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**BARRIERS TO ELECTRONIC RECORDS MANAGEMENT (ERM): AN
EXPLORATORY CASE STUDY INVESTIGATING ERM IN THE DEPLOYED
ENVIRONMENT DURING OPERATIONS ENDURING FREEDOM AND IRAQI
FREEDOM**

THESIS

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AFIT/GIR/ENV/05M-07

**DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY**

AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED

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AFIT/GIR/ENV/05M-07

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THESIS

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Department of Systems and Engineering Management
Graduate School of Engineering and Management
Air Force Institute of Technology
Air University
Air Education and Training Command
In Partial Fulfillment of the Requirements for the
Degree of Master of Science in Information Resource Management

Brian G. Hobbs, BS

First Lieutenant, USAF

March 2005

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Abstract

Corporate and government organizations can use electronic records as an important strategic resource, if the records are managed properly. In addition to meeting legal requirements, electronic records can play a vital role in the management and operation of an organization's activities. Corporate America is facing challenges in managing electronic records, and so too is the U.S. Air Force (USAF). The deployed environment is particularly problematic for electronic records management (ERM). This research, thus, investigates ERM in the deployed environment to identify and characterize the barriers faced by USAF personnel who deployed to locations supporting Operations Enduring Freedom and Iraqi Freedom. This investigation was conducted through a qualitative approach, drawing much of its rich data from in-depth interviews. An exploratory case study was designed using a socio-technical framework and inductive analysis was used to proceed from particular facts to general conclusions. The analysis revealed 15 barriers to ERM. All 15 barriers were determined to exist throughout the entire records lifecycle and were categorized based on common overarching themes. This research reveals some unique barriers contained within the context of a deployed location, while also showing that the barriers are similar to known ERM challenges.

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Brian G. Hobbs

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I. Introduction

Electronic records management (ERM) is an important issue facing both corporate and government organizations. Electronic records can play a vital role in the management and operation of an organization's activities. Effectively managing such electronic records can be a strategic resource for organizations, if the records are analyzed and the results are used to make better future decisions. Traditional records management processes, marked by paper records and filing cabinets, have been changing since the arrival of the information age arrived. The arrival, marked by information technology (IT) advances, allows for the creation of information in myriad forms. As the number of ways to create information increases, so too does the volume of potential record-quality material regardless of whether or not any system collects and stores it in any systematic way. Record-quality material is a subset of an organization's information that meets the definition of an official record and must be managed accordingly.

The ERM challenge, then, is upon us, because information and the subset called records are recognized for their value. The U.S. National Commission on Libraries and

Information Science (2001) recommends elevating information to the “strategic national resource” level. According to Yakel (2000), information is critical for reducing uncertainty and guiding decisions. An organization’s “memory” is captured within printed and electronic records (Department of the Air Force, 1994, p. 2). Now, with nearly all new information being electronic instead of paper, “handling and managing electronic records is one of the biggest – if not the biggest – challenges facing organizations today” (Swartz, 2004, p. 30).

With recent, tougher legislation and increasing numbers of electronic records, ERM is challenging corporate America and federal agencies alike. The U.S. Air Force (USAF) is not immune to such ERM challenges. Yakel (2000) notes that information “is distributed unevenly and is often inaccessible because it is located in geographically dispersed locations,” (p. 24) and the consequence the USAF can not afford is “there is often a lack of knowledge concerning what information even exists” (p. 24). The entire Air Force is separated into dozens, if not hundreds, of geographically dispersed locations, many of them in a deployed environment. Lessons learned from recent military operations in Kosovo state that when “information flow did not match [the decision-maker’s] need, leadership lost confidence in information provided and weapons employment decisions [were] impacted” (LaMaster, 2004, p. 7).

Purpose

The goal of this research is to identify and characterize the barriers that hinder, discourage, or otherwise prevent the management of electronic records in the context of a deployed environment. USAF doctrine states that “records play a vital role in managing

and operating Air Force activities...they serve as the memory of the organization, a record of past events, and the basis for future actions” (Department of the Air Force, 1994, p. 2). We are encouraged to use technology innovatively to accomplish our mission. Oftentimes this use of technology results in creating information. When the information fits the definition of a record, the USAF, as a federal agency, is bound by regulatory guidance to manage those records, “regardless of media” (44 U.S.C. § 3301). We usually operate computers and other electronic devices independently, however, with no ERM oversight, and there are no widespread automated information systems (AIS) employed to assist in properly managing electronic records. In countering the ERM challenge posed by the proliferation and advancement of technology, an ERM integrated process team (IPT) was established to “ensure electronic records are available and protected to support business operations” (Electronic Records Management Integrated Process Team, 2003, p. 1). We are frequently sent to deployed locations to handle the “business operations” of the Air Force, thus the same IPT stressed the need for any ERM solution to fit our deployed forces’ needs (Electronic Records Management Integrated Process Team, 2004).

Characterized by turnover and change, long duty hours, enemy threats, and a commitment to get the job done, a deployed military location is a hostile environment. The volatile and unpredictable deployed environment is quite different from the stable in-garrison setting at fixed air bases. A high operations tempo, however, does not relieve the USAF of its legal obligation to manage its records. To date, the author’s research revealed no published literature addressing ERM in a deployed environment, with the exception of Shaw and Hickok (2000, p. 35) identifying “remote use and control of a

records and information management system” (p. 35) as a challenge. Lessons learned, documented from recent operations (OEF and OIF), suggest our ERM initiatives are not sufficient to support the Air Force’s increased information sharing capability (LaMaster, 2004). The Air Force is expeditionary in nature, and decision-makers need access to information that is “authoritative, relevant, and sufficient” (Department of the Air Force, 2002, p. 4). A decision-maker, regardless of location, “should be able to put records into the system and search for records already resident within the system” (Shaw & Hickok, 2000, p. 35).

Research Questions

To satisfy the goal, the main question asked within this research is:

What were the characteristics of the barriers to ERM encountered by deployed USAF personnel during OEF and OIF?

To answer the main research question adequately, the researcher used seven investigative questions (IQ) to guide the exploratory nature of the subject.

The first set of investigative questions frame the socio-technical aspects of ERM enablers.

- IQ1. What were the characteristics of the *organizational culture* barriers to ERM encountered by deployed USAF personnel during OEF and OIF?
- IQ2. What were the characteristics of the *organizational structure* barriers to ERM encountered by deployed USAF personnel during OEF and OIF?
- IQ3. What were the characteristics of the *people* barriers to ERM encountered by deployed USAF personnel during OEF and OIF?
- IQ4. What were the characteristics of the *information technology* barriers to ERM encountered by deployed USAF personnel during OEF and OIF?

The Department of Defense (DoD) record life-cycle model (Department of Defense, 2000) is the basis for the second set of investigation questions. The second set of investigative questions address barriers encountered specifically in each of the phases of the records lifecycle. The records life-cycle is characterized by three phases: (a) creation, (b) maintenance and use, and (c) disposition (Department of Defense, 2000). Using the records life-cycle construct generates the following three investigative questions:

- IQ5. When *creating* records, what were the characteristics of the barriers to ERM encountered by deployed USAF personnel during OEF and OIF?
- IQ6. When *maintaining and using* records, what were the characteristics of the barriers to ERM encountered by deployed USAF personnel during OEF and OIF?
- IQ7. When addressing the *disposition* of records, what were the characteristics of the barriers to ERM encountered by deployed USAF personnel during OEF and OIF?

Significance

This research explores and investigates one previously unexamined context where ERM is, arguably, needed most—the deployed environment. Identifying and characterizing the barriers to ERM recently encountered in the deployed environment will clarify whether they are unique, or if they are similar, to known ERM challenges. Knowing the barriers to ERM allows decision-makers to define necessary steps to minimize their impact, reduce or eliminate them, or mitigate the inherent risks while conducting operations at a deployed location.

Thesis Overview

Five distinct chapters form the main content of this thesis. Chapter I introduces the topic, frames the scope of the research, and identifies the research questions. Chapter II contains a literature review that examines the current body of knowledge as it pertains to ERM. The chosen research methodology is detailed in Chapter III, and the reader will find a presentation of the strengths, weaknesses, benefits, and limitations of it. Chapter IV details the culmination of data gathering and analysis and presents the research findings. Chapter V contains a discussion of the research, the author's conclusions, and recommendations for further study.

II. Literature Review

This chapter contains a review of existing topical and methodological literature pertaining to this research. As a quick reference, the definitions for many of the terms used in this section are consolidated in Appendix A. The opening sets the stage for a discussion of managing records in the modern electronic environment versus the traditional paper-based setting. Regarding ERM, prevailing definitions and pertinent legal documents are examined to orient the reader to the complexity involved in ERM. An examination of known challenges to ERM that includes social and technical topics is then presented. The DoD's approach to ERM is discussed, with specific attention focused on the USAF. The chapter concludes with an introduction to the research framework used as a foundation for this research.

The Transition to Electronic Records

Records management is not a new topic. Society mastered the process of coding, filing, transferring and/or destroying paper records long ago. But then the information age arrived and changed the recordkeeping landscape forever. With each new technological innovation, the number of ways to create data and information increases. Consequently, as technology evolves, new electronic objects in never-before used formats are created that contain data and information. When appropriate, these electronic objects must be managed as records. There is a difference, however, between traditional paper-based records management and modern ERM. Not surprisingly, the traditional paper-based paradigm for managing records is not translating well to the current electronic environment. The difference stems from technological advances that allow for

more distributed, and sometimes more efficient, work. These advances, though, create new challenges in managing electronic records. Understanding accepted electronic records management definitions, pertinent legal documents, and the known challenges of ERM facilitates identifying the barriers potentially experienced in managing electronic records. As such, these topics are reviewed next.

Records, Records Management, and Electronic Records Management

The identification of electronic records must occur before managing them. Knowing which information constitutes being labeled a record is a difficult decision, and simply knowing the definition of a federal record does not necessarily make this decision any easier. According to the Federal Records Act (1950, as amended), the statutory definition of a *record* is

Information, regardless of medium, detailing the transaction of business. . . made or received by an Agency of the United States Government under federal law or in connection with the transaction of public business and preserved or appropriate for preservation by that Agency or its legitimate successor as evidence of the organization, functions, policies, decisions, procedures, operations, or other activities of the Government or because of the value of data in the record. (44 U.S.C. § 3301)

By including the terms “regardless of medium,” this definition does not differentiate between paper and electronic media; thus, the definition is also applicable to electronic records. Simply stated, an electronic object is a record if it provides proof of a governmental agency’s functions, policies, decisions, procedures, or operations (44

U.S.C. § 3301). That is not to say, however, that a paper record and an electronic record are identical. A more thorough explanation of the difference is provided in the later section titled “Armstrong, et al. v. Executive Office of the President.”

Paradoxically, records residing on electronic media are simultaneously durable and fragile. The actual medium may provide massive storage capability for an unspecified number of years, but the ease in altering the record—intentionally or unintentionally—makes it quite fragile. Electronic records are also dependent on technology to access them. If the required technology is not available, the record can not be accessed. These peculiarities complicate the management of electronic records, because “the ease of updating, revising, or reusing electronic media makes their life cycle brief and more complex than that of other records” (Department of the Air Force, 1994a).

While most federal agencies (Department of Defense, 2002; Department of the Air Force, 2003; Sprehe, McClure, & Zellner, 2002), and those doing work for the government (Sprehe et al., 2002), use the statutory definition provided above, other records and information management (RIM) professionals have their own perspective on what constitutes a record. According to Bantin (2001), “a record is not just a collection of data but the consequence or product of an **event** [emphasis in original]” (p. 18). The disparity in definitions illustrates a struggle in identifying records. Another important consequence of the disparity in definitions is correctly identifying information that is a *non-record*, for knowing the difference between records and non-records is the necessary first step of managing electronic records (Bantin, 2001).

Defining Records Management.

The legal statutes also provide federal employees with a definition of records management that is pertinent to this research. The Federal Records Act (1950, as amended) defines the term *records management*:

The planning, controlling, directing, organizing, training, promoting, and other managerial activities involved with respect to records creation, records maintenance and use, and records disposition in order to achieve adequate and proper documentation of the policies and transactions of the Federal Government and effective and economical management of agency operations. (44 U.S.C. § 2901)

Records management, then, governs the life cycle of records from creation, through maintenance and use, to final disposition (U.S. General Accounting Office, 2002). This governance occurs through the use of a records disposition schedule (RDS) that details how long to keep a specific record and the nature of its appropriate disposition (transfer or destruction). The State of California describes this governance as the “procedural infrastructure that ensures authentic information is available, preserved, and when appropriate, destroyed” (California Department of General Services, 1992 p. 8). While governing the life cycle of a paper record is well-defined, managing electronic records includes more complicated rules and challenges.

Defining Electronic Records Management.

Because the electronic or virtual world has characteristics different from the physical world, managing electronic records is more difficult. Nearly all information created by USAF personnel takes the form of a word processing document, a

spreadsheet, a slideshow presentation, an e-mail, an instant messaging text conversation, an electronic audio recording, an electronic photograph, or some other electronic object. When the informational value of data in the documentary material, regardless of medium, is significant, the material is a record (44 U.S.C. § 3301). By definition, the electronic records created by federal agencies are important for accountability and historical value. Consequently, each electronic object that is identified as a record must be managed. Some of the legal statutes impacting ERM are examined in the next section.

The Law and ERM in the Federal Government

The law requires federal agencies to maintain records, and Table 1 presents a timeline of pertinent legislation currently affecting ERM in federal agencies. This section reviews four of these primary sources of legal guidance concerning ERM: (a) the Federal Records Act (FRA), (b) the Freedom of Information Act (FOIA), (c) the Paperwork Reduction Act (PRA), and (d) the Armstrong, et al. v. Executive Office of the President court ruling.

An understanding of the requirements placed on a federal agency by legal statutes, and their effects, is important. Rawlings-Milton (2000) wrote an entire dissertation on the subject of electronic records and the law. While examining each and every statute is important in its own right, it is beyond the scope of this research. Accordingly, brief summaries of the main statutes are provided.

Table 1. Timeline of legal statutes affecting ERM (adapted from Rawlings-Milton, 2000)

Date	Event
1949	National Archives merged with General Services Administration
1950	Federal Records Act passed
1966	Freedom of Information Act (FOIA) passed
1968	Federal Records Act amended
1974	Privacy Act passed
1978	Federal Records Act amended
1980	Paperwork Reduction Act passed
1993	<u>Armstrong, et al. v. Executive Office of the President</u> decided
1995	Paperwork Reduction Act renewed
1996	Electronic Freedom of Information Act passed (FOIA amended)
1996	Health Insurance Portability and Accountability Act passed
1998	Government Paperwork Elimination Act of 1998 passed
2002	E-Government Act passed
2002	Sarbanes-Oxley Act passed

Federal Records Act.

The FRA (1950, as amended) establishes the framework for ERM programs in federal agencies. It does this by requiring the head of each federal agency to do the following:

Make and preserve records containing adequate and proper documentation of the organization, functions, policies, decisions, procedures, and essential transactions of the agency and designed to furnish the information necessary to protect the legal and financial rights of the Government and of persons directly affected by the agency's activities. (44 U.S.C § 3301)

The FRA also charges the National Archives and Records Administration (NARA) with “accurate and complete documentation of the policies and transactions of

the Federal Government” (44 U.S.C § 2902). NARA, then, is required to provide “guidance and assistance to Federal agencies to ensure economical and effective records management by such agencies” (44 U.S.C § 2904). In turn, NARA provides ERM guidance through the Code of Federal Regulations (36 C.F.R., Part 1234) and “ultimately takes control of permanent agency records judged to be of historic value. Of the total number of federal records, less than three percent are designated permanent” (U.S. General Accounting Office, 2003, p. 1). Rawlings-Milton highlights the extent of the FRA in the following statements:

The adequate and proper documentation requirement in the FRA requires agencies to document more than simple transactions. The statute requires agencies to keep documentation necessary to support their actions and protect the rights of the government and the public. This requirement is to provide accountability for agencies’ action. The Federal records program looks at capturing a much broader group of records that not only document the transactions but document the agency’s mission. (2000, p. 41)

The FRA was written long before electronic records were created. The proliferation of technology and the passing of other legal statutes places a tremendous responsibility on federal agencies.

Freedom of Information Act.

The enactment of the FOIA occurred in 1966 and has significant implications on ERM, especially with the 1996 amendment adding electronic records to the act. The FOIA requires each agency to publish in the Federal Register records of its activities and to “make available for public inspection and copying, copies of all records, regardless of

form or format, which have been released to any person” (5 U.S.C § 552). Under this act, when an agency makes a record available, it “shall provide the record in any form or format requested by the person if the record is readily reproducible by the agency in that form or format” (5 U.S.C § 552). DoD Directive 5400.7 (1997) exists to comply with the FOIA. The directive establishes the policies and responsibilities of the DoD Freedom of Information Act Program. This directive requires each DoD component to “make [records] available for public inspection and copying in an appropriate facility or facilities...in hard copy, by computer telecommunications, or other electronic means” (1997, p 3).

Paperwork Reduction Act.

Congress established the PRA in 1980 and amended it with the Paperwork Reduction Act of 1995. The PRA is an example of a statute that encourages or requires an agency to exchange information or conduct its business/mission activities electronically. The PRA requires each agency to “carry out the agency's information resources management activities to improve agency productivity, efficiency, and effectiveness” (44 U.S.C. § 3506). According to Penn (1997), the rationale of the PRA is “to minimize the Federal paperwork burden on the public and to establish uniform Federal information policies and practices” (p. 3). Rawlings-Milton (2000) states that through the guidance of the PRA, “agencies are encouraged to share information with other agencies and allow the public to use information technology to reduce their reporting and recordkeeping burden” (p. 66). Similar to the PRA, Congress passed the Government Paperwork Elimination Act (GPEA) in 1998 to encourage federal agencies to accept reports and requests (i.e. tax forms and FOIA requests) from the public

electronically. The GPEA is yet another example of a legal statute that encourages the exchange of information electronically. Despite explicit urging to communicate via electronic means, neither the GPEA nor the PRA “require the integration of records management into information management systems” (Rawlings-Milton, 2000, p. 66). Accordingly, insufficient or no ERM planning has occurred at many federal agencies (Patterson & Sprehe, 2002).

Armstrong, et al. v. Executive Office of the President.

Until 1993, there was no legal guidance that differentiated an electronic record from a paper record. That changed with the ruling in Armstrong, et al. v. Executive Office of the President (EOP). The essential argument of the plaintiffs was “an electronic record has a value that is different from the paper copy of the same record” (Armstrong, et al. v. Executive Office of the President, 1 F.3d at 127, 1993). The District Court ruled in favor of the plaintiffs, and the U.S. Court of Appeals upheld the District Court’s decision stating “the electronic version of the record has a value for the researcher that is unavailable in the paper version of the record and that this case presents important questions of federal agencies’ statutory obligations to manage electronic records” (Armstrong v EOP, F.3d at 1278, as cited in Rawlings-Milton, 2000, p. 56). The court’s ruling established characteristics unique to electronic records, such as contextual attributes (e.g., directories, distribution lists, and read receipts). Rawlings-Milton (2000) and Wallace (2001) provide a more in-depth analysis of the Armstrong case.

Difficulties in Obeying the Legal Statutes

In testimony provided to the subcommittee on Government Management, Information, and Technology, L. Nye Stevens stated the following:

Over the past quarter century, NARA received approximately 90,000 agency electronic data files. However, now NARA estimates that some federal agencies, such as the Department of State and Department of the Treasury, are individually generating ten times that many electronic records annually just in e-mail – and many of those records may need to be preserved by NARA. (U.S. General Accounting Office, 1999, p.3)

The massive amount of electronic records, coupled with the described laws, places tremendous recordkeeping responsibilities on each federal agency. Today, there are even more statutes affecting ERM (e.g., Privacy Act of 1974, Sarbanes-Oxley Act of 2002, Health Insurance Portability and Accountability Act (HIPAA) of 1996, and E-Government Act of 2002). Despite the legal mandates, one need not look far to find examples of federal agencies failing to adhere to the law. An example comes from a recent report to Congressional requesters:

In 2001, NARA completed an assessment of the current federal recordkeeping environment; this study concluded that although agencies are creating and maintaining records appropriately, most electronic records (including databases of major federal information systems) remain unscheduled, and records of historical value are not being identified and provided to NARA for preservation in archives. (U.S. General Accounting Office, 2002, p. 2)

In 2001 and 2002, the Federal Bureau of Investigation came under intense scrutiny for mishandling important records related to the Oklahoma City Bombing case against Timothy McVeigh (Electronic Records Policy Working Group, 2004; Sprehe, 2001). This mishandling is one example of the result when an agency fails to abide by its ERM responsibilities. Concerning the motivation for ERM being based on legal pressure, one author writes the following:

Records management is the law; it's the Federal Records Act. But telling feds that something is legally required does not serve as management motivation. After all, everything agencies do is in some sense legally required or they wouldn't be doing it. (Sprehe, 2001)

The next section outlines some of the difficulties faced in executing ERM even when an agency is willing to obey the law.

Known Challenges of ERM

Although the legal scene expanded to address new electronic communication mediums, records management in general has not been an integral component of IT planning or systems design and took a back seat while businesses capitalized on advancing technologies (Patterson & Sprehe, 2002). Couple this advancing technology with the steady devaluing of the records management field over the last decade (Penn, 1994, 1996; Swartz, 2003), and it becomes evident that the ERM landscape is ripe with substantial technical and social challenges. A review of four recent articles (published after 2002) provides examples of current challenges. The challenges that were mentioned

in more than one of the articles are illustrated in Table 2. A discussion of a few of the most mentioned challenges follows.

Table 2. Types of challenges mentioned in ERM literature

	Williams (2004a)	ERPWG (2004)	Sprehe, McClure, and Zellner (2002)	Patterson and Sprehe (2002)
<i>Inadequacies due to exponential growth, pervasive presence, and volume of electronic records and technology</i>	✓	✓	✓	✓
<i>Lack of training, tools, and guidance due to low senior management and leadership support</i>	✓	✓	✓	✓
<i>Managing e-mail as records</i>	✓	✓	✓	✓
<i>Ineffective communication between stakeholders—legal, IT, records officers records managers, and end users</i>	✓	✓	✓	
<i>Complexity of business processes and electronic records produced by them</i>	✓			✓
<i>Long-lasting digital preservation/technological obsolescence</i>	✓	✓		
<i>ERM not currently integrated with other IT systems and not an integral component of IT planning, systems design and architecture</i>		✓		✓
<i>Adhering to legal responsibilities</i>	✓		✓	
<i>ERM viewed as non-mission related admin activity, not critical to agency mission and not incorporated into business processes</i>		✓	✓	

One of the most mentioned, and perhaps most obvious, challenges is the volume of items to manage as records that result from the exponential growth of IT systems capable of producing electronic records. NASA, the Patent and Trademark Office, the Department of Veterans Affairs, and the State Department are examples of federal agencies where “the volumes of electronic records that these agencies manage are far

larger than the volumes of permanent electronic records that NARA currently archives.” (U.S. General Accounting Office, 2003, p. 66).

Increased storage capacity is a catalyst to the volume challenge experienced by many federal agencies—that is, the sheer number of electronic records produced by modern technology. With the distributed nature of computing, electronic records are more dispersed and more numerous than ever. Electronic storage costs continue to decline in today’s computing environment, and the availability of excess digital storage space encourages a “keep-everything” attitude. This leads to a decentralized information environment where records management responsibility resides with the end user at each desktop. When end users have no knowledge of, or little concern for, the proper identification and timely disposition of records, the situation creates problems for the identification, management, and preservation of records (Electronic Records Policy Working Group, 2004; Sprehe, 2001). Although a “keep-everything” philosophy is better than the “keep-nothing” alternative, it ignores the disposition component of records management. Keeping records past their appropriate end also exposes an organization to unnecessary legal risk, because such records are discoverable during litigation (Williams, 2004b). Accordingly, the State of California recommends that “the enterprise keep only what is required, and assure that any new system has mechanisms in place to purge the superfluous when it is time” (California Department of General Services, 1992, p. 8). As the number of records increases, so too does the effort required to manage them.

Two recent reports by the federal government concluded that RM policies and formal guidance are inadequate in this decentralized environment and noted the low priority often given to records management programs (U.S. General Accounting Office,

2002, 2003). This type of finding is indicative of another prevailing challenge found throughout the literature, namely the lack of training, tools, and guidance resulting from low senior management and leadership support. One conclusion from a 2002 study of federal recordkeeping issues states “agency leadership focuses primarily on carrying out the principal programs of the institution and, all other things being equal, tends to view RM as primarily a non-mission related, administrative activity” (Sprehe et al., 2002, p. 297). One barrier found in a recent federal study of the effective management of Government information assets maintains that “records and information are not managed as agency business assets” (Electronic Records Policy Working Group, 2004, p. 4).

Without leadership committed to ERM, one finds inadequate resources available to personnel charged with managing or participating in the ERM activities, as recent Congressional testimony revealed that federal agencies afforded low priority to their RM programs and the acquisition of IT resources needed for ERM (U.S. General Accounting Office, 2003). In fact, based on survey results collected from more than 2,200 records and information management respondents, Williams (2004a) concludes that “for an alarming number of organizations, *the job of records management simply is not getting done* [emphasis in original]” (p. 7). One specific result found in the survey reveals that electronic records (the majority of all records being created today), are not included in 47% of organizations’ retention schedules covered by records management programs, policies and procedures, retention schedules and hold orders (Williams, 2004a, 2004b).

Sprehe (2001) commented on leaders and managers becoming “so accustomed to coping with today's IT demands and planning for tomorrow's growth that they are incapable of considering the need for efficient access to yesterday’s data”. One technical

challenge receiving continual attention is e-mail. Managing e-mail as records is often on the minds of Chief Information Officers (CIOs) when they think of ERM, especially in light of recent legislation concerning compliance and litigation, for instance the 2002 Sarbanes-Oxley Act (Swartz, 2004). The unfortunate truth, according to Williams (2004a), is that 59% of organizations do not have any formal e-mail retention policy.

The EPRWG reported that “records management and information technology disciplines are poorly integrated within Federal agencies” (Electronic Records Policy Working Group, 2004, p. 4). One possible reason for this poor integration is found in analyzing two related results in Williams’ (2004a) survey. In 71% of the organizations represented, the IT department has primary responsibility for the day-to-day management of electronic records, yet 67% of RM respondents do not believe their IT colleagues really understand the concept of “lifecycle” regarding the management of the organization’s electronic records. In essence, records managers are stating that the majority of those who are responsible for the day-to-day management of electronic records do not understand the fundamental record lifecycle concept. Ineffective integration and communication can occur between other departments as well (e.g. legal and senior leaders). The following anecdotal story is one small example of how ERM is viewed as non-mission related admin activity, not critical to agency mission and subsequently not incorporated into business processes:

The Office of Thrift Supervision (OTS) has been attempting to implement a DoD certified records management application (RMA) since 1997. The software arrives as a shell and information about the records maintained by the agency, the records retention schedules, access controls, and employee information must be

imported or entered manually. In addition, the metadata needed for the records must be identified and data entry forms created. With a staff of three working on several administrative programs and attempting to configure the software to OTS' requirements, the task took two years before offices within OTS could experiment with filing electronic records into an electronic recordkeeping system. The software automatically pulled information from the record and the creators' profile within the application. The information required from the creator was limited to three fields of data. Creators were uninterested in adding these three fields. The program staff and their immediate managers refused to be responsible for determining what is a record and what is not. As a result, the testing was cancelled. (Rawlings-Milton, 2000, p. 43)

A few other challenges include adhering to legal responsibilities, digital preservation and obsolescence, and ERM/RM not being an integral part of IT planning. Sadly, a large majority of records managers (62%) are not confident that their organization could successfully demonstrate that its electronic records were accurate, reliable and trustworthy many years after they were created (Williams, 2004a). More than half (53%) of respondents reported that their organization does not realize that it will have to migrate many of its electronic records in order to comply with established records retention policies (Williams, 2004a).

Overall, the literature identifies that the challenges to ERM have both social and technical aspects. The framework, thus, used in this research for exploring ERM in the deployed environment is adapted from an existing socio-technical framework. The research framework is discussed later in this chapter.

ERM in the Military

ERM is not a new topic in the DoD. Specifically, a DoD initiative, and later a Task Force, was formed to conduct a business process reengineering (BPR) study on ERM in the early 1990s. The DoD published the BPR Report in 1994 and included six identified improvement opportunities:

1. Develop standard DoD retention schedules for electronic records
2. Reduce the number of records retention periods
3. Migrate toward a standard DoD coding system for records
4. Develop standard DoD functional and automated system requirements for records management, including public access to electronic records
5. Incorporate records management requirements into automated information systems development and redesign
6. Develop standard DoD systems requirements for voice and e-mail records. (Prescott, 2001)

The DoD pursued these opportunities through IDEF modeling, business process reengineering (BPR), and strategic planning efforts. Eventually, the pursuit led to the development of DoD 5015.2-STD. Three additional opportunities were identified but not pursued by the DoD: (a) require the review and approval of automated support systems by records managers to ensure compliance with the law, (b) build Privacy Act and FOIA rules into information systems, and (c) implement a common DoD records schedule compatible with electronic records (Prescott, 2001). Although, it is not known why the opportunities were not pursued, it is interesting to note that some of the major known challenges detailed previously in this chapter are similar to the opportunities not pursued. Specifically, the lack of records managers contributing to systems planning and design,

the overwhelming number of potential FOIA requests, and the reported lack of integrated retention schedules.

The authoring of DoD 5015.2-STD sets forth a “mandatory baseline functional requirements for Records Management Application (RMA) software used by the DoD Components in the implementation of their records management programs” (Department of Defense, 2000). This standard has been around since 1997 and has gained widespread acceptance and support beyond the DoD to the larger federal government. NARA has recognized and endorsed the standard. The document also “provides a minimum set of metadata required to identify and manage information as a record” (Shaw & Hickok, 2000) and identifies those elements necessary for electronic records to be considered authentic and reliable. Operational, legislative and legal needs are the basis of the standard, and Table 3 provides an abbreviated timeline of the events between the initial BPR initiative and the completion DoD 5015.2-STD in 1997.

Table 3. DoD 5015.2-STD development timeline (adapted from Prescott, 2001)

Date	Event
Aug 1993	DoD RM Functional Process Improvement Scoping Session #1
Jan 1994	DoD RM Functional Process Improvement TO-BE Report
Aug 1994	RM BPR Compendium Report
Jan 1995	Managing Information As Records 2003
May 1995	Electronic Records Management Software Requirements
Nov 1997	DoD 5015.2-STD finalized
Jun 2002	DoD 5015.2-STD revised

Records Life-cycle

DoD policy mandates life-cycle management of records. The lifecycle of electronic records is characterized as having three phases: (a) creation or receipt, (b)

maintenance and use, and (c) disposition (Department of Defense, 2000). For the purposes of this research, Figure 1 depicts the lifecycle as adapted from DoD and USAF regulations (Department of Defense, 2002; Department of the Air Force, 1994, 1995, 2003). Each phase of the records lifecycle may have unique, or perhaps similar, aspects contributing to barriers in the deployed environment. Accordingly, the framework used as a foundation for this research allows for an investigation of not just the socio-technical factors, but also how barriers may be particular to certain records lifecycle phases.

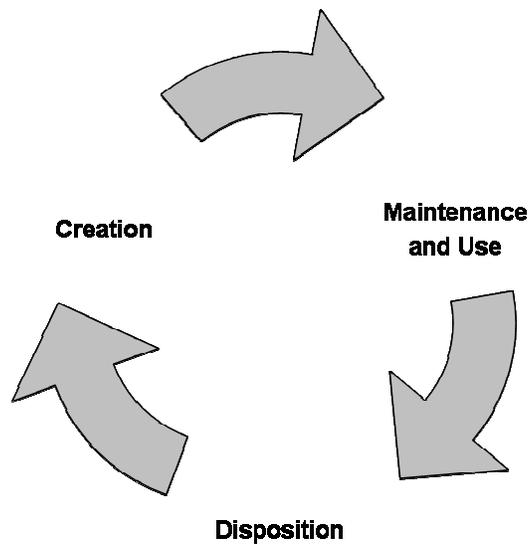


Figure 1. Records Lifecycle (Adapted from Department of Defense, 2002)

ERM in the U.S. Air Force

ERM is not a new topic in the U.S. Air Force. The USAF was one player in the larger BPR effort focusing on ERM (described earlier) as technology permeated organizations in the 1990s. The USAF had no overarching ERM policy at the time, and local offices were left to manage their own records appropriately. While organizations were generally left to fend for themselves, students at AFIT were studying the topic. One information system considered for widespread use was Document Librarian (DL), and the

research conducted on DL contained mixed results. In their 1993 thesis, AFIT students Gaines and Nelson (1993) constructed an RM process model and measured the difference in productivity when an automated system, DL, was used instead of manual record keeping tasks. Their results showed a 30-31% increase in productivity when records were managed with DL. One year later, Austin and Moseley (1994), also AFIT students, generated a definition of *RM effectiveness* through a Delphi study. They concluded, based on a small sample survey, there was no dramatic increase in productivity from RM automation using the DL system. Two years after their work, Snoddy (1996) explored the topic of automatic classification of records in his AFIT thesis. His proof of concept system demonstrated the possibility of automatic classification with a “reasonable level of accuracy” (Snoddy, 1996). While the current computing environment in the USAF does not include any widespread use of the DL system, nor any automatic classification of records, a fair amount of ERM policy with a supporting personnel structure is in place.

USAF Records Managers’ Organizational Structure and ERM Policy.

The USAF manages its ERM activities through the publication of Air Force Instructions (AFIs) and Air Force Manuals (AFMANs). AFI 33-322, *Air Force Records Management Program* (2003), establishes the RM program and outlines the responsibilities of USAF records management personnel. Figure 2 is adapted from AFMAN 37-123 and AFI 33-322 and illustrates the different levels of records managers in the USAF.

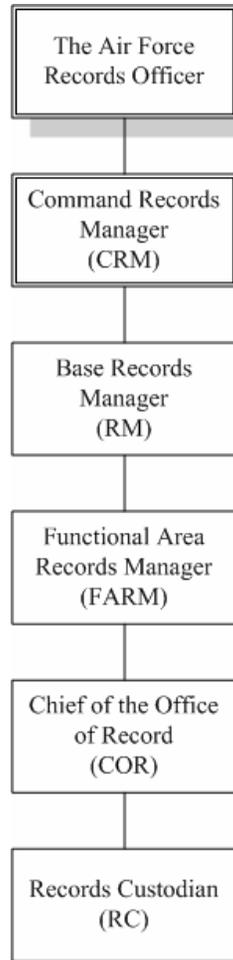


Figure 2. Organizational Structure of USAF Records Managers

Based on official USAF policy (Department of the Air Force, 2003), the following list describes the responsibilities of each records manager depicted in Figure 2:

1. The Air Force Records Manager administers the program, represents the Secretary of the Air Force on records management issues, and oversees the legal requirements of records disposal;
2. The Command and Agency Records Managers (CRM/ARM) manage the records program within their command or agency;
3. The Base Records Managers (BRM) administer the RM program at their installation;

4. The Functional Area Records Manager (FARM) assigned to each unit guides and assists assigned personnel in maintaining and disposing of records, while monitoring the RM program within their functional area;
5. The Chief of Office of Record (COR) has responsibility for physical and legal custody of records within each office where records are created, received, or maintained;
6. The Records Custodian (RC) manages the internal record keeping program and maintains guardianship and control of records within an office of record. (Department of the Air Force, 2003, p. 3-8)

Disposition of USAF records is managed through AFI 37-138, *Disposition of Air Force Records--Policies and Procedures*. This document lists the objective of the program and details the responsibilities of USAF personnel in “disposing of special types of records, retiring or transferring records using staging areas, and retrieving information from inactive records” (Department of the Air Force, 1994a, p. 1).

AFMAN 37-123, *Management of Records*, establishes organizational policies, procedures, and techniques for managing records, and it states the following:

Records play a vital role in managing and operating Air Force activities. They serve as the memory of the organization, a record of past events, and the basis for future actions. Records managed systematically are complete, easily accessible, and properly arranged to serve current and future management needs and enhance effectiveness and economy of operations. (Department of the Air Force, 1994)

During the eleven years since the publication of AFMAN 37-123, the USAF did not systematically manage electronic data as new technology rapidly evolved and found its way into every workplace. As a result, the rapid pace of technological evolution, coupled with increases in both volume of records and number of formats, left in its wake an electronic information environment that cannot assure the authenticity, reliability, and

integrity of electronic records (Electronic Records Policy Working Group, 2004, p. 4). In 1998, the Air Force Communications Agency (AFCA) began developing an ERM solution for the entire USAF—one it envisioned would “automate the records management function, not just digitize our file cabinets” (Cabrera, 2003, p. 14). By 2003, AFCA had failed to develop or acquire an enterprise-wide solution and was working its third pilot effort. In the mean time, the different MAJCOM’s issued interim guidance to assist the records managers working within the command.

Interim ERM guidance

While AFCA struggled in implementing an approved electronic RMA, the CRMs developed interim guidance for their MAJCOMs to make use of existing IT. One solution, developed by Air Combat Command (ACC) includes: (a) designating an area of the network specifically for ERM, (b) assigning folder/directory permissions based on the RM structure presented in Figure 2, (c) establishing business rules to maintain the ERM structure, and (d) creating folders/directories for electronic files based on an approved office file plan. Figure 3 provides a notional folder/directory structure for storing electronic records that might be developed and implemented under the interim guidance (Bethea, 2003, p. 13).

Coupled with this organized network structure was the interim guidance encouraging a user to input document properties associated with a record. Such guidance tried to utilize existing capabilities of widespread applications, such as Microsoft® Office, to capture metadata about the objects to provide a better search capability. In her article, Bethea (2003) contends that this type of network structure “enforces a periodic

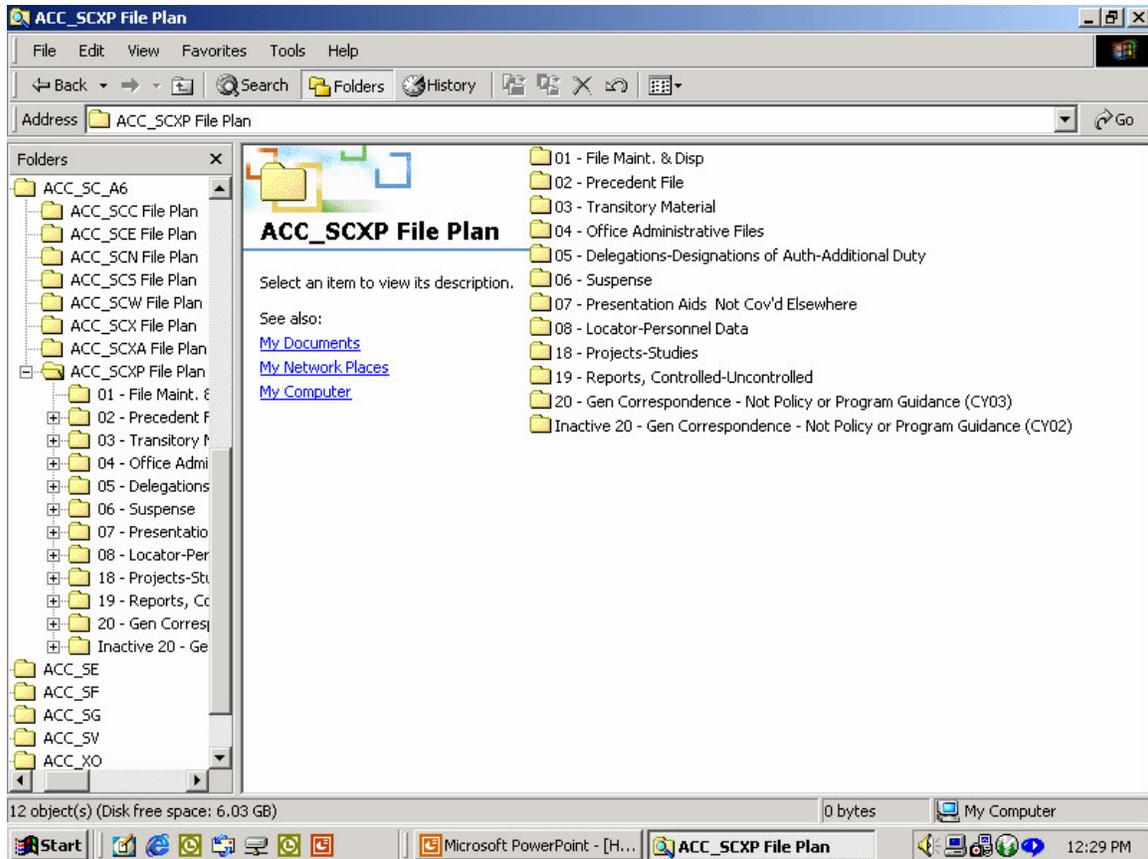


Figure 3. Notional electronic structure for storing records (Bethea, 2004)

review of documents in accordance with business rules and disposition schedules” (2003, p. 13) and “also reduces the infinite growth of your server storage requirements” (2003, p. 13). Such a network structure certainly aids in the storing retrieval of records. One overlooked issue, however, is the lack of an electronically integrated records retention schedule to automatically handle the disposition of all electronic records stored on the network.

Typically, one RC is responsible for managing records within an office of record. Without an electronically integrated records retention schedule to automatically handle electronic records disposition, one person might not be able to responsibly manage such a

large volume of records as the number of records increase. Without an electronic and automated solution, eventually “everyone in the Air Force would have to undergo abbreviated records manager training, which is both cost-prohibitive and time-consuming” (Cabrera, 2003, p. 14).

The USAF RM Workforce.

The duties involved in RM are numerous, and Bantin (2001, p. 17) states “recordkeeping is itself a full-time job” (p. 17). With the onslaught of technology, Cox (2001, p. 2) found that “records managers seemed unable to cope with the increasing use of electronic information technologies to create and maintain records” (p. 2). Deeper in the literature, one finds discussion about the turbulent RM and IT relationship and which of them is driving ERM in organizations (Launchbaugh, 2004; Williams, 2004a).

Despite 1999 Congressional testimony stating that “records management is the initial responsibility of the staff member who creates the record, whether the record is paper or electronic” (U.S. General Accounting Office, 1999) and Kahn’s (2004) assertion that “a successful records management program requires much more than what any one person can deliver” (p. 31), only one USAF career field includes RM in its job description in the mentioned USAF documentation. The career field is titled “Information Management” and is designated with a specialty code beginning with 3A which is also the common lingo used to refer to the personnel in the career field. RM is one of many duties for the 3A career field, and no specialized or formal RM training is required for entry.

According to AFMAN 36-2108, the 3A career field has six primary responsibilities: (a) staff support, (b) publications and forms, (c) records management,

(d) administrative communications, (e) workgroup management (information systems and technology support), (f) operation of Base Information Transfer System and Official Mail Center. Within (c), the specific RM tasks are listed as:

1. Establishes and maintains offices of records
2. Creates manual and automated file plans
3. Applies file cutoff procedures and disposes of and retrieves records
4. Operates and manages automated records information management system
5. Operates and manages a records staging area for inactive records storage
6. Complies with Privacy Act (PA) and Freedom of Information Act (FOIA) procedures and provides assistance to ensure others comply
7. Provides PA, FOIA, and RM training. (Department of the Air Force, 2004, pp. 321-323)

Each USAF career field has required qualification scores for entry into the career field. These qualification scores are derived from four areas of the Armed Forces Vocational Aptitude Battery (ASVAB). For the 3A enlisted career field, the required aptitude score is A-32. The 'A' designates the administrative aptitude area of the ASVAB which measures numerical operations, coding speed, and verbal expression (Sum of Word Knowledge and Paragraph Comprehension). The following table shows the other career fields with an administrative aptitude area requirement, ranking them from highest to lowest based on required score.

In 2003, Cabrera wrote of the 3A career field needing versatile people. He also reported that “ninety percent of 3As are assigned outside the mainstream communications community, working for non-3A supervisors,” (p. 8) and “the vast majority of them reside in one-deep positions in support of other career fields” (Cabrera, 2003, p. 8).

Table 4. Minimum aptitude scores required for career field entry

Minimum required aptitude score	Air Force Specialty Code and Title
A-61	2G0X1-Logistics Plans
A-45	1C0X1-Airfield Management
A-45	1C0X2-Operations Resource Management
A-45	3C1X1-Radio Communications Systems
A-45	3S0X1-Personnel
A-45	3S1X1-Military Equal Opportunity
A-40	5R0X1-Chaplain Service Support
A-32	1A6X1-Flight Attendant
A-32	3A0X1-Information Management

Private sector companies and federal agencies alike employ specialized records officers or certified records managers to support their records management program. When the paper and electronic records are located in a deployed environment, however, the 3A military members (with no specialized or formal RM training) are expected to accomplish all RM and ERM duties in addition to five (or more) other major information management tasks.

Research Framework

The focus of this research is the identification and characterization of the *barriers* to ERM experienced by USAF personnel in the deployed environment. Based on the review of ERM literature, using a socio-technical framework to investigate an organization's ERM activities is appropriate. The framework used as a foundation for this research comes from the knowledge management (KM) literature. Because the relationship between ERM and KM is well established (discussed in the following

paragraphs), the existing KM framework has been determined to be very appropriate for this research. Figure 4 illustrates the Lee and Choi (2003) integrative framework for studying KM. The framework includes two components particularly useful for this exploratory research: (a) enablers (social and technical influencing factors), and (b) process. The Lee and Choi (2003) framework is, thus, used to identify the influencing factors relevant for exploration in identifying and characterizing barriers to ERM. Consistent with Bartczak (2002) and Sherif (2003), factors that positively influence an activity can be seen as enablers, while factors that negatively influence an activity can be seen as barriers.

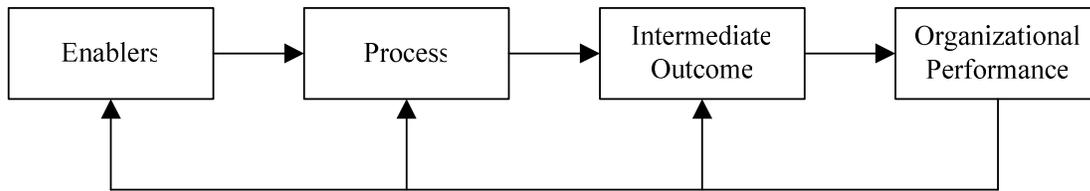


Figure 4. Integrative Research Framework for Studying KM (Lee & Choi, 2003).

Under the statutory definitions reviewed earlier, official records contain information about a federal agency’s past events, transactions, and decisions. In illustrating the relationship between ERM and KM, a recent report contends “records and information are business assets that form the foundation supporting information management and knowledge management” (Electronic Records Policy Working Group, 2004, p12). Duffy (Duffy, 2001, p. 66) explains “there is increasing recognition that the true value of corporate information cannot be exploited unless it is organized and made accessible” (p. 66). The relationship then is hierarchical, with ERM being one component of the broader concept of KM. Hunter (2004) acknowledges differences in KM definitions, but states that “virtually everyone agrees that there is an ‘explicit’

component—knowledge that is already recorded in some way” (p. 269). If one component of KM is accepted as being explicit, objective in nature and typically codified (Bartczak, 2002; Nonaka & Takeuchi, 1995), then electronic records are the epitome of explicit knowledge. It is reasonable then, to expect factors influencing KM to have applicability in exploring ERM. In terms of personnel, Duffy (2001) explains that records and information management professionals, because of their existing training and education, are uniquely poised to lead a KM initiative. The Lee and Choi (2003) framework, then, provides a starting point for evaluating the influencing factors that may act as barriers to ERM in the deployed environment. These influencing factors, or enablers, are discussed next.

Enablers in the Lee and Choi (2003) Framework

Lee and Choi (2003) state that “enablers may be structured based upon a socio-technical theory” (p. 188). Socio-technical theory is based on both social and technical perspectives. The first factor in the Lee and Choi (2003) integrative framework is the enablers component. The enablers component contains both social and technical variables. The social enablers in the framework are (a) organizational culture, (b) organizational structure, and (c) people. The single technical enabler is IT. A discussion of the social and technical enablers, as found in current literature, follows.

Organizational Culture.

An organization can have positive or negative culture(s). “A negative culture can hinder behavior, disrupt group effectiveness, and hamper the impact of a well-designed organization” (Gibson, Ivancevich, Donnelly, & Konopaske, 2003, p. 9). The U.S. General Accounting Office (2002) reviewed RM activities and obtained the views of

record managers in selected federal agencies and reported to Congressional requesters that “records management will likely continue to be considered a low-priority ‘support’ activity lacking appropriate management attention” (p. 32). Values are part of an organization’s culture. They are the “conscious, affective desires or wants of people that guide their behavior” (Gibson et al., 2003, p. 32). Lee and Choi (2003,) state that “culture defines not only what knowledge is valued, but also what knowledge must be kept inside the organization for sustained innovative advantage” (p. 188). Sprehe, McClure, and Zellner (2002) concluded the following about the culture surrounding ERM in an organization:

Agencies and organizations in which employees strongly believe in the importance of recordkeeping to the mission of the agency or organization and, more importantly, see the link between their own jobs and the successful performance of the mission are more likely to perform good [recordkeeping] (RK). (p. 297)

Organizational Structure.

Academically, organizational structure is defined as the “reporting responsibilities in an organization and identifies who manages and controls key resources” (Gordon, 2004). Gold, Malhotra, and Segars (2001) contend that “structures that promote individualistic behavior in which locations, divisions, and functions are rewarded for ‘hoarding’ information can inhibit effective knowledge management across the firm” (p. 188). Lee and Choi (2003) state that “structure influences the behavior of individuals and groups who make up the organization” (p. 188). The structure, then, is an “important cause of individual and group behavior” (Gibson et al., 2003, p. 378). Organizational

structure influences individuals and “may encourage or inhibit KM” according to Lee and Choi (2003, p. 188). With an established chain-of-command, the USAF structure is hierarchical in nature. Functional duties oftentimes blur the hierarchy. For instance, while reporting to one supervisor, involvement in non-primary duties may require following instructions or directions of another individual or group. This is exactly the case witnessed in the structure of RM professionals (detailed in Figure 2), as the structure is one in addition to their primary chain-of-command structure .

Another component of organizational structure found in the literature involves communication and the exchange of information with geographically separated individuals or groups. The entire Air Force is separated into dozens, if not hundreds, of geographically dispersed locations. Yakel (2000) notes that in an organization like the USAF, information “is distributed unevenly and is often inaccessible because it is located in geographically dispersed locations.”

People.

People are the workforce within the organization, and they are “at the heart of creating organizational knowledge” (Lee & Choi, 2003, p. 188). An individual’s education, training, knowledge, and behavior affect ERM and the organization as a whole. In terms of those individuals specifically trained in and responsible for RM, Yakel (2000) states that “records management professionals need to recognize the intellectual capital they control and to capitalize on opportunities for knowledge creation and the enhancement of organizational learning” (p. 24). Every individual is not, however, a trained records manger. Within the USAF, there is a lack of individual knowledge concerning what electronic information constitutes a record and, if so, what to

do with it. A lack of training in and commitment to ERM (Bantin, 2001) leads to poor decision-making—the primary source of RM errors (Sprehe, 2003). In order to positively affect ERM, individuals must be good managers of electronic records, of which “a solid grounding in basic archival principles and techniques is essential” (Bantin, 2001, p. 20). Instead of placing the onus on individuals, an organization could choose IT solutions to manage electronic records.

Information Technology.

As early as 1994, the USAF stated that “massive volumes of electronic data require automated solutions” (Department of the Air Force, 1994). Concerning individuals making RM decisions, Sprehe (2004) contends that “trained records officers are the only people who should be making such decisions.” He advocates IT solutions that allow ERM to “occur in the background, transparent and nonintrusive to end users” (2004). Fortunately, the GAO found that “agencies are turning to automated records management applications to help automate electronic records management lifecycle processes” (U.S. General Accounting Office, 2003, p. 7). IT as an enabler, then, is needed because the increased number of ways to create information makes the number of people currently responsible for ERM insufficient.

One IT aspect of managing electronic records is the accurate identification and classification of such records. A 1996 Air Force Institute of Technology (AFIT) thesis proved automatic classification of records is feasible (Snoddy, 1996), and seven years later “some applications are beginning to be designed to automatically classify electronic records and assign them to an appropriate records retention and disposition category” (U.S. General Accounting Office, 2003, p. 8).

Lee and Choi (2003) recognize IT as enablers that “allow an organization to create, share, store, and use knowledge” (p. 188). With the software applications and infrastructural technologies in today's distributed work environment, an individual can access electronic records from many remote locations. IT does play an important role, then, in the mission of the USAF—“to connect people with reusable codified knowledge” (Lee & Choi, 2003, p. 188). Though efficient, this distributed nature can negatively affect ERM if it leads to “a lack of knowledge concerning what information even exists” (2000). IT can decrease worker productivity if an organizational ERM solution requires the individual to accomplish extra work to support ERM in addition to their primary duty. As IT advances, other issues involving ERM develop. A few of the known examples affecting IT are: (a) obsolescence (hardware and software become obsolete leading to inaccessible electronic records), (b) complexity (dynamic web pages, embedded multimedia, databases), and (c) identification (initial record decision, multiple copies, authenticity).

Chapter Overview

This chapter reviewed existing literature pertaining to this research. The opening dealt with managing records in the modern electronic environment versus the traditional paper-based setting. Prevailing definitions and legal documents were then examined. An examination of known challenges to ERM was presented. An explanation of the U.S. military's approach to ERM, with specific attention paid to the USAF was then provided. The chapter concluded with an explanation of the socio-technical research framework.

III. Methodology

Only in the last few years, with the 1996 Health Insurance Portability and Accountability Act and the 2002 Sarbanes-Oxley Act in response to the Enron and WorldCom debacles, has the topic of ERM received widespread attention. No previous literature, however, was found that addressed ERM in a deployed environment.

The lack of ERM literature in the context of a deployed or geographically-separated environment led to the development of an exploratory case study method to advance our understanding of the barriers to ERM found in the deployed environment. Consequently, the qualitative approach of this study is interpretive in character, with a case study employed to explore and characterize the barriers to ERM that were experienced in the context of a deployed environment during OEF and OIF. Simply put, a case study was used to explore ERM in the deployed environment. A socio-technical framework to study enablers and an examination of the record lifecycle process are used as the foundation for the exploration. Details of these methodological elements are explained in this section. This chapter also presents justification for selecting a qualitative approach and utilizing a case study method, along with the rationale behind the case study's design, the design's quality factors, and information on the data collection and interview process.

Qualitative Approach

In deciding whether to pursue this research qualitatively or quantitatively, many factors were considered. This research was conducted utilizing a qualitative approach because of the research goal, type of available data, and nature of the questions being

asked. In identifying the research topic and goal, a brief literature review revealed a gap in knowledge of the barriers to ERM in deployed locations. The goal of this research is to identify the existence and characterize the nature of the barriers to ERM in the deployed environment.

Rationale for Qualitative Approach.

Leedy and Ormrod (Leedy & Ormrod, 2005) explain that “data and methodology are inextricably interdependent” (p. 93), and for this reason choosing the appropriate methodology “must always take into account the nature of the data that will be collected in the resolution of the problem” (p. 93). Direct observation of the environment under study could not occur because of the associated high financial cost. The qualitative data for this research, thus, came from in-depth interviews with personnel that participated in RM activities while deployed and reviews of pertinent documents. Because qualitative data can “focus on *naturally occurring, ordinary events in natural settings*” (Miles & Huberman, 1994, p. 10), adopting a qualitative approach allowed for answering questions about ERM in the complex deployed environment. Fortunately, “another feature of qualitative data is their *richness and holism*, with strong potential for revealing complexity” (Miles & Huberman, 1994, p. 10).

The initial examination of existing lessons learned (Electronic Records Management Integrated Process Team, 2004) revealed that the unique deployed context might be particularly important to the results. Using a qualitative approach, “the influences of the local context are not stripped away, but are taken into account” (Miles & Huberman, 1994, p. 10). Maxwell (1998) states “qualitative studies are especially useful for understanding the particular *context* within which the participants act, and the

influence this context has on their actions [emphasis in original]” (p. 75). Confining the scope to deployed settings during OEF and OIF allows for the examination of “a specific *case*, a focused and bounded phenomenon embedded in its context” (Miles & Huberman, 1994, p. 10), and an understanding of “how events, actions, and meanings are shaped by the unique circumstances in which these occur” (Maxwell, 1998, p. 75).

To accurately state, and then answer, the research questions, a flexible approach was needed to explore the unknown. Patton (2002) explains that “qualitative inquiry is particularly oriented toward exploration, discovery, and inductive logic” (p. 56). An inductive approach is used in this research to “find out what the important questions and variables are (exploratory work)” (Patton, 2002, p. 57). A qualitative approach, then, is well-suited to answer the research and investigative questions of this exploration. Table 5 (adapted from Leedy & Ormrod, 2005, p. 96) shows some of the other characteristics that typify a qualitative approach.

Some of the characteristics found within this qualitative study of ERM in the deployed environment are (a) exploratory and interpretive, (b) holistic, (c) flexible guidelines, (d) emergent method, (e) small narrative sample, and (f) inductive analysis. These characteristics are indicative of the qualitative characteristics outlined by Leedy and Ormrod (Leedy & Ormrod, 2005) and further support the choice to use a qualitative approach.

Maykut and Morehouse (1994) provide a useful model (Figure 5) that was used as the overarching guide during this research. Using this qualitative approach yielded an exploratory and descriptive focus that resulted in a deeper understanding of the deployed environment, not a generalization of results to other contexts. During ongoing analysis,

Table 5. Qualitative approach characteristics (adapted from (Leedy & Ormrod, 2005))

Question	Qualitative Characteristics
<i>What is the purpose of the research?</i>	To describe and explain To explore and interpret To build theory
<i>What is the nature of the research process?</i>	Holistic Unknown variables Flexible guidelines Emergent methods Context-bound Personal View
<i>What are the data like, and how are they collected?</i>	Textual and/or image-based data Informative, small sample Loosely structured or nonstandardized observations and interviews
<i>How are data analyzed to determine their meaning?</i>	Search for themes and categories Acknowledgment that analysis is subjective and potentially biased Inductive reasoning
<i>How are the findings communicated?</i>	Words Narratives, individual quotes Personal voice, literary style

the emergent design allowed flexibility to refine the focus when necessary. A purposive sample was identified and provided qualitative data—interviews from a small, context-rich sample of experienced personnel that were at deployed locations and pertinent documents and document reviews. Intermediate outcomes from early and ongoing inductive data analysis indicated, when necessary, the need to refine the focus. A case study approach to reporting research outcomes effectively presents a rich narrative.

(Maykut & Morehouse, 1994)

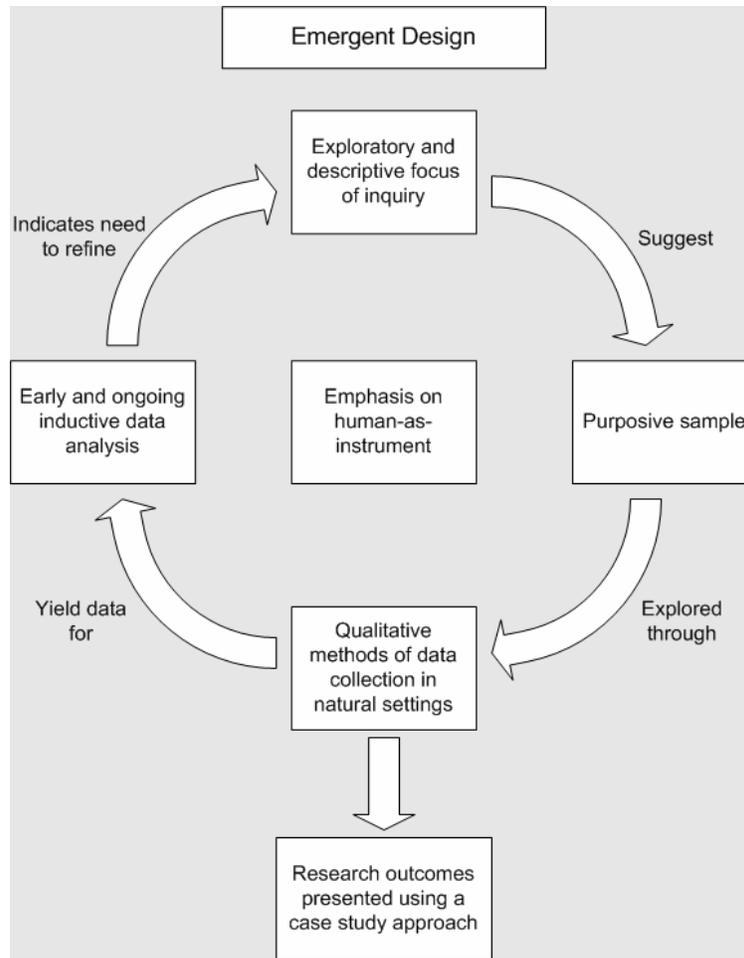


Figure 5. Characteristics of Qualitative Research (Maykut & Morehouse, 1994)

The case study was not just used as the means to report the outcomes as suggested by Maykut and Morehouse (1994). Yin (2003) technically defines the scope of a case study as an “empirical inquiry that

- investigates a contemporary phenomenon within its real-life context, especially when
- the boundaries between phenomenon and context are not clearly evident” (p. 13).

Because the context of a deployed environment is of particular interest in this research and qualitative data was used, a case study was determined to be a suitable method for answering the research questions.

Case Study Method

There are many and varied definitions of *case study* (Leedy & Ormrod, 2005; Maykut & Morehouse, 1994; Patton, 2002; Stake, 1995; Yin, 2003). Because this research used the case study method to answer the research questions, Yin's (2003) definition is used. Yin (2003) states that "the case study as a research strategy comprises an all-encompassing method—covering the logic of design, data collection techniques, and specific approaches to data analysis" (p. 14). Regardless of the chosen definition, Benbasat et al. (1987) believe that "the case research strategy is well-suited to capturing the knowledge of practitioners and developing theories from it" (p. 370). Based on their review of previous case study research Benbasat et al. (1987) detailed eleven characteristics of case studies. Table 6 shows their eleven characteristics. These characteristics of the case study method were compared to the goal of this research. The closely matched comparison combined with consideration of resources and time available for data collection led to the determination that a case study was appropriate for answering the research question.

Although the focus of this study is not on information systems per se, an exploration into the barriers to ERM in the deployed environment may reveal the existence or absence of information systems used while managing electronic records.

Table 6. Key Characteristics of Case Studies (Benbasat et al., 1987, p. 371)

1. Phenomenon is examined in a natural setting.
2. Data are collected by multiple means.
3. One or few entities (person, group, or organization) are examined.
4. The complexity of the unit is studied intensively.
5. Case studies are more suitable for the exploration, classification and hypothesis development stages of the knowledge building process; the investigator should have a receptive attitude towards exploration.
6. No experimental controls or manipulation are involved.
7. The investigator may not specify the set of independent and dependent variables in advance.
8. The results derived depend heavily on the integrative powers of the investigator.
9. Changes in site selection and data collection methods could take place as the investigator develops new hypotheses.
10. Case research is useful in the study of “why” and “how” questions because these deal with operational links to be traced over time rather than with frequency or incidence.
11. The focus is on contemporary events.

The case study method is well-suited for discovery of barriers related to information systems and information technology. Specifically, Benbasat et al. (1987) provide three reasons why a case study is a viable information systems research strategy:

1. The researcher can study information systems in a natural setting, learn about the state of the art , and generate theories from practice.
2. Allows the researcher to answer “how” and “why” questions, that is, to understand the nature and complexity of the processes taking place.
3. A case approach is an appropriate way to research an area in which few previous studies have been carried out. (Benbasat et al., 1987, p. 370)

The objective of this research is to explore a phenomenon that is not well understood, or at least not well documented. According to Yin (2003) “as an exploratory study, any of the five research strategies (experiment, survey, archival analysis, history,

case study) can be used” (p. 6). The rationale, then, behind choosing a case study is (a) the case study allows for investigating a contemporary event within its natural context and gaining a more holistic understanding of the topic (Miles & Huberman, 1994; Yin, 2003) and (b) using a case study captures the knowledge of practitioners (Benbasat et al., 1987) and provided insightful stories that permit a better understanding of the “bounded” system (Stake, 1995).

Case Study Design

Dubè and Pare (2003) suggest reporting certain aspects related to the research to assist the reader in making “informed judgments” (p. 627) about the research. It is useful, then, to identify the traits that define this case study. Consistent with Dubè and Pare (2003), this case study adopts a positivist philosophical approach in that it attempts to construct knowledge from empirical qualitative data. Specifically, the lack of pertinent literature concerning ERM in the deployed environment led the author to adopt an exploratory case study approach (Yin, 2003) to identify and characterize the barriers to ERM. With such barriers identified and characterized, the next logical step after this research would be “to develop pertinent hypotheses and propositions for further inquiry” (Yin, 2003, p. 6). To help understand this research, the design aspects of the case study are presented next.

Yin (2003) writes of four types of designs for case studies: (a) Type 1 is a single-case (holistic), (b) Type 2 is a single-case (embedded), (c) Type 3 is a multiple-case (holistic), and (d) Type 4 is a multiple-case (embedded). This 2 x 2 combination therefore

produces four possible types of basic case study designs (Yin, 1998, p. 241). Figure 6 illustrates the four types of designs.

	single-case designs	multiple-case designs
holistic (single unit of analysis)	Type 1	Type 3
embedded (multiple units of analysis)	Type 2	Type 4

Figure 6. Basic types of designs for case studies (Yin, 1998, p. 241)

This case study utilized a Type 1 design because the focus is holistic and the deployed environment is a unique case. The difference between holistic and embedded in this context is “a case study with only a main unit of analysis may be considered a *holistic* case study” (Yin, 1998, p. 238). As noted earlier, this research employs a holistic approach, thus, a single unit of analysis is appropriate. More discussion about the unit of analysis is contained in a later section. When determining whether to use a single- or multiple-case design, Yin (2003) states “the single-case study is an appropriate design under several circumstances” (p. 39). One of the five rationales for using a single-case study, given by Yin (2003), is when “the case represents an *extreme* case or a *unique* case” (p. 40). Because it is characterized by turnover and change, long duty hours, enemy threats, and a commitment to get the job done, a deployed military location is a

hostile and unique environment that differs from the stable in-garrison setting at fixed air bases. The case study takes advantage of the phenomenon-context interplay with “its ability to deal with contextual conditions, and the reality of many social phenomena is that phenomenon and context are indeed not precisely distinguishable” (Yin, 1998, p. 237). The deployed environment is constantly changing, so in order to explore this previously little-studied area, some constraints were imposed concerning the aspects that constitute the definition of the deployed environment being studied. These constraints are detailed in the next section.

Deployed Environment Definition.

Because the goal of this research is to identify ERM barriers encountered in a *deployed* environment, the researcher chose to examine data from the two most recent military operations. With major combat operations occurring primarily in Afghanistan, OEF began 7 October 2001 when the United States commenced military action in a global war on terrorism. Although OEF is officially in its fourth year now, President Bush announced the end of major combat operations in Afghanistan on 1 May 2003 (Bush, 2003). Six weeks earlier, on 20 March 2003, OIF began with combat operations occurring primarily in Iraq. At the time of writing, OIF is also officially ongoing and considered a major military operation of the United States. The two operations overlap in time, and many personnel, organizations, and military installations simultaneously support(ed) both operations. The inability to clearly separate the scope of the two operations is the primary reason for choosing to use both operations to define the time constraints for this single-case study.

To gain a more holistic picture of the barriers to ERM encountered in the deployed environment, research questions were developed in hopes of gaining “insightful stories rather than statistical information, which leads to a better understanding” (Benbasat et al., 1987). Dubè and Pare (2003) call for an explanation of the “moment data was collected in relation to the time the events occurred” (p. 611). During this research, the author was not able to collect data from individuals while they were deployed; rather, data collection occurred *a posteriori* (Dubè & Pare, 2003).

Concerning the conduct of this research, it was conducted by a USAF officer (1st Lt) that was a graduate student at AFIT from August 2003 through March 2005 as one of the requirements for graduation. The topic of this thesis was selected because, shortly after arriving at AFIT, the author heard reports of ERM problems in the deployed environment and then became aware of a USAF initiative to implement an enterprise information management software tool suite, one component of which is an ERM application. All primary data was gathered via obtainable documents (public and military restricted) and in-depth interviews with USAF personnel that have first hand experience with the topic of investigation.

Concerning the timeframe of this research, informal conversations, discussions, and e-mails commenced in April 2004 and continued until the end of this research in March 2005. Document and archive analysis also occurred intermittently during this same timeframe. Formal interviews were obtained during the single data collection period of September 2004 – January 2005. The following discussion is structured into three sections dealing mainly with the research design, research questions, and data collection methods.

Main Research Question.

To succeed in contributing knowledge, identifying clear research questions is necessary (Dubè & Pare, 2003; Yin, 2003). This research answered the following main research question:

What were the characteristics of the barriers to ERM encountered by deployed USAF personnel during OEF and OIF?

The main research question is written in the form of a “what” question, and Yin (2003) states that “what” questions are appropriate for exploratory research. In answering the main research question, the conclusions draw on the experience of USAF personnel, characterizing the unique barriers experienced in the deployed environment.

Framework.

“The case study inquiry benefits from the prior development of theoretical propositions to guide data collection and analysis” (Yin, 2003, p. 14). Unfortunately, in establishing a framework to guide the exploration, no literature was found that provided precise definitions of the constructs or enablers of ERM in a deployed environment. There was, however, literature characterizing known barriers to ERM in a non-deployed environment (see Electronic Records Policy Working Group, 2004; Sprehe et al., 2002). Dubè (2003) insists that “exploratory case researchers must continue to define *a priori* constructs in order to help them make sense of occurrences, ensure that important issues are not overlooked, and guide their interpretation and focus when conducting theory-building research” (p. 621). Although this research does not claim to produce formal, testable theory, the exploratory nature still benefits from guidance. Chapter II of this thesis details how ERM is linked to KM, and reviews the enablers and process

components of the Lee and Choi (2003) integrative research framework for studying KM (see Figure 7).

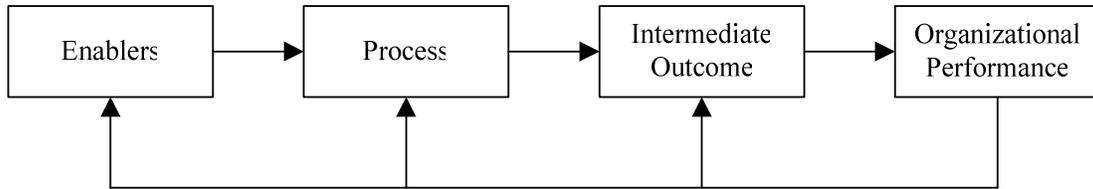


Figure 7. Integrative Research Framework for Studying KM (Lee & Choi, 2003)

Enablers and process were thus chosen as the foundation of this research, since the goal of this research was similar to that of Lee and Choi, only with an ERM focus instead of KM. Based on the elements described in Chapter II, the resultant framework used to guide this research, then, is summarized in Table 7.

Table 7. Research framework used to study ERM (adapted from Lee & Choi, 2003)

Framework components	Elements
Enablers	
<i>Social Perspective</i>	Organizational Culture Organizational Structure People
<i>Technical Perspective</i>	Information Technology
Process	Record Lifecycle

Investigative Questions

To answer the main research question, and based on the adopted socio-technical framework, seven investigative questions (IQs) were developed to guide the research and “ensure that important issues are not overlooked” (Dubè & Pare, 2003, p. 621). The first second, third, and fourth investigative questions were based on the elements of the enablers component in the identified framework. Investigative questions five, six, and

seven were based on the record lifecycle element that comprises the process component of the framework. Table 8 summarizes the IQs and to which exploratory framework element they are related. In pursuing the purpose of this research (to identify and characterize the barriers to ERM that exist in the context of a deployed environment), the use of these seven questions “directs attention to something that should be examined within the scope of the study” (Yin, 2003, p 22). The emergent design allowed the exploration to continue outside of the IQs based on a respondent’s input or the results of document reviews. The combination of emergent design with initial IQs allowed the research to be both flexible and directed towards the goal.

Unit of Analysis.

In defining the case study, perhaps no other single criteria is as important as accurately defining the unit of analysis. Yin refers to the unit of analysis as the “basic definition of the ‘case’” (Yin, 1998, p. 237). Since this research adopts a holistic single-case approach, the unit of analysis is identified primarily by examining the main research question and the case definition (Yin, 2003). In defining the unit of analysis, Patton(2002) suggests considering what it is that one wants to report about upon completion of the research. “Regardless of the unit of analysis, a qualitative case study seeks to describe that unit in depth and detail, holistically, and in context” (Patton, 2002, p. 55). Again, the goal in this research is to identify and characterize *barriers*. As discussed in Chapter II, barriers (negative influencing factors) can be viewed as the opposite of enablers. Barriers, then, are essentially the challenges that adversely affect (hinder, discourage, or otherwise prevent) ERM in the deployed environment.

Table 8. Investigative Questions

Framework elements	Investigative questions
<i>Organizational Culture</i>	IQ1: What were the characteristics of the organizational culture barriers to ERM encountered by deployed USAF personnel during OEF and OIF?
<i>Organizational Structure</i>	IQ2: What were the characteristics of the organizational structure barriers to ERM encountered by deployed USAF personnel during OEF and OIF?
<i>People</i>	IQ3: What were the characteristics of the people barriers to ERM encountered by deployed USAF personnel during OEF and OIF?
<i>Information Technology</i>	IQ4: What were the characteristics of the information technology barriers to ERM encountered by deployed USAF personnel during OEF and OIF?
<i>Record Lifecycle</i>	IQ5: When creating records, what were the characteristics of the barriers to ERM encountered by deployed USAF personnel during OEF and OIF? IQ6: When maintaining and using records, what were the characteristics of the barriers to ERM encountered by deployed USAF personnel during OEF and OIF? IQ7: When addressing the disposition of records, what were the characteristics of the barriers to ERM encountered by deployed USAF personnel during OEF and OIF?

The appropriate unit of analysis, thus, is the ERM policies, practices, and activities in a deployed environment during the OEF/OIF timeframe specified in the scope section of this chapter. While examining the ERM policies, practices, and activities, barriers can be illuminated without assuming that they necessarily exist. The practices and activities are further refined by utilizing the targeted IQs to explore the following aspects:

(a) organizational culture, (b) organizational structure, (c) people, (d) information technology, and (e) the record lifecycle.

Criteria for interpreting the findings.

Properly executed inductive logic with an established chain of evidence will provide a rich case study database from which themes emerge, thereby enabling the "pattern-matching" (Yin, 2003). Using inductive logic during pattern matching activities, the researcher continually asked the following types of questions about the data to interpret the findings

- Are there characteristics in the deployed environment that act as barriers to ERM?
- Are there unique characteristics of this data considering some of the known aspects of the deployed environment (e.g. high operations tempo, individual dedication to mission, threat of ambush)?
- How is the current data being reviewed consistent or contradictory with existing literature on ERM barriers?
- Is the current barrier being analyzed common among other sources of data?
- Is there a pattern within the data related to or similar to the barrier currently being analyzed?

Through an examination of ERM in the deployed context and with barriers identified, characterized, and differentiated from known challenges to ERM, the research questions are answered. Answering the questions, though, requires interviewing individuals with first-hand experience in the deployed environment. The collection of data in this research is discussed next.

Data Collection

Creswell (1998) states “the idea of qualitative research is to purposefully select informants (or documents or visual material) that will best answer the research question” (p. 148). Accordingly, data was generated from multiple, purposefully chosen sources. The principal method of data collection was in-depth, semi-structured interviews (telephone and in-person) with targeted USAF personnel that were responsible for RM activities in a deployed environment during OEF/OIF. These formal interviews were conducted from October 2004 – January 2005 and occurred after an individual returned from a deployment (maximum two years). The targeted personnel are, or were at the time of their deployment, in the 3A career field that was detailed in Chapter II; the closely related 3C (Communications-Computer Systems Operator) career field was also accepted as a respondent in this research because the individual participated in RM decisions and directed RM tasks while deployed. In relation to a non-military career field, the 3A can be thought of as a records and information management professional and the 3C as an IT professional. A total of 12 formal interviews were conducted with USAF personnel. Table 9 shows the number of interviews per career field and managerial tier.

Table 9. Formal Interviews Conducted

Number of people interviewed	Career field and managerial level
5	3A Senior Non-Commissioned Officer
4	3A Non-Commissioned Officer
2	3A Airman
1	3C Senior Non-Commissioned Officer

The other source of information was document reviews. Figure 8 illustrates the primary sources used in the document reviews. These items were analyzed to gain additional insight into the barriers. Secondary sources, such as GAO reports, other scholarly research, magazine articles, and white papers were used as a cross-check for the findings generated by the analysis of the interview data and document reviews.

Legal documents	Informal conversations
DoD directives	Slide presentations
USAF instructions	Meeting minutes
USAF Strategy documents	Personal e-mails
USAF Organizational memos	Interim ERM plan

Figure 8. Primary sources of data for document reviews

During data collection, there were two main categories of grouped data: (a) interview transcripts and notes, and (b) documents and document review notes. A brief note annotating the relevant content and connections (if any) with other items was inserted on every item in the two categories of data.

Maykut and Morehouse (1994) suggest collecting data until no new information is uncovered or a saturation point is reached when newly collected data is redundant with existing data. This research does not contend that no other barriers exist, rather that the collected data reached a redundancy point that made it reasonable to stop. In evaluating the interview data, it is helpful to understand the approach of this research.

Interview Guide Approach.

The interview guide (Appendix B) contains suggested questions and issues that the researcher used to explore and use when pursuing lines of inquiry (Lofland & Lofland, 1995). The questions in the interview guide focused the interview on the

components of the socio-technical framework described earlier. By using the interview guide, the same lines of inquiry were pursued, though not always obtained, with each respondent. Patton (2002) states that using a guide “helps make interviewing a number of different people more systematic and comprehensive by delimiting in advance the issues to be explored” (p. 243). Using an interview guide approach forced the researcher to define topics and issues in advance and allowed the researcher to decide the sequence and wording of questions during the course of the interview (Patton, 2002). It is true that important and salient topics may have been inadvertently omitted, however the flexibility of the approach did allow for exploring unanticipated responses (Patton, 2002).

In designing the interview guide, the topics were sequenced in a logical manner that would make sense to the respondent, as suggested by Lofland and Lofland (1995). The interviews were tailored to each particular person and focused on their perceptions of ERM in the deployed environment. In concluding each interview, the respondent was asked if there were questions that “should have” been asked. No affirmative reply was ever given.

All respondents volunteered to participate in an interview. The voluntary, fully informed consent of the subjects used in this research was obtained as required by 32 CFR 219 and AFI 40-402. Appendix C contains the human subjects approval and authorization to begin data collection.

Interviewing

Interviews are an essential source of case study data, according to Yin (2003). The time spent during the interviews in this research was 24+ hours. The interviews were

semi-structured and the questions were open-ended, providing the respondents an opportunity to share information about their background, their experience, and their perceptions of ERM in the context of a deployed environment. The use of open-ended questions allowed the researcher to explore the informants' responses to the questions. This flexibility helped each informant "reconstruct his or her experience within the topic under study" (Seidman, 1998, p. 9) and helped the researcher to understand "the world as seen by the respondents" (Patton, 2002, p. 343). By utilizing semi-structured interviews and open-ended questions, respondents could use their own words to describe ERM in the deployed environment as they experienced it.

The interviews were focused by the investigative questions and were of an open-ended nature. Lofland and Lofland (1995) call this style "intensive interviewing" and characterize it as a guided conversation seeking rich, detailed data. Importantly, they point out that in contrast to the structured interview that seeks to determine the frequency of preconceived kinds of things, the unstructured interview seeks to find out what kinds of things exist in the first place (Lofland & Lofland, 1995). A guide was used that listed prompts, themes and notional questions rather than a rigid series of questions with predetermined answers. All of the formal interviews were tape-recorded and subsequently summarized or transcribed. To find eligible respondents, different avenues were used to identify and request volunteers.

Sample Selection.

Defining a meaningful sample for qualitative research is different from quantitative sampling. A quantitative study necessitates a sample size large enough to reduce variability down to an acceptable value, whereas in this qualitative work a

carefully selected group of individuals contributed more to understanding the ERM barriers encountered than would a large random sample. Patton (2002) states “sample size depends on what you want to know, the purpose of the inquiry, what’s at stake, what will be useful, what will have credibility, and what can be done with available time and resources” (p. 244). Thus, consistent with Maykut and Morehouse (1994) and Patton (2002), no decision was made *a priori* as to how many people to include in this study. As detailed in Chapter II, only one USAF career field has RM training and activities in their documented responsibilities. It was thought that these individuals would provide the richest source of data concerning ERM in the deployed environment. Although no other career fields were ruled out, the main thrust of identifying respondents focused on the 3A career field. Of those who responded, no respondent was turned away.

In seeking volunteers, three procedures were used. The first procedure was the posting of a message in two separate electronic domains frequented by 3A personnel. The first message (Appendix D) was posted on Enterprise Corporate Analysis - Time Saver (ECATS), which is an ad hoc interactive web-based information exchange divided into issues (<https://ecats.amc.af.mil/ecats/>). The request for volunteers was posted on an issue called “Electronic Records Management (ERM) - Deployed Environment.” All subscribers (114 at the time of posting) received notification of the posted message. A similar message (Appendix E) was posted to a listserv dedicated to 3A personnel (WM@infosphere.scott.af.mil). 848 subscribers were automatically sent the message when the researcher sent the message to the listserv. Seven respondents were identified from this procedure.

The second procedure used to request volunteers was performed by the researcher who personally contacted known RM professionals throughout the USAF. Most were not interview respondent candidates themselves, but they had enough knowledge of the subject material to warrant contacting them to identify other potential respondents. Contact was made with the USAF Records Officer and five CRMs. These contacts then attempted to find interview candidates through their respective channels. Three respondents were identified as a result of this procedure.

The third procedure attempted “snowball sampling” which is defined as “identifying a few members of a rare population and asking them to identify other members of the population, those so identified are asked to identify others, and so on” (Thompson, 2002, p. 183). During each interview, the respondent was asked who else might be worthwhile to interview. This “snowball” approach was only successful two times.

Research Design Quality

Four aspects primarily establish the positivist criteria for rigor and have commonly been used to establish the quality of any empirical social research: (a) construct validity, (b) internal validity, (c) external validity, and (d) reliability (Dubè & Pare, 2003; Patton, 2002; Yin, 2003). The following sections address the four conditions related to design quality as they pertain to this research. Table 10 contains a summary of how each of the four aspects were addressed in this particular research.

Table 10. Design quality summary for this case study research

Design Condition	Tactics used
<i>Construct Validity</i>	Multi-method approach used to data collection Conclusions developed from collected data Cross-referenced interview data
<i>Internal Validity</i>	IQs matched with empirical patterns from data Open coding and pattern matching Convergence of multiple data sources
<i>External validity</i>	Compared findings to similar existing literature No explicit claims made about generalizability Purposeful case and respondent selection
<i>Reliability</i>	Case study notes (transcripts and documents) Interview guide Case study protocol

Construct Validity.

According to Yin (2003), multiple sources of evidence increase construct validity when used “in a manner encouraging convergent lines of inquiry”(p. 36). To increase construct validity, then, a multi-method approach was employed to collect data. The first data source was semi-structured interviews (telephone and in-person) with USAF personnel responsible for RM activities in a deployed environment. The second source of information was document reviews. The documents were analyzed to gain additional insight into the barriers. Secondary sources, such as GAO reports and other scholarly research were then used as a cross-check for the findings generated by the analysis of the data.

Internal Validity.

Yin (2003) suggests that internal validity is perhaps “only a concern for causal (or explanatory) case studies, in which an investigator is trying to determine whether event x

led to event y” (p. 36) and thus not applicable to exploratory research. In the conduct of this exploratory research, internal validity, or the extent to which accurate conclusions were drawn from the research design and obtained data, is related to credibility and believability (Leedy & Ormrod, 2005; Miles & Huberman, 1994; Patton, 2002). The inferences drawn from the collected interview transcripts, interview notes, and document review were qualitatively and inductively generated using pattern matching. Internal validity and the conclusions of this case are more logical than statistical. Converging multiple sources of data support the conclusions and help to eliminate other possible explanations for the results, or rival explanations (Leedy & Ormrod, 2005; Yin, 2003).

External Validity.

External validity is commonly thought of as whether, and the extent to which, the research findings can be generalized beyond the immediate case study (Leedy & Ormrod, 2005; Miles & Huberman, 1994; Yin, 2003). Yin (1998) states that, in fact, “generalizing from case studies is not a matter of *statistical generalization* (generalizing from a sample to a universe) but a matter of *analytic generalization* (using single or multiple cases to illustrate, represent, or generalize to a theory” (p. 239). The data of this research is non-numerical and therefore conclusions cannot be generated that are based on statistical inference and generalized to a larger population as in a quantitative approach. Stake (1995) comments that “the real business of case study is particularization, not generalization” (p. 8), and goes on to say that the emphasis is on uniqueness or “understanding the case itself” (p. 8). Purposefully selecting the case, and subsequently the respondents, permits “inquiry into and understanding of a phenomenon in depth” (Patton, 2002, p. 46). In defining a purposeful case and sample, Patton (2002) writes

“information-rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the research, thus the term purposeful sampling” (p. 46). The task in this exploratory case study was to develop rich contextual data from a small number of experienced individuals about ERM in the deployed environment.

Reliability.

In discussing reliability, Yin (2003) states “the goal of reliability is to minimize the errors and biases in a study” (p. 37). To achieve this goal in case studies, Yin (2003) suggests reliability is established by using a case study protocol and developing a case study database. The underlying issue here, according to Miles and Huberman (1994), is whether the process of the study is consistent, reasonably stable over time and across researchers and methods. Benbasat et al. state that “a clear description of the data sources and the way they contribute to the findings of the research is an important aspect of the reliability and validity of the findings” (p. 381). This chapter covers this requirement by describing the methodology and including a description of the data collection and sources. Appendix B contains the interview guide or protocol used with every respondent.

Limitations

In this exploratory, qualitative research, the first known limitation is the emphasis on “human-as-instrument” (Maykut & Morehouse, 1994). Despite a conscious effort to remain as objective as possible, unintentional bias might be injected during interviews, observations, and inductive reasoning. The researcher may unintentionally skew, or spin, the results due to familiarity with the subject area. “Rather than decrying the fact that the

instrument used to gather data affects this process, we say the human interviewer can be a marvelously smart, adaptable, flexible instrument who can respond to situations with skill, tact, and understanding” (Seidman, 1998, p. 16).

An inability to generalize the findings and results is another limitation of this research. This exploratory research targets one specific case and does not attempt to generalize to other organizations. Time as a confound is also present in this type of research, as interviewees may not accurately recall exact details of events and issues occurring up to two years earlier. When using interviews as a primary data source, the interviews should always be considered verbal reports only. They are subject to the common problems of bias, poor recall, and poor or inaccurate articulation (Yin, 2003).

Chapter Overview

Details of these methodological elements are explained in this section. Justification was presented for selecting a qualitative approach. Also offered were the rationale underlying the use of a case study method, the logic of the case study’s design, the design’s quality factors, and information on the data collection and interview process.

IV. Analysis and Results

The purpose of this research was to identify and characterize the barriers to the management of electronic records in the deployed environment context. Through the exploration of this research, aspects that hindered, discouraged, or otherwise prevented ERM were sought and analyzed. This chapter presents the analysis and results of the collected qualitative case study data. The chapter presents first a summary of the interview data and an overview of the inductive analysis process. After describing the analysis process, the results are then presented to answer each investigative question.

Interview Data Summary

Individuals from different managerial levels were sought to provide differing perspectives of the barriers to ERM experienced in the deployed environment. When conducting the interviews, a brief discussion of the respondent's background was accomplished first. Respondents were then specifically asked about their AFSC (job specialty code) and their managerial level (rank) at the time of deployment. The number of respondents from each AFSC and managerial tier is presented in Table 11.

A sample size of twelve respondents, although seemingly small, provided ample data for this research. The interviews were conducted with a wide range of personnel in terms of experience and rank and provided rich data for analysis. The respondents' comments were sufficiently useful in illuminating credible barriers to ERM.

During each discussion of the respondents' background, the researcher also asked about the location to which they deployed. In an effort to fully investigate the deployed environment, a variety of individuals were sought, some who deployed to operational

Table 11. Demographics of interview respondents

AFSC	Managerial Tier	# Respondents	
3A	<i>SNCO</i>	5	
	<i>NCO</i>	4	
	<i>Amn</i>	2	
3C	<i>NCO</i>	1	
		12	<i>Total</i>

units and some who worked in an Air Operations Center (AOC). An operational unit is one with a specific mission (e.g. communication squadron, fighter squadron). The AOC is the nerve center, a highly complex command and control node, for theater aerospace combat power. In wartime, the AOCs deal with staggering amounts of information, including potential record-quality material. Table 12 illustrates the countries to which the respondents deployed and denotes whether a respondent was interviewed that worked in an AOC at the location.

Analysis and Results Overview

The investigative framework for this research (presented in Chapter III) was based on the integrative model for studying KM proposed by Lee and Choi (2003). The socio-technical framework was then used to develop investigative questions to examine pertinent areas relevant to this exploration. The interview data was continually analyzed with the investigative framework in mind, trying to identify organizational culture, organizational structure, people, IT, and records lifecycle barriers to ERM in the deployed environment. This case study was designed with the ability to adjust

Table 12. Deployment locations of respondents

Year	Locations
2002	<i>Manas AB, Kyrgyzstan Prince Sultan AB, Saudi Arabia* Incirlik AB, Turkey</i>
2003	<i>Baghdad, Iraq Ali Al Salem AB, Kuwait Al Udeid AB, Qatar* Prince Sultan AB, Saudi Arabia* Incirlik AB, Turkey</i>
2004	<i>Baghdad, Iraq Ali Al Salem AB, Kuwait Manas AB, Kyrgyzstan Al Udeid AB, Qatar*</i>

* One or more respondents worked in air operations center

subsequent data collection activities based on comments mentioned by respondents as the data collection process continued.

Inductive analysis was used as the data analysis technique in this research. The specific analytical technique used is what Yin (2003) calls “pattern matching” and what Strauss (1998) calls “conceptual ordering.” The goal of both is seeking the important and interesting emergent themes (Seidman, 1998). In executing this inductive analysis, the collected data was organized into discrete categories according to its properties. The initial coding of the interview data, according to Lofland and Lofland (1995), is the concrete characterization of the abstract data, the emergent induction of analysis.

In analyzing the transcripts of each interview, respondents’ comments were characterized and then organized into categories. Each transcript was analyzed in light of and in relation to characterizations of barriers already identified in previous interviews.

The data, thus, fed into the framework during the iterative data collection and analysis

process. If a subsequent interview was dissimilar to previous interviews, then new characterizations were added.

The initial pass through each transcript occurred within a couple of days of the interview. During the initial passes, the researcher categorized the data by identifying characterizations of the respondents' comments about their experiences with ERM in the deployed environment. A total of 40 separate characterizations emerged, and the results are contained in Figure 9. The characterizations listed in Figure 9 denote the central topic of a respondent's comment. For example, if a respondent stated "I could not access an electronic record during certain times," then the central characterization for this comment was listed as *accessibility*.

<i>accessibility</i>	<i>enforcement</i>	<i>maintenance</i>	<i>resources</i>
<i>accountability</i>	<i>environment</i>	<i>motivation</i>	<i>standardization</i>
<i>ad hoc</i>	<i>FOIA requests</i>	<i>ownership</i>	<i>org. structure</i>
<i>behavior</i>	<i>identification</i>	<i>people</i>	<i>support</i>
<i>collaboration</i>	<i>info ownership</i>	<i>personnel</i>	<i>taxonomy</i>
<i>complexity</i>	<i>integration</i>	<i>policy</i>	<i>timeliness</i>
<i>org. culture</i>	<i>interoperability</i>	<i>policy (lack of)</i>	<i>training</i>
<i>decentralization</i>	<i>IT</i>	<i>prioritization</i>	<i>turnover</i>
<i>disparity</i>	<i>leadership</i>	<i>process</i>	<i>utilization</i>
<i>disposition</i>	<i>legal</i>	<i>record identification</i>	<i>workload</i>

Figure 9. Terms used to characterize respondents' comments about ERM in the deployed environment (1st pass)

After all interviews were conducted, a second and third pass through all of the interview transcripts were then accomplished. The respondents' comments were already characterized during the first time through the transcripts. The second and third passes through the transcript data, thus, can be best categorized as focused coding or the process of winnowing out less productive and useful themes/patterns and focusing in on a selected few (Lofland & Lofland, 1995). Characterizations within the selected categories

were expanded, while other characterizations were collapsed or dropped. The second pass was conducted in an effort to identify overlapping and redundant terms, as well as correct any misidentifications of themes or misrepresentation of the respondents' comments. During the third pass, all similarly characterized excerpts were examined together. The third pass sought to connect related concepts and identify overarching themes. After completing the third pass through the interview transcripts and reviewing notes from the document reviews, 18 characterizations had emerged. Further analysis and grouping of the 18 characterizations produced 15 barriers connected by five overarching themes. Each of the 15 identified barriers to ERM in the deployed environment exist throughout the records lifecycle. The individual characterizations, the overarching themes, and the results of each investigative question are presented next.

Results Overview.

Once all interviews were complete, the researcher searched for patterns and connections in the data that might be called themes. Five general themes of barriers emerged from the analysis of the 18 individual sets of respondents' characterizations. Table 13 illustrates the 18 characterizations, categorized by their overarching theme. All of the characterizations in Table 13 are in the context of ERM, as experienced by individuals who deployed during OEF and OIF.

Explanation of Results

This section explains the results in detail. Each of the 18 underlying characterizations of the respondents' comments are explained. This exploratory research was conducted with investigative questions developed from the guiding socio-technical

Table 13. Categorization and characterization of respondents' comments

Categories	Excerpt Characterizations
Organizational Culture	<i>Non-Reinforcing Behavior/Beliefs/Values</i> <i>Minimal Collaboration</i> <i>Low Prioritization</i> <i>Generation Gap</i> <i>High Ops Tempo and Pers Tempo</i>
Organizational Structure	<i>Insufficient Support Structure</i> <i>Prohibitive Workload</i> <i>Misuse of Personnel</i> <i>High Turnover Rate</i>
IT	<i>Lack/Misuse of IT Capabilities</i> <i>Complexity of Systems</i>
Records Lifecycle	<i>Record Creation Problems</i> <i>Record Maintenance and Use Problems</i> <i>Record Disposition Problems</i>
Organizational Guidance	<i>Lack of Policy and Direction</i> <i>Lack of Standardization</i> <i>Lack of Accountability</i> <i>Inadequate Training</i>

framework (see Chapter II). After collecting data with this framework, it logically follows that most of the inductively produced categories are similar to the original guiding framework. Table 14 illustrates a comparison between the original categories of the investigative framework and the inductively generated categories of barriers.

In discussing the results of this research in depth, each investigative question is considered, except for the third one. The third investigative question was originally stated as

IQ3: What were the characteristics of the people barriers to ERM that Air Force personnel encountered while deployed during OEF and OIF?

An analysis of the collected data did not generate any results specific to IQ3. The data showed that the *people* barriers were similar to and encompassed in the *organizational culture* and *organizational guidance* characterizations and themes.

Table 14. Comparison of original framework categories to resulting categories

Categories of original investigative framework	Categories of barriers inductively generated from collected data
Organizational Culture	Organizational Culture
Organizational Structure	Organizational Structure
People	
IT	IT
Records Lifecycle	Records Lifecycle
	Organizational Guidance

Investigative Question #1—Organizational Culture.

The first investigative question centered on the organizational culture influence factors that act as barriers to ERM in the deployed environment. The first investigative question was stated as

IQ1: What were the characteristics of the organizational culture barriers to ERM encountered by deployed USAF personnel during OEF and OIF?

As stated earlier in Chapter II, organizational culture is a set of collective norms (values, assumptions, and beliefs), which are held by the organization’s members. The norms, as well as the collective actions of leaders, managers, and individuals, influence the culture. In general, the respondents described a culture not conducive to accomplishing ERM in the deployed environment. The described culture was not one

that blatantly rejected ERM. Rather, the culture was one that did not elevate ERM to a level of importance needed to encourage the accomplishment of ERM or one that recognized the added value in properly managing electronic records in the deployed environment. It was an environment where the Communications & Information (C&I) leadership was typically focused on the communication aspect of the career field and not the information. The data showed that C&I personnel were typically concerned about issues such as network throughput, satellite communications, and e-mail reliability; but they were typically not concerned about managing the actual information (the other half of the C&I career field). Meanwhile other personnel, outside the C&I career field, were too busy with their primary jobs to concern themselves with ERM. The *organizational culture* category is comprised of five groups themes that characterize the respondents' comments. These specific themes are discussed next.

Non-Reinforcing Behavior/Beliefs/Values

In general, the respondents indicated a lack of reinforcing behaviors to implement or sustain ERM in the deployed environment. The described lack of reinforcing behaviors included comments regarding a widespread "save everything" paradigm prevalent among most users. The typical end-user was described as saving all data, information, and records in a manner only meaningful to that single individual or their local work center. Individual work centers bought 200GB USB storage devices to address their perceived storage needs. The data revealed the inexpensive nature of electronic storage propagates the "save everything" philosophy. Respondents noted that personalized electronic storage systems were procured with no ERM consideration, as the

users intent was only to save their individual data, not manage the data as organizational information and records.

Along with the “save everything” mentality, the interview data illuminated a systemic resistance to suggestions concerning how individuals should store and share their information. The respondents described scenarios where other personnel were unconvinced that any given ERM proposal would work to increase information sharing. The unconvinced personnel did not believe the records would actually be accessible when needed most. The 3A personnel were not allowed access to certain work centers by personnel commonly using the reasoning that the 3A did not have a "need-to-know." The “need-to-know” rationale is largely based on the classified nature of the data, information, and records in the deployed environment. The respondents described a “close-hold” environment where non-3A personnel insist on controlling and storing their own information. The described controlling and storing of information/records occurred locally, within a work center, on local computers, and typically in unique, non-standardized ways. Even with users hoarding all of their information, respondents described instances where individuals were unable to locate their own information. Some causes of not being able to find one’s own information/records were explained as: a) users having electronic “shortcuts” on their computer, while not knowing where the actual data resided, and b) users simply forgetting where they saved the item, while not knowing how to electronically search for it. The respondents recognized this issue as being important because, they reasoned, if the users could not find their electronic items during day-to-day operations, imagine the difficulty when working under more hostile conditions and increased pressure.

One aspect of the culture described by the respondents concerned a general trend of personnel (3A and non-3A) becoming accustomed to accomplishing tasks however they see fit. A "whatever works for you" mentality, possibly fostered by vague AFIs, was experienced by the respondents when attempting to accomplish information and records management related tasks. The respondents described feelings of frustration in watching the non-3A personnel accomplish their mission with no regard for ERM. Jets were flown, missions were planned, decisions were made, but individuals did not incorporate tasks relating to the records lifecycle process into their day-to-day duties. ERM is a duty that most USAF personnel either did not know about or did not want to accomplish. Typically, non-3A individuals shy away from ERM while focusing mainly on their specialized function (e.g. flying, analyzing, repairing). ERM duties were viewed as unimportant administrative tasks to many individuals responsible for tasks involving operations, maintenance, or support in the deployed environment. Concerning some of the administrative duties (especially ERM), individuals would say "just tell us what you want us to do, as long as it doesn't interfere with operations that we need to get done."

3A personnel are not exempt from exhibiting non-reinforcing behaviors, beliefs, and values themselves. Many 3A personnel simply did not want to do ERM, an administrative duty for which their career field traditionally is responsible. 3A personnel are oftentimes specialized in workgroup management (WM) duties that include information systems and technology support. Once they work in the WM role, they do not want to return to traditional information management core functions, such as ERM. One reason provided by the respondents was a lack of motivation to do ERM fostered by

a belief that the program rarely worked as advertised and was typically surrounded only by negativity.

The respondents also commented on ERM not being a forethought in the initial planning phases when new systems are being considered for implementation. The respondents noted this inaction concerning ERM led to major problems when later the USAF needed to manage as records the information created or captured by new systems. Also noted was the recognition that attempts to accomplish ERM after a system is fielded were typically done half-heartedly and unsuccessfully. With no forethought given to how the information might be managed as a record, the long-term consequences of not considering ERM during system development are detrimental to accomplishing ERM in the deployed environment.

Minimal Collaboration

Collaboration in this research is used to mean “the degree to which people in a group actively help one another in their work” (Lee & Choi, 2003, p. 190). The respondents described situations during their deployment where decisions concerning ERM were inconsiderate of the impact on other career fields. Sometimes a decision was made with no consultation with a 3A, like buying personal electronic storage mechanisms for official information and records. Sometimes a 3A decided to make a change without telling the end user, like locking permissions on a certain electronic file folder. Both situations were reported and demonstrate lack of knowledge that a change in ERM policy by both 3As and end users may have a far-reaching impact. Implications from decisions affecting ERM were reported to be easily recognizable by the IT, historian, and legal professions. Many other USAF personnel, however, were not aware of the impact their

decisions had on ERM because there is little collaboration with the personnel who have corporate knowledge about ERM. Additionally, the higher ranking personnel were described as typically being outwardly uncomfortable asking junior 3A personnel how to store their information and records. This situation was compounded when 3A personnel were assigned to a unit or office where they were unfamiliar with the mission. The 3A personnel were expected to find out what kinds of records for which a unit was responsible, on which type of media the records were stored, and in what format they were transmitted. Without specialized knowledge of how a work center operates and because collaboration was minimal, the respondents characterized 3As as sometimes ineffective in assisting their work centers in managing electronic records.

A divide between 3C (IT) and 3A (IM) personnel was described, with minimal collaboration witnessed or experienced between the two. Tension was created because the WM role performed by the 3A personnel is very similar to, if not sometimes overlapping with, the duties performed by the 3C personnel. Some of the 3A respondents experienced feelings of being viewed merely as "paper-pushers" by colleagues in the 3C career field. 3C network control center (NCC) personnel sometimes would not grant 3As the rights to modify access permissions to setup the directories needed to effectively implement an electronic filing structure on the local area network (LAN).

Low Prioritization

The prioritization issue found in this research deals with the relative order of importance among ERM and other duties or programs. The data revealed the existence of an environment keen on ensuring the war fighting mission always gets done—at any expense. The respondents witnessed others doing their very best to accomplish the main

mission. All “non-essential” duties were naturally moved down on the list of priorities. Consequently, ERM was seen as a duty or program with less importance in the deployed environment because personnel were so focused on getting their main job accomplished. Even 3As were sometimes not able to do ERM because of being overtasked and focused on WM duties. When safe shelter and warm food do not even exist, having a sound ERM program is pushed way down on the list of priorities. This is similar to the situation faced by personnel when setting up a bare base. Computers were turned on right after the tents were set up, but in one reported case, ERM was not addressed until approximately three months later.

Interestingly, ERM received much higher priority during two distinct timeframes: a) the time during the movement of an AOC from Saudi Arabia to Qatar, and b) the time when each individual was scheduled to rotate back home. The respondents repeatedly described these two timeframes as the only time ERM received any priority. When moving the AOC, there was a concern for ERM because one goal was to not lose any information or records during transition. Also, when 3As rotate out of the deployed environment, there are concerns about ERM because one goal is to ensure process and procedural continuity between rotating personnel.

The data revealed that the warfighting mission was always higher priority than properly managing records. ERM did not happen until the warfighting effort was reduced and the time for some units and personnel to go home arrived. In the day-to-day deployed environment, leadership typically did not push ERM as an essential duty for everyone. Rather, it was the job of a few 3A personnel to bring some sort of ad-hoc ERM solution together on the fly. One respondent voiced concerns about ERM during

one deployment, only to find the same issues were still unresolved during a return visit months later. According to the respondents, there simply was no expectation or emphasis for ERM because the daily hot topics were always the order of the day.

The respondents described a common perception among non-3A personnel of ERM being viewed as the exclusive responsibility of the 3A personnel. Without a perceived personal stake, ERM efforts were thwarted by non- or half-participating personnel. The data showed that when senior leadership did not demand ERM or middle-management did not promote ERM, an abandonment of the ERM program occurred, if one was ever started.

Generation Gap

The interview data provided a rich source of data concerning the existence of a generation gap within the 3A career field itself. The more senior “career 3As” view their job differently than the more junior “first-term” 3As. The focus for the former is on traditional IM duties, whereas the focus for the latter is on WM duties. A natural divide now exists where the senior 3A resists the WM role and the junior 3A resists the traditional IM role, including ERM. Respondents noted the staff support (e.g. administrative communication or records management) responsibilities are becoming less and less desirable duties for everyone. Instead, they want to do techno-centric WM duties that pay well in the private sector. This problem is compounded when a younger 3A receives heavy training on WM duties, is utilized in the WM role, but then deploys and is expected to perform traditional IM duties, such as ERM.

High Ops Tempo and Pers Tempo

In the military vernacular, Operations Tempo (Ops Tempo) and Personnel Tempo (Pers Tempo) typically refer to unit level activity and individual level activity respectively. From the researcher's personal experience, the cumulative effects of both a high Ops Tempo and high Pers Tempo have the potential to reduce commitment to non-mission critical activities and increase general burnout. Adding one or the other or both to an environment already unconcerned with ERM can act as a barrier. The respondents described the situation as always feeling like they were making history at that very moment and *should* be capturing the records being created. One example of a high Ops Tempo affecting ERM was when individuals deployed to a bare base and initially had a very small window of time between planning and development of ERM processes and procedures to full scale implementation. An ad-hoc ERM program was the result. Everything happened faster in the deployed environment, with tight decision cycles, escalating war efforts, and ever changing hostile threats. Working seven days a week, 14-16 hours per day was common among the respondents experiences. The Ops Tempo afforded no time for training or familiarizing 3A personnel on the complex systems and processes that they needed to know to accomplish good information management, including ERM.

Investigative Question #2—Organizational Structure.

The second investigative question centered on the organizational structure influence factors that acted as barriers to ERM in the deployed environment. The second investigative question was stated as

IQ2: What were the characteristics of the organizational structure barriers to ERM encountered by deployed USAF personnel during OEF and OIF?

As stated in Chapter II, organizational structure can act as a barrier, especially when the structure “promotes individualistic behavior in which locations, divisions, and functions are rewarded for ‘hoarding’ information” (Gold et al., 2001, p. 188). In general, the respondents described a structure not conducive to accomplishing ERM in the deployed environment. The described structure was one characterized by four aspects. First, an insufficient support structure existed for providing guidance, answering questions, and advocating the need for ERM. Second, an unreasonable workload was placed on the 3A personnel in the way the organization utilized them in numerous and varying positions of responsibility. Third, 3A personnel were seemingly misused due to them being tasked with miscellaneous responsibilities formally unaccounted for by the organizational structure. Last, the 3A personnel working, regardless of placement, experience a high turnover rate due to the expeditionary nature of warfighting today. Each of these four dimensions underlying organizational structure are discussed next.

Insufficient Support Structure

The formal, MAJCOM-based records management organizational structure outlined in Chapter II is not directly applicable in deployed location. The structure, as presented, is organized under MAJCOMs, yet deployed units are organized under Unified Commanders and Numbered Air Forces (NAFs). Many of the positions in the MAJCOM-based organizational structure presented earlier are occupied by non-deploying, government civil servants. Furthermore, the records management chain-of-command, above the base records manager, is not in place at a deployed location. The

data showed that when 3A personnel needed ERM support at deployed locations (questions answered or guidance provided), they found no support or guidance by using the in-place organizational structure, such as HQ Central Air Forces (CENTAF), HQ Central Command (CENTCOM), and the Office of the Secretary of Defense (OSD).

The data revealed a significant barrier existed when an individual had an ERM issue which required them to seek assistance from higher headquarters (HHQ). The respondents all mentioned frustration in trying to work through unresolved issues, such as record ownership, record retention requirements, and the authority to release records. Because the organizational structure places 3As in numerous different types of roles, 3A personnel brought differing levels of ERM training, experience, and responsibilities with them to the deployed environment. Some 3As had no experience, and they were oftentimes faced with tough decisions. When facing tough ERM issues, respondents reported having to rely on their own personal network of knowledgeable individuals. Because the structural hierarchy was not clear to them, needed support in the deployed environment was rarely found. Even in describing the highest levels of the formal structure presented in Chapter II, the respondents felt as though the office of the CRMs were even unsure who was in charge or who had the authority to make decisions concerning deployed ERM issues. Elevating issues up the defined RM structure, thus, did not typically yield any productive assistance. Examples were conveyed of individuals elevating issues up through HQ CENTAF, HQ CENTCOM, the AF Records Officer, and the DoD Records Officer to find guidance for establishing the ownership of electronic records and for determining rules on releasing records. In the end, issues were not resolved while the respondents were in place at the deployed location.

The 3A career field, which has AFI-defined responsibility for IM/ERM, is part of the enlisted corps. The C&I career field also exists in the officer ranks. The respondents, however, noted that the C&I officers reported to higher officials directly involved with the technical communications aspect of IT and not the information aspect. With no single person or team responsible for ensuring ERM and without mid- or senior-level officer advocates for ERM, the ERM piece of the C&I world was left mostly to the enlisted 3A personnel in the deployed environment. The activities involved in ERM, however, crossed functional boundary lines, and the 3A personnel were not able to identify and implement ERM processes outside of their immediate area of responsibility. The respondents reported that as a 3A explicitly charged with managing electronic records, they were unable to enforce ERM policies to non-3A personnel.

A common topic among the respondents' comments was a lack of expertise to determine what types of records to collect, how to collect it, or which format to store it in. There was a lack of personnel knowledgeable on how information systems interact, how processes connect, and how work centers were related. Without an enterprise-wide planning or IT solution for managing electronic records, the respondents felt isolated and unsure when they were forced to develop and implement their own ERM plan. When ERM challenges occurred, the respondents sought assistance from superiors but experienced resistance and slow support from those who were busy with their primary duties at non-deployed locations. "We'll get back to you," was the common response to requests for assistance and contributed to a perceived divide between deployed 3A personnel and "never deployed before" RM personnel working at higher, non-deployed

levels. The frustration only increased during phone calls trying to reach sometimes one-deep positions and going to significant lengths to work around the large time difference.

Prohibitive Workload

The prohibitive workload aspect described here involves all the jobs one person is expected to accomplish in the deployed environment. The 3A career field, with primary responsibilities for all aspects of information management, are inadequately prepared to handle the entire spectrum of information resources management problems because the number of responsibilities are too many for one career field to master. The 3A personnel's tasks oftentimes also includes non-3A duties, thus compounding the problem by adding even more responsibilities. The respondents reported frequent cases of too many tasks being assigned to the deployed 3A personnel. Their focus was on WM to keep the computers up and running, which means all other information management duties, including ERM, received less attention. With no FARMs in many of the squadrons, and only as an additional duty for those that did exist, the responsibility for ERM was placed typically on some unsuspecting non-3A with instructions to just "figure it out." Even the BRM, typically a 3A, was inundated with other IM duties, such as performance report and decoration tracking for an entire wing. The BRM role was only one of many additional duties—it was not even the individual's primary job. The data showed that when non-3A personnel were required to accomplish traditional 3A tasks, the tasks were not a priority for them because of their already high workload associated with other tasks.

With every person and every system creating information needing to be managed as records, the respondents concluded that the USAF cannot insist on managing records

by expecting a 3A to “touch” all official records. An example of high workload found in the data included a single individual responsible for properly maintaining thousands of service and product contracts as the only 3A in place to handle the IM workload. A second example showed how non-3A personnel misunderstand the scope of an ERM effort. Typically, one RC and one COR are responsible for all the records in one office; and the records within that office have a file plan. One respondent reported, however, that a 500-person unit had 27 offices of record and wanted only one file plan, one RC, and one COR to manage all records. With the exponential increase in the volume of data and records being generated, expecting one person to manage all the electronic records acts as a barrier because they can not do the job effectively, especially when the ERM task is only one of many duties.

Misuse of Personnel

Misusing personnel, in the context of this research, refers to what the respondents described as a tendency to use 3As to accomplish tasks outside their realm of responsibility. This “get the 3A to do it” tendency acts as a barrier because the 3A personnel were getting pulled from their primary duties, including ERM. With the 3A being used in other roles, the corporate ERM knowledge was not being fully employed. The respondents described situations where they were expected to fix computers first, and get to ERM whenever time permitted. At the AOC, the 3A personnel were almost exclusively used in the WM role versus administrative communications or records management roles. There were instances where proofreading and coordinating personnel performance reports, awards and decorations, and tracking suspenses, was deemed more important than any ERM activities, and the 3A was forced to assume responsibility for

duties typically executed by a personnel specialist (3S). Even when deployed explicitly as part of an IM functional management package responsible for ERM and publishing functions within the communications squadron or flight, the respondents reported that they were instructed to accomplish personnel tasks because the IM tasks were "not as important." (Note: USAF deployment documents specifically authorize the substitution of 3A personnel for 3S personnel). When manning the IT helpdesk in a communications squadron was higher priority than accomplishing ERM, the 3A was forced to assume responsibility for duties typically executed by a communications-computer systems operator (3C). The data showed frequent examples of a 3A not being employed in the role they were actually sent to do.

The respondents described the most successful duty sections as having a permanent 3A presence to handle IM, including ERM duties. Even in these units that were better able to manage their information, the WM role dominated the 3A knowledge base because of frequent utilization in those roles. Thus, when it came to RM/ERM tasks, the 3A did not always have the answer because they had never been utilized in that role before. Oftentimes, the 3A personnel were not used by an organization in refining processes involving information flow or capture; rather, the 3As were expected to just handle the information and records given to them by other people.

High Turnover Rate

In this research, the word turnover is used in the sense that personnel frequently rotate in and out of positions in the deployed environment. Typical rotation times are 90, 120, or 180+ days. It is not uncommon for some personnel to be in place for longer time spans during periods of increased need for their skills, and some senior leader positions, a

wing commander for instance, might remain in place for up to one year. The respondents described the situation as frustrating because by the time they were spun up and working efficiently, it was almost time to leave. In some situations, the overlap time was reported by the respondents to consist of five days, while other times units incurred 30-day gaps waiting for late-arriving personnel to replace an individual that exited early. With respect to ERM, the situation just described led to a “reinventing the wheel” syndrome experienced by all of the respondents. Each new set of arriving personnel created their own processes for the storage and management of information and records. Each newly created process was specific to an individual’s needs and desires, with little concern for efficient sharing of the data.

The respondents also reported a feeling of lack of continuity. Information and records saved by exiting personnel were sometimes never used again, yet remained on local electronic storage with no information concerning its retention and disposition. The data showed significant learning curves for the 3As when arriving at the deployed locations, primarily because it was common for 3As to arrive in theater and not know exactly how they would be employed. It is one thing for pilots, for instance, to know the expectation is for them to fly an aircraft when upon arriving at a deployed location, A different scenario altogether exists for information managers in not knowing which of their many and varied responsibilities they will be expected to perform. The respondents spoke of difficulty in trying to stay current in all their duties when they were constantly rotated among their three core competencies: administrative communications, workgroup management, and records management.

With continually rotating personnel and occasionally relocating entire units, continuity was always mentioned as a desired goal. When a rotation ended though, 3A and non-3A individuals would then attempt to address ERM just as they were leaving. When relocating entire units intra-theater, ERM issues came up just before it was time to move because no unit-wide ERM program had been established and information/records were sporadically managed. The respondents indicated it was too late in the game to think about ERM at that time, and chaotic IM and ERM was the result. The high turnover rate contributes to this situation frequently occurring, and no indications existed of the situation changing. The high turnover rate was a barrier that made continuity difficult to achieve and often prevented continuity entirely.

Investigative Question #4—Information Technology.

The fourth investigative question centered on the information technology influence factors that acted as barriers to ERM in the deployed environment. The fourth investigative question was stated as

IQ4: What were the characteristics of the information technology barriers to ERM encountered by deployed USAF personnel during OEF and OIF?

As stated in Chapter II, there is an increased number of ways to electronically create information and records. IT essentially enables each and every member of the USAF to create electronic records. The USAF has a relatively small number of people knowledgeable on ERM issues compared to the total number of personnel creating records in the organization. The resulting situation, enabled by IT, makes some current ERM practices insufficient, such as expecting one 3A to accomplish ERM for an entire unit. IT can act as a barrier, then, when ERM capabilities are deficient or do not exist.

The USAF operates a great number of automated information systems, and significant complexity exists among each system. These two aspects of IT (lacking capabilities and system complexity) characterize the respondents' comments regarding IT. Each is discussed next.

Lack/Misuse of IT Capabilities

Nearly every person and every system created information needing to be managed as records in the deployed environment, according to the respondents. Current practices in the USAF rely on a small number of individuals to manage records. The respondents indicated that managing such large numbers of electronic records is difficult, at best, and they frequently spoke of wanting an automated solution. Their organizations, however, did not have any electronic records management software application to allow for record creation, document control, searching and retrieval capabilities, or disposition of the records. In short, there was no enterprise-wide capability (IT-based or otherwise) for handling ERM requirements.

Without an automated and centrally managed IT solution for ERM, all end users were required to act as a records manager in making decisions about the electronic records they created. Most of the end users, however, did not even know they were creating records. The respondents reported that following the interim ERM guidance discussed in Chapter II led to complex and confusing technical procedures. Electronic directory creation and proper setting of access rights to network resources (folders, documents, e-mail) are difficult tasks for any personnel without in-depth IT familiarization.

Storage limits, particularly for e-mail, were problematic issues encountered by the respondents. Though electronic storage is inexpensive, it is still not ubiquitous. Large electronic files and records were created and then copied to many locations, resulting in decreased performance and unnecessarily redundant data and records. Logging functions are available to provide reports detailing which users electronically “touched” information and records, but the logging caused a huge increase in storage needs, included a degradation in performance, and was thus not used to provide an accountability trail. The storage issue extends beyond the electronic realm to include the physical storage requirements for IT components used in ERM solutions. Typically, IT components have firm requirements for operating conditions and need protection from the weather elements. This protection was afforded in very limited amounts in the deployed environment. Any ERM solution, thus, must also consider physical space requirements for the actual hardware.

When told of storage limitations, individual work centers bought USB storage devices to address their perceived storage needs, with no ERM consideration. They just wanted to save their data and information. Without a centrally managed solution for storage, moving data from one location to another was a tremendous challenge. Eventually, in the case of moving the entire AOC, thousands of CD-R and CD-RW discs were provided for users to "carry their own information" to the new AOC location. In addition to storage limitations, the bandwidth capability in the deployed environment was also limited, contributing to the tendency to store all of an office’s information/records on a local computer instead of network storage resources. Lastly, it is a deployed environment, and because of all the hostile conditions involved, the respondents indicated

there was no access to local servers, wide area networks, or the Internet. Automated ERM solutions, thus, need to be distributed and accommodate end users that may be sporadically connected to the network.

Complexity of Systems

With every individual and every automated information system creating information needing to be managed as records, the IT setting was quite complex. There was a relatively high number of computers and other electronic devices in existence at the deployed locations, adding to the IT complexity. The non-standardized methods of creating records and the task of defining the formats for storing records (e.g. video footage) contributed to the complexity. Too much information to manage was the common feeling among the respondents, especially in certain work centers that collected information from many different sources (e.g. intelligence, surveillance, and reconnaissance data links). There simply was more information than was humanly capable of being managed.

The respondents commented that before deploying, ERM had negative connotations in the USAF because of associated complexity and required time investment. Then, during a deployment they learned that ERM was applicable to a different and more complex IT environment. ERM, then, was even more of a problem in the deployed environment. The end result from the complexity of the deployed environment's complex, interconnected systems was frustration with, mediocre commitment to, or total abandonment of ERM in the deployed environment.

Investigative Questions #5, 6, and 7—Records Lifecycle.

In analyzing the records lifecycle excerpts, the results showed that all 15 of the other characterizations existed throughout the entire records lifecycle process. In other words, there was no particular barrier found that exists only in one phase of the records lifecycle.

The remaining three investigative questions were focused on the records lifecycle influence factors that acted as barriers to ERM in the deployed environment. The fifth, sixth, and seventh investigative questions were stated as

IQ5: When creating records, what were the characteristics of the barriers to ERM encountered by deployed USAF personnel during OEF and OIF?

IQ6: When maintaining and using records, what were the characteristics of the barriers to ERM encountered by deployed USAF personnel during OEF and OIF?

IQ7: When addressing the disposition of records, what were the characteristics of the barriers to ERM encountered by deployed USAF personnel during OEF and OIF?

It was originally thought that there might be barriers found specifically in each of the phases of the records lifecycle. In actuality, all of the barriers identified thus far applied to all phases. The records lifecycle is a cyclic process, where the phases are not linear nor equal. Once a record is created, maintenance and use can occur repeatedly before final disposition. Even when disposition occurs (e.g. transfer to national archives) electronic records can still be accessed, allowing for more maintenance and use (provided the eventual disposition is not permanent destruction). The barriers found when discussing the records lifecycle, thus, were identified as permeating across all of the

socio-technical aspects already addressed, i.e. organizational culture, organizational structure, and IT. Each of the three steps in the records lifecycle are addressed next.

Record Creation Problems

The term *record creation* is used here to include both the creation and the capture (e.g. from another system or organization) of electronic records. Both result in identification of the record as existing in the system responsible for managing the electronic records. The toughest challenge described by the respondents was the expectation levied on them to find out what kind of records a unit was creating, collecting, maintaining, and using. In addition, determining the transport medium and the associated format of the record were also important aspects of identification reported by the respondents. Without specialized knowledge of the respective automated information systems, the respondents had difficulty identifying precisely what needed to be stored and how to store it. Additionally, there was no clear understanding of how the electronic records could be mapped to decisions, and thus 3As frequently did not know which records were needed by decision makers, if any at all. Essentially, when identifying records that needed to be managed, 3A personnel needed operators and other non-3A personnel to assist them in making the identification determination. Identifying records was a lot of extra work responsibility placed on the non-3A end users and administrators of the different information systems.

The respondents provided many examples of occasions when records were misidentified. E-mail not being managed as records was frequently mentioned, as messages were oftentimes needed at a later point in time. A second example involved information being unavailable for a safety investigation board because the associated

information was not managed as records. Historical information about the events occurring during bare base buildup was not captured or managed as records, leading to useful information never being available for later reference.

Record Maintenance and Use Problems

Just knowing that records existed did not necessarily allow users the ability to access the records or properly maintain them. Determining the proper retention of the electronic records was a tough challenge for the respondents, considering the massive volume of information produced in the deployed environment. When trying to maintain the records, the authority to release them (in the case of a FOIA request or accident investigation) could not readily be determined. Identifying the authoritative owner of the records was explained to be a difficult endeavor for the respondents. There was never an ability for an individual (3A or record owner) to issue a hold order on any given record, or record set. A hold order would change the retention to a status equal to indefinite while the issue was resolved. The records associated with a safety investigation board, a follow-up inquiry to a failed mission, and FOIA requests are all examples where the respondents experienced the need for a hold order.

Record Disposition Problems

Problems with *record disposition* were compounded by the maintenance and use problems just discussed. Disposition was made incredibly difficult by exiting personnel that saved their information locally, only for it to be never used again. It remained on local storage with no information concerning its retention or disposition. Without such knowledge, and with no owner identified, the resulting choice for 3As was: a) delete the record or b) perpetuate the "save everything" practice. Defaulting to the "save

everything” practice, such records were simply left alone, often remained unused, and were likely never sent anywhere for proper disposition. The fact that most individuals did not recognize the historical value of properly preserving records was described by the respondents as prevalent in the deployed environment, even though all the deployed individuals were making history daily.

Because the 3A personnel needed operators and other non-3A personnel to determine what records, to collect, store, and use, the end user experienced frustration when they were required to look up disposition instructions to find which rule to file it under. A lack of education and training on appropriate disposition instructions was also described by the respondents.

Organizational Guidance.

In addition to answering the categories represented by the investigative questions, one new category of barriers was inductively generated from the collected data. The emergent category, *organizational guidance*, is discussed here.

The lack of clear policy and direction on managing electronic records emerged as the most critical barrier to ERM in the deployed environment. All of the respondents reported an absence of understandable organizational policy and direction addressing ERM while they were deployed. Existing federal laws and AFIs were viewed by the respondents as being written without current technology in mind. Many of the formal legislative documents encouraged the use of automated information systems and mandated the products of such systems be managed as records. The documents reviewed, however, did not provide any meaningful or concrete ERM guidance for the individuals who deployed to the Middle East during Operations Enduring Freedom and

Iraqi Freedom. When ERM policy did exist, it was reported to be inconsistent among USAF Major Commands. Without understandable policy and direction, the respondents were not able to manage electronic records in the deployed environment.

The *organizational guidance* category of barriers emerged from the respondents' comments and is composed of four characterizations: a) lack of policy and direction about ERM, b) lack of standardization for ERM tasks and processes, c) lack of accountability for ERM failures, and d) inadequate training of all individuals expected to manage electronic records. Each of the four dimensions underlying the organizational guidance theme are discussed next.

Lack of Policy and Direction

In general, the respondents reported being aware of federal legislation mandating ERM. The USAF strategy documents, however, do not mention ERM specifically, and the respondents noted the absence. The respondents were also aware of the existing AFIs and interim ERM policy which provided minimal guidance in accomplishing ERM. The interim ERM policies from the 2001-2002 timeframe were described as only providing instructions for controlled storage on a LAN, not true management of electronic records. One problematic issue with the interim solution was the decisions about where to file and when to archive remained human and required an in-depth understanding of records management rules. The interim policy, in theory, created more work for all end users by requiring them to learn and employ ERM knowledge. In practice, the 3A personnel were primarily affected by the interim policy as they were the ones required to file and archive all the electronic records.

Some of the comments containing the most frustration from the respondents concerned their unanswered questions. Examples of such questions are illustrated by the following examples:

- What exactly are we to do with all these records?
- Who is the owner of any given record?
- Which regulations/policy should be referenced by USAF personnel when deployed with units composed of joint and coalition personnel conducting non-USAF missions?
- Who is the controlling authority for destroying (or not destroying) electronic records?
- Is there even a process in-place to manage electronic records?
- Who retains the authority for officially releasing records to requestors?
- How should a bare base be prepared for long-term sustainment of ERM?

These types of questions were researched by the respondents and eventually channeled up through HHQ for answers and subsequent policy. Most of the issues raised by the respondents were unresolved as of the time they returned from their deployment. With no guidance in hand, the 3A personnel just did what they thought was best (e.g. approving their own file plans). The respondents suggested the freedom given by AFIs led to problems in the deployed environment because everyone had their own way of doing ERM.

Lack of Standardization

Electronic records were stored differently on local computer hard drives, floppy disks, CD-ROMs, and portable USB storage devices. Simply stated, there was no

standardized method of filing electronic records found when analyzing the data in this research. Entire deployed units accomplished their information management, including ERM, processes differently. Even units with similar or identical missions had non-standardized policies.

ERM is not a new concept, yet the respondents did not know exactly how they would do ERM before arriving at a deployed location. Disparate equipment, systems, programs, and processes different from non-deployed locations were used and necessitated the deployed personnel being quickly spun-up, which did not always happen. The respondents experienced a feeling of having to start over when moving from command to command or unit to unit. More frustration was experienced because an ERM implementation can vary depending if you are assigned to a "first-in," transitory, or semi-permanent unit. The respondents reported no ability to manage, relocate, or destroy one centralized record repository. This situation arose because of the non-standardized manner of accomplishing ERM and too much information/records being distributed out to each user's desktop computer.

From reviewing existing documentation, at least four of the MAJCOMs (ACC, PACAF, USAFE, and AMC) all had different interim solutions addressing ERM during OEF and OIF. Once the end user, RC, or FARM arrived at the deployed location, they did not realize that the policy from their home base was a MAJCOM-specific policy and not the only way to accomplish ERM. This disparity led to disagreements among personnel from different MAJCOMs, at deployed locations, on how ERM should be handled. Personnel from different bases and different commands viewed ERM differently, based on their familiarization with policies, their level of how-to skills, and

the non-deployed ERM importance level. The problems did not end with dissimilar MAJCOM policies, as the data revealed no firm guidance existed that addressed other services or coalition partners either.

Lack of Accountability

Individual and organizational accountability in this context refers to the respondents descriptions of situations where there was no documented responsibility for implementing ERM, no justification or rationale for ERM decisions, and no consequences for poor ERM outcomes and results. The respondents indicated there was no policy or guidance concerning who was responsible for implementing ERM or the appropriate level or contact person to address specific questions and problems. The issue was extended, as respondents reported no known consequences for any person or organization inappropriately managing their electronic records. There was no inspection program to ensure compliance in the deployed environments. Creators and users of the electronic records were not held to any standard of accountability because no standard was implied, documented, or understood. Legislation and AFIs do contain specific guidance on these responsibilities, but the affected individuals (other non-3A end users) were unaware according to the respondents' experiences. It was clear to the respondents who was accountable for flying jets, maintaining them, or planning their use. It was not, however, clear who was accountable for implementing policy or executing the needed information management requirements, including ERM.

Inadequate Training

Training is discussed in term of both the 3A personnel charged with lifecycle information/records management and every other non-3A personnel who creates,

maintains or uses electronic records. The training needed by deployed individuals to guide their organization towards successfully managing electronic records was absent. Essentially, the respondents described the situation as all end-users implicitly being records managers without proper education and training to do so. For example, ERM was accomplished only as a means of storing *needed* information. End users had little knowledge of the enduring value of electronic records or of the records' ability to improve decision quality when combined with techniques such as data mining. End users not receiving appropriate training for handling information as records contributed to the widespread lack of ERM practices in the deployed environment.

Commonly, the training received by 3A personnel prior to their deployment was only in the WM area of their responsibilities. 3A personnel could, thus, be deployed with no ERM skill set and be expected to implement an ERM solution when they arrived at the deployed location. Respondents described incorrect differentiation between RM and ERM, as users would simply print e-mails and hand them to a 3A for appropriate filing. As discussed in Chapter II, there is additional data available about electronic records typically lost when converting to paper. Without specialized knowledge of work center processes and training on the work center's information systems, a 3A's ERM skills could be counter-productive or ineffective, even if they had the necessary training in ERM. The respondents described feeling as though no guidance existed for them to reference in order to develop a more robust understanding of their work center's ERM requirements. Further, they reported no specific training to convey the unique and peculiar aspects of the deployed environment. The data revealed situations where on-the-job-training was needed when entering the deployed environment, because individuals

were working in unfamiliar ERM roles and with unfamiliar records lifecycle processes with little or no training to prepare them.

Chapter Overview

This chapter provided details of the inductive analysis completed on the gathered data. After the analysis was explained, the results were explained generally and then in relation to each investigative question. Overall, this research identified 15 wide ranging barriers to ERM in the deployed environment and categorized them into 5 overarching categories. The 15 identified barriers exist throughout the 3 phases of the records lifecycle.

V. Discussion, Recommendations, and Conclusion

This thesis focused on identifying and characterizing the barriers to ERM in the deployed environment as they were experienced by USAF personnel sent to such locations. Chapter IV presented the results and showed that organizational culture, organizational structure, IT, the records lifecycle, organizational guidance were found to be the five encompassing themes of the identified barriers. This chapter contains a discussion of the results, recommendations based on the findings, and the final conclusion of this research.

Discussion

After completing the inductive analysis of the collected data, the researcher conceptualized a model to capture the results of this study. Figure 10 offers a model of the barriers to ERM in the deployed environment based on the collected data. The 18 characterizations are grouped into five higher-level abstractions or categories. At the center is ERM, with one category (the records lifecycle) depicted as a cyclic and on-going process surrounding it. The cyclic abstraction illustrates how the records lifecycle permeates and endures in everything that surrounds ERM. To be sure, barriers affect ERM regardless of the records lifecycle phase. The remaining four categories, along with their underlying dimensions, are depicted as boxes with lines and arrows showing their influence on ERM.

In addition to the explicit characterizations of respondents' comments found in Chapter IV, two important general issues were raised and are worth discussing. First, individual barriers can be overcome, but the combination of 15 substantial barriers

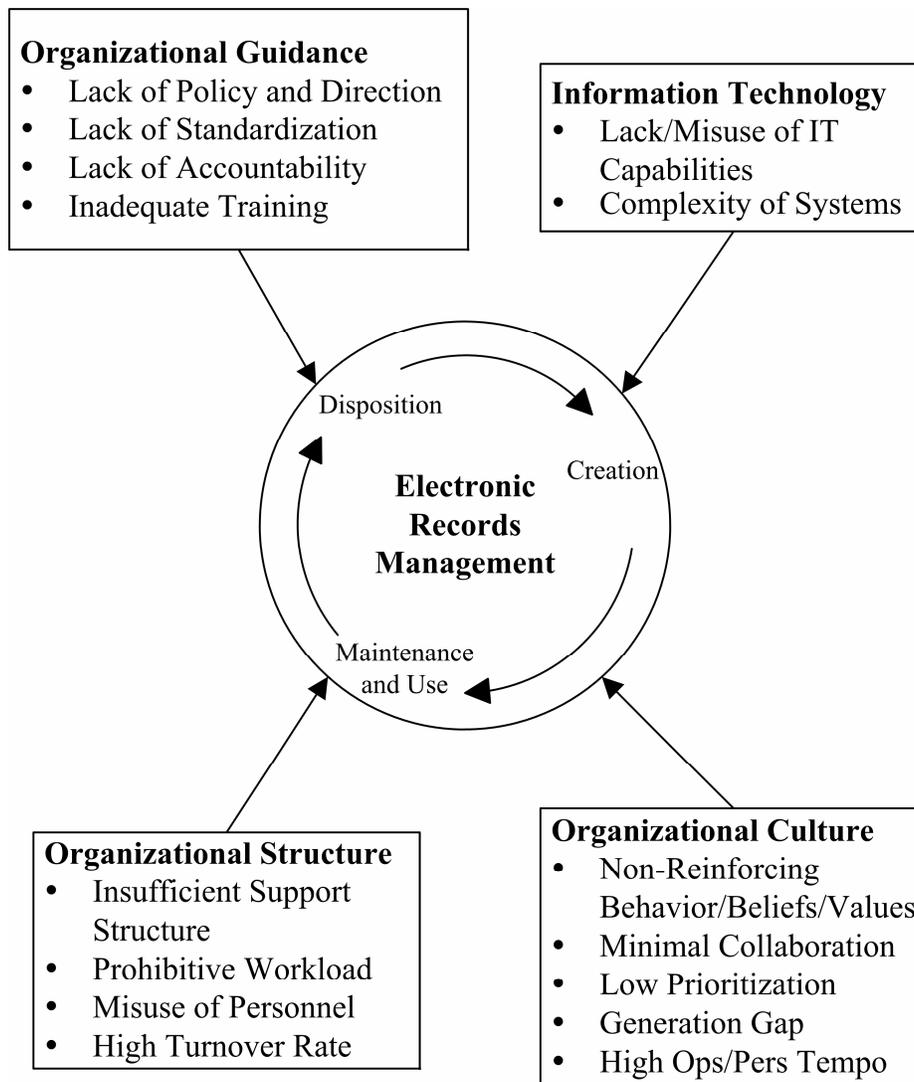


Figure 10. Barriers to ERM in the deployed environment

existing throughout the records lifecycle makes it difficult to accomplish ERM, much less do it well. The model shown in Figure 10 illustrates many of the factors that influence ERM in the deployed environment. With so many negative influencing factors, the U.S. Air Force has an important choice to make now during a defining moment for ERM. Consider the situation where there are no 3A personnel at a deployed location. If there are no pilots, aircraft do not fly. If there are no 3As at a deployed location, information, including electronic records, still continues its lifecycle. Will the USAF turn to

technology or individuals to ultimately manage the ever increasing number of electronic records? If the answer is not wholly technology or if the technology is not available in the deployed environment, then to what extent does the rest of the force learn to be records managers? Regardless of the chosen option, the personnel interviewed in this research expect clear policies. The lack of understandable ERM policy has left the information managers hungry for organizational guidance to direct their ERM efforts.

Second, the very nature of the USAF mission is operationally focused—“to defend the United States and protect its interests through air and space power.” USAF personnel take extreme pride in their commitment to get the job done, and they focus exclusively on their wartime mission in a deployed environment. At the same time, nearly every electronic piece of information could become a record in the deployed environment. A balance, then, is needed between the wartime mission and the benefits of support activities (e.g. ERM). Enduring historical value, improved decision quality, and expedient responsiveness to requests for information from those entitled to it are three such benefits. Executing the mission in the deployed environment is the main purpose of being there; but consider whether there is an equal or greater responsibility to adequately and properly document the execution of the mission through electronic records management. The results of this research suggest ERM will continue to face the identified barriers until transparently integrated into day-to-day operations.

Consistency with existing literature.

With the 18 characterizations identified and categorized into five overarching categories, a brief examination of the findings compared to existing literature is offered in order to illustrate similarities and differences. In Chapter II, nine broad issues were

identified as challenges in the examined body of literature. Table 15 provides a side-by-side comparison of the issues from the literature and whether or not this research identified their existence in the deployed environment. Eight of the nine issues found in the literature were identified in the data collected during this research.

Table 15. Comparison with existing literature

	Found in reviewed literature	Found in this emergent research
<i>Inadequacies due to exponential growth, pervasive presence, and volume of electronic records and technology</i>	✓	✓
<i>Lack of training, tools, and guidance due to marginal senior management and leadership support</i>	✓	✓
<i>Managing e-mail as records</i>	✓	✓
<i>Ineffective communication between stakeholders—legal, IT, records officers records managers, and end users</i>	✓	✓
<i>Complexity of business processes and electronic records produced by them</i>	✓	✓
<i>Long-lasting digital preservation/technological obsolescence</i>	✓	
<i>ERM not currently integrated with other IT systems and not an integral component of IT planning, systems design and architecture</i>	✓	✓
<i>Adhering to legal responsibilities</i>	✓	✓
<i>ERM viewed as non-mission related admin activity, not critical to agency mission and not incorporated into business processes</i>	✓	✓

As can be seen in Table 15, the emergent barriers to ERM in the deployed environment are very similar to those found in the existing body of literature that primarily deals with non-military settings. The single issue not found in the collected data was that of long-lasting digital preservation and technological obsolescence. The

literature identifies these related issues as being a barrier to ERM. That is not to say the issue does not apply to the deployed environment. Rather, the respondents simply did not mention the issue as being a barrier to ERM while they were deployed. The data collected in this research is by no mean exhaustive. The 18 characterizations that emerged, then, are not necessarily all of the factors influencing ERM in the deployed environment.

Recommendations

The results from this research show that every person working at a computer or operating some advanced piece of technology is potentially creating or using electronic records in the deployed environment. Since the ERM issue permeates through the entire USAF workforce, a cross-functional records management team (composed of 3Cs, legal experts, finance, etc.) might provide useful insight from non-3A personnel and lead to more widespread acceptance of ERM policies. The Clinger-Cohen Act requires agencies to consider the potential to share costs and benefits across offices and applications when designing their information systems. Thus, an effort to integrate ERM processes and tasks into daily business processes across offices, across organizations, and across services is recommended.

Policies, procedures, and audit mechanisms are needed to ensure all employees capture and preserve records in a manner that will ensure the authenticity and reliability of the records. Clear leadership to support and guide the development of such policy and advocate the implementation is also necessary. With clear and enforced guidance in hand, an effort to institute, promote, and sustain a culture where ERM is valued and seen

as important might flourish. To increase the way individuals prioritize ERM, increased accountability, motivation, and rewards are necessary. Personnel need encouragement and reasoning to treat information objects as records and to value the worth of such electronic records. Now, more than ever, the 3A is needed to advocate the importance of ERM to those who do not know. Coveted training certifications have lured 3As toward WM and away from ERM. Equivalent or similar certifications do exist for information and records management knowledge and training. Instead of sending most 3As off to become computer repair people, an investment in educating them more about information management topics may prove more useful as the demand for IM skills learned by each 3A is increasing.

The existing generation gap found in this study is cause for concern. Addressing the generation gap could potentially restore some of the lost IM corporate knowledge and bolster motivation among younger personnel to focus on such traditional tasks. Lost IM corporate knowledge has also occurred among the officer ranks. An effort to restore an IM knowledgebase in the C&I officer ranks is also recommended.

Other federal agencies (USN and FBI) have developed certification programs for all of their IT systems. Without the proper certification, which includes compliance with ERM policies and the approval of a senior records manager in the organization, the systems are not used. Such a policy demonstrates a firm commitment to ensuring ERM is accomplished. With such policy in place, an evaluation of any new ERM implementation in light of the results of this research can identify potential problems when the implementation enters the deployed environment.

Suggestions for Further Study.

This research is the beginning of an entire line of potential research topics. First, this study's results could be used as a starting point in conducting a field study, a naturalistic investigation, using participant observation and more intensive interviewing, to validate the results of this study. One could also develop and send questionnaires and surveys to the field to gather more robust data, especially interesting might be the data collected from non-3A career fields. Such a study could improve the reliability and internal validity of the results of this research.

A second potential follow-on study could be a multiple-case study to investigate the same phenomenon in all DoD components. The results from such multiple-case study could help generalize results to a higher (DoD vs. USAF) level. The results might contribute a better understanding of similar and different barriers among different services while in deployed environment.

After studying the deployed environment further, the next step could be an attempt to develop a model of "effective" ERM. An IG inspection checklist could be a starting point for such definitions. Using the Delphi method and/or questionnaires including non-3As could provide enough data to establish a model of desired ERM practices, or effective ERM. Once a model is developed, an understanding of the influencing factors most determinant of ERM effectiveness could be prepared using a survey (perhaps longitudinal) or conducting a controlled experiment using the Air Force Command and Control, Intelligence, Surveillance, and Reconnaissance Center. Such a survey and/or experiment could ultimately establish a correlation between influencing factors and effective ERM outcomes.

The USAF is currently pilot testing an initiative called Enterprise Information Management (EIM), which contains an IT tool for ERM. A longitudinal study could assess ERM before and after implementation. With the probable implementation of EIM, a subtle or fundamental shift in the way we manage our information could occur due to a paradigm shift to centrally managed hardware, software, information, and records. A study using the Technology Acceptance Model (TAM) could provide useful information about the long term success of such an IT implementation of accomplishing ERM (for a starting point on TAM, see Venkatesh and Davis, 2000).

Conclusion

This research identified and characterized 15 barriers to ERM in the deployed environment through an inductive analysis process—all of which existed throughout the 3 phases of the records lifecycle. 18 separate characterizations were grouped into five categories or themes: a) organizational culture, b) organizational structure, c) IT, d) records lifecycle, and e) organizational guidance. The results of this research showed no ERM automated information system existed in the deployed environment during Operations Enduring Freedom and Iraqi Freedom. Without an automated solution, personnel in the 3A career field were primarily responsible for ERM. This responsibility was in addition to other workgroup management and administrative communications duties. Consequently, ERM did not receive high prioritization in relation to other tasks. Regardless of how the 3A career field is organized, current legislation clearly places the onus for record keeping on each federal employee, including all military personnel. Despite the published legislative guidance, a systemic perception of no policy and no

guidance on ERM was found in the data. This perception contributed significantly to many of the other barriers, because with no clear guidance many ERM issues remained unresolved. Based on the data, this research concluded that ERM in the deployed environment is a problematic area for the USAF, in need of further critical studies, and ripe for change.

Chapter Overview

In this chapter a discussion of the results was presented, followed by recommendations based on the findings of this research. The conclusion summarized not just this chapter, but also the synthesized results of the entire study.

Appendix A: Definition of Terms

Automated Information System (AIS): Computer hardware, computer software, telecommunications, information technology, personnel, and other resources that collect, record, process, store, communicate, retrieve, and display information. An AIS can include computer software only, computer hardware only, or a combination of both.

Disposition: any activity with respect to disposal of temporary records no longer necessary for the conduct of business by destruction or donation; transfer of records to federal agency storage facilities or records centers; transfer to the National Archives of the United States of records determined to have sufficient historical or other value to warrant continued preservation; or transfer of records from one federal agency to any other federal agency (44 U.S.C. § 2901). Also, the third stage of the records life cycle.

Electronic Records: Items/objects created, stored, used, by an electronic device, (e.g. computer, video recorder, or medical device) that meet the definition of a record in 44 U.S.C. § 3301 (see Federal Record).

Electronic recordkeeping system: An electronic system in which records are collected, organized, and categorized to facilitate their preservation, retrieval, use, and disposition (36 C.F.R. § 1234.2).

Nonrecord Material: any item which does not fit the definition of **Federal Record**. This includes extra copies of documents kept only for convenience of reference.

Federal Record: the term “includes all books, papers, maps, photographs, machine readable materials, or other documentary materials, regardless of physical form or characteristics, made or received by an agency of the United States Government under federal law or in connection with the transaction of public business and preserved or appropriate for preservation by that agency or its legitimate successor as evidence of the organization, functions, policies, decisions, procedures, operations, or other activities of the Government or because of the informational value of data in them. Library and museum material made or acquired and preserved solely for reference, and stocks of publications are not included” (44 U.S.C. § 3301).

Record: see Federal Record

Records Management: “the planning, controlling, directing, organizing, training, promoting, and other managerial activities involved with respect to records creation, records maintenance and use, and records disposition in order to achieve adequate and proper documentation of the policies and transactions of the Federal Government and effective and economical management of agency operations”(44 U.S.C. § 2901).

Records Creation: “the production or reproduction of any record” (44 U.S.C. § 2901).

A federal record is created once it is determined that the document meets the criteria for a record established in 44 U.S.C. § 3101. Also, the first stage of the records life cycle in which records are made or received by an office or individual.

Records Disposition Schedule: A set of mandatory instructions for what to do with records (and nonrecord materials) no longer needed for current Government business, with provision of authority for the final disposition of recurring and nonrecurring records.

Records Maintenance and Use: any activity involving location of records of a federal agency; storage, retrieval, and handling of records kept at office file locations by or for a federal agency; processing of mail by a federal agency; or selection and utilization of equipment and supplies associated with records and copying (44 U.S.C. § 2901 #2).

Retention Schedule: see Records Disposition Schedule

Appendix B: Interview Guide

Introduction

This interview guide was developed to assist the interviewer in conducting in-depth, semi-structured interviews using many open-ended questions. A great deal of preparation and effort are required of the interviewer in using the guide. The interviewer must be familiar with the details of the outline so that the interview flows smoothly. The interviewer should also be knowledgeable enough on the research topic to understand basic RM and ERM terminology and concepts. Some general guidelines provided by Lofland (1995) are as follows

- Explain purpose and nature of the study to the respondent, telling how or through whom he came to be selected.
- Give assurance that respondent will remain anonymous in any written reports growing out of the study, and that his responses will be treated in strictest confidence.
- Indicate that he may find some of the questions farfetched, silly or difficult to answer, the reason being that questions that are appropriate for one person are not always appropriate for another. Since there are no right or wrong answers, he is not to worry about these and do as best he can with them. We are only interested in his opinions and personal experiences.
- He is to feel perfectly free to interrupt, ask clarification of the interviewer, criticize a line of questioning, etc.
- Interviewer will tell respondent something about himself—his background, training, and interested in the area of inquiry.

Steps to accomplish prior to the interview are

1. Ask the respondent to read and sign the informed consent letter.
2. Ask for permission to tape record the interview and explaining this purpose of transcribing interviews to allow for pattern matching analysis.
3. Give the respondent a brief outline of the interview.
4. Provide the notional questions in this guide as an information sheet to the respondent.

In conducting the interview, the opening of the interview should set an informal tone and attempt to put the respondent at ease. The suggested beginning of a conversation is “Thank you for taking time to discuss ERM in a deployed environment. I am very interested in hearing about your own experience. May I have your permission (with the assurance of anonymity) to tape record our conversation?”

In concluding the interview, be sure to ask the respondent who else it is worthwhile to interview.

Notional Interview Questions

While interviewing, take notes about the interviewees demeanor and actions, if possible. Recognize and look for leads and follow them. The interviewer should attempt to ask questions related to the respondent's answers. The interview questions are semi-structured in nature, but enough flexibility exists to allow for unstructured interviews as long as the interviewer guides the process. The interviewer might use terminology such as "in what way did you experience" or "what is your opinion of." Coverage of these topics may vary, and it is the judgment of the interviewer that will determine the most relevant topics of discussion for any given interview. One interview may cover many or all of the topics, and another interview may cover only a few.

Background/demographic questions.

To assist in establishing rapport with the respondent, first inquire about the person's background and obtain the demographic information. The questions to ask at this point could be

- What is your rank? Is it different from when you deployed?
- What is your primary AFSC?
- To where did you deploy? How many deployments?
- What were your responsibilities while deployed?
- How long since returning from your deployment(s)?

Potential transition questions to guide the interview toward relevant areas are

- How would you describe your ERM experience to others?
- What stands out for you about your experience?

To stay consistent, the interviewer should make every effort to ask the respondent questions within five primary areas: (a) organizational structure, (b) organizational culture, (c) people, (d) information technology, and (e) record lifecycle/processes. The interviewer need not use these words specifically. The following questions are notional questions that may assist the interviewer in asking questions related to these areas.

Organizational structure questions.

- How does organization structure facilitate or obstruct ERM in the deployed environment?
- How did ERM affect the ability of the senior leader(s) to make correct decisions?
- Were reporting relationships, managerial hierarchy, and the span of control of managers and supervisors conducive to conducting ERM in the deployed environment?

- Were decisions or information filtered, changed, delayed or blocked because of ERM?
- Was information misinterpreted or corrupted because of ERM?
- How might the AF organize to better address deployed ERM?

Organizational culture questions.

- Describe the level of importance that was associated with ERM
- Describe the culture surrounding ERM during your experience
- Describe your perception of deployed ERM
- Concerning deployed ERM, what did you expect to do? What *were* you expected to do?
- What do you believe deployed ERM should be?
- How did your experience with the deployed environment change your expectations about deployed ERM?
- What were you taught about ERM upon arrival? What did you teach others upon leaving?
- Describe how decisions about ERM were made.

People questions.

- Describe the RM education and training you received for your deployment
- Describe the education and training of RM personnel you worked with
- Describe any motivation or rewards for individuals or teams to implement ERM
- How does ERM affect your career progression and job security?

Information technology questions.

- Does the capability already exist to accomplish ERM while deployed?
- Describe any systems that existed specifically to support ERM? Did you suggest any?
- How were suggestions to implement an ERM IT system received?
- How did ad-hoc addition/invention of information systems influence or affect ERM?
- What solutions did you utilize for ERM?
- What problems with existing technology did you experience?

Records lifecycle/process questions.

- Describe the overall process for accomplishing ERM in the deployed environment as you experienced it.
- What level of documentation existed to explain this process?
- How did the process work for you? For others?
- Describe any issues you encountered while trying to create electronic records

- Describe any issues you encountered while trying to maintain electronic records
- Describe any issues you encountered while trying to use electronic records
- Describe any issues you encountered while trying to disposition electronic records

Appendix C: Human Subjects Approval



DEPARTMENT OF THE AIR FORCE
AIR FORCE RESEARCH LABORATORY (AFRL)
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

1 July 2004

MEMORANDUM FOR AFIT/ENV
ATTN: Brian Hobbs

FROM: AFRL/HEH

SUBJECT: Approval for the Use of Volunteers in Demonstrations

1. Human experimentation as described in Protocol 04-51-E, "Deployed Electronic Records Management Issues", may begin.
2. In accordance with AFI 40-402, this protocol was reviewed and approved by the Wright Site Institutional Review Board (WSIRB) on 24 June 2004, the AFRL Chief of Aerospace Medicine on 1 July 2004.
3. Please notify the undersigned of any changes in procedures prior to their implementation. A judgment will be made at that time whether or not a complete WSIRB review is necessary.

Signed 1 July 2004
HELEN JENNINGS
Human Use Administrator

Appendix D. ECATS request for volunteers posting

=====
Comment posted by: 1st Lt Brian Hobbs AFIT/ENV
Posted on: 07 Sep 2004 - 20:46:37

Fellow Communications and Information Management Professionals-

Hello from the Air Force Institute of Technology. This message is a request for assistance.

I am leading a study focusing on Electronic Records Management (ERM) in the deployed environment. We are investigating the unique aspects, particularly the barriers, related to ERM that were experienced during OEF/OIF.

To identify these barriers, I need to hear from the people who were there. Thus, I am asking for volunteers willing to share their stories. If you were deployed anytime during OEF/OIF and you had RM/ERM responsibilities while deployed, please contact me for more information.

Also, please pass this request on to your colleagues who might be willing to share their knowledge.

Thanks in advance for your support.

v/r
-Lt Brian Hobbs
Email: brian.hobbs@afit.edu

BRIAN G. HOBBS, 1Lt, USAF
Student, Air Force Institute of Technology
Graduate School of Engineering and Management
AFIT/ENV
2950 Hobson Way, Bldg 640
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Discussion: https://ecats.amc.af.mil/ecats/reports/message_view.cfm?iss_id=2239

=====
Enterprise Corporate Analysis - Time Saver (ECATS)
<https://ecats.amc.af.mil/ecats>

Appendix E. WM listserv request for volunteers message

From: Hobbs Brian G 1stLt AFIT/ENV
Sent: Tuesday, September 07, 2004 9:58 PM
To: 'WM@infosphere.scott.af.mil'
Subject: Electronic Records Management During OEF/OIF

Fellow Communications and Information Management Professionals-

Hello from the Air Force Institute of Technology. This message is a request for assistance.

I am leading a study focusing on Electronic Records Management (ERM) in the deployed environment. We are investigating the unique aspects, particularly the barriers, related to ERM that were experienced during OEF/OIF.

To identify these barriers, I need to hear from the people who were there. Thus, I am asking for volunteers willing to share their stories. If you were deployed anytime during OEF/OIF and you had RM/ERM responsibilities while deployed, please contact me for more information.

Also, please pass this request on to your colleagues who might be willing to share their knowledge.

Thanks in advance for your support.

v/r
-Lt Brian Hobbs

=====
BRIAN G. HOBBS, 1Lt, USAF
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Vita

First Lieutenant Brian G. Hobbs graduated from Northland High School in Columbus, Ohio. He enlisted in the Air Force in 1994 as a communications-computer systems programmer. He served two assignments as a computer programmer; the first was at Tinker AFB OK. He left Tinker in the Spring of 1996 and was transferred to Langley AFB VA. While at Langley, he was selected to enter the Airman Education and Commissioning Program and began the final two years of his undergraduate studies in January, 1999. He graduated in December, 2000 with a Bachelor of Science degree in Computer Science from the Virginia Polytechnic Institute and State University in Blacksburg, VA. He was then commissioned through the Officer Training School at Maxwell AFB in April, 2001.

His first assignment as an officer was at Tinker AFB as the Wing Information Management Systems branch chief. While stationed at Tinker, he deployed overseas in January 2003 to the Sultanate of Oman where he spent 120 days at Thumrait AB as the Officer in-Charge, Communications Support Section, 968th Expeditionary Airborne Air Control Squadron. Shortly after returning from Operation IRAQI FREEDOM, he was transferred to Wright-Patterson AFB OH and entered the Graduate School of Engineering and Management, Air Force Institute of Technology in August, 2003. Upon graduation, he will be assigned to Headquarters Air Combat Command at Langley AFB, VA.

REPORT DOCUMENTATION PAGE

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14. ABSTRACT Corporate and government organizations can use electronic records as an important strategic resource, if the records are managed properly. In addition to meeting legal requirements, electronic records can play a vital role in the management and operation of an organization's activities. Corporate America is facing challenges in managing electronic records, and so too is the U.S. Air Force (USAF). The deployed environment is particularly problematic for electronic records management (ERM). This research, thus, investigates ERM in the deployed environment to identify and characterize the barriers faced by USAF personnel who deployed to locations supporting Operations Enduring Freedom and Iraqi Freedom. This investigation was conducted through a qualitative approach, drawing much of its rich data from in-depth interviews. An exploratory case study was designed using a socio-technical framework and inductive analysis was used to proceed from particular facts to general conclusions. The analysis revealed 15 barriers to ERM. All 15 barriers were determined to exist throughout the entire records lifecycle and were categorized based on common overarching themes. This research reveals some unique barriers contained within the context of a deployed location, while also showing that the barriers are similar to known ERM challenges.					
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U	U	UU	137	19b. TELEPHONE NUMBER (Include area code) (937) 255-3636, ext 4826 e-mail: summer.bartczak@afit.edu	

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