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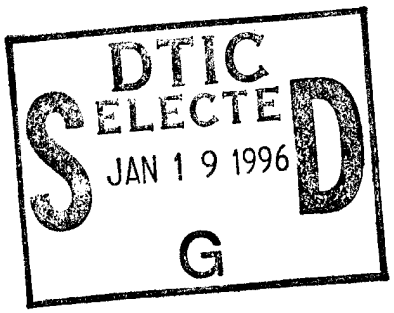

BUILDING A FRAMEWORK FOR INFORMATION DOCTRINE: A SIGNIFICANT FACTOR IN MANAGING AIR FORCE INFORMATION RESOURCES

THESIS

Kimberly C. Mawson Ullmann, Captain, USAF

AFIT/GIR/LAR/95D-9

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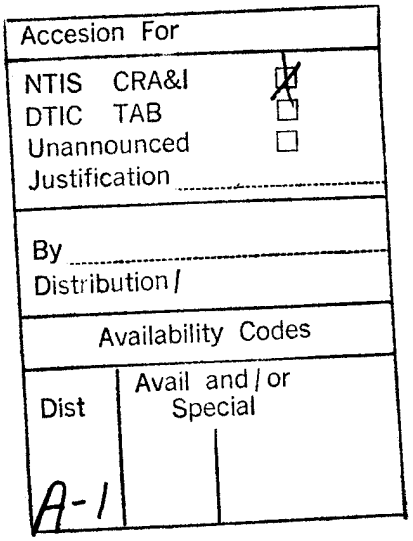

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THESIS

Presented to the Faculty of the School of Logistics and Acquisition Management

Air Education and Training Command

In Partial Fulfillment of the Requirements for the Degree of

Master of Science in Information Resource Management

Kimberly C. Mawson Ullmann, B.A.

Captain, USAF

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Kimberly C. Mawson Ullmann

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Abstract

The information revolution is sweeping through the military. At the same time, the Air Force has not fully addressed legal requirements to develop an agency-wide framework for managing information resources. This lack of foundation creates a void for Air Force information resources management practitioners. Since the Department of Defense and the Air Force are engaged in doctrinal revolution, the opportunity exists to consider developing Information Doctrine. This thesis explores the definition and role of doctrine in the Air Force, the doctrine development process, and practical examples of doctrine's use in the Air Force and Department of Defense. It also examines the Air Force information environment to determine the definition and role of information resources. By analyzing the applicability of doctrine to the Air Force information environment, this thesis proposes a concept for Air Force Information Doctrine. Similar to other resource doctrine, Information Doctrine could include a description of Information Processes, Principles and Functions; Information Planning Considerations and Support Requirements; and Information Training and Personnel. A well-marketed Information Doctrine could be a significant factor in developing strategic plans and policies involving Air Force Information Resources.

BUILDING A FRAMEWORK FOR INFORMATION DOCTRINE: A SIGNIFICANT FACTOR IN MANAGING AIR FORCE INFORMATION RESOURCES

I. Introduction

General Issue

The Information Revolution is making headlines. Pick up any newspaper or magazine or watch television news to see the latest installment of updates on the Information Age. Businesses and individuals are bombarded with more information every day and they are demanding better ways to digest, sort, store and disseminate it. Maj Gen Paul K. Van Riper, the Marine Corps' Assistant Chief of Staff for Command, Control, Communications, Computers and Intelligence said:

> During the first 30 hours of the Persian Gulf War, U.S. troops were bombarded by 1.3 million electronic messages. Information poured in over radios, computers, telephones, fax machines. The age of "information-based warfare" was born, but it was not a birth without complications. It was information overload, overwhelmed by the flood of information, troops often lacked the ability to convert data into informed decisions. (Matthews, 1995:1)

The Air Force has not been spared in the information revolution. Improvements in information technology make it possible to collect, store and retrieve more and more information. Personnel drawdowns and shrinking budgets leave fewer people and less money to sift through the ever-increasing flow of information. Although computers and information systems provide significant assistance in managing the flow of information,

technology alone cannot alleviate the entire information management burden. Information practitioners need to know what tools and techniques have worked in the past and what technology may be available in the future to assist them. Meeting this need involves identifying the best ways to manage Air Force information resources required to achieve the mission.

Information Management is a relatively new entry in Air Force management philosophy. In 1987, the United States Air Force declared information its sixth strategic resource, along with people, money, material, real property and energy. This shift in paradigm, suggesting the importance of managing information with as much diligence as any other resource, was documented in *Air Force Combat Support Doctrine* (DAF, 1987:2-1). More recently, the July 1994 revision of Office of Management and Budget Circular A-130, "Management of Federal Information Resources," included a provision that "prompts agencies to address the need for organization-wide frameworks for using information resources" (OMB, 1994:37908).

One such framework for military policy development is doctrine, which the Air Force defines as "what we hold true about aerospace power and the best way to do the job in the Air Force" (DAF, 1992a:vii). In fact, the Air Force has entered what could be called a doctrinal revolution. In addition to ongoing revisions of AFM 1-1, *Basic Aerospace Doctrine*, the Air Force is currently revising fourteen existing documents and developing fourteen others that address doctrine. Moreover, doctrine writing responsibilities recently transferred from Air University and Air Staff to a newly activated Air Force Doctrine

Center. Additionally, doctrinal thought is progressing rapidly as joint doctrine promulgation increases (forty-three publications now under development, fifty-nine in revision). The ongoing roles and missions debate also contributes to the desire for published doctrine. As a result, the Air Force continues to commit increasing amounts of resources to doctrine development, factors that indicate an institutional belief in the value of doctrine. Clearly, then, the opportunity to assess the need for information management doctrine exists.

Specific Problem Statement

This research addresses the question: Does the Air Force need Information Doctrine? Despite the changes brought by the Information Revolution and the emerging doctrinal revolution, no previous research addresses this need. This historical-comparative research investigates the following questions:

1. What is doctrine's definition and role in the Air Force?
2. What is the information resource role in the Air Force?
3. What could the term Information Doctrine mean?

Scope

This study examines previous doctrine development efforts and analyzes the role of information to determine the feasibility of developing Information Doctrine. Additionally, this thesis focuses on mission requirements to identify possible roles for Information Doctrine. Based on definitions and roles of doctrine and information, a concept for information doctrine is proposed. An examination of doctrine's use in peace and war

provides an indication of doctrine's mission impact. Comparing that mission impact with the Information Doctrine concept illustrates the impact Information Doctrine could have on the Air Force mission. However, this study does not provide a yes or no answer to the need for Information Doctrine. It simply provides the historical evidence of doctrine's role and leaves the decision makers to determine if the proposed concept of Information Doctrine is necessary.

Research Approach. The scope of this research will be limited to examining literature associated with doctrine and information management. A historical review of various studies and articles on doctrine provides definitions, purposes and indications of mission impact. Interviews with experts in the fields of doctrine and information management provide additional perspectives for consideration.

Definition

Although definitions of information management are explored in later chapters, this section defines information management to provide a foundation for readers of this research. In addition to treating information as a resource throughout its life cycle:

> Information management identifies, coordinates and exploits information entities in an organization for the purpose of using the characteristics of that information to achieve greater value (of existing information resources) and to gain advantage over competitors. This concept exists apart from the technology . . . technology is not a prerequisite for IM. (Taylor and Farrell, 1992:319)

The management question initiating this research asks: What could Information Doctrine offer the Air Force? Thus, a preliminary definition of doctrine frames further discussions.

A synthesis of AF and DOD definitions indicates doctrine includes those principles, concepts and tenets believed to have been successful in the past and to be the best way to do the job. Additionally, doctrine provides the framework for policy development for training, equipping, and employing Air Forces.

Potential Contributions

This research is sponsored by the Air Force Information Management Strategic Planning Office. The results of this study will be used in determining the need for information doctrine development. At a minimum, the research efforts should provide a foundation for further research into doctrine's mission impact and information management tenets.

Summary

The merging of the Information Revolution and the Air Force doctrinal revolution provides an opportunity for the information management community to examine the need for a doctrinal foundation. The next chapter discusses the methodology employed to examine that need. The remainder of the study discusses the various aspects of determining what the term Information Doctrine could mean. First, it identifies what doctrine is in the Air Force by examining its definitions, roles and development. Next it examines definitions and roles of information in the Air Force. Finally, by comparing the definitions and roles of doctrine and information, it proposes a concept of Information Doctrine.

II. Methodology

This chapter explains the methods used to analyze the data gathered from literature and personal interviews to answer the question, what could Information Doctrine offer the Air Force? Although Air Force Policy Directives and Instructions define roles for doctrine, they do not specify when or why doctrine should be written. Further, although several studies of doctrine have been completed, none specify the method for determining the need for new operational or functional doctrine. Lacking official guidance, this study adopts a historical methodology to examine previous doctrine development efforts and the role of information in the Air Force to draw conclusions about what necessitates Information Doctrine development.

Historical Research

This research seeks to identify the meaning and role of doctrine and information in the Air Force. A search of the literature reveals little previous research into these arenas. Thus, this research strives to provide a foundation upon which to build the concept of Information Doctrine. Developing that foundation requires a review of historical approaches to doctrine and information. This historical review includes both legal requirements and operational uses of doctrine and information. The foundation is capped by analysis of current uses of doctrine and information. This analysis shows the effects of historical trends. Without a carefully developed foundation for studying doctrine and information, conclusions drawn from the research could be tainted.

Approaching the need for Information Doctrine based on historical information provides the most effective way to examine previous doctrine development efforts. Gerhard Lang and George D. Heiss propose in *Practical Guide to Research Methods* that historical research deals with the past "based on a critical analysis and synthesis of sources" (Lang, 1984:64). Although this research also employs results of interviews, the reviews of studies, articles and books are the primary method for gathering data. Unlike experimental research which uses historical information as background to quantitatively solve problems, "the historical methodology does generate the answers" (Lang, 1984:65).

In addition to the investigative questions outlined in Chapter One, this study uses the historical methodology to identify and explain "institutions, conditions, events, persons, and elements" (Lang, 1984:70) involved in developing doctrine. Further, the trends that emerge as keys to doctrine development and use are applied to the current role of information. Based on the comparison of roles for doctrine and information, a concept of Information Doctrine is proposed.

Interviews

Several informal, loosely-structured interviews provided background information and basic data for this study. The interviewees (listing at Appendix A) included doctrine experts at Air University and the Air Force Doctrine Center, and information management personnel. Interviewees were selected based on their experience in a functional area or on recommendation from another interviewee.

Source Selection

Reliability and validity of source material have special importance in historical research. Since the data analyzed is based primarily on historical documents, the accuracy of each source is vital to the success of the research. Isaac and Michael, in *Handbook in Research and Evaluation,* discuss two categories of criticism, external and internal, which should be applied to sources used in historical research. "External criticism asks, is the document or relic authentic?, and internal criticism asks, are the data accurate and relevant?" (Isaac, 1981:45). These issues were considered in selecting the source material for this study. This research proceeded with the understanding that "the fundamental task of the researcher is to get as close as possible to the truth" (Lang, 1984:73).

Research Plan

Understanding the historical methodology and the need to consider internal and external criticism, an outline of the research plan completes the discussion of the methods used to conduct this research. Chapters III and IV address the first research question with discussions of doctrine's definition, role and development. Information and information resource management enter the research in Chapter V which reviews the definitions and roles for information and the information resource in the Air Force and merges the concepts of doctrine and information to propose the concept of Information Doctrine. Together, these chapters provide the framework to analyze the possibilities for development of Information Doctrine. Chapter VI presents the conclusions and recommendations resulting from this research as well as suggestions for further research.

III. What is Doctrine?

Studies of Air Force doctrinal history demonstrate little agreement among Air Force leaders on a single definition of doctrine. Nearly every study begins with an attempt to define, describe or characterize exactly what doctrine is. This chapter presents the prevalent views on doctrine's definition by examining the historical definitions of doctrine, components of doctrine and existing doctrine documents.

Historical Definitions

The Air Force formally defines doctrine in Air Force Policy Directive 10-13, *Aerospace Doctrine*.

> Air Force doctrine is a statement of officially sanctioned beliefs and warfighting principles which describe and guide the proper use of aerospace forces in military action. It is authoritative, but requires judgment in application. (DAF, 1994a:1)

However, many informal definitions are in common use. In fact, since issuing the first official Air Force doctrine in 1953, each of nine revisions featured a slightly different explanation of doctrine. In the 1953 *United States Air Force Basic Doctrine*, General Hoyt Vandenberg stated that doctrine "evolves from experience gained in war and from analysis of the continuing impact of new weapon systems on warfare" (Futrell, 1964:87). The 1953 version of doctrine suggested the historical perspective of doctrine and a need for a forward looking component. This definition was based on the experiences while the Air Force was still the Army Air Corps. Major General I.B. Holley, Jr., one of the most respected military doctrine experts, explained:

> Doctrine is what is officially approved to be taught . . . the point of departure for virtually every activity in the air arm. Basic doctrine defines the roles and missions of the service, the scope and potential capabilities of its weapon systems. Doctrine lies behind the decisions as to what weapons will be developed and gives guidance. . . . provides the rationale for favoring one weapon system over another. (Holley, 1974:2)

He also emphasizes the future looking component of doctrine. Holley adds to Vandenberg's definition by suggesting these principles are approved for teaching to Air Force members. In 1968 General Curtis E. LeMay wrote, "At the heart of warfare lies doctrine. It represents the central beliefs for waging war. Doctrine is of the mind, a network of faith and knowledge reinforced by experience which lays the pattern for the utilization of men, equipment, and tactics" (DAF, 1984:1). This more nebulous idea of doctrine as a set of beliefs fits more closely with the definition found in the current version of *Basic Aerospace Doctrine*. The current edition, written in 1992, describes doctrine as:

> what we hold true about aerospace power and the best way to do the job in the Air Force. . . . It is based on experience, . . . What we have learned about aerospace power. . . a guide for the exercise of professional judgement . . . a standard against which to measure our efforts. (DAF, 1992a:vii)

Although the 1992 edition does state, "Doctrine should be alive -- growing, evolving, and maturing" (DAF, 1992a:vii), it neglects the notion of a future looking doctrine mentioned prominently in earlier versions of aerospace doctrine. In 1994, the Air Force issued a new policy directive (AFPD 10-13) defining Basic Doctrine as:

> Broad enduring guidance for sound employment of aerospace forces in war. Unifying in effect, it describes principles, concepts, and considerations for using aerospace forces to solve military problems of all types. (DAF, 1994a:6)

The policy directive also describes two other types of doctrine which are derived from basic doctrine: operational and tactical. Operational doctrine "proposes ways aerospace

forces can best be employed to solve specific military problems. . . anticipates technical and strategic needs. . . covers mission areas, operating environments, enabling functions, combat support operations" (DAF, 1994a:6). Tactical doctrine, published by major commands, prescribes "detailed tactics, techniques, and procedures to gain optimum employment of aerospace forces" (DAF, 1994a:7), Before 1994, 2- and 3- series publications contained operational and tactical doctrine. Under the current numbering system there is no numerical distinction between basic, operational and tactical doctrine.

The Air Force concept of doctrine must fit within the Department of Defense definition. Joint Publication 1 states "Doctrine presents fundamental principles that guide the employment of forces. Doctrine is authoritative. It provides the distilled insights and wisdom gained from our collective experience with warfare" (CJCS, 1991:5). The Air Force definition fits easily into this definition. However, the Department of Defense includes only a brief reference to future looking doctrine by suggesting that doctrine guides forces.

Both Department of Defense and Air Force definitions state that doctrine includes principles (or beliefs) based on experience. Perhaps the answer to the question, what is doctrine, could be answered by investigating what Air Force officers actually **believe** doctrine is. Unfortunately, to date, only one study investigated Air Force members' beliefs about the meaning of the word doctrine. In 1987 the Air Force Institute of Technology researcher found that 74% of the officers surveyed at Wright-Patterson AFB in the grades of 0-2 to 0-4 could identify the correct definition of doctrine: "The officially

taught procedures, based upon numerous, repeated experiences, to be used to carry out military operations" (Smariga, 1987:56). This study, with a single question about doctrine's definition, focused solely on Combat Support Doctrine. Subjects were limited to support personnel at Wright-Patterson Air Force Base and applicability of their responses to the Air Force as a whole was neither documented nor discussed. Studies completed by students at Air Command and Staff College and Air War College state "doctrine is a difficult term to conceptualize" (Conner, 1977:4) or "few officers read and understand it [doctrine]" (Hooten, 1976:2). However, these statements are made without documentation and are assumed to be the authors' personal opinions. The lack of serious studies of Air Force members' understanding of doctrine limits the ability of researchers to adequately define doctrine.

Components of Doctrine

Despite the lack of a consensus on doctrine's definition, several underlying components emerge. Doctrine is derived from history and past experience. It represents a set of beliefs or principles about the best way to do things. It guides military forces, based on beliefs and future perspective. Finally, although authoritative, it should not be directive because no written document can replace the sound judgement of an experienced military member. Figure 1 illustrates the influencing components of doctrine based on studies by Viccellio, Erhart, the Royal Australian Air Force and others cited in this chapter.

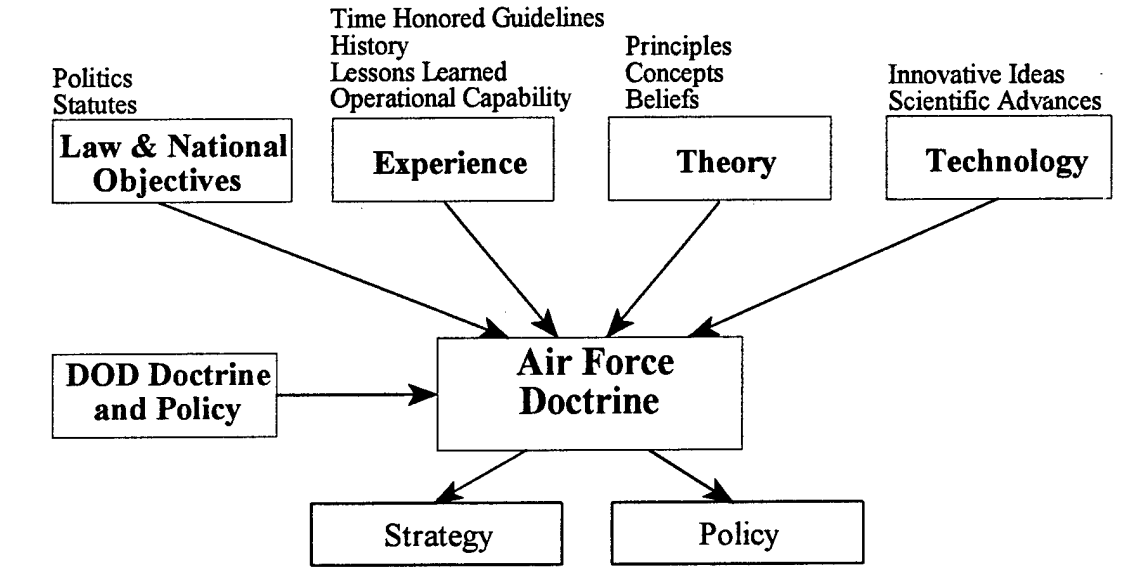

Figure 1. Components of Doctrine

This model of doctrinal components shows the main sources of doctrine: Law and National Objectives, Experience, Theory, and Technology. Department of Defense Joint Doctrine also influences Air Force doctrine. The components do overlap in some areas. For example, operational capability can be a contributor to both experience and technology. Similarly, principles, concepts and beliefs could be influenced by experience as well as influencing theory. Unlike the model's presentation, General Holley considers concepts, doctrines and principles three points on a continuum. First, concepts are hypotheses based on observation. After testing the hypothesis in the field to ensure its validity it might become doctrine. "While a concept is tentative and speculative, a doctrine is more assured." Principles are different from doctrine too. They "are truths that are evident and general" (Holley, 1984:92). Doctrinal statements are created from concepts by generalizing; principles are abstracted from doctrine. While the model's terminology is vague, it does represent the compilation of many perspectives.

Current Doctrine

Looking at what doctrine exists today illustrates what types of things the Air Force and the Department of Defense have written into doctrine. Figures 2 and 3 on the next pages show the complete breakdown of Joint and Air Force doctrine including those documents proposed or under development. A close review reveals significant differences in the framework for doctrine development between the Department of Defense and the Air Force.

Joint doctrine covers the full range of military operations. Authority for joint doctrine originates in the Goldwater-Nichols Defense Reorganization Act of 1986, which directs the Chairman of the Joint Chiefs of Staff to develop "doctrine for the joint employment of the armed forces" (10 USC 153). Joint doctrine's framework originates in the "traditional Joint Staff lines of responsibility." **Capstone doctrine**, as defined in joint publications, "links joint doctrine to national strategy and the contributions of other government agencies and alliances" (CJCS, 1993:IV-1), and serves as the foundation for all other joint and service doctrine. **Keystone doctrine**, the level below capstone doctrine, provides the foundation for doctrine in particular operational or functional areas including: reference publications, intelligence, operations, logistics, planning, C4 Systems (Command, Control, Communications-Computer Systems), and personnel and administration. Through this hierarchy, the Chairman of the Joint Chiefs of Staff includes duties of every soldier, sailor, airman and marine in fundamental joint doctrine.

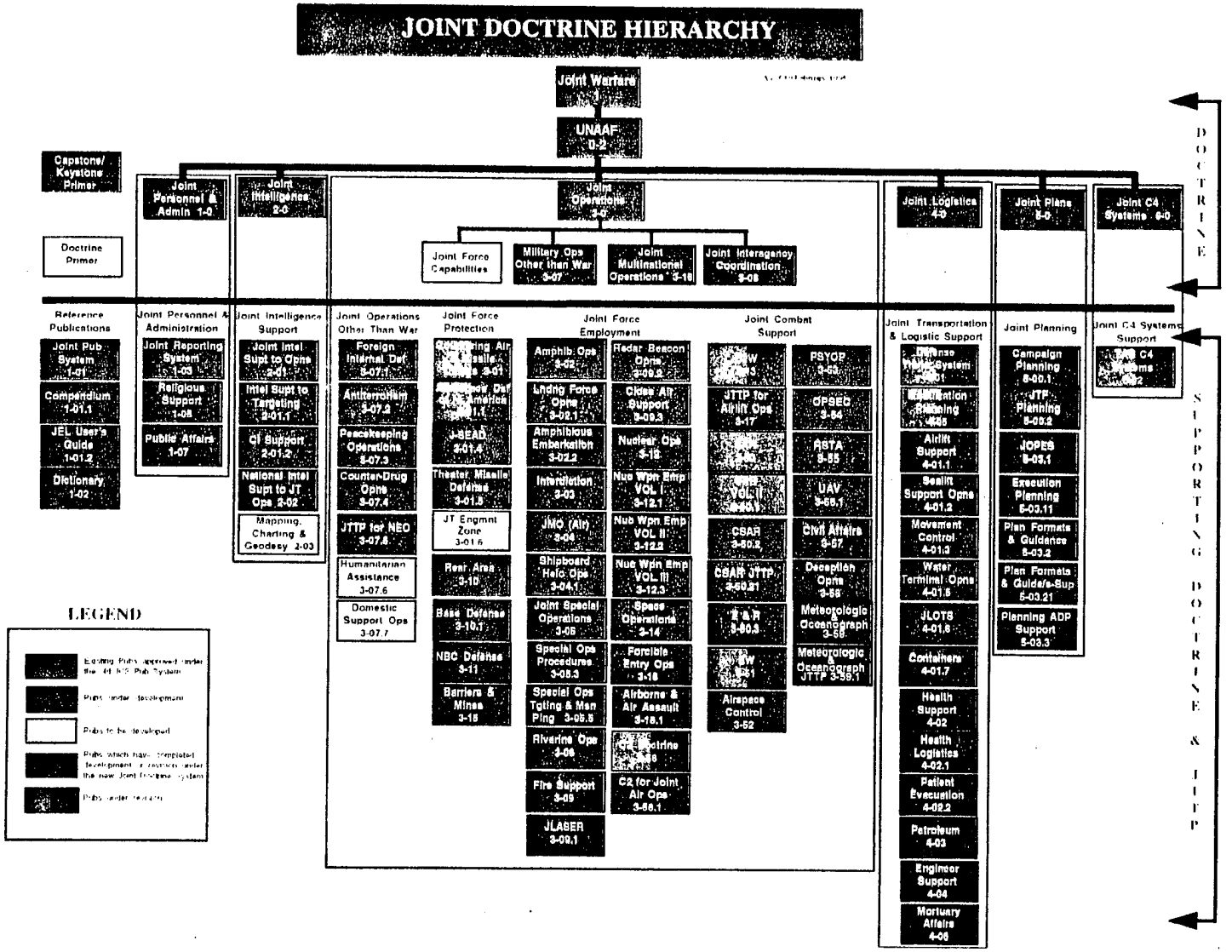

Figure 2. Joint Doctrine Hierarchy

AIR FORCE DOCTRINE DOCUMENTS

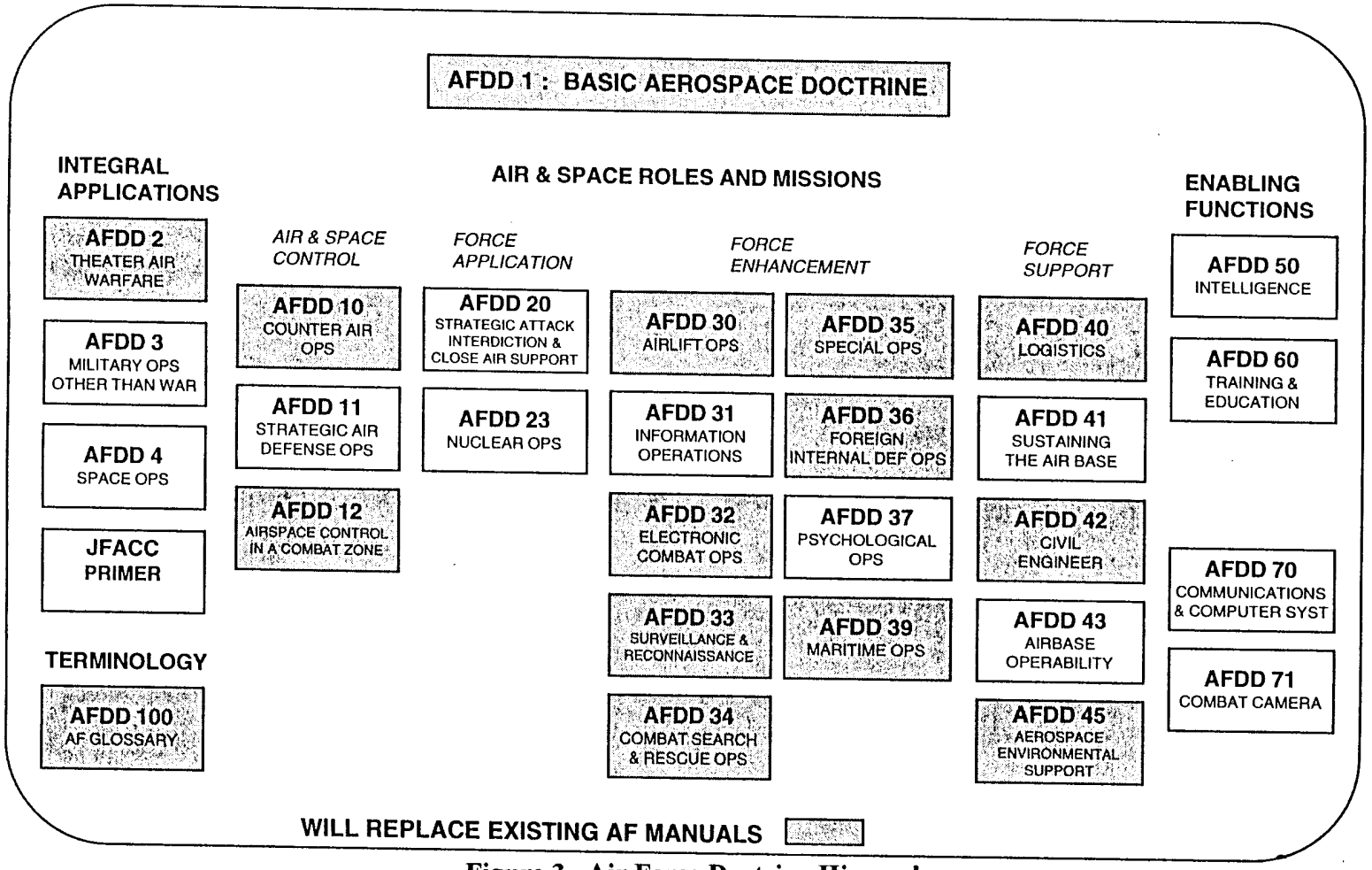

Figure 3. Air Force Doctrine Hierarchy

The Air Force framework for doctrine builds on Air Force roles as defined in *Basic Aerospace Doctrine*: Aerospace Control, Force Application, Force Enhancement, Force Support. The Air Force Doctrine Center defines two other areas: Integral Applications and Enabling Functions. A great deal of doctrine for specific weapon systems (tactical doctrine) can be found in Major Command publications. Unlike the joint capstone and keystone doctrine which specify what functional areas are covered in doctrine, Air Force doctrine framework does not ensure all career fields are included in some form of basic or operational doctrine.

This lack of clear guidance creates a challenge for doctrine developers who must determine if every Air Force member should be able to identify his or her duties in basic aerospace doctrine. The 1984 edition of *Basic Aerospace Doctrine* included many items, such as the personnel life cycle, which some considered extraneous to true doctrine. The 1992 edition, primarily through a change in format, presented only key principles of the Air Force in a brief first volume. A carefully documented second volume included references to all Air Force activities. The second volume provided the opportunity for everyone to find a place in basic doctrine. This debate to determine what functional areas belong in doctrine continues today as the Air Force revises *Basic Aerospace Doctrine* (Williamson, 1995).

Despite the continuing debate about the contents of basic doctrine, several functional communities developed doctrine to support their needs. For example, the Civil Engineers wrote their first doctrine just before the Gulf War. Recently, due to career field changes

and issues resulting from implementing their new doctrine in the Gulf War they revised it. Likewise, the Logistics community completed a similar revision based on lessons learned in the Gulf War and the changing world environment. Notably, Combat Support Doctrine was eliminated and replaced solely with a Logistics Doctrine under the new Doctrine Document system. Combat Support Doctrine included doctrine for the entire combat support arena. The new Logistics Doctrine presents doctrine for the functional area known as logistics in the Air Force. This revision leaves some communities previously covered by Combat Support Doctrine without guidance. Other functional communities with doctrine include Intelligence, Communications and Computer Systems, and Space.

Doctrine Is . . .

The ideas presented in this chapter illustrate the basics that doctrine developers and readers must consider. The official definition found in Air Force Policy Directive 10-13 represents the institutional definition. However, doctrine developers and readers can acknowledge other aspects of doctrine's definition including historical and future looking components, technological possibilities, and operational experiences. With the background of definition and components, a look at current Joint and Air Force doctrine illustrates what doctrine exists. By comparing the definitions of doctrine with existing doctrine, doctrinal voids in the Air Force become apparent. Once voids are identified the opportunity to develop new doctrine becomes clearer.

IV. What is the Role of Doctrine?

Doctrine's definitions and components described in Chapter III clearly reflect the inclusion of historical Air Force beliefs, principles and experience in Air Force doctrine. Doctrine's future looking component also defines prospective Air Force roles and missions which guide weapon development and provide some analysis of future capabilities. This chapter takes the next step in an analysis of doctrine by describing perspectives on doctrine's role in the Air Force, including an explanation of doctrine's relationship to strategy, policy and quality principles. Beyond the themes identified in doctrine's definitions, doctrine impacts many aspects of the Air Force mission, from strategy and policy formulation to supply decisions. Although some Air Force leaders suggest doctrine merely documents historical experience and beliefs, many others suggest doctrine performs other vital roles. These additional roles include serving as the blueprint for force employment, the foundation for training, a knowledge base of Air Force experience and culture and a public relations tool for explaining Air Force missions to Congress, the public and other services.

Before doctrine can be used to fulfill any of the suggested roles, however, it must first be developed and disseminated. The last section of this chapter discusses the steps necessary to formulate doctrine and the current dissemination procedures in the Air Force. Although this chapter does not stipulate why and how to develop doctrine, its primary purpose is to explain possible roles for doctrine and highlight doctrine development issues so decision makers can decide whether doctrine needs to be developed.

Doctrine, Strategy and Policy

Doctrine, strategy and policy are often individually referred to as the guiding influence for nearly everything the Air Force does. The need to distinguish between military strategy and policy and national strategy and policy further complicates the interrelationship among these three terms. Gen Holley wrote that national strategy should not be confused with doctrine because national strategy includes diplomatic, economic, social and military means for achieving a goal. Military strategy, he writes, involves the objectives, targets and employment of military force. Doctrine does not address the specific goals of a ntaional strategy; however, it does describe ways to achieve those goals (Holley, 1986:9). With the advent of the quality movement, vision, mission and goals add another confusing layer to the hierarchy of forces that guide Air Force decision making.

One illustration of how these influences work together can be found in *Making Strategy: An Introduction to National Security Processes and Problems* by Col Dennis M. Drew and Dr Donald M. Snow. These airpower scholars suggest a cyclical relationship. "Doctrine provides, in essence, a knowledge base for making [military] strategy decisions." However, history has shown doctrine does not always guide national strategy or strategic decisions. Often public policy and a variety of other factors result in decisions made contrary to military doctrine and advice. This brings another function of doctrine into view. "Doctrine provides a standard against which to measure our efforts." If doctrine is substantially followed and the resulting military strategy is successful, then the doctrine is validated and the military policies are accepted. Alternatively, if doctrine is followed and the resulting military strategy is unsuccessful, then the doctrine needs

reevaluation and adjustment. So, the results of implemented strategies provide experience, which is a component of doctrine (Drew and Snow, 1988:163-174).

In addition to guiding strategy, "doctrine is basic guidance for the development of [military] policy." Thus, doctrine also influences changes in military policy. As with military strategy, the results of implemented military policy statements provide feedback to measure the success of doctrine (Rider, 1972:1-2).

Dr. James Mowbray, a faculty member at the Air War College, suggests a similar cyclical relationship between doctrine, military strategy and military policy. His model (Figure 4), designed to help students analyze historical military campaigns, includes factors that influence military strategy. Mowbray includes doctrine as a factor in military decision making, along with leadership, force structure and technology. That decision making process is the majority influence in military strategy with significant additional influence from national objectives. In Mowbray's model, military strategy indirectly impacts policies which, in turn, influence and are influenced by, military decision making and doctrine (Mowbray, 1994).

Brigadier General Dale O. Smith, in his 1955 study, *U.S. Military Doctrine: A Study and Appraisal*, noted the feedback between military strategy, national objectives and doctrine has not always worked well.

> Military doctrine, or the current philosophy for waging war, is just one of many influences on national policy, and until recently, a minor one. Cultural tenets, domestic problems, politics, economics, the budget, and

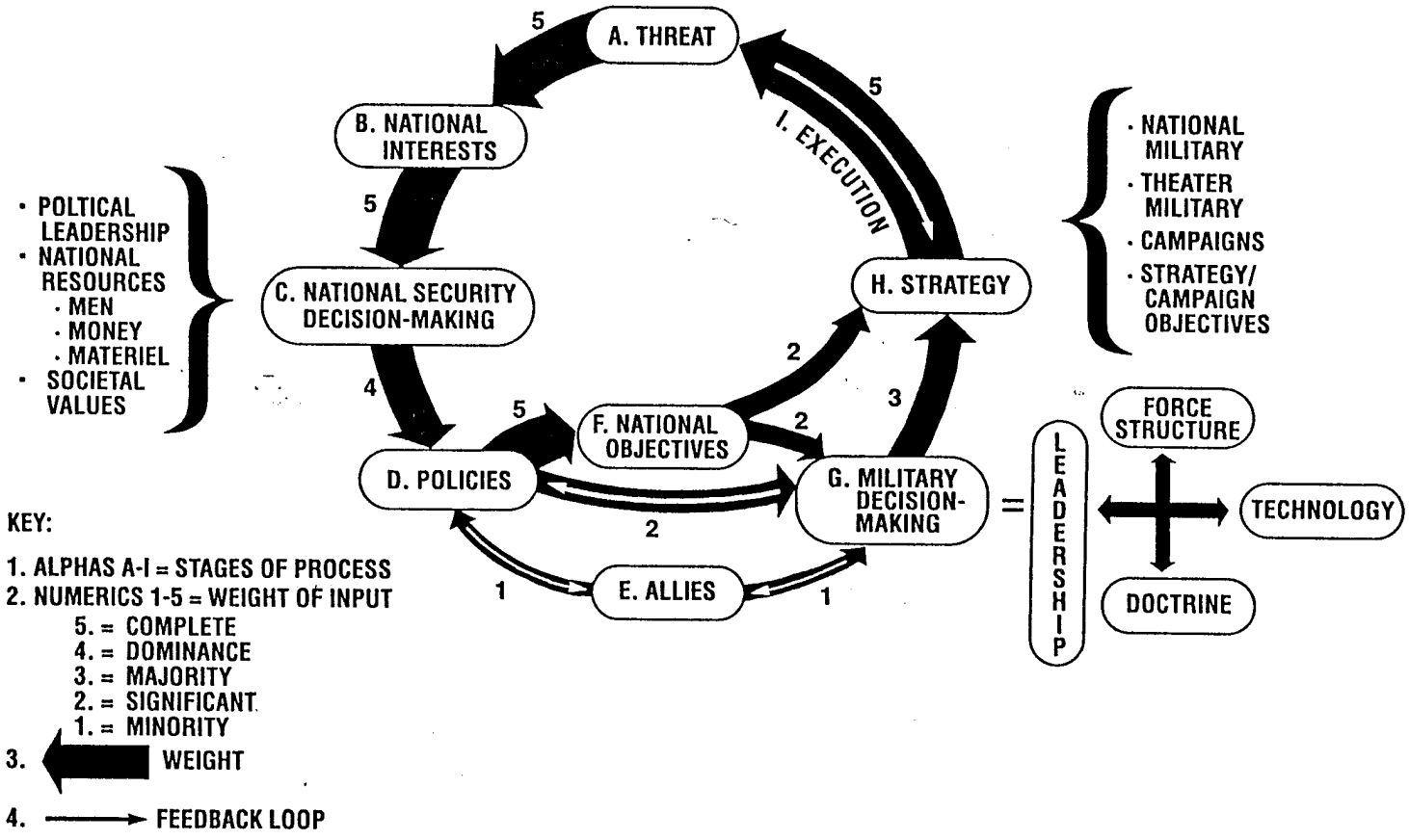

Figure 4. Mowbray Strategy Model

> the pressing demands of foreign affairs have formerly dominated the national policy of the United States, while military doctrine was largely ignored. This noncorrelation of military doctrine with [national] policy has led us into many unrealistic military postures and has caused us to wage wars for which we were unprepared. (Smith, 1955:7)

He notes that "today [1955] this is changing . . . Military doctrine is being given attention in the formulation of national military policy" (Smith, 1955:7). However, feedback present in 1955 was not present a decade later during Vietnam. In 1990 the feedback reappeared, coordinated military and political strategic planning during the Gulf War shows evidence of interplay between military doctrine and national policy. Despite instances that contradict a cyclical relationship among doctrine, strategy and policy, "Military planning, which rests on military doctrine and national policy, will determine the strategy we employ in an all-out war" (Smith, 1955:152).

Adding the total quality management terms vision, mission and goals to the doctrine-strategy-policy equation results in a hierarchical relationship. The Air Force Doctrine Center does not actively consider quality vision or mission statements while formulating doctrine (Williamson, 1995). Similarly, the Air Force Quality Center does not actively consult doctrine when developing vision and mission statements because they believe doctrine is only historical in nature (Martin, 1995). The Air Force Quality Center (AFQC) considers vision an explanation of what to look for in the future of the organization. The AFQC Consulting office believes mission statements typically tie in closely with the Air Force warfighting mission. However, when doctrine's forward-looking component is considered, doctrine and vision can have a much closer relationship. Similarly, the

missions described in doctrine should correlate with the quality missions derived from vision.

So, the web of doctrine-strategy-policy expands by including the quality concepts of vision and mission. Doctrine guides strategy and policy at the Joint and Air Force levels. Several feedback loops between policy and doctrine at different levels suggest tight interrelationships between these terms. Similarly, a forward-looking doctrine could provide valuable insight to those developing quality visions. Then, quality mission statements have basis in doctrine, as well as vision. Figure 5 shows the relationships.

The Role of Doctrine

Doctrine's role is not limited to influencing strategy and policy. Air Force policy states:

> The Air Force will develop, promulgate, and teach this doctrine as a common frame of reference for the best way to employ aerospace forces. Most importantly, doctrine provides the foundation for Air Force policies which guide our personnel as they plan, employ, organize, train, equip, and sustain Air Force forces. US Air Force doctrine will describe aerospace missions, tasks, and operating environments, guide commanders on employment of aerospace power, guide weapon development programs and force planning, guide organizational and personnel policies, provide the foundation for training and professional development of Air Force personnel, and provide the foundation for Air Force contributions to joint and combined doctrine development. (DAF, 1994a:2)

According to this official explanation, doctrine guides, describes, and provides the foundation for Air Force missions. In fact, the roles emphasize the forward-looking, guiding, component not mentioned in the current Air Force definition of doctrine. However, doctrine may not actually perform these roles. One doctrine analyst speculates

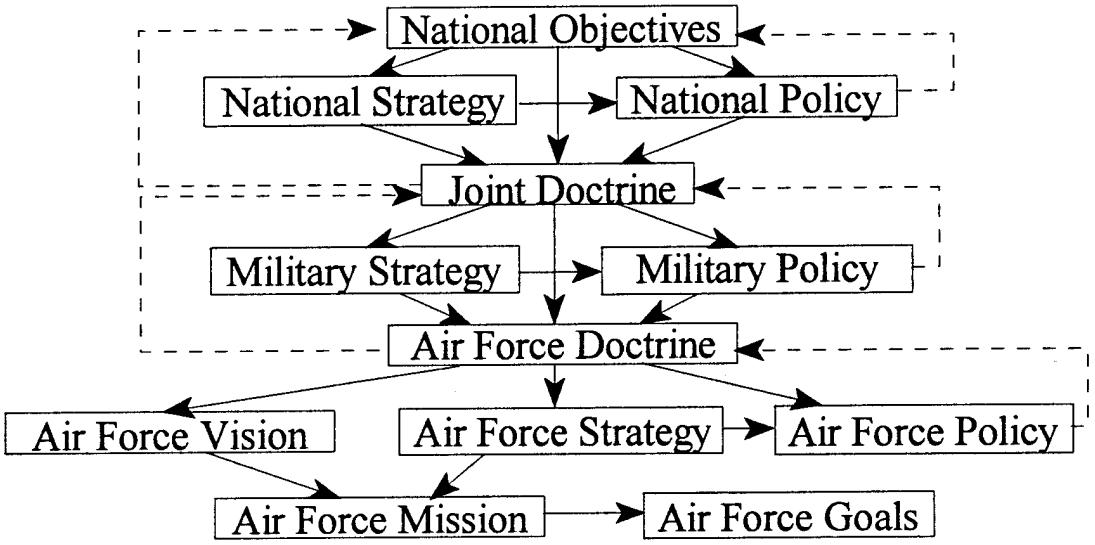

Figure 5. Doctrine-Strategy-Policy Hierarchy

"doctrine was out there and maybe it was important to the people running up and down the halls of the Pentagon and pontificating in the school system, but it did not really matter to those in the field" (Winton, 1992:21).

Dennis Drew, a respected military doctrine analyst and historian on the staff of the School of Advanced Airpower Studies, suggested doctrine has played three primary roles in the Air Force. First, "and perhaps most important, is to provide an analysis of experience." He stresses that doctrine cannot be a one time endeavor. Without reevaluating doctrine in light of changing circumstances, primarily technological developments, it becomes "irrelevant." He offers the example of the failed French doctrine that led to construction of the Maginot Line. The French did not reanalyze their doctrine in light of highly mobile

German forces. Second, doctrine "must teach these beliefs or lessons to successors." Again, he offers a concrete example. In World War I the Allies attempted to implement a frontal assault doctrine, despite the failure of such doctrine in the Civil War, the Russo-Turkish War and the Russo-Japanese War. Third, doctrine should "provide guidance for actions, particularly important in the heat of combat when directions from superiors may be unavailable." Drew suggests that the guidance function, however important, results from the success of analysis and teaching (Drew, 1982).

General Curtis E. LeMay offered a more graphic explanation for doctrine's role. He said, "It [doctrine] represents the central beliefs for waging war. Doctrine is of the mind, a network of faith and knowledge reinforced by experience which lays the pattern for the utilization of men, equipment, and tactics" (DAF, 1984:1). Colonel Harry G. Summers, United States Army retired and Army War College Fellow, explained this further.

> Doctrine is to planners of military forces what blueprints are to architects. Doctrine takes the conceptual notions of the functions to be served by military operations and, as General LeMay said, "lays the pattern" from which the force structure can be constructed. Like a blueprint, if the doctrine is flawed the result can be the collapse and destruction of the entire edifice. (Summers, 1992:9)

The Department of Defense defines doctrine's role much as LeMay and Summers did.

> The purpose of joint doctrine and JTTP [Joint Tactics, Techniques, and Procedures] is to enhance the combat effectiveness of US forces . . . to (1) guide the joint employment of joint forces, (2) provide the national position for multinational doctrine consistent with existing security procedures, (3) provide a basis for joint training, (4) provide instructional material for the military education system. (CJCS, 1993:I-1)

Whatever the multitude of uses found in official policy, Air Force leaders have not always accepted the importance of doctrine. In 1952, General Nathan F. Twining, Acting Chief of Staff, testified to Congress, "The Air Force is not bound to any fixed doctrine or concept. It grew out of scientific achievement" (Futrell, 1964:86). Another leader, General Laurence S. Kuter, "admitted that he could not suggest that doctrine had ever been the controlling factor in setting the rate of development of air power" (Futrell, 1964:87). So, some questions remain about doctrine's actual use.

Three revisions of doctrine in six years also left the issue of technology's interaction with doctrine unresolved. General Lloyd P. Hopwood, DCS Personnel in 1958, stated "We try to make our doctrine and strategy conform to glamorous hardware, instead of studying modern conflict to find acceptable solutions from which to establish the hardware requirements we need" (Futrell, 1964:87). One perspective addresses the dilemma by suggesting that doctrine results from the synthesis of theory and practice (Pauly, 1976:3). History provides the practice; technology development provides the theory. Nevertheless, the debate over the interaction between technology, air power and doctrine continues forty years later as the current Air Force considers technological implications in the revision of basic doctrine.

So, in addition to guiding strategy and policy, doctrine has several other roles in the Air Force. Air Force policy states that doctrine provides a foundation for planning, employing, organizing, training, equipping and sustaining forces; describes aerospace missions, tasks and operating environments; and guides weapon development, force

planning and contributions to joint efforts. Other research indicates doctrine serves additional roles too. These other roles include providing an analysis of experience, teaching Air Force beliefs and lessons, and guiding commanders.

Practical Examples of Doctrine in Use

Has doctrine fulfilled any of these roles? Doctrine has played a role from the days of the Army Air Corps through Desert Storm. In the early days of World War II, planners believed in the value of strategic bombing. Although unwritten, the doctrine of strategic bombing led to the development of two of the world's best bombers (B-17 and B-24). The same planners acknowledged the use of air power in other supporting roles, but did not commit the resources to procure similarly capable fighters. Unfortunately, the same doctrine created many flaws in planning during the Vietnam conflict. Doctrine had become dogma, but was still driving the war planning in the Air Force. Finally, air superiority doctrine drove the use of Coalition Air Forces during the Gulf War. This successful implementation of doctrinal driven planning resulted in stunning victories for air power. As a Central Command J3 Planner said, "We said at the beginning we would not depart from joint doctrine unless forced to do so, and we were never forced" (CJCS, 1991:64). The results of these war planning efforts validate existing doctrine, but it is up to the people to use it wisely. As Clausewitz said, "principles and rules are intended to provide a thinking man with a frame of reference for the movements he has been trained to carry out" (Clausewitz, 1976:141).

While compelling, the examples above only provide evidence of doctrine at a very abstract level. There are examples of doctrine's role in shaping Air Force activities at the concrete, worker, level. Table 1, on the next page, illustrates one example for each doctrinal role specified in AFPD 10-13.

Doctrine Development

Obviously, doctrine fills an important role in many aspects of the Air Force mission. Still, before doctrine can be used by planners, strategists, policy makers, or commanders it must first go through a rigorous development process. Air Force Instruction 10-1301, *Aerospace Doctrine*, specifies the required administrative process for coordination and publication. Although this AFI provides a clear outline of how doctrine works through the approval process, neither it nor any other official Air Force publication describes the steps and the decision process that determines why or how doctrine is developed. General Holley noted this lack of guidance in 1979 when he wrote, "One can find statements indicating which organizations are *responsible* but very little guidance on *how* the flow of *information* is *secured and* how the *analysis* is to be *conducted*" (Holley, 1979:4).

Why Develop Doctrine? Knowing what doctrine does for the Air Force as a whole, and for some Air Force functional communities, provides insight into what newly developed doctrine can do for a community without doctrine. Since Air Force policies do not explain why organizations should develop doctrine, it is up to the decision makers to decide whether doctrine answers their needs. The following paragraphs discuss why some organizations develop doctrine.

Table 1. Doctrinal Roles

Doctrinal Role	Example of Doctrine in Action
Provides the frame of reference for employing forces	Air Superiority "Aerospace control normally should be the first priority of aerospace forces" (DAF, 1992a:10)
Provides the foundation for force planning	CONUS Sustaining Force Civil Engineer Doctrine includes a need to "posture the civilian force to continue base operations after deployment" (DAF, 1994f:8).
Provide the foundation for organizing air forces	Objective Wing Reorganization "Air Force units should be organized to best harness people, equipment, and operational methods in effective arrangements to accomplish assigned missions" (DAF, 1992a:18).
Provides the foundation for training the force	Realistic Exercise and Training Scenarios Logistics Doctrine specifies "logistics scenarios should test the deployment and resupply of forces. . . duplicate the intensity of activity at a site from pre-attack through post-attack conditions" (DAF, 1994g:15).
Provides the foundation for equipping the force	War Readiness Spares Kit "C[ivil] E[ngineers] need to maintain an adequate supply of spare parts at all times" (DAF, 1994f:10).
Provides the foundation for sustaining the force	Prepositioned Supplies During Desert Storm "prepositioning of supplies made it easy for force to quickly move from a deployment phase to full combat operations" (DAF, 1992b:202)
Describes missions	Combat Support, Aerospace Control, Force Application, Force Enhancement "Aerospace control includes all missions whose objectives are designed to gain and maintain control of the aerospace environment" (DAF, 1992a:6).
Describes tasks	Counterair, Logistics, Airlift, Interdiction "Logistics creates and sustains aerospace forces" (DAF, 1992a:7)
Describes operating environments	Air and Space Realms "The aerospace environment can be most fully exploited when considered as an indivisible whole. Aerospace consists of the entire expanse above the earth's surface" (DAF, 1992a:5)
Guides Weapon Development	Smart Bombs "Precision weaponry has greatly enhanced the efficiency of strategic attack" (DAF: 1992a:12)
Provides the foundation for contribution to joint efforts	Red Flag Exercises "Success in modern war often depends on the synergies resulting from Air Force aerospace forces working closely with forces provided by the other services and by allies" (DAF, 1992a:18).

Management Theory. A key tenet of management requires developing knowledge of the organization. Doctrine is one source for knowledge about a military organization's

mission, future and past. Further, doctrine provides indications of the organization's culture. According to an organizational behavior text:

> It is the culture in an organization that helps workers respond to the inevitable uncertainties and chaos of performing a job. . . . organizational culture is a way of looking at and thinking about behavior of and in organizations, a perspective to take for understanding what is occurring. (Gibson, et al, 1994:62)

This explanation of organizational culture reflects the themes which describe doctrine. That is, doctrine may be the written representation of the military's culture. Without doctrine, a functional community or the Air Force is left without a personality. Because "culture is to the organization what personality is to the individual -- a hidden, yet unifying theme that provides meaning, direction, and mobilization" (Gibson, et al, 1994: 62).

Joint Doctrine. The Joint Chiefs develop doctrine within six mission areas: intelligence, operations, logistics, operations planning, C4 systems support (refer to Figure 2). New joint doctrine proposals are designed to "enhance the combat effectiveness of joint U.S. forces" (CJCS, 1993:D-1). Further, joint doctrine is written for a specific target audience which must be one of the following: "those who (1) provide strategic direction to joint forces, (2) employ joint forces, (3) support or are supported by joint forces" (CJCS, 1993:I-1). The joint world develops doctrine to provide guidance to planners and commanders in every mission area.

Navy Doctrine. The Navy develops doctrine under the same framework as the joint world. They also have six capstone doctrine publications, aligned with their mission areas: naval warfare, intelligence, operations, logistics (combat support), planning and command

and control warfare (Neff, 1995). Although the Navy has only been formally developing doctrine for two years, they clearly articulate goals for their doctrine. Navy doctrine is designed to provide input to joint doctrine, explain to Navy personnel and personnel from other services what the Navy's missions are, and describe naval missions to Congress. Naval Warfare Publications, the next lower level of Navy doctrine, describe tactics, techniques and procedures to implement capstone doctrine.

Army Doctrine. According to General Gordon R. Sullivan, Army Chief of Staff, "Doctrine is the *how* in the way the Army expects to conduct its operations; it is the accepted way we conduct our missions. It is so widely understood that it is an important part of our institutional culture, a part of the fabric of the Army" (Sullivan, 1992: 3). The Army develops doctrine to provide a common framework for all soldiers, private to commanding general, to understand. The Army also believes doctrine provides two strategic advantages. First, "doctrine is key to maintaining our warfighting edge over our opponents." Second, "doctrine is the catalyst for change across the army" (Sullivan, 1992:4). As in the joint world and the Navy, the Army develops doctrine for each mission area with a capstone doctrine, FM 100-5, *Operations*.

Air Force Functional Communities' Approach to Doctrine. Several functional communities have developed doctrine. Although many Air Force doctrine documents are under revision, some analysis of the reasons behind functional communities' decisions to develop doctrine provide insight into why doctrine should be developed.

Space. Since 1959, when *Basic **Air** Doctrine* became *Basic **Aerospace** Doctrine*, the Air Force has tried to define its role in space. The driving factor in this struggle involves the need to adequately differentiate the **space** environment from the **air** environment. Lack of appropriate doctrine led to decision making and goal setting for the space arena without a common base in doctrine or strategy (Wolf, 1991:29). The Air Force developed space doctrine because "sound doctrine, combined with national policy, fiscal reality, and other constraints can lead to strategies and plans that would allow us to acquire and employ space forces most effectively in support of national objectives" (Wolf, 1991:29). However, an overarching space doctrine also must be accompanied by lower-level manuals describing space capabilities. To achieve the objective of comprehensive space doctrine, Air Force Space Command convened a symposium to develop the doctrinal framework.

Civil Engineers. The Civil Engineers (CE) also found basic doctrine lacking in describing their mission. Further, the community realized that "the fundamental principles and lessons learned from those experiences have not been recorded in official doctrine" (Kishiyama, 1986:19). The engineers who had experience supporting full-scale conflict were vanishing from the Air Force. Adding to these deficiencies was the fact that basic doctrine in 1986 neglected to mention the importance of the basing system to the Air Force. The CE community felt that their lack of doctrine contributed to neglect in acquiring vital basing systems. Dramatic changes in technology since Vietnam resulted in "vulnerability of primarily fixed-site basing systems." Thus, CE doctrine could provide the needed emphasis on basing systems.

This decision was further reinforced by exercises such as SALTY DEMO and the TAB VEE (Theater Air Base Vulnerability) study (Kishiyama, 1986:19-20). The Air Force Directors of Engineering and Services during this period, Generals Ellis and Ahearn, decided doctrine would be developed to correct the deficiencies. A two-year research effort studied historical accounts, other services' engineering forces, other countries' engineering forces, and possible technological impacts. The research effort provided the corporate knowledge base for doctrine. The resulting doctrine, published in 1990 just prior to the beginning of Desert Storm, guided a restructuring of the RED HORSE and Prime BEEF organizations. Although the doctrine was not disseminated or institutionalized in the way the community desired, it did receive validation through its use in the Gulf War.

As a result of experiences in the Gulf, General McCarthy, the Air Force Civil Engineer, directed the revision of CE Doctrine. During a one-week conference, coordinated with the Air Force Doctrine Center, the Civil Engineers identified needed changes and revised their doctrine to reflect new technologies, organizational changes and wartime experience. A more intensive dissemination process is planned for this revision of CE doctrine, including articles in the *Civil Engineer* and a video (Hartzer, 1995).

Logistics. While Space and CE are new to the doctrine arena, Logistics Doctrine was initially formulated by two Air Force Institute of Technology students and published by the Air Force in 1968 as AFM 400-2, *Air Force Logistics Doctrine* (Boatright, 1992:14). In 1980 the *Air Force Journal of Logistics* published the first proposal to

revise the twelve year old doctrine. Major James D. Gorby explained the reasons for a new doctrine. They are:

> to serve as the underlying rationale for the logistics decision/planning process, to provide a structure for long range logistics planning, to encourage further thought on how we support and should support the combat strength of the Air Force, and to improve the training of our people. (Gorby, 1980)

This proposal was not acted on until 1984 when Lieutenant General Alfred G. Hansen, then Director of Plans and Programs, tasked Lieutenant Colonel William T. McDaniel, Jr to formulate a new doctrine. The motivation for doctrine at that time was that "many Air Force beliefs [were] not documented, which allows competing ideas to proliferate causing organizational ineffectiveness" (McDaniel, 1986:10). The resulting manual, AFM 1-10 *Combat Support Doctrine*, was intended as an "umbrella document for follow-on logistics doctrine." The target audience was "commanders, first, and logisticians, second." As with CE and Space doctrine, symposiums were used to develop and refine the draft. "The publication and institutionalization of combat support doctrine represents a pioneering effort to fundamentally and irrevocably alter the mind-set of Air Force members. Doctrine was chosen as the means of achieving this metamorphosis" (McDaniel, 1986:14). The institutionalization was aided by distribution of a video and establishment of a research fellow position in the Center for Aerospace Doctrine, Research and Education (McDaniel, 1986:14). In 1994 the Logistics community revised its doctrine, based on Gulf War experiences, new technologies and the changing face of war. This revision process was managed by the Air Force Doctrine Center. The new doctrine offers a fundamentally

different view of logistics. Under the 1994 doctrine, logistics is strictly those functions under logistics in the Air Force structure; it does not include other support functions.

There is no single answer to the question why develop doctrine. In fact, some past leaders suggest doctrine is irrelevant. However, examining theories behind decisions to develop doctrine identifies some common rationale. Doctrine can describe and teach the culture and beliefs of an organization. As Clausewitz suggested, doctrine serves as a frame of reference for the airman, soldier or sailor in the field. Doctrine describes the Air Force (or functional) mission to Air Force members, other services, the public, and Congress. (This role may be among the most important as Congress and the Administration downsize the military). The three functional communities saw doctrine as a way to document functional experiences and increase emphasis on their functions not found in basic doctrine. The rationale presented here are not the only reasons to develop doctrine, they merely represent some common reasons. Each community must determine the need for doctrine as appropriate.

How Doctrine is Developed. After a functional community decides it needs doctrine, the next step is developing the doctrine. This step presents special challenges to an Air Force that has a somewhat sketchy doctrinal history. This dearth of doctrine leaves much corporate knowledge and many lessons learned undocumented. "Doctrine is derived by means of the intellectual process of generalization" (Holley, 1979:5). Making generalizations based on an incomplete or non-existent body of facts makes a difficult task nearly impossible. Even with a complete body of facts, several steps must take place to

formulate good doctrine. General Holley suggests the doctrine formulation process involves three phases: collection, formulation and dissemination (Holley, 1979:5). The following paragraphs offer a closer look at each of these steps.

Collection. Doctrine formulation begins with collecting the knowledge and experiences of the people (Holley, 1979:5). A single 1987 study by Major James C. Miller, an Air Command and Staff College student, offers a suggested method for collecting corporate information for doctrine formulation: "The problem of collecting required data prior to formulation has been virtually ignored" (Miller, 1987:iii). His study proposes a series of at least six personal interviews with "credible" sources. A series of open-ended questions, posed to mid- to senior- level personnel in appropriate functional communities, provides the means to collect the experiences of the community (Questions listed at Appendix B). He suggests that most airmen in the field do not understand the vagaries of doctrine or doctrine development. By conducting these interviews the doctrine developers capture the corporate knowledge and understood doctrine of the community (Miller, 1987). The components of this corporate knowledge include recorded combat experience of United States' and other nations' forces, exercise results, war games, literature, and cross-flow with organizations outside the military (Holley, 1979:6-8).

Major Miller's method leaves some components of doctrine out. His proposal neglects technology and theory. General "Hap" Arnold was the first airmen to emphasize that "any Air Force which does not keep its doctrines ahead of its equipment, and its vision far into

the future, can only delude the nation into a false sense of security" (Futrell, 1989:180). To keep doctrine ahead of technology, developers should address issues of technology and theory with the same credible sources mentioned previously. Additionally, technology and theory issues should be included by surveying other sources to ensure thinking *outside the box*. Both the definitions and roles of doctrine encourage its use as a guide for future endeavors. Including technology and theory in the collection process provide the important forward-looking component in doctrine development.

Technology. The interaction of technology and doctrine presents another challenge to doctrine developers. Many question whether doctrine pulls technology or whether technology pushes doctrine. General Alton D. Slay, Commander of Air Force Systems Command in 1978, stated, "the days are past when the Air Force has the resources to develop technologies for which an operational mission has not been defined" (Slay, 1978:43). Nearly twenty years later, the policy directives and instructions for acquisition and research and development still contain no references to doctrine as a factor in determining mission need. In fact, the policy directives (AFPD 10-6 and 10-14) suggest changing doctrine if technology is not available to meet the doctrinal need. As I.B. Holley suggests, the Air Force should consider that:

> For every weapon system there are two crucial elements, although they are not always recognized as such. These are: hardware and doctrine, which is to say, the weapon itself and guidance on the best way to employ it. (Holley, 1978:407)

Holley goes on to say that the Air Force has institutionalized the motivation to improve hardware but has no motivation, except during war, to improve doctrine. If doctrine determines the method to use the hardware, then the Air Force has no revolutionary

doctrine to guide the use of the revolutionary hardware (Holley, 1978:408). Robert Perry, a career Air Force historian, sums it all up:

> The moral of all this is that marvelously impressive technology that contributes nothing to the solution of a critical national problem is worth no more, and no less, than a persuasively worded requirement that calls for some technological achievement scientists and engineers cannot provide. (Perry, 1978:388)

Technology and doctrine must be worked hand in hand to ensure the most for the Air Force mission. Doctrine written without considering technology provides no future guidance. Technology with no doctrinal employment basis does not contribute to the Air Force mission.

Formulation. Doctrine development involves many disparate talents. Collecting the necessary components to formulate the doctrine is the first hurdle. Writers can clear it by combining the corporate knowledge gained through functional community interviews with technological and theoretical ideas of others. The next hurdle is formulating the collected experiences, theories and technological possibilities into a coherent doctrine.

As with scientific research, doctrine developers must state their assumptions. Despite the organizational politics involved, they must also resist hierarchical pressures to be truly objective. After acknowledging biases, and recognizing hierarchical influence, the developer completes two steps to analyze the collected experiences: first, comparing like experiences to identify successful themes; second, looking for dissimilar experiences to refute the generalizations based on common experience. General Holley suggests that doctrine develops from concepts to doctrine then to principles. A concept is "a theory, an

idea yet unproved . . . Concepts spring from creative imagination." (Holley, 1984:91). An example of a concept might be that in the early days of flight, combat pilots noticed that "in air-to-air attacks out of the sun, or from a rear-area blind spot, opponents were placed at a disadvantage" (Townsend, 1979:54). This repeated experience resulted in the concept that attacks should be initiated from out of the sun or from a "deep-six position" (Townsend, 1979:54). After successfully exercising this concept, the resulting doctrine states, "maneuver to approach an opponent so he cannot observe your aircraft" (Townsend, 1979:54). This doctrine "is an officially approved teaching based on accumulated experience" (Holley, 1984:91). Concepts might lead to the planned result; doctrine probably leads to the desired result (Holley, 1984:91). Finally, this doctrine could evolve into a principle. "Principles are truths that are evident and general. . . derived by abstraction" (Holley, 1984:92). The principle resulting from the example here would most likely be "surprise."

Another approach to doctrine formulation, based on systems theory, augments the strictly historically based process of generalization. This approach "examines events in an environmental context. . . it draws from current situations -- the environment -- and looks ahead to the future" (Townsend, 1979:54). The external environmental factors include politics, perceived threats, resources, technologies. Internal sources include history, weapons, leadership and bureaucracy (Townsend, 1979:55). By combining historical generalization and systems based approaches, doctrine formulators can provide both the experience and future-looking components of doctrine.

After making the generalizations based on successful themes and dissimilar experience and examining the environmental factors, the developer begins writing doctrine. Often, the developer proposes doctrinal statements in journals or among colleagues as an informal test of the concepts proposed. In fact, strong discussion about the validity of doctrinal statements usually strengthens the final product (Holley, 1979:8-9). Once finalized, getting airmen to use the doctrine is the last hurdle.

Dissemination. For Air Force members to use doctrine they must first know it exists and understand what it means. Air Force Policy Directive 10-13, *Aerospace Doctrine*, tasks Air University to educate Air Force members about basic and operational doctrine. The standard publication bulletins provide notice of new doctrine publication. A fundamental concept of dissemination is understanding. The 1992 version of *Basic Aerospace Doctrine* includes many references to substantiate the generalizations written into doctrine. Without this documentation, which offers evidence of application and experience with the doctrinal statements, the Air Force invites, "belief as an act of faith rather than justifiable inferences on the basis of objective evidence open to independent scrutiny" (Holley, 1979:11). Still, before airmen can understand doctrine, they must first know it exists.

However, no formal method exists to market new doctrinal publications throughout the Air Force. If doctrine is to live up to its role as a guide and a description of the best way to do things, marketing new doctrine becomes an important issue in the doctrine development process.

The *Air and Space Doctrine Education* Instruction (AFI 10-1302) states, "Air University provides doctrine education through professional military education (PME), professional continuing education (PCE), and officer accession programs" (DAF, 1994c:3). However, consultations with staff at the Air Command and Staff College and the Air War College indicate that little formal education about basic doctrine occurs. The seminars at these schools do, however, include the broader topic of doctrine's relationship to strategy.

Both schools assume students have read and understand basic doctrine when preparing curriculum. This assumption may not be accurate. AFI 10-1302, published in 1994, is the first directive to define responsibilities for doctrine education. Examining the AU-sponsored programs that could provide doctrine education raises further doubt about the assumption. AU-sponsored PCE courses reach few functional communities (logistics, services and civil engineers primarily). Before the Air Force reorganization in 1992 most officer accession programs were not under AU influence. Since accession programs were outside the guidance of AU and no formal requirement for doctrine education existed, few junior officers would have received formal doctrine education. Finally, Squadron Officer School, the first professional military education school for officers, offers only a small introduction to doctrine in a historical perspective. In fact, the entire doctrine introduction in the correspondence course contains no references to current aerospace doctrine. These examples provide little evidence that officers receive any **formal** doctrine education.

While AFI 10-1302 requires doctrine education during officer accession programs, the Air Force postpones enlisted and civilian doctrine education until well after accession. In fact,

doctrine is not covered in enlisted PME until the Senior NCO Academy. Additionally, few enlisted members attend AU-sponsored professional continuing education. Lack of even basic doctrine education for Airmen and NCOs leaves more than 78% of the Air Force military population without knowledge or understanding of doctrine (Active Duty, 1995:37). Similar problems exist when examining the civilian doctrine education process. AFI 10-1302 states "Air Force PME and PCE programs provide DAF civilian doctrine education" (DAF, 1994c:3). When civilians are included, more than 75% of the entire Air Force work force received no doctrine education.

Despite direction that "Doctrine education includes basic and operational levels of doctrine as contained in Air Force doctrine documents. Doctrine education programs will span an individual's career" (DAF, 1994c:3), programs do not exist to educate Air Force members about doctrine's definition and role. The future holds promise though. The Air Force often revises PME programs to reflect current issues and policies. New initiatives in Basic Military Training and 7-Level (Technical Sergeant level) Training may include emphasis on formal doctrine education. Also, the Air Force is making some headway by informally promoting doctrine. Air University distributed the first two installments of a four-video series to educate Air Force members about basic doctrine in early 1995. However, AU does not plan to implement similar programs for education about operational doctrine. This leaves a void which functional communities or individual units must fill.

Commanders must determine if doctrine education is necessary. However, no previous studies investigated the impact of doctrine education on individuals. Perhaps this stems from the experience component of doctrine. Senior Air Force leaders have been immersed in Air Force beliefs for many years. They lived many experiences that form Air Force doctrine. Therefore, they may have an inherent understanding of what the Air Force believes eliminating their need for a written explanation of these beliefs. Does this experience factor eliminate the need to educate new members? Probably not. The Air Force still needs a strong plan to inform and educate others, especially new members, about its key principles.

Conclusions

Despite the lack of consensus that plagues doctrine research, some issues can be clarified. Doctrine can influence strategy, policy, and the quality concepts of vision and mission. It can provide a framework for planning, organizing, training, equipping, sustaining and employing the force. Doctrine can also provide a foundation for Air Force action in Joint efforts.

The reasons for developing doctrine are not entirely clear. Despite clear roles for doctrine, some communities and missions do not have guiding doctrine. How doctrine gets developed is clearer. Despite the lack of official direction in policies or instructions, doctrine developers seem to follow a three-step process of collection, formulation, and dissemination. Collection and formulation have no prescribed methodologies. Developers are left to decide what works best in a particular situation. Although the Air Force

explains dissemination procedures in official policy, problems in the process abound. Most noticeable among those problems are the lack of marketing plans for new doctrine, an unproven assumption that officers have read and understand doctrine and a lack of formal education for operational doctrine. However, the Air Force's new plan for doctrine education (videos) offers some promise. Further study of doctrine education and marketing are key to the success of future doctrine efforts.

Decision makers must decide if their organizations or communities need doctrine. Some Air Force leaders, Generals Twining and Kuter for example, believed doctrine had little relevance to Air Force operations. On the other hand, General LeMay, Clausewitz, Vandenberg and many other Air Force leaders and scholars reported doctrine's primary role in many facets of the Air Force. Doctrine influences policy and strategy formulation, weapon system acquisition, training and professional development, and the roles and missions debate. Doctrine provided a foundation for Space and Civil Engineering to promote their missions. Doctrine gave Logistics a foundation to work from in planning force structure and employment. Doctrine gives the Army its sense of culture. Doctrine provides a common frame of reference during the heat of battle when consultations with higher headquarters might be impossible. Although the examples presented in this chapter represent only a sampling of the reasons for doctrine development, this information provides the background to make a decision about the need for doctrine.

Finally, if a community decides to develop doctrine it then begins the challenge of determining *what* its doctrine is. Although very little has been published describing the

task of doctrine formulation, the overall process and some approaches were suggested. General Holley proposed the three phases in doctrine development collection, formulation and dissemination. This chapter presented key issues to be considered during each phase.

V. What is Information Doctrine?

With the significant foundation in doctrine provided by Chapters III and IV, the remainder of this thesis seeks to identify how doctrine could be applied to the current role of information management in the Air Force. Specifically, this chapter identifies definitions and roles of information, information practitioners, and challenges faced by information practitioners in the midst of the *information revolution.* This exploration of information in the Air Force, combined with the doctrinal foundation, provides the building blocks for a proposed concept of Information Doctrine.

First, to provide the necessary background to analyze the meaning of Information Doctrine, this chapter presents an overview of the current information environment in the Air Force. The information environment includes definitions of information, information management and information resource management; historical development of legal and regulatory requirements; mission requirements of information; information practitioners; and current challenges faced by information practitioners.

What is Information Management?

"There is no universal definition of information management despite numerous discussions" (Taylor and Farrell, 1992:319). Other publications echo this statement about the difficulty of defining information management. (Wilson, 1991:89; Diener, 1992:18) The variety of definitions for information, and information (resources) management used

by the Federal government creates a challenge in the study of information management in the Air Force. The Air Force, Department of Defense, Office of Management and Budget (OMB), and Congress define the key terms in different ways.

Information and Information Resources. The Office of Management and Budget defines information as "any communication or representation of knowledge such as facts, data, or opinions in any medium or form, including textual, numerical, graphic, cartographic, narrative, or audiovisual" (OMB, 1994:37900). DoD echoes this definition stating, "Information is the meaning that a human assigns to data by means of the known conventions used in their representation" (CJCS, 1993:184). These comprehensive descriptions assume an understanding of data as a:

> representation of facts, concepts, or instructions in a formalized manner suitable for communication, interpretation, or processing by humans or by automatic means. Any representations such as characters or analog quantities to which meaning is, or might be, assigned. (CJCS, 1991:104)

These definitions differentiate data and information. This research is interested in information, that is, data in some context to give it meaning, regardless of the medium.

Information resources differ from information, they include not only the information "created, collected, processed, disseminated or disposed of by or for the Federal Government" but also the "hardware, and software operated . . . to accomplish a Federal function, regardless of the technology involved, whether computers, telecommunications or others" (OMB, 1994: 37900).

Information Management (IM) and Information Resources Management (IRM). Information Management as described by both Public Law 96-511 and the OMB, in Circular A-130, includes the "planning, budgeting, manipulating and controlling of information throughout its life cycle" (OMB, 1994: 37900). IRM builds on IM to envelop all "information resources to accomplish agency missions. The term encompasses both information itself and the related resources, such as personnel, equipment, funds and information technology" (OMB, 1994: 37900). DoD adds to this, stating IM involves:

> the functional proponents creation, use, sharing, and disposition of data or information as corporate resources critical to the effective and efficient operation of functional activities. . . . It includes the structuring of functional management information processes by the OSD Principal Staff Assistants to produce and control the use of data and information in functional activities; information resources management; and supporting information technology and information services. (DoD, 1992: 2-1 - 2-2)

The Air Force simplifies this definition, "IM is a policy to manage information from its creation through its disposition" (DAF, 1993: 1). AF IM includes "information collection, paperwork reduction, statistical activities, records, forms and publications management, privacy and security of records data standards, and sharing and dissemination of information" (DAF, 1988:1). The Air Force further specifies that the mission of IM includes providing "systems, services, training and resources with specific emphasis on combat readiness of the information resource" (DAF, 1988:1).

Historical Development of Information (Resources) Management

In 1977, the Congressional Commission on Federal Paperwork completed its study of the burden imposed by Federal information collection and maintenance concluding that lack of comprehensive information management policies placed an undue burden on citizens and

the Federal Government. As a result Congress passed the Paperwork Reduction Act (PRA) of 1980 (USC, 1980).

The PRA mandated significant reductions in information collections, reduction in costs of administering information, and designated the Office of Management and Budget as the IM policy making organization for the Federal government. This legislation marked the first change in governmental information policy since the 1942 Federal Reports Act. The PRA also formally recognized information's value as a resource (USC, 1980: 6241-6146).

As a result of the PRA, the OMB issued the first version of Circular A-130, "Management of Federal Information Resources," in December 1985. The circular stressed the importance of planning and budgeting for information services. Between 1985 and 1992 Congress enacted further legislation regarding information technology, including the 1986 Paperwork Reduction Reauthorization Act, necessitating a revision of OMB's policy in April 1992 to reflect changes in law (OMB, 1994: 37906). The revision effort culminated 25 July 1994 with the issuance of an updated Circular A-130. Primary changes incorporated in the 1994 document included more comprehensive definitions; updates of basic considerations and assumptions including training, mission and automation issues; and revisions to guidance for selecting and employing information technology. The DOD and AF fall under the policy umbrella of OMB Circular A-130. Although defense policies have not been updated since OMB revised the circular, the initial version created a fundamental change in defense information administration. Managing information is no

longer just about filing papers and moving data. It is now about using information to help the organization.

Information Practitioners

After defining the terms and identifying legal and regulatory requirements for managing Air Force information, the next important factor in the information environment is identifying the information practitioners. In the Air Force nearly every career field or functional area manages and uses information in some way. However, this research considers information practitioners to be those individuals in fields that manage information resources as a primary responsibility. Information practitioners include individuals in Information Management, Communications, Intelligence, Public Affairs, History and Librarian career fields. All these career fields have the primary responsibility for managing a particular aspect of Air Force information. Information Managers are responsible for collecting and storing information throughout the information life cycle (from creation through disposition) (DAF, 1994h:186). Communicators manage communications-computer systems used to create, store or transmit information in electronic form (DAF, 1994h:171). Intelligence specialists collect, analyze and distributed data that have "strategic, tactical or technical value" (DAF, 1994e:194). Public Affairs personnel provide information about the Air Force to Air Force members and the public (DAF, 1993b:1). Historians "research, write, edit and organize historical data" (DAF, 1994e:364) to document Air Force activities. Finally, librarians maintain collections of information and provide assistance in researching information (DAF, 1994d:1).

These career fields represent the individuals involved in creating, collecting, managing, processing, analyzing, and disposing of Air Force information. However, each career field has a separate functional community that sets policy and procedures. Additionally, some communities are aligned under the Secretary of the Air Force and others under the Air Force Chief of Staff. For example, the information management function, until 15 October 1995, was aligned under the Secretary of the Air Force. On 15 October 1995 information management and communications-computer systems functions were integrated into a new Communications directorate under the Chief of Staff. Under the requirements of OMB Circular A-130, the Air Force appointed the Assistant Secretary of the Air Force for Acquisition, aligned under the Secretary of the Air Force, as the Senior Information Resources Management Official. This position adds yet another career field to the mix of information practitioners, without any individual leader in the management of Air Force information resources.

Mission Requirements of Information

Managing information to meet Air Force and organizational mission requirements is the challenge information practitioners face. A study by the General Accounting Office warns "being unable to obtain needed data, wading through unneeded data or inefficiently processing needed data wastes resources" (GAO, 1992:6). The same study suggests decision makers need "readily available, complete, and accurate information" (GAO, 1992:6). Joint and Air Force doctrine and regulations also address the mission requirements of information resources. Although Joint Doctrine primarily addresses

computer systems issues, some key information tenets appear. Information management systems must:

> have the capability to filter the information that is important, determine who needs it, and ensure that it gets there in time to be used. Two characteristics have remained constant: the human element and the need for relevant, timely, and accurate information. (CJCS, 1992:1)

The DoD Information Management directive specifies "accurate and consistent information shall be made available to decision makers expeditiously to effectively execute the DoD missions" and information security, integrity, and survivability must be assured (DoD, 1992:1-2). DoD Directive 7740.1 echoes those tenets and adds, "IRM policy and procedures should address such areas as availability, timeliness, privacy, auditability, ownership, use and cost-effectiveness of information" (DoD, 1983:1). Further discussions include directions for "effective economic acquisition and use of information" and "general quality" of information (DoD, 1983:2-3). According to this literature, correct, consistent, accurate information should be provided to users when they need it and how they need it.

Concerns of Information Use. Meeting the ambitious requirements for information requires addressing issues of impact on the public, individuals and other organizations. OMB's Circular A-130 addresses concerns of information use and management. It suggests that public accessibility to government information and protection of individuals' privacy should be paramount concerns of information managers (OMB, 1994:para 7b,7g). DoD Directive 5122.5, which specifies the role of Public Affairs, confirms those tenets. Enclosure 2 of *Assistant to the Secretary of Defense for Public Affairs*, documents five principles of information. The first, that information be readily available to the public.

Second, that information must flow freely to DoD members and dependents. Principles three and four address withholding information only for national security reasons, never to protect the government from criticism. The fifth principle recognizes the need for planning to ensure the expeditious flow of information (DoD, 1993:2-1). The Air Force addresses the concept of accessibility in describing the mission of information management stating information should be shared and disseminated (DAF, 1988:1). Sharing goes beyond public accessibility though, as DoD specifies in DoD Directive 8000.1, information must be easily shared within the government to foster cooperation and efficiency. Accessibility and privacy issues impact information flow and must be considered not only by information managers, but also by information users. Similarly, the opportunity to share information with the public and across organizational boundaries is an important consideration.

Managing the Information Resource. Demands for privacy, accessibility and sharing suggest information has some inherent value itself. Without question, federal government sources agree when they dictate the need to handle information as a resource. The Paperwork Reduction Act of 1980 marked the first time the government recognized information as a national resource and demanded management minimize costs and maximize usefulness. The implementing guidance, developed by OMB, identified several tenets of IM.

> The Paperwork Reduction Act introduced the concept of information resources management and the principle of information as an institutional resource which has both value and associated costs. Information resources management is a tool that mangers use to achieve agency objectives. Information resources

> management is successful if it enables managers to achieve agency objectives efficiently and effectively. (OMB, 1994: 37920)

The Act further emphasized the importance of acquiring technology only when it would improve service, effectiveness, dissemination or management of the vast information resource (USC, 1994: 367). According to the PRA, information's value depends on three factors: it must be needed, it must not be duplicative, and it must be collected efficiently (USC, 1980:2).

The Department of Defense recognized information as a corporate resource commensurate with manpower, money and equipment when it established the DoD Information Resources Management Program which specified user ownership of information and cost-effectiveness principles (DoD, 1983:1,2-3). Information as a resource is described in defense Command, Control, Communications and Computer Systems doctrine which states the "ultimate goal" of C4 systems is the synthesis of information from data (CJCS, 1992:1). Another indicator of information's importance as a resource can be found in the establishing documents of the Information Resources Management College under the National Defense University. According to the *Joint Staff Officers' Guide*, the IRM college was established as the "capstone institution for Defense IRM education" to prepare officials for "joint management of the information resource component of national power" (AFSC, 1993). A 1986 Directive, *Management and Control of Information Requirements*, calls for user responsibility.

> The central ingredient in information management is the user's responsibility and accountability for assuring that information requirements are valid, accurate, and essential to the mission of the user's organization. (DoD, 1986:2)

The original DoD IRM program directive initiated the call for "effective economic acquisition and use of information" (DoD, 1983:3) and management of the information resource throughout its life cycle. These requirements parallel OMB's collection of Federal information management tenets, including the theme of an information management life cycle. Other tenets introduced in the circular include: efficient and effective management, recognizing unquantifiable benefits of information, and a vital link of information policy to organizational mission (OMB, 1994).

The *Defense Information Management Program* Directive documents fourteen principles of information management, summarized in Table 1 below.

Table 2. IM Tenets in DoD Directive 8000.1

1. Manage information with centralized control and decentralized execution.
2. Simplification by elimination and integration before automating.
3. Use cost-benefit analysis and benchmarking to evaluate business practices.
4. Validate new business methods before implementation.
5. Information Systems should be common and shared.
6. Functional users must justify and control Information System costs.
7. Minimize cost and development time of new DoD systems.
8. Business processes guide Information System development.
9. The architecture of Information Systems should be transparent to the user.
10. Be aware of the DoD common data standards and definitions.
11. Competitively bid for information services whenever possible.
12. Enter data only once.
13. Safeguard information as appropriate.
14. Friendly user interfaces are required.

(DoD, 1992:3-1)

Although this directive addresses IM, these principles present many computer-systems specific concepts. Other media-indifferent information management principles addressed include: functional determination of information need, life cycle management, and corporate resource value (DoD, 1992:1).

Following the DoD lead, in 1987 *Air Force Combat Support Doctrine* described information as a resource, on par with money, people, materiel, real property and energy, to be managed and transformed to create warfighting capability (DAF, 1987:2-1). This doctrine document described the eight "principles of combat support" which follow from the principles of war. Information vitality figures prominently in the section describing the principle of "control." The information life cycle is indirectly documented as well. The doctrine suggests all resources go through an eight step life cycle that transforms them into combat capability: "definition, acquisition, maturation, distribution, integration, preservation, restoration and disposition" (DAF, 1987: 2-1). Although *Air Force Combat Support Doctrine* was superseded by *Logistics* (AFDD 40) in 1994, the new doctrine does not include all Air Force combat support functions, it merely addresses the functions performed in the logistics career field. This revision of doctrine leaves many career fields without published fundamental doctrine.

Records Management also performs a primary role in Air Force Information Management. The 1986 Records Management Program regulation clearly addresses some principles of records (information) management. It states "All records belong to the command whose organization or activities they document" (DAF, 1986:1). The information user is clearly the information owner. This indicates the Air Force goal to manage information as a resource, regardless of the media, regardless of the system (manual or automated). Recently, the Air Force formally recognized "information as a valuable DoD resource" and stated the Air Force's policy to "manage information from its creation through its disposition" (DAF, 1993a:1). This policy repeats tenets of information management found

in OMB and DoD documents: cost effectiveness, quality service provision, minimized collection and reporting burdens, accessibility, privacy (DAF, 1993a:1).

Supporting Information Management. The mission to manage information resources must also be supported with planning, budgeting and training for information practitioners. OMB Circular A-130 requires training for information managers and planning to preserve information's historical value (OMB, 1994:para8a1f, 7h). The DoD Information Resources Management Program Directive suggests the need to "create a broad awareness of IRM concepts and practices" including information life cycle planning, sharing of information throughout all parts of the organization and encouraging user responsibility for information administration (DoD, 1983:3). The Air Force includes planning and budgeting in information management's mission (DAF, 1988:1). These considerations cannot be ignored if information management is to be successful.

Obviously information resources management has evolved as an important concern for Air Force mission accomplishment.

> On the battlefield, the right information enables commanders to deprive the enemy of crucial capabilities with minimum risk to lives and weapon resources. In peacetime, effective information management enables commanders to meet increasing mission and contingency requirements in an environment of rapidly decreasing human and materiel resources. (DAF, 1995b:4)

Commanders and decision makers need the right information, in the right form, at the right time, in the right place, and information practitioners are expected to provide it.

Issues in the Information Environment

The variety of definitions and players in the information environment point to the opportunity for information practitioners to face many issues as they manage Air Force information resources. This section describes the significant issues.

Information Revolution. The challenges of the information revolution directly impact information resources management practitioners. "Information overload threatens to drown the American worker. The sheer volume of data -- from E-mail, voice mail, the Internet and World Wide Web, fax, news feeds, commercial online services, and much more -- keeps growing" (Foley, 1995:30). Information practitioners address this challenge every day. However, according to Paul Saffo, a director with the Institute for the Future, "Information overload is not a function of the volume of information out there. It's a gap between the volume of information and the tools we have to assimilate that information into useful knowledge" (Foley, 1995:30). Identifying the right tools to help assimilate the information is one job of the information practitioner. Meeting the challenges of the information revolution will involve the efforts of all information practitioners.

Strategic Planning. According to Air Force Policy Directive 90-1, *Strategic Planning and Policy Formulation*, Air Force strategic planning is based on the Global Reach-Global Power framework. Global Reach-Global Power (and, now, Global Presence) "addresses the roles and functions of the Air Force and details our goals and objectives" (DAF, 1993c:1). Except for the recent cooperative effort to publish *Vistas*, the Air Force Information Resources Management Strategic Plan, little evidence exists to show an

integrated plan to manage information resources across information practitioner career fields. *Vistas* was a cooperative effort by the Office of the Assistant Secretary of the Air Force (Acquisition), Information Management and Communications-Computer Systems. Despite the effort to create a "road map to the information management of the future" (DAF, 1995c), the plan neglects to include the four other information practitioner communities. Although there may be some debate about the inclusion of two career fields (Historians and Librarians) as information practitioners, descriptions of the four missing career fields indicate all four career fields provide significant information support to the Air Force. Nevertheless, *Vistas* is the first visible effort to coordinate information resources planning and therefore marks an important first step in recognizing information resources as strategic tools which need to be appropriately planned and managed. Hopefully, future efforts will include the full realm of Air Force practitioners.

Integration of Information Management and Communications-Computer Systems Career Fields. In spring 1994 serious reengineering efforts began to integrate the Information Management and Communications-Computer Systems career fields. This effort culminated in October 1995 with the integration of SAF/AAI (Information Management) and AF/SC (Communications-Computer Systems) into one organization on the Air Staff. Further integration at major command and base level is expected in late 1995 and early 1996. This dramatic change in structure and duties of two key information practitioner communities creates uncertainty for the future of the field. The results of the integration will not be available for inclusion in this thesis, but the integration is sure to be a challenge to Air Force information resources management planning and execution.

Information Warfare. 1994 and 1995 witnessed a dramatic increase in interest in Information Warfare. According to Lieutenant General Joe Ralston, deputy chief of staff for plans and operations, information warfare is "any action to deny, exploit, corrupt or destroy the enemy's information and its systems; while protecting against those actions; and exploiting our own information operations" (Pomeroy,1995:1). Information warfare involves knowing about the enemy in ways to enhance the United States' warfighting potential while protecting United States information. Information warfare adds three operational tasks to the Air Force arsenal -- information operations, counter-information and command and control attack (C2 Attack). Information operations involve "enhancing the employment of military forces through the acquisition, transmission, storage or transformation of information" (Pomeroy, 1995:1). Counter-information parallels counter-air, it involves offensive and defensive means to control information. C2 Attack is "any action against any element of the enemy's command and control system" (Weaver and Guinn, 1995:21). These three tasks span the roles and missions traditional fulfilled by air and space warfare: aerospace control, force application and force enhancement (Weaver and Guinn, 1995:22). Additionally, information warfare serves as a force multiplier (DAF, 1995a). The concepts and tools of information warfare have existed for many years. However, the idea of a new realm equal to air and space resulted in the creation of a concept paper for Information Warfare. Drafted by Majors Weaver and Guinn in the Air Force Plans and Operations Directorate, *Information Warfare: Pouring the Foundation* answers many questions about the place of information warfare in today's Air Force.

Information Warfare: Pouring the Foundation neglects the need to exploit information resources for internal Air Force purposes. The Air Force recognizes the legal and business needs to manage information resources in regulations. However, the concept paper for information warfare does not address the need to optimize and exploit Air Force information for daily Air Force operations -- unless the operations are offensive or defensive in nature. In terms of Air Force roles and missions, information warfare neglects the force support role of information. The information needs for daily operations include not only the offensive and defensive aspects of information, but also business information. Business information can include status of particular programs, financial management information or community relations information. Without a firm handle on these day to day factors, decision makers will find information dominance more difficult. As Air Force Chief of Staff General Ronald Fogelman said, "The side that can analyze, act, and assess faster -- will win" (DAF, 1995a). All Air Force information needs to be available to decision makers so the analysis, action and assessment can be made quickly and effectively.

The increased emphasis on information warfare also resulted in a large "spread the word" effort. The College for Aerospace, Doctrine, Research and Education spearheaded the JUMPSTART program, providing a familiarization briefing to nearly every base. Courses were developed for major air command and numbered air force staffs. Mid- and Senior-level professional military education courses incorporated information warfare into their curriculum. Finally, "we're incorporating IW into our doctrine, so that airmen everywhere will share a common foundation and a common terminology" (Fogelman, 1995:5). By

developing doctrine and dedicating significant resources to an informational campaign, the Air Force gives credence to the importance of information warfare.

Wartime Preparedness. In October 1992 the Air Force Information Management Executive Council directed Air Force Material Command to "critically determine whether IM policies, procedures, processes, and training were responsive to the wartime needs of deployed commanders" (Davidson, 1995:1). The report, nicknamed CRUCIAL OASIS, identified eight critical issues that major command Information Managers were asked to prioritize for impact to future warfighting needs. (No similar studies were available for the other information practitioner fields.) The eight critical issues identified were as follows:

- The Air Force doctrine that outlines the role of the information resource for wartime and peacetime environment, does not exist.
- The Air Force requires policy or procedures for information architectures; in the future these architectures should be developed in conjunction with data and technical architectures.
- The Air Force requires long-term planning for and managing of information as a resource, especially for wartime operations.
- The IM community needs to develop standard skills sets for officer and enlisted personnel who deploy in both wartime and contingency scenarios. Those skills sets must be incorporated into IM training and education. MAJCOMs may also need to develop MAJCOM-unique wartime skills sets for these personnel.
- The IM community needs to develop and implement information access, retrieval and storage (records management) policies, and procedures, for a variety of media within the wartime and contingency environments.
- The IM community needs to develop policies for and implement user training for handling captured enemy information (records). This area requires coordination with the HQ USAF/IN to ensure any policies and procedures correlate with national security policies.
- The IM community needs to evaluate standard equipment and O&M capabilities required in the future for deployed IM personnel.
- The IM after-action reporting process must be revised to capture statistical information needed to improve IM processes and training. The present day after-action reporting process does not identify and cross-feed information-

related problems from all AF functions to SAF/AA for validation and resolution. (Davidson, 1995:Atch 1)

Although these issues are all relevant to the wartime readiness of the information management field, the key issue in this thesis is the identification of the lack of doctrinal foundation for the use of information resources. However, as the CRUCIAL OASIS report points out, the lack of doctrinal foundation could be a significant contributing factor to the other issues (Shediack, 1994). The report clearly identified that information resources management, in its force support role, is a vital component of warfighting.

What is Information Doctrine?

Combining the preceding discussion of the Air Force information environment and the definitions, roles and development of doctrine explained in Chapters III and IV, the third research question of this thesis can be answered. To determine what the term Information Doctrine could mean it is important to look at all aspects of doctrine and information. From Chapter III, remember that doctrine includes the following components:

- Operational experiences,
- Historical and future looking components, and
- Technological possibilities.

Chapter IV described doctrine's role, development and dissemination. The following key points about doctrine resulted:

- Doctrine influences strategy, policy and quality concepts of vision and mission
- Doctrine provides a framework for planning, organizing, training, equipping, sustaining and employing the force
- Doctrine provides a foundation for Air Force participation in Joint efforts
- Doctrine informs government policy makers and the public about the Air Force mission

- Doctrine development has no formally prescribed development format, but typically authors follow a three step process of collection, formulation and dissemination.
- Doctrine can help promote functional missions, provide a foundation for planning force structure and employment, develop a sense of culture, provide a common frame of reference for airmen.

Combining these factors with the information presented in this chapter about the information environment help clarify what Information Doctrine could be. Information Environment factors considered in developing a concept of Information Doctrine include the following:

- Information Resources should be managed commensurate with other resources (people and money, for example),
- The concept of information resources management has historical foundations in law and practice,
- Air Force information practitioners include information managers, communication-computer systems specialists, intelligence specialists, public affairs specialists, historians and librarians,
- Many principles of IRM are included in laws and regulations including the foremost rule of IRM: get the right information to the right person at the right place at the right time in the right format, and
- Many information resources related issues impact the Air Force today including the information revolution, strategic planning, integration of career fields, information warfare and wartime preparedness of information managers.

So, the concept of Information Doctrine would address the historical foundation of IRM. It would address operational experiences of information practitioners and information users in peace and war. This specifically would address successes and failures experienced during the Persian Gulf War because of common reference to that war as the first "information war" where information capabilities played a critical role in the success of the coalition forces. The technological possibilities associated with information resources are nearly unlimited. The information revolution provides ample fodder for considering

dramatic technological developments which could enhance the future capabilities of the Air Force. These three items address the typical components of doctrine.

Information doctrine could fulfill many of the roles suggested for doctrine. It could provide the foundation for commanders and decision makers to consider information resources issues, including management of information as an Air Force resource, when developing strategy, policy and quality vision and mission statements. Information Doctrine could provide background for the government, other services, and the public about information resources in the Air Force mission. Information Doctrine would fill a role similar to the role of civil engineering and logistics doctrines. Civil Engineering and Logistics doctrine represent doctrine for two other Air Force resources, facilities and materiel. Logistics and Civil Engineering Doctrine provide a foundation for commanders and decision makers to employ forces and fulfill their specific functional missions. The two doctrines also assist in planning force structure and employment. Information Doctrine can provide a common frame of reference for airmen in disparate information practitioner career fields so that all information resources are managed with the same underlying principles (for example, getting the right information to the right person at the right place at the right time in the right format). Finally, Information Doctrine would provide a foundation to build IRM strategic plans, address career field integration issues, and improve the wartime preparedness of information practitioners.

Development of Information Doctrine. Information Doctrine *could* include many items to help the Air Force and Information Practitioners accomplish the mission. However,

Information Doctrine would need to be developed first. As Chapter III described, no official doctrine development process exists. This thesis adopts General Holley's proposal of a three step process of collection, formulation and dissemination. Holley's process clearly describes the undocumented process some analysts at the Air Force Doctrine Center follow. Further, the method should be widely accepted since General Holley is the preeminent doctrinal scholar. Understanding that "Doctrine is derived by means of the intellectual process of generalization" (Holley, 1979:5), Information Doctrine can not be developed overnight. A strong plan, following the three step development process, would ensure a carefully crafted doctrine.

Collection. Collection of the facts, history and beliefs of the information resources field is the first step in crafting Information Doctrine. Major James C. Miller's proposal for a series of interviews with mid- to senior- level personnel in appropriate functional communities provides a strong foundation to build doctrine. The interview questions listed in Appendix A must be tailored to the information resources arena and appropriate interviewees selected. Completing the interview process allows doctrine developers to capture the corporate knowledge and understood doctrine of the community (Miller, 1987). A thorough review of documented sources of combat experiences, exercise results, foreign nations' experiences, and academic and corporate literature provides a complementary source for additional information about the information resources arena (Holley, 1979:6-8). The collection methods proposed by General Holley and Major Miller neglect one key component of doctrine -- future technological possibilities. Doctrine developers involved in collecting the experiences and beliefs of the information

practitioners should take special care to include questions, discussion and research about future capabilities.

The Air Force Logistics and Civil Engineer career fields found that the collection process was effective when conducted as a meeting or seminar. Both communities revised their doctrine by convening one or more meetings, assisted by the Air Force Doctrine Center, to assess the current state of doctrine and identify necessary changes. Information Doctrine developers could consider a similar tool to assist in the collection of information practitioner experiences. After completing a sufficient number of interviews with information practitioners, surveying the literature and assessing the future capabilities of technology, doctrine developers are ready to formulate doctrine.

Formulation. After collecting information to address the key components of doctrine, doctrine developers face the daunting task of actually formulating the doctrine. Many sources pointed out the necessity of stating any assumptions. For example, Information Doctrine developers may need to address the issue of two Major Regional Conflicts or the Global Reach-Global Power-Global Presence vision of the Air Force. The process of doctrine formulation requires is quite complex. First, formulators must identify common successes, failures and conflicting experiences found during the collection phase. Next, these common themes provide concepts "theory, an idea yet unproved" (Holley, 1984:91) from which doctrine can be generalized. For example, experience of many information practitioners might show that during the Persian Gulf War information practitioners were not able to maintain legally and operationally required records sets.

Based on this experience, future exercises could test a concept by tasking trained information practitioners to maintain necessary records sets. Finally, doctrine results from the generalization of a concept. Continuing the example, if the training was successful, and records sets were maintained to legal and operational requirements, the doctrine would be that information practitioners should be trained to properly maintain records sets in a deployed environment. Often, the suggested concepts and doctrine are published in journals or discussed at appropriate symposium as an informal test of the proposals. After careful formulation, the final hurdle in the three step process is "getting the word out" about the new doctrine.

Dissemination. Air Force members must know a doctrine exists, and understand it, before it can help them. Beyond publication in Air Force publishing bulletins, doctrine developers need to market their work to commanders and other target audiences. Information Doctrine would span many career fields and would impact many others since information resources management is primarily a force support tool. Information Doctrine developers would need to develop a comprehensive plan to inform and educate the Air Force about Information Doctrine. Air Force Civil Engineers found that their previous doctrine, published just prior to the Gulf War, was not publicized well and thus was not recognized or used. However, they are developing an aggressive campaign, based on videos and articles in *The Civil Engineer*, to publish their revised doctrine. They also plan renewed emphasis on doctrine in Engineering 101, the introduction to Civil Engineering for Officers at the Air Force Institute of Technology (Hartzer, 1995). The Logistics community went through similar efforts when their first doctrine was published,

and later with the publication of *Air Force Combat Support Doctrine*. Videos, articles in the *Air Force Journal of Logistics*, and lessons in logistics doctrine as part of the curriculum at the Air Force Institute of Technology combined to educate not only logisticians, but also commanders charged with effectively employing combat support forces. Although Air Force Instructions direct Air University to provide education about "basic and operational levels of doctrine as contained in Air Force doctrine documents" (DAF, 1994c:3) throughout members' careers, programs do not exist to provide this education. The lack of formal doctrinal education leaves doctrine developers and functional communities to "get the word out" and promote understanding of their doctrine. Information Doctrine developers will need to meet this challenge if Information Doctrine is to have an impact on Air Force personnel and operations.

Information Doctrine -- A Concept

Once the development process is completed what would the doctrine actually include. Based on the other "resources" with Force Support doctrine, Information Doctrine could take a variety of forms. Doctrine documents are, by design, short and relatively general. This stems from the fact that doctrine is an overarching framework for more specific strategies, policies and tactics. Logistics doctrine (AFDD 40) has three sections: Logistics Processes (very similar to the Information Life Cycle), Logistics Principles (based closely on well known principles of war), and Logistics Concepts (DAF, 1994g:1-2). Civil Engineer doctrine (AFDD 42), like Logistics doctrine, provides doctrine for peace, war and Military Operations Other than War (MOOTW) (now called Other Military Operations). Civil Engineers (CE) take a slightly different approach to doctrine,

they address CE Functions and Tasks; Organization, Command and Control; Planning Considerations and Support Requirements; and Training and Personnel (DAF, 1994f:1-2). Civil Engineer doctrine focuses on identifying the role of CE in supporting Air Force operations across the spectrum from peace to war. The audience is commanders first and civil engineers second (Hartzer, 1995). Information Doctrine could adopt the best from each of these structures.

Information Doctrine shares common elements of support with both Logistics and Civil Engineers. As a proposal, Information Doctrine Could be structured in the following manner:

- **Information Processes**--creation, processing, dissemination, use, storage, and disposition
- **Information Principles**--Responsiveness, simplicity, flexibility, economy, attainability, sustainability, survivability
- **Information Functions**--Records Management, Intelligence, Public Communication, Information Transmission, Historical Documentation, Research Assistance, etc.
- **Information Planning Consideration and Support Requirements**--Intelligence and Threat, Logistics, Climate and Weather, Communications, Facilities, Technological Considerations, etc.
- **Information Training and Personnel**--Warriors, Professionals, etc.

(Adapted from AFDD 40 and AFDD 42)

While the structure and contents presented above are only examples of what Information Doctrine could "look" like, they illustrate the descriptive power of the prospective doctrine. Commanders and information practitioners need to understand how the information resource fits into the Air Force mission and what it can do to enhance the mission, Information Doctrine is one tool to help further this understanding.

VI. Conclusions and Recommendations

Through the study of doctrine and information resources, this thesis investigated the need for Air Force Information Doctrine. To assess this need, this thesis explored what Information Doctrine could offer the Air Force by examining the following research questions:

1. What is doctrine's definition and role in the Air Force?
2. What is the information resource role in the Air Force?
3. What could the term Information Doctrine mean?

These questions provide the background for decision makers to answer the central question, does the Air Force need Information Doctrine.

What is Doctrine's Definition and Role in the Air Force?

The investigation of doctrine's definition and role spanned chapters III and IV. Although doctrine has several official definitions, the meanings behind the definitions can be summarized as follows:

- Doctrine is made of three components--historical experiences, operational capabilities, future possibilities,
- Doctrine, very basically, is what "we" believe; the principles "we" have found to be true over time, the best way to do things
- Doctrine can form the basis for strategy, policy and quality vision and mission,
- Doctrine can illustrate Air Force roles and missions to other services, Congress and the public,
- Doctrine provides the framework for organizing, training, equipping and employing forces,
- Doctrine, if known and understood, can provide a blueprint for action in the heat of battle. It allows airmen to know what has worked, what is expected and what is accepted.

These facts suggest doctrine has the capability to be a strong factor shaping the culture of the Air Force. Further, the recent increased emphasis on doctrine development at both Department of Defense and Air Force levels indicates an institutional belief in the need for doctrine.

What is the Information Resource Role in the Air Force?

The second research question required investigating role of information resources in the Air Force. As with doctrine, the variety of official definitions challenge research in this area. Ultimately, this research adopted the notion that information is more than merely data, it is data with instructions or interpretation to give it some meaning. Thus, information is a resource, commensurate with money, people, energy, facilities and materiel. Following from that, information resources are, as described by the Office of Management and Budget, the information, personnel, equipment, systems, training, and funding necessary to manage the information resource. Information resources are vital to the continued success of the Air Force, evidenced by substantial interest in information warfare, exploding interest in computer systems to manage information and references in doctrine, policy directives and instructions. Ultimately, information is the life blood of commanders and decision makers.

Other key information resources issues to consider in determining the need for Information Doctrine include the following:

- OMB Circular A-130 requires an agency-wide framework for managing information resources,
- Air Force information practitioners span several functional communities,

- Information Resources Management has historical and legal foundations, and
- The Air Force is impacted by many information resources issues, including the information revolution, strategic planning, integration of career fields, information warfare and wartime preparedness of information managers.

Together, these factors indicate the management of Air Force information resources needs a common framework that crosses functional boundaries and provides guidance for organizing, training, equipping and employing Air Force information practitioners.

What Could the Term Information Doctrine Mean?

The third research question asks what the term Information Doctrine might mean. This research did not identify specific principles or tenets that could be included in doctrine. However, the historical, legal and operational background of the information resource role in the Air Force combined with the doctrinal role provides several possibilities for the content and structure of Air Force Information Doctrine. As presented in Chapter V, Information Doctrine might include five sections, covering the following topics:

- **Information Processes**: discusses the processes common across information practitioner activities; for example, creation, processing, dissemination, use, storage, and disposition
- **Information Principles**: discusses the principles common across information practitioner activities to achieve the goal of *the right information to the right person at the right time at the right place in the right format*; for example, responsiveness, simplicity, flexibility, economy, attainability, sustainability, survivability
- **Information Functions**: discusses the specific functions accomplished by information practitioner activities to support the Air Force mission; for example, Records Management, Intelligence Collection and Analysis, Public Communication, Information Transmission and Storage, Historical Documentation, Research Assistance, etc.
- **Information Planning Consideration and Support Requirements**: discusses items information practitioners and commanders should consider when employing information practitioners; for example, Intelligence and Threat, Logistics, Climate and Weather, Communications, Facilities, Technological Considerations, etc.

- **Information Training and Personnel**: discusses training philosophy for information practitioners and describes expectations of individuals in information practitioner fields; for example, Warriors, Professionals, etc.

Although this outline provides little detail about what specific information might be contained in Information Doctrine, it does illustrate the types of information that would be found in Information Doctrine and allows decision makers to assess the need for this doctrine given the existence of other policies and guidance.

Is Information Doctrine the Right Answer?

Although the value of Information Doctrine may be apparent, several questions may linger. This section of the conclusion address some of the possible questions facing decision makers assessing the need for Information Doctrine.

- Do any other doctrine documents address the items suggested for inclusion in Information Doctrine?
  - No. Combat Support Doctrine (1987) did address all areas of combat support, including information resources management. However, in 1994 it was revised to *Logistics* (AFDD 40) and it no longer addresses functions outside the functional logistics community. Doctrine for "Enabling Functions" under development includes AFDD 50, *Intelligence*, and AFDD 70, *Communications and Computer Systems*. These doctrine documents are not published but may include similar information to that suggested for Information Doctrine.

- Why publish doctrine instead of a policy directive, instruction or manual?
  - Doctrine is descriptive and Policy directives, instructions and manuals are prescriptive. A doctrine document describes the activity including culture, historical experiences, future capabilities, and is based on what is believed to work best. Policy directives, instructions and manuals tell an Air Force member what to do and how to do it, typically allowing for little interpretation or judgement.

- If doctrine is not taught and no studies show its impact on the Air Force why develop a new doctrine?
  - True, there is no definitive answer to what doctrine does for the Air Force. However, doctrine's impact on daily operations was illustrated in Chapter

IV. Further, many Air Force leaders have extolled the virtues of doctrine and its guiding framework. Doctrine provides airmen with another "tool" to accomplish their mission; one that describes their role in the Air Force and the Air Force's culture and expectations.

- If we decide to develop Information Doctrine, how do we ensure it is used?
  - Follow the lead of the Logistics and Civil Engineer communities which have successfully fielded doctrine. Also, CADRE has developed an educational program for AFM 1-1, Basic Aerospace Doctrine, that could assist in developing a marketing and education plan. Some key factors in these efforts include: a publicity campaign that gets the word out to the functional community **and** commanders, a video or briefing series on the doctrine, inclusion in PME for officer and enlisted, inclusion in education provided by AFIT and training provided by AETC. Develop ways to include consideration of doctrine when developing plans, policies, budgets, exercises and quality programs.

- Without specific Information Doctrine, what other vehicles could provide an Air Force framework for managing information resources?
  - Air Force manuals, policy directives and plans could address some of the issues proposed in doctrine. However, these publications typically have a slightly different focus than doctrine. For example, doctrine is written for the entire Air Force as a general description of beliefs and "best practices" in a particular arena. Manuals, policy directives and plans typically mandate methods to carry out the ideas contained in doctrine. If doctrine is not developed, one method to insure the concepts suggested for Information Doctrine are included in other doctrine is to encourage doctrine developers to consider the information resources requirements in their doctrinal publications.

Conclusions

Throughout the discussions of Information Doctrine several factors become clear. First, the Air Force has no global framework for managing information resources or information practitioners. Each of the six practitioner communities manages its own personnel, training, and budget and sets its own policy for the management of the information it generates. Second, no doctrinal document addresses the specific concerns of information resources management. Although Information Warfare Doctrine may soon be published,

it focuses fully on the offensive and defensive aspects of information warfare and neglects the many force support functions accomplished by information practitioners. Third, a **properly marketed** Information Doctrine could have significant impact on Air Force policy, strategy and mission accomplishment. If understood and known, Information Doctrine could encourage the management of information as an Air Force resource regardless of its source or form. For these reasons, it appears the Air Force may need Information Doctrine.

Recommendations

In addition to proposing the concept for Information Doctrine and making an initial assessment of the need for Information Doctrine, this thesis also presents several recommendations. First, several questions remain unresolved regarding doctrine's use in the Air Force. Areas needing further research include the following:

- **Doctrine Education** -- does the Air Force educate its members about basic and operational doctrine throughout their careers?
- **Doctrine in Action** -- is doctrine simply shelf material, or do planners and commanders use doctrine to enhance understanding of Air Force missions?
- **Doctrine Development** -- does the Air Force use or need a formal doctrine development process that outlines minimum requirements for collection, formulation and dissemination?
- **Doctrine Hierarchy** -- why does the Air Force develop doctrine in line with roles and missions, while Joint doctrine is developed consistent with Joint Staff responsibilities? How do Air Force doctrine documents correspond to similar Joint doctrine when the fundamental systems are different? How does the doctrine document numbering system differentiate between basic, operational and tactical doctrine?

Additionally, some issues associated with the information resource role in the Air Force would benefit from further investigation. Researchers should consider examining the following issues:

- **Information Practitioners** -- how do the six information practitioner fields interrelate? Do they operate under the same basic principles and if not, how and why do they differ?
- **Career Field Integration** -- how is the integration of Information Management and Communications-Computer Systems career fields affecting the understanding of information as a resource?
- **Information Warfare** -- how is the emerging concept of information warfare impacting the information practitioner?

Further Research. In addition to the issues which could benefit from additional research, several opportunities exist to further investigate the concept of Information Doctrine in the Air Force. First, a serious collection effort is necessary to begin the doctrine development process. Research including literature searches and interviews with information practitioners could begin the process. Second, development of a rigorous doctrine formulation process could aid development of Information Doctrine and future Air Force doctrine efforts. Finally, research into the best methods for marketing doctrine to the Air Force community would enable Information Doctrine to become widely read and understood.

Summary

The results of research into the need for Air Force Information Doctrine identified many unresolved issues in both the doctrine and information resources management arena. In this concluding chapter, readers can find several proposals for additional research. Nevertheless, the proposed concept of Information Doctrine, as a framework for organizing, training, equipping and employing information resources, could be a significant factor in Air force mission accomplishment. Information Doctrine also has the possibility

of providing assistance to information practitioners in meeting the challenges of the information revolution.

Appendix A: Interviews Conducted

Interviews Conducted

Informal interviews with the individuals listed below provided background information for this research.

Information Resources Management

Colonel Kevin Collins, Director of Information Management, SAF/AAI

Colonel Patricia Almany, Chief of Plans, SAF/AAIX

Colonel Bernard Hoenle, Chief of Publishing, SAF/AAIP

Colonel Joan Blankenbeker, Director of Information Management, AETC/IM

Ms. Marian Bowser, Strategic Planner, SAF/AAIX

Lieutenant Colonel Sgroi, Chief of Publishing, ACC/IMP

Major Bruce Cowser, IM Strategic Planning, AETC/IMX

Chief Master Sergeant Patrick D. Shediack, Author of CRUCIAL OASIS, AFMC/SCI

Mr. Al Luke, Instructor, Information Resources College, National Defense University

Major Weaver, AF/XOXD, Information Warfare

Doctrine

Air Force Doctrine Center

Colonel Iris M. Hageney, Deputy Commander

Lieutenant Colonel Anne Leary, Chief, Air Force Doctrine Development (Communications-Computer Systems, Future Concepts)

Lieutenant Colonel Ann Story, Chief MOOTW Doctrine Development (Logistics, Civil Engineering, MOOTW)

Major Tenley Erickson, Chief Intelligence Doctrine Development (Information Warfare)

Mr. Wayne Williamson, Doctrine Analyst (AFDD 1)

College for Aerospace Doctrine Research and Education

Colonel Tom Gary, Chief of Doctrine Education

Lieutenant Colonel Mike Kirtland, Doctrine Analyst

Lieutenant Colonel Hutcherson, Information Warfare Education

Lieutenant Colonel Jones

Colonel Bob Johnston

Naval Doctrine Center

Captain Neff (USN)

Dr. Tritton

Commander Kevin Campbell (USN)

LCDR Gordon Thomas (USN)

US Army Training and Doctrine Command

Lieutenant Colonel (USA) Heldur Liivak, Doctrine Development,

Dr. James A. Mowbray, Instructor, Air War College

Dr. Ronald B. Hartzer, Historian, Air Force Civil Engineer Support Agency

Major Ron Mitchell, Executive Officer, Air Command and Staff College

Major Ann Martin, Air Force Quality Center Consulting Office

Appendix B: Collection Tool

Questions from *A Proposed Tool for Doctrine Formulation Data Collection*
by Major James C. Miller, IV, USAF
April 1987

The following series of questions is designed to generate a base of information about a discreet military activity. The object is to gather and record subjective data from technical experts and to identify additional source material. The questions are grouped into four broad categories that address the "what, how, who, and why" of a particular military activity. Comments following each question provide expanded detail, rationale, or underlying issues.

CATEGORY ONE: WHAT IS THE ACTIVITY OF INTEREST?

COMMENT: This category attempts to define the nature and scope of the task - one of the determinants of the form the doctrine will ultimately take.

QUESTION ONE: How does it relate to operational missions or combat support processes?

COMMENT: Is it a mission, task, function, or process? How does it fit in with the categories in AFM 1-1, Chapter 3 and AFM 2-15, Chapter 2? Underlying issue: Why do we do it? What would happen if we didn't do it? *[note: AFM 2-15 was Combat Support Doctrine]*

QUESTION TWO: What other activities does this one support?

COMMENT: Follows up Question One. What are related activities? How are they related?

QUESTION THREE: What constraints or other factors limit its accomplishment?

COMMENT: Other than doctrine, what are the primary factors that determine how we can (or can't) do it -- legal, political, technical, economic, etc.?

QUESTION FOUR: How does the requirement to perform this activity change across the spectrum of conflict?

COMMENT: Underlying issue: Does the requirement really differ? Should it? Do we need multiple doctrines?

CATEGORY TWO: HOW IS THE ACTIVITY CURRENTLY ACCOMPLISHED?

COMMENT: This category contains five questions which address the three functions of all doctrine: analysis, guidance (including instruction), and policy formulation.

QUESTION FIVE: What are the mechanics of its operation?

COMMENT: Briefly describe the process/procedure; include reference to directives, regulation, technical orders.

QUESTION SIX: What organizational structure supports the operation?

COMMENT: Identify the various levels (NOT a line chart).

QUESTION SEVEN: Who are the major players?

COMMENT: This information may suggest additional sources; it may also help when the coordination plan is developed.

QUESTION EIGHT: Any recent examples of exceptional success or failure?

COMMENT: May help in the development of criteria during development of generalizations (formulation phase).

QUESTION NINE: Are we currently doing anything "dumb?" Anything "smart?"

COMMENT: Assumes nonattribution; may indicate presence of "informal" or "unwritten" doctrine.

CATEGORY THREE: WHAT GUIDANCE CURRENTLY APPLIES?

COMMENT: This category is designed to provide source material. It also may give an indication of how much (or little) is known about doctrine.

QUESTION TEN: Is there any current formal doctrine?

COMMENT: That is, published in AFM -1, -2, or -3 series documents *[note: prior to 1994 these were Basic, Operational and Tactical doctrine respectively. The current numbering system does not differentiate between types of doctrine.]*

QUESTION ELEVEN: Any "informal" principles contained in plans, regulations, technical orders?

QUESTION TWELVE: Any "unwritten" doctrine?

COMMENT: What is the conventional wisdom of how the activity should be done?

CATEGORY FOUR: HOW WAS THE ACTIVITY DONE IN THE PAST?

COMMENT: Thrust of this category is lessons learned; what generalizations may be formulated?

QUESTION THIRTEEN: How long has the activity been performed?

COMMENT: Underlying issue: what is our experience base?

QUESTION FOURTEEN: Was it done differently in the past?

COMMENT: If yes, what factors caused the change -- legal, political, technical, economic, doctrinal?

QUESTION FIFTEEN: What lessons have been learned from history?

COMMENT: Where are these lessons documented?

QUESTION SIXTEEN: What lessons have been learned from exercises, simulations, war games, unit evaluations?

COMMENT: Where are these lessons documented? Underlying issue: Can any of these be used to confirm or confute generalizations derived during formulation?

QUESTION SEVENTEEN: Are there any current studies, analyses, expert opinions?

COMMENT: Highlights contentious issues, contending theories of how to accomplish the activity. The people involved may be good sources/subjects.

QUESTION EIGHTEEN: How is the activity currently accomplished in other services/countries?

COMMENT: Depending on the form of the proposed doctrine (determined by scope of the activity and level of abstraction), this data may have direct application.

Summary

The emphasis of the data collector is on recording information in the form of individual experiences and beliefs, and in collecting sources and citations that may be useful in the formulation phase. The collector is basically a "get smart" exercise and annotated bibliography the doctrine writer can maintain and use in subsequent efforts.

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The information revolution is sweeping through the military. At the same time, the Air Force has not fully addressed legal requirements to develop an agency-wide framework for managing information resources. This lack of foundation creates a void for Air Force information resources management practitioners. Since the Department of Defense and the Air Force are engaged in doctrinal revolution, the opportunity exists to consider developing Information Doctrine. This thesis explores the definition and role of doctrine in the Air Force, the doctrine development process, and practical examples of doctrine's use in the Air Force and Department of Defense. It also examines the Air Force information environment to determine the definition and role of information resources. By analyzing the applicability of doctrine to the Air Force information environment, this thesis proposes a concept for Air Force Information Doctrine. Similar to other resource doctrine, Information Doctrine could include a description of Information Processes, Principles and Functions; Information Planning Considerations and Support Requirements; and Information Training and Personnel. A well-marketed Information Doctrine could be a significant factor in developing strategic plans and policies involving Air Force Information Resources.

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