STUDY PROJECT



# ARMY INFORMATION MANAGEMENT

BY

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The creation of the Information Mission Area (IMA) recognized the value of information as an Army corporate resource. It simultaneously united information disciplines which the Army previously managed separately under diverging rules.

The disciplines united in the IMA are telecommunications, automation, visual information, records management, and publications and printing. These disciplines are active throughout the three Army environments, the Theater/Tactical, the Sustaining Base, and the Strategic.

Information management is a command responsibility executed under the direction of the organization's information manager. Information has a useful life and is managed using life cycle concepts. Information systems are tools that make valuable information available to increase the effectiveness and motivation of the work force.

The Army Information Resources Management Program (AIRMP) focuses on the management of information as a valuable corporate resource. It includes the concepts of an organizational


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This paper includes a number of observations and recommendations for consideration by those who can influence the future of Army information management.

USAWC MILITARY STUDIES PROGRAM PAPER





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AN INDIVIDUAL STUDY PROJECT

by

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## ABSTRACT

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This paper includes a number of observations and recommendations for consideration by those who can influence the future of Army information management.

## PREFACE

This paper offers a proposed chapter on Information Management for the reference text, Army Command and Management: Theory and Practice, produced by the Department of Command, Leadership, and Management (DCLM) at the U.S. Army War College. A separate section containing observations, conclusions, and recommendations of the author follows the proposed chapter in this paper.

The first seven sections make up the proposed chapter. They present an overview of information management within the Army according to official publications. Army Regulation 25-1 was the definitive source. Other related publications, especially those in the 25-series, added clarity. Main sources are identified in endnotes. These should be removed prior to publication to be consistent with the DCLM text format. The author's objective has been to describe information management for those who lack the time or the inclination to dig through the official publications. The presentation is an overview from which one can visualize the top level objectives and processes of information management.

The final section is not appropriate for the DCLM text. It captures observations, conclusions, and recommendations the author developed in researching this work. These thoughts are offered for consideration by those who influence Army information management for any benefit they may be to the Army.

# ARMY INFORMATION MANAGEMENT

## INTRODUCTION

Information is the most valuable resource in the Army, personnel excepted. It enhances the value of all other resources including the work force. Its value increases as it is shared within proper bounds. As a valuable resource, information must be managed carefully and wisely for the good of the total Army.

While it is valuable, information is likely the most overlooked resource. Army managers are unaccustomed to regarding information as a resource requiring management for several reasons. Its value is not measurable by current standards. Few bosses check it. It is not well understood.

Army leaders established the Information Mission Area (IMA) to correct deficiencies in Army information management. The Army Information Resources Management Program (AIRMP) now governs Army information management.

This chapter provides an overview of the IMA including the concept of information management and the governing AIRMP. It includes particular discussions on the Army Information Architecture, the IMA Cycle including planning, and the organization and resources available to assist the commanders with their information management responsibilities. It includes

the roles, responsibilities, and relationships of the major players in information management.

The emphasis of this chapter is on the management of information as a valuable corporate resource. Information management is a command responsibility executed under the direction of the organization's information manager throughout the useful life of the information. Information systems are tools for the commander to make the valuable information resource available.

The term "information management" used in this chapter signifies management of information, management of information systems, and management of other information resources unless the context specifically indicates otherwise. The term "commander" applies both to commanders and directors as they have the same IMA responsibilities. The masculine form of pronouns is used without favor or prejudice.

## THE INFORMATION MISSION AREA

The creation of the Information Mission Area (IMA) in 1984 recognized the value of information as an Army corporate resource. It simultaneously united information functions that the Army previously managed separately under diverging rules. The "Army's Bold Move Into the Future" [1] emphasized the need for managers at all levels to be aware of the information resource and to manage it as carefully as other valuable resources.

While the IMA is now well established in the Army, further evolution is inevitable. The implementation of the IMA in the Army predates the "Plan for Implementation of Corporate Information Management in DoD," but is largely consistent with it. Even so, as the Director of Defense Information begins DoD central oversight of principal information management functions, the Army undoubtedly will have to adjust it's implementation. The DoD action is guided by a principle the Army has yet to implement fully, namely, that information systems decisions will be made on a business case basis with the cost of information support services passed to the customer based on fee-for-service. [2]

### Scope of the Information Mission Area.

The Information Mission Area touches almost every element of the Army. It includes all activities and resources of the Army employed in getting data, processing information, making it

available, using it, and managing it. The activities are all the things one can do with information: acquire, develop, collect, process, integrate, transmit, distribute, use, retain, retrieve, maintain, access, secure, manage. archive, and discard. The information resources include the following: doctrine, policy, data, equipment, and software with the related personnel, services, facilities, and organizations. [3]

The emphasis of the IMA centers on the information rather than any particular means employed in handling it. Specifically, there is no requirement for automation, although the value of automated tools is a reality. Information handled manually is and must be included in the Army's total information management.

**Data and Information.**

Information is data in context. The raw materials in the production of information are data, those little bits of fact that are numbers, words, names, and a myriad of other items about people, places, things, or ideas. By themselves the data are meaningless. Only when data are assembled and placed in the context of real problems, usually with the considered reasoning of an interested person, do they become useful. It is this context that enables a human to attach meaning to data and turn it into information.

**The Information Resource.**

Information is a valuable corporate resource. Unlike most resources, its value may actually increase as it is shared. It becomes a powerful tool for increasing the effectiveness and

motivation of both managers and employees who have access. [4] It also can also be valuable to adversaries and must be safeguarded because of the additional power it can give them.

Information is an often overlooked resource. Managers tend to overlook the value of information because it is difficult to measure. Comptrollers typically do not include it among the management indicators they report. Accounting standards do not consider its value. [5] There is no page in the property book for information assets. Nevertheless, information is a valuable resource to be managed like any other valuable resource. [6]

**Information Systems.**

An information system is a tool which makes data available to the benefit of commanders and their work force. In the IMA the concept of an information system goes far beyond a narrow technological definition. An information system is an organized assembly of resources and procedures designed to provide needed information to execute or accomplish specific tasks or functions. Most modern information systems will be multidisciplinary in that they will support multiple functions.

An information system may be manual, automated, or both. It has components (such as people, files, forms, procedures, hardware, and software) used to manipulate data and produce information. [7] For example, while much of the pay and personnel systems are automated, the systems also include the procedures for manually creating and processing a personal leave request.

Modern information technology provides automated tools to help in manipulating data and producing information. Computing systems, if properly applied, help by producing associations of data in ways humans, because of time limits or the sheer volume of data, simply cannot. As humans consider new associations of data, they have opportunities to explore ideas otherwise inaccessible to them. Herein lie the real benefits of computers and the complex support systems that tie them together. They magnify the value of the information resource.

**Why an Information Mission Area is Needed.**

The designation of the IMA focuses management attention on the valuable information resource. It also concentrates efforts toward attaining information services appropriate to the needs of the Army. Such direction helps the Army get the greatest possible benefit from its scarce resources.

The IMA focuses management attention on information as a resource in three ways. First it identifies specific responsibilities of commanders. Second it specifies management procedures that feed into the Planning, Programming, Budgeting, and Execution System (PPBES). Third it identifies the people to help do the management tasks.

Attaining an information system capable of meeting the needs of a large organization such as the Army is both complex and costly. It is complex because people in all parts of the organization at every location generate data in diverse and firmly entrenched ways. It is costly because it involves

difficult changes to existing systems, the replacement of those systems, or sometimes the creation of new systems.

The IMA helps manage the complexity and costs of moving from disjointed to unified information systems by defining objectives and standards. The task of bringing together disparate data generated at dispersed places to serve the whole of the Army is both hard in concept and tremendously difficult in practice. The information architecture, the information systems architecture, and the planning and execution mechanisms of the IMA are tools that help define the objective and the necessary standards to unify the whole. The alternative is to squander resources on services and equipment that do not contribute to the total Army objective.

**Disciplines of the Information Mission Area.**

The IMA unites five information disciplines and one additional information service. Public Law 89-306 (the Brooks Act) codified the union of these disciplines, which are all involved in the "automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission or reception of data or information." [8]

The next paragraphs discuss briefly the disciplines of telecommunications, automation, visual information, records management, publications and printing, and the additional related service of library management. It is important to realize that the there are no barriers among these five disciplines. Collectively, they constitute the IMA. Not stated in the

following paragraphs, but common to all, is the human resource, the people who make them work.

Telecommunications moves information. It is the transmission of all types of information such as sound, video, message, and digital data. This discipline includes the transmission paths and the switching equipment necessary to connect the source with the desired destination. It includes all means such as electrical, optical, and radio, both local and long distance. It includes the telephone system, data networks, radio systems, satellite systems, and others.

Automation is the world of computers. This discipline includes hardware and software. Automation includes all general purpose computing systems such as laptop systems, desktop systems, shared office systems, mainframe systems, and the powerful supercomputers.

Visual information ranges from simple still photography to highly complex video teleconferencing. It includes garrison and battlefield photography, both still and motion picture. It includes video information.

Records management comprises the storage, distribution, and disposition of official records and files whether hand written, typed or printed, graphic, or image. It includes the archival technologies such as micrographics and optical disk storage. It includes the handling of official mail.

Publications and printing ranges from office copiers to major printing establishments.

The management of libraries is a service closely related to other aspects of the IMA. While libraries likely will always

have a large manual aspect, huge volumes of traditional library information are becoming available in automated media including optical storage devices and on-line retrieval services.

**Environments of the Information Mission Area.**

The IMA exists throughout the Army. To clarify thinking about the IMA, it is viewed in three Army environments: Theater/Tactical, Strategic, and Sustaining Base (see Figure 1). The definitions of these environments are somewhat arbitrary. They imply boundaries that, in the world of information, do not really exist. In fact a specific goal of the IMA is the elimination of all artificial barriers between information and information systems in all environments. In practice, most information and many information systems exist and function in more than one environment. [9]

The Theater/Tactical environment is the operational theater army area of operations as defined in JCS Publication 1. This environment comprises the area of interest of the forward deployed forces and extends to the theater army rear boundary. It includes the headquarters of joint, unified, specified, or combined commands.

The types of information resources managed in this environment help to direct, coordinate, and support deployable combat, combat support, and combat service support forces in their projection of combat power through all levels of conflict. The information systems found in the Theater/Tactical environment include the Maneuver Control System (MCS), wartime Standard Installation/Division Personnel System (SIDPERS), the Theater

# ENVIRONMENTS

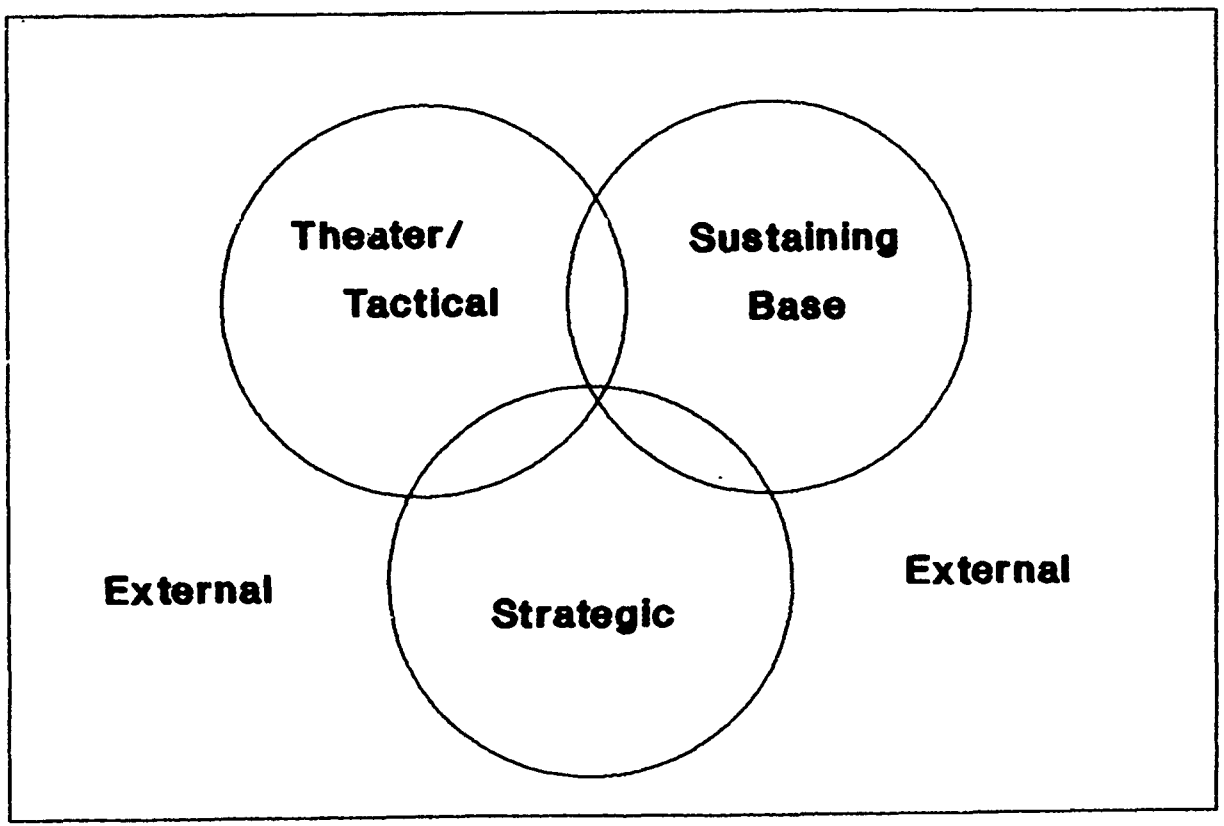


Figure 1

Army Medical Management Information System (TAMMIS), and supporting communications systems such as Mobile Subscriber Equipment (MSE). [10]

The Sustaining Base environment usually exists outside the area of operations. It is in the continental United States, but, during peace and transition to conflict, extensions of the Sustaining Base may be in the geographic area of the Theater/Tactical environment. The Sustaining Base includes recruiting centers, training centers, supply depots, maintenance facilities, test facilities, laboratories, long haul communications sites, installations, and command and control facilities.

The information resources managed in this environment cover all functional areas of the Army. They include the information resources and activities used to raise, organize, train, equip, deploy, and sustain Army and other assigned forces. Examples of the information systems found in the Sustaining Base are SIDPERS, the Standard Financial System (STANFINS), and Integrated Facilities System. [11]

The Strategic environment lacks geographic delineation. It is the class of information resources that supports decision making in national crisis actions by the National Command Authorities, the JCS, and the Army on their behalf. HQDA agencies, major Army commands, and the Army components of deployed forces are major users and providers of this type of information.

The information systems of the Strategic environment support large unit readiness and deployability status, ports and

strategic movement capabilities, strategic intelligence, and strategic contingency plans and deployment schedules. Examples of Strategic information systems are the Worldwide Military Command and Control System (WWMCCS) and the Defense Communications System (DCS). [12]

**Principles of Army Information Management.**

The following is a brief statement of Army information management principles. No official publication lists these principles of Army information management as they appear here. They appear in the various publications that define the IMA. This is not an all-inclusive set. Neither are the principles inviolable given sufficient reason. These are listed because they seem essential to a fundamental understanding of the IMA. The references listed after the chapter contain more details.

-- The data an organization creates and consumes is the life-blood of an organization.

-- There is a set of data essential to an organization. It is independent of the organizational structure.

-- The commander is responsible to manage information resources just as any other valuable resource.

-- Any single item of data will come from a single source.

-- Every class of data will have a designated proponent.

-- There will be common definitions and standards for data.

-- Army data is a shared resource consistent with security and privacy constraints.

-- Data will be readily accessible to whomever in the Army requires it.

-- Data flow will be without artificial organizational, administrative, or technical barriers.

-- Data will be protected from unauthorized disclosure, corruption, and destruction.

-- Definition and enforcement of standards are key to the success of an information architecture.

-- Only by implementing the available standards will information systems serve the total Army.

-- There are opportunities for economies throughout the IMA.

-- Information professionals operate the crew-operated systems for the benefit of other people.

-- End users operate systems for their use.

-- An information system exists only to support one or more of the functions and organizational processes of the Army.

-- Resourcing decisions about an information system will be measured by the priorities of the functions or processes the system will support.

-- Information systems performing a common function will be shared.

**The Information Mission Area in Practice.**

The implementation of the IMA has deviated far from the pure, theoretically unified objective described in the 25-series publications. In practice most MACOMs implemented exceptions, some with approval and some without approval. The following sections follow the concepts of the 25-series publications. Local information managers should be able to identify their deviations and to justify them.

## THE ARMY INFORMATION RESOURCES MANAGEMENT PROGRAM

The Army Information Resources Management Program (AIRMP) defines information management in the Army. The goal is to ensure that information users receive appropriate, timely, and accurate information. Reaching that goal requires both that the information be identified and that it be made available. [13] The AIRMP describes a concept of operation and establishes several management processes and structures for the management of both information and information systems in the Army.

The fundamental elements of the AIRMP are the Army Information Architecture, the Army's IMA Cycle, planning processes for the IMA (including the interface with the PPBES), Life Cycle Management of Information and Information Systems, the Army Data Management Program, the Army Information Standards Management Program, and the Army Information Systems Security Program. This section briefly introduces each of these elements and concludes with a discussion of funding. Subsequent sections will deal with the Army Information Architecture and the IMA Cycle in more detail. The planning processes of the IMA are included in the later discussion of the IMA Cycle. Army Regulation 25-1 governs the AIRMP.

### Concept of Army Information Resources Management.

The AIRMP is a resource management program. It defines mechanisms to identify information resources, to validate

information requirements, and it establishes a systematic approach to satisfy those requirements.

Information resources include the data or information, the information systems, the associated equipment, support facilities, software, and personnel. Management extends through the complete life cycle of the information or the information system. There is an exception to the AIRMP for similar resources embedded in weapons systems, machines, medical instrumentation, and other cases where the information system is a component of an end item. The management concept for those resources governed by the AIRMP is similar to the management of any other Army resource. A possible exception is the information itself, which is somewhat less tangible than most Army resources.

**The Army Information Architecture.**

The Army Information Architecture (AIA) is the framework within the AIRMP that defines the relationships among all elements of Army information management. It contains a description of the required data and the flow of that data in the organization. A following section addresses the AIA in more detail.

**The Army's Information Mission Area Cycle.**

The IMA Cycle is a general road map of how the Army manages within the IMA. The IMA Cycle describes seven simultaneous and continuous activities during which the programs and management processes of the IMA interact at all levels of the organization. A following section contains more information on the IMA Cycle.

**Planning in the Information Mission Area.**

Planning in the IMA does two things. It forms the basis for PPBES inputs to obtain resources to reach information management goals and it assures integration and interoperability of information systems throughout the Army. The section on the IMA Cycle contains more information on planning.

**Life Cycle Management in the Information Mission Area.**

Data and their associated information, however valuable, usually have limited useful lives. Beyond that they become burdensome. This idea leads to information management by life cycle concepts. Life cycle management of information is the control of recorded information, despite display media, from the moment of its creation or collection to its final disposition. [14] The governing regulation is Army Regulation 25-9, Army Data Management and Standards Program.

Information systems also are managed as valuable resources. Dollar thresholds decide the specific management controls. Life cycle management principles apply, but the degree of management and the management level depend on the nature, scope, and complexity of the system. [15] The governing regulation is Army Regulation 25-3, Army Life Cycle Management of Information Systems.

**The Army Data Management Program.**

The goal of the Army Data Management Program is to reduce the amount of redundant data maintained and to reduce the number of information systems developed to those required to function

effectively. It addresses both manually-processed and automated data. The program aims to identify, organize, and manage Army data down to the level of each data element.

The Army Data Management Program includes the activities of strategic data planning, data element standardization, data synchronization, data security, information management control, and data base development and maintenance. It supports the development and implementation of information systems that are interoperable throughout the Army.

Data communicated and shared across organizational boundaries will conform to specified policies and standards. This applies to both manual and automated systems. The purpose is to make it easier to share Army data through uniform data representation, consistent interpretation, and common understanding. The governing regulation is AR 25-9, Army Data Management and Standards Program.

**The Army Information Standards Management Program.**

The Army Information Standards Management Program is the means to identify and implement standards for interoperability in the IMA. The goal is to implement emerging military, federal, national, and international standards to the greatest extent possible. The Army implements this program by participation the Defense Standardization and Specification Program. [16]

**The Army Information Systems Security Program.**

The Army Information Systems Security Program is the Army's program for securing information systems. It is a unified

program combining signal security (SIGSEC) and computer security (COMPUSEC) to protect sensitive (classified and unclassified) information in electronic form both during transmission and while contained in information processing systems.

**Funding for Information Services.**

Funding methods for information services are in a transition period. In the past users received information services constrained only by availability. The user was not a bill payer. That changed with direction from the Office of Management and Budget (OMB) that "customers" pay for the information services they use.

The Army is developing procedures to comply with the OMB direction and "charge back" for Sustaining Base and Strategic services. Some services are now charged, others not yet. Currently there is movement toward an industrial fund for services including the information services. Regardless, tactical organizations, those under Tables of Organization and Equipment (TOE), will not be charged for information services in the practice or execution of their TOE missions.

"Charge back" does at least two things. First it makes users aware of the costs of those services thereby motivating frugality. Second it provides funds to upgrade, modernize, or replace aging equipment.

The form "charge back" takes will vary by type of service. Today USAISC plans, programs, and funds for replacement and modernization of assigned information systems. Users plan, program, and fund for some user-operated equipment. USAISC funds

for part of the DCSIM and DOIM support. Users reimburse USAISC for the rest of their services. Users also plan and program for upgrades to information systems or operating resources assigned to USAISC when user initiatives require those upgrades. As the procedures evolve there will be continual changes in the funding for information services until an industrial fund, or another mechanism stabilizes.

## THE ARMY INFORMATION ARCHITECTURE

The Army Information Architecture (AIA) defines the relationships among all elements of Army information management. It serves as the basic frame of reference for information management decisions. It is the basis for identifying, integrating, validating, and prioritizing requirements to meet mission needs. It contains a description of the required data and the flow of data in the organization. DA Pamphlet 25-1 contains detailed guidance for the AIA.

In practice the Army has yet to produce more than pieces of the AIA. The following paragraphs describe the theory. Several organizations at MACOM level and below have produced significant efforts, but these have been without the overarching guidance of a capstone architecture.

### Definition of the Army Information Architecture.

The AIA is a hierarchy of documents. It is a set of documents beginning with the very general Capstone Army Information Architecture by DISC4 and descending through the organization. The documents of the AIA become progressively more specific as they proceed through the MACOMs to installations and activities, and through major deployable units to division and separate brigade. An installation's architecture includes the requirements of all supported activities with its own. The information architecture at each level of the hierarchy is built

on the architecture guidance from higher levels. Through this mechanism the DISC4 can specify Army-wide data standards essential for data sharing, and within those standards, each organization can design its piece of the architecture to meet its needs.

The AIA, properly designed and based on mission needs, is the basis for managing change in the IMA. It provides a basis for goals and objectives. It helps managers develop information policy and planning guidance. It helps to evaluate initiatives for competing information resources because it contains the standards to which information systems should be built. It is the basis for identifying, validating, and prioritizing information requirements. A requirement that does not fit the AIA needs careful evaluation. It may be superfluous, or the AIA may need modification. The AIA is key to information and information system management because it contains the standards and the objective.

**Elements of the Army Information Architecture.**

The AIA describes three data configurations and a plan (see Figure 2). The configurations are the Baseline Configuration, Current Target Configuration, and Objective Configuration. These describe data and data flows within the organization as it is, as it is possible, and as the organization would like it to be. The plan describes how to reach the Objective Configuration.

This AIA structure seems to presuppose the Baseline Configuration is something less than the Current Target Configuration and the Objective Configuration. This is not

# INFORMATION ARCHITECTURE COMPONENTS

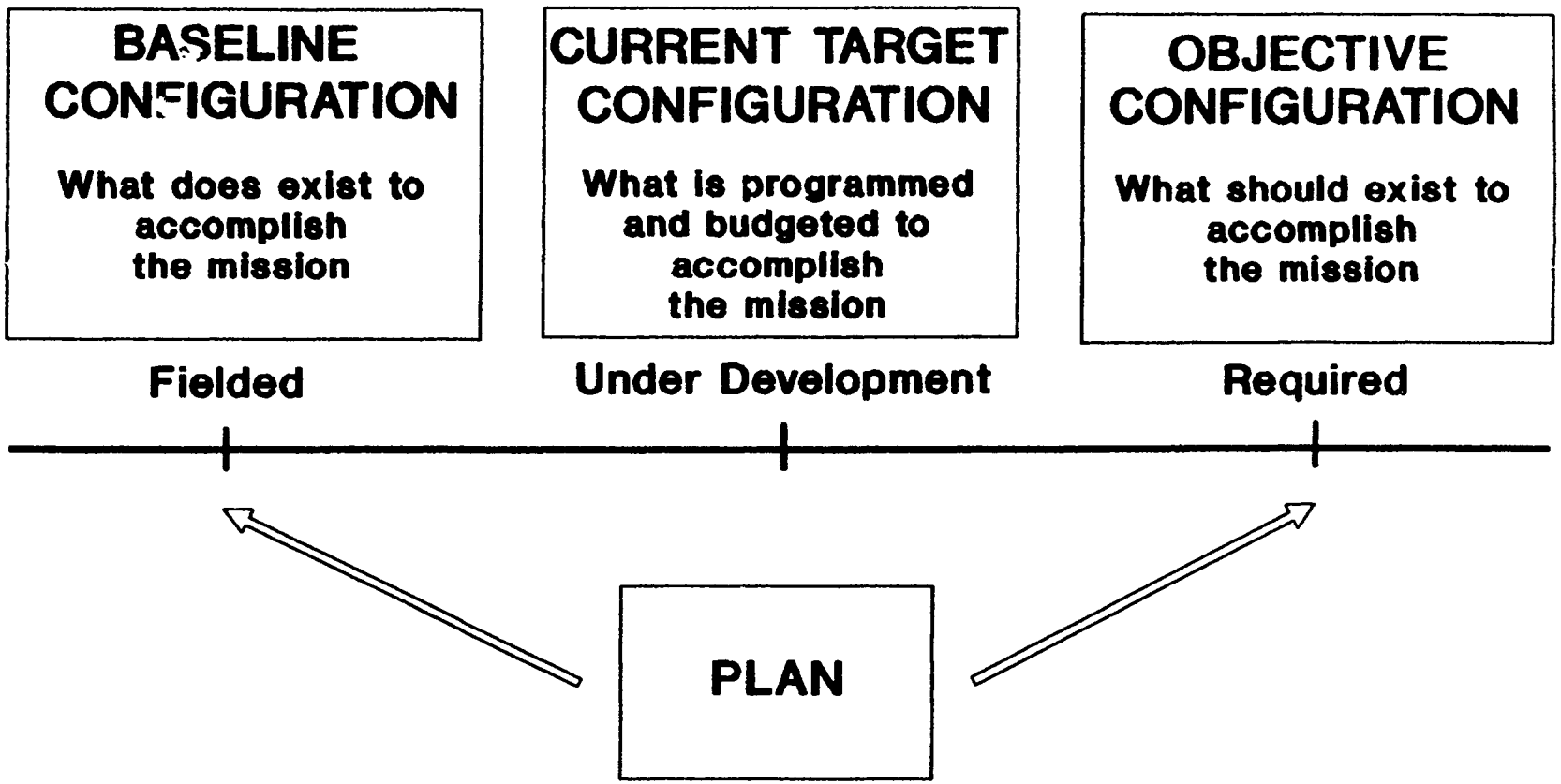


Figure 2

necessarily the case. Organizations may have acquired more sophisticated equipment and software than they need to accomplish the mission. The AIA applies equally well to such situations as managers plan to bring resources in line with needs.

The Baseline Configuration describes existing data resources currently employed and their interrelationships. It describes the requirements and how the requirements are currently satisfied. It considers all data flows whether manual and automated.

The Current Target Configuration is a realistic, resource constrained configuration including the Baseline Configuration as modified by those information resources planned and under development but not yet operational. It is the intermediate step required because funding constraints prevent the immediate attainment of the Objective Configuration. Managers adjust the Current Target Configuration as required to reflect programming changes and changes to the Objective Configuration.

The Objective Configuration is a description, in terms of technology and information requirements, of the optimum capability needed to support the mission. It provides an objective for planning purposes and, therefore, is unconstrained by resource availability. Managers adjust the Objective Configuration continuously to recognize available emerging technologies, mission changes, and architectural guidance. [17]

The Plan describes how the organization will move from the Baseline Configuration through the Current Target Configuration, to achieve the Objective configuration. Managers revise the Plan periodically to reflect changes in guidance and priorities. [18]

**Information Requirements Study.**

An Information Requirements Study (IRS) is the foundation of the AIA. It can be a complex, costly study, but it is important to the success of an information management program. The products of the IRS are four data models of the business processes of an organization. These models enable the organization to design information systems to meet its needs.

The IRS is an exercise in corporate introspection that results in a detailed description of the organization's work and the associated data needs. First an organization analyzes its mission. Second it determines the business processes it must perform to accomplish its mission. Third it determines the data or information classes it needs to do these business processes. Fourth it determines who in the organization is responsible for the execution of each business process.

The product of the IRS is an unambiguous definition of the information requirements of an organization. The IRS identifies workers who create or consume data. It identifies specific data the workers use, shows where the data come from, and shows where they must go. These requirements are captured in a matrix that is the information model of the organization. This information model is independent of the structure of the organization. It is valid despite the structure of the organization while the mission remains reasonably constant.

The information model is essential in developing the organization's information architecture. By comparing the information needs in the model with the current capabilities in the Baseline Configuration, commanders can find deficiencies.

Deficiencies not addressed in the Current Target Configuration can then be made part of the Objective Configuration. The results are potentially beneficial both in the information world and outside it.

Information world benefits come from the unambiguous definition of the information requirements. One can develop an information architecture to match the needs of the organization. Excess data collection and reporting can be identified and perhaps eliminated. Computing and communications systems can be designed with minimum redundancy. Importantly, a single source for each class of data can be identified and the responsibility for that data can be fixed in job descriptions.

Outside the information world the IRS provides insight into the workings of the organization. The organization's business processes, where they are done, and by whom they are done are not obvious in any complex organization that has evolved in mission and structure over considerable time. The business processes often do not align with organizational subdivisions. This may or may not be a problem. It is something for review after the IRS has highlighted the situation. In this way the IRS can be of value in optimizing both work flow, structure, and control within an organization.

**Architecture Control.**

Each headquarters or command level maintains approval authority for information architectures below it. The organization's information manager ensures that proposed information initiatives, both manual and automated, comply with

the AIA as approved and established by office of the Director of Information Systems for Command, Control, Communications, and Computers (DISC4), HQDA. The ultimate responsibility for architectural control for the Army resides in the IMA Architecture Control Committee (ACC) including representatives of the DISC4, all Army functional and process proponents and U.S Army Training and Doctrine Command (TRADOC), U.S. Army Materiel Command (AMC), and U.S. Army Information Systems Command (USAISC).

## INFORMATION MISSION AREA CYCLE

The IMA Cycle is a tool to clarify the interaction of key IMA-related programs and management processes (see Figure 3). The cycle has seven general activities that together meet the goal of satisfying user information requirements. The IMA Cycle is a general description of IMA and related programs, IMA management processes, and how they interact. [19] It is a cycle only from the perspective of an individual information requirement. The activities are simultaneous, continuous, and interrelated, and can be modified appropriately. The purpose of the combined activities is to document the baseline, develop objectives, identify shortfalls, set priorities, plan, program, budget, acquire, field, and evaluate information systems. DA Pamphlet 25-2 (DRAFT) describes the planning processes in detail. The following paragraphs discuss the activities.

**Document the Baseline and Current Target Configurations.**

Information managers document the Baseline and Current Target Configurations at all levels. The Baseline Configuration is what the organization uses to perform its daily mission. The current program is the basis for the Current Target Configuration. The output of this activity is a description of the Baseline and Current Target Configurations, parts of the information architecture.

# INFORMATION MISSION AREA CYCLE

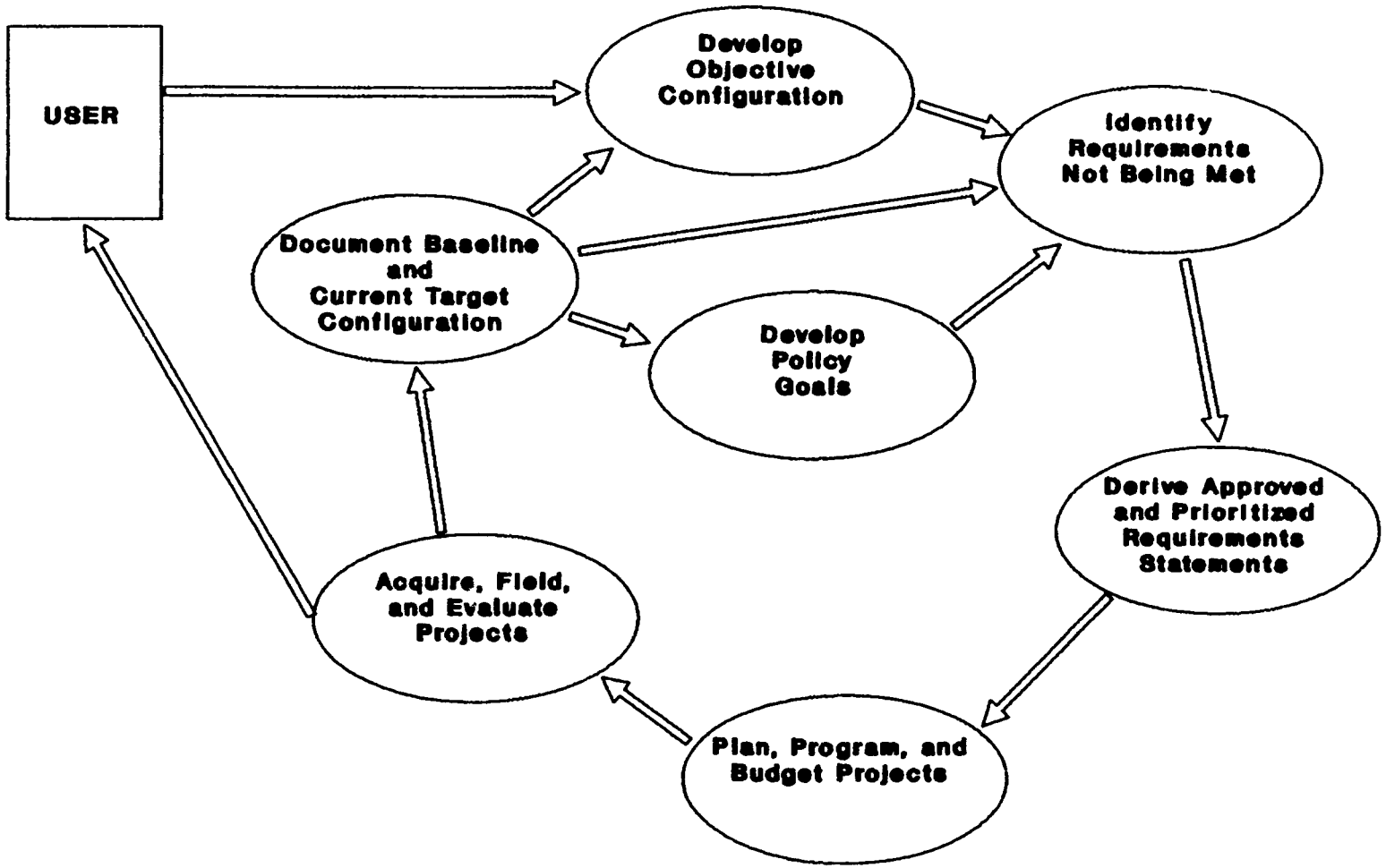


Figure 3

**Develop the Objective Configuration.**

Managers, users, and information professionals participate in developing the Objective Configuration. New information requirements enter the IMA Cycle in this activity. Requirements come from unsatisfied needs identified in the Information Requirements Study. In the changing real world, requirements also come from users with needs not otherwise identified. The output of this assimilation is the Objective Configuration, a description of where the organization would like to go. The Objective Configuration is in the information architecture.

**Develop Policy Objectives.**

The DISC4 establishes information management policy goals for the Army. Managers at all levels establish procedures in consonance with those policies to support the goal of meeting user information requirements. Information professionals advise. The output of this activity is a statement of policy objectives.

**Identify Information Requirements Not Being Met.**

Information managers at all levels decide the information requirements in the Objective Configuration that are not being met in the Baseline and Current Target Configurations. Their constraints are policy objectives and planning guidance. They prepare the needed Requirements Statements (RS) after integrating requirements from their organizations and organizations they support. The commander validates the RSs. Those RSs beyond the capability or authority of the organization to fund go to the

next higher level for action. The output of this activity is a prioritized set of validated RSs.

**Derive Approved and Prioritized Initiative List.**

The DISC4 integrates RSs, sets priorities, and publishes the RS Status Report. He assigns initiatives to material developers or other agencies for development of the technical solutions. The output of this activity is the RS Status Report.

**Plan, Program, and Budget Projects.**

Commanders at all levels plan, program, and budget for IMA support just as any other. Each successive command level evaluates other technical solutions to decide and set priorities on a list of viable projects authorized to compete for funding. Approved projects requiring only the application of existing resources for execution pass directly to implementation. Projects that require significant resources or management compete through the PPBES. Resourced projects come from this activity.

**Acquire, Field, and Evaluate Projects.**

Organizations acquire, field, and evaluate projects within their capabilities. The Army Acquisition Executive (AAE) assigns managers to projects where necessary. Fielded projects move from the Current Target Configuration to the Baseline Configuration. Fielding completes the IMA Cycle from the perspective of an individual information requirement. Evaluations of projects take place at all levels during and after fielding with DISC4 responsible for Army-wide evaluations. These evaluations

determine if projects meet the users' needs and if they continue to make economic sense. The output of this activity is satisfied information requirements.

## ORGANIZATION AND RESOURCES FOR INFORMATION MANAGEMENT

This section describes roles in information management in four major parts of the Army. These parts are the TOE organizations of the Theater/Tactical environment, MACOMs and installations in the Sustaining Base environment, and USAISC in both the Sustaining Base and the Strategic environments. While these parts are the bulk of the three environments of information management, they are not all inclusive. The principles are the same for other organizations in the Army. Specific details are in AR 25-1 and related references.

### The Commander's Responsibilities.

Commanders throughout the Army are responsible for the information they create and use. The fundamental responsibility is the command responsibility to ensure that the Army's resources in their charge are managed according to Army policies and doctrine. Each appoints an information manager with staff responsibility to develop the organization's information management program and to supervise its implementation. The information management program is appropriate to the mission, size of the organization, and the availability of external information management support. [20]

External support comes from several sources. Key players in Army information policy, direction, and guidance include the Headquarters Department of the Army (HQDA), the U.S. Army

Training and Doctrine Command (TRADOC), the U.S. Army Material Command (AMC), and the U.S. Army Information Systems Command (USAISC).

**Headquarters, Department of the Army.**

The Director of Information Systems for Command, Control, Communications and Computers (DISC4) is the senior Army official for information management. He implements higher level policy and is the senior Army policy official in the IMA. He reviews, validates, and approves the Army Information Architecture. He consolidates information requirements and sets priorities according to the Army Plan (TAP). He coordinates with the DCSOPS in the planning, programming, executing, operating and maintaining command and control (C2) information systems to accomplish the Army's C2 missions and functions. [21]

The Army Acquisition Executive (AAE) establishes overall guidance for the policy and programmatic aspects of information system acquisitions. He appoints Program Executive Officers (PEO) and program managers to provide management oversight for major and other selected programs.

The Deputy Chief of Staff for Operations and Plans (DCSOPS) is the HQDA functional and process proponent for C2. He ensures that Army-wide information management priorities are supportive of total Army-wide priorities. He establishes priorities for developing and acquiring materiel and force structure in support of the AIRMP.

**U.S. Army Training and Doctrine Command.**

The Commanding General, U.S. Army Training and Doctrine Command (TRADOC) formulates information management and information systems management doctrine for the Theater/Tactical and Strategic environments less the Army portion of the Defense Communications System. TRADOC determines the organization and equipment necessary to accomplish the IMA mission for units organized under Tables of Organization and Equipment (TOE). [22]

**U.S. Army Materiel Command.**

The Commanding General, U.S. Army Materiel Command (AMC) is the materiel developer for information systems in the Theater/ Tactical and Strategic environments less the Army portion of the Defense Communications System.

**U.S. Army Information Systems Command.**

The Commanding General, U.S. Army Information Systems Command (USAISC) provides information systems operational support and services in all three environments. He is the primary provider in the Sustaining Base environment. He provides the Army portion of the Defense Communication System in the Strategic environment. He provides the echelon above corps (EAC) support in the Theater/Tactical environment. He coordinates interoperability and compatibility among the information systems in all environments. He is the systems engineer, technical integrator, and materiel developer for assigned information systems. He implements the Army Data Management Program and is the focal point within the IMA for data element standards. He

executes Army leases of telecommunications services and facilities. He develops communications security and survivability programs. He supports the AAE, PEOs, and DISC4. He is the primary provider of information management staff assistance. [23]

**Other Responsibilities**

Army Regulation 25-1 defines other major responsibilities. Table 1, extracted from AR 25-1, summarizes selected responsibilities by IMA environment.

Requirements Identification and Validation.

The commander or functional proponent identifies and validates the information and information systems needed to accomplish assigned mission. [24]

**Technical Solutions.**

The information manager or information system materiel developer determines the most cost-effective technical solution to fulfill a validated information requirement. Regardless, an overriding, mission-essential consideration may dictate another solution. [25]

**Contracting Out.**

Management functions will not be contracted out to commercial sources. These include formulating, planning, supervising, and resourcing the program, identifying and validating requirements, setting priorities, and overseeing program execution. [26]

Table 1: Selected Primary Responsibilities by IMA Environment [27]

| Areas of responsibility | Overall | Theater/ Tactical | Strategic | Sustaining base |
|---|---|---|---|---|
| Command & control function | ODCSOPS | TRADOC | ODCSOPS | ODCSOPS |
| Information management function | ODISC4 | TRADOC | ODISC4 | ODISC4 |
| Information architecture & models | ODISC4 | TRADOC | ODISC4, JCS, & Combined | ODISC4, HQDA staff & MACOMs |
| Information requirements development | ODISC4 | N/A | ODCSOPS, MACOMs, & others | HQDA staff & MACOMs |
| Combat development (information requirements) | (ODCSOPS approve & ODISC4 process) | TRADOC | N/A | N/A |
| IMA materiel development | N/A | AMC | USAISC | USAISC |
| IMA system(s) engineer | USAISC | AMC | USAISC | USAISC |
| Functional information requirements integration | ODICS4 | TRADOC | ODISC4 (with Functional Proponent) | ODISC4 (with Functional Proponent) |
| Technical information systems integration | USAISC | AMC | USAISC | USAISC |
| Information systems programmatic integration | ODISC4 | PEO for selected & AMC for others | PEO for selected & USAISC for others | PEO for selected & USAISC for others |
| IMA program and resource integration | ODISC4 | TRADOC (with Functional Proponent) | Functional Proponent | Functional Proponent |

**Theater/Tactical Information Management.**

Information management in the Theater/Tactical environment is organized and executed according to doctrinally based TOEs and procedures to support the AirLand Battle. During peacetime conditions, deployable TOE organizations connect to the Sustaining Base information systems. They may be required to perform Sustaining Base type functions, but they must retain their uninhibited capability to perform their TOE missions.

The focus of information management in the Theater/Tactical environment is to support the C2 function. Commanders and functional users play a far greater role in the management of information and the operation of information systems and equipment than their counterparts play in the other IMA environments. [28]

**Resourcing Theater/Tactical Information Management.**

The human and equipment resources for the IMA in the Theater/Tactical environment may be organic, assigned, or in support depending on the organizational level. Despite the source of support, the general concepts are the same.

Below Army division level, users provide their information management and information systems support and services.

In the Army corps and division, the assigned signal brigade or battalion, provides information management and information systems support. An element of the signal unit staff usually locates with the supported headquarters to coordinate these services. [29]

For forward deployed EAC units, USAISC provides organizations, information management staff, and information systems operational services and support. In particular, the Theater Signal Command (Army) (TSC(A)) provides these services and support to the Theater Army commander and his headquarters. Doctrinal publications describe the role of the TSC(A) in the operational level of war. This support may be augmented by appropriate non-Army and host nation capabilities as arranged by USAISC. [30]

**Sustaining Base Information Management.**

Sustaining Base information management takes place at the MACOM and installation levels. These are different with the work at the MACOM level being that of staff supervision, coordination, and resourcing. The work at installation level is that of providing support to users.

**Sustaining Base Information Management - MACOM.**

The MACOM commander appoints an information manager as a principal staff officer to oversee his IMA responsibilities. [31] The MACOM's information manager is responsible for the direct management and supervision of the information management staff activities in the IMA and related programs and activities. He coordinates and unifies the information management program for all elements of the MACOM. Information management and information systems management in the MACOM is organized and executed according to guidance from DISC4 and technical direction from USAISC.

The MACOM's information architecture is the tool the information manager uses to unify information services within the command. He ensures it is consistent with architectural guidance from DISC4. He reviews the architectural efforts of subordinate elements to ensure they are also consistent. The result is an architecture that promotes the Army goals of data sharing and accessibility while meeting the needs of the MACOM.

The MACOM information manager prepares and submits the MACOM Requirement Statements (RS) to HQDA for review and approval. He sets priorities and validates IMA initiatives beyond the capability of the MACOM to approve or resource. In producing the RSs the information manager reviews the information requirements of the MACOM and its subordinate elements to ensure they are coordinated and integrated. He ensures that the primary functional responsibilities of the MACOM and subordinate commands are supported under the MACOM's architecture and within the priorities and constraints set by the MACOM commander. By that he capitalizes on good ideas, meets all needs, and eliminates duplication.

**Resourcing Sustaining Base Information Management - MACOM.**

The MACOM information manager usually is designated the Deputy Chief of Staff for Information Management (DCSIM). He is the commander or director of the supporting USAISC activity who is dual-hatted in the role of MACOM DCSIM and assigned the responsibilities of the MACOM staff officer responsible for information management. [32] The people and other assets to meet

these responsibilities normally are assigned to USAISC and placed under the operational control (OPCON) of the MACOM commander.

**Sustaining Base Information Management - Installation.**

The installation commander appoints a Director of Information Management (DOIM) as a principal staff officer to oversee his IMA responsibilities. [33] The DOIM is responsible for the direct management and supervision of the information management staff activities and operational activities in the IMA unless HQDA has exempted them. He coordinates and unifies the information management program for all units on and supported by the installation. [34] Information management and information systems management on the installation is organized and executed according to guidance from DISC4, the MACOM information manager, and technical direction from USAISC.

The installation commander meets the challenge of coordinating and unifying IMA services for the variety of requirements likely on any installation through an installation Information Management Support Council (IMSC). The IMSC is represents all on and off post installation information management customers. It is responsible to ensure that IMA priorities are according to the Army's priorities. [35] The DOIM implements the decisions of the IMSC and the MACOM information architecture in developing and maintaining the installation's information architecture. [36]

The DOIM prepares and submits the installation Requirement Statements (RS) to the MACOM for review and approval. He sets priorities and validates installation IMA initiatives beyond the

capability of the installation to approve or resource. In producing the RSs, the information manager reviews the information requirements of the installation and its tenant units to ensure they are coordinated and integrated. He ensures that the primary functional responsibilities of the installation, subordinate, and supported commands are supported under the installation's architecture and within the priorities and constraints set by the installation commander. By that he capitalizes on good ideas, meets all needs, and eliminates duplication. [37]

Tenant activities with needs that the DOIM cannot support, which they themselves cannot fund, submit their IMA initiatives through their MACOM channels for approval and resourcing. These initiatives must have the approval of the DOIM showing consistency with the installation information architecture. Once resourced, the installation DOIM implements these initiatives on a reimbursable basis.

**Resourcing Sustaining Base Information Management - Installation.**

The installation DOIM is the commander or director of the supporting USAISC activity. He is dual-hatted in the role of DOIM and assigned the responsibilities of the installation staff officer responsible for information management. [38] The people, the crew-operated hardware, and other assets necessary to meet the Sustaining Base IMA responsibilities normally are assigned to the USAISC activity, despite ownership, and placed under the operational control (OPCON) of the installation commander. [39]

**Services the DOIM Provides.**

The DOIM provides for the full range of information services support to Army activities located in his designated geographical area. The support includes mobilization planning assistance for information services, and upon mobilization, information services support to Federalized State Area Commands (STARCs). [40] The following paragraphs illustrate the kinds of services the DOIM provides. The presentation is roughly according to the five disciplines integrated in the IMA, but the blurring of the traditional distinctions is apparent.

Telecommunications. The DOIM manages the installation telecommunications center and leased commercial and Army telecommunications systems. He may provide voice, video, and computer communications lines, local area networks, telephone systems, interfaces to DOD voice and data networks, and facsimile systems. The services may include secure handling of record traffic for transmission, delivery, relay, interchange, or transfer. [41]

Automation. The DOIM manages assigned data and information processing facilities, document imagery technology (such as optical digital document imagery and optical character recognition systems), electronic mail systems, and other means of transmitting information through local networks and long distance telecommunications. [42]

Visual Information (VI) Services. The DOIM manages assigned VI activities. He supervises photographic, motion picture, television, audio, graphic art, VI library, VI instruction, VI consulting, presentation, and VI maintenance services. He may

manage other VI services, as directed or agreed to, including VI production, radio and TV broadcasting, cable television, and video teleconferencing. [43]

Records Management. The DOIM manages the life cycle of the information itself. Records management encompasses records creation, maintenance and use, and disposition. This includes files, correspondence, official mail and distribution, declassification, vital records, duplicate emergency files, reports control, office symbols, military general purpose dictionaries, and brevity codes. He also oversees the implementation of Privacy Act and Freedom of Information Act requirements. [44]

Publishing and Printing. The DOIM manages the installation's publications and forms management programs. He is responsible for distribution systems, printing and copying facilities, the design, production, and procurement of printed materials, and the installation print plant facilities. This includes the responsibility for office copier management. [45]

Library Management. The DOIM manages library services, resources, and facilities that support the organizational mission by identifying, selecting, acquiring, organizing, controlling, retrieving, and distributing information and library resources and services. [46]

**Strategic Information Management.**

USAISC provides information management services in the Strategic environment. These services focus on communications and the support of the C2 function. They are primarily in

support of the Army Command and Control System (ACCS) and National Command Authorities. In providing these services USAISC works closely with its counterparts in the other military departments, with the Defense Communications Agency, and with the armed forces of other nations. [47]

## SUMMARY

The creation of the Information Mission Area (IMA) recognized the value of information as an Army corporate resource. It simultaneously united information disciplines which the Army previously managed separately under diverging rules.

The disciplines united in the IMA are telecommunications, automation, visual information, records management, and publications and printing. These disciplines are active throughout the three Army environments, the Theater/Tactical, the Sustaining Base, and the Strategic.

Information management is a command responsibility executed under the direction of the organization's information manager. Information has a useful life and is managed using life cycle concepts. Information systems are tools that make valuable information available to increase the effectiveness and motivation of the work force.

The Army Information Resources Management Program (AIRMP) focuses on the management of information as a valuable corporate resource. It includes the concepts of an organizational data model, the Army Information Architecture, the IMA Cycle outlining the interaction of planning and implementation activities, and the roles, responsibilities, and relationships of the major players in information management.

## OBSERVATIONS, CONCLUSIONS, AND RECOMMENDATIONS

This section is not intended to be part of the previous Information Management chapter in the DCLM textbook. It is here because it captures related thoughts of the author as he read, researched, and discussed the material for that work. These thoughts are offered for consideration by those who can influence the future of Army information management.

The ideas evolved as the author researched the official publications governing the IMA, related publications from the civilian world, and discussed the IMA with managers and staff at Department of the Army and various subcommands. While the author gratefully acknowledges many valuable contributions, the following positions do not necessarily represent official positions of the Department of the Army, the U.S. Army War College, or any other Army organization. The author carries sole responsibility.

### Managing Information by Value.

**Observation.**

The Army lacks a means for measuring the value of information. While Army publications have many words about the value of the information resource, and some Army leaders talk about the value of the information resource, for the most part these are hollow words because the value is not measurable.

Other resources get better treatment because they can be quantified. Commanders can count people, they can report readiness of materiel, and they can show balance sheets of their budgets. Simply stated, commanders know when they have done well in other areas because they can measure their progress.

It is a maxim in the Army that a unit does well what the commander inspects. As a rule, commanders do not evaluate information management because there is no established way to quantify the value of information. They have no way of knowing when they have done well.

**Conclusion.**

The Army will not do well in information management until commanders have some way to measure their progress.

**Recommendation.**

That Department of the Army, with technical advice and assistance from USAISC and TRADOC, devise a way to measure the quantitative and qualitative value of data. That once the value is measurable, data be subject to similar controls as other valuable resources, including accountability, internal controls, and fraud, waste, and abuse protections.

## Industrial Fund for Information Services.

**Observation.**

The Army is about to place information services, and some other services, under an industrial fund. In theory this will

establish a stable funding base for those services with the beneficiaries paying the bill based on "fee-for-service." The Defense Communications Agency (DCA) has been the steward for the Communications Services Industrial Fund (CSIF), which has provided some services that way for years. DCA experience portends ill for the impending action.

In recent years fee-for-service on the Defense Data Network was added within the scope of the CSIF. There were difficulties balancing network expenditures with actual revenues and in generating precise bills. Network managers and consumers alike lacked the data necessary for exact planning and billing.

The Army can expect similar difficulties. Systems managers will attempt to design fee schedules to recover actual costs based on estimates of projected usage. Users will estimate their expected usage and program accordingly. Simultaneously users will seek ways to economize and will be unpredictably successful. Therefore revenues will be unpredictable. The information systems that already exist will continue to incur costs whether they are used or not. The result will be a period of financial instability for both the systems managers and the users.

**Conclusion.**

The implementation of an industrial fund for information services will be fraught with fiscal pain and anguish. Only once historical data are available can either users or system managers plan and manage successfully.

**Recommendation.**

That Department of the Army provide relief for the users and systems managers by preparing to cover funding discrepancies at Department of the Army level during the first two complete budget cycles of operation.

## Enforcing Good Management.

**Observation.**

Information systems are so costly the Army cannot afford to duplicate and proliferate them. Yet when the Army installed project VIABLE, which concentrated at five Regional Data Centers computing power for 47 installations, many of those 47 installations fought to retain their local computers. That VIABLE extended some 18,000 terminals, with response times near three seconds, to those installations did not suffice.

The insistence that an organization is unique and must remain so is expensive in information management. Today, off-the-shelf technology permits users to access computing power without even knowing where the computer is. These factors make it generally preferable to modify business methods rather than to proliferate, or even to maintain uniqueness. Yet, as the Army attempts to move toward shared data and shared systems, some commands continue to maintain their uniqueness.

The Army has preserved information management uniqueness by permitting or overlooking exceptions to information management objectives. This has happened so much that it seems embedded in the corporate culture.

**Conclusion.**

A real paradigm shift is required. Tough senior leaders must insist that the good of the total Army transcends the convenience of subordinate organizations. Without such a commitment there will be no real Army information management.

**Recommendation.**

That Department of the Army make the paradigm shift and enforce total Army information management. That business practices in FORSCOM, TRADOC, AMC, HSC, USAISC, INSCOM and all other MACOMs be standardized to capitalize on the potential of corporate information management. That now is the opportune moment as DOD seeks similar goals in the plan for Corporate Information Management.

## Turf.

**Observation.**

It is easy to perceive data as the private "turf" of the organization that created it. It is uncomfortable to think that someone outside the organization can look over the shoulder of decision-makers or workers without even being known. This is exactly a capability inherent in modern information systems. Two issues arise from this situation.

Many data elements have value outside the creating organization. These must be shared, or someone else in the Army will be less effective. To be shared these must be in a form understood by those who use them and they must be available.

These data must be in some standard form on some common system. This is the domain of corporate information management.

On the other hand, workers in their creative moments produce data that may be exploratory and of questionable value. Until they are proved, these data should not be shared. Workers need to be free to exercise initiative, to create, to explore, without someone's passing value judgments on their unfinished work. The alternative is to stifle creativity and initiative.

**Conclusion.**

Some data must be shared for the good of the organization. Some data must not be shared for the good of the organization. Information managers need to know the difference and provide appropriate tools.

**Recommendation.**

That Department of the Army recognize in Army policy and in the implementing publications places for both shared data and protected initiative within the scope of Army information systems. That systems designers and managers provide both including reasonable resources to workers whose jobs allow opportunity to benefit the Army through creative initiative.

## The Impossible Dream.

**Observation.**

The Director of Information Management (DOIM) at the installation level has an impossible job. To expect a DOIM to

meet all the requirements of the IMA with fewer people than performed information functions before the creation of the IMA is truly an impossible dream. The following is not a call for more people. It is an alternative.

The DOIM has two jobs. One is to run the day-to-day operation of the information systems. The other is to lead the charge on information management. When the manpower crunch really presses, priority goes to the operational services. This is nearly always the situation.

The regulations and pamphlets of the IMA, led by AR 25-1, require essential, but esoteric actions such as information requirements studies and information architectures. These are essential for real management of information. Yet they provide little near-term benefit either to information managers or to their commanders. Compounding this is a severe lack of higher level participation in essential preparatory processes.

The result is DOIMs have a difficult mission that will not bite them or their commanders on any watch. So, while some DOIMs have attained commendable results, many DOIMs (and DCSIMs also) either ignore them altogether, or give only token attention getting marginal results.

**Conclusion.**

Essential elements of information management will never happen with the current allocation of responsibilities, requirements, and resources.

**Recommendation.**

That business practices of the Army be standardized to the point that a small set of standard information architectures will fit most situations. (This may already be the case.) That Department of the Army, with technical assistance of USAISC and TRADOC, prepare those architectures and provide them in doctrinal publications. That DOIMs be required only to deal with exceptions.

## Competition for Services.

**Observation.**

Fee-for-service business practices in the Army cause users to question the value of Army services. Similar services may be available from non-Army sources. That non-Army sources may cost less should not be a surprise given that the "competition in contracting" rules saddle the Army with requirements no profit making enterprise could survive, and that the Army cannot compete in the market to increase its customer base.

This generates a fundamental question about service sources and service users. Should Army information service users be free to obtain that service from any available source?

There is some foundation cost for information systems that is independent of the number of users. For example, one communications channel, which may have the capacity to service many users, costs the same whether it is used or not. The incremental cost to add users often is the relatively small cost of modules in the terminal equipment. If some Army users are

permitted to obtain service from non-Army sources while others are constrained to the Army source, the cost per user on the Army service mounts. If no Army user must be on the Army service, one has to question the need for the Army to provide the service.

**Conclusion.**

If the Army must provide an information service, it should be a mandatory source for Army users. If no Army user must use an Army service, the Army should not provide it.

**Recommendation.**

That decision makers judge existing and proposed information systems on a business basis. That where the Army must provide a service for some, the service be mandatory for others up to the limit of its minimum required capacity. That where there is no Army user who must use an Army service, the Army service be provided only if it is and can stay competitive with non-Army offerings.

## ENDNOTES


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4. Toffler, Alvin, quoted in INFOWORLD, 12 Nov 90, Volume 12, Issue 46, p. 66.

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22. AR 25-1, para. 4-1a.

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25. AR 25-1, para. 2-3b.

26. AR 25-1, para. 2-3f.

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39. AR 25-1, para. 4-3b(2).

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41. AR 25-1, para. 4-3b(7)a.

42. AR 25-1, para. 4-3b(7)b.

43. AR 25-1, para. 4-3b(7)c.

44. AR 25-1, para. 4-3b(7)d.

45. AR 25-1, para. 4-3b(7)e.

46. AR 25-1, para. 4-3b(7)f.

47. AR 25-1, para. 4-4.

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[*] This List of References is provided to be used with the Information Management chapter should portions of this paper be used in the DCLM USAWC text.

## COMMENTS FOR FINAL CHAPTER [*]

Information is a valuable corporate resource which the Army has taken bold steps to bring under good management control. The creation of the IMA was a major step forward. Much yet remains to be done.

Some of the information management questions and issues facing the Army are:

-- How can the Army get required information services within budget constraints?

-- How can the value of information be quantified for better management visibility?

-- How can the Army best manage the move to industrial funding for services including the information services?

-- Under what circumstances should the Army permit deviations from data and information system standards?

-- How can the Army assist local information managers with the difficult task of managing information on top of their day-to-day responsibilities to run the information services?

-- Under what circumstances should Army users be permitted to obtain information services from non-Army sources when adequate Army sources exist?

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* Thse comments are provided to be used in the concluding chapter of the DCLM USAWC text should portions of this paper be used in that work.