REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS
BEFORE COMPLETING FORM

1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER

4. TITLE (and Subtitle)	5. TYPE OF REPORT & PERIOD COVERED
LIFE CYCLE MANAGEMENT OF ARMY TACTICAL MANAGEMENT INFORMATION SYSTEMS (TACMIS)	Study Project Report, 76-1
	6. PERFORMING ORG. REPORT NUMBER

7. AUTHOR(s)	8. CONTRACT OR GRANT NUMBER(s)
Mack C. Ward	27p.

9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
Defense Systems Management College Library, Ft. Belvoir, VA. 22060	13 May 76

11. CONTROLLING OFFICE NAME AND ADDRESS	12. REPORT DATE
Defense systems Management College Library, Bldg 205 Ft. Belvoir, VA 22060	76-1
	13. NUMBER OF PAGES
	26

14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)	15. SECURITY CLASS. (of this report)
	UNCLASSIFIED
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

DISTRIBUTION STATEMENT A
Approved for public release;
Distribution Unlimited

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

UNLIMITED

DDC
RECEIVED
NOV 26 1976
A

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

SEE ATTACHED SHEET

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

SEE ATTACHED SHEET

DD FORM 1473 EDITION OF 1 NOV 65 IS OBSOLETE

408 462

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS
BEFORE COMPLETING FORM

REPORT NUMBER | 2. GOVT ACCESSION NO. | 3. RECIPIENT'S CATALOG OR NUMBER

4. TITLE (and Subtitle)

LIFE CYCLE MANAGEMENT OF ARMY TACTICAL MANAGE-
MENT INFORMATION SYSTEMS (TACMIS)

5. TYPE OF REPORT & PERIOD COVERED

Study Project Report 76-1

6. PERFORMING ORG. REPORT NUMBER

7. AUTHOR(s)

Mack G. Ward

8. CONTRACT OR GRANT NUMBER(s)

9. PERFORMING ORGANIZATION NAME AND ADDRESS

Defense Systems Management College
Library, Ft. Belvoir, VA. 22060

10. PROGRAM ELEMENT, PROJECT, TASK
AREA & WORK UNIT NUMBERS

11. CONTROLLING OFFICE NAME AND ADDRESS

Defense Systems Management College
Library, Bldg 205
Ft. Belvoir, VA 22060

12. REPORT DATE

76-1

13. NUMBER OF PAGES

76

14. MONITORING AGENCY NAME & ADDRESS(If different from Controlling Office)

15. SECURITY CLASS. (of this report)

UNCLASSIFIED

15a. DECLASSIFICATION/DOWNGRADING
SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release;
Distribution Unlimited

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, If different from Report)

UNLIMITED

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

SEE ATTACHED SHEET

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

SEE ATTACHED SHEET

DD 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

STUDY TITLE: Life Cycle Management of Army Tactical Management Information Systems (TACMIS)

STUDY PROJECT GOALS:
Comparison and integration of the LCSMM and AMIS models. Determination of the feasibility of developing a single Army TACMIS Life Cycle Model (TACMIS-LCM).

and

STUDY REPORT ABSTRACT:

The purpose of this study is to examine the life cycle management of Army Tactical Management Information Systems with particular emphasis on integration of the requirements of the Life Cycle System Management Model (LCSMM) for Army Systems, DA Pam 11-25, and the Army Management Information System (AMIS) AR 18-1. Considerable attention, both in the literature and in practice, has been given to the systems acquisition process for inception through development into production. The principal thrust of this attention, however, has been directed towards RDT&E and acquisition of weapons systems to counter a perceived threat. This study focuses on areas in the present AMIS Model that appear to be weak and attempts to correlate some of the more significant activities and documentation requirements with the LCSMM. The end result of this effort is the determination of the feasibility of developing a single Army TACMIS model with the detail of the LCSMM.

Key Words:

	MATERIEL MANAGEMENT	INFORMATION SYSTEMS	LIFE CYCLE MANAGEMENT
TACMIS		AMIS	LCMS
MIS			
ADPS	ECS		
	MODELS		

ACCESSION for
NTIS   White Section
DDC   Buff Section
UNANNOUNCED
JUSTIFICATION

BY
DISTRIBUTION/AVAILABILITY CODES
Dist.   AVAIL. and/or SPECIAL

A

NAME, RANK, SERVICE	CLASS	DATE
MACK C. WARD, MAJOR, ARMY	PMC 76-1	13 May 1976

DEFENSE SYSTEMS MANAGEMENT SCHOOL

PROGRAM MANAGEMENT COURSE
INDIVIDUAL STUDY PROGRAM

LIFE CYCLE MANAGEMENT
OF TACTICAL MANAGEMENT
INFORMATION SYSTEMS

STUDY PROJECT REPORT

PMC 76-1

Mack C. Ward Jr.
MAJ   USA

FORT BELVOIR. VIRGINIA 22060

LIFE CYCLE MANAGEMENT OF ARMY

TACTICAL MANAGEMENT INFORMATION SYSTEMS (TACMIS)

Study Project Report

Individual Study Program

Defense Systems Management School

Program Management Course

Class 76-1

by

Mack C. Ward Jr.
Major, US Army

May 1976

Study Project Advisor

LCDR Sue Anderson

This study project report represents the views, conclusions, and recommendations of the author and does not necessarily reflect the official opinions of the Defense Systems Management School or the Department of Defense.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Purpose and Focus of the Study Project

Life cycle management of any system is by no means a simple endeavor. Automatic Data Processing equipment has provided the Tactician and the Logistician a near "real-time" means of manipulating data and solving problems which enhances mission accomplishment probabilities. The purpose and focus of this study project is to increase the author's knowledge of life cycle management of Army Tactical Management Information Systems (TACMIS).

The Army Management Information Systems (AMIS) Model does not adequately define pre-phase I activities and documentation requirements. It also appears to lack some definition in the area of integrated logistics support with respect to TACMIS. This paper examines the AMIS Model and compares it to the Life Cycle System Management Model (LCSMM) for Army systems. The purpose of this comparison is to determine the feasibility, in gross overview terms, of modification and restructure of the AMIS Model along the lines of the LCSMM.

Material presented herein requires a working knowledge of the AMIS and LCSM models. In the event the reader is unfamiliar with the models it is recommended that Army Regulation 18-1 and Department of the Army Pamphlet 11-25 be reviewed prior to reading this paper.

ACKNOWLEDGEMENTS

Sincere appreciation and gratitude is extended to the following

individuals for their personal contribution of guidance and/or

counsel during the analysis and data gathering phase of this study

project.

NOTE: The contributions of the above named individuals are not to be

misinterpreted as approval of this study project report, since only

the views and opinions of the writer are represented herein.

SECTION I

INTRODUCTION

Purpose of the Study Project

Life cycle management of any system, major or otherwise, is
by no means a simple endeavor. Automatic Data Processing Equipment
(ADPE) has provided the Tactician and Logistician a near "real-time"
means of data manipulation with attendant problem solving capabilities
that significantly enhance mission accomplishment probabilities. Con-
siderable attention, both in the literature and in practice, has been
given to the systems acquisition process from inception through develop-
ment into production. The principal thrust of this attention, however,
has been directed towards RDT&E and acquisition of weapons systems to
counter a perceived threat. The purpose of this study project is to
increase the authors knowledge of life cycle management of Army Tactical
Management Information Systems (TACMIS).

Specific Goals of the Project

The goals of this project are summarized as follows:

1. Examination of the life cycle management of TACMIS.

2. Comparison and integration of the Life Cycle System Management
Model (LCSMM) and Army Management Information System (AMIS) procedures
and documentation.

3. Determination of the feasibility of developing a Army TACMIS
Life Cycle Model (TACMIS-LCM).

1

Definitions

1. <u>Army Systems Acquisition Review Council (ASARC)</u>.

The ASARC is an advisory body consisting of the VCSA, ASA(FM), ASA(R&D), ASA(I&L), DUSO(OR), ACSFOR, COA, DCSRDA, and DCSLOG. The ASARC reviews designated programs at critical points during the acquisition process. In general, the ASARC supports the overall decision making process by advising and recommending program decisions to the Secretary of the Army and the Chief of Staff, US Army on:

1. Initiation of or change in program commitments to include transitioning to different acquisition phases.

2. Courses of action in response to an actual or threatened breach of a program threshold. (1:1)[1]

2. <u>Assigned Responsible Agency (ARA)</u>:

The organizational element designated by HQDA to be responsible for the development, test and maintenance of a standard ADP system. (2: A-4)

3. <u>Automatic Data Processing System (ADPS)</u>:

An aggregation of software and the resources to support it-- ADPE, manpower and facilities. ADPS's are associated with selected operational levels which cut across functional levels and include the activities of all DPIs operating at the selected level. (2: A-4)

4. <u>Class A AMIS</u>:

a. All multicommand Management Information Systems (MIS) except Worldwide Military Command and Control Systems (WWMCCS) and Intelligence Data Handling System (IDHS) (A1).

b. All command-standard MIS operated at more than one Data Processing Installation (DPI) (Multi-installation systems) (A2).

c. Army elements of the WWMCCS and IDHS (A3).

d. All command-unique MIS operated at a single DPI, where these systems require 15 man-years or more of effort from initial concept formulation through prototype approval (A-4).

---

[1] This notation will be used throughout the report for sources of quotations and major references. The first number is the source listed in the bibliography. The second number is the page in the reference.

e. Automated data systems in support of RDT&E projects which require 15 man-years or more of effort from initial concept formulation through Systems Integration Test (SIT) approval (A-5) (2: 1-21).

5. <u>Defense Systems Acquisition Review Council (DSARC)</u>.

The DSARC is an advisory body consisting of DDRE, ASD(I&L), ASD(C), ASD(SA), and for their programs, ASD(T) and ASD(I). The DSARC reviews programs at critical points during the acquisition process. In general, the DSARC supports the overall decision making process by advising and recommending program decisions to the SECDEF/ DEPSECDEF on:

a. Initiation of or change in program commitments to include transitioning to different acquisition phases.

b. Courses of action in response to an actual or threatened breach of a program threshold (1:1).

6. <u>Detailed Functional System Requirement (DFSR)</u>:

The document used to provide that level of detailed functional guidance essential to the development and maintenance of an ADP system by the ARA and which identifies the functional procedures necessary to develop the automated system (2: A-9).

7. <u>General Functional System Requirement (GFSR)</u>:

The document used to describe an automated management system concept and to provide a basis for initial determination of the general kind and degree of automation which could be feasibly undertaken (2: A-11).

8. <u>Management Information Systems Economic Analysis (MISEA)</u>:

A systematic investigation of the economic/operational considerations of several competing alternatives available, including status quo, for satisfying a functional requirement (2: 2-7).

9. <u>Project Master Plan (PMP)</u>:

An action plan which places in context all the plans, schedules, costs, scopes of work, and resource requirements necessary to complete the project (2: A-14).

10. <u>Proponent Agency (PA)</u>.

The organization/agency with responsibility for the particular function(s) which a management information system automates (2: A-14).

11. <u>Tactical Data Systems (TDS)</u>:

   An automated data processing system which supports the decision making process for combat and support functions, as opposed to direct control of weaponry, with respect to battle field tactics and/or employment of combat weapons systems (2: A-17).

12. <u>Tactical Management Information Systems (TACMIS)</u>:

   Multicommand mobile environment standard Army Automatic Data Processing Systems (ADPS) that provide combat service support assistance (e.g., administrative, logistic, financial or personnel support) and operate from the Corps rear boundary forward (7:1).

<u>Scope and Limitations of the Project.</u>

This report encompasses life cycle management procedures for Class A Tactical Army Management Information Systems. The principal thrust revolves around Automatic Data Processing Systems (ADPS) and computers which <u>are not</u> integral to a combat weapons system. Classes B and C AMIS are excluded from direct coverage since these systems do not involve augmentation or replacement of the computer mainframe. The exclusion of these systems is not intended to imply non-applicability of the materiel presented. It is done only as an expedient due to time limitations.

4

SECTION II

BACKGROUND

Evolution of Army Automated Data Systems

The US Army pioneered the development of electronic computers and
sponsored the first high-speed electronic digital computer. The Electronic
Numerical Integrator and Calculator (ENIAC) was designed and constructed at
the University of Pennsylvania for the Ballistic Research Laboratories (BRL),
Aberdeen Proving Ground, Maryland, and was installed in 1947. Subsequent
efforts began in 1955 with the preparation of a large number of combat
development studies. These studies indicated that significant improvement
could be realized by the application of ADP techniques to the combat tasks
falling in the general functional areas of the four principal staff sections.
From these studies, requirements evolved for five ADP systems within the
Command Control Information System - 1970 (CCIS-70) framework. These
systems were fire support, logistics, personnel and administration operations,
and intelligence.

Many combat service support data systems evolved throughout CONUS and
in the overseas theaters. Most of these were installed to meet local require-
ments or to produce specialized information for the Department of the Army
staff. As a result, there is little compatibility among the systems. More-
over, they possess only limited capability to provide the information
required for the planning and direction of tactical operations. Although
there had been several years of effort and activity in this area, no
fieldable system resulted. The Department of the Army prepared, and in
May 1965 the Vice Chief of Staff approved, the Automatic Data Systems within

5

the Army in the Field (ADSAF) study which reoriented the old CCIS-70 effort; defined three related but semi-independent tactical automatic data systems; and established schedules and resource allocations for their fielding. The three systems were Tactical Fire Direction System (TACFIRE), Tactical Operations System (TOS), and the Combat Service Support System (CS3). (9:2). A fourth system, Missile Minder (AN/TSQ-73) which is a computer driven mobile air defense system, was established in 1968.

Embedded Computer Systems

An increasing trend in the development and acquisition of new military weapons systems is the requirement for automated computational subsystems to perform control functions and to provide rapid calculation and display of environmental factors that affect the mission of the system. The new terminology for these subsystems is embedded computer systems (ECS). An ECS is defined as "a computer system that is integral to an electro-mechanical system such as a combat weapon system; technical system; aircraft, ship, missile, spacecraft, certain command and control systems; and civilian systems such as an automated rapid transit system." ECS are primarily differentiated from ADPS by how they are developed, acquired, and operated in a using system (11:15). Key attributes of an ECS are:

1. It is physically incorporated into a larger system whose primary function is not data processing.

2. It is integral to such a larger system from a design, procurement and operations viewpoint.

3. Its output includes information, control signals and computer data (11:15).

Categories of Management Information Systems

The distinction between ECS and Non-ECS has resulted in a different acquisition and life cycle management process for each type of system. The four systems previously mentioned can be placed in two broad categories:

1. <u>Tactical Data Systems:</u> Specific tactical data systems that support combat and combat support functions (other than logistics and administrative systems) are categorized as weapons systems for acquisition and life cycle management purposes. TOS, TACFIRE, and the AN/TSQ-73 are categorized as Tactical Data Systems and are managed by the Project Manager, Army Tactical Data Systems (PM, ARTADS).

2. <u>Tactical Management Information Systems:</u> Standard Army ADPS that provide combat service support assistance (administrative, logistic, financial or personnel support) are categorized as non-weapons systems. This categorization is significant in that it results in the use of different regulations and procedures in acquisition and life cycle management. Tactical Management Information Systems are managed by the Project Manager, Tactical Management Information Systems (PM, TACMIS) and have been expanded from one to five systems. The PM, TACMIS is presently responsible for the following systems:

a. Combat Service Support System (CS3). The mobile division level system to include ADPE, Non-ADPE, and software to support the management information requirements of the Army division.

b. Corps Automation Requirements (CAR). The Corps ADP support configuration to satisfy, reasonably projected functional application requirements of the Corps in a combat environment. CAR mobile environment includes

7

centralized and decentralized MIS mobile ADPE envisioned to satisfy mid-range (3-8 years) requirements.

3. Non-divisional Direct Support Unit/General Support Unit (DSU/GSU). A replacement system for the current NCR 500 system.

4. IBM 360/40 Mobile Corps Reconfiguration. The refurbishment of Non-ADP equipment to support the current IBM 360/40 Corps configuration.

5. National Guard/Reserve Mobile UNIVAC 1005 System. The establishment of the mobile UNIVAC 1005 System and associated software in the National Guard/Reserve divisions and separate brigades   (7:1).

SECTION III

PRESENT SYSTEM

Level of Management Attention

Army system acquisition from materiel concept investigation to ultimate phaseout and disposal of unneeded systems receives varing degrees of management attention depending upon the type of system, weapons or otherwise, and the anticipated monetary expenditures for RDT&E and production. Tactical Data Systems are managed under AR 70-1 and subject to Army Systems Acquisition Review Council (ASARC)/Defense Systems Acquisition Review Council (DSARC) review. Tactical Management Information Systems on the other hand are managed under AR 18-1 and are not presently subject to ASARC/DSARC review.

TACMIS Acquisition Process

TACMIS development activities during the early stages are rather unique with respect to the TDS acquisition process in that ADPE required to support the TACMIS is generally available as off-the-shelf commercial hardware. Therefore, the normal RDT&E that is associated with the early development stages is unnecessary. This peculiarity may account for the fact that the TACMIS acquisition process is not subject to ASARC/DSARC review. It is essentially possible to move from the conceptual to the full-scale development phase due to the availability of off-the-shelf commercial ADPE which, with minor modification, will fully meet the TACMIS requirements. As a result of this peculiarity it appears, to the author, that a considerable amount of the detailed guidance and procedural aspects of early-on development, normally associated with the systems acquisition process, are missing. This matter will be explored in subsequent sections.

9

The AMIS life-cycle encompasses three separate and distinct phases: Phase I, Systems Planning and Definition; Phase II, Systems Development; Phase III, System Installation, Operations and Maintenance. Each phase requires definitive and increasingly explicit systems documentation, review, and management (2: 2-3).

Pre-Phase I Activities

Early investigations that take place prior to Phase I should be characterized by close, continuing dialogue and synchronous interaction between the combat developer or designated sponsor and the materiel developer and involve extensive efforts to expand the technology base and to use knowledge gained through exploratory development for potential systems application. Early investigations are concluded when the materiel developer and the combat developer or designated sponsor agree that both technical and operational potential exists for system-oriented advanced development or a determination has been made by the materiel developer that the capability being investigated exceeds the current state of the art or a determination has been made by the combat developer or designated sponsor that the requirement lacks operational relevance (5: 3-1). Subsequent to agreement that the requirement has operational relevance the materiel developer and combat developer or designated sponsor will determine if a Letter of Agreement (LOA) should be initiated. The purpose of the LOA is to insure agreement between the combat developer and the materiel developer on the nature and characteristics of the proposed system and the investigations needed to develop and validate the system concept; to define the

10

associated operational, technical and logistical support concepts; and to promote synchronous interaction between the combat developer or designated sponsor and the materiel developer during the conduct of these investigations (5: 4-0).

Pre-Phase I activities and procedural requirements are ill-defined in the present AMIS model. It does not describe requirements for an operational capability desirable of achievement in a specified time frame; an LOA, a Required Operational Capability, or an Initial Operational Capability (IOC). These areas are, of necessity, addressed in the actual development of a TACMIS even though they are not clearly stated or required by the present AMIS model. The present AMIS model indicates that a TACMIS concept investigation may be initiated by subordinate commands/installations or major Army commands (MACOM). The results of the initial investigations are submitted to the Proponent Agency (PA) in the form of a concept proposal. Initial identification of projected functional information systems requirements result from the submission of a conceptual systems description by the PA or MACOM to OAVCSA, MISD. This description is used as a basis for initial development of the General Functional System Requirement (GFSR) (2: 2-2). Examination of the gestation of an emerging logistics system revealed the following scenario:

1. The initial system requirement was generated as a result of:

a. The use of different data processing systems to perform the same logistical functions.

b. Reports from the field indicated that the present system was experiencing maintenance problems due in large measure to the age of the ADPE.

11

c. The lease contract for the present ADPE was due to expire within two years.

2. The PA authorized the initiation of an in-house study to devise a standard replacement system. This initial effort was a broad base study which involved the interrelationships of supply, maintenance and transportation.

3. Approximately three months later, the PA directed the initiation of a study which would evaluate current and evolving supply systems and recommend a standard system for implementation, if feasible, Army wide. The study effort was to culminate with a final report in the form of a GFSR. A Study Advisory Group (SAG) was appointed and conducted the first meeting approximately six months after authorization of the initial in-house study. A final SAG meeting was held approximately five months later which resulted in the approval of a draft General Functional Description (GFD).

4. The final GFD was completed approximately 13 months subsequent to authorization of the initial in-house study (8: 1-3). Completion of the final GFD terminated the Pre-Phase I activities for this particular system. It is interesting to note that the present AMIS model does not provide specific guidance for any of the Pre-Phase I activities that occured in this development effort. As a result of this deficiency the PA imposed a hydrid procedure on the developers which was derived from AR 5-5, The Army Study System.

Phase I - Systems Planning and Definition Activities

The systems planning and definition phase encompasses all documentation and procedures, from concept formulation through requirements formulation. It provides for definition of these concepts and requirements in terms of specific systems objectives. The key documents/products produced in this

phase are the General Functional System Requirement (GFSR), Management Information System Economic Analysis (MISEA), Organization and Personnel Plan (OPP), Detailed Functional System Requirement (DFSR) Guidance, Assigned Responsible Agency (ARA) assignment, the DFSR, Project Master Plan (PMP) Guidance, PMP and, if required, recommended ADPE specifications. Activities during this phase of the TACMIS acquisition process very closely parallel the activities during the conceptual and validation phases of the Life Cycle System Management Model for Army Systems (LCSMM), DA Pamphlet 11-25. The following documentation/decision point equivalencies are apparent to the author:

LCSMM	TACMIS
Documentation	Documentation
Cost and Operational Effectiveness Analysis (COEA)	Management Information Systems Economic Analysis (MISEA)
Outline Development Plan (ODP)	GFSR and DFSR
Development Plan (DP)	Project Master Plan (PMP)
Decision Point	Decision Point
ASARC I/DSARC I/DCP I Approval	GFSR/MISEA/OPP Approval
ASARC II/DSARC II/DCP II Approval	PMP Approval

Phase II - Systems Development

The systems development phase encompasses all documentation and procedures subsequent to approval of the DFSR through the prototype evaluation. It may include the procedures for acquiring ADPE to support the systems during test, evaluation and operational life. The key documents/products produced in this phase are the Project Guidance document, ADP systems specifications, ADP system software and documentation, systems integration test report, systems development package, prototype evaluation report and systems extension plan. Also produced as required are the ADPE guidance document and documents supporting the selection and acquisition of ADPE. During this phase the MISEA is again updated (2: 2-4). Activities during this phase are very similar to activities that occur during the full scale development phase of the LCSMM. For example, systems integration testing and prototype evaluation generally occur during this phase.

Phase III, Systems Installation, Operations and Maintenance

The systems installation, operation and maintenance phase encompasses all procedures for installing, operating, maintaining and modifying the system. This phase starts with approval to extend the system and continues until the system is phased out by a replacement system or otherwise terminated (2: 2-4).

14

SECTION IV
TACMIS LIFE CYCLE MODEL

Methodology

The intent of this section is to identify areas in the present AMIS LCM which appear to be deficient and to establish the rationale for development of a detailed TACMIS LCM along the same lines as the LCSMM contained in DA Pam 11-25. The TACMIS LCM suggested is of necessity a bare bones skeleton due to time constraints during the preparation of this paper. This model does, however, suggest definition and standardization of early on procedural and documentation requirements and an overlay of the LCSMM on the AMIS model with extraction of applicable activities, procedures and terminology to afford as much standardization between the two as possible. Standardization and definition of this type is considered extremely important for the following reasons:

1. The present lack of standardization and definition places a requirement on system developers to utilize hybrid procedures that could vary from system to system thereby resulting in significant potential for loss of lessons learned and corporate memory.

2. Considerable interest appears to be mounting within OASD(C) with respect to Management Information System Life Cycle Management as evidenced by recent ADP policy memorandums and DOD Instruction 7910.0, MIS Life Cycle Management, (Preliminary Strawman). The principal thrust of this strawman is the development of the DOD MIS Life Cycle which consists of the following phases.

a. Conceptual Phase - This phase establishes the concept of the system to be automated, the benefits expected, general estimates of the cost of

automation and a general plan for accomplishing the design and development of the system.

b. Design Phase - This phase determines the actual structure of the system to be automated. Two major design elements are involved; the design of the functional system to the level required to allow automation and the design of the automated system.

c. Development Phase - This phase results in the production of the ADP software, associated system and user documentation, including training material, acquisition of ADPE and support equipment as necessary, and testing of the system parts.

d. Integration Phase - This phase is required to integrate all products into the system and validates the system.

e. Operations Phase - This phase controls the operation, maintenance and modifications to the system from the time it is approved as an operational system until it is terminated.

f. Termination Phase - System termination is accomplished during this phase. Indications are, at this point, that DOD components will be required to develop ADP Life Cycle Management models based upon the six phases defined above and in sufficient detail to allow specification of discrete, logical modules, sequential and concurrent, which result in identifiable products whose adequacy can be assessed and whose contribution to the cost of the system can be specified.

Present AMIS Deficiencies

The present AMIS model lacks sufficient definition and detail of Pre-Phase I activities, procedures and documentation requirements. The following

areas are of specific concern:

1. The model does not describe the development of requirements for an operational capability desirable of achievement in a specified time frame.

2. Procedures for the establishment of a Study Advisory Group (SAG), Special Task Force (STF), or Special Study Group (SSG) are not defined.

3. Provisions for the development and coordination of a Letter of Agreement which is extremely vital to the development of a multi-application ADPS are not included in the model.

4. Procedures for the development and coordination of a Required Operational Capability are not covered.

Activities during the Pre-Phase I and early Phase I periods are extremely significant since the initial system baseline is being developed at this time. Logistical support planning during Phase I of the present AMIS model appears to lack definition particularly with respect to identification and initiation of acquisition planning for long lead time items such as environmental shields (tactical systems housing and support). The model deals rather well with each development module, e.g., software, hardware, but lacks in the total integration of these sub-elements and their interface with non-ADP requirements of the total system development.

A General Model

The principal thrust of this paper is the comparison and integration of the present AMIS and LCSM models. There appears to be considerable overlap between the two models with a significant amount of applicability of the LCSMM to the present AMIS, particularly during the early developmental stages.

17

In evaluating the AMIS model with respect to applicability to a TACMIS there appears to be a case for considerable modification along the line of LCSMM. Each model is excellent for its intended purpose, however, TACMIS acquisition and life cycle requirements seem to fall conveniently between the two models. An attempt to describe the detailed overlap and interface requirements is beyond the scope of this overview. However, the LCSMM phases can be superimposed on the AMIS model with critical decision points being aligned as shown on figure 1. Pre-Phase I activities and Phase I activities of the AMIS model that occur from concept proposal until approval/disapproval of the GFSR/MISEA/OPP closely correlate with the activities that occur during the Conceptual Phase of the LCSMM. Activities that occur subsequent to GFSR/MISEA/OPP approval until PMP/Recommended ADPE specifications correlate closely with the activities that occur during the validation phase of the LCSMM. As indicated by figure 1, the same correlation exists between Phase II/Full Scale Development and Phase III/Production and Deployment. A summary of the principal decision points is as follows:

TRANSITION	LCSMM	AMIS
Conceptual to Validation	ASARC/DSARC I	GFSR/MISEA/OPP Approval
Validation to Full Scale Development	ASARC/DSARC II	PMP Approval
Full Scale Development to Production/Deployment	ASARC/DSARC III	Extension Approval

SECTION V
SUMMARY

Conclusions

The basic thrust of the LCSMM and AMIS model is the coordinated and systematic development, acquisition and life cycle management of a defense materiel system. No single procedure applies to all materiel acquisitions. The integration of a specific system and the extent of development may vary from system to system but must be consistent with a general model that describes the acquisition process. Several areas which appear to be deficient in the present AMIS model were noted and are summarized as follows:

1. Lack of procedural definition and documentation requirements during the pre-phase I period.

2. Insufficient detail in the area of logistical support planning, particularly during Phase I and II. Although the deficiencies were expressed in gross, general terms the author considers the observations to be of sufficient importance to warrant a more detailed investigation. The development of a TACMIS life cycle model closely resembling the LCSMM appears to be not only feasible but highly desirable. Such a development effort would result in the resolution of problems previously mentioned and standardization of procedures, documents and terminology in common areas.

BIBLIOGRAPHY

1. Department of the Army. Army Regulation 15-4, Systems Acquisition Review Council Procedures. Washington, DC, 17 January 1973.

2. Department of the Army. Army Regulation 18-1, Management Information Systems Policies, Objectives, Procedures, and Responsibilities. Washington, DC, Undated Advance Copy.

3. Department of the Army. Army Regulation 70-1, Army Research Development, and Acquisition. Washington, DC, 1 May 1975.

4. Department of the Army. Army Regulation 70-27, Outline Development Plan/Army Program Memorandum/Defense Program Memorandum/Decision Coordinating Paper. Washington, DC, 17 March 1975.

5. Department of the Army. Army Regulation 71-9, Materiel Objectives and Requirements. Washington, DC, 7 February 1975.

6. Department of the Army. Army Regulation 1000-1, Basic Policies for Systems Acquisition by the Department of the Army. Washington, DC, 5 November 1974.

7. Department of the Army. Draft Revised PM Charter. Fort Belvoir, VA.

8. Department of the Army. General Functional System Requirements, Direct Support Unit Standard Supply System (DS4). Fort Lee, VA, May 1975.

9. Department of the Army. Project Master Plan: Combat Service Support System (CS3), Division Concept. Fort Belvoir, VA, September 1975.

10. Department of the Army. Pamphlet No. 11-25, Life Cycle System Management Model for Army Systems. Washington, DC May 1975.

11. Manley, John H., "Embedded Computer System Reliability," Defense Management Journal, V. 11, No. 4, October, 1975.