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Development of a USMC Officer Assignment Decision Support System: Needs Assessment

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**Development of a USMC Officer Assignment Decision
Support System: Needs Assessment**

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The current USMC officer assignment system was evaluated to identify functional and operational deficiencies. Among the problems found were lack of standardization among monitors in assignment procedures, lack of a comprehensive centralized data base and reliance upon the manual, labor-intensive review of data elements. The required capabilities for an Officer Assignment Decision Support System (OADSS) designed to aid monitors in their assignment strategies and to correct deficiencies in the present system were presented. <i>Keywords:</i>					
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FOREWORD

This report identifies the functional and operational deficiencies in the current United States Marine Corps (USMC) officer assignment system. Among the deficiencies discussed are the labor-intensive review of hard copy-based information, need for a comprehensive and centralized data base, and lack of standardization among officer Monitors in their assignment strategies. Officer Monitors critically need interactive, computer-based support for assignment decisions because of the volume of assignment-related information available and the vast number of assignment alternatives to be weighed. The final portion of this report presents the enhanced capabilities to be provided by the Officer Assignment Decision Support System (OADSS) being developed.

This is the first in a series of reports that detail the "definition and design" phase of the USMC Life Cycle Management (LCM) process associated with OADSS. The research was conducted under work unit number M5402688WRRD8FY, Marine Corps Decision Support System for Officer Assignment. Future reports will include a feasibility analysis, an economic analysis, and system design specifications for OADSS development.

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SUMMARY

Background

Officer Monitors need support in their decision-making process due to the vast amount of assignment-related information to be considered and the number of assignment alternatives to be weighed. It is anticipated that a user-friendly, interactive Officer Assignment Decision Support System (OADSS) will help Monitors better implement USMC staffing policy, significantly reduce their clerical workload, and enhance the match of officers to billets.

Objectives

The objectives of this Needs Assessment were to identify problems in the current officer assignment system; provide a functional overview of the current officer assignment system; specify enhanced capabilities to be provided by the OADSS; and specify functional and operational requirements to be provided by the OADSS.

The Current Officer Assignment System

There are a number of deficiencies in the current officer assignment system. Among the problems documented is a lack of standardization among Monitors in assignment procedures; lack of a comprehensive, centralized data base; dependence upon manual, labor-intensive review of relevant data elements; lack of a user-friendly data base management system (DBMS) for ad hoc query and reports; duplication of effort among Monitors and their assistants; and poorly structured, inadequate training for new Monitors.

Required Capabilities for Proposed Officer Assignment System

Development of OADSS must be the broad-based effort to correct the variety of deficiencies cited in the present assignment system. New functional and operational capabilities will include expanded scope of data elements and improved availability of computer-based decision support; easy to use procedures for ad hoc query and reporting on data bases; reduction in the clerical workload of Monitors; increased reliability and responsiveness of the automated information system; and development of specialized, computer-based training for new Monitors.

Recommendations

The following recommendations are made:

1. A feasibility study/economic analysis should be completed to evaluate the technical/operational and economic viability of alternative approaches to system development.
2. Consideration should be given to using modular system design and employing a "rapid prototyping" approach as means of reducing system development time.
3. The hardware/software selected for system implementation should be readily integrated with existing Marine Corps automated information system and have the capability to access existing mainframe data bases.

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INTRODUCTION

Background

The mission of the Officer Assignment Branch (MMAA), located at Headquarters, U.S. Marine Corps (HQMC) is to administer assignment of all Marine Corps officer (Colonel and below) in accordance with regulations, approved assignment policies, and criteria of the Commandant of the Marine Corps (CMC). Functions carried out in support of this mission include: issuing travel orders; classifying/reclassifying officers in occupational specialties; and assigning officers to educational, intermediate, and top level schools. The individuals within MMAA who make assignment decisions (subject to approval by higher authority) are referred to as officer Monitors. Monitors have a very difficult job in that they are expected to accommodate both the manning requirements of the Marine Corps and the career/personal needs of officers via the assignment process. Performing this task requires concurrent consideration of the job dimensions of available billets and the skills and attributes of officers being assigned.

Monitors' first consideration in staffing is the "fill" of available billets while the next is the "fit" of officers to specific billets based upon their education, work experience, military occupational specialty (MOS), etc. The process of reaching an assignment decision may involve accessing on-line personnel data bases such as the Joint Uniform Military Pay System/Manpower Management System (JUMPS/MMS), reviewing Officer Fitness Reports (FITREPS) on microfiche, talking with constituents in person or on the telephone, or reviewing a number of other relevant sources of information. In conjunction with this, Monitors must also be mindful of established staffing policy, USMC manning levels, and career development needs of individual officers when weighing assignment alternatives.

The idea for establishing an Officer Assignment Decision Support System (OADSS) came about because it was evident that Monitors need support in their decision-making process due to the vast amount of assignment-related information to be considered and the number of assignment alternatives to be weighed. It is anticipated that a truly user-friendly, interaction Decision Support System (DSS) will help Monitors better implement USMC staffing policy, significantly reduce the clerical workload of Monitors, and enhance the match of officers to billets.

The original effort to develop a DSS for Monitors was carried out by a contractor as part of the Officer Precise Personnel Assignment System (Officer PRE-PAS) in 1979. However, this work stressed an optimization approach to officer assignment and was terminated in the early, concept development stage of the Life Cycle Management (LCM) process. A subsequent contractor effort to build OADSS, in 1981, was also terminated in the concept development stage as it too relied heavily upon optimization techniques and was not sufficiently interactive. Both of these attempts were doomed to failure as the Marine Corps objected to any "black box" (optimization) approach perceived to automate the assignment process. The goal was to support Monitors in their decision-making, not to make assignment decisions for them.

The idea for developing the OADSS lay dormant until 1985 when support for a third attempt at system development became available at the Navy Personnel Research and Development Center (NPRDC). The project sponsor, Manpower Plans and Policy (MPI), specified that system design be carried out by personnel research psychologists rather than operations researchers or computer specialists under the assumption that this would avoid yet another optimization-oriented approach to system design that would be

unacceptable to the CMC. Also, it was MPI's hope that psychologists could perhaps better assess Monitors' needs and translate them into design of a system that was easy to access and truly user-friendly.

In compliance with the USMC Life Cycle Management Plan for Automated Information Systems (LCM-AIS), MCO-P5231.1, a Requirements Statement (RS) was prepared. This document provided a basis for users to verify that their requirements would be adequately addressed by the system to be developed and provided the Marine Corps with a means of evaluating the merits of proceeding with subsequent phases in system development. The present Needs Assessment is based largely upon the RS submitted to MPI and serves to: (1) describe deficiencies in the current officer assignment system; and (2) present required capabilities of the OADSS to be developed.

Objectives

The overall objectives of this Needs Assessment were to:

1. Identify problems in the current officer assignment system.
2. Provide a functional overview of the current officer assignment system.
3. Specify enhanced capabilities to be provided by the OADSS.
4. Specify functional and operational requirements to be provided by the OADSS.

THE CURRENT OFFICER ASSIGNMENT SYSTEM

A comprehensive review of current USMC officer assignment procedures was undertaken to document existing capabilities and identify deficiencies. Extensive interviews were conducted throughout the MMOA Branch with 12 of the 17 Monitors interviewed. In addition, a survey was administered to Monitors and their assistants requesting them to identify key data elements used in assignment decision-making and to describe information not presently available that would significantly aid them in the assignment process. Supplementary interviews were conducted with departments providing data used for officer assignment (e.g., MMOS-2 FITREP Section) to gain in-depth information about specific data files. Finally, Monitors' daily work activities and assignment strategies were observed firsthand over a 3-day period. The primary focus of all of these efforts was to gather information to improve current procedures and to develop new functional capabilities for assignment decision-making.

To supplement information gained from interviews and survey feedback, the following documents were reviewed:

1. "Mission Element Needs Statement for the Development of the Officer Assignment Decision Support System (OADSS)," Navy Personnel Research and Development Center, 1 August 1985. This document states the mission needs based upon current problems.
2. "Automated Data System (ADS) Plan for the Officer Precise Personnel Assignment System (Officer PRE-PAS)," Potomac Research Incorporated and General Research Corporation, 15 September 1979. This report presents a proposal for development of the Officer PRE-PAS System and an assignment management information system.

3. "Development of Specifications for the Officer Assignment Decision Support System," Andrulis Research Corporation, 25 February 1981. This report presents a proposal for development of an officer assignment system based on optimization strategies.

4. "Officer Staffing Goal Model (OSGM): Design Specifications," Decision Systems Associates, June 1978. This report contains a description of the function, logic, and data definitions of the OSGM at the time of development.

5. "Users Manual: Officer Staffing Goal Model (OSGM)," Decision Systems Associates, September 1984. This manual describes how to create and run an OSGM job.

6. "Marine Corps Personnel Assignment Policy," Marine Corps Order 1300.8M, 2 May 1984. This MCO implements Department of Defense policy and provides policy guidance relative to assignment and Permanent Change of Station (PCS) of Marines.

7. "Officer Assignment Branch Slating Guidance Memorandum," Director, Personnel Management Division, 18 October 1982. This memorandum provides guidance for the slating process, amplifies existing instructions, and establishes branch policies not covered elsewhere.

8. "Joint Uniform Military Pay System/Manpower Management Systems Code Manual," Marine Corps Order P-1080.20, current to 11 December 1984. This manual contains definitions used in the JUMPS/MMS and Reserve Military Pay System (REMMPS) system.

9. "Staffing Precedence for Officer and Enlisted Billets," Marine Corps Order 5320.12, 22 June 1982. This MCO establishes personnel management guidance and staffing precedence for officer and enlisted billets in Marine Corps Commands.

10. "Life Cycle Management for Automated Information Systems (LCM-AIS)," Marine Corps Order P-5231.1, 9 August 1983. This MCO establishes policies, procedures, and regulations governing the development, operation, and management of automated information systems.

11. "Automated Data Systems (ADS) Documentation," Department of Defense (DoD) Standard 7935, 15 February 1983. This document provides DoD guidelines for the development and revision of documentation for ADSs and describes technical documents to be produced throughout the life cycle of an ADS.

Problems in Current Operation

Development of the OADSS must be a relatively broad-based effort to address deficiencies identified in the present system. While the primary focus of system development is upon providing computer-based assistance for officer assignment, the effort also encompasses: (1) upgrading of the OSGM dictionary update procedure; and (2) improving Monitor orientation and training. Deficiencies in the current system of officer assignment are presented below.

1. Lack of standardization among Monitors in assignment procedures and decision-making. There is tremendous variability among Monitors in personnel record management, scope of data elements reviewed, use of computer-based assistance, and knowledge of USMC assignment policies and guidelines.

2. Data elements are not accessed in a simple, consistent manner. With the exception of the Officer Slate File (OSF) and Headquarters Master File (HMF), Monitors are unable to access computer-based information without assistance from MMOA-3 (Systems).

3. Available computer data bases do not contain all of the data elements desirable for review in assignment decision-making. Supplementary hard copy and microfiche sources are referenced in an extremely tedious, time-consuming manner.

4. Various data elements (e.g., education and experience codes) are misleading and not reflective of actual skills and qualifications.

5. Review of data elements is typically characterized by manual, labor-intensive procedures that are inefficient in light of existing automated data processing (ADP) technology.

6. Existing methods of searching, sorting, and displaying data are not adequately user-friendly and interactive. Monitors must be reasonably skilled with ADABAS NATURAL (the existing DBMS) syntax to conduct ad hoc queries and generate reports.

7. Current sources of computer-based assistance are not adequately utilized by the majority of Monitors. A number of Monitors seek to avoid "computer literacy" and delegate computer-oriented tasks to their assistants.

8. Existing computer hardware is overworked and response time decrement is unacceptable for productive data element query/review. Video Display Terminal (VDT) availability is problematic during periods of heavy usage by Monitors and assistants.

9. Extensive duplication of effort exists because most Monitors change entries in the "Paper Slate" (hard copy printout of the OSF and selected HMF elements) but delegate the responsibility of updating the OSF, performed via an interactive computer program, to their assistants.

10. Data element reliability/accuracy from some sources is questionable and must often be verified/corrected by Monitors.

11. Materials carried on travel for on-site interviews with constituent officers are heavy and cumbersome. Information documented must be entered into the computer upon the Monitors' return and this is seldom accomplished.

12. Update/modification of the OSGM dictionary is time-consuming for both MMOA-3 (Systems) and Monitors alike. A great deal of manual processing is required primarily because editing facilities are poor.

13. Monitors' input to the OSGM dictionary is frequently not well considered and reviewed, resulting in OSGM output of questionable validity. As Monitors do not completely comprehend OSGM logic and operations, they often "fix" resources which runs counter to the intended purpose of the model.

14. Training for Monitors is inadequate. Materials are not tailored for their role and responsibility as a Monitor. Existing training is too concentrated in the early stages of a Monitor's tour and there is no refresher or phased supplementary training.

Functional Overview of Existing System

Figure 1 provides a data flow diagram to illustrate procedural steps and flow of information in the existing officer assignment system. The following sections describe the procedures and information flow, with each paragraph corresponding to the eight major states represented in the diagram.

Provide Input to the OSGM Dictionary. Deriving staffing goals via the OSGM is theoretically, if not functionally (depends on when the Monitor assumes responsibilities), the first step in officer assignment. While MMOA-3 (Systems) is tasked with overall responsibility for developing the OSGM dictionary and running the model, Monitors are accountable for providing input pertaining to billets falling within their designated Monitor Activity Code (MAC). Monitors should review all of the dictionary, but they are specifically responsible for the following sections:

<u>SECTION</u>	<u>FUNCTION</u>
B1 MOS Definition Cards	Specifies the Military Occupational Specialties (MOS) to be recognized by the OSGM Model. These cards assign each MOS one of 8 MOS type codes (e.g., Naval Aviator Fixed Wing (NAFW), Ground Combat Services Support (GDCS)). Affects processing of the OSGM MMS Extract File.
B2 Critical MOS Cards	Used during a mobilization run to modify the Staffing Precedence Level (SPL) input. Designates critical MOSs in mobilization so that the SPL is automatically raised to one (highest priority).
D1 Master Authorization	Directs allocation of Authorized Strength Report (ASR) authorizations control cards to officer Monitors.
E1 Billet Officer Description Definition	Defines general eligibility and desirability policies for allocated billets. Each Billet Officer Description (BOD) Card set is defined with from one to five cards. Establishes the desirable characteristics of officers to staff billets in terms of grade, MOS, experience, etc.
E2 Billet MCC Identification Set Definition Cards	Defines Billet Monitored Identification Sets (BMISs), a collection of billets with the same MOS/MCC/grade and the same fill, eligibility, and desirability policies.
E3 Nonchargeable/Training/ Training Requirement Definition Cards	Estimates the portion of the officer population, which will be in a nonchargeable status and removes them from available resources. Nonchargeable requirements have a SPL of zero so they have preference over other demands.

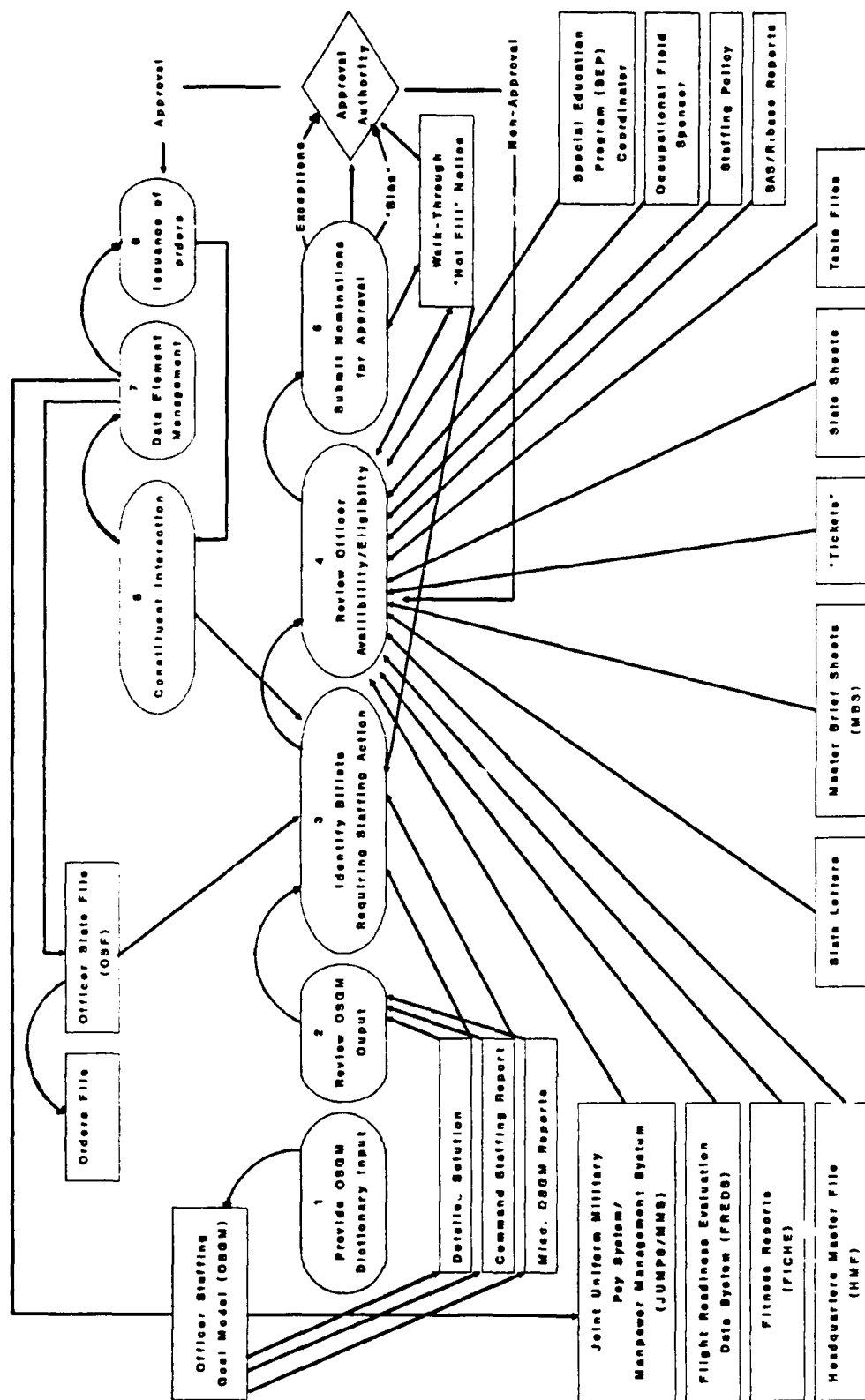


Figure 1. Information flow of current officer assignment procedures.

The OSGM Dictionary File contains approximately 10,000 records and is updated/modified in a slow, inefficient manner. Current editing facilities do not allow the file to be segmented into sections for each Monitor's constituent population. A hard copy listing of the file is provided to Monitors for their input to be penciled in. MMOA-3 (Systems) collects the hard copy and edits the dictionary file to make the changes. Monitors must often be prompted for their input as the update procedure is generally not a high priority for them.

Review of OSGM Output. The OSGM is run three to four times per year (and twice for mobilization) to produce staffing goals. The OSGM produces staffing goals for Monitored Command Codes (MCCs) based upon authorized strength figures (from the Tables of Organization) that have been adjusted to conform with available resources. Resulting staffing goals represent an optimal distribution of officers to be targeted in the assignment process. A problem is that Monitors frequently "fix" resources (withhold officers from consideration in the staffing solution) by specifying Assigned Billet Grade (ABGRD) and Assigned Billet Military Occupational Specialty (ABMOS), which negates the attempt at optimal distribution of officers. Several reports are based on OSGM output with the Command Staffing Report (CSR) and "Detailed Solution" being the primary reports utilized by Monitors in the assignment process. The CSR provides a summary of officers staffed at each MCC and their slated replacements. The CSR also presents manning numbers for both the staffing goals and authorized strength. The Detailed Solution provides information about officers that the OSGM selected in determination of staffing goals. Although Military Identification Numbers (Social Security Number preceded by a "0") are intentionally not provided, Monitors can often identify officers used in the formulation of staffing goals by referring to unique combinations of Additional Military Occupational Specialties.

Identification of Billets Requiring Staffing Action. Monitors work both ends of the assignment process by identifying billets that are coming open and officers approaching their end of tour. The CSR is particularly useful for identifying billets requiring staffing action and provides a field for specifying inbound replacements. Monitors identify "movers" by reviewing OSF records, conversing with constituents, etc. Although staffing needs are identified at the billet level, Monitors are authorized to staff only to the MCC.

Review of Officer Availability and Eligibility. After billets/officers requiring staffing action are identified, Monitors begin the process of reviewing officers' records to locate those most qualified to be assigned to given billets. The first consideration is "availability"--officers must be targeted for reassignment within the same time frame as the billet open. Officers satisfying the availability criterion are subsequently evaluated for "eligibility"--the extent to which their skills/qualifications match those of the billet. A variety of computer/hard copy reports are reviewed at this stage in an effort to achieve the best officer/billet match. This review stage is the key activity in assignment decision-making and is the stage at which OADSS will make a significant contribution. Monitors refer to several sources of information on officers when reviewing their billet-related qualifications. Among the informational resources available to Monitors are computer-resident data bases, hard copy reports, and officers serving in assignment related advisory roles (e.g., Special Education (SEP) Coordinator). The following section presents a brief summary of the information sources Monitors often access throughout the review stage.

Officer State File (OSF)--Maintained by MMOA, the OSF is the primary source of officer information. It contains data pertaining to present command, future command, advance command, officer qualifications, mobilization, etc. The OSF is the

"working document" for Monitors as they can access the file and modify data elements via an interactive update process.

2. Joint Uniform Military Pay System/Manpower Management System (JUMPS/MMS)--The JUMPS/MMS is a collection of data bases maintained by Marine Corps Central Design and Programming Activity (MCCDPA), Kansas City, and provides the most comprehensive source of information on officers. The main source of personnel data provided by the JUMPS/MMS is the Central Master File (CMF) that is updated daily with personnel information reported by the Unit Diary. An extract of this file is available on-line in the Video Inquiry System.

3. Headquarters Master File (HMF)--The HMF is a weekly extract of JUMPS/MMS and is maintained by MCCDPA, Quantico. The HMF provides the basis for development of the OSF and is a key source of information about officers. HMF data elements cannot be updated by monitors.

4. The Historical Master File (HMF)--The Historical Master File (also denoted as HMF) is an archival copy of the Headquarters Master File created on a one-for-one basis. Quarterly copies of the HMF are available dating back to 1972 and are useful for performing special analyses on officers from some earlier period. The files are processed and stored by MCCDPA, Quantico.

5. Flight Readiness Evaluation Data System (FREDS)--The FREDS, maintained by the Aviation Department, is periodically accessed but pertains only to aviation qualified officers. Data elements include aviation service entry date, operational flying time, prior flying status billets and a variety of other potentially assignment-relevant information.

6. Table Files--Table Files are available in the MMOA System Library and may be interactively accessed. These files contain a variety of information periodically referenced by Monitors. Among the 20 table files currently available are those pertaining to exception codes, joint service billets, service school codes, etc.

7. Statistical Analysis System (SAS) and R:base 5000 Output--Monitors frequently request MMOA-3 (Systems) to produce analyses that cannot be performed with the existing DBMS, ADABAS NATURAL. Both the SAS on the mainframe and R:base 5000 on microcomputers are used for these special requests. Output to Monitors consists of a hard copy report or a specially formatted computer file.

8. Officer Fitness Report (FITREP)--FITREP data are managed by Operations and Support Branch (MMOS) and reviewed to ascertain officers' job history and historical level of performance. Monitors do not currently have computer access to FITREPS and must review them using a microfiche reader.

9. Master Brief Sheet (MBS)--MBSs are also produced by MMOS and provide basic identifying data along with a summary of FITREPS on file (sections A and B). The MBS also includes information on officers' decorations, military and civilian education, languages, and selected HMF data. Computer access to MBSs are not presently available and Monitors must review them in hard copy form.

10. "Ticket" Folder--Monitors maintain a folder of information on each officer that is referred to as a "ticket." A ticket contains a variety of information, including past MBSs, administrative action forms, annual slate letters, and miscellaneous Monitor notes from conversations with officers.

11. Annual Slate Letter--The Annual Slate Letter, often referred to as the "Dear Major" letter, is sent by Monitors to constituents with the rank of Major and above on an annual basis. Content of the slate letter varies among Monitors but sections typically include a listing of projected vacancies for the upcoming year, a duty preference questionnaire, and a brief history of military history to be completed by the officer. Slate letters are stored in an officer's ticket and there is no computer storage of responses.

12. Slate Sheet--The Slate Sheet is a brief, one page questionnaire that constituents complete when meeting with Monitors conducting on-site visits. The sheet provides officers with an opportunity to request specific future assignments and asks them to provide justification for their requests.

13. Marine Corps Staffing Policy--Monitors are required to follow specific published staffing policy such as that promulgated in Marine Corps Order 1300.8M. Published directives cover such diverse areas as assignment of women Marines, prescribed tour lengths, PCS transfer rules, etc.

14. "Blue Book"--The "Blue Book" or MANMC P-1005 is published every year and contains promotion-related data. Monitors reference the publication primarily to review an officer's lineal reference number in grade. This number, in conjunction with Lineal Control Number (LCN) of the HMF, is useful for predicting promotion. Additional information includes date of present rank, pay entry base date, and date of rank of first commission in the Marine Corps.

15. Special Education Program Coordination--Monitors must often coordinate assignments with the SEP coordinator in MMOA-3. For example, officers with an Automated Monitor Orientation Subsystem (AMOS) of 96XX are legally obligated to serve specific types of "payback" tours.

16. Occupational Field Sponsor Coordination--For most MOSs, there is an HQMC occupational field sponsor who provides specific billet requirements and recommendations regarding qualifications of officers to fill billets. The sponsors serve as a resource to Monitors but have no authority to make assignments.

17. Monitor/Constituent Interaction--Monitors frequently receive telephone calls and correspondence from officers in the field and drop in visits by their constituents visiting HQMC. Discussions cover such topics as duty preferences, career progression, and "humanitarian" factors impacting on assignments (e.g., child with learning disability enrolled in a special education program available in few locations).

18. Subjective Input--In addition to reviewing available formalized data sources, Monitors always maintain a good measure of subjective input in the assignment process. They must predict future promotion, assess if assignments are career enhancing, consider constituents' personal factors (e.g., site-specific medical treatment for family member), etc., which are considerations that can never be acceptably quantified.

According to official Marine Corps staffing guidance, the responsibility of Monitors is to fill billets, not to find the best assignments for their constituents. Although Monitors do their best to comply with constituents' stated duty preferences, this cannot be their primary objective in making assignments. Monitors' assignment goal hierarchy is as follows:

1. To meet the needs of the Marine Corps.
2. To meet the career needs of the individual.

3. To meet the desires (duty preferences) of the individual.

Submit Assignment for Approval. After a Monitor has tentatively identified an officer for assignment, a formal nomination must be reviewed and approved by the appropriate authority. Nominations of company grade officers are approved at the section level, field grade officers at the branch level, Lieutenant Colonel and high visibility (regardless of rank) nominations by the Director, Personnel Management Division (MM), and Colonel nominations by the CMC. Assignments that represent exceptions to staffing policy (e.g., a second overseas accompanied tour) must be identified and approved. In addition, several types of nominations require that a Brief Digest of Military History, or "Bio," be prepared to summarize officer qualifications. Following approval of a nomination, Monitors update data elements of the "future command" section of the OSF. A program is run daily on the OSF to flag new assignments so the Orders File maintained by Manpower and Personnel Enlisted Assignment Branch (MMEA) can be updated and the orders writing procedure initiated.

Issuance of Orders. PCS paperwork will soon be completely carried out by the Automated Orders Writing Procedure (AOWP) with orders written directly on printers at cognizant commands. However, unlike assignment of enlisted personnel by MMEA, AOWP is not yet operational in MMOA. The output of the current procedure is a naval message providing authority to cognizant commands to cut the orders. Monitors are typically not closely involved with issuance of orders as these matters are delegated to their assistants and support personnel. Monitors are aware that the PCS has been accomplished when diary entries to the MMS are made at the receiving command and Future Monitored Command Code (FMCC) data elements automatically become those of the Present Monitored Command Code (PMCC).

Data Element Management/Constituent Interaction. In addition to stages in the assignment process detailed in preceding sections, there are several ongoing procedures conducted by Monitors. For example, they manage (e.g., update/delete) data elements that are maintained as computer files, most notably the OSF. Most Monitors simply determine the nature of the update and delegate the responsibility of updating the OSF to their assistant. This duplication of effort would be eliminated if Monitors actually updated the OSF themselves as changes arise. Another ongoing Monitor activity is interaction with constituent officers. This interaction is an integral part of the Monitors' job, whether it be via telephone, on-site visit, or constituent visit. Constituent interaction takes precedence over other activities and can constitute a large part of the Monitor's workday.

Organizational Responsibilities

The Director, Personnel Management Division (MM), under the direction of the Deputy Chief of Staff for Manpower, is responsible for: administration and retention of officer and enlisted Marine Corps personnel; distribution, appointment, promotion, retirement, and discharge of commissioned officers, warrant officers, and enlisted personnel. The MMOA, end users of the OADSS, is responsible for administering the assignment and classification of all Marine Corps Officers (Colonel and below). The sections within MMOA and their responsibilities are presented below.

<u>Section</u>	<u>Responsibility</u>
MMOA-1	Ground Officer Assignment
MMOA-2	Aviation and Aviation/Ground Officer Assignment
MMOA-3	Plans, Policy, Systems, and Special Programs
MMOA-4	Air and Ground Colonel Assignment

Sections MMOA-1, MMOA-2, and MMOA-4 are responsible for actual officer assignment within their designated areas. MMOA-3 coordinates administration of the SEP, LATERAL MOS moves, and retention and release matters. MMOA-3 (Systems), formerly MMOA-5 (Operations Analysis and Systems Support), coordinates running of the OSGM, distributes OSGM reports, and provides analysis and programming support to the other sections. While a complete discussion of all MMOA responsibilities is beyond the scope of this report, the primary assignment-related functions are presented below:

1. Effects and monitors assignment of all officers (Colonel and below).
2. Issues travel orders for officers in accordance with approved policies, laws, and fiscal/travel regulations.
3. Administers delay in route leave between duty stations.
4. Classifies/reclassifies officers.
5. Enters officer personnel data into appropriate data files (e.g., OSF, MMS).
6. Assigns officers to professional military education schools while following established assignment policies.
7. Assigns officers to military schools in conjunction with the Deputy Chief of Staff for Training and occupational field sponsors.

The assignment process is supported by several organizational entities, which maintain data sources accessed by the Monitors. The FITREP Section (MMOS-2) of the MMOS is responsible for the processing and distribution of Officer FITREPS. MBSSs, like FITREPS, are also a product of MMOS. The JUMPS/MMS is maintained by MCCDPA, Kansas City, while the HMF is maintained by the MCCDPA, Quantico. Overall ADP support of MMOA is handled by MCCDPA, Quantico, which includes centralized file maintenance, providing access to the Amdahl mainframe, and assisting with data communications between HQMC and the MCCDPA.

ADP Environment and System Input/Output

ADP Environment. The OSGM is run on a Cyber mainframe computer located at Computer Data Corporation (CDC) in Rockville, Maryland. MMOA-3 (Systems) edits the control card deck using the Network Operating System (NOS) and submits the model run via Remote Job Entry (RJE). Output tapes produced by the OSGM are then carried by courier to HQMC where they are reformatted prior to bulk transfer to MCCDPA, Quantico. Other than this CDC tie for OSGM, MMOA is completely supported by the Amdahl 470V/7 mainframe located at MCCDPA, Quantico. Permanent master files (e.g., OSF, HMF, etc.) are resident on the Amdahl. MCCDPA, Quantico, coordinates file maintenance for all MMOA-related data bases except the OSF, which is maintained by MMOA. Monitors access the mainframe via RJE terminals located throughout MMOA

offices. Data is transferred between the two sites using standard communication channels. Monitors perform ad hoc queries of the data base using ADABAS NATURAL, a fourth generation language. In addition to the mainframe usage, a number of IBM-compatible microcomputers are located within MMOA. The microcomputers are often used by MMOA-3 for program development of SAS or R:base 5000 programs in response to special requests made by Monitors.

Input. As discussed earlier, Monitors review data elements from several sources in carrying out the assignment process. In this section, only computer-based data sources will be addressed.

1. Officer FITREP output, produced by MMOS-2, is reviewed to establish prior work experience and levels of performance. Although approximately 250,000 reports are submitted for the Marine Corps each year, Monitors are concerned only with FITREPS for constituent officers. The number of constituents per Monitor currently ranges from approximately 275-2000. FITREPS are issued on an annual basis and also when changes occur in a Marine's duty status, grade, or reporting senior. FITREPS contain four sections but only the first two are scanned for computer entry. Monitors must review FITREPS with a microfiche reader as computer access is not available. However, MMOA-3 (Systems) has recently gained computer access to Section A of FITREPS and can access the data with SAS or NATURAL.

2. MBS, also a product of the MMOS branch, are created every time there is a FITREP issued and serve to provide a brief summary of all FITREPS on file for an individual. Additional information provided includes military decorations, military/civilian education, and assorted HMF data. There is currently no computer access to MBSs available and monitors file these hard copy reports in "ticket" folders.

3. The FREDs is maintained by the Aviation Department and pertains to officers that are aviation qualified. The FREDs file provides more extensive flying-related data than does the Aviation Career Incentive Pay (ACIP) section of the OSF.

4. The JUMPS/MMS is maintained by MCCDPA, Kansas City, and provides the most comprehensive information about Marine Corps personnel. The JUMPS/MMS is actually comprised of several interrelated data bases and provides access to "real-time" data as it is updated with diary entries on a daily basis. Monitors can access the JUMPS/MMS using ADABAS NATURAL but are restricted in their ability to update data elements because of security considerations.

5. The HMF is maintained by MCCDPA, Quantico, and is an extract of the JUMPS/MMS. Updates of the file are made every 1-2 weeks so data is fairly current. The HMF is the basis for development of OSF records but cannot be directly updated as this is done via JUMPS/MMS diary entries. The HMF is accessed for ad hoc queries and data retrieval by using ADABAS NATURAL.

6. The Historical Master File (also HMF) is an archival copy of the Headquarters Master File. MCCDPA, Quantico, processes and stores the file with copies of the file dating back to 1972 available. The historical data is useful for running special management reports and Monitor requests for an earlier time period.

7. SAS and R:base 5000 files are periodically created in response to special Monitor requests that cannot be accomplished with NATURAL. Output may include summary statistical analyses, reformatted officer records, etc.

8. Table Files reside in the MMOA System Library and are interactively accessed. The 20 files currently available contain information such as service school codes, accompanied tour requirements, and other billet-related assignment information to which Monitors must often refer.

Outputs. As the primary responsibility of MMOA is to effect and monitor the assignment of Marine Corps officers, the production of formalized assignment-related outputs at a minimum. Monitors are concerned with reviewing a variety of inputs but are not responsible for generating outputs to be used by other Marine Corps organizations. For all practical purposes, the only true "output" from MMOA is the Command Staffing Report modified (CSR (mod)) that is distributed to MCCs. The CSR (mod) is similar to the CSR except that MCCs have been "rolled up" within their respective parent MCCs. CSR (mods) are distributed to commands following an OSGM run and list the on board and in bound officers projected from the present to three years in the future. The CSR (mod) is valuable to MCCs because it indicates their "fair share" of resources as determined by the OSGM.

While Monitors access several data files throughout the assignment process, they are responsible for the maintenance of only one--the OSF. OSF records are initially created with HMF data. The primary "working file" for Monitors is comprised of the OSF and several HMF elements. This file contains the following sections: present command, future command, advanced command, aviation career incentive pay, and mobilization. Monitors update OSF data elements using an interactive program originally developed by MPI. The OSF updates MMEA's Orders File on a daily basis to initiate the orders writing procedure.

REQUIRED CAPABILITIES FOR THE PROPOSED OFFICER ASSIGNMENT SYSTEM

Development of the OADSS is a broad-based effort designed to help make Monitors' jobs easier and more efficient. Besides enhancing computer-based ad hoc query and data retrieval capabilities, OADSS will include improved Monitor training and an enhanced method of updating the OSGM dictionary. It is important to stress that OADSS is designed to merely support Monitors' decision-making and will not introduce automated assignment of officers (as is the case with enlisted personnel). The assignment of Marine Corps officers is by necessity a highly subjective process and it is critical to maintain this "human touch." Decisions that can dramatically affect the personal and career satisfaction of officers cannot acceptably be performed by a computer because of the subjective factors involved. The following sections describe the specific functional and operational capabilities required in the OADSS. Other issues discussed are the organizational environment in which the system will operate, additional sources of assignment-related information, interfaces with other automated information systems, ADP environment in which OADSS will operate, system security, and system performance requirements.

Current Capabilities. The OADSS must continue to support all of the functional capabilities listed below that are currently extant:

1. Development of staffing goals for optimal distribution of available manpower resources via the OSGM. Although some modifications to the OSGM were discussed during the aforementioned interviews, these issues are beyond the scope and funding level of the OADSS effort and will not be further addressed.

2. On-line update of JUMPS/MMS data elements using diary entry procedures.

3. Maintenance of the OSF for active duty Marine Corps officers, which serves as the "working document" for Monitors and provides input to MMEA's Orders File.

4. Nomination and approval of officer assignments consistent with current organizational practices. Includes following formalized assignment policy, citing of policy exceptions, preparations of "bios," etc.

5. Providing Monitors with access to a data base management system (currently ADABAS NATURAL) for management and analysis of data.

6. Generation of all outputs currently produced (e.g., Command Staffing Report) or their equivalent. The system should have sufficient flexibility to accommodate format changes in different versions of a common output.

7. Support of miscellaneous officer-related activities such as career level school nomination/assignment, SEP coordination, and assignment of MOSs to recent graduates of Officer Candidate School (OCS).

Enhanced Capabilities. To address the deficiencies of the present system cited earlier, the OADSS must provide both enhanced functional and operational capabilities. These enhancements will include the following:

1. Streamlined and simplified procedures for updating the OSGM dictionary.

2. Development of specialized training materials and instructional programs for officer Monitors.

3. Expanded availability of computer-based decision support informational resources, to include data elements critical for assignment decision-making not presently available.

4. Support for system user ad hoc query, retrieval, and manipulation of data elements.

5. Versatile report generator that can support timely, accurate management reports and special analysis requests.

6. Reduction in duplication of effort and reliance on time-consuming, manual procedures evident in the present system.

7. Increased reliability and responsiveness of the computer system supporting monitor activities.

8. Easy to use procedures for accessing data elements, downloading/uploading of files, and other computer-oriented activities.

9. Security and control over access to sensitive information such as performance evaluation data.

10. Ease of maintaining and upgrading system hardware/software.

11. Support of inter-office communications (e.g., electronic mail).

12. Sample, systematic procedures for file backup/recovery and restart in the event of a system failure.

13. Compatibility with existing ADP environment.

Functional Requirements

The functional requirements for development of the OADSS are summarized in Figure 2. Each of the six requirements is discussed in detail in the following sections.

OSGM Dictionary Update. Present methods of updating the OSGM dictionary are cumbersome and excessively time-consuming. MMOA-3 (Systems) first provides Monitors with hard copy output of their respective sections, based on Monitor MAC. Monitors then pencil in dictionary insertions, deletions, and modifications, and return the hard copy to MMOA-3 so the required changes can be made to the dictionary file. As Monitors do not directly modify the dictionary, there is duplication of effort in this process. Another problem is that the editing facility for the dictionary file is very rudimentary. For example, to alter one character in a record, the entire record must be deleted and retyped. The process of prompting Monitors for their input and making changes to the OSGM dictionary currently takes 3-4 weeks. Clearly, computer applications should be expanded to streamline and simplify the update procedure.

Editing procedures must be developed to automatically provide Monitors with a file containing their control card sections. Interactive procedures will be developed to allow Monitors to modify their records in an easy, efficient manner. Monitors will actively manage their dictionary sections and MMOA-3 (Systems) will then build the master file through a simple concatenation process. If feasible, field and card order error checking should be incorporated to eliminate unreliable visual checking. The enhanced update procedures will substantially reduce the time required to build the OSGM dictionary while also improving Monitors' ability to manage their MAC-defined sections.

Monitor Training. Training materials specifically designed for Monitors must be developed and administered in an appropriately staged training program. Current training of Monitors is cursory and not well structured. Monitors-to-be receive a notebook containing several hundred pages of published staffing policy ("desk reference"), which they are instructed to become familiar with prior to assuming responsibilities at HQMC. Formalized training consists of a few presentations on the OSGM process, the NATURAL language, using computer resources, etc. Unfortunately, this up front "information overload" often results in confusion and frustration because the material cannot be completely absorbed. Monitors typically learn mostly via informal channels such as spending a few days with the officer they are relieving or by word-of-mouth.

Training materials must be developed for Monitors that will address such important topics as: influence of dictionary input on staffing goals; key data elements to review in weighing assignment alternatives; prioritization of job responsibilities; formal and informal exceptions to staffing guidance; and relationship with constituent officers. A primary goal of the training materials and associated training sessions should be to develop standardized procedures for Monitors. Much of the extreme variability among Monitors in assignment decision-making stems from the lack of a well organized, thorough training curriculum. Training would be phased over several months to build upon Monitors' increasing skills and knowledge. In addition, refresher training will be introduced to review key concepts and to disseminate new information. The exact content and format of the training curriculum will be developed in conjunction with MMOA.

REQUIREMENT

Streamlined and simplified procedures for updating the OSGM dictionary.

Development of specialized training materials and instructional programs for Officer Monitors.

Expanded availability of computer-based information, to include data critical for assignment decision-making not presently available.

Support for ad hoc query, data retrieval and database maintenance.

JUSTIFICATION

Present methods of updating the dictionary are inefficient and time-consuming due to manual processing and limited editing facilities. Improved update procedures will promote Monitors' active management of their sections, improve staffing goals, and reduce file building complexity.

Present training materials and methods are inadequate. Materials must be tailored for Monitors as a means of reducing variability in their decision-making strategies. Training sessions should be phased to prevent "Information overload."

Data presently available only in hardcopy form will be more efficiently reviewed when made computer-resident. The expanded scope of information available will promote better match of officer to billet.

Monitors' ability to perform rapid ad hoc queries will be greatly improved by eliminating the need to learn DBMS language and syntax. Usage of "applications generator" technology" will allow Monitors to effectively use the system with little formal training. Without improvement in this area, there will be continued reliance upon paper-and-pencil methods.

Figure 2. Summary of functional requirements for OADSS.

REQUIREMENT	JUSTIFICATION
Availability of a versatile report generator to support management reports and special analyses.	A powerful, but easy to use report generator is needed to meet MMOA reporting needs. The present system relies upon several software packages (NATURAL, SAS, R:base) to produce required reports. Without a comprehensive report generator, Monitors will continue to be dependent upon MMOA-3 (Systems) for the majority of their reports.
Reduction in duplication of effort and reliance upon inefficient, manual procedures now evident.	Extensive duplication of effort wastes a great deal of Monitors' time. Also, labor-intensive, manual review of data elements is a time-consuming process that will be significantly improved with expanded computer-based assistance.

Figure 2. (Continued).

Computer-based Data Elements. Efforts must be made to bring about expanded computer storage/access of data elements reviewed by Monitors. Data presently available in hard copy form only such as MBSs, could be made available (for selected elements) in a computer data base for easy ad hoc query and data retrieval. In addition, data elements critical for assignment decision-making but not presently readily accessible would be made available for computer-assisted review. For example, key promotion-related information that must now be extracted from a variety of sources (MBSs, FITREPS, "Blue Book") could be made available via access to a computer file maintained by MMPR-3. The expanded scope of computer-based information will significantly reduce laborious, manual review of data elements.

Ad Hoc Query and Data Retrieval. Monitors' capability to perform ad hoc query, data retrieval, statistical analysis, and data manipulation must be enhanced. Although the present DBMS provides many of the query/retrieval functions that Monitors require, additional capabilities are needed. For example, providing substring or "wild card" searches will allow data elements to be searched for a key word/phrase. This capability would be useful for reviewing data fields such as Job Title where there is little standardization in naming and abbreviation conventions. The primary problem with the existing DBMS is that Monitors must develop expertise in the NATURAL language and syntax before they can query the data base. Although it is as touted as a "natural, non-procedural language," NATURAL requires extensive hands-on experience to develop proficiency. Unfortunately, Monitors typically have neither the time nor inclination to devote to such an endeavor.

Whether it is attributable to "computer phobia" or insufficient time available for the requisite practice, only a few Monitors have learned NATURAL and can effectively conduct ad hoc query and data retrieval. What is needed is a DBMS that contains an "applications generator" designed for novice users. This program development tool allows users to interactively "build" a program with few key strokes and virtually no knowledge of the underlying language and syntax. The applications generator will allow Monitors to utilize the power of the DBMS immediately, without devoting a great deal of time to learning the language. In addition, application generators are excellent for training as they display the program as it is created. In this way, users gain familiarity with the language and are encouraged to expand their proficiency. Ideally, Monitors will build their own libraries of frequently run reports as a means of saving time in writing future data base queries.

Report Generation. A versatile, easy to use report generator capable of supporting production of management reports and special analysis requests must be made available. Currently, a combination of NATURAL, SAS, and R:base 5000 software packages are used for this purpose. Ideally, the new system will be able to generate virtually any type of report without the need to access other software. The report generator will have both default automatic formatting and customized report capabilities. Graphic, tabular, and statistical facilities must be available to support display needs. Reports received at the computer terminal will be easily directed to an off-line printer eliminating the need for rerunning the job.

Reduced Duplication of Effort and Manual Review of Data Elements. All efforts should be made to reduce the duplication of effort and reliance upon time-consuming, manual procedures that characterize the present officer assignment system. Monitors have an extremely heavy workload and aforementioned problems serve to compound the problem. The following examples of duplication of effort have been identified earlier and will not be readdressed here: (1) MMOA-3 (Systems) update of the OSGM elements based

upon Monitors' changes; (2) Monitor Assistant update of OSF data elements based upon Monitors' changes and noted in the "paper slate;" and (3) Monitor/Monitor Assistant update of the OSF and other files based upon information collected from on-site visits with constituents. The laborious, manual review of data elements and Monitors' inability to use the DBMS to search, sort, and report on available information. The manual/visual review of data elements is very time-consuming and could be performed much more efficiently with computer assistance, thereby freeing up a substantial amount of time for Monitors to devote to other activities that are now short-changed.

Operational Requirements

The operational requirements for OADSS are summarized in Figure 3. Each of the seven requirements are discussed in detail in the following sections.

System Reliability and Responsiveness. A critical requirement is that the system reliably and efficiently support the increased demand for computer resources resulting from OADSS implementation. While the existing ADP environment has improved in recent years, the system is still prone to periods of "down time" and performance degradation. As there is no backup for the mainframe, Monitor activities are brought to a virtual standstill when system failure occurs. A key requirement for the new system is to improve ADP equipment reliability and provide backup facilities, where feasible. In addition to the issue of reliability, a major shortcoming of the present system is severe response time degradation that accompanies periods of heavy usage. For example, during a recent demonstration of a menu-driven library system, it took in excess of 3 minutes to simply proceed from one screen to the next. Under such circumstances, it is impossible to productively use the computer so users will predictably return to simple, paper and pencil methods. This type of response time is completely unacceptable and OADSS cannot function effectively under these circumstances, no matter how good the software. Indeed, increased computer usage dictated by the proposed system will only exacerbate the problem.

OADSS must be supported by equipment that will consistently provide rapid results for ad hoc queries and data retrieval. While overnight turnaround is acceptable for some batch jobs, most of the Monitors' requests consist of ad hoc query and reporting that require immediate results. Ideally, turnaround time for any query or report request will not exceed 60 seconds. Additionally, multi-tasking capability is desirable as it allows the user to run a job in the "background" while concurrently performing another task in the "foreground." Options for ADP equipment configurations will be addressed in the feasibility study phase of the LCM process, but certainly reliability and responsiveness are critical criteria for acceptability.

Ease of Use. As discussed in previous sections, the current system is characterized by extensive manual processing of data. Even where computerization has been introduced (i.e., ad hoc query with NATURAL), few Monitors have capitalized upon its capabilities. A critical requirement for the system is that it be exceptionally easy to use for data entry, retrieval, query, sorting, and reporting functions. Features should, as a minimum, include the following.

1. Menu-driven terminal screen facilities to minimize typing and reduce entry errors. Menus also eliminate the need to learn operating system commands.

REQUIREMENT

Increased reliability and responsiveness of the computer system supporting Officer Monitors.

Simplified procedures for accessing data elements, downloading/uploading files, and all other computer-based activities.

Security and control access to sensitive personnel data.

Ease in maintaining and upgrading system hardware and software.

JUSTIFICATION

The present computer system has marginal reliability and unacceptable performance degradation during periods of heavy usage. The proposed system must be supported by ADPE that ensures rapid turnaround for Monitor requests. No matter how good the software, poor response will result in Monitors' refusal to use the system.

Few Monitors utilize computer resources available as they lack requisite expertise. The system must include features (e.g., menu driven interface, "applications generator") that ensure user-friendliness and will permit Monitors to use the system with minimal training.

Strict security and access control is necessary as sensitive personnel data will reside on the system. Users' read, write, and update privileges must be monitored to prevent data corruption and to prevent individuals' privacy.

The system must be easily maintained by a system administrator without extensive ADP experience since MMOA does not have a billet for this MOS. Expanded processing demands must be met without extensive hardware/software modifications to reduce costs and system interruptions.

Figure 3. Summary of operational requirements for OADSS.

REQUIREMENT

Support of inter-office communications (e.g., electronic mail).

Simple, systematic procedures for file backup/recovery and system restart in the event of a "crash."

Compatibility with existing ADP environment.

JUSTIFICATION

Inter-office communication facilities will decrease the flow of paperwork within MMOA. Information would be quickly disseminated to branch personnel with receipt verification included.

Frequent backup of computer files must be conducted to minimize data loss in a system "crash." System restart must be easy and fast to minimize "down time" as Monitors' activities will come to a standstill during periods of system unavailability.

Compatibility with existing ADP equipment is critical to enable sharing of common databases, transfer of data, etc. Compatibility will also support interfacing with other Marine Corps automated information systems.

Figure 3. (Continued).

2. An "applications generator" for end user ad hoc query and data retrieval. Programs are written by the user simply responding to prompts in an interactive mode. The applications generator serves to tutor novices but can be bypassed by more experienced users.

3. Flexible, easy to use report generator with both default and customized report generation capabilities.

4. On-line help facilities and immediate error detection accompanied by clear, complete error diagnostics.

5. A basic, well-written users manual covering such topics as system log-on, use of available libraries/utilities, data review and reporting using DBMS facilities, etc. The manual will serve as a reference guide and supplement introductory training.

6. Development of a standardized user interface with the system. Multiple interfaces and access modes promote confusion and must be avoided.

7. The system must be designed such that: (a) end users can productively use its capabilities after only 3-4 hours of instruction; and (b) require no prior computer programming or other ADP-related experience.

System Security. Because sensitive performance and promotion-related data will be included in the system, it is essential to provide security and strict access control. The system must provide file, field, and value within field security features to prevent unauthorized access and protect the privacy of officer records. Users' ability to read, write, read/write, and update data elements will also be controlled by the data base administrator. Consideration should be given to also providing an audit trail for monitoring individuals' activities and file access within the system.

Maintenance and Upgrading. The system must be designed and implemented so that it is easily maintained and can be readily upgraded to support new demands. A full-time system operator or administrator must not be required. The system must capably handle expanded processing requirements, such as in war time mobilization, without requiring major modifications to hardware/software. Although the system will be designed for 20 users, it should be able to support up to 30 users without marked performance decrement. Ease of maintenance and upgrading will be facilitated with such features as: (1) well written and complete operations and maintenance manuals; (2) use of DoD-approved or commonly used programming languages; and (3) use of a data dictionary to document source, format, and content of data elements.

Inter-office Communications. Inter-office communications must be available on the system. Features such as "electronic mail" will substantially reduce the volume of memorandums, messages, and reminders that circulate within MMOA. Acknowledgement of message receipt will effectively eliminate the excuse for "lost" information. Inter-office communications will expediently disseminate information to branch personnel and could be expanded to other procedures such as tracking the status of assignment nominations or informing users of meetings and special events via a system-wide update of individuals' computer-maintained appointment calendars.

System Backup and Recovery. Periodic backup of computer files must be accomplished to minimize data loss in the event of system failure. Recovery procedures must be simple and expedient, not requiring systems analyst skills. Restart procedures for

the operating system and programs must also be straightforward so that the system can quickly be brought back up after problem correction. System documentation for the system manager will include instructions to complete the aforementioned procedures.

ADP Environment Computability. It is a major requirement that the system become fully integrated with existing hardware/software with a minimum of development effort. As the majority of data elements required by Monitors for decision-making are resident on the mainframe, it is essential that the new system be completely compatible with existing equipment. This compatibility will allow sharing of common data bases, promote download/upload procedures, and minimize system start up requirements (e.g., building of large data bases). In addition, compatibility will ensure that the new system can interface with other existing Marine Corps information systems (e.g., JUMPS/MMS). It is desirable that the system be capable of reading data in a variety of formats (VSAM, IDMS, TOTAL, ADABAS) to eliminate the necessity of rebuilding existing data bases.

Miscellaneous Requirements

In addition to the functional and operational requirements previously discussed, a number of other "miscellaneous" requirements must be addressed in system design. Each of these factors is discussed in detail in the following sections.

Organizational Structure. The OADSS will operate within the MMOA of MM. The mission of MMOA is to administer the assignment and classification of all Marine Corps officers with the rank of Colonel and below. Functions include: effect and monitor assignment of all officers (Colonel and below) in accordance with regulations, approved assignment policies, and criteria of the CMC; issue PCS travel orders; classify/reclassify officers; assign officers to professional education schools; and enter personnel data into the MMS. The MCCDPA, Quantico, will provide support in computer services, telecommunications, download/upload of data, and other computer-related areas. The extent of the MCCDPA involvement will be more fully delineated within the feasibility study phase of this project. Several organizational units will be required to provide MMOA with access to their data bases in support of the OADSS. Units tentatively identified as maintaining data critical for assignment decision-making includes MMOS (FITREPS, MBS), MMPE (promotion history), and the MCCDPA, Kansas City (JUMPS/MMS). As the units that will support the OADSS functions have not been finalized, a discussion of interrelationships among organizational entities is not possible at this time.

Interface with Other Systems. Because of the diversity of data elements encompassed by the assignment process, the OADSS will interface with a number of automated information systems. On-line access to JUMPS/MMS is essential because of the range and depth of personnel data available. Access to the JUMPS/MMS is coordinated with the MCCDPA, Kansas City, and will continue to be so under the new system. Access to the FREDs will continue to be essential for providing information about aviation qualified officers. Interface with the FREDs will continue to be made via the Amdahl mainframe in conjunction with the Aviation Department. In an effort to expand the scope of data elements available to monitors, additional performance data must become accessible. An interface with the enhanced Automated Fitness Report System (AFRS), a project currently in progress, could provide these data provided AFRS is completed as scheduled. Again, communication with the Amdahl mainframe will provide this link. Finally, the OADSS will have the need to interface with systems/files maintained locally by various HQMC organizational entities (e.g., MMRP-3 for promotion records) on microcomputers. Access to these data will be provided by appropriate download/upload facilities. Required

interfaces with other systems will be more fully explored in the functional description phase of the LCM process.

Operating Environment. Determination of the operating environment of the OADSS will be made during the feasibility study phase of the LCM process. At this time, it appears that there are three options to consider: (1) continued support of Monitor activities with the Amdahl mainframe and/or other existing ADP equipment; (2) acquisition of a super microcomputer or "low end" minicomputer dedicated to supporting MMOA functions; and (3) development of a microcomputer-based local area network (LAN) within MMOA. All options require that the system be able to share existing data bases and exhibit compatibility with the existing ADPE environment. The OADSS will be structured to operate in an on-line mode to support users' ad hoc queries and data retrieval as well as in a batch mode for production of reports that are not particularly time-sensitive. The portion of the system to be resident at HQMC, whatever its final configuration, must be able to operate within the constraints of the current physical environment. For example, air conditioning, power requirements, and telephone lines will be evaluated for operational feasibility. In addition, the system's equipment must be able to be operated by personnel without specialized ADP qualifications and experience.

Communications. Communications requirements for the OADSS will be determined by both the ADPE configuration and the operating system selected during the feasibility study. If the existing mainframe environment is used, communication requirements will likely be met by current services. In contrast, implementation of a minicomputer or microcomputer-based LAN will produce the need for communications that can support rapid download/upload of large data files. The OSF alone contains approximately 20,000 records that will need to be periodically transferred from the OADSS equipment to the Amdahl mainframe at the MCCDPA, Quantico. Communications will also need to support on-line access for ad hoc query, data retrieval, and reports processing. It is anticipated that the communications requirements will not be excessive because file access will be controlled and limited to a small number of organizational entities at HQMC. The actual volume, frequency, and types of data communications will be addressed during the functional design phase of the project.

Data Classification. Because the OADSS will include sensitive performance evaluation data, strict system and data access controls will be required to ensure that officers' privacy is maintained. Data security must prevent unauthorized access to both performance summary statistics and individual officer records. Many DBMSs have security that is applicable at the file, field, and value within field level that will likely be acceptable for much of the access control. Data security will also have to be provided to prevent unauthorized update/modification of data elements in the OSF, MMS, and any other Monitor-updatable files. This type of security is currently present and few changes are anticipated.

Performance Standards

To be considered acceptable, the OADSS must measurably improve service, scope, and efficiency relative to current methods. The system should simplify Monitors' jobs, increase the variety and depth of officer/billet data reviewed, and yield better assignment decision-making. The following performance requirements and acceptance standards are provided to assist in evaluating system performance.

Responsiveness and Time-savings. A large part of Monitors' reluctance to use existing computer hardware/software stems from the extreme system performance

decrement evident during periods of heavy usage. The new system must provide rapid turnaround for ad hoc query and data retrieval requests during all periods of the day. To the extent that responsiveness deteriorates, Monitors will turn to inefficient paper and pencil methods purely out of frustration. Overall, the new system will yield substantial time-savings for Monitors. The combination of improved ADP resources and increased automation of current manual processes will free Monitors from labor intensive procedures and provide them with more time to conduct other necessary activities.

Reliability. The reliability of the current system is "good" with down time estimated at 5 percent. However, these percentages only pertain to the Amdahl mainframe itself and don't reflect unavailability of other hardware components or software systems. A more accurate down time estimate, assessing the total hardware/software environment, is in the 10-15 percent range. As a minimum, the new system should have sufficient reliability to provide the same availability (85-90%). Ideally, overall down time for the system will not exceed 5 percent. The system should not be unavailable for more than a workday (8 hours) without a backup system available to allow Monitors to continue their work activities. The issue of reliability will be a major consideration when evaluating hardware configurations during the forthcoming feasibility study.

Ease of Use. The bottom line in acceptance of the system is the extent to which it is easy to use. As the majority of Monitors have no prior experience using computers, system access and use must be simple and straightforward to engender confidence and trust. The current system requires a good deal of "hands on" experience to be gained before proficiency is reached. In contrast, features of the new system will be designed to reduce the learning curve and to allow users to become productive with minimal training and practice involved.

Satisfaction of User Requirements. Development of an OADSS to assist Officer Monitors in their activities has a high priority within the Manpower Department and it is essential that the system developed adequately address user requirements. A full summary of user requirements appeared earlier in Figures 2 (Functional Requirements) and 3 (Operational Requirements). To the extent that these requirements are not met, officer assignment decision-making will continue to be plagued by inefficient, labor-intensive practices, a lack of procedural standardization among Monitors, and under-utilization of existing ADP resources.

RECOMMENDATIONS

Based on the present Needs Assessment for development of the OADSS, the following recommendations are made.

1. As the next stage in the Definition and Design Phase of the LCM process, a combined Feasibility Study and Economic Analysis should be completed. The Feasibility Study would focus on evaluating the technical and operational validity of possible alternative approaches to satisfy user requirements cited in the Needs Assessment. The Economic Analysis would present cost estimates associated with feasible alternatives and ensure that the alternative selected is cost-effective.

2. Because of the diversity of deficiencies identified in the present system, consideration should be given to developing the system as a series of subsystem prototypes. This "rapid prototyping" approach is consistent with modular system design and would minimize the time it takes to deliver a working product to users.

3. The hardware/software selected for system implementation should be readily integrated with existing Marine Corps automated information systems. Ideally, the system will be able to access mainframe data bases already resident at the MCCDPA, Quantico.

APPENDIX
TERMS AND ABBREVIATIONS

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ABGRD	Assigned Billet Grade
ABMOS	Assigned Billet Military Occupational Specialty
ACIP	Aviation Career Incentive Pay
AFRS	Automated Fitness Report System
ADP	Automated Data Processing
ADS	Automated Data System
AIS	Automated Information System
AMOS	Automated Monitor Orientation Subsystem
AOWP	Automated Orders Writing Process
ASL	Annual Slate Letter
ASR	Authorized Strength Report
BMIS	Billet Monitored Identification Set
BOD	Billet Officer Description
CDC	Computer Data Corporation
CMC	Commandant of the Marine Corps
CMF	Central Master File
CSR	Command Staffing Report
DBMS	Data Base Management System
DSS	Decision Support System
FITREP	Officer Fitness Report
FMCC	Future Monitored Command Code
FREDS	Flight Readiness Evaluation Data System
GDCS	Ground Combat Services Support
HMF	Headquarters Master File
HQMC	Headquarters, United States Marine Corps
JUMPS/MMS	Joint Uniform Military Pay System/Manpower Management System
LAN	Local Area Network
LCM	Life Cycle Management
LCN	Lineal Control Number
MAC	Monitor Activity Code
MBS	Master Brief Sheet
MCC	Monitored Command Code
MCCDPA	Marine Corps Central Design and Programming Activity
MCO	
MENS	Mission Element Needs Statement
MID	Military Identification Number
MM	Personnel Management Division
MMEA	Manpower and Personnel Enlisted Assignment Branch
MMOA	Manpower Management Officer Assignment Branch
MMOS	Manpower Management Operations and Support Branch
Monitor	An officer in the Manpower Management Officer Assignment Branch responsible for effecting assignment of USMC officers

MOS	Military Occupational Specialty
MPI	Manpower Plans and Policy
NAFW	Naval Aviator Fixed Wing
NPRDC	Navy Personnel Research and Development Center
OADSS	Officer Assignment Decision Support System
OCS	Officer Candidate School
OSF	Officer Slate File
OSGM	Officer Staffing Goal Model
PCS	Permanent Change of Station
PMCC	Present Monitored Command Code
REMMPS	Reserve Military Pay System
RJE	Remote Job Entry
RS	Requirements Statement
SAS	Statistical Analysis System
SEP	Special Education Program
SPL	Staffing Precedence Level
Ticket	Folder containing miscellaneous information about an officer maintained by his/her Monitor.
USMC	United States Marine Corps
VDT	Video Display Terminal

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