

NAVAL POSTGRADUATE SCHOOL MONTEREY, CALIFORNIA



THESIS



**REENGINEERING THE DEPARTMENT OF
DEFENSE: THE CORPORATE INFORMATION
MANAGEMENT INITIATIVE**

by

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September, 1994

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In order to operate effectively in the 1990s and beyond, the DoD must improve its management and business processes. To accomplish this, the DoD has just released its "Corporate Information Management (CIM) Strategic Plan for the 21st Century." A number of independent studies, relating to CIM, have also recently been completed.

This paper compares and evaluates the CIM Strategic Plan, the independent studies, and recognized methodologies of reengineering large organizations. It addresses shortcomings of the CIM Strategic Plan and recommends modifications and additions. Notable among these recommendations is the need to gain support for the Strategic Plan at all levels of the DoD. Additional measures, such as establishing a National Military Advisory Council, will help institutionalize the plan at the DoD and ensure its effective implementation.

Finally, this paper concludes that reengineering the DoD in accordance with a modified CIM Strategic Plan is feasible.

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THE
CORPORATE INFORMATION MANAGEMENT INITIATIVE**

by

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the requirements for the degree of

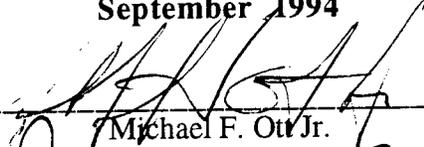
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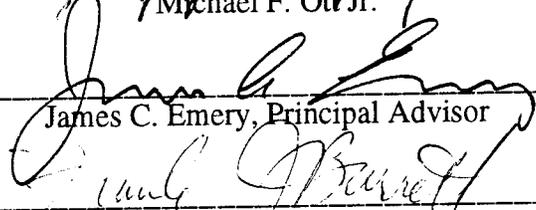
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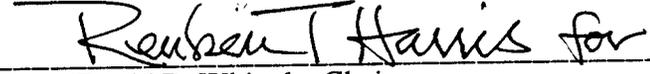
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I. INTRODUCTION

A. BACKGROUND

Why can the DoD not continue to conduct business as it has done in the past? Beyond simply stating the obvious, that the DoD will have to deal with dwindling resources, there are two arguments that support reengineering: the changing world political situation and the accelerating pace of technical innovation.

For over 40 years the United States has built its defense around a threat that could demand a large-scale struggle for national survival. With the collapse of the former Soviet Union, this threat has been removed for the foreseeable future. While strategic deterrence remains a key foundation of the United States' National Military Strategy, the structure of its forces must change to meet smaller, regional conflicts.

"The Military Technical Revolution," a report from the Center for Strategic and International Studies (CSIS), found that "US military forces ought to be designed and their development prioritized with primary emphasis on regional conflicts." [Ref. 1:p. 8] The CSIS study reduces military operations to two basic types. The first, combined-arms operations, consists of traditional, large-scale mechanized operations. Regional conflicts are included in this category of operations.

The second type, irregular operations, includes peace enforcement, peacekeeping, and humanitarian relief. Even though priority is given to forces designed to fight regional conflicts, it is clear from current situations around the world that the role of the services have been broadened to fulfill these irregular operations.

While the "Bottom-Up Review" of the DoD addressed this reorganization, specifically outlining the force structure required to win two nearly simultaneous major regional conflicts, it is evident that the reduction in force size will call for dramatic changes in the way the services operate. Clearly the role of the DoD is changing to demand a smaller, more mobile, flexible, and less expensive force. The second, and less obvious, need for reengineering the DoD is the dynamic pace at which technology is changing. The lead time between the discovery of a new technology and its application is becoming progressively shorter [Ref. 2:p.18]. Daryl Conner, author of *Managing at the Speed of Change*, believes that the pace of change will continue to accelerate. He also believes that managers are now faced with the least amount of ambiguity they will see in their careers (see Figure 1-1).

<u>Key Characteristics of Accelerating Change:</u>	<u>Results:</u>
- Answers will be more sophisticated and less durable	- Today's turmoil will appear tame by comparison
- More time spent "in between" rather than "in" familiar territory	- Success will not lead to stability, but to more change
- No time outs, no substitutions	

Figure 1-1 The Accelerating Pace of Change [Ref. 3:p. 3]

The United States, in its next conflict, is likely to face a foe that is similarly armed with modern weapons. To increase the chances for successful outcomes, the United

States must remain a leader in the development and application of new technology.

In order to maintain our technical superiority, the DoD must learn to do things differently. It must be able to do more with less resources, to reduce technology lead times, and to incorporate continuing change into its operations. The transformation of any large, inefficient bureaucracy into a flexible, dynamic, results-driven organization appears a challenging job. When that organization happens to be the DoD, many would call the task impossible. However, political realities, coupled with numerous current and potential conflicts throughout the world, demand that the DoD make dramatic changes. The current situation, with the reduction in resources, personnel downsizing, and expanding, diverse operations, presents not only a challenge but a unique opportunity for the DoD to become proactive in the formation of United States strategy, instead of responding to a perceived threat as it has since the end of World War II. As Secretary of Defense, William Perry, stated in his confirmation hearing:

There always comes a moment in time when the door opens and lets the future in. For more than four decades the Defense Department has built its strategy and programs on dealing with the cold war. The ending of the cold war has opened a door, and the future is waiting to come in. By our actions, and by the new strategies we develop, we can shape the future instead of being shaped by it.

[Ref. 4:p. 3]

There is no question that the DoD needs to change in order to become an efficient, effective, proactive organization. To this end, reengineering in the DoD began five years ago under the title of the Corporate Information Management (CIM) initiative. The question now is whether or not DoD's CIM initiative and its latest creation, the CIM Strategic Plan, can provide the reengineering necessary to meet these goals.

B. OBJECTIVE

The success of the CIM Strategic Plan will depend in large measure upon its broad dissemination throughout the DoD and its understanding by DoD members. The objective of this paper is to assist in this dissemination and understanding. To accomplish this objective, this paper will provide an in-depth description of the origin of the CIM initiative, the policies it has spawned, and its long-term goals.

This paper will define the widespread changes currently taking place in private sector organizations, commonly referred to as reengineering. Reengineering requires dramatic and innovative redesign of the operations that are at the heart of every organization.

And finally, the objective of this paper will be met by describing how the CIM initiative fits into the overall context of reengineering.

C. RESEARCH QUESTIONS

In order to meet this paper's objective, the following questions must be answered: What is the CIM Strategic Plan and what is its relationship to the broader CIM initiative? Does the Strategic Plan provide the necessary foundation for successful reengineering of the DoD? What resistance has CIM met in the DoD, and in what ways has it adapted in order to survive in a traditional, change-resistant organization?

D. SCOPE, LIMITATIONS, AND ASSUMPTIONS

The CIM initiative is not without controversy within the DoD. Just as reengineering has been dismissed by many private-sector organizations as the latest management fad,

so has CIM met with the same resistance within DoD. Because the implementation of CIM within the DoD is an ongoing effort, with continuing controversy and changes, it cannot be analyzed as a complete program. Instead, this paper will examine CIM from a strategic perspective as an external observer, learning from CIM's failures and successes.

Reengineering began as a process of fundamentally changing the way businesses operate. It has since been applied to public sector operations as well. The assumption of this paper is that reengineering can achieve higher standards and increased efficiency, while reducing resources, and that these improvements can be applied to large, public sector organizations, and to the DoD in particular.

E. LITERATURE REVIEW AND METHODOLOGY

Because the CIM initiative is still relatively new, there is a limited amount of published information available. However, DoD directives, memos, and instructions are available to trace CIM's history. In addition, personal interviews have been conducted to gain more insight into what CIM is truly about and what resistance it has met.

While the amount of published information on the CIM initiative is limited, there is, in the private sector, a wealth of published information available on the general topic of reengineering and business process redesign. All of these sources have been used to provide a clear understanding and analysis of CIM, by itself, and in the context of widely recognized theories of reengineering.

F. CHAPTER OUTLINE

Following this introduction, Chapter II will provide the necessary background on the CIM initiative, tracing it from inception in the late 80s to its current status. Chapter III introduces reengineering as practiced in the private sector. Through the examination of numerous studies, interviews, and reports, this chapter describes the most recent developments of the CIM initiative in the context of reengineering theories. Chapter IV is an analysis of the CIM initiative and includes descriptions of the major problems encountered in implementing this concept in DoD. Chapter V presents principles of change management in organizations, and demonstrates how this has been one of the major obstacles to the implementation of CIM within the DoD. Chapter VI, the final chapter, summarizes the several recommendations made throughout this paper and presents this paper's conclusions.

II. THE CORPORATE INFORMATION MANAGEMENT INITIATIVE

A. INTRODUCTION

Before the CIM initiative can be correctly analyzed, it is necessary to understand the circumstances in which it became such a significant force in the DoD. This chapter traces the CIM initiative from its origins and foundation within the DoD to the recently released CIM Strategic Plan. It places emphasis on providing a basic understanding of CIM rather than looking to specific instructions, directives, or an all-encompassing memorandum that defines the CIM initiative.

B. DoD's INFORMATION RESOURCE MANAGEMENT DILEMMA

After World War II, the National Security Act of 1947 created a loose confederation among the services. Legislation passed through the 1950s and 1960s strengthened the role of the Secretary of Defense but did little to unite the services [Ref. 5:p. 198]. A series of conflicts from Vietnam to Desert I, the failed Iran hostage rescue mission, revealed the need for an effective joint doctrine.

The Goldwater-Nichols Department of Defense Act of 1986 may have been the first real attempt at meaningful reform and integration of the services. This legislation increased the responsibilities of the Chairman of the JCS and gave the CINCs direct access to the NCA, but it did little to end the partisanship demonstrated by the services. While Goldwater-Nichols appears to have been partially successful in reforming joint

doctrine, it did little to solve the problem of allocating resources among the services [Ref. 6:p. 72].

Recent conflicts such as Desert Storm represent marked improvements in joint operations, but problems still exist. Consequently, when the computer revolution matured in the late 1970s and early 1980s, the services worked independently to design, procure, and implement information systems. Compounding this enthusiastic acquisition was the Reagan Era military build-up, which provided funding for numerous programs despite duplication between the services and inefficient design, implementation, and management. In June of 1986, the Packard Commission criticized many of the DoD's management practices and its acquisition process. The Commission urged reforms in both of these critical areas [Ref. 7:p. 8].

Criticism from the legislative branch continued. In July of 1989, Congress, responding to GAO reports of mismanagement of automated data processing (ADP) systems in the DoD, threatened to cut funding for DoD information technology until the DoD produced a comprehensive, department-wide strategy for the acquisition and maintenance of its information resources. Specifically, the House Armed Services Committee recommended reducing the DoD Automated Data Processing (ADP) appropriation by \$165.5 million for fiscal year 1990. The committee also recommended that:

- All funds used for major information systems must be approved by the Major Automated Information Systems Review Council (MAISRC).
- Proposed that expenditures for major automated information systems must include an economic analysis in support of the system, which shall be reviewed annually and submitted in the DoD budget to Congress.

- Any major administrative automated information system which is determined to be service-unique must be reported to the Armed Services Committee prior to any initial MAISRC milestone.
- Each major, automated information system project that is submitted in the annual budget must include a current set of management indicators.
- The DoD Comptroller and the Director of Operation Test and Evaluation (DOT&E) are charged with developing a quality assurance program for major, automated information systems.
- The DoD Comptroller and the Defense Acquisition Board must report to Congress, within 90 days of a critical milestone, whether to use MAISRC for evaluation of computer systems in weapons programs.

[Ref. 8:p. 181]

The above recommendations resulted in a direction from President Bush in 1989 to completely overhaul the DoD's acquisition policies and management practices. In July of 1989, in response to the president's directive, the Secretary of Defense, Richard Cheney, drafted the *Defense Management Review to the President*. The DMR, as it became known, addressed the Packard Commission recommendations and other legislative branch management recommendations. A progress report on the DMR, which appeared in the March/April issue of "Defense 90," identified the following six broad goals:

- Reduce overhead costs while maintaining military strength
- Enhance weapon systems program performance
- Reinvigorate the planning and budgeting process
- Reduce micro-management
- Strengthen the defense industrial base
- Improve observation of ethical standards in government and industry

[Ref. 7:p. 1]

Additionally the article stated that:

the DoD has identified initiatives to save about \$2.3 billion in fiscal year 1991. Over a five-year period, fiscal years 1991-1995, the cumulative savings will be close to \$39 billion....

[Ref. 7: p. 9]

Donald Atwood, Deputy Secretary of Defense appointed by President Bush in the early years of his administration, was tasked with implementing initiatives to meet the DMR's goals. Deputy Secretary Atwood was keenly aware of the types of problems facing the DoD. He had come to government service from General Motors (GM), and was quite familiar with the problem of managing technology. Long before CIM became a buzzword in the DoD, it was used extensively at GM. In the mid-1980s, GM was faced with a decreasing market share and increasing competition.

In an attempt to streamline its manufacturing process and increase its efficiency, GM acquired Electronic Data Systems (EDS) at a cost of \$2.55 billion [Ref. 9: p.164]. At the time, this was one of the largest acquisitions in United States history, from the beginning, the GM/EDS merger was troublesome. In addition to dealing with the clash of two totally different corporate cultures, brought on by the transfer of all GM information systems personnel to EDS, EDS was handed the job of streamlining GM's computer services operations. By the late 1980s GM was still losing ground. The acquisition of EDS, a move that was supposed to solve their technology problems, only made matters worse.

Donald Atwood, then Vice-President of Operations at GM, was intimately involved in the GM/EDS deal. While battles raged over employee compensation and fixed price contracts, Atwood was one of the few that recognized the unnecessary bureaucracy and redundancy in GM's information systems operations. Furthermore, he fought, together with EDS, to manage the services more efficiently. He found that the problems existed in management and not in technology; or more precisely, in the management of technology. To combat these problems, GM devised the CIM approach. To put it simply, GM started

over and totally redesigned their business practices. One result is the Saturn plant in Spring Hill, Tennessee, which has been identified as a model of efficiency in automobile manufacturing.

In 1989, Deputy Defense Secretary Atwood conceived the Defense Management Review Decisions (DMRDs) as the vehicle to simplify the support infrastructure of the DoD [Ref. 10: p. 1]. The central theme of the DMRDs was to achieve the desired cost reductions by cutting overhead rather than fighting capabilities. Specifically, the goal of the DMRDs was to save \$71 billion between 1990 and 1997 through consolidation, increased efficiency, and business process improvement [Ref. 10:p. 2]. It was initially intended that \$36 billion of these savings would come from changing long-standing policies and practices; this left \$35 billion to be achieved by CIM [Ref. 11:p. 281].

The Corporate Information Management (CIM) initiative was formally established by Deputy Defense Secretary Atwood on October 4, 1989, through three actions. First, an executive level group was formed to examine strategies for information resource management throughout the DoD. Second, the Deputy Secretary instructed the DoD Information Resource Management Office to develop a process guide and management plan for management information systems in the DoD. Finally, eight technical and functional groups were directed to develop information requirements for the DoD.

C. EARLY CIM EFFORTS

The CIM initiative was established under the direction of the DoD Comptroller's Office. Initially, it had the following three broad objectives:

- To ensure the standardization, quality, and consistency of data from DoD's multiple management information systems.

- To identify and implement management efficiencies in support of business areas throughout the information system life-cycle.
- To eliminate duplication of efforts in the development of multiple information systems to meet a single functional requirement.

[Ref. 12:p. 2]

These initial efforts were almost certain to fail, for two principal reasons. First, the job was put in the hands of financial managers whose primary goal was meeting budget deadlines rather than making changes. Second, processes needed to be redesigned, not just automated or accelerated.

D. THE EXECUTIVE LEVEL GROUP

The Executive Level Group (ELG), formed by Secretary Atwood, reported directly to him. Its members are listed in Table 2-1. For the most part, members of the ELG

TABLE 2-1 THE EXECUTIVE LEVEL GROUP

<u>NAME</u>	<u>POSITION</u>
David Hill (Chairman)	CIO, General Motors
Duane Andrews	Assistant Secretary of Defense (C3I)
David Chu	Assistant Secretary of Defense (PA & E)
Gary Garret	Partner, Anderson Consulting
Jack Hancock	Vice President, Pacific Bell
George Lundy	Dean of Faculties, Loyola University
David Norton	President, Nolan, Norton, Inc.
Sean O'Keefe	Comptroller of the Department of Defense
Paul Strassmann	Vice President, Xerox (retired)

[Ref. 13]

came from outside the DoD and brought with them a broad perspective, unhindered by the

Pentagon's bureaucracy and compartmentalization. For over six months, members of the ELG examined the DoD's \$9.2 billion information resource management budget. The group found that the DoD, the world's largest information processing organization, was overwhelmingly lacking in leadership, control, and strategic planning.

The ELG observed that when the DoD attempted to apply new information technologies, the estimated savings did not result. As with the GM/EDS merger, the problem was a failure to improve the overall process before applying the technology. The management philosophy that the ELG recommended stressed process improvements prior to the enhancement of existing technology or the application of new technology.

When they had finished, the ELG gave Secretary Atwood a set of 14 principles and a model of priorities, both of which exist today in the CIM Strategic Plan. The principles are as follows:

1. Information will be managed through centralized control with decentralized implementation.
2. Simplification by elimination and consolidation is to be preferred to automation, whether developing new, or enhancing, existing information systems.
3. Proposed and existing business methods will be subject routinely to cost-benefit analyses, which include benchmarking against the best public and private sector achievement.
4. New business methods shall be proven or validated before implementation.
5. Information systems performing the same function must be common unless specific analysis determines they should be unique.
6. Functional management shall be held accountable for all benefits and all directly controllable costs of developing and operating their information system.
7. Information systems shall be developed and enhanced according to a department-wide methodology and accomplished in a compressed time frame in order to minimize the cost of development and achieve early realization of benefits.

8. Information systems shall be developed and enhanced in the context of process models that document business methods.
9. The computing and communication infrastructures shall be transparent to the information system that relies upon them.
10. Common definitions and standards for data shall exist department-wide.
11. Wherever practical, information services shall be acquired through competitive bidding, considering internal and external sources.
12. Data must be entered only once.
13. Access to information shall be facilitated, controlled, and limited as required. Information also must be safeguarded against unintentional or unauthorized alteration, destruction or disclosure.
14. The presentation to the user shall be friendly and consistent.

[Ref. 11:pp. 286-288]

The CIM model (Figure 2-1), first drawn by David Hill, defined CIM priorities in

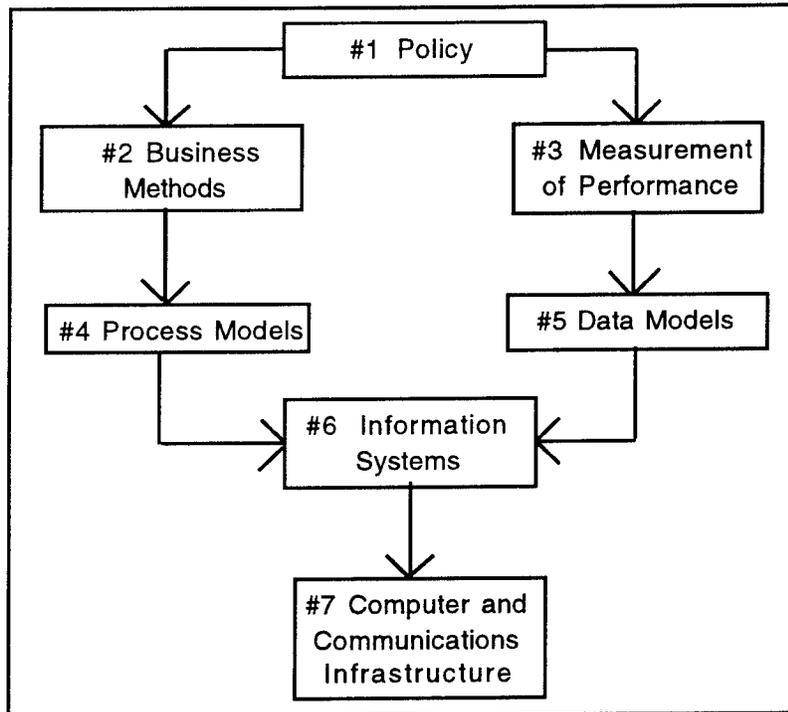


Figure 2-1 The CIM Model [Ref 11:p. 288]

the following order: a) policy ahead of everything else; b) business methods and performance measurement ahead of modeling; and c) information systems and technology decisions take place only after all the conditions for their success are in place.

[Ref. 11: p. 288]

E. FUNCTIONAL WORK GROUPS

In addition to the ELG, the following eight functional work groups were formed:

1. Civilian Payroll
2. Civilian Personnel
3. Contract Payment
4. Financial Operations
5. Government Furnished Materials
6. Material Management
7. Medical
8. Warehousing (Distribution Center)

[Ref. 12:p. 2]

The functional groups consist of senior-level defense officials, charged with the task of examining business practices, identifying management efficiencies, developing standard requirements and data formats, and determining how best to implement standard systems within common functional areas. It was intended that each functional group would use consistent development processes and methodologies. These processes and methodologies were to produce standard functional requirements and specifications for single management information systems within each functional area [Ref. 12:p. 2].

F. CIM REORGANIZATION

In December of 1990, the Secretary of Defense moved control of CIM from the Comptroller's office to ASD(C3I) [Ref. 14:p.1]. Additionally, ASD(C3I)'s responsibilities were increased to cover the Defense Communication Agency (now DISA), the Defense Mapping Agency, the Defense Intelligence Agency, and the General Defense Intelligence Program [Ref 14:p.1]. The organization chart is shown in Figure 2-2.

One of the most significant changes was the creation of the Director of Defense

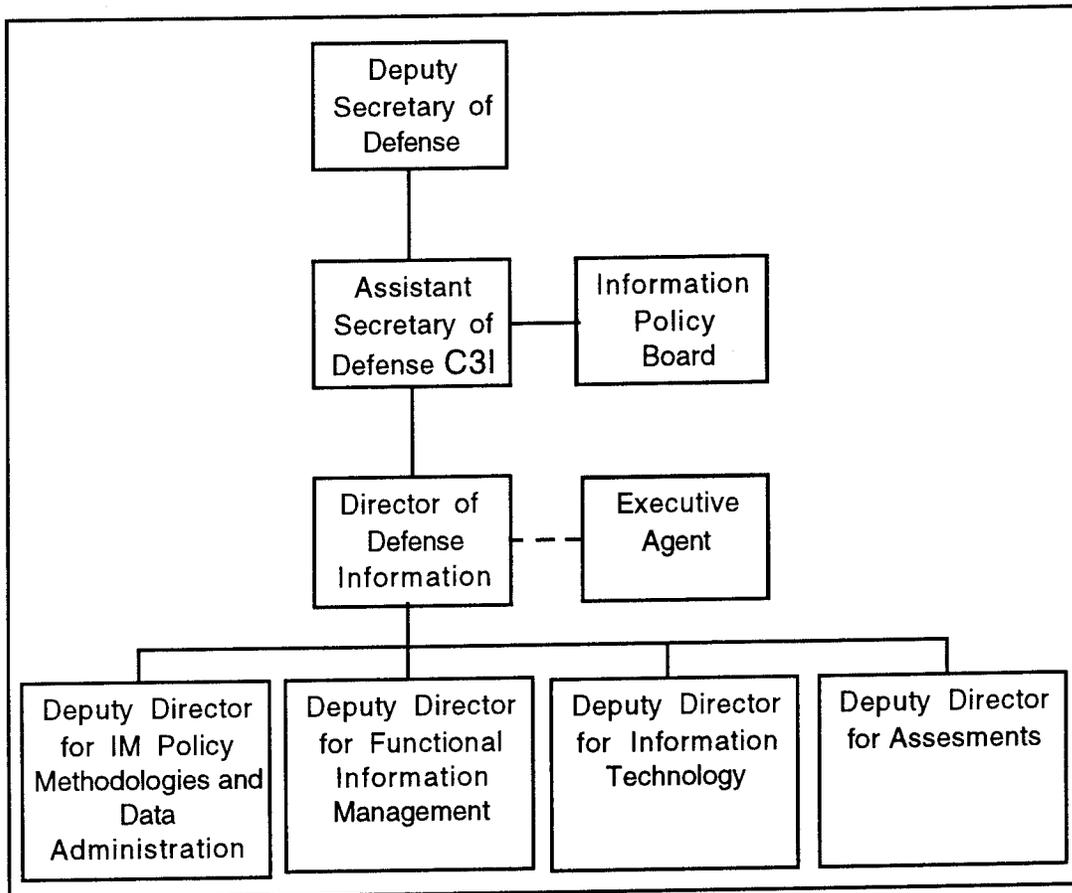


Figure 2-2 CIM Organization [Ref. 15:p. 6]

Information (DDI). The DDI was given defense-wide information technology

responsibilities for the development and implementation of standard information systems [Ref. 15:p. 7]. In conjunction with this reorganization, a plan was developed for the implementation of CIM that was more closely aligned with the original recommendations of the ELG. Its was intended to be a top-down effort to simplify and improve functional processes by: (1) documenting business goals, methods, and performance measures, (2) identifying and developing improved business processes and data requirements, and (3) evaluating and applying information technology to support these business process improvements. In 1992, the DDI issued guidance on how the DoD should manage and implement business improvements along functional lines. This guidance was a major shift for the services that have historically managed their own business functions. Moreover, 1992 was also the year when DISA became the central manager of the DoD's information systems infrastructure. The DoD infrastructure includes all DoD communication support networks requiring systems integration which were managed under the CIM initiative. As the central manager, DISA responsibilities included:

1. implementation of information system security
2. development, specifications, certification, and enforcement of information technology standards
3. network management, engineering, design, and control of long haul and regional communications
4. management and work load control of data processing instruments
5. central design activities for support systems activities
6. acquisition of information technology components and services that require integration. [Ref. 16:p. 12]

An additional change for the Services came under the Defense Information Management Program (DoD directive 8000.1), which formally established policy for CIM implementation, and created the position of Principle Staff Assistants (PSAs), senior functional officials responsible for implementing improvements within the DoD's business functions across traditional service and agency boundaries. The PSAs, which continue to figure prominently in the new Strategic Plan, are responsible for evaluating their respective business areas, reengineering them as required, and identifying systems and technology needed for support.

Just when it seemed the CIM initiative was making progress, administrations changed. While the current administration stated their support for the CIM initiative, it lost the momentum it had gained prior to the election. The role of the DDI, which had been pivotal in pushing CIM implementation, was vacant for months and finally returned from DISA to the ASD(C³I) office as it had been previous to the reorganization. Furthermore, while the current ASD(C³I), Emmett Paige, has professed his support for CIM, there was an initial misunderstanding during his confirmation hearings that may have contributed to slowing the CIM initiative's momentum [Ref. 17]. It wasn't until the recently released Strategic Plan, the formation of the DoD Enterprise Integration Executive Board and the DoD Enterprise Integration Corporate Management Council, that the current administration demonstrated their support.

The DoD Enterprise Integration(EI) Executive Board and the DoD Enterprise Integration Corporate Management Council were officially established in April of

1994, in a memorandum from the Deputy Secretary of Defense, John Deutch.

The EI Executive Board was established to "...exchange information about cross-functional management concepts and plans, and as a forum for the exchange of a full range of views about DoD policies to achieve the goals of CIM and an enterprise integration approach...." [Ref. 18] The board is the replacement for the Information Policy Board, which had functioned as an advisory council to the DDI. It is scheduled to meet twice a year with ad hoc sessions as required. Its membership is listed below:

- Deputy Secretary of Defense (Chairman)
- PDUSD-Acquisition and Technology (Executive Secretary of the Army)
- Secretary of the Navy
- Secretary of the Air Force
- Vice Chairman, Joint Chiefs of Staff
- USD-Acquisition and Technology
- USD-Policy
- USD- Personnel and Readiness
- Comptroller of the DoD
- ASD(C³I)
- General Counsel of the DoD (Legal Advisor)

[Ref. 18]

The same memorandum established the EI Corporate Management Council, with a similar purpose. The members of the council include:

- ASDC³I (Co-Chairman)
- PDUSD-Acquisition and Technology (Co-Chairman)
- USD-Personnel and Readiness
- Comptroller of the DoD
- ASD-Health Affairs
- ASD-Reserve Affairs
- Director, Program Analysis and Evaluation
- DUSD-Policy
- DUSD-Acquisition Reform
- DUSD-Environmental Security
- DUSD-Logistics

- Director, J-6
- Members of the military departments as nominated by their service secretaries
[Ref. 18]

The Council is scheduled to meet four to six times per year. Issues that cannot be resolved at the council level will be forwarded to the EI Executive Board.

G. CIM FOR THE 21st CENTURY

The recently released "CIM Strategic Plan for the 21st Century" fills a gap that has existed in the CIM initiative since the ELG. While much work has been accomplished, CIM has lacked the strategic guidance that this plan is meant to provide. In addition, because the two are so closely related, the Strategic Plan has been distributed in conjunction with "Enterprise Integration Implementing Strategy." The two documents, together represent a combined effort on the parts of ASD(C³I) and DISA, with ASD(C³I) responsible for the CIM plan and DISA accountable for the integration strategy. The two documents were endorsed in an introductory from the Deputy Secretary of Defense that instructed the documents be used as management guidance for the EI Executive Board and the EI Corporate Management Council. Additionally, the Deputy Secretary of Defense tasked the ASD(C³I) to work with the members of the EI Corporate Management Council to:

- Update and integrate the initial version of this plan by the fall of 1994.
- Expand the CIM planning to include functional plans of the Principle Staff Assistants and Component plans.
- Focus the planning and implementing strategy to identify issues appropriate for consideration of the EI Executive Board and EI Corporate Management Council
[Ref. 19]

The CIM Strategic Plan stated the following six goals:

1. "Reinvent" and reengineer DoD functional processes to achieve greater mission effectiveness at lower cost.
2. Tie DoD together through the use of common shared data.
3. Minimize duplication and enhance DoD's information systems to embody reengineered processes.
4. Implement a flexible, world-wide computer and communications infrastructure.
5. Apply corporate information management to integrate defense enterprise-wide operations.
6. Establish CIM polices and management structure.

[Ref. 20:p. 7]

These six broad goals are intended to address functional process reengineering, standardization, functional and technical integration, and management of the CIM initiative at all levels of the DoD. Lead and support roles, objectives, actions required, and performance measures are outlined for each goal. There is also an "over-arching" CIM goal which states that CIM will "Enable the commanders of military forces and the managers of support activities to achieve the highest effectiveness, agility, and efficiency in their operations through the effective use of information applied in improved functional processes." [Ref. 20:p. 6]

The management structure necessary for these far reaching goals is supported by four pillars:

- business process improvement
- data
- information systems
- computer and communications infrastructure

[Ref. 20:p. 6]

The EI Implementing Strategy is the key for integrating these four foundations. It provides the link between the functional and technical aspects at all levels in the DoD, enterprise, mission, functional and application.

III. REENGINEERING

A. INTRODUCTION

After gathering steam for many years, "reengineering" burst upon corporate America in 1990. It has been touted by some as a management panacea ever since, and has become firmly entrenched in corporate management ideology. Yet many organizations that have attempted to reengineer have not been successful. As Hammer and Champy attest, as many as 50 to 70 percent of organizations that attempt reengineering fail to achieve the dramatic results they intend [Ref. 21:p. 200]. Nevertheless, reengineering success stories in the private sector do exist and cannot be overlooked by the public sector.

This paper was written with the premise that reengineering should be, and is, taking place in the public sector, most notably in the DoD through the CIM initiative. This chapter will examine what reengineering is, and how information technology is influencing business process redesign. It will provide two brief examples of reengineering success in the private sector. In addition, the reengineering effort currently underway in the DoD will be examined through a number of reports and personal interviews focused on the CIM initiative and business process redesign.

B. DEFINITION

The foundations of today's organizations were established over two hundred years ago under the assumption that work should be broken down into tasks. These tasks could, for the most part, be completed sequentially. In today's post-computer revolution, successful

organizations are designed to unify these tasks into business processes [Ref. 21:p. 2]. True reengineering is a radical redesign of business processes to achieve major gains in cost, service, and/or time. Many of today's popular buzzwords—such as “rightsizing,” “reinventing” and “downsizing”—fail to accurately describe what reengineering truly means. Therefore, it is important to better understand what reengineering means and what it involves.

One of the most widely accepted definitions of reengineering is provided by Michael Hammer and James Champy's book, *Reengineering the Corporation: A Manifesto for Business Revolution*. It states, “Reengineering is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service and speed.” [Ref. 2:p. 32] Given this definition, it is no surprise that reengineering appears foreign to the inertia-bound DoD. Yet, it serves as an appropriate start to the DoD reengineering effort because of the dramatic change it demands from the traditional DoD organizational paradigm.

In addition, Hammer and Champy list four themes that emerge from analyzing reengineering case studies:

- Rule-Breaking
- Process orientation
- Ambition
- Creative use of information technology

A key foundation for successful reengineering is breaking away from the traditional assumptions of how the organization functions. In order for an organization to succeed at reengineering it must abandon old assumptions, such as specialization and sequential design; Hammer and Champy refer to this as rule-breaking. Process orientation allows an organization to cut across traditional organizational boundaries. As the examples later in this chapter will show, the entire process must be reengineered, not only a

specific department's tasks. In the third category, ambition, Hammer and Champy are alluding to the "dramatic improvements" and "radical" changes cited in their definition of reengineering. If an organization seeks only moderate gains in efficiency (e.g., through automation), it does not have the ambition to make the giant leap of total process redesign. Last, it is only through the creative use of technology that effective reengineering is possible. Modern technology enables the organization to alter its processes in radically different ways. [Ref. 2:p. 47]

In his landmark article, "Reengineering Work: Don't Automate, Obliterate," that appeared in *Harvard Business Review*, Michael Hammer presents the following seven principles of reengineering:

1. Organize around outcomes, not tasks.
2. Have those that use the output perform the process.
3. Subsume information-processing work into the real work that produces the information.
4. Treat geographically dispersed resources as though they were centralized.
5. Link parallel activities instead of integrating their results.
6. Put the decision point where the work is performed.
7. Capture information once at its source.

[Ref. 22:p. 108-112]

As Hammer points out in his article, "reengineering need not be haphazard." [Ref. 22:p.108] While all seven principles may not pertain to every organization, many organizations are already applying a number of these principles in their reengineering efforts.

Hammer and Champy are not the only experts on reengineering. Thomas Davenport, a partner at Ernst and Young's Center for Information Technology and Strategy, is also a

proponent of reengineering. In an article with James Short, Davenport supports a five-step approach to redesigning business processes; see Figure 3-1 [Ref. 23:p.14].

In the first step, *Develop Business Vision and Process Objectives*, the organization should set its targets and prioritized objectives. As with Hammer and Champy, Davenport and Short recommend that because it is difficult to gage how much improvement is possible, “reach should exceed grasp” with respect to targets. Davenport and Short also recommend prioritizing objectives, such as cost reduction, time reduction, improving output quality, etc., at this stage [Ref. 23:p.14].

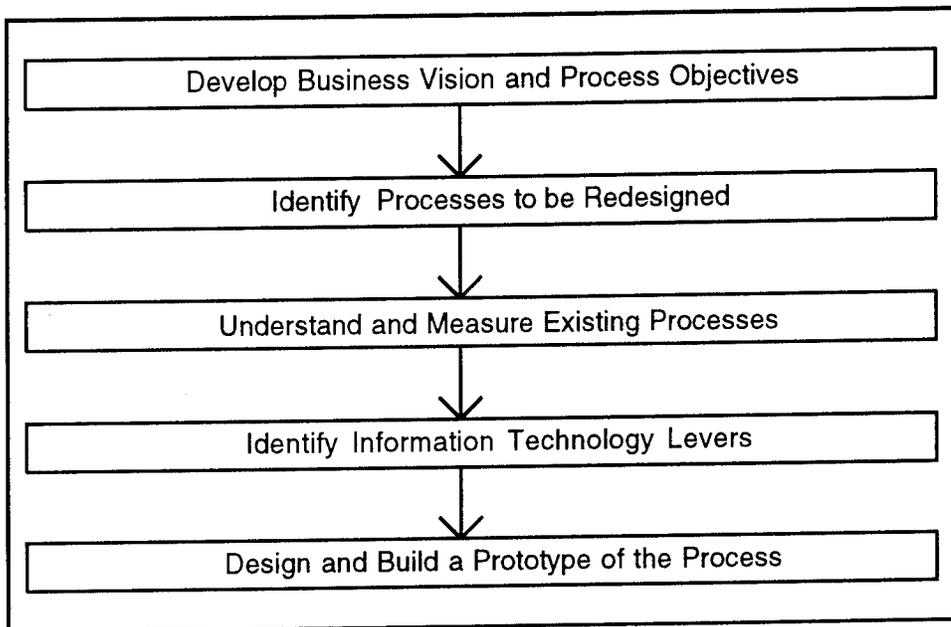


Figure 3-1 Five Steps in Process Redesign [Ref. 23:p. 14]

The second step in process redesign, *Identify Processes to be Redesigned*, contains a notable difference from Hammer and Champy’s “all or nothing” approach. As Davenport and Short point out:

Even when total redesign was the ultimate objective, the companies we studied selected a few key processes for initial efforts. Moreover, when there was insufficient commitment to total redesign, a few successful examples of IT-enhanced processes became a powerful selling tool.

[Ref. 23: p.15]

Davenport and Short specify two approaches in the identification of processes to be redesigned: exhaustive and high-impact. Using the exhaustive approach, all processes within the organization that will be redesigned are identified and prioritized.

Alternatively, the high-impact approach redesigns only the most important processes, given the business vision and process objectives developed in step one of Figure 3-1.

According to Davenport and Short, organizations undertaking the high-impact approach have been generally more successful than those that have employed the exhaustive approach. Their general rule is that most organizations can only manage the redesign of ten to fifteen processes per year. [Ref. 23:p. 15]

The third step in process redesign is to *Understand and Measure Existing Processes* before redesigning them. Clearly understanding the process may in itself identify problems that can be avoided in the redesign. An accurate measurement of the process prior to redesign provides a benchmark for later assessments.

Davenport and Short's fourth step is to *Identify Information Technology Levers*. Their central theme is the involvement of information technology from the outset of redesign, rather than simply designing a system to fulfill the requirements of a process. The use of information technology will be discussed in greater detail later in this chapter.

The last step in process redesign is to *Design and Build a Prototype of the Process*. However, Davenport and Short note that this is not the end of the redesign. While they recommend that the same team that performed the previous four steps design and build

the prototype, they recognize that it is an iterative procedure that will be continually examined and improved.

In his book, *Process Innovation: Reengineering Work Through Information Technology*, Davenport offers the following six points for managers:

1. Process innovation is a new and desirable approach to transforming organizations and improving their performance.
2. An explicit approach to process innovation is important.
3. Information and information technology are powerful tools for enabling and implementing process innovation.
4. How a firm approaches organization and human resources is critical to the enablement and implementation of innovative process.
5. Process innovation must occur within a strategic context and be guided by a vision of the future process state.
6. Innovation initiatives can benefit all manner of processes.

[Ref. 24:p. 299]

To understand the differences between Davenport and Hammer, each of these points should be addressed individually. Davenport's first conclusion clearly differentiates between process innovation and process improvement. However, unlike Hammer and Champy, Davenport comes to the realistic conclusion that reengineering may be a combination of both innovation and improvement. Furthermore, it is for the organization to determine which to pursue for any given situation. As addressed earlier, both Davenport and Hammer express the need to follow a specific approach when reengineering. Process innovation can not just happen casually; it must be structured to include several if not all of the key elements of the approaches described by both Davenport and Hammer. Yet, while Hammer mentions the enabling role of information technology, it is Davenport who addresses information technology as both an enabler and

implementer. Specifically, Davenport identifies CASE tools, which allow design activities to implement process innovation concurrently across traditional organizational boundaries. [Ref. 24:p. 212]

Davenport compares the roles organization and human resources play in process innovation to that of information technology. They both enable and implement the change process through empowering workers, establishing work teams, and creating new process-oriented organizational structures. [Ref. 24:p. 301]

Yet Davenport warns of the problems that organization and human resources may cause. He states:

Process innovation must somehow be associated with a broad program of cultural change, whether it engenders it or results from it. An early initiative can run counter to an organization's culture, but for it and subsequent initiatives to be successful, the culture must adapt.

[Ref. 24:p. 304]

Accepting that organizational cultures are developed over time, it is evident that adapting the organization's culture may be one of the greatest obstacles to reengineering.

Adapting to change is the focus of Chapter V of this paper.

According to Davenport's fifth conclusion, strategy and vision must precede the design and analysis for process innovation to be a successful undertaking. The processes that will be redesigned should be identified and measured with specific targets to direct efforts. Successfully demonstrating dramatic improvements in cost, service or time will enhance support for reengineering. Without vision and strategy, process innovation risks achieving only incremental improvement that, while desirable, fails to attain the dramatic improvement that is sought.

Davenport's last conclusion, the focus of three chapters of his book, deals with specific types of processes, ranging from product development to order management.

While most his examples are from the private sector, none of the processes is unique. Davenport also adheres to the belief that while it may be more difficult in the public sector, "...there is no reason to believe that process innovation efforts...in the public sector are any less likely to succeed." [Ref. 24:p. 303]

In summary, while both are strong advocates of reengineering, Davenport provides a method for organizations to "test the waters." Hammer, in contrast, would have organizations jump in from the start. Given the size and complexity of an organization such as the DoD, Davenport's approach may prove more prudent. It also provides the time necessary to disseminate a Strategic Plan and foster support through successful examples.

C. THE ROLE OF INFORMATION TECHNOLOGY

The information technology explosion is transforming the ability to collect, evaluate, disseminate, and apply information on a global scale. Both of the methods described above by Davenport and Hammer rely in large part on information technology to assist in business process redesign. Admittedly, many of the changes taking place within organizations today are due to the introduction of new and sometimes untested information technology. However, while it is important to stress the proper use of it as a critical link in business process redesign, information technology alone is not the answer. Many early attempts at applying information technology failed because they focused on using the technology to automate or improve existing processes.

Richard Foster, a management consultant with McKinsey and Company, refers to this as the "sailing ship phenomenon." [Ref. 25:p. 28] When steamships first made their appearance, builders of sailing ships realized they had a problem, so they set out to build

faster, sleeker, more efficient sailing ships. Initially, the builders were able to improve upon old designs and make faster sailing ships, but eventually the steamships proved far more reliable than the best sailing ships. The builders of the sailing ships were unable to break from their traditional paradigm. Thus, they were unable to apply the available technology limiting the potential success of their solution. Hammer and Champy also subscribe to the "sailing ship phenomenon":

The fundamental error that most companies commit when they look at technology is to view it through the lens of their existing process. They ask, "How can we use these new capabilities to enhance or streamline or improve what we are already doing?" Instead, they should be asking, "How can we use technology to allow us to do things we are not already doing?" Reengineering, unlike automation, is about innovation. It is about exploiting the latest capabilities of technology to achieve entirely new goals. One of the hardest parts of reengineering lies in recognizing the new, unfamiliar capabilities of technology instead of its familiar ones.

[Ref. 21:p. 85]

While Hammer and Champy support the use of information technology, Davenport and Short more clearly depict its interdependency with business process redesign. This interdependency is shown graphically in Figure 3-2. In Table 3-1, Davenport and Short identify nine information technology capabilities and their organizational benefits. While this list is not meant to be exhaustive, it does provide the generic capabilities of information technology in improving business process redesign. However, Davenport also warns of the constraints information technology may place on some organizations' infrastructures that cannot or will not be changed. He acknowledges that it is important to determine these constraints and how they will limit an organization's freedom in designing new processes. [Ref. 24:p. 301]

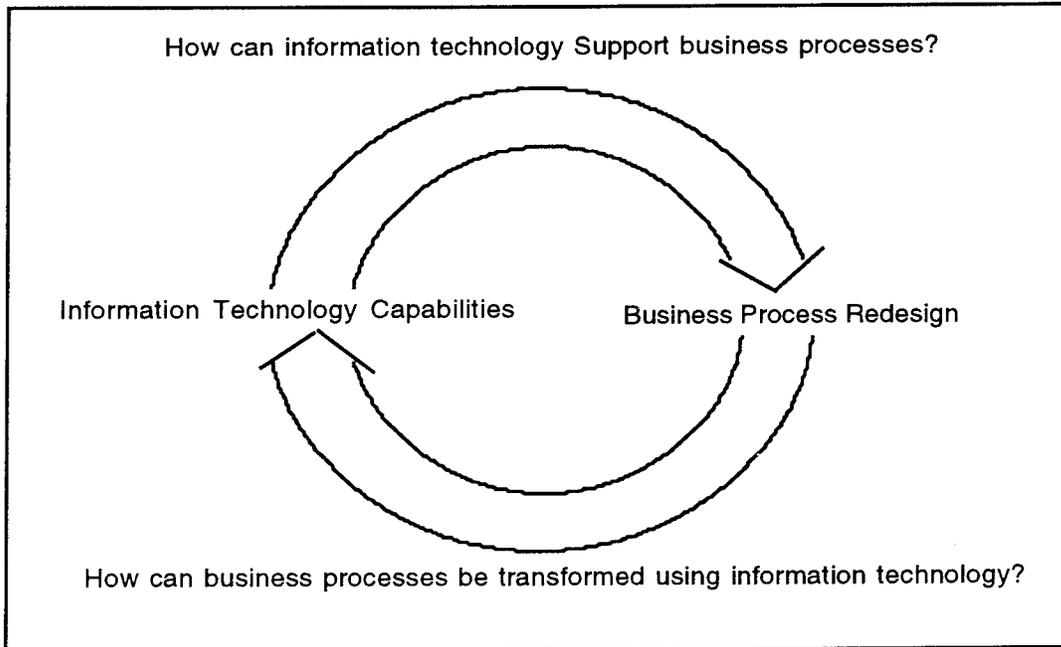


Figure 3-2 Relationship Between Information Technology and Business Process Redesign
[Ref. 23:p.12]

TABLE 3-1 BENEFITS OF INFORMATION TECHNOLOGY [Ref. 23:p. 17]

Capability	Organizational Impact/Benefit
Transactional	IT can transform unstructured process into routine transactions
Geographical	IT can transfer information with rapidity and ease across large distances, making processes independent of geography
Automational	IT can reduce or replace human labor in a process
Analytical	IT can bring complex analytical methods to bear on a process
Informational	IT can bring vast amounts of detailed information into a process
Sequential	IT can enable changes in the sequence of tasks in a process, often allowing multiple tasks to be worked on simultaneously
Knowledge Management	IT allows the capture and dissemination of knowledge and expertise to improve the process
Tracking	IT allows the detailed tracking of tasks, inputs, and outputs
Disintermediation	IT can be used to connect two parties within a process that would otherwise communicate through an intermediary

D. FORD MOTOR COMPANY

The total redesign of the Ford Motor Company's accounts payable process provides an example of reengineering in practice. When Ford analysts first began to examine the accounts payable process, their goal was to process invoices more quickly and with fewer employees. At the time, Ford's accounts payable employed more than 500 people. Figure 3-3 provides a graphic view of the accounts payable process prior to reengineering. Initially, Ford expected that new computer systems and better management practices could reduce their personnel in accounts payable by 20 percent [Ref. 22:p. 105]. However, when Ford compared their accounts payable to Mazda's,

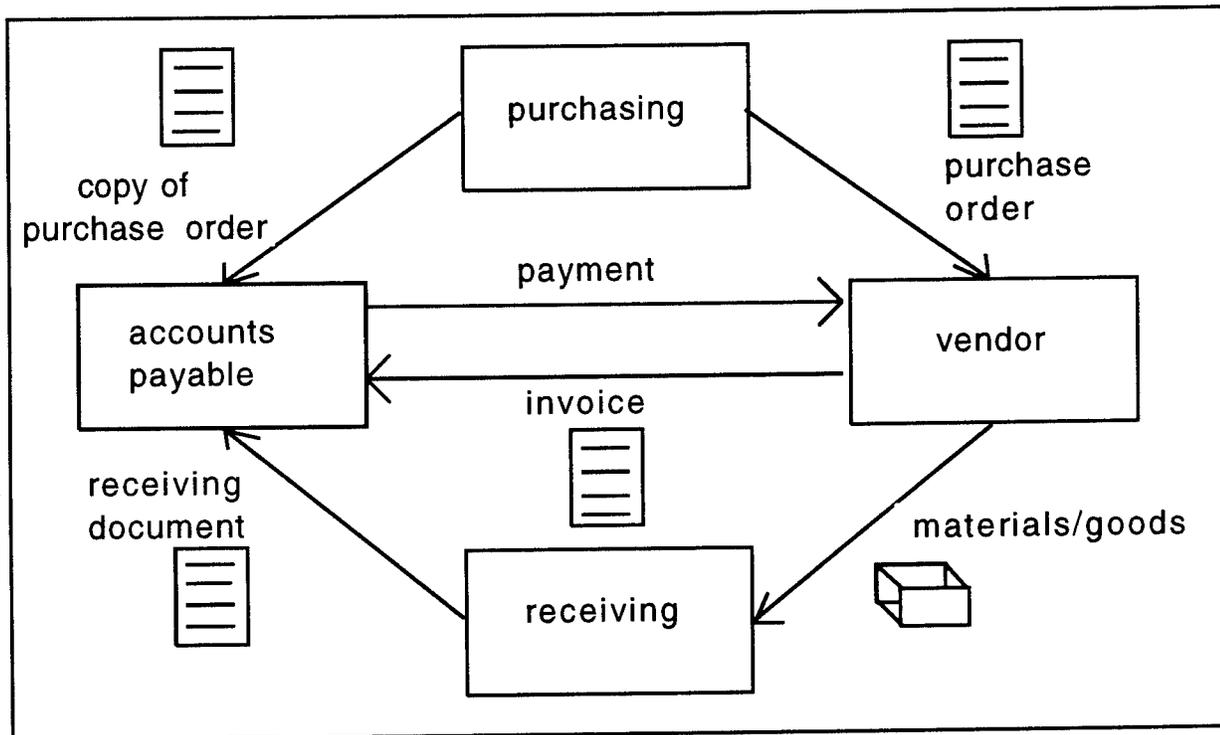


Figure 3-3 Accounts Payable Prior to Reengineering [Ref. 26:p. 88]

they discovered the astounding fact that Mazda required only five people to process their

accounts payable. It was obvious to Ford managers that much more than a 20 percent personnel reduction would be necessary to remain competitive.

Before the reengineering effort began, Ford executives realized that they would have to define the processes that accounts payable actually performed. As Hammer points out, this step was critical to the effort's success. He believes, "Reengineering must focus on redesigning a fundamental business process, not on redesigning departments or other organizational units." [Ref. 21:p. 40]

It soon became apparent that the old accounts payable process at Ford was outdated and inefficient. For example, when the purchasing department wrote a purchase order, the original document went to the vendor and a copy to the accounts payable department. Subsequently, the vendor would send an invoice to the accounts payable department, and the items ordered to the receiving department. The receiving department, after verifying the material was delivered, would send the accounts payable department a receiving document. The accounts payable department was responsible for matching the purchase order against the invoice and receiving document to ensure that they agreed, whereupon they would issue payment to the vendor. Under this archaic process, the accounting department had to match 14 data items between the receipt record, the purchase order, and the invoice before it could make a payment to the vendor. Unfortunately, much of the accounts payable department's time was spent reconciling differences between documents. [Ref. 22:p. 105]

The new accounts payable process, shown in Figure 3-4, is dramatically different from the old process. Presently, when the purchasing department issues a purchase order to a vendor, the order is also entered into an on-line database. The vendor then sends the materials to receiving as before, but now receiving has the ability

to verify the shipment directly. Moreover, a receiving clerk can check a computer terminal to see if the materials received match an outstanding purchase order. If a match is found, the clerk at the dock accepts the goods and enters the acceptance into the database that automatically issues a payment to the vendor. However, if the material does not match an outstanding purchase order, it is returned to the vendor. This new method requires only three items to match between the purchase order and the receipt record: the part number, unit of measure, and the supplier code. [Ref. 21:p. 42]

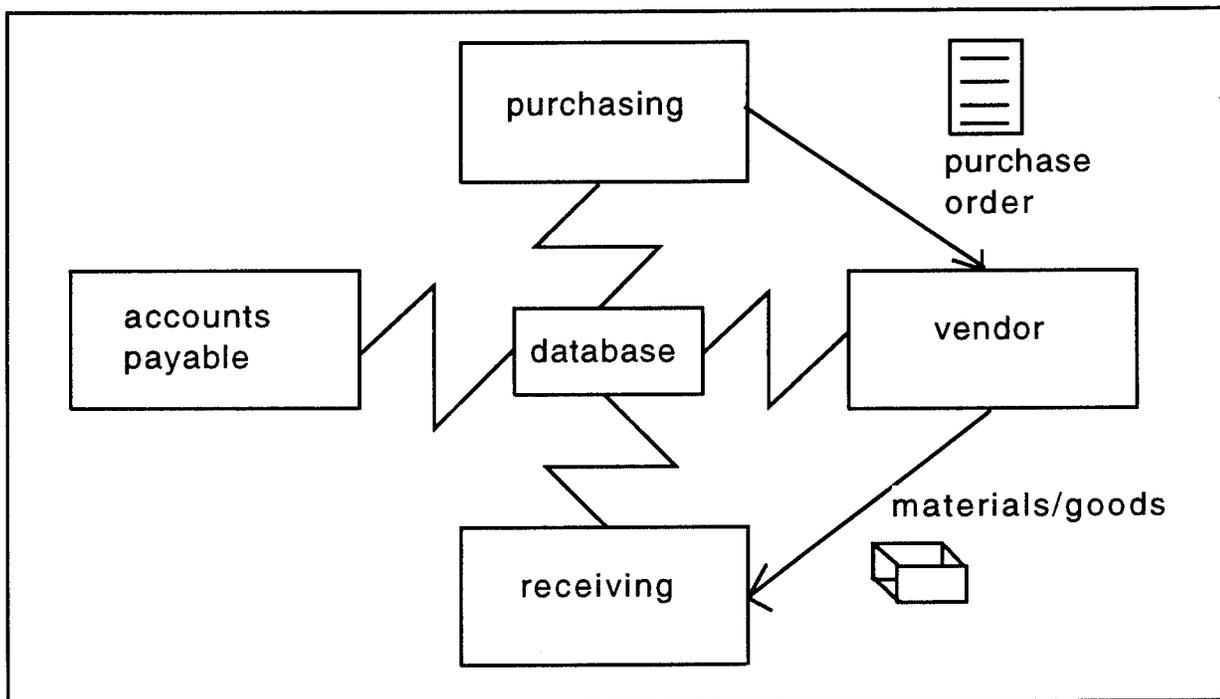


Figure 3-4 Ford's Accounts Payable Process after Reengineering [Ref. 26:p. 88]

The results at Ford meet both the “radical” redesign and “dramatic improvements” requirement of Hammer and Champy’s definition of reengineering. Now, instead of five hundred people there are only 125 responsible for vendor payments [Ref. 21:p. 42]. Initially, when Ford began their reengineering effort, they expected to

be able to speed up the accounts payable process. But they discovered that they could do away with invoices altogether, not only making the process quicker, but doing away with the needless paper trail. Instead of paying suppliers when an invoice is received, Ford now relies on the "invoiceless payment" system described above.

E. BOEING COMMERCIAL DIVISION

A second example of reengineering can be found at Boeing's Commercial Division, with the design and assembly of their newest aircraft, the 777. In the production of the first 777, which recently made its maiden flight, Boeing broke with their traditional rules, which had left a legacy of compartmentalization and typical corporate practices.

The design and assembly of the 777 relies on two important innovations. First, it is the only commercial airliner to have been completely designed electronically, using 3-D computer systems. Second, the manufacturing and engineering departments formed a single product team for the 777, rather than adhere to the tradition of bringing together inputs from different departments. [Ref. 27:p. 143]

To understand the magnitude of the changes that took place with the 777, a brief description of traditional aircraft design is necessary. Before the 777, structural specialists would first design the shell of the airplane, and a full-scale wooden mock-up would be built. When the mock-up was complete, everyone from hydraulics to electrical systems specialist would enter into the design cycle. Each of the specialist groups would then negotiate with the structure specialist, competing for the space and weight required by their design changes. This process, simplified in Figure 3-5, was sequential in nature: after one group of specialists had completed its work, the next group could come in and make its changes.

Boeing's new process threw out the old notion of working sequentially. The specialists worked from the beginning of the project in collocated teams, allowing the processes in the design of the aircraft to run concurrently instead of sequentially. Additionally, the teams, which became known as DBT's (Design Build Teams), worked without a full-scale model. This new method, also shown in Figure 3-5, allowed the design of the aircraft to reach across traditional organizational boundaries.

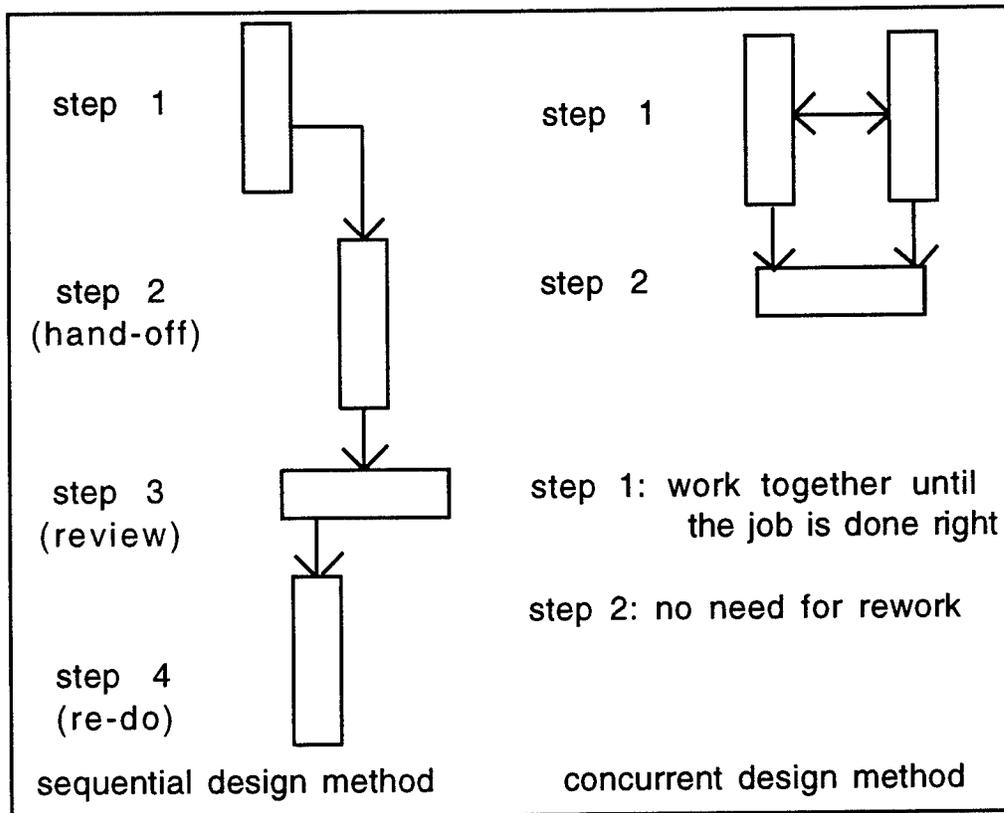


Figure 3-5 Simplified Reengineering at Boeing [Ref. 27:p 144]

The Boeing example, where innovation was limited to the design of a single aircraft through the use of new information technology, is an example of the Davenport and Short approach to reengineering. Unlike the everything-at-once Hammer and Champy approach, Boeing focused its attention on the enablement of new technology to accomplish a task never before attempted, the building of an aircraft entirely through

electronic imaging and testing without a mock-up. Boeing didnot attempt to use the technology to design automobiles, ships, or all their aircraft. They applied the technology to design, a specific aircraft -- the 777.

F. REENGINEERING THE DoD

Any large organization that expects to be effective in the 1990s and beyond must optimize its internal management and business processes. The DoD is no exception. Reengineering the DoD is not only possible, but at this point may be unavoidable. When it is approached correctly, CIM can provide the foundation to successfully reengineer the DoD. Recently, there have been a number of studies, internal and external, examining CIM in the context of reengineering and its implementation within DoD. The remainder of this chapter examines the CIM reengineering effort from four of the most recent studies, and from personal interviews with members of DISA and ASD(C3I).

The Information Technology Association of America (ITAA), using notable experts from both industry and the DoD, undertook a study to determine: (1) how the DoD can achieve enterprise integration, (2) how to gain the commitment of the DoD's senior leadership to make a change of this magnitude, and (3) what can be done to address the human consequences of downsizing and reengineering. The ITAA report determined that the Office of Secretary of Defense (OSD), specifically the Deputy Secretary of Defense, should be responsible for the overall reengineering effort. The report also recommended that a strategic enterprise integration implementation plan be designed, disseminated, and implemented immediately. [Ref. 28:p. 20]

Similarly, the DoD Inspector General completed a report on the status of CIM's implementation plan and the effort by the DoD to institutionalize the CIM initiative. The

report found that CIM institutionalization within the DoD has been severely hindered by the lack of a strategic plan. Furthermore, it found that savings from, and budgeting for, the CIM initiative are improperly tracked and analyzed. The report concluded that the Director of Defense Information (DDI) needs to develop formal policy and implementation guidance for the CIM initiative. [Ref. 28:p. 21]

One of the most extensive studies is the *Defense Information Management Follow-On Action Study*, completed by Booz, Allen and Hamilton, Inc., at the request of ASD(C³I). Concerning business process redesign, this study found the following:

While the Department has successfully implemented business process reengineering (BPR) and functional process improvement (FPI) to reduce costs and improve effectiveness, the organization has yet to address the larger scale issues that still exist. To date, DoD has initiated more than 200 projects focused on process improvement and reengineering. The majority of these efforts have been driven from the bottom up, rather than from the top down. These efforts have also focused on local functional improvements, rather than the far-reaching change that can result in significant improvements throughout the Department. The continuing evolution of BPR success within the Department requires a change in participation at the executive level. While the Department has demonstrated its support for BPR activity, it has yet to back this support up with clear examples of the reengineering that should be encouraged.

[Ref. 29:p. ES17]

This same study recommended that the DoD overcome the incorrect perception that CIM is limited to reducing information technology costs through systems replacement.

Rather, the savings are expected to come from business process redesign. While the report determined that ASD(C³I) should have the lead role in business process redesign, it recommended that DISA control compliance with all information technology standards and policies. The report stated:

...DISA should exercise centralized authority to ensure compliance with all IT standards and policies. Clear, written responsibilities are required to explicitly define the Service/Agency and DISA roles in base-level IT support. Additional emphasis should be placed on innovative acquisition strategies to accomplish

base-level IT modernization. Uniform methodologies should be developed to prioritize IT needs at all bases, depending upon mission impact. This prioritization can then be used to allocate scarce IT modernization resources among the Services so that power projection (overseas) bases receive the modernization and upgrades they need.

[Ref. 29:p. ES19]

Furthermore, the study found that cost data within the DoD is often absent or inaccurate.

Thus, many decisions are based on uncertain or incompatible economic information.

A summary of the report is provided in Figure 3-6.

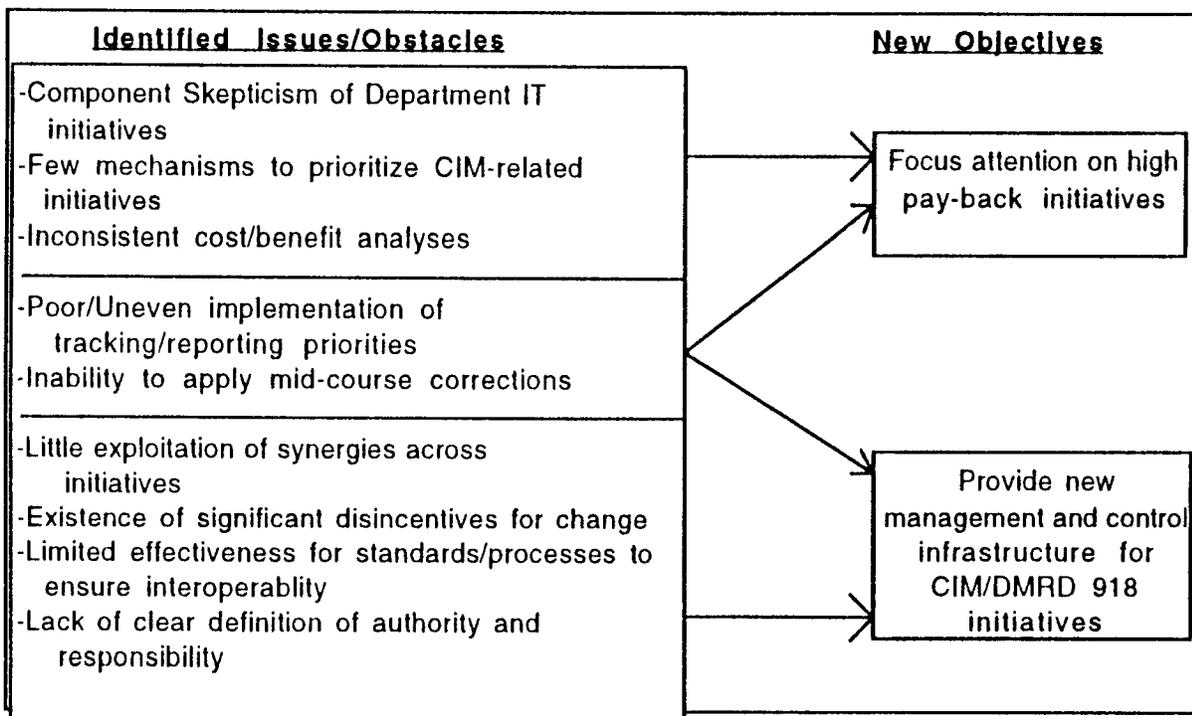


Figure 3-6 Summary of Results of Booz, Allen and Hamilton Study [Ref. 29:p. 6F]

Another study, by George Mason University's Institute of Public Policy, found the DoD must continue to examine successful (and unsuccessful) examples of reengineering in the private sector [Ref. 30:p. 17]. The report points out that while business process redesign is not unique to the DoD, the DoD faces the additional challenge of downsizing in

conjunction with reengineering. While the study admits that downsizing and reengineering are not mutually exclusive events, it suggests that it will be difficult for both to occur concurrently. Employee involvement in the reengineering effort has been identified as a prerequisite for success. Given the threat of termination, it is unlikely that DoD employees will be receptive to reengineering. However, in the example of reengineering used earlier at the Ford Motor Company, Ford employees that participated in the process innovation were promised redeployment.

Given the downsizing issue at DoD, the George Mason University report found that:

...several key processes should be selected. Initiate process innovation within these processes...Once successes are obtained, reevaluate and select additional processes for innovation initiatives. A DoD-wide reengineering effort does not seem practical. Build some successes prior to "shocking" the entire organization.

[Ref. 30:p. 17]

Since the CIM initiative's inception, there have been numerous reports from the GAO, criticizing the DoD implementation of CIM. The most recent GAO report, released in April 1994 to specifically address the CIM initiative, was "Defense Management: Stronger Support needed for CIM Initiative to Succeed." It made the following recommendations:

- Ensure the development of a management strategy with well defined roles and authorities to (1) plan and manage CIM, (2) gain the mutual support of the military services and defense agencies, and (3) manage and control funds to ensure the effective implementation and integration of improved business processes and systems.
- Seek the views of outside, expert practitioners to provide independent perspectives on the CIM initiative.
- Ensure the development of a cohesive, complete strategic plan, that builds on the recommendations of the ELG, to guide CIM implementation and integration.

- Ensure an appropriate balance between departmental efforts to reengineer and integrate business processes, and to standardize systems.
- Require that migration systems be supported by sound economic and technical analyses before implementation.
- Require that the costs and benefits of major process and systems improvements be assessed prior to making investment decisions, and that post-audits be performed to assess benefits and verify cost savings obtained.
- Direct the PSAs to establish plans consistent with the overall strategic plans goals and objectives.

[Ref. 28:p. 14]

To obtain a broader perspective on recent advances in the implementation of the CIM initiative, a number of personal interviews were conducted with individuals at ASD(C³I) and at DISA. The interviews supported the conclusions in the above-mentioned reports, and produced the following assessments. First, despite the intention for the widest dissemination of the CIM initiative, many employees, both civilian and military, do not understand CIM's far reaching goals and objectives. Organizations, commands, and units "outside the beltway" are often not up to date on the status of CIM. Second, many interviewees express doubt about the ability of DISA to undertake such an enormous task, given the frequent reorganizations. Finally, some feel that integration, even if attainable, may not be as desirable as the status quo.

The following list summarizes recurring problems with the CIM initiative, based on the studies and interviews described above.

- There is still a need for guidance at all levels of the DoD with regard to strategic planning for the CIM initiative.
- Continuity in the mission of the CIM initiative is questionable due to political turbulence.
- There is no central authority to enforce policy and prioritized CIM-related initiatives.

- Lack of a clear DoD-wide understanding of the CIM initiative is hindering its acceptance.
- There exists a lack of executive level commitment
- Allegiances to individual services and agencies remains a considerable obstacle.
- Lack of consistency of economic analysis throughout the DoD is hindering CIM-related initiatives.
- DoD-wide process innovation is likely to fail if attempted.

Each of the above points will be addressed in the following chapters.

In short, the CIM initiative has demonstrated the inability of the DoD to effectively implement fundamental change. Despite recommendations from the ELG and numerous subsequent reports, not enough emphasis has been placed on the aspect of organizational change demanded by the CIM initiative.

IV. OBSTACLES TO CIM AND REENGINEERING THE DoD

A. INTRODUCTION

The creation of the CIM Strategic Plan and the EI Implementation Strategy, as well as the formation of the EI Corporate Management Council and the EI Executive Board, are steps in the right direction. But there are still many unresolved issues and a need for continuing evaluation. This was recognized in the strategic plan when it was referred to as a "living document that will be refined as priorities change and implementation evolves." [Ref. 19] Among the unresolved issues are the eight mentioned at the end of Chapter III. This chapter will elaborate on each of these.

B. CIM GUIDANCE

While there is no doubt that those in leadership roles must completely understand and support the reengineering effort, the Strategic Plan may to a certain extent alienate members of the services and civilian employees who do not see a place for themselves in the new organization. As the George Mason University study suggests, without commitment from the work force, reengineering will most likely fail [Ref. 30:p.12]. In the absence of job security, or the perception of such, there will be little incentive for the work force to move from the status quo. While commitment from the top is a prerequisite for success, educating the work force and gaining each worker's commitment is also necessary.

If processes are to be redesigned, who is best suited to recommend changes --

managers who are responsible for the process or those who actually perform the process? Of course, the redesign will prove more successful if the individuals most familiar with the actual process are encouraged to participate. But within the DoD there is currently no method or motivation for these individuals to dramatically alter the processes with which they are most familiar.

Central to this theme of guidance at all levels is the need for the DoD to institutionalize CIM. As Paul Strassmann, former Defense Director of Information, states, a major area that defines CIM deals with the "effort to make CIM a permanent fixture, a permanent program, a permanent change in the way the DoD handles information." [Ref. 10:p. 1] Thomas Davenport continues along this line:

...process innovation must itself be viewed as a process, not a project. If initial efforts are successful, companies will move on to redesign other processes, a prospect that stretches to decades.

[Ref. 24:p. 305]

Unfortunately, the vacuum at the top created by a change in administrations is viewed by many as a lack of commitment. Even though events of the past year, such as the Secretary of Defense's vocal support for CIM, and the release of the Strategic Plan, are significant steps in the institutionalization of CIM, there remains a significant amount of doubt as to the survival of the initiative.

C. CONTINUITY IN MISSION

Lack of continuity of mission is seen most clearly through two examples in the early stages of CIM: the placement of CIM under the DoD Comptroller, and through the change in strategy from the initial grand design to the current migration of systems. The move

to ASD(C³I), while necessary, led to confusion over who was in charge. In retrospect, the CIM initiative probably should have originally been placed under ASD(C³I). It was prevented by resistance from the services to integrating command and control systems.

The change from initial strategy of a grand design to migration was simply a matter of dollars. Functional Economic Analysis (FEA) demonstrated that, in almost every case, building a system from scratch was a more expensive choice -- to say nothing of the difficulties of convincing people to migrate towards a radically system. Resistance to such change may be attributed to the organizational cultures and subcultures that have developed through the DoD. The difficulty has been compounded because the selection of systems has not been viewed with confidence by DoD members.

Participation by all members of the DoD is closely related to continuity of mission.

As Davenport states:

The long-term nature of process innovation leads to issues of executive continuity. Enthusiasm for process innovation must not reside with a single executive, however important that one person. For process innovation to succeed over the long term, a management group that transcends individual executives and organizational structures must be committed to process management, to information technology, and to organizational change. Process innovation is most likely to succeed in firms that exhibit a consistency of mission or "strategic intent" that is shared widely among executives and employees.

[Ref. 24:p. 306]

Another problem in the DoD is caused by changes in administrations and frequent turnover of political appointees. Even in the most recent change in administrations, where there was said to be agreement in support of CIM, the turnover of officials created a gap in top leadership. In the private sector, when a change in top management occurs, the organization's first order of business is to demonstrate that the change provides continuity of leadership in a planned, systematic manner [Ref. 31:p. 32]. This enables

managers to handle short-term crises and to achieve a minimum disruption of long term planning. With the periodic changes that occur in the leadership of the DoD, it is difficult for the CIM initiative to establish any continuity in mission. This issue needs to be addressed, with a commitment that allows CIM implementation to supersede political considerations.

D. POLICY ENFORCEMENT

While the Strategic Plan does provide CIM strategic goals and define support roles for each goal, the plan remains a collaboration of management effort between ASD(C³I), DISA, the Armed Services, and other agencies. As before, there is not a single individual or organization responsible for its implementation. Therefore, while the formation of the EI Executive Board and the EI Corporate Management Council does, in a limited fashion, address the need for centralized management of the integration effort, even these bodies, given their memberships, are susceptible to deterioration over time due to political turbulence. Even with the strategic plan there are currently few compliance mechanisms to ensure that policies and standards are followed [Ref. 29:pp. XI-3,4]. Skepticism persists as to DISA's ability to operate effectively as an operations and maintenance agency: "...some Pentagon and service brass felt that the growth of DISA's staff, from 5,000 people to about 40,000, might hinder the agency's ability to be an efficient, responsive organization." [Ref. 32]

This is indicative of a larger issue that may be considered unique in government and the DoD. Unlike private industry, there is a system of checks and balances within government that resist change through inherent delays in time and division of control.

As Constance Horner, Director of the U.S. Office of Personnel Management in the Reagan Administration, states:

Congress is another big barrier to reform. In micromanaging...Congress advances its interest in accountability but hampers the ability...to achieve goals.
[Ref. 33]

In effect, Secretary Atwood's DMRD process was an administrative innovation that worked around the cumbersome program, planning, and budgeting system for making long-term commitments [Ref. 11:p. 278].

The need for reform of the mechanisms that control the development, acquisition, and management of DoD information resources is a major barrier to reengineering that must be addressed for successfully implementing the CIM initiative.

E. LACK OF UNDERSTANDING AND DISSEMINATION

Changes in leadership and policy concerning the CIM initiative have left many individuals throughout the DoD unclear about its true objectives. When changes do occur, dissemination has been slow and haphazard. The Defense Inspector General's report on CIM, mentioned in the previous chapter, found a "lack of an overall CIM plan that is clearly presented to, and understood, by DoD managers...." [Ref. 28:p.6] While this problem has been alleviated to some extent by the Strategic Plan, criticism of the CIM initiative from inside and outside the DoD continues, based on a misunderstanding of the CIM initiative.

One of the best examples of this lack of understanding and dissemination can be found here at the Naval Postgraduate School (NPS). No environment exists in the Navy better suited to deliver the principles of CIM to line managers in the services. NPS, the

Navy's premier graduate institute, provides the ideal environment to educate junior officers in the principles originally set forth by the ELG. Specifically, within the Information Technology Management curriculum, a number of courses could include instruction on the efforts to reengineer the DoD. Currently, the concept of reengineering is only covered in a limited number of classes. Ideally, instruction could be broadened to include all of NPS's students.

F. EXECUTIVE LEVEL COMMITMENT

Perhaps the largest gap in the implementation of the CIM initiative, prior to the release of the Strategic Plan, was the lack of commitment from senior levels of DoD management. Changes in leadership and confusion over strategy have led to widespread skepticism regarding commitment to the initiative. Additional criticisms from outside the DoD contributed to the ambiguity over the future of the initiative. As recently as last year, the CIM initiative seemed likely to fail due to lack of funding and political infighting. [Ref. 34]

Even taking into consideration that the Strategic Plan and the creation of the EI Corporate Management Council and the EI Executive Board have helped to clear up the ambiguity, there is still need for more clearly defined roles and responsibilities. Specifically, the DoD needs a Chief Information Officer (CIO), a position critical to ensuring effective management of information technology within the DoD. In the private sector, the function of the CIO is characterized by little or no direct implementation responsibility. Instead, the CIO's emphasis is on policy setting, standards, and enterprise strategy development [Ref. 29:p. II-4]. Currently, the ASD(C³I) is most

analogous to the role of CIO; however, the authority of the CIO should be more in line with that held by the Deputy Secretary of Defense [Ref. 29:p. II-4]. Few would expect the Chief Executive Officer of a large private corporation to also wear the hat of CIO; the DoD is essentially no different. Thus, authority for information technology decisions on policy and standards need to rest in a single office.

G. SERVICE ALLEGIANCE

Service allegiances are a barrier to CIM implementation. The Odeen Panel, created by Secretary Of Defense Aspin in January of 1994 to review the DMR program, found that while a major drive is underway to develop common systems, the services object to areas where they feel centralization has gone too far [Ref. 32]. As Roger Beaumont points out in *Joint Military History*, at the core of friction between the services lies a difference in their functions. Despite a meshing to some extent of weapons and systems, "many practices, values and reflexes have remained separate, well beyond the level dictated by a division of labor..." and that "...formal obedience to edict may not be matched in essence." [Ref. 5:p. 190]

Even if CIM is successful in all other aspects, it is the cultures of the services that must be altered for true cross-functionality. Additionally, as the study at George Mason University determined, "The Services should be educated in change management so they will want to enforce policy decisions made at the OSD level." [Ref. 30:p. 10]

H. CONSISTENT ECONOMIC ANALYSIS

While historically the DoD has not approached cost tracking as operationally imperative, there is currently economic pressure for effective cost tracking. From its inception, CIM has been criticized for failure to track costs and analyze savings in a consistent, accurate, and timely manner. In response, the DoD developed the Functional Economic Analysis (FEA) decision package.

The FEA is guided by three principles. First, it focuses on functional processes, not information systems. It is intended to provide a bottom-line understanding needed to use various types of resources in order to meet objectives. The second guiding principle is measurement. The FEA requires the measurement of key attributes of functional processes, such as cost and outputs. These quantitative measures are important in assessing the current state of the functional process in setting substantive objectives, in evaluating an alternative means to achieve those objectives, and in gauging progress towards the objectives. Finally, the FEA is designed to be a continuing management tool, not a one-time reporting requirement. It is intended to allow managers to respond more quickly, and consistently, to analyses required for the existing acquisition and programming/budgeting processes.

[Ref. 35 p.124]

Despite the guidance offered by the FEA decision package, the DoD continues to lack sufficient cost tracking. As a recent GAO report found, in the nine functional areas examined, none had completed the FEA. It is clear that the effective management of costs and analysis of cost savings is another obstacle for CIM to overcome.

I. DoD-WIDE PROCESS INNOVATION

Finally, it is important to address the view that DoD-wide process innovation is likely to fail. In fact, while conclusions reached by the reports and interviews above may appear to favor abandoning reengineering, they are actually recommending an approach to reengineering that is more likely to succeed in the DoD. Specifically, these conclusions point to Thomas Davenport's high-impact approach to process innovation, discussed earlier. By identifying a few processes to be redesigned and then using these processes as examples, the DoD could lend credibility to the reengineering effort. Perhaps focusing attention on just one functional area would be more successful than attempting DoD-wide reengineering in all functional areas, in all business processes, and all at the same time.

Thus, the first step in Davenport's high-impact approach, identifying processes for innovation, is extremely significant to an organization such as the DoD, that is so resistant to change. Davenport outlines the following five key activities that enable an organization to identify processes for innovation:

1. Enumerate major processes
2. Determine process boundaries
3. Assess strategic relevance of each process
4. Render high-level judgements of the "health" of each process
5. Qualify the culture and politics of each process

[Ref. 24:p. 27]

Davenport's first step, Enumerate major processes, is most appropriate to the DoD, given the department's attempt at reengineering all processes simultaneously. He states:

...experience leads us to set the appropriate number of processes at between 10 and 20. Within this range—which leaves us some cross-process activity but

renders each process small enough to be understood—change management is only very difficult rather than impossible.

[Ref. 24:p. 28-30]

Davenport advises that the processes be defined as broadly as possible if the goal is radical redesign. This will enable the organization to realize benefits by improving handoffs between functions.

Davenport's second key activity, Determine process boundaries, is an iterative exercise. As innovation takes place in one process, it may give rise to redesign, or at least modification, in others. [Ref. 24:p. 31]

Once the boundaries of the processes have been identified, the organization can begin innovation on selected individual processes within the given range. Again, Davenport warns that attempting innovation on all processes concurrently is likely to fail due to the demand on the organization's resources. Moreover, even if the resources are available, most organizations cannot endure the magnitude of organizational change required by simultaneous innovation over all processes. In addition, simultaneous change in multiple processes can be extremely difficult to coordinate. Even if the organization understands the level of change and can endure the unrest that the change will cause, it is more advantageous to limit the number of processes undergoing innovation due to the coordination required between them.

Finally, Davenport does lend a word of caution that is especially significant to the DoD. When organizations attempt reengineering, he states "...the best candidates for process innovation are those whose short-term survival is not in question, but whose long-term viability is unlikely without major change." [Ref. 24:p. 305] The DoD certainly fits into this category.

V. CHANGE MANAGEMENT

A. INTRODUCTION

Managing change effectively within the DoD is critical to the success of the CIM initiative. The basic premise of this chapter is that those individuals within the DoD who will be expected to implement change are ill prepared to do so. It is intended that the principles introduced in this chapter will help those individuals become more resilient and better suited to manage the changes ahead. This chapter draws on the work of Daryl Conner, founder of Organizational Development Resources (ODR), Inc., a management consulting firm in Atlanta, Georgia. This chapter will examine the following seven patterns of change that Conner identifies in his book, *Managing at the Speed of Change*:

1. The nature of change
2. The process of change
3. The roles of change
4. Resistance to change
5. Commitment to change
6. Culture and change
7. Synergy

[Ref. 36]

Central to the concept of managing change is the premise that change is no longer an occasional event. Tomorrow's organizations will have to deal with change as a constant. The DoD is entering an era of unending transition that will likely accelerate far beyond anyone's expectations. Managing change in this new era will be critical to the continued success of the DoD.

B. THE NATURE OF CHANGE

The nature of change focuses on the disruption that change causes, and how successful managers of change adapt to the disruption. As Davenport states, "The wrenching nature of organizational change is the most difficult aspect of process innovation...."

[Ref. 24:p. 13] Understanding the nature of change, and that change can be perceived differently by different individuals, groups or organizations, are key aspects to assimilation. Conner defines major change as a loss of control resulting in a significant disruption in established expectations [Ref. 36:p. 74]. Many individuals view change as a crisis, and cope by trying to maintain control and revert to the status quo, rather than attempting to adapt. Moreover, while Conner asserts that every person, group, and organization has a finite capacity to assimilate change, he also believes that people and organizations can learn to increase their assimilative capacity if they understand and can recognize the patterns of change. Knowing your organization's capacity for change and understanding when the organization is at its limit of change are necessary to successfully manage the pace of change.

Conner identifies the levels of change as micro, organizational, and macro. Micro change, when only the individual must change, affects family, close friends, and associates. Organizational change, when the group must change, may affect work, church, professional associations, unions, etc. Macro change, when everyone must change, may affect a large constituency, such as with the national debt or health care reform [Ref. 36:p. 79]. Paradoxically, Conner observes that although the term macro implies a large change, it actually has the least effect on an individual's day-to-day routine:

Until people see a personal connection between their own behavior and the resolution of the organizational or macro issue, the problem is simply an intellectual exercise and not personally relevant... Much of our problem with making organizational or macro changes is that we fail to adequately communicate the impact these decisions will have on them personally.

[Ref. 36:p. 80-81]

Admittedly, few decisions within the DoD can be made under the consideration of how each and every individual will be affected. But successful managers of change will understand that, wherever possible, consideration should be given to how change will impact individuals, and to how individuals may perceive the impact of change.

It is important that change managers realize that each level of change has a cumulative effect and as such works against an individual's overall capacity to assimilate change. Whether the change is micro, organizational, macro or a combination, individuals use a portion of their assimilation capacity to deal with the change. On the micro level a person may be facing such dramatic change that they are unable to deal with even the simplest organizational change.

In describing the nature of change, Conner offers the following five key principles which help increase resilience to change:

1. Realize that control is what we seek, ambiguity is what we fear.
2. Attempt to exercise some degree of direct or indirect control over what happens during the implementation of change.
3. Assimilate change at the speed commensurate with the pace of other events taking place.
4. Understand the micro implications of organizational or macro change.

5. Face a total assimilation demand from the micro, organizational, and macro that is within the individual or organization's absorption limits.

[Ref. 36:p. 84]

C. THE PROCESS OF CHANGE

In describing the process of change, Conner employs a model of change first introduced by Kurt Lewin in 1958; see figure 5-1. With this model,

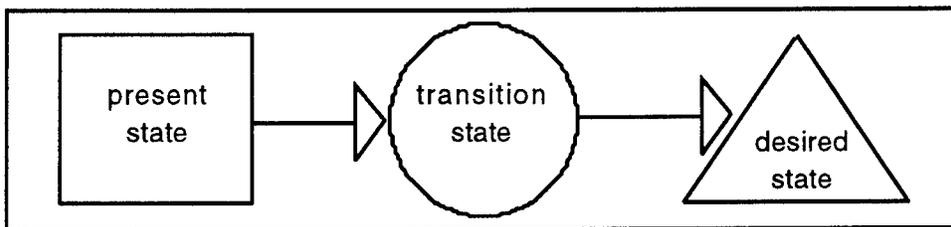


Figure 5-1 States of Change [Ref. 36:p. 87]

change is defined using three states: present, transition and desired. Major change is only possible when the pain or cost of the status quo, the present state, exceeds the cost of that of the transition state. However, he observes that:

In today's fast-paced world, [existing in] a permanent state is not likely. Most of our time will be spent in transitions, not stable states. To understand how we live in a constant state of "in between," we must view transitions as periods of "leaving from" something, periods of reordering or reconstruction, and periods of "going to" something, even if the goals to which we are heading are constantly moving.

[Ref. 36:p. 87]

Conner presents two prerequisites for major organizational change: pain and remedy. The pain, which may come in the form of financial costs, layoffs, and/or overtime, appears between the present and the transition states. Remedies, actions that resolve problems or take advantage of an opportunity, occur between the transition and the desired state [Ref. 36:p. 97]. Too often in the DoD, the pain of transition is overlooked

by the promise of remedies. With the CIM initiative, it was the necessity for cost savings that got the program off the ground. In GAO report 91-18, CIM savings were estimated at \$3.5 billion over fiscal years 1991 through 1995. \$1.3 billion was to be set aside for new system development and the remaining \$2.2 billion cut from the DoD IRM budget [Ref. 12:p. 3]. However, the report found that the savings estimates were based on the OSD staff's collective judgement, without the benefit of proper analysis. Even if the savings estimates had been accurate, cost savings cannot be the only way to gain support for change. The DoD itself cannot be blind to the realities, the "pain" associated with organizational change. In the case of CIM, the cost-saving remedies that got the initiative moving hindered its credibility in the long run when they failed to materialize.

Conner provides the following six key principles for the process of change that will build resilience:

1. Approach change as an unfolding process rather than a binary (either/or) event.
2. Accept that change is expensive; whether early or late, the change will be costly.
3. Believe that the status quo has become more expensive than the transition.
4. Accept the discomfort of ambiguity as a natural reaction to transition.
5. Accept only remedies that seem accessible.
6. Consider the frame of reference in which the change is presented and understand the potential impact.

[Ref. 36:p. 106]

D. THE ROLES OF CHANGE

For the roles of change, Conner observes that the volatility of major organizational change makes it difficult to determine who will play the key roles. Yet, he does define four roles critical to the success of the change process. The sponsor is the individual or group that has the power to sanction or legitimize change. The agent is responsible for making the change happen. The target is the individual or group that must change, and the advocate is the individual or group who wants change but lacks the power to sanction it. [Ref. 36:p. 106]

It is helpful to explain the relationship between these roles for the change effort to be successful. In *Managing at the Speed of Change*, Conner presents three basic forms these relationships have taken: linear, triangular and square; see Figure 5-2.

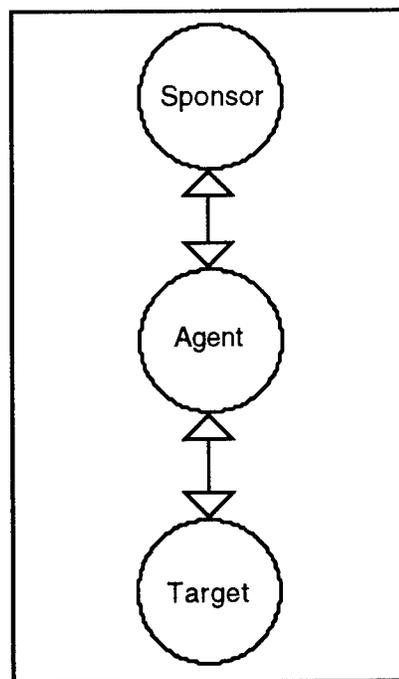


Figure 5-2 Traditional Relationship [Ref. 36:p. 108]

The linear relationship is the most traditional. The sponsor delegates the change responsibility to the agent who then deals directly with the target. Likewise the target reports to the agent and the agent to the sponsor [Ref. 36:p. 107]. In the triangular relationship, Figure 5-3, both the agent and the target report directly to the sponsor. ODR's research has found an 80 percent failure rate in organizations that attempt this relationship when implementing change [Ref. 36:p.108]. ODR attributes this failure rate to the sponsor's attempt at delegating authority to an agent not recognized by the target as having that authority. This relationship is visible in the services-versus-DISA conflict. Until authority is vested in DISA, and successful examples can be displayed, the resistance from the services is likely to continue.

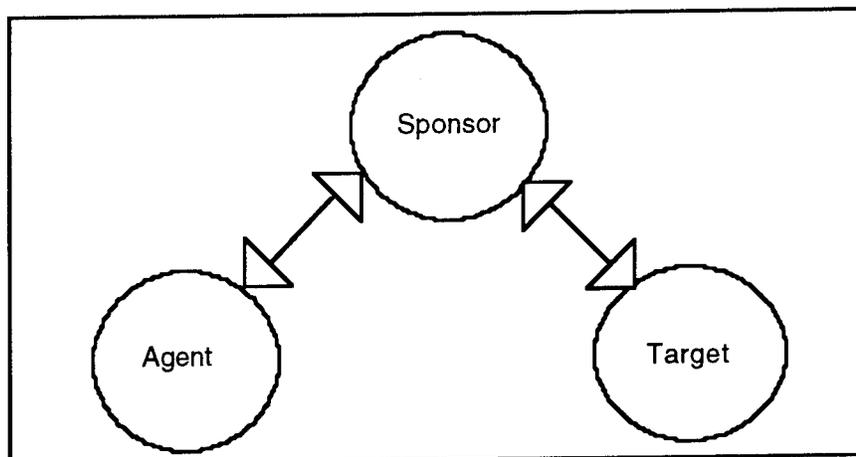


Figure 5-3 Triangular Relationship [Ref. 36:p. 109]

In the square relationship, Figure 5-4, both the agent and target report to a different sponsor. Again, ODR has usually found this relationship to be dysfunctional because the targets only recognize the authority of their respective sponsor. Thus, they

resist the agents' attempts at change because the agent lacks the authority to enforce change directives.

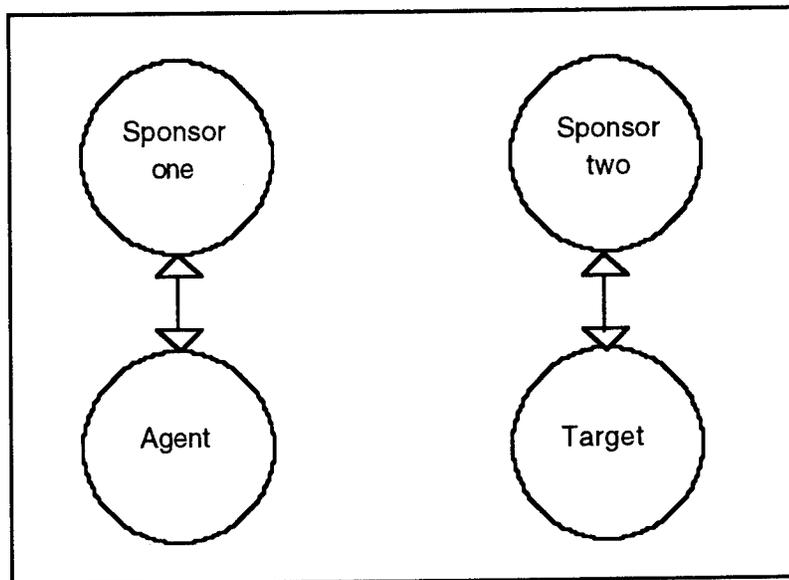


Figure 5-4 Relationship with Dual Sponsors [Ref. 36:p. 111]

The definition of roles and responsibilities is one of the greatest obstacles that must be overcome for CIM to succeed. Within the DoD, clearly defining roles of change are difficult; addressing their relationships are nearly impossible. The primary problem is defining a sponsor with the authority to make and enforce changes. The planning, programming, and budgeting system prevents even the highest levels of the DoD from exerting the control necessary to institute a change of CIM's magnitude. This barrier is not likely to be resolved in the foreseeable future, but by incremental implementation of process innovation, one functional area at a time, it may be possible to clearly define the necessary roles and responsibilities. On the scale at which the DoD is currently implementing CIM, there are too many advocates and not enough sponsors with the

proper authority.

For the roles of change there are five ways to increase resilience:

1. Understand and recognize the key roles in a change.
2. Understand the relationships between the key roles.
3. Understand the requirements of a strong sponsor.
4. Recognize that a change must be clearly and strongly sanctioned by those initiating and sustaining sponsorship positions.
5. Perceive that the rhetoric of change is consistent with meaningful consequences.

[Ref. 36:p. 122]

E. RESISTANCE TO CHANGE

Resistance to change, positive or negative, is a natural reaction to the disruption change causes. Conner believes that the ability and willingness of individuals are prerequisites for change. Ability is possessing the necessary skills and knowing how to apply them. Deficiencies in ability can be addressed through training and education. Willingness is the motivation to apply abilities. A lack of willingness can be overcome through a system of punishment and rewards [Ref. 36:pp. 127-128]. One key to overcoming resistance to change is anticipation. Noel Tichy, author of *Managing Strategic Change: Technical, Political and Cultural Dynamics*, recognizes that resistance to change can be due to habit, fear, absence of skills, unpredictability and sunk cost [Ref. 37:p. 344-345]. Therefore, recognizing that resistance will accompany disruption to the norm enables managers of change to anticipate and minimize the resistance. Conner even encourages overt resistance (in the form of free discussion, etc.), for it is covert

resistance that managers are unable to aggressively pursue and overcome.

Again, Conner provides five key principles to deal with resistance to change:

1. Understand the basic mechanisms of human resistance.
2. View resistance as a natural and inevitable reaction to the disruption of expectations.
3. Interpret resistance as a deficiency of either ability or willingness, and address it as such.
4. Encourage and participate in overt expressions of resistance.
5. Understand that resistance follows a sequence of events that can be anticipated and managed.

[Ref. 36:p. 145]

F. COMMITMENT TO CHANGE

Davenport presents three qualities essential to the leadership of organizational change: commitment and the ability to inspire, conceptual skills, and impatience for results [Ref. 24:p. 178]. Of these three, commitment is the essential ingredient. The degree of commitment from senior leadership may be the single greatest factor for the success of change management. When involved in major organizational change, Conner recommends the following four principles that bolster the commitment to change:

1. Realize the sequence in steps involved when committing to something new.
2. Provide appropriate time and involvement to become emotionally and intellectually committed to change.
3. Demonstration from the sponsor through the investment of time, resources, and effort.
4. Understand that commitment to change is expensive, either through achieving it or avoiding it.

[Ref. 36:p. 160]

G. CULTURE AND CHANGE

Culture and change is Conner's sixth group of supporting principles. Not until recently, has corporate culture been recognized as having a profound influence on the outcome of any change effort. Now it is realized that the organization's culture is not only the most elusive element in the change process, but often the most difficult to change [Ref. 37:p. 352]. Conner attributes the most recent attention to corporate culture to increasing global competition, diminishing financial resources, obsolete technology, traditional and inadequate organizational structures, a disenchanting work force, and a demand for quality and customer service [Ref. 36:p. 162].

It appears that an organization's culture, to a great extent, determines the pace of change. For example, in the DoD, for example, there are numerous cultures and subcultures that exist. Change within any of these cultures will be viewed differently. Within the Navy, the addition of women into combat positions has met with far more resistance in the aviation communities than in other service communities.

When involved in major organizational change, Conner recommends the following three principles that relate to organizational culture:

1. Understand the powerful effect culture has on the outcome of any major change effort.
2. Know that major organizational change must be supported by the organization's overall culture and its local subcultures.
3. Recognize that when counterculture changes are introduced, you must alter the existing culture to support the new initiative.

[Ref. 36:p. 178]

H. SYNERGY

Synergism is defined as the interaction of discrete agencies or agents such that the total effect is greater than the sum of the individual effects [Ref. 38:p. 1198]. Although, it is the seventh and last group of supporting principles in the change process, Conner refers to it as the "cornerstone" of managing change [Ref. 36:p. 184]. How the individuals or groups involved in the change effort relate to each other is an indication of the organizations collective ability to implement change.

Within the DoD there are a number of cultural barriers to the teamwork exhibited by a synergistic organization. While the services share a common goal, there are traditional rivalries that are detrimental to synergy. Further, operational units tend to consider themselves a higher priority than the units that support them. These examples do not even approach the many non-synergistic elements between the services and the civilian agencies that support them. In any event, without positive interaction among all members of the DoD, synergy cannot exist.

To foster positive interaction and guard against misunderstandings, Conner recommends three methods of interaction: effective communication, active listening and generating trust [Ref. 36:p. 202].

Conner's key principles to promote synergy in the change process are:

1. Recognize how important synergy is to the success of change.
2. Display a genuine willingness and ability to join with others in efforts to produce a synergistic equation.
3. Listen, value and apply different perspectives.

[Ref. 36:p. 215]

VI. CONCLUSION

A. RECOMMENDATIONS

Having examined the CIM initiative, perspectives on reengineering and support principles that enable effective change management, it is now possible to draw some conclusions about, and make recommendations for, the DoD's reengineering effort. From its earliest beginnings with the ELG to the most recently released Strategic Plan the basic concept of CIM is sound: it is to redesign processes around their functions rather than by organizational boundaries, standardize requirements, and remove duplication to achieve greater efficiency. Reduced to its essence, CIM is a common-sense approach to information management. However, in its implementation, CIM has been forced to adapt to the bureaucracy of the DoD. Instead of making the DoD a more efficient organization, CIM has become another requirement to fulfill, another layer in the bureaucracy.

Before the CIM initiative can be successful in the effort to reengineer the DoD, the following recommendations should be implemented:

- The goals in the CIM Strategic Plan must reach and be understood by all members of the DoD.
- Continuity in the overall mission of the CIM initiative must be ascertained.
- There must a central authority to enforce policy and to prioritize CIM related initiatives.
- Executive level commitment must be demonstrated.
- The services must accept and support the changes CIM will create.
- The DoD must use consistent economic analyses throughout the DoD to determine what changes will be necessary.

- The DoD must learn to manage change
- Examples of process innovation from within the DoD should be used to foster support throughout the DoD.

To a large extent, ASD(C³I) is now functioning as the DoD's CIO. As a member of the EI Executive Board and the EI Management Council, this role is reinforced. However, given the magnitude of CIM and the scope of the Secretary's present duties it appears more practical to appoint a CIO at the ASD level or higher if possible. Success of the CIM initiative hinges on the DoD leadership's ability to integrate and manage a variety of programs across organizational units. By tasking the current ASD(C³I) office with this undertaking, the DoD is not looking beyond its traditional organizational structure.

The DoD's CIO—which could be called the ASD for Information Management—should be filled from the private sector - possibly one of the original members of the ELG. Currently, neither the EI Executive Board nor the EI Management Council has the benefit of the perspective of an expert in the field of information management from outside the DoD.

In addition to the appointment of a CIO and the use of outside talent, the DoD should attempt process innovation in a single functional area as opposed to a concurrent, department-wide effort. While the DoD may possess the resources to attempt implementation on a department-wide scale, Davenport's high-impact (selective) approach is more practical and less risky. Moreover, the DoD is hardly the type of dynamic organization designed to handle the magnitude of disruption a change on a department-wide scale would cause.

If successful examples of the CIM can be demonstrated, more support can be gained at

all levels of the department. Central to building this support is guaranteeing security to all of the DoD's employees—obviously no small task. But as the CIM initiative is incrementally implemented, it may be necessary to reach the desired personnel levels through voluntary separations.

It is also necessary to specifically address the problem of service allegiances—a major obstacle to CIM implementation. Each of the services is threatened by the loss of control of functions that have historically been theirs to manage. At the level of the Joint Chiefs of Staff, each service chief is expected to have and voice opinions parochial to his service. An article, by Peter Chiarelli, in the Autumn, 1993 issue of *Joint Force Quarterly*, advocated the formation of a National Military Advisory Council (NMAC) to replace the JCS. The reform, originally proposed by General Edward Meyer, former Army Chief of Staff, proposed that

NMAC [would be] composed of senior flag officers from each service, plus one civilian and the Chairman. NMAC members would be distinguished retired or active four-star flag or general officers serving on terminal assignments.

[Ref. 6:p.72]

While that reform never came about, it should be revisited in view of CIM. Abolishing the JCS is unrealistic, but the advisory council or similar positions could be added to the EI Corporate Management Council. Ideally, these members could represent the best interest of the services from a non-partisan standpoint. This would serve to alleviate some of the partisanship the services now display. Of further benefit, the positions, which would be recommended by the JCS, could run counter to the election years. This would make the council less susceptible to the political turmoil during changes in administrations and thus bolster the continuity of mission.

B. CONCLUSION

The CIM initiative is already under scrutiny of the GAO and many other agencies, internal and external to the DoD. Congress, on more than one occasion has threatened to reduce or stop funding if the CIM initiative does not demonstrate notable savings. While the CIM Strategic Plan is a step in the right direction, the recommendations listed above can also be considered measures necessary to ensure CIM's survival. Should the DoD continue its attempt at haphazard and unsupported implementation the initiative is destined to fail. If the recurring problems addressed in this paper do not receive prompt and appropriate attention, the initiative is also likely to fail to achieve the desired results.

Despite the shortcomings of the Strategic Plan, CIM remains the most feasible vehicle for changing the DoD. However, the shortcomings described in this paper should be addressed immediately. If the recommendations are successfully implemented in conjunction with the CIM Strategic Plan, its chances of acceptance across the DoD increase. Whether it is labeled reengineering, process innovation, process redesign, or CIM, the task is the same: to fundamentally examine the core processes that are performed to accomplish our missions, with the aim of increasing efficiency and use of fewer resources. As the missions of the DoD increase in diversity and scope, its resources will have to be managed better. The dramatic improvements required of our forces demand a commitment to the total redesign of current policies, organizational structure, culture and systems.

LIST OF REFERENCES

1. Mazarr, Michael, The Military Technical Revolution: A Structural Framework. Washington, D.C. The Center for Strategic and International Studies, 1993.
2. Dussauge, Pierre, Strategic Technology Management. John Wiley & Sons, 1992.
3. Conner, Daryl, Organizational Development Research, Inc., 1993.
4. Smith, Bunnie, "Functional Economic Analysis: The OSD Perspective", Briefing for ASD(C3I), September 1993.
5. Beaumont, Roger A., Joint Military Operations: A Short History. Greenwood Press, 1993.
6. Chiarelli, Peter M., "Beyond Goldwater-Nichols." Joint Force Quarterly, Autumn, 1993.
7. "The DMR at Work: Towards Six Broad Goals." Defense 90, March/April 1990.
8. U.S. Congress House. Committee on Armed Services. National Defense Authorization Act for Fiscal Years 1990-1991. 101st Congress, 1st session H.R. 2461. Washington D.C.; GPO, 1 July 1989.
9. Levin, Doron P., Irreconcilable Differences: Ross Perot Versus General Motors. Penguin Books, 1990.
10. "CIM: Consider it Mañana?" Defense Issues. Volume 7 No. 55, American Forces Information Services, Washington D.C.
11. Strassmann, Paul A., The Politics of Information Management. The Information Economics Press, 1994.
12. "CIM Savings Estimates." GAO Report 91-18. 22 Feb. 1991.
13. Phone Conversation. David Hill, Chief Information Officer, General Motors Co. 29 June 1994.
14. Brewin, Bob, "DoD Sends CIM to C3I, Andrews named Czar." Federal Computer Week. November 1990.

15. "Defense ADP: CIM Initiative Faces Significant Challenges." GAO Report 91-35. 22 Apr. 1991.
16. "Defense Transportation: Commercial Practices Offer Improvement Opportunities." GAO Report 94-26. 26 Nov. 1994.
17. Endoso, Joyce, "DoD's Paige Denies Killing Off CIM; IRM Chief says Program is One of Many He Supports." Government Computer News, 16 Aug. 1993.
18. Deutch, John, Official Memorandum. Subject: " Management Structure for the Accelerated Implementation of Migration Systems, Data Standards and Process Improvement." 6 Apr. 1994.
19. Deutch, John, Official Memorandum. Subject: " Corporate Information Management (CIM) Strategic Plan and Enterprise Integration (EI) Implementing Strategy." 13 June 1994.
20. U.S. Department of Defense. Corporate Information Management (CIM) Strategic Plan and Enterprise Integration (EI) Implementing Strategy. Assistant Secretary of Defense, Command, Control, Communications, and Intelligence, and Center for Integration and Interoperability, Defense Information Systems Agency.
21. Hammer, Michael and James Champy, Reengineering the Corporation: A Manifesto for Business Revolution. HarperCollins, 1993.
22. Hammer, Michael, "Reengineering Work: Don't Automate, Obliterate." Harvard Business Review. July-August 1990.
23. Davenport, Thomas and James Short, " The New Industrial Engineering: Information Technology and Business Process Redesign." Sloan Management Review. Summer, 1990.
24. Davenport, Thomas, Process Innovation: Reengineering Work Through Information Technology. Harvard Business School Press, 1993
25. Foster, Richard, "A Call for Vision in Managing Technology." Business Week. May 24, 1982.
26. Sprague, Ralph and Barbara McNurlin, Information Systems Management in Practice. 3rd Edition. Prentice-Hall, Inc., 1993.

27. Dimancescu, Dan, The Seamless Enterprise. HarperCollins, 1992.
28. "Defense Management: Stronger Support Needed for CIM Initiative to Succeed." GAO Report 94-101. 12 Apr. 1994.
29. "Defense Information Follow-On Action Study." Booz, Allen and Hamilton, Inc., 1994.
30. Gullledge, Thomas, David Hill, and Edgar Sibley, "Functional Process Improvement Implementation: Public Sector Reengineering." The Institute of Public Policy, April 1994.
31. Moskow, Michael H., Strategic Planning in Business and Government. Committee for Economic Development, 1978.
32. Endoso, Joyce, "Odeen Panel Cautions DoD to Review Consolidation Plan." Government Computer News, 24 May 1993.
33. Posner, Bruce G. and Lawrence R. Rothstein, "Reinventing the Business of Government: An Interview with Change Catalyst David Osborne." Harvard Business Review. May-June 1994.
34. Green, Robert, "Is CIM Destine to Suffer the Death of a Thousand Cuts." Government Computer News, 7 June 1993.
35. "CIM Process Improvement Methodology for DoD Functional Managers." 2nd Edition, D. Appleton Company, Inc., 1993.
36. Conner, Daryl, Managing at the Speed of Change. Villard Books, 1993.
37. Tichy, Noel M., Managing Strategic Change: Technical, Political, and Cultural Dynamics. John Wiley & Sons, 1983.
38. Mish, Frederick C.(ed), Webster's Ninth New Collegiate Dictionary. Merriam Webster, Inc., 1984.

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