

# Navy Personnel Research and Development Center

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## Research Needs in the Management of Concurrent Dual Career Development: Military and Industry Findings and Research Approach

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**Research Needs in the Management of Concurrent Dual  
Career Development: Military and Industry  
Findings and Research Approach**

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| 19. ABSTRACT (Continue on reverse if necessary and identify by block number)<br>→ The development of members of the URL community as potential Materiel Professionals (MPs) is extremely vital to the Navy because of the operational experience that these officers can bring to the MP positions. However, few junior officers have developed their MP abilities in the past. The Navy currently has not developed policies to aid the URL officer in the simultaneous development of two partially related skills. Therefore, there is a need to develop a framework for understanding and identifying the parameters involved in the effective design and administration of policy for URL officers in the concurrent development of dual careers. This report describes policies and practices used in other organizations (Air Force, Army, and industry) to manage dual career personnel. The results of a literature review (the first report in the series) and the review of external experience are compared with the Navy's policies, practices, and future needs. The voids that are identified between what are needed and what are present are used to specify the research that should be done to provide the policy, practices, and technology required to meet the Navy's requirements for managing the URL MP manpower resources. |               |                                                      |                                                                                                                                                                                                                                                       |                                                                      |                       |               |            |                           |                                                                                                                                                                                                               |         |            |  |
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## FOREWORD

This report identifies the parameters involved in effective multi-career path management and specifies areas that require programmatic research within the Navy before its system can be managed effectively. The Materiel Professional (MP) community requires input from the operational, unrestricted line (URL) officer communities to make the acquisition of new weapons systems responsive to operational needs. Therefore, URL officers need to acquire the knowledge, skill, and ability necessary to serve at the senior grade level as an MP while they are URL officers, primarily when assigned to shore billets. The rotation between sea (URL) and shore (MP-related) careers during the first 15 to 20 years in the Navy is the focus of this report.

This is the second of two reports conducted under TCN 87-412. The first report was a literature review of components of integrated human research management systems. TCN-412 was conducted under work unit number 1487WR4B424, Materiel Professional Officer Careers sponsored by the Office of Naval Technology (OCNR-22). A third report completed at the Navy Personnel Research and Development Center under the above work unit described the MP officers' impressions of the first 2 years of the MP program and the differences between URL officers that transferred to the MP program and those that chose not to do so.

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Director, Personnel Systems Department

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## SUMMARY

### Problem

The new (1985) Materiel Professional (MP) community was designed to improve the Navy's management and acquisition of weapons and materials. The development of some unrestricted line (URL) officers as potential MPs is critical because of the operational experience they can provide. Currently, a number of Navy practices inhibit the technical development of officers for future transition from the URL to the MP community. Therefore, a less than optimal number of junior officers currently have developed their technical and managerial skills along with their operational skills.

### Purpose

The purpose of the research is to develop an approach that will identify the problem domain and the relevant factors and systems involved in the management of concurrent multi-career paths. The literature review described in Cleveland (in review) is one step in achieving this objective. The second step, described in this report, is to (1) report the outcomes of interviews conducted within the Department of Defense and selected industry, and (2) present a framework to guide programmatic research within the Navy on the development and management of multi-career ladders.

### Approach

Key personnel with the U.S. Navy, Army, Air Force, and selected private industry were interviewed in order to (1) assess the current Navy practices and information on officer career development, and (2) obtain information from other organizations on the practices, personnel systems, job/person information, etc. involved in the management of multiple career paths. These interviews and the findings presented in the Cleveland (in review) literature review provided the basis for the proposed framework that identifies critical considerations in an integrated human resource system and can guide programmatic research within the Navy.

### Findings

Personnel from each military department (Navy, Army, and Air Force) were interviewed to obtain information on the current availability of officer skill and billet/job analyses, training opportunities and orientation, career development of officers, and the coordination of multiple paths with other personnel systems. Interviews in the Navy indicated that the Navy currently has little officer billet information, little information on officer skills, and low coordination of other personnel systems (such as the Officer Fitness Report and promotion practices). The U.S. Army has some survey data on officer billets and the coordination of training and promotion practices with the development of multiple career paths. The Air Force has extensive officer billet information and develops training programs based on this job/task analysis information. Interviews of industry practices indicate that although private organizations can offer more incentives for the development of multiple skills, unequal status among career ladders and associated problems continue to exist.

A framework is proposed to guide research within the Navy on the development and integration of multiple career ladders within the URL, specifically, and the Navy, in general. Six career factors were identified as critical considerations in this problem: (1) identification of target occupations and target skills, (2) identification and development

of job requirements and officer skills prior to entrance into the MP community, (3) coordination of information systems and dissemination methods; (4) management of multiple career ladders (incentives and disincentives), (5) coordination of Navy personnel systems, and (6) quantification of URL-MP needs by improved manpower planning. Within each of these six factors, sets of research questions have been generated and described. Further, the framework suggests that each of these factors require activities at each stage or grade within the Navy.

#### Conclusions and Recommendations

The proposed framework suggests a set of priorities for programmatic research within the Navy. The assessment of skills needed to successfully perform in key MP billets is a top priority. Once the knowledge, skills, and abilities (KSAs) of target MP positions are identified, the analysis of manpower requirements for those MP positions by skill and by grade should receive priority. After the Navy answers the questions of what skills need to be developed and how many officers at each rank need to develop such skills (given attrition rates, promotion rates, flow rates, etc.), then job analysis and the means to assess individuals to establish which KSAs they need to develop prior to entrance into the MP community should be pursued. Research questions that fall within the remaining three factors, although critical to the management of multiple ladders, may be pursued simultaneously or, if necessary, sequentially, after the research in the three priority factors is completed.

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## INTRODUCTION

### Problem Statement

In 1985, at the direction of the Secretary of the Navy, the United States Navy introduced a new officer community called Materiel Professional (MP). The new community was designed to improve the Navy's management of weapons and materials acquisition by introducing officers with highly developed technical expertise into the acquisition process. Because of the operational experience that the unrestricted line (URL) officers can provide, the development of some URL officers as potential MPs is critical to the Navy. However, a number of current Navy practices inhibits the development of URL officers for future transition into the MP community. First, URL officers enter into the new community relatively late in their careers. For the first 18 to 20 years, the URL officers are primarily operational officers. As such, most are developing skills that will prepare them as a member of a warfare specialty such as aviation, surface, or submarine. Therefore, the URL officers as a whole, have less time than officers in the restricted line (RL) or staff corps to devote to developing technical knowledge. Second, the rewards that URL officers achieve, including strong evaluations on officer Fitness Reports (see Bjerke, Cleveland, Morrison, & Wilson, 1987), are primarily based on achievements in their warfare or operational specialties rather than on the development of acquisition skills and knowledge. Third, MP-related abilities that are developed within the URL are implicitly viewed as secondary in importance. Rewards associated with the development of these technical management skills in the URL and the primary use of the skills are typically deferred until officers reach the grade of captain (O-6). Thus, within the URL, a less than optimal number of junior officers have developed their MP abilities simultaneously with their warfare specialty skills.

### Objective

Currently, the U.S. Navy has not systematically developed policies to assist the URL officer in developing simultaneously two partially related sets of occupational skills (operational and technical/management). There is a need to develop an approach that will define the problem domain; identify the relevant factors, processes, and systems in the development of concurrent career paths; and guide the strategic planning efforts for the design of multiple career paths within the URL. One step in achieving this objective is to review and integrate available research and practice that may be relevant to the design and management of simultaneous progress in multiple career ladders. The approach, findings, and conclusions for step one are presented in a related technical report entitled, Literature Review on Concurrent Dual Career Development in the URL (Cleveland, in review). The recommendations from the literature review provide the basis for the present report. The second step in achieving this objective is presented here and consists of two parts: (1) the collection and integration of relevant job, career, and organizational information from key personnel in the Navy, Army, Air Force, and selected private industry representatives, and (2) the formulation of a framework from which an integrated set of proposed research (questions) is generated for the development of simultaneous multiple career development.

## APPROACH

Key personnel within the U.S. Navy were identified and interviewed in order to (1) assess current Navy information on URL officer billets and role/skill requirements, (2) assess the current manpower planning and career practices for URL and URL MP officers,

and (3) review training and development programs for skill acquisition for URL officers. In order to obtain such information, seven officers and two civilians within the Navy were interviewed from Navy Occupational Data Analysis Center, OP-39 and OP-13.

In order to obtain information on the career practices and the structures of multiple career path organizations, the Army, Air force, and representatives from three private organizations were interviewed using a semi-structured format. Table 1 presents a breakdown of individuals interviewed. The interviews within the Navy, the other military branches, and private industry and the findings from the literature search provided a basis for the development of a framework for identifying the parameters involved in effective concurrent multi-career management. The second part of the present report provides an integration of current Navy information procedures/systems within a framework designed to guide research effective in multi-career ladder development.

Table 1  
Representatives Interviewed in the Navy, Army, and Air Force

| Navy                                                                                                                                                                                       | Number |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| <u>Navy</u>                                                                                                                                                                                |        |
| Naval Military Personnel Command Detachment<br>Navy Occupational Development and Analysis Center (Code 102)<br>Building 150, Washington Navy Yard (Anacostia)<br>Washington, DC 20374-1501 | 3      |
| Community Managers (OP-130E19), (OP-130E5), (OP-130E2), (OP-130E3)<br>Office of the CNO<br>Washington, DC 20350                                                                            | 4      |
| Training Policy<br>Chief of Naval Operations (OP-39)<br>Department of the Navy<br>Washington DC 20350-2000                                                                                 | 1      |
| Training Practices<br>NAVPERSRANDCEN<br>San Diego, CA 92152-6800                                                                                                                           | 1      |
| <u>Army</u>                                                                                                                                                                                |        |
| Army Occupational Survey Program<br>Soldier Support Center<br>Military Occupational development Directorate<br>2000 Stoval Street<br>Alexandria, VA 22332-0400                             | 1      |
| Officer Career Development, Pentagon<br>Headquarters DAPEMPO<br>Room 2B726<br>Washington, DC 20310-0300                                                                                    | 2      |
| <u>Air Force</u> (All at Randolph Air Force Base)                                                                                                                                          |        |
| Occupational Measurement Center<br>USAF-OMC/OMY<br>Randolph Air Force Base, TX 78150                                                                                                       | 2      |
| Training/Job Requirements<br>USAFOMC/OMTO, and HQ AFMPC/DPMRPO                                                                                                                             | 6      |
| Officer Career Development<br>HQ AFMPC/DPMRPS, HQ AFMPC/DPMRSS, HQ AFMPC/DPMROM,<br>HQ AFMPC/DPMRSA                                                                                        | 4      |
| Acquisitions Management Model<br>HQ AFMPC/DPMRSA                                                                                                                                           | 1      |

## FINDINGS--PART I

### Interviews with Navy Personnel

The goal of the interview with persons at the Navy Occupational Development and Analysis Center (NODAC), URL and URL-MP community managers, and training representatives was to obtain general information on the current career issues and practices regarding the development of potential MP officers within the URL. Since the development of URL officers for transition to MP involves changing career ladders, the factors reported here are those that are critical to the success of managing multiple career paths in organizations. These factors include the determination of job/billet requirement (i.e., tasks, roles, etc.), the identification of the officer knowledge, skills, and abilities (KSAs) and experience necessary for the MP community, the delineation of training opportunities associated with MP community, the development of job ladders and career guidance for junior officers, the provision of support from management, including integrating career managers across the Navy and MP communities, the coordination of MP with other personnel systems (i.e., Fitness Report, promotion, and manpower planning), and the integration of the MP community with the Navy mission.

### Billet Requirements

Currently, the Navy has little information on the tasks and activities performed in specific officer billets in the URL, RL, or staff corp. In 1985, the NODAC conducted one of the Navy's first surveys of the tasks required in officer positions. Using a restricted set of the survey data, four models were developed that allowed Civil Engineering Corps officer billets to be systematically assigned pay grade levels.<sup>1</sup> Two years later, NODAC began a job analytic (occupational) survey in the medical community. Further, in November 1987, NODAC pretested the Officer Survey Instrument, which is designed to be administered across all designators. Job information is perhaps the most fundamental, critical factor in the successful management of career development activities. NODAC will conduct analyses of officer billets in the next 2 to 3 years. There currently is a need for officer billet information. Further, within the MP community, there is a need to identify URL billets that are MP related. A billet structure must be designed to support the development of URL-MP officers. However, such a billet structure can not be developed unless the tasks, skill requirements, etc. of specific billets are obtained routinely and documented.

### Identification of KSAs for Target MP Billets

The Navy has communicated clearly to the grades, the necessary qualifications of an officer desiring to move from the URL to the MP community. For selection into the MP community at the commander (CDR) level, an officer must be CDR command screened. That is, (s)he must have proven operational performance. Second, the officer should have post-graduate school experience in one of the areas the Navy has deemed as related to acquisitions/procurement (i.e., MBA, a Master's in finance, or in a technical degree). Further, an officer might become MP qualified if (s)he has had acquisition experience through successive tours and obtained a subspecialty or relevant additional qualification designators (AQD). Since the primary mission of the URL officer in the MP community is to provide current operational experience and perspective to acquisition, the proven operational performance of a URL officer is viewed by the URL-MP officers as critical

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<sup>1</sup> Personal communication with R. J. Wilson, 24 June 1985).

to the success of the community. Proven operational performance serves another function as well, namely to ensure that the attractiveness of the MP community to a Navy officer will not become greatly discrepant with the attractiveness of the URL.

In summary, this community is attempting to identify URL officers who have management ability, operational skill, and the ability to communicate with civilian engineers.

Currently, however, the Navy lacks information on the KSA levels required to perform in positions in the MP community (i.e., Program Manager). The Navy has established entrance qualifications for transition from URL to MP and there is a written description of desired MP skills prior to O-5 (CDR) or O-6 (captain). However, the career description apparently reflects desired or recommended skill development rather than a formal career structure.

#### Training Opportunities/Requirements

Currently the subspecialty system within the Navy supports the MP program. Many technical and managerial billets are compatible with MP needs. Again, however, many of these billets are not coded appropriately for the MP community manager. Currently, there is a need for a coded billet system compatible with the MP needs to identify officers with MP-related experience and who might be MP-qualified. One way to become MP-qualified is to become Weapon System Acquisition Management (WSAM) qualified. The WSAM program was established in 1974 to develop policy for the selection, training, development, and tracking of officers up through appointment as Program Manager. Selection for WSAM usually occurs at the grade of lieutenant (LT)/lieutenant commander (LCDR)--allowing the opportunity to develop acquisition experience. Selection criteria for WSAM include education, experience (billet), and performance. Frequently, the officers that have been selected for WSAM are in demand for other (operational) billets and detailers often send them to non-WSAM billets outside of normal rotation.

Currently, education (i.e., at Naval postgraduate school, etc.) is a risk that URL officers frequently do not choose to take. Education takes time and given the rotational practices within the URL, a Fitness Report based on operational performance at sea is viewed as more promotable than a strong Fitness Report at postgraduate school.

Further, training in the URL is more billet specific than directed toward developing sets of more general skill areas. The current movement toward more on-board computer-aided instructional (CAI) training is directed primarily toward the development of very billet specific operational skills and knowledge. This CAI program requires the establishment of standards for competence or mastery levels. Generally, policymakers for training within the URL are concerned with the successful development of officer warfare skills, rather than the early development of MP-related skills within the URL community.

#### Job Ladders or Development Paths Within the URL

The MP community is reaching its third year. Given its relatively short existence, the Navy has a remarkable amount of documentation on the career path of an MP officer (post CDR command). That is, a URL officer selected for MP and who chooses to change designators just after CDR command screen will move into, for example, an Assistant Deputy Program Manager or Design Project Supervisor position; then into the position of Deputy Program Manager Navy Materiel or OPNAV Staff, then at the junior captain grade into such positions/billets as Major Program Manager, Program Manager, OPNAV or

Program Coordinator, finally at the senior captain grade into Systems Command Assistant Deputy Commander. However, there are no systematic efforts to examine or cluster billets for URL officers that are junior to the command selection period in their careers in a way that assignments could be made to develop selected URL officers for movement later in their career into the MP community. One impediment to the development of a MP job path for URL officers in the first 20 years of their careers is the lack of task or skill information on officer billets. Further, before the appropriate officer billets can be sensibly clustered to create career paths that will develop MP skills, there is a need to fully document the skills necessary to successfully perform in such MP positions (target positions) as Program Manager or System Command Assistant Deputy Coordinator.

#### Career Managers and MP Career Guidance for Junior URL Officers

The MP community, similar to the warfare specialties within the URL, has both a community manager (whose job is to establish career selection policy for the community) and a detailee (who assigns billets to officers who have changed designators from URL to MP). These officers have a particularly demanding set of goals given a less than adequate support system. First, the Navy Occupational Billet Codes (NOBCs) do not provide useful information for the systematic identification of MP-qualified officers thereby making the identification of the pool of potential MP candidates a less than optimal process. The NOBCs are warfare-coded, not MP-coded. Second, once URL-MP-qualified candidates are identified (CDR command screen), the MP community manager must delay informing the officer that (s)he qualifies for MP designator. Further, although URL officers appear to possess MP talent (i.e., have WSAM AQD etc.), some officers, particularly surface warfare officers, lack sufficient interest in converting to the MP designator.

At the CDR (O-5) grade, the MP community has officer career guidance or representation within the Navy. However, at the junior officer grades (LCDR and below), where the cultivation of future MP talent should begin, there are no clear career guidance representatives. Junior officers tend to have either no knowledge of the MP career, incomplete knowledge, or incorrect knowledge. Further, given the current structure, it is very difficult for junior officers who aspire to become MP to maintain visibility in their warfare community while they are assigned to MP-related shore tours. Three factors may contribute to the lack of MP career guidance and the ambivalence of junior officers to pursue MP-related activities: Navy support for MP, coordination of MP community with other personnel systems within the Navy, and the Navy values and mission. Each of these factors will be described briefly.

Navy Support for Weapons Acquisition and Procurement. After 3 years, the formal Navy policy supporting the MP community continues. However, the success of the community depends not only on top management or formal policy support but also requires the informal, yet crucial support of junior and senior officers within the URL. The critical role that the URL officer provides when (s)he moves into the MP community has received mixed support among officers. The role and the development of MP community within the URL has received good support in the subsurface community, but, at best, ambivalent acceptance within some aviation communities and in the surface community. There appears to be some resistance to and concern about the practice of encouraging strong, top-notch warfare officers to transfer from the warfare operation to a non-warfare technical community. The concern among officers who might desire such a move stems generally from at least two facts; the coordination (or lack of Navy personnel practices (i.e., Fitness Report and promotion boards) and the goals of the MP community and the values or mission of the U.S. Navy.

Coordination of MP Community and Navy Personnel Systems. One possible reason for the reluctance of URL officers to indicate an early career desire to develop MP skills is that the reward and promotion practices within the Navy are not consistent with the development of technical and managerial (vs. operational) skills. For example, the officer Fitness Report (Navy performance appraisal) is a critical document in assessing the promotability of officers in the Navy (Bjerke, Cleveland, Morrison, & Wilson, 1987). Commanding officers use the Fitness Report to convey to promotion boards their assessments of the promotability of their officers. This assessment is based exclusively on the warfare or operational performance of officers (i.e., sea duty performance) rather than on the technical or managerial (i.e., shore assignments generally) capability of officers. Therefore, currently, URL junior and senior officers realistically assess their probability of promotion to the next rank as low if they focus on the development of non-operational skills. Further, while the other services establish promotion quotas or requirements to promote officers with technical or non-operational expertise (sometimes at the risk of passing over an officer that has a somewhat better operational performance record), the Navy has no such system to maintain a balance among operational, technical, and managerial expertise. The way to obtain a promotion within the URL (and stay in the Navy) is to be a good warrior, not an exceptional manager or acquisition specialist.

Navy Values and Mission. The Navy mission or purpose as perceived by officers is to be ready and to be the best in terms of "driving ships and submarines and in flying aircraft." The mission is perceived as exclusively operational and unidimensional. During the 200-plus year history of the Navy, this value system has remained largely unchanged. The strong operational mission permeates and sets the standards for other Navy personnel systems. Although the Navy formally, via policy etc., communicates support for the non-operational skill development of its officers, such development may not occur at the desired rate or magnitude since the Navy mission and value system implies that such skills are secondary.

#### Interviews with U.S. Army Personnel

Three representatives from the Army were interviewed regarding officer career development and the management of simultaneous operational and non-operational officer skill development. A civilian employee at the Army Occupational Survey (AOS) Program, U.S. Army Soldier Support Center was interviewed to obtain information on job skill and training practices within the Army. A major and a colonel (DAPEMPO) assigned to the Pentagon were interviewed about the structure and practices of officer career development, specifically the development of both operational and non-operational skills and the coordination of such development with other Army personnel systems (i.e., officer effectiveness reports and promotion practices).

#### Billet/Job and Skill Information

The AOS program oversees the development of questionnaires, the procedures, and the analysis of job-task analyses questionnaires for both officer and enlisted ranks. (AOS parallels in purpose and function the Navy's NODAC. One key difference is that while NODAC has extensive billet or job information on Navy enlisted jobs, the Navy has little job information on officers. AOS uses the output from job analysis to (1) analyze training needs, (2) revise occupational structures, (3) assess skills (i.e., skill level analyses, personnel requirement for new equipment, etc.), and (4) personnel and manpower analyses. The information obtained through the questionnaires includes the importance and frequency of tasks and duties in a job. Further, at the same time that job incumbents are sent the task analysis survey, supervisors are sent a training factors survey. The primary

purpose of this survey is to obtain information on the training required for specific tasks (training emphasis) and to determine the relative time required to train a task (learning difficulty). From this job information, the Army can generate skill/task information required by various officer jobs. This information is used extensively as input to officer training programs.

### Training

The job analyses information collected by the AOS program contributes directly to the development and modification of training programs in the Army. In general, at the officer ranks, training is aimed primarily at knowledge development. There is less emphasis on the training of tasks required in specific job assignments than on the acquisition of more general skills.

### Career Development of Officers

The Officer Personnel Management System in the Army encompasses all policies and procedures by which commissioned officers are selected, trained, developed, assigned, evaluated, promoted, and separated from duty (Officer Ranks Personnel, 1987). When officers are commissioned, they are assigned to a basic branch (an arm or service of the Army: i.e., infantry, armor, field artillery, etc.) for training and utilization. During the officer's first 6 to 7 years, development of skills associated with the officer's branch (large, although not exclusively, operational) are emphasized. After approximately 6 to 7 years, all Army officers select a career pattern and a preference for designation in a functional area (i.e., a career field that is different from a branch that requires an interrelated grouping of tasks or skills and significant education, training, and experience). An officer may be assigned to only one branch and only one functional area. Most officers will dual track or serve repetitive and progressive assignments in both a branch and a functional area. Some dual tracked officers may later decide to single track in their branch or functional area only. The selection of a functional area is a key aspect to enhancing the officer's professionalism and promotion potential within the Army. Further, the practice of shifting to the development of a functional area from a branch recognizes the need to meet the Army's growing requirements (generally non-operational billets) at the more senior grade.

The Army does have a Materiel Acquisition Management (MAM) program. The MAM has been classified as a skill not a specific branch or functional area. The MAM program requires capabilities that reflect a continuation of both branch and functional area (specialties). The MAM program in the Army appears to be similar in many respects to the Navy's WSAM AQD.

### Coordination of Multiple Paths with Other Army Personnel Systems and the Army Mission

One apparent difference between the WSAM and MAM program in practice is that the Army MAM program is intergrated into the Army's evaluation, promotion, and manpower planning systems. For example, at promotion boards, the Army communicates its needs (manpower needs) at each grade by branch, functional area, and, at times, by skill area (MAM is considered a skill). For example, at the major promotion boards, 100 captains are slated to be promoted. Of a total of 500, 200 captains are assessed by the board as promotable based primarily on their operational performance as conveyed through the officer evaluation report (OER) in their branch areas. However, to meet the needs of the Army, including technical and managerial needs, the Army needs to promote 30 officers with specific technical/managerial functional areas. If in the first 100 officers, 30

officers with such functional areas are not found than the promotion board will move down through the 200 until the various functional area needs are met. Therefore, the Army personnel systems are designed to achieve a balance in the development of officers who have sound operational and non-operational skills.

### Interviews with U.S. Air Force Personnel

Thirteen officers and civilian employees were interviewed regarding Air Force practices and current information on job or billet requirements, training and education in the Air Force, officer career development, and development of officers as managers in the systems acquisition process. (See Table 1 for addresses.)

### Billet/Job and Skill Information

The Air Force has extensive information on the tasks and skills requirements for both enlisted and officer positions. In the late 1960s, the Air Force began assessing enlisted jobs using the Comprehensive Occupational Data Analysis Programs (CODAPs). In 1976, this task-based approach to analyzing jobs was used to assess the requirements in officers jobs (including management and leadership skills). Currently, the Occupational Analysis Division (OMY) of the USAF Occupational Measurement Center (USAFOMC) at Randolph Air Force Base is responsible for designing, conducting, analyzing, and reporting job and task analysis information on officer positions; although much of the data that the Air Force currently possesses on officer billets is task based, some questionnaires have been skill targeted. Further, OMY is pursuing alternate methods for officer billet assessment using, for example, a scenario or knowledge-based approach to job analysis as well as a task analysis approach. The primary uses of OMC's job analysis information are in Air Force personnel classification, training, and education programs.

### Training

Similar to the Army, the officer job analysis information is used extensively as input for establishing and modifying training and education requirements. The task and activity clusters found among jobs are used as a basis for the identification of skills and knowledge required to perform those jobs. Training programs are then designed to develop these skills. The Air Force has a Training and Development Services Division (OMT) at USAFOMC. This division uses, as one major input, the task information provided by OMY and provides recommendations on how to structure training programs to develop various skills. Within the training programs, skill acquisition is assessed on specific tasks that most frequently reflect that skill. Further, the Training Development Services Division looks at the training needs across the career span of officers. Therefore, skills are assessed in terms of difficulty (i.e., how long it takes to learn certain tasks) and the decay of certain skills (i.e., how often should an officer receive refresher courses, etc.) especially those skills that the division determines as necessary and utilized throughout the officer's career.

### Career Professional Development

The Air Force is currently reorganizing their approach to Officer Professional Development. Only the most general features of their present career development structure will be presented here. The objective of the Air Force professional development program is to (1) enhance an officer's ability to perform his/her job and (2) prepare an officer to assume additional, increased responsibilities. This development begins with concentration on the officer's primary job area (i.e., pilot, navigator, etc.), and broadens

gradually throughout the officer's career. The professional development program is largely decentralized and implemented through respective major commands. The program consists of three elements: (1) an assignment pattern, (2) a training and education program, and (3) a professional development counseling program. The assignment pattern provides general paths and time frames for officer development among various education and training options and assignment levels (AF, DOD, and joint services (ODP)). After officers develop adequately in their primary area, they are guided toward professional development (via staff or support positions and education). The time at which an officer begins this professional development varies among rated (largely operational), non-rated, and mission support career fields. In all utilization fields (or specialties) in the Air Force, training and education opportunities play a key role in the promotability of an officer. For example, in the professional development guide for pilot/navigator, the officer develops primarily operational skills during the first 12 years of service. During the advanced development phase or 12 to 17 years, the rated officer is provided the opportunity to acquire and develop knowledge of, for example, managerial (not leadership) techniques required for future high-level responsibilities. As an officer progresses through the grades, he becomes a more promising promotion candidate when he accumulates more education in areas outside his primary operational specialty.

The Air Force has utilization fields called Scientific (26XX) and Development Engineering (28XX) which are designed to develop officers in the acquisition and support of weapon systems and products. Further, the Acquisition Program Management (APM) Utilization Field (27XX) assists in the planning and management function associated with acquisitions programs. Over one-half of the officers in this field are majors and above. The APM field is then a professional development route for scientific and development Engineers. It is recognized in the professional development of officers in this utilization field that they should have experience in operational as well as technical activities. Therefore, officers are assigned to operational commands at various stages in their career. However, it was difficult to assess how much operational experience and knowledge these officers obtain.

#### Coordination of Multiple Paths with Other Personnel Systems

Although the Air Force appears to have the framework for a well-integrated career system (i.e., extensive job analysis information, training programs based on job analytic outcomes, a value for education and a promotion system that reflect this value, etc.), it is not clear whether this framework has been adapted to facilitate the simultaneous development of operational and materiel acquisition skills.

For example, during the first 12 years or so of service, an officer develops primarily operational skills. However, as the officer progresses through the grades, he becomes a more promising promotion candidate when he accumulates more education and/or training outside his primary operational specialty. The increased promotability via education differs from the Navy promotion practices yet is consistent with the goal of developing non-operational as well as operational skills. However, the development of weapons acquisitions skills in operational officers should begin early in an officer's career so that he operational officer may obtain the necessary 8 years' experience to qualify for procurement positions. Similar to the Navy, the Air Force currently does not have a method for monitoring and guiding the development of materiel acquisition skills for their operational officers.

### Air Force Acquisition Management Model

Although the Air Force does not have a formal system to manage currently, they are aware of the need to have officers with operational skills in Acquisition Program Management. Recognizing this need, the Air Force Analysis Center (DPMY, DPXA) has developed and is testing an Acquisition Management Model, which is a simulation model intended to identify problems in the career development plans for acquisition managers. The model attempts to integrate three major program modules: personnel flows, assignment planning, and force management overhead. Although a complete technical description of the Air Force Acquisition Management Model is beyond the scope of this paper, the model utilizes information from four data bases: job inventories, personnel inventories, loss rates, and promotion rates. Further, the model represents one attempt to assess the conditions under which sufficient number of officers would develop both operational and non-operational (i.e., acquisition) skills.

### Interviews with Private Industry

Representatives from three organizations were interviewed in order to obtain information on how private industry develops and manages multiple career ladders. Three themes emerged from these interviews and are presented here: common features of dual ladder systems, drawbacks or persistent problems of such multiple path systems, and differences between private industry and the Navy. It is important to begin by describing the general features of a dual or multiple ladder system within private industry. "Dual ladders" in industry refers to the managerial or "line" ladder and the technical or scientific ladder within the organization. Often an employee with specialized knowledge enters the organization in a technical capacity (i.e., engineering, chemist, etc.). Since the traditional fast path or more mobile ladder to upper management is through the managerial ladder, technical employees either attempt to switch from technical/scientific ladder to the managerial ladder (if they wanted upward mobility) or remain in the technical function where there are fewer promotion opportunities, job changes, unequal pay, etc. To address the inequities between the management or line and the technical/scientific functions, the three organizations interviewed developed career ladders that were equitable enough to enhance the technical/scientific function within their organization, yet different enough to meet the specific need of each function (managerial or technical).

### Common Features of Dual Ladders

All three organizations interviewed incorporated the following features in their dual ladder structure: equivalent job title at each "rung," similar number of "rungs" or promotion opportunities within each ladder, equivalent pay at each level, increased visibility of career achievement in the technical ladder, and keeping the technical/scientific employees close together in location. Each of these characteristics is designed to enhance the formerly lesser status of the technical/scientific ladder to become more equivalent to the managerial or "line" ladder. Further, in some of the organizations, employees in either ladder might rotate from one to the other up to approximately 5 to 6 years with the organization. Typically, a technical employee might be assigned to a position with supervisory responsibilities. If (s)he performed well, then the employee might obtain additional rotation from one ladder to the other. However, if the employee does not do well in management then (s)he remains within the technical ladder. Further, after approximately 7 to 8 years, employees in industry generally remain in one career ladder. The exception to this is in the case of a high potential employee who might rotate into most functions within the organization.

### Perceived Drawbacks or Persistent Problems with Dual Ladders

The organizations echoed the issue raised in the literature (Cleveland, in review) as a persistent problem with dual ladders; namely, the ladders although designed to be "equal" on most objective features tend to formalize the lesser status of the technical/scientific ladder. For example, in one organization, the technical employees tended to have less impact or influence than the managerial ladder in critical decision-making arenas. In another organization, the top "rungs" of the technical ladder reported to the managerial side. Further, some of the influential program managers in the technical ladder were employees with extensive and high quality managerial expertise, but with little technical knowledge and experience. In a third organization, the technical ladder tended to lack visibility at the highest levels in the organization. Each of these factors were identified by organizations as undermining the effectiveness of the dual ladder system.

Representatives from the organizations recommended a number of features that should be present in a dual ladder system: top level support and visibility for the technical ladder, clear career development plans, top level organization representatives who are devoted/responsible for developing and tracking the technical employees (i.e., mentors or spokes persons) and increased visibility throughout the organization.

### Differences Between Private Industry and the Navy

There are a number of areas where private industry and the Navy, as a military organization, differ in terms of dual or multiple ladders. First, although each of the three organizations varied somewhat, in general, private industry has more job requirements information on middle level managers and technical personnel than does the Navy. Further, industry tends to have skill information on its employees although not all employees. Skill inventories are developed primarily on only high potential employees, both in the managerial and in the technical ladders. Second, the opportunity for varied and developmental rotations or assignments targeted toward developing specific skills is in theory greater in industry. Selected employees, again those identified as high potentials, are rotated across various functions. Further, the length of the rotation can vary depending upon the employee, the demands of the business and the skills or knowledge to be acquired. Some of the organizations interviewed indicated that there are tracking systems in place to identify, track, and develop specific employees. Again, however, extensive employee monitoring is associated with developing employees with high potential (who eventually will lead the organization as Chief Executive Officer). Finally, unlike the Navy, private industry has clear financial indicators of how well or how productive it is. If an organization is not competing well in a market (i.e., not winning contracts for equipment design, etc.), then the organization has fairly unambiguous evidence on where the problems are. Further, given that organizations frequently must be flexible and adjust to market demands, organizational values may not be as deeply ingrained as they are in the military branches. Therefore, changing an organizational value system or climate, although difficult, may not meet with as much resistance as in the services.

## FINDINGS—PART II

### Proposed Framework for Research on Managing Concurrent Multiple Career Development Ladders

The problem of managing the simultaneous development of skills reflecting slightly different careers is a complex one. Based on the findings from an extensive literature review and interviews with other military branches and selected private industry, an organization must determine what KSAs are necessary to perform successfully in different career ladders. In order to know what skills an individual employee or officer must possess, the organization must know what job tasks or activities the employee will be performing. Further, the organization must assess the effectiveness of alternative methods to develop these skills throughout the officer's career. However, the complexity of the management of multiple career paths does not rest with the identification and development of skills and job requirements. The fact that an organization develops extensive skill inventories on employees or has current job requirement information does not necessarily guarantee the successful management of multiple career ladders. Job and employee information is an obvious yet critical component of such management although it alone is not sufficient.

The research approach presented here is consistent with the conclusions drawn from the Cleveland (in review) literature review and the findings from organizational interviews. In order to effectively manage multiple career ladders, an organization must look at specific, micro analytic issues such as job analysis, skill development, mastery and decay of skills, etc. and also attend to such macro-organizational concerns as integrating the goals of multiple career paths with other personnel systems (i.e., performance evaluation, promotion practices, salary increases, etc.) so that at the individual level, the goals of skill acquisition and development etc. are consistent with the goals and practices of the organization (i.e., promotion based on operational and non-operational potential/performance). The proposed research framework identifies six key individual and organizational factors that are necessary considerations in concurrent career ladder management. The six factors are (1) the identification of target occupation skills knowledge and activities, (2) the identification job requirements and development of relevant skills etc. at various career stages prior to entry into target occupations, (3) the consideration of manpower needs at key career stages (i.e., promotion rates and pool of officer skills), (4) the nature and dissemination of information to appropriate career managers in the organization, (5) the resolution of incentives, disincentives, and motivational issues involved with dual ladder management, and (6) the coordination of the goals of multiple career ladders and other personnel systems (and goals and values) in the organization. In addition to the identification of critical sets of considerations in addressing this problem, the proposed framework provides an organization of these issues by officer grade (i.e., LT, LCDR, CDR, etc.). That is, for each officer grade, the framework outlines the questions that should be posed, activities performed, and information obtained in order to more effectively manage officer development within the URL. The framework for programmatic research then can be described as a career issue by organizational level taxonomy of recommended and coordinated research activities.

Although it is largely a descriptive approach to research, there are some career issues or factors that provide input to other factors; and thereby, are more important and should receive higher priority in terms of the sequence of research activities. For example, it would not be reasonable to identify skills at the LT level (i.e., financial skills) if such skills are not target skills identified as necessary in the MP community. Therefore, it is necessary to identify and carefully measure the type, degree, and array of

skills necessary to successfully perform key MP assignments or billets. Further, the six career factors differ in that some career factors include questions that suggest the need for basic research projects; other factors, however, such as determining manpower needs and information dissemination require the application or coordination of existing technologies rather than basic research. Third, readers should keep in mind that when referring to identifying target KSAs or the development of KSAs, the framework encompasses more than one set of KSAs within the URL. There are, in fact, multiple operational "ladders" in the URL (i.e., aviation, surface, and subsurface). Further, by virtue of the variety of skills or expertise necessary for the successful development and procurement of naval weapons, there are multiple paths (i.e., finance, engineering, etc.) for operational officers to move into the MP community. Figure 1 presents the six career factors by officer grade. Examples of research activities suggested by the framework are listed under the appropriate research domain.

### Proposed Research Questions

#### Identification of Target Occupations and Target Skills, Knowledge, and Roles

A critical component of Human Resource Planning and Career Development (Dyer, Shafer, & Regan, 1982) is job analysis and skill evaluation of target positions. That is, the identification of key activities, tasks, and requirements of "end" or target jobs in an organization (i.e., Vice President, CEO, or Program Manager, etc.) and the person skills or roles etc. necessary to successfully perform these activities. Further, the Human Resource Planning indicates the need to assess manpower needs in these positions (Dill, Gauer, & Weber, 1966). Currently, the Navy has information on the numbers of officers needed each year to move from the URL to the MP community. Further, the Navy has forecasted that specific proportions of these officers should come from aviation, surface, subsurface, and general URL. Currently, however, job and person information on target MP billets is not available.

Given the role that job analysis and skill evaluation of target positions plays in the development of officers, the following research questions should be addressed.

#### 1. What are the tasks, activities, etc. performed in key or target MP billets?

There are at least two issues raised in this question. First, the best method or set of methods for assessing officer jobs should be identified. Officer positions, especially in the MP community at the higher grades, tend to parallel in nature the high level executive position in industry where sound management (U.S. military leadership) and technical skills are necessary. Therefore, methods for management job assessment may include role analysis (Lau & Pavett, 1980) as well as the more traditional job analyses techniques (Cox, 1983; Sparrow, Patrick, Spurgeon, & Barwell, 1982). The second issue concerns how MP-related URL billets are identified. Are they billets that have traditionally been sources for MP personnel? Since the Navy currently does not have information on the skills required for officer billets, this might be one initial method for identifying such MP-related URL billets. However, one limitation of relying exclusively on traditional sources is that the Navy may overlook non-traditional yet valuable billet sources for potential URL-MP personnel.

#### 2. What are skills, knowledge, etc. necessary for an officer to successfully perform MP target positions?

| Career Stage | Target KSA's     | Development of KSA's                                                                                                                                                                                                                                                                     | Information Systems                                                                                                                                                                                                                                               | Manpower Analysis                                                                                                                                                                                                                    | Dual Ladder Mgmt: Rewards                                                                                                                                                                                                  | Coordination of Personnel Sys.                                                                                                                         |
|--------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examples:    |                  |                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                            |                                                                                                                                                        |
| LT (0-3)     | (See CAPT grade) | <ul style="list-style-type: none"> <li>*Job/Task Analysis of MP-related billets</li> <li>*Skill inventories</li> <li>*Training needs/ on the job ex-maintenance</li> <li>*Skill decay/ maintenance</li> </ul>                                                                            | <ul style="list-style-type: none"> <li>*Disseminate to JO's information on MP as a career in URL</li> <li>*Track officers in MP assignment or with MP education</li> </ul>                                                                                        | <ul style="list-style-type: none"> <li>*Determine quantity of LT needed in MP-related assignments (given resignations, promotion, designator changes, etc.)</li> <li>*Track quality of WSAM coded billets to assess needs</li> </ul> | <ul style="list-style-type: none"> <li>*Identify incentives and disincentives to pursue MP education, training, billets.</li> </ul>                                                                                        | <ul style="list-style-type: none"> <li>*Establish guidelines to promotion boards to recognize Navy needs re: sub-specialties, MP, etc.</li> </ul>      |
| LCDR (0-4)   | (See CAPT grade) | <ul style="list-style-type: none"> <li>*Job/Task Analysis</li> <li>*Skill inventories</li> <li>*Skill/training decay or maintenance</li> <li>*Establish competency mastery levels for skills</li> </ul>                                                                                  | <ul style="list-style-type: none"> <li>*Determine information (billet, training, etc.) that community managers/detailers can use to ID potential MPs</li> <li>*Allow community managers to communicate with officers regarding their MP qualifications</li> </ul> | <ul style="list-style-type: none"> <li>*Determine how many LCDR's are needed to develop a sufficient pool of potential MP's</li> </ul>                                                                                               | <ul style="list-style-type: none"> <li>*Identify incentives and disincentives for LCDR to pursue MP career</li> </ul>                                                                                                      | <ul style="list-style-type: none"> <li>*Establish guidelines to promotion boards to recognize Navy needs re: MP community</li> </ul>                   |
| CDR (0-5)    | (See CAPT grade) | <ul style="list-style-type: none"> <li>*Job/Task Analysis</li> <li>*Skill/ Inventories</li> <li>*Skill Competencies</li> <li>*Training/ education for MP transition</li> </ul>                                                                                                           | <ul style="list-style-type: none"> <li>*Need to have NOBC's coded to meet URL and MP needs so MP rep can ID/select MP candidates</li> </ul>                                                                                                                       | <ul style="list-style-type: none"> <li>Same as above</li> </ul>                                                                                                                                                                      | <ul style="list-style-type: none"> <li>*Identify methods to encourage URL officer to move to MP community</li> <li>*Identify methods enhance MP status and status of officer who moves from URL to MP community</li> </ul> | <ul style="list-style-type: none"> <li>Same as above</li> <li>*Need to assess methods for increased interactions with non-URL and civilians</li> </ul> |
| CAPT (0-6)   |                  | <ul style="list-style-type: none"> <li>*Identify target MP positions</li> <li>*Assess tasks, activities, roles in target MP positions</li> <li>*Assess officer skills necessary for MP positions</li> <li>*Assess education and Navy training and experience necessary for MP</li> </ul> |                                                                                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>*Determine quantity of officers needed for MP at CAPT rank</li> <li>*Determine quantity and composition of KSA's needed for MP community</li> </ul>                                           | <ul style="list-style-type: none"> <li>*Identify incentives and disincentives for officers to remain in Navy post 20 years and MP qualified</li> </ul>                                                                     |                                                                                                                                                        |

Figure 1. Major research domain by Navy career stage--examples of activities.

This question may be difficult to address in the Navy MP community, because the community is so new. There have been relatively few opportunities to observe successful and unsuccessful URL-MP officers in action in target positions. However, one approach might include assessing the skills of successful program managers in the private sector--the Navy's counterpart. A further consideration is whether the skills for a successful program manager differ for former URL officers (given their contribution of operational experience over technical expertise) and RL or staff officers (whose contribution is more technical or managerial than operational).

3. How are the skills necessary to be a successful MP (i.e., program manager) different than, the same as, or overlap with the skills necessary to be a successful URL operational officer?

As Cleveland (in review) indicates, it is important for career development and progression purposes to know how jobs overlap with each other in terms of requirements. In principle, the best approach to determining skill requirements of jobs would be to develop a list of tasks found in most jobs together with the abilities and skills required to perform those tasks. If this list was sufficiently comprehensive, it would be possible to determine the skill requirements and skill overlap of any job simply by knowing the tasks performed (Peterson & Bownas, 1982).

#### Identification and Development of Job Requirements and Officer Skills Prior to Entrance into MP Community

This factor covers multiple importance considerations in the management of multiple career development. The research questions proposed here cover job and skill analysis, formal training issues, on-the-job learning and rotation, experiential learning and mastery or competency learning (Cleveland, in review). The research proposed within this factor focuses upon understanding the job, skills, and the individual rather than larger organizational systems.

4. What are the tasks, activities, etc. performed in MP-related URL billets?

This question should be addressed in order to establish career ladders (Burack & Mathys, 1980), which represent a hierarchically organized set of jobs that involve common sets of tasks, activities and knowledges, skills, and abilities.

Further, this question suggests two related questions. First, what is the best method for determining the requirements of jobs--expert judgment, job analysis, etc? Second, how does the Navy identify MP-related URL billets? Burack and Mathys (1980) distinguished between the traditional career path, which is based on a historical pattern of career movement from the career ladder discussed above and a career ladder that represents a hierarchically organized set of jobs involving common knowledge, skills, etc. In order to accurately identify MP-related billets, the Navy should distinguish between billets that have been traditional sources for MP personnel (i.e., career path) and billets that are empirically (verifiably) the most and least relevant to the MP community (i.e., career ladder).

5. What knowledge, skills, abilities, etc. are developed efficiently on the job and by what jobs?

As Cleveland (in review) cited in her review of job transfers, a central assumption to Human Resource Planning is that occupying a variety of jobs or carrying

out a variety of assignments will develop skills necessary for success at higher levels in the organization. Work experience has been shown to affect a variety of factors ranging from intellectual and personality variables (i.e., Frese, 1982) to work values, particularly motivation (Gould & Hawkins, 1978; Toffler, 1981) and reward variables (Mortimer & Lorence, 1979). However, there is little empirical support for the assumption that job rotation facilitates the development of critical job skills (i.e., Brett, 1984; Pinder & Walter, 1984). There is a need for research to determine if skill can be effectively developed on the job. If it is so established, then there is a need to: (1) determine what skills can be developed on the job and (2) determine what jobs develop such skills. Further, since we are concerned with officer positions (that parallel middle management positions) and with individuals who bring an array of experiences to the job, we need to ask whether or not the same KSAs are developed. These latter issues suggest the need to identify relevant individual difference variables that may moderate the relationship between the activities in the job and an officer's skill development (Grotelueschen, 1979).

6. What KSAs are developed most efficiently through formal training and education? And by what type?

Here it may be useful to differentiate training provided by the Navy versus courses etc. that officers might take (including Defense Systems Management Education, etc.). Training, in general, stands to be reviewed as a shorter-turn more focused activity than education (Parry & Robinson, 1979). Therefore, there is a need to identify the skills or knowledge that could be most efficiently learned through formal training or education as opposed to on-the-job learning. Further, if a skill can be developed through either training in the Navy or through a course or degree program outside of the Navy, the cost-effectiveness of each approach should be determined.

7. How is level of competence or mastery for each KSA established by billet and/or officer rank?

The central notion behind mastery is that there are two distinct levels of any given skill: mastery and non-mastery. All individuals classified in the mastery category are treated as equivalent; the same holds for those in the non-mastery category. This assumption is most appropriate when there is a clear minimum level of skill needed to perform some task and if increases in skill beyond this level have little effect on task performance (Cleveland, in review). Research in "criterion-referenced testing" "domain-referenced testing," and "competency testing" all attempt to establish that a specific performance level on a test or a task reflects a mastered or non-mastered skill. One method used in management training to assess mastery is through the use of expert judgments. The recurring problem, however, is the definition of mastery.

8. How long does it take to develop specific KSAs?

- a. Does development depend upon the SKA?
- b. How long are specific KSAs maintained? What is/are the rate(s) of decay?
- c. What is the length of time needed to update these skills?
- d. What are appropriate methods to refresh/update specific skills?

e. Is on-the-job training sufficient or efficient for some skills while formal training or education may be necessary of others.

Even from the general interviewing it is clear the Navy and the other military have some well-designed, well-conceived training programs. However, the above questions cut to the foundation of most sound training programs yet to-date remain largely unanswered with respect to complex skill acquisition and development. Research in the area of the relation of skills has concentrated on the maintenance of motor skills (Adams, 1987; Fleishman & Quaintance, 1984). Further, researchers in this area have urged that caution be observed in generalizing from research on motor skills to managerial skills (Welford, 1980). Therefore, there is a need to pursue research addressing questions 8a to 8e.

Both questions 8a, 8b, and 8c are directed at the average amount of time to develop and maintain KSAs. The standard deviation or variability of this time should also be considered. For example, there are some skills that may take all officers a year to develop, while other skills may have an acquisition time that varies from 6 months to 18 months.

Question 8d would attempt to determine if there are refresher methods that are effective yet do not take the officers away from his or her other duties. For example, it might be cost-effective to develop self-study guides to refresh specific skills rather than having officers take refresher courses or engage in peripheral job assignments that refresh/update skills.

Question 8e not only is concerned about determining what type of method is best for what skills but also is concerned about the conditions under which various methods are most effective. The Navy may ask under what conditions is on-the-job training better or worse than formal training. For example, it might be possible to have on-the-job training on large ships (i.e., carriers) where job rotation is possible, but not on small ships (i.e., frigates) where there is only a hand full of officers.

9. Does the rate of KSA development or decay vary depending upon the patterns of prior experiences of the officers, the cognitive capacity of the officer, etc.?

The experiential learning literature (Cleveland, in review) indicates that one issue that should be carefully examined in skill acquisition/development/mastery is the prior experience of individuals. It is known that the cognitive structures created by prior knowledge affect subsequent learning (Grotelueschen, 1979). Therefore, two individuals with similar abilities or potential, but different background, might learn very different things and at a different rate from the same experience. If possible, research should identify clusters of prior developmental experiences and relate each cluster to the rate and nature of the skill learned.

10. What are the predictors or measures of early identification of potential MP officers within the URL?

a. Are these measures valid at each grade?

b. What are the consequences (to the officers, to the URL, and to the MP) of early identification of officers with MP potential?

The literature on middle to upper level managerial and technical jobs suggests that these positions may vary considerably in terms of the KSAs thought to be needed for successful performance (Mumford, 1986). Thus, the validity of predictors may

be job and organization specific. Further, several predictors of success might be needed depending upon the climate or direction of the organization (Gerstein & Reisman, 1983).

Further, Murphy (1988) suggests that valid predictors of success at one level within an organization may not retain validity when predicting success at a different one in time. This notion suggests that predictors or measures of MP potential at the LT grade may not be effective or useful predictors at the LCDR grade (and vice versa).

Similar to concerns raised in the literature on the early identification of high potential employees, the Navy should assess the range of possible consequences (i.e., self-fulfilling prophecy, "Kiss of death" when tagged as MP material, etc.) of such early identification within the URL community.

#### Information Systems and Dissemination Methods

The framework for research presented in Figure 1 suggests that the information collected, utilized, and disseminated in the management of technology-driven multiple careers may differ by grade. Another feature should be noted. The foundation for the research questions in this factor assumes that some information has already been obtained in the job requirements and KSAs of Target MP positions and on-the-job requirements of MP-related billets in the URL from LT to CDR grades. The questions in this factor concern how to best convey this information to Navy units including detailers, assignment officers, and community managers. For example, community managers do not need to know how rapidly a specific skill decays or is learned. Rather, these users must be provided with accurate/valid and useful information in a manner that they can use to perform their duties effectively (i.e., identify and select officers to community).

11. How can the Navy obtain/convey information regarding officers current KSAs? What is the best method to use to know what the officers' skills and skill levels are likely to be at the time of assignment and upon completion of that assignment (i.e., current level of skill and if given a certain assignment, skill level within 18 months or 2 years)?

Currently, URL assignment officers (detailer) believe they know what billets prepare officers for other assignments through a historically developed hierarchy of promotable vs. less promotable billets (Bjerke, Cleveland, Morrison, & Wilson, 1987). There is no empirical verification that, in fact, officers develop certain skills or knowledge through this "ticket-punching" process although detailers use the officers' patterns of previous billets to assign them to their next billets. However, no clear hierarchy of billets that develop requisite MP skills has been established to support the detailing process.

One idea would be to develop a KSA profile for each officer. If KSAs for all billets were known, the officer's KSA profile could be automatically updated with each new assignment. The Navy could develop a fully computerized information system that allows detailers and community managers (or Navy information users) to: (1) keep track of KSAs for each officer, (2) project future KSAs if the current assignment is completed or if a transfer is made to a new assignment, and (3) inventory the total KSA pool (current and projected). This information system would support manpower planning, which is discussed in questions 26 through 28.

12. In what form and how can the Navy disseminate the information necessary for the MP community manager and detailers to identify and select MP candidates officers?

At what state in an officer's career should the Navy be tracking the officers or identifying officers as potential MPs?

The problem here may be information overload. The primary task is to select the most relevant and useful information for community managers and detailers. Also, it is most important to know the most useful method for communicating and displaying that information. Corollary questions to this one include: Do you send the same information to detailers etc. regardless of whether the person is a LT (i.e., training, education) or a CDR (i.e., specific MP-related billets).

13. How can the Navy provide effective communication between the MP community manager or detailer and junior officers (and more senior MP candidates) in order to (a) facilitate officers development of MP skills and MP career options within the URL and (b) communicate officer candidacy for MP community; thereby increasing officer latitude of career choice within the Navy?

The literature on career development and dual career ladders indicates that new employees (junior officers) should be aware of the career options within the organization. The MP community within the Navy is relatively new. Further, the future of the URL career path to potential members of the MP community is not certain. All of this contributes to the perpetuation of less than desirable information regarding the MP career path within the URL. The unsupported speculation is further complicated by the lack of formal representation at the Junior grades of the MP community. Related considerations in this question include: (1) at what point do you inform officers that they have been identified as potential MP candidates; and (2) does the Navy begin developing relevant officer KSAs before or after the officer is informed of his/her MP potential?

#### Multiple Career Ladder Management: Incentives and Disincentive

Dual or multiple career paths for managerial and technical workers present special motivational problems in private industry (as well as in the military). Although such ladders are created to provide more promotional opportunities for technical workers and to develop mature technical skills, such ladders may also formalize the less powerful position of the technical staff (Goldberg & Shenhav, 1984). Even when pay, job titles, benefits, etc. of parallel jobs in different tracks are the same, one track usually has more status than other tracks (Schoner & Harrel, 1965). This factor and set of questions highlights the importance of identifying incentives and disincentives associated with multiple career ladders; in particular, the incentives/disincentives associated with obtaining MP-related training and education, developing and maintaining MP-related skills, choosing to pursue MP-related URL billets, and moving into the MP community from the URL.

14. Identify intrinsic/extrinsic rewards and disincentives associated with billets that develop MP capabilities. (What are the incentives and disincentives for officers to seek them?)

This question is largely concerned with what could be done to increase rewards of billets that are not seen as attractive, but that may be critical for developing MP KSAs. Further, identifying the rewards associated with these assignments may not be sufficient to overcome the disincentives that may be associated with them. Therefore, research on this topic should include the identification of disincentives and how their impact on officer career decisions to remain in URL could be reduced.

15. What are (identify) the incentives and disincentives of pursuing training and education associated with MP?

Similar issues raised in question 14 are raised here concerning officer training and education.

16. Identify incentives and disincentives for officers to maintain KSAs that predominantly will be used in the future and not in present assignments.

This research will dovetail with question 6. The most effective incentives may depend on the type of refresher activity that is involved. The research may need to pay special attention to activities that are self-directed as opposed to being formalized in training or education coursework.

17. How does the Navy motivate top-notch CDR and CAPT level officers to move from the URL to the MP community?

At the senior grades, there is a need to identify the incentives and disincentives of moving from the traditional and more highly valued URL career paths to the MP community. Further, there is a need to determine if officers that move from URL to MP continue to be perceived as "top-notch."

18. How should the Navy structure rewards that will encourage the development of MP knowledge and skills via appropriate shore assignments, training, and education for competitive junior URL officers and CDRs and their transfer from the URL to MP as senior officers? How can the Navy retain URL officers that have high potential for the MP community early in their careers?

Here the most difficult issue involves the URL officers that have adequate but not exceptional operational skills, yet have excellent MP KSAs. These officers may decide that they have a greater probability of promotion, especially to CDR, in the RL or staff corp, and therefore, transfer out of the URL at the LT or LCDR grades. If the officer with average, but not excellent operational skills remains in the URL, (s)he may not be promoted to the next grade even though (s)he has strong MP-related potential. Again, the Navy loses a potential URL-MP at the junior grade.

19. Identify methods that can increase the status of the MP community with the URL and within the Navy without decreasing the status of the individual officer who moves from the URL to MP within the Navy.

Part of the status issue may be contingent on promotion opportunities. Is it more likely that an MP officer that has transferred from a URL community as a senior officer will be promoted to flag than a similar URL warfare officer? This issue involves examining both the status of the MP community as a whole (in relation to the URL) and the status of the individual officer who chooses to move from the URL to the MP community. It might be that the URL MP officer not only experiences stress and difficulty when (s)he moves from the URL to the MP community but also when (s)he begins to interact with a large proportion of non-operational and civilian Navy (and non-Navy) personnel. That is, is the former operational MP viewed as less competent than his/her non-URL MP counterpart?

### Coordination of Navy Personnel Systems

The focus of this factor is on other organizational systems and practices that may enhance or inhibit the effectiveness of multiple career ladders in the URL. The goal here is to develop improved methods of communication and coordination among training units, assignment officers, education boards, and promotion boards. In order to enhance the coordination of the Navy's personnel systems, research addressing the following questions should be conducted as well as the development of new technologies to interface the outcomes of each research.

20. How can the Navy communicate and demonstrate support for the MP system (top level organizational support)?

Part of the top level support will be determined by the interactions between URL and MP communities. Top brass need to make it clear that they support the MP community and support the transfer of excellent URL officers into the MP community.

21. What methods will lead to increased planned/systematic interactions among URL officers with the potential to be successful MPs and RL, staff, and civilian communities within the Navy?

Currently, URL officers, especially in aviation, surface, and subsurface, interact infrequently with RL, staff corp, or civilians within the Navy. When URL officers do interact with non-URL personnel, it is generally during shore assignments; assignments that currently have less weight in the officer's career (i.e., promotability). Further, many URL officers continue to interact predominantly with operational officers on shore assignments as well. Issues that should be considered here include more extensive, and required participation in such programs as DSMC, longer shore tours (i.e., 2 or 3 years as well as 18 months) that involve extensive interactions with non-URL personnel, and increased attention to the stage in the officer's career that such interaction should begin.

22. How do the Navy's current promotion practices coordinate with the goals of the URL-operational and the URL-MP career paths? How can the promotion practices be modified to facilitate the development of the URL-MP officers without reducing the effectiveness of the URL operational functions?

Currently, the Navy promotes all URL officers based primarily on their warfare skills (Bjerke, Cleveland, Morrison, & Wilson, 1987) and the assumption that leadership is an ability that generalizes across any organization/leadership task. This practice suggests that the goal of developing URL officers for future MP assignment may be inconsistent with the current Navy promotion practices. URL officers with excellent managerial or technical expertise will be "passed over," because they may have only "adequate" warfare skills. Alternative procedures could be assessed. For example, what would be the impact of using the Army's procedure to integrate the URL-MP path with promotion practices by recommending quotas to selection/promotion boards for officers with specific skills or expertise (as well as a predetermined acceptable level of operational performance). The Army currently establishes quotas for various subspecialties.

23. To what degree does the Navy's current performance appraisal system allow for the coordination of the URL and MP community needs?

In their evaluation of the Navy Officer Fitness Report, Bjerke et al. (1987) found that commanding officers complete the Fitness Report with primarily one goal in mind:

the promotability of the officer--given his/her operational or warfare performance. In theory, the Fitness Report could be used to identify officers with strong managerial or technical skills as well as strong warfare skills. In practice, the Fitness Report provides information to the promotion boards regarding an officer's warfare skills or capacity to become a future Navy commanding officer. There is a need to develop a method for evaluating URL officers on non-operational skills.

24. To what degree are current Navy training and education orientation/practices consistent with the goals of both the URL and the URL-MP career paths?

Two issues are reflected in this question. Development of URL-MP skills may require systematic training over repeated tours. If so, this would be at variance with the Navy's current practice in the URL of billet-specific training. Second, the development and maintenance of URL-MP skills may require educational tours. Formal education for officers within the Navy, particularly the URL, may need to receive a higher weight during promotion decisions.

25. What methods will increase the coordination among the personnel systems (a) promotion system, (b) Fitness Report (performance appraisal), (c) URL rotational practices, (d) Navy postgraduate school selection/practice, and (e) formal training programs applied to the URL and MP communities?

The focus here is on the development of a technology or information system that can store multiple levels of information (i.e., skill inventories vs. time to skill proficiency, vs. manpower needs, etc.) and retrieve and output such information so that users from different personnel units can readily and effectively obtain and utilize it.

#### Manpower Planning: Quantifying URL-MP Needs

Manpower assessment and manpower forecasting refer to the determination of the number and type of personnel needed to carry out specific functions and the prediction, on the basis of current personnel, what types of recruitment, selection, transfers, etc. will be needed to meet those personnel needs. The purpose of this factor is to identify the quantitative manpower needs that are relevant to filling positions in the MP community without hindering the manning requirements in the operational URL. This factor is an important one in the management of multiple career ladders within the URL. However, although the Navy must obtain this "quantity" information, it would be difficult to conduct an effective analysis if the target skills and target billets etc. have not already been identified. Therefore, effective manpower analysis in a multicareer path system is dependent to a large degree on the identification of the domains or skills or billets, etc. to be analyzed.

26. How can the Navy identify and project overall KSA needs, coordinating the needs of the MP and URL communities?

Just as we need qualitative career information on officer skills and activities, quantitative information regarding the numbers of officers with specific skill arrays needs to be determined. One approach would be to develop a skill by job taxonomy in order to assess how many officers within the MP community need various skills.

27. How many officers in the URL should pursue development of MP-related KSAs at the LT, LCDR, CDR, etc. grades given the Navy's promotion rates, retirements, and transfers to RL/staff designators.

This question targets the Navy's manpower needs more specifically by grade. Here a KSA by grade matrix could be generated to identify the quantitative skill needs at each rank.

28. What methods can be identified to ensure sufficient numbers of officers who are WSAM qualified in the URL?

Currently, the Navy's WSAM program is the major source of URL officers for the MP community. However, it is not clear how it is determined whether an officer has "WSAM potential." Further, many officers that have WSAM potential are sent to other, non-WSAM URL billets. The issue here concerns how the Navy can provide 8 years experience in weapon system acquisition-related assignments in order to develop fully qualified program managers at the O-6 grade. The personnel at the Air Force Analysis Center who developed the Acquisition Management Model might provide useful information on this question.

### CONCLUSIONS AND RECOMMENDATIONS

A critical component of the Human Resource Planning and Career Development process is the evaluation of the skills, knowledge, roles, experience, etc. necessary to perform target positions. Research geared toward assessing key MP positions is a top priority in the process of managing multiple career ladders. All other factors in the proposed framework and in the career development process rest on the availability of this information.

Once the KSAs of target MP-URL positions are identified, the next step is a quantitative issue. That is, an analysis of manpower needs by KSAs by billets and by grade is necessary.

Once the Navy obtains the primary qualitative career development information (what skills need to be developed) and the primary quantitative information (how many officers with such skills are needed) then the research questions identified in the remaining four factors may be pursued either simultaneously or in overlapping phases--Job Analysis and Development of KSAs, Information Systems and Dissemination Methods, Managing Incentives and Disincentives, and the Coordination of Navy Personnel Systems.

The Job Analysis and KSA Development research domain should receive higher priority once information on Target Jobs and Manpower Analysis is obtained. The Navy currently has the personnel at Navy Occupational Development and Analysis Center to conduct much of the officer job-task analysis surveys.

Further, it should be noted that the development of URL-MP related KSAs is not primarily a Navy training and education issue. Officers in the Navy are analogous to middle-level managers in industry. It is well documented (Cleveland, in review) that individuals occupying such positions are most appropriately trained on the job through varied job experiences, assignments, etc. Therefore, the billet structure (and nature of the billets) and the rotational practices within the Navy require careful analysis and attention. The purpose of the Job Analysis and KSA Development factor is to assess jobs and officers early in their careers. The outcomes of this research domain provide the basis for job ladders, beneficial rotational practices, billet assignments, and, when necessary, appropriate training and education methods for each ladder.

The goal of the Information Systems and Dissemination domain is to identify methods to convey information, determine the nature of information to be utilized effectively by such Navy users as assignment officers, community managers, postgraduate school boards, subspecialty boards, and promotion boards. It is important to continue and expand the dissemination of career information regarding the MP community to junior officers in the URL through such methods as the Navy's career newsletter (Perspective).

Although it is critical to identify the skills necessary for success in the MP community and to identify how the Navy can develop sufficient numbers of officers with those skills, such information alone will not ensure that officers will pursue those career paths. Therefore, the Navy must also identify strategies that can be used to motivate officers to develop and maintain MP-related skills. Rewards and disincentives associated with URL officer movement into the MP community should be assessed.

Currently, the Navy's Officer Fitness Report does not provide useful information regarding an officer's MP potential (Bjerke, Cleveland, Morrison, & Wilson, 1987). There is no personnel system in place that can match officer skills to billet requirements (other than informal word of mouth).

In order for the Navy to successfully develop, maintain, and manage a high quality operational force and top-notch weapons acquisition personnel, there is a need to support both the leadership and the technical/manager development practices within the Navy. The support should include such personnel as the CNO, key officers in the URL, middle level community support, and support from junior officers. The support should be communicated to all levels within the Navy and clear indicators of support should be highly visible.

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