise system? Probe question(s): Think about what is missing as well as what does not create value. In what way is your work impacted?	
Question 4. If you do use a nonenterprise business system, what capabilities does it have that would be the most important for your business processes? Probe question(s): Are there other examples or anything else in another application or venue that would provide what you need, want, or value?	
Question 5. If you could build your own business structure or processes, what would you include? Probe question(s): If you built your own business structure or processes, what did you include to add value?	
Question 6. What example inside or outside the government can you identify that most nearly depicts the capabilities you need in an IT business system? Probe question(s): Can you describe a program or process that you have used/seen/heard about that could meet your business processes needs? Do you have an example that comes closest to what you think would add value?	

Interview questions	Notes
Question 7. Is there any other information you would like to share that will help in understanding your perceptions about the value of our existing enterprise business systems or the additional things you need?	

Thank you for participating in this interview. Please, do not discuss this interview so that I may collect other participants' information for the study without influence from others. The information in this interview and your identity will be kept confidential. I will provide the transcript from the interview to you so you can validate its content. How do you want to receive the transcript? May I contact you if I need clarification on the content of the interview? Please contact me if you have any questions concerning this interview. I can be reached at phone number 661-256-5344.

APPENDIX C: FIELD NOTES

Field Notes for Pilot A

August 11, 2008

Preinterview

Record information and background on the participant, role in organization and in relation to IT enterprise systems. Describe why and how they were selected as a participant. This participant was selected for the pilot study because they had over 20 years of experience in leading and managing Information Technology (IT) related developments, infrastructure, services, and support in private and public organizations. The participant was a former director in an AF base level communications and information technology organization that provided IT services and support to approximately 13,000 users. They had insight and experience into the issues, concerns, needs, and requirements of AF users of enterprise business systems. The participant currently holds a planning position that allows for a broad view of the issues associated with the study question and the AF enterprise business system concept.

Interview

Note if the interview was conducted on site, by telephone, or other. Annotate changes in interview questions due to learning from previous interview or from the direction of the conversation with the participant. The interview was held in the participant's office. This interview was the first interview so each question was carefully read to the participant. The participant did not request any re-reading of the questions and was able to respond promptly. The probe questions were used to help clarify the question and expand the conversation. The participant's responses led to each successive question.

The participant's responses were easily related to previous questions and their responses as well as to successive questions which allowed for further dialog and clarification in the responses. There is a need to review definitions of terms with the participants before the interview to ensure the concept of enterprise system is stated especially if they indicate they are not fully familiar with the AF enterprise business system concept.

Observations During the Interview

Record personal observations, interview process, or comments made in pre or post interview. The participant was put at ease and was able to articulate answers without struggling to understand the meaning. The pace of the interview was good; it allowed the participant time to answer each question. There were some silent pauses that were effective and led the participant to think about their response. Forty-eight minutes of dialog passed quickly. In all, 65 minutes were taken to introduce the study, answer questions, and then wrap up the conversation with a thank you for participating.

Personal Reflections

Notes after the interview, what can be improved or changed and why. The opening question was needed to warm up the discussion. The dialog improved with each succeeding question as both I and the participant became more comfortable. The participant demonstrated ease when they added lighthearted self-deprecation. The pilot participant provided feedback that the questions were understandable and allowed for responses. The questions and responses flowed into each one, which allowed for continuity and smooth discussion. I used the probe questions as part of the initial question a few times and will try to hold back on using the probe as part of the initial question in

the next interview to determine if the questions can be understood without using them initially. Some of my thinking was said out loud and was captured in the transcription as incomplete sentences. I will work to avoid that so that I am clear in my communications and questions.

Field Notes for Pilot B

August 18, 2008

Preinterview

Record information and background on the participant, role in organization and in relation to IT enterprise systems. Describe why and how they were selected as a participant. This participant was selected for the pilot study because they have over 20 years of experience in leading and managing Information Technology (IT) related developments and infrastructure, services, and support in private and public organizations. They were a former deputy director in an AF base level communications and information technology organization that provided IT services and support to approximately 13,000 users. They have insight and experience into the issues, concerns, needs, and requirements of AF users of enterprise business systems. The participant currently holds a planning position that allows for a broad view of the issues associated with the study question and the enterprise business system concept in the AF.

Interview

Note if the interview was conducted on site, by telephone, or other. Annotate changes in interview questions due to learning from previous interview or from the direction of the conversation with the participant. The interview was held in the

participant's office. Each question was read to the participant and was re-read as requested to bring the conversation back on target or to clarify the question. The probe questions were used once to clarify a question and the responses that followed each re-reading were picked up well. I could relate previous questions and their responses to each other and to successive questions.

Observations During the Interview

Record personal observations, interview process, or comments made in pre or post interview. The participant was not feeling well (allergies) but still provided an insightful interview. The primary recorder had to be restarted within the first interview question, which caused a slight disruption. After that the taping went well and even after the recorder was shut off the participant picked up the conversation on the last question again! The recorder was not restarted but notes were taken.

Personal Reflections

Notes after the interview, what can be improved or changed and why. Care will be taken that the primary and back up recorders are functioning before starting an interview. This interview was the second interview and the researcher was more at ease with the interview process.

Field Notes for Participant 1

September 11, 2008

Preinterview

Record information and background on the participant, role in organization and in relation to IT enterprise systems. Describe why and how they were selected as a

participant. This participant was selected because they had experience in using and directing development of local interfaces to enterprise systems to accomplish work in the organization. The participant was an influencer in the organization, researches new products and tools, and brings them to the attention of the organization. The participant understands the organization work, the effort it takes to accomplish it, and has lived through much of the development of AF enterprise systems.

Interview

Note if the interview was conducted on site, by telephone, or other. Annotate changes in interview questions due to learning from previous interview or from the direction of the conversation with the participant. The interview was held in the researcher's business office, which the participant preferred. No changes were made to the interview questions and each successive question fit the scope and pace of the conversation and dialog.

Observations During the Interview

Record personal observations, interview process, or comments made in pre or post interview. The participant was enthusiastic about sharing their thoughts, ideas, and perceptions about AF and their local base business systems. The participant considered the conversation therapeutic, laughed, yet was serious about the IT enabled business processes and the concerns, issues, and needs of the users in the organization. At one point, the participant said that they could use another hour of conversation. The participant had much to say and share and asked several times for the question to be re-read to refocus them.

Personal Reflections

Notes after the interview, what can be improved or changed and why. Although the participant indicated that the work they did was laborious and they were considering a professional job change, the participant held that they were deeply committed to improving the business processes with IT enabled tools. This comment indicated how important it was both personally and professionally to the participant to provide the best tools to users to accomplish their work. The participant asked to be refocused several times and apologized for getting off track. The researcher provided reassurance that they were doing fine and information they provided was valuable and not off track.

Field Notes for Participant 2

September 12, 2008

Preinterview

Record information and background on the participant, role in organization and in relation to IT enterprise systems. Describe why and how they were selected as a participant. This participant was selected because they have experience in using and directing resource and financial management using information from enterprise systems to accomplish work and make decisions in the organization. The participant was an influencer in the organization because they understand the organization work, the effort it takes to accomplish it, have lived much of the history in the development of AF enterprise systems, and allocate resource for IT development (hardware and software).

Interview

Note if the interview was conducted on site, by telephone, or other. Annotate changes in interview questions due to learning from previous interview or from the direction of the conversation with the participant. The interview was conducted in the participants' office. They just returned from a business trip the day before.

Observations During the Interview

Record personal observations, interview process, or comments made in pre or post interview. The first question the participant asked was whether the interview was only going to take one hour. The researcher responded yes, and the pace of the interview resulted in a 65-minute interview. The participant never appeared rushed and thought out the responses.

Personal Reflections

Notes after the interview, what can be improved or changed and why. The participant was knowledgeable and had opinions on the enterprise system and what was needed to improve them, which the participant thought was a better question. The participant placed more of the issue on the management of the system than the system itself and saw the system as a system of people, what they know, and how they connected what they knew together.

Field Notes for Participant 3

September 16, 2008

Preinterview

Record information and background on the participant, role in organization and in relation to IT enterprise systems. Describe why and how they were selected as a participant. This participant was selected because they held a position in the organization that oversees project management for major test customers. The project managers must use and rely on information from enterprise and nonenterprise business systems so the participant had a full understanding and appreciation of the value of the systems. The participant was also an influencer in the organization and had the people and funding to create systems to meet their needs. The background of the participant had evidence of creating systems in their background, including determining many business processes for the organization.

Interview

Note if the interview was conducted on site, by telephone, or other. Annotate changes in interview questions due to learning from previous interview or from the direction of the conversation with the participant. The interview was conducted in the participant's office. The participant carried most of the conversation and the researcher found ways to introduce the questions in the conversation. Few of the questions were introduced directly as the "next question is…"

Observations During the Interview

Record personal observations, interview process, or comments made in pre or post interview. The participant was knowledgeable and adamant about their views, concerns, and perceptions of the system. At one point they apologized for talking too much. This participant was assured that they were not and the conversation continued. The overtone was one of frustration that progress in business systems was not made in spite of years of discussion and collecting requirements on what was needed. The conversation continued even after the interview was over and the tape recorder was shut off. The participant described how “we live and die by the data” and how they developed a “stop light chart” for leadership to use. The “stop light chart” was a report that allowed for drilling down into information levels that was created by asking employees to gather data and populate worksheets, as a quasi database. This comment demonstrated the participants approach to getting what they needed without an IT enabled business enterprise system. Further discussion was held on why years of discussion and effort resulted in no systems, how resources were used as a reason for not developing a system yet other resources were used to do the work manually and how there were many systems to benchmark from that could have been adopted. The researcher offered from their experience that perhaps the perfect solution was always sought but never gained, and perhaps going back to basic systems would be a better solution than none. The participant wanted to meet again after the interview was transcribed to review it and discuss it further. A telephonic meeting was held and some corrections were made to the transcripts.

Personal Reflections

Notes after the interview, what can be improved or changed and why. The researcher was faced with a dilemma as to start the tape recorder again as the discussion after the recorder was shut off was valuable. Taking detailed notes at that point did not seem appropriate because it could stifle the participant's willingness to speak so the conversation was committed to memory and noted as described in the paragraph above. The pace of the conversation throughout the interview was fast which made it difficult to take notes. The transcription relied on the success of the tape recording.

Field Notes for Participant 4

September 18, 2008

Preinterview

Record information and background on the participant, role in organization and in relation to IT enterprise systems. Describe why and how they were selected as a participant. This participant was selected because they were a leader in their organization, knowledgeable about the business of their organization, and could make decisions on the use of resources to accomplish the organization's mission.

Interview

Note if the interview was conducted on site, by telephone, or other. Annotate changes in interview questions due to learning from previous interview or from the direction of the conversation with the participant. The interview was conducted in the participant's office. The definition of what an IT-enabled enterprise business system was

reviewed before the interview started to ensure that the participant's responses would pertain to the topic.

Observations During the Interview

Record personal observations, interview process, or comments made in pre or post interview. The interview was held at the start of the workday. The participant was not feeling well but was still willing to participate and interested in the study process. Details were provided on the method and how the study was progressing. The interview ended within the allotted time and met the participants' time schedule.

Personal Reflections

Notes after the interview, what can be improved or changed and why. The participant indicated a need that was not heard in the other participant conversations that focused more on using enterprise systems for communication. The higher level position of the participant in the organization may be the reason for this need as they are involved in gaining agreement on issues, policies, and decisions with a wide-range of organizations and individuals. Connection with the private sector was important and the participant was focused on needing capabilities available in the private sector for the government sector so that information could be gained from research on the web from commercial sites. The participant believed enterprise systems that did not work well or prohibited access to commercial sites often impeded research and caused lost opportunities for learning and gaining knowledge to occur.

Field Notes for Participant 5

September 18, 2008

Preinterview

Record information and background on the participant, role in organization and in relation to IT enterprise systems. Describe why and how they were selected as a participant. The participant was a key manager and leader in a test and evaluation organization that relied on business data for decision making. The individual had many years of experience in leading and managing a large number of resources and understand the benefits, issues, and concerns of the enterprise business systems.

Interview

Note if the interview was conducted on site, by telephone, or other. Annotate changes in interview questions due to learning from previous interview or from the direction of the conversation with the participant. The interview was conducted in the participant's office. There were no changes in the interview protocol.

Observations During the Interview

Record personal observations, interview process, or comments made in pre or post interview. The participant focused on the process of creating enterprise systems because they did not believe that their total usefulness was attained which was a different approach to viewing the usability of the systems. The participant believed that it was possible to make them useful and that it was possible if the correct process was used.

Personal Reflections

Notes after the interview, what can be improved or changed and why. It was learned to let the participant choose where to sit so they were comfortable during the interview. The researcher made the decision where to sit near a needed power outlet. This location was not near the participants chair so the participant had to relocate to another chair and they appeared to not be as comfortable. It would have been better to use an extension cord than make the participant relocate in their own office.

Field Notes for Participant 6

September 19, 2008

Preinterview

Record information and background on the participant, role in organization and in relation to IT enterprise systems. Describe why and how they were selected as a participant. The participant was a senior level organizational leader who understood the technical and business aspects of their organization. They had an understanding of what the people in their organization needed and wanted from the enterprise systems. They could also identify the challenges and issues they faced in doing their daily business and providing information for management decisions.

Interview

Note if the interview was conducted on site, by telephone, or other. Annotate changes in interview questions due to learning from previous interview or from the direction of the conversation with the participant. The interview was held in the participant's office. No change was made to the interview questions or protocol.

Observations During the Interview

Record personal observations, interview process, or comments made in pre or post interview. The participant made a comment at the end of the interview that they did not think that they had anything to say and they were somewhat surprised that I was able to get them to talk. The participant became more comfortable with the interview as it progressed and provided a great amount of valuable information on how business and technical system aspects are used together to provide business information. For example, the technical job or work, schedule, and spare part re-ordering were integrated.

Personal Reflections

Notes after the interview, what can be improved or changed and why. The researcher's comfort and confidence in the interview process was strengthened by the participant's comment that the researcher got a lot out of them. The participant did not think they would have much to say.

Field Notes for Participant 7

September 19, 2008

Preinterview

Record information and background on the participant, role in organization and in relation to IT enterprise systems. Describe why and how they were selected as a participant. The participant is a senior level manager with a wide range of experience in their organization's technical and business matters. They had influence over policy and processes.

Interview

Note if the interview was conducted on site, by telephone, or other. Annotate changes in interview questions due to learning from previous interview or from the direction of the conversation with the participant. The interview was held in the participant's office. I was asked to come in but wait for a few minutes while the participant discussed a business issue with another person. The interview started after that was completed.

Observations During the Interview

Record personal observations, interview process, or comments made in pre or post interview. The participant gave the researcher examples of what they meant by their comments by pointing to books and cabinets in their office. This example added clarity and showed how important the issues, concerns, and needs were to the participant.

Personal Reflections

Notes after the interview, what can be improved or changed and why. The participant provided the idea of asking for clarification with specific examples so that both the participant and interviewer could be sure that the concepts, questions, and answers were understood correctly.

Field Notes for Participant 8

September 23, 2008

Preinterview

Record information and background on the participant, role in organization and in relation to IT enterprise systems. Describe why and how they were selected as a

participant. The participant was selected because they were a senior member of the financial field and had many years of experience in a business office working with enterprise and nonenterprise systems. They could identify the issues, concerns, and needs based on their experience and work with others in the financial and business fields.

Interview

Note if the interview was conducted on site, by telephone, or other. Annotate changes in interview questions due to learning from previous interview or from the direction of the conversation with the participant. The interview was held in a conference room in the participant's building. The location was selected by the participant for more confidentiality.

Observations During the Interview

Record personal observations, interview process, or comments made in pre or post interview. The participant was knowledgeable on the systems and worked in their field before the systems were in place. Because of this experience they were able to identify the system progress and where it should lead to. The interview was rapid. When it was transcribed it was of the average size of the rest of the interviews.

Personal Reflections

Notes after the interview, what can be improved or changed and why. No change was made to the interview questions or protocol.

Field Notes for Participant 9

September 23, 2008

Preinterview

Record information and background on the participant, role in organization and in relation to IT enterprise systems. Describe why and how they were selected as a participant. The participant was selected based on their position in the organization, their years of experience of running the business of the test activities, and their understanding of the issues they and their organization faced with enterprise business systems.

Interview

Note if the interview was conducted on site, by telephone, or other. Annotate changes in interview questions due to learning from previous interview or from the direction of the conversation with the participant. The interview was held in the participant's conference room near their office. There was ample time to set up the recorders and paperwork prior to their entry in the room. No changes were made to the interview questions.

Observations During the Interview

Record personal observations, interview process, or comments made in pre or post interview. The participant clearly articulated the issues with existing enterprise systems and identified what was missing and what was needed. They believed part of the problem was due to the way the systems were developed and indicated that the part of the process that was weak was the requirements definition. This point was similar to another participant's comment and could have been due to their engineering backgrounds and

experience they brought into their current positions of operations and business oversight in their organizations.

Personal Reflections

Notes after the interview, what can be improved or changed and why. This participant identified an assumption made by the enterprise systems that users would have a higher level of experience and ability to use the systems than most managers would have. The participant spoke and joked about this assumption, but it could be seen it was perceived as a serious shortfall in their ability to manage and lead the organization. They wanted to be more self-sufficient and knowledgeable in using the systems but found them as "hurting" when they used them. The systems had a personal impact on this experienced manager and leader.

Field Notes for Participant 10

September 26, 2008

Preinterview

Record information and background on the participant, role in organization and in relation to IT enterprise systems. Describe why and how they were selected as a participant. The participant was selected based on their seniority in the organization, ability to influence decisions on business processes and tools, and knowledge of the needs and issues surrounding existing enterprise business systems.

Interview

Note if the interview was conducted on site, by telephone, or other. Annotate changes in interview questions due to learning from previous interview or from the

direction of the conversation with the participant. The interview was conducted in a conference room because there was too much noise around the participants' office. No changes were made to the interview questions or protocol.

Observations During the Interview

Record personal observations, interview process, or comments made in pre or post interview. The participant was interested in what the study was about and wanted to share their perceptions about it from a user's view. They were generally optimistic about the enterprise systems and felt that the data they needed was there but just not accessible. They found the systems to be fairly easy to use after a learning curve and liked the control of doing it themselves. This opinion was different than most of the participants.

Personal Reflections

Notes after the interview, what can be improved or changed and why. This participant appeared to think that the enterprise systems were a fairly good idea. This perception was a different opinion than I encountered from the other participants, which may have been because the individual's comfort level with using technology as compared to the others. This perception may have been due to the amount of time they used the systems, prior experience, patience, or other factors that were not mentioned or evident.

APPENDIX D: CATEGORIES AND SUBCATEGORIES OF MEMOS

Category Memos

Analysis. Analysis is the ability to manipulate data to identify trends, gaps, forecasts, schedules, requirements, or projections for management information and decision making. Analysis includes the manipulation of data through analysis to provide forecasts of expected results, trends, gap analysis, and what-if scenarios. The outcome of the analysis is information that management or leadership can use to make decisions. The participants also indicated that enterprise systems that did analysis were valuable but indicated most systems could not do that and it required the user of manual or local level systems. The subcategories for the category analysis were common enterprise process aids in understanding, communication, joint use, management information, and support business process. This category related to the axial codes of joint use, adaptable and relevant system and management decision making because systems that enable analysis were viewed as adaptable and relevant to the users' needs. Analysis allowed them to provide information they needed for decision making. Enterprise systems that provide consistent tools or processes for analysis could be used jointly throughout the enterprise and across organizations in a joint manner.

Change management. Change management included the influence and actions the enterprise system had on the user and the business process. Enterprise systems enable change because they allow a large amount of rapid and repeated communication. Enterprise systems need to reduce complexity during times of process change. Enterprise systems must plan and communicate changes in new software so that they do not impact

the user or local systems, which often are impacted by system upgrades and transformations. Users lost data history when the enterprise system changed. The enterprise managers did not talk to the users to find out if their change would impact the user. Systems must be compatible with upward changes in new software. Enterprise system changes that do not burden the user or make the system easier to use increase the value of the system. Systems changes that adapt to the different data and processes of the organization using the system increase its value. Enterprise systems that are flexible and provide useful tools for developing or finding information for management decision making are valuable to complete their organizational work and mission. The subcategories for the category change management were common enterprise process aids in understanding, communicate change in the enterprise system, data upward compatibility, management information, meets user or local needs, relevance to user mission, and user ease and usability. Users need the enterprise to manage the change in processes and systems so it does not impact their local systems for their specific mission, requirements, or the usability of the system. Participants voiced that the enterprise systems could and should ensure that changes did not impact their local level systems and requirements. They recognized how the enterprise systems provided a common basis for understanding processes and information but also indicated the need to keep the change relevant to the user mission, their need for usability, and ability to provide management information. Change management contributed to the axial coding of adaptable and relevant system, user expectations, knowledge management, and common enterprise systems and processes enable understanding. The value of managing change for

enterprise data repositories was that data history would be maintained and the ability to up and down load information would meet users' local needs. The enterprise changes must meet the user expectations for adaptable and relevant systems that protect their data and maintain information and knowledge for future reference. Users expect enterprise systems change management to consider the users' needs for maintaining their information and knowledge through system changes, and providing the most modern and updated systems to use. They value and expect change communications that inform the user on what to expect. The change itself should improve the systems' ability to create a shared understanding of the processes and information it provides across the enterprise.

Communication. Communication encompassed how the system communicated directly with the user, what the system communicated through its standard or common references, and how the system could be used to spread information. Enterprise systems communicated system process information and change in the enterprise system itself. Enterprise systems need to communicate changes in the system to the user to ensure expectations are met, custom interfaces are not broken, and data integrity is maintained. Enterprise systems that inform and communicate system changes to the user proactively provide value to them and meet their expectations for service. The subcategories for the category communication included collaboration, common enterprise process aids in understanding, communicate change in the enterprise system, management decision making, meets the user or local needs, and support the business processes. The users saw the need for systems that not only processes transactions and compiled data, but ones that provide a means to communicate and share it with others. The participants valued and

needed systems that supported communication for collaborative work online for teams and groups. The pilot study data did not speak directly about collaboration but the main study participants did. They wanted systems they could modify or adapt to meet their communication needs and to support decisions. Participants indicated that the systems could enable and assist in communicating common processes and understanding of what information means as well as provide consistent interpretation of data for decision making. Systems that enabled communication were needed and valued by the user for their local processes. Communication contributed to the axial coding of the enabling properties of the common enterprise systems to communicate through common processes, create a shared understanding of what the system could produce, the meaning of the data and information from it, and how it could facilitate decisions making across the enterprise. The ability of the systems to be used jointly could bring greater unity within and among organization and meet user expectations that their needs, requirements, and positions in the management of government activities were understood.

Data repository. Enterprise systems can manage information and truth sources so they were protected. There is value of holding data, information, and documents in a centralized repository, ensuring accuracy, and making it accessible to multiple users. The subcategory for the category data repository was data quality. Users value a system that collects and maintains their data and information with the assurance that they will be protected, uncorrupted, and available when they and others throughout the organization need them. They want a centralized place to store and retrieve data and information that is consistent and where there is configuration control. Data repository contributed to the

axial coding of MIS for management decision making, joint use, and knowledge management.

Integrated data and processes. Systems that support the business process allow for consistency across the enterprise provide value. Enterprise systems that meet the need of the organization as a whole and enhance the consistency of business processes provide a way to follow common business rules. The subcategories for the category integrated data and processes were systems characteristics, meets user or local needs, MIS and management decision making, support business process, relevant to user mission, user ease and usability, and common enterprise process aids in understanding. Systems that support the business processes enhanced consistency across the enterprise and provide value. Enterprise systems provide a way to follow common business processes so the enterprise acts as a whole. It decreases guesswork in what the rules are and can provide a way to integrate data from different systems so users can go to one place for information. Some enterprise systems provide this value and eliminate the need to maintain user made spreadsheets, which reduces manual work and can also help prevent a loss of information from local systems or unintegrated enterprise systems. Users value data and systems that are integrated so it saves them time and effort in processing, finding, or analyzing data and provides data that are relevant to their needs and business processes. They value integrated data and processes that portray information so there is a common understanding of its meaning which assists in decision making within and across organizations. Integrated data and processes contributed to the axial coding of MIS for management decision making, efficient and effective systems, adaptable and relevant

system, joint use, and knowledge management. System that are integrated not only assist the users in transactions, processes, and extracting information, they act as an integrator of data and information which can be used to inform and maintain knowledge.

Joint use. Enterprise systems have commonality that allows for joint use throughout and between organizations and agencies. Enterprise systems provide a framework for consistency in management actions, processes, and in data that can be used throughout the organization at different levels. It aids in understanding and communication and can expedite processes across and between organizations. The subcategories for the category joint use were meet user or local needs, relevance to user mission, common enterprise aids in understanding, communication, and management information. Enterprise systems provide value if they not only provide what the local user needs and is relevant to their mission, but what the enterprise as a whole needs to accomplish. The standards provide the commonality that aids communication and understanding of the processes and information from the system and contributed to the axial coding of joint use, adaptable and relevant system, and common systems and processes are enablers for understanding. Enterprise systems are developed and managed at the enterprise level and when they support the user by answering their questions and fixing problems their value increases. Additionally, the user does not have to use their resources to maintain the system as they do for nonenterprise systems. Joint use of systems is possible when the enterprise sets the standards for the architecture of the system and its processes and can allow for consistent data and communication using common criteria, definitions, and terms. It aids in integrating work and project schedules

and understanding on how to develop or interpret financial planning across agencies and organization in the enterprise.

Knowledge management. Pilot study participants identified knowledge management as valuable in enterprise systems. They are systems that support the business process and allow for consistency across the enterprise. Knowledge management included concepts surrounding the ability to archive data and use the archives to access and share that information for knowledge advancement. The participants valued the share directories that are part of the enterprise system because they allow for information access. Knowledge management included the storing, accessing, integrating, and maintaining data and information in enterprise systems so that there is a history, data can be accessed, and there is the assurance that they maintain their meaning. The system not only manages data and information, but becomes the archive for managing knowledge. The subcategories for the category knowledge management were data repository, meets user or local needs, management information, management decision making, common enterprise process aids in understanding, support business process, user ease and usability, change management, data quality, and integrated data and processes. This wide range of subcodes indicated that knowledge management was valued and essential in the work and information the users accomplished with the enterprise systems. They need the systems not only to complete transaction, but to keep a history that could be used to auto-populate future transactions and make their work easier and faster. They need the enterprise systems to keep historical records so trend data and analysis could be access for management information and decision making. They see the

value of the system for research information and sharing it for group work. The enterprise system is valuable in maintaining the historical integrity of the archive of information for the enterprise. This archive capability contributed to the axial coding of knowledge management, adaptable and relevant system, MIS for management decision making, and joint use.

Management decision making. The participants in the study indicated a specific need for management information for decision making that was timely and relevant for resource and scheduling decisions. A system that enables management decision making will provide value to managers and leaders who need data supported analyses and information for decision making. The subcategories for the category management decision making were management information, system characteristics, analysis, common enterprise process aids in understanding, user ease and usability, and management decision making. Management decision making contributed to the axial coding of MIS and management information, adaptable and relevant system, common enterprise systems and processes enable understanding, and joint use. Enterprise systems add value for the user if they can access timely information for management decisions such as the scheduling use of resources. Consistent processes and data and a timely and relevant system enhances a shared understanding of the information and helps in decision making and planning across the enterprise.

Management information. Management information is the value derived from being able to pull information to do analysis with the enterprise tool or the data in the system, including what-ifing, gap analysis, and forecasting and producing information for

management. The participants' concept of management information centered on integrated information that is collected consistently and extracted, sorted, and used to provide answers for vague management questions. The subcategories for the category management information were data quality, data repository, meets user needs, user ease and usability, integrated data and processes, analysis, common enterprise process aids in understanding, communication, management decision making, and knowledge management. This contributed to the axial coding of joint use, MIS for management decision making, adaptable and relevant system, and knowledge management. Management information is needed and valued by the users of enterprise systems for decision making on resources, programs, and projects. They need high-quality data and systems that are user friendly, efficient, and effective so their time and resources are utilized efficiently in producing management information. They see a need for a true MIS and cost accounting system and want flexible systems that meet their specific needs. The common systems provide value in responding to headquarters requests and direction and assist in a shared understanding of what the information means when everyone uses the system. The collection of data and information in the MIS can help in the management of knowledge for future use.

Meets user or local needs. Systems that support the user and provide flexibility to interface with enterprise systems with custom products were valuable. The participants found value in systems that meet the user or local needs by gathering their requirements before systems development, fully testing it before implementation, and listening to their feedback. The subcategories for the category meets user or local needs were data quality,

system quality, data repository, management information, efficient and effective systems, relevance to user mission, support business process, and user ease and usability and contributed to the axial coding of adaptable and relevant system, efficient and effective systems, user expectation, and MIS for management decision making. The user found value in systems that met their requirements and MIS information needs, were flexible so they could adapt them and maintain their relevancy to their mission requirements. Users wanted tools that were easy to use and produced quality products and information for managerial decision making. Efficient and effective systems were valuable to the users as was the ability of the system to do what it was intended to do in a timely and most resource effective manner. The participants indicated that paperless transactions accomplished with the enterprise systems were quicker than manual processing. However, the participants indicated that existing enterprise systems were only effective for basic services and did not meet all of the users' needs. The study data suggested a subcategory breakout of efficiency and effectiveness to indicate the concept of quality in the way the enterprise system could process business transactions.

Quality. Quality is indicated if the system does what it is suppose to do, when the data and system are accurate, consistent, valid, and reliable, and by the professionalism in the system development, operations, service, and support. The concept of quality in the Pilot study focused on service and support quality. The participants described quality as a system that is modern in appearance and has the same look and feel as commercial software and the internet. Users value a system where the truth source of information is secured, maintained with configuration controls, and unchanged so when it is accessed by

multiple users it is the same information. The subcategories for the category quality were data quality, system quality, service and support quality, and user ease and usability. Quality contributed to the axial coding of adaptable and relevant system, efficient and effective systems, MIS and management decision making, knowledge management, joint use, and common enterprise processes and system enable understanding. Users value systems that had high quality hardware and software, data, and online or help desk support. The quality of the system makes it usable, efficient, effective, and relevant as a knowledge and information repository. This quality encourages joint use leading to a common understanding of the processes and information from the systems. The study data indicated the need for a subcategory for data quality meaning that the data in enterprise systems are correct, consistent, and reliable. The concept of data quality was also found in the categories of user ease and usability and systems characteristics where, accuracy was essential to the user.

Support business processes. Enterprise business systems should be built to support the business process and not the other way around so they are flexible and can change with the business process. The participants needed a business intelligence system and one that could deliver information for business decisions. The participants identified systems that supported the business processes as a concept that provided value to their mission, work, and the enterprise as a whole. They valued enterprise systems that keep up with dynamic and changing business processes and rules and believed they provided a framework for consistent data and information for decisions. This common framework provides a basis for understanding and communication across the organization and the

enterprise. The subcategories for the category support business processes were system quality, data quality, management decision making, joint use, meets user or local needs, common enterprise process aids in understanding, and communication. This category contributed to the axial coding of adaptable and relevant system, efficient and effective systems, MIS for management decision making, and joint use. Systems that are built to support the process and meet a high standard of quality create more effective systems that accomplish the process and not drive the process. A system that follows the business rules provides processes, information, and results that are valued by the user and aids in consistency throughout the enterprise.

System characteristics. System characteristics depict what the system is capable of doing and what the user expects such as speed, timeliness, reports, and other capabilities to accomplish work. They wanted systems that integrated data from other systems; were fully automated; provided real-time information; and were responsive, accessible, efficient, and effective. They wanted a management information system. The participants indicated that centralized systems were valuable for their connectivity but could also be a detriment if the system malfunctioned or went down. They believed the systems that integrated commercial products and standards increased the flexibility and usefulness of the system. The subcategories for the category system characteristics were efficient and effective systems, integrated data and processes, MIS, security, user ease and usability, efficient and effective systems, meets user or local needs, system quality, service and support quality data repository, communication, management decision making, relevance to user mission, integrated data and processes, support business

process, common enterprise process aids in understanding, and change management. Management Information System (MIS) and the categories for system characteristics, integrated data and processes, and management information led to the participants' comment that they need, want, and value a MIS or an integrated set of tools or applications for their business work. For example, they want a project management tool that is linked to the financial system so that data can be integrated without manual inputting. They want a MIS that integrates data from other systems, has common definitions of what things mean, and produces reports for managing projects. This category contributed to the axial coding of adaptable and relevant system, MIS for management decision making, knowledge management, efficient and effective systems, user expectations, and joint use. This category indicated all that users needed and value as well as what they thought was missing. The system must provide the capabilities for efficient and effective business processes and resulting MIS for management decision making. The system needs to meet their expectations in performance and quality. Participants indicated they wanted enterprise systems that ensured not only the systems were secure and access to them is controlled, but the data also are protected in them. The systems' characteristics need to provide this level of security but not cause delays in accessing information due to multiple levels of passwords and logins. The study participants articulated factors describing service and support quality as important to them. Service and support quality was indicated as the enterprise system's ability to respond to the users in an urgent manner and meet their expectations for service and help.

User ease and usability. User ease and usability was the perception of how friendly and easy the system is to use and included the ability to use the system with little or no training, systems with capabilities such as query and report generation, searches, and electronic signatures, and integrated software and hardware that made using the system easy. The subcategories for the category user ease and usability were system quality, integrated data and processes, data repository, meets user or local needs, support business process, efficient and effective systems, MIS, support business process, and common enterprise process aids in understanding. Users valued systems that were easy to use that operated efficiently, did what they were suppose to do, and produced quality business products without wasting effort. The systems must be easy to use but capable of processing and archiving complex data that they can access when they need them which contributed to the axial coding of adaptable relevant system, efficient and effective, common enterprise systems and processes enable understanding, user expectations, MIS and management decision making, and joint use.

Subcategory Memos

*Collaboration.*The pilot study participants did not speak directly about collaboration but the main study participants did. Some of the participants indicated that they knew there were ways to use the system to collaborate but did not utilize this capability. Others indicated they valued and needed systems that allowed communication for collaboration, not impersonal communication sent in an email to the person sitting in the next cube. Users want the ability to conference online with direct links for collaboration, video, and chart viewing.

They felt that the enterprise systems including the email system are good way to transfer information but not a good way to explain information. They need an interactive mean to explain information. The participants valued and needed systems that enabled collaboration or working on teams and in groups. They need an interactive way to work and communicate.

Common enterprise process aids in understanding. Enterprise systems provide a common reference that can increase understanding of the process and the automated reports, products, and information. Enterprise systems provide value through a common understanding of the data and results that increase understanding of a process or action.

Communicate change in enterprise system. Enterprise systems need to communicate changes in the system to the user to ensure expectations are met, custom interfaces are not broken, and data integrity is maintained.

Data quality. Data in the enterprise system are correct, consistent, and reliable. The concept of data quality was mentioned in the user ease, usability, and systems characteristics. Enterprise system changes allow for upward compatibility of data from previous versions of the system so that data are not lost.

Data upward compatibility. The pilot study participants indicated that they valued enterprise system changes that allowed for upward compatibility of data from previous systems so that data were not lost. The main study participants pointed out similar change management concerns.

Efficient and effective systems. Enterprise systems provide an efficient and effective way to process business transactions. The pilot study participants were the only

ones who felt that enterprise systems provide an efficient and effective way to process business transactions. The main study participants described efficient and effective systems as system characteristics that were missing.

Integrated data and processes. Integrated systems provide automatic interfaces of data from different processes so that they reflect related, relevant, updated information and data.

Management Information System. Users want an MIS or an integrated set of tools or applications for their business work. They want an MIS that integrates data from other systems, has common definitions of what things mean, and produces reports for managing their projects.

Relevance to user mission. The pilot study participants specifically mentioned that enterprise systems that are flexible, adaptable, and perform for the user's needs and mission were important and is where the systems are relevant to the data requirements or adapt to the different data or situations. The systems keep up with business process rules and changes. The participants' responses did not specifically delineate this concept, but indicated that they needed system to get work done for their organization.

Security. Participants indicated they wanted enterprise systems that ensured that not only the systems were secure and access to them was controlled, but the data also were protected in them. The systems' characteristics still needed to ensure this level of security but not cause delays in accessing the information due to rebooting the system for security patches, or multiple levels of passwords and log-ins.

Service and support quality. The pilot study participants clearly articulated factors describing service and support quality as important to them. Service and support quality meets concerns and needs of the user for urgency, expected results.

System quality . Quality is indicated when the system does what it is suppose to do and by its availability and reliability. System quality supports the business processes and allows for consistency across the enterprise.

APPENDIX E: AXIAL CODING of CATEGORIES AND SUBCATEGORIES

Table E1

Axial Coding of Categories and Subcategories

Category	Subcategories	Axial coding
Analysis	Common enterprise process aids in understanding	Joint use
	Communication	MIS for management decision making
	Joint use	Joint use
	Management information	MIS for management decision making
	Management information	Adaptable and relevant systems
	Support business process	MIS for management decision making
Change management	Change management	User expectations
	Change management	Knowledge management
	Change management	Adaptable and relevant systems
	Common enterprise process aids in understanding	Adaptable and relevant systems
	Communicate change in enterprise system	User expectations
	Communicate change in enterprise system	Common enterprise systems and processes enable understanding
	Data upward compatibility	Adaptable and relevant systems
	Management information	Knowledge management
	Meets user or local needs	User expectations
	Relevance to user mission	Adaptable and relevant systems
	User ease and usability	Adaptable and relevant systems
Communication	Collaboration	Common enterprise systems and processes enable understanding
	Common enterprise process aids in understanding	Common enterprise systems and processes enable understanding
	Communicate change in enterprise system	User expectations
	Communication	Common enterprise systems and processes enable understanding
	Management decision making	Joint use
	Meets user or local needs	User expectations
	Support business process	Common enterprise systems and processes enable understanding
Data repository	Data quality	MIS for management decision making
		Knowledge management
	Data repository	MIS for management decision making
		Knowledge management
		Joint use

Category	Subcategories	Axial coding
Integrated data and processes	Common enterprise process aids in understanding	Knowledge management
		Joint use
	Integrated data and processes	MIS for management decision making
		Joint use
		Efficient and effective systems
	Management decision making	Efficient and effective systems
	Meets user or local needs	Efficient and effective systems
		Adaptable and relevant systems
	Relevance to user mission	Adaptable and relevant systems
	Support business process	Efficient and effective systems
		Adaptable and relevant systems
	System characteristics	Efficient and effective systems
	User ease and usability	Efficient and effective systems
		Adaptable and relevant systems
Joint use	Common enterprise process aids in understanding	Joint use
		Common enterprise systems and processes enable understanding
		Adaptable and relevant systems
	Communication	Adaptable and relevant systems
	Joint use	Joint use
		Common enterprise systems and processes enable understanding
		Adaptable and relevant systems
	Management information	Joint use
	Meets user or local needs	Joint use
	Relevance to user mission	Joint use
		Adaptable and relevant systems
Knowledge management	Change management	Knowledge management
	Common enterprise process aids in understanding	MIS for management decision making
		Common enterprise systems and processes enable understanding
	Data quality	Knowledge management
	Data repository	MIS for management decision making
		Knowledge management
	Integrated data and processes	MIS for management decision making
		Knowledge management
		Joint use
	Knowledge management	Knowledge management
	Management decision making	MIS for management decision making
	Management information	Knowledge management
		Adaptable and relevant systems
	Meets user or local needs	Knowledge management

Category	Subcategories	Axial coding
		Adaptable and relevant systems
	Support business process	MIS for management decision making
	User ease and usability	Adaptable and relevant systems
Management decision making	Analysis	MIS for management decision making
	Common enterprise process aids in understanding	Joint use
		Common enterprise systems and processes enable understanding
	Management decision making	Joint use
	Management information	MIS for management decision making
	System characteristics	MIS for management decision making
	User ease and usability	Adaptable and relevant systems
Management information	Analysis	MIS for management decision making
		Joint use
	Common enterprise process aids in understanding	Joint use
		Common enterprise systems and processes enable understanding
	Communication	MIS for management decision making
		Joint use
	Data quality	MIS for management decision making
	Data repository	MIS for management decision making
		Knowledge management
	Integrated data and processes	MIS for management decision making
	Knowledge management	MIS for management decision making
		Joint use
		Adaptable and relevant systems
	Management decision making	MIS for management decision making
	Management information	Knowledge management
	Meets user or local needs	MIS for management decision making
		Adaptable and relevant systems
	System characteristics	MIS for management decision making
	User ease and usability	MIS for management decision making
Meets user or local needs	Data repository	MIS for management decision making
	Efficient and effective systems	User expectations
	Management information	MIS for management decision making
		Adaptable and relevant systems
	Meets user or local needs	User expectations
		MIS for management decision making
		Efficient and effective systems
		Adaptable and relevant systems
	Relevance to user mission	Adaptable and relevant systems
	Support business process	Adaptable and relevant systems

Category	Subcategories	Axial coding
	System quality	Efficient and effective systems
	User ease and usability	Adaptable and relevant systems
Quality	Data quality	MIS for management decision making
		Knowledge management
		Efficient and effective systems
		Adaptable and relevant systems
		Adaptable and relevant systems
	Service and support quality	Adaptable and relevant systems
	System quality	MIS for management decision making
		Joint use
		Efficient and effective systems
		Adaptable and relevant systems
	User ease and usability	Adaptable and relevant systems
Support business process	Common enterprise process aids in understanding	MIS for management decision making
		Joint use
		Adaptable and relevant systems
	Communication	Joint use
	Data quality	MIS for management decision making
	Joint use	MIS for management decision making
		Joint use
	Management decision making	MIS for management decision making
	Meets user or local needs	Efficient and effective systems
		Adaptable and relevant systems
	Support business process	MIS for management decision making
		Joint use
		Efficient and effective systems
		Adaptable and relevant systems
	System quality	MIS for management decision making
		Adaptable and relevant systems
System characteristics	Change management	Joint use
		Adaptable and relevant systems
	Common enterprise process aids in understanding	User expectations
		Joint use
		Adaptable and relevant systems
	Communication	User expectations
	Data quality	MIS for management decision making
		Efficient and effective systems
	Data repository	MIS for management decision making
		Knowledge management
		Efficient and effective systems
	Efficient and effective systems	MIS for management decision making
		Efficient and effective systems
		Adaptable and relevant systems

Category	Subcategories	Axial coding
	Integrated data and processes	MIS for management decision making
		MIS for management decision making
	Management decision making	Joint use
		Adaptable and relevant systems
	Management Information System	MIS for management decision making
		Efficient and effective systems
	Meets user or local needs	User expectations
		User expectations
		User expectations
		MIS for management decision making
		Efficient and effective systems
		Adaptable and relevant systems
	Relevance to user mission	Adaptable and relevant systems
	Security	User expectations
		MIS for management decision making
		Efficient and effective systems
	Service and support quality	Adaptable and relevant systems
	Support business process	Efficient and effective systems
		Adaptable and relevant systems
	System characteristics	Efficient and effective systems
	System quality	User expectations
		Knowledge management
		Efficient and effective systems
	User ease and usability	User expectations
		MIS for management decision making
		Efficient and effective systems
		Adaptable and relevant systems
User ease and usability	Common enterprise process aids in understanding	User expectations
		Common enterprise systems and processes enable understanding
		Adaptable and relevant systems
	Data repository	User expectations
	Efficient and effective systems	Adaptable and relevant systems
	Integrated data and processes	Efficient and effective systems
		Common enterprise systems and processes enable understanding
	Management Information System	MIS for management decision making
	Meets user or local needs	User expectations
		Efficient and effective systems
		Adaptable and relevant systems
	Support business process	Efficient and effective systems
		Adaptable and relevant systems
	System characteristics	Adaptable and relevant systems
	System quality	User expectations
		Adaptable and relevant systems

Category	Subcategories	Axial coding
	User ease and usability	User expectations
		Efficient and effective systems
		Common enterprise systems and processes enable understanding
		Adaptable and relevant systems

Axial Code Memos

Adaptable and relevant system. The axial code, adaptable and relevant systems means that enterprise systems are adaptable, dynamic, relevant, and perform for the user's needs and mission. They are valuable when they are flexible and change with business rules or process changes. Users want adaptable systems so they do not have to change; they believe the tool should change (Pilot A). The systems are relevant to the data requirements or adapt to different data or situations. Users want managed change so systems adapt and are compatible with changes in both enterprise and nonenterprise software and hardware. The systems need to adapt to processing and providing integrated data and analysis for management information for decision making. The systems need to adapt to specific individual user missions yet allow for joint use. They need to keep up with changes in business processes and rules, support the management of knowledge, and allow users access to the data and information. Adaptable systems give the user control yet support a common business strategy at the level of detail they need. Systems are valuable if they provide individualized information and views, give control over the transactions or work, and have flexibility to produce reports. Custom-produced interfaces or user-defined requirements should be made possible so the user can get the level of information and data they need. Enterprise systems should integrate commercial products

or allow user determined commercial interfaces to increase the usefulness of the system (Pilot A).

Adaptable systems that can handle different situations yet maintain high levels of quality in data, functions, appearance, accuracy, and consistency were considered valuable. The enterprise systems need to keep up with tools and capabilities that are already in the private sector and must be developed and maintained with a high level of professionals who understand both the systems' technology and the business processes. Adaptable flexible systems that support the business process, keep up with the dynamics of the work, and remain relevant to user needs were valuable. The systems need have to be structured or built to adapt to when the business policy or processes change or they will be quickly out-dated. The systems need to maintain their relevancy during process changes and remain efficient and effective.

Common enterprise process aids in understanding. Enterprise systems are enablers for communicating understanding. They provide a common reference that can increase understanding of the process, automated reports and products, and resulting information. Enterprise systems provide value through a common understanding of the data and results that increase not only an understanding of the enterprise processes but the meaning of the information and how that may impact policy, decisions, and behavior in the enterprise as a whole. The axial code, common enterprise systems and processes enable understanding refers to the value enterprise systems provide as an enabler for communication and understanding of common references, processes, the way things work, and what can be gained from them. The system should be designed so it becomes

so common that user training is not essential; it should be easy to use with consistent logins and passwords. Further, this commonality means that the enterprise system standards in process, architecture, hardware, software, and operation help to create a common understanding of not only how to use the systems but what the process and system could provide in terms of data and information. Enterprise systems provide value through a shared concept of the data, which is valuable in obtaining organizational resources as "it provides the understanding of what the capability is in terms of what it is, resources required to achieve that capability" (Pilot A). The common reference can increase not only an understanding of the process, products, and information but how that may impact policy, decisions, and behavior in the enterprise.

Enterprise systems also provide the "ability to communicate and deliver data across a wide audience almost instantaneously" (Participant 4). Sharing information and communication can go all the way up through the DoD. The message can remain consistent throughout all levels, which adds value in creating a shared understanding. Enterprise systems assist managers in decision making through these communications yet collaborative sites would make it even better. The AF CoP sites are an example of how the centralization of information and gathering of like interest or concerns could provide a location for people to come together to communicate and share information. However, they are static rather than interactive sites.

Efficient and effective systems. Enterprise systems provide an efficient and effective way to process business transactions. They save time and resources in completing transactions, processes, and gaining information. The concept of efficient and

effective systems refers to the processing of business transactions in a manner that is timely, easy to use, reduces work, saves resources, and supports the business processes. Efficient and effective systems complete transactions quickly and provide accurate information and data. Pilot A described efficient and effective systems as “smart systems” or ones that provides multiple options, ranking of best options, and have features that allow for searches or transaction histories. Pilot B highlighted factors such as usability and speed as efficiency and effectiveness issues, with the added concern for system reliability.

Systems were perceived as efficient and effective on how easy it was to use the hardware and software, how well data were integrated, and how much they reduced the users’ work effort. Efficiency is gained when systems are capable of automatically producing reports or displays of data so the user does not have to create their own spreadsheets for analysis and calculations. Users want a system that integrates with other systems or that “talk to each other” (Participant 8). This integration minimizes redundant manual work that the system could do quickly and saves users’ time and effort because they do not have to enter into each system separately with different logins and passwords and they can go to one place for information that is cross-referenced. Integrated systems reduce process steps for the user and make it faster to get what they want (Participant 10). An added benefit of an integrated system is data are protected because there is configuration control over the way the system functions.

Joint use. Enterprise systems provide a framework for consistency in management actions, processes, and for consistency in data that can be used throughout the

organization at different levels. It aids in understanding and communication and can expedite processes across organizations and throughout its levels. Joint use means that a system that provides a framework for consistent data, management decisions, and processes can be used throughout the organization at different levels. It provides value because it improves understanding and communication and can expedite processes throughout an organization and across agencies. Systems encourage joint with common processes, data, and terms that create shared meaning and understanding that users find useful for management decision making.

Knowledge management. Knowledge management includes the storing, accessing, integrating, and maintaining data and information in enterprise systems so that there is a history, data can be accessed, stored with the assurance that it maintains its meaning. Maintaining a history of information, analysis, and documentation from the enterprise system is valuable and important to its users. The systems' value is dependent on how it is managed to ensure there is no impact on the data they contain. Centralized repositories with configuration management and control ensure information for knowledge management maintains its meaning, accuracy, credibility, and endures management changes.

Users need a system where the truth source of information is stored. It needs to be secure, maintained with configuration controls, and unchanged when it is accessed by multiple users (Participant 1). Users need a business intelligence system that has a good way to extract secure information or data, has clear definitions and terms, and does not get corrupted (Participant 1). Stewardship over the management of knowledge can help

identify what data need to be integrated from different systems or processes and what can be done to help prevent the loss of data in both the enterprise and nonenterprise systems (Pilot B). It provides a centralized place where users across the organizations can begin to understand business processes and information from an enterprise or joint perspective.

MIS for management decision making. Users needed a Management information system that would enable management decision making. A system that enables management decision making will provide value to managers and leaders who need data supported analyses and information for decision making. This axial code characterizes a system that enables decision making and provides value to managers and leaders who need analyses and information supported by data for decision making. Pilot A identified the value in enterprise systems that provided reports and data from previous years so leaders had a "good business systems that gives them insight into where the money is going and a tool, a decision support tool, that will allow him to make decisions on where the money is spent before the money is spent." The MIS should be able to provide education to the user on the data and information they contain and how they can be used for decision making (Participant 2).

Enterprise systems could provide more value when they go beyond transactional and data collection capabilities and provide a MIS for management decision making. Users need an enterprise system that has a good way of extracting and sorting data and can provide answers for management decision making with information that has consistent descriptions and definitions across the enterprise. Systems are valuable that provide a ready source of information (Participant 5) or allows them to generate reports

and information they need with the data they want and when they want it (Participant 9). The users value the ability to access that data from secure, yet flexible MIS systems that saves them resources in getting the job done. The MIS would collect and report on workload indicators, track progress, forecast work, as well as track transactions. The central repository would provide information for management decision making with the characteristics of a flexible and adaptable system that provides the analysis tools, integrated data and information, and reporting capabilities needed by the user to portray their business information and processes. The participants also voiced the need for a true cost accounting system so they could provide management information for decision making (Participant 3).

User expectations. User expectations include aspects such as quality and characteristics of a system including consistency; the system does what it is suppose to do, meet their needs, is reliable, and modern. User expectations include characteristics of a system or aspects such as quality, consistency, reliability, meeting their needs, and low cost. Overall, the perceived value of the enterprise system is influenced by how it meets users' expectations for meeting their requirements, ease of use, quality system characteristics, security, accessibility, and the convenience of a central data repository. The quality of the systems' hardware and software also need to be high to provide value for the user. The products from the system must be easy to read, handle, update, and use (Participant 6). Users expect modern systems that are user friendly and not cumbersome. The users value some control on what the systems do and they want systems that can be modified to the uniqueness of the users' processes and requirements (Participant 9). Pilot

A identified value in a system that could provide both enterprise and “individual organizational needs or niche needs” yet recognized “there [has] to be flexibility locally as well at the enterprise level.” It meets their expectations if the systems are developed using a process of systems engineering that considers the users’ requirements and are fully tested before implemented (Participant 5).

APPENDIX F: SELECTIVE CODING

Table F1

Selective Coding: Relationships Among Categories, Subcategories, and Axial Codes

Category	Subcategories	Axial coding	Selective codes
Analysis	Common enterprise process aids in understanding	Joint use	Support joint use through adaptable and relevant systems that communicate a common understanding of management information for decision making.
	Communication	MIS for management decision making	
	Joint use	Joint use	
	Management information	MIS for management decision making	
	Management information	Adaptable and relevant systems	
	Support business process	MIS for management decision making	
Change management	Change management	User expectations	Change management through communicative, adaptable, and relevant enterprise systems.
	Change management	Knowledge management	
	Change management	Adaptable and relevant systems	
	Common enterprise process aids in understanding	Adaptable and relevant systems	
	Communicate change in enterprise system	User expectations	
	Communicate change in enterprise system	Common enterprise systems and processes enable understanding	
	Data upward compatibility	Adaptable and relevant systems	
	Management information	Knowledge management	
	Meets user or local needs	User expectations	
	Relevance to user mission	Adaptable and relevant systems	
	User ease and usability	Adaptable and relevant systems	
Communication	Collaboration	Common enterprise systems and processes enable understanding	Communication for a common understanding and decision making.
	Common enterprise process aids in understanding	Common enterprise systems and processes enable understanding	
	Communicate change in enterprise system	User expectations	
	Communication	Common enterprise systems and processes enable	

Category	Subcategories	Axial coding	Selective codes
		understanding	
	Management decision making	Joint use	
	Meets user or local needs	User expectations	
	Support business process	Common enterprise systems and processes enable understanding	
Data repository	Data quality	MIS for management decision making	
		Knowledge management	Maintain an adaptable and relevant system with integrated data and processes that support the business needs of the enterprise and user mission.
	Data repository	MIS for management decision making	
		Knowledge management	
		Joint use	
Integrated data and processes	Common enterprise process aids in understanding	Knowledge management	
		Joint use	
	Integrated data and processes	MIS for management decision making	
		Joint use	
		Efficient and effective systems	
	Management decision making	Efficient and effective systems	
	Meets user or local needs	Efficient and effective systems	
		Adaptable and relevant systems	
	Relevance to user mission	Adaptable and relevant systems	
	Support business process	Efficient and effective systems	Maintain an adaptable and relevant system with integrated data and processes that support the business needs of the enterprise and user mission.
		Adaptable and relevant systems	
	System characteristics	Efficient and effective systems	
	User ease and usability	Efficient and effective systems	
		Adaptable and relevant systems	
Joint use	Common enterprise process aids in understanding	Joint use	
		Common enterprise systems and processes enable understanding	Systems support joint use that manages information and knowledge for decision making, and communications.
		Adaptable and relevant systems	
	Communication	Adaptable and relevant systems	
	Joint use	Joint use	

Category	Subcategories	Axial coding	Selective codes
		Common enterprise systems and processes enable understanding Adaptable and relevant systems	
	Management information	Joint use	
	Meets user or local needs	Joint use	
	Relevance to user mission	Joint use Adaptable and relevant systems	
Knowledge management	Change management	Knowledge management	
	Common enterprise process aids in understanding	MIS for management decision making Common enterprise systems and processes enable understanding	
	Data quality	Knowledge management	
	Data repository	MIS for management decision making Knowledge management	
	Integrated data and processes	MIS for management decision making Knowledge management Joint use	
	Knowledge management	Knowledge management	
	Management decision making	MIS for management decision making	
	Management information	Knowledge management Adaptable and relevant systems	
	Meets user or local needs	Knowledge management Adaptable and relevant systems	Support joint use through adaptable and relevant systems that communicate a common understanding of management information for decision making.
	Support business process	MIS for management decision making	
	User ease and usability	Adaptable and relevant systems	
Management decision making	Analysis	MIS for management decision making	
	Common enterprise process aids in understanding	Joint use Common enterprise systems and processes enable understanding	Support joint use through adaptable and relevant systems that communicate a common understanding of management information for decision making.
	Management decision making	Joint use	
	Management information	MIS for management decision	

Category	Subcategories	Axial coding	Selective codes
		making	
		MIS for management decision making	
	System characteristics	Adaptable and relevant systems	
	User ease and usability		
Management information	Analysis	MIS for management decision making	
		Joint use	
	Common enterprise process aids in understanding	Joint use	
		Common enterprise systems and processes enable understanding	
	Communication	MIS for management decision making	
		Joint use	
	Data quality	MIS for management decision making	
	Data repository	MIS for management decision making	
		Knowledge management	
	Integrated data and processes	MIS for management decision making	
	Knowledge management	MIS for management decision making	
		Joint use	
		Adaptable and relevant systems	
	Management decision making	MIS for management decision making	
	Management information	Knowledge management	
	Meets user or local needs	MIS for management decision making	
		Adaptable and relevant systems	
	System characteristics	MIS for management decision making	Communication for a common understanding and decision making.
	User ease and usability	MIS for management decision making	
Meets user or local needs	Data repository	MIS for management decision making	
	Efficient and effective systems	User expectations	
	Management information	MIS for management decision making	
		Adaptable and relevant systems	High-quality service, system characteristics, and user friendly systems.
	Meets user or local needs	User expectations	
		MIS for management decision	

Category	Subcategories	Axial coding	Selective codes
		making	
		Efficient and effective systems	
		Adaptable and relevant systems	
	Relevance to user mission	Adaptable and relevant systems	
	Support business process	Adaptable and relevant systems	
	System quality	Efficient and effective systems	
	User ease and usability	Adaptable and relevant systems	
Quality	Data quality	MIS for management decision making	
		Knowledge management	
		Efficient and effective systems	
		Adaptable and relevant systems	
		Adaptable and relevant systems	
	Service and support quality	Adaptable and relevant systems	
	System quality	MIS for management decision making	
		Joint use	
		Efficient and effective systems	
		Adaptable and relevant systems	High-quality service, system characteristics, and user friendly systems.
	User ease and usability	Adaptable and relevant systems	
Support business process	Common enterprise process aids in understanding	MIS for management decision making	
		Joint use	
		Adaptable and relevant systems	
	Communication	Joint use	
	Data quality	MIS for management decision making	
	Joint use	MIS for management decision making	
		Joint use	
	Management decision making	MIS for management decision making	
	Meets user or local needs	Efficient and effective systems	Maintain an adaptable and relevant system with integrated data and processes that support the business needs of the enterprise and user mission.
		Adaptable and relevant systems	
	Support business process	MIS for management decision making	
		Joint use	

Category	Subcategories	Axial coding	Selective codes
		Efficient and effective systems	
		Adaptable and relevant systems	
	System quality	MIS for management decision making	
		Adaptable and relevant systems	
System characteristics	Change management	Joint use	
		Adaptable and relevant systems	
	Common enterprise process aids in understanding	User expectations	
		Joint use	
		Adaptable and relevant systems	
	Communication	User expectations	
	Data quality	MIS for management decision making	
		Efficient and effective systems	
	Data repository	MIS for management decision making	
		Knowledge management	
		Efficient and effective systems	
	Efficient and effective systems	MIS for management decision making	
		Efficient and effective systems	
		Adaptable and relevant systems	
	Integrated data and processes	MIS for management decision making	
		MIS for management decision making	
	Management decision making	Joint use	
		Adaptable and relevant systems	
	Management Information System	MIS for management decision making	
		Efficient and effective systems	
	Meets user or local needs	User expectations	
		User expectations	
		User expectations	
		MIS for management decision making	
		Efficient and effective systems	High quality system characteristics and user friendly systems.
		Adaptable and relevant systems	

Category	Subcategories	Axial coding	Selective codes
		Adaptable and relevant systems	
	Relevance to user mission	User expectations	
	Security	MIS for management decision making	
		Efficient and effective systems	
		Adaptable and relevant systems	
	Service and support quality	Efficient and effective systems	
	Support business process	Adaptable and relevant systems	
	System characteristics	Efficient and effective systems	
	System quality	User expectations	
		Knowledge management	
		Efficient and effective systems	
	User ease and usability	User expectations	
		MIS for management decision making	
		Efficient and effective systems	
		Adaptable and relevant systems	
User ease and usability	Common enterprise process aids in understanding	User expectations	
		Common enterprise systems and processes enable understanding	
		Adaptable and relevant systems	
	Data repository	User expectations	
	Efficient and effective systems	Adaptable and relevant systems	
	Integrated data and processes	Efficient and effective systems	
		Common enterprise systems and processes enable understanding	
	Management Information System	MIS for management decision making	
	Meets user or local needs	User expectations	
		Efficient and effective systems	
		Adaptable and relevant systems	
	Support business process	Efficient and effective systems	
		Adaptable and relevant systems	
	System characteristics	Adaptable and relevant systems	High-quality system characteristics and user friendly systems.
	System quality	User expectations	

Category	Subcategories	Axial coding	Selective codes
		Adaptable and relevant systems	
	User ease and usability	User expectations	
		Efficient and effective systems	
		Common enterprise systems and processes enable understanding	
		Adaptable and relevant systems	

Selective Code Memo

Change management through enterprise system communication and adaptable and relevant enterprise systems. Users expect and value enterprise systems that manage change and ensure that their data and business processes are supported as they continue to evolve and maintain relevancy to their mission. This code related to supporting business processes and maintaining relevancy to the user needs and mission. It requires the development of systems that ensure data upward compatibility and the creation of efficient and effective systems that guide the enterprise towards integrated processes and data.

Communication and knowledge management for a common understanding and decision making. The value of the enterprise system is that it enables communication through the system itself and the common understanding of what the processes and the results from the system provide. Enterprise systems that manage the information and data in them become valuable knowledge repositories that can be used to create a shared understanding and retention of quality data and history for the future. This code related to the value enterprise systems have in providing and protecting information so that it is maintained as knowledge for management decision making.

Support joint use through adaptable and relevant systems that communicate a common understanding of management information for decision making. Enterprise systems that provide a MIS and analysis capabilities will provide information that management can use for decision making. Adaptable and relevant systems provide information that can be used jointly to communicate a shared understanding of what the data and information are and what they mean.

Maintaining an adaptable and relevant system with integrated data and processes that support the business needs of the enterprise and user mission. The users valued integrated data and processes to ensure usability and continued relevancy for their business needs. Adaptable and relevant enterprise systems are needed that provide MIS for management decision making and communicate a common understanding of what the data and analysis means that supports the decision. Users valued the enterprise system and data resources for a MIS that they could use to obtain management information for decision making. Systems only had value if they supported the business processes and what the user needed to accomplish. This code related to the value of joint system use and a common reference for management decision making.

Systems support joint use that manages information and knowledge for decision making, and communications. Users valued the enterprise systems as a jointly used repository for data for management analysis, decision making, and as knowledge management. Joint use, knowledge management, communications, and management information and decision making related to each other. The users valued the concept of a common system and standards that could be used jointly and would improve or increase

understanding through consistent process or data. Enterprise systems enable joint use and shared understanding of processes and their results through common processes, terms, definitions, and data. Enterprise systems provide the value of common systems and processes that can be used across agencies and organizations in a joint environment. In addition to creating a common understanding of the processes and data, the more adaptable and relevant the system was to the user the greater the value.

High quality service, system characteristics, and user friendly systems. Users found value in high quality systems that were easy to use and saved them time and effort. They found value in systems with quality characteristics such as usability and consistent data and service. They also valued systems that were adaptable so that the data and information could be used for knowledge and decision making. They needed an MIS that could be used jointly. However, systems that did not do what the user expected or needed them to do were not valued even if the quality of the system was high.

APPENDIX G: COMPARISON OF CODES AND NEGATIVE ANALYSIS

Table G1

Negative Analysis

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
Accurate	Accurate, accuracy, accurate information	1, 4		Enterprise systems ensure accuracy because they hold data in a central repository. Enterprise systems could increase accuracy of data and calculations with embedded math in them. Users have to ensure information in reports is accurate. Enterprise systems need to provide accurate information for decisions.
Accurate	Noncorrupt data	1		Users need an enterprise system where the data do not get corrupted.
Adaptable	Adaptable, changeable	2, 4, 8		Users want adaptable enterprise systems. They have to developed local tools because the system is developed at too high of a level. Systems should be able to handle different levels of work.
Adjustable	Absorb custom products	4	Users identified need for more individualized functionality in enterprise systems. They are not flexible nor meet all user business needs. Need to add functionality.	
Autonomous	Control over applications	8		User should be able to control when a system downloads new applications or patches that would interfere with work.
Autonomous	Decentralized process		Opposite Theme 2: unify work across agencies, interoperable systems,	

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
			collaboration	
Centralized	Centrally managed	5		Users find value in the enterprise systems because they are centrally managed and they do not have to manage them. Users want one place to go for transactions such as training.
Centralized	Consolidated sites	2		They do not like the confusion of multiple sites.
Centralized	Designed according to enterprise processes	2	Diverse is opposite. Identified need for more diversity or individualized functionality in enterprise systems. They are not flexible nor meet all user business needs.	
Centralized	Issue resolution	5		Users find value in the enterprise systems because they are centrally managed where system errors can be worked and issues can be resolved.
Centralized	Redistributed work	6	Centralization had an opposite and negative effect.	Enterprise systems and centralization of work caused work to be distributed to other work centers than before. What was done by another office is now done by users and adds new work and costs.
Centralized	Similar tool, Similar process	2		Uses want a system where they learn how to write reports that will work in any system. They do not want to learn how to use multiple systems that all operate differently because it wastes their time.
Centralized	Too specific	1		Enterprise systems are too specific and are not always the right kind of tools that are needed. They can be too generic and not meet the users' needs.

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
Centralized	User funded systems	3		Nonenterprise systems require user funding that is not always available for programming their system requirements.
Centralized	Vision	6	Opposite of providing what the user needs.	The vision of the enterprise system is to divest of duplication, and consolidate requirements down to one tool that meets 80% of the needs. One tool will help afford the systems and provides value to the user.
Concurrent	Missing			
Cost Control	No user development costs for enterprise systems	3		
Cross-agency	Applicability	2		Also joint use. Give us an enterprise system that others use and can be applicable to other users.
Cross-agency	Common architecture	2	Need interfaces between local and enterprise systems	Common architecture provides ability to unite separate systems.
Cross-agency	Common business system, common systems	2		Users want common systems that can be understood by all users in the enterprise.
Cross-agency	Common criteria, terms, definitions, reference point	2		Enterprise systems allow for communication using common criteria. They allow for communication using definitions and terms with the same meaning. Enterprise systems allow for communication using common naming conventions and terms with the same meaning. Users want an enterprise system so there is a shared understanding of meaning.
Cross-agency	Common work break down structure	2		Enterprise systems can provide a common work break down structure across bases.
Cross-agency	Comparison	1	Relates to comparison of a cross-agency standard	Enterprise systems add value in tracking work that can be rated and compared against a standard for compliance.

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
Cross-agency	Compatibility	6, 8		Enterprise systems provide value because they are compatible with other applications throughout the enterprise. Enterprise systems must be compatible with upward changes in new software.
Cross-agency	Joint use	2	Breaks interfaces. Users can not count of upward compatibility for their custom interfaces.	
Cross-communications	Clear communication		Theme 2 is on collaboration, less on communication	Enterprise systems that clearly communicate information to the user provide value for user actions.
Cross-communications	Collaboration	2		Need systems that allow communication for collaboration, not impersonal communication sent in an email to the person sitting in the next cube. However, others did not see the need for collaboration as much as data repository.
Cross-communications	Communication, communication	2, 6		Enterprise systems allow for communication using the "same language" or concepts, terms with the same meaning and in clear, understandable language. They provide a way of communicating information to other activities and provide a standard to one set of tools. They create interchangeability, they are compatible with other applications, and provide a way to communicate throughout the enterprise.
Cross-communications	Conferencing on-line	2		Users want the ability to conference on-line with direct links for collaboration, video, and chart viewing.
Cross-communications	Definitions	2		Users want a system that interfaces with others and has common definitions of what things mean.

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
Cross-communications	Local area network	2		The local area network is considered as part of the enterprise system because communication and transfer of data and information go all the way up to DoD.
Cross-communications	Notification	1		The system should notify the user if data input by the user was not saved. Systems need to record and track transactions. Transfers of work or completion of transactions need to be communicated by notifying users and the people involved in the process.
Cross-communications	Rapid communication	2		Enterprise systems have the ability to communicate and deliver data across a wide audience quickly
Customer knowledge repository	Additional information	1	This code is not the same as collecting data on the user so the system recognizes the user. It is information the user needs to do their business.	The systems focus on the information the user needs as well as additional information.
Customer knowledge repository	Captures information	1	Same as above.	Enterprise systems capture cost information.
Customer knowledge repository	Catalogs	1	Same as above.	Systems need to allow cataloging of information so it can be accessed.
Customer knowledge repository	Categorization	1	Same as above.	Enterprise systems allow for the collection of data by categorization.
Customer knowledge repository	Continuity	2		Enterprise systems should provide continuity from one business leader to the next.
Customer knowledge repository	Cross-references	7	Theme is on complying with mandates to	

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
			ensure information security but not on how to manage knowledge.	
Customer knowledge repository	Record current data, recording		This code is not the same as data repository. Theme 5 is aligning systems, set priorities, control investments.	Enterprise systems that provide a place or record for information helps prevent a loss of information.
Customer response capability	Include user defined improvements			
Customer response capability	Preload information			Systems that preload integrated information from multiple systems or sources add to their functionality and reduce manual work for the user to get the data they need for their work.
Data sharing	Data mapped into categories	4		Users need a cost accounting system that maps data into categories.
Data sharing	Data mining	1		Users need systems that provide the ability to pull data out of databases that are truth sources. Enterprise systems allow for some data mining to answer nebulous questions as the critical questions or what information can answer the question is not clear.
Data sharing	Database	1		Users need databases so they can draw out accurate data for analysis, reports, and management information.

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
Data sharing	Integration, integrated set of tools, integrated, integrated data, information, schedule, system	1, 2, 4, 6	Theme 6 is on integrated systems, not data	Integrated systems and data will reduce process steps for the users and make it faster to get what users want. Users want a system that integrates data from other systems and "talk to each other" and minimizes user made spread sheets and redundant work including determining funding status, passwords and logins. Users want a collection of tools to use as a MIS that could help integrate financial data and project schedules within and across agencies.
Data sharing	One data repository			Enterprise systems provide a way of storing and displaying consistent data and information.
Data sharing	Retrievable	1		Data in enterprise systems are retrievable. Users need to be able to retrieve data from systems easily.
Data sharing	Same information	2		The effectiveness of the business enterprise system is that all bases are getting the same information.
Decreased effort	Reduce redundant work	4, 6		Users find value in systems that are handy or useful as it saves them time and resources to do other things.
Decreased effort	Resources	3		Enterprise system should help reduce resources, not require more people with specific skills to do the work.
Decreased effort	See effective and efficient			
Distributive	See decentralized process			
Ease of use	Adoption	4		Systems should be easily adopted and used by all aged employees.
Ease of use	Cumbersome	1, 4	Opposite ease-of-use.	Enterprise system processes should not be cumbersome to the user. The electronic systems allow for multiple changes at multiple levels and creates cumbersome processes and does not add value. Users do

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
				not want to use a system that is cumbersome.
Ease of use	Ease of use, easy to use	1, 4		Uses want an uncomplicated system that is easy to use. The systems should be as easy to learn as Microsoft tools and operate like generally accepted systems so that training to use the system is not a necessity to use the system; they are intuitive. Systems should be easy for the user to use, especially if they do not use them an expert level or on a daily basis. They want GUIs, help menus, on-line assistance. Nonenterprise systems accommodate exactly what the user needs so it is easy to use.
Ease of use	Great experience	4	User need	
Ease of Use	Usability, usability	8	Theme 6 is on integrated systems, not data	Enterprise systems are not as good as Microsoft because they are old but better than a piece of paper and pencil.
Ease of Use	User ease	1		Users want a system that is not tough to use and that does not anger and frustrate them when they use it.
Effective	Business effectiveness	4		The tool provides value to the business and makes it more effective.
Effective	Business processes, business tool, follows business rules	2, 4	Support business processes	Systems need to codify business process so that data can be used appropriately and good decisions can be made from the data or information out of them. The tool needs to be useful for the business and the business needs to use the tool, not feed the tool or run the system for the sake of the system.
Effective	Effective	4		Enterprise systems are effective when they are designed to do what the user needs them to do.

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
Effective	Less expensive	4, 6		
Efficient	Cost saving	8		Enterprise systems should save costs; users should not have to reinvent the wheel to get what they need.
Efficient	Efficient systems	4		Users want enterprise systems that make the process more efficient or result in a true savings and not reallocate or push work down on them from another area or organization with no true savings.
Efficient	Expedite processes	4, 6		
Efficient	Manual process	4		Enterprise systems that do not work or do not do a complete process make the user do manual work. The enterprise systems still require manual processes to get information out of them.
Efficient	Manual work	4, 6		Enterprise systems require manual work of inputting and converting data into graphics, charts, and reports. Users value a system that eliminates manual work by interfacing with other systems. Enterprise systems can integrate data and eliminate the need to maintain user made spreadsheets. It can eliminate manual work.
Efficient	Minimize work arounds	4, 6		
Efficient	Optimize time	1		Systems that integrate schedules can optimize time.
Efficient	Process time	4		Enterprise systems should decrease time to complete processes or transactions. Many do not.
Efficient	Save money			
Efficient	Save time	4		Users want systems that save them time in doing their work. Users want systems that save time, not delay work because they take time to boot or start up.

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
Efficient	Time consuming	4		Users want a system that is fully automated. Users do not want systems that are time consuming. Some systems are only partially automated and require manual work and consume their time.
Efficient	Wastes time	2	Opposite efficient	Enterprise systems enable rapid and wide spread communication but can also waste time if users reply to "all" in emails.
Flexible	See changeable			
General application	Accounting	1	Need business systems that help with business performance.	Enterprise systems contain data on accounting of spending. Need enterprise systems that account for resources used and where the money is going.
General application	Analysis, analysis, analytical tool, assessment	1	Need a general application to do analysis but it must be flexible to meet the user needs.	Users need tools to do analysis. Systems that allow for analysis and comparison are valuable. Users want systems that support analysis work. Users need systems that they can do analysis with or on the information they contain.
General application	Enterprise tool covers critical functions	2	Customized	
General application	Financial planning	1, 2		Users need systems for financial planning. Enterprise systems can provide a common way to do financial planning across bases.
General application	Generic	1		Enterprise systems that are on a more macro level can become more generic.
General application			Priority to individual user needs	OPPOSITE: Enterprise systems provide an 80 percent solution and do not meet the needs of the other users.
High quality results	Consistency, consistent data, consistent process, results or data accuracy	4	Theme is on comply with mandates to ensure information security but not on how to manage	Users need consistent data that are free from errors.

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
			knowledge	
High quality results	Error checks, error tolerance, errors and mistakes	4, 6		Users need a system that provides a data entry error check to ensure accurate data. The electronic systems allow for multiple changes at multiple levels that are cumbersome and create an environment of zero tolerance for error, which does not always add value. Nonenterprise systems and spreadsheets are error prone. Nonenterprise systems require intensive effort and manual work and using large spreadsheets with a lot of data often results in errors and mistakes.
High quality results	Information stewardship			Enterprise systems that consider information stewardship as essential to data integrity are necessary.
High quality results	Professionalism			Users value the professionalism used in the system development, operations, service, and support.
High quality results	Quality			Quality is indicated by the professionalism used in the system development, operations, service, and support.
High quality results	System quality	4		The quality of the system's hardware and software need to high to provide value to the user. The products from the system must be easy to read, handle, update, and use.
Improved job performance	See effective and efficient			
Improved productivity	See effective and efficient			
Interactive	Missing			Users did not indicate a high value in interactive capabilities.

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
Interchangeable	Interchangeable	2		Enterprise systems provide value that standardize to one set of software tools because they are interchangeable, they are compatible with other applications, and they provide a way to communicate throughout the enterprise. Systems must allow for interchangeable hardware. The skills people have should allow them to use the other hardware easily.
Interchangeable	See adjustable			
Knowledge management	Access to commercial sites	1		Uses need access to commercial sites without having to request access to each one to do research. The impediment raises the potential for a lost opportunity to occur, resulting in not gaining access to the information because the site is blocked or filtered.
Knowledge management	Answer vague questions	1	Users want more than a data repository; want a smart system that can provide answers.	Could answer vague questions better with a business intelligence capability where data are collected consistently.
Knowledge management	Archive	1	Need to include management information needs for decision making.	Users want a system that archives their work, data, and information. Systems are valuable that provide a ready source of information for managers who need the information.

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
Knowledge management	Centralized data repository, centralized repository of information, collection of records, Community of Practice	1, 2, 6	Collection of records. The enterprise systems are only a collection of records and analysis is needed to get information.	Enterprise systems can hold information in centralized repositories, ensure accuracy, and make it accessible to multiple users. Users want configuration control and someone to be in charge of uploading the most current information. Users like the enterprise system Communities of Practice because they can go to a centralized place for data, documents, and information that are the most up to date items. Users find value in working specific projects on Community of Practice (COP) sites. Opposite: Enterprise systems are only a collection of records that can be used to do second and third order analysis. Enterprise business systems were not sophisticated and not mature. Nonenterprise systems are created to fill this gap and are not transferable between bases.
Knowledge management	Data descriptions	2		Enterprise systems need to describe the data they contain so that users understand what the data are and what information they can provide.
Knowledge management	Decision making, decision support	1	Focus on providing data for decision making is missing.	A system that enables management decision making will provide value to managers and leaders who need data supported analyses and information for decision making. Users need information in the system that is useful for making decisions on schedules and use of resources.
Knowledge management	Detailed information	1		Systems need to provide detailed information.
Knowledge management	Foundation of information	1		Enterprise systems provide a foundation of information that could be pulled by the user to

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
				do their job.
Knowledge management	History, Historical records	1, 2		Data in enterprise systems can provide a history of data for management information and enable research on trends to see how things are evolving. Users need a system that allows them to file and maintain emails as historical records.
Knowledge management	Information repository			Enterprise systems that maintain information and data over changes and time add value when they can access their data, and they have the same meaning or are as accurate as when they were first collected.
Knowledge management	Intellectual capital	1	Opposite: Nonenterprise systems provide knowledge management.	Nonenterprise systems include what subject matter experts know, what is in the human brain, who can provide that information, and how that all connects.
Knowledge management	Knowledge management	1		Users need the system to help with knowledge management.
Knowledge management	Prioritization			A system that is able to do analyses and provide answers to prioritization of projects and resources is valuable for management information for decision making and can be used across the organization to provide answers for headquarters.
Knowledge management	Provides history			Users find value in systems that provide a history of their transactions.
Knowledge management	Provides understanding			Enterprise systems can provide data and results that increase understanding of a process or action.
Latest technology	Adopt business systems	8	Latest technology in terms of what the user needs	Need to adopt business systems that already exist in the private sector.

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
Latest technology	Design	8	Need latest technology.	The design of the system needs to be like web page references, touch of a button, information that is easy to find and access.
Latest technology	Dynamic application of technology	4	Need latest technology.	Enterprise systems are not flexible or agile enough to handle different or dynamic data or situations.
Latest technology	Include commercial products in the enterprise	4	Need latest technology.	
Latest technology	Information search	1	Need latest technology.	Need ability to find and search for information like the commercial searches.
Latest technology	Modern	8	Need latest technology.	Users want a system that is modern in appearance and has the same look and feel as commercial software and the internet.
Latest technology	Old systems	8	Need latest technology.	Users want and value new systems, not old ones that are not user friendly or do not keep up with new tools or changes in the business processes such as a common work breakdown system.
Latest technology	On-line commerce		Need latest technology.	Users find value in proven commercial systems that save them time and resources to do other things.
Latest technology	Smart system	8	Need latest technology.	Users find value in systems that are smart and can provide multiple options, ranking of best options, and have features that allows for searches or history transactions.
Latest technology	Use commercial applications, common commercial tools, industry standards		Need latest technology.	Enterprise systems should integrate commercial products or allow user determined commercial interfaces to add flexibility to the system.
Low maintenance	Enterprise pays for operations and maintenance of the system	5	Too expensive.	Custom interfaces are expensive but are needed because the enterprise systems do not provide all the needed functions.

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
Meets schedule Performance	Scheduling	?	Rework.	Enterprise systems cause rework as they mainly do transactions and do not have integrated knowledge management capabilities.
Reliable	Correlation	1		Users need products where data correlate with each other and are logical.
Reliable	Credibility	8		Users want systems that have credibility and will endure with management changes.
Reliable	Does what it is suppose to do	4		The system does what it is suppose to do.
Reliable	Reliability	4		Quality is indicated when the data and system are available, accurate, consistent, valid, and reliable and can be used for management decisions and business transactions.
Secure	Business intelligence system	1	This code means more than just a secure system. It is a system that manages data to inform decisions.	Users need an enterprise system that is a good business intelligence system, a good way to extract information or data that are secured, that don't get corrupted, and where there are clear definitions of terms and concepts.
Secure	Protect information from loss	7		Enterprise systems can provide a way to integrate data from different systems or processes to help prevent a loss of information from local systems or unintegrated enterprise systems.
Secure	Secure data, secure system	1, 4		Users need an enterprise system where the data secured. Users need secure systems but do not cause delays in accessing systems when they have to reboot to apply software.
Shared goals	Agreement	2	Agreement needs to be based on shared goals between the user and system developers.	Enterprise systems are valuable if everyone agrees on what is to be used.

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
Shared goals Socially acceptable				
Specific	Give niche needs attention		Meets user needs	. Focus is on enterprise. Identified need for more individualized functionality in enterprise systems. They are not flexible nor meet all user business needs.
Support mission	Not invented here	2	Opposite enterprise system	Enterprise systems are hard to make common because there is a "not invented here" attitude. If users build their own system they should meet the enterprise requirements so time is not wasted in the development.
Supports mission	Meet the needs of the enterprise, meet enterprise requirement	2, 6		Enterprise systems meet the needs of the enterprise as a whole.
Supports mission	Meets mission needs	1, 2	Enterprise mission	
Timely	Current information	1		Enterprise systems need to have the most current information in them to be useful.
Timely	Lost opportunity	4		Systems that get bogged down or reboot too slow cause the user to divert effort and may cause a lost opportunity to communicate, find information, or to provide a quality product because of compressed time to do so.
Timely	Quick access	2		Users want quick access to metrics, data, shared data rather than everyone keeping their own spreadsheets of historical data that are not linked or accessible to others.
Timely	Quick process	4, 6		Enterprise processes can be quicker than manual processes.
Timely	Real-time, real-time information	1		Real-time information is valuable to users. Users want real-time information.
Timely	Responsive	4		Users want systems that are responsive and boot up quickly without lag time.

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
Timely	Timely, timeliness, timely information	1, 4, 8		Some systems do not accomplish work for the user quickly and do not boot up quickly. Systems are needed with timely information and reports to make decisions in dynamic environments. Users need systems like commercial systems that provide updated cost estimates for work and parts and allow the customer to respond to questions.
Useful	Handy	4	User needed interfaces that make systems useful are expensive.	Systems that are useful help users get work done.
User focused	Dash boards	1		Uses want information dashboards that show measurements for their activities.
User focused	Data	1		Users need to able to get specific data out of the enterprise systems that are useful to them for decision making.
User focused	Data ownership			Systems that provide full access to the data that users own provide value.
User focused	Documentation repository	1, 2		Systems are valuable that provide a documentation repository. They allow for documenting work, tracking, and accounting for resources.
User focused	Downloadable, download information		Missing	Systems that provide full access to the data in it let the users download and upload data for their use.
User focused	Electronic signatures	1		Electronic signatures are a valuable enterprise process for users.
User focused	End-user comfort	8		Enterprise systems are not as good as Microsoft because they are old but are better than using manual methods.
User focused	Filters	1		Enterprise systems that provide a filtering capability are valuable for the user.

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
User focused	Flexibility, flexible system, flexibility	1, 4		Enterprise systems need to provide flexibility to create reports with information needed to build trust with users' customers. They need the ability to do ad hoc queries and reports without the assistance of a programmer. Standard queries and reports do not always meet the user's needs; they want flexible systems to meet unique needs.
User focused	Focused	1		Systems that focus on the information the user needs as well as additional information provide value.
User focused	Front-ends	1		Users need to be able to put individualized front-end programs on enterprise system databases to satisfy their information requirements.
User focused	Gap analysis	1		A system that supports gap analysis provides value to managers and leaders who need data supported analyses and information for decision making.
User focused	Human resources	1		Users need systems for personnel and human resource management.
User focused	Identifies resources, capabilities, requirements	1		Systems that help identify resources to accomplish work are valuable.
User focused	Individualization, individualized, individualized views of information	1, 2, 4		Systems that allow individualized information views provide value to the user. Users want a system that will fit their needs. Users want a system that generates reports and information they need, and when they want it.
User focused	Linked charts, linked records	1		Systems are needed that link data and charts.
User focused	Local tools	4		Users want adaptable enterprise systems. They have to developed local tools they can use in the high level systems.

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
User focused	Manipulate the data and system	1, 7		Users need to be able to manipulate data; enterprise systems are often locked down and the user cannot manipulate the data.
User focused	Meet user needs	1		Enterprise systems need to meet user unique needs.
User focused	Modifiable	8	Opposite	The uniqueness of user processes and requirements will not be solved by enterprise systems so users need tools they can modify.
User focused	On-line reports	1		Users need reports on-line so they are accessible.
User focused	Priority to individual user needs		Opposite	Enterprise systems provide an 80 percent solution and do not meet the needs of the other users.
User focused	Queries	1		Queries in data in enterprise systems are valuable; users need a system that enables information queries.
User focused	Reports, reporting	1, 2, 4		Users need a system that generates reports for higher command. They need report capabilities that are easy to use and can be done on the desk top.
User focused	Research	1		Enterprise systems provide a place to research data because the data are maintained in them and there is a history.
User focused	Resource management, resource management	2		Systems that aid in communication help resource management.
User focused	Resource modeling	4		Users want an enterprise resource modeling tool.
User focused	Sort and filter data, slice and dice data, sorting	1		Users want a system that keeps data and allows user to sort, filter, and slice and dice data in different ways.
User focused	System customization needed by the user		User pays for customization. Focus is on the enterprise.	Systems that include custom developed interfaces add value because the user can interface or extract information that is useful to them. Users pay for these expensive custom

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
				interfaces because the enterprise system does not provide all the needed functions.
User focused	Tailorability	1		Users want to be able to tailor enterprise systems to meet their requirements.
User focused	Track progress, tracking	1		Systems are valuable that track transactions, program progress, and resources such as logistics tracking. They are valuable in making comparisons against standards for compliance.
User focused	Trend data	1		Users need trend data.
User focused	Useful, usefulness	1, 4		COPs are useful because they have a lot information in them. The usefulness of enterprise system evolves without training for the user, is based on trial and error on the part of the user.
User focused	User control	7		Enterprise systems are not under the user's control so when they need something unique they are limited by the system because they do not have the ability to change it or make it do what they need it to do. They are forced to build some thing on their own or live with it and not get something done.
User focused	User education	1		Enterprise systems need to provide education to the user on the data and information they contain and how they can be used for decision making.
User focused	User friendly	1, 8		Enterprise systems are not as user friendly as Microsoft products. The user friendliness of enterprise system evolves without training for the user, is based on trial and error, and is extremely painful to users, which is invisible to the people who developed it.

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
User focused	User learning	4		Users have to learn how to use the system which takes time.
User focused	User manual	8		Enterprise systems need to provide a user manual for continuity, training, and educating new business managers.
User focused	User needs	1		Nonenterprise system requirements are developed by the users who are going to be using them so it meets exactly what they need.
User focused	User recognition	4		Users need a system that recognizes the user and does not require different passwords and logins for each system. They need to be integrated.
User focused	User requirements	3		The enterprise needs to make decisions on what nonenterprise systems will be kept based on user requirements.
User focused	User systems	1		Make the systems at the user level, not the expert level so they are easy to use and understood by the user.
User focused	Visibility	1		Users need to have visibility in the system so they know where their transactions are in the process.
User focused	Workload forecasting, workload indicators	1		Users need systems for workload forecasting. Users need enterprise systems that can collect and report workload indicators.
User focused	Workload requirements	1		Users need data to predict future workload requirements.
	Access, accessible, availability	1, 2	Easy access to data is important.	Users want access to data, information, and records with particular levels of access to protect their information. Data are accessible in enterprise systems. Enterprise system hold data in a centralized repository, ensure accuracy, and are accessible to multiple users. Users can get to or access the system when they need them. Share directories are part of the

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
				enterprise system and allow for information access.
	Approval and justification	1	Decision support	Users need systems that help with approval and justification decisions.
	Approval confirmation	4		Need to understand user requirements for information on what the status of transactions are in a system. Enterprise systems need to emulate commercial applications with transactional confirmation processes.
	Automation, automate work, automatic links, automatic reports	4, 6	Shopping cart feature	Users want a system that automates their work and that automatically links or updates information. Some systems are only partially automated and require manual work.
	Business information, business decisions	2	Opposites, some system provide business information for decisions, others do not.	Enterprise systems do not allow for business decisions. They only collect data that have to be analyzed. Enterprise systems provide information on business performance across organizations.
	Change management, change management	8	Focused on process improvement and not on how the enterprise changes systems. Could also relate to support continuous improvement	Enterprise systems must plan and communicate changes in new software so they do not impact the user or local system. Users lost data history when the enterprise system changed. The enterprise managers did not talk to the users to find out if their change would impact the user. Enterprise systems need to reduce complex, convoluted efforts during times of process change.
	Coherent systems	6		Users want a system that is developed around the process, provides essential business information, and that is a

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
				coherent collection of data.
	Compartmentalized	2	Opposite of integrated systems and data that the users value.	Some systems do not integrate information and create manual work for the user.
	Compromise	7	Opposite of meeting customer needs, comply with mandate to use the system.	Uses compromise their needs when they use enterprise systems because they do not meet all their needs.
	Configuration control, configuration management	1, 3, 5, 6		Users want configuration control over the information they put into an enterprise system. Nonenterprise systems provide the user configuration management. Users want configuration management on documents so they are ensured they have the most up to date information, software, upgrades, and data. Configuration management helps the user trust what they are pulling off the internet. However, most nonenterprise systems lack configuration control.
	Connectivity	4		Enterprise systems provide connectivity but can also be a detriment if the system malfunctions or goes down.
	Control	1	This code is not the same as collecting data on the user so the system recognizes the user; it is information that can help inform future users of the systems.	Enterprise systems give the user control when they do the work, process, or transaction themselves. The system should provide control to the user for their data.
	Cost reports	1		Users need a cost accounting system to show the cost of

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
				resources used.
	Data history cohesiveness	2	Change management	Changes in the enterprise system should not have an impact on the data. They should have upward compatibility and data should not be lost or changed.
	Drill down of information	6		Users want a system that allows for an automatic, linked, drill down of information.
	Enable change	2, 8		Enterprise systems enable change because they allow a large amount of rapid and repeated communication.
	Enablers	1, 8		Enterprise systems are enablers that help uses provide management information and data.
	Extractions, extract data	1		Users need an enterprise system that has a good way of extracting information or data.
	Feedback			Systems that automatically inform the use on the receipt of a transaction provides needed communication for feedback and decision making.
	Forecasting, forecasting	1		Users need information in the system to help with forecasting work.
	Functionality	1		Systems that are functional for the user increase their value.
	Implementation	1	Opposite	System implementation is not providing value to the user because their requirements are not being met.
	Information	1		Systems need to provide clear, understandable information. Nonenterprise systems provide more information for the user that is based on their specific information and level of detail needs.
	Information for decision making	1		Enterprise systems provide information for decision making.
	Information for headquarters	2		Enterprise systems provide value in responding to

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
				headquarters in the same direction.
	Interface, interface legacy systems with enterprise system, interface local and enterprise systems, interface with other systems	1, 2, 6		Users want a system that interfaces with other systems and tools and has common definitions of what things mean. They want interfaces with automatic updates that eliminate manual work. Users need a system that interfaces with other systems such as one system with multiple modules.
	Management decision information, management information, management information	1		Users value and need an information management system and enterprise systems do not provide that. They need historical data and a system that allows for sorting data and providing management information to prove or disprove intuition.
	Mandate	7		Headquarters uses the system so users have to use the system.
	No choice	6		Enterprise systems operate from an enterprise perspective; they emphasize integration and do not give the individual organizations a choice.
	Only means	7		Enterprise systems that are the only means to complete a process and provide no alternative impacts the user.
	Painful	4		Systems that are painful are not good.
	Paperless, paperless	1, 4	User specific	Enterprise systems can increase accuracy of data and calculations and save paper. Users want paperless processes.
	Planning			A system that enables management decision making will provide value to managers and leaders who need data supported analyses and information for decision making and planning.
	Policies	2		Need to grow or change policy with new system capabilities.
	Process first	2		Systems should be developed to

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				support the process first.
	Relevant information	1		Enterprise systems need to provide relevant information for decisions.
	Repository	1		Users want to be able to file emails so they can be searched for or filed as a historical record.
	Requirements and documents	1		Uses need data from the enterprise systems for requirements and documents.
	Requirements validation	3		Users want enterprise systems that are developed on valid user requirements.
	Search, search feature	1		Enterprise systems that provide a searching capability are valuable for the user. Users want systems that provide a search capability on content and that bring back relevant searchers with quality information.
	Solves problems			Users find value in systems that help them solve problems.
	Speed	4		The systems can be slow but can ramp up with new versions.
	Spread sheets	4		Users find spreadsheets useful in tracking their resources, which they considered to be a nonenterprise system. It provides a way to track and manage business activities including budgets, property, equipment, and personnel.
	Stable system, stable business process	1		Systems need to be stable so data are not lost.
	Standard system, standardization	2		Users want standard systems that look like or perform like generally accepted systems across industry. Enterprise systems provide value of standardizing to one set of tools, which enhances interchangeability, compatibility with other applications, and standard process execution.

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	Standards	1		Enterprise systems add value in tracking work that can be rated and compared against a standard for compliance.
	Store data	1		Users need a system that can store and secure data.
	Strategy			A system that enables analysis and management decisions on strategies provides value to managers and leaders.
	Streamline process			Business processes can increase their consistency in the enterprise by using the same system. The process needs to drive the system.
	Substandard	8		Enterprise systems are substandard and users are forced to use them or develop their own product.
	Support business process			Business processes can increase their consistency in the enterprise by using the same system. The process needs to drive the system.
	System choice	7		Users feel they have to settle with what the enterprise provides and they do not think they have a choice.
	System information capabilities	2		Enterprise systems need to inform users of what information and reports they can produce.
	System notification that something has been changed	1	Unmet user needs. Enterprise mission.	Systems that automatically informs the user on the receipt of a transaction or change provides needed communication.
	Systems engineering	4		Users want enterprise systems developed using systems engineering so that systems are not implemented before they are ready, the user requirements are included, and beta testing is completed.
	Tool supports business process, tools support the user	4		Users want tools that provide support so the user can produce a quality product. Support was in terms of system responsiveness so the user

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
				would not waste time waiting for the system to reboot or access the needed program.
	Training	1		Enterprise systems are implemented without training for the user. User friendliness and usefulness only gradually evolve.
	Transaction	2		Enterprise systems are used to perform transactions such as financial and travel.
	Transaction feedback	4	Self-populating	Commercial systems populate customer information automatically.
	Transactional, transactions	1, 2		Users find value in the transactional capabilities in the enterprise systems. Users need enterprise systems to do business transactions including purchasing on credit cards, personnel hiring, financial, and acquisition of training.
	Transferable	2, 4		Most enterprise systems are not providing business decision information so individual spreadsheets are created and are often not transferable to the next individual. Skill in using one system should be transferable to another to save resources on training to use the system.
	Truth sources	1		Users need a system where the truth source of information is stored. It needs to be secure, maintained with configuration controls, and unchanged, so when it is accessed by multiple users it is the same information.
	Understanding	2		Enterprise systems including the email system are good way to transfer information but not a good way to explain information. Need interactive means for understanding.
	Unfriendly	1		Users do not want systems that are unfriendly.

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
	Urgency		No urgency.	OPPOSITE: The enterprise shows no urgency to listen or meet user needs.
	Well defined processes			Business processes can increase their consistency in the enterprise by using the same process. The process needs to drive the system.
			Burdens user	OPPOSITE: Centralized systems burden the customer to do work that centralized functions did for them in the past.
			Local flexibility	OPPOSITE: Local users may find a loss in capability in enterprise systems that work towards a general solution for all.
			Lost capability	Local users may find a loss in capability in enterprise systems that work towards a general solution for all.
			Create nonenterprise systems	OPPOSITE: Enterprise systems do not allow for enough flexibility and users create their own systems.
			Segregated business system	OPPOSITE: Enterprise systems and data are not integrated so users cannot go to one place for information.
			Intermediate step or other tools to help feed it	Systems that include custom developed interfaces add value because the user can interface or extract information that is useful to them.
			Service wait time	Users find value in systems that are handy or useful as it saves them time and resources to do other things.
			Responsive	Users want systems that are responsive and boot up quickly without lag time.
			Upload information	Changes in the enterprise system should not have an impact on the user and their files. Should have upward compatibility and data should not be lost.

Open codes identified in proposal	Open codes from pilot study and main study participants	Themes referenced	Opposite or missing themes, codes	Memos
			Uploadable	Enterprise systems should be uploaded with user information.
			Upward compatibility	Changes in the enterprise system should not have an impact on the user and their files. Should have upward compatibility and data should not be lost.
			Search feature	Users want systems that provide a search capability on content and that bring back relevant searchers with quality information.
			Notification	The system should notify the user if data input by the user was not saved.
			Order confirmation	Systems that automate approval and justification for services and products expedite the process
			Provides best options	Users find value in systems that help them select the best option for their transactions.
			Provides multiple options	Users find value in systems that are a great experience to use and can provide multiple options that they can choose from that meets their needs.

CURRICULUM VITAE

KATHLEEN THOME-DIORIO

WORK HISTORY

2009	Director, Financial Management, X Test Wing, USAF
2006 – 2009	Chief, Plans and Programs, X Air Base Wing (ABW), USAF
2004 – 2006	Comptroller, Financial Management, X ABW, USAF
2003 – 2004	Budget Officer, Financial Management, Y Center, USAF
2000 – 2003	Chief, Business Manager, Information Technology, Y Center, USAF
1998 – 2000	Reengineering, Plans and Programs, Y Center, USAF
1992 – 1998	Business Management, Technical Directorate, Z Wing, USAF
1986 – 1992	Budget Analyst, Financial Management, Y Center, USAF
1981 – 1986	Aquatics Manager, Barstow and Lancaster, CA

WORK EXPERIENCE

- Director, Financial Management
- Chief, Plans and Programs
- Comptroller, Financial Management
- Chief, Business Management, Information Technology (IT)
- Reengineering, Plans and Programs
- Business Manager, Technical Directorate
- Budget Analyst, Financial Management
- Aquatics Manager, City of Lancaster and County of San Bernardino Parks and Recreation Departments

PROFESSIONAL AFFILIATIONS/CERTIFICATES

2006 – Council for Excellence in Government Program Fellow
2004 – Certified Defense Financial Manager
1998– Air Force Education with Industry Fellow
1994 – Acquisition Professional Development Program Certification, Financial Management, Level 3
1986 to Present – American Society of Military Comptrollers

EDUCATION

Doctoral Candidate in Public Policy & Administration, Walden University
Master of Public Administration, Golden Gate University
Master of Science, University of Wisconsin
Bachelor of Science, Douglass College, Rutgers University