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A COMPARATIVE STUDY OF THE NAVY PROJECT
MANAGER AND HIS CIVILIAN COUNTERPART IN
INDUSTRY

Peter William Sushka

NAVAL POSTGRADUATE SCHOOL

Monterey, California



THESIS

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MANAGER AND HIS CIVILIAN COUNTERPART IN
INDUSTRY

by

Peter William Sushka, Jr.

March 1976

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The purpose in examining these factors is to identify those contextual considerations that contribute to healthy organizations and to improved project performance. Those factors that benefit one type of project manager are examined to determine the extent to which they exist and might be mutually applicable to that manager's counterpart.

Data is collected through the structured interview with Navy project managers and their civilian counterparts in industry.

Recommendations for modifying particular contextual factors are made to benefit project performance and reduce project manager conflict.

A Comparative Study of the Navy Project Manager and
His Civilian Counterpart in Industry

by

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Lieutenant Commander, United States Navy
B.S., United States Naval Academy, 1962

Submitted in partial fulfillment of the
requirement for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

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March 1976

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An effective interface and working relationship between the Navy project manager and his industrial counterpart is essential. The Navy project manager and the civilian project manager accomplish basically the same job but do so in different environments, with different experience, and under dissimilar incentive systems. This comparative study of the two project manager types involves a functional analysis of the many different "environmental/experience/incentive" factors that result in different values, behavior and performance.

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I. INTRODUCTION

A. THE PROBLEM

One of the most serious problems facing the military today is the less than satisfactory way the Department of Defense has been managing the development and procurement of new weapons system.

A Blue Ribbon Defense Panel described the situation in part as follows:

"The policies of the DOD on development and acquisition of weapons have contributed to serious cost overruns, schedule slippage, and performance deficiencies. The difficulties do not appear amenable to a few simple cure-alls, but require many interrelated changes in organization and procedures."¹

During the past five years since this report's issuance, much has been accomplished in the field of weapons acquisition. Directives like the Department of Defense Directive 5000.1 have been issued; increased training for program managers has been initiated; and new methods of reporting such as the Selected Acquisition Reports have been instituted to better monitor individual program progress. However sweeping these changes have been, they are at best only a beginning to solving a problem that continues to expand in both scope and size.

¹ Fitzhugh, Gilbert W., Report to the President and the Secretary of Defense on the Department of Defense, p. 2, U. S. Government Printing Office, 1 July, 1970.

At the center of the problem, affected by any and all changes and proposals in organization and procedures, is the government Project Manager. At times lacking the proper experience, background, educational training or technical expertise, this military officer must not only be a manager who is able to plan and control his project adequately but one who is also an aggressive salesman. He must understand everything there is to know about his program and beyond that, he must know everything he can about competing programs. Responding from the middle of a morass of demands and requirements from both those within the project and all those outside it who may have some interest, the Navy project manager acts in a way that ultimately affects the project's success or failure.

Many of these demands and requirements originate even before the project manager arrives on the scene. As figure 1 shows, the project manager usually does not come aboard a project until advanced development. By this time about ninety percent of the ultimate program cost has already been preset. Once this occurs, at the direction of many different "composers" (not including the project manager) it is up to the project manager who is then introduced to become the "conductor" of the project. It is also at this point of project manager introduction, with many of the major cost impacting issues decided, that all executive and congressional controls start.

PHASES OF SYSTEM ACQUISITION

Research Exploratory Development Prelim. Design Adv. Development Eng. Design OT&E Production

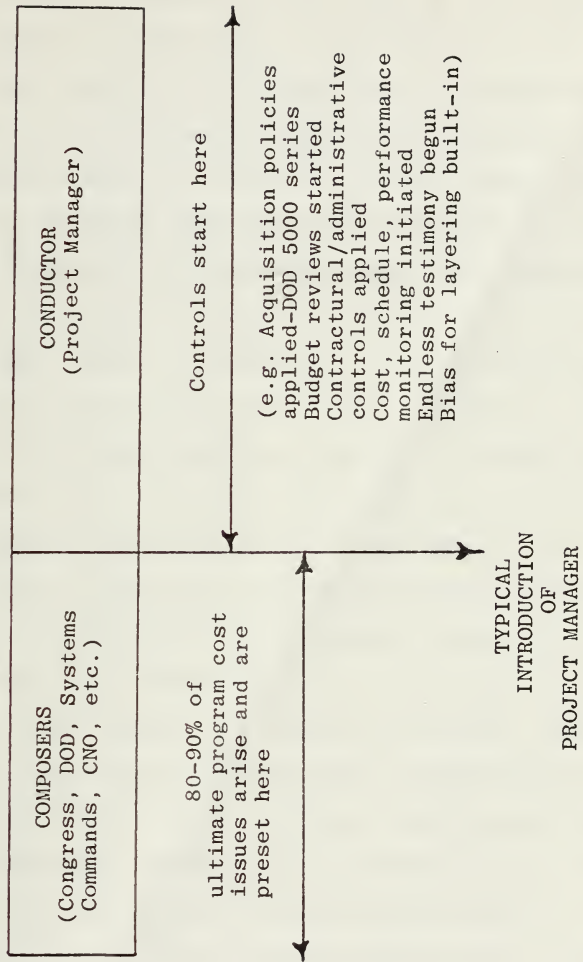


Figure 1

Early budget-related decisions made in any programs life, if made poorly, without adequate information or by too many people, often results in obstacles such as management layering, excessive reporting and inspection procedures, etc. later in a programs evolution. Thus the project manager often exists in a situation where many of his problems are the result of front-end decisions which bias the relationships of the project manager throughout the duration of the project. As the project grows its complexity grows and before he gets a chance to start managing, the project manager is beset by a number of influences which are effects of earlier decisions. These weigh heavily upon his time and cause many of the complex problem areas discussed in this thesis.

Additionally many influences significantly affecting the project manager and thus the project itself are often taken for granted, accepted as is, or classified as too hard or difficult to change. The weapons acquisition field has increased in size and technology, and changed significantly over the past twenty years and in so doing has generated numerous additional restrictive influences such as increased budgetary awareness and new inspections and reports. In this thesis many factors which directly influence the project manager are examined to determine if possible changes, alteration or institutionalization of these factors might help bring about the many "interrelated changes" that the Blue Ribbon Defense Panel suggested five years ago as being necessary to solving in part the problems of weapons acquisition and development.

B. PURPOSE OF THE STUDY

In the accomplishment of his task the Navy project manager must maintain an effective interface as well as a working relationship with his industrial counterpart. The Navy and the civilian project manager accomplish basically similar jobs but do so in different environments; each with different experience; and under dissimilar incentive systems.

The purpose of this paper is to present a comparative study of the two project managers. It involves functional analysis of the many different "environmental/experience/incentive" factors that result in different values and behavior. Additionally the civilian project manager involved strictly in nondefense related industry will be compared with the Navy and civilian project manager in defense oriented industry. Both individuals, the Navy project manager and his civilian counterpart, must be able to utilize their experience, background, and environment properly in order to be able to tie together their efforts and ultimately meet schedule requirements and expenditure restraints. Though working together to achieve project success - a workable weapons system at acceptable cost - the Navy and civilian project manager go about their tasks in different ways, influenced by numerous dissimilar factors and considerations. In highlighting some of these differences J. Ronald Fox says in his book, Arming America:

"Although program managers in Government and industry program officers are dedicated to the success of their program, 'success' means something quite different to each...interpretations of defense priorities vary widely

and spring from divergent values and goals. In fact, too few Government personnel know anything about controlling cost schedules and performance...Industry managers do not emphasize cost control...A major reason for lack of balance on the program office level is the stability and expertise within industry management, as compared with the constant turnover of military program management staff, most of whom bring little more than good intentions to their assignments."²

The basic goal of comparing the military project manager with his civilian counterpart is to discover areas that influence the Navy project manager which if changed, altered or improved can ultimately benefit project performance.

C. HYPOTHESIS

The central hypothesis of this thesis is that a comparison of the two types of project managers, Navy and civilian, indicates a number of factors that affect the job of one to a different degree than that of the other. By evaluating these factors it can be determined which are linked directly or indirectly to project success.

Project success within the context of this paper is defined as a resultant effective and workable weapons system being obtained for operational service - reliable and completed in a timely and affordable manner.

D. APPROACH/INVESTIGATION

The approach to this study consisted of four basic phases. The first phase involved a visit to Headquarters, Naval Material Command, Washington, D.S., to conduct

² Fox, J. Ronald, Arming America, p. 213, Harvard University, 1974.

interviews with Navy project managers and civilians working in weapons system acquisition.

This research was to validate the author's hypothesis that certain identifiable factors exist which significantly affect the project manager's values and behavior and thus his performance. Additionally interviews were designed to describe the relationship between the Navy and civilian project manager.

The second phase of the approach involved primary library research into the problems, influences and requirements of the project manager. Various articles and books were researched to explore the role of project management.

The third phase consisted of testing the established hypothesis. Data were collected through further structured interviews addressed to Navy project managers and their civilian counterparts in industry.

The fourth phase consisted of an analysis of the data collected and recommendations for modifying particular contextual factors in order to benefit project performance and reduce project manager conflict.

E. OBJECTIVES

It was the objective of this thesis to examine the functional relationship between the civilian and Navy project manager and the various influence factors affecting their respective performance in the weapons system acquisition field. The specific objectives were to:

1. Determine which of many influence factors result in different values and behavior in the case of the Navy and civilian project manager.
2. Determine those factors discovered that directly result in or contribute to project success.
3. Determine if project performance of the Navy project manager can be enhanced and project manager conflict reduced by the alteration, elimination, or incorporation of some influence factor within his environment, background, or incentive system.
4. Determine if influences which affect the Navy project manager also affect or constrain the management prerogative of the civilian project manager.

II. THE PROJECT MANAGER

In this section of the thesis the requirements and problems of the project manager are discussed through a survey of the literature in the field. The various factors which have been found to influence the project manager and his performance are presented. Finally, the numerous roles the project manager must play in responding to the myriad external and internal influences, are summarized. All of this will serve to define the problem and present the broad areas for comparison of the military with the civilian project manager.

A. BACKGROUND

Thirteen years ago Peck and Scherer observed that the weapons acquisition process was "characterized by a unique set of uncertainties which differentiates it from any other economic activity."³ They further defined uncertainty as "the relative unpredictability of the outcome of a contemplated action" and characterized it as unique to weapons acquisition both in magnitude and source. These uncertainties are still evident today and play a significant part in influencing the project manager in the effective accomplishment of his job.

³ Peck, Merton J. and Scherer, Frederic M., The Weapons Acquisition Process: An Economic Analysis, p. 17, Harvard University, 1962.

The forerunner of the modern weapons system project manager was described by David I. Cleland in 1964 as having been first designated a project expediter. These project expediters of the 1940's and 1950's did not perform line functions but instead rather informally motivated those persons doing the work. They were mainly concerned with schedules and depended for the most part upon personal diplomacy and persuasion in accomplishing their work and in removal of management bottlenecks. They were perhaps the earliest kind of project manager, and were fortunate in having a "single project coordinator" under them responsible for synchronizing and organizing all activities toward a specific objective. The remainder of this chapter will be devoted to this project expediters successor in the acquisition business -- the project manager.⁴

B. REQUIREMENTS

The business of the project manager is to create a product, i.e. produce a product of advanced technology. In accomplishing this, he usually finds himself responsible for effective management as well as advanced technology. He is that one man in the organization who must be equally at home with budgets and time schedules as he is with technical

⁴ In the Department of Defense as well as in most companies contracting with them, the terms project manager and program manager are used interchangeably. While the project manager tends to be more closely associated with the military and the program manager more aligned with civilian industry, the term project manager is used throughout this paper.

research and development. Richard L. Chapman in 1973 put it in the simplest terms in his Project Management in NASA by describing the project manager as the single point of management who is responsible for the conduct of a specific, usually complex, time-constrained task. Chapman further characterizes the performance of this task as requiring a superior individual as well as non-traditional lines of structure and authority within the organization. With this perspective of the project managers role a further look into the requirements of his job and the individual can be accomplished.

In 1965, John M. Stewart in his paper "Making Project Management work," summarized some clear and applicable guidelines and requirements of the day for effective and successful project management. Many of these requirements that dealt with the project manager such as:

- 1) insuring that the man assigned was experienced
- 2) assigning him full time
- 3) setting out a clear organization of the project managers responsibilities and
- 4) maintaining an adequate yet flexible time structure

are as applicable today as they were in the early 1960's. In later sections it will be important to discover which of those early recommendations have been accomplished or accepted, and to what degree, by either military or civilian project management.

From the earliest concepts of project management to the present, the requirements of the project manager and his

job grew considerably. Today the basic responsibility is to deliver the end product in accordance with performance requirements; within the limitations of his budget; and within the time schedule specified. In order to accomplish the basic but all encompassing requirements the project manager must be an individual with the proper perspective to intergrate cost, time, technology and total production compatibility. He must have "an individual mastery of influence management -- the ability to direct and control people both inside and outside his own organization."⁵

In addition, Chapman observed that the project manager must put much of his time into planning and analysis to permit him to develop an understanding of the purposes of the tasks and requirements assigned as well as to provide him with proper direction. Ideally, he must possess a working knowledge of many fields of science as well as a good understanding of general management problems including marketing, control, contract work, purchasing, law and personnel administration. He should have some familiarity with the concept of profitability as well as have an active and strong interest in teaching, training and developing his team.

Paul O. Gaddis presented further requirements of the project manager for the Harvard Business Review as early as 1959. He observed that as well as the prime responsibility

⁵ Gaddis, Paul O., "The Project Manager," Harvard Business Review, Vol. 37 #3, p. 95, May-June 1959.

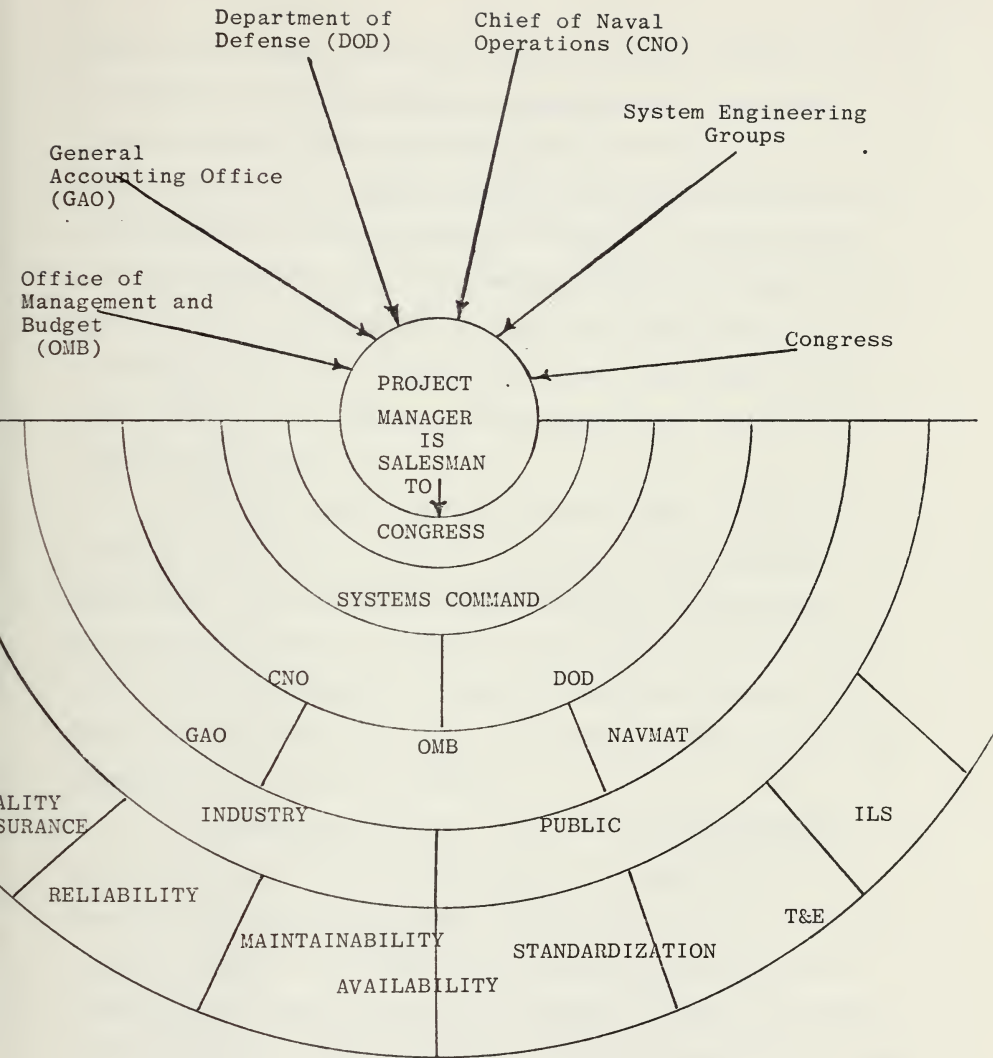
for the day to day supervision and execution of the project, the project manager may at any time during the course of the project be called upon by senior management or military personnel to help shape or reshape the priorities that affect his project. In short he must also be a salesman for his project. In addition to all the technical and administrative demands, "selling" also becomes a never ending job of the project manager. In the matters of acquiring scarce funds, people and materials, the project manager is required to be able to make effective presentations to senior management or military personnel as depicted in figure 2.

Thus the individual assigned to manage a complex, technical project is quickly entrenched in a net of numerous requirements. Traditional methods of leadership, management and organization must often be modified as the project manager tries to struggle with the numerous problems which envelop and encompass his job.

C. PROBLEMS CONFRONTING THE PROJECT MANAGER

1. Similar Problem Areas

In the relatively short history of project management the number and type of recurring problems confronting both civilian and military project managers have remained remarkably similar. All project managers seem to face the rather unusual problems involved with trying to direct and coordinate the diverse forces at work within the project situation. The main difficulties of weapons acquisition suggested in the



INFLUENCE/SALESMAN RELATION

Figure 2

early 1960's remain obstacles today. John M. Stewart in his 1965 paper Making Project Management Work described these problems as arising from three main sources: organizational uncertainty, unusual decision pressures, and vulnerability to top management mistakes. The difficulty of determining who is to accomplish, assign or decide what, coupled with the penalties of delay and cost overrun and the damage done by a seniors ill-advised intervention all are as serious to today's project manager as to yesterday's "project expediter."

The typical new project manager today in either the military or civilian industry finds his role as painful, confusing, and even demoralizing as did his predecessors. He finds the lack of sufficient line authority too much of a fact, and the necessity to lead, persuade, and coerce his peers while receiving at times too little support from senior management, too harsh a reality.

J. Ronald Fox, in his recent book, Arming America, points to the problem of ambiguity in job definition as having impeded the management process and one that continues to be a problem. The complaint that many major decisions affecting the progress of their programs are made at higher levels has been a difficulty facing project managers from the beginning of project management in weapons acquisition. Time itself remains a critical problem as the lack of an adequate amount of it, required to evaluate the many possible trade-offs within his project or the cost involved, becomes even

more severe as higher levels of management become even more demanding. The problem of responsiveness of the project manager to senior managements, says Fox, has increased as steadily as the dollar value of the weapons acquisition process has increased.

The above serves to reduce the status of the project manager causing him the further problem of being unable to give first priority to his project and to his own management responsibilities. When too much of his time is spent dispensing information the degradation of the project managers function becomes inevitable.

Cleland observed similar recurring problems existing for the project manager in the areas of personnel and communication. For example, he is often concerned and frustrated with accomplishing specific projects that require the participation of organizations and agencies outside his direct control. He is burdened with overseeing an especially high proportion of professionals which requires different and sometimes unique techniques. The lack or absence of feedback information particularly in the early stages of the project is a problem of communication that may be severe.

2. Problem Areas Unique to the Military Project Manager

As with the many similar difficulties faced by both the civilian and military project managers, so also are there problem areas that have been and are unique to the military manager.

For example, he is usually but a part-time representative to the project group on loan from the functional group to which he is primarily responsible. The job rotation of Naval officers, initially designed to broaden their capabilities, was seen as a potential difficulty to the weapons acquisition process as early as 1962. At that time, Peck and Scherer gave attention to the problem of personnel instability by noting that:

"Since it usually takes one or two years for a person to obtain a thorough working knowledge of the technology and personalities involved in a complex weapons program, rotation can interfere seriously with the smooth administration of programs."⁶

The concept of job rotation may have been useful in the past however, the problem it now creates in the increasingly specialized field of procurement management makes the concept an anachronism of the 1970's. On the other hand the civilian project manager often has stability and balance in his job assignment and transfers that do occur are usually within the program.

It was further noted by Fox that a recurring absence of any uniform standards by which to evaluate project manager performance necessitates the individual being judged to conform more to traditional and therefore less risky procedures and also adhere strongly to service or company loyalty. In the Navy this creates a different problem from that of his civilian counterpart. Loyalty to any job for

⁶ Op. cit., p. 254.

example is and has been of a short term nature in the Navy and the short term successes are the ones attributed to the individual Navy project manager. Long term goals and ideas which more acutely affect overall project performance thus suffer by receiving less than their share of interest and enthusiasm. This problem is not felt as strongly in the more stable world of civilian project management.

As pointed out by Peck and Scherer early in the last decade, and more recently by Fox, project manager difficulties previously attributed to senior management, are intensified by the sheer number of personnel in the military and bureaucratic chain that exists above him outside his project office. The military project manager is thus located in an organizational position several echelons down the managerial hierarchy of the Department of Defense but is still expected to act as decisively as the civilian in industry, in managing the particular weapons development.

However complex, this mechanism of project management does contain numerous variables of significance that influence project success and effectiveness. Figure 3 depicts the model relating influence factors, the project manager and his performance that will be discussed and analyzed throughout this paper.

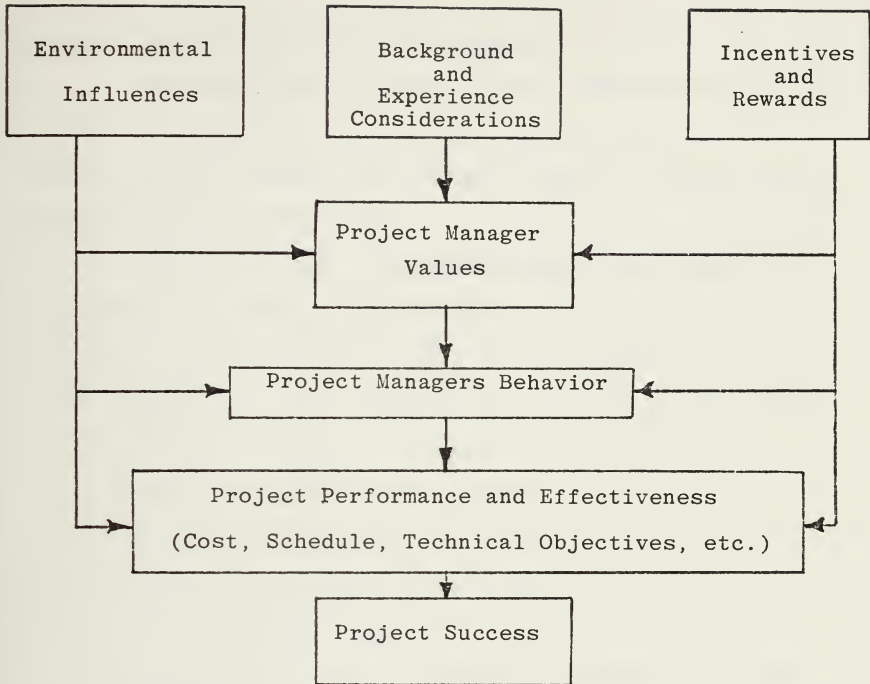


Figure 3

D. INFLUENCES ON PROJECT MANAGERS AND PERFORMANCES

Douglas McGregor in his 1967 work entitled The Professional Manager states that the role of the manager can be visualized as "a dynamic interplay between environmental forces, factors and pressures operating on the manager and the forces originating from within the manager, his values, personality and aspirations."⁷

⁷ McGregor, Douglas, The Professional Manager, p. 55, McGraw-Hill, 1967.

1. Environmental Considerations

The magnitude of this role has increased and is likely to continue to increase as the environment of the modern project manager becomes more dynamic, clogged and turbulent than in the past.

Considerations in his environment that affect and influence the project manager have been found by most writers in the field to include the following:

- a) Cooperation and coordination among the project team
- b) Adequacy of project structure and control
- c) Legal and political influences
- d) Layers of management
- e) Clarity of established criteria
- f) Competitive and budgetary pressures
- g) Adequacy and number of reports, documentation and directives
- h) Authority and influence within the project.

These are but a few of the many considerations which exert an influence on the project manager's behavior but are ones found to be most important. Every project manager reveals certain predictable patterns of behavior due to some mixture of the influences listed above. His somewhat predictable methods of coping with the reality of the work environment may be termed his management style with each manager's style being unique. For example, Douglas McGregor describes the influence factors and therefore resultant style as often categorizing a project manager as being "paternalistic,

authoritarian, democratic, permissive, soft, hard, firm but fair, scientific, production centered, etc." depending upon how they let the various influences affect their management style. In coping with his unconventional environment the project manager will find relatively little written guidance in the vital techniques of persuasion, salesmanship and in-fighting. The degree and extent to which the above factors affect project managers performance are further discussed and compared in Chapter III.

2. Experience and Background Considerations

In order to be effective it is important, though it has not by any means been a requirement in the past, for the project manager to have a certain mixture of factors in his background and experience. These factors can be termed his needs if in fact his goal is to be successful and his project performance to be effective.

Factors in his background and experience that influence or are responsible for the project managers performance were summarized by Cleland and King in their 1972 book, Management: A Systems Approach and include the following:

- a) Sufficiency of rank or seniority
- b) Previous project experience
- c) Project managers human relations skills
- d) Technical and operational expertise
- e) Project managers administrative skills.

These factors are further analyzed and compared in later sections.

3. Incentives and Rewards

Chapman notes that most project managers are attracted to their jobs by the technical and managerial challenges that they offer. Project management thus poses a test of their background and acquired skills as well as their ability to respond to the various factors in their environment. Once project managers become familiar with the rigors of the job, its requirements and its problems, most enjoy the the responsibility, the fast pace and the excitement. Being at the head of an endeavor as unique as project management produces great personal satisfaction.

In general, most project managers respond to a similar set of incentive and reward factors although each to a different degree. Fox observes that some of the more important incentive considerations that influence the actions of the project manager are:

- a) Job satisfaction
- b) Established career field
- c) Job security
- d) Promotion opportunity
- e) Patriotism
- f) Monetary considerations and bonuses.

4. Priority and Importance

A 1974 study conducted by Murphy, Baker and Fisher for the Boston College School of Management was directed to

some three thousand individuals who had direct project management experience. The study's purpose was to discover what the major determinants were that influence project managers' effectiveness. Although no direct comparison was made between the military and civilian project personnel questioned, a listing of the most important influence variables responsible for affecting the project manager's performance was as follows;

- a) Adequacy of project structure and control
- b) Coordination and relations of the project team
- c) Clarity of success criteria
- d) Competitive and budgetary pressures
- e) Legal and Political environment
- f) Project managers technical and human skills
- g) Authority and influence of the project manager

Although the above factors were found to strongly affect project manager performance, a noteworthy result of the study was the large total number of factors produced that individuals with project experience felt influenced performance to some degree. This finding, the survey concludes, illustrates the multi-dimensional complexity of the project management world. A further, more detailed study of how some of the above considerations affect both the civilian and the military manager as well as a direct comparison of the two are examined in Chapter III.

5. The Project Manager - The Individual

The project manager's conception of his job and his ability to perform it successfully depends not only on the many environmental pressures and considerations in his background but also on his own characteristics, his values, needs, capabilities and view of himself. This further tends to differentiate each project manager and makes the comparison more difficult. Douglas McGregor concludes that the manager's behavior - his fulfillment of his role - is therefore not just simply the sum of all of these objective influences but rather his own synthesis of them. That synthesis being his own way of resolving the interplay of forces within himself with the pressures and factors in his environment.

E. ROLES OF THE PROJECT MANAGER

In 1975, Henry Mintzberg, author of The Nature of Managerial Work characterized project managers as playing a very "complex, intertwined combination of inter-personal, informational and decisional roles."⁸ He further states that if they are to be effective they must recognize these roles as well as what their job actually is. The understanding of the job and the influences upon it as well as the understanding of themselves takes a combination of objectivity and introspection.

⁸ Mintzberg, Henry, "The Manager's Job: Folklore and Fact," Harvard Business Review, Vol. 53 No. 4, p. 49, July - August 1975.

A project manager's job can be defined in terms of the various roles of organized sets of behaviors that become identified with his position and are a result of the interplay of influences and factors in his environment, background and incentive systems. A description of ten of these roles has been made by Mitzberg which gives rise to a grouping of three interpersonal roles leading to three informational roles which together enable the manager to play four decisional roles. These ten roles that follow describe in concise terms exactly what the project manager must be - whether he be military or civilian.

Interpersonal Roles

1) Figurehead -- by the very nature of his position as the head of an organizational unit the project manager from time to time performs some duties of a ceremonial nature.

2) Leader -- because he is in charge of an organizational unit he is responsible for the actions and the work of all people in that unit.

3) Liaison -- due to the complex world of project management, the manager must contact and communicate with numerous individuals and organizations outside of his own chain of command.

Informational Roles

4) Monitor -- The project manager consistently searches for information from his environment, interrogates his liaison contacts and subordinates and receives much unsolicited information all of which must be monitored.

5) Disseminator -- all of the above information must be shared and distributed within his own organization.

6) Spokesman -- The project manager is often required to present some of this information to people or groups outside his organization and thus becomes spokesman for the project.

Decisional Roles

7) Entrepreneur -- The project manager perpetually seeks to improve his organization and his project and is constantly on the lookout for new ideas and methods.

8) Disturbance Handler -- When pressures of a situation become too severe and change cannot be ignored the manager must act to calm the disturbance.

9) Resource Allocator -- The manager is responsible for deciding who will get what within his organization whether the resource is time, money, personnel or the like.

10) Negotiator -- much time is spent in the important art of negotiating - an integral part of the project manager's job whatever the nature of the individual or organization with which he is trying to come to terms.

These ten roles that define today's project manager are not easily separable but instead must be viewed as an integrated whole. They are the parts he must play in carrying out his job and the degree of success with which he plays each role is in large part dependent upon the influence factors at large and how he is able to respond to them. The project manager must be able to perceive these roles as well

as to recognize and evaluate the effect of the various influence factors upon the sum in order that he be able to understand, change or live with the existing considerations that affect the very nature of his job. In short, "The project managers effectiveness is significantly influenced by his insight into his own work. His performance depends on how well he understands and responds to pressures and dilemmas which influence his job. Managers who can be introspective about their work are likely to be effective at their jobs."⁹

Throughout this study and the questions put forth in the following chapter, project managers of both military and civilian industrial projects were asked to be introspective of themselves and their jobs in order that the influences, similarities, conflicts and obstacles to project success could be best determined and sorted out.

F. SUMMARY

This section has pointed out the numerous requirements, problems and influences faced by the project manager. The point is made that many of these are in fact similar to both the military and civilian project manager. However, studies are rare that have attempted any comparisons of how the two types of project managers are differently affected by their environments and background influences in the performance of their jobs. The mutual goals are definitely similar and the

⁹ Ibid., p. 60.

jobs are essentially the same. The objective of the following chapters is to examine more closely what the factors are and how strong their influence is upon the two different types of men in the same basic job. Project manager responses to similar questions are to be compared in order to discover exactly where the major difference lie between the military and civilian worlds of project management.

III. THE COMPARISON

In this section of the thesis the methodology used to obtain the data for the comparison of the military and civilian industry project manager is discussed. Then the relationship between the two types of manager as well as their similarities and differences are presented. Influence factors are then compared, the different parts each play, and the degree to which they affect each type of project manager are analyzed. Finally, based primarily on data obtained from structured personal interviews, problem areas are discussed and influence factors are identified as being either obstacles to project management or as determinants of project effectiveness.

A. INTRODUCTION

Drucker has described the manager's task in the following terms:

"The manager has the task of creating a true whole that is larger than the sum of its parts, a productive entity that turns out more than the sum of the resources put into it. One analogy is the conductor of a symphony orchestra, through whose effort, vision and leadership, individual instrumental parts that are so much noise by themselves, become the living whole of music. But the conductor has the composer's score: he is only the interpreter. The manager is both composer and conductor."¹⁰

There was widespread support for this view of project managers as both composer and conductors among both civilian

¹⁰ Drucker, Peter F., The Practice of Management, p. 341, Harper and Row, 1954.

and military project managers interviewed. However, there were disagreements with respect to the achievement of goals and responding to the varying environmental, incentive and educational stimuli. In support of these differences, a DOD sponsored study of the Logistics Management Institute observed that:

"It is impossible to write a job description for the program manager's job. What the program manager does is whatever is needed to move the affairs of business. He does one thing at one time and another thing at another time - whatever is most needed at the moment to achieve his objective or accomplish his task."¹¹

His accomplishments and actions to meet each succeeding "moment" are influenced by a wide variety of factors which are perceived and reacted to differently by the military and the civilian project manager.

It is these differences that must be scrutinized, compared and evaluated. First, an important assumption must be made: that project managers themselves are in fact necessary, important and critical to the systems acquisition process and not, as concluded by Admiral John T. Hayward, "just another attempt to put on an image in management to react to the continuous criticism of the Department of Defense in the major systems acquisition area."¹² Project managers are integral to the effective accomplishment of the procurement process and understanding how they work and why

¹¹ "Introduction to Military Program Management," LMI Task 69-28, p. 4, Washington, D.C., March 1971.

¹² Hayward, John T., "Program Managers?," Government Executive, p. 11, January 1975.

they perform as they do is a necessary and vital link in obtaining cost-effective and reliable weapons systems.

By comparing the civilian and the military project manager, it is hoped that the best mix of organizational and management factors contributing to mission success can be determined. In order to make the comparison, the methodology described in the following section was used.

B. METHOD OF STUDY

The method used to collect data in this portion of the study was the face-to-face structured personal interview. Interviews were conducted for the following reasons:

1. First, the interviews were important in order to test the author's belief that project managers in the military and civilian industry field do perform essentially the same job but under different circumstances. In order to understand the real-life circumstances which act upon the project manager, it was necessary to interview people who were involved in the every day problems of weapons system acquisition.

2. Secondly, data concerning what the different influence factors are and how they affect project manager performance are sparse from available publications, manuals and reports. Interviews were thus conducted with military and civilian project managers to further refine the nature of the problem.

3. Thirdly, a real effort was made to get a balanced point of view. This was done by structuring the interview

so that the same questions were asked of both the military and the civilian project manager.

Interviews were conducted with twelve of the Navy's project managers in addition to six senior Naval officers in acquisition billets. In addition, thirteen others, representing the civilian side of both defense-related and commercial corporate project management, were interviewed. The organizations and positions of personnel who were interviewed are presented in Appendix A and questions utilized during the interviews are listed in Appendix B.

Gathered from the interviews were organization charts, directives and reports relating to the project manager, information about company project management policy and detailed explanations of problem areas. Responses were received to ten specific question areas posed to each individual and are summarized in Table I.

TABLE I
Tabulation of Responses
from
18 Military and 13 Civilians Interviewed

1. In the interaction between the military project manager and his counterpart in civilian industry, what areas of conflict do you see as most likely to occur?

<u>Responses</u>	<u>Military</u>		<u>Civilian</u>	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
Fiscal Arena	13	71%	8	62%
Differing Incentives	11	63%	7	54%
Engineering Change Orders	9	50%	5	40%

2. Of those factors external to the project itself (e.g. location, directives, political), which have the most significant impact/effect on project management?

<u>Responses</u>	<u>Military</u>		<u>Civilian</u>	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
Political Pressures	15	85%	7	54%
Funding Pressures	13	71%	11	84%
Management Layering	13	71%	5	40%
Directives/Reports	9	50%	4	31%
Geographic Separation Communication	9	50%	8	62%

3. What are considered as being major similarities in the way the military and the civilian project managers perform their jobs?

<u>Response</u>	<u>Military</u>		<u>Civilian</u>	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
Project Office Structure	13	11%	11	84%
Small Professional Staffs	15	85%	8	62%
Communication Needs	9	50%	7	54%
Interaction	11	63%	11	84%

4. What are considered to be the major differences between the military and civilian project manager?

<u>Responses</u>	<u>Military</u>		<u>Civilian</u>	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
Motivation	15	85%	11	84%
Salesmanship	8	44%	8	62%
Management Layers	13	71%	5	40%
Directives/Reports	13	71%	4	31%
Experience	9	50%	5	40%
Orientation	6	33%	8	62%

5. What does the project manager consider the major determinants of project success?

<u>Responses</u>	<u>Military</u>		<u>Civilian</u>	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
Successful Product Delivery	16	90%	11	84%
Competent Personnel	11	63%	9	71%
Project Stability	15	85%	8	62%
Open Communications	13	71%	7	53%
Authority	13	71%	5	40%

6. What does the project manager consider the greatest obstacles to project management?

<u>Response</u>	<u>Military</u>		<u>Civilian</u>	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
Management Layering	15	85%	5	40%
Budgetary Pressures	14	78%	11	84%
Directives/Reports	11	63%	6	46%
Political/DOD Control	15	85%	6	46%
Outside Organizations	11	63%	5	40%

7. What incentives (e.g. promotion, career field, job security) are project managers most responsive to?

<u>Responses</u>	<u>Military</u>		<u>Civilian</u>	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
Recognition	15	85%	10	77%
Promotion	11	63%	5	40%
Career Field	12	67%	5	40%
Job Satisfaction	14	78%	10	77%
Bonus or Financial Reward	Not Applicable		9	69%

8. What are the optimum/most suitable qualifications (e.g. education, experience, background) for a successful project manager?

<u>Responses</u>	<u>Military</u>		<u>Civilian</u>	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
Education	14	78%	7	54%
Operational Experience	13	71%	9	69%
Technical Expertise	11	63%	10	77%

9. In the interaction between the military project manager and his counterpart in civilian industry, what mutual goals do you see as existing?

<u>Responses</u>	<u>Military</u>		<u>Civilian</u>	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
Successful End Product	17	94%	11	84%
Timely Completion	15	85%	7	54%
Cost-Effective Job	13	71%	9	69%
Efficient use of Resources	13	71%	11	84%

10. How much contact do you have with your counterpart or counterparts in either the military or in industry? Who is he?

<u>Responses</u>	<u>Military</u>		<u>Civilian</u>	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
Close and Frequent	18	100%	13	100%

The remainder of this chapter is devoted to a presentation, discussion and summary of the numerous responses by both types of project managers to the questions included in the structured interview. Interviews exposed the author to a wide range of spontaneous commentary regarding the military-civilian industry project manager relationship.

C. RELATIONSHIP BETWEEN CIVILIAN AND MILITARY PROJECT MANAGERS

1. Contact

All project managers interviewed were in agreement that close, continuous contact between the military project manager in Washington, D.C. and the civilian project manager in industry was a necessary requirement for success. Project managers said that contact was in fact almost daily by telephone and varied somewhere between bi-weekly and monthly on a personal basis with some representative of the project office. There are occasional two or three day lapses of no personal contact when contact is merely for routine operations. When specific problems arise, or critical meetings or tests are in progress, contact between the two project managers may range up to several times each day until the issue or problem is satisfactorily resolved. Thus, the importance of communication between the two project managers is apparent. The necessity for it is realized, and in establishing and maintaining this vital link between the military and civilian project office, the managers are themselves carrying out their roles of Leader, Liaison and Spokesman as described in Chapter II.

2. Mutual Goals

Military and civilian project managers both remarked that the basic goal common to the two is to produce a similar end product - the successful completion of the weapons system which requires mutual trust and cooperation. Without exception all project managers interviewed expressed the desire to produce the best system possible as the long range mutual goal, whereas the day-to-day mutual goal was seen to be the ironing out of differences and conflict in order to continue the program. Later sections in this chapter will discuss these differences and the conflict that occurs.

All project managers highlighted the achievement of success as not only their goal but that of their superiors in government and industry. Success, previously defined in this paper as a workable weapons system at acceptable cost is, in general, the commonly agreed to definition, satisfying both the military and civilian project managers. A product that is recognized as being outstandingly effective by both the ultimate customer and by the top level of the producing company is a mutual area of accord. This goal of introducing these weapons systems into the fleet in a cost-effective and timely manner by efficient use of resources and people is the explanation for the many similarities between the two types of project managers and the manner in which they perform their jobs.

D. SIMILARITIES

In the conduct of day-to-day business, the military and civilian project managers operate in similar fashion. The setting in which they both perform involves numerous technical meetings, reports, personnel problems, correspondence and the like. The civilian project manager may be more likely to spend some time in the marketing field thinking up new sellable programs but at the same time the military project manager is also busy to some degree selling his program to higher authority.

Most project managers singled out organizational structure within the project office as the major similarity between the military and civilian project manager. Both use the matrix organization and must rely on the functional managers to do the detailed tasks. One military project manager summarized the idea of most being interviewed in discussing similar organization:

"both have small staffs directly reporting to them and capable of providing direction in all aspects of the project. They are dependent on functional organizations not directly under their line control to execute the program. In the military case, the functional organizations are within the Systems Command or outside laboratories and consultants. In the industry case, the functional organizations are line groups generally reporting to other than the project manager."

Another civilian project manager further explained the similarity:

"Our jobs are that of coordinator to ensure that the actions required to achieve the objectives of the project are carried out efficiently. Both project managers face the problem of communication - of getting good and bad news spread throughout the functional organization

(disseminator role) in order that problems can be solved as quickly as possible."

In both cases the project manager must accomplish defined goals within schedule and financial constraints. The military project manager generally has to cope with more administrative formality than the civilian; however, industrial reporting on military programs is becoming increasingly more formal. Both are managing a higher proportion of professional employees that have a large degree of independence from detailed supervision.

Further similarities include dealing with a large number of participants (sub-contractors, vendors, other project managers, etc.) with the necessary requirement to induce expediency and responsiveness through effective communications and management relations. Both types of project managers expressed a similar need for a high personal knowledge of financial management which would promote a closer relationship with their contracting agents. Likewise, they both remarked upon their similar frustrations at the lack of effective tools to control costs and, therefore, both consequently struggle throughout the project life to certain cost growth.

A listing expressing how most civilian and military managers saw their jobs and themselves as being similar follows:

- 1) They both work to develop and produce a useful product.
- 2) They both are schedule, cost and performance conscious.

- 3) Both jobs are challenging and of a broad scope,
- 4) They have extensive internal interfaces.
- 5) They both need and rely on functional (engineering, test, safety, reliability) groups for data.
- 6) They have extensive external interfaces to congressional groups, other company/service components, news media, etc.
- 7) They both work and operate under the responsibility of "produce or else."
- 8) Both have to depend heavily on implied authority.
- 9) Both are continually reporting on progress to some layers of management above them.

Many of these similarities are due to and are a natural result of the many mutual goals inherent in the tasks of project managers discussed earlier. Many others, however, are due to the mutual problems and difficulties that exist in project management which were discussed in Chapter II. It has been said, in one form or another, by many of the project managers interviewed that the most common bond or similarity shared by the civilian and military project managers is in fact, the problems they face. Having thus discussed the major similarities, relationship and mutual goals of the two types of project manager, a presentation of the difference between them will follow in the next section.

E. DIFFERENCES

Since producer and buyer motives prevail in nearly all business relationships, it is natural that the military and civilian project manager will each possess these differences -

the buyer wanting the highest quality product for the least cost and the producer or seller providing the best product possible that still allows optimum profits in a competitive market. This view was expressed by the majority of civilian project managers interviewed although classical economic theory says that industry managers first maximize profits and only then improve quality if it's profitable.

With the government and the military project manager as the customer and industry and the civilian project manager as the seller, they of course view the program from different perspectives. The customer wants to get more for less money and usually in less time, whereas the seller wants to meet contract terms while maximizing profit. The military manager as consumer has more user experience but the civilian manager as producer has more knowledge and background in the art of business management. In general, the majority of project managers interviewed agreed that the major differences between the two types of managers stems from the fact that the industry is first profit oriented and the military is first performance and schedule oriented. The civilian of course is also concerned with performance, cost and schedule as is the military, particularly recently, also concerned with cost, but the basic fact remains that the driving force behind the civilian project manager is the profit motive. Unless the contractor can bring in defense contracts at a profit, the company will either go under or stop bidding on future defense contracts. Therefore,

the civilian is judged on his ability to make money for the company. On the other hand, the military manager is looking for a quality product he can buy within the goals established by the user to meet the defense needs for which the weapons system was designed.

Further differences evolve from the manner of project justification. Industry project managers justify the project to higher or staff levels in terms of resources and goals and what it means to the company, whereas the military manager justifies the project as a necessary military weapon that is cost-effective.

The civilian project manager is very often as good a salesman as he is a manager. On the other hand, military project managers are often inexperienced salesmen and, therefore, do not promote high confidence in their program to either Congress, the public or to the rest of the military.

The military project manager is almost always "product oriented" as he is concerned with the users of the weapons developed. The civilian project manager, however, is graded upon other factors and is thus more sensitive to considerations such as economy of operations, return on investment and efficiency in production. Most civilian managers remarked that they can usually rely on their corporation to provide them the personnel resources in relatively short order to achieve objectives, while this is not always the case of the military project manager because of various bureaucratic constraints.

One military project manager discussed additional motivational differences that were generally agreed to by the majority of managers interviewed.

The military project officer is motivated by National Security, protection of government interest, loyalty to his service and patriotism. In general, he has grown up in an environment of discipline, authority and rigid regulations and, therefore, he tends to employ a more authoritarian leadership style. The civilian project manager is motivated by company interest, sales, and profit considerations, though, he may also have national security as a broad motive as well. In contrast, the civilian exists in a more fluid environment that is somewhat less constrained and, therefore, tends to employ a more participative management style. Often times these different motives lead to conflict without a broad understanding on both sides of the other's perspective. The subject of conflict mentioned here will be discussed in greater detail in a later section of this chapter.

Further differences seen by many civilian and military project managers interviewed include the following:

- 1) The military manager has more bosses and layers of management to satisfy than his civilian counterpart. Generally, military managers cited at least a dozen different bosses who had authority over their decisions in the chain of command, whereas civilian managers normally quoted two bosses (i.e. executive vice-presidents) to whom they were responsible. Charts depicting higher

level organization as perceived by the various project managers were examined during interviews. These showed that military managers view the management layering above them as consisting of upwards of thirty to forty individual officers at the extreme, while no civilian manager viewed more than five different levels of organization existing above his authority.

- 2) The military manager is plagued by more outside influences, especially staff organizations within his command and higher echelons, than the civilian manager. These outside influences include the General Accounting Office, the Office of Management and Budget, Naval Material Command, Chief of Naval Operations (OPNAV), the Congress, etc. and all exert more direct influence over the military project manager than his civilian counterpart, although many find their way into influencing him also to some extent.
- 3) The military manager is further constrained by more numerous directives, policies, instruction and report requirements although the civilian is also constrained by many of them but to a lesser degree.
- 4) The military manager must rely on many activities for assistance over which he has no control. The civilian manager, however, although similarly constrained, can usually go right to the top of the department or to the executive vice-president or president to obtain any cooperation needed.

5) The military manager usually spends more time engaging his office in formal reporting and presentation preparation serving no other purpose than keeping various levels of the Department of Defense and the Congress informed and up to speed on the project, while the civilian project manager likewise must report his projects progress normally to fewer people and in a more informal manner. With the fewer layers of management above him and a lesser requirement to report on every aspect of his project, the civilian manager usually has a good deal more latitude in the decision making process than does his military counterpart.

Table II summarizes the similarities and differences existing between the two types of project managers. A number of factors have been mentioned that influence the project in either the form of an obstacle or as a contributor to its success. Although many of the problems, goals and constraints mentioned are alike in both the government and industry fields of project management, it is usually the degree to which these influences exist that creates the obstacle or contributes to success and thus results in the prime differences between the civilian and military project manager. A later section further discusses and categorizes these influences as being either obstacles to or determinants of project success.

TABLE II

Military/Civilian Project Manager Profiles Summarized

Similarities

Civilian/Military Project Manager

Project Office Organizational Structure - Matrix

Small Professional Staffs

Necessity of Personal Direct Communications

Need for Financial Management Knowledge

Extensive Internal Interfaces

Extensive External Interfaces

Mutual Goals of Useful Product Production

High Degree of Interaction

Differences

<u>Area</u>	<u>Military</u>	<u>Civilian</u>
Designation	User	Producer
Motives	High Quality/ Lowest Cost	Maximum Profit/ Best Product
Experience	User	Business Management
Orientation	Performance/ Schedule	Profit
Salesmanship	Poor	Good
Motivation	National Security/ Patriotism, Loyalty to Service	Company Interest/ Sales/Profit
Leadership Style	More Authoritarian	More Participative
Management Layers	10-50	2-5
Outside Influences	Many	Few

Table II (continued)

<u>Area</u>	<u>Military</u>	<u>Civilian</u>
Directives/Reports	Numerous	Fewer
Reliance on Outside Assistance	Much with little control	Less with more control
Time Spent Reporting	High Degree	Lower Degree
Authority	Less	More
<u>Responsibilities</u>		
<u>Military</u>	<u>Civilian</u>	<u>Shared</u>
Meet cost Goals	Design	Meet Schedule
Contract Administration	Contract Execution	Testing
Issue Change Orders	Quality Assurance	Achieve performance characteristics of reliability/maintainability, etc.
Respond to numerous outside activities	Subcontractor Relations/ Assistance	Standardization
	Respond to fewer outside activities (except as effected by military project manager's outside influences)	GAO Inspection

F, IDENTIFICATION OF INFLUENCE FACTORS AFFECTING PROJECT MANAGERS

1. Environmental Factors

In large part the type of factors in the environments of the civilian and military project managers are similar. This is due to the fact that the scope of project management is broad enough that all its many facets do, in fact, influence and encompass both the civilian and military project manager, each however to a different extent.

By far the majority of all project managers interviewed concurred that the external factor having the most significant impact on project performance is Congressional and Department of Defense higher level influence and control. All military project managers viewed this environmental factor as having tremendous impact on their office while civilian project managers noted the influence as considerable but not overwhelming. Although Department of Defense Instruction 5000.1 makes a strong case for an autonomous project manager, today military project managers explain that the real world has successive layering that attempts to provide controls and guidance on the operation of the project. Too many layers of management existing above the military manager making decisions and possessing their own "sacred cows" make the decision process much more difficult. Due in part to the rampant inflation, the economy, current energy crisis, and long turn around time for building weapons systems, the succession of cost growths and resulting claims

have caused Congress to take an intensely active interest in nearly all projects. Military managers remark that hardly a week goes by without Congressional or press inquiries into the projects status and future cost projections. Less frequent contact with Washington and much less layering of management is experienced by the civilian project manager who normally reports but to one or at most two company vice-presidents. However, some of the constant pressures and demands experienced by the military manager naturally affects his civilian counterpart causing a drain on his time as well. Political factors affect project management to the extent that the Defense budget is at the mercy of the mood of the Congress, thereby limiting solid long term planning for implementation, continuity and stability. The military project manager performing in this atmosphere is less able to devote his full energies and time to the direction of his project than is his civilian counterpart performing in the more stable environment in terms of personnel turnover. However, Congressional funding perturbations and resulting schedule adjustments influence both types of project managers and the work they accomplish. Other factors seen by most project managers as affecting performance are the ever expanding and for the large part generally nonproductive or useful fringe groups which impose directives of additional specifications on programs and thereby requiring extensive formal reporting. The amount of external directives imposes rigid, and often unnecessary requirements on the government

project manager who must then pass them on to the industry manager to some lesser extent. This burden of external directives imposed primarily on the military project manager is even felt to some degree by the subcontractors. This multitude of directives to comply with thus further restricts the efforts and the time the project manager can devote to effective project management. Another factor particularly influencing the military manager is his concern for the survival of the planned funds through the Navy and Department of Defense review cycle and the Congressional authorization and appropriations cycles. This annual exercise involving the project manager in Washington, D.C. to get the money almost always ends up with a different sum than anticipated or submitted and new caveats or direction upon its release. Often funds are cut for reasons completely independent of project requirements thereby creating further instability.

The factors discussed so far of political involvement, layers of management, excessive directives and funding pressures make up the critical difference between the industrial and the government project manager. The factors are essentially the same, but it is the degree to which they exist and influence each manager's environment that constitutes the major differences. At all levels of government, taxes paid by citizens and business are used to purchase required materials and services for new weapons systems. Therefore, government procedures permit considerably less freedom of

action and discretion to the military manager than business can allow his industrial counterpart. Government procedures are strict and are designed to protect public funds and, therefore, a lot less flexibility and authority is allowed the military project manager. The government manager operates his project under a budget fixed by legislation where major changes each require congressional action. Thus funding restrictions can be seen as being partially responsible for the other major influences.

Lastly, the requirements for good communications discussed earlier as a similar necessity to both project types can be affected by the physical location of the two project managers. This geographic separation makes communication and problem solving more difficult and time consuming. The problem is further aggravated if travel funding restrictions are imposed upon the project as is often the case. Thus a particular location of the military manager with respect to his counterpart in industry can downgrade the project managers effectiveness by restricting one of his most important tools of management - direct personal communications.

Numerous other factors exist in the environment of the two project managers that affect their performance. Many of those mentioned, however, such as organizational structure, mutual management goals, coordination and team cooperation were found to be similar.

2. Experience and Background Factors

All personnel interviewed agreed that the project manager must be a generalist whether he be military or civilian. He should not be expected to be an expert in all the technical fields involved in the weapons systems but must have sufficient knowledge of each technical discipline to make trade-off decisions rationally. Beyond that he needs knowledge in the financial and business fields. All managers remarked that educationally he must have an equal background in engineering and business management. In addition to industrial and engineering experience, his background should include time in the environment of his product (i.e. military managers agreed that a previous tour in the Washington, D.C. area and knowledge of the "politics" involved would be a definite asset for a future project manager of either type).

Essentially, the degree to which the factors of higher education, operational experience and technical expertise exist in the project manager's background tend to influence his methods and manner of performance and ultimately project effectiveness. Taken separately, the education should be of suitable breadth to provide creditability, stature and self-assurance and should include matters of contract law, business law and administration, financial management and engineering. Military managers tend to put more weight on the masters degree level of management training while civilian project types tend to emphasize this

development more through lectures, seminars, and on-the-job training.

Next, experience tends to emphasize creditability where both types of manager must have an adequate background to communicate with the people working on the project and must also know what it is they are promoting in order to be effective. Military managers explain that operational experience is not enough in that the project manager has to have prior experience in the project management world in order to operate productively. Civilian project managers agree in that essentially they all have operated within the project or within the scope of project management for upwards of twenty years prior to assuming their duties as project manager.

Technical expertise is an absolute must if the manager is trying to convince anyone of the needs, requirements or problems associated with the project. To understand and be professionally aware of the many technical disciplines influencing systems definitions and design and its application in the field enhances a project managers creditability as well as his effectiveness. Military managers tended to have less of this technical expertise due to the historical emphasis on their being more of a generalist, whereas the civilian manager, often involved for several years in the same area of design or development, has acquired an impressive technical understanding of all aspects of the project.

In addition to the above three major factors affecting the project manager, consideration of emotional maturity, acquired communication skills, ambition, honesty, patience, common sense, tolerance and a will to succeed all ranked high as qualities in the make-up of each project manager which have an effect on his performance. Leadership and the ability to organize diverse activities into efficient operating teams were also noted as important; however, all of these influences in general come with the project manager, be he civilian or military, and are not usually subject to change once he is on the job.

It is rather the areas of education, experience and expertise which influence most, wherein the possibility for change lies and where the major differences exist between the two project manager types. The civilian project manager usually has several years working on the same or similar projects. He has progressed vertically in management with increasing supervisory responsibilities in order to gain the necessary insight into getting specific tasks completed through other people and organizations. On the other hand, the military line project manager usually comes to his project management job through a career progression that has continually put the opportunity to gain on the job acquisition experience and training, required for project managers, in "jeopardy because of the forces created in pursuing the classic career carrot at the end of the stick:

major combatant command,"¹³ Instead of coming to his job with procurement experience, management education and weapons acquisition expertise to combat all the adversaries, the military manager arrives more as the operational warrior of the past and less the proficient project manager. He thus tends to be more conservative and less of a risk taker. He often shows less initiative and is less innovative than his civilian counterpart, as the background for taking risks and demonstrating something other than conformity often is lacking and is less adequate than that of the civilian manager in industry. That background and experience which is required to get the project management job done effectively and that which is the expected norm of a typical line captain's behavior as he proceeds through the prescribed stepping stones to flag rank are often in conflict - often to the detriment of the overall project.

3. Incentive and Reward Factors

Perhaps the best incentive as explained by all project managers interviewed in both government and industry is recognition of performance made periodically by top level management and reviewing agencies. Recognition documented by action influences the project manager to strive harder against whatever obstacles exist to achieve project success. In industry the civilian project manager desires military

¹³ Featherston, Frank, H., "The Business of Project Management," Naval Institute Proceedings, p. 27, January 1972.

commendation of a good job and well done. This leads to job security, promotion and future similar developments. Military project managers desire recognition, usually via the fitness report, of a job well done leading to promotion and expanded assignments. Appropriate recognition also includes recognition of the right to be wrong.

A further incentive is job satisfaction where the project manager of either type has confidence that his accomplishments are really worthwhile despite all his anguish and effort. This opportunity to perform and contribute is gratifying, and when it is accomplished with excellence in industry, it is often rewarded monetarily in the form of a bonus. In the military, however, with no system of bonus or financial reward and a very low promotion opportunity to flag rank, incentives of job satisfaction and patriotism must remain high in order that the military manager can stay motivated throughout his time on the project and perform effectively. The personal satisfaction of seeing the fruits of his labor successfully meet the trials and testing as his weapons system joins the fleet is recognized as more of a major incentive to the military project manager than to his civilian counterpart.

Additional incentives that project managers are responsive to are career enhancement and genuine support or sponsorship from above. The military manager is constantly concerned with his career field, reviewing where his job rotation has brought him to date and exactly where future

rotation will take him, Although stated Department of Defense policy is to retain military project managers in their billets for at least three to four years with transfers only at a major project milestone, managers interviewed remarked that turnover in project offices continues at a much too rapid pace. Although selection boards are directed by higher authority to regard military project managers as having had a major command, the positive results of this have not been evident to date. Thus, the influence of job security and promotion remains an important concern of the military manager. His seniors give much lip service to his formally defined role and the security of promotion and continuance in the billet that goes with it but in large part ignore it in practice. On the other hand, the civilian manager has no definite career pattern of any kind. His assignment as a project manager is seen rather as a broadening experience where he and his decisions are generally recognized as expert. His job security results instead from the stability acquired throughout his background and training and the fact that he genuinely feels he is a much needed member of the acquisition team. The instability associated with the military project manager as compared with the stability of his civilian counterpart, pervades many of the incentives such as job satisfaction, security, recognition and career field that influence his behavior and project performance. With fewer really achievable incentives in an already more layered, bureaucratic environment and with less

management experience, the military managers are often times .
at a distinct disadvantage in managing their projects.

G. CATEGORIZATION OF FACTORS - POSITIVE OR NEGATIVE

Having identified many of the factors which influence the project manager and his resultant performance, it is necessary to sort out those which benefit the project and those which are obstacles.

1. Determinants of Project Success

The will and determination of each individual project manager is a key determinant for a successful project. Lacking this, the project will be overwhelmed with reasons for not succeeding. With this and a positive attitude, certain other fundamental influences are necessary as viewed by the majority of managers interviewed. These include a well conceived organizational plan, complete specifications, and a funding plan that is supported at all levels by five year development plan commitments. In addition, competent technical and financial personnel on both the military and civilian sides of project management are a prerequisite. Next, the stability of these project objectives, finances and people must be maintained. With this stability assured, the job of the project manager becomes one of leadership, management and motivation; a more familiar pattern to a Naval officer who has had at least some management education and project experience.

Additional influences regarded as determinants of success were: positive and firm direction from just a few

higher level management personnel; open and candid communications with all parties; a strong, hard core, capable staff who work together well and have authority to act; high respect for professionalism and recognition given to it; an effective and strong cost control and technical capability; and authority commensurate with responsibility. With the proper mix of the above factors in the project managers environment, background and incentive systems, the chances are increased that the project manager will be able to effect proper and successful performance of his weapons system in a timely manner and within targeted cost.

2. Obstacles to Project Managers

Essentially, there are four major factors among the influences previously discussed that stand out as the major obstacles confronting the project manager. Order is not important in their presentation here as all were seen as equally detrimental to project success. First is the vast number of non-line authority activities that have veto power over project decisions. The amount of direction and management assistance received from higher levels in the Navy, Department of Defense, Congress and the General Accounting Office is often more than the project, its military manager and his civilian counterpart can bear. This excessive layering of management leads to another obstacle which is the problem of how to prevent people outside the program from attacking or cutting the program due to erroneous conclusions drawn from partial information or wrong

interpretation of information. The program manager is required almost continuously to try to explain and assist in the understanding of the highly complex issues involved. The general attitude of the public and of Congress toward defense spending frequently places the project manager in the position of justifying the objectives and costs of his particular weapons system, especially in today's inflationary economic situation. Bureaucratic and Congressional cuts and delays in budget authorizations and decisions promote even further instability in the area of any long range programming. This higher level influence and control over various funding and decisional aspects of the project leads to one of the biggest obstacles faced by the project manager - that of the amount of actual time which it takes to get things done. The number of activities mentioned so far as making demands upon the project managers time are excessive enough and yet there exists additional programs such as test and evaluation, design to cost, quality assurance, integrated logistics support, survivability/vulnerability etc., all with some amount of authority and all making demands on the time of the project manager. With these critics at every hand, the military project manager consumes vast energies in defending and justifying his project. This energy significantly subtracts from that available to actually run the program. This same effort affects to a lesser degree his civilian counterpart as well in supporting the military officer and his project office.

Finally, project managers interviewed see this influx of non-project personnel, who make evaluations and recommendations with little or no responsibility except to make sure their specialty is adequately covered and funded, as really a major factor in driving up program costs. The demands and directives requiring management data, safety, reliability, hazard analysis, and logistics are too frequently efforts in data generation. They seem to lack any contribution to the real problem of successful project completion. Once generated the requirements or directives become rigid and inflexible and result in virtually tons of paper work being requested, generated and delivered by both project manager types and their offices - all in the name of program effectiveness and usually at the expense of project management.

H. CONFLICT

Though this chapter has presented numerous mutual goals and similarities, conflict was found to exist in varying degree between the two project manager types. A major area found was generally in the fiscal arena. Within the three major areas of performance, schedule and cost, the civilian and military project managers are both in agreement - to provide maximum technical capability and to do so in minimum time. Incentives are usually opposite, however, as to cost with the military manager wanting to minimize cost and his civilian counterpart wanting to maximize profit.

Fiscal differences usually can lead to conflict over what can and should be accomplished in a given time and for what reasons. Further, the definition and acceptance of scope changes (schedule and cost arguments) to the contract provide fuel for conflict as does the continuing schedule perturbations due to external (Congressional) funding adjustments. Though the goals of industry profit and government cost minimization are not necessarily mutually exclusive, it at times tends to make contractor - submitted proposals seem excessively costly to the military project manager who must exert positive cost control over his contractor. Attempting this with little background or experience in the financial arena can generate considerable conflict between the two project managers.

Fixed annual budgets, an inflationary economy, military rejection of contractor - sponsored alternatives and engineering change orders which disrupt schedule can further aggravate the potential conflict. Civilian project managers, reflecting top management philosophy, resent and attempt to thwart the military manager who sometimes becomes too deeply involved in the company's internal management, scheduling and cost procedures. In many cases, the military manager seeks and requires this information in order to track his program properly and in some cases in response to higher directives or to satisfy higher echelons. With an industry manager carefully guarding his financial information and a government manager seeking it by direction, conflict can often occur.

Thus, the area of conflict most prevalent involves profit as it relates to resolution of continuous problems involving performance, budget and time schedule. The military project manager is in a key role to influence the contractor's profits because of the scope and nature of his activities. The contractor meanwhile has immense pressures of managing technological innovations under severe time constraints and at the same time making a profit.

I. SUMMARY

Frank Featherstone writing on The Business of Project Management for the January 1972 Naval Institute Proceedings said of the military project manager:

"... he comes from an at sea operational job to the project management environment ashore in Washington, D.C., which is an adaptive fishbowl world, lacking absolutes; where advice, scrutiny, and discourse between fractious coordinating elements flow together in a never ending crescendo of noise in day to day deliberations and decisions. The military project manager, used to a uniformed and obedient ships company, finds instead a polyglot technical crew of service specialists and contractor civilians, a sprinkling of military action officers, politically appointed and inspired civilian bosses, a continually shifting flag hierarchy, numerous other executive branch officials, representatives of the news media, legislators and staffs, and the general accounting office, all with allegiances and motivations completely foreign to the day to day operations of his ship or squadron yet nevertheless directly influencing the project manager and his project."¹⁴

Civilian counterparts to this aptly described individual must respond in like manner but to a lesser degree to all of the above influencing factors in the world of project management.

¹⁴ Ibid., p. 24.

This chapter has pointed out and identified those factors found to be the strongest influences upon the project manager and has discussed in what different way and to what degree these factors affect each type of project manager. It has presented similarities but has dwelt on differences and conflict and has prepared the way for the following chapter. Having thus far investigated which influences contribute to project success and those which are obstacles, chapter IV makes a detailed study of which are the most important factors, the degree of importance that the two types of project managers attach to each factor and studies in which of these areas change or alteration is practical or possible. Influence factors regarded as candidates for change will be examined as to whether they are mutually advantageous and can accomplish improved project manager effectiveness.

IV. INFLUENCE CONSIDERATIONS - IMPORTANCE/EXISTENCE/CHANGE

In this section of the thesis the methodology used to obtain the final data necessary for the further comparison of the two project manager types is discussed. The data obtained allow the presentation of those factors considered by project managers as having the most impact on their performance. These factors are further examined as to their specific effects upon project management and also the extent to which they exist in the project manager's environment or background. Finally, those factors considered to be the most likely candidates for change are presented. The possibilities of and difficulties associated with modification of each of the factors are examined.

A. INTRODUCTION

The subject about the relationship between the defense program manager and his industry counterpart is important. The identification of significant areas of influence, the degree to which that influence exists and the discovery of worthwhile change is a vital and fruitful area for research. An alternative approach that could be taken is "disengagement" - getting out of industry's hair and letting them do the job they have contracted to do. However, as the DOD sponsored study by the Logistics Management Institute stated:

"The ultimate responsibility for a successful program rests squarely on the Service and on the military program

manager as its agent. The program manager cannot disengage in any literal sense. He must manage contracted work in just the same sense as he manages all parts of his program. More precisely, in this case he manages contractor management of his program. It is not a question of whether he manages; it is only a question of how he manages - or mismanages."¹⁵

It is in direct support of this question of how to manage a project effectively that this research is conducted. The purpose of this section is therefore to determine ways in which the project manager's capability to manage can be enhanced by the modification of certain influence factors which impact heavily on his performance and exist pervasively in his environment. In order to accomplish this, the following research procedures and data collection techniques were used.

B. PROCEDURES AND TECHNIQUES OF DATA COLLECTION

As in the previous section comparing the civilian and military project managers, the technique used to collect data for section IV was also the structured personal interview. Reasons for using this method in this section are similar to those described previously. In short, the structured personal approach was the best vehicle for direct contact with weapons acquisition personnel that was necessary to investigate properly the three question areas pertinent to this section. These areas are as follows:

- (1) Which factors influence the project manager's performance the most and in what ways?

¹⁵ "Introduction to Military Program Management," LMITASK 69-28, p. 11, March, 1971.

- (2) To what extent do these factors exist in the project manager's environment or background?
- (3) Where is change or modification possible in certain influences in order to improve project effectiveness?

The structured interview provides the opportunity to examine carefully and personally question responses from all individuals. Similar questions were asked of all personnel interviewed and a chance to elaborate on any particular area was afforded each individual.

Based upon the research done in the previous sections of this thesis, a set of preliminary thoughts regarding the nature, impact, existence and possible change of the most significant factors influencing the project manager was developed. Based upon the literature review and interviews accomplished prior to this section, a set of eleven questions (Appendix C) was utilized in interviewing all acquisition personnel. In the summary of this section the preliminary impressions are compared with the responses given by military and civilian project management personnel. In the interest of time, copies of the eleven questions discussed in the interview were left with each individual in order that he could respond in writing with any further thoughts he might have that were not covered in the interview. Written responses were received from all of these acquisition personnel interviewed.

Appendix D presents a list of those project management personnel by position and organization who were interviewed in connection with this section of the thesis. An effort

was made to gather data from a different group of individuals than the ones contacted during research on the previous section. Additionally, contact was attempted on at least twenty-five percent of those interviewed initially. Both the above efforts were successful.

The remainder of this section is devoted to those factors found to have the most impact on project managers and the specific effects they have on project managers' performance. Based upon the numerous responses by both the military project manager and his civilian counterpart to the questions included in the structured interview, a discussion of the existence of these factors is presented along with those areas found by most project management personnel as most likely candidates for change or modification. The structured interview allowed follow-up and elaboration of the desired question areas.

C. MOST SIGNIFICANT INFLUENCE CONSIDERATIONS

In order to determine which factors have the most significant impact on a project manager, civilian and Navy individuals interviewed were asked to pick from a list of twelve factors those three they considered as affecting their project the most. This list of twelve factors was based upon the research done in Section III and the responses to the questions associated with that section as listed in Appendix A. Project management personnel interviewed in connection with this section were given the opportunity to

add additional factors to those presented in the interview. No additions were made and therefore the list is considered relatively complete as to those factors which influence project managers the most. Table III summarizes those factors among the twelve discussed that were most often mentioned.

TABLE III

TABULATION AND RANKING OF FACTORS HAVING THE MOST SIGNIFICANT IMPACT (POSITIVE OR NEGATIVE) ON THE JOB OF PROJECT MANAGER (number of individuals listing factor as one of the three most important)

<u>MILITARY RESPONSE</u>		<u>CIVILIAN RESPONSE</u>	
Budgetary Pressures Congressional/DOD	(16)	Budgetary Pressures	(12)
Influence & Control	(12)	Layering of Management	(9)
Layering of Management	(8)	Experience of Project Manager	(8)
Amount of Directives and Reports	(5)	Direct Personal Communications	(5)
Experience of Project Manager	(4)	Amount of Directive & Reports	(2)
Promotion and Career Opportunities	(2)	Congressional/DOD Influence/Control	(1)
Direct Personal Communications	(1)		

The impact of those factors mentioned most often are discussed in the following paragraphs as well as a comparison made between the military and civilian responses.

1. Budgetary Pressures

The impact of budgetary and fiscal consideration upon project management was most often mentioned by military and civilian project managers. Money or the lack of it drives everything in the major acquisition business.

Budgetary pressures are seen by most managers as having a significant demand upon their time as so much emphasis is being increasingly placed by everyone on the budget. The project manager must know all things about each budget whether its for the current fiscal year, past budgets or one in the five year development plan throughout the life of his program. Inflation, escalation and increasing lead times all affect the project manager's ability to perform by creating cost growth. The preparation of the budget and associated explanation and justification via oral and written reports are an unending drain on both the civilian and the military project manager's time. The resultant budgetary constraints form the guideline and foundation upon which the project manager must guide his entire program.

2. Congressional/DOD Influence and Control

This factor is mentioned next most often by military project managers and hardly at all by civilian project managers. It is the natural follow on to the most significant consideration of budgetary pressures as the Congress and the DOD are the sources of authority for funds and number and types of weapons or ships in the project. Both project managers must keep their programs pointed in the directions set by Congress and the DOD but the military manager experiences more of the direct influence from Congressional and DOD control than does the civilian counterpart. The geographic location of the military project manager makes it more important for him to develop a favorable relationship with

Congress and the DOD to ensure the smooth functioning of his project than it does the civilian manager who is further from this control and more affected by its results, i.e. the budget.

3. Layering of Management

This consideration is the third most mentioned factor by military managers and the second most mentioned factor by civilian project personnel. Acquisition personnel see project management as having too many organizational elements - all with authority to inquire, investigate and require concurrence but without responsibility for the success or failure of the program. The bureaucracy once established is virtually unchangeable and the reaction time required by project managers to overcome this bureaucracy is considerable. The requirements put on the project by the various staffs, subgroups and organizations created over the past ten years in particular act as a further drain on the project manager's time. The impact of these many bureaucratic groups interacting with civilian contractors without the military project manager's knowledge can have devastating effects. Civilian project managers, while not experiencing a great deal of layering within their own organizations, view the layering of management above and around their military counterpart as being very time consuming to him while being very frustrating to themselves.

4. Experience of the Project Manager

This factor is recognized by civilian project managers as being the third most important consideration.

It is considered to be the fifth most important factor as viewed from the military managers perspective. The knowledge concerning how the system works, how to overcome organizational roadblocks, etc, which is vital to getting the job done effectively comes only with experience. All civilian project managers tend to have more experience in the field of project management than do their military counterpart and thus tend to rate this factor more importantly though both types agree to the vital necessity of knowing the environment, the hardware and the organization. This knowledge almost certainly comes best and easiest from actual time and experience in systems acquisition. Experience is actually top ranked factor by all project personnel that positively affects project management as others discussed so far are negative influences or obstacles.

5. Others

Additional factors that were generally rated as having the high impact upon project management include the amount of directives and reports, communications and promotion and career opportunities. These considerations among others are discussed further in the following pages which investigate the individual and separate effects on the job of project manager that are caused by the twelve influence factors present above.

D. EFFECTS ON THE JOB OF PROJECT MANAGER

Collectively all the various factors which influence the project manager are responsible in large part for the way in

which he performs his job. Taken separately many factors group together to cause a specific effect that is evident in every project manager performance. These effects in the form of time, authority, risk, instability and motivation are affected by the twelve influences shown in Figure 4 and are all important in the determination of how well the project is accomplished.

INFLUENCES CAUSE SPECIFIC EFFECTS WHICH IMPACT UPON PROJECT EFFECTIVENESS

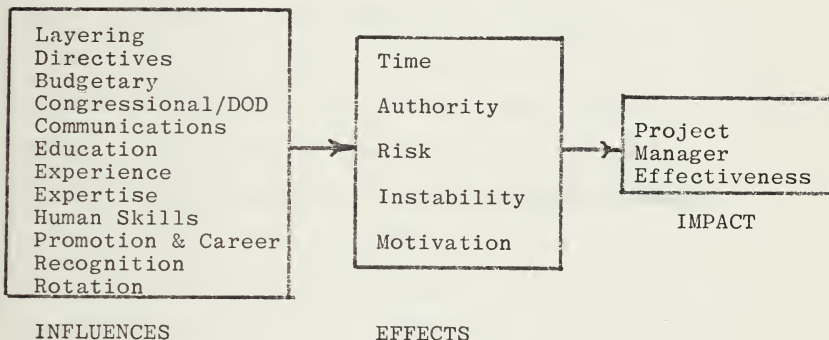


Figure 4

1. Time

Time historically is a trouble maker and the lack of it has been recognized a problem by such as Byron dubbing time "the avenger;" Ovid, "the devourer;" and Tennyson scolding time for "a maniac." The fact is that when questioned as to the single factor accounting for the largest drain on the project manager's time, few military individuals interviewed were able to respond that "management of their project" accounted for the majority of their time. Rather, many of the factors previously discussed

were cited as being responsible for the largest amount of the project manager's time. One Navy project manager summed up the military responses to the time question best by stating:

"the single factor accounting for the largest amount of my time is being responsive to the continual line of inquiries, questions, demands, etc., placed on the project manager from higher authority - from within the Navy, from DOD and the Congressional committees and others such as GAO. The briefing of various people in the numerous levels of management is a never ending drain on a project manager's time."

This continued responding to demands from above was mentioned in one form or another by every military project manager interviewed. Many of the requirements placed on the project manager are in connection with the monitoring of funds and the budget and thus it becomes evident that factors mentioned most often by military project managers as impacting upon the project managers job (Table III) are also the factors which account for the largest share of his time - layering of management, reports and directives, budgetary pressures and Congressional/DOD influence and control. It is important also to note here that these same factors as discussed in the previous section (III.G.2) are all regarded as obstacles to effective project management. Further, it is interesting to note that these factors have little or no contribution to project effectiveness and that they are also considered by project managers as essentially unchangeable influences.

Civilian project managers respond to the question of what accounts for the largest amount of their time by

discussing such things as keeping the project team on the same course and maintaining constant, total communications with subordinates and peers within the project and functional organization. Although they recognize the time spent responding to directives and higher levels of authority, the importance and amount is less than the importance and amount of time attached to it by military managers. Civilian project managers are found to spend the majority of their time in the active management of their project, their team and their organizational coordination and ocmunication.

2. Authority

Civilian and Military project managers respond to the question of how close their authority matches their assigned responsibilities as indicated in Table IV below.

TABLE IV

TABULATED RESPONSES ABOUT HOW AUTHORITY MATCHES RESPONSIBILITY

	<u>MILITARY</u>	<u>CIVILIAN</u>
VERY CLOSE		5
FAIRLY CLOSE	3	7
SOMEWHAT CLOSE	12	
VERY DIFFERENT	1	
EXTREMEMELY DIFFERENT		

Note: When the median and chi-squared tests (level of significance $\alpha=.05$) for two independent samples are applied, a significant difference exists between the responses of the

two groups (military and civilian). These results are in substantial agreement with the results obtained through the interviews as discussed below.

Thus civilian project managers in large part see their authority as being commensurate with their responsibilities while the majority of military managers view their authority only as somewhat close to their responsibility. This finding is supported by Gemmill and Wilemon (1970) who discuss two of the most frequent findings on project management as being a) the amount of authority granted a military project manager is usually perceived as ambiguous and b) military project managers feel they require more authority while many project managers in industry have a charter specifically granting them authority.

In discussing authority Cleland, while defining it as the legal or rightful power to command, to act, and to direct, goes further to list various factors that affect or influence the degree of authority available to the project manager. These are:

- a) influence inherent in a project manager's rank and time with the organization.
- b) influence inherent in the manager's specialized knowledge.
- c) status or prestige of the project manager.
- d) priority and obligation of the project.
- e) integrative and related requirements of the project manager's job.

Interpreting and comparing these findings of Cleland with those of Table IV above helps to clarify the reasons why the civilian manager has more authority than his military counterpart. Section III of the thesis determined that the civilian project manager was richer in rank, expertise and prestige than the military manager and thus this strength is in part responsible for his greater degree of authority. Project priority influences both managers equally. Therefore, it is left to the numerous additional requirements mentioned in (e) above and which have been attached to the military project manager more so than his civilian counterpart, to confirm the military managers somewhat diminished authority. In short, the military manager's lesser amount of project experience and shorter time on the job as program manager in comparison to his civilian counterpart in addition to the more numerous written and oral demands by other levels of authority, are the major reasons why a military project manager perceives himself as having less actual authority than does his civilian counterpart.

Project managers interviewed did not consider this lesser authority on the part of military personnel as having a major impact upon accomplishing a program effectively. Rather they view it as more bothersome in the manner that it prevents speedy progress and necessary actions and causes the military project manager to react instead of act and thus spend more time than his counterpart in accomplishing the same objectives.

Thus the influence considerations of experience, expertise and rotation of military project managers join the four influence factors discussed in the previous paragraphs on time, in affecting the authority of the project manager and in the end, the project itself by delaying decision-making at the project manager level.

3. Risk

The former Assistant Secretary of Defense (Installation and Logistics) Barry J. Shillito said:

"the very first category of risks involve the time it takes to acquire a weapons system ... the process must provide the degree of flexibility necessary to deal effectively with the kinds of risks peculiar to the weapons system in question ... the system and the managers being responsive to the range of risks, balancing the opportunities for economic gain to the contractor with quality and timeliness of his performance in developing or producing the weapons system."¹⁶

The factors affecting time and authority discussed to this point also play an important part in determining whether a project manager avoids taking risks in making decisions. The lack of adequate time to manage the project and the lesser amount of authority resulting in a more time consuming process with more lengthy decision making have been presented as hampering effective project progress. In discussing risk, all project managers agree that they must frequently gamble and that risk taking is no different in the civilian world than it is in the military establishment. However, the degree of risk taking was noted by most project managers as

¹⁶ Shillito, Barry J., "Management of Major Weapons Systems Acquisition," Defense Industry Bulletin, p. 2, Jul.-Aug. 1965.

as being dependent upon the degree or level of proven performance by the individual project manager. One military project manager summed up most of the answers to the question of risk taking as follows:

"The better man - more experienced - more qualified and educated, etc. will generally stick his neck out more often. The less experienced and less qualified will tend to duck risky positions routinely."

Thus the military project manager often is found to be in a more risk-averse position than his civilian counterpart due to less experience in the project management field. Additionally the more rigid constraints placed on him by his environment and his closer contact with bureaucracy often do not allow the military manager the chance to take the risks that his civilian counterpart in industry does. A project with a manager who is risk-averse is a slower-moving project often getting bogged down in the small details associated with reports, directives and presentations. A project with a risk taker may suffer from some mistakes but that is only because decisions were made in the first place. In general project managers agree that the project will be more dynamic, flexible, balanced and fast moving and in the end probably more successful if it has as its manager an individual who is experienced, has been with the project for several years and who thus is willing and able to take some risk in decision making.

4. Instability

In an October 1975 speech, Vice Admiral E. C. Waller, III, Director of Weapons System Evaluation

Group and a former project manager quoted the current figures on the present average tour length of Navy project managers as twenty-seven months. This figure indicates that even five years after numerous directives were issued regarding increased project manager tour lengths, Navy project managers are still being rotated in and out of their jobs too quickly. Although the current average tour length of two plus years is greater than it was five years ago, it still does not approach the four to five years length recommended by almost every study group or commission assigned to investigate project management (e.g. Blue Ribbon Committee, LMI Reports, DOD Directives, etc.).

Project managers interviewed were asked to what degree the instability created by project personnel rotation affected effective project management and responded as follows in Table V.

TABLE V

TABULATION OF RESPONSES ABOUT HOW PROJECT PERSONNEL ROTATION AFFECTS EFFECTIVE PROJECT MANAGEMENT

	<u>MILITARY</u>	<u>CIVILIAN</u>
VERY MUCH	3	
A GOOD DEAL	6	
FAIR AMOUNT	7	2
SMALL AMOUNT		8
NOT AT ALL		2

Note: When the median and chi-squared tests ($\alpha=.05$) for two independent samples are applied on the above table, a

significant difference exists between the responses of the two different groups (military and civilian). These results are in substantial agreement with the results obtained through the interview as discussed below.

Civilian project personnel interviewed both in connection with this section of the thesis and the previous section III were found generally to have project experience with their specific project, either as project manager or another junior advisory capacity, that was in excess of seven years. This explains the fact that civilian project managers respond to the question of instability by saying that there is little or no effect on project effectiveness caused by rotation. However, as the twenty-seven month figure quoted by Vice Admiral Waller earlier indicates, military project personnel see the rotation of managers as affecting their project effectiveness at least to some degree. One military project manager summarized responses best by saying:

"Changes within the projects of participating managers requires extensive training and even so, a loss of corporate memory will result to some degree which therefore, results in some temporary degradation in performance. Required repeated briefings and explanations and the going over of old ground in justifying on-going actions and plans takes a significant amount of time away from actual project management not only from the military standpoint but from the civilian counterpart involved."

This is not to say that many managers, both civilian and military felt that officer rotation was all bad. If carried out at a four to five year interval, most personnel

interviewed considered the adverse impact to be negligible and offset by the fresh new views, up to date technical education and fresh fleet experience that the new military manager would bring with him. It is rather the unplanned for or uncertain changes resulting in rotation after only two or three years that causes the difficulty and impacts upon the previously discussed areas of time (increases it), authority (lessens it) and risk taking (lessens it). Rotation is in fact looked at by many military officers as a positive motivational factor and an incentive but only if it is carried out in a prescribed four to five year interval with no sudden or unannounced changes.

5. Motivation

All of the influence considerations discussed so far in this section that exist and cause the specific effects of time, authority, risk and instability also in part have their effect on the attitude and motivation of each individual project manager. In addition the incentives of promotion and recognition play a very important part in this respect.

All project managers interviewed concurred that there is a basic need in government as well as in industry for a management pattern that puts the emphasis on the people rather than the system. This pattern or style might be one that encourages project manager involvement in the decision making process rather than discourages it - a participating management style which as determined in Section III was more likely to be found at present in industry than in government.

As Dr. Warren Bennis, a distinguished author on management styles noted, participatory management means developing a climate of inquiry and an environment where any and every project leader can feel free to bring forth any problem. Further it requires knowledgeable people who know and respect each other, to enter the acquisition arena together ready to accomplish and produce. In any case as former Deputy Assistant Secretary of Defense, Vice Admiral Reich said, it means a less formal and less rigid working environment - one that generates a sense of belonging and a sense of doing among the people responsible for this nation's defense.

Motivated in this manner and by a management style such as that described above, in addition to having achievement recognized and confidence given to the achievers, project managers in both government and industry can accomplish a project more effectively, more aggressively and in a more timely, less costly manner.

E. EXISTENCE AND CONTRIBUTION OF INFLUENCE CONSIDERATIONS

In the previous section it was hypothesized that it is usually the degree to which various influences exist that actually creates the obstacle or contributes to success or a project and thus results in the prime difference between the civilian and military project manager. In the following tables and paragraphs this extent of each is presented along with the amount of importance and contribution to project effectiveness that project managers attach to each influence.

1. Existence

Table VI below presents in tabulated form the extent that project managers view each of the factors discussed in this section as existing in their environment.

From this table several interesting points are observed. First, the four factors of management layering, budgetary pressures, Congressional influence and control and directives and reports are considered by military managers as being either pervasive in their environment or existing to a large degree. While civilian managers see these influences as existing in their environment also it is uniformly to a lesser degree than their military counterpart. These same four factors are the ones discussed previously throughout this and Section III, as accounting for the largest amount of the project manager's time and as presenting the greatest obstacles to him. Thus it may be concluded that it is because these factors exist in a lesser degree in the civilian project manager's areas than they do in the Navy project manager's atmosphere that the industry manager has more time to spend actually managing his project and is faced with obstacles that are less detrimental to the effective management of his project.

Second, in the area of communications, technical expertise and human skills, both types of project managers attach approximately the same weight of importance to these and consider them as existing almost equally in a medium to large degree in both their environments and backgrounds.

TABLE VI

TABULATION OF RESPONSES ON THE DEGREE TO WHICH EACH INFLUENCE FACTOR EXISTS IN THE PROJECT ENVIRONMENT

FACTOR	NON-EXISTENT	EXTENT		
		SMALL DEGREE	MEDIUM DEGREE	LARGE DEGREE
*LAYERING OF MANAGEMENT			7	5
	Civilian Military		1	8
*BUDGETARY PRESSURES			5	6
	Civilian Military		7	9
*CONGRESSIONAL/DOD INFLUENCE AND CONTROL			8	4
	Civilian Military		1	9
	Civilian Military		10	2
	Civilian Military		7	8
AMOUNT OF DIRECTIVES AND REPORTS			2	10
DIRECT PERSONAL COMMUNICATIONS			7	9
*EDUCATION OF PROJECT MANAGER			1	10
	Civilian Military	2	7	7
*EXPERIENCE OF PROJECT MANAGER			1	9
	Civilian Military	2	8	6
TECHNICAL EXPERTISE OF PROJECT MANAGER			8	4
	Civilian Military		9	7
HUMAN SKILLS OF PROJECT MANAGER			2	10
	Civilian Military		4	12
*PROMOTION AND CAREER OPPORTUNITIES			1	9
	Civilian Military	8	8	2
*RECOGNITION			5	7
	Civilian Military	10	6	

Table VI (continued)

FACTOR	EXTENT				
	NON-EXISTENT	SMALL DEGREE	MEDIUM DEGREE	LARGE DEGREE	PERVASIVE
*ROTATION OF PERSONNEL		6	6		
Civilian		2	7		
Military					7

* When analyzing each factor, a significant difference exists here between the responses of the two groups (Military and Civilian) as determined by applying the median and chi-squared tests ($\alpha=.05$) for two independent samples. These results are in substantial agreement with the results obtained through the interview as discussed below.

These three considerations were viewed throughout the thesis as important to effective project management. Although not impacting on project effectiveness as much as others discussed so far, their existence to about an equal degree in both worlds indicates the widespread acceptance and mutual accord that exists throughout much of industry and government.

Third, although the factors of education and experience are considered critical to both types of project managers, it is interesting to note that civilian managers view these factors as being either pervasive or existing to a large degree within their project. This differs from their military counterparts who view them as existing somewhere between a small to a large degree and in no instances as being pervasive. This supports earlier findings as to the industry project manager having a greater amount of project experience than his counterpart and thus being able to wield more authority and take more risks in building a more effective, flexible and dynamic project team.

Fourth, government personnel view the rotation of project personnel, particularly at the higher levels, as being a factor that exists and affects them in a medium to large extent. Civilian managers however saw rotation as existing to no more than a medium degree and this accounts for the greater personnel stability that exists within industry than exists within Navy project offices in the case of project managers themselves or their top assistants.

Lastly in the area of promotion and recognition, there appears to be still another difference. Military managers consider these two factors as existing to only a small to medium degree while their industry counterparts see promotion and recognition as almost uniformly existing to a medium to large extent. It is these two areas which go a long way toward project manager motivation as discussed earlier and result in a motivated manager often handling his project more effectively.

It is based on this portion of the research, which also supports all previous interviews and questions, that it is possible to conclude that with the exception of the three considerations of communications, human skills and technical expertise, that a difference does exist between the Navy project manager and his industry counterpart. This difference is in the degree of existence of the other nine factors and the resultant positive or negative influence these factors have in affecting the job each manager accomplishes. The factors themselves influence everyone in a somewhat similar manner but it is when the factors are either pervasive or close to non-existent or somewhere close to these extremes that the influence which is creating either an obstacle to or a determinant of success becomes vitally important. Further, when the degrees of existence are dissimilar between the two manager types, the influences must affect each differently and also the way in which they perform their work. It has been shown which factors create the obstacles

and which are the determinants of project effectiveness. It has also been shown in what specific ways each influence causes its effect to a project manager. By understanding this point and Table VI, it is readily apparent to see where differences exist and why the industry project manager might have more time, fewer obstacles, more authority, less instability and be more motivated in his job.

2. Contribution

Although in the degree of existence of each factor there is a difference between civilian and military project managers there is still considerable agreement between all project managers as to the extent of contribution to project effectiveness that is attached to each influence consideration. Table VII summarizes much of what has already been presented and analyzed with regard to those factors contributing the most or the least toward the project manager's job. It is interesting to note that with the single exception of the recognition factor, no significant difference exists between the responses of the two different groups (military and civilian) when applying the median and chi-squared tests for independent samples. These tests show a consensus in the degree of contribution of each factor between the two groups which supports earlier conclusions.

This table presents, from a different group of project personnel interviewed, the same essential information as discussed in section III regarding obstacles and determinants of project success. This uniform agreement between all

TABLE VII

TABULATION OF RESPONSES ON THE CONTRIBUTION TO PROJECT EFFECTIVENESS BY EACH INFLUENCE CONSIDERATION

FACTOR	CONTRIBUTION						
	Very Detri- mental	Detri- mental	Slightly Detri- mental	No Cont- ribution	Some Cont- ribution	Large Cont- ribution	Maximum Cont- ribution
LAYERING OF MANAGEMENT	Civilian	7	5				
	Military	3	6	7			
BUDGETARY PRESSURES	Civilian	10	2				
	Military	8	6	2			
CONGRESSIONAL/DOD INFLUENCE	Civilian	8	4				
	Military	7	7	2			
DIRECTIVES/REPORTS	Civilian		2	10			
	Military		8	8			
COMMUNICATIONS	Civilian					2	10
	Military					7	9
EDUCATION OF P.M.	Civilian					7	5
	Military				2	8	6
EXPERIENCE OF P.M.	Civilian					2	2
	Military					8	8
TECHNICAL EXPERTISE OF P.M.	Civilian					3	9
	Military					8	8
HUMAN SKILLS OF P.M.	Civilian					2	10
	Military					2	14
PROMOTION/CAREER OPPORTUNITIES	Civilian					6	6
	Military					15	1

TABLE VII (continued)

FACTOR	CONTRIBUTION						
	Very Detri- mental	Detri- mental	Slightly Detri- mental	No Cont- ribution	Some Cont- ribution	Large Cont- ribution	Maximum Cont- ribution
RECOGNITION						8	4
					9	7	
ROTATION				10	2		
		2	4	4	6		
	Civilian Military						
	Civilian Military						

systems acquisition personnel leads to the conclusion that it is those influence factors which are the most pervasive that are also the most detrimental, create the biggest obstacles and further take up the majority of the manager's time. Those that are in existence to a somewhat lesser degree are ones which contribute to project effectiveness, are determinants of project success and enhance authority, stability and motivation.

F. MODIFICATION OR CHANGE

It is recognized that many of the methods and results of project management in the past both by government and industry have been responsible, at least in part, for many of the pervasive influence factors discussed in this paper. Things such as buy-ins, cost overruns, excessive engineering changes, etc. in the past lead directly to much of the increased Congressional control, budgetary pressures, directives and management layering of the present. Many other influence considerations presented herein, such as project manager education, experience, recognition, promotion, etc., are still in the stages of infancy with regard to ideas, recommendations and proven results. Most all of the twelve important influences researched in this thesis will remain with project managers for some time to come. Some may increase in importance while others diminish but project managers will have to live with them all for at least the foreseeable future. As they are the influences considered by most acquisition personnel to be the most significant and

the ones with the most impact, the best alternative to complete elimination of anyone factor - a rather unrealistic goal - is to find ways to combat, live with or overcome these major considerations in environment, background and incentive systems. As one military project manager put it:

"A small improvement in a serious problem or significant influence factor is better than a complete success on a TRIVIAL issue."

All the influence considerations require some change and all can probably be modified in many different or unique ways. In the remainder of this section the possibilities and difficulties of change or modification are discussed with the following final section of the thesis devoted to actual recommendations for change.

1. Management Layering

This factor is an outgrowth of bureaucracy itself as management by bureaucracy eclipses management by people. Once bureaucracy gets firmly into operation there are many whose objective is to keep it working and keep their own functions going as before. For this reason the difficulty in accomplishing any change in this area is very hard indeed. Most managers interviewed see some chance for possible change in this factor but generally agree that the modification will come from innovations incorporated into the project manager's game plan that will allow him to combat layering more effectively. To suggest total change or elimination of management layering is to imply a change in the basic administrative practices existing in the federal bureaucracy.

2. Budgetary Pressures

The cost overruns and handling of systems acquisition of the past has generated the budgetary constraints today's project manager must live with. The new Budget and Control Act of 1974 goes a long way toward making both the budget and defense and acquisition more visible in the public's eye. As long as it is the taxpayers dollar being spent to buy new weapons systems, the project managers of the future can expect, if anything, even more pressure in the fiscal year. As with layering, this consideration's impact can only be lessened by a better equipped project manager both in defense and industry.

3. Congressional/DOD Influence and Control

Project managers of all types interviewed view this influence consideration as being virtually unchangeable. The major factor here being increased public awareness of government and therefore, defense processes. This awareness will not diminish but rather continue to grow and project management can only be improved by insuring that their project managers are better equipped to communicate with Congress and the DOD.

4. Directives and Reports

The numerous directives emanating from DOD, SECNAV, GAO and the like along with voluminous regulations such as the Armed Service Procurement Regulations (ASPR) were also brought about in large part as a result of defense procurement fiascos of the 1960's. Despite all the many words to

the contrary, DOD directives, reports and regulations affecting project management have increased over the past five years rather than decreased. The difficulties involved in either reducing or canceling presently existing directives are many and in most cases would result in more paper work and take a period of time in excess of two years to see even the first effects. There exists in the system the false assumption, seen by many project managers interviewed, that people can solve the problems of weapons acquisition by issuing more directives. Attention should rather be focused on the people themselves as it is the people and not the directives that solve the problems.

5. Direct Personal Communications

The area of communications is seen by the majority of project managers as being a good candidate for changes or modification. The difficulties are relatively few for the benefits gained. The cost is mainly an individual effort on the part of every person involved in project management as well as the insurance of adequate dollars to sustain continuous communications between all members of the team.

6. Education and Experience of the Project Manager

These considerations are viewed by the majority of systems acquisition personnel interviewed as being either very probable or good candidates for change. The difficulties again involve adequate funding to keep operating the schools presently involved in systems acquisition management. Further problems exist in the actual restructuring of career paths

for Naval officers in order to groom them for the project manager job. The benefits that can be garnered from the individual educated in management and experienced in system acquisition are substantial (e.g. increased financial expertise, more authority, less risk-averse, etc.).

7. Technical Expertise and Human Skills of the Project Manager

These factors, which have been discussed as existing to a large degree in both the government and industry sides of the project management and affecting acquisition in a positive manner, are both undergoing change virtually all the time. The project manager as an aggressive, professional and forward thinking individual is always adding to his technical knowledge and improving his skills in working with and directing other individuals. The costs are simply to maintain the highest standards for individuals in project management and these two factors will of themselves continue to improve.

8. Promotion/Career and Recognition

Military managers consider there to be good chance for change in these areas while civilian counterparts consider change unlikely from their viewpoint of being rather satisfied with these factors. The difficulties involved in change are sufficient dedication, time and follow-through to make a reality all the many words written to date on Weapons System Acquisition Management, career fields, project major commands and promotion opportunities. If that which has been directed

is carried out along with some additional recommendations in the next section, the benefits are a more motivated team of Navy project managers resulting in better managed weapons systems projects.

9. Rotation

The words have been written and directives issued regarding military stability within project management. It now merely takes the time and, as with the previous factors, the follow through to insure Navy project managers are in fact retained on their jobs for at least four years and through major program milestones. The costs are none and the benefits are a continuity and integrity within the Navy project management system that is felt in industry, Congress, DOD and all the organizations associated with project management.

G. SUMMARY

This section shows that the factors influencing project management which create the biggest obstacles are also the ones which take the largest amount of the manager's time, contribute least to project effectiveness, have the most negative impact on the project manager's job, are in existence to the largest extent and finally are the ones least able or likely to be changed or modified. It is, therefore, mainly in the other areas, where change is more possible, that the final sections recommendations will concentrate. By incorporating numerous smaller improvements

or coping mechanisms, the impact of the obstacles can be lessened and the manager himself can be better equipped to adapt to or fight against these obstacles. In this section the responses of project managers previously interviewed in section III were not found to be different from the responses of project personnel interviewed for the first time in connection with this section. The preliminary thoughts regarding the important influences affecting the project manager withstood the questioning of twenty-eight additional systems acquisition personnel. Few surprises were noted other than the fact that there was so much general agreement among different individuals in project management both in government and industry as to where the problems lie, what the influences are and where change is possible. The final section of the thesis concludes with a discussion of specific recommendations for change or modification in the various influence factors presented throughout as well as areas thought worthwhile of consideration in reducing potential or actual conflict existing between industry and government managers.

V. CONCLUSIONS AND RECOMMENDATIONS

The importance of project management and of a paper dealing with those directly responsible for effective and successful project management is seen in the recent words of Admiral Holloway, Chief of Naval Operations. In listing the five objectives of the Navy for the future he discussed offensive capability, defensive capability, flexibility, balance and personal professionalism. All of these future five objectives depend on a successful systems acquisition process and likewise effective government and industrial project managers.

A. CONCLUSIONS

Much of what is written in this paper has been previously discussed at some point over the past five years. Many of the important problems, requirements, differences and influence considerations presented here have been individually identified in the past by different groups or individuals studying project management. It is recognized that there is no one "classical" project and that although there are common elements, many individual key elements might be different. The thrust behind this thesis is to combine and present the current ideas and thoughts regarding the most significant factors influencing all of the project management today. It integrates the perceptions and the feelings of fifty-nine Navy and civilian industry personnel involved in system

acquisition who were interviewed about what it's like inside a project.

A conclusion is that, although many of the problems and influences included in this thesis may have been seen before in some form or another, the fact that some five dozen project management personnel still view the same issues as current problems indicates the necessity for follow up. Had every problem presented herein been remedied earlier the necessity for this report would be obviated. Instead a lack of follow through in many problem areas indicates the urgency behind addressing systems acquisition problems over and over again until the proper results are achieved. Additionally early program realities and historical project management difficulties have created many of the obstacles to the project manager and have robbed him of the chance to actually manage. Thus the importance of developing coping mechanisms to better handle these realities is evident.

The comparison attempted in this paper concludes that project management, whether it be in government or in industry, is affected by essentially the same set of considerations. The real differences lie in the degree of severity of each factor in either the civilian or military environment. It is this degree of severity which affects each project manager type and accounts for differences in the way he manages and performs his job. Things such as the manager's authority, time, risk taking and motivation as well as the stability of the project itself are affected to the extent each factor is a resource or an obstacle.

Of the recommendations presented, some have been previously recommended, others are unique ideas and recommendations of some of the many project personnel interviewed, while still others are the author's. Most recommendations originate from the study of the comparison of the two project manager types. Where some facet or consideration of a project management variable was found to benefit particularly one project manager or exist to a large and favorable degree, it is recommended as a potential change for the other project manager in order to improve his effectiveness. For instance, the experience and salesmanship of the industry manager were found to be better than their Navy counterpart's therefore leading directly to recommendations in these areas for Navy project managers.

Where recommendations appear that are repetitive or a reinforcement of project management recommendations of the past, it is because this recommendation is still important, and to date has not been adequately followed up. For instance, RADM R. G. Freeman, III, USN, recently said in a November 1975 speech, that the Navy is still not picking all its project managers with the right qualifications and education, experience, and expertise. Instead, many officers are selected as project managers as a reward for prior excellence in operational performance, not in the systems acquisition field, and which in any case is not necessarily a measure of a good project manager. This statement supports the need for repeating the type of

recommendations regarding experience and education that follow.

B. RECOMMENDATIONS

Based upon the research conducted in developing this thesis, the following recommendations are presented for modifying many of the contextual factors discussed throughout the paper in order to benefit project performance and reduce project manager conflict. It is with full recognition of the constructive work presently being done to improve the systems acquisition process that these recommendations are made. Recommendations are made in three groups. First are those suggestions designed to improve the qualifications of the project manager and the characteristics of his career. The second grouping includes recommendations to enhance project management techniques while the final group relates to suggestions to combat problems associated with project management. Figure 5 presents a summary of the grouping of all recommendations as well as potential costs and benefits that can be realized.

1. Project Manager Qualification and Career

(a) A recommendation to "groom" the Navy project manager for his job in a manner similar to his civilian counterpart would strengthen the influences of his experience and expertise. Operational experience is vital to a project officer in the area he will manage but likewise and of equal importance is experience in the systems acquisition field. Grooming means to pick the potential corps of project managers

RECOMMENDATIONS

GROUP 1

P.M.Grooming
P.M.Education
P.M.Rotation
P.M.Training

GROUP 2

Communications
Reporting
Salesmanship
Civilian Deputy

GROUP 3

Flag rank P.M.
Travel funding
P.M.Introduction
Recognition

P.M.QUALIFICATIONS
and CAREER
IMPROVEMENTS

IMPROVEMENTS TO
PROJECT MANAGEMENT
TECHNIQUES

ALLEVIATION OF
ADVERSE
PROBLEMS

COST

Individual P.M. effort
Additional funding
Time
Organizational reform
Follow-up on current
directives

ACHIEVED BENEFITS

Overcome management layering
Cope with bureaucracy,
Congress, etc.
Effective handling of budgetary
pressures
Effective handling of
directives, reports
More stability
Improved and increased
authority
Reduction of Navy/Civilian
conflict

RESULT

More effective
Project
Management

Figure 5

Cost and Benefit Relationship of the Twelve Recommendations

early, insure they get the operational and hardware training and then detail them to the field of procurement or other projects in the area of the system he will be managing. Without a dedicated adherence to a system such as this, project managers in Washington will have to work extraordinarily hard to learn what is happening. The present WSAM program approach to project manager selection and training is an excellent start and only needs to be carried out in a realistic and timely manner so that the individual who gets assigned as a project manager is as thoroughly experienced in his field as is his civilian counterpart.

(b) In order to strengthen the educational factor several recommendations are apparent. Continuance of financial support in the budget for the Systems Acquisition Management curriculum at the Naval Postgraduate School as well as the management course at Ft. Belvoir is essential. As financial training and expertise continue to be significant areas of concern and weakness for Navy project managers, additional required instruction in this subject at both schools should be considered. As the above education usually does not immediately precede assignment to the job as project manager, a short CNM (Chief of Navy Material) or Systems Command sponsored orientation and familiarization course should be considered. Before the newly assigned project manager actually reports to his PMS, PMA, etc., desk, he would participate in a three to four week school taking place in the actual environment of project management. This

would provide the time necessary to learn the political, bureaucratic, and financial situation as well as time to study the current directives, reports, and contracts that are applicable to the project. This preliminary period still outside his new project office and with CNM would allow the new project manager to step into his job with more assurance and more time to devote to learning the project and its organization. All of this education improves the Navy manager's authority and risk-taking situation and allows him to deal more effectively with layering, Congressional and budgetary influences.

(c) The recommendation to retain Navy project managers at their job for at least four years should be made inviolate. It is so directed in DOD Directive 5000.23 as well as in memorandums from Deputy Secretary of Defense Clements but, as numerous speakers from the Systems Acquisition field as well as project managers themselves point out, it is still not being carried out. The stability this policy would add to the project office as well as the added continuity it would impart to industry could definitely enhance project effectiveness.

(d) In order to further enhance the experience factor, a recommendation for a period of sabbatical training of prospective Navy project managers in a civilian organization might have merit. Likewise a period of time for indoctrination of prospective industry project managers in both the political environment of Washington, D.C. as well as the

operational at sea environment of the weapons system project they are to manage should be considered. This mutual training period in each other's environment not only can improve the experience of the project managers but can go far toward relieving potential conflict when the two individuals begin their jobs as project managers and start working together. Having lived in each other's environment for a period of time can significantly help each project manager type to better understand the other's problems, gain respect for each other's background, and thus be better equipped to work together in producing an effective and successful project.

2. Project Management Techniques

(a) A prime recommendation for the reduction of potential conflict between the Navy and industry project manager is the establishing and maintaining of open and honest reciprocal communications. By achieving a respect for the particular problems that each faces and an appreciation that the solutions may not necessarily be appealing to each party in all cases, conflict resolution can be significantly enhanced. Communications that are private (based upon mutual respect with a confidence that information shared will not be abused) and direct often achieve a mutual high confidence and trust that can go a long way toward efficient problem solving. An open dialogue with each manager realizing that his counterpart is the most important man in the overall project not only enhances the communications influence but substantially assists the project office in combating the

adverse affects of management layering, Congressional influence, and budgetary pressures. By each manager helping the other in all facets of the acquisition process each becomes strengthened in both knowledge and tactics to enable him to perform more effectively in his environment. This recommendation is enhanced and communication further promoted and strengthened by suggestions 1-d above and 3-b that follows. Additionally a required course on interpersonal relations and communications in the Naval Postgraduate School's System Acquisition Management curriculum could be instituted. Through a freeflow of information on problems in the cost, schedule, and technical areas, the necessary visibility is achieved to alert the project to potential problems and to provide the tools to make rational decisions. In this recommended close relationship, with the industry counterpart being a partner and vice versa, it is proper and important for each to be an adversary at times but never to be an antagonist. Likewise, each must understand the middle ground or boundaries of their respective positions and be wary of the risk involved in overstepping this area or boundary by being either too candid, providing too much information, or making too many demands.

(b) In order to overcome excessive management layering, a recommendation to allow major project managers to report directly to the Systems Commander should be undertaken. As is the case with his civilian counterpart, the Navy project manager should have direct access to the top

management that makes decisions without having to go through the many levels existing above and to all sides of his present office. The recently instituted program of monthly direct reporting of project managers to Deputy Secretary of Defense Clements is a start in this direction but can only work if this communication is direct and not, as reported by one project manager, open with copies by direction to all intermediate management levels.

(c) In order to minimize the current effects of instability created by officer rotation, a recommendation to have a systems command civilian deputy in the Navy Project Office should be considered. This individual can provide the continuity necessary for a strong and working confidence to be established early. This civilian assistant, acting as a trouble shooter for the Navy Project Manager, can substantially assist in overcoming some of the bureaucratic influences that slow the decision making process as well as Congressional and DOD influences and control that are constantly draining the military manager's time.

(d) A recommendation to improve the salesmanship abilities of the Navy project manager to a level of and in a manner similar to his industry counterpart should be considered. This can be accomplished in part by the possible incorporation of a marketing course in the Naval Postgraduate School's System Acquisition Management curriculum. Additionally the requirement for an industrial marketing course to be taken by all project managers either prior to reporting to

the job or included in the previously mentioned CNM or SysCom sponsored short course for project managers could be attempted. As with the industry counterpart schooled in industrial marketing, a similar education in salesmanship can assist the Navy project manager in selling his program and thus alleviate some of the Congressional/DOD budgetary influences that currently exist. Regardless of what is said, selling is a vital part of the Navy manager's job as a good salesman can get Congress, GAO, DOD, etc. on his side and behind his project.

3. Adverse Problems

(a) The recommendation that only flag rank officers head selected major projects is a particularly important principle to adopt especially during the first critical, formative years of a project. This can provide an objectivity and perspective not available today because a promotion to flag rank would no longer be a stake. A flag rank project manager can deal more effectively with recalcitrant functional shops including those in the office of the Chief of Naval Operations. Thus the influences of management layering, Congressional/DOD control and budgetary pressures might better be dealt with by a project manager who has already achieved flag rank than one who might be overly concerned with making flag rank. Positions of risk and authority could be enhanced as the rank and status would allow a stronger decision making position from the Navy's side that could only increase project effectiveness. Factors discussed in this paper such

as promotion, career field and recognition would be enhanced by the importance DOD would be attaching to project management by making the key individual in each project a flag rank officer,

(b) Another recommendation is that, no matter how the project's budget may be structured, sufficient funds for project team travel and communication must always be maintained. The contact and information gained through both project officer and team travel to their counterpart's site is invaluable. By insuring the small amount of dollars is available for this type of communication, project teams in both government and industry can work more closely in order to adapt successfully to the many obstacles discussed in this paper.

(c) A recommendation to charter the Navy project manager earlier than at present, perhaps in the concept formulation stage while doing mission feasibility studies, might be a worthwhile undertaking. It is not even necessary for him to be formally designated a project manager but rather it is vital that the prospective initial project manager be there early in the project's life as is his civilian counterpart who is in his company and usually involved in project development well before actually becoming a project manager. The additional background this would give to the Navy manager would aid him substantially as the project progresses in selling his program and representing its merits to the Congress, DOD, and other layers of management.

(d) The recognition factor can be enhanced if the current WSAM directives are carried out and actively supported throughout DOD. More career recognition for the project manager's profession would permit career planning starting early in the manager's career and allow the necessary exposure to both the military and civilian sides of the process. Tangible recognition of the worth of what they are accomplishing directly influences job satisfaction. That recognition for project managers in its simplest form is promotion and wider career opportunity after the job is done.

C. SUMMARY

The final recommendation is for prospective Navy project managers and includes the summarized thoughts of today's project managers and the many acquisition experts interviewed during the research portion of this paper. It regards authority and the adaptation to a job that is influenced by as large and as varied a field of factors as has been presented in this thesis. The project manager must realize that upon accepting this job, he is the responsible and accountable individual--not the Department of Defense, the Defense System Acquisition Review Committee (DSARC), etc. He is going to have to be independent, feel the responsibility and take the authority with honesty, integrity and at times his own personal sacrifice. He is going to have to feel in charge and, while listening to the many levels of management's advice on every decision, make the final decisions himself

and see them through. Although the many recommendations presented above, if adopted, will substantially aid him in his endeavors, it is still the project manager, the individual, who finally determines how he will handle each influence and how effective his project will be. When a project manager exerts authority and makes a decision other levels will be less likely to counter a decisive action that is communicated throughout the project structure. It is when decisions are not made by the project manager that other levels of management are eager to step in--and do so not always for the project's benefit. By learning the bureaucratic system and where the power centers are in advance and interacting with the Congress in a truthful, candid manner, a project manager is more likely to be effective in his project management. Various cults such as ILS, reliability and maintainability, test and evaluation, etc. have existed and will continue to do so in the acquisition of major weapons systems. It is up to the project manager to keep his focus on the end product--a successful weapons system delivered complete, tested, and ready (if need be) for war. He must concentrate on what his business really is and not let himself become swallowed by the many distracting influences around him. He must concentrate on making the system work despite "the system." A project manager who has more of the contributing factors such as education, experience, expertise, communications, motivation, recognition in his environment and background is better equipped to accomplish this overall

recommendation. Thus by the incorporation of the previous twelve recommendations, the project manager might be better able to focus his sights on his end product and better able also to overcome the influences that present themselves as obstacles along the path of effective project management. Thus the better educated, more experienced, and skilled manager who is also properly recognized and promoted will also be better able to know when to be innovative, flexible and aggressive. He may have to take his career into his hands when he does so but he recognizes that sometimes it is the only way to succeed. The truly effective project manager can not afford to do otherwise given the inherent complexity of his job.

D. IMPLICATIONS

Many attempts at recommendations for organizational reform are focused only on remedies for defects in the existing system. As Crecine and Fischer (1971) stated, reforms with some hope of success must also consider the positive functional aspects of the existing system as well as its dysfunctional features. It is in this spirit that the recommendations of this section have been made as well as the major portion of the research conducted. The positive as well as the negative influences were studied throughout in order to discover possible areas for change. The majority of recommendations focus on small improvements in areas of major concern rather than complete change or elimination of influences of lesser concern.

It is recognized that all recommendations cannot be instantly implemented without a study of the costs involved. In being objective, some problems can be seen to exist in incorporating some of the recommended areas of reform. While some recommendations such as the increased interaction between industry and military managers will take little more than individual efforts, other changes will take time, additional funding, and possible organizational reform while still others will take only follow-up to presently existing directives. For instance, money is necessary to institute a CNM sponsored course for prospective project managers as well as the incorporation of additional training in the financial areas and industrial marketing. Structural reform might have to occur in order to assign flag rank officers as project managers, have them report directly to the Systems Commander, or to initiate the civilian deputy as the Navy project manager's prime trouble shooter and continuity link. Time and follow-through are necessary in order to see the recommendations for total grooming of the Navy project manager, four to five year rotation, and the recognition of the WSAM career to become a reality. Chartering of the prospective project manager earlier as well as opposite environment experience are presently possible with only minor cost increases. Each recommendation is thought to have merit in that each could positively benefit the project manager thus the project itself in coping with the environmental influences of systems acquisition. Each recommendation in itself is a worthy area of study for future research.

APPENDIX A

List of Interviews

Naval Material Command	Systems Acquisition Division (NMAT 023) (NMAT 023A) (NMAT 023B)
Naval Sea Systems Command	Project Manager, CVAN Project (PMS 392) Project Manager, Trident Project (PMS 396) Project Manager, LHA Project (PMS 377) Project Manager, Deep Submergence (PMS 395) Project Manager, Patrol Frigate (PMS 397) Project Manager, Attack Submarine (PMS 393) Project Manager, Aegis Weapons System (PMS 403)
Naval Air Systems Command	Project Manager, Harpoon Project (PMA 258) Project Manager, Cruise Missile Project (PMA 263) Project Manager, Sidewinder Project (PMA 259) Project Manager, P-3 Project (PMA 240)
Strategic System Project Office (PM-1)	Deputy Director SSP (NSPO1)
Naval Plant Representative Office	NAVPRO GEOD Pittsfield, Ma. NAVPRO Lockheed Burbank, Ca. NAVPRO Lockheed Sunnyvale, Ca.

Civilian Industry

DC-10 Program Planner, McDonnell
Douglas Corp.
Aerospace and Marine Systems
Manager, Singer Librascope
Vice-President, Standard Missile
Programs, General Dynamics
Program Manager, Cruise Missile
Guidance Set, McDonnell
Douglas Corp.
Program Manager S-3, Lockheed
Program Manager P-3, Lockheed
Chief Master Scheduler, Lockheed
Manager, L-1011 Program, Lockheed
Vice-President, Advance
Development Projects, Lockheed
Project Manager Coordinator, TRW
Program Planner, FMC Corporation
Project Manager Hughes Aircraft

APPENDIX B

Structured Interview Questions

1. In the interaction between the military project manager and his counterpart in civilian industry, what areas of conflict do you see as most likely to occur?
2. Of those factors external to the project itself (e.g. location, directives, political), which have the most significant impact/effect on project management?
3. What are considered as being the major similarities in the way the military and the civilian project managers perform their jobs?
4. What are considered to be the major differences between the military and civilian project managers?
5. What does the project manager consider the major determinants of project success?
6. What does the project manager consider the greatest obstacles to project management?
7. What incentives (e.g. promotion, career field, job security) are project managers most responsive to?
8. What are the optimum/most suitable qualifications (e.g. education, experience, background) for a successful project manager?
9. In the interaction between the military project manager and his counterpart in civilian industry, what mutual goals do you see as existing?
10. How much contact do you have with your counterpart of counterparts in either the military or in industry? Who is he?

APPENDIX C

STRUCTURED INTERVIEW QUESTIONS

- (1) Of the following factors which influence project management, rank in order of priority the three you consider as having the most impact (positive or negative) on the job of project manager.

(1=most impact; 2=next most; 3=third most)

- | | |
|--|---|
| <input type="checkbox"/> Layering of management | <input type="checkbox"/> Experience of Project Manager |
| <input type="checkbox"/> Budgetary pressures | <input type="checkbox"/> Technical expertise of Project Manager |
| <input type="checkbox"/> Congressional/DOD Influence and control | <input type="checkbox"/> Human skills of Project Manager |
| <input type="checkbox"/> Amount of directives and reports | <input type="checkbox"/> Promotion and career Opportunities |
| <input type="checkbox"/> Direct personal communication | <input type="checkbox"/> Recognition |
| <input type="checkbox"/> Education of Project Manager | <input type="checkbox"/> Rotation of personnel |
| | <input type="checkbox"/> Other |

- (2) Of the factors ranked 1, 2, and 3 in question one above, specifically how does each affect the Project Manager, his work, and his behavior in his job?
- (3) What single factor accounts for the largest amount of the Project Manager's time?
- (4) Do project managers tend to avoid taking risks in making decisions? Why or Why not?
- (5) Using the below scale how close does the project manager's authority match his assigned responsibilities? ()

1	2	3	4	5	6
very close	fairly close	somewhat close	somewhat different	very different	extremely different

- (5a) What affect does this have on project management?

- (6) To what degree does instability created by personnel rotation affect the project? ()

1	2	3	4	5
very much	a good deal	fair amount	small amount	not at all

(6a) Cite specific examples of how this affects the project.

(7) Do you consider the organizational structure of your project office to be adequate? If not, what change would you recommend?

(8) Rate each of the following influence factors on the below scale of 1 to 7 in terms of its contribution to project effectiveness.

1	2	3	4	5	6	7
Very Detri- mental	Detri- mental	Slightly Detri- mental	No Contri- bution	Some Contri- bution	Large Contri- bution	Maximum Positive Contri- bution

- | | |
|---|---|
| <input type="checkbox"/> Layering of management | <input type="checkbox"/> Experience of Project Manager |
| <input type="checkbox"/> Budgetary pressures | <input type="checkbox"/> Technical expertise of P.M. |
| <input type="checkbox"/> Congressional/DOD influence
and control | <input type="checkbox"/> Human skills of Project Manager |
| <input type="checkbox"/> Amount of Directives and reports | <input type="checkbox"/> Promotion and career opportunities |
| <input type="checkbox"/> Direct Personal communication | <input type="checkbox"/> Recognition |
| <input type="checkbox"/> Education of Project Manager | <input type="checkbox"/> Rotation of personnel |

(9) To what degree or extent do each of these factors exist in the Project Manager's environment or background?

1	2	3	4	5
Non- existent	small degree	medium degree	large degree	pervasive

- | | |
|---|---|
| <input type="checkbox"/> Layer of management | <input type="checkbox"/> Experience of Project Manager |
| <input type="checkbox"/> Budgetary pressures | <input type="checkbox"/> Technical expertise of P.M. |
| <input type="checkbox"/> Congressional/DOD influence
and control | <input type="checkbox"/> Human skills of P.M. |
| <input type="checkbox"/> Amount of directives and
reports | <input type="checkbox"/> Promotion and career opportunities |
| <input type="checkbox"/> Direct Personal communication | <input type="checkbox"/> Recognition |
| <input type="checkbox"/> Education of Project Manager | <input type="checkbox"/> Rotation of personnel |

(10) Rate on a scale of 1 to 5 each of these factors as to whether you consider any change or modification possible in order to improve project performance.

1	2	3	4	5
not changeable	Possible change	some chance of change	probable change	good candidate for change

- | | |
|---|--|
| <input type="checkbox"/> Layering of management | <input type="checkbox"/> Experience of Project Manager |
| <input type="checkbox"/> Budgetary pressures | <input type="checkbox"/> Technical expertise of P.M. |
| <input type="checkbox"/> Congressional/DOD influence
and control | <input type="checkbox"/> Human skills of Project Manager |
| <input type="checkbox"/> Amount of directives and reports | <input type="checkbox"/> Promotion and career
opportunities |
| <input type="checkbox"/> Direct Personal communication | <input type="checkbox"/> Recognition |
| <input type="checkbox"/> Education of Project Manager | <input type="checkbox"/> Rotation of personnel |

- (11) Of those factors that are either probable or good candidates for change (ranked 4 or 5) in question #10 above, discuss in what ways change or modification in the particular factor is possible that could lead to improved project effectiveness.

APPENDIX D

LIST OF INTERVIEWS CONDUCTED IN CONNECTION WITH
SECTION IV OF THE THESIS AND THE STRUCTURED
INTERVIEW QUESTIONS OF APPENDIX C

NAVAL SEA SYSTEMS COMMAND	Project Manager CVAN Project (PMS 392) Project Manager Trident Project (PMS 396) Project Manager LHA Project (PMS 377) Project Manager Attack Submarine (PMS 393) Project Manager DD 963 (PMS 389) Project Manager SM-2 (PMS 403) Project Manager HEL (PMS 405) Project Manager MK48 (PMS 402) Project Manager Adv. Lightweight Torpedo (PMS 406)
NAVAL AIR SYSTEMS COMMAND	Project Manager Harpoon Project (PMA 258) Project Manager P-3 Project (PMA 240) Project Manager S-3A Project (PMA 244) Project Manager A-7 Project (PMA 235) Project Manager VAST (PMA 238) Deputy Commander Plans and Programs Project Manager E-2/C-2 (PMA 231)
CIVILIAN INDUSTRY	Project Manager FFG - Bath Ironworks Plans and Programs Director DD 963 - Litton Project Coordinator - Polaris/ Poseidon/Trident Westinghouse Senior Vice President Northrop Corporation Director Policy & Planning Boeing Company

CIVILIAN INDUSTRY
(continued)

Corporate Planning Director
Lockheed
Project Manager S-3A Lockheed
Vice President, SMS General
Dynamics
Program Manager P-3 Lockheed
Program Coordinator Huges
Aircraft
Project Manager FFG Sperry
Systems Division,
Sperry Rand Corporation
President Hazeltine Corporation

BIBLIOGRAPHY

- Baumgartner, John Stanley, Project Management, Homewood, Illinois: Richard Irwin, 1963.
- Baumgartner, John Stanley, "Project/Program Management: A Career with Visibility," Defense Management Journal, p. 49-52, October 1974.
- Chapman, Richard L., Project Management in NASA, Washington, D.C.: Scientific and Technical Information Office, NASA, 1973.
- Christian, Donald, "Cutting the Frills and the Costs," IEEE Spectrum, p. 506-507, January 1974.
- Cleland, David I., "Why Project Management?," Business Horizons, p. 82, Winter 1964.
- Cleland, David I., and King, William R., Management: A Systems Approach, New York: McGraw-Hill, 1972.
- Cleland, David I., and King, William R., Systems Analysis and Project Management, New York: McGraw-Hill, 1968.
- dePoix, Vincent P., Vice Adm. USN, "Concepts for Improving Defense Management," Defense Management Journal, p. 36-40, Spring 1971.
- Drucker, Peter F., The Practice of Management, New York: Harper and Row, 1954.
- Featherston, Frank H., "The Business of Project Management," Naval Institute Proceedings, p. 23-29, January 1972.
- Fitzhugh, Gilbert W., Chairman of Blue Ribbon Defense Panel, Report to the President and the Secretary of Defense on the Department of Defense, Washington, D.C.: U.S. Government Printing Office, 1 July 1970.
- Fox, J. Ronald, Arming America, Boston: Division of Research, Graduate School of Business Administration, Harvard University, 1974.
- Gaddis, Paul O., "The Project Manager," Harvard Business Review, v. 37 no. 3, p. 89-97, May-June 1959.

- Gemmill, Gary and Wilemon, David L., "The Power Spectrum in Project Management," Sloan Management Review, Fall 1970.
- Grusky, Oscar and Miller, George A. ed, The Sociology of Organizations, New York: The Free Press, 1970.
- Gwinn, William P., Project Management, paper presented at Industry Advisory Council, Washington, D.C., 13 February 1971.
- Hayward, John T., "Program Managers?," Government Executive, p. 12-13, January 1975.
- "Introduction to Military Program Management," LMI TASK 69-28, Logistics Management Institute, Washington, D.C., March 1971.
- Lee, Lamar and Dobler, Donald W., Purchasing and Materials Management, New York: McGraw-Hill, 1971.
- McGregor, Douglas, The Professional Manager, New York: McGraw-Hill, 1967.
- McGuire, E. Perkins, Chairman of the Commission on Government Procurement, Report of the Commission on Government Procurement, Washington, D.C: U.S. Government Printing Office, 31 December 1972.
- Mintzberg, Henry, "The Manager's Job: Folklore and Fact," Harvard Business Review, v. 53, no. 4, p. July-August 1975.
- Murphy, David Charles, Baker, Bruce N., and Fisher, Dalmar, Determinants of Project Success, Chestnut Hill Massachusetts: School of Management Boston College, 1974.
- Peck, Merton J. and Scherer, Frederic, M., The Weapons Acquisition Process: An Economic Analysis, Boston: Graduate School of Business Administration, Harvard University, 1962.
- Ramo, Simon, "Management of Government Programs," Harvard Business Review, v. 43, no. 4, p. 6-13, July-August 1965.
- Reich, Eli T., Vice Adm. USN, "The Process of Acquiring Major Weapons Systems," Defense Management Journal, p. 32-35, Spring 1971.
- Sapolsky, Harvey M., The Polaris System Development, Cambridge Massachusetts: Harvard University Press, 1972.

- Shillito, Barry J., "Management of Major Weapons System Acquisition," Defense Industry Bulletin, p. 2-5, January 1970,
- Siegel, Sidney, Nonparametric Statistics, New York: McGraw-Hill, 1956.
- Steiner, George A. and Ryan, William G., Industrial Project Management, Columbia University: The MacMillan Company, 1968.
- Stewart, John M., "Making Project Management Work," Business Horizons, Fall 1965.
- Stormo, Douglas D. and Heite, James R., A Comparative Study of the Functional Relationship Between the Air Force Plant Representative Office and the Systems Program Office in Defense System Acquisition, Thesis, Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio, 1972.
- "The Program Manager - Authority and Responsibilities," LMI TASK 72-6, Logistics Management Institute, Washington, D.C., August 1972.

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