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THESIS

THE ROLE OF THE PROJECT MANAGER
AND PROJECT ORGANIZATION IN
TURKISH NAVAL WEAPON SYSTEM ACQUISITION

by

Erdal Toprakhisar

December 1979

Thesis Advisor: J. W. Creighton

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Abstract (cont.)

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The Role of the Project Manager and Project Organization in Turkish Naval Weapon System Acquisition

by

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Submitted in partial fulfillment of the
requirements for the degree of

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December 1979

ABSTRACT

This thesis addresses some of the many issues associated with the role of the project manager in weapon systems acquisition for the Turkish Navy. Three different project manager organizations are examined: Functional, Project and Matrix. The interrelationship of many government agencies are considered and major tasks are defined. The Project Manager's participation in the weapon system acquisition and his staff's organization are presented. Finally, the specific program office organization, program coordinator structure is developed that would be implemented in the Turkish Navy.

ACKNOWLEDGEMENT

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TABLE OF CONTENTS

LIST OF FIGURES

I. INTRODUCTION

A. GENERAL

The complexity of a project or the reality of day-to-day job pressures, often cause organizations and their managers to concentrate on the present, ignore the past and let tomorrow take care of itself. Organizations and their managers who yield to this approach, however, are not exercising their leadership to its fullest potential. Behaviorally and psychologically, management should be oriented toward the future; carving time out of the present for service tomorrow (1:267). Some managers tend to neglect planning becuase they are too busy in the present striving for immediate rewards or avoiding reprimands.

Major projects represent an extensive capital investment in material and human effort. Experience indicates that, even with "good" planning, major cost over-runs and considerable delays of these projects are not uncommon. An even more embarrassing and less excusable occurrence on such projects is the inability to fully utilize the products upon their completion.

In the past ten years, there have been major efforts to try to get a grasp on weapon system acquisition processes, costs, and risks. There has been considerable sucess in both areas in the Turkish Navy. The author is concerned that the approach to solving each of the individual problems

which arose was perhaps too "piecemeal." Each problem was addressed with a "tailored solution" which, in fact, did tend to reduce cost in a specific area and did frequently reduce risk of non-completion at the same time. This is an all too common phenomenen, not caused solely by lack of technical knowledge nor the irresponsible attitude of individuals, but also by a variety of other factors. It is time to step back and assess the overall acquisition processes and organization of the Turkish Navy to reduce the effects of this phenomenon.

B. PURPOSE

The purpose of this research is to identify some of the key elements involved in the weapon system acquisition process and the Project Manager's organizational structure in the Turkish Navy. In this unique situation, understanding the complexity of the problem, the resource requirements (human and materials), the constraints (budget, time, environment, etc.), and coordination of the acquisition process is of great importance.

Long range planning is a key factor for the success of any complex and multi-faceted project, requiring a systematic method of anticipating future conditions and coordinating the utilization of resources in a manner which enhances achievement of established goals and objectives. The objective is "efficient project manager organization in the weapon acquisition process" within a certain time allotment.

To reach this objective, major decision points must be reached throughout the process for the weapon acquisition cycle in the Turkish Navy.

This work will explain briefly the acquisition process, a proposed organizational structure, and coordination and relationship techniques employed to satisfy the goal of a sucessful weapon system acquisition process in the Navy.

Heavy emphasis is placed on the organizational structure and its functions for sucessful management of the projects. Certain observations and recommendations are presented that may be helpful to the commander and executives for strategic planning, to managers for timely planning and to project teams for overall control and coordination of the program.

The author emphasizes that this thesis is not a planning document and it certainly is not a comprehensive guide for project manager organization. Due to the sensitivity of the classified materials, this report should be considered as a conceptual approach to the tasks which should be performed.

C. THESIS STRUCTURE

This thesis study consists of six chapters. Chapters I and II give a general idea of the thesis, background of the Turkish acquisition process and the present organizational structure noting the advantages and disadvantages within such a system to achieve the objectives of the Turkish Navy. Chapter V is related to the project manager organization and staffing aspect of the acquisition process.

Finally, Chapter VI is a recommendation for the solution of the organizational problem in the Turkish Navy.

II. HISTORY AND PRESENT ACQUISITION TYPES

The environment generally consists of the physical (i.e., location, climate) and the social or cultural traditions. Every organization has great influence on its environment as well as being influenced by the environment. As organizations become larger, the interaction between the environment and the organization becomes more significant and, in fact, the organization and environment begin to affect and modify each other.

Big organizations such as the Turkish Navy have been influenced by the Turkish environment for centuries. Besides influencing the organizational structure, the environment has been influencing the Navy's major objective and mission.

The Turkish Navy has approximately a 1000 year background prior to the present Turkish Republic, under various governmental nomenclatures such as the Ottoman Empire. The Turkish Navy had its own unique acquisition process and organization before it became a NATO member in 1954. This was not the same as the present acquisition process. After World War II, technology started growing rapidly in the Western European countries and the U.S.A. and their weapon systems became more and more sophisticated. Rapid changes in technology were not at the same rate in Turkey during this period.

An increase in weapon system technology throughout the world simultaneously caused an increase in NATO needs. The Turkish Navy could not meet NATO needs adequately because of a low technology level within their weapon systems and also because of a lack of qualified engineers, managers and labor. Automatically the Navy's acquisition policy and organizational structure started to change in response to the changing situations without any deliberate planning. The Turkish Navy then had difficulties meeting their objectives and missions; the major missions being:

1. provision of equal or more extensive power against the external threat
2. to maintain a high contribution for NATO according to NATO strategic policy.

Difficulties on meeting the objectives were not too painful during the time period 1954-1974 until the Cypress Operation in 1974. The cost of the Cypress War caused serious budget problems for the government and all the governmental agencies. Besides this unexpected expenditure all the fundamental raw material prices increased (oil, steel, uranium, etc.).

It then became urgent to cut down the cost of acquisition and the Navy decided to change the balance from international acquisition to other acquisition processes which are listed below.

A. DEVELOPING NEW WEAPON SYSTEMS

As was mentioned earlier, the Turkish Navy does not have a sophisticated technology, so acquisition of high technology

weapons was negligible until recently. Now the development of new weapon systems is becoming more important because of budget constraints. Funds for the armed forces are about 52% of the National Budget. The author would like to discuss in two different categories the development of new weapon systems:

a. the military-industrial complex

b. technology transfer.

1. The Military-Industrial Complex

Turkish Naval shipyards have quite a sophisticated technology level in comparison to other private and governmental industrial areas in Turkey. A situation primarily evolving from the Turkish Naval relations with other nation's Navies that has improved the circumstance. Because of military security reasons the Turkish Navy wants to accomplish all projects in the military complex with present facilities or with assistance from the other NATO nation's naval facilities. The Turkish Navy has a tendency to perform research and development with naval engineers and produce in its own military complex. The most common attitude in the upper-level military is,

> "Defense is a unique business operation. The military-industrial complex must achieve economic efficiency while simultaneously maintaining a strong mobilization capability and a significant research and development base."

With this unique idea in mind, the Turkish Navy depended upon individual engineers efforts and was limited by the shipyards facilities over a long period of time.

Then the Turkish Navy realized that the shipyards capacities and facilities could not meet the objectives properly.

To work with the other NATO countries together within the Turkish military-industrial complex became important, especially in research and development. Engineering and partially finished equipment imported from Germany were largely instrumental in an increase of achieved objectives.

2. Technology Transfer

Assistance from other NATO countries for the military complex still was not sufficient. In order to increase research and development facilities in the military complex the Turkish Navy turned to the private sector within the nation for technology.

What is the concept of transferring private technology to the military? There are many definitions used by U.S. government agencies:

> "...The process by which existing research knowledge is transferred operationally into useful processes, products, or programs that fulfill actual or potential public or private needs...In some cases (such as for defense) technology transfer is the process of employing a technology for purposes other then that for which it was developed" (14:5).

This exposure to private industry is quite innovative for the Turkish Navy. It consists of a small portion of total acquisition, but it parallels the present U.S. acquisition process in its relationship with subcontractors.

B. DONATIONS FROM NATO COUNTRIES

Acquisition through donation was most common in Turkey until 1974; basically, used and unsophisticated weapon

systems are available for free or at a discounted rate of exchange. This kind of acquisition was very common from the U.S.A. Under it, the Turkish Navy had no choice and could not comment on the system which contributed to meet NATO's mission at a low level.

C. INTERNATIONAL ACQUISITION

Basically, acquisition from other nations consists of buying weapon systems from NATO countires to meet Turkish Naval needs and missions. All of the weapon systems which are available to purchase are pretested and have proper specification/capacity standards according to NATO RIS.

All the specifications of the system are known by the Navy in advance; so the only important point is to match up the needs and negotiate for this type of system.

D. ORGANIZATION STRUCTURE AND ORGANIZATIONAL PROBLEMS

The Turkish Navy is a small Navy in comparison to the United States Navy, but it is a medium size Navy in the world. To meet their missions, the Turkish Navy has a traditional organizational structure, like a general military structure which consists of strategic geographic regions, fleet, and facilities. The present Turkish Naval organizational structure is presented in Figure 1.

As can be seen, there is no Program/Project Organization attached to the Navy's organizational structure. Therefore, all the acquisitions including a multi-billion dollar acquisition is managed by a temporary project manager who

TURKISH NAVY PRESENT ORGANIZATIONAL STRUCTURE

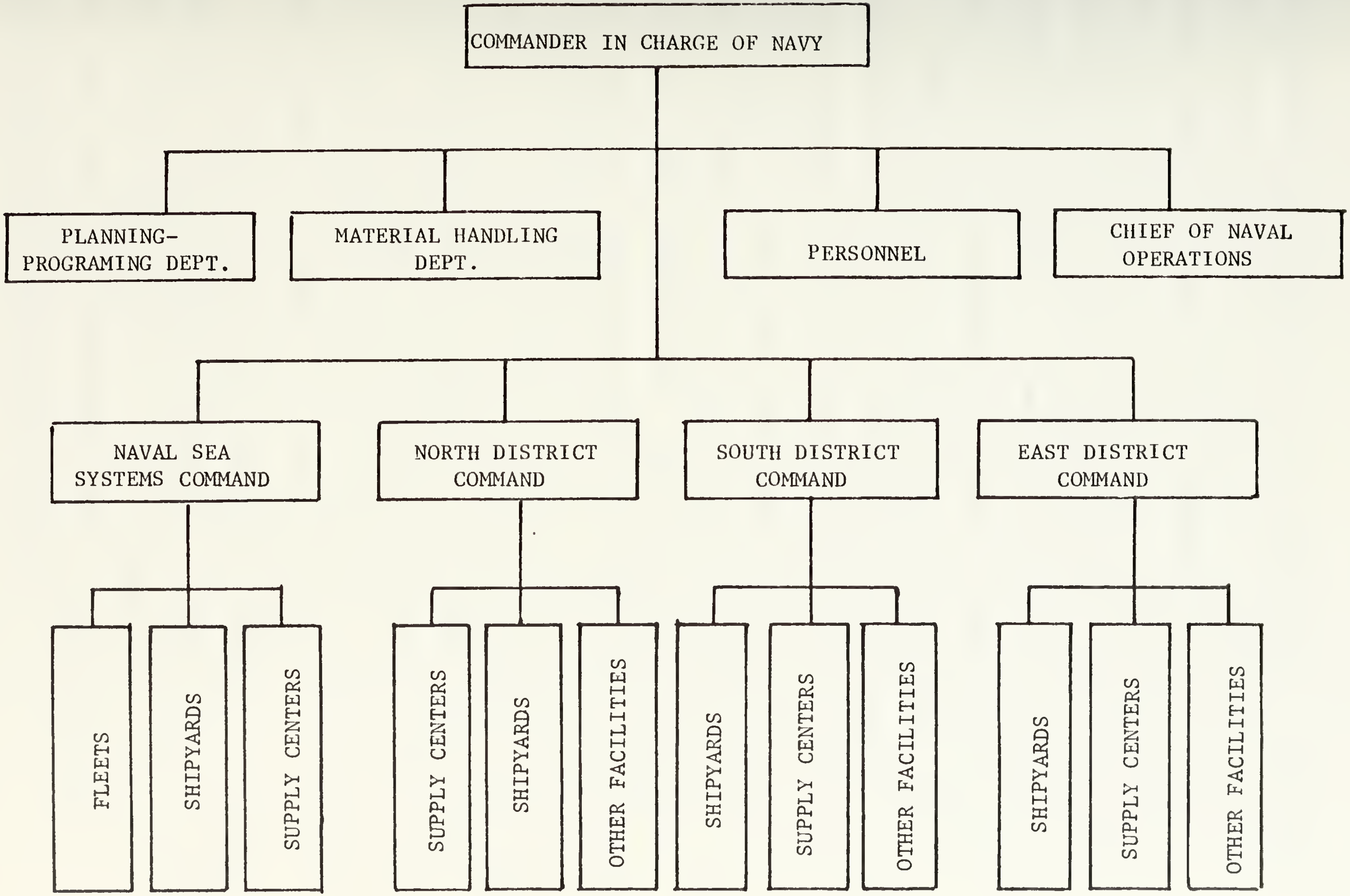


FIGURE 1

individually establishes his own organization. Sometimes the project manager was an engineer of a shipyard or the senior officer of the region. Especially for the international and/or donation acquisition, the project manager has been a Turkish Naval attache with his staff in a particular NATO country. Generally, the program manager has been one of the commanders in charge of the Navy's staff.

Nonexistence of a centralized program manager and organization has left the temporary project managers by themsleves without enough functional support during the acquisition cycle. Also, each individual project manager has had a different organization, primarily functional for his project. They created their own acquisition procedures which were not considered proper procedure for acquisition in meeting the requirements for cost and completion dates. Over a period of years different project managers would use various acquisition procedures for the same type of acquisition. Due to this practice the shipyards and other naval facilities could not function efficiently and had failures particularily in regards to life-cycle cost.

The author has suffered from this situation. He would, therefore, like to present possible solutions for the Turkish Navy for the rearrangement of the organization. The suggestions involve the technology level, qualified labor, culture and other environmental factors.

III. RESEARCH METHODOLOGY

In August 1979, the subject of "Project Manager Organization" was still vague in the mind of the author when first discussed with the prospective thesis advisors. My advisor elaborated on the planning aspect of the subject and pointed out that the research could have far-reaching, practical application to the successful program/project manager and organization.

After more discussion with the other professors and further refinement of the topic, the following research methodology was adopted.

A. LITERATURE SEARCH

There is a large amount of literature and many research studies available for every chapter and section of this thesis. The author's continuous battle has been to contain such a broad subject to a manageable size. The understanding of the role of a weapon system acquisition project manager and his organization is a unique task by itself. However, for further discussion in the following chapters about project manager organizations, search and reviews concentrated on: Webber, Ross A., Management, Richard D. Irwin, Inc., 1975; Fox, J. Ronald, How the United States Buys Weapons, Harvard University, Boston, 1974; and Baumgartner, John S., Project Management, first edition, Richard D. Irwin, Inc., 1963. The purpose of this search was to explore organization

types for the project manager such as: functional, project, matrix and the advantages versus the disadvantages of the organizational structure. Also, for the implementation of the proposed organization and its function, search on the topics of the project manager staffing, project control, coordination and responsibility distribution in the military organization, was obtained from Cleland, David L. and King, William R., Systems Analysis and Project Management, McGraw-Hill Book Company, 1975.

Proper logistic support is a prime consideration for the success of any system, and its importance is emphasized in Appendix A. Hence, a study of Integrated Logistics Systems (I.L.S.) began from Blanchard, S. Benjamin, Logistics Engineering and Management, Prentice-Hall, Inc., 1974, and the elements of I.L.S.: personnel and training, facilities, supply support, transportation and handling, test and support equipment and technical data were identified.

B. VISITS AND INTERVIEWS

Personnel with extensive background in the subject and those with previous experience on the project manager organizations were the target of this effort. After some study, plans were made to visit some of the individuals who had experience in this field and some of the facilities of the similar function. Noted officials were interviewed during the visits and considerable insight was gained from their views and expertise. More than ten professors who had experience and background on the related subjects of:

planning logistics and organizational development were interviewed. Those individuals and locations visited were:

Director, Special Projects, Hewlett-Packard, Palo Alto, California: "Accountability and responsibility in the Matrix organization."

Operational Research and Administrative Science Department professors, United States Naval Postgraduate School, Monterey, California:

David N. Burt - "Recommendations for the Turkish Navy Project Manager and its Organization."

LCDR David Lamm - "Project Manager in the Matrix Organization."

Professor McMaster - "Integrated Logistics Support System."

Turkish Naval Attache, Washington, D.C. - "Turkish Navy's Organizational Problem."

Ex-military officers and businessmen who served overseas or had experience in Turkey - "Advantages and Disadvantages of Proposed Organizations."

Finally, many United States and allied student friends with interest in this subject - "Overall discussion of the thesis."

C. STUDY OF SIMILAR PROJECTS

Further, a search was carried out through the inter-library computer service and also the Defense Logistics Studies Information Exchange (DLSIE). Documentation on previous base development management of NASA organization's structure were obtained and studied, which are:

Project Manager Guide, NCAR PROJECT 77.2, January, 1978, and A.109 - Major System Acquisitions, "System Acquisition Cycle."

D. PERSONAL EXPERIENCE

Personal experience both in the Turkish Navy and overseas has given the author much insight and motivation as to the identification of problems and the importance of this task. He has had more than ten years Navy experience of which more than five years have been spent in responsible positions on ships and within the military-industrial organization in Turkey. Many months of research and extensive interviews with many experts and specialists in this field has given the researcher great insight and reinforced his strong belief and own conviction of the need for positive long-range planning in the Turkish Navy.

IV. PROPOSED ORGANIZATIONS

In recent years, project management has found widespread use in industrial, governmental and public service agencies, as well as volunteer organizations. Specifically, it is being used to manage projects in research and development, construction, computer system implementation, several environmentally-oriented programs, weapon systems procurement in the U.S. Department of Defense and various corporate development programs (6:111).

Three factors account for most of the increasing dependence on project management. First, the problems that contemporary organizations face have become more complex. This in turn has demanded more sophisticated and flexible organizational approaches.

Second, the size and scope of many projects necessitated the development of various management systems for planning and controlling project performance, schedules and budgets. Some of the most powerful management control systems have been developed in project-oriented environments. Without these systems, projects would rapidly evolve into administrative chaos.

The third factor for wide-scale use of project management is that the environments within which contemporary organizations function are becoming increasingly unstable. The accelerated rate of external change and uncertainty that this predicament produces, demands new management approaches which can provide an effective internal response capacity. Most traditional organizations simply are not equipped to achieve the adaptability to cope with rapidly changing, turbulent environments.

In view of the above, there is no one perfect organizational structure for managing projects. But one can assess the feasibility of the various alternatives regarding the Turkish acquisition system policy and volume.

The success or failure of a project is highly dependent upon the quality of the staff and organizational structure that is employed. With this in mind, the methodology that is used is to first examine the characteristics of the various structures in organizational theory and then compare these with the requirements of the project environment. Second, to examine the advantages and the disadvantages of the various types of organizations that are feasible to the

project policy and volume. The proposed project organization and staffing for the Turkish Navy will be presented in Chapter VI.

A. FUNCTIONAL ORGANIZATION

The functional structure is also known as traditional or bureaucratic structure. It is the most common organizational structure in the world today (Figure 2). This is the basic hierarchial structure with top management/commander on the upper level of the chart and middle and lower management spreading out down the pyramid. The organization is usually broken down into different functional departments, such as, engineering, administration, research and financing.

This hierarchieal structure was originally based on such management theories as specialization, line and staff relations, authority and responsibility and span of control (3:46). It is generally considered easier to manage specialists if they are grouped together and if the department head has the same training and expertise in that particular field. A primary characteristic of functional organization is the division of labor into specialized groups. Its strength lies in its centralization of similar resources.

This form of organization has a number of weaknesses. For example, when involved in multiple projects, conflicts may arise over the relative priorities of those projects in competition for resources. Also, the functional departments often place more emphasis on its own specialty than on the overall goals of the organization creating integration and communication problems that hinder the progress of projects.

FUNCTIONAL ORGANIZATION

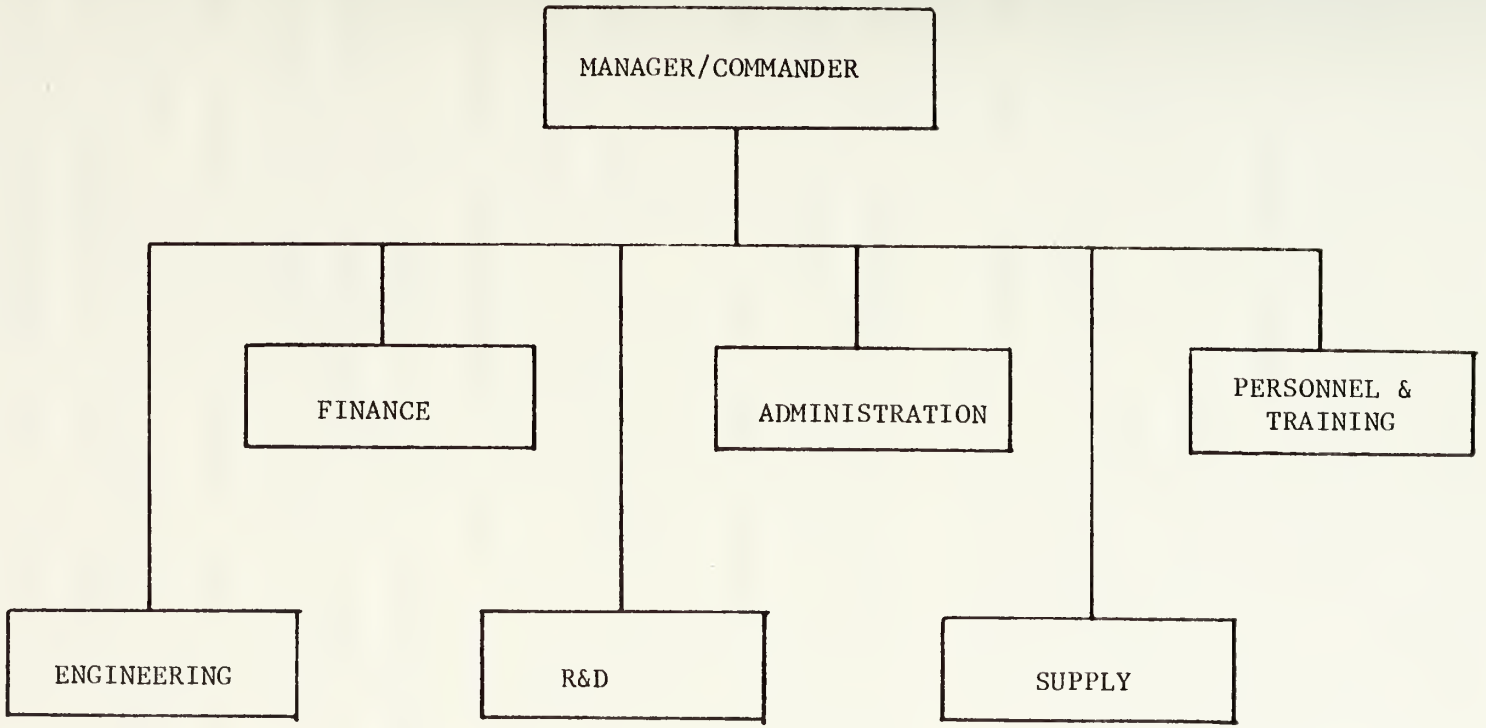


FIGURE 2

B. PROJECT/DEDICATED ORGANIZATION

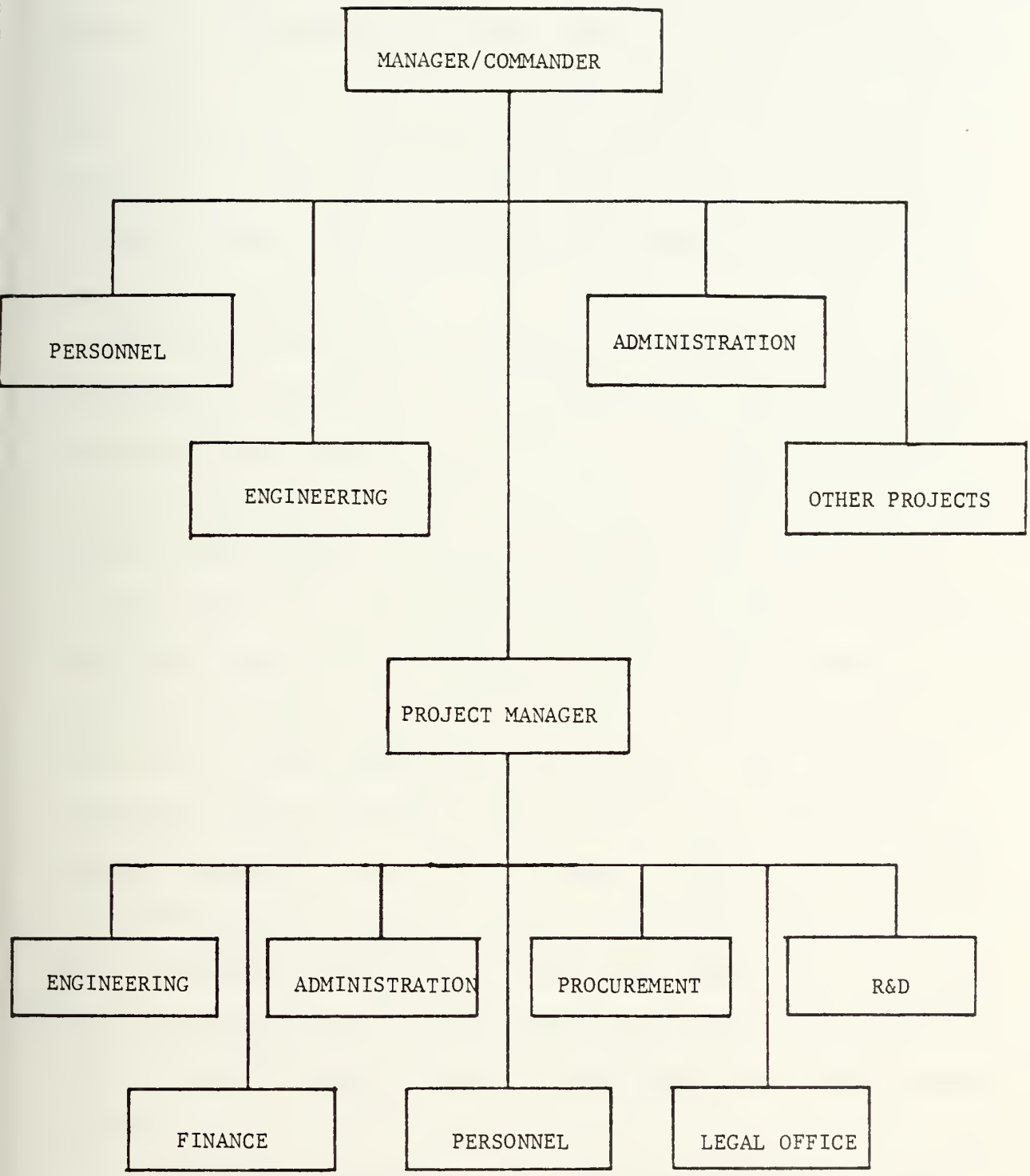
The project structure emphasizes the project rather than the specialized functions. That is, all the resources of the various functional specialists necessary to attain a specific objective are set up in a self-contained unit headed by a program/project manager. This individual is given considerable authority over the project and may acquire resources from inside or outside the overall organization (3:47) (Figure 3). The internal organizational structure or the project organization is functional; that is, the project/program team is separated from the various functional disciplines.

The major advantages of the project organization are the singleness of purpose and the unity of command. Informal communication and clear understanding is effective in a closely knit team. And the program manager has all the personnel resources required under his direct control. The project structure is optimal for very large projects.

The major disadvantage of such an approach is that it requires a large number of full-time personnel. Such an investment may be appropriate for a small number of critically important programs. However, resource limitations preclude the use of the project organization approach for all programs. Thus, for a large-scale program such as development or activation of a naval shipyard or unique weapon acquisition, even though this single purpose project organization may seem suitable for the choice of organizational structure, the personal constraints may preclude such a luxury.

FIGURE 3

PROJECT ORGANIZATION



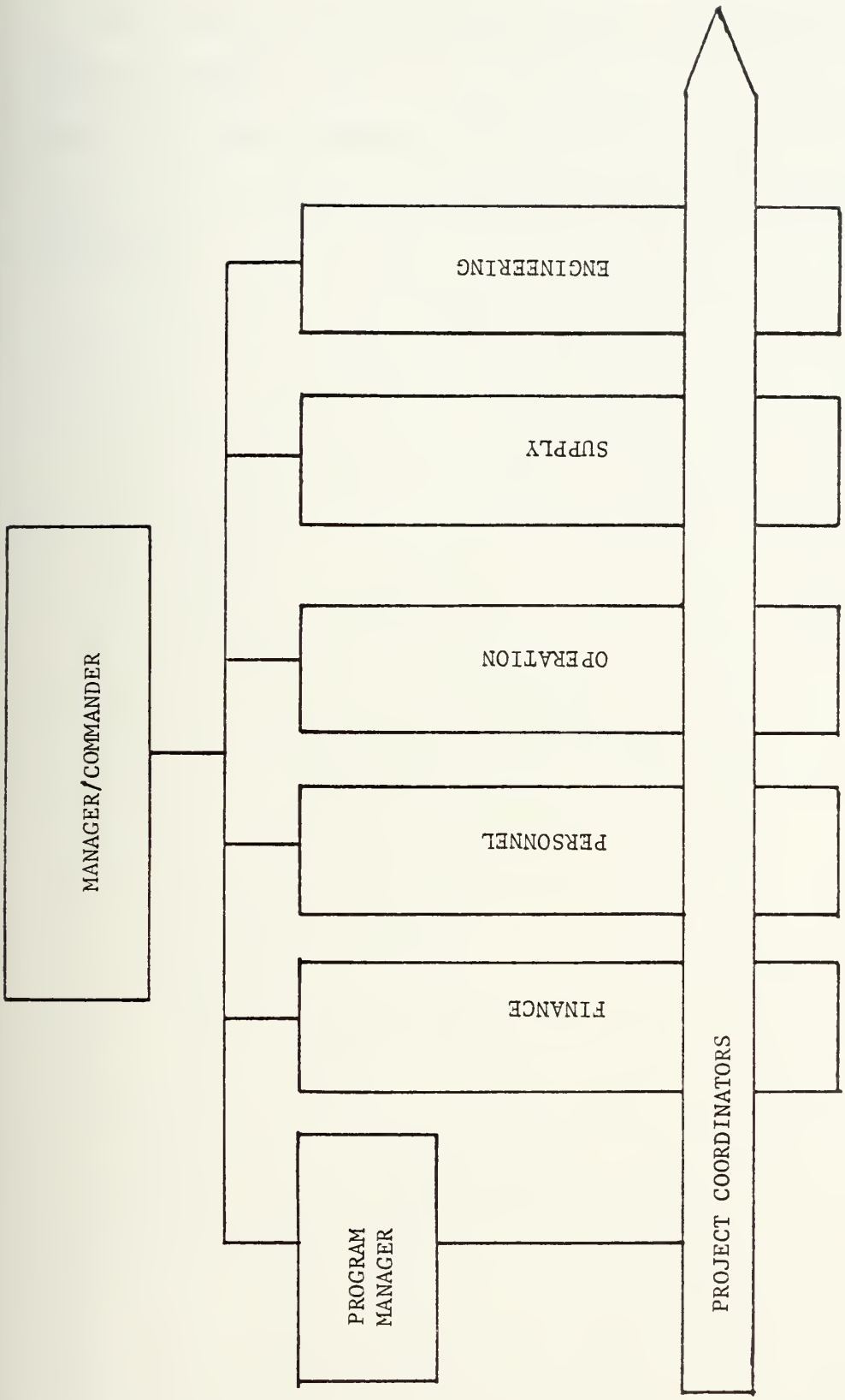
C. MATRIX ORGANIZATION

The matrix structure tries to maximize the strengths and minimize the weaknesses of both the project and the functional structure. It retains the functional specialties and overlays a project organization with a single program manager (Figure 4). The project organization emphasizes completion of the program, while the functional organization pursues the various specialties.

The major benefits of the matrix organization are the balancing of objectives, the coordination across functional department lines and the visibility of the program objectives to the project coordinators. The major disadvantage of this form of organization is that individuals may work for two or more superiors. He reports vertically to his functional department head and horizontally to the program manager. The project/program managers often feel that they have little authority over the functional departments. The functional department head also feels that the project coordinator is interfering in his job. The solution to this problem is the clear definition of roles, responsibility and authority. The coordinator should specify what and when a task is to be done and the functional departments that are responsible for how it should be done. Figure 5 clarifies this relationship (4:347).

Considering the shortage of qualified personnel in the Turkish Navy to plan and direct the acquisition in the Navy, some form of matrix organization may be most appropriate.

FIGURE 4


MANAGER/COMMANDER
ENGINEERING
SUPPLY
OPERATION
PERSONNEL
FINANCE
PROGRAM MANAGER
PROJECT COORDINATORS

Regardless of the organizational structure used, the program management task is by no means an easy one, for the project/program manager relies heavily on his staff to monitor and control the functions of an extremely complex program.

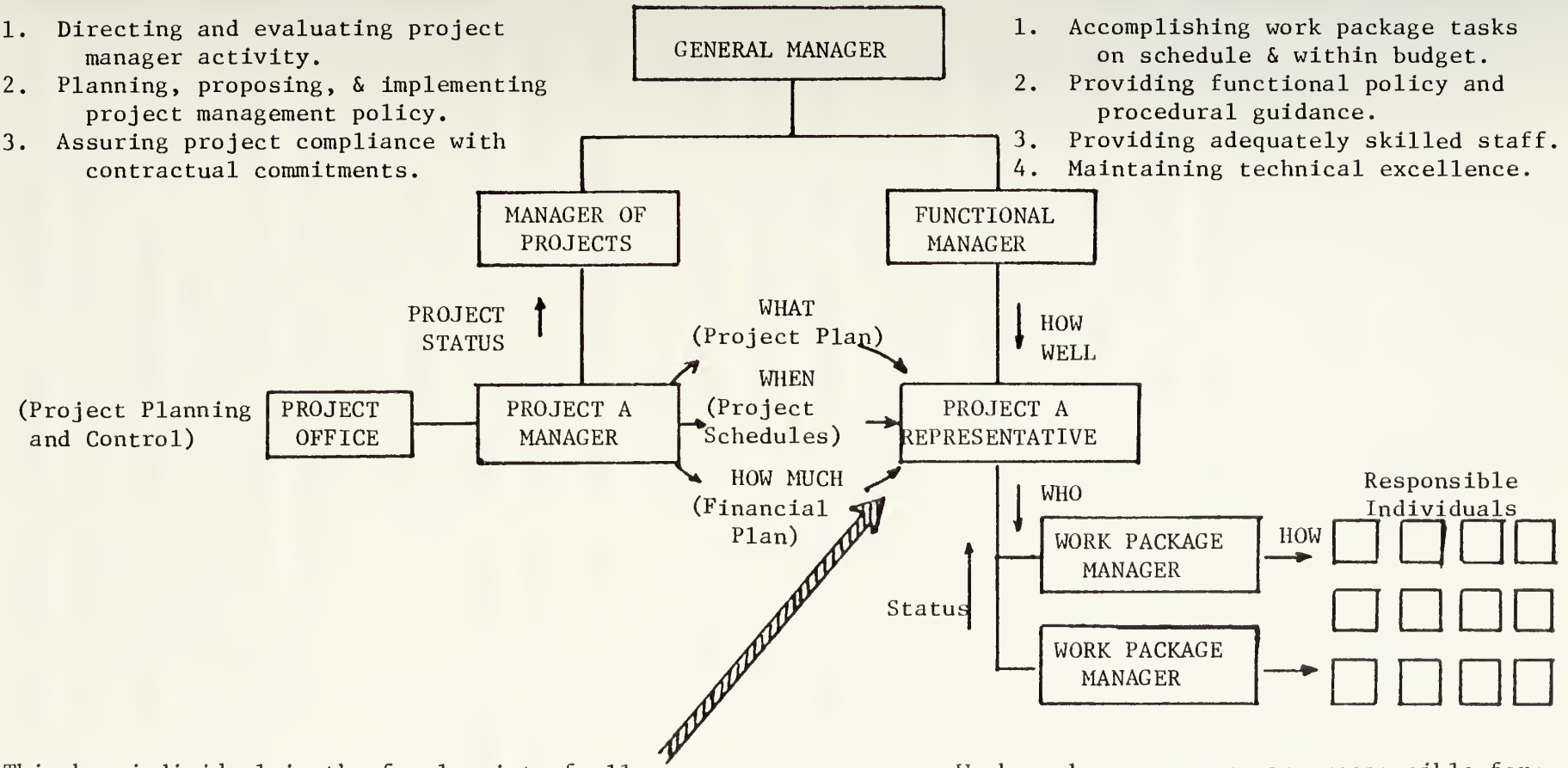
PROJECT-FUNCTIONAL ORGANIZATIONAL INTERFACE

The manager of projects is responsible for:

1. Directing and evaluating project manager activity.
2. Planning, proposing, & implementing project management policy.
3. Assuring project compliance with contractual commitments.

Functional managers are responsible for:

1. Accomplishing work package tasks on schedule & within budget.
2. Providing functional policy and procedural guidance.
3. Providing adequately skilled staff.
4. Maintaining technical excellence.



This key individual is the focal point of all activity on Project A within the functional organization. He is the alter-ego of his supervisor, the functional manager, and performs all sub-functional tasking, & cuts across all sub-functional lines for the total functional effort on Project A. He shall actively plan and control his organization's efforts on the project.

Work package managers are responsible for:

1. Developing & maintaining work package plans for accomplishment.
2. Establishing work package technical guidance.
3. Establishing work package detailed schedule & operating budgets.
4. Controlling & reporting work package performance.

FIGURE 5

Adapted from Management: A Systems Approach, Cleland & King, McGraw-Hill, 1972, p.347

V. PROJECT MANAGER

In the past few decades interest has grown in techniques and approaches for management of temporary projects (in contrast to ongoing operations) in large complex organizations. Thus, project management evolved from the realization that modern organizations are so complex that it is extremely difficult to achieve effective management using traditional organizational structures and relationships based on a vertical flow of authority and responsibility.

Centralized program management was introduced in the United States Department of Defense (DOD) in the 1950's. Before this time, task-oriented management organizations worked on several projects simultaneously (5:169). A distinct departure from traditional management occurred when the Defense Department recognized the need to streamline the acquisition process and introduced the concept of project management. The key person in that management organization is the project manager, normally in the Department of Defense, a senior military officer.

The weapon system acquisition of the Turkish Navy is a notable undertaking and involves a large amount of capital investment. Regarding the life-cycle of the systems, buildings and machinery will be of little or no value in meeting the objectives of the Navy if the absense of other equally important resources prevents their utilization. The

mission requirements can only be met through the integration of trained personnel, supply support, production, maintenance, utility support, transportation and handling, and the completed naval acquisition activities. The optimum utilization of all these resources requires proper control of this investment through an organized and effective management information and decision system. One must appreciate that the total program consists of a number of individual but highly interrelated projects. Completion of any single project requires an organized and dynamic management system that can coordinate the acitivities within that project from beginning to end and meet the desired completion date. Understanding and utilizing the concept of project management is essential to the success of each project and thus to the overall program. Hence, in this section, the general characteristics of project/program management are described, also organization and staffing are discussed.

A. GENERAL CHARACTERISTICS

The terms "program" and "project" frequently are interchanged. To avoid ambiguity in this thesis, it is appropriate to distinguish a "project" from a "program."

> "The project can be best distinguished from a program in terms of scale. Programs generally are larger and more directly related to basic organizational objectives than are projects. Any one program of an organization might be composed of many different projects, which in sum will aid in achieving a specific output-oriented objective of the organization. Programs also may be open-ended in nature, while projects have specific objectives and specific end points (4:184)."

The weapon system acquisition process may be viewed as a major program consisting of several projects. These projects may be grouped as: (1) developing electronics' units in the military-industrial complex; (2) purchasing mechanical units from private companies, or (3) international acquisition of some special unique units. The first group of projects may include: (a) Integrated Logistic Support (I.L.S.) and (b) full-scale production. The second group of projects includes: (a) Request for Proposal (R.F.P.), (b) Advertising/Negotiation, and (c) the Contractor. Finally, the last group of projects consist of (a) Integrated Logistics Support (I.L.S.), (b) Supply Support and (c) Management Information Systems (M.I.S.).

Each of the major projects is a separate but interrelated aspect of the total program. Before further discussion of the subject, one should understand "project/program" and "program manager."

Generally, projects or programs have: (1) an objective that is known and can be specified, (2) a starting date and completion date of the program, (3) actions and activities to accomplish the objective that can be determined in advance, and (4) a desired or required sequence for performing the activities (4:341).

The complexity of major projects have caused revolutionary changes in the fashion in which decisions are implemented. The most striking example of this is the emergence of the "program manager."

The program manager may be defined as that individual who is appointed to accomplish the task of integrating functional and extra organizational efforts directed toward the successful performance of a specific program (4:18). The program manager is faced with a unique set of circumstances with each project and these situations direct his thought and his behavior in achieving the total program-specified goals. The program manager faces a complex managerial activity consisting of a broad spectrum of authority and responsibility.

In Appendix A, the system life-cycle is defined. It is appropriate at this point that a project/program life-cycle be discussed. Figure 6 presents a comparative view of the system life-cycle and the program office life-cycle.

A brief explanation of each phase of a project/program follows:

a. Conceptual Phase:

This is the period in which the idea is conceived and given preliminary evaluation. An idea may originate from basic research, a current organizational problem or an external influence. During this phase, the environment, forecasts, objectives and alternatives are examined and evaluated. There is a first look at performance and cost and time aspects of a project. It is the period in which basic strategies, organization and resource requirements are conceived. Also during this phase, the overall scope and direction of the project will emerge.

b. Definition Phase:

The purpose of the definition phase is to determine, as accurately as possible, the cost, schedule, performance and resource requirements and how they fit together. This phase identifies in more detail what is to be done, how it will be accomplished and how much it will cost. If a contract is necessary it may be awarded during this stage.

c. Production and Acquision Phase:

The system elements are produced/acquired and tested individually and as a total system, using the procedures and standards developed during the preceding phases. This phase involves such things as procurement, personnel training, identification and ordering of long lead-time materials, allocation of authority and responsibility and finalization of the supporting documentations.

d. Operational Phase:

Reaching the operational phase indicates that the system has been tested satisfactorily, proven economical and is ready to be employed toward the attainment of the major goals of the organization. This is the phase in which the results of the efforts taken in earlier phases of the program often come to fruition.

e. Divestment Phase:

In this phase, the "final report" is submitted and the "lessons learned" are most important documents for future projects and should be included in the data base of the organization's Management Information System (M.I.S.).

SYSTEMS LIFE-CYCLE VS PROGRAM OFFICE LIFE-CYCLE

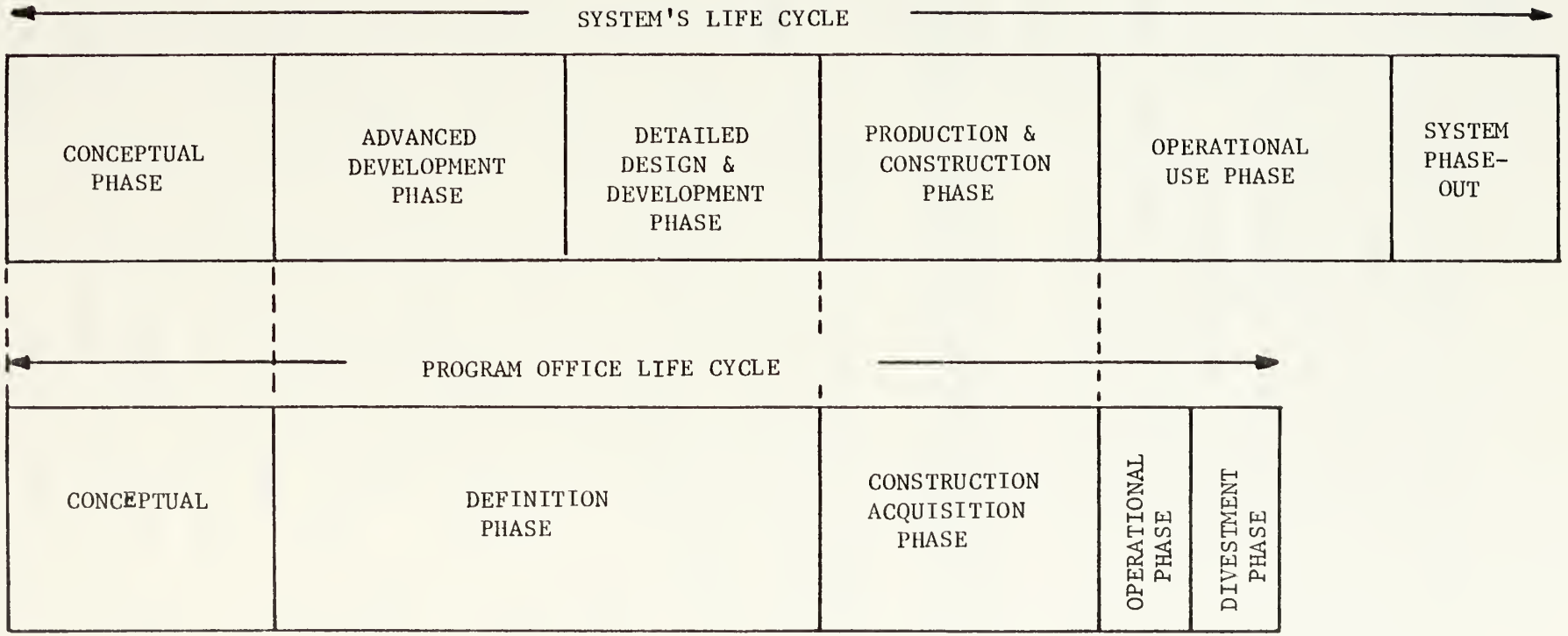


FIGURE 6

B. PROJECT STAFFING

The nature of the program itself will have considerable impact on the kind of staff required. The project team gneerally includes the permanent members of the program office as well as all the functional contributors (coordinators) to the projects. The management functions to be accomplished during completion of the overall program are those necessary to enable the program manager to fulfill his basic responsibility.

> "This encompasses the overall direction and coordination of the program through all of its phases to achieve the desired results with the established budget and schedule (6:112)."

As a general rule, the number of individuals working in the program office under the direct supervision of the program manager should be as small as possible. This emphasizes the responsibility of each functional department for its contribution to the program while retaining the maximum benefits of a specialized work force. It also increases the flexibility of the project staff, reduces cost and allows the program manager to devote maximum effort to the program itself, rather than supervising a large staff. Archibald states that the individuals who should be assigned permanently to the program office are those who: (1) deal with the management aspects of the project; (2) are required on a full-time basis for at least six months; (3) must maintain close contact with the program manager and his staff in the performance of his duty; and (4) cannot otherwise be controlled effectively, due to organizational and geographical considerations (6:57).

Some of the key members of the project team may be: the Program/Project Mnaager, Executive Assistant, Director of Personnel and Training, Director of Logistic Support, Director of Systems Requirements, Director of plans and Programs, Contract Administrator, Program Controller, Program Accountant, Construction Coordinator, Organizational Development Consultant, Community Development Specialist, Purchasing and Subcontractor Coordinator, and Field Project Manager.

Also, the project team includes all the functional contributors to the project, as well as the members of the project office. The basic functions to be carried out during the completion of the overall project are discussed in the following paragraphs.

(1) The management functions are those necessary to enable the project manager to fulfill his basic responsibility. This encompasses the overall direction and coordination of the project through all of its phases to achieve the desired results within the established budget and schedule (2:32).

(2) The system design and development function is to ensure requisite documentation so that the system can be manufactured in the quantity required within the desired cost and schedule. This function is factored into the following sub-functions:

a. The systems analysis, engineering and integration sub-functions which include: system studies; functional analysis and design; and coordination of detailed designs, including mechanical interfaces between components.

b. The system design sub-function which includes the detailed engineering design and development activities required to transfer the functional system designs into specifications and drawings which can be used to manufacture, assemble and test the product.

c. The systems control sub-function which includes systems quality control, using established staff specialists and procedures; system cost control, including value engineering practices; system configuration control practices and documentation control practices (2:33).

The project office in a given situation may perform none, a few, or all of the above system development sub-functions, depending on many factors. Genrally, a major share of these functions are assigned to the project office when the system under consideration is new or unusual to the responsible unit, or when there is little confidence that the work will be accomplished in an efficient manner and on schedule within established engineering departments of the organiation. Except for these situations, the sub-functions are usually the responsibiltiy of project team members within existing engineering departments, under the active coordination of the project manager.

Another basic function within the responsibility of the project manager is that of system manufacture. This function includes purchasing materials and components, fabrication, assembly, test and delivery of the equipment necessary to complete the project. These functions are performed by the

established manufacturing departments within the project's parent organization on a subcontract or purchase order basis.

However, the project manager must coordinate and integrate the manufacturing functions with systems development on one hand and field operation on the other. The lack of proper integration between these areas is the most common cause of project failure (2:34).

In order to achieve this integration, it is imperative to appoint a project manufacturing coordinator who can devote his undividied attention to this area. He is a key project team member and may either be assigned full-time to one project or more, if they are small.

(3) The purchasing and subcontracting function is sometimes included in the manufacturing areas, but is normally important enough to warrant full functional responsibility. In this vein, a separate project purchasing and subcontracting coordinator with equivalent status as the manufacturing coordinator is usually appointed to handle all purchasing and subcontracting matters. As such, he remains part of the purchasing department within the organization so as to maintain day-to-day contact with all persons performing procurement functions (2:34).

Many projects require field installation and test of a system and some include continuing field support for a period of time. In these cases, a field project manager is needed.

VI. IMPLEMENTATION IN THE TURKISH NAVY

A. SUMMARY

This chapter states what was accomplished by the research, interviews and studies in view of the Turkish Navy's organizational problems as addressed in the first two chapters. An attempt is also made, when applicable, to recommend improvements and to point out areas where additional research and study could be accomplished.

The concepts of "program manager and office organization" in the previous chapters of this thesis could be applied to any large-scale program where there exist acute constraints on resources, pre-established rigid objectives and environmental factors. It must be emphasized here that these proposals are considerations to apply to a conceptual program managerial organization for the Turkish Navy and should not be considered as essentially rigid requirements. In the following pages, the special program office organization, program office staff, program manager and program coordinator presented would be implemented for the Turkish Navy to solve its organizational problem.

1. Program Office Organization

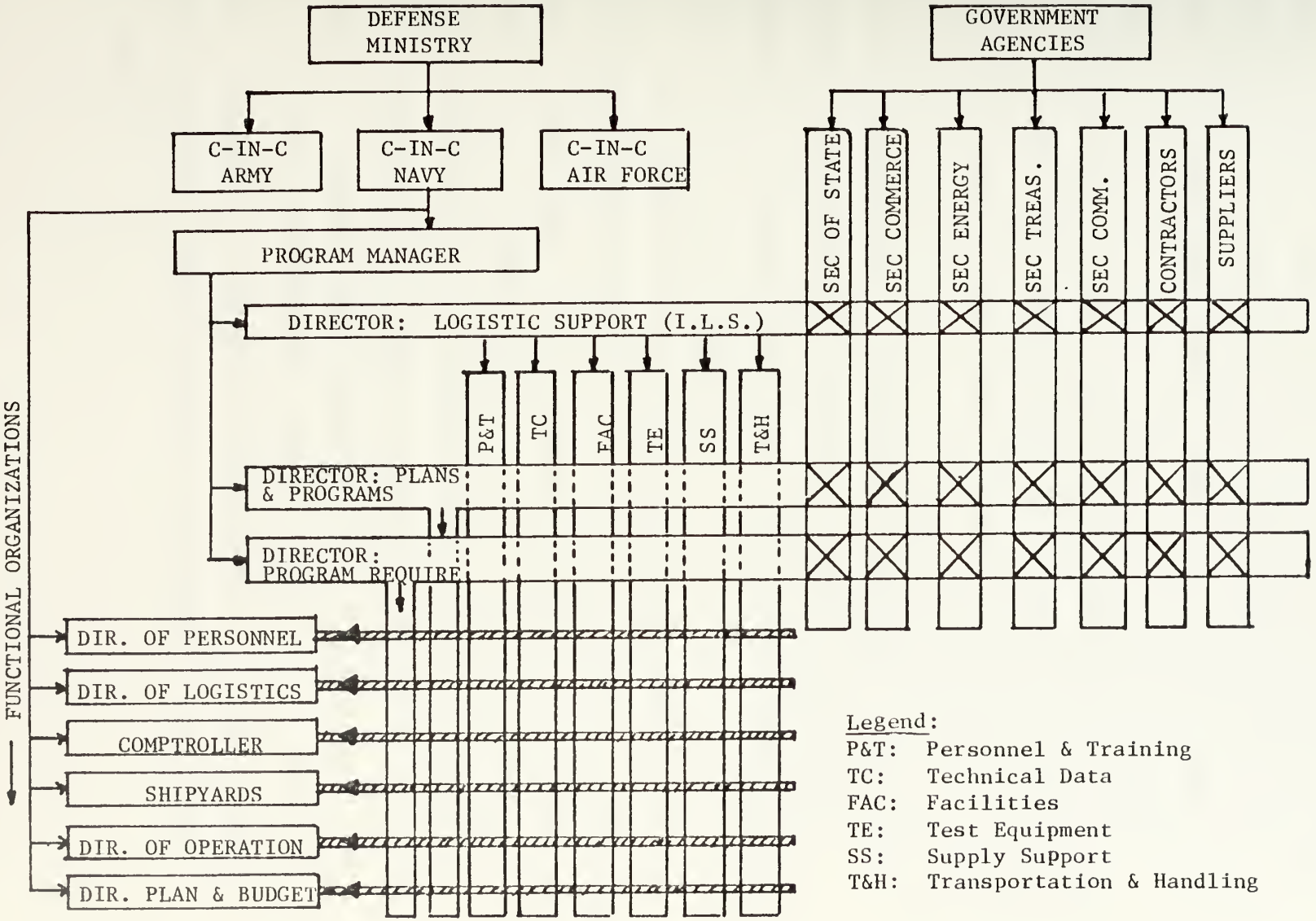
The concepts of three different project manager organizations, a. Functional; b. Project; and c. Matrix, were presented and discussed in Chapter IV. During the research phase of this thesis, the author's personal impression was

"There is no such single perfect or ideal organizational structure for managing all the programs that exist."

The functional, the project and the different matrix structures all have some strengths and weaknesses. These possible strengths and weaknesses could have various weights depending upon the objective of the organizations, complexity of jobs and other factors. With this idea in mind, the final choice should come after weighing several factors, such as: the nature of the task, the needs of the organization, the environment of the program, and the cultural and social behavior of those who are going to participate in the organization. To properly manage such a complex program, an organizational structure should be set up to be able to plan, direct, coordinate and control all the tasks involved to meet the stated objectives. Considering the complexity of the task and the constraints for qualified personnel, a matrix form of organization (as described and discussed in Capter IV) is probably the most suitable for this program office structure with some additional modifications. Figure 7 shows a multi-matrix organizational structure that the author proposes for the Turkish Naval program office.

The Turkish Navy is not an independent organization by itself. Turkish weapon systems acquisition and other naval activities have close relationships with other government agencies. These relationships sometimes affect the Navy's decision, therefore, the multi-matrix organization is proposed to maintain advantageous relationships with the other

PROGRAM OFFICE MULTI-MATRIX ORGANIZATION



Legend:

P&T: Personnel & Training
TC: Technical Data
FAC: Facilities
TE: Test Equipment
SS: Supply Support
T&H: Transportation & Handling

FIGURE 7

governmental agencies. The proposed organization consists of several interfaced matrix organizations:

a. An internal matrix pattern within the program office would provide the interaction between the Director of Plans and Programs, the Director of Program Requirements, the Director of Integrated Logistic Support (I.L.S.), and other managers. This pattern provides the necessary internal information flow for the control and coordination of projects.

b. An external organization in the Navy's organizational base would provide the external organizational format between the Program Office Directors and the Turkish Navy's traditional functional departments (Director of Personnel, Director of Planning and Programming, Director of Naval Operations, Comptroller, Shipyard Facilities, Director of Naval Air Force); which is also a matrix approach.

c. In complex and multi-million dollar projects, the other governmental agencies and ministries plan to coordinate, direct or cooperate in the ongoing projects. To provide this interaction, a second external pattern of a matrix organization is necessary. An external pattern of interactions exists between the Director of Planning and Programs, the Director of Program Requirements, and the Director of I.L.S. and with other governmental agencies such as the Secretary of State, Secretary of Commerce, Secretary of Treasury, Communication Ministry, Energy Ministry, government contractors and suppliers.

Figure 5 basically identifies the accountability and responsibility of management in this matrix organization. When an activity is performed or a decision made, two or more manager/executives could have overlapping authority and responsibility. Sometimes, authority and responsibility could be a problem, when executives of various governmental agencies share common work. But in public opinion, it is a part of bureaucracy.

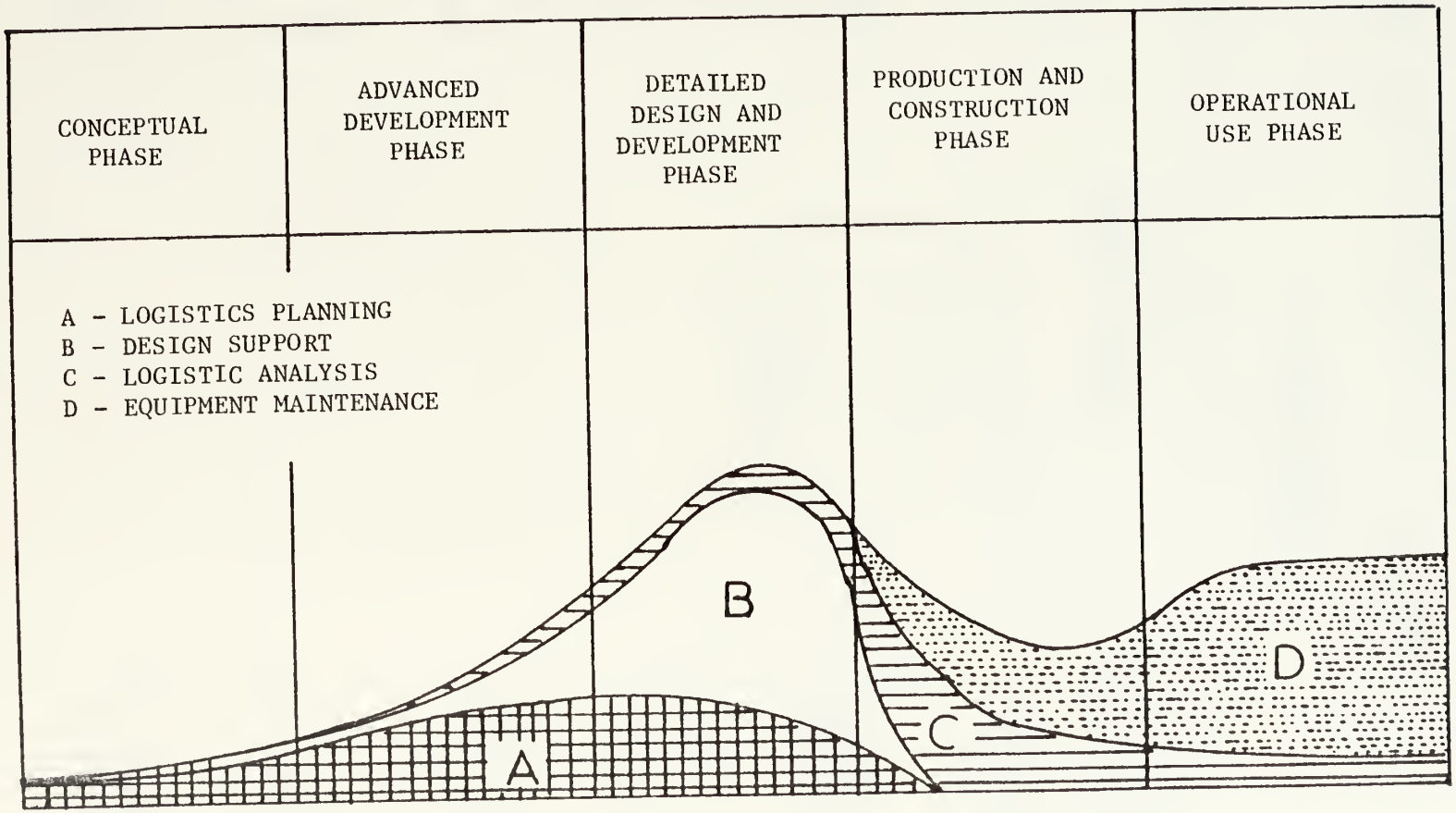
It is recognized that a major program organization and relationship must change as the program matures. That is, major changes occur in the transition phases: from the development phase to prototype, to the acquisition phase and finally the divestment phase. This is not a structural change; this is a staff change, in number skills, to accomplish program responsibilities. Figure 8 shows the number of staff required during the acquisition phases (9:305).

2. Program Office Staff

The program office requires a full-time program manager and sufficient staff to handle a program of such magnitude. The personnel should consist of qualified and experienced management-oriented mixes of generalists and specialists. A proposed program office staff for the Turkish Navy is presented in the Organization Chart, Figure 9. The total recommended staff for this program is 50-60 personnel. The key immediate subordinates to the program manager are:

(1) Executive Assistant; (2) Director of Plans and Programs; (3) Director of Program Requirements; and (4)

SYSTEM LIFE-CYCLE AND TYPICAL MANLOADING CURVES
FOR INTEGRATED LOGISTICS SUPPORT

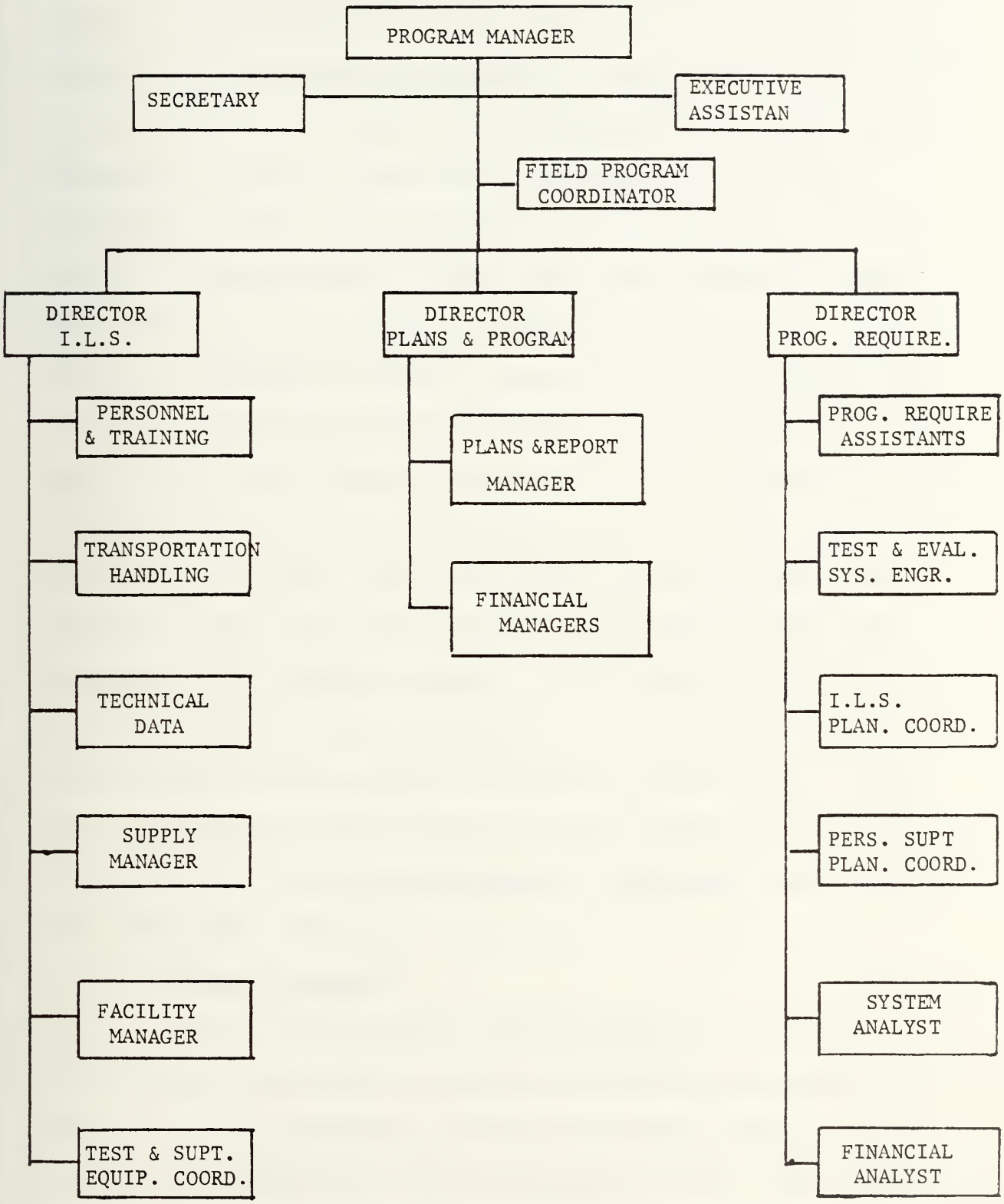


Source: Blancard, Benjamin S., Logistics Engineering & Management, Prentice-Hall, Inc. 1979

FIGURE 8

FIGURE 9

PROGRAM OFFICE STAFF ORGANIZATION



Director of I.L.S. The program office staffs are the unifying agents who coordinate and integrate the interests of various independent organizations towards a common goal. The senior staff, especially, should be comprised of well-experienced, management-oriented individuals who would get involved personally in the planning aspects of the program and not rely on planning staffs or the specialist planners. They may consist of experienced managers, system analysts, cost analysts, schedule analysts, system engineers, program controllers, organizational development specialists, community specialists, etc. There would also be I.L.S. specialists and analysts in the fields of personnel and training, facility construction, supply and procurement, transportation and handling, test and support equipment, technical data and management information systems. It is realized that sufficient qualified talent and specialists may not be available at the required time within the naval organization. Hence, full use should be made of experienced personnel and specialists from other ministries/agencies, contractors and management consultant services.

3. Program Manager

Ideally, the program manager should be a multi-disciplined, experienced manager with sufficient tenure and interest in the program to provide continuity and to accrue personal accountability for his actions (7:10). The initial responsibility of the program manager would be to identify and recruit the staff with the required skills and experience

to manage the assigned task. The organization and the management level of the program should be consistent with the scope and importance of the program. The golden rule in matrix management states, "He who has the gold makes the rules." That is, if the program manager does not control the budget, he would not have full control over the program. A matrix budget assigns resources to the program manager for purchases from the functional departments. Making up such a budget takes careful work during long-range and annual planning. Regular up-dating of plans and budgets are essential for the success of the program (8:52).

The program manager is responsible for program management to include planning, direction, control, integration and coordination of all efforts within the organization. For the program manager to perform his task in a multi-matrix organization as described in the previous section, he must further be prepared to perform the following:

a. identify interfaces between functional departments (e.g., Energy, Commerce, Treasurey, Secretary of State, and other departments within agencies and the Navy program elements;

b. constantly communicate status of interfaces to all concerned;

c. monitor, evaluate and take appropriate actions to ensure the completion of objectives within the interface structure.

The general personal traits may be listed as: flexibility,

d. The program coordinator's main power comes from the approved objectives, plans and budgets for the program. These documents should be used to hold departments to their commitments.

e. It is important that the functional department heads be committed to the plans and schedules for the program.

f. It is usually best to avoid direct conflict with the functional department personnel. Matrix personnel should use their bosses when a situation threatens to get out of hand.

g. It is important to remember that the program coordinator is concerned with "what" is to be done and not "how." A management-by-objectives approach should be used, and unduly close supervision of the functional departments avoided.

h. Most problems arise from the unawareness and uncertainty inherent in the program environment. Careful review, effective communications and continuous planning can help clarification and reduce uncertainty.

B. RECOMMENDATIONS

The author emphasizes that this study for the Turkish Naval organizational need is not a rigid planning document and is not a comprehensive guide for the "Program Manager" concept. Due to the sensitivity of classified materials, the proposed organizational structure and its function in the preceding chapter should be considered as a conceptual approach to the Turkish Navy which primarily should be implemented.

The proposed organizational structure and its functions would cause a tremendous amount of change in the Turkish Navy's present traditional organization. This change in the Turkish Navy to provide more efficient acquisition processes with the proposed organization might be achieved in the next five years.

The following recommendations are submitted by the author for more efficient results:

1. Establish a program office consisting of a high-ranking program manager with a program office staff of qualified individuals. Convince all the staff members that this organizational structure will be implemented under any circumstances. The potential for conflict will be present because of the nature of matrix organizations. Authority and responsibility could be balanced when it is necessary to solve the conflict.

2. Personnel recruitment and training should be seriously considered and programs started without delay.

3. After the organization is established, minor changes would be necessary, as recommended by the program manager.

4. If this appears to be too monumental of an organiational task, WE MUST RELY ON ALLAH/GOD!

APPENDIX A. SYSTEM LIFE-CYCLE

The system life-cycle may be said to originate in the preception of a need and terminate with disposal of the system. Between the two end-points of a system's life, there are a number of phases. Some of the phases have a close relationship with the major system acquisition process. Therefore, before a system life-cycle discussion, it is important to explain the major system acquisition cycle.

A. MAJOR SYSTEM ACQUISITION CYCLE

Each major system acquisition program has its unique features; no two are identical. Differences in time, cost, technology, management and contracting approach must be recognized. However, despite the differences, the basic acquisition process is common to all programs. Figure 10 illustrates the basic process or cycle, with the boxes describing the types of activities involved, and the numbered circles indicating the major decision points requiring agency head approval (10:5).

A mission Analysis Model is shown in Figure 11; included are examples of parameters of concern in key activities (13:12). Exploration of alternative system process in Figure 12, and the Construction Acquisition Process in Figure 13 are presented.

B. SYSTEM LIFE-CYCLE

A system/project in the dynamic sense must be considered throughout its life-cycle or the so-called "cradle-to-grave"

viewpoint. The system life-cycle is illustrated in Figure 14. In regard to the system life-cycle, Professor Kline[1] states that,

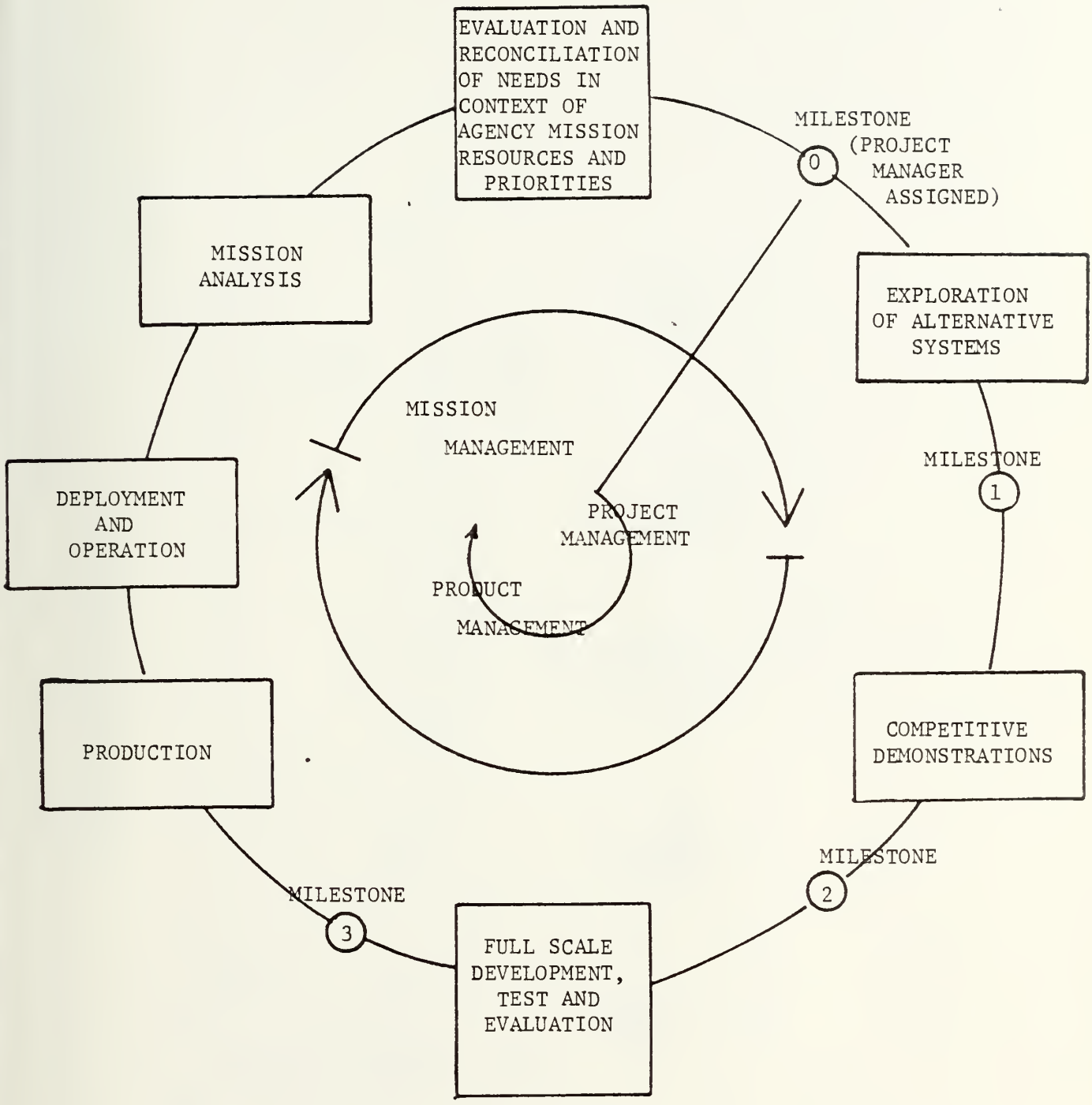
> "In the total sense of a system, one might consider three distinct periods: the planning period, the major acquisition perid and the use period (Figure 14)."

---

[1]Kline, Melvin B., Professor of the Department of Operational Research and Administrative Science, Naval Postgraduate School, Minterey, California 93940.

FIGURE 10

MAJOR SYSTEM ACQUISITION PROCESS



MISSION MODEL ANALYSIS

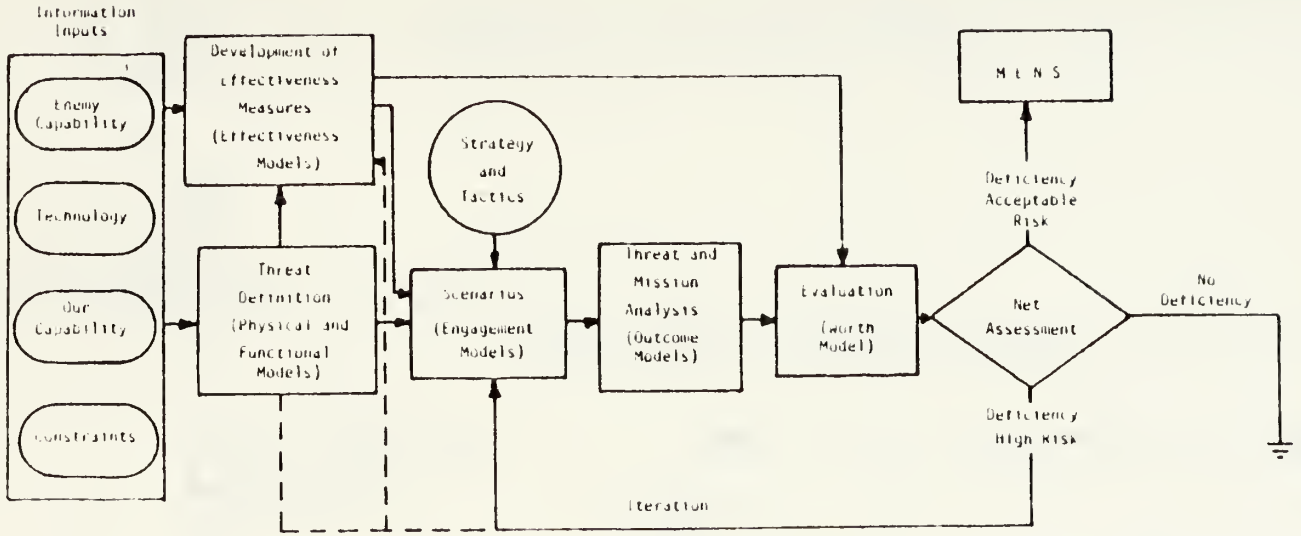


FIGURE 11

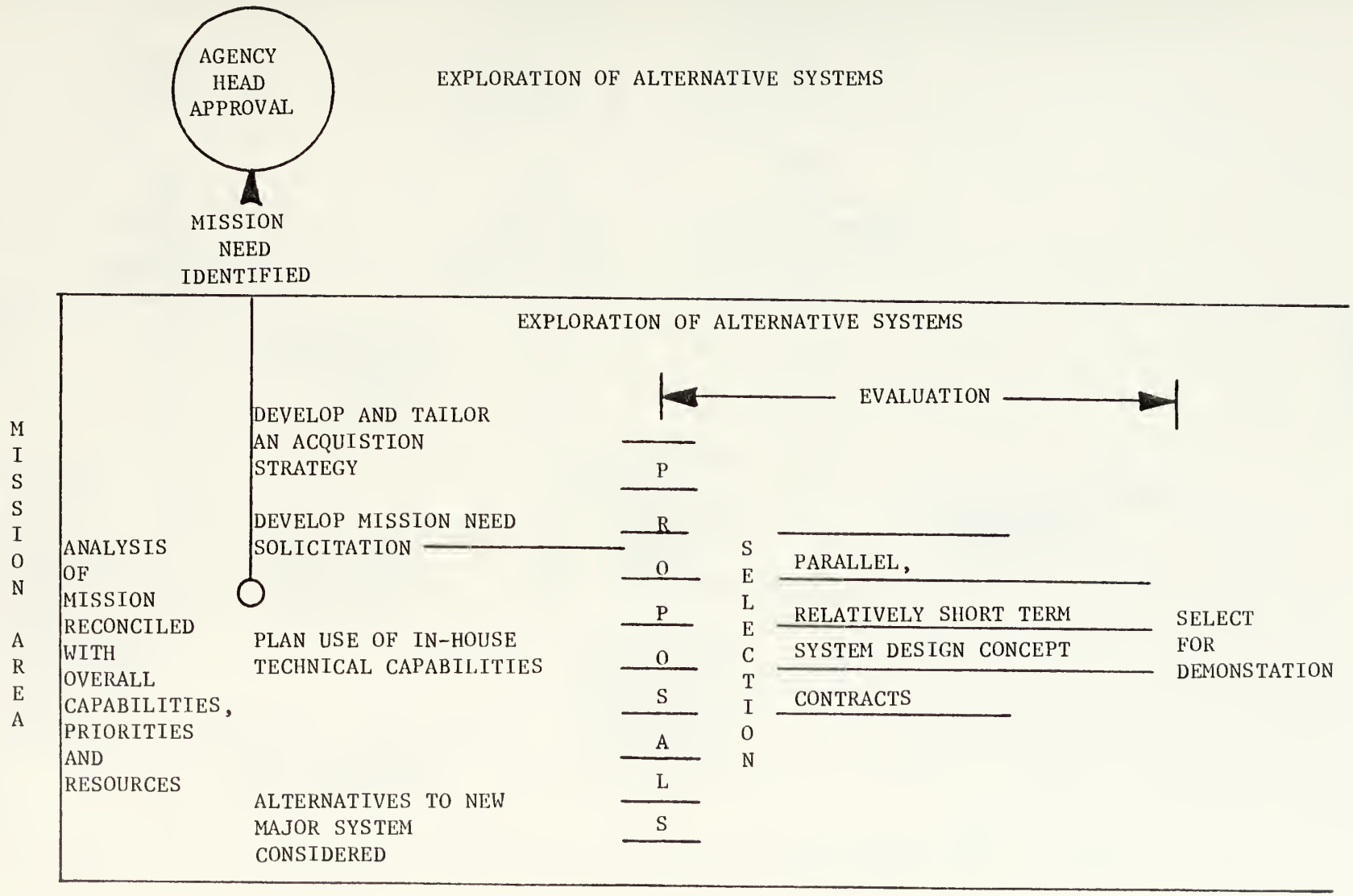

AGENCY HEAD APPROVAL
EXPLORATION OF ALTERNATIVE SYSTEMS
MISSION NEED IDENTIFIED
EXPLORATION OF ALTERNATIVE SYSTEMS
EVALUATION
MISSION AREA
ANALYSIS OF MISSION RECONCILED WITH OVERALL CAPABILITIES, PRIORITIES AND RESOURCES
DEVELOP AND TAILOR AN ACQUISTION STRATEGY
DEVELOP MISSION NEED SOLICITATION
PLAN USE OF IN-HOUSE TECHNICAL CAPABILITIES
ALTERNATIVES TO NEW MAJOR SYSTEM CONSIDERED
PROPOSALS
SELECTION
PARALLEL,
RELATIVELY SHORT TERM
SYSTEM DESIGN CONCEPT
CONTRACTS
SELECT FOR DEMONSTATION

FIGURE 12

CONSTRUCTION ACQUISITION PROCESS

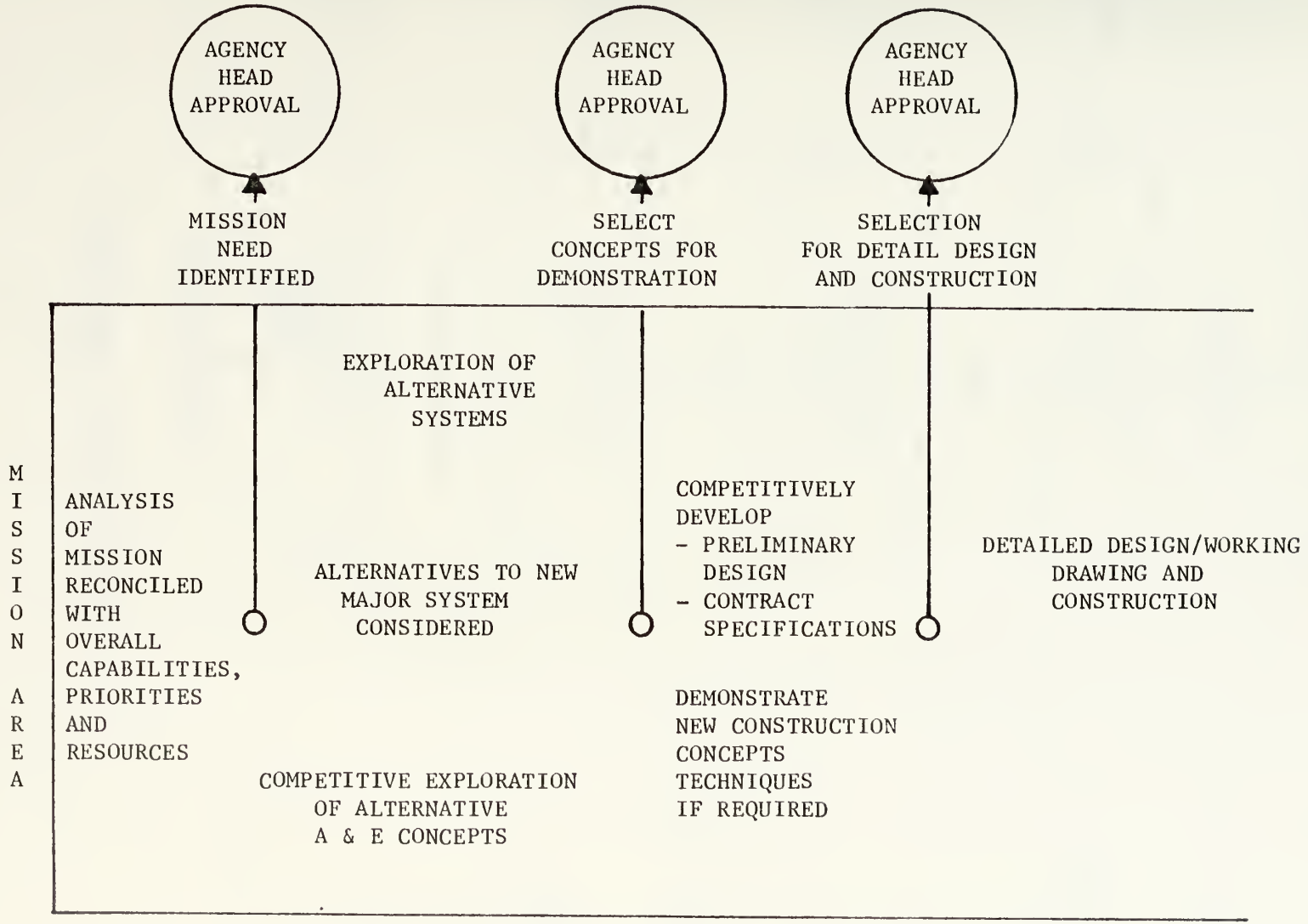
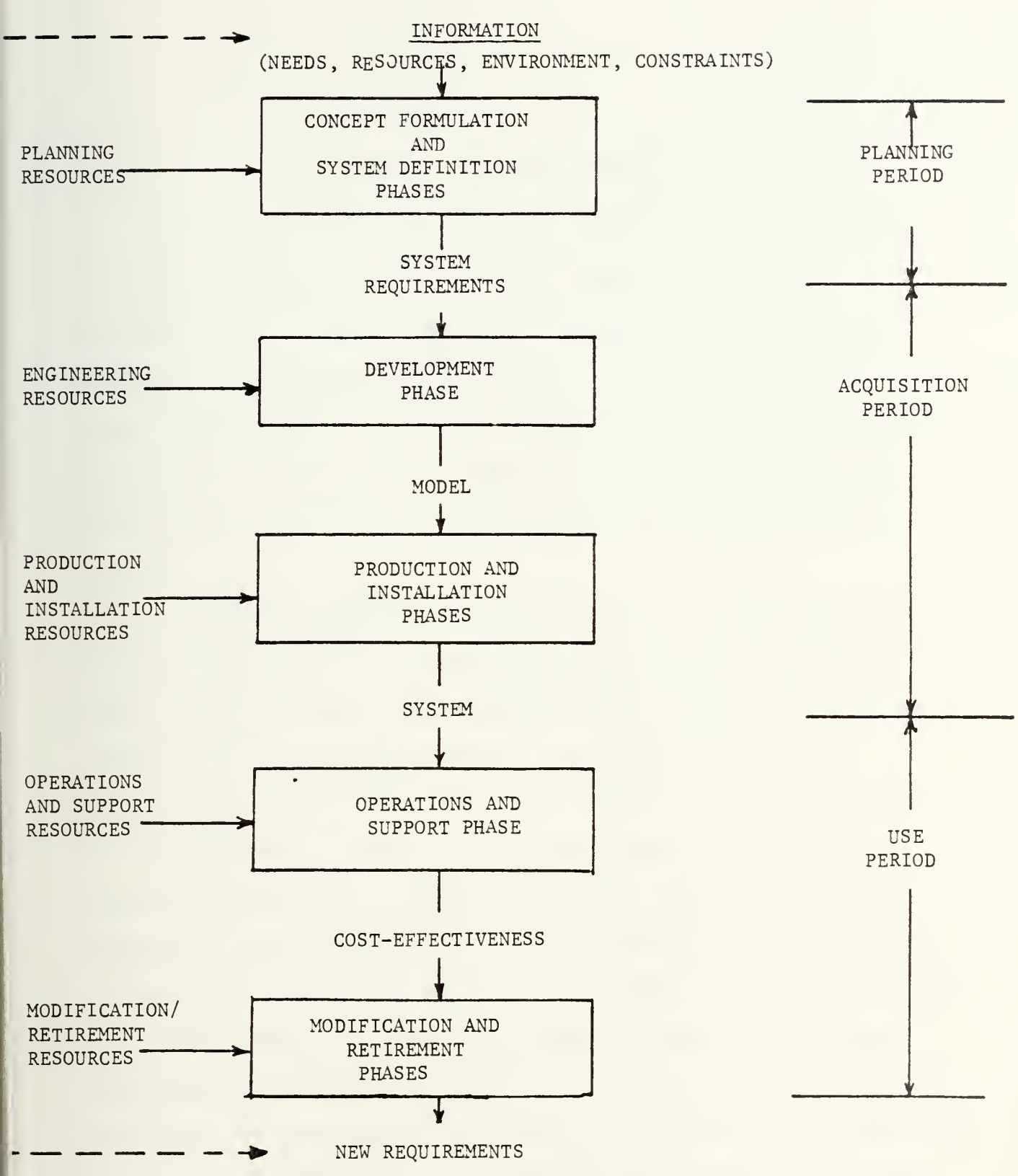


FIGURE 13

FIGURE 14



SYSTEM LIFE CYCLE

Source 12:4

APPENDIX B. LOGISTIC SUPPORT

One of the greatest challenges facing industry, military and other government managers today and in the future is the growing need for more intelligent management of our scarce resources. The demands of the modern world have created unprecedented incentives for management techniques to design and operate less costly systems, simplify products and processes and create more effecient supply and distribution methods.

No government agency or private organization can reach its full potential as an efficient allocator of resources until logistic support requirements are properly analyzed and integrated logistics management techniques assume their proper roles in the hierarchy of management activities (9:15). It is, therefore, important that the proper analysis of logistic support of a system or project, whether the acquisition of a new class of ships or construction of a shipyard, be considered at a very early stage. That is, we must look at the "total aspect" of logistics support from the conceptual phase (which is long before any significant investment is committed) to the operational phase. To improve the management of our limited resources, one should view logistics in terms of the effectiveness of support and on the basis of life-cycle cost. Life-cycle cost includes all costs associated with planning, research, design, production, system operations and

maintenance support and ultimate system requirement and phase-out. For better appreciation of the subject, this section will present some definitions of logistics; the concepts of Integrated Logistics System (I.L.S.).

a. Logistics definitions: Logistics is not a new subject; in fact, it has been a concern since the first movement of men and material.

"Conventionally, systems and equipment have been designed and developed and logistic support requirements have evolved 'after the fact'."

This approach to logistics has resulted in high costs of maintenance and support currently being experienced for many systems (9:15).

Logistics is defined by Professor McMaster as,

"A collection of people, resources, concepts and procedures required to keep the prime mission system operationally ready."

Military logistics is denfined by the Joint Chiefs of Staff as:

"The science of planning and carrying out the movement and maintenance of forces. It is those aspects of military operations which deal with: (a) design and development, acquisition, storage, movement, distribution, maintenance and disposition of material; (b) induction, classification, training, assignment, welfare, movement and separation of personnel; (c) acquisition or construction, maintenance, operations and disposition of facilities; (d) acquisition or furnishing of services. It comprises both planning, including determination of requirements and implementation (11:16)."

b. Integrated Logistic Support (I.L.S.):

"Integrated logistic support is a management function providing the initial planning, funding and controls which help to assure that the ultimate customer or user will recieve a system that will not only meet performance requirements, but one which can be expeditiously and economically supported throughout its programmed life cycle (9:7)."

In regard to integrated logistic support, Professor McMaster states:

"Prime mission system and the logistic support system are considered together during the planning and development phases of the system acquisition."

The elements of integrated logistic support are: personnel and training, test and support equipment, technical data, facilities, supply support, transportation and handling and maintenance planning. The purpose of integrated logistic support is to assure that effective logistic support is planned, acquired and managed as an integrated whole.

DOD Directive 4100.35 states that,

Military readiness is fundamental to national security and...can best be achieved through effective integrated logistic support of...system and equipment."

Its primary objective is,

"to assure that...effective logistic support...is systematically planned, acquired, and managed as an integrated whole...to obtain maximum material readiness and optimum cost effectiveness (12:1.2).

The following are brief descriptions of the elements of Integrated Logistics Support:

(1) Personnel and training: The human element is required for the operation and maintenance of the prime weapon system and associated support facilities throughout the life-cycle. Personnel are identified in terms of numbers and skill level requirements for each operation and maintenance function of the system. The training of personnel includes both the initial training for Navy/ equipment familiarization and operation of the system,

and also the replenishment training to cover attrition and replacement of personnel. Training is also provided to upgrade the assigned personnel to the skills required for the particular system/equipment.

(2) Test and support equipment: Consists of all monitoring and checkout equipments, tools, calibration equipment, handling equipment required to support scheduled preventive maintenance and unscheduled maintenance repair actions associated with the system.

(3) Technical data: are the operating and maintenance instructions, drawings, microfilms, inspection and calibration procedures, provisioning and facilities information, specifications, computer programs required to support the construction, checkout and operation of a system and its supporting facilities.

(4) Facilities: In general, facilities consist of real estate, physical plant, portable buildings, housing, intermediate shops and depots, etc., required to support operation and maintenance functions associated with the prime system. The weapon systems here are considered the prime system; hence, the housing, drydocks, cranes, and other training and repair facilities required to support the system; test and support equipment and training equipment throughout the life-cycle of the weapon system, are the supporting facilities.

(5) Supply support: Consists of all general consumable and outfitting materials for the weapon system, repairable spares (units, assemblies, modules), repair

parts, consumables, special supplies and related inventories needed to support the system and supporting facilities. Special considerations should be given to the geographical location of the system with respect to where the supply materials originate, are stocked and distributed, the means of transportation and methods of distribution.

(6) Transportation and handling: Consists of all those vehicles, equipment, special provisions, containers and supplies necessary to support packaging, preservation, storage, handling and transportation of, test and support equipment, spare/repair parts, personnel, facilities and technical data.

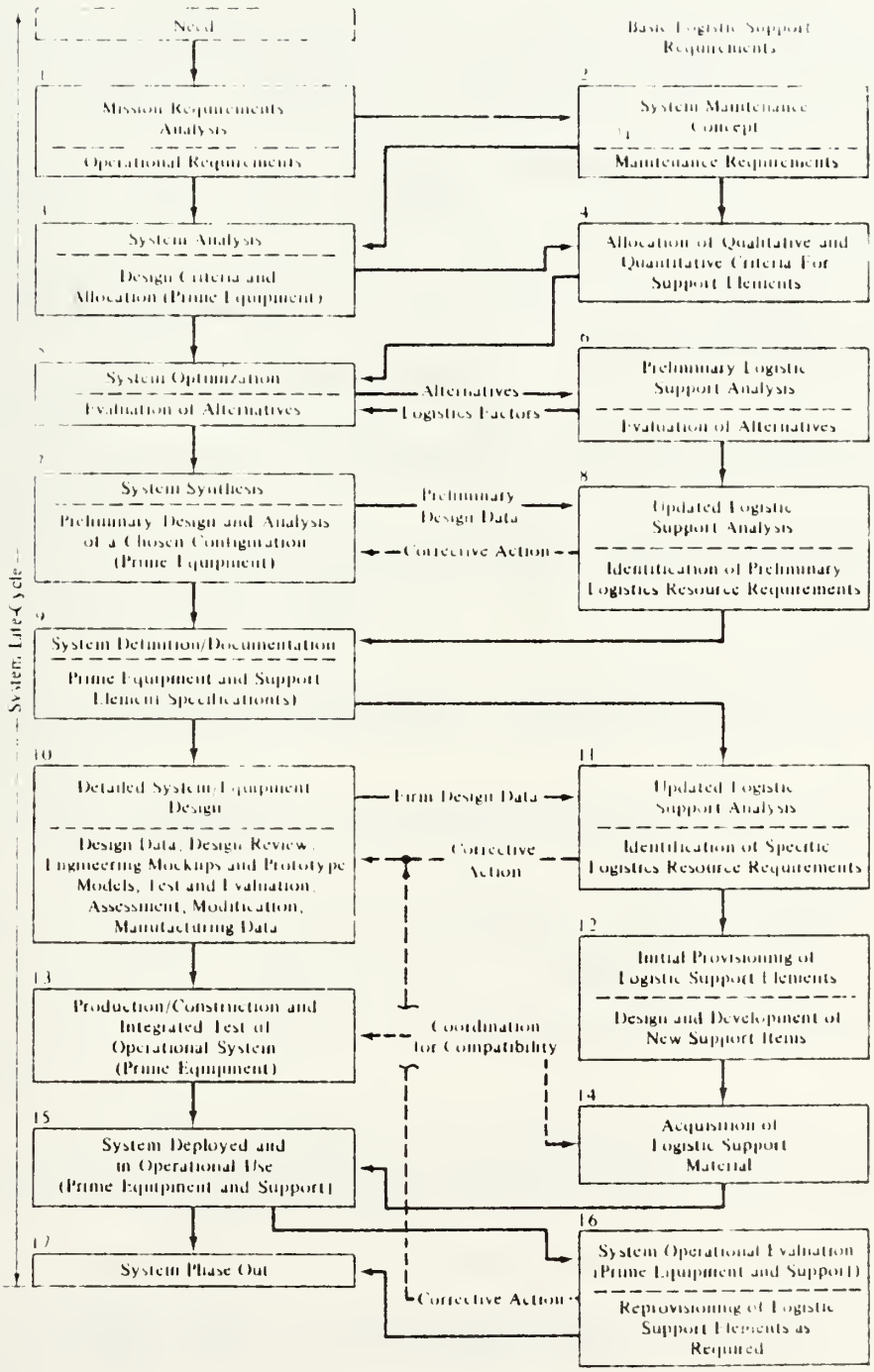
(7) Maintenance planning:

"accomplished through the definition of the maintenance concept, accomplishment of logistic support analysis, provisioning and assessment and evaluation of the overall support capability with the necessary feedback loop for corrective action and modification (12:9)."

Maintenance planning facilitates the necessary logistic support considerations in the system design process. Figure 15 presents the system design/development process.

FIGURE 15

SYSTEM DEVELOPMENT PROCESS



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