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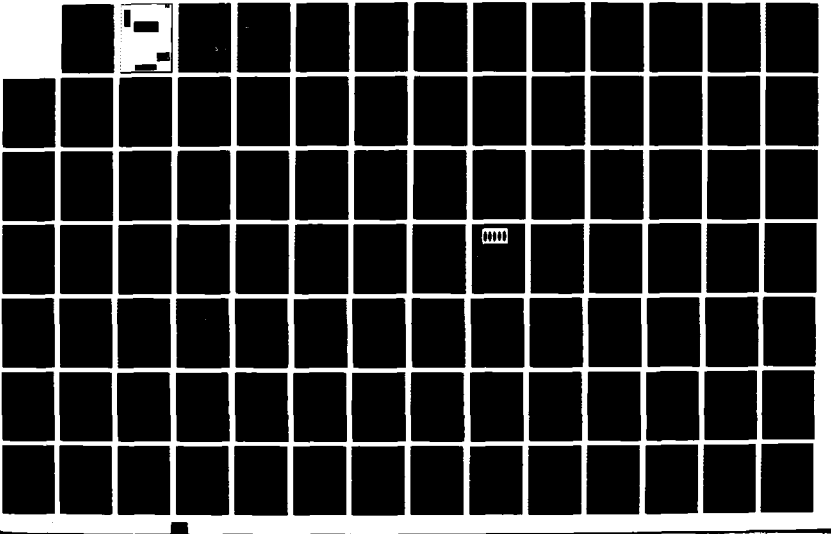

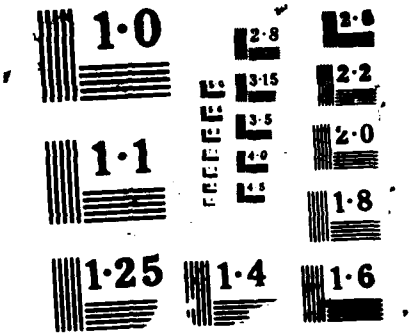
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Study Recommendations Report

(Final Design and Implementation Plan)

7 August 1987

Contract No. MDA903-86-C-0329

Design of the Army Chargeback and Cost Accounting System

Study Recommendations Report

(Final Design and Implementation Plan)

7 August 1987

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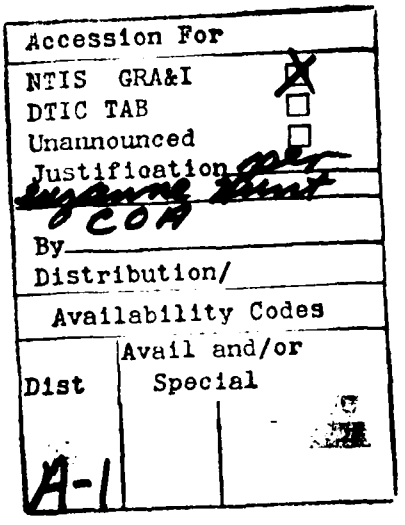
The views, opinions, and findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other official documentation.

PREFACE

Vance designed this document to be read by both Army managers and Army technical experts. Vance recommends that Army managers are best served by reading the following sections of this document: Executive Summary, Section 1, Section 3, Section 4, Section 5, Section 6, but only through Sub-Section 6.1, and Section 9. Vance recommends that Army technical experts are best served by reading the whole document, but should closely read Sections 6, 7, and 8.



EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

- SCOPE
- SYSTEM DESIGN OBJECTIVES
- IMPLEMENTATION PLAN OVERVIEW
- DESIGN OVERVIEW
- COSTS AND BENEFITS SUMMARY
- CONCLUSIONS AND RECOMMENDATIONS

EXECUTIVE SUMMARY

The purpose of this executive summary is to provide a high-level overview, in briefing format, of the final design and implementation plan for new techniques for managing IMA services in the Army.

This summary is organized into six sections: Scope, System Design Objectives, Implementation Plan Overview, Design Overview, Costs and Benefits Summary, and Conclusions and Recommendations.

Reference is made in each section to more detailed discussions in the document.

SCOPE

- NMC/C NOT SUBJECT TO NEW TECHNIQUES
- NEW TECHNIQUES SHOULD APPLY TO RESOURCES USED FOR ADMINISTRATIVE SYSTEMS AND SUPPORT OF SUSTAINING BASE

1.0 SCOPE

Vance recommends the Army not apply the new techniques that Vance has designed to the resources used for the National Military Command and Control (NMC/C) mission of the Army. Vance refers to these resources as the strategic and tactical resources used within the Army. Vance recommends the Army identify the specific resources used in support of the NMC/C mission and the MACOM responsible for the management of those resources. Once identified, Vance recommends the Army directly fund the MACOMs from appropriations for the acquisition and use of all strategic and tactical resources.

During the conduct of this study, several Army managers have indicated to Vance that control of all resources associated with the Defense Communications System (DCS) should be given to the Defense Communications Agency (DCA). Vance does not have enough information to make a recommendation for or against this concept; however, the concept seems plausible. Therefore, Vance recommends the Army determine the advantages to the Army of giving DCA control of all the DCS.

Vance recommends the Army apply the new techniques that Vance has designed to all resources used to support the sustaining base. These are the resources used for most all administrative systems, such as all STAMMISs and other accounting systems, personnel systems, logistics support systems, etc. The new techniques Vance has designed will enable the Army to manage these resources in a business-like manner and provide more control over the resources and associated costs.

SYSTEM DESIGN OBJECTIVES

- PROVIDE AN ENVIRONMENT WHERE USERS HAVE MULTIPLE SOURCES FROM WHICH TO BUY IMA SERVICES

- PROVIDE AN ENVIRONMENT WHERE SERVICE PROVIDERS CAN OPERATE MORE LIKE A BUSINESS AS THEY SELL THEIR SERVICES TO USERS

- PROVIDE AN ENVIRONMENT WHERE ECONOMIC PRINCIPLES WILL ENCOURAGE EFFICIENT USE OF IMA SERVICES

- PROVIDE AN ENVIRONMENT WHERE MODERN INFORMATION TECHNOLOGY CAN BE TAKEN ADVANTAGE OF QUICKLY AND EFFICIENTLY

- PROVIDE USERS AND PROVIDERS BETTER INFORMATION ON THE COSTS OF IMA SERVICES

2.0 SYSTEM DESIGN OBJECTIVES

To achieve these objectives, Vance recommends that new management techniques be developed and applied to the way IMA services are managed and IMA services requirements are developed.

Users are those activities who will pay for the services from which they benefit. The users must be able to obtain the services from the best source available, consistent with their requirements and resources. Where services are available commercially or from another Government agency, they should be compared to the cost of providing the services in-house.

Providers need to be able to operate on a competitive basis with the other sources of service. Making the provider more business-like includes their operating in a business-like environment in which costs are compared to capacity under a revolving fund. However, having the providers operate in a business-like environment does not mean that the Army loses control. The Army maintains control by developing standards which do not constrain the providers (or the users), but which ensures efficient networking, where applicable. In addition to the development of effective standards, critical evaluation must be made to ensure there is no detriment to mobilization or war-fighting capability.

Providers and users must have a system which gives information on costs of services. This information will give the users the necessary basis for making purchase decisions and providers with sufficient data to manage the efficiency of their activity.

The Army should avoid excessive guidance and permit the users and providers to let decisions be made on an economic basis. Users will demand the services which they are able to afford, from the most responsible source; providers will increase efficiency to be competitive. Guidance should be limited to providing standards that ensure inter-operability, reliability, and survivability.

Information technology is evolving rapidly. The Army must be sensitive to these changes and be able to take advantage of these changes rapidly. Users must be able to quickly obtain IMA services produced with modern technology and providers must be able to use modern technology to provide IMA services. This is why a revolving fund is recommended, it helps shorten the procurement cycle and will enable the Army to acquire modern technology more rapidly.

A more detailed discussion of the Army's objectives are presented in Section 4.

IMPLEMENTATION PLAN OVERVIEW

- SPECIFIC CAPABILITIES BY DISCIPLINE
- NON-ARMY SOURCES OF SERVICE
- PROGRAM MANAGEMENT INITIATIVES
- SYSTEM INTEGRATION

3.0 IMPLEMENTATION PLAN OVERVIEW

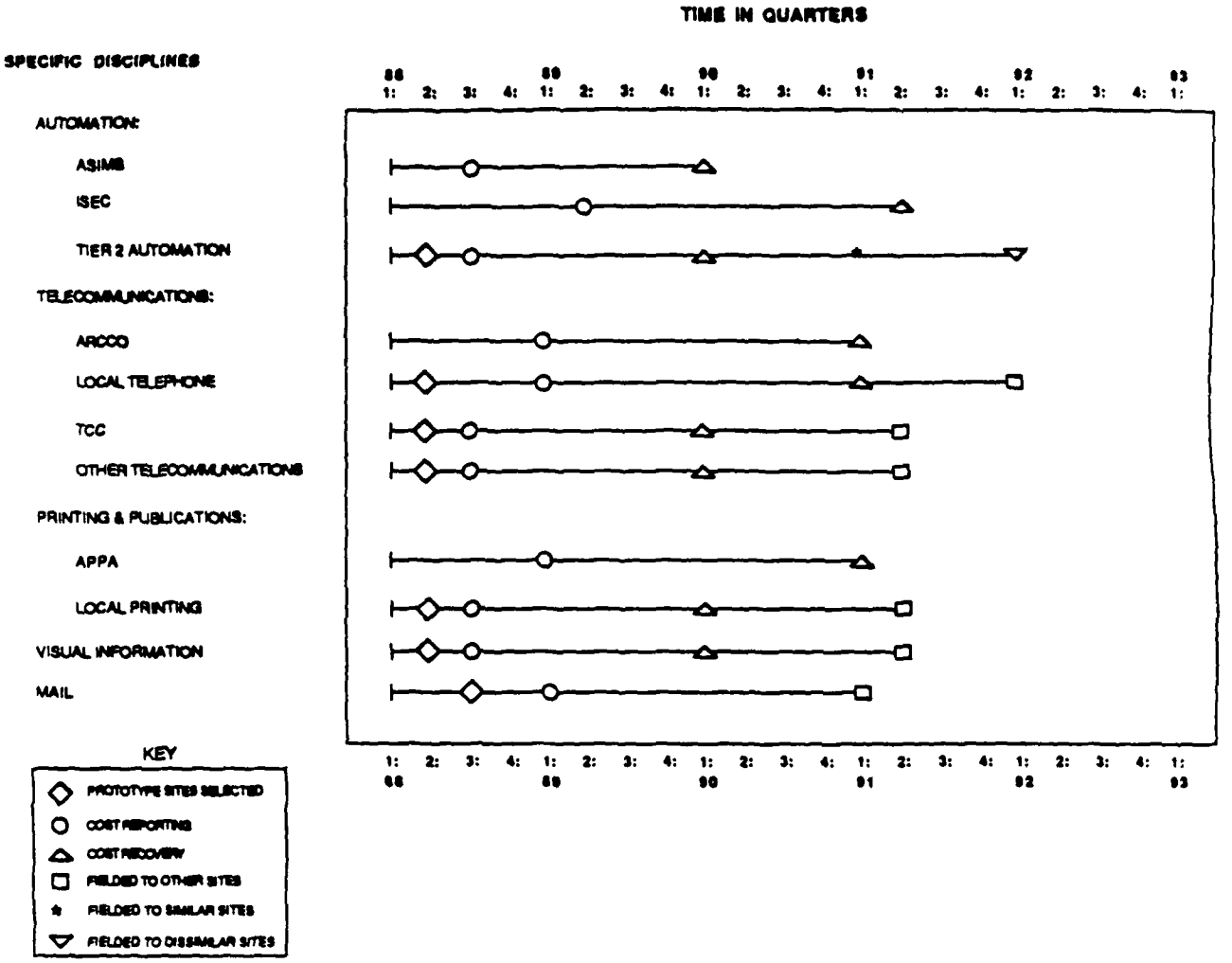
The Army can assimilate the recommended management techniques in an aggressive, but reasonable fashion. Accordingly, Vance recommends the Army approach implementation by following parallel and simultaneous paths for each discipline. This will permit rapid progress in some areas (e.g., networked Tier 1 Automation (ASIMS) and ISEC software development that was not transferred with the recent Program Executive Officer/Program Manager [PEO/PM] realignment) where cost reporting and recovery capabilities exist and slower progress in other areas (e.g., long-haul telecommunications (ARCCO) and local telephones) where metering hardware and software is expensive and is not readily available.

Vance recommends distinct areas of service be identified within each discipline, and a cost reporting and recovery capability be developed for each specific service area. For example, Vance recommends that the telecommunications discipline be separated into long-haul services; local telephone services; message centers (TCCs); and other types of telecommunications services such as pagers, local radios, and cellular telephones. Vance also recommends the Army use prototype or test bed sites to "shake-out" the new techniques before fielding them to the entire Army. Vance believes that full cost recovery capabilities can be implemented in each of the disciplines by the first quarter of FY90 or FY91.

Concurrent with development of each discipline, Vance recommends the Army begin collateral efforts to develop effective methods of obtaining IMA services from other sources. Evaluations should be made of current services provided from outside the Army and expeditious contract vehicles, such as Basic Ordering Agreements, should be developed. Vance recommends the Army conduct a series of experiments in the field to determine the best way of integrating non-Army suppliers into the Army's day-to-day business activities.

Vance recommends the Army begin program management initiatives in several areas which will provide a framework for development and fielding of an integrated system. Critical activities include developing and implementing a marketing plan for disseminating information throughout the Army and obtaining feedback from the users and providers in the field, developing a revolving fund as a funding mechanism, establishing policy for and integrating capacity planning and cost recovery into existing planning and programming processes, and implementing effective training programs.

Vance recommends the Army integrate the separate cost reporting and recovery capabilities of the disciplines only after obtaining sufficient experience with them. Consequently, the Army should begin system integration efforts only after cost reporting and recovery techniques have been implemented for each of the disciplines.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SPECIFIC DISCIPLINES
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AUTOMATION:
ASIMS
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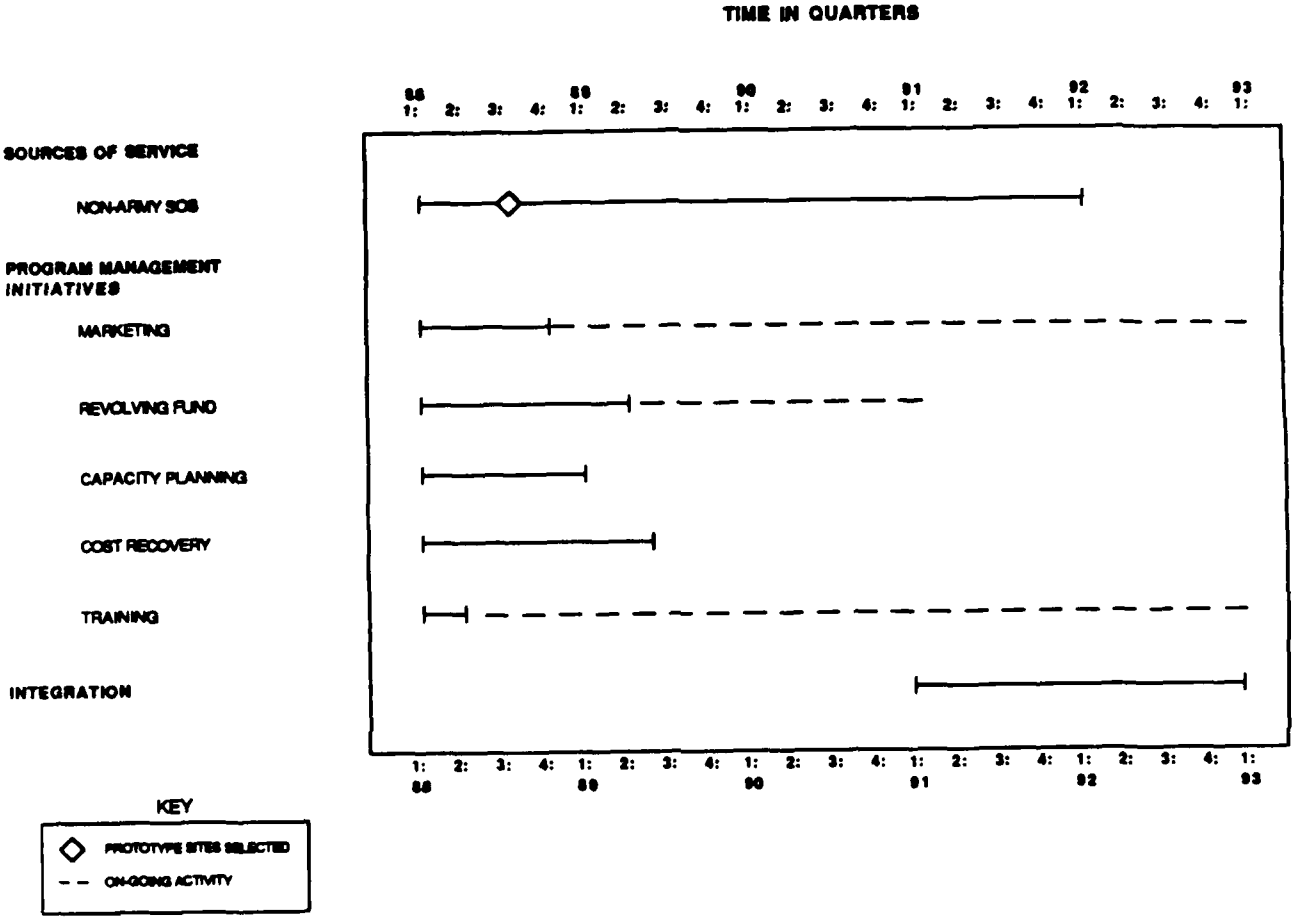
TELECOMMUNICATIONS:
ARCCO
LOCAL TELEPHONE
TCC
OTHER TELECOMMUNICATIONS
PRINTING & PUBLICATIONS:
APPA
LOCAL PRINTING
VISUAL INFORMATION
MAIL
KEY
PROTOTYPE SITES SELECTED
COST REPORTING
COST RECOVERY
FIELDED TO OTHER SITES
FIELDED TO SIMILAR SITES
FIELDED TO DISSIMILAR SITES

Vance recommends the automation discipline be separated into three areas for cost reporting and recovery purposes: (1) networked Tier 1 Automation (ASIMS) to include the regional centers and the Tier 2 minicomputers on the installations that are connected to the regional centers; (2) software development performed by ISEC, this does not include the funds and resources for the PEOs/PMs that were recently transferred to the Army Acquisition Executive; and (3) all other Tier 2 Automation on the installations. The realignment of the PEOs/PMs directed that they begin buying software development services from ISEC beginning in the first quarter FY88. Tier 3 equipment should be bought by the users directly, where it is not already done so, and should not be subject to the new cost reporting and recovery techniques. Vance recommends the Army implement the new techniques Army-wide for the areas that provide Army-wide services and use prototype sites to test the new techniques for areas that provides services that are unique to installations. For the automation discipline, prototype tests are only recommended for Tier 2 Automation. For all areas, the Army should implement and use a cost reporting capability for between 18 and 24 months before cost recovery is implemented.

As mentioned earlier, Vance recommends the telecommunications discipline be separated into four areas for cost reporting and recovery purposes: long haul services (ARCCO), local telephone services, message centers (TCCs), and other miscellaneous telecommunications services. Vance recommends the Army use prototype tests in all areas except ARCCO and implement and use cost reporting for between 18 and 24 months before implementing cost recovery.

Vance recommends the printing and publications discipline be separated into two areas: departmental printing (APPA) and local printing. Vance recommends the Army use prototype tests only for the local printing area and use a 18 to 24 month period for cost reporting before implementing cost recovery.

Vance recommends the Army manage the visual information discipline as a single area, use prototype tests, and use cost reporting for 18 months before implementing cost recovery. Vance recommends the Army conduct a series of mail tests to determine the best techniques for decentralizing the paying for Army mail.


TIME IN QUARTERS
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SOURCES OF SERVICE
NON-ARMY SOS
PROGRAM MANAGEMENT INITIATIVES
MARKETING
REVOLVING FUND
CAPACITY PLANNING
COST RECOVERY
TRAINING
INTEGRATION
1: 2: 3: 4: 1: 2: 3: 4: 1: 2: 3: 4: 1: 2: 3: 4: 1: 2: 3: 4: 1:
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KEY
PROTOTYPE SITES SELECTED
ON-GOING ACTIVITY

Vance recommends the Army verify the benefits the could be obtained by acquiring IMA services from non-Army sources before implementing them Army-wide. The Army should identify prototype sites and conduct a series of experiments to determine the feasibility of modifying the Army's contracting procedures and obtaining services from non-Army sources. Vance estimates that fielding of the modified contracting procedures, to allow easier purchase of IMA services from non-Army sources, could begin as early as the first quarter of FY90.

Vance recommends the Army conduct several program management initiatives to enable the new management techniques to be implemented as efficiently as possible.

- The first initiative is for the Army to develop and follow a plan for marketing the new techniques to the field and non-Army concerns, such as GAO, OMB, and Congress. Vance recommends the Army place marketing as the most important of all of the program management initiatives.

- The second initiative is for the Army to request approval to establish a revolving fund. Vance recommends the Army use a revolving fund as the vehicle for managing the finances when using the new techniques. A revolving fund will enable the Army to operate more efficiently by shortening the lead time needed to procure new equipment.

- The third initiative is for the Army to establish a group that will be responsible for helping the Army determine its capacity requirements. Vance recommends this group be dispersed throughout the Army and provide assistance on an as needed basis.

- The fourth initiative is for the Army to develop procedures for transferring funds from the accounts of Army users to the accounts of Army providers. Vance recommends the Army develop and use these funds transferral procedures if the use of a revolving fund is not approved.

- The fifth initiative is for the Army to develop training in the new way of providing and using IMA services. Vance recommends the Army develop a comprehensive program for both the users and providers of IMA services because both will be impacted by the new techniques. The Sage failure avoidance process indicated that the field was most concerned about obtaining the proper level of training before the new techniques are implemented.

Vance recommends the Army begin integrating the separate techniques in each of the disciplines into a single system after all cost recovery capabilities have been implemented. Vance anticipates that the soonest system integration could start in the 1st quarter FY91. Vance also recommends the Army revisit it's system integration objectives and design to determine if they are still valid.

A more detailed discussion of Vance's recommended implementation plan is presented in Section 6.

DESIGN OVERVIEW

- o SUSTAINING BASE RESOURCES
- o USERS
- o NON-ARMY SUPPLIERS
- o ARMY PROVIDERS
  - oo RATE-CALCULATION ACTIVITIES
  - oo BILLING ACTIVITIES

4.0 DESIGN OVERVIEW

Vance has designed new management techniques for IMA services based around an integrated system that should be viewed as the ideal system for the Army environment. This integrated system accomplishes all of the Army's objectives and provides a goal for which the Army should strive. The Army should revise this design after experience has been obtained with the separate capabilities identified in the implementation plan. The integrated system is designed for use with the sustaining base resources, provides specific techniques for the users of IMA services, identifies techniques for buying IMA services from non-Army suppliers, and focuses on the techniques that Army providers should use to sell IMA services to users.

Vance recommends the Army use the new techniques to manage only the resources that provide IMA services to support the sustaining base. This includes all resources for the disciplines of automation, telecommunications, printing and publications, visual information, and mail. Vance recommends the Army continue to direct fund ISC for the resources used for records management and libraries.

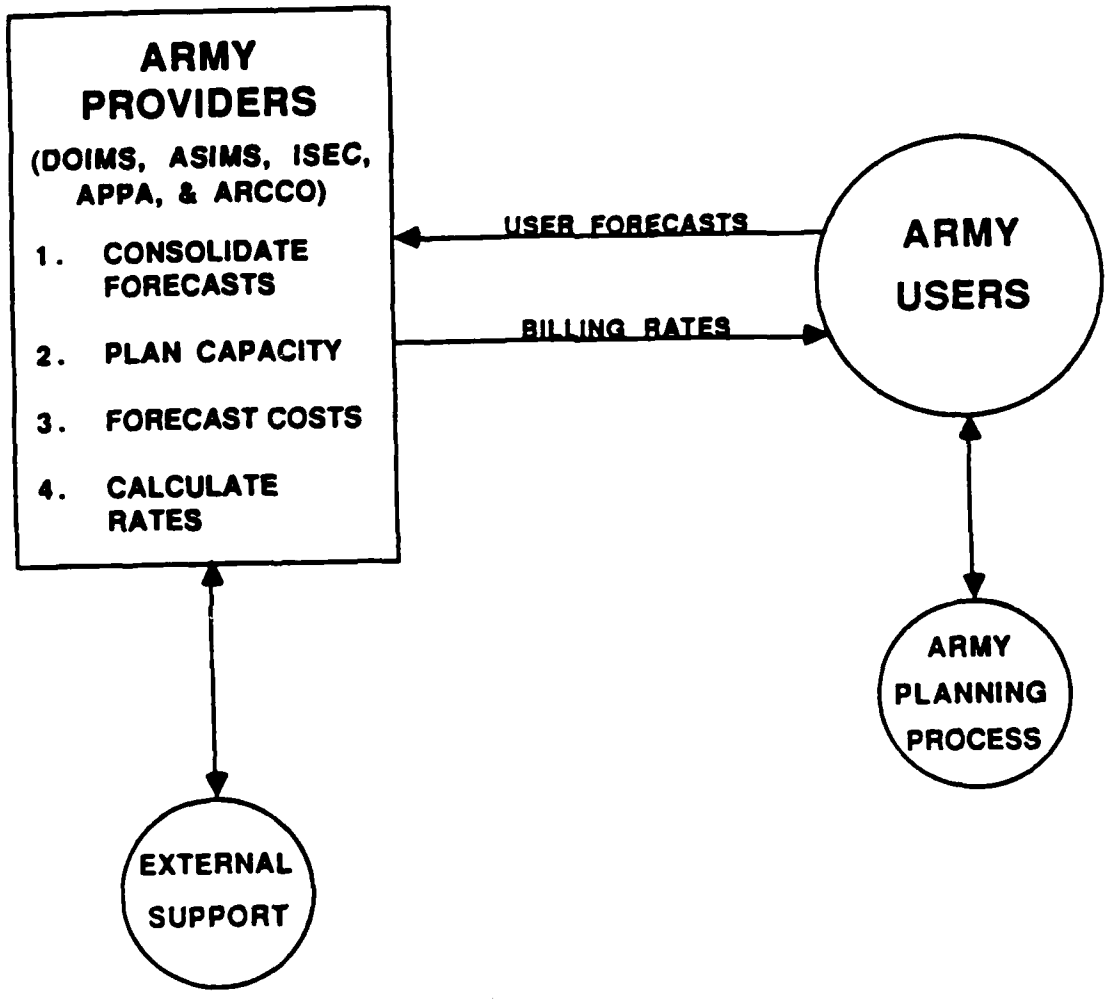
Determining who the users should be is one of the more important parts of the new techniques, but a difficult task for the Army because it is so large and diverse. Vance recommends the Army define users as the group or individual that is responsible for utilizing, causing the utilization of, or has the ability to control the utilization of IMA services. For most of the IMA services, this will be either the unit/activity on the installation or the proponent of a major application/system (e.g., STAMMIS). Vance recommends the Army require system proponents pay for a standard level of usage and other users pay for usage above the standard.

OMB has indicated several times during the last five years that private industry should be viewed as the preferred source of supply for Government agencies. Independent studies have supported this direction by indicating that several Government agencies have experienced savings of between 10% and 30% when buying services directly from private industry. The precedence has been set for Government agencies to turn to private industry to accomplish some of their mission objectives. Consequently, Vance recommends the Army implement techniques that permit users to obtain their IMA services from two sources: Army and non-Army. Non-Army represents both other Government agencies and the private industry. Vance also recommends the Army utilize the existing DCSIM and DOIM structure to assist users in defining requirements, determining technical solutions, and selecting the best source for obtaining their IMA services.

For IMA services that are provided with Army resources, Vance recommends techniques that will enable the Army providers to operate more like a business and to sell IMA services to the users. These techniques will also encourage Army providers to be more efficient and effective in their providing of IMA services, and will encourage the users to become more accountable and efficient in their utilization of IMA services. The techniques are comprehensive and are presented as rate-calculation and billing activities. If the Army decides to provide most of the IMA services using in-house resources, then the rate-calculation and billing activities will have to be extensive and will require considerable resources to implement and operate. However, if the Army decides to provide most of the IMA services using non-Army suppliers, then the rate-calculation and billing activities can be much simpler and will require minimal resources to implement and operate. The main problem with the latter approach is the lack of adequate contracting

vehicles to ensure that users can obtain IMA services in a timely manner. Vance has addressed the problem of contracting vehicles in the implementation plan.

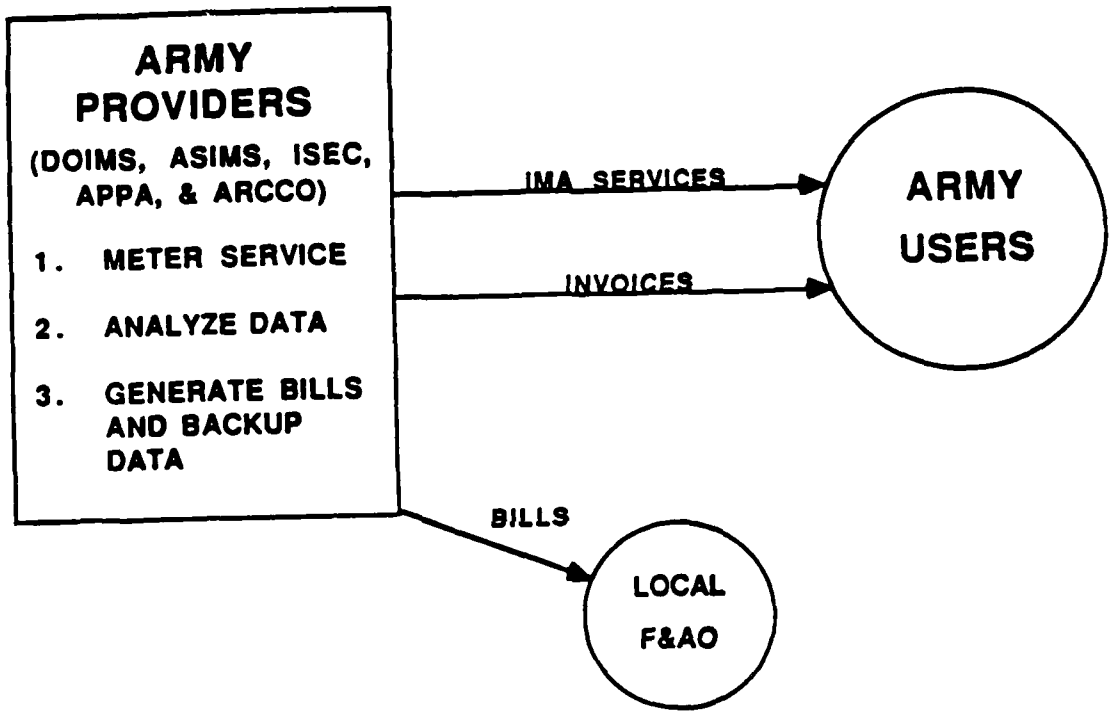
RATE-CALCULATION ACTIVITIES



The rate-calculation activities will enable the providers to develop tariffs or billing rates for IMA services based on user demand and available capacity. These activities will also provide information that will (1) enable Army managers to better control the costs of IMA service production and (2) assist users and providers in budgeting for IMA services.

Vance recommends the rate-calculation activities begin with users supplying the Army providers with forecasts of the quantity of IMA services to be used during the next year. The user forecasts should be integrated with and obtained from the normal Army planning processes. Next, the Army providers consolidate the forecasts from all of the respective users into a single forecast by discipline. The Army providers should then obtain the assistance of the capacity planning groups to determine capacity requirements and whether additional equipment will be needed in the near future. After the capacity planning is completed, costs of providing the user requirements can be forecast. The Army providers can now calculate and distribute the billing rates for the services with the assistance of a central support group. Finally, users and providers should use the information generated by the rate-calculation activities to prepare their annual budgets.

BILLING ACTIVITIES



The billing activities will enable the Army providers to track actual costs, meter services, generate bills, and recover charges. Essentially, any user of sustaining base IMA services will be billed, on a fair and equitable basis, based on their utilization. The billing activities will also provide information on the variances between projected and actual costs and revenues, and on the status of user accounts. The billing activities, in conjunction with the rate-calculation activities, will enable the providers to operate like an internal business within the Army.

Vance recommends the billing activities begin with the users utilizing IMA services from the Army providers. The Army providers will use manual or automated metering devices and meter the utilization of the services. This metered data should be analyzed on a monthly basis and an invoice prepared and sent to the users. Concurrently with the invoices being sent to the users, Vance recommends that bills and detailed backup reports supporting the bills be sent to the local finance and accounting office (F&AO). The local F&AO would have the primary responsibility for starting the process to transfer funds from the users account to the providers account.

A conceptual overview of Vance's recommended design is presented in Section 5. A more detailed discussion of the design is presented in Section 7.

COSTS AND BENEFITS SUMMARY

- MACRO VERSUS MICRO ANALYSES
- FOUR SCENARIOS FOR COST ANALYSIS
  - NO REVOLVING FUND, LOW PERCENTAGE OF NON-ARMY SUPPLIERS
  - REVOLVING FUND, LOW PERCENTAGE OF NON-ARMY SUPPLIERS
  - NO REVOLVING FUND, HIGH PERCENTAGE OF NON-ARMY SUPPLIERS
  - REVOLVING FUND, HIGH PERCENTAGE OF NON-ARMY SUPPLIERS
- KEY COST VARIABLE: PERCENTAGE OF IMA SERVICES OBTAINED FROM NON-ARMY SOURCES

  (HIGH PERCENTAGE = LOWER COST)
- BENEFITS ANALYSIS
- NET PRESENT VALUE ANALYSIS

  (NEW TECHNIQUES COST EFFECTIVE)

5.0 COST AND BENEFITS SUMMARY

Vance conducted a high-level, macro analysis of the costs and benefits to the Army in implementing the new management techniques. The results of this analysis provide the Army a "ballpark" estimate of the potential costs and benefits that it can expect as the Army evolves to a new way of managing IMA services. If the Army implements Vance's recommendations, numerous decisions will arise that require the conduct of a problem-specific (micro) cost and benefit analysis. Vance recommends the Army follow a methodology similar to the one Vance employed for the macro analysis.

Vance developed four scenarios for the macro level cost analysis. For each scenario, Vance assumed that the Army would implement the new techniques but in a slightly different manner. Vance used two variables to develop the four scenarios. The first variable addressed operating the new techniques with or without the use of a revolving fund. The second variable addressed the percentage of IMA services that would be obtained from non-Army sources, either low or high.

The results of the cost analysis indicated that the key discriminating variable was the percentage of services obtained from non-Army sources. The high percentage scenarios resulted in a lower overall cost. Using or not using a revolving fund did not result in a substantial difference in costs.

Vance's analysis of the benefits indicated that the Army could, potentially, expect significant cost savings from implementing the new management techniques. Vance surveyed private industry and other Government agencies and found that on the average cost reporting and recovery techniques resulted in an annual net savings of approximately 5%. Vance also found a recent study of a Government agency that compared operating a data processing facility in-house to buying the data processing services from private industry. The study results indicated that the Government agency would realize a cost reduction of between 10%-30%. The Army will also receive significant non-quantifiable benefits. Specific benefits the Army will receive are:

- Implementing cost reporting and recovery techniques will yield:
  - Increased user accountability
  - Better economic information for decision making
  - Better information for resource management
- Being able to obtain IMA services from non-Army sources will yield
  - More control over expenses
  - Reduced investment expenses
  - An ability to move personnel from support to line positions
  - A private sector infrastructure for supporting war-time needs
  - Access to modern technology
- Using a revolving fund for providing in-house services will yield
  - Simplified financing techniques
  - Vehicle for depreciating equipment
  - Faster procurement cycles

A net present value analysis of the costs of all scenarios and the potential benefits resulted in a positive net present value, which indicates that implementing the new techniques for managing IMA services would be cost effective for the Army.

A more detailed discussion of the cost and benefit analysis that Vance conducted is presented in Section 8.

CONCLUSIONS AND RECOMMENDATIONS

- CONCLUSIONS
  - ARMY OBJECTIVES CAN BE ACHIEVED
  - MANY EXAMPLES OF SUCCESSFUL SYSTEMS INSIDE AND OUTSIDE OF ARMY
  - MULTIPLE AND DIVERSE TECHNICAL ENVIRONMENTS
  - MANY ISSUES REMAIN

RECOMMENDATIONS

- IDENTIFY RESPONSIBLE ARMY ORGANIZATION AND DIRECT FUND FOR ACQUISITION AND USE OF STRATEGIC AND TACTICAL RESOURCES
- IMPLEMENT NEW MANAGEMENT TECHNIQUES
- PROCEED MORE SLOWLY IN OCONUS
- DEDICATE RESOURCES TO DEVELOPMENT AND IMPLEMENTATION OR NEW TECHNIQUES WILL FAIL

6.0 CONCLUSIONS AND RECOMMENDATIONS

The Army's objectives can be achieved. In the face of large budget deficits and slowing economic growth, the Army must take every step possible to ensure that it spends its information dollars in the most efficient and effective way possible.

All of the techniques that Vance has recommended do work. Most of the techniques are only new to the Army, other organizations both inside and outside of the Government have been using these same techniques for years to increase accountability and better manage their information dollars. There are even examples of some of the techniques successfully operating within the Army.

The Army is unique in that it has multiple and extremely diverse technical environments. However, it is Vance's opinion that this is not a roadblock to success, merely a challenge.

As with any study, this study identified many additional issues that will need to be resolved as the recommendations are implemented. The Army will have to resolve this issues as the time and funds permit.

Vance recommends the Army identify the organizations's within the Army responsible for managing the strategic and tactical resources and fund through direct appropriations for their acquisition and use.

Vance recommends the Army proceed with the implementation plan as designed. However, should the Army not be able to proceed on all fronts at one time, Vance recommends that the Army implement one or two high priority areas. This will ensure that progress continues.

Vance recommends the Army implement the new techniques more slowly in OCONUS installations than in CONUS installations because of the additional and unique problems that occur in OCONUS installations.

Vance recommends the Army dedicate the resources necessary to successfully implement and operate the new techniques. If the resources are not made available, the results from Sage's failure avoidance analysis have indicated that the new techniques will not succeed.

A more detailed discussion of the conclusions that Vance developed and the recommendations that Vance formulated is presented in Section 9.

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SECTION 1. INTRODUCTION

On 9 January 1987 Vance Government Systems, American Management Systems, Inc., and J.G. Van Dyke and Associates, Inc., completed a preliminary design and implementation plan for new information management techniques under contract MDA903-86-C-0329. The design and implementation plan were presented in a project report entitled "Study Recommendations Report." The purpose of the report was to serve as a "strawman" design and implementation plan which would provide the Army a comprehensive understanding of a proposed new way of managing its Information Mission Area (IMA) services. The report was intended to elicit comments and criticisms, and to identify failure points so that Vance could address them in this final design and implementation plan.

The Army contracted with Sage Institute International (Sage) to conduct a failure avoidance analysis of Vance's Study Recommendations Report (hereafter referred to as the Preliminary Design and Implementation Plan). Sage's failure avoidance analysis consisted of three parts: (1) Sage collected data on potential failures by interviewing, in private, the individuals who had reviewed the Preliminary Design and Implementation Plan; (2) Sage analyzed the identified failures, validated the data through additional interviews with the original and new participants, and obtained additional data; and (3) Sage had all participants rank order the potential failures, Sage then analyzed the rank ordering and developed a critical path of potential failures.

To conduct its failure avoidance analysis, Sage requested that Vance (1) distribute the Preliminary Design and Implementation Plan to selected Army organizations and individuals, other government agencies, and the private sector for their review; and (2) conduct workshops throughout the United States and Germany to explain the Preliminary Design and Implementation Plan and to answer questions. The workshops also provided Vance an opportunity to obtain information from the Army that Vance was unable to obtain prior to the preparation of the Preliminary Design and Implementation Plan.

After Sage completed the first part of its failure avoidance analysis, it became clear that the scope of what the Army was trying to accomplish was much broader than designing a cost accounting and charging system. The Army indicated that Vance should view this effort as designing new techniques which will enable (1) Army users to buy their information services from whatever supplier they choose and (2) Army providers to operate more like a business organization that provides information services. As a result of this change in project scope and as a result of apparent misunderstandings of the Preliminary Design and Implementation Plan, Vance prepared an addendum to the Preliminary Design and Implementation Plan on 7 May 1987.

This document is the Final Design and Implementation Plan. It provides Vance's final design of the new techniques that Vance recommends the Army use to manage its IMA services, and Vance's final implementation plan. This document addresses all of the potential failures identified in Sage's final report. The following sections present a brief overview of the background of the Army's IMA program and outlines the contents of this document.

1.1 Background

Over the years, the Army attempted to find ways to manage its information more

effectively. The Army concluded that it needed better management of its information in addition to more sophisticated technology. Consequently, on 9 May 1984 the Chief of Staff of the Army approved the establishment of the IMA which defines the support of the total Army management and command and control requirements. Also approved were the establishment of organizations whose missions were to manage the IMA: the Office of the Assistant Chief of Staff for Information Management (ACSIM) and the United States Army Information Systems Command (USAISC).

During the recent Army reorganization the ACSIM was renamed the Director for Information Systems, Command, Control, Communications, and Computer (DISC4). The DISC4 mission is to provide Headquarters, Department of the Army (HQDA), guidance and policy on the IMA, and to work closely with external agencies which influence the Army's information management program. USAISC was established from the assets of the Army Communications Command, the Computer Systems Command, and several other smaller elements. The USAISC mission is to operate and maintain assigned information systems in the areas of telecommunications, automation (including office automation), visual information, records management, and printing and publications.

The scope of the approved IMA includes information policy, information resources (equipment, software, firmware, hardware, services, staffpower and personnel, organizations, and data), communications, information security, office automation, tactical automation, information presentation and media (printing, publishing, forms control, etc.), standards, methods and practices for information use in support of managers, policies in support of the management of command and control information, and acquisition of information resources. The IMA consists of the associated resources and activities employed in the acquisition, development, transmission, use, integration, retention, retrieval, and management of information.

Elements of the IMA include five disciplines (automation, printing and publications, records management, telecommunications, and visual information), three information system components (hardware, software, data), three information environments (tactical/theater, strategic, sustaining base), interfaces/standards (Army, joint/combined, Federal, commercial), and time (now (fielded), coming (developing), and future (desired)).

The Army Information Architecture (AIA) defines the relationships between all elements in the IMA. It serves as the overall perspective for the hardware, software, and data in the IMA.

The Army's information manager (responsible for the management of the information) is the DISC4, a principal Army general staff position. DISC4 also serves as the IMA project manager responsible for the supervision and direction of the IMA. The role of DISC4 is to ensure a total integrated systems approach, ensure compatibility of emerging systems, ensure that the systems support the Army rather than an individual functional area, ensure the validation of requirements and the integration of information organizations into the force, and ensure the prioritization of requirements.

At each level of command (Deputy Chief of Staff for Information Management (DCSIM)) down to the installations (Director of Information Management (DOIM)) and separate organizations (Information Manager (IM)) there is a staff officer responsible for information management. USAISC is the "systems manager," and

supports the commanders when and where it is appropriate. The responsibility for the creation of the information is the proponents or the major Army commands (MACOMs).

1.2 Objectives of the Final Design and Implementation Plan

The primary objectives of this document are to present (1) the new techniques that Vance recommends the Army use to manage the resources that provide IMA services and (2) to present a plan for implementing the techniques. The Army should view the design as functional or objective, and not a detailed system specification. The new techniques that Vance designed will result in the establishment of a buyer-seller relationship between service providers and users, and accomplishes all of the objectives stated by the Army. Specifically, (1) Army providers will have an incentive to operate more efficiently, because users will buy from non-Army sources if the providers are not efficient and (2) Army users will become more responsible for their consumption of information services, because they will be required to budget and pay for the services.

Vance designed the implementation plan to provide the Army a plan for a smooth transition from the current "free service" environment to the new management techniques. Vance recommends that the Army develop independent cost reporting and recovery techniques for major groups of information resources and conduct extensive tests before fielding the new capabilities or alternative sources for services Army-wide.

While Vance's design and implementation plan is comprehensive, the Army still must make many management and policy decisions to implement Vance's recommendations. This must occur before a more detailed system specification can be completed.

1.3 Organization of the Final Design and Implementation Plan

This document is organized into nine sections and seven appendices. The following is a description of the document contents:

- Section 1 presents the background and objectives of the project, the environment in which this document was developed, the objectives that this document is intended to accomplish, and the organization of this document.
- Section 2 explains the methodology that Vance used to gather and analyze the information presented in this document.
- Section 3 details the assumptions that Vance made and constraints under which Vance operated while preparing this document.
- Section 4 identifies the objectives that the Army indicated the new management techniques should satisfy.
- Section 5 provides a conceptual overview (design) of the new management techniques that Vance recommends the Army adopt.
- Section 6 presents a detailed implementation plan for developing the new management techniques.

- Section 7 explains the detailed design of the new management techniques that Vance recommends the Army use for: obtaining IMA services from non-Army sources, employing cost reporting and recovery techniques for IMA services provided by the Army, and modifying the way users obtain and use IMA services.

- Section 8 contains a cost analysis of four alternative approaches under which the Army could implement Vance's recommendations.

- Section 9 presents the conclusions and recommendations regarding the final design and implementation plan.

- Appendix A describes how Vance responded to the results of the Sage study.

- Appendix B presents a standard methodology developed by General Services Administration (GSA) for implementing cost reporting and recovery techniques for information services.

- Appendix C contains the assumptions Vance made to complete the cost analysis.

- Appendix D provides more detail on the cost analysis.

- Appendix E provides a list of the acronyms used throughout the document and the associated meanings.

- Appendix F contains a glossary of important terms and concepts used in the document.

SECTION 2. METHODOLOGY

This section describes Vance's approach to the development of the final design and implementation plan. Vance completed this effort in the following seven steps: (1) identified the Army's cost reporting and recovery requirements, (2) identified the Army's baseline cost reporting and recovery capabilities, (3) identified successful cost reporting and recovery systems and discussed their characteristics, (4) compared the Army's requirements to its baseline capabilities and to other cost reporting and recovery systems, (5) developed a preliminary design and implementation plan, (6) broadened the project from the design of a cost reporting and recovery system to the design of new techniques for managing IMA services, and prepared an addendum to the preliminary design and implementation plan reflecting the broadening, and (7) developed the final design and implementation plan. The following is a brief discussion of each step. For greater detail, the reader is referred to the individual documents cited in this section.

2.1 Army Requirements

Vance identified and described the Army cost reporting and recovery requirements in five steps. Vance obtained initial guidance from and established coordination with the Army managers responsible for the development of the original cost reporting and recovery system concept; collected and reviewed documentation, including Army regulations and pamphlets, briefing material, message traffic on cost reporting and recovery issues, and various reports; interviewed Army policy, operations, financial, and accounting managers; presented and resolved issues which might impact the design of the original cost reporting and recovery concept; and, documented the requirements in the Charging System Requirements Report dated 14 November 1986.

This report was reviewed by the appropriate Army officials; their comments were submitted to Vance. These comments were incorporated into a revised requirements document that was resubmitted to the Army in late January.

2.2 Army Baseline Capabilities

Vance identified and described the Army's baseline cost reporting and recovery capabilities in two steps. During the first step, Vance determined the Army IMA finance and accounting baseline by collecting and reviewing pertinent documentation, and interviewing finance and accounting managers. During the second step, Vance determined the Army usage tracking and reporting baseline by reviewing pertinent documentation and interviewing key Army managers. The results are documented in the Army Baseline Report dated 12 December 1986.

2.3 Other Successful Cost Reporting And Recovery Systems

Vance identified and described existing government and private industry organizations' cost reporting and recovery systems through a formalized, industry survey. The purpose of this survey was to assist the Army in implementing a cost reporting and recovery concept based not only on theory, but on the experience of other government and private industry organizations. Vance conducted the survey by the following five steps: selected organizations to be surveyed based on certain criteria including their similarities to the Army environment, their success in operating a cost reporting and recovery system, and their willingness to participate in the survey; developed a survey schedule based on the availability of the

organizations, the schedule of Army interviews, and the project time constraints; made travel arrangements; conducted the interviews following the format of a questionnaire developed early in the project period; and prepared the working papers. The results of the interviews are documented in the Industry Survey Responses dated 12 December 1986.

2.4 Data Analysis

Vance analyzed the data collected during the first three tasks by completing the following three steps: the Army's cost reporting and recovery requirements were compared to the Army's baseline cost reporting and recovery capabilities; the Army's cost reporting and recovery requirements were compared to existing cost reporting and recovery systems identified in the industry survey; and the results of the analyses are documented in the Charging System Findings Report dated 26 December 1986.

2.5 Developed Preliminary Design and Implementation Plan

The results of the first four tasks were used to develop the preliminary design and implementation plan. Vance's preliminary design and implementation plan consists of a cost reporting and recovery system architecture and a plan for developing and implementing the architecture. The design satisfies the Army's requirements, accommodates the Army's baseline capabilities, and includes industry-accepted principles.

2.6 Broadened Project

The Army contracted with Sage Institute International (Sage) to conduct a failure avoidance analysis of Vance's preliminary design and implementation plan. Based on the results of Sage's initial data collection and the data Vance collected during the workshops, it became clear that the scope of the project was broader than designing a cost reporting and recovery system for the Army's IMA services. Therefore, the project was redefined as an effort to design new techniques for the management of IMA services. These techniques include allowing Army IMA users to buy their services from non-Army sources, both within and outside of the government, and having the Army providers report and recover, from the users, the costs of providing sustaining base IMA services. Vance prepared an addendum to the preliminary design and implementation plan on 7 May 1987. The addendum was provided to all participants in the Sage failure avoidance analysis prior to the validation and rank ordering stages.

2.7 Developed Final Design and Implementation Plan

Vance developed the final design and implementation plan using (1) the results of Sage's analysis documented in its June 1987 final report "Prioritized Potential Program Deficiencies," (2) the new concepts addressed in Vance's 7 May 1987 Addendum, and (3) the results of additional interviews with government and non-government experts in the field of information technology.

SECTION 3. ASSUMPTIONS

This section outlines the assumptions and constraints that Vance used to develop the final design and implementation plan. The assumptions that Vance used to prepare the cost analysis are found in Section 8 and detailed in Appendix C. The final design and implementation plan is based on the following general assumptions.

- The Army decided to manage the resources of the IMA in a more business-like manner, and needs a direction in which to proceed and a plan to follow. The purpose of this project is to provide the direction and plan and not to determine if the Army should manage the IMA resources in a more business-like manner.

- The new management techniques that will create and maintain the business-like environment will not cost more than the benefits received. However, there is one qualification to this assumption. The benefit/cost comparison should be over a reasonable period of time, approximately five to seven years. It is clear that during the first several years the cost could be greater than the benefits received (both quantitative and qualitative). Therefore, the proposed solution must return a net benefit to the Army during the last several years of the life cycle period.

- The new management techniques must be consistent with applicable Office of Management and Budget (OMB), General Accounting Office (GAO), Department of Defense (DoD), and Army regulatory guidance, except where the Army has indicated that it will seek authorization to deviate from that guidance. Relevant regulations include OMB Circular A-130, GAO Federal Government Accounting Pamphlet Number 4 (FGAP4), and Federal Information Processing Standard Publication Number 96 (FIPS PUB 96). Additionally, when validated requirements conflict with Federal, DoD, or Army regulations, the Army will seek to have the regulations changed to allow the implementation of new techniques.

- In the ideal, unconstrained environment, all potential users and providers of information services provide input, feedback, and recommendations during the design phase. However, because of time constraints, Vance limited the number of on-site visits and interviews to a representative set of key Army managers and Army organizations. Vance assumes that information gathered from these interviews can be generalized to the Army as a whole.

- This project represents an early step in an effort that will continue for some time. There are two significant parts to this assumption: (1) the Army will commit the necessary resources to the development and implementation tasks to complete them on time; and (2) the new management techniques will continue to evolve as technology evolves over time.

SECTION 4. OBJECTIVES

This section discusses the overall Army objectives for implementing new techniques to manage the Army's IMA services. Additionally, specific objectives identified by the Army during the project are presented.

The Army's primary objective in implementing new management techniques is to encourage maximum efficiency in both the operation and consumption of IMA services. These new techniques ideally will yield real net savings in IMA funding requirements while maintaining full service levels. Implicit in this objective is the restriction that the new management techniques not cost more than the savings received by the Army from implementing them. The Army identified the following objectives to be met by the new management techniques:

- Provide an environment where (1) users are required to buy IMA services instead of getting the services free of charge and (2) users have multiple sources or suppliers from which they can buy their IMA services. The two basic sources are essentially Army sources or non-Army sources. Non-Army sources can be further subdivided into other Government agencies and private industry.

  There are three sub-objectives that the Army identified for this objective. First, the IMA services that users will be able to buy must be identified, because it does not make sense to allow users to buy all categories of IMA services (i.e., strategic, tactical, and sustaining base). Second, potential sources of IMA services must be screened and approved or disapproved. This process will enable the Army to ensure that (1) users will select cost effective sources, (2) the IMA services procured will comply with Army standards and be interoperable, and (3) users will have enough guidance to help prevent them from buying the wrong services. Third, guidelines for users to follow when buying IMA services will be established. It is important that the Army establish these guidelines because many of the users do not possess the expertise to buy IMA services.

- Enable IMA service providers to operate more like a business, and sell their services to their users.

- Provide an environment where the efficient use of IMA services can be encouraged without having to mandate it.

- Better balance the Army's corporate appetite for IMA services with the benefits derived from those services.

- Enable users to become more accountable for their consumption of IMA services.

- Better control information budgets by ensuring that consuming organizations which dictate service level requirements have the responsibility to justify and fund those requirements.

- Provide an environment where the approval for the consumption of IMA services is justified through the functional organization that directs the consumption.

- Provide Army managers better information on the cost of performing Army missions.

- Charge users only for services that they can control the utilization of through their personal management initiatives.

- Abide by the spirit of the guidelines established by OMB and GAO that direct all Federal agencies (1) to implement cost reporting and recovery techniques for information services and (2) to look to private industry as the preferred supplier for the Government whenever possible.

- Enable users to become more aware of what it costs to provide IMA services within the Army.

- Provide users economic information for decision making.

- Motivate Army users to utilize IMA services more efficiently.

- Provide the tools and techniques needed to account for the costs of IMA services in a more accurate and timely manner.

- Provide a basis for identifying and migrating to the best service source.

- Provide an environment in which the IMA service providers can provide the services more efficiently.

- Provide an environment in which the Army can quickly and efficiently obtain IMA services from modern information technologies in accordance with OMB Circular A-130.

SECTION 5. CONCEPTUAL DESIGN

This section presents a conceptual design of the new techniques that Vance recommends the Army use to manage it's IMA services. The detailed design of the new techniques is presented in Section 7. This conceptual design represents the final integrated system which is the primary Army objective. However, Vance does not recommend that the Army implement the integrated system initially. Instead, Vance recommends that the Army implement separate cost recovery and reporting techniques by discipline and transition to the integrated system over several years. Vance's detailed implementation recommendations are presented in Section 6.

At a high level, Vance recommends that the Army (1) develop new techniques for managing the resources used to provide IMA services in support of the sustaining base; (2) use two sources for obtaining IMA services, Army and non-Army; and (3) have Army users budget and pay for IMA services regardless of whether the services are obtained from Army or non-Army sources. The system that Vance designed develops a buyer-seller relationship between service providers and users, and accomplishes all of the objectives stated by the Army. Specifically, (1) Army providers will have an incentive to operate more efficiently, because users will buy from non-Army sources if the providers are not efficient and effective and (2) Army users will become more responsible for their consumption of IMA services, because they will be required to budget and pay for the IMA services.

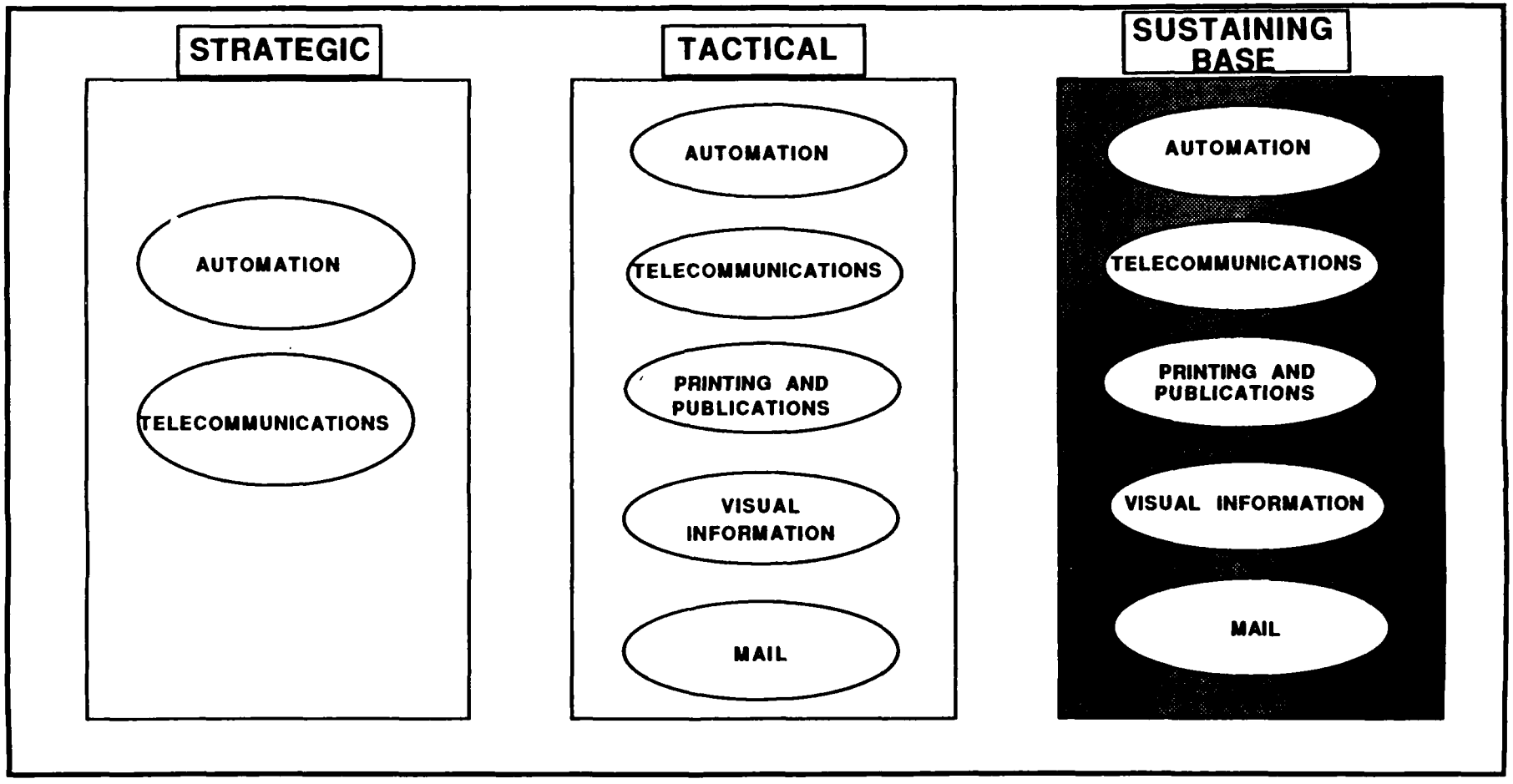
Vance presents the conceptual design in this section by discussing the following concepts: (1) the resources that should be managed using the new techniques; (2) the techniques that Vance recommends the Army develop and implement for buying IMA services from non-Army sources; (3) the techniques that Vance recommends the Army develop and implement for providing IMA services with Army resources; and (4) how the techniques will affect the Army users.

5.1 The IMA Environment

Vance recommends that all resources used to provide IMA sustaining base services be managed with the new techniques. As illustrated in Figure 5-1, this recommendation includes all resources for the following disciplines: automation, telecommunications, printing and publications, visual information, and mail. Vance recommends that the Army continue to manage the resources used for records management and libraries with the current techniques.

Additionally, Vance recommends that the Army use special management techniques for those resources that provide IMA services in support of both the sustaining base and strategic and/or tactical area. Vance makes this recommendation because, for these resources, it will be difficult for the Army to separate the sustaining base costs from the costs for strategic and/or tactical missions. Vance does not recommend that users pay for IMA services used to support strategic and/or tactical missions. Instead, Vance proposes techniques that will permit the Army to identify costs of IMA services and then only charge sustaining base users. In other words, all users of IMA services that support the sustaining base, regardless of which resources are used to provide the services, will be required to pay for the services. All users of IMA services that support strategic and/or tactical missions, regardless of which resources are used to provide the services, will **not** pay for the services. Examples of IMA services for which Vance recommends ISC receive funding and that users receive free of charge are:

IMA



Resources Subject to New Management Techniques

Figure 5-1

- o Defense Communications Systems (DCS) in the strategic and tactical areas.
- o Technical and advisory support from the DOIM staff.
- o Over the counter service from the Army message centers (also known as Telecommunications Centers (TCCs)).
- o DCS/World-Wide Military Command and Control System (WWMCCS).
- o Headquarters command and control.
- o Sustaining Base Network Activity (SBNA) office.
- o Information Systems Engineering Command (ISEC) network engineering and services in support of command and control.

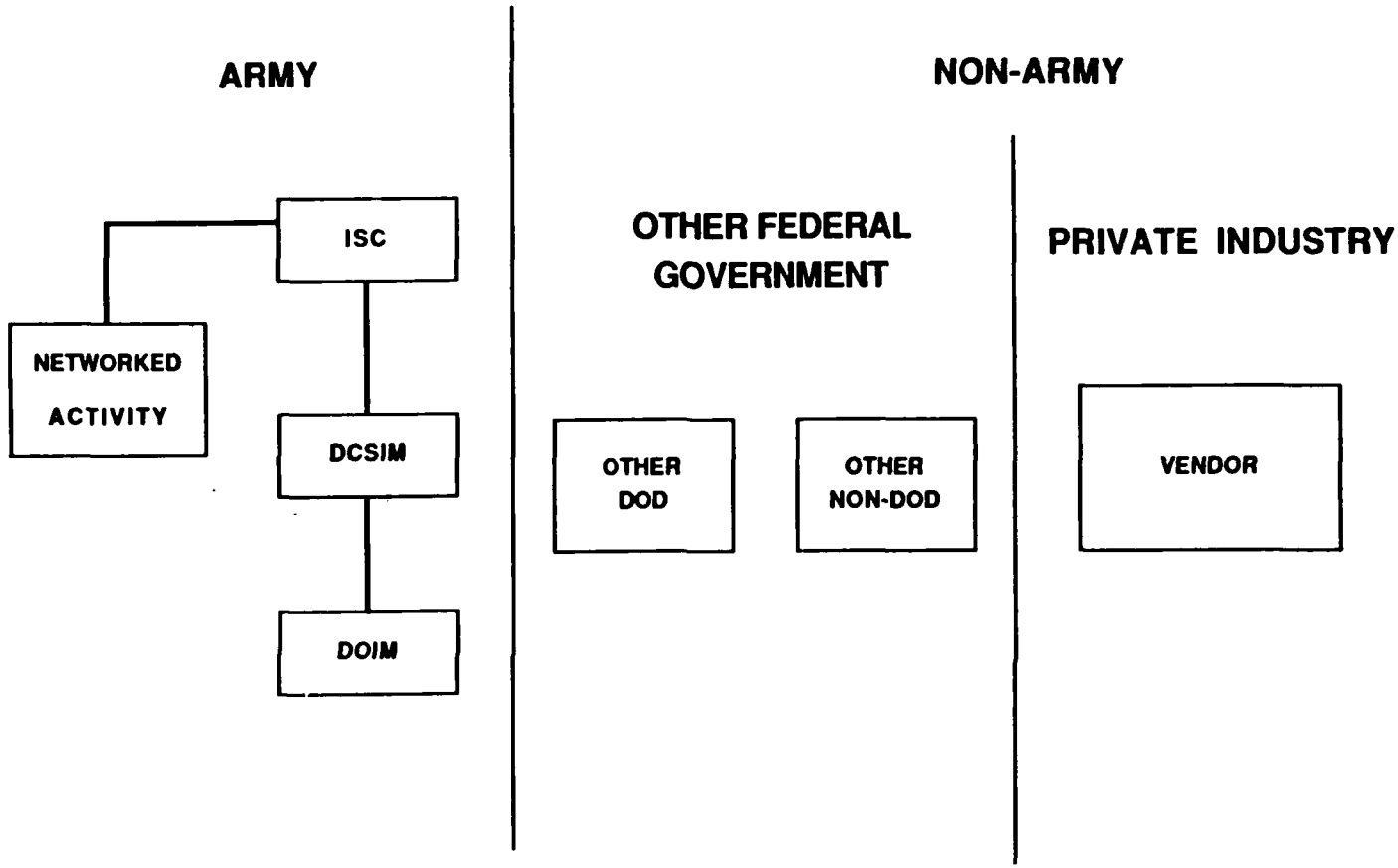
5.2 Non-Army Source of Service

Vance recommends that the Army implement techniques that permit users to obtain their services from two sources: Army and non-Army. As illustrated in Figure 5-2, Vance defines the first source, Army, as the existing ISC infrastructure and the second source, non-Army, as other Government agencies and private industry. Vance recommends that the Army provide strategic and tactical services free of charge and sustaining base services on a cost reimbursable basis. Vance further recommends that the Army provide sustaining base services using either the Information Systems Command (ISC) infrastructure or a non-Army source.

Obtaining IMA services from non-Army sources should provide the Army the following benefits:

- o The Army should be able to control its operating costs better as it experiences fluctuations in appropriations. Most importantly, the ratio of fixed to variable costs will decrease, thus allowing the Army to quickly scale back expenses when appropriations decrease.
- o The Army would not have to incur major investment expenses.
- o The Army will be able to move personnel out of support positions and into line positions. This should help the Army better deal with fixed levels of personnel.
- o An infrastructure for supporting the sustaining base will be established in the private sector which could, potentially, more quickly support the Army's wartime needs.
- o The Army can obtain IMA services that are supplied with modern technology, wherever that technology is located.

This part of the conceptual design addresses the techniques that Vance recommends the Army implement to enable its users to obtain IMA services from non-Army sources. The sources for service for each discipline are summarized first and the specific techniques that Vance recommends are summarized second.



Sources for Sustaining Base Information Services

Figure 5-2

5.2.1 Proposed Source of Services. This section describes the generic sources that Vance recommends the Army use to obtain IMA services. Table 5-1 provides a summary of the sources. The source of service column in Table 5-1 includes a distinction between Army and non-Army sources and a distinction between private industry and other Government sources within the non-Army source. Vance makes the latter distinction because there are some services that should only be obtained from a Government agency and not private industry.

- o In the telecommunications discipline, Vance recommends that:
  - oo Local telephone services be obtained from all sources.
  - oo Long-haul telecommunications services be obtained from the Army for basic Autovon services, from all sources for the telephone instruments used for Autovon, and from all sources for other services similar to Autovon. Vance recommends that the Army not participate in the Federal Telephone System (FTS) or FTS 2000. Vance makes the latter recommendation because: (1) both programs recover all fixed costs and if there are a small number of users, then each will pay a large percentage of fixed costs, (2) many Federal agencies have withdrawn from FTS or have refused to sign up for FTS 2000, and (3) there are alternative sources from which the Army can acquire the services.
  - oo TCC services be obtained from the Army.
  - oo Other telecommunications services be obtained from the Army for Defense Data Network (DDN) Electronic Mail (E-Mail) services, from the private sector for other E-Mail services, from the Army or other Government agency for secure services, and from all sources for the other miscellaneous telecommunications services (e.g., facsimile, teleconferencing, pagers, radios, mobile telephones, etc.).
- o In the automation discipline, Vance recommends that:
  - oo Use of automation services be obtained from the Army for all runs of single and multi-command STAMMISs and from all sources for Tier 1 and 2 unique and Tier 3.
  - oo Software development be obtained from all sources.
  - oo Software maintenance be obtained from all sources.
- o In the printing and publications discipline, Vance recommends that:
  - oo Army Regulations (AR) forms and other basic services be obtained from the Army.
  - oo Extra requirements for AR forms and other non-basic services be obtained from all sources.
- o In the visual information discipline, Vance recommends that services be obtained from all sources.

SERVICE	SOURCES OF SERVICE		
	NON-ARMY		ARMY
	PRIVATE	GOVT	
TELECOMMUNICATIONS			
Local (Voice/Data)	X	X	X
Long-Haul:			
AUTOVON:			
DCS/Basic Services			X(DCS)
Instruments	X	X	X
FTS	N/A	N/A	N/A
Other	X	X	X
TCC (AUTODIN)			X(DCS)
E-Mail (DDN)			X
E-Mail	X		
Secure Services		X	X
Other	X	X	X
PRINTING			
AR/Forms/Basic Services			X
AR/Forms/Extra Requirements & Other	X	X	X
VISUAL INFORMATION	X	X	X
RECORDS MANAGEMENT	N/A	N/A	N/A
MAIL	X	X	
LIBRARIES	N/A	N/A	N/A
AUTOMATION			
Use:			
Tier 1&2 STAMMIS (Standard & Extra Runs, Multi & Single Commands)			X
Tier 1&2 (Unique) & Tier 3	X	X	X
Software Development	X	X	X
Software Maintenance	X	X	X

Summary of Sources

Table 5-1

- o In the area of mail, Vance recommends that services be obtained from non-Army sources.

- o Since Vance recommends that records management and libraries not be managed using the new techniques, sources of service are not applicable.

5.2.2 Techniques For Obtaining Services From Non-Army Sources. This section presents a summary of the techniques that Vance recommends the Army use to permit its users to obtain new IMA services from non-Army sources. The recommended techniques apply to both Army providers and users. Vance views Army providers as the ISC infrastructure and in particular the DSCIM and DOIM organizations within the MACOMs. Vance recommends that the DSCIMs and DOIMs continue to be viewed as both a provider of services and as a technical consultant to the users. In their role as a technical consultant the DSCIMs and DOIMs would help users determine the best technical solution to their requirements and the best source of service.

Vance recommends that the Army use an inter-agency work request and the contracting concept of basic ordering agreements (BOAs) or requirements contracts as the basic technique to permit a user to quickly obtain IMA services from a non-Army source. Vance also recommends that the Army staff each DOIM, that will be issuing a large number of BOAs or requirements contracts, with a contracting officer. A contracting officer will provide the DOIM the expertise needed to negotiate and establish contracts. Vance recommends that Army providers use the following techniques:

- o Conduct the studies to determine which IMA services should be supplied from non-Army sources.

- o Survey users and determine the specific types of IMA services that should be contracted for and made ready for use.

- o Identify potential non-Army sources for the IMA services.

- o Establish a buyer seller relationship with other Government agencies, when they are a source, and develop and document the procedures that Army users should follow to obtain IMA services from the Government agency.

- o Develop and make use of standard contracting documents that would enable a BOA or requirements contract to be put into place with one or more companies in private industry. There should be contracts for each type or group of IMA services. The contracts should include negotiated prices and service levels or quality.

- o Establish a BOA or requirements contract for each supplier of services, and develop and document the procedures that Army users should follow to obtain IMA services from the private industry supplier.

Vance recommends that the Army users utilize the following techniques to obtain IMA services from non-Army suppliers:

- o Plan, budget, and pay for the use of IMA services in support of the sustaining base out of their operating funds.

- o Identify their own requirements, but work with the DSCIMs and DOIMs to identify technical solutions.

- o Work with the DSCIMs and DOIMs to identify the best source of service, and take full responsibility for selecting the source.

- o Follow the procedures documented by the DCSIMs and DOIMs for obtaining IMA services from other Government agencies and private industry.

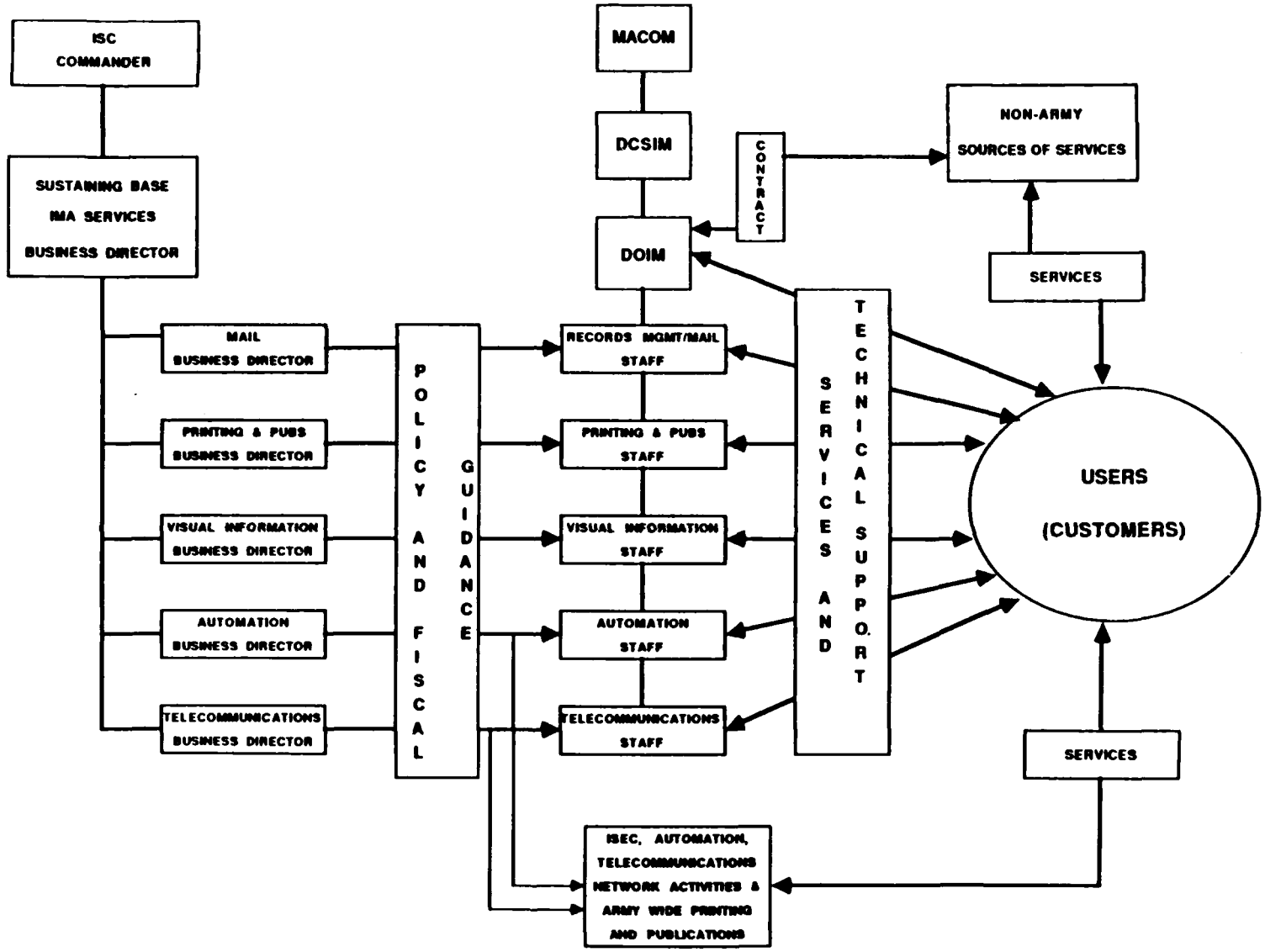
5.3 Providers

This section summarizes the techniques that Vance recommends the Army develop and implement to manage the IMA services provided with Army resources. The new techniques are presented and discussed, first, according to the inter-relationships and responsibilities of Army providers (i.e., ISC, MACOMs, DCSIMs, DOIMs) and the users and, second, according to the cost reporting and recovery techniques that the providers should use.

5.3.1 Army Providers, Inter-Relationships and Responsibilities. The inter-relationships and responsibilities that Vance envisions resulting from the new techniques it recommends are summarized in Figure 5-3. Vance recommends that ISC be responsible for operating the cost reporting and recovery techniques that will be used to manage the resources that provide sustaining base IMA services. Vance also recommends that the Army identify individuals or organizations within ISC and assign them the management responsibility. Vance identified these individuals or organizations within ISC as business directors in Figure 5-3. Vance recommends that the individuals or organizations be part of the existing ISC organization and not additions to it.

Vance recommends that a single IMA business director be identified that is responsible for the cost reporting and recovery techniques for all IMA services. Within the organization of the IMA business director, Vance envisions a discipline or service business director for each discipline or category of services (e.g., automation business director which could be subdivided into an ASIMS business director and a Tier 2, non-ASIMS, automation business director). The tracking of expenses and revenues should be part of the operational responsibilities. In addition to the operational responsibility for the cost reporting and recovery techniques, Vance envisions that the business directors should supply policy and fiscal guidance to the DCSIM and DOIM staffs within the MACOMs and to the organizations that provide Army-wide IMA services.

As part of the new techniques, Vance recommends that the DCSIMs and DOIMs (1) provide sustaining base services to the users on a reimbursable basis; (2) provide technical guidance to the users for defining technical requirements and for buying services from non-Army sources; (3) work to identify non-Army sources from which users could buy sustaining base services; (4) develop contracting vehicles (such as BOAs) with non-Army sources of services; and (5) help resolve problems between users and service providers. Vance recommends that the organizations that provide Army-wide sustaining base services, such as Army Standard Information Management System (ASIMS), ISEC, Army Commercial Communications Office (ARCCO), and Army Printing and Publications Activity (APPA) also provide those services to the users on a reimbursable basis.



Sustaining Base IMA Relationships

Figure 5-3

5.3.2 Conceptual Design of the Cost Reporting and Recovery Techniques. Vance recommends that cost reporting and recovery techniques for all IMA services be developed by the Army according to the FIPS PUB 96 model for cost reporting and recovery of automation services. The techniques should consist of two major sets of activities: rate-setting and billing. This subsection presents an overview of the operation of the two sets of activities that Vance recommends. They are described in detail in Section 7. The activities discussed below represent Vance's recommendation of the ideal system for the Army. Vance readily acknowledges that while transitioning from the current environment to the ideal, the Army may, and likely will, discover that changes will need to be made to Vance's recommendations.

5.3.2.1 Rate-Setting Activities. The purpose of the rate-setting activities is to collect data regarding demand for each IMA service, identify and project the total resources and associated costs needed to provide each IMA service based on the projected demand, develop billing rates for each IMA service, and support provider and user planning and budgeting requirements. A pictorial representation of the rate-setting activities is presented in Figure 5-4. The lines in Figure 5-4 are numbered for clarity and are referred to in the following discussion. The following are the major functional features of the new techniques recommended by Vance. Rate-setting activities that will be performed by non-Army providers are discussed in Section 5.2 and those performed by the users are discussed in Section 5.4.

- ISC will initiate the rate-setting activities by requesting that its users develop usage forecasts based on the historical data provided them and submit these forecasts to the DOIM or the Central Network Management Activity (CNMA) (See No. 1).

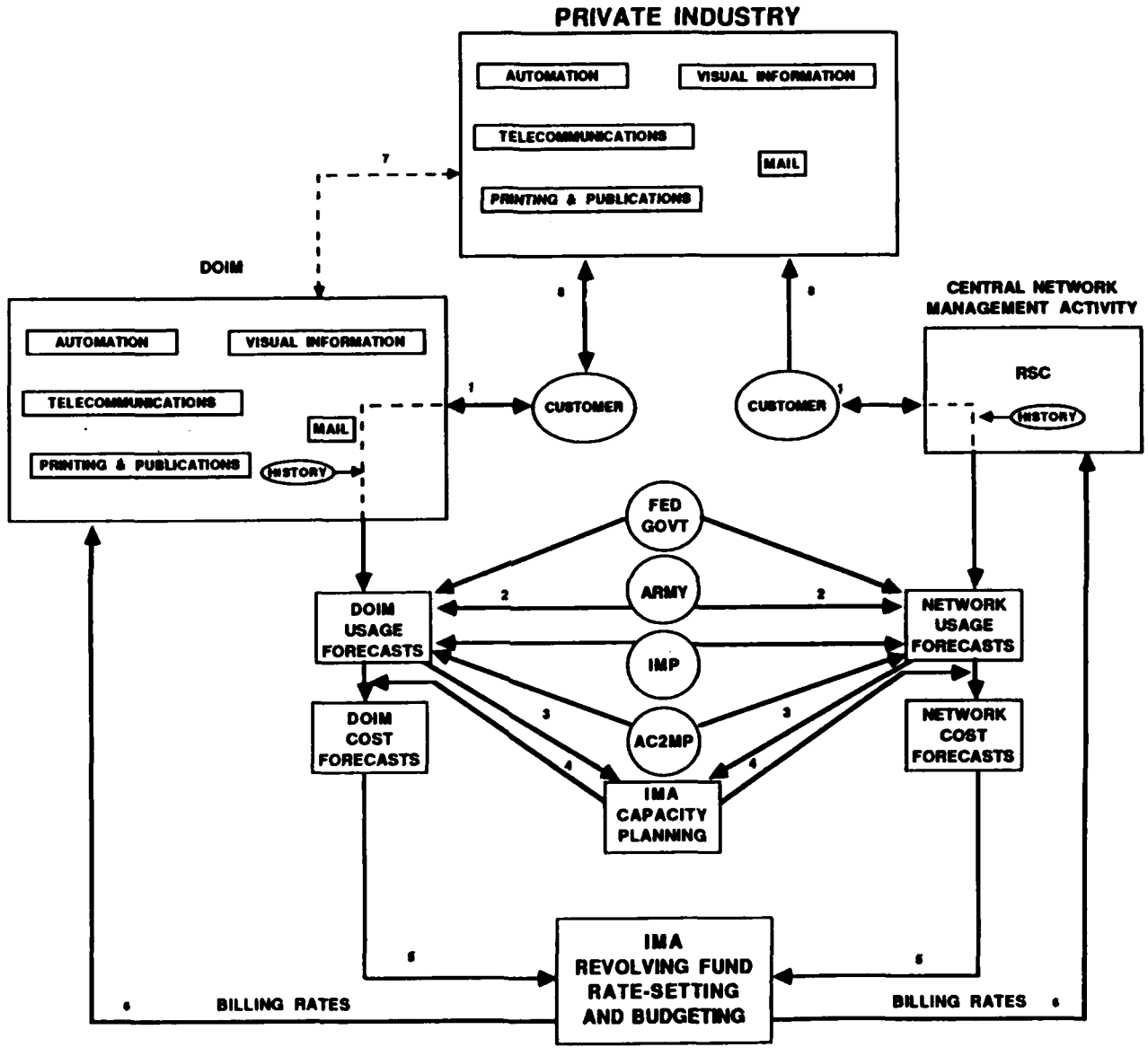
- The DOIM and CNMA organizations will consolidate user forecasts and historical usage data to develop usage forecasts for each DOIM and CNMA as a whole. These forecasts also will take into consideration any significant changes in policy or regulations which are planned to occur in the Army or Federal Government environment. Forecasts should be developed in conjunction with preparation of the Information Management Master Plan (IMMP), Army Command and Control Master Plan (AC^2MP), and Program Objective Memorandum (POM) (See No. 2).

- DOIM and CNMA usage forecasts will provide the data necessary to develop a capacity plan for each IMA discipline. ISEC will provide systems engineering in support of capacity planning (See No. 3).

- Usage forecasts will be used in conjunction with capacity plans to develop service cost forecasts by IMA discipline and type of service (See No. 4).

- Historical costs, usage forecasts, and capacity plans will be collected and aggregated using the regional facilities of the IMA computer network. Similar data will be collected for all IMA disciplines (See No. 5).

- A central rate-setting group, with technical direction from ISC and policy participation by Army staff organizations, will oversee the calculation of standard rates for all IMA services. Billing rates will be developed from cost and usage forecasts. In addition to the projected costs of services at the required levels, these rates may reflect policy incentives and factors to compensate for historical over- or under-recovery.



Rate-Setting Activities

Figure 5-4

- o IMA budgets will be prepared based on the usage forecasts and standard rates and prices. If feasible, all Army-wide IMA services will be funded and executed as revolving fund activities.

- o Billing rates for each IMA service will be published and distributed to the DOIMs and CNMAs annually. These rates will be made available to all users within the organization to assist them in budgeting for information resources (See No. 6).

- o The DOIMs will be responsible for negotiating BOAs or inter-agency work requests with set rates, against which customers can place delivery orders throughout the year or the life of the contract. Negotiations may be conducted annually or on an as-needed basis, whichever is determined to be the most appropriate for the service requirement (See No. 7).

5.3.2.2 Billing Activities. The purpose of the billing activities recommended by Vance is to establish and maintain user accounts, account for information usage, track and report costs associated with each service, and prepare and effect billings for service charges. A pictorial representation of the billing activities is presented in Figure 5-5. The lines in Figure 5-5 are numbered for clarity and are referred to in the discussion below. The following are the major functional features of the techniques recommended by Vance. Billing activities that will be performed by non-Army providers are discussed in Section 5.2 and those performed by the users are discussed in Section 5.4.

- o All central or regional services will be provided by the DOIM or CNMA on a reimbursable basis. If feasible, the operation and maintenance of these facilities and networks will be funded as revolving fund activities. If a revolving fund is not feasible, then the billing rates will not include depreciation costs. Otherwise, all other operating procedures will be the same (See No 1).

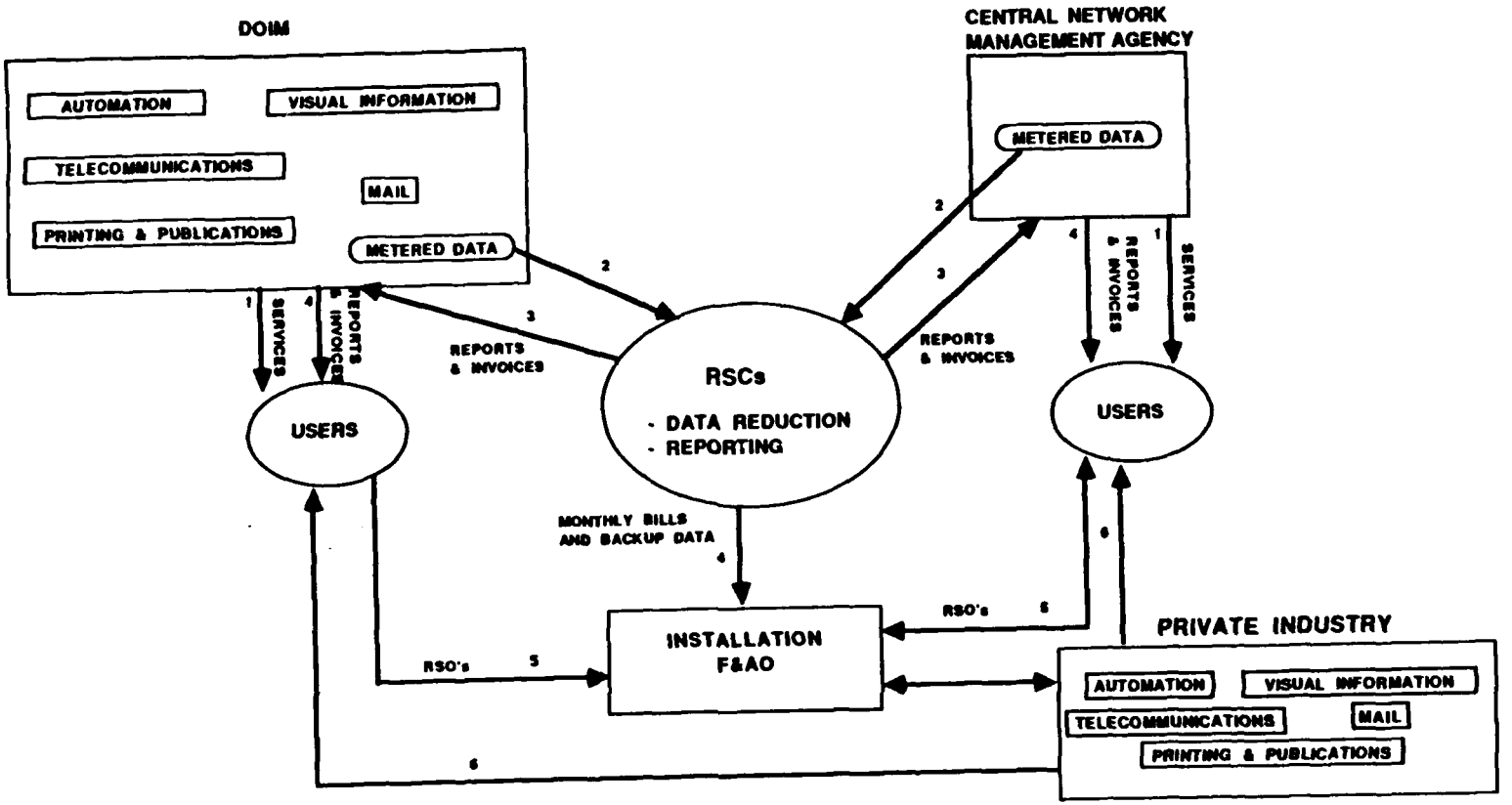
- o ISC organizations will be responsible for metering the services that they provide. Data from metered facilities at installations, such as TCCs or local PBXs, will be forwarded to regional facilities for consolidation and invoice preparation (See No. 2).

- o ISC will monitor, periodically audit, or independently verify all metering that is performed by non-Army sources of services.

- o Whenever possible, the providers will give users utilization costs at the time of service consumption. In addition, ISC should provide user inquiry responses and account status information upon request.

- o ISC operating and overhead costs will be accumulated by work center and will be incorporated into the rates for the IMA services. ISC will track and report variances between projected and actual costs by work center.

- o Monthly reports and billings, based on analysis of the metered data and IMA service rates, will be prepared centrally and sent via the DOIMs and CNMAs to the users. One information report and bill, summarizing utilization and costs for all IMA disciplines, will be prepared (See No. 3).



Billing Activities

Figure 5-5

- o Monthly billings will also be distributed to the Finance and Accounting Office (F&AO) organizations. Detailed utilization reports will be prepared to itemize cost components and to justify the amounts of the bill (See No. 4).

- o The users will reimburse ISC on a monthly basis via the local F&AO utilizing the reimbursable order process (See No. 5).

- o Monthly utilization reports and bills for services obtained from non-Army sources will be sent to the users' F&AO. The users should pay the non-Army suppliers directly via their local F&AO (See No. 6).

5.4 Users

The new techniques that Vance recommends the Army use to manage its IMA services have the most impact on the Army providers. While the impact on the Army users is not as large, it is important, and needs to be clearly defined. Vance recommends that the users be defined as the group or individual that is responsible for utilizing, causing the utilization of, or has the ability to control the utilization of IMA services. For most of the IMA services, this will be either the unit/activity on the installation or the proponent of a major application. Specifically, Vance recommends that all Army users be charged for IMA services used in support of the sustaining base. This includes activities in the following Army organizations: Army Materiel Command (AMC), Corps of Engineers (COE), and Army Reserve Components.

Vance has summarized the impacts of the new techniques on the Army users in this section. This should enable the Army to obtain a clear understanding of the effects of Vance's recommendations on the users. The user impacts are addressed as follows: requirements definition, budgeting, service acquisition and use, and payment.

5.4.1 Requirements Definition. In an environment where users are required to pay for the consumption of IMA services, the task of defining requirements becomes increasingly important. Requirements definition consists of identifying one's functional requirements and converting those functional requirements into billable service units. The conversion into billable service units will enable the users to budget for the services and the providers to plan their capacity requirements.

Users will be required to define and forecast their functional requirements more accurately. For example, users will need to know how many reports they plan to generate for one or two years. After defining the functional requirements, the users will be required to work with the Army providers, DCSIMs and DOIMs, to convert their functional requirements into billable service units. After the users have defined all of their functional requirements and converted them into billable service units, they will then be ready to budget for the services.

5.4.2 Budgeting. Vance recommends that the Army incorporate budgeting for IMA services into the normal Planning, Programming, Budgeting, and Execution System (PPBES) process. This can be accomplished by developing elements of resource (EORs) that specifically address IMA services. Vance recommends that the Army require its users to specifically request for IMA services as part of their budget. These requests will enable the Army to clearly identify how much IMA services each user plans to consume. Once the funds have been approved, the users will be required to pay the Army and non-Army providers out of these funds.

5.4.3 Service Acquisition And Use. Vance recommends that the Army require its users to work with the DCSIMs and DOIMs to select the best source of service for each distinct IMA service request. Vance further recommends that the Army require its users to make and, therefore, take responsibility for the final source selection. Once the users have selected the sources, the Army should require the users to follow the procedures developed by the DCSIMs and DOIMs for acquiring the services. Typically, this will include developing a service level agreement for Army provided IMA services, a task order for a BOA with a private company, or a work order request for IMA services provided by other Government agencies.

Vance recommends that the Army require the users to monitor the providers performance while they are utilizing the services. Should the providers performance fall below the negotiated level, Vance recommends that the users be required to first request corrective action from the provider. If the provider response does not solve the problem, then the user should contact the DCSIM and/or DOIM and ask for assistance. Vance recommends that the Army require the DCSIM and/or DOIM to step in and resolve the problem for the user. The DCSIM should be required to resolve the problem only if the original contract was negotiated by the DCSIM or if the problem is with the DOIM.

5.4.4 Payment. Vance recommends that the Army have users pay Army providers via the reimbursable order process or a modified version of the process, pay other Government agencies via the Military Inter-departmental Procurement Request (MIPR) process, and pay private industry companies via the normal contract payment process. Users should receive a monthly bill, authorize payment, and pay on a monthly basis.

6. IMPLEMENTATION PLAN

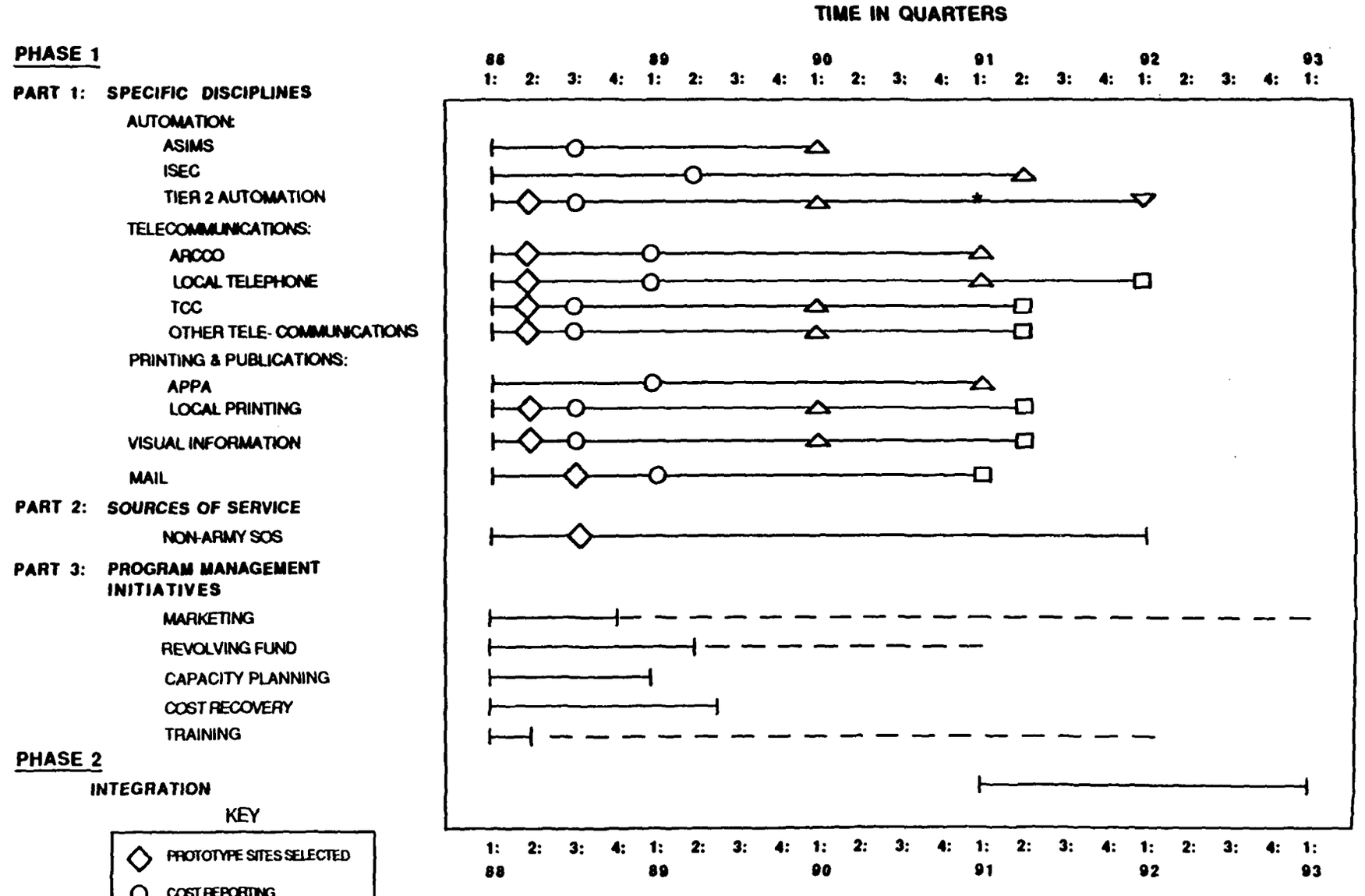
Vance presents its recommended implementation plan for the Army in this section. The discussion of the implementation plan is separated into two subsections: a summary discussion which addresses the entire implementation plan at a high-level and a detailed discussion of the specific activities of the implementation plan. The implementation plan represents a synthesis of the results obtained on this project: feedback on Vance's preliminary design and implementation plan, comments made to Vance during presentations on the preliminary design and implementation plan, results obtained from the implementation of the Sage failure avoidance methodology, and other input obtained by Vance from the Army.

The overall objective of the implementation plan is to provide the Army a way of transitioning, as smoothly as possible, from an environment where Army providers fund and pay for all IMA services to an environment where users are required to fund and pay for IMA services. The basic problem that the Army faces is how to develop and implement (1) cost reporting and recovery techniques for a large number of diverse and geographically separate information facilities, efficiently and effectively and (2) procedures to permit users to obtain IMA services from non-Army sources.

Vance recommends that the Army not try to develop and implement a single integrated system at one time because (1) these new management techniques are such a radical change in the way the Army operates and (2) in Vance's opinion, it would require a monumental effort. Instead, Vance recommends that the Army first learn how to operate efficiently and effectively under the new management techniques. The Army can accomplish this by using a two-phase implementation approach, as shown in Figure 6-1. During the first phase, Vance recommends that the Army complete multiple activities in parallel. This approach will enable the Army to rapidly complete certain activities and delay completing other activities. Vance grouped the activities into three parts. In the first part, Vance recommends that the Army implement separate cost reporting and recovery techniques for the identified types of information services (i.e., ASIMS, ISEC, Tier 2 Automation, ARCCO, local telephone, other telecommunications, TCC, APPA, local printing, visual information and mail). In the second part, Vance recommends that the Army develop procedures that will permit users to buy as many IMA services as feasible from non-Army sources. In the third part, Vance recommends that the Army complete a series of program management initiatives, such as establishing a revolving fund. During the second phase, Vance recommends that the Army integrate all of the separate systems into an integrated cost reporting and recovery system.

6.1 Implementation Plan Summary

This section provides the reader a general overview of the activities of the implementation plan. These activities are separated into two phases. The first phase consists of developing and implementing cost reporting and recovery techniques for specific disciplines, obtaining services from non-Army sources, and performing program management activities. Phase two consists of combining separate techniques into a single integrated system. Each part of the implementation plan consists of one or more activities as illustrated in Figure 6-1. Each activity in the implementation plan consists of multiple sub-activities.



Summary Schedule For Implementation Plan

Figure 6-1

For each activity listed in Figure 6-1, Vance recommends an implementation schedule in terms of the total calendar months and number of work months within the total calendar months that it should take to complete the activity. For example, for ASIMS Vance indicates that it would take approximately 24 work months to complete the activity. Vance estimates the work months based on a reasonable level of effort and staffing level by the Army for the activity.

During the first part of Phase One, Cost Reporting and Recovery For Specific Disciplines, Vance recommends that the Army implement cost reporting and recovery techniques for each distinct category of IMA service: ASIMS, ISEC, Tier 2 Automation, ARCCO, local telephones, TCC, other telecommunications, APPA, local printing, visual information and mail. A brief discussion of each of the activities is provided below.

- Vance estimates that the Army could implement cost reporting techniques for ASIMS services in six months and implement cost recovery techniques in two years.

- Vance estimates that the Army could implement cost reporting techniques for ISEC services in 12 months and implement cost recovery techniques in three years.

- Vance estimates that the Army could implement cost reporting techniques for Tier 2 Automation services at prototype sites in six months, implement cost recovery techniques in approximately two years, field cost reporting and recovery techniques to other sites with similar equipment configurations in approximately three years, and field cost reporting and cost recovery techniques to other sites with dissimilar equipment configurations in approximately four years.

- Vance estimates that the Army could implement cost reporting techniques for ARCCO services in 12 months and implement cost recovery techniques in three years.

- Vance estimates that the Army could implement cost reporting techniques for local telephone services at prototype sites in 12 months, implement cost recovery techniques in approximately three years, and field cost reporting and cost recovery techniques to other sites in approximately four years.

- Vance estimates that the Army could implement cost reporting techniques for TCC services at prototype sites in 12 months, implement cost recovery techniques in approximately three years, and field cost reporting and cost recovery techniques to other sites in approximately four years.

- Vance estimates that the Army could implement cost reporting techniques for other telecommunications services at prototype sites in 12 months, implement cost recovery techniques in approximately three years, and field cost reporting and cost recovery techniques to other sites in approximately four years.

- Vance estimates that the Army could implement cost reporting techniques for APPA services in 12 months and implement cost recovery techniques in three years.

- Vance estimates that the Army could implement cost reporting techniques for local printing services at prototype sites in 12 months, implement cost recovery techniques in approximately three years, and field cost reporting and cost recovery techniques to other sites in approximately four years.

- Vance estimates that the Army could implement cost reporting techniques for visual IMA services at prototype sites in 12 months, implement cost recovery techniques in approximately three years, and field cost reporting and cost recovery techniques to other sites in approximately four years.

- Vance estimates that the Army could implement new techniques to enable users to buy mail services directly from the Post Office in approximately three years.

During the second part of Phase One, Vance recommends that the Army implement procedures for allowing providers and users to buy IMA services from non-Army sources. Vance estimates that these procedures could be tested and, if proven feasible, completely fielded at all candidate sites in approximately four years.

During the third part of Phase One, Vance addresses program management initiatives: marketing, IMA revolving fund, capacity planning, cost recovery, and training. Each of these is briefly discussed below.

- Vance estimates that the Army could develop a marketing plan in approximately six months, should implement the marketing plan for however long is necessary, and should complete several other marketing-related sub-activities.

- Vance recommends that the Army pursue obtaining approval for a revolving fund and identifies several sub-activities for accomplishing this. Vance estimates that it could take the Army approximately 15 months to lay the groundwork for obtaining approval for a revolving fund. Vance is not able to estimate how long it should take the Army to obtain final approval.

- Vance recommends that the Army establish an activity with the charter to determine the Army's capacity requirements for each of the disciplines. Vance estimates that this initiative should take aproximately 12 months to complete.

- Vance recommends that the Army implement detailed procedures for recovering IMA costs from users, and estimates that it should take the Army approximately 16 months.

- Vance recommends that the Army develop and implement a plan for training providers and users in the new techniques, and estimates that it would take three months to develop the plan. Vance estimates that implementation should be an on-going effort.

Phase Two of the implementation plan addresses integrating the cost reporting and recovery techniques, where feasible, into a single integrated system. Vance estimates that this effort should take approximately 24 months and could not start until after the techniques for the specific disciplines are completed.

6.2 Detailed Discussion Of Activities

As indicated, the implementation plan is separated into four parts. This section presents a detailed discussion of activities and sub-activities for each part.

6.2.1 Activities Related to Specific Disciplines. This section addresses the activities and sub-activities related to the specific IMA disciplines. Each of the activities in this part of the implementation plan consists of developing and implementing cost reporting and recovery techniques for a specific part of the Army's IMA. Vance recommends that the Army follow a system development approach when developing and implementing the cost reporting and recovery techniques. Vance recommends the Army follow a system development methodology for cost reporting and recovery systems that is gaining acceptance within the Federal Government. The methodology is presented in Appendix B.

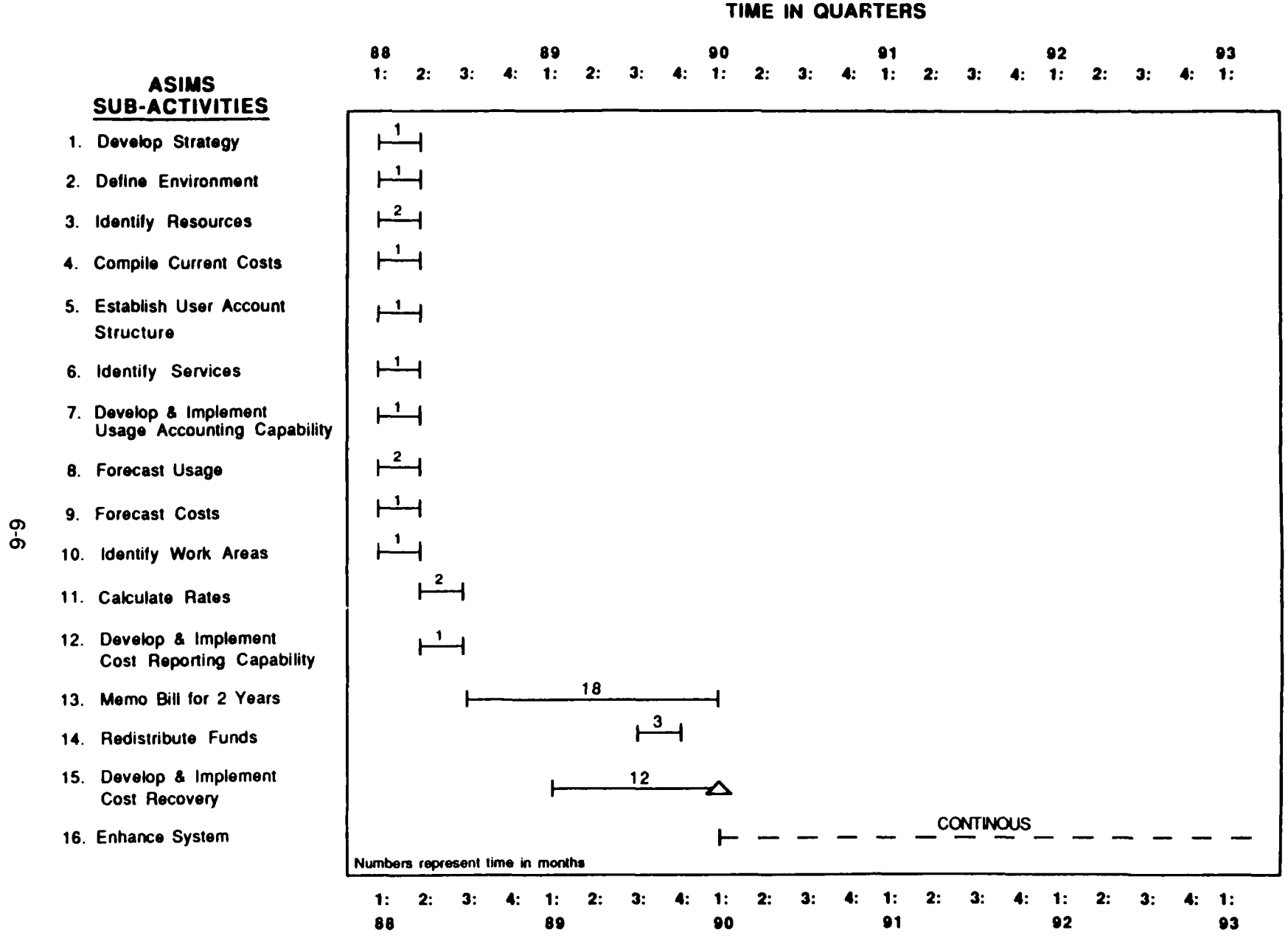
Vance identifies and discusses sub-activities for each activity discussed below based on the methodology in Appendix B. While the sub-activities for each activity are somewhat repetitive, the discussion of each sub-activity is tailored to the specific part of the Army's IMA that is being addressed. Vance believes that, if necessary, this approach will enable the Army to address each activity separately.

6.2.1.1 ASIMS. Vance recommends that the Army implement separate cost reporting and recovery techniques for the ASIMS automation environment. Vance estimates that the Army can develop these techniques relatively quickly because many of the functions that need to be performed, such as memo billing, have already been completed within the ASIMS environment. Vance identifies 16 sub-activities which must be performed. Vance's completion time estimate for each sub-activity is provided in Figure 6-2. Vance recommends that the Army proponent oversee the activity, but that the Sustaining Base Network Office (SBNO) perform most of the actual work.

6.2.1.1.1 Develop Strategy. The first sub-activity that the Army should perform is to develop a detailed strategy for completing the ASIMS activity. This strategy should include a refinement and a schedule of the sub-activities and should incorporate any concerns or constraints relative to the ASIMS environment not considered in this implementation plan. Since the SBNO is currently producing memo bills, most of the functions needed are currently in place in some form. An issue that needs to be addressed in more detail is how much of the existing ASIMS techniques can be used without modification. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.1.2 Define Environment. The ASIMS environment must be more clearly defined. This should consist of identifying all organizations and facilities that are involved in providing and using ASIMS services. Thus, the environment should be defined from both a provider and user perspective. A clearly defined environment should provide valuable information for the Army proponent and should enable easier enhancements in the future. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.1.3 Identify Resources. After the environment is defined, a detailed list of the ASIMS resources to be managed using the techniques of cost reporting and recovery should be compiled. The identification of these resources will help to



Schedule For ASIMS Sub-Activities

Figure 6-2

better define, or draw a boundary around, the organizations and facilities affected by the ASIMS cost reporting and recovery techniques. Vance recommends that the resources be defined according to the following categories: equipment, personnel, software (if applicable), supplies, space utilization, contracted services, resources used from non-Army agencies, and Army overhead costs. Certain issues will arise that must be addressed by the Army proponent. One such issue is should the SBNO be included or excluded. Vance estimates that this sub-activity should take approximately two work months within three calendar months from the start of the effort.

6.2.1.1.4 Compile Current Costs. After all of the resources are identified, the cost incurred by the Army for each ASIMS resource or group of resources should be compiled. It is important that only costs incurred by the Army are included. However, depreciation costs should be included for equipment and software that are within the Army accepted depreciation period. For information equipment, Vance recommends a depreciation period of five to eight years. The depreciation costs, along with the costs of military salaries, should be used only for information purposes unless a revolving fund is approved. The Army should use actual cost data to the extent possible. However, if actual data is not available, then cost estimation techniques should be used. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.1.5 Establish User Account Structure. The Army must determine who the ASIMS users will be. This is best accomplished by establishing a user account structure. Every user of ASIMS services must have a user ID and an account against which charges will eventually be billed. The development team should work closely with the ASIMS user managers in completing this sub-activity and let the user managers define their own user levels. The Army proponent should be consulted whenever there are problems defining the appropriate users and user levels. The development team must also ensure that the desired, user tracking levels can be incorporated into a user ID and that the user ID can be accepted by the usage accounting (metering) capability (See 6.2.1.1.7). Vance estimates that this sub-activity should take approximately one work month within three calendar month from the start of the effort.

6.2.1.1.6 Identify Services. Since the Army is currently memo billing for utilization of ASIMS services, services are already defined. However, Vance recommends that the Army consider redefining the services according to those recommended in Chapter 7. These services are: CPU time, disk and tape storage, disk and tape mounts, print lines, microfiche, data communications, and direct. Whatever services the Army finally selects must be meterable by the monitoring software (IBM's SMF utility) used within the ASIMS hardware architecture. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.1.7 Develop And Implement Usage Accounting (Metering) Techniques. Since the Army is currently memo billing for utilization of ASIMS services, a usage accounting capability already exists. Little work needs to be completed unless the Army selects services that cannot be metered by the current metering capability. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.1.8 Forecast Usage. The Army must forecast the amount of service usage by each ASIMS user for the period in which rates will be set. The Army should accomplish this by using any historical data that is available and querying the users. Since the Army is currently tracking ASIMS service utilization, there should be considerable historical information available to analyze. Vance estimates that this sub-activity should take approximately two work months within three calendar months from the start of the effort.

6.2.1.1.9 Forecast Costs. After forecasting the service utilization, the Army must forecast the cost of providing those service quantities. The forecasted costs should be a function of the historical costs, compiled during Sub-Activity 6.2.1.1.4, and the cost of any additional resources needed to support increased service utilization. The costs associated with depreciation and military salaries should also be included in the forecasts. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.1.10 Identify Work Areas. Vance recommends that as part of the process of calculating billing rates or tariffs, the Army should track costs by work areas in each of the ASIMS organizations and facilities. Tracking costs by work areas should enable the Army to compare the operating efficiencies of similar organizations and facilities. Work areas should be identified based on the structure of the organization or facility. Further guidance on identifying work areas is found in FGAP 4 and FIPS PUB 96. Vance recommends that the Army use standard work areas for all ASIMS organizations or facilities that are similar. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.1.11 Calculate Rates. The billing rates for each service unit should be calculated using the procedures identified in Appendix B and should be set for the memo billing period. Two sets of rates should be calculated, one with depreciation and military salaries included, and one with them excluded. Vance recommends that the Army make liberal use of electronic spreadsheets and other automated tools to facilitate the rate calculation process. The basic philosophy that should be followed is to divide the total estimated cost to provide a service by the forecasted service units to yield a rate per unit. Vance estimates that this sub-activity should take approximately two work months within three calendar months after the completion of all prior sub-activities.

6.2.1.1.12 Develop And Implement Cost Reporting Techniques. Vance recommends that the Army continue to use the cost reporting techniques that currently exist within ASIMS' memo billing system. The only work to be completed is to modify the services and billing rates currently being used. Vance estimates that this sub-activity should take approximately one work month within three calendar months after the completion of sub-activities one through ten.

6.2.1.1.13 Memo Bill. Vance recommends that the Army continue using the concept of memo billing for utilization of ASIMS services until the users obtain a clear understanding of the charges they are incurring and a mechanism for recovering costs can be set up. The memo bills should be prepared on a monthly basis. Since the Army is currently doing this, little additional work is needed for this sub-activity. Vance recommends that the Army continue to use memo billing for 18 months after sub-activities 11 and 12 are completed.

6.2.1.1.14 Redistribute Funds. Vance recommends that the Army redistribute the ASIMS appropriated funds during the 13th through the 15th months of the memo billing period. This should permit sufficient time to collect data on user expenditures and calculate the financial resources each user should receive. The data collected should be used along with the judgement of Army senior managers to distribute the appropriated funds for ASIMS to the users' appropriations. The exact procedures for accomplishing this must be identified early enough so that putting them into place will not delay fielding the cost recovery techniques. An important issue to be resolved is ensuring that the fixed price contract the Army has with Electronic Data Systems is always covered.

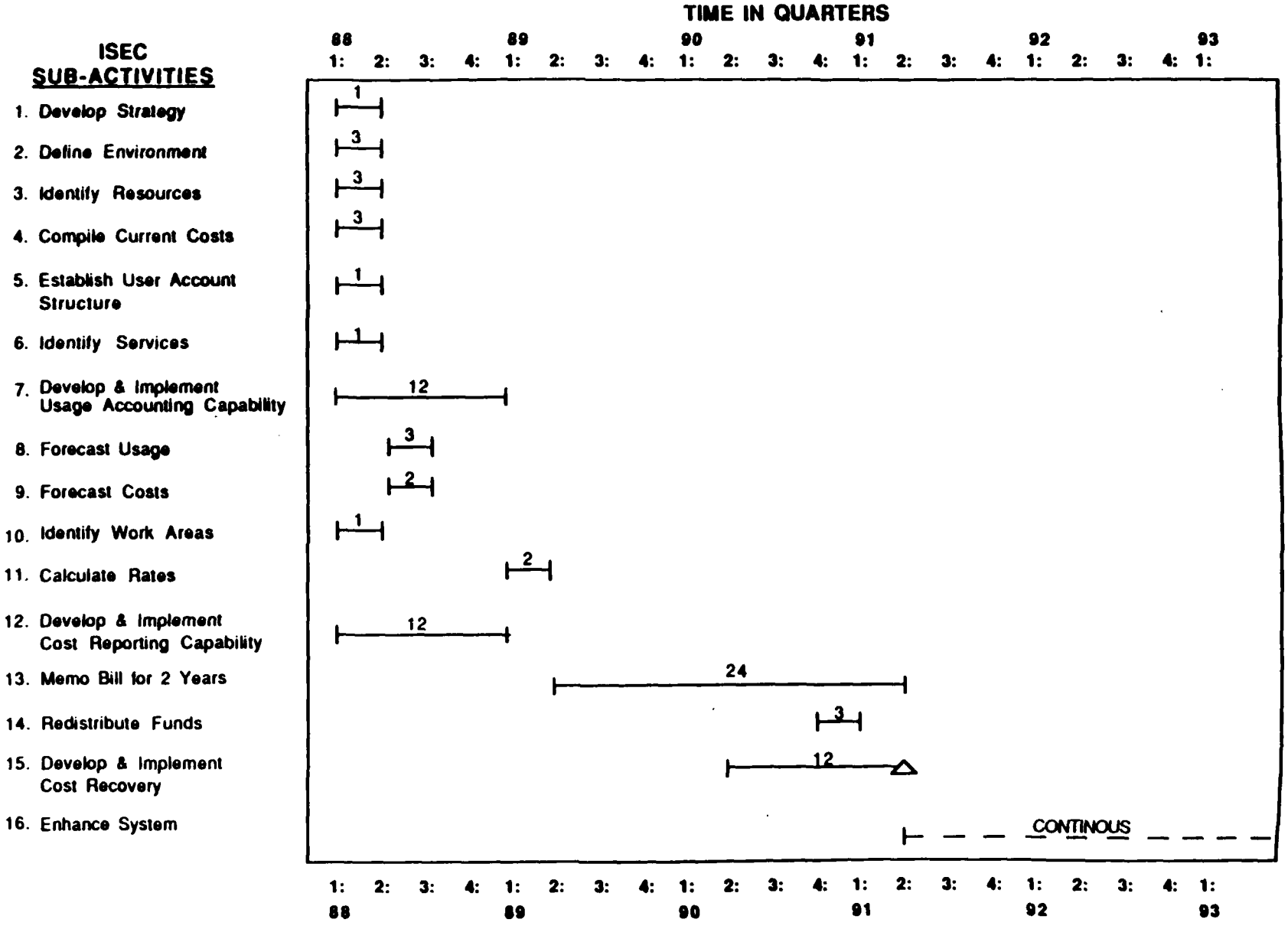
6.2.1.1.15 Develop And Implement Cost Recovery. The cost recovery techniques identified during the cost recovery activity in the third part of the implementation plan must be tailored to the ASIMS environment. After the funds are distributed, the cost recovery procedures should be implemented and users should begin paying for ASIMS services. Vance estimates that this sub-activity should take approximately 12 work months beginning approximately six months after the start of memo billing.

6.2.1.1.16 Enhance System. After the cost recovery techniques are implemented and cost recovery begins, periodic system enhancements should begin. These enhancements should take place on a continuing basis as time and resources permit. System enhancements that should be performed include: incorporation of Tier 2 minicomputers used on the installations to communicate with the ASIMS mainframe computers; automation of the rate-setting procedures; interface to the Army cost accounting systems, when developed; automated interface to the Army's accounting systems; well defined procedures for usage forecasting and IMA service budgeting; a sophisticated user ID structure; additional summary reports; assistance to users for reducing billings; and modification of services as necessary. This sub-activity should be an on-going process.

6.2.1.2 ISEC. Vance recommends that the Army implement separate cost reporting and recovery techniques for the ISEC software environment. Vance identifies 16 sub-activities which should be performed. Vance's completion time estimate for each sub-activity is provided in Figure 6-3. Vance recommends that the Army proponent oversee the activity, but that ISEC perform most of the actual work.

6.2.1.2.1 Develop Strategy. The first sub-activity that the Army should perform is to develop a detailed strategy for completing the ISEC activity. This strategy should include a refinement and a schedule of the sub-activities. The strategy should incorporate any concerns or constraints relative to the ISEC environment not considered in this implementation plan. Issues that should be addressed in more detail are: existing arrangements for cost reimbursements during prototype tests, and the need to distinguish among the different types of engineering services provided and to determine if all should be subject to cost reporting and recovery. Vance recommends that all software development be subject to cost reporting and recovery and that the Army consider having all engineering service costs recovered. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.2.2 Define Environment The ISEC environment must be more clearly defined. This should consist of identifying all organizations and facilities that are involved in providing and using ISEC services. Thus, the environment should be defined from both a provider and user perspective. A clearly defined environment



Schedule For ISEC Sub-Activities

Figure 6-3

should provide valuable information for the Army proponent and should enable easier enhancements in the future. For example, the impact of the recent Program Executive Officer/Program Manager (PEO/PM) reorganization on the ISEC cost reporting and recovery techniques needs to be defined. Vance estimates that this sub-activity should take approximately three work months within three calendar months from the start of the effort.

6.2.1.2.3 Identify Resources. After the environment is defined, a detailed list of the ISEC resources to be managed using the techniques of cost reporting and recovery should be compiled. The identification of these resources will help better define, or draw a boundary around, the organizations and facilities that will be affected by the ISEC cost reporting and recovery techniques. Vance recommends that the resources be defined according to the following categories: equipment, personnel, software (if applicable), supplies, space utilization, contracted services, resources used from non-Army agencies, and Army overhead costs. Certain issues will arise that will need to be addressed by the Army proponent. One such issue is should the ISEC organizations in Europe be included or excluded. Vance recommends that they be included if they support the sustaining base. Another issue is how to handle software analysts that support both the sustaining base and the strategic and tactical areas. Vance recommends that they be included, but only bill for time spent in support of the sustaining base. Vance estimates that this sub-activity should take approximately three work months within three calendar months from the start of the effort.

6.2.1.2.4 Compile Current Costs. After all of the resources are identified, the costs incurred by the Army for each ISEC resource or group of resources should be compiled. It is important that only costs incurred by the Army be included. However, depreciation costs should be included for equipment and software that are within the Army accepted depreciation period. For information equipment, Vance recommends a depreciation period of from five to eight years. The depreciation costs, along with the costs of military salaries, should be used only for information purposes unless a revolving fund is approved. The Army should use actual cost data to the extent possible. However, if actual data is not available, then cost estimation techniques should be used. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.2.5 Establish User Account Structure. The Army must determine who the ISEC users will be. This is best accomplished by establishing a user account structure. Every user of ISEC services must have a user ID and an account against which charges will eventually be billed. The development team should work closely with the ISEC user managers in completing this sub-activity and let the user managers define their own user levels. The Army proponent should be consulted whenever there are problems defining the appropriate users and user levels. The development team must also ensure that the desired, user tracking levels can be incorporated into a user ID, and that the user ID can be accepted by the usage accounting (metering) techniques (See 6.2.1.2.7). Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.2.6 Identify Services. The Army must identify the services to be used as the bases for charging users. Criteria to help the Army in selecting services are presented in Appendix B. Vance recommends that the Army use at least analyst hours plus direct costs as the services. Whatever services are finally identified

must be capable of being metered. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.2.7 Develop And Implement Usage Accounting (Metering) Techniques. Unless significant machine-oriented services are selected, the metering techniques must consist of time sheets and labor hour accounting. Vance recommends that the Army research and find a labor accounting system in use in the Federal Government and modify it for use in ISEC. Vance estimates that this sub-activity should take approximately 12 work months from the start of the effort.

6.2.1.2.8 Forecast Usage. The Army must forecast the amount of service usage by each ISEC user for the period in which rates will be set. The Army should accomplish this by using any historical data that is available, querying the users, and estimating based on provider experience. Vance estimates that this sub-activity should take approximately three work months beginning after the completion of sub-activities one through six.

6.2.1.2.9 Forecast Costs. After forecasting the service utilization, the Army must forecast the cost of providing those service quantities. The forecasted costs should be a function of the historical costs, compiled during Sub-Activity 6.2.1.2.4, and the cost of any additional resources needed to support increased service utilization. The costs associated with depreciation and military salaries should also be included in the forecasts. Vance estimates that this sub-activity should take approximately two work months within three calendar months beginning after the completion of sub-activities one through six.

6.2.1.2.10 Identify Work Areas. Vance recommends that as part of the process of calculating billing rates or tariffs, the Army should track costs by work areas in each of the ISEC organizations and facilities. Tracking costs by work areas should enable the Army to compare the operating efficiencies of similar organizations and facilities. Work areas should be identified based on the structure of the organization or facility. Further guidance on identifying work areas is found in FGAP 4 and FIPS PUB 96. Vance recommends that the Army use standard work areas for all ISEC organizations or facilities that are similar. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.2.11 Calculate Rates. The billing rates for each service unit should be calculated using the techniques identified in Appendix B and should be set for the memo billing period. Two sets of rates should be calculated, one with depreciation and military salaries included, and one with them excluded. Vance recommends that the Army make liberal use of electronic spreadsheets and other automated tools to facilitate the rate calculation process. The basic philosophy that should be followed is to divide the total estimated cost to provide a service by the forecasted service units to yield a rate per unit. Vance estimates that this sub-activity should take approximately two work months within three calendar months after the completion of all prior sub-activities.

6.2.1.2.12 Develop And Implement Cost Reporting Techniques. The Army must determine whether ISEC has any existing in-house techniques that can satisfy the cost reporting requirements. If not, the Army will need to research the software marketplace and determine if a cost reporting package can be purchase and tailored to ISEC's needs. Otherwise, the Army will have to develop cost reporting

techniques for ISEC from scratch. Vance estimates that this sub-activity should take approximately 12 work months from the start of the effort.

6.2.1.2.13 Memo Bill. Vance recommends that the Army use the concept of memo billing for utilization of ISEC services until the users obtain a clear understanding of the charges they are incurring and a mechanism for recovering costs can be implemented. The memo bills should be prepared on a monthly basis. Vance recommends that the Army use memo billing for 24 months after sub-activities 1 through 12 are completed. This should provide the users sufficient time to become familiar with the charges they are incurring.

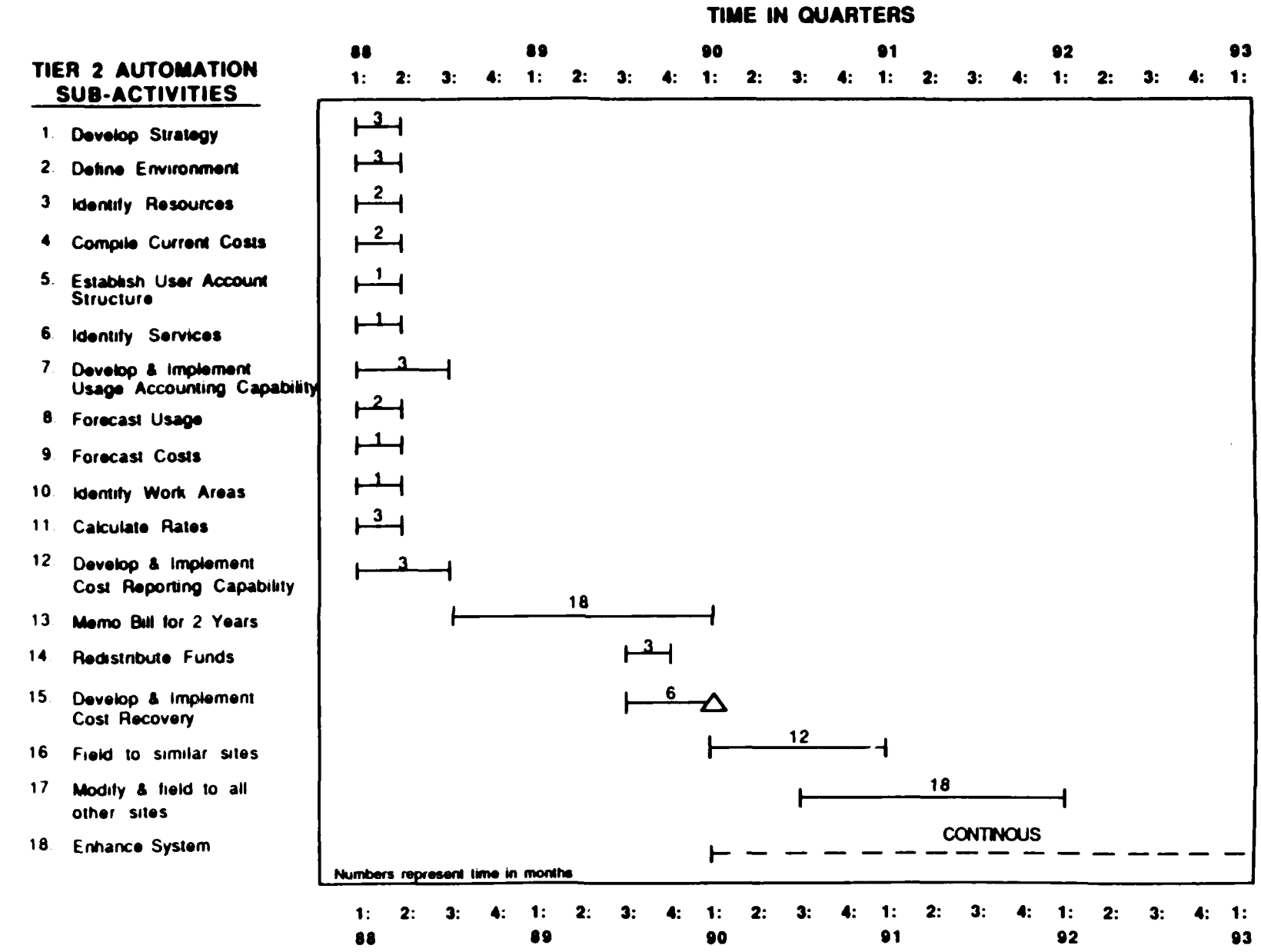
6.2.1.2.14 Redistribute Funds. Vance recommends that the Army redistribute the ISEC appropriated funds during the 18th through the 21st months of the memo billing period. This should permit sufficient time to collect data on user expenditures and calculate the financial resources each user should receive. The data collected should be used, along with the judgement of Army senior managers, to distribute the appropriated funds for ISEC to the user's appropriations. The exact techniques for accomplishing this must be identified early enough so that putting them into place will not delay fielding the cost recovery techniques.

6.2.1.2.15 Develop And Implement Cost Recovery. The cost recovery techniques identified during the cost recovery activity in the third part of the implementation plan must be tailored to the ISEC environment. After the funds are distributed, the cost recovery techniques should be implemented and users should begin paying for ISEC services. Vance estimates that this sub-activity should take approximately 12 work months beginning approximately 12 months after the start of memo billing.

6.2.1.2.16 Enhance System. After the cost recovery techniques are implemented and cost recovery begins, periodic system enhancements should begin. These enhancements should take place on a continuing basis as time and resources permit. System enhancements that should be performed include: automation of the rate-setting techniques; interface to the Army cost accounting systems, when developed; automated interface to the Army's accounting systems; well defined techniques for usage forecasting and IMA service budgeting; a sophisticated user ID structure; additional summary reports; assistance to users for reducing billings; and modification of services as necessary. This sub-activity should be an on-going process.

6.2.1.3 Tier 2 Automation. Vance recommends that the Army implement separate cost reporting and recovery techniques for the Tier 2 Automation environment. The objective is to test the cost reporting and recovery techniques at several selected sites before fielding to the remaining Tier 2 Automation sites at Army posts, camps, and stations. Vance recommends that the Army develop similar but separate cost reporting and recovery techniques at each post, camp, and station. Vance further recommends that the integration of the Tier 2 Automation, cost reporting and recovery techniques with the other discipline's occur after all techniques are completely fielded. Vance identifies 18 sub-activities that should be performed. Vance's completion time estimate for each sub-activity is provided in Figure 6-4. Vance recommends that the Army proponent oversee the activity, but that ISC perform most of the actual work.

6.2.1.3.1 Develop Strategy. The first sub-activity that the Army should perform is to develop a detailed strategy for completing this activity. This strategy should include a refinement and a schedule of the sub-activities. The strategy should



Schedule For Tier 2 Automation Sub-Activities

Figure 6-4

incorporate any concerns or constraints relative to Tier 2 Automation services not considered in this implementation plan. Issues that should be addressed in more detail are: identification of similar and non-similar sites for the purpose of prototype selection, and the appropriate mix of prototype sites that should be used to conduct the tests. Vance estimates that this sub-activity should take approximately three work months within three calendar months from the start of the effort.

6.2.1.3.2 Define Environment. The Tier 2 Automation environment must be more clearly defined. This should consist of identifying all organizations and facilities that are involved in providing and using Tier 2 Automation service. Thus, the environment should be defined from both a provider and user perspective. A clearly defined environment should provide valuable information for the Army proponent and should enable easier enhancements in the future. Vance estimates that this sub-activity should take approximately three work months within three calendar months from the start of the effort.

6.2.1.3.3 Identify Resources. After the environment is defined, a detailed list of the Tier 2 Automation resources at each of the prototype sites to be managed using the techniques of cost reporting and recovery should be compiled. The identification of these resources should help to better define, or draw a boundary around, the organizations and facilities that will be affected by the Tier 2 Automation cost reporting and recovery techniques. Vance recommends that the resources be defined according to the following categories: equipment, personnel, software (if applicable), supplies, space utilization, contracted services, resources used from non-Army agencies, and Army overhead costs. Vance estimates that this sub-activity should take approximately two work months within a three calendar month period from the start of the effort.

6.2.1.3.4 Compile Current Costs. After all of the resources are identified, the costs incurred by the Army for each Tier 2 Automation resource or group of resources at each of the prototype sites should be compiled. It is important that only costs incurred by the Army be included. However, depreciation costs should be included for equipment and software that are within the Army accepted depreciation period. For information equipment, Vance recommends a depreciation period of five to eight years. The depreciation costs, along with the costs of military salaries, should be used only for information purposes unless a revolving fund is approved. The Army should use actual cost data to the extent possible. However, if actual data is not available, then cost estimation techniques should be used. Vance estimates that this sub-activity should take approximately two work months within three calendar months from the start of the effort.

6.2.1.3.5 Establish User Account Structure. The Army must determine who the Tier 2 Automation users should be at each of the prototype sites. This is best accomplished by establishing a user account structure. Every user of Tier 2 Automation services must have a user ID and an account against which charges will eventually be billed. The development team should work closely with the Tier 2 Automation user managers in completing this sub-activity and let the user managers define their own user levels. The Army proponent should be consulted whenever there are problems defining the appropriate users and user levels. The development team must also ensure that the desired, user tracking levels can be incorporated into a user ID, and that the user ID can be accepted by the usage accounting (metering) techniques (See 6.2.1.3.7). Vance estimates that this sub-activity should

take approximately one work month within three calendar months from the start of the effort.

6.2.1.3.6 Identify Services. The Army must identify the Tier 2 Automation services to be used as the bases for charging users. Criteria to help the Army in selecting services are presented in Appendix B. Vance recommends that the Army use the following services: CPU time, disk and tape storage, disk and tape mounts, print lines, microfiche, data communications, and direct. Whatever services the Army finally selects must be meterable by the monitoring software used within the Tier 2 Automation hardware architecture. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.3.7 Develop And Implement Usage Accounting (Metering) Techniques. Metering for Tier 2 Automation should be relatively straightforward in that most of the metering techniques should already exist in the form of vendor supplied software monitors. If the Army has not purchased the monitors from the vendors, then the Army should purchase them; however, if the vendors do not supply a monitor then different services should be defined that would eliminate the need to meter on that computer. The completion of this sub-activity should be tied to the AIME effort, because AIME's objective is to develop and implement metering techniques for IMA services. Vance estimates that this sub-activity should take approximately three work months within six calendar months from the start of the effort.

6.2.1.3.8 Forecast Usage. The Army must forecast the amount of service usage by each Tier 2 Automation user for the period in which rates will be set. The Army should accomplish this by using any available historical data, querying the users, and estimating based on provider experience. Vance estimates that this sub-activity should take approximately two work months within three calendar months beginning after the completion of sub-activities one through six.

6.2.1.3.9 Forecast Costs. After forecasting the service utilization, the Army needs to forecast the cost of providing those service quantities. The forecasted costs will be a function of the historical costs, compiled during Sub-Activity 6.2.1.3.4, and the cost of any additional resources needed to support increased service utilization. The costs associated with depreciation and military salaries should also be included in the forecasts. Vance estimates that this sub-activity should take approximately one work month within three calendar months beginning after the completion of sub-activities one through six.

6.2.1.3.10 Identify Work Areas. Vance recommends that as part of the process of calculating billing rates or tariffs, the Army should track costs by work areas in each of the Tier 2 Automation organizations and facilities. Tracking costs by work areas should enable the Army to compare the operating efficiencies of similar organizations and facilities. Work areas should be identified based on the structure of the organization or facility at each of the prototype sites. Further guidance on identifying work areas is found in FGAP 4 and FIPS PUB 96. Vance recommends that the Army use standard work areas for all Tier 2 Automation organizations or facilities that are similar. Vance estimates that this sub-activity should take approximately one work month within three calendar months after the completion of sub-activities one through six.

6.2.1.3.11 Calculate Rates. The billing rates for each service unit should be calculated using the techniques identified in Appendix B and should be set for the memo billing period. Two sets of rates should be calculated, one with depreciation and military salaries included, and one with them excluded. Vance recommends that the Army make liberal use of electronic spreadsheets and other automated tools to facilitate the rate calculation process. The basic philosophy that should be followed is to divide the total estimated costs to provide a service by the forecasted service units to yield a rate per unit. Vance estimates that this sub-activity should take approximately three work months after the completion of sub-activities one through six.

6.2.1.3.12 Develop And Implement Cost Reporting Techniques. Vance recommends that the Army use Utilization Reporting System II (URS II) as the cost reporting system for Tier 2 Automation. URS II is the best candidate for supplying cost reporting techniques for a diverse range of computers. Vance further recommends that the Army expedite the URS II project so that the software will be available for use in the prototype sites and subsequent fielding to the other posts, camps, and stations. Vance also recommends that the Army take whatever steps are necessary to ensure that it retains rights to the URS II source code. Vance estimates that this sub-activity should take approximately three work months within six calendar months from the start of the effort.

6.2.1.3.13 Memo Bill. Vance recommends that the Army use the concept of memo billing for utilization of Tier 2 Automation services until the users obtain a clear understanding of the charges they are incurring and a mechanism for recovering costs can be set up. The memo bills should be prepared on a monthly basis. Vance recommends that the Army use memo billing for 18 months after sub-activities 1 through 12 are completed. This should provide the users sufficient time to become familiar with the charges they are incurring.

6.2.1.3.14 Redistribute Funds. Vance recommends that the Army redistribute the Tier 2 Automation appropriated funds during the 13th through the 15th months of the memo billing period. This should permit sufficient time to collect data on user expenditures and calculate the financial resources each user should receive. The data collected should be used along with the judgement of Army senior managers to distribute the appropriated funds for Tier 2 Automation to the user's appropriations. The exact techniques for accomplishing this must be identified early enough so that putting them into place will not delay fielding the cost recovery techniques.

6.2.1.3.15 Develop And Implement Cost Recovery. The cost recovery techniques identified during the cost recovery activity in the third part of the implementation plan must be tailored to the Tier 2 Automation environment. After the funds are distributed, the cost recovery techniques should be implemented and users should begin paying for Tier 2 Automation services. Vance estimates that this sub-activity should take approximately six work months beginning approximately 12 months after the start of memo billing.

6.2.1.3.16 Field To Other Similar Sites. Vance recommends that the Army first field the cost reporting and recovery techniques to other Tier 2 Automation sites that have hardware architectures similar to those at the prototype sites. This should enable the Army to make the most progress in the shortest period of time, and to more easily identify problems in fielding the techniques. Vance recommends that a detailed fielding schedule be developed as the first part of this sub-activity.

Vance estimates that this sub-activity should take approximately 12 work months beginning approximately one month after the start of cost recovery.

6.2.1.3.17 Modify And Field To All Other Sites. Vance recommends that the Army field the cost reporting and recovery techniques to other Tier 2 Automation sites that have hardware architectures dissimilar to those at the prototype sites, after having fielded the techniques to several similar sites. Vance anticipates that the Army will have to modify some or all of the techniques to operate on the dissimilar sites. Vance recommends that a detailed fielding schedule be developed as the first part of this sub-activity. Vance estimates that this sub-activity should take approximately 18 work months beginning approximately six months after the start of fielding to similar sites.

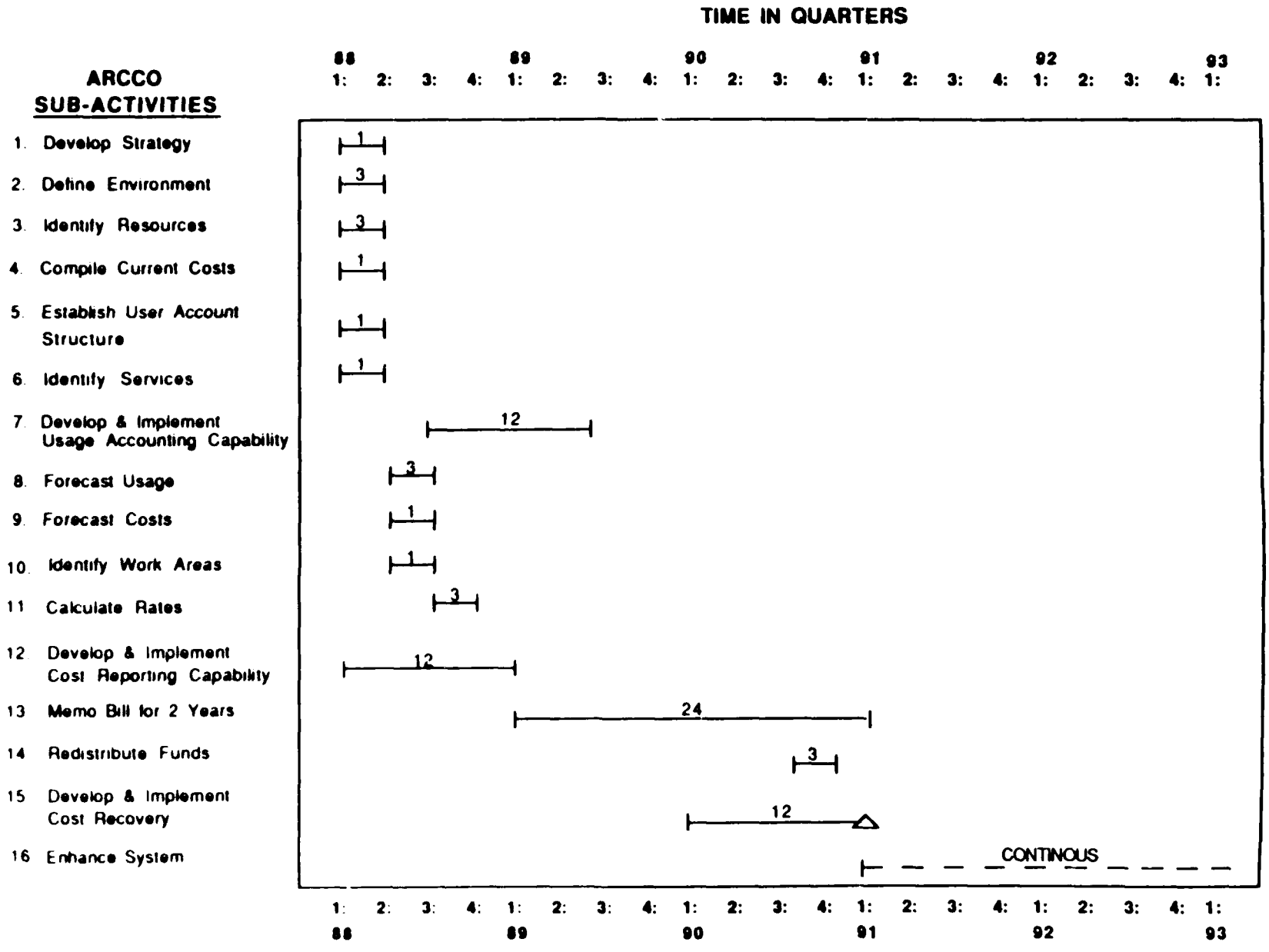
6.2.1.3.18 Enhance System. After the cost recovery techniques are implemented and cost recovery begins, periodic system enhancements should begin. These enhancements should take place on a continuing basis as time and resources permit. System enhancements that should be performed include: automation of the rate-setting techniques; interface to the Army cost accounting systems, when developed; automated interface to the Army's accounting systems; well defined techniques for usage forecasting and IMA service budgeting; a sophisticated user ID structure; additional summary reports; assistance to users for reducing billings; and modification of services as necessary. This sub-activity should be an on-going process.

6.2.1.4 ARCCO. Vance recommends that the Army implement separate cost reporting and recovery techniques for the ARCCO telecommunications environment. Vance identifies 16 sub-activities that should be performed. Vance's completion time estimate for each sub-activity is provided in Figure 6-5. Vance recommends that the Army proponent oversee the activity, but that ARCCO perform most of the actual work.

6.2.1.4.1 Develop Strategy. The first sub-activity that the Army should perform is to develop a detailed strategy for completing all of the ARCCO activity. This strategy should include a refinement and a schedule of the sub-activities. The strategy should incorporate any concerns or constraints relative to the ARCCO environment not considered in this implementation plan. Issues that should be addressed in more detail are: continuing to bill at the installation level until new techniques can be installed, identifying those networks that are used only or partially in support of the sustaining base, determining the metering techniques of each network, and billing levels below the installation requiring the metering techniques to be in the installation PBXs. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.4.2 Define Environment. The ARCCO environment must be clearly defined by identifying all organizations and facilities that are involved in providing and using ARCCO services. Thus, the environment should be defined from both a provider and user perspective. Specific attention should be paid to the networks that are used fully or partially in support of the sustaining base. A clearly defined environment should provide valuable information for the Army proponent and should enable easier enhancements in the future. Vance estimates that this sub-activity should take approximately three work months from the start of the effort.

6.2.1.4.3 Identify Resources. After the environment is defined, a detailed list of



Schedule For ARCCO Sub-Activities

Figure 6-5

the ARCCO resources to be managed using the techniques of cost reporting and recovery should be compiled. The identification of these resources should help better define, or draw a boundary around, the organizations and facilities affected by the ARCCO cost reporting and recovery techniques. Vance recommends that the resources be defined according to the following categories: equipment, personnel, software (if applicable), supplies, space utilization, contracted services, resources used from non-Army agencies, and Army overhead costs. Certain issues will arise that should be addressed by the Army proponent. One such issue is should the ARCCO main office be included or excluded. Vance estimates that this sub-activity should take approximately three work months from the start of the effort.

6.2.1.4.4 Compile Current Costs. After all of the resources are identified, the cost incurred by the Army for each ARCCO resource or group of resources should be compiled. It is important that only costs incurred by the Army be included. However, depreciation costs should be included for equipment and software that are within the Army accepted depreciation period. For information equipment, Vance recommends a depreciation period of five to eight years. The depreciation costs, along with the costs of military salaries, should be used only for information purposes unless a revolving fund has been approved. The Army should use actual cost data to the extent possible. However, if actual data is not available then cost estimation techniques should be used. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.4.5 Establish User Account Structure. The Army must determine who the ARCCO users should be. This is best accomplished by establishing a user account structure. Every user of ARCCO services must have a user ID and an account against which charges will eventually be billed. The development team should work closely with the ARCCO user managers in completing this sub-activity and let the user managers define their own user levels. The Army proponent should be consulted whenever there are problems defining the appropriate users and user levels. The development team must also ensure that the desired, user tracking levels can be incorporated into a user ID, and that the user ID can be accepted by the usage accounting (metering) techniques (See 6.2.1.4.7). Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.4.6 Identify Services. The Army must identify the ARCCO services to be used as the bases for charging users. Criteria to help the Army in selecting services are presented in Appendix B. Vance recommends that the Army use the services identified in Chapter 7 call, technical consulting, and direct. Vance also recommends that users who use voice networks to transmit data be charged using the same services and rates set up for voice usage. Whatever services are finally identified must be capable of being metered. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.4.7 Develop And Implement Usage Accounting (Metering) Techniques. The primary focus of this sub activity is to develop and implement an interface into the metering techniques of the local PBXs. Unless this interface is developed, Vance does not believe that it will be possible to meter long haul telecommunications below the installation level. To complete this sub activity a detailed analysis of the Station Message Detail Recorders (SMDR) and Call Detail Report (CDR) techniques of the Continental United States (CONUS) Telephone Modernization Program

(CTMP), European Telephone System (ETS), Korean Telepho Upgrade (KTU), and Japan Telephone Upgrade (JTU) must be performed. Additionally, the schedule for PBX upgrade must be determined. Vance estimates that this sub-activity should take approximately 12 work months starting approximately six months after the start of the activity.

6.2.1.4.8 Forecast Usage. The Army must forecast the amount of service usage by each ARCCO user for the period in which rates will be set. The Army should accomplish this by using any available historical data, querying the users, and estimating based on provider experience. Vance estimates that this sub-activity should take approximately three work months beginning after the completion of sub-activities one through six.

6.2.1.4.9 Forecast Costs. After forecasting the service utilization, the Army must forecast the cost of providing those service quantities. The forecasted costs should be a function of the historical costs, compiled during Sub-Activity 6.2.1.4.4, and the cost of any additional resources needed to support increased service utilization. The costs associated with depreciation and military salaries should also be included in the forecasts. Vance estimates that this sub-activity should take approximately one work month within three calendar months beginning after the completion of sub-activities one through six.

6.2.1.4.10 Identify Work Areas. Vance recommends that as part of the process of calculating billing rates or tariffs, the Army should track costs by work areas in each of the ARCCO organizations and facilities. Tracking costs by work areas should enable the Army to compare the operating efficiencies of similar organizations and facilities. Work areas should be identified based on the structure of the organization or facility. Further guidance on identifying work areas is found in FGAP 4 and FIPS PUB 96. Vance recommends that the Army use standard work areas for all ARCCO organizations or facilities that are similar. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.4.11 Calculate Rates. The billing rates for each service unit should be calculated using the techniques identified in Appendix B and should be set for the memo billing period. Two sets of rates should be calculated, one with depreciation and military salaries included, and one with them excluded. Vance recommends that the Army make liberal use of electronic spreadsheets and other automated tools to facilitate the rate calculation process. The basic philosophy that should be followed is to divide the total estimated cost to provide a service by the forecasted service units to yield a rate per unit. Vance estimates that this sub-activity should take approximately three work months after the completion of all sub-activities eight through ten.

6.2.1.4.12 Develop And Implement Cost Reporting Techniques. Vance recommends that the Army continue to use the cost reporting techniques that currently exist within ARCCO to report costs and, eventually, bill users within the installation. The only work to be completed is to modify the current services and billing rates. These cost reporting techniques should be analyzed in detail to ensure that they can provide the increased capacity and requirements. Vance estimates that this sub-activity should take approximately 12 work months from the start of the effort.

6.2.1.4.13 Memo Bill. Vance recommends that the Army use the concept of memo billing organization of ARCCO services below the installation level until the users

obtain a clear understanding of the charges they are incurring and a mechanism for recovering costs can be set up. The memo bills should be prepared on a monthly basis. Vance recommends that the Army use memo billing for 24 months after sub-activities 1 through 12 are completed. This should provide the users sufficient time to become familiar with the charges they are incurring.

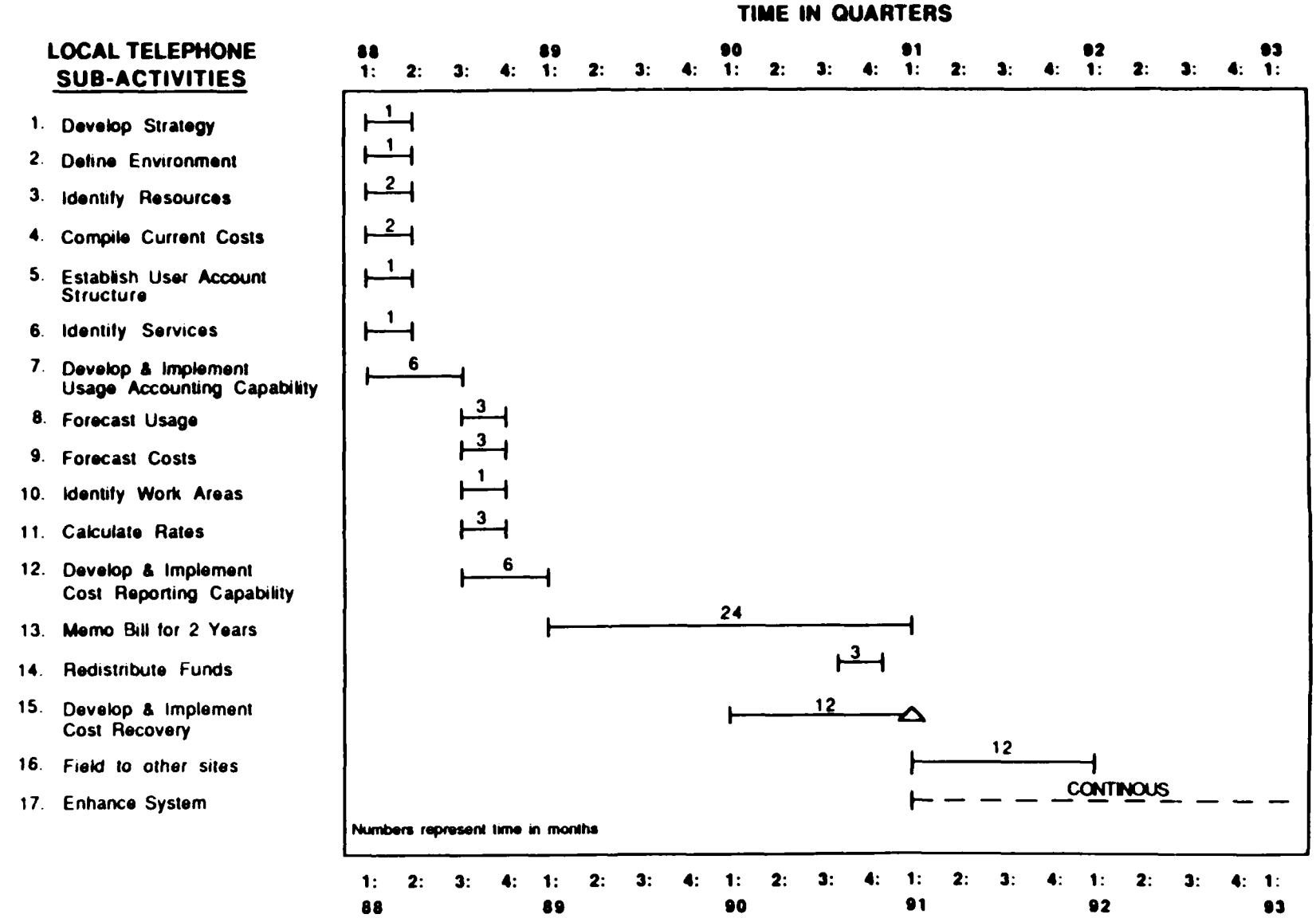
6.2.1.4.14 Redistribute Funds. Vance recommends that the Army redistribute the ARCCO appropriated funds during the 18th through the 21st months of the memo billing period. This should permit sufficient time to collect data on user expenditures and calculate the financial resources each user should receive. The data collected should be used, along with the judgement of Army senior managers, to distribute the appropriated funds for ARCCO to the user's appropriations. The exact techniques for accomplishing this must be identified early enough so that putting them into place will not delay fielding the cost recovery techniques.

6.2.1.4.15 Develop And Implement Cost Recovery. The cost recovery techniques identified during the cost recovery activity in the third part of the implementation plan must be tailored to the ARCCO environment. After the funds are distributed, the cost recovery techniques should be implemented and users should begin paying for ARCCO services. Vance estimates that this sub-activity should take approximately 12 work months beginning approximately 12 months after the start of memo billing.

6.2.1.4.16 Enhance System. After the cost recovery techniques are implemented and cost recovery begins, periodic system enhancements should begin. These enhancements should take place on a continuing basis as time and resources permit. System enhancements that should be performed include: automation of the rate-setting techniques; interface to the Army cost accounting systems, when developed; automated interface to the Army's accounting systems; well defined procedures for usage forecasting and IMA services budgeting; a sophisticated user ID structure; additional summary reports; assistance to users for reducing billings; and modification of services as necessary. This sub-activity should be an on-going process.

6.2.1.5 Local Telephone. Vance recommends that the Army implement separate cost reporting and recovery techniques for the local telephone environment, similar to the Defense Telecommunications Service-Washington (DTS-W). The objective is to test the cost reporting and recovery techniques at several selected sites before fielding to the rest of the local telephone sites at Army posts, camps, and stations. Vance recommends that the Army develop similar but separate cost reporting techniques at each post, camp, and station. Vance further recommends that the integration of the local telephone, cost reporting and recovery techniques with the other discipline's occur after all techniques are fielded. Vance identifies 17 sub-activities that should be performed. Vance's completion time estimate for each sub-activity is provided in Figure 6-6. Vance recommends that the Army proponent oversee the activity, but that ISC perform most of the actual work.

6.2.1.5.1 Develop Strategy. The first sub-activity that the Army should perform is to develop a detailed strategy for completing the Local Telephone activity. This strategy should include a refinement and a schedule of the sub-activities. The strategy should incorporate any concerns or constraints relative to local telephone services not considered in this implementation plan. Vance recommends that the Army wait until some of the PBX upgrades are installed to select prototype sites. Waiting will enable the Army to take advantage of the metering techniques of the



Schedule For Local Telephone Sub-Activities

Figure 6-6

upgrades. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.5.2 Define Environment. The local telephone environment must be clearly defined by identifying all organizations and facilities that are involved in providing and using local telephone services. Thus, the environment should be defined from both a provider and user perspective. A clearly defined environment should provide valuable information for the Army proponent and should enable easier enhancements in the future. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.5.3 Identify Resources. After the environment is defined, a detailed list of the local telephone resources at each of the prototype sites to be managed using the techniques of cost reporting and recovery should be compiled. The identification of these resources should help better define, or draw a boundary around, the organizations and facilities affected by the local telephone cost reporting and recovery techniques. Vance recommends that the resources be defined according to the following categories: equipment, personnel, software (if applicable), supplies, space utilization, contracted services, resources used from non-Army agencies, and Army overhead costs. Vance estimates that this sub-activity should take approximately two work months within three calendar months from the start of the effort.

6.2.1.5.4 Compile Current Costs. After all of the resources are identified, the costs incurred by the Army for each local telephone resource or group of resources at each of the prototype sites should be compiled. It is important that only costs incurred by the Army be included. However, depreciation costs should be included for equipment and software that are within the Army accepted depreciation period. For information equipment, Vance recommends a depreciation period of five to eight years. The depreciation costs, along with the costs of military salaries, should be used only for information purposes unless a revolving fund is approved. The Army should use actual cost data to the extent possible. However, if actual data is not available then cost estimation techniques should be used. Vance estimates that this sub-activity should take approximately two work months within three calendar months from the start of the effort.

6.2.1.5.5 Establish User Account Structure. The Army must determine who the local telephone users should be at each of the prototype sites. This is best accomplished by establishing a user account structure. Every user of local telephone services must have a user ID and an account against which charges will eventually be billed. The development team should work closely with the local telephone user managers in completing this sub-activity and let the user managers define their own user levels. The Army proponent should be consulted whenever there are problems defining the appropriate users and user levels. The development team must also ensure that the desired, user tracking levels can be incorporated into a user ID, and that the user ID can be accepted by the usage accounting (metering) techniques (See 6.7.1.5.7). Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.5.6 Identify Services. The Army must identify the local telephone services to be used as the bases for charging users. Criteria to help the Army in selecting services are presented in Appendix B. Vance recommends that the Army use the following services: telephone handset, telephone relocation, and direct. Vance also

recommends that users who use voice networks to transmit data be charged using the same services and rates established for voice usage. Whatever services the Army finally selects must be meterable by the monitoring software used within the PBXs or by some other means. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.5.7 Develop And Implement Usage Accounting (Metering) Techniques. Vance recommends that metering local telephone usage be performed using the metering techniques installed via the different upgrade programs: CTMP, ETS, KTU, and JTU. For stepper switches that will not be upgraded, the Army should analyze the users supported and then make an assessment as to whether a flat rate charging basis can be used. This would eliminate automated metering requirements. The completion of this sub-activity should be tied to the Army Information Management Environment (AIME) effort because AIME's objective is to develop and implement metering techniques for IMA services. Vance estimates that this sub-activity should take approximately six work months within 12 calendar months from the start of the effort.

6.2.1.5.8 Forecast Usage. The Army must forecast the amount of service usage by each local telephone user for the period in which rates will be set. The Army should accomplish this by using any available historical data, querying the users, and estimating based on provider experience. Vance estimates that this sub-activity should take approximately three work months beginning after the completion of sub-activities one through six.

6.2.1.5.9 Forecast Costs. After forecasting the service utilization, the Army must forecast the cost of providing those service quantities. The forecasted costs should be a function of the historical costs, compiled during Sub-Activity 6.2.1.5.4, and the cost of any additional resources needed to support increased service utilization. The costs associated with depreciation and military salaries should also be included in the forecasts. Vance estimates that this sub-activity should take approximately three work months beginning after the completion of sub-activities one through six.

6.2.1.5.10 Identify Work Areas. Vance recommends that as part of the process of calculating billing rates or tariffs, the Army should track costs by work areas in each of the local telephone organizations and facilities. Tracking costs by work areas should enable the Army to compare the operating efficiencies of similar organizations and facilities. Work areas should be identified based on the structure of the organization or facility at each of the prototype sites. Further guidance on identifying work areas is found in FGAP 4 and FIPS PUB 96. Vance recommends that the Army use standard work areas for all local telephone organizations or facilities that are similar. Vance estimates that this sub-activity should take approximately one work month within three calendar months after the completion of sub-activities one through six.

6.2.1.5.11 Calculate Rates. The billing rates for each service unit should be calculated using the techniques identified in Appendix B and should be set for the memo billing period. Two sets of rates should be calculated, one with depreciation and military salaries included, and one with them excluded. Vance recommends that the Army make liberal use of electronic spreadsheets and other automated tools to facilitate the rate calculation process. The basic philosophy that should be followed is to divide the total estimated costs to provide a service by the forecasted service units to yield a rate per unit. Vance estimates that this sub-activity should take

approximately three work months within three calendar months after the completion of sub-activities one through six.

6.2.1.5.12 Develop And Implement Cost Reporting Techniques. The Army must determine whether ISC has any existing in-house techniques that will satisfy the cost reporting requirements. If not, the Army must research the software marketplace and determine if a cost reporting package can be purchased and tailored to the needs for local telephone services. Otherwise, the Army must develop cost reporting techniques for local telephones from scratch. Vance estimates that this sub-activity should take approximately six work months after the completion of sub-activities eight through 11.

6.2.1.5.13 Memo Bill. Vance recommends that the Army use the concept of memo billing for utilization of local telephone services until the users obtain a clear understanding of the charges they are incurring and a mechanism for recovering costs can be set up. The memo bills should be prepared on a monthly basis. Vance recommends that the Army use memo billing for 24 months after sub-activities 1 through 12 are completed. This should provide the users sufficient time to become familiar with the charges they are incurring.

6.2.1.5.14 Redistribute Funds. Vance recommends that the Army redistribute the local telephone appropriated funds during the 18th through the 21st months of the memo billing period. This should permit sufficient time to collect data on user expenditures and calculate the financial resources each user should receive. The data collected should be used, along with the judgement of Army senior managers, to distribute the appropriated funds for local telephones to the user's appropriations. The exact techniques for accomplishing this must be identified early enough so that putting them into place will not delay fielding the cost recovery techniques.

6.2.1.5.15 Develop And Implement Cost Recovery. The cost recovery techniques identified during the cost recovery activity in the third part of the implementation plan will need to be tailored to the local telephone environment. After the funds are distributed, the cost recovery techniques should be implemented and users should begin paying for their utilization of local telephone services. Vance estimates that this sub-activity should take approximately 12 work months beginning approximately 12 months after the start of memo billing.

6.2.1.5.16 Field To Other Sites. Vance recommends that the Army begin fielding the local telephone cost reporting and recovery techniques to other sites after cost recovery begins. Vance recommends that a detailed fielding schedule be developed as the first part of this sub-activity. Vance estimates that this sub-activity should take approximately 12 work months beginning approximately one month after the start of cost recovery.

6.2.1.5.17 Enhance System. After the cost recovery techniques are implemented and cost recovery begins, periodic system enhancements should begin. These enhancements should take place on a continuing basis as time and resources permit. System enhancements that should be performed include: automation of the rate-setting techniques; interface to the Army cost accounting systems, when developed; automated interface to the Army's accounting systems; well defined techniques for usage forecasting and IMA service budgeting; a sophisticated user ID structure; additional summary reports; assistance to users for reducing billings; and

modification of services as necessary. This sub-activity should be an on-going process.

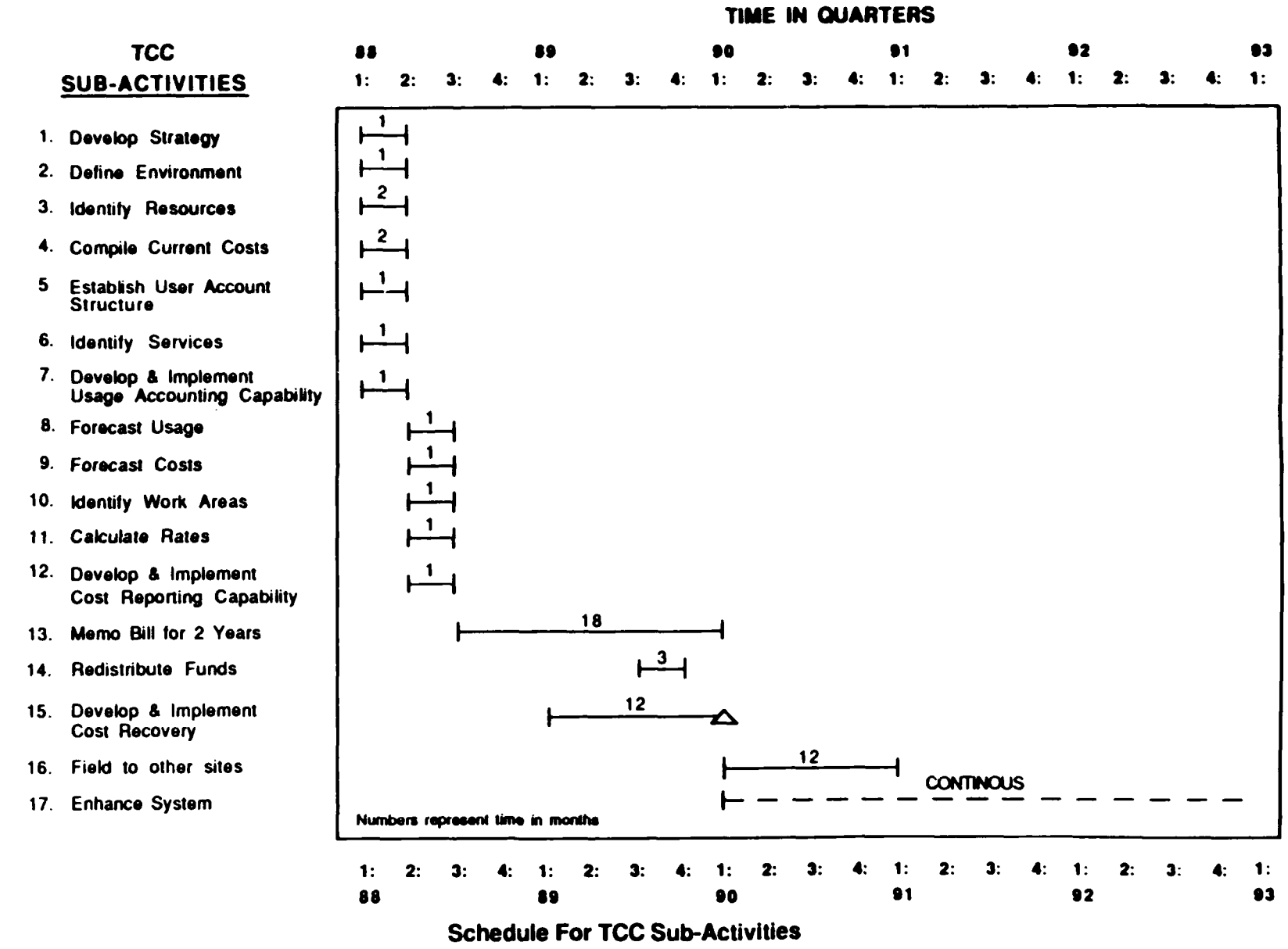
6.2.1.6 TCC. Vance recommends that the Army implement separate cost reporting and recovery techniques for the TCC environment. The objective is to test the cost reporting and recovery techniques at several selected sites before fielding to the rest of the TCC sites at Army posts, camps, and stations. Vance recommends that the Army develop similar but separate cost reporting and recovery techniques at each post, camp, and station. Vance further recommends that the integration of the TCC, cost reporting and recovery techniques with the other discipline's occur after all techniques are fielded. Vance identifies 17 sub-activities that should be performed. Vance's completion time estimate for each sub-activity is provided in Figure 6-7. Vance recommends that the Army proponent oversee the activity, but that ISC perform most of the actual work.

6.2.1.6.1 Develop Strategy. The first sub-activity that the Army should perform is to develop a detailed strategy for completing the TCC activity. This strategy should include a refinement and a schedule of the sub-activities. The strategy should incorporate any concerns or constraints relative to TCC services not considered in this implementation plan. Vance recommends that the techniques used for the TCC services parallel those used for the Tier 2 Automation services, because it should enable the Army to use the Tier 2 Automation cost reporting software for the TCC services. Thus, subsequent fielding to other TCC sites should parallel the fielding of the Tier 2 Automation techniques. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.6.2 Define Environment. The TCC environment must be clearly defined by identifying all organizations and facilities that are involved in providing and using TCC services. Thus, the environment should be defined from both a provider and user perspective. A clearly defined environment should provide valuable information for the Army proponent and should enable easier enhancements in the future. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.6.3 Identify Resources. After the environment is defined, a detailed list of the TCC resources at each of the prototype sites to be managed using the techniques of cost reporting and recovery should be compiled. The identification of these resources should help better define, or draw a boundary around, the organizations and facilities affected by the TCC cost reporting and recovery techniques. Vance recommends that the resources be defined according to the following categories: equipment, personnel, software (if applicable), supplies, space utilization, contracted services, resources used from non-Army agencies, and Army overhead costs. Vance estimates that this sub-activity should take approximately two work months within three calendar months from the start of the effort.

6.2.1.6.4 Compile Current Costs. After all of the resources are identified, the costs incurred by the Army for each TCC resource or group of resources at each of the prototype sites must be compiled. It is important that only costs incurred by the Army be included. However, depreciation costs should be included for equipment and software that are within the Army accepted depreciation period. For information equipment, Vance recommends a depreciation period of five to eight years. The depreciation costs, along with the costs of military salaries, should be used only for information purposes unless a revolving fund is approved. The Army



Schedule For TCC Sub-Activities

Figure 6-7

should use actual cost data to the extent possible. However, if actual data is not available then cost estimation techniques should be used. Vance estimates that this sub-activity should take approximately two work months within three calendar months from the start of the effort.

6.2.1.6.5 Establish User Account Structure. The Army must determine who the TCC users should be at each of the prototype sites. This is best accomplished by establishing a user account structure. Every user of TCC services must have an user ID and a account against which charges will eventually be billed. The development team should work closely with the TCC user managers in completing this sub-activity and let the user managers define their own user levels. The Army proponent should be consulted whenever there are problems defining the appropriate users and user levels. The development team must also ensure that the desired, user tracking levels can be incorporated into a user ID, and that the user ID can be accepted by the usage accounting (metering) techniques (See 6.2.1.6.7). Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.6.6 Identify Services. The Army must identify the TCC services to be used as the bases for charging users. Criteria to help the Army in selecting services are presented in Appendix B. Vance recommends that the Army use the following service: terminal access to autodin. Vance recommends that the Army manage message traffic submitted to TCCs over the counter using some other management technique. Whatever services the Army finally selects must be meterable. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.6.7 Develop And Implement Usage Accounting (Metering) Techniques. Metering for TCC usage should be relatively straightforward in that each user with a terminal will be billed automatically each month. Vance recommends that the Army not develop sophisticated metering software or hardware until it determines that all TCC message traffic should be billed. The completion of this sub-activity should be tied to the AIME effort because AIME's objective is to develop and implement metering techniques for IMA services. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.6.8 Forecast Usage. The Army must forecast the amount of service usage by each TCC user for the period in which rates will be set. The Army should accomplish this by using any available historical data, querying the users, and estimating based on provider experience. Vance estimates that this sub-activity should take approximately one work month within three calendar months beginning after the completion of sub-activities one through six.

6.2.1.6.9 Forecast Costs. After forecasting the service utilization, the Army must forecast the cost of providing those service quantities. The forecasted costs will be a function of the historical costs, compiled during Sub-Activity 6.2.1.6.4, and the cost of any additional resources needed to support increased service utilization. The costs associated with depreciation and military salaries should also be included in the forecasts. Vance estimates that this sub-activity should take approximately one work month within three calendar months beginning after the completion of sub-activities one through six.

6.2.1.6.10 Identify Work Areas. Vance recommends that as part of the process of

calculating billing rates or tariffs, the Army should track costs by work areas in each of the TCC organizations and facilities. Tracking costs by work areas should enable the Army to compare the operating efficiencies of similar organizations and facilities. Work areas should be identified based on the structure of the organization or facility at each of the prototype sites. Further guidance on identifying work areas is found in FGAP 4 and FIPS PUB 96. Vance recommends that the Army use standard work areas for all TCC organizations or facilities that are similar. Vance estimates that this sub-activity should take approximately one work month within three calendar months after the completion of sub-activities one through six.

6.2.1.6.11 Calculate Rates. The billing rates for each service unit should be calculated using the techniques identified in Appendix B and should be set for the memo billing period. Two sets of rates should be calculated, one with depreciation and military salaries included, and one with them excluded. Vance recommends that the Army make liberal use of electronic spreadsheets and other automated tools to facilitate the rate calculation process. The basic philosophy that should be followed is to divide the total estimated costs to provide a service by the forecasted service units to yield a rate per unit. Vance estimates that this sub-activity should take approximately one work month within three calendar months after the completion of sub-activities one through six.

6.2.1.6.12 Develop And Implement Cost Reporting Techniques. Vance recommends that the Army use the cost reporting techniques used for Tier 2 Automation, URS II, for the TCCs. Vance estimates that this sub-activity should take approximately one work month within three calendar months after the completion of sub-activities one through seven.

6.2.1.6.13 Memo Bill. Vance recommends that the Army use the concept of memo billing for utilization of TCC services until the users obtain a clear understanding of the charges they are incurring and a mechanism for recovering costs can be implemented. The memo bills should be prepared on a monthly basis. Vance recommends that the Army use memo billing for 18 months after sub-activities 1 through 12 are completed. This should provide the users sufficient time to become familiar with the charges they are incurring.

6.2.1.6.14 Redistribute Funds. Vance recommends that the Army redistribute the TCC appropriated funds during the 13th through the 15th months of the memo billing period. This should permit sufficient time to collect data on user expenditures and calculate the financial resources each user should receive. The data collected should be used, along with the judgement of Army senior managers, to distribute the appropriated funds for TCC to the user's appropriations. The exact techniques for accomplishing this must be identified early enough so that putting them into place will not delay fielding the cost recovery techniques.

6.2.1.6.15 Develop And Implement Cost Recovery. The cost recovery techniques identified during the cost recovery activity in the third part of the implementation plan must be tailored to the TCC environment. After the funds are distributed, the cost recovery techniques should be implemented and users should begin paying for TCC services. Vance estimates that this sub-activity should take approximately 12 work months beginning approximately six months after the start of memo billing.

6.2.1.6.16 Field To Other Sites. Vance recommends that the Army begin fielding the TCC cost reporting and recovery techniques to other sites after cost recovery

begins. Vance recommends that a detailed fielding schedule be developed as the first part of this sub-activity. Vance estimates that this sub-activity should take approximately 12 work months beginning approximately one month after the start of cost recovery.

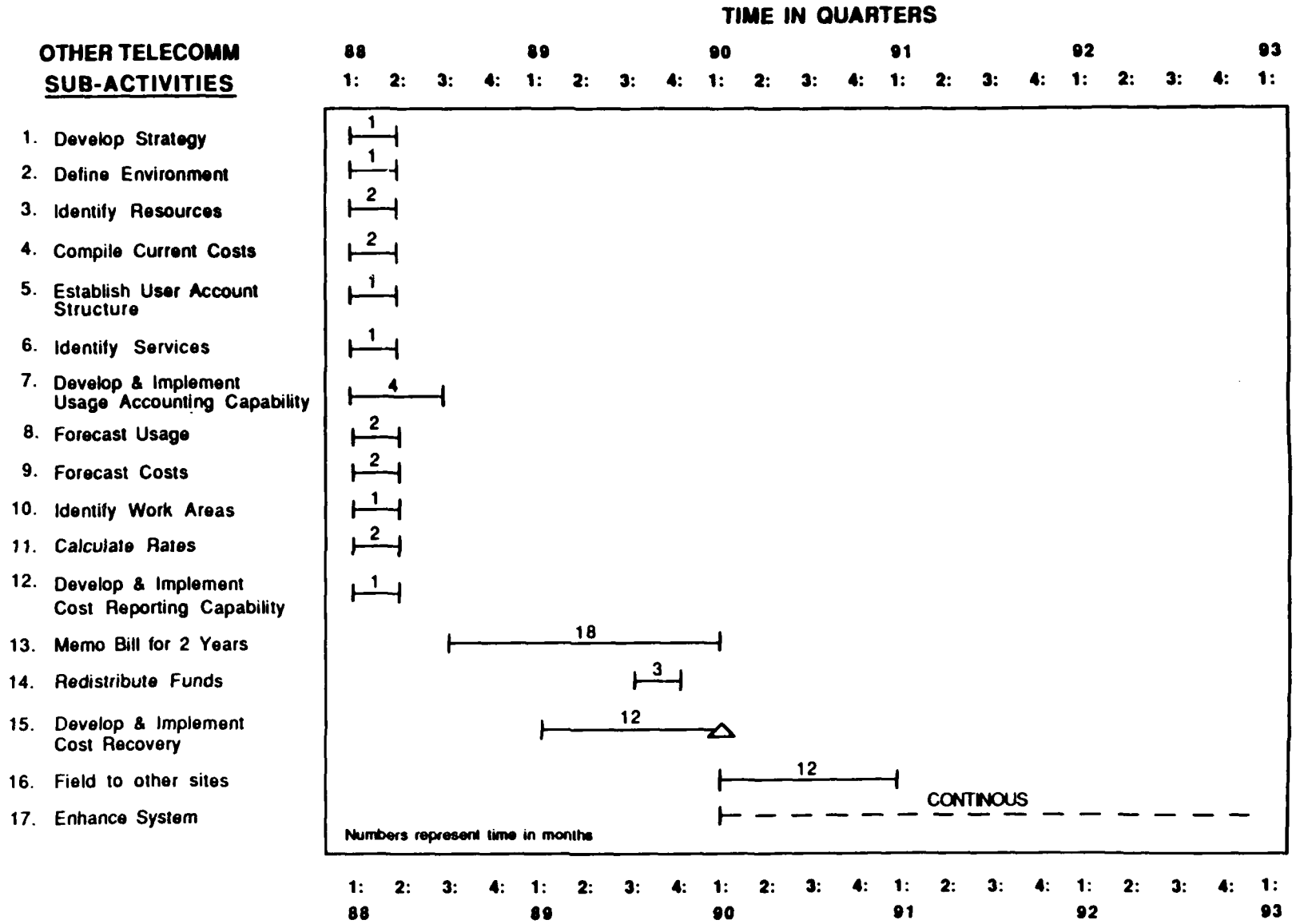
6.2.1.6.17 Enhance System. After the cost recovery techniques are implemented and cost recovery begins, periodic system enhancements should begin. These enhancements should take place on a continuing basis as time and resources permit. System enhancements that should be performed include: automation of the rate-setting techniques; interface to the Army cost accounting systems, when developed; automated interface to the Army's accounting systems; well defined techniques for usage forecasting and IMA service budgeting; a sophisticated user ID structure; additional summary reports assistance to users for reducing billings; and modification of services as necessary. This sub-activity should be an on-going process.

6.2.1.7 Other Telecommunications. Vance recommends that the Army implement a separate cost reporting and recovery techniques for the other telecommunications environment. The objective is to test the cost reporting and recovery techniques at several selected sites before fielding to the rest of the other telecommunications sites at Army posts, camps, and stations. Vance recommends that the Army develop similar but separate cost reporting and recovery techniques at each post, camp, and station. Vance further recommends that the integration of the other telecommunications, cost reporting and recovery techniques with the other discipline's occur after all techniques fielded. Vance identifies 17 sub-activities that should be performed. Vance's completion time estimate for each sub-activity is provided in Figure 6-8. Vance recommends that the Army proponent oversee the activity, but that ISC perform most of the actual work.

6.2.1.7.1 Develop Strategy. The first sub-activity that the Army should perform is to develop a detailed strategy for completing the Other Telecommunications activity. This strategy should include a refinement and a schedule of the sub-activities. This strategy should incorporate any concerns or constraints relative to other telecommunications services not considered in this implementation plan. Vance recommends that the techniques used for the other telecommunications services parallel those used for the Tier 2 Automation services because it will enable the Army to use the Tier 2 Automation cost reporting software. Thus, subsequent fielding to additional other telecommunications sites should parallel the fielding of the Tier 2 Automation techniques. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.7.2 Define Environment. The other telecommunications environment must be clearly defined by identifying all organizations and facilities that are involved in providing and using other telecommunications services. Thus, the environment should be defined from both a provider and user perspective. A clearly defined environment should provide valuable information for the Army proponent and should enable easier enhancements in the future. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.7.3 Identify Resources. After the environment is defined, a detailed list of the other telecommunications resources at each of the prototype sites to be managed using the techniques of cost reporting and recovery should be compiled. The identification of these resources will help better define, or draw a boundary



Schedule For Other Telecommunications Sub-Activities

Figure 6-8

around, the organizations and facilities affected by the other telecommunications cost reporting and recovery techniques. Vance recommends that the resources be defined according to the following categories: equipment, personnel, software (if applicable), supplies, space utilization, contracted services, resources used from non-Army agencies, and Army overhead costs. Vance estimates that this sub-activity should take approximately two work months within three calendar months from the start of the effort.

6.2.1.7.4 Compile Current Costs. After all of the resources are identified, the costs incurred by the Army for each other telecommunications resource or group of resources at each of the prototype sites should be compiled. It is important that only costs incurred by the Army be included. However, depreciation costs should be included for equipment and software that are within the Army accepted depreciation period. For information equipment, Vance recommends a depreciation period of five to eight years. The depreciation costs, along with the costs of military salaries, should be used only for information purposes unless a revolving fund is approved. The Army should use actual cost data to the extent possible. However, if actual data is not available then cost estimation techniques should be used. Vance estimates that this sub-activity should take approximately two work months within three calendar months from the start of the effort.

6.2.1.7.5 Establish User Account Structure. The Army must determine who the other telecommunications users should be at each of the prototype sites. This is best accomplished by establishing a user account structure. Every user of other telecommunications services must have a user ID and an account against which charges will eventually be billed. The development team should work closely with the other telecommunications, user managers in completing this sub-activity and let the user managers define their own user levels. The Army proponent should be consulted whenever there are problems defining the appropriate users and user levels. The development team must also ensure that the desired, user tracking levels can be incorporated into a user ID, and that the user ID can be accepted by the usage accounting (metering) techniques (See 6.7.1.7.7). Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.7.6 Identify Services. The Army must identify the other telecommunications services to be used as the bases for charging users. Criteria to help the Army in selecting services are presented in Appendix B. Vance recommends that the Army use the following service: monthly rental charges for each type of telecommunications device. The services the Army finally selects must be meterable. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.7.7 Develop And Implement Usage Accounting (Metering) Techniques. Metering for other telecommunications services should be relatively straightforward in that each user with a device will be billed automatically each month. Vance recommends that the Army not develop sophisticated metering software or hardware for any of the other telecommunications services. The completion of this sub-activity should be tied to the AIME effort because AIME's objective is to develop and implement metering techniques for IMA services. Vance estimates that this sub-activity should take approximately four work months within six calendar months from the start of the effort.

6.2.1.7.8 Forecast Usage. The Army must forecast the amount of service usage

by each other telecommunications user for the period in which rates will be set. The Army should accomplish this by using any available historical data, querying the users, and estimating based on provider experience. Vance estimates that this sub-activity should take approximately two work months within three calendar months beginning after the completion of sub-activities one through six.

6.2.1.7.9 Forecast Costs. After forecasting the service utilization, the Army must forecast the cost of providing those service quantities. The forecasted costs should be a function of the historical costs, compiled during Sub-Activity 6.2.1.7.4, and the cost of any additional resources needed to support increased service utilization. The costs associated with depreciation and military salaries should also be included in the forecasts. Vance estimates that this sub-activity should take approximately two work months within three calendar months beginning after the completion of sub-activities one through six.

6.2.1.7.10 Identify Work Areas. Vance recommends that as part of the process of calculating billing rates or tariffs, the Army should track costs by work areas in each of the other telecommunications organizations and facilities. Tracking costs by work areas should enable the Army to compare the operating efficiencies of similar organizations and facilities. Work areas should be identified based on the structure of the organization or facility at each of the prototype sites. Further guidance on identifying work areas is found in FGAP 4 and FIPS PUB 96. Vance recommends that the Army use standard work areas for all other telecommunications organizations or facilities that are similar. Vance estimates that this sub-activity should take approximately one work month within three calendar months after the completion of sub-activities one through six.

6.2.1.7.11 Calculate Rates. The billing rates for each service unit should be calculated using the techniques identified in Appendix B and should be set for the memo billing period. Two sets of rates should be calculated, one with depreciation and military salaries included, and one with them excluded. Vance recommends that the Army make liberal use of electronic spreadsheets and other automated tools to facilitate the rate calculation process. The basic philosophy that should be followed is to divide the total estimated costs to provide a service by the forecasted service units to yield a rate per unit. Vance estimates that this sub-activity should take approximately two work months within three calendar months after the completion of sub-activities one through six.

6.2.1.7.12 Develop And Implement Cost Reporting Techniques. Vance recommends that the Army use the cost reporting techniques used for Tier 2 Automation, URS II, for the other telecommunications services. Vance estimates that this sub-activity should take approximately one work month within three calendar months after the completion of sub-activities one through seven.

6.2.1.7.13 Memo Bill. Vance recommends that the Army use the concept of memo billing for utilization of other telecommunications services until the users obtain a clear understanding of the charges they are incurring and a mechanism for recovering costs can be set up. The memo bills should be prepared on a monthly basis. Vance recommends that the Army use memo billing for 18 months after sub-activities 1 through 12 are completed. This should provide the users sufficient time to become familiar with the charges they are incurring.

6.2.1.7.14 Redistribute Funds. Vance recommends that the Army redistribute the other telecommunications appropriated funds during the 13th through the 15th

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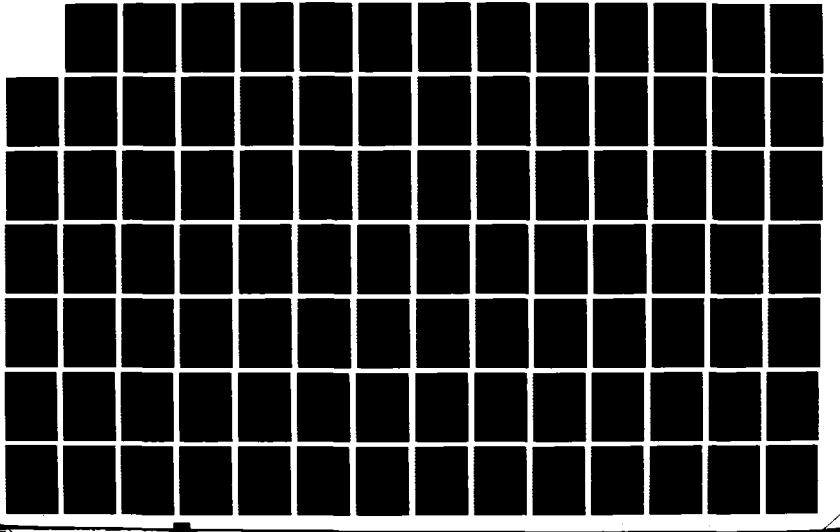

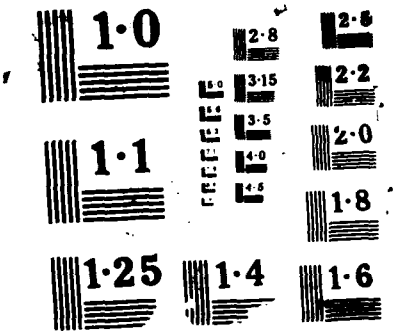
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months of the memo billing period. This should permit sufficient time to collect data on user expenditures and calculate the financial resources each user should receive. The data collected should be used, along with the judgement of Army senior managers, to distribute the appropriated funds for other telecommunications to the user's appropriations. The exact techniques for accomplishing this must be identified early enough so that putting them into place will not delay fielding the cost recovery techniques.

6.2.1.7.15 Develop And Implement Cost Recovery. The cost recovery techniques identified during the cost recovery activity in the third part of the implementation plan should be tailored to the other telecommunications environment. After the funds are distributed, the cost recovery techniques should be implemented and users should begin paying for other telecommunications services. Vance estimates that this sub-activity should take approximately 12 work months beginning approximately 12 months after the start of memo billing.

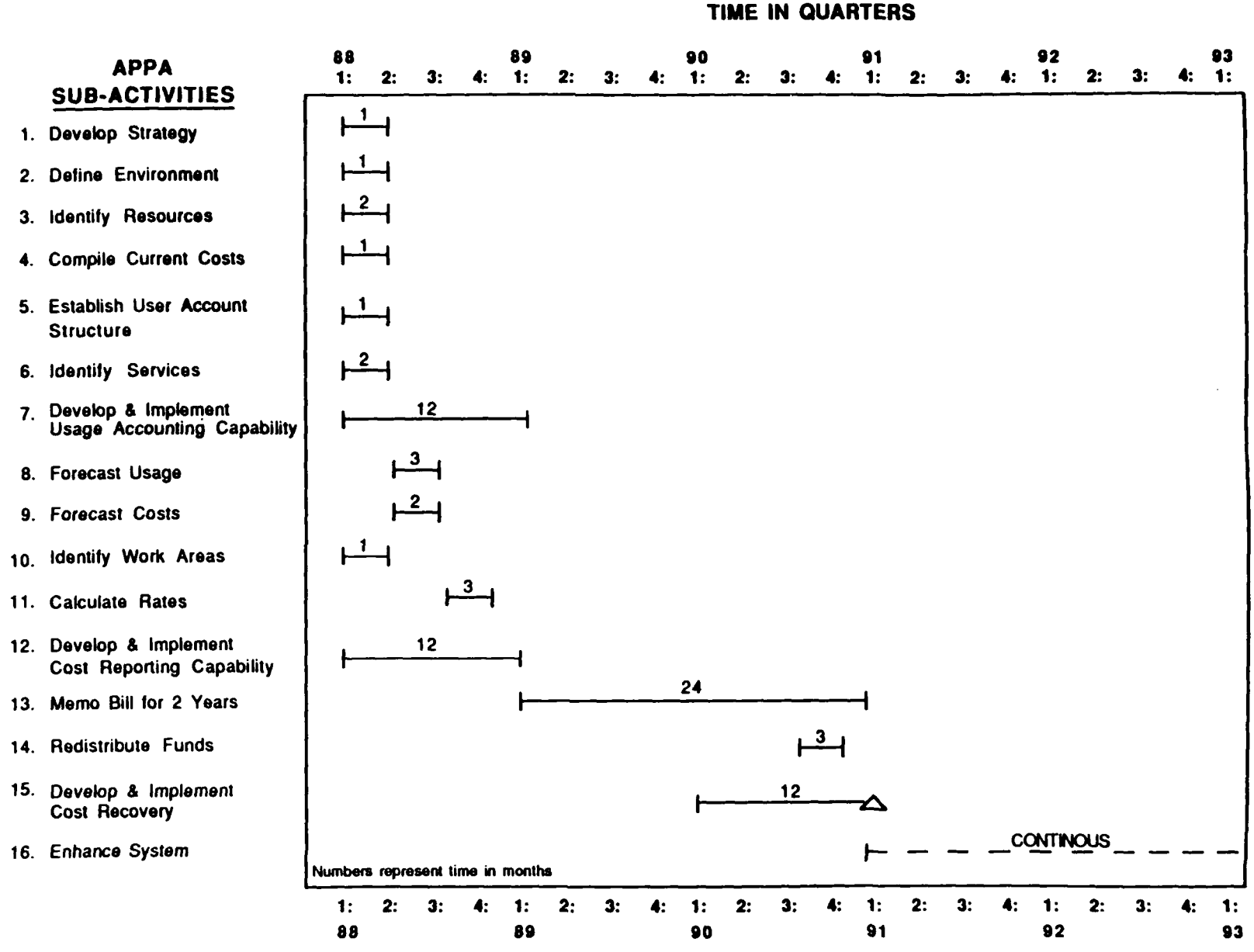
6.2.1.7.16 Field To Other Sites. Vance recommends that the Army begin fielding the other telecommunications cost reporting and recovery techniques to other sites after cost recovery begins. Vance recommends that a detailed fielding schedule be developed as the first part of this sub-activity. Vance estimates that this sub-activity should take approximately 12 work months beginning approximately one month after the start of cost recovery.

6.2.1.7.17 Enhance System. After the cost recovery techniques are implemented and cost recovery begins, periodic system enhancements should begin. These enhancements should take place on a continuing basis as time and resources permit. System enhancements that should be performed include: automation of the rate-setting techniques; interface to the Army cost accounting systems, when developed; automated interface to the Army's accounting systems; well defined techniques for usage forecasting and IMA service budgeting; a sophisticated user ID structure; additional summary reports assistance to users for reducing billings; and modification of services as necessary. This sub-activity should be an on-going process.

6.2.1.8 APPA. Vance recommends that the Army implement separate cost reporting and recovery techniques for the APPA printing and publishing environment. Vance identifies 16 sub-activities that should be performed. Vance's completion time estimate for each sub-activity is provided in Figure 6-9. Vance recommends that the Army proponent oversee the activity, but that APPA perform most of the actual work.

6.2.1.8.1 Develop Strategy. The first sub-activity that the Army should perform is to develop a detailed strategy for completing the activity. This strategy should include a refinement and a schedule of the sub-activities. This strategy should incorporate any concerns or constraints relative to the APPA environment not considered in this implementation plan. Issues that should be addressed in more detail are: continuing to pass through the Government Printing Office's (GPO's) charges for departmental printing to the MACOMs, incorporating the GPO's charges into the new techniques, limiting the new techniques to departmental printing and publishing, incorporating the warehouses in Baltimore and St. Louis, and including shipping costs for publications. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.8.2 Define Environment. The APPA environment must be clearly defined by



Schedule For APPA Sub-Activities

Figure 6-9

identifying all organizations and facilities that are involved in providing and using APPA services. Thus, the environment should be defined from both a provider and user perspective. A clearly defined environment should provide valuable information for the Army proponent and should enable easier enhancements in the future. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.8.3 Identify Resources. After the environment is defined, a detailed list of the APPA resources to be managed using the techniques of cost reporting and recovery must be compiled. The identification of these resources should help better define, or draw a boundary around, the organizations and facilities affected by the APPA cost reporting and recovery techniques. Vance recommends that the resources be defined according to the following categories: equipment, personnel, software (if applicable), supplies, space utilization, contracted services, resources used from non-Army agencies, and Army overhead costs. Certain issues will arise that should be addressed by the Army proponent. One such issue is should the APPA main office be included or excluded. Vance estimates that this sub-activity should take approximately two work months within three calendar months from the start of the effort.

6.2.1.8.4 Compile Current Costs. After all of the resources are identified, the costs incurred by the Army for each APPA resource or group of resources must be compiled. It is important that only costs incurred by the Army be included. However, depreciation costs should be included for equipment and software that are within the Army accepted depreciation period. For information equipment, Vance recommends a depreciation period of five to eight years. The depreciation costs, along with the costs of military salaries, should be used only for information purposes unless a revolving fund is approved. The Army should use actual cost data to the extent possible. However, if actual data is not available then cost estimation techniques should be used. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.8.5 Establish User Account Structure. The Army must determine who the APPA users should be. This is best accomplished by establishing a user account structure. Every user of APPA services must have a user ID and an account against which charges will eventually be billed. The development team should work closely with the APPA user managers in completing this sub-activity and let the user managers define their own user levels. The Army proponent should be consulted whenever there are problems defining the appropriate users and user levels. The development team must also ensure that the desired, user tracking levels can be incorporated into a user ID, and that the user ID can be accepted by the usage accounting (metering) techniques (See 6.2.1.8.7). Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.8.6 Identify Services. The Army must identify the services that will be used as the bases for charging users. Criteria to help the Army in selecting services are presented in Appendix B. Vance recommends that the Army use at least an hourly rate for publishing assistance and pass GPO's charges directly to the users. The services finally identified must be meterable. Vance estimates that this sub-activity should take approximately two work months within three calendar months from the start of the effort.

6.2.1.8.7 Develop And Implement Usage Accounting (Metering) Techniques. Unless significant machine-oriented services are selected, the metering techniques must consist of time sheets and labor hour accounting. Vance recommends that the Army research and find a labor accounting system in use in the Federal Government and modify it for use in APPA. Vance estimates that this sub-activity should take approximately 12 work months from the start of the effort.

6.2.1.8.8 Forecast Usage. The amount of service usage by each APPA user must be forecast for the period in which rates will be set. The Army should accomplish this by using any available historical data, querying the users, and estimating based on provider experience. Vance estimates that this sub-activity should take approximately three work months beginning after the completion of sub-activities one through six.

6.2.1.8.9 Forecast Costs. After forecasting the service utilization, the Army must forecast the cost of providing those service quantities. The forecasted costs should be a function of the historical costs, compiled during Sub-Activity 6.2.1.8.4, and the cost of any additional resources needed to support increased service utilization. The costs associated with depreciation and military salaries should also be included in the forecasts. Vance estimates that this sub-activity should take approximately two work months within three calendar months beginning after the completion of sub-activities one through six.

6.2.1.8.10 Identify Work Areas. Vance recommends that as part of the process of calculating billing rates or tariffs, the Army should track costs by work areas in each of the APPA organizations and facilities. Tracking costs by work areas should enable the Army to compare the operating efficiencies of similar organizations and facilities. Work areas should be identified based on the structure of the organization or facility. Further guidance on identifying work areas is found in FGAP 4 and FIPS PUB 96. Vance recommends that the Army use standard work areas for all APPA organizations or facilities that are similar. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.8.11 Calculate Rates. The billing rates for each service unit should be calculated using the techniques identified in Appendix B and should be set for the memo billing period. Two sets of rates should be calculated, one with depreciation and military salaries included, and one with them excluded. Vance recommends that the Army make liberal use of electronic spreadsheets and other automated tools to facilitate the rate calculation process. The basic philosophy that should be followed is to divide the total estimated cost to provide a service by the forecasted service units to yield a rate per unit. Vance recommends that the APPA directly pass the charges levied by GPO to the users, possibly adding a surcharge to cover overhead costs. Vance estimates that this sub-activity should take approximately three work months after the completion of sub-activities eight through ten.

6.2.1.8.12 Develop And Implement Cost Reporting Techniques. The Army should research the software marketplace and determine if a cost reporting package can be purchase and tailored to the APPA needs. Otherwise, the Army will have to develop cost reporting techniques for APPA from scratch. Vance estimates that this sub-activity should take approximately 12 work months from the start of the effort.

6.2.1.8.13 Memo Bill. Vance recommends that the Army use the concept of memo billing for utilization of APPA services until the users obtain a clear understanding

of the charges they are incurring and a mechanism for recovering costs can be set up. The memo bills should be prepared on a monthly basis. Vance recommends that the Army use memo billing for 24 months after sub-activities 1 through 12 are completed. This should provide the users sufficient time to become familiar with the charges they are incurring.

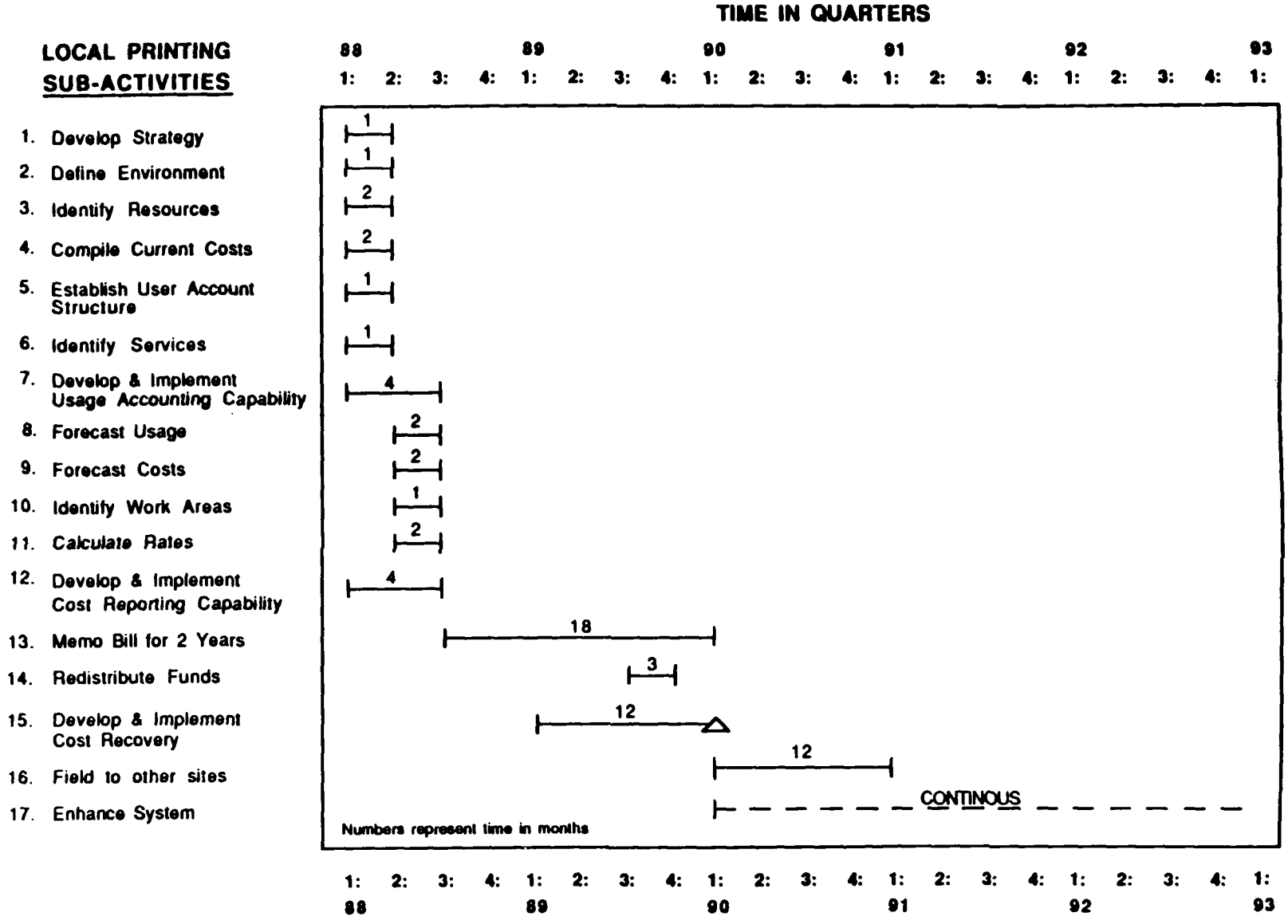
6.2.1.8.14 Redistribute Funds. Vance recommends that the Army redistribute the APPA appropriated funds during the 18th through the 21st months of the memo billing period. This should permit sufficient time to collect data on user expenditures and calculate the financial resources each user should receive. The data collected should be used, along with the judgement of Army senior managers, to distribute the appropriated funds for APPA to the user's appropriations. The exact techniques for accomplishing this must be identified early enough so that putting them into place will not delay fielding the cost recovery techniques.

6.2.1.8.15 Develop And Implement Cost Recovery. The cost recovery techniques identified during the cost recovery activity in the third part of the implementation plan will need to be tailored to the APPA environment. After the funds are distributed, the cost recovery techniques should be implemented and users should begin paying for APPA services. Vance estimates that this sub-activity should take approximately 12 work months beginning approximately 12 months after the start of memo billing.

6.2.1.8.16 Enhance System. After the cost recovery techniques are implemented and cost recovery begins, periodic system enhancements should begin. These enhancements should take place on a continuing basis as time and resources permit. System enhancements that should be performed include: automation of the rate-setting techniques; interface to the Army cost accounting systems, when developed; automated interface to the Army's accounting systems; well defined techniques for usage forecasting and IMA service budgeting; a sophisticated user ID structure; additional summary reports; assistance to users for reducing billings; and modification of services as necessary. This sub-activity should be an on-going process.

6.2.1.9 Local Printing. Vance recommends that the Army implement a separate cost reporting and recovery techniques for the local printing environment. The objective is to test the cost reporting and recovery techniques at several selected sites before fielding to the rest of the local printing sites at Army posts, camps, and stations. Vance recommends that the Army develop similar but separate cost reporting and recovery techniques at each post, camp, and station. Vance further recommends that the integration of the local printing, cost reporting and recovery techniques with the other discipline's occur after all techniques are fielded. Vance identifies 17 sub-activities that should be performed. Vance's completion time estimate for each sub-activity is provided in Figure 6-10. Vance recommends that the Army proponent oversee the activity, but that ISC perform most of the actual work.

6.2.1.9.1 Develop Strategy. The first sub-activity that the Army should perform is to develop a detailed strategy for completing the Local Printing activity. This strategy should include a refinement and a schedule of the sub-activities. The strategy should incorporate any concerns or constraints relative to local printing services not considered in this implementation plan. Vance recommends that the Army select prototype sites which already installed the Reprographics Automated Management Information System (RAMIS) software package. Vance estimates that



Schedule For Local Printing Sub-Activities

Figure 6-10

this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.9.2 Define Environment. The local printing environment must be clearly defined by identifying all organizations and facilities that are involved in providing and using local printing services. Thus, the environment should be defined from both a provider and user perspective. A clearly defined environment should provide valuable information for the Army proponent and should enable easier enhancements in the future. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.9.3 Identify Resources. After the environment is defined, a detailed list of the local printing resources at each of the prototype sites to be managed using the techniques of cost reporting and recovery must be compiled. The identification of these resources should help to better define, or draw a boundary around, the organizations and facilities affected by the local printing cost reporting and recovery techniques. Vance recommends that the resources be defined according to the following categories: equipment, personnel, software (if applicable), supplies, space utilization, contracted services, resources used from non-Army agencies, and Army overhead costs. Vance estimates that this sub-activity should take approximately two work months within three calendar months from the start of the effort.

6.2.1.9.4 Compile Current Costs. After all of the resources are identified, the costs incurred by the Army for each local printing resource or group of resources at each of the prototype sites must be compiled. It is important that only costs incurred by the Army be included. However, depreciation costs should be included for equipment and software that are within the Army accepted depreciation period. For information equipment, Vance recommends a depreciation period of five to eight years. The depreciation costs, along with the costs of military salaries, should be used only for information purposes unless a revolving fund is approved. The Army should use actual cost data to the extent possible. However, if actual data is not available then cost estimation techniques should be used. Vance estimates that this sub-activity should take approximately two work months within three calendar months from the start of the effort.

6.2.1.9.5 Establish User Account Structure. The Army must determine who the local printing users should be at each of the prototype sites. This is best accomplished by establishing a user account structure. Every user of local printing services must have a user ID and an account against which charges will eventually be billed. The development team should work closely with the local printing user managers in completing this sub-activity and let the user managers define their own user levels. The Army proponent should be consulted whenever there are problems defining the appropriate users and user levels. The development team must also ensure that the desired, user tracking levels can be incorporated into a user ID, and that the user ID can be accepted by the usage accounting (metering) techniques (See 6.2.1.9.7). Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.9.6 Identify Services. The Army must identify the local printing services to be used as the bases for charging users. Criteria to help the Army in selecting services are presented in Appendix B. Vance recommends that the Army use standard job costing techniques for the services. Whatever services the Army finally selects must be meterable. Vance estimates that this sub-activity should

take approximately one work month within three calendar months from the start of the effort.

6.2.1.9.7 Develop And Implement Usage Accounting (Metering) Techniques. Vance recommends that the Army meter for local printing using the techniques devised for the RAMIS cost reporting system. RAMIS requires a mixture of manual and automated metering; workers who work on a job record the time and materials used and provide this data to a data entry clerk. The completion of this sub-activity should be tied to the AIME effort because AIME's objective is to develop and implement metering techniques for IMA services. Vance estimates that this sub-activity should take approximately four work months within six calendar months from the start of the effort.

6.2.1.9.8 Forecast Usage. The amount of service usage by each local printing user must be forecast for the period in which rates will be set. The Army should accomplish this by using any available historical data, querying the users, and estimating based on provider experience. Vance estimates that this sub-activity should take approximately two work months within three calendar months beginning after the completion of sub-activities one through six.

6.2.1.9.9 Forecast Costs. After forecasting the service utilization, the Army must forecast the cost of providing those service quantities. The forecasted costs should be a function of the historical costs, compiled during Sub-Activity 6.2.1.9.4, and the cost of any additional resources needed to support increased service utilization. The costs associated with depreciation and military salaries should also be included in the forecasts. Vance estimates that this sub-activity should take approximately two work months within three calendar months beginning after the completion of sub-activities one through six.

6.2.1.9.10 Identify Work Areas. Vance recommends that as part of the process of calculating billing rates or tariffs, the Army should track costs by work areas in each of the local printing organizations and facilities. Tracking costs by work areas should enable the Army to compare the operating efficiencies of similar organizations and facilities. Work areas should be identified based on the structure of the organization or facility at each of the prototype sites. Further guidance on identifying work areas is found in FGAP 4 and FIPS PUB 96. Vance recommends that the Army use standard work areas for all local printing organizations or facilities that are similar. Vance estimates that this sub-activity should take approximately one work month within three calendar months after the completion of sub-activities one through six.

6.2.1.9.11 Calculate Rates. The billing rates for each service unit should be calculated using the techniques identified in Appendix B and should be set for the memo billing period. Two sets of rates should be calculated, one with depreciation and military salaries included, and one with them excluded. Vance recommends that the Army make liberal use of electronic spreadsheets and other automated tools to facilitate the rate calculation process. The basic philosophy that should be followed is to divide the total estimated costs to provide a service by the forecasted service units to yield a rate per unit. Vance estimates that this sub-activity should take approximately two work months within three calendar months after the completion of sub-activities one through six.

6.2.1.9.12 Develop And Implement Cost Reporting Techniques. Vance recommends that the Army use the RAMIS package for cost reporting. Vance further

recommends that the Army take whatever steps are necessary to obtain the rights to the source code for RAMIS since the Army paid to have it developed. Vance estimates that this sub-activity should take approximately four work months within six calendar months from the start of the effort.

6.2.1.9.13 Memo Bill. Vance recommends that the Army use the concept of memo billing for utilization of local printing service until the users obtain a clear understanding of the charges they are incurring and a mechanism for recovering costs can be set up. The memo bills should be prepared on a monthly basis. Vance recommends that the Army use memo billing for 18 months after sub-activities 1 through 12 are completed. This should provide the users sufficient time to become familiar with the charges they are incurring.

6.2.1.9.14 Redistribute Funds. Vance recommends that the Army redistribute the local printing appropriated funds during the 13th through the 15th months of the memo billing period. This should permit sufficient time to collect data on user expenditures and calculate the financial resources each user should receive. The data collected should be used, along with the judgement of Army senior managers, to distribute the appropriated funds for local printing to the user's appropriations. The exact techniques for accomplishing this will need to be identified early enough so that putting them into place will not delay fielding the cost recovery techniques.

6.2.1.9.15 Develop And Implement Cost Recovery. The cost recovery techniques identified during the cost recovery activity in the third part of the implementation plan will need to be tailored to the local printing environment. After the funds are distributed, the cost recovery techniques should be implemented and users should begin paying for local printing services. Vance estimates that this sub-activity should take approximately 12 work months beginning approximately 12 months after the start of memo billing.

6.2.1.9.16 Field To Other Sites. Vance recommends that the Army begin fielding the local printing cost reporting and recovery techniques to other sites after cost recovery begins. Vance recommends that a detailed fielding schedule be developed as the first part of this sub-activity. Vance estimates that this sub-activity should take approximately 12 work months beginning approximately one month after the start of cost recovery.

6.2.1.9.17 Enhance System. After the cost recovery techniques are implemented and cost recovery begins, periodic system enhancements should begin. These enhancements should take place on a continuing basis as time and resources permit. System enhancements that should be performed include: automation of the rate-setting techniques; interface to the Army cost accounting systems, when developed; automated interface to the Army's accounting systems; well defined techniques for usage forecasting and IMA service budgeting; a sophisticated user ID structure; additional summary reports; assistance to users for reducing billings; and modification of services as necessary. This sub-activity should be an on-going process.

6.2.1.10 Visual Information. Vance recommends that the Army implement a separate cost reporting and recovery techniques for the visual information environment. The objective is to test the cost reporting and recovery techniques at several selected sites before fielding to the remaining visual information sites at Army posts, camps, and stations. Vance recommends that the Army develop similar but separate cost reporting and recovery techniques at each post, camp, and station.

Vance further recommends that the integration of the visual information, cost reporting and recovery techniques with the other discipline's occur after all techniques are fielded. Vance identifies 17 sub-activities that should be performed. Vance's completion time estimate for each sub-activity is provided in Figure 6-11. Vance recommends that the Army proponent oversee the activity, but that ISC perform most of the actual work.

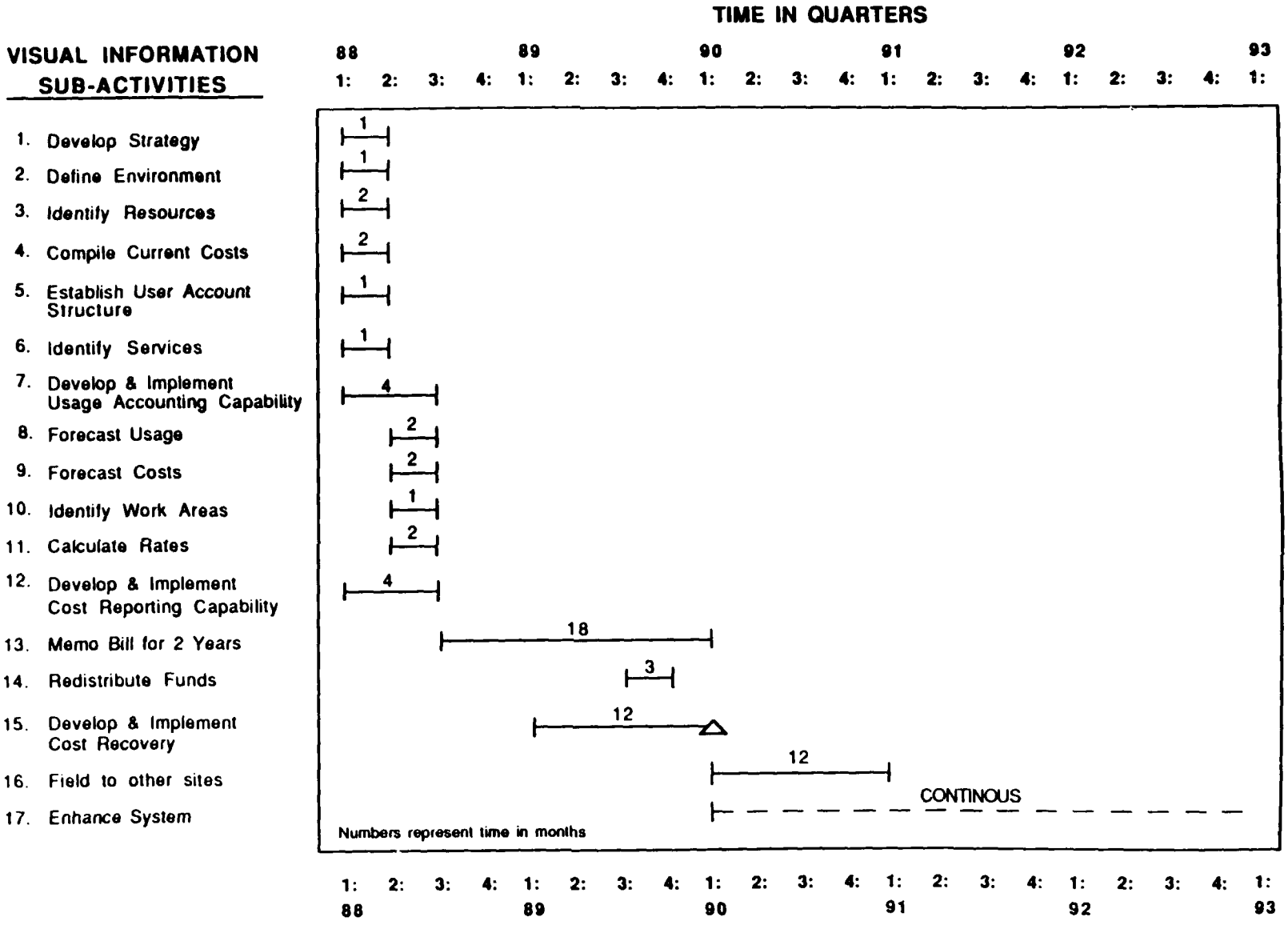
6.2.1.10.1 Develop Strategy. The first sub-activity that the Army should perform is to develop a detailed strategy for completing the activity. This strategy should include a refinement and a schedule of the sub-activities. The strategy should incorporate any concerns or constraints relative to visual IMA services not considered in this implementation plan. Vance recommends that the Army select prototype sites that already installed the Work Order Management System (WOMS) software package or that could easily install the RAMIS package. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.10.2 Define Environment. The visual information environment must be clearly defined by identifying all organizations and facilities that are involved in providing and using visual IMA services. Thus, the environment should be defined from both a provider and user perspective. A clearly defined environment should provide valuable information for the Army proponent and should enable easier enhancements in the future. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.10.3 Identify Resources. After the environment is defined, a detailed list of the visual information resources at each of the prototype sites to be managed using the techniques of cost reporting and recovery must be compiled. The identification of these resources should help better define, or draw a boundary around, the organizations and facilities affected by the visual information cost reporting and recovery techniques. Vance recommends that the resources be defined according to the following categories: equipment, personnel, software (if applicable), supplies, space utilization, contracted services, resources used from non-Army agencies, and Army overhead costs. Vance estimates that this sub-activity should take approximately two work months within three calendar months from the start of the effort.

6.2.1.10.4 Compile Current Costs. After all of the resources are identified, the costs incurred by the Army for each visual information resource or group of resources at each of the prototype sites must be compiled. It is important that only costs incurred by the Army be included. However, depreciation costs should be included for equipment and software that are within the Army accepted depreciation period. For information equipment, Vance recommends a depreciation period of five to eight years. The depreciation costs, along with the costs of military salaries, should be used only for information purposes unless a revolving fund is approved. The Army should use actual cost data to the extent possible. However, if actual data is not available then cost estimation techniques should be used. Vance estimates that this sub-activity should take approximately two work months within three calendar months from the start of the effort.

6.2.1.10.5 Establish User Account Structure. The Army must determine who the visual information users should be at each of the prototype sites. This is best accomplished by establishing a user account structure. Every user of visual IMA



Schedule For Visual Information Sub-Activities

Figure 6-11

services must have a user ID and an account against which charges will eventually be billed. The development team should work closely with the visual information user managers in completing this sub-activity and let the user managers define their own user levels. The Army proponent should be consulted whenever there are problems defining the appropriate users and user levels. The development team must also ensure that the desired, user tracking levels can be incorporated into a user ID, and that the user ID can be accepted by the usage accounting (metering) techniques (See 6.2.1.10.7). Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.10.6 Identify Services. The Army must identify the visual IMA services that will be used as the bases for charging users. Criteria to help the Army in selecting services are presented in Appendix B. Vance recommends that the Army use standard job costing techniques for the services. Whatever services the Army finally selects must be meterable. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the effort.

6.2.1.10.7 Develop And Implement Usage Accounting (Metering) Techniques. Vance recommends that the Army meter for visual information using the techniques devised for the RAMIS cost reporting system. RAMIS requires a mixture of manual and automated metering; workers who work on a job record the time and materials used and provide this data to a data entry clerk. Vance also recommends the use of timesheets and labor accounting for visual information metering. The completion of this sub-activity should be tied to the AIME effort because AIME's objective is to develop and implement metering techniques for IMA services. Vance estimates that this sub-activity should take approximately four work months within six calendar months starting from the start of the effort.

6.2.1.10.8 Forecast Usage. The amount of service usage by each visual information user must be forecast for the period in which rates will be set. The Army should accomplish this by using any available historical data, querying the users, and estimating based on provider experience. Vance estimates that this sub-activity should take approximately two work months within three calendar months beginning after the completion of sub-activities one through six.

6.2.1.10.9 Forecast Costs. After forecasting the service utilization, the Army must forecast the cost of providing those service quantities. The forecasted costs should be a function of the historical costs, compiled during Sub-Activity 6.2.1.10.4, and the cost of any additional resources needed to support increased service utilization. The costs associated with depreciation and military salaries should also be included in the forecasts. Vance estimates that this sub-activity should take approximately two work months within three calendar months beginning after the completion of sub-activities one through six.

6.2.1.10.10 Identify Work Areas. Vance recommends that as part of the process of calculating billing rates or tariffs, the Army should track costs by work areas in each of the visual information organizations and facilities. Tracking costs by work areas should enable the Army to compare the operating efficiencies of similar organizations and facilities. Work areas should be identified based on the structure of the organization or facility at each of the prototype sites. Further guidance on identifying work areas is found in FGAP 4 and FIPS PUB 96. Vance recommends that the Army use standard work areas for all visual information organizations or

facilities that are similar. Vance estimates that this sub-activity should take approximately one work month within three calendar months after the completion of sub-activities one through six.

6.2.1.10.11 Calculate Rates. The billing rates for each service unit should be calculated using the techniques identified in Appendix B and should be set for the memo billing period. Two sets of rates should be calculated, one with depreciation and military salaries included, and one with them excluded. Vance recommends that the Army make liberal use of electronic spreadsheets and other automated tools to facilitate the rate calculation process. The basic philosophy that should be followed is to divide the total estimated costs to provide a service by the forecasted service units to yield a rate per unit. Vance estimates that this sub-activity should take approximately two work months within three calendar months after the completion of sub-activities one through six.

6.2.1.10.12 Develop And Implement Cost Reporting Techniques. The Army should conduct additional research to determine the best cost reporting package to be used for visual information. Vance recommends that the Army analyze and consider using either the WOMS or the RAMIS software. Vance estimates that this sub-activity should take approximately four work months within six calendar months from the start of the effort.

6.2.1.10.13 Memo Bill. Vance recommends that the Army use the concept of memo billing for utilization of visual IMA services until the users obtain a clear understanding of the charges they are incurring and a mechanism for recovering costs can be set up. The memo bills should be prepared on a monthly basis. Vance recommends that the Army use memo billing for 18 months after sub-activities 1 through 12 are completed. This should provide the users sufficient time to become familiar with the charges they are incurring.

6.2.1.10.14 Redistribute Funds. Vance recommends that the Army redistribute the visual information appropriated funds during the 13th through the 15th months of the memo billing period. This should permit sufficient time to collect data on user expenditures and calculate the financial resources each user should receive. The data collected should be used, along with the judgement of Army senior managers, to distribute the appropriated funds for visual information to the user's appropriations. The exact techniques for accomplishing this must be identified early enough so that putting them into place will not delay fielding the cost recovery techniques.

6.2.1.10.15 Develop And Implement Cost Recovery. The cost recovery techniques identified during the cost recovery activity in the third part of the implementation plan must be tailored to the visual information environment. After the funds are distributed, the cost recovery techniques should be implemented and users should begin paying for visual IMA services. Vance estimates that this sub-activity should take approximately 12 work months beginning approximately 12 months after the start of memo billing.

6.2.1.10.16 Field To Other Sites. Vance recommends that the Army begin fielding the visual information cost reporting and recovery techniques to other sites after cost recovery begins. Vance recommends that a detailed fielding schedule be developed as the first part of this sub-activity. Vance estimates that this sub-activity should take approximately 12 work months beginning approximately one month after the start of cost recovery.

6.2.1.10.17 Enhance System. After the cost recovery techniques are implemented and cost recovery begins, periodic system enhancements should begin. These enhancements should take place on a continuing basis as time and resources permit. System enhancements that should be performed include: automation of the rate-setting techniques; interface to the Army cost accounting systems, when developed; automated interface to the Army's accounting systems; well defined techniques for usage forecasting and IMA service budgeting; a sophisticated user ID structure; additional summary reports; assistance to users for reducing billings; and modification of services as necessary. This sub-activity should be an on-going process.

6.2.1.11 Mail. Vance recommends that the Army develop and implement techniques to bill users for their use of stamps and postage meters at the meter or permit level. The resources associated with the Army's APO in-house mail and drug surveillance of mail should not be managed with these techniques. Vance recommends that these resources be funded out of a central account and not out of user's appropriations. Vance also recommends that the Army handle this techniques in the same manner as buying any service from a non-Army source. Since the Post Office only wants to bill the Army as one entity, the Army should develop a system where the Post Office's charges can be further broken down to individual users. Vance identifies two sub-activities that should be performed. Vance's completion time estimate for each sub-activity is provided in Figure 6-12. Vance recommends that the Army proponent oversee the activity, but that ISC perform most of the actual work.

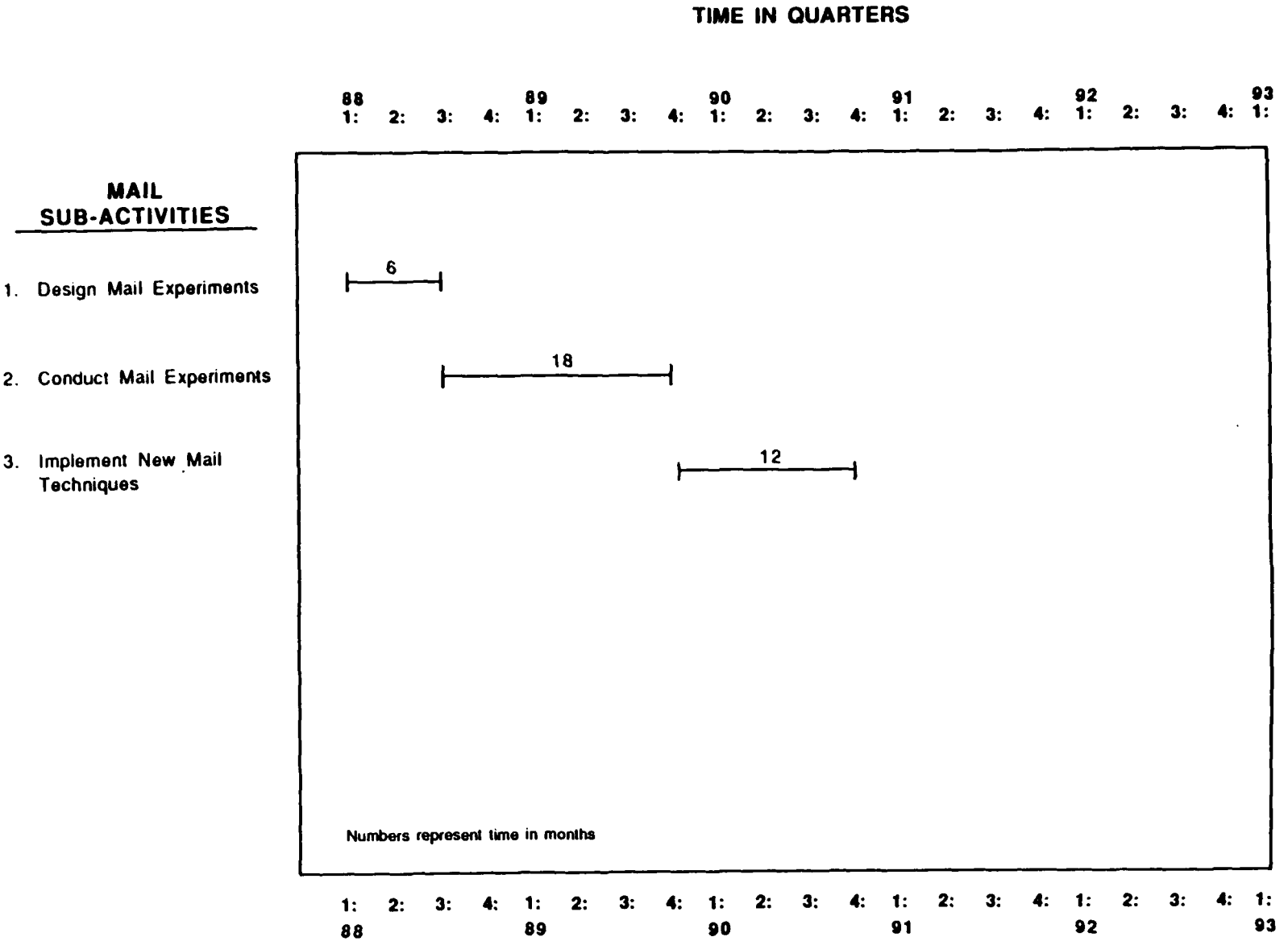
6.2.1.11.1 Design Mail Experiments. Vance recommends that the Army analyze the feasibility of using an independent billing service, such as a major credit card company, to act as the intermediary between the Army and the Post Office. Vance envisions the relationship operating as follows. The Army users use a credit card or billing card to buy stamps or refill their postage meters at the Post Office. The Post Office bills the credit card company a lump sum bill. The credit card company uses the payment vouchers to allocate the charges to users and bill the users. The users pay the credit card company which, in turn, pays the Post Office.

The logistics of such a technique needs to be explored in more depth. Vance recommends that the Army determine the feasibility of the approach by conducting an experiment for mail with the other sources of service experiments. The purpose of this sub-activity is to design the experiment. Vance estimates that this sub-activity should take approximately six work months beginning after the start of the activity.

6.2.1.11.2 Conduct Mail Experiment. The purpose of this sub-activity is to conduct the mail experiment and analyze the results. Vance estimates that this sub-activity should take approximately 18 work months beginning after the completion of sub-activity one.

6.2.1.11.3 Implement New Mail Techniques. The purpose of this sub-activity is to implement the new mail capability based on the results of the mail experiment. Vance estimates that this sub-activity should take approximately 12 work months beginning after the completion of sub-activity two.

6.2.2 Activities Related to Non-Army Sources of Service. This part of the implementation plan addresses activities that Vance recommends the Army complete to enable users to buy IMA services from non-Army sources. Vance recommends



Schedule For Mail Sub-Activities

Figure 6-12

that the Army integrate, to the extent feasible, the activities described in this subsection into the Army's commercial activities (CA) program. The activities in this subsection are designed to determine the feasibility and appropriateness of buying services from non-Army sources. However, conducting CA studies will only be necessary when the Army intends to buy IMA services from private industry. If the Army intends to buy services from other Government agencies, then CA studies are not required.

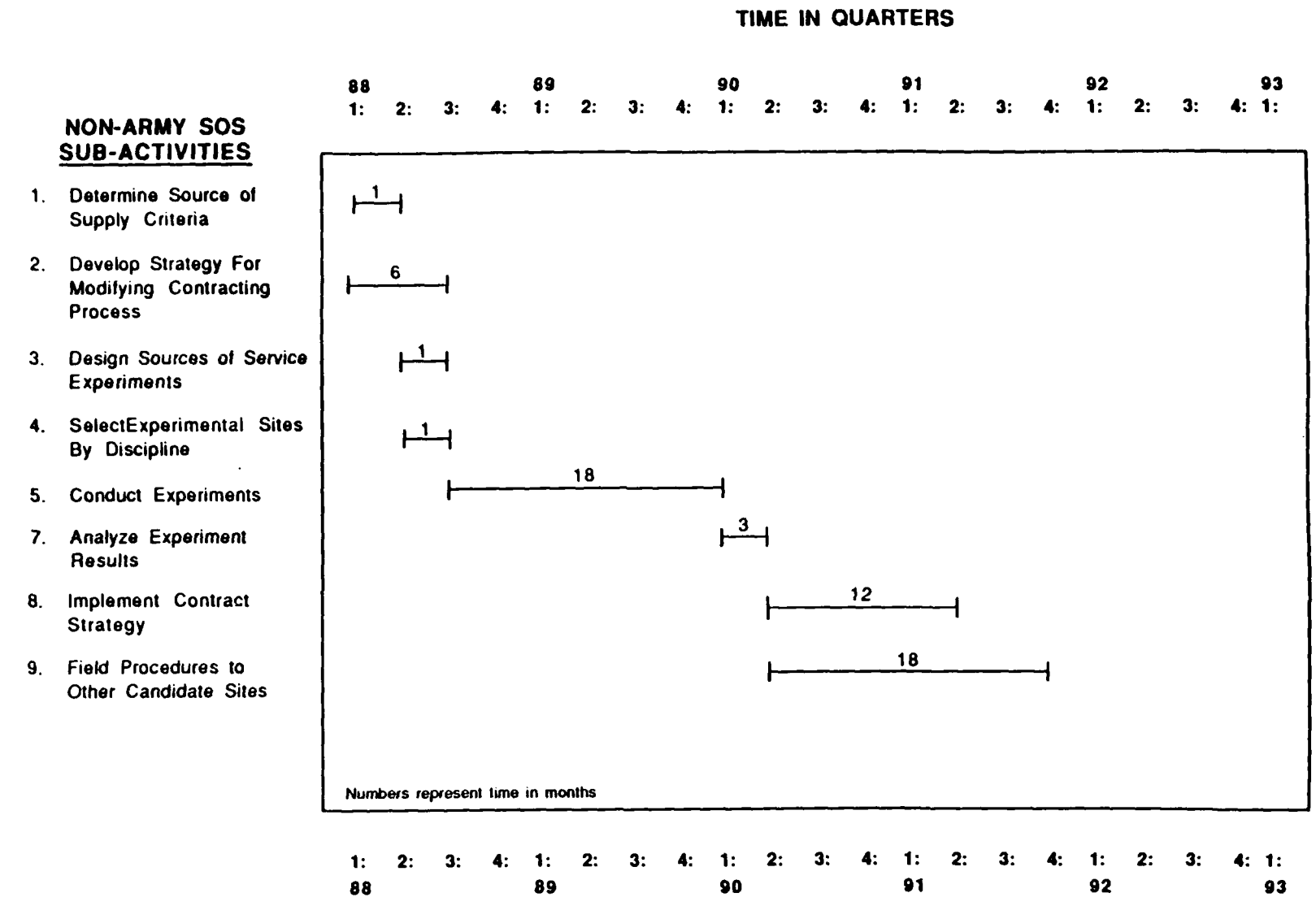
Vance recommends that the Army conduct a series of controlled experiments that are designed to yield data on whether obtaining IMA services from non-Army sources results in stated benefits. Vance identifies nine sub-activities that should be performed. Vance's completion time estimate for each sub-activity is provided in Figure 6-13. Vance recommends that the Army proponent oversee the activity, but that ISC or the Army organization responsible for CA studies perform most of the actual work.

6.2.2.1 Determine Source Of Supply Criteria. Vance recommends that the Army determine criteria that can be used to evaluate the results of the experiments and, subsequently, used to help design the experiments. The Army should also be able to use the criteria in the future to identify which IMA services should be bought from non-Army sources and which should be provided with Army assets. Vance recommends that the criteria include at least: cost, service level, federal regulations, politics, availability, competition, contracting reforms, mobilization requirements, and labor impacts. For each criteria determined, Vance recommends that the Army prepare a detailed description of each criteria and discuss how it can be used to evaluate appropriate sources of supply. Vance estimates that this sub-activity should take approximately one work month within three calendar months from the start of the activity.

6.2.2.2 Develop Strategy For Modifying Contracting Process. The current contracting techniques are a major obstacle which the Army must overcome before it can efficiently obtain information services from non-Army sources, Vance recommends that the Army take steps to modify its contracting procedures. As a first step, Vance recommends that the Army develop a strategy which addresses what the Army must do to modify the procedures. Issues that should be included in the strategy are: what approvals need to be obtained, what regulations need to be changed, are there any precedents within the Government in this area, are there standard contracting documents available that can be used, and can temporary changes be made to conduct experiments. The Army should use the completed strategy to help design the sources of services experiments. Vance estimates that this sub-activity should take approximately six work months from the start of the activity.

6.2.2.3 Design Sources Of Services Experiments. Vance recommends that the Army design experiments that will demonstrate the feasibility of buying IMA services from non-Army sources. The Army should design each experiment in some detail following standard experimental design techniques. The experimental design should incorporate the criteria and contracting strategy previously discussed. Additionally, Vance recommends that the Army make the experiments of sufficient length to ensure valid results. Vance estimates that this sub-activity should take approximately three work months beginning after the completion of sub-activity one.

6.2.2.4 Select Experimental Sites By Discipline. Vance recommends that the Army conduct the experiments for all of the IMA disciplines by selecting at least one site



Schedule For Non-Army Sources of Service Sub-Activities

Figure 6-13

for each disciplines. This will ensure that the Army can identify any advantages or disadvantages from the potential interactive effects of buying IMA services from multiple disciplines from non-Army sources. The experiments should include obtaining services from both other Government and private industry suppliers. Vance also recommends the selection of several sites to serve as a control group. Vance estimates that this sub-activity should take approximately three work months after the completion of sub-activity one.

6.2.2.5 Conduct Sources Of Services Experiments. During this sub-activity, the experiments designed above should be conducted. Vance recommends that the Army closely monitor the experiments and correct problems as they arise. Vance estimates that this sub-activity should take approximately 18 work months beginning after the completion of sub-activities three and four.

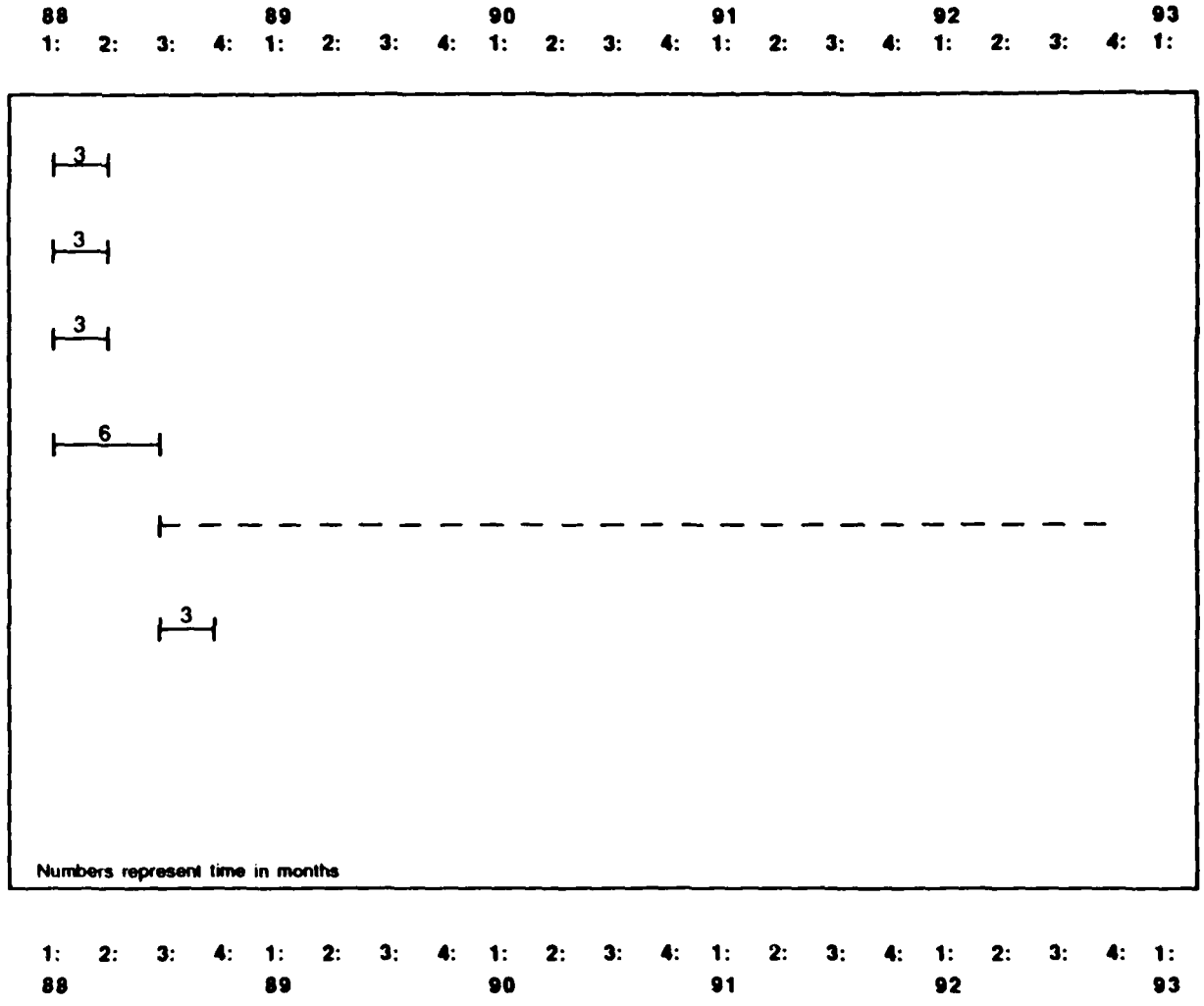
6.2.2.6 Analyze Experiment Results. Vance recommends that the Army periodically assess and analyze the results of the experiments. Vance also recommends that a formal data analysis be conducted at six month intervals. The data analysis techniques used should be a function of the criteria that are being measured; some criteria will require quantitative analysis techniques while other criteria will require qualitative analysis techniques. Vance estimates that this sub-activity should take approximately three work months beginning at the conclusion of the experimental period.

6.2.2.7 Implement Contract Strategy, If Feasible. If the results of the experiments indicate that buying IMA services from non-Army sources is feasible, then Vance recommends that the Army implement the strategy developed for modifying the contracting techniques. Vance recommends that the Army include as part of the implementation strategy, the development of standard contracts to facilitate the buying of services from private industry. Vance estimates that this sub-activity should take approximately 12 work months beginning after the completion of sub-activity seven.

6.2.2.8 Field Techniques To Other Candidate Sites, If Feasible. If the experimental results prove successful, Vance recommends that the Army begin fielding the techniques for buying IMA services from non-Army sources to all sites. A detailed fielding schedule should be prepared to ensure an orderly fielding effort. Vance also recommends the development of a non-Army source of service test, which should be used to determine which IMA services an installation should acquire from non-Army sources. Vance estimates that this sub-activity should take approximately 18 work months beginning after the completion of sub-activity seven.

6.2.3 Program Management Initiatives. This part of the implementation plan addresses several activities that should enable the Army to more easily complete the activities addressed in the first two parts of the implementation plan. The activities addressed in this part of the implementation plan are Marketing, Army IMA Revolving Fund, Cost Accounting, and Cost Recovery, and Training.

6.2.3.1 Marketing. Marketing refers to the selling of the concept of new information management techniques for IMA services to the rest of the Army, DoD, and Federal Government. Vance identifies six sub-activities that should be performed. Vance's completion time estimate for each sub-activity is provided in Figure 6-14. Vance recommends that the Army proponent perform most of the actual work.



Schedule For Marketing Sub-Activities

Figure 6-14

6.2.3.1.1 Army Proponent. Vance recommends that the Army identify a proponent for these new management techniques before any additional work is completed. Vance further recommends that the proponent be responsible for conducting the activities identified in this implementation plan. Vance estimates that this sub-activity should take approximately three work months from the start of the activity.

6.2.3.1.2 Steering Committee. Vance recommends that the Army charter a steering committee made up of senior Army managers to oversee the conduct of the activities of this implementation plan. Vance recommends that the steering committee be given the responsibility of resolving problems, turf battles, that arise and not be involved in the day-to-day management of the activities. Vance estimates that this sub-activity should take approximately three work months from the start of the activity.

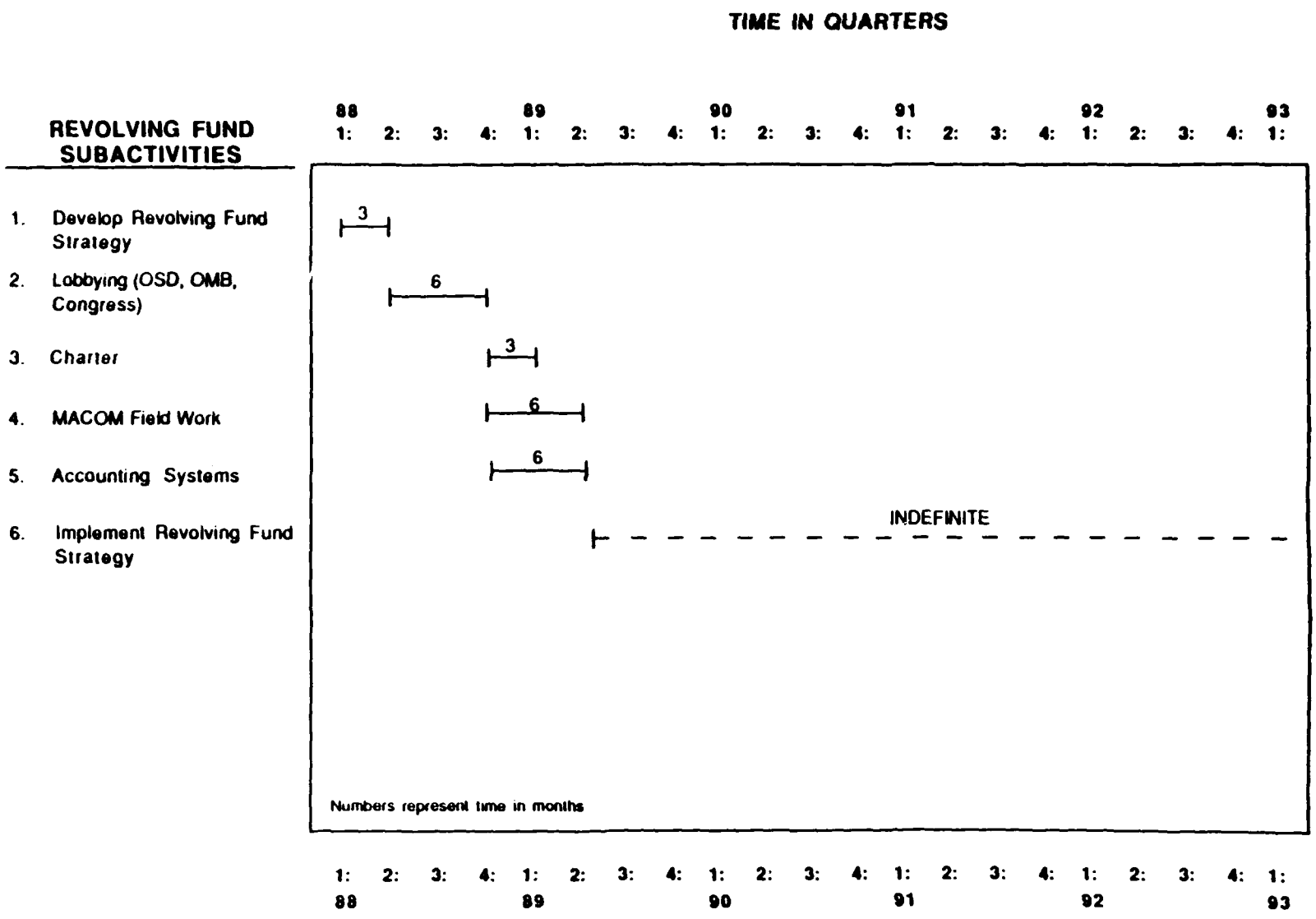
6.2.3.1.3 Project Transition. Vance recommends that Vance be required to provide a smooth, orderly transition of project information to the proponent, and that the proponent spend as much time as possible with Vance to ensure that the proponent has the benefit of all Vance's knowledge. Vance estimates that this sub-activity should take approximately three work months from the start of the activity.

6.2.3.1.4 Develop Marketing Plan. Vance recommends that the Army develop a marketing plan that consists of a strategy for gaining acceptance for the new management techniques from the users, providers, finance and accounting staff, senior Army management, OSD, OMB, and Congress. Vance recommends that the marketing strategy consist of meetings to attend, presentations to give, input to request, briefings to conduct, policy guidance to be given to the field, and a synopsis of efforts inside and outside of the Army to obtain services from alternative sources. The objective of the marketing plan should be to provide an open forum for discussion of the new management techniques and subsequent acceptance. Vance estimates that this sub-activity should take approximately six work months from the start of the activity.

6.2.3.1.5 Implement Marketing Plan. Vance recommends that the marketing plan developed during sub-activity four be implemented immediately. This sub-activity should be an on-going process.

6.2.3.1.6 Blue Ribbon Panel. Vance recommends that as part of the marketing strategy, the Army convene a panel of senior corporate officials and distinguished professors to discuss the proposed management techniques. The objective of this panel should be to obtain input from leaders experienced in the operation of similar management techniques. The panel should also be used to provide the opportunity for senior Army officials to discuss the concepts with the corporate officials on a one-to-one basis. Vance estimates that this sub-activity should take approximately three work months beginning with the completion of sub-activities one through three.

6.2.3.2 Army IMA Revolving Fund. This activity addresses the establishment of a revolving fund for managing the Army's IMA resources. Vance identifies six sub-activities that should be performed. Vance's completion time estimate for each sub-activity is provided in Figure 6-15. Vance recommends that the Army proponent oversee the activity, but that ISC and United States Army Finance and Accounting Command (USAFAC) perform most of the actual work.



Schedule For Revolving Fund Sub-Activities

Figure 6-15

6.2.3.2.1 Develop Revolving Fund Strategy. Vance recommends that the Army develop a detailed strategy for gaining acceptance from OSD, OMB, and Congress to use a revolving fund to manage the Army's sustaining base IMA resources. Vance further recommends that this strategy be developed after consultation with other agencies that have established a revolving fund and are thoroughly familiar with the process and politics. Vance estimates that this sub-activity should take approximately three work months from the start of the activity.

6.2.3.2.2 Lobbying (OSD, OMB, Congress). Vance recommends that part of the strategy consist of a lobbying effort to OSD, OMB, and Congress to gain their support informally before an official request is made for approval. Other agencies that obtained approval for revolving funds recommend this approach. Vance estimates that this sub-activity should take approximately six work months beginning with the completion of sub-activity one.

6.2.3.2.3 Charter. Vance recommends that after the initial lobbying efforts are complete and indicate that the Army has a chance for success, then the Army prepare a proposed revolving fund charter. Vance recommends that the Army draw on past work performed by ISC and other agencies as a base for the charter. Vance estimates that this sub-activity should take approximately three work months beginning with the completion of sub-activity two.

6.2.3.2.4 MACOM Field Work. MACOM field work is related to the development of the charter and consists of identifying all of the resources that will be included under the revolving fund. Vance recommends that the Army complete this sub-activity by having one group develop a model for identifying resources that can be followed by each MACOM. Using such an approach should enable the Army to speed up the identification process. Vance recommends that a detailed schedule be developed to ensure that this sub-activity is completed in a timely manner. Vance estimates that this sub-activity should take approximately six work months beginning with the completion of sub-activity two.

6.2.3.2.5 Accounting Systems. Since revolving funds can only be operated with special accounting systems, Vance recommends that the Army prepare a plan for developing and implementing the necessary accounting systems. Many of the accounting systems within AMC currently have cost accounting techniques and could be used for the revolving fund. However, the Army should realize that any cost accounting module is always part of an integrated accounting system and cannot be used by itself. Therefore, a complete change in accounting systems should be required. Vance recommends that the Army conduct additional research to identify specific accounting systems and techniques that should be changed for use in the IMA area. Vance estimates that this sub-activity should take approximately six work months beginning with the completion of sub-activity two.

6.2.3.2.6 Implement Revolving Fund Strategy. This sub-activity addresses implementing the strategy developed in sub-activity one, other than what is already addressed in sub-activities two through five. Vance is not able to provide a reasonable estimate for how long it could take to get a revolving fund approved and implemented (it will be a function of the level of support and the political environment).

6.2.3.3 Cost Accounting. This activity addresses what Vance recommends the Army do regarding the development and implementation of a cost accounting system for the IMA, needed regardless of whether or not a revolving fund is approved.

After discussions with USAFAC and AMC, Vance recommends that the Army not take any special steps to implement cost accounting techniques specifically for the IMA. Instead, the Army should wait until existing cost accounting efforts are completed (e.g., STANFINS-R) and tie into those systems. The Army will be able to use cost estimation techniques to calculate billing rates until such time the cost accounting systems are in place. It is Vance's opinion that it is not efficient to attempt to develop a special accounting system for the IMA and require all installations to have two accounting systems: one normally used on the installation and one used for the ISC components.

6.2.3.4 Capacity Planning. This activity addresses the establishment of a capacity planning capability for assisting in the rate calculation activities. Vance identifies two sub-activities that should be performed. Vance's completion time estimate for each sub-activity is provided in Figure 6-16. Vance recommends that the Army proponent oversee the activity, but that ISC perform most of the actual work.

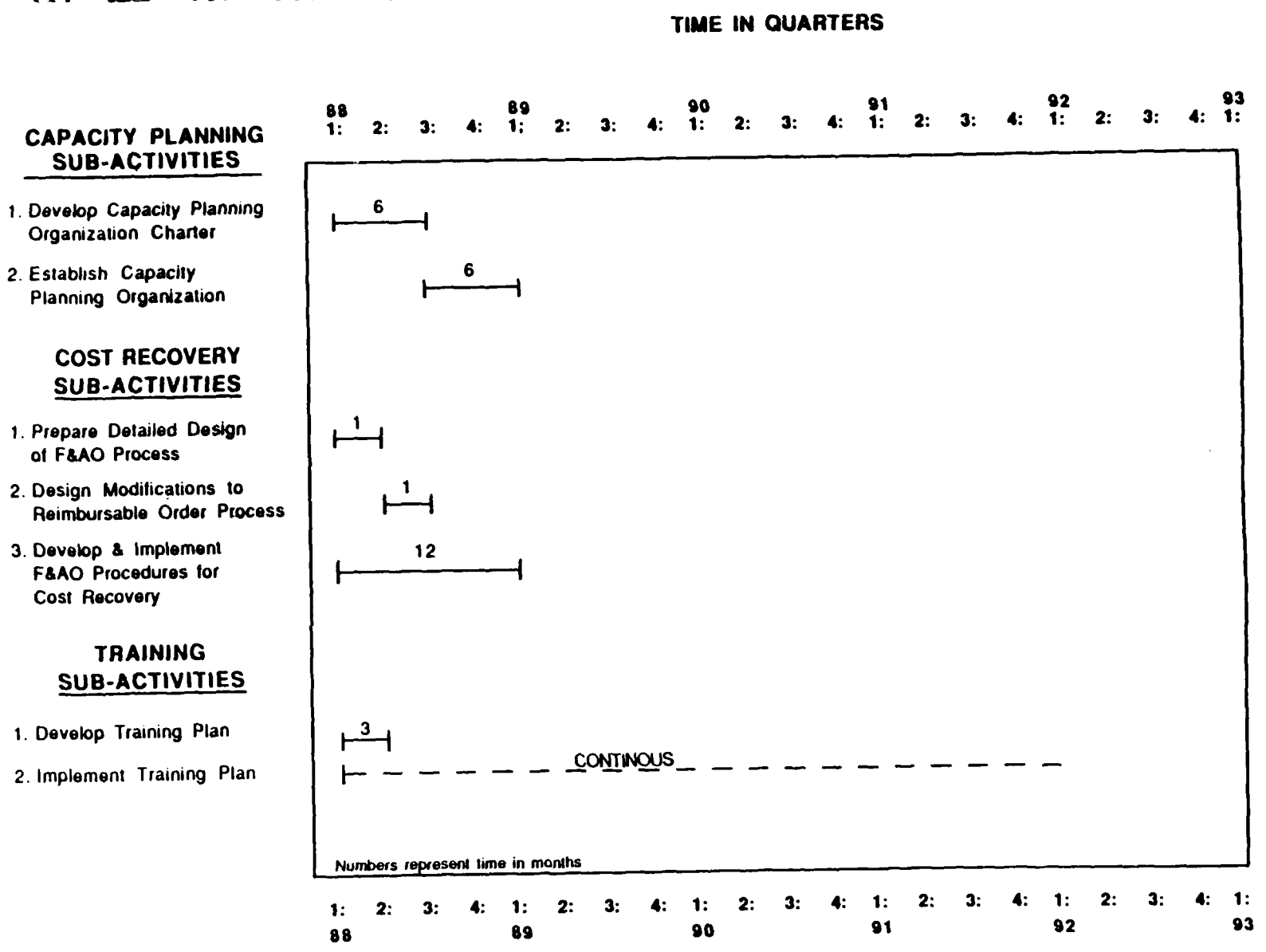
6.2.3.4.1 Develop Capacity Planning Capability Charter. Vance recommends that the Army develop a charter that specifies the purpose of the capacity planning capability, projected staffing level, and the MACOM in which it should belong. Vance also recommends that the Army develop a detailed schedule for establishing the capability. Vance estimates that this sub-activity should take approximately six work months after the start of the activity.

6.2.3.4.2 Establish Capacity Planning Capability. During this sub-activity the Army should establish the capacity planning capability. Vance estimates that this sub-activity should take approximately six work months beginning with the completion of sub-activity one.

6.2.3.5 Cost Recovery. This activity addresses what must be accomplished to develop and implement techniques to recover costs from the users if the use of a revolving fund is not approved. Vance recommends that the Army utilize the existing reimbursable order process as the base for cost recovery and modify it as necessary to ensure that it satisfies all of the requirements. Vance identifies three sub-activities that should be performed. Vance's completions time estimate for each sub-activity is provided in Figure 6-16. Vance recommends that the Army proponent oversee the activity, but that ISC and USAFAC perform most of the actual work.

6.2.3.5.1 Prepare Detailed Design Of F&AO Process For Reimbursable Orders. Vance recommends that the Army analyze and prepare a detailed design of the reimbursable order process. The objective of the analysis is to provide a clear understanding of the reimbursable order process so new techniques and modifications to existing techniques can be designed during sub-activity two. Vance anticipates that the new techniques and modifications to existing techniques will be needed to ensure that the process will work for IMA services. Vance estimates that this sub-activity should take approximately two work months within three calendar months arter the start of the activity.

6.2.3.5.2 Design Modifications To Reimbursable Order Process. Vance recommends that the Army design modifications to the reimbursable order process to support cost recovery for IMA services. The design should consist of modifications needed to existing procedures and new procedures. Vance also recommends that the Army develop a schedule for implementing the modifications. Vance estimates that this



Schedule For Capacity Planning, Cost Recovery, and Training Sub-Activities

Figure 6-16

sub-activity should take approximately two work months within three calendar months beginning with the completion of sub-activity one.

6.2.3.5.3 Develop And Implement F&AO Techniques For Cost Recovery. Vance recommends that the Army develop and implement the modified and new techniques according to the design and schedule develop during sub-activity two. Vance estimates that this sub-activity should take approximately 12 work months beginning with the completion of sub-activity two.

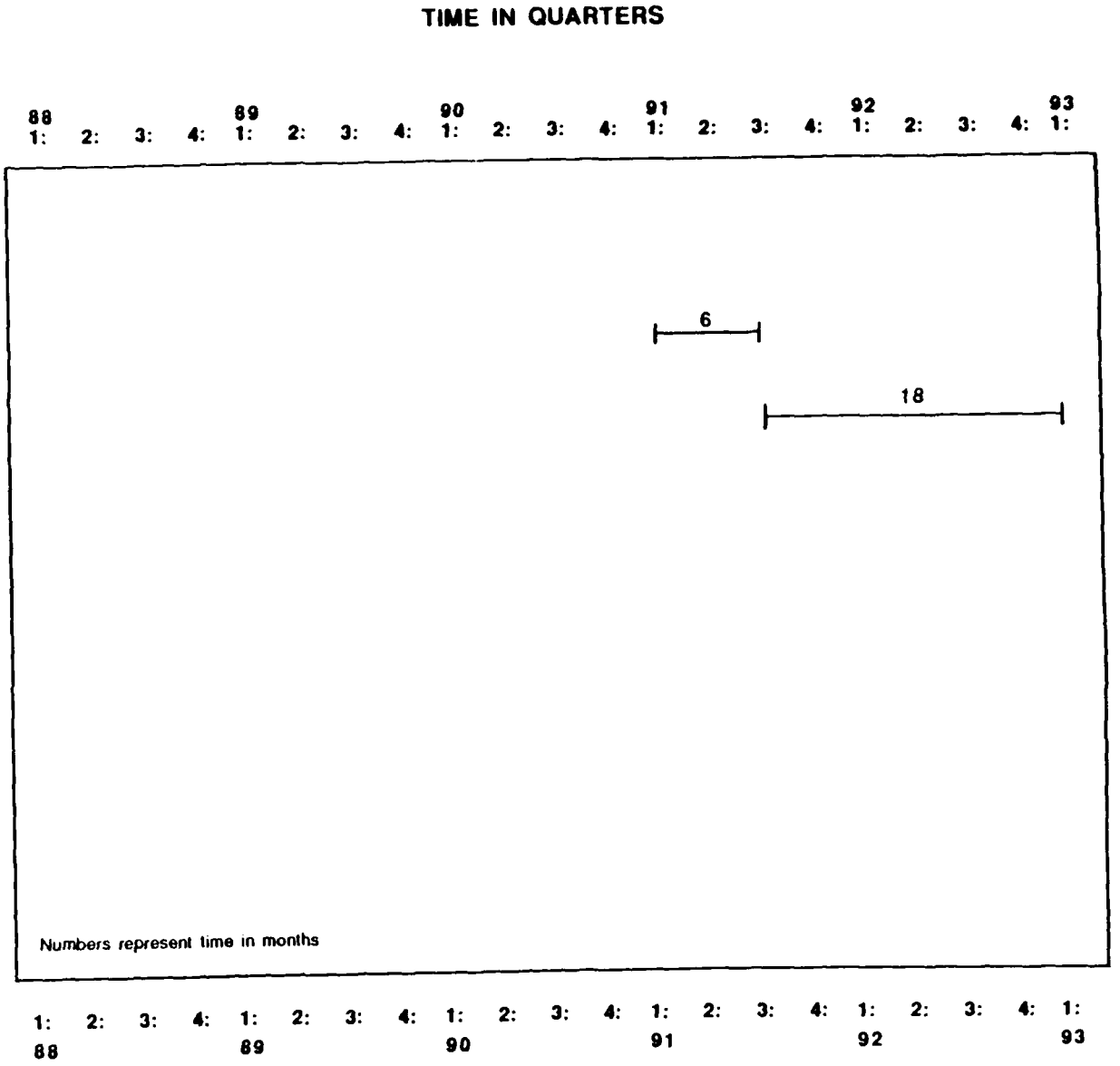
6.2.3.6 Training. This activity addresses what must be accomplished to provide adequate training in the new techniques to the field. Vance identifies two sub-activities that should be performed. Vance's completion time estimate for each sub-activity is provided in Figure 6-16. Vance recommends that the Army proponent oversee the activity, but that the training be performed through the normal Army training channels.

6.2.3.6.1 Develop Training Plan. Vance recommends that the Army develop a plan for training Army personnel in the use of the new management techniques. Personnel that will need to be trained are: technical and/or financial analysts in the DOIM organizations, financial clerks and analysts in the F&AOs, and users who will be required to budget and pay for the IMA services. The plan should include training classes needed and training schedules for each of the disciplines. Vance estimates that this sub-activity should take approximately three work months after the start of the activity.

6.2.3.6.2 Implement Training Plan. Vance recommends that the Army implement the training plan after it has been approved. Implementing the training plan should consist of designing and developing the training courses, conducting the training courses according to the schedule and on an as needed basis, and modifying the courses as required. This sub-activity should be an on-going process beginning after the completion of the first sub-activity.

6.2.4 Integration of Discipline Techniques. This part of the implementation plan addresses integrating the cost reporting and recovery techniques of the individual disciplines to take advantage of available economies of scale and avoid unnecessary duplication of effort. Vance recommends that the Army development teams always keep the objective of an integrated system in mind while they are developing and implementing the individual techniques. Vance identifies two activities that should be completed. Vance's completion time estimate for each sub-activity is provided in Figure 6-17. Vance recommends that the Army proponent oversee the activity, but that ISC perform most of the actual work.

6.2.4.1 Develop System Integration Plan. Vance recommends that the Army develop a comprehensive integration plan to migrate the individual systems into the integrated system described in Chapter 5. Vance also recommends that the Army revisit the concept of system integration after having several years experience with cost reporting and recovery with the individual systems, because practical experience may change the overall philosophy. The results of the specific implementations should be analyzed thoroughly before the system integration plan is developed. Vance further recommends that the Army consider integrating only those techniques that it believes will be beneficial in terms of cost, efficiency, and effectiveness. Vance estimates that this sub-activity should take approximately six work months after the first quarter of FY91.



Schedule For System Integration Sub-Activities

Figure 6-17

6.2.4.2 Implement Plan. During this activity the Army should implement the plan developed during sub-activity one. Vance estimates that this sub-activity should take approximately 18 work months beginning with the completion of sub-activity one.

SECTION 7. DETAILED DESIGN

The purpose of this section is to provide a detailed design of the new management techniques discussed in Section 5, the Conceptual Design. This section provides the detailed design on how IMA services can be obtained from non-Army sources, the responsibilities and procedures of the Army providers, and the responsibilities and procedures of the users.

This section focuses on designing the establishment of a buyer/seller relationship with respect to the utilization of all IMA services. This relationship is established when the user is able to access the universe of providers and when the providers can report and recover the cost of the resources used to provide the service. This section discusses and provides a detailed design of the following: the IMA environment after the Army implements Vance's recommendations; the techniques for obtaining IMA services from non-Army sources; the techniques for the Army providers to report and recover costs including structural elements and rate calculation and billing activities; and the procedures for users to forecast usage and budgeting requirements and to pay for IMA services.

7.1 IMA Environment

Vance recommends that the Army reconsider how it manages and provides IMA services in support of the sustaining base. The recommendations consist primarily of decentralizing who budgets and pays for the services and providing users the opportunity to obtain services from the best source. As a result of the recommendations, Vance envisions the Army managing the IMA environment as depicted in Table 7-1.

Table 7-1 consists of the following information:

- The type of service available within each discipline of the IMA.
- The organization that should be responsible for setting Army policy regarding the acquisition and use of the services.
- The organization or organizational level that should be responsible for defining the service requirements.
- The organization or organizational level that should be responsible for (1) budgeting for funds to acquire and pay for the services and (2) making the actual payment for the use of the services.
- The level at which management of the physical resources that are used to provide the IMA services should be performed.
- The recommended sources that the Army users should have for buying sustaining base IMA services or receiving strategic and tactical IMA services.

Vance separated the services in Table 7-1 into the disciplines and type of service within each discipline. The entries in the column labeled services have the following meanings.

- Telecommunications Services

SERVICE	POLICY SETTING	REQUIRMENTS DETERMINATION	BUDGET & PAY FOR SERVICE UTILIZATION	MGT OF RESRCS USED TO PRVD SERVICES	SOURCES OF SUPPLY		
					PRIVATE	OTHER GOVT	ARMY
TELECOMMUNICATIONS							
LOCAL (Voice/Data)	DISC4	LOCAL	LOCAL	NON-CENTRAL	X	X	X
LONG-HAUL:							
AUTOVON:							
DCS/BASIC SERVICES	DCA/JCS	ISC FOR DCA	ISC	CENTRAL			X(DCS)
INSTRUMENTS	DISC4	LOCAL	LOCAL	CENTRAL	X	X	X
FTS	DISC4	N/A	N/A	N/A	N/A	N/A	N/A
OTHER (e.g., WATS)	DISC4	LOCAL	LOCAL	NON-CENTRAL	X	X	X
TCC (AUTODIN):							
DCS/BASIC SERVICES	DCA/JCS	ISC FOR DCA	ISC	CENTRAL			X(DCS)
TERMINAL ACCESS	DISC4	ISC/LOCAL	ISC/LOCAL	CENTRAL			X
OTHER:							
E-MAIL (DDN):							
TODAY	DISC4	DISC4	DISC4	CENTRAL			X
FUTURE	DISC4	MACOM/LOCAL	MACOM/LOCAL	CENTRAL			X
EMAIL	DISC4	LOCAL	LOCAL	NON-CENTRAL	X		
SECURE SERVICES:							
VOICE	DISC4	ISC	ISC	CENTRAL		X	X
DATA	DISC4	ISC	ISC	CENTRAL		X	X
FACSIMILE	DISC4	LOCAL	LOCAL	NON-CENTRAL	X	X	X
TELECONFERENCING	DISC4	LOCAL	LOCAL	NON-CENTRAL	X	X	X
PAGERS	DISC4	LOCAL	LOCAL	NON-CENTRAL	X	X	X
RADIOS	DISC4	LOCAL	LOCAL	NON-CENTRAL	X	X	X
MOBILE TELEPHONE	DISC4	LOCAL	LOCAL	NON-CENTRAL	X	X	X
OTHER	DISC4	LOCAL	LOCAL	NON-CENTRAL	X	X	X
PRINTING							
AR/FORMS/BASIC SERVICES	DISC4	DA PROPONENT	DA PROPONENT	CENTRAL			X
AR/FORMS EXTRA REQUIREMENTS	DISC4	LOCAL	LOCAL	CENTRAL	X	X	X
OTHER	DISC4	LOCAL	LOCAL	NON-CENTRAL	X	X	X

Customer Identification and IMA Service Supply Options

Table 7-1

SERVICE	POLICY SETTING	REQUIREMENTS DETERMINATION	BUDGET & PAY FOR SERVICE UTILIZATION	MGT OF RESRCS USED TO PRVD SERVICES	SOURCES OF SUPPLY		
					PRIVATE	OTHER GOVT	ARMY
VISUAL INFORMATION							
GENERAL PURPOSE	DISC4	LOCAL	LOCAL	NON-CENTRAL	X	X	X
TASC	TRADOC	TRADOC	TRADOC	NON-CENTRAL	X	X	X
OTHER SPECIAL PURPOSE	DISC4	LOCAL	LOCAL	NON-CENTRAL	X	X	X
RECORDS MANAGEMENT	DISC4	LOCAL	LOCAL	NON-CENTRAL	N/A	N/A	N/A
MAIL	OSD	LOCAL	LOCAL	CENTRAL	X	X	
LIBRARIES							
TECHNICAL	DISC4/DA PROPONENT	PROPONENT MACOM	PROPONENT MACOM	N/A	N/A	N/A	N/A
GENERAL PURPOSE	DISC4/DCSPER	LOCAL	LOCAL	N/A	N/A	N/A	N/A
AUTOMATION							
USE:							
TIER 1&2 STAMMIS (STANDARD RUNS, MULTI-COMMANDS)	DISC4/HQDA	DA PROPONENT	DA PROPONENT	CENTRAL			X
TIER 1&2 (EXTRA RUNS, MULTI-COMMANDS)	DISC4/HQDA	LOCAL	LOCAL	CENTRAL			X
TIER 1&2 STAMMIS (STANDARD SINGLE-COMMAND)	DISC4/HQDA	MACOM	MACOM	CENTRAL			X
TIER 1&2 (EXTRA RUNS, SINGLE-COMMAND)	DISC4/HQDA	LOCAL	LOCAL	CENTRAL			X
TIER 1&2 (UNIQUE)	DISC4/HQDA	MACOM/LOCAL	MACOM/LOCAL	NON-CENTRAL	X	X	X
TIER 3	DISC4/HQDA	MACOM/LOCAL	MACOM/LOCAL	NON-CENTRAL	X	X	X

Customer Identification and IMA Service Supply Options (Cont'd)

Table 7-1

SERVICE	POLICY SETTING	REQUIREMENTS DETERMINATION	BUDGET & PAY FOR SERVICE UTILIZATION	MGT OF RESRCS USED TO PRVD SERVICES	SOURCES OF SUPPLY		
					PRIVATE	OTHER GOVT	ARMY
SOFTWARE DEVELPMENT:							
TIER 1&2 STAMMIS (MULTI-COMMANDS)	DISC4/HQDA	DA PROPONENT (PEO/PM)	DA PROPONENT (PEO/PM)	CENTRAL	X	X	X
TIER 1&2 STAMMIS (SINGLE-COMMANDS)	DISC4/HQDA	MACOM	MACOM	CENTRAL	X	X	X
TIER 1&2 (UNIQUE)	DISC4/HQDA	MACOM/LOCAL	MACOM/LOCAL	NON-CENTRAL	X	X	X
TIER 3	DISC4/HQDA	MACOM/LOCAL	MACOM/LOCAL	NON-CENTRAL	X	X	X
SOFTWARE MAINTENANCE:							
TIER 1&2 STAMMIS (MULTI-COMMANDS)	DISC4/HQDA	DA PROPONENT (PEO/PM)	DA PROPONENT (PEO/PM)	CENTRAL	X	X	X
TIER 1&2 STAMMIS (SINGLE-COMMANDS)	DISC4/HQDA	MACOM	MACOM	CENTRAL	X	X	X
TIER 1&2 (UNIQUE)	DISC4/HQDA	MACOM/LOCAL	MACOM/LOCAL	NON-CENTRAL	X	X	X
TIER 3	DISC4/HQDA	MACOM/LOCAL	MACOM/LOCAL	NON-CENTRAL	X	X	X

Customer Identification and IMA Service Supply Options (Cont'd)

Table 7-1

- oo Local (Voice/Data) refers to local telephone services and includes instruments.

- oo Long-haul refers to those services provided by ARCCO. Specific examples addressed are Autovon (basic services required for DCS and instruments), FTS, and other (e.g., WATS and other commercial long-haul services).

- oo TCC (Autodin) refers to the Autodin message service and is subdivided into DCS/basic services and terminal access.

- oo Other refers to a variety of services including: Defense Data Network (DDN) E-Mail for today and the future, regular E-Mail, secure services both voice and data, facsimile, teleconferencing pagers, radios, mobile telephone, and other miscellaneous services.

- o Printing Services

  - oo Army forms/basic services refers to the Army publications that are required for each installation.

  - oo Army forms extra requirements refers to the requests for publications over and above the amount required.

  - oo Other refers to any of the other types of printing that the Army does at a departmental or local level.

- o Visual IMA services

  - oo General purpose refers to the basic services normally provided in the visual information discipline (see discussion in Section 7.3.1.1.7.8).

  - oo TASC refers to the visual information activities under Training and Doctrine Command (TRADOC).

  - oo Other special purpose refers to visual information services that are a one-time need.

- o Records management refers to all records management services.

- o Mail refers to all mail services.

- o Library Services

  - oo Technical refers to special purpose libraries such as tape libraries or electronic libraries.

  - oo General purpose refers to the standard libraries that house books and other documents.

- o Automation Services

  - oo Use refers to the utilization of the hardware and software as follows: use of a multi-command STAMMIS at the Tier 1 and 2

levels at the standard amount dictated by the STAMMIS proponent, use of a multi-command STAMMIS at the Tier 1 and 2 levels above the standard amount, use of single-command STAMMIS at the Tier 1 and 2 levels at the standard amount dictated by the STAMMIS proponent, use of single-command STAMMIS at the Tier 1 and 2 levels above the standard amount, use of Tier 1 and 2 services unique to a local installation, and use of Tier 3 hardware and software.

- oo Software development refers to developing multi-command STAMMIS' at the Tier 1 and 2 levels, developing single-command STAMMIS' at the Tier 1 and 2 levels, developing installation unique applications at the Tier 1 and 2 levels, and developing Tier 3 applications.

- oo Software maintenance refers to maintaining multi-command STAMMIS at the Tier 1 and 2 levels, single-command STAMMIS at the Tier 1 and 2 levels, installation unique hardware and software at the Tier 1 and 2 levels, and Tier 3 hardware and software.

The entries in the column labeled policy setting have the following meanings.

- o DISC4 refers to the Director for IMA services, Command, Control, Communications, and Computers.

- o DCA/JCS refers to the Defense Communications Agency and Joint Chiefs of Staff.

- o The other entries are self explanatory.

The entries in the column labeled requirements determination have the following meanings.

- o Local refers to the users being responsible for determining their own requirements.

- o ISC for DCA refers to ISC being responsible for determining the requirements for the Defense Communications Agency.

- o ISC/local or MACOM/local refers to either group being given the responsibility.

- o DA Proponent refers to the proponent of the system having the responsibility.

- o PEP/PM refers to the Program Executive Officer or Program Manager of the system having the responsibility for determining the requirements. Vance includes the PEOs and PMs here based on the recent reorganization within the Army which resulted in all of the PEOs and PM moving from ISEC to the Army Acquisition Executive. Several Army managers have indicated that beginning with the first quarter FY88, the PEOs and PMs will be given the funding for major system development. Once they have the funding, the PEOs and PMs will be required to buy software development and maintenance services from ISEC or another

source. Therefore, the PEOs and PMs will provide input in determining the requirements.

- o TRADOC refers to TRADOC having the responsibility for determining the requirements for the TASCs.

The entries in the column labeled budget and pay for service utilization have the same meanings as when used in the column labeled requirements determination.

The entries in the column labeled management of resources used to provide services have the following meanings.

- o Non-central refers to decentralized management of the resources, such as at the MACOM or installation level.

- o Central refers to centralized management of the resources, such as at the ISC or DISC4 level.

The entries in the column labeled sources of service indicate from which source of service Vance recommends that the Army obtain IMA services. For most of the entries Vance recommends that the Army consider all sources, and choose whichever source is the best in terms of cost and performance.

7.2 Techniques For Obtaining Services From Non-Army Sources

Vance recommends that the Army develop and implement techniques that will permit users to obtain IMA services from non-Army sources (i.e., other Government agencies or private industry) if they are a better source for the services than the Army. The techniques that Vance recommends the Army use are presented in this subsection in three parts: general techniques that the Army should use, techniques that the Army providers (ISC) should use, and techniques that the Army users should use.

7.2.1 General Techniques. Vance recommends that the Army implement several general techniques to permit Army users to obtain IMA services from non-Army sources: new contracting procedures and standard contracts. The new contracting procedures consist of permitting the use of BOAs and/or requirements contracts with private industry suppliers, and work order requests with other Government agencies. The new procedures must permit the Army to rigidly enforce service quality without extensive delays in time. Vance also recommends that the Army identify the DOIMs that will be issuing a large number of BOAs and requirements contracts. Once identified, Vance recommends that the Army provide each DOIM with a contracting officer to help the DOIM negotiate and establish contracts.

Vance recommends that the Army use the concept of standard contracts to facilitate the use of BOAs and/or requirements contracts. One or more standard contracts should be developed at the Army-wide level and should be usable at most all Army locations. The standard contract will enable an Army contracting office to decrease the procurement time in getting access to an IMA service supplier. The new contract procedures must permit the use of standard contracts.

7.2.2 Provider Techniques. Vance recommends that the Army implement the following techniques to enable Army providers (DCSIMs and DOIMs) to make non-Army sources for IMA services available to users. First, the providers should be

responsible for determining which services should and can be provided from non-Army sources. The providers should accomplish this by using the criteria defined in Section 6, such as periodically analyzing the requirements of the users and the availability of non-Army suppliers. The providers should also solicit input from the users regarding services that they are aware are available from non-Army sources.

Second, for all other Government suppliers identified, Vance recommends that the Army providers be required to establish the buyer-seller relationship between the provider's installation and the other Government facility. This relationship should consist of at least the required service levels, tariff structure, reporting requirements, billing requirements, payment schedule, payment process, and sign-up procedures.

Third, for each buyer-seller relationship established with another Government supplier, Vance recommends that the Army provider be required to develop a set of operational procedures describing how a user utilizes the Government supplier. These procedures should be comprehensive and permit the user to quickly obtain services once they have approved funding.

Fourth, Vance recommends that the Army providers be required to use standard contracts developed by HQDA, ISC or one of its FOAs, or other MACOMs to establish BOAs or requirements contracts with private industry suppliers. These contracts should be for an indefinite quantity of services and Army users should be able to quickly obtain services by issuing a task order under the contract.

Fifth, Vance recommends that the Army providers be required to develop a set of operational procedures describing how a user utilizes one of the BOAs or requirements contracts. These procedures should be comprehensive and permit the user to quickly obtain services once they have approved funding.

Sixth, Vance recommends that the Army require users to consult with the Army providers prior to selecting a non-Army supplier. This will enable the Army to ensure that the users consider all criteria and select the best source of service and not conduct a partial analysis.

Seventh, Vance recommends that the Army providers be required to help users solve problems in quality or timeliness of delivery. The providers should only become involved after the users have exhausted all avenues of corrective action available to them, such as direct discussion with the supplier.

7.2.3 User Techniques. Vance recommends that the Army implement the following techniques to enable Army users to acquire IMA services from non-Army sources. First, Vance recommends that the users be required to plan for and determine their own requirements. This process should take place in concert with and as part of the preparation of the Information Management Master Plan (IMP) and Program Objective Memorandum (POM). The providers should provide as much assistance as possible to the users because most Army users have little experience in defining their requirements.

Second, Vance recommends that the users be required to budget for their planned consumption of services supplied by non-Army sources. The budgeting for IMA services should take place as part of the existing PPBES process, just as should budgeting for services supplied by Army facilities. The providers should provide the users as much information as is available to help them estimate the costs.

Third, Vance recommends that the users be required to work with the DCSIMs and DOIMs in determining the best source for services. Since the DCSIMs and DOIMs are the information managers for the MACOMS and installations they should have considerable input into the selection process. However, the users should have the final say regarding the source since they will be responsible for payment.

Fourth, Vance recommends that the users be required to follow the procedures developed by the providers when obtaining services from non-Army sources. These procedures should be the most efficient and legal way for the users to obtain the services.

Fifth, Vance recommends that the users be required to monitor the performance of the non-Army supplier and, when necessary, take whatever corrective action is within their power to take. Only after the user has made every attempt to correct a problem, should the DCSIM or DOIM be requested to take corrective action.

Fifth, Vance recommends that the users be required to authorize receipt of and make payment for the services received. This should eliminate as many "middlemen" as possible between buyer and seller and help ensure that the relationship is responsive.

7.3 Army Providers

This sub-section addresses the detailed design of the new techniques that Vance recommends the Army providers utilize to manage the resources used to provide IMA services. The new techniques consist of structural elements, rate-calculation activities, and billing activities. Vance recommends that the Army providers use these new techniques to report and recover the costs of providing IMA services.

7.3.1 Structural Elements. The structural elements are the resources, services, and work areas. Services are the bases used to determine how the costs of the information resources are allocated to, and recovered from, the users of those services. Work areas are mechanisms for tracking the costs of the information facility and providing senior management the information required to better manage that facility. Resources are information assets (people, equipment, software, space occupancy, supplies, contracts, and overhead) that an organization wants to manage.

Since it is critical to modify the structural elements as needed, it is not possible nor logical to identify a fixed set of structural elements. However, it is possible and logical to identify a set of structural elements that should be used for cost reporting and recovery. The latter is what Vance includes in this section.

The structural elements that Vance recommends are based, in part, on the implementation plan. Should the Army decide to develop and implement the new management techniques differently than recommended in the implementation plan, some of the recommended structural elements may need to be modified.

7.3.1.1 IMA Resources. The major categories of resources used to provide IMA services will not generally differ by IMA discipline. Further, the Army management and control of resource groups should be similar across the IMA disciplines and services. However, different categories of resources generally need to be managed and controlled differently. Therefore, the Army resources to be managed are described for each of the eight basic categories of information resources as defined in FGAP 4. Following the discussion of the resource categories is Vance's

recommendation on how the Army should change its resource tracking to better collect and monitor cost data.

7.3.1.1.1 Personnel. The personnel resource category should include funded and unfunded costs of regular salaries, overtime, and fringe benefits for civilian and military persons who manage and perform functions related to providing IMA services. This includes the development and upkeep of computer software, operation and management of in-house IMA facilities, data preparation, electronic output reproduction and distribution, equipment maintenance and contract management. It also includes persons performing custodial services, security, and building maintenance related to the IMA facilities. Furthermore, the personnel cost category should also include other personnel-related costs for training, travel, and recruiting. Military personnel costs, including pay and allowances, retirement accrual, subsistence allowances and temporary duty per diem, should continue to be paid from the Military Personnel, Army (MPA); National Guard Personnel, Army (NGPA); and Reserve Personnel, Army (RPA) appropriations.

The personnel resource category should include all of the following elements of resources (EORs).

EOR-Codes	Definition
1100	Civilian Pay Full-Time Permanent & Military Pay
1200	Civilian Benefits Full-Time Permanent & Military Benefits
1400	Civilian Pay, Full-Time Temporary
1500	Civilian Benefits, Full-Time Temporary
1600	Civilian Pay, Part-Time
1700	Civilian Benefits, Part-Time
1800	Civilian Pay, Intermittent
1900	Civilian Benefits, Intermittent
2100	Travel and Transportation
2800	Contractual Personnel, Indirect Hire Foreign Nationals

7.3.1.1.2 Space Occupancy. The Space Occupancy resource category should involve funded and unfunded costs for: (1) rental, lease, and depreciation of buildings and general office furniture; (2) building maintenance, (3) utilities; and (4) custodial services and security. All space occupancy costs that are currently funded in the users' appropriations through the real property management activity (RPMA) accounts should be included in the cost reporting and recovery techniques. Specifically, the major account groupings within RPMA, by "letter" account, are:

.J - Operation of utilities
.K - Maintenance and repair of real property
.L - Minor construction
.M - Engineer support (miscellaneous services, such as custodial)

The Space Occupancy resource category will include all of the EORs listed below.

EOR-Codes	Definition
23--	Rents, Communications, and Utilities, including contracted management and facility support maintenance on installation equipment, etc.

2310	Rents/Leases from GSA
2320	Rents/Leases From Other than GSA
2330	Communications
2340	*Purchased Utilities*
2570	Purchased Services - Other (includes facility maintenance)
3210	Site Construction/Modification for Automated Systems

7.3.1.1.3 Supplies. Supplies should consist of all expenditures for noncapital office supplies and general- and special-purpose materials related to the IMA disciplines. Special-purpose supplies are those prepared for one or a few applications. For example, ADP tapes and disk packs may be considered either in the Supplies or Equipment resource category. The Equipment category is recommended where the inventory value is large enough to distort costs if expensed in a given accounting period.

The supplies resource category should include all of the following EORs. Supplies in general are expensed in object class 26-- (Supplies and Materials). The fourth position of the EOR specifically identifies ADP expenses as follows:

- o N - Magnetic tapes, disk packs and software less than $25,000
- o P - ADP maintenance
- o Q - All other ADP supplies

7.3.1.1.4 Contracted Services. The Contracted Services resource category should include expenditures and contracting expenses for:

- o Technical and consulting services for agency-operated facilities and equipment, including equipment maintenance; security and custodial services; advice on the custodial services; and advice on the acquisition, selection, and use of facilities or software.

- o Computer system services and off-line-equipment services such as key data entry and report reproduction.

- o Analysis, design, programming, documentation, and testing for development, modification, conversion, and upkeep of computer software.

- o Data communications network services, associated telecommunications line charges, channel lease and rental, equipment rental, equipment rental and maintenance, and telecommunications system analysis and design.

- o Requirements contracts for any IMA discipline: local and long-haul telephone services; pagers, radio, mobile telephone, and other telecommunications services; printing and publications services; visual IMA services; and mail services. Records management and libraries should be direct funded to ISC who will provide the services.

The Contracted Services resource category should include all of the following EORs.

EOR-Codes	Definition
2400	Printing and Reproduction
2500	Other Contractual Services
2510	Purchased Equipment Maintenance
2520	Purchased Automation Services (Non-Government Sources)
2540	Contract Consultants and Studies
2550	Professional Management Services

7.3.1.1.5 Intra-Agency Service or Overhead. This resource category should include the costs of normal agency support services and overhead, either billed or allocated, and the costs of central management, policy and procurement services.

The Intra-Agency resource category should include the following EORs.

EOR-Codes	Definition
2530	Purchased Automation Services - Within Government
2330	Communications for All Telecommunications
25--	Other Contractual Services

7.3.1.1.6 Inter-Agency Services. This resource category should include the resources received from other governmental agencies or organizational elements for those expenses cited in Subsection 7.2.1.1.4, Contracted Services.

7.3.1.1.7 Equipment. The Equipment resource category should include the nonrecurring expenditures for acquisition and recurring costs for rental, leasing, and depreciation (pro rata acquisition cost) of all the IMA discipline's equipment. The equipment resource category should include all of the following EORs.

EOR-Codes	Definition
31--	Equipment, include purchase of equipment with ADP equipment explicitly identified by the letters D-G in the fourth position
2320	Rents/Leases other than GSA
232D	Hardware-Punchcard Machines

The following subsections discuss the equipment for each major category of IMA services.

7.3.1.1.7.1 ASIMS Equipment. Vance recommends that the Equipment resource category should include the following ASIMS equipment, IBM-compatible AMDAHL computers, provided at the RDC's Government Owned, Contractor Operated (GOCO) facilities, and the installations' IBM 43XX series computer acting as remote job entry devices which interface with the RDCs.

7.3.1.1.7.2 Local Automation Equipment. The Army's non-ASIMS, automation equipment that should be incorporated into the Equipment resource category includes a wide variety of mainframe, mini-, and micro-computers; front-end processors; multiplexors; other network gateway devices; LANs; and various terminals and other peripherals.

The Equipment resource category should include all of the equipment identified in the ARPMIS data base maintained by ISC. The following are the types of local automation equipment that belongs under the control of IMA cost reporting and recovery techniques. This list should not be considered all inclusive as project limitations may have restrained the identification of all equipment.

- o All IBM mainframe computers, generally in the 4300 series, which are the most common installation processors.
- o Sperry Univac equipment used to provide large-scale centralized service at USAFAC, RDAISA, and numerous other sites.
- o The National Guard Burroughs equipment.
- o The CDC Cyber equipment which provides training supported by operating PLATO software.

In spite of official policy, the transition of equipment to ISC ownership and operation is not complete. For example, at Ft. Belvoir, equipment for the Research and Development Center Topographical Labs, Facilities Engineering Support Agencies, and others are not under DOIM control. Vance recommends that as this equipment is brought under the IMA, it come under the purview of IMA cost reporting and recovery techniques and included under the equipment resource category.

7.3.1.1.7.3 ARCCO Equipment. The Equipment resource category should include all of the equipment resources, whether leased or purchased, associated with providing long-haul services. All the resources which are centrally procured and managed by DCA should also be included. Much of the services in the telecommunications discipline is contract provided and should be included under the Contracted Services resource category.

7.3.1.1.7.4 Local Telephones. Most local services, as well as dedicated and commercial long-haul services, are provided on public telephone networks. The Army does, however, own and operate most of the telecommunications equipment residing on its installations. Most notable are the local PBXs which provide access to and switching for the installations. These are, for the most part, older relay-based switches without techniques for software-based configuration or metering. The older Government-owned mechanical PBXs, are being replaced in phases by newer computer-based switches. The Equipment resource category should include both the old and, as the old is replaced with the newer switches, the new equipment.

7.3.1.1.7.5 Other Telecommunications Equipment. The Equipment resource category should include the following types of other telecommunications equipment.

- o A wide variety of equipment used at the TCCs.

- o The LANs which are rapidly growing with the proliferation of microcomputers.

- o All of the other wide variety of telecommunications equipment which is owned, maintained, and operated by ISC including: non-tactical radio, high frequency radio transmitters, FAX devices, beepers and pagers, and satellite transmission facilities.

7.3.1.1.7.6 APPA Printing and Publications Equipment. The great majority of departmental printing and publication services are provided by non-government sources; and, therefore, there is little Army-equipment employed in this printing. The services provided by the 400-S contract are provided by a non-government source. The majority of the equipment used in departmental printing and publications is used for automated warehouse retrieval and distribution. For example, the Baltimore regional center has a multi-million dollar investment in such automatic equipment as wire-guided fork-lifts, "robot" material transports, automatic mail sorters, a variety of shrink-wrap and other packaging equipment, and postage metering devices. The Equipment resource category should include all of this equipment.

7.3.1.1.7.7 Local Printing and Publications Equipment. the Equipment resource category should include all of the equipment associated with the local print plants. With the recommendation towards optional sources of services, Vance believes that only a small amount of printing and publications equipment will need to be controlled and managed by IMA cost reporting and recovery.

7.3.1.1.7.8 Visual Information Equipment. Although many of the visual information service activities are provided by non-Army sources, there is an extensive variety of services provided within this discipline and equipment used to provide those services is included on ISC's inventory. Figure 7-1, extracted from AR 108-2, lists the major service categories in which visual information equipment exists. The Equipment resource category should include all of this equipment.

7.3.1.1.8 Software. The Software resource category should include the non-recurring expenditures for rental, leasing, and depreciation (pro rata acquisition cost) of all types of software--operating, multipurpose, and application. The Software resource category should include all of the following EORs.

EOR-Codes	Definition
232E	Software for Computers and Peripherals, also includes leasing of software
31-H	Equipment - ADP software, includes software purchase

7.3.1.1.9 Changes to Army IMA Resource Expense Tracking. In support of the implementation of these new management techniques, Vance recommends that the Army change its resource tracking to enable the collection and monitoring of cost data required for implementing IMA cost reporting and recovery. Most of these changes may be accomplished through restructuring of Army Management Structure Code (AMSCO) elements. Specifically the Army should:

AUDIO VISUAL SERVICE

Management (Type A)
Still Photography
Motion Picture
Television (Video)
Audio
Graphic Art
AV Library
Av Instruction
Consultant Service
Presentation
Maintenance

AUDIOVISUAL PRODUCTION
(Category 1)

Video Disc
Television (Video)
Motion Picture
Film Strip
Slide & Trans Sets
Audio
Multi Media

AUDIOVISUAL PRODUCTION
(Category 2)

Video Disc
Television (Video)
Motion Picture
Film Strip
Slide & Trans Sets
Audio
Multi Media

AUDIOVISUAL PRODUCTION
(Category 3)

Video Disc
Television (Video)
Motion Picture
Film Strip
Slide & Trans Sets
Audio
Multi Media

AUDIOVISUAL RECORDS CENTER

COMBAT DOCUMENTATION

Operations
Journalism

TECHNICAL DOCUMENTATION

RDTE
Other Special

INSTALLATION BROADCASTING

Radio
Television

CENTRAL AFRTS BROADCASTING

AFRTS BROADCASTING

AUDIOVISUAL TRAINING

AUDIOVISUAL MANAGEMENT

VIDEO TELECONFERENCE

Visual Information Services

Figure 7-1

- o Redefine the EOR codes to better identify IMA resources. Currently, data automation has many of the codes necessary for resource tracking in keeping with FGAP 4, but no such designations exist for the other IMA disciplines. Vance recommends that the Army either establish EORs for the other IMA disciplines (for example, EORs for printing equipment, visual information supplies, etc.) or expand the definition of the existing ADP EORs to include expenses for the other disciplines.

- o Establish a means for better identifying mission funds programmed for IMA operations. As cost reporting and recovery is implemented, it will be necessary to reconcile the operating budgets of the service providing organizations with those of the consuming ones. The Army should establish an identification of IMA service purchase funds as a low-order code in the mission program elements (i.e., employ a coding scheme similar to that which designates Headquarters Management Activities (HQMA) funding).

- o Expand and better enforce the use of the Functional Cost Account (FCA) codes for STAMMIS system cost tracking. The current FCA scheme should be reviewed and revised to support the collection of costs for software development reimbursement and possible application to determining baseline costs.

7.3.1.2 Services. The services that Vance recommends are best viewed within the three tier Army Information Architecture, although they apply to all of the IMA disciplines. The Tier 1 services are provided Army-wide by networked information resources. The billing rates for Tier 1 services should be standard across the Army. The Tier 2 services are provided at the installation by local information resources. The billing rates for Tier II services will be set locally. The concept behind the Tier 2 billing rates is that they must be competitive with other local services provided by private industry and with the Tier 1 services. The Tier 3 services are basically direct services in that the users buy these services directly from other-government sources, industry, or off of local requirements contracts. The three tiers of services can be provided with either of the sources of services: Army or non-Army.

Vance recommends that the Army use two types of services: resource based and product based. Resource based services are services whose utilization is reported to users as a function of the equipment or resources used to provide the services. For example, CPU time is a resource based service and is a function of the amount of time a user utilizes the central processing unit of a computer. Product based services are services whose utilization is reported to users as a function of a user understandable event that is generated by utilizing the equipment or resources. For example, charging a user for a payroll application based on the number of checks produced or charging a user for using STANFINS based on the number of runs conducted are product based services. The services that Vance recommends are listed in Figure 7-2 and discussed in the following subsections by IMA discipline. The recommendations are based on the present Army environment; they can be easily changed should the Army decide to do so.

Vance recommends that the Army also make following adjustments to the services listed in Figure 7-2. First, different rates should be established for usage during prime and non-prime periods. This should encourage more efficient utilization of Army resources. Second, different rates should be established for priority

AUTOMATION

- CPU TIME
- DISK STORAGE
- PRINTING
- MICROFICHE
- TAPE STORAGE
- TAPE MOUNTS
- DATA COMMUNICATIONS ACCESS
- DATA COMMUNICATIONS UTILIZATION
- SOFTWARE DEVELOPMENT
- DIRECT
- DOMINANT PRODUCTS (STAMMIS)

TELECOMMUNICATIONS

LOCAL TELEPHONES:
- TELEPHONE SET (BY TYPE AND NUMBER OF LINES)
- RELOCATION
- DIRECT

LONG-HAUL COMMUNICATIONS:
- CALL (TIME AND DISTANCE)
- TECHNICAL CONSULTING
- DIRECT

TELECOMUNICATION CENTER:
- TERMINAL ACCESS

LOCAL AREA NETWORKS:
- ACCESS

MOBILE TELEPHONES:
- DIRECT
- UTILIZATION (PAY PRIVATE COMPANY)

FACSIMILE:
- ACCESS (RENTAL OR USER PAYS FOR EQUIPMENT)

PAGERS:
- UTILIZATION (PER USE)

NON-TACTICAL RADIO:
- UTILIZATION (MONTHLY RENTAL)

SATELLITE:
- ROLLED INTO LONG-HAUL

OTHER:
- AS NEEDED

PRINTING & PUBLICATIONS

- JOB COSTING
- STANDARD RATES, WHERE APPROPRIATE

VISUAL INFORMATION

- JOB COSTING
- STANDARD RATES, WHERE APPROPRIATE

MAIL

- AS CHARGED FROM POST OFFICE

IMA Services

Figure 7-2

utilization. This should provide the information users with the option of receiving their services quicker or slower, if they want to spend more or less for the services, respectively.

7.3.1.2.1 Automation Services. For the automation discipline, Vance recommends that the Army use product based or resource based services for all IMA services that are centrally provided such as the ASIMS services. Thus, the use of the STAMMIS' should be charged to the users based on some product that must be defined as the IMA new management techniques are developed and implemented. If a product cannot be defined for a STAMMIS, then Vance recommends that the Army use resource based services. For all services that are locally provided, Vance recommends that the Army use resource based services.

Vance recommends that the Army use the following resource based services and service units for all of the automation discipline regardless of the type of equipment used to provide the services.

SERVICE	SERVICE UNIT
CPU time	Seconds
Disk storage	Mbyte per month
Printing	Number of lines
Microfiche, master	Number of originals
Microfiche, copy	Number of copies
Tape storage	Reel per month
Tape mounts	Number of mounts
Data communications access	Ports per month
Data communications utilization	Time used
Software development	Analyst hours
Direct	Actual cost plus management percentage
STAMMIS	Products

7.3.1.2.2 Telecommunications Services. Vance recommends that the Army use primarily product based services for the telecommunications discioline, but use resource based services whenever the use of product based services is not feasible. The recommended services are presented below by major type of services: local telephones, long-haul communications, telecommunications centers, local area networks, mobile telephones, facsimile, pagers, non-tactical radios, satellites, and other telecommunications services.

7.3.1.2.2.1 Local Telephones. Vance recommends that the Army use the same services for local telephones regardless of where the services are obtained. Vance recommends that the Army use the following services and service units for local telephones.

SERVICE	SERVICE UNIT
Telephone set	Monthly rate based on type and number of lines
Relocation	Per move
Direct	Actual cost plus management percentage

7.3.1.2.2.2 Long-Haul Communications. Vance recommends that the Army use the same services for long-haul communications regardless of where the services are obtained. Vance recommends that the Army use the following services and service units for long-haul communications.

SERVICE	SERVICE UNIT
Call	Per call based on time and distance
Technical consulting	Analyst hour
Direct	Actual cost plus management percentage

7.3.1.2.2.3 Telecommunication Centers. Vance recommends that the Army only charge for the use of remote terminals. Vance recommends that the Army direct fund all other use of the TCCs, and control utilization using some other management technique.

SERVICE	SERVICE UNIT
Terminal Access	Flat monthly rate

7.3.1.2.2.4 Local Area Networks. Vance recommends that the Army use the same services for local area networks regardless of where the services are obtained. Vance recommends that the Army use the following service and service unit for local area networks.

SERVICE	SERVICE UNIT
Access	Number of ports per month

7.3.1.2.2.5 Mobile Telephones. Vance recommends that the Army use the same services for mobile telephones regardless of where the services are obtained. Vance recommends that the Army use the following services and service units for mobile telephones.

SERVICE	SERVICE UNIT
Direct	Users pay for telephone set

Utilization	Private company bills user directly

7.3.1.2.2.6 Facsimile. Vance recommends that the Army use the same services for facsimile regardless of where the services are obtained. Vance recommends that the Army use the following services and service units for facsimile.

SERVICE	SERVICE UNIT
Access	Monthly rental charge
Direct	User pays for equipment directly
Utilization	Page sent

7.3.1.2.2.7 Pagers. Vance recommends that the Army use the same services for pagers regardless of where the services are obtained. Vance recommends that the Army use the following service and service unit for pagers.

SERVICE	SERVICE UNIT
Utilization	Monthly charge

7.3.1.2.2.8 Non-Tactical Radio. Vance recommends that the Army use the same services for non-tactical radio regardless of where the services are obtained. Vance recommends that the Army use the following service and service unit for non-tactical radio.

SERVICE	SERVICE UNIT
Utilization	Monthly rental

7.3.1.2.2.9 Satellite. Vance recommends that the Army not explicitly charge users for the use of satellites. Instead, the Army should roll the costs associated with the satellite resources into the costs associated with long-haul communications because it is essentially just another media for long-distance transmission and not a special capability in and of itself.

7.3.1.2.2.10 Other Telecommunication Services. Vance recommends that the Army use the same services for any other telecommunications resources regardless of where the services are obtained. Vance recommends that the Army establish the services and service units for resources not addressed under the above sections when the need arises by following the same reasoning described in this document.

7.3.1.2.3 Printing and Publications Services. Vance recommends that the Army use the same services for printing and publications regardless of where the services are obtained. Vance recommends that the Army follow a normal job costing concept using the services that are normally used in the printing and publications industry. For example, the rate charged for a piece of work should be calculated as a function of the material needed to complete the work and the standard work estimates for that type of work. Examples of the full range of specific services or types of work that the Army should use can be provided by the Navy Printing and Publications Service.

All printing and publications services that are centrally provided should use a standard rate regardless of where the user is located in the Army. All printing and publications services that are locally provided should use a local rate.

7.3.1.2.4 Visual Information Services. Vance recommends that the Army use the same services for visual information regardless of where the services are obtained. Vance recommends that the Army follow a normal job costing concept with the services being those that are normally used in the visual information industry. For example, the rate charged for a piece of work should be calculated as a function of the material needed to complete the work and the standard work estimates for that type of work. A significant portion of the work completed by the visual information activities should use a fixed rate for a piece of work; e.g., standard rate for a black and white 35mm slide, standard rate for two-color view graph, etc.

All visual information services that are centrally provided should use a standard rate regardless of where the user is located in the Army. All visual information services that are locally provided should use a local rate.

7.3.1.2.5 Mail. Vance recommends that the Army use the same services for mail regardless of where the services are obtained. Vance further recommends that the Army obtain the bulk of its mail services directly from the Post Office.

7.3.1.2.6 Records Management. This service should be provided by ISC and direct funded.

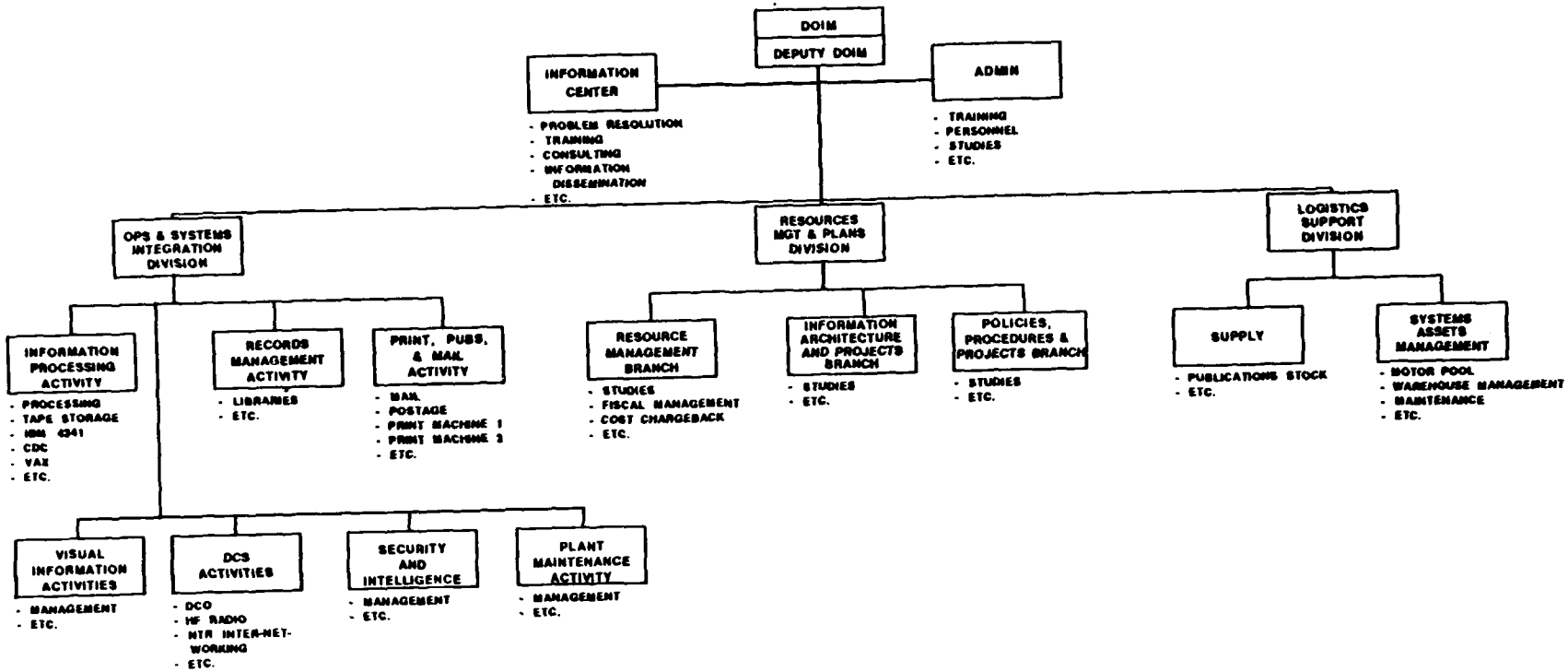
7.3.1.2.7 Libraries. This service should be provided by ISC and direct funded.

7.3.1.3 Work Areas. Work areas are a valuable tool for cost control and management. Work areas serve as a mechanism for collecting and analyzing actual cost data and for forecasting budgeted costs. The establishment of work areas is a function of each organization and how it is structured and, therefore, is outside the scope of this design document. The establishment of the work areas should be part of the development process.

Figure 7-3 is an example of work areas. It is a high-level work area structure for the Ft. Belvoir DOIM. Work areas should always be established according to the structure of the organization. Therefore, the first step in identifying work areas is to clearly identify the organization structure at the lowest level of detail. Once the structure has been identified, the lowest level managers should be interviewed and asked to identify the types of work for which their group is responsible. The answers provided are the lowest level work areas. It should be up to the DOIM or organization manager whether or not to track costs at the lowest level or only at the lowest managers level. Figure 7-3 provides an example of some possible work areas which could be used if the DOIM wanted to track costs at work areas one level below the branch and activity levels.

The capability of tracking costs by work area, once they are defined, should be available in the STANFINS-R cost accounting module. However, until the cost accounting module is fielded, Vance recommends that cost estimation techniques be used.

Vance recommends that although the process of establishing work areas can be standardized across organizations within the IMA, each organization's management be allowed the freedom to establish its own unique work areas. The reason for this



Example Work Areas

Figure 7-3

recommendation is that no matter how similar each organization's structure is, the actual work that is performed is different and unique.

7.3.2 Rate-Calculation Activities. Vance recommends that the Army providers implement the following activities for calculating billing rates or tariffs for the services: usage forecasting, capacity planning, cost forecasting, rate-setting, and information budgeting. The following subsections present Vance's recommendations for each set of activities.

7.3.2.1 Usage Forecasting. Usage forecasting activities are necessary to project the level of service usage which will be provided or the number of products that will be sold. These estimates are used to set billing rates and to plan capacity. This section provides general recommendations for the development of Army usage forecasting techniques and more specific recommendations for each IMA discipline.

7.3.2.1.1 General Usage Forecasting. Vance recommends that usage forecasting policies and procedures be standardized at a high level and a subset of IMA-unique procedures be developed where required to meet Army objectives. Formal, time-consuming procedures which are expensive to implement are not necessarily the best alternative. It is preferable to use historical usage data and general knowledge of the Army environment, e.g., current and planned missions, as a basis for forecasting. Official estimates of resource requirements stated in terms of dollars, staffpower, and products which currently are prepared as part of the Information Management Plan (IMP) and POM submitted by each MACOM should be used as a starting point for usage forecasting.

The following general rules should apply across IMA disciplines when developing usage forecasting techniques:

- The rate-setting period should be annual, but set for two years at a time to correspond to the biennial budget currently adopted by the Army. Projections should be made for an additional three years to correspond to the Army's planning cycle.
- Historical usage data for each user should be the primary basis for projecting utilization for the next rate-setting period.
- The usage forecasting techniques should incorporate the IMP, POM, and AC^2MP processes.
- Regular communication with users should be encouraged and maintained to identify any extraordinary usage requirements as far in advance as possible.
- DCSIMs and/or DOIMs knowledge of the Federal Government and Army environments should be used to augment historical data and refine usage forecasts.
- Usage data for all users should be summarized and total usage forecasts should be generated for each tier of services and each organization within each IMA discipline.
- Prior to forecasting service utilization, each DCSIM or DOIM should evaluate the services being offered to determine if any services should be

added or discontinued. Recommendations should be made to policy and decision-makers and, if necessary, new sources for services sought.

- Forecasts should be based on forecasted usage. Reserve capacity should not be incorporated into the forecasts.

7.3.2.1.2 IMA Discipline Specific Usage Forecasting. The recommended specific usage forecasting techniques are:

- For automation, forecasts for product based services should first be made for the number of products and then be translated into an estimate of resource based services required to provide that number of products. If it is not feasible to obtain user input or user input is inadequate to forecast resource based services, standard forecasting tools such as regression or trend analysis should be used whenever possible.

- For telecommunications, in those cases where it is not feasible to obtain the required input from users, standard forecasting techniques should be used.

- For printing and publications and visual information, the procedures and techniques used to develop annual reports to Congress should be used as a basis for usage forecasts. This includes summarization of historical job accounting data and projections of volume based on the printing life cycle of standard Army documents. This includes summarization of job accounting data produced by each field and departmental print and visual information activity.

7.3.2.2 Capacity Planning. Capacity plans should be prepared and updated on a regular basis for each IMA discipline and generally should be based on usage forecasts that are provided by the users. Formal techniques and procedures which are expensive to implement are not necessarily required; however, standardized policies and guidelines are important for consistency. This section provides general recommendations for the development of Army capacity planning techniques and more specific recommendations for each IMA discipline.

7.3.2.2.1 General Capacity Planning. The necessity for formalized, time-consuming, and expensive capacity planning techniques should be minimized by (1) using existing historical usage data and (2) assigning planning activities to individuals who have easy access to the data and a good understanding of the Army and Federal Government environments. Vance recommends that the Army use the following general guidelines for implementing capacity planning techniques:

- The majority of capacity planning activities should be performed by a central support group(s) and should be made available to the DCSIMs and DOIMs through several world-wide locations.

- Usage forecasts for each DOIM and CNMA should be submitted to the central support group(s) in ISC or DISC4. The support group should then work with representatives of the DOIM or CNMA to analyze the data and determine capacity requirements.

- The capacity planning group should have the responsibility for determining capacity for both in-house resources and contracted services.

- o DISC4 should have the primary responsibility for setting policy and conducting the analyses which affect Army-wide resources. The DOIMs should have similar responsibilities for local resources.

- o The capacity planning group should periodically analyze and reevaluate the product based services to determine if the number of resource based services consumed to provide each product has changed.

7.3.2.2.2 IMA Discipline Specific Capacity Planning. Vance recommends that specialized capacity planning groups be established to provide support for all IMA disciplines. The DISC4/ISC should have the primary responsibility for determining when to buy additional equipment or contract to provide Army-wide services. The DCSIMs and DOIMs should have responsibility for acquisition for local usage. Most importantly, Vance recommends that ISC have the responsibility to ensure that all services are integrated and that standards, such as those for usage metering and reporting, are strictly adhered to.

The visual information and printing and publications planning groups must pay particular attention to trends toward increased contracting for services. These trends could substantially impact the acquisition of new capacity and the disposal of existing capacity.

7.3.2.3 Cost Forecasting. Cost forecasting consists of the software and procedures to accurately predict the costs of developing and providing information services. Such predictions should be provided for the full range of IMA services: staff support as well as technology, new services as well as old, and new resources as well as old. These forecasts should, in combination with capacity planning, form the basis for establishing IMA service rates. This section provides general, recommendations for the development of Army cost forecasting techniques and more specific recommendations for each IMA.

7.3.2.3.1 General Cost Forecasting. The forecasting of costs typically requires historical cost data and projected future costs. The historical costs can be obtained from a cost accounting system or by using cost estimation techniques until a cost accounting system can be developed. Vance recommends that the Army use cost estimation techniques until its cost accounting systems are completed. The future costs should be obtained by using the resource projections generated by the capacity planning group and industry cost surveys. Vance recommends that the Army use the following general guidelines for implementing cost forecasting techniques.

- o IMA cost forecasting should be integral with the Information Master Planning and IMA programming processes. Forecasts should be developed for the POM years and submitted through the MACOMs and ISC as part of the information management program budget. This should enable estimated rates to be established for new initiatives.

- o Guidance for cost forecasting should be developed by the Office of the Assistant Secretary of the Army for Financial Management (ASAFM) (formerly COA) and DISC4. ASAFM should describe acceptable forecasting procedures, as well as costing factors and parameters such as depreciation schedules, statistical rates for costing unfunded resources (such as military pay and depreciation of public works facilities), and inflation factors. DISC4 should provide systems engineering standards

pertinent to IMA costing. These may include descriptions of planned changes in network services, software development costing models, estimated rates for generic resource based services (for example, costs for generic CPU hours), and schedules for common procurement costs (e.g., costs for standard microcomputers).

- Cost forecasting guidance should be distributed through both the MACOM and ISC hierarchies with the Program Budget Guidance (PBG) for POM submission. During distribution, the MACOMs and network service providers may prescribe specific cost parameters to the effected DOIM organizations.

- Detailed cost forecasts should be initially prepared at the installation level and submitted forward, accompanied with the capacity planning data, for rate calculations. Generally, historical costs tracked by work area, with consideration for capacity and technology changes, should be used for costing existing services. As appropriate for each service, new requirements costs should be based on historical costs for providing similar services at other installations, fair market prices for similar services in the private sector, or engineered estimates based on standard rates and models. Total costs for new services, including costs for military salaries, capitalized equipment, and apportioned installation overhead, must be identified for the rate calculation process.

- To a large extent, the cost forecasting process should be supported by automation. Historical costs should be automatically reported by work area, giving each level of management a basis for cost estimation. These should be accumulated at and distributed from central systems operating at the RDCs. Likewise, once installation cost forecasts are developed, they should be forwarded to the RDCs for consolidation.

- Automated support for cost forecasting should also take the form of automated models. They should provide trend and multi-variable analysis techniques to improve the accuracy of the forecasts. Analysis of alternatives should be supported by "What-if" comparison techniques. Appropriate forecasting models should be developed as stand-alone installation modules and integrated with the central cost reporting and recovery components at the RDCs.

7.3.2.3.2 IMA Discipline Specific Cost Forecasting. Although the capacity planning and usage accounting activities will vary with the types of services provided, Vance recommends that cost forecasting for all services be similar. Cost forecasting should, however, be accomplished differently for the resources used to provide Army-wide services from those used to provide local services.

Vance recommends that the emphasis of installation cost forecasting be on comparative pricing. Since little, if any, service will be provided locally, the DOIM's prime responsibility should be to identify the least costly feasible source for required services and price them accordingly.

Vance recommends that the organizations which provide Army-wide services be more directly concerned with the cost components of operating or providing specific services. Although they, too, must consider commercial alternatives for services and

resources, their emphasis should be on anticipated process costs and the effects of capacity requirements changes on the resources consumed in each work area.

7.3.2.4 Rate-Setting. The rate-setting software and techniques should calculate rates, by type of service, from the cost and usage forecasts. Vance recommends that standard rates, applicable to all Army organizations world-wide, be computed for all Army-wide services. Vance recommends that the billing rates be set every year even though the Army has shifted to a biennial (two year) budget. Vance recommends that the Army impose a limit, such as the inflation rate, on how much the rates can increase during the second year of the two year budget. This should enable the users to plan and budget with some degree of accuracy. Should the inflation rate not be sufficient to recover costs, Vance recommends that the amount of the shortfall be included as a cost to be recovered during the first year of the next two year budget period.

7.3.2.4.1 General Rate-Setting. The primary IMA rate setting function should be to compute standard rates for Army-wide services. All central IMA organizations should use these rates as the basis for service billings. If their operations can be funded through a revolving fund, Vance recommends that the rates include both full overhead and equipment depreciation costs. Vance recommends that rate-setting be accomplished in accordance with the pertinent Army regulations, notably AR 37-110: Budgeting, Accounting, Reporting and Responsibilities for Industrial Funded Installations and Activities, AR 37-41: Regulations Governing the Use of Project Orders and AR 37-60: Pricing for Materiel and Services. The following is a general discussion of how the Army should calculate its rates.

Standard rates and prices should be computed by a series of calculations developed in several automated models. The first is the *Resource Distribution Matrix*, which is used to allocate resource costs among the work areas consuming those resources. This model is a preliminary step in identifying the indirect cost components of providing services. The second model is the Sub-Function Distribution model, which allocates work area costs among the services it supports. The third model is the Billing Rate Distribution Matrix. This model calculates billing rates by dividing total forecasted costs by capacity or usage. This model includes techniques to apply special adjustment factors, such as surcharges or discounts. Figures 7-4 through 7-6 depict representative models of these matrices. These models should be applied iteratively to appropriately allocate the multiple levels of overhead costs and to aggregate standard rates.

A fixed factor should be applied to each rate to recoup accumulated service operating gains and losses through the year prior to that in which the rate is to take effect. This factor should remain a fixed element of the rate through budget execution. Any further gains or losses should not be recognized for recoupment until the following year's budget is prepared.

In most cases, rate calculations should be performed both at each service providing activity and in aggregate for the Army as a whole. Army-wide rates should be computed from aggregate costs by direct and indirect cost pool, using the models outlined above, rather than derived from an averaging process. This approach should better enable the Army to adjust standard rates and should give the service providing organization a basis for projecting loss/gain expectations.
Different, but integrated, rate setting models should be established for each IMA discipline. These will be necessary to take into account equipment variations among providers in each discipline. For example, the billing rates for automation should

AMR / WF / SF / RESOURCES	COMPUTER PROCESSING AND OPERATIONS				MANAGEMENT
	COMPUTER OPERATIONS			DIRECT CHARGES	
		BATCH	OPERATIONS		
APPLICATIONS SOFTWARE $20,000				1.00 20,000	
SUPPLIES $20,000	.30 6,000			.40 8,000	.30 6,000
CPU A $150,000		.50 75,000	.50 75,000		
ADMINISTRATIVE STAFF $300,000					1.00 300,000
ANALYSTS $500,000		.30 150,000	.10 50,000	.60 300,000	
SPACE $70,000		.10 7,000	.30 21,000	.30 21,000	.30 21,000
SUBTOTAL	6,000	232,000	146,000	349,000	327,000
WORK FUNCTION COSTS		3,600	2,400	0	0
TOTAL		$235,600	$148,400	$349,000	$327,000

Resource Distribution Matrix

Figure 7-4

SERVICE CENTER / SUB-FUNCTION	TSO	ORDER PROCESSING	ANALYST
BATCH $235,600	.70 164,920	.30 70,680	
OPERATIONS $148,400	.60 89,040	.40 59,360	
DIRECT CHARGES $349,000	.10 34,900	.10 34,900	.80 279,200
MANAGEMENT $327,000	.40 130,800	.20 65,4000	.40 130,800
TOTAL	$419,660	$230,340	$410,000

Subfunction Distribution Matrix

Figure 7-5

SERVICE CENTER	TSO				ORDER PROCESSING		ANALYST		
SERVICE	CPU	CONNECT	DIO	TIO	ORDER PROCESSING	CREDIT CHECK	SENIOR	REGULAR	JUNIOR
SERVICE UNIT	SECONDS	SECONDS	1000 DIOS	1000 TIOS	ORDER	CHECK	HOURS	HOURS	HOURS
COST OF SERVICE CENTER	$419,660				$230,340		$410,000		
SERVICE FORECAST	6M	8M	3,000	1,000	50,000	25,000	4,000	12,000	6,000
STANDARD-IZATION FACTORS	5	1.0	100	200	5	1.0	1.5	1.0	.75
STANDARDIZED FORECAST	38,500,000				275,000		22,500		
BASE RATE	.011				.84		18.22		
BILLING RATE	.055	.011	1.10	2.20	4.20	.84	27.33	18.22	13.67

Billing Rate Distribution Matrix

Figure 7-6

be adjusted by a power factor to account for the differing speeds of the various computers used within the Army. These specific models should also enable rates for product based services (i.e., those for specific output or products, such as an automated report page) to be derived from rates for resource based services (e.g., CPU hour, I/O channel usage).

Rate calculation software should be provided to accommodate the volumes of data required for standard rate calculations and to better assure the accuracy of those calculations. This software should be integrated with the regional modules, particularly those for cost forecasting and capacity planning.

The rate calculation software should include analysis functions. These functions should support the exploration of the effects of alternative rate structures or proposed IMA economy measures.

Once standard rates are established, they should be distributed to ISC organizations for planning and budgeting. The standard rates in the billing modules should be replaced annually.

7.3.2.4.2 IMA Discipline Specific Rate-Setting. Although standard rates should be established for all Army-wide services, Vance has identified a need for a number of variations on these standard rates. Notable among these are rates for direct contracted services, for local cost estimation, and for special case users.

All IMA services that an installation contracts for directly with a non-Army source should be charged directly to the user activities at the contracted rates. Most services provided by private industry should be billed in this manner. In some cases it may be necessary to have the DOIM organization monitor and manage contracted services, collecting overhead charges for this support.

When new service requirements arise, the DOIM should be responsible for forecasting the costs of those requirements. This projection process may require the DOIM to collect and compute several rates for comparison. These rates might include the standard rate for obtaining the service as an Army-wide service, fair market rates for commercial procurement of the service, or estimated costs for providing the services locally using existing equipment and resources.

Finally, regulations require that specific costs be included and/or excluded from reimburseable orders for certain classes of user. Foreign military sales and non-Federal users are such cases. Alternate rates or factors for adjusting standard rates should be required for billing these users.

7.3.2.5 Information Budgeting. Users must be provided with realistic cost estimates for their forecasted usage and budget planning. The "user" organizations must have the data necessary to defend their estimates during budget formulation, and the service providing organizations must have a basis for their operating budget and means for identifying unfinanced requirements. Therefore, tools should be provided as well as the data to assist in the formulation and execution of IMA budgets for both the provider and user organization. Vance recommends that the Army use the following general guidelines for implementing information budgeting techniques.

- o Budget policy and guidance should be prepared and disseminated within the general context of the Army PPBES process. Similar procedures

should be employed for all IMA disciplines. Conceptually, those procedures should be much like those currently used to budget for IMA services under the DCP program.

- Generally, budgets should be formulated to meet the constraints defined in the Program Budget Guidance (PBG). The PBG is prepared and distributed from HQDA through the MACOMs, including ISC, to the installations three times per year. The PBG document provides guidance and data regarding the availability of dollar and staffing resources. The MACOMs and operating agencies use the information to prepare the Program Analysis and Resource Review document and the Command Operating Budget (COB). Constraints are defined at HQDA to the appropriation, program and sub-program levels of detail, and are made successively more restrictive at lower organization levels.

- Budget formulation should begin at the installation. For IMA services this process should be an extension of the capacity planning and cost forecasting processes discussed previously in this report. The estimate requirements prepared during those processes should be reconciled to the PBG. During this process, the Program Budget Advisory Committees (PBACs) should establish priorities for the application of resources and determine the disposition of unfinanced requirements. Since all IMA services in support of the sustaining base are to be funded from mission programs, these services should be competing for funds with other mission activities. Upon completion of installation budget formulation, these IMA budgets should be submitted through the MACOM as part of the COB.

- In the COB submission, secondary positions of the IMA funding program elements should identify the services to be acquired. This should enable these budgets to be reconciled with the ISC annual operating budget.

- IMA EORs should be established to facilitate user budgeting. These EORs should indicate the type of IMA service a user plans to buy: automation, telecommunications, printing and publications, visual information, and mail. Additionally, descriptive criteria that can be incorporated into the EORs are: (1) whether the service will be acquired from Army or non-Army providers and (2) which Army provider will supply the service (i.e., ASIMS, ISEC, Tier 2 automation, ARCCO, local telephone, TCC, other telecommunications, APPA, local printing, visual information, and mail).

- With DRM assistance, each DOIM should prepare an annual operating budget and conform to command budget guidance of the DOIMs MACOM. Such guidance should include workload projections based on capacity planning, standard rates, and current resource constraints. In keeping with revolving fund requirements, the ISC annual operating budget should include estimated operating costs, estimated costs of un- or under-utilized capacity, projections of procurements, forecasts of reimbursements and disbursements, and projected statements of financial condition. These should be submitted, approved and consolidated through the ISC echelons. At the Department of the Army level, the DISC4 should reconcile the budget with the consolidated command budgets by discipline, apply any necessary final adjustments, and approve the budget. The budget should be submitted for the concurrence of the DCSLOG, who has oversight over

revolving funds, prior to the incorporation into OSD's and eventually the President's Budget.

- o STAMMIS system operation and development, as well as other departmentally mandated requirements, should be funded by the proponent agency at the HQDA level. Requirements for these budgets should be developed jointly by the proponent agency and ISC. Non-proponent users of these systems should pay for their operations only if their local service requirements exceed the standard service baselines that should be established for each system.

- o Software should be developed in support of the budget process. This software should be used for distribution of guidance, reporting, and incorporating capacity requirements and cost forecasts. Modeling and administrative functions should support budget formulation, consolidation, and reconciliation. During budget execution, automated software (much of which is currently in place) should be used to prepare the standard financial reports.

7.3.3 Billing Activities. The Army providers should implement the following activities for reporting and recovering costs: information accounting, usage accounting, usage reporting, and cost recovery. The following subsections outline the techniques for each set of activities.

7.3.3.1 Information Accounting. The Army must establish and maintain user accounts, track actual expenditures, and establish policies for handling aborted work and inappropriate charges. This section provides Vance's recommendations for conducting general IMA information accounting.

The Army should integrate user account maintenance functions into usage reporting software. These functions should provide the following information: funds spent to date, funds remaining, account number, and historical trends.

The Army should track actual expenditures of the Army providers by adding cost accounting modules to existing and future accounting systems. The cost accounting modules must be fully integrated with the standard accounting policies. For those portions of the IMA disciplines which are covered by a revolving fund, the planned cost accounting modules of the STANFINS-R system should provide the capability to track actual costs within an account structure defined by managers. The use of work areas to define this structure should be considered. Installations which do not have access to the STANFINS-R system should use new or existing techniques such as other Army cost accounting capabilities, the Reprographics Administrative Management Information System (RAMIS), the revolving fund cost accounting modules, or commercially available alternatives to track costs. The systems used to track actual expenditures must comply with Title 2 of GAO's accounting policies.

There is the necessity for a labor distribution system in the short- and long-term. For the short-term, a labor distribution system is needed to accumulate labor hours that are billable to users. Labor hours that are not billable to users can be incorporated into the rate-setting algorithms by estimation techniques. For the long-term, a labor distribution system is needed as part of the cost accounting modules.

All aborted runs or spoilage should be charged to an ISC overhead account unless they are determined to be the fault of the user, in which case the user should be charged for the aborted run. Charges should be accounted for by system (i.e., the charge of an aborted run on a local system will be incorporated into the local rate).

7.3.3.2 Usage Accounting. Detailed service utilization data is needed to measure and equitably allocate user charges. Metering and recording utilization of services, i.e., usage accounting, is the core activity when reporting and recovering service costs and provides the basis for most other activities. This section provides general recommendations for conducting usage accounting and more specific guidance on IMA discipline specific usage accounting techniques and procedures.

7.3.3.2.1 General Usage Accounting. Separate metering systems should be implemented for functions within each IMA primarily because the available automated mechanisms are function-specific. For example, within the telecommunications discipline, long-haul and message communication require different mechanisms to track usage. Metering should be automated to the greatest extent possible to minimize the labor required to collect data and to increase data accuracy.

All services should be metered at the point of sale, i.e., where the services are consumed by the user. For example, long-haul phone service should be tracked at the instrument level and CPU time should be metered internally at the user ID level. Raw utilization data should be forwarded in a standard format to the RDCs on a regular basis (either weekly, biweekly, or monthly) for data reduction.

7.3.3.2.2 IMA Discipline Specific Usage Accounting. This section provides recommendations for IMA-specific usage accounting techniques. For automation, Vance recommends the following specific techniques and procedures:

- o IBM's SMF and SMF-like utilities should be the primary metering devices for automation services. These utilities produce the raw data necessary to track use of services such as CPU time, memory, and I/O usage.

- o Labor accounting for analyst time related to software development should be accomplished with the completion of weekly time sheets. The data should be entered into a local program for formatting and preparation for transmission to the responsible RDC.

- o Any services provided by organizations outside the Army should be metered by the provider in the format predefined by the Army and should be delivered to the user as part of the bill.

For telecommunications, Vance recommends the following specific techniques:

- o Most metering of long-distance communications provided by the Army should be accomplished using DCA tools and local PBXs. The data should be provided to ARCCO for verification and sent to the responsible RDC.

- o Metering of local telephone services should be performed in the local PBXs using CDR and SMDR capabilities as they are installed.

- o All other telecommunications services should be metered by a local PC-based or minicomputer-based system. All data should be passed to the responsible RDC for data reduction.

For printing and publications, Vance recommends the following specific techniques and procedures:

- o All services provided in-house should be metered manually in conjunction with a RAMIS-like system. Data should be sent to the responsible RDC for data reduction.

- o All services provided by organizations outside the Army should be metered by the provider. The data should be delivered in a predetermined format and delivered to the user as part of the bill.

For visual information, Vance recommends the following specific techniques and procedures:

- o All services provided in-house should be metered manually in conjunction with the use of a Work Order Management System (WOMS) or Audio Visual Library Service (AVLS) type system. The data should be sent to the responsible RDC for reduction.

- o All services provided by organizations outside the Army should be metered by the provider. The data should be delivered in a format predetermined by the Army and subsequently sent to the user as part of the bill.

7.3.3.3 Usage Reporting. Usage reporting activities must be conducted to reduce service usage data collected with the usage accounting techniques, to calculate user charges, and to prepare/distribute reports on service usage and charges to users. These reports are used as invoices when costs are recovered. This section provides general recommendations for the development of Army usage reporting techniques and procedures and more specific recommendations for IMA discipline specific forecasting.

7.3.3.3.1 General Usage Reporting. A single usage report which itemizes units consumed (e.g., CPU hours, reports produced, telephone calls made, pages printed, charts made, etc.) and total cost for each service provided should be produced monthly for distribution to users. Consumer organizations should determine the level to which reports should be detailed and establish the appropriate user accounts. Backup detail should be maintained and made available to users upon request and at their expense.

The planned installation of the KOMAND reporting package at all ASIMS IBM or IBM-compatible sites and the Universal Report System (URS) II effort to install the JARS reporting package or JARS-like techniques at all non-ASIMS sites should play a major role in standardizing reporting techniques. The Army should closely monitor the effectiveness of these and other usage reporting techniques as they are implemented so that a determination can be made regarding the feasibility of integrating them into a universal reporting system. This type of system would require a standardized, automated system, including such things as standard user ID formats, standard data formats, and a centralized processing capability. The degree of difficulty required to develop such a system and the extent to which it will

lessen the time spent to prepare usage reports should be the major factors considered in determining the feasibility of establishing a universal reporting system.

Management reporting techniques should also be developed. In particular, the ability to prepare detailed variance analysis reports should be developed for all levels of Army managers including HQDA, ISC Commander, ISC IMA Business Director, ISC discipline specific business directors, DOIMs, or an IMA activity. Other management reporting requirements include year-to-date summaries for all business levels, income and expense statements, and utilization summaries.

7.3.3.3.2 IMA Discipline Specific Usage Reporting. Vance recommends the following regarding IMA discipline specific usage reporting:

- o A detailed report should be produced monthly for each discipline to be maintained as backup data for charges to user.

- o For the automation discipline, a standard set of services should be reported. They should be determined by extracting common services from each of the automated reporting packages installed at ISC data centers.

7.3.3.4 Cost Recovery. Cost Recovery refers to the systems and procedures for transferring funds from user accounts to service provider accounts. Army provider organizations should acquire their operational funds through this process.

The overall cost recovery policies and procedures are set and regulated by the OMB, GAO, DoD, and ASAFM. Notable among these are the "Economy Act," 31 U.S.C. 1535 and "Project Order Law," 41 U.S.C. 23 which establish legal authority for one government entity to perform work for another; DoD Directive 4000.19, which establishes DoD policy for inter- and intra-agency work for others; DoD Instruction 7230.7 regarding work for non-Federal government parties; DoD 7290.3-M regarding foreign military sales; and DoD Directives 7410.4 and 7410.4-R applicable to revolving fund operations. These public laws and directives, and the Army regulations which implement them, describe the requirements which must be adhered to in cost recovery procedures.

In general, the necessary techniques for cost recovery are currently in place in Army Finance and Accounting Offices which support the IMA organizations. Funds transfer capabilities should use existing accounting systems (like STANFINS) in most instances. Interfaces with the usage accounting and rate calculation modules should be established, so that billings can be computed on the basis of standard rates for services consumed. Billing and reimbursement procedures should vary with the type of service, level at which it is provided, and the type of user using it.

Vance recommends that Army-wide services be operated as activities of a revolving fund and recover costs in accordance with revolving fund management procedures. Services that should be funded in this manner should include all Tier 1 operations, notably that of the ASIMS RDCs and centrally procured telecommunications. Although currently designated as Tier 2, facilities such as ISC-P, that provide diverse services to broad user communities, should also be managed through a revolving fund. Similarly, the centralized software development and acquisition of ISEC and printing and publications of APPA should be included.

- o The cost recovery procedures should consist of the user paying the Army providers, via a revolving fund or through direct appropriations.

Additionally, CNMAs could buy some of their physical resources or services from non-Army providers and would pay for them out of a revolving fund. For example, the SBNA contracts with a commercial supplier for computer hardware, software, and operation. As discussed in Section 5, Vance recommends that a revolving fund be used at the present time for providing sustaining base related services and not strategic and/or tactical services.

- The terms and conditions of service and of billings should be established by means of a revolving fund user order. Such orders are effectively contracts between the providing and consuming organizations, and should specify such particulars as service price, order completion or expiration date, and ceiling on the amount which may be billed. The order may also contain other requirements or conditions, such as minimum order quantities and performance or quality requirements. These orders should generally cite mission funds of the user organization, and acceptance of the order by ISC should represent a valid obligation of the users appropriation.

- The DOIMs should act as the installation commander's agent for the "procurement" of Army-wide services. They should provide local production and fair market costs for comparison; consider such qualitative factors as availability, speed, reliability, etc.; and recommend a service source.

- All Army-wide services should be billed on the basis of stabilized, standard rates. These rates should apply equally to all services provided world-wide. Since these rates should be the basis for budgeting, they should be expected to remain in place for the full two years of execution. However, different rates for each of the two years should be established. Redistribution of over- or under-recovered funds among ISC activities should be a function of their common use of a revolving fund. Rates should be adjusted in subsequent years to compensate for net annual variances. New services for which a stable user base has not been established should be billed on a fixed price for service availability basis.

- Bills should be generated monthly on the basis of services consumed by the user. The usage accounting modules should provide consumption data. A single bill should be prepared for each user order. Usage report backups should be provided, possibly in automated form, to detail service consumption and costs by activity. The installation DRM should monitor these consumption costs against activity funding targets. That activity should also apply for credits in the event of erroneous billings or provider caused waste.

- Departmental organizations should fund the operation and development of the STAMMIS system baseline. This should include both the core capability of the software and the basic installation operation requirements. The latter requirements should be established for each system, generally bases such as number of transactions per population served, runs per month, standard report volumes, etc. Local requirements for service in excess of these basic levels should be funded by the MACOM and/or installations.

Funding or charging for Tier 2 services, those currently provided by DOIM organizations, should depend in large measure on the success of establishing alternative sources of services. Three funding possibilities exist, the choice of which should depend on the scope of services which the DOIM organization continues to provide and whether the Army can obtain permission to manage information resources out of a revolving fund.

First, if the sources of services concept is sufficiently successful that the DOIM organization is left with little or no operational responsibility, then Vance recommends that the organization be treated as installation overhead. In such cases, the mission of the DOIM should strictly be to provide technical planning, quality assurance, and information management advise to the commander.

Second, if the Army obtains permission to use a revolving fund, all direct financial transactions for the DOIM organization should cite the revolving funds. Under this scheme, a host/tenant agreement between an installation and its DOIM will be required to charge BASOPS-type overhead to DOIM operations. General and cost accounting for the DOIM operations should be handled centrally at regional ISC sites.

Third, if the Army cannot obtain permission to use a revolving fund, then funding should be made via reimburseable service orders. Establishment and billing for services should be similar to the user order procedures described above; however, the following major exceptions should apply:

- Full costs, including all labor, equipment depreciation, and facilities costs, should be used for cost comparisons among in-house, Tier 1, and non-Army service prices.

- A host/tenant agreement between the DOIM organization and the installation is recommended so that all appropriate overhead would be included in service charges.

- The DOIM should collect usage by user account and compute consumption-based bills monthly. A single bill should be issued for each user with accompanying usage reports reflecting current and cumulative consumption costs.

Services that are dedicated to the mission of a single user organization should be directly funded by that organization's mission funding. Hardware and software for all Tier 3 operations, as well as dedicated facilities, such as laboratory or training systems, should also be direct funded. Contract services that service a single mission, including those which may be considered portions of BASOPs functions, should also be direct funded.

7.4 Users

Vance recommends that the users should be defined as a group or individual responsible for utilizing, causing the utilization of, or has the ability to control, the utilization of IMA services. For most of the IMA services, it should be either the unit/activity on the installation or the proponent of a major application. For example, the user of the STAMMISs should be the HQDA proponent of each STAMMIS for a predetermined standard amount of utilization. However, should an organization or unit/activity desire to utilize the STAMMIS over and above the

standard, then that organization or unit/activity becomes the user of that additional service and must pay for it. Additionally, the users of services related to the development and use of unique systems and services should always be the unit/activity on the installation, unless the operation and use of the system is directed by a HQDA proponent. Army users should pay either ISC or a non-Army source for IMA services received, depending on the final determination of which services should be acquired from non-Army sources.

Vance also recommends that the Army use the concept of a surrogate user for those activities or users which cannot be billed directly. In this situation, the ISC service provider should bill the surrogate user, which most likely should be an account set up for receiving information bills for the real user. This should enable the Army to easily track the total information costs that each non-billable user is incurring.

Vance also envisions that the primary change for the IMA user should be the need for the users to become more accountable for their utilization of IMA services. IMA users should define, forecast, budget, monitor, and pay for IMA services. They should interact with their DCSIMs and DOIMs to refine their service requirements, to define the best technical solution, and to select the best source of service. The users should monitor contract performance of non-Army providers as well as monitor service level agreements with Army providers, and obtain service cost data from the provider for budgeting. Finally, the service users must pay for the services. These activities, and how they should be accomplished, are outlined in the following subsections.

7.4.1 Requirements Definition. Vance recommends that the users define the IMA services required to support their needs. This is more critical in an environment where users must pay for services because the user will want to ensure that they have budgeted enough funds to meet their service requirements. This section details the techniques that Vance recommends the users follow.

The user should first determine their functional requirements, i.e., application programs to be processed, books or pamphlets to be printed, movies to be made, applications programs to be developed, or telephones to be installed. These requirements should be a function of the users' need for the information service to operate successfully in their organization. For example, a user must have visual information support to brief a Congressional Committee on the user organization's budget request.

Based on the defined functional requirements, users should define their service requirements, i.e., CPU time, print lines, film footage, software development labor hours, or installed lines, and the quantity of services. Two factors impact the ability of the users to define their service requirements: the discipline for which the services are being defined and the user's level of technical knowledge. It is more difficult to define the amount of CPU time to run an application in the automation discipline than to estimate the number of slides to be produced in the visual information discipline. It is more difficult for a data entry clerk to estimate CPU time than for a systems engineer. Therefore, Vance recommends that users obtain technical assistance from, and work with, their DCSIM and DOIM to define their service requirements. DCSIMs and DOIMs should also provide the users assistance in defining service performance levels such as CPU response time, turnaround time (i.e., three hours versus three days), night processing versus day processing, etc.

By defining the functional and IMA service requirements, the users are also developing their usage forecasting data that should be provided to the Army providers for incorporation into their rate-setting activities. To estimate the amount of service units, the users should obtain historical service usage data from the providers and then apply statistical or estimation techniques to forecast future requirements. If little or no historical data is available, users should estimate their requirements based on their experiences and knowledge of upcoming DoD or Army initiatives that may impact information service requirements.

Vance also recommends that the users work with their DCSIM or DOIM to define the best technical solution for meeting their requirements. For example, the DCSIM or DOIM could recommend the purchase of a software program rather than the development of a program in-house, or it could recommend a PC versus a mainframe solution.

7.4.2 Budgeting. Vance recommends that the Army incorporate IMA services budgeting into the PPBES process. To do so, users must include specific, line item, O&M budget requests for IMA services. This section discusses how the users should estimate their budget requirements.

- First, users must collect the usage forecasting data developed when their functional and service requirements were defined. The usage data should be expressed in billable service units.

- The users must then work with the Army and non-Army providers to obtain their estimated service cost, or billing rates, for each billable service unit for the budget year.

- The estimated usage forecasting data should be multiplied by the estimated service cost, to arrive at a budget estimate for their IMA services.

- Following existing procedures, the users' budget estimates for information services should then be submitted, along with their requested budget for other resources, to their MACOM.

7.4.3 Service Acquisition and Use. The users should work with the DSCIMs and DOIMs to identify sources of services that will provide the users' defined functional and service requirements. However, since they will pay for the service, the users should make the final decision as to the source of service. As discussed earlier, the user should contract with non-Army providers using the BOAs, requirements contracts, inter-agency work requests (for other government organizations), and service level agreements (for Army providers) put into place by the DCSIMs and DOIMs. If the user chooses a non-Army source, they should follow the DSCIM and DOIM procedures for obtaining IMA services from those providers.

Vance recommends that the users be required to monitor the performance of all IMA service providers. Users should work with the Army and non-Army provider to insure that the services are being provided on time, at cost, and at a performance level agreed to in the BOA, requirements contract, the inter-agency work requests or service level agreement. If the non-Army provider is not in compliance, the user should work with the provider to solve the problems. If the problem is not solvable, or if the provider is unable or unwilling to provide the IMA services, then

the user should notify the DCSIM and/or the DOIM and request assistance to resolve the problem.

7.4.4 Payment. Vance recommends that the users receive a single, monthly bill for each user order with backup usage reports that detail the service consumption and costs by activities. The users should monitor their billings to ensure the charges reflect the services provided and that there are no arithmetic errors. The user should then authorize the monthly payment. The methodology used for payment may differ depending on the service:

- Vance recommends that all Tier 1 IMA services be operated within a revolving fund. Vance also recommends that whether or not an IMA charter can be established within a revolving fund, payment be made to ISC using the existing or a modified reimbursable order process.

- Vance recommends that all Tier 2 services provided by the Army be operated out of a revolving fund, if feasible. Vance also recommends that payment for Tier 2 IMA services provided by the Army, follow the same existing or modified reimbursable order process used for Tier 1 services.

- Vance recommends that payment of services that are dedicated to the mission of a single user organization be directly funded by that organization's mission fund. Hardware and software for all Tier 3 operations, as well as dedicated facilities, such as laboratory or training systems, should be direct funded. So should contract services that service a single mission, including those which may be considered portions of BASOPSs functions.

- Vance recommends that payment for services provided by other Government agencies be made following the procedures for the Military Inter-departmental Procurement Request (MIPR) or intra-agency transfer of funds. There are many precedents for these type of payments in the Federal Government that the Army can use. The data processing facilities at the Department of Justice and National Institutes of Health are two examples where extensive work is performed for other agencies.

- Vance recommends that payment for services provided by private industry be made following existing procedures for BOAs or requirements contracts.

SECTION 8. COST AND BENEFIT ANALYSIS

The results of the cost and benefit analysis of Vance's final design and implementation plan are presented in this section: cost analysis and benefit analysis. The cost and benefit analysis is a high-level, macro analysis designed to provide the Army an estimate of potential costs and benefits. If the Army implements Vance's design and implementation plan, numerous decisions will arise that require additional low-level, micro analyses. Vance recommends that the Army follow a methodology similar to the one Vance employed for the macro analysis.

8.1 Cost Analysis

Vance conducted a cost analysis of the final design and implementation plan by developing four scenarios that represent different ways the Army could implement Vance's recommendations. The four scenarios are different combinations of two variables: (1) whether or not the Army would obtain permission to manage the IMA resources out of a revolving fund and (2) the amount of non-Army services that the users would buy. The cost analysis is presented in this sub-section: each scenario is discussed, the estimated costs of each scenario are presented, and the estimated costs of each scenario are compared. This sub-section also presents a summary of the assumptions Vance made to estimate the costs; the detailed assumptions are provided in Appendix C.

8.1.1 Scenarios. The Army indicated to Vance that the decision to develop IMA cost reporting and cost recovery techniques was made; therefore, Vance did not analyze the null scenario of no change in the Army's current techniques for managing IMA resources. All scenarios assume that the Army will implement the new techniques for managing IMA services proposed in this document.

Under Scenario 1, Vance assumes that most IMA services will be obtained from Army providers without the use of a revolving fund. ISC should receive direct funding for all strategic and tactical IMA services and for some minimal sustaining base services. ISC should receive the bulk of its sustaining base funds by reporting and recovering costs from the users. The reported costs should not include depreciation costs.

Under Scenario 2, Vance assumes that most IMA services will be obtained from Army providers with the use of a revolving fund. As with Scenario 1, ISC should receive direct funding for all strategic and tactical IMA services and for some minimal sustaining base services. ISC should receive the bulk of its sustaining base funds by reporting and recovering costs from the users. The reported costs should include depreciation costs.

Under Scenario 3, Vance assumes that most IMA services will be obtained from non-Army providers, and that the IMA services obtained from Army providers will be accomplished without the use of a revolving fund. As with Scenario 1, ISC should receive direct funding for all strategic and tactical IMA services and for some minimal sustaining base services. ISC should receive additional, but minimal, sustaining base funds by reporting and recovering costs from the users. The reported costs should not include depreciation costs. The remaining sustaining base funds should be included in the user's appropriations for payment to the non-Army sources.

Under Scenario 4, Vance assumes that most IMA services will be obtained from non-Army providers, and that the IMA services obtained from Army providers will be accomplished with the use of a revolving fund. As with Scenario 1, ISC should receive direct funding for all strategic and tactical IMA services and for some minimal sustaining base services. ISC should receive additional, but minimal sustaining base funds by reporting and recovering costs from the users. The reported costs should include depreciation costs. The remaining sustaining base funds should be included in the user's appropriations for payment to the non-Army sources.

8.1.2 Assumptions. Vance completed the cost analysis by making several assumptions. Vance made these assumptions based on the design and the implementation plan recommended in this document. The assumptions for the non-recurring and recurring cost categories of Personnel, Hardware, Software, Space Occupancy, Supplies, Contracted Services, Inter-Agency Services, and Intra-Agency Services are addressed for the rate-setting and billing activities in the following sub-sections. The assumptions common to all scenarios are discussed first, followed by the assumptions that are unique to each scenario.

8.1.2.1 Non-Recurring Costs. Vance made the following assumptions in developing the non-recurring costs for the rate-setting and billing activities of all scenarios: (1) to perform all development and implementation activities outlined in the implementation plan ten positions will be required at ISC, one position will be required for each CNMA, and two positions will be required at HQDA; (2) an Army-wide total of 619 PC systems will be needed for operating the cost reporting and cost recovery techniques; (3) a standard set of software packages will be needed for each PC and additional metering software will be required for most of the major categories of IMA services; (4) additional supplies will be required for the DOIMs, CNMAs, F&AOs, and the capacity planning groups; (5) contractor assistance will be required to develop and help field the new techniques for each major category of IMA service, and to assist HQDA in integrating the cost reporting and cost recovery techniques; (6) overhead and G&A costs will be incurred.

Vance made the following assumptions which are unique to Scenarios 2 and 4: (1) for Scenario 2, two positions and six contractors will be required to perform activities associated with developing and implementing a revolving fund at USAFAC; and (2) for Scenario 4, one position and three contractors will be required at USAFAC.

8.1.2.2 Recurring Costs. Vance made the following assumptions in developing the recurring costs for the rate-setting and billing activities of all scenarios: (1) 1023 positions will be required at the DOIMs, CNMAs, capacity planning groups, and the F&AOs to operate the new techniques; (2) licenses for modeling software will be required for the capacity groups and software capable of processing metering data will be required for the DOIMs and CNMAs; (3) additional space will be required for the capacity planning groups; (4) additional supplies will be required for each DOIM and CNMA, and for the capacity planning groups; (5) in-house automation will be required for the DOIM, CNMAs, and the capacity planning groups; and (6) overhead and G&A costs will be incurred.

Vance made the following unique assumptions for each scenario: (1) for Scenario 1, 249 contractor positions will be required to assist the DOIMs, CNMAs, and the capacity planning groups in operating the rate-setting activities; (2) for Scenario 2, ten positions will be required at USAFAC to handle additional accounting activities

and to establish revolving fund policy, procedures, and guidelines, additionally, 249 contractor positions will be required to assist the DOIMs, CNMAs, and the capacity planning groups in operating the rate-setting activities; (3) for Scenario 3, 204 Army positions will be required at the DOIMs and CNMAs to assist them in negotiating contracts for the services to be obtained from non-Army sources; (4) for Scenario 4, five additional positions will be required at USAFAC for revolving fund activities and 204 Army positions will be required at the DOIMs and CNMAs to assist them in negotiating contracts for the services to be obtained from non-Army sources.

8.1.3 Cost Summary. This section summarizes the results of the cost analysis of the scenarios. The detailed results are presented in Appendix D.

8.1.3.1 Scenario 1. A summary of the non-recurring and recurring costs for Scenario 1 from FY88 through FY92 is presented in Figure 8-1. As shown in Figure 8-1, the total, un-discounted life cycle cost estimate is $238,195,604.

In FY88, the non-recurring cost estimate of $10,747,573 reflects the acquisition of all hardware, software, and supplies associated with the planning, development, and implementation of the new techniques for managing IMA services. Also included are personnel, contracted services, and administrative costs. The FY88 estimates represent 60.3% of the total non-recurring, life cycle cost estimate of $17,830,653.

Since Vance assumes that the new techniques will not be implemented until FY89, no recurring costs are identified for FY88. Operations begin in FY89 and remain constant through FY92. The increase in recurring costs for the billing activities reflects the addition of the USAFAC positions for cost recovery. The total recurring, life cycle cost estimate is $220,364,950.

Figure 8-2 depicts the life cycle cost estimate for Scenario 1, by cost element. The total non-recurring personnel and contracted services cost estimates to develop and implement the new techniques exceeds all other costs combined. Of the total life cycle non-recurring cost estimate of $17,830,653, personnel and contracted services estimates represent $10,792,416 or 60.5% of the total. The personnel and contracted services categories also represent the predominate recurring costs. Of the total recurring costs of $220,364,950, the personnel and contracted services categories are approximately $179,411,000 or 81%.

When recurring and non-recurring costs are combined, Army personnel costs of $118,666,512 represent 49.8% of the total, while contracted services costs of $71,537,200 represents 30.0%. The two cost items represent 79.8% of the total life cycle cost for Scenario 1.

8.1.3.2 Scenario 2. A summary of the non-recurring and recurring costs for Scenario 2 from FY88 through FY92 is presented in Figure 8-3. As shown in Figure 8-3, the total, un-discounted life cycle cost estimate is $240,802,074.

In FY88, the non-recurring cost estimate of $11,185,825 reflects the acquisition of all hardware, software, and supplies associated with the planning, development, and implementation of the new techniques for managing IMA services. Also included are personnel, contracted services, and administrative costs. The FY88 estimates represent 59.8% of the total non-recurring, life cycle cost estimate of $18,707,156.

Since Vance assumed that the new techniques would not be implemented until FY89, no recurring costs are identified for FY88. Operations begin in FY89 and remain

SUMMARY TABLE
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
SCENARIO 1

	FY88	FY89	FY90	FY91	FY92	TOTAL
NON-RECURRING						
RATE-SETTING	4,681,774	374,826	1,124,461	1,343,586	698,666	8,223,314
BILLING	6,065,799	374,826	1,124,461	1,343,586	698,666	9,607,339
SUBTOTAL	10,747,573	749,653	2,248,922	2,687,173	1,397,333	17,830,653
RECURRING						
RATE-SETTING	0	37,946,591	37,946,591	37,946,591	37,946,591	151,786,366
BILLING	0	4,306,630	21,423,985	21,423,985	21,423,985	68,578,585
SUBTOTAL	0	42,253,222	59,370,576	59,370,576	59,370,576	220,364,950
TOTAL	10,747,573	43,002,875	61,619,498	62,057,749	60,767,909	238,195,604

Summary Table
Scenario 1

Figure 8-1

SUMMARY TABLE
BY COST ELEMENT
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
SCENARIO 1

	FY88	FY89	FY90	FY91	FY92	TOTAL	Cost Elmt to Subtl	Cost Elm to Total
NON-RECURRING								
PERSONNEL	702,016	651,872	551,584	651,872	651,872	3,209,216	18.00%	1.35%
HARDWARE	1,857,000	0	0	0	0	1,857,000	10.41%	0.78%
SOFTWARE	2,028,500	0	0	0	0	2,028,500	11.38%	0.85%
SPACE	0	0	0	0	0	0	0.00%	0.00%
SUPPLIES	827,000	0	0	0	0	827,000	4.64%	0.35%
CONTRACTED SERVICES	3,931,200	0	1,404,000	1,684,800	563,200	7,583,200	42.53%	3.18%
INTER AGENCY SERVICES	0	0	0	0	0	0	0.00%	0.00%
INTRA AGENCY SERVICES	1,401,857	97,781	293,338	350,501	182,261	2,325,737	13.04%	0.98%
SUBTOTAL	10,747,573	749,653	2,248,922	2,687,173	1,397,333	17,830,653	100.00%	7.49%
RECURRING								
PERSONNEL	0	17,700,832	32,585,488	32,585,488	32,585,488	115,457,296	52.39%	48.47%
HARDWARE	0	0	0	0	0	0	0.00%	0.00%
SOFTWARE	0	2,140,000	2,140,000	2,140,000	2,140,000	8,560,000	3.88%	3.59%
SPACE	0	140,600	140,600	140,600	140,600	562,400	0.26%	0.24%
SUPPLIES	0	468,000	468,000	468,000	468,000	1,872,000	0.85%	0.79%
CONTRACTED SERVICES	0	15,988,500	15,988,500	15,988,500	15,988,500	63,954,000	29.02%	26.85%
INTER AGENCY SERVICES	0	0	0	0	0	0	0.00%	0.00%
INTRA AGENCY SERVICES	0	5,815,290	8,047,988	8,047,988	8,047,988	29,959,254	13.60%	12.58%
SUBTOTAL	0	42,253,222	59,370,576	59,370,576	59,370,576	220,364,950	100.00%	92.51%
TOTAL	10,747,573	43,002,875	61,619,498	62,057,749	60,767,909	238,195,604		100%

Summary Table
By Cost Element
Scenario 1

Figure 8-2

SUMMARY TABLE
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
SCENARIO 2

	FY88	FY89	FY90	FY91	FY92	TOTAL
NON-RECURRING						
RATE-SETTING	4,681,774	374,826	1,124,461	1,343,586	698,666	8,223,314
BILLING	6,504,050	813,078	1,124,461	1,343,586	698,666	10,483,842
SUBTOTAL	11,185,825	1,187,904	2,248,922	2,687,173	1,397,333	18,707,156
RECURRING						
RATE-SETTING	0	37,946,591	37,946,591	37,946,591	37,946,591	151,786,366
BILLING	0	4,306,630	22,000,641	22,000,641	22,000,641	70,308,553
SUBTOTAL	0	42,253,222	59,947,232	59,947,232	59,947,232	222,094,918
TOTAL	11,185,825	43,441,126	62,196,154	62,634,405	61,344,565	240,802,074

Summary Table
Scenario 2

Figure 8-3

constant through FY92. The increase in recurring costs for the billing activities reflects the addition of the USAFAC positions for cost recovery. The total recurring, life cycle cost estimate is $222,094,918.

Figure 8-4 depicts the life cycle cost estimate for Scenario 2, by cost element. The total non-recurring personnel and contracted services cost estimates to develop and implement the new techniques exceeds all other costs combined. Of the total life cycle non-recurring cost estimate of $18,707,156, personnel and contracted services estimates represent $11,554,592 or 61.7% of the total. The personnel and contracted services categories also represent the predominate recurring costs. Of the total recurring costs of $222,094,918, the personnel and contracted services categories are approximately $180,915,616 or 81%.

When recurring and non-recurring costs are combined, Army personnel costs of $120,371,408 represent 50% of the total, while contracted services costs of $72,098,800 represents 29.9%. The two cost items represent 79.9% of the total life cycle cost for Scenario 2.

8.1.3.3 Scenario 3. A summary of the non-recurring and recurring costs for Scenario 3 from FY88 through FY92 is presented in Figure 8-5. As shown in Figure 8-5, the total, un-discounted life cycle cost estimate is $211,703,633.

In FY88, the non-recurring cost estimate of $10,747,573 reflects the acquisition of all hardware, software, and supplies associated with the planning, development, and implementation of the new techniques for managing IMA services. Also included are personnel, contracted services, and administrative costs. The FY88 estimates represent 60.3% of the total non-recurring, life cycle cost estimate of $17,830,653.

Since Vance assumed that the new techniques would not be implemented until FY89, no recurring costs are identified for FY88. Operations begin in FY89 and remain constant through FY92. The increase in recurring costs for the billing activities reflects the addition of the USAFAC positions for cost recovery. The total recurring, life cycle cost estimate is $193,872,980.

Figure 8-6 depicts the life cycle cost estimate for Scenario 3, by cost element. The total non-recurring personnel and contracted services cost estimates to develop and implement the new techniques exceeds all other costs combined. Of the total life cycle non-recurring cost estimate of $17,830,653, personnel and contracted services estimates represent $10,792,416 or 60.5% of the total. The personnel category represent the predominate recurring cost. Of the total recurring costs of $193,872,980, the personnel category is approximately $156,374,800 or 73.9%.

When recurring and non-recurring costs are combined, Army personnel costs of $159,584,016 represent 75.4% of the total, while contracted services costs of $7,583,200 represents 3.6%. The two cost items represent 79% of the total life cycle cost for Scenario 3.

8.1.3.4 Scenario 4. A summary of the non-recurring and recurring costs for Scenario 4 from FY88 through FY92 is presented in Figure 8-7. As shown in Figure 8-7, the total, un-discounted life cycle cost estimate is $213,114,509.

In FY88, the non-recurring cost estimate of $11,020,519 reflects the acquisition of all hardware, software, and supplies associated with the planning, development, and implementation of the new techniques for managing IMA services. Also included are

SUMMARY TABLE
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
SCENARIO 2
BY COST ELEMENT

	FY88	FY89	FY90	FY91	FY92	TOTAL	Cost Elmt to Subtl	Cost Elm to Total
NON-RECURRING								
PERSONNEL	802,304	752,160	551,584	651,872	651,872	3,409,792	18.23%	1.42%
HARDWARE	1,857,000	0	0	0	0	1,857,000	9.93%	0.77%
SOFTWARE	2,028,500	0	0	0	0	2,028,500	10.84%	0.84%
SPACE	0	0	0	0	0	0	0.00%	0.00%
SUPPLIES	827,000	0	0	0	0	827,000	4.42%	0.34%
CONTRACTED SERVICES	4,212,000	280,800	1,404,000	1,684,800	563,200	8,144,800	43.54%	3.38%
INTER AGENCY SERVICES	0	0	0	0	0	0	0.00%	0.00%
INTRA AGENCY SERVICES	1,459,021	154,944	293,338	350,501	182,261	2,440,064	13.04%	1.01%
SUBTOTAL	11,185,825	1,187,904	2,248,922	2,687,173	1,397,333	18,707,156	100.00%	7.77%
RECURRING								
PERSONNEL	0	17,700,832	33,086,928	33,086,928	33,086,928	116,961,616	52.66%	48.57%
HARDWARE	0	0	0	0	0	0	0.00%	0.00%
SOFTWARE	0	2,140,000	2,140,000	2,140,000	2,140,000	8,560,000	3.85%	3.55%
SPACE	0	140,600	140,600	140,600	140,600	562,400	0.25%	0.23%
SUPPLIES	0	468,000	468,000	468,000	468,000	1,872,000	0.84%	0.78%
CONTRACTED SERVICES	0	15,988,500	15,988,500	15,988,500	15,988,500	63,954,000	28.80%	26.56%
INTER AGENCY SERVICES	0	0	0	0	0	0	0.00%	0.00%
INTRA AGENCY SERVICES	0	5,815,290	8,123,204	8,123,204	8,123,204	30,184,902	13.59%	12.54%
SUBTOTAL	0	42,253,222	59,947,232	59,947,232	59,947,232	222,094,918	100.00%	92.23%
TOTAL	11,185,825	43,441,126	62,196,154	62,634,405	61,344,565	240,802,074		100%

Summary Table
By Cost Element
Scenario 2

Figure 8-4

SUMMARY TABLE
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
SCENARIO 3

	FY88	FY89	FY90	FY91	FY92	TOTAL
NON-RECURRING						
RATE-SETTING	4,681,774	374,826	1,124,461	1,343,586	698,666	8,223,314
BILLING	6,065,799	374,826	1,124,461	1,343,586	698,666	9,607,339
SUBTOTAL	10,747,573	749,653	2,248,922	2,687,173	1,397,333	17,830,653
RECURRING						
RATE-SETTING	0	31,323,599	31,323,599	31,323,599	31,323,599	125,294,395
BILLING	0	4,306,630	21,423,985	21,423,985	21,423,985	68,578,585
SUBTOTAL	0	35,630,229	52,747,584	52,747,584	52,747,584	193,872,980
TOTAL	10,747,573	36,379,882	54,996,505	55,434,756	54,144,916	211,703,633

Summary Table
Scenario 3

Figure 8-5

SUMMARY TABLE
BY COST ELEMENT
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
SCENARIO 3

	FY88	FY89	FY90	FY91	FY92	TOTAL	Cost Elmt to Subtl	Cost El to Tota
NON-RECURRING								
PERSONNEL	702,016	651,872	551,584	651,872	651,872	3,209,216	18.00%	1.52%
HARDWARE	1,857,000	0	0	0	0	1,857,000	10.41%	0.88%
SOFTWARE	2,028,500	0	0	0	0	2,028,500	11.38%	0.96%
SPACE	0	0	0	0	0	0	0.00%	0.00%
SUPPLIES	827,000	0	0	0	0	827,000	4.64%	0.39%
CONTRACTED SERVICES	3,931,200	0	1,404,000	1,684,800	563,200	7,583,200	42.53%	3.58%
INTER AGENCY SERVICES	0	0	0	0	0	0	0.00%	0.00%
INTRA AGENCY SERVICES	1,401,857	97,781	293,338	350,501	182,261	2,325,737	13.04%	1.10%
SUBTOTAL	10,747,573	749,653	2,248,922	2,687,173	1,397,333	17,830,653	100.00%	8.42%
RECURRING								
PERSONNEL	0	27,930,208	42,814,864	42,814,864	42,814,864	156,374,800	80.66%	73.86%
HARDWARE	0	0	0	0	0	0	0.00%	0.00%
SOFTWARE	0	2,140,000	2,140,000	2,140,000	2,140,000	8,560,000	4.42%	4.04%
SPACE	0	140,600	140,600	140,600	140,600	562,400	0.29%	0.27%
SUPPLIES	0	468,000	468,000	468,000	468,000	1,872,000	0.97%	0.88%
CONTRACTED SERVICES	0	0	0	0	0	0	0.00%	0.00%
INTER AGENCY SERVICES	0	0	0	0	0	0	0.00%	0.00%
INTRA AGENCY SERVICES	0	4,951,421	7,184,120	7,184,120	7,184,120	26,503,780	13.67%	12.52%
SUBTOTAL	0	35,630,229	52,747,584	52,747,584	52,747,584	193,872,980	100.00%	91.58%
TOTAL	10,747,573	36,379,882	54,996,505	55,434,756	54,144,916	211,703,633		100%

Summary Table
By Cost Element
Scenario 3

Figure 8-6

SUMMARY TABLE
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
SCENARIO 4

	FY88	FY89	FY90	FY91	FY92	TOTAL
NON-RECURRING						
RATE-SETTING	4,681,774	374,826	1,124,461	1,343,586	698,666	8,223,314
BILLING	6,338,745	647,772	1,124,461	1,343,586	698,666	10,153,230
SUBTOTAL	11,020,519	1,022,598	2,248,922	2,687,173	1,397,333	18,376,545
RECURRING						
RATE-SETTING	0	31,323,599	31,323,599	31,323,599	31,323,599	125,294,395
BILLING	0	4,306,630	21,712,313	21,712,313	21,712,313	69,443,569
SUBTOTAL	0	35,630,229	53,035,912	53,035,912	53,035,912	194,737,964
TOTAL	11,020,519	36,652,828	55,284,833	55,723,084	54,433,244	213,114,509

Summary Table
Scenario 4

Figure 8-7

personnel, contracted services, and administrative costs. The FY88 estimates represent 60% of the total non-recurring, life cycle cost estimate of $18,376,545.

Since Vance assumed that the new techniques would not be implemented until FY89, no recurring costs are identified for FY88. Operations begin in FY89 and remain constant through FY92. The increase in recurring costs for the billing activities reflects the addition of the USAFAC positions for cost recovery. The total recurring, life cycle cost estimate is $194,737,964.

Figure 8-8 depicts the life cycle cost estimate for Scenario 4, by cost element. The total non-recurring personnel and contracted services cost estimates to develop and implement the new techniques exceeds all other costs combined. Of the total life cycle non-recurring cost estimate of $18,376,545, personnel and contracted services estimates represent $11,267,104 or 61.3% of the total. The personnel category represent the predominate recurring cost. Of the total recurring costs of $194,737,964, the personnel category is approximately $157,126,960 or 80.7%.

When recurring and non-recurring costs are combined, Army personnel costs of $160,436,464 represent 75.3% of the total, while contracted services costs of $7,957,600 represents 3.7%. The two cost items represent 79% of the total life cycle cost for Scenario 4.

8.1.4 Comparative Analysis. The estimated costs of the scenarios are compared and analyzed by cost element in this sub-section. Figure 8-9 summarizes the costs for each scenario by cost element. As shown in Figure 8-9 all cost elements other than Personnel, Contracted Services, and Intra-Agency Services, are identical among the scenarios. The Intra-Agency Services cost element differs primarily because of the administration or Army overhead costs. The overhead costs are a function of the other cost elements and, therefore, varies among the scenarios. The Personnel and Contracted Services cost elements represent the largest percentage of costs for each scenario.

The non-Army sources of services variable proves to be more discriminating than the revolving fund variable. The total cost estimates for the scenarios that represented buying a small percentage of services from non-Army sources, Scenarios 1 and 2, are similar. The total cost estimates for the scenarios that represent buying a large percentage of services from non-Army sources, Scenarios 3 and 4, are also similar. The primary differences in the total cost estimate for each scenario are discussed below.

The primary difference between the total, non-recurring cost estimates for Scenarios 1 and 2 are the two USAFAC positions required for Scenario 2 to develop and implement a revolving fund and the six contractors that will support the two USAFAC personnel. The primary difference between the total, recurring cost estimates for Scenarios 1 and 2 are the ten USAFAC positions required for Scenario 2 to operate the revolving fund and to establish revolving fund policy, procedures and guidelines.

The primary difference between the total, non-recurring cost estimates for Scenarios 3 and 4 is the one USAFAC position required for Scenario 4 to develop and implement a revolving fund and the three contractors that will support the one USAFAC person. Vance assumes that since a large percentage of services will be

SUMMARY TABLE
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
SCENARIO 4
BY COST ELEMENT

	FY88	FY89	FY90	FY91	FY92	TOTAL	Cost Elmt to Subtl	Cost El to Tota
NON-RECURRING								
PERSONNEL	752,160	702,016	551,584	651,872	651,872	3,309,504	18.01%	1.55%
HARDWARE	1,857,000	0	0	0	0	1,857,000	10.11%	0.87%
SOFTWARE	2,028,500	0	0	0	0	2,028,500	11.04%	0.95%
SPACE	0	0	0	0	0	0	0.00%	0.00%
SUPPLIES	827,000	0	0	0	0	827,000	4.50%	0.39%
CONTRACTED SERVICES	4,118,400	187,200	1,404,000	1,684,800	563,200	7,957,600	43.30%	3.73%
INTER AGENCY SERVICES	0	0	0	0	0	0	0.00%	0.00%
INTRA AGENCY SERVICES	1,437,459	133,382	293,338	350,501	182,261	2,396,941	13.04%	1.12%
SUBTOTAL	11,020,519	1,022,598	2,248,922	2,687,173	1,397,333	18,376,545	100.00%	8.62%
RECURRING								
PERSONNEL	0	27,930,208	43,065,584	43,065,584	43,065,584	157,126,960	80.69%	73.73%
HARDWARE	0	0	0	0	0	0	0.00%	0.00%
SOFTWARE	0	2,140,000	2,140,000	2,140,000	2,140,000	8,560,000	4.40%	4.02%
SPACE	0	140,600	140,600	140,600	140,600	562,400	0.29%	0.26%
SUPPLIES	0	468,000	468,000	468,000	468,000	1,872,000	0.96%	0.88%
CONTRACTED SERVICES	0	0	0	0	0	0	0.00%	0.00%
INTER AGENCY SERVICES	0	0	0	0	0	0	0.00%	0.00%
INTRA AGENCY SERVICES	0	4,951,421	7,221,728	7,221,728	7,221,728	26,616,604	13.67%	12.49%
SUBTOTAL	0	35,630,229	53,035,912	53,035,912	53,035,912	194,737,964	100.00%	91.38%
TOTAL	11,020,519	36,652,828	55,284,833	55,723,084	54,433,244	213,114,509		100%

Summary Table
By Cost Element
Scenario 4

Figure 8-8

TOTAL LIFE CYCLE COST
CURRENT DOLLARS
($000s)

	SCEN 1	SCEN 2	SCEN 3	SCEN 4
Personnel	118,666	120,372	159,584	160,437
Hardware	1,857	1,857	1,857	1,857
Software	10,589	10,589	10,589	10,589
Space Occupancy	562	562	562	562
Supplies	2,699	2,699	2,699	2,699
Contracted Services	71,537	72,099	7,583	7,958
Inter-Agency Services	0	0	0	0
Intra-Agency Services	32,285	32,626	28,830	29,014
TOTAL	238,196	240,802	211,704	213,115

Total Life Cycle Costs
Current Dollars

Figure 8-9

acquired from non-Army sources, fewer services will be provided out of a revolving fund and, therefore, less work would be needed in setting up a revolving fund than is required under Scenario 2 which also assumes a revolving fund. The primary difference between the total, recurring cost estimates for Scenarios 3 and 4 is the five USAFAC positions required for Scenario 4 to operate the revolving fund and to establish revolving fund policy, procedures and guidelines.

A comparison of Scenarios 1 and 2 to Scenarios 3 and 4 indicates the potential cost savings to the Army if it obtains a large percentage of IMA services from non-Army sources. A comparison of Scenarios 1 and 3 to Scenarios 2 and 4 indicates the potential costs associated with managing the IMA services out of a revolving fund. While this preliminary cost analysis indicates Scenario 3 is the most cost effective approach, there are important issues to consider when examining these different approaches. A discussion of some of the benefits associated with the two variables, buying services from Army or non-Army sources and operating with or without a revolving fund, is presented in Subsection 8.2.

8.2 Benefit Analysis

This subsection discusses the benefits associated with implementing cost reporting and recovery techniques and the benefits associated with the two major variables used to develop the four scenarios. Where feasible, this sub-section attempts to quantify the potential benefits. Where this is not possible, this sub-section cites the experience of experts in the public and private sector and attempts to estimate benefits based on that experience.

8.2.1 Benefits of Cost Recovery and Reporting. Vance found during it's survey of cost reporting and cost recovery techniques in private industry that an annual net savings in the range of approximately 5% can be expected after the system is fully implemented. Vance estimates that the Army FY88-FY92 budget for the Information Mission Area is approximately $33 billion. This estimate is based on the "5 Year Plan for Managing ADP and Telecommunications Needs of the Federal Government" for FY87-FY92 and other sources. Vance assumed that the budget for the sustaining base would be approximately one-third of the total budget of $11 billion. If the industry experience is translatable to the Army, cost recovery and reporting techniques, if fully implemented, could save the Army approximately $550 million over the FY88-FY92 budget period. These estimated savings would primarily result from customers consuming fewer IMA services because of their increased sensitivity to the costs, and the providers becoming more efficient and cost effective in producing IMA services.

If the Army follows Vance's implementation plan, no new techniques will be in place in FY88, only partial techniques will be in place in FY89 and FY90, and almost complete techniques will be in place in FY91 and FY92. Using $550 million as an estimate of the potential savings over a five year period and $110 million as potential annual savings, Vance estimates that the Army would receive no benefits during FY88, approximately $55 million in benefits during FY89 and FY90, and approximately $110 million in benefits during FY91 and FY92. This yields a potential, undiscounted savings of approximately $330 million over the five year period between FY89 and FY92.

8.2.2 Revolving Fund Versus Direct Appropriations. In 1976, the Comptroller General of the United States issued a report entitled "27 Years' Experience With

Defense Industrial Funds." This report provided an appraisal of the Defense Industrial Funds and included a discussion of the shortcomings and problems of the funds. The following discussion regarding the utilization of revolving funds is based on the findings of the GAO report; however, no quantitative studies have been done as to the potential cost savings in having a defense organization operate through a revolving fund; therefore, Vance did not attempt to estimate any dollar savings.

Defense policy stipulates that the primary reason for using revolving funding is the benefits that derive from the buyer/seller relationship that is established: a relationship not present when an organization is funded through direct appropriations. This relationship forces the users to consider costs when deciding their requirements and placing their orders. This forces the sellers (or providers) to operate more efficiently, to provide the best price for a given level of service. It also makes producers financially dependent on obtaining orders from users and matching costs with reimbursements to remain solvent. Users must pay for what they receive and fund managers have greater financing flexibility, thus providing the users and providers incentives to effect efficiencies and economies. Other incentives are discussed in the following paragraphs.

Revolving funds simplify financing, provide a more disciplined approach to budgeting, and promote the use of cost accounting thus focusing on the costs of producing the products and/or services. By having costs tracked and charged to specific jobs, the providers as well as the customers, will know what the operating costs are. Managers can evaluate an activity's efficiencies and can evaluate the reasonableness of expenses incurred. The cost data also allows the managers to evaluate the performance of their personnel with respect to minimizing costs. However, the usefulness of the cost data is a function of the sophistication of the cost accounting procedures and the willingness of management to effectively use this tool. Also, cost accounting capabilities are not unique to an organization funded through a revolving fund. That is, the Army can have modern cost accounting and control without operating through a revolving fund.

By consolidating the source of funding and financing an organization from a revolving fund rather than from direct appropriations, the fund managers have greater financing flexibility. A revolving fund permits the capitalization of equipment thereby creating a reserve for the replacement or new purchase, of state-of-the-art technology. The organization funded through a revolving fund thus avoids competing with other defense programs for the limited appropriations dollars. This is especially important for the information technology activities that must compete with "guns and tanks" for scarce dollars. Also, a revolving fund permits the acquisition of supplies and materials without regard to the fiscal year. Under direct appropriations, supplies and materials bought in FY88 must be acquired with FY88 funds. Also, since the operation of an organization funded through a revolving fund is financed with customer receipts, as long as the customers have enough appropriated funds to acquire products or services, the provider has built-in flexibility to respond to increases in workload although there may be some personnel and other constraints.

There are constraints in the Federal military environment that can impede an organization from realizing the benefits of operating through a revolving fund. As are other government activities, revolving funds are subject to civilian employee ceilings and constraints on hiring and firing. Therefore, managers of revolving funds do not have the flexibility to always quickly increase or decrease personnel

levels to meet workload requirements. However, managers can use overtime (which is expensive), hire temporary or part-time help, use military personnel (which is a free resource), or contract work out. It should be noted that these personnel constraints also apply when an organization is funded by direct appropriations.

Revolving fund activities in DoD will have an inherent amount of unused and under-used capacity that must be available in the event of war or an emergency to meet military requirements. While Secretary of Defense policy required that this excess capacity should be identified and separately funded from appropriated funds, GAO found, and reported in their 1976 report, that 45 selected Army and Navy industrially funded activities included excess capacity costs in their prices and passed it to the customers without identifying the amount. Prior to 1977, no guidelines were issued for implementing DOD's policy. In response to this issue, DOD developed guidelines for computing, reporting, budgeting, and funding the cost of maintaining unused and under-used plant, equipment, and people at the industrial fund activities. Operating by direct appropriations does not resolve this problem because the mobilization, or excess capacity, costs are less visible since the true cost could still be inflated by an unknown amount.

8.2.3 Benefits of Army Versus Non-Army. The non-quantifiable benefits of obtaining IMA services from non-Army sources are discussed under the Conceptual Design, Section 5. The are briefly repeated here:

- o Provides the Army greater ability to control its operations cost as appropriations levels fluctuate.
- o Reduces the Army's need for major capital investments.
- o Frees up support personnel that could be applied to the Army's strategic and tactical missions.
- o Provides an infrastructure that will permit the focus of Army resources to quickly change for mobilization response.
- o Enables the Army to access modern technology wherever that technology is located.

One approach to quantifying the benefits of acquiring services from non-Army sources would have been to compare the total operating cost of an Army data center to the cost of processing the same workload at a time sharing service. Since a study of this nature was not part of the original contract, Vance contacted a number of firms in the Washington area that specialize in this area.

A recent study conducted by Support Services, a small business located in Washington, compared an internal, government data center to four, what the industry considers to be the most competitive, commercial time sharing firms. The total current and projected costs to operate the government data center, and the current and projected workload of the data center, were calculated. The costs to process the workload via four time sharing services were determined (using benchmarking techniques to ensure similar performance levels). The results of the Support Services study (the study and the name of the Government agency is proprietary) indicated that the Government agency could expect a cost reduction of from 10%-30% if it obtained its data processing services from commercial time sharing services.

If this experience could be applied to all IMA services, not just automation, and assuming the five year (FY88-FY92) sustaining base budget is $11 billion, the Army could realize a range of $1.1 billion to $3.3 billion savings by acquiring all its IMA services from non-Army sources. Even if the Army acquired only half of their services (in terms of budget requirements) from non-Army sources, the Army could save $550 million to $1.65 billion over five years. Even if the savings were only 5%, the savings or benefits, exceed the costs of implementing and operating the technical and management procedures proposed in this document.

Another view of the cost savings would be to examine what the impact of obtaining service from non-Army sources would have on the Army's procurement budget. The total five year (FY88-FY92) Other Procurement, Army (OPA) budget for the Information Mission Area is approximately $14 billion. This data is based on the "5 Year Plan for Managing ADP and Telecommunications Needs of the Federal Government" for FY87-FY92 and other sources. The OPA budget for automation and telecommunications represents 99.2% of the total with telecommunications representing 73.7% or $10.032 billion.

Currently the Army is undergoing a significant telephone upgrade effort (CONUS Telephone Modernization Program, Korean and Japan Telephone Upgrades). Devices such as automatic message accounting and switches that will be able to meter telephones are being procured. If telephone services were acquired from non-Army sources, the OPA dollars, as well as the costs to design, develop, and implement the upgrades, to acquire the hardware and software could be avoided. Budgeted OPA dollars to upgrade the Army's telephone system was not made available; therefore, Vance cannot estimate the cost avoidance savings if the Army acquired its telephone service from non-Army sources. Assuming the telephone upgrade is only 5% or $515 million of the total OPA telecommunications budget over the five year period, the savings would far exceed the life cycle cost estimate of $211.7 to $240.8 million to implement and operate the new techniques for managing IMA services under all scenarios. When all of the disciplines' OPA budget is considered, the savings potential increases significantly over the implementation and operation costs.

Of course, while the OPA budget would decrease, the O&M budget would increase since the service costs would be paid from O&M accounts. Vance was unable to collect the appropriate data to estimate the percentage O&M would increase, but the cost savings percentage in the Support Services report, as well as the experience of private industry, all report net savings.

8.3 Present Value Analysis

Expenditures for any one of the scenarios most likely will be time phased. Since there is time value to money, it is necessary to determine when the expenditures for the scenarios will be made. This section expands the cost analysis by examining the effects of the time-value of money on the Army's investment decisions. The present value is calculated by applying a discount rate to the annual expenditures. The net present value is the sum total of the annual discounted costs. The present value of $100 payable in two years can be defined as the amount of money necessary to invest today at a compound interest in order to have $100 is two years. Therefore, present value depends on the rate of interest, the frequency of compounding, and the time horizon selected.

Assuming equal benefits, the scenario whose present value cost is least is the more desirable because it implies a more efficient allocation of resources. The lowest

present value cost means that resources are allocated more efficiently in the sense that fewer current resources must be diverted to satisfy the requirement.

The Department of Defense currently has a 10% discount rate established by DoD Instruction (DoDI) 7041.3 to be used in all economic analysis of proposed Defense investment. That discount rate is used for this present value analysis. The frequency of compounding is every year and the time horizon is five years with FY88 as year 1.

Figure 8-10 is a summary of the non-recurring and recurring costs estimates for Scenario 1 expressed in 1987 dollars. The total, discounted, life cycle cost estimate is $171,724,049.

Figure 8-11 is a summary of the non-recurring and recurring costs estimates for Scenario 2 expressed in 1987 dollars. The total, discounted, life cycle cost estimate is $173,669,822.

Figure 8-12 is a summary of the non-recurring and recurring costs estimates for Scenario 3 expressed in 1987 dollars. The total life cycle cost estimate is $152,638,604.

Figure 8-13 is a summary of the non-recurring and recurring costs estimates for Scenario 4 expressed in 1987 dollars. The total life cycle cost estimate is $153,704,897.

Figure 8-14 is a summary of the present value costs for all scenarios for all years. An analysis of the present value estimates shows that discounting has little, if any impact, on the cost estimate relationship among the scenarios. When the time value of money is considered, Scenario 3 is the most efficient alternative. Since Scenarios 3 and 4 require almost identical resources, a traditional cost benefit analysis may impact the Army's ultimate decision. The reader is cautioned that the present value analysis does not include benefits; therefore, the final outcome may change significantly.

PRESENT VALUE MATRIX
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
SCENARIO 1

	FY88	FY89	FY90	FY91	FY92	TOTAL
NON-RECURRING COSTS	10,747,573	749,653	2,248,922	2,687,173	1,397,333	17,830,653
RECURRING COSTS	0	42,253,222	59,370,576	59,370,576	59,370,576	220,364,950
TOTAL TANGIBLE COSTS	10,747,573	43,002,875	61,619,498	62,057,749	60,767,909	238,195,604
SYSTEM LIFE COST	10,747,573	53,750,448	115,369,946	177,427,695	238,195,604	
PRESENT VALUE COST	9,770,522	35,539,554	46,295,653	42,386,249	37,732,071	171,724,049

Present Value Matrix
Scenario 1

Figure 8-10

PRESENT VALUE MATRIX
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
SCENARIO 2

	FY88	FY89	FY90	FY91	FY92	TOTAL
NON-RECURRING COSTS	11,185,825	1,187,904	2,248,922	2,686,713	1,397,333	18,706,696
RECURRING COSTS	0	42,253,222	59,947,232	59,947,232	59,947,232	222,094,918
TOTAL TANGIBLE COSTS	11,185,825	43,441,126	62,196,154	62,633,945	61,344,565	240,801,614
SYSTEM LIFE COSTS	11,185,825	54,626,950	116,823,104	179,457,049	240,801,614	
PRESENT VALUE COSTS	10,168,932	35,901,745	46,728,903	42,779,799	38,090,129	173,669,508

Present Value Matrix
Scenario 2

Figure 8-11

PRESENT VALUE MATRIX
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
SCENARIO 3

	FY88	FY89	FY90	FY91	FY92	TOTAL
NON-RECURRING COSTS	10,747,573	749,653	2,248,922	2,687,173	1,397,333	17,830,653
RECURRING COSTS	0	35,630,229	52,747,584	52,747,584	52,747,584	193,872,980
TOTAL TANGIBLE COSTS	10,747,573	36,379,882	54,996,505	55,434,756	54,144,916	211,703,633
SYSTEM LIFE COSTS	10,747,573	47,127,455	102,123,961	157,558,717	211,703,633	
PRESENT VALUE COST	9,770,522	30,066,008	41,319,699	37,862,659	33,619,716	152,638,604

Present Value Matrix
Scenario 3

Figure 8-12

PRESENT VALUE MATRIX
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
SCENARIO 4

	FY88	FY89	FY90	FY91	FY92	TOTAL
NON-RECURRING COSTS	11,020,519	1,022,598	2,248,922	2,687,173	1,397,333	18,376,545
RECURRING COSTS	0	35,630,229	53,035,912	53,035,912	53,035,912	194,737,964
TOTAL TANGIBLE COSTS	11,020,519	36,652,828	55,284,833	55,723,084	54,433,244	213,114,509
SYSTEM LIFE COST	11,020,519	47,673,347	102,958,180	158,681,264	213,114,509	
PRESENT VALUE COST	10,018,655	30,291,583	41,536,324	38,059,591	33,798,745	153,704,897

Present Value Matrix
Scenario 4

Figure 8-13

TOTAL LIFE CYCLE COST
DISCOUNTED DOLLARS
($000s)

	SCEN 1	SCEN 2	SCEN 3	SCEN 4
TOTAL TANGIBLE COSTS	238,196	240,802	211,704	213,115
TOTAL PRESENT VALUE COSTS	171,724	173,669	152,639	153,705

Total Life Cycle Cost
Discounted Dollars

Figure 8-14

SECTION 9. CONCLUSIONS AND RECOMMENDATIONS

Vance developed conclusions and formulated recommendations regarding the implementation of new techniques for managing IMA services. The conclusions are presented in this section, followed by a listing of the recommendations.

9.1 Conclusions

Vance developed five conclusions regarding the implementation of new techniques for managing IMA services. They are discussed in this Section.

First, Vance concludes that the Army objectives for managing IMA services can be achieved. The techniques that Vance recommends achieve all of the Army's objectives, incorporate many capabilities that currently exist within the Army, are cost effective, and can be implemented in a reasonable time-frame.

Second, Vance concludes that the Army goal of an integrated system, needed to produce a single bill, cannot be implemented initially. Vance believes that implementing an integrated system would be too complicated and resource intensive to be successful. As documented in the implementation plan, Vance concludes that the Army should implement separate cost reporting and recovery capabilities initially, and then evolve to an integrated system.

Third, Vance concludes that there are important issues with which the Army must deal while implementing Vance's recommendations. The issues that Vance identified are:

- Some contractors may bill the Army for a large amount of work on a single bill. This could limit the extent to which individual Army users could be required to pay for the use of the contractor. This will be a continuing issue until contracts can be negotiated requiring contractors to bill at the required level.

- The Army Reserve receives some of its funding for its automation centers from the states. The extent to which costs, paid for with state funds, can be included in the billing rates must be determined.

- There is a requirement for positions in which military personnel can be trained and maintain existing skills. The number of these positions required in Army organizations which provide support to the sustaining base must be determined.

- The extent to which IMA resources are used to supply services for both the sustaining base and the strategic and tactical areas must be determined.

- The Army has multiple, diverse accounting environments, both industrial funded and direct appropriations, and multiple, diverse accounting systems which must be dealt with while implementing the new techniques.

- Many of the installations where Army providers currently reside do not have the capability to account for costs at a low level of detail. The ability to track actual costs must be developed without overloading the local F&AO.

- The Army currently does not have a labor distribution mechanism capable of tracking personnel costs.

- Metering software is currently being acquired as part of the different telephone system upgrades throughout the Army. However, the schedule for completion of the upgrades may cause delays in implementing the new techniques for the local telephone systems.

- Army organizations in Europe have different problems which could cause delays in implementing new techniques or modifying current techniques to meet the proposed new way of managing IMA resources. An example of a different problem is the apparent lack of responsiveness of the Deutsches Bundes Post (German telephone, telegraph, and postal system).

- The URS II project has not received the support needed to ensure that cost reporting capabilities for non-IBM equipment will be available in a timely manner.

Fourth, Vance concludes that the Army has multiple, diverse technical environments within each of the IMA disciplines. Consequently, Vance concludes that the Army will have to develop different versions of the new techniques to enable them to operate effectively in the diverse environments and to satisfy all of the Army's objectives.

Fifth, Vance concludes that there are multiple examples of Army and DoD organizations that have successfully implemented cost reporting and recovery techniques. Vance modeled many of its recommendations based on the techniques used in the following organizations.

- DTS-W provides telephone and telecommunications service to all of the Military District of Washington on a cost recovery basis.

- ASIMS has been developing and distributing memo bills for most of FY87.

- AMC, parts of the COE, and other research organizations have operated as full cost recovery organizations for many years.

- The direct customer payment program (DCP) has provided many Army organizations a head-start in implementing cost reporting and recovery techniques. Fort Belvoir is a good example, where the Fort Belvoir DOIM has gone well beyond what was originally required for DCP.

- The Navy Printing and Publications Service has been operating as a full cost recovery organization out of the Navy Industrial Fund for over 30 years.

- The Navy Data Automation Command has operated over 17 automation centers as full cost recovery organizations for the last four years.

- The Air Force Data Services Center has operated as a full cost recovery organization for approximately ten years.

- The Air Force operated a full cost recovery consulting organization, the Federal Computer Performance Evaluation and Simulation Center (FEDSIM), until it was transferred to the GSA.

9.2 Recommendations

Vance formulated six recommendations regarding the implementation of new techniques for managing IMA services. They are discussed in this Section.

First, Vance recommends that the Army proceed to implement the new techniques for managing IMA services according to the plan presented in this document.

Second, Vance recommends that the Army provide the resources (personnel, hardware, and software) necessary to successfully implement and operate the new techniques. If the resources are not made available, the results from Sage's failure avoidance analysis indicate that the new techniques will not succeed.

Third, Vance recommends that the same basic techniques implemented in CONUS be implemented in OCONUS. However, Vance recommends that the Army implement the new techniques more slowly in OCONUS because of the added and unique problems that Army organizations oversees must deal with.

Fourth, should the Army determine that it does not have the resources to implement all of the activities identified in the implementation plan simultaneously, then Vance recommends that the Army implement the activities in the order listed below. Vance developed the order based on which activities were easier to implement, needed fewer resources to complete, and could be implemented the quickest.

- The priorities of the cost reporting and recovery activities are presented below from highest to lowest along with a discussion of each ranking.

  - ASIMS - ASIMS should be implemented first as it provides a good example for the field since the major users will likely be the proponents and its services will be provided Army-wide. It will be relatively easy to implement since many of the cost reporting and recovery techniques are already in place. The resources to implement cost reporting and recovery for the RDCs should be minimal, and implementation can be accomplished quickly.

  - ISEC - ISEC also provides a good example for the field since the users will likely be the proponents and services will be provided Army-wide. It will be moderately easy to implement since the techniques are not complex, and few, if any, machines will need to be metered. A moderate level of resources will be required for implementation, and implementation can be accomplished in a moderate period of time.

  - Mail - Mail should be the first area for acquiring services from non-Army sources. It will be moderately easy to implement since the mail subactivities are straightforward. Relatively few resources will be required to implement because much of the usage will be self metering, and implementation can be completed in a moderate period of time.

  - APPA - APPA should be the second activity to be implemented since the users will likely be the proponents or MACOMs and services will be

provided Army-wide. It will be moderately difficult to implement since many external interfaces must be developed, such as between GPO and APPA. Only moderate resources will be required since much of the groundwork was completed under DCP, and implementation can be completed in a moderate period of time.

- oo Tier 2 Automation - Tier 2 Automation should be implemented before the TCC and other telecommunications activities because they need to use the Tier 2 Automation reporting capabilities. It will be moderately difficult to implement because of the diversity of computer equipment owned by the Army. More resources will be required because of the large number of installations that have and use Tier 2 Automation equipment, and implementaiton will take a moderate to long period of time.

- oo TCC - The TCC activity requires the use of Tier 2 Automation reporting capabilities. It will be easy to implement since there is only one service and it will be easy to meter. Minimal resources will be required, and implementation can be completed in a short period of time.

- oo Other Telecommunications - The Other Telecommunications activity requires the use of Tier 2 Automation reporting capabilities. It will be easy to implement since the services are simple and relatively easy to meter. Minimal resources will be required, and implementation can be completed in a short period of time.

- oo ARCCO - The ARCCO activity may have to meter services using the local installation's PBXs. It will be moderately difficult to implement because of the wide diversity of networks. A moderate amount of resources will be required, and a moderate to long period of time will be required to implement since each of the networks must be analyzed to determine its metering capabilities.

- oo Local Printing - There are no real benefits to implementing Local Printing activity more quickly. It will be moderately easy to implement since only preliminary procedures need to be developed. A moderate amount of resources will be needed since Tier 3 equipment will need to run the reporting software, and implementation can be completed in a moderate period of time.

- oo Visual Information - There are no real benefits to implementing the Visual Information activity more quickly. It will be moderately easy to implement since only preliminarly procedures need to be developed. A moderate amount of resources will be needed since Tier 3 equipment will need to run the reporting software, and implementation can be completed in a moderate period of time.

- oo Local Telephones - The Local Telephones activity should be the last activity implemented because of the magnitude of the task. It will be difficult to implement because of the large number of installations and the diverse types of equipment. A large amount of resources will be required, and a substantial period of time will be required since metering software for the PBXs must be acquired. Finally a need to adhere to existing telephone upgrade schedules must be met.

AD-A183 554 DESIGN OF THE ARMY CHARGEBACK AND COST ACCOUNTING SYSTEM STUDY RECOMMENDA..(U) VANCE GOVERNMENT SYSTEMS MCLEAN VA S M HUNT 07 AUG 87 MDA903-86-C-0329 3/3

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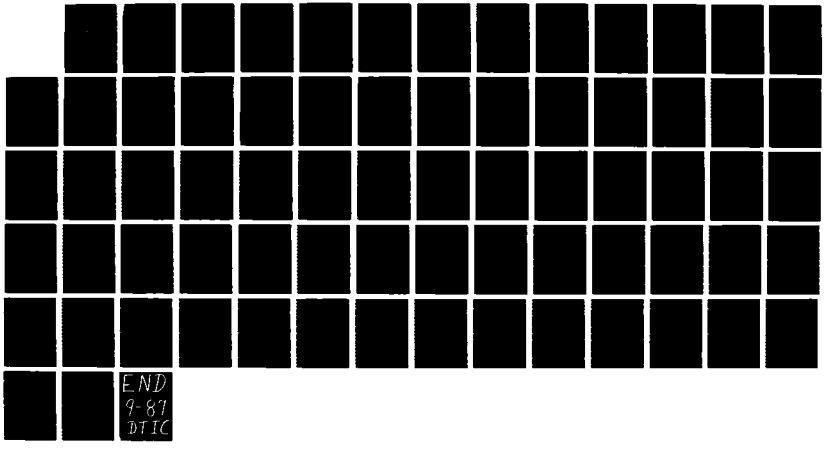

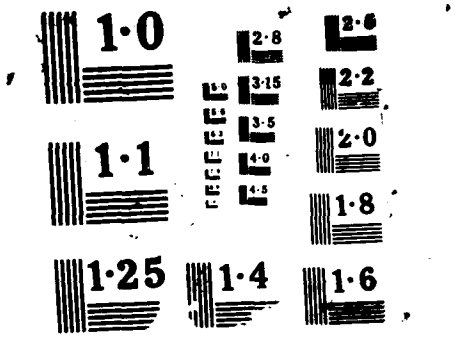
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- The priorities of the other activities from highest to lowest identified in the implementation plan are presented along with a discussion of each ranking.

  - Marketing - Marketing is the most important activity because the concept must be sold Army-wide, and support must be gained from the field. The marketing subactivities will be relatively easy to implement, a small amount of resources will be required, and implementation can be completed quickly.

  - Training - Training will require effort, but as indicated in the Sage analysis, the field believes training is critical and believes that the new techniques will fail without it. It will be moderately easy to implement, a moderate amount of resources will be required, and implementation can be completed in a moderate period of time.

  - Non-Army Sources of Services - Establishing the capability for obtaining services from non-Army sources is the most important of the remaining activities. It will be moderately difficult to implement because of the changes required in the Army's current method of operation. A moderate to high amount of resources will be required, and implementation can be completed in a moderate to long period of time depending upon the results of early studies.

  - Revolving Fund - The Army must determine early the possibility of establishing a revolving fund since it will affect how the cost recovery activity is completed. It will be moderately difficult to complete because the Army must coordinate with, and gain approval from, OSD and Congress. A low to moderate amount of resources will be required, and implementation can be completed in a moderate to long period of time.

  - Cost Recovery - After determining the feasibility of using a revolving fund, the Army should begin the cost recovery activity. It will be moderately easy to implement, a low to moderate amount of resources will be required, and implementation can be completed in a minimal to moderate period of time.

  - Capacity Planning - Capacity Planning is not as important as the other activities and, consequently, should be implemented last. It will be easy to implement, a moderate amount of resources will be required, and implementation can be completed quickly.

  - System Integration - System Integration should be performed only after all other activities are completed and the Army has obtained some experience with the cost reporting and recovery techniques. It will be relatively difficult to implement, a large amount of resources will be required, and implementation can take a long period of time to complete.

Fifth, Vance recommends that the Army extend the schedules provided in the implementation plan, as needed, to allow for delays in acquiring metering software and hardware. This problem is most likely to arise in the areas of local telephones and ARCCO because much of the metering software is being acquired under existing procurement schedules.

Sixth, Vance recommends that the Army provide ISC direct funding for the following resources and they not be subject to the new techniques.

- o Tactical resources associated with the DCS.
- o Resources associated with the WWMCCS.
- o Resources associated with the management office of the SBNA.
- o Resources associated with the message centers (the TCCs).
- o Resources associated with the DOIM staff which provides advisory services to the users.
- o Resources associated with the strategic and tactical parts of ISC and ISC sub-commands.
- o Resources associated with ISEC engineers not involved in supporting the sustaining base.

APPENDIX A

VANCE'S RESPONSE TO THE COMBINED RESULTS OF SAGE'S FAILURE AVOIDANCE ANALYSIS

SECTION 1. RESPONSE TO COMBINED RESULTS

This appendix documents the modifications that Vance made to its preliminary design and implementation plan based on the critical strategic events identified by the combined group. This combined group represents the summation of all participants in Sage Institute International's (Sage) failure avoidance methodology. The critical strategic events were identified as those having a strategic event value of at least .83.

Vance analyzed the critical strategic events identified by Sage and grouped the events based on the concepts that were being addressed. The event groupings that Vance derived are presented in Figure A-1. Figure A-1 contains the number of the grouping, the code of the highest level strategic event in the group, a brief comment describing the concept, and the section in this document that describes the modification. To fully understand the scope of the groupings, it is necessary for the reader to review Sage's final report for the combined group. For example, the grouping with the high level code DAC encompasses the lower level codes DACC, DACCC, DACCCC, and DACCCA. A brief discussion of how Vance modified the preliminary design and implementation plan to respond to Sage's results are provided below, keyed by group number.

1.1 Vance no longer recommends that the Army implement the first stage by the first quarter of FY88.

1.2 Vance recommends that the Army provide extensive training prior to implementing either the cost reporting and recovery techniques or the techniques for acquiring services from non-Army sources.

1.3 Vance modified its implementation plan to incorporate a slower implementation schedule with more testing of the proposed procedures.

1.4 Vance is aware of this problem and recommends that the Army phase in the new techniques more slowly in Europe to allow for completion of the IMA realignment. Regarding the lack of civilian staffing, Vance recommends the use of contractor personnel to provide additional staffing levels.

1.5 Vance significantly modified the implementation strategy to allow for unique environments. For example, Vance only recommends the use of non-Army sources for services when they are the best alternative. If the Deutches Bundes Post (DBP) is not the best alternative, then it should not be used.

1.6 Vance recommends that either ASIMS, the Tier 2 automation equipment, or in some instances Tier 3 equipment be used to operate the cost reporting and recovery techniques. The Army must ensure that the recommended resources are made available for operating the new techniques.

1.7 Vance is aware that its recommendations regarding buying services from non-Army sources cannot be efficiently implemented with the current contracting process within the Army. Vance recommends that the Army take steps to modify the contracting process to permit more efficient procurement from non-Army sources.

1.8 Vance recommends that the Army develop special techniques to help both providers and users to budget for IMA services. Vance cannot recommend policies that would prevent users IMA budgets from being cut.

1.9 Vance recommend that the Army analyze the current reimbursable order process and develop modifications to the process that will permit it to be used to transfer funds from the users to the providers. Vance believes that the reimbursable order process is the best candidate for handling the transfer of funds and that its recommendations will overcome the identified problems.

1.10 Vance recommends that the Army provide the resources necessary to develop, implement, and operate the new techniques. Vance cannot ensure that the Army follows this recommendation.

1.11 Vance recommends the preparation of detailed backup reports that contain the information necessary to explain the single bill received by the users.

1.12 Vance is aware of the cost accounting requirement and recommends that an interface to the Army's cost accounting systems be developed as soon as the cost accounting systems are completed.

1.13 Vance recommends that the Army develop interfaces to the Army financial accounting systems. The techniques that Vance recommends should enable all types of users to be billed.

1.14 Vance recommends that data transmission over voice circuits be billed at the regular rates for voice services. Vance made recommendations regarding how to deal with the problems of metering software for telephone PBXs, the step-by-step switches, and metering within ETS.

1.15 Vance is aware of the potential problem in procuring metering software and recommends that the Army extend schedules, if necessary, to accommodate for the delays.

1.16 Vance recommends that application software support be charged to the users and that system software support be included in the billing rates as part of the overhead. Vance also recommends that system software support be metered and costs reported, but that no funds be transferred. Vance also recommends that the Army include all costs in calculating the billing rates. This includes the costs associated with additional hardware, hardware maintenance, and software maintenance.

1.17 Vance recommends that the users pay for the costs associated with software development and maintenance. For example, with the STAMMISs the proponent would pay. Vance recommends that the users pay for all IMA services associated with the support of the sustaining base. Vance also recommends that the users (proponents) pay for all externally directed changes.

1.18 Vance recommends that billing rates be set annually and that limits be set on how high the rates can be increased during the middle of a two year execution period. Vance recommends that the Army recover shortfalls that occur because of the limited increase, during the next period that the rates can be modified. Vance recommends that the Army deal with the long-term contracts by projecting the costs and including them into the billing rates.

1.19 OMB and GAO have indicated to Vance that O&M funds can be used to pay for IMA services whose rates include both O&M and procurement costs. Vance

recommends that the Army change its policy regarding the movement of funds if it proves to be a problem with operating the new techniques.

1.20 Vance's recommendations puts the Army providers in a position where they should be motivated to operate more efficiently.

1.21 Vance's recommendations focus on changing the behavior of both the Army providers and users of IMA services. Vance also recommends that the Army make changes in its contracting procedures to permit Army users to buy services from non-Army sources more efficiently.

1.22 Vance recommends that the Army make the investment. Financial information indicates that it makes economic sense to do so.

1.23 Vance analyzed the potential impact of the new techniques through interviews with both Army managers and managers in other Government agencies and private industry. Vance concludes that the benefits of using the new techniques would more than offset the potential impacts. Vance conducted a cost analysis and included it in the final document.

1.24 Vance identified and documented in this report the objectives that were identified by the Army for the new techniques. Vance's recommendations provide for the completion of the appropriate analyses before the detailed design and implementation is completed.

1.25 Vance describes the proposed techniques at a level which is appropriate for the project objectives.

1.26 Vance recommends that the users have the final choice on determining which source of service is the best. Vance recommends that the Army permit users to propose technical solutions if they have the skills to do so.

NUMBER	CODE	THEME	DOCUMENT REFERENCE
1	DB	Implementing first stage by FY88	Section 6.1
2	DAC	Lack of adequate training prior to implementation	Section 6.2.3.6
3	DAA	Inapproapriately phased plan to support implementation schedule	Section 6
4	CADEA	Incomplete re-alignment of IMA in USAREUR	Section 9.2
5	CADEC	Implementation strategy does not meet unique requirements of OCONUS organizations	Sections 6 and 9.2
6	CADEB	ADP system not provided to implement system in Europe	Section 9.2
7	CADEE	Deficiencies in the procurement of IMA services in Eurpoe by contract	Sections 5.2, 6.2.2, and 7.2
8	CBB	Deficiencies regarding general budgeting assistance for proposed system	Sections 5.3.2.2 and 7.3.2.5
9	CBA	Deficiencies relative to information program development and budgeting	Sections 5.3.2.2, 6.2.3.5, and 7.3.3.4
10	CDCAAD	Cost recovery procedures too complex--choose central or decentral fund control	Section 9.2
11	CDCAAB	Cost recovery procedures too complex--user may not understand concept over time	Section 7.3.3.3 and 7.3.3.4
12	CDCB	Lack of adequate reporting processes to support efficient cost recovery	Sections 6.2.3.3 and 7.3.3.1
13	CDA	Deficiencies in basic design criteria of billing subsystem	Section 7.3.3.1 and 7.3.3.4
14	CDBAAA	Inadequate metering system due to problems metering some telephone systems	Sections 5.3.2.2, 7.3.3.2, and 9.2

Strategic Event Groupings
From Sage Combined Group

Figure A-1

NUMBER	CODE	THEME	DOCUMENT REFERENCE
15	CDBAAB	Inadequate metering system due to need to procure (develop) metering software	Section 9.2
16	CEBCAC	Inaccurate software costs for rates-- clarify overhead and absorbed costs	Section 7.3.2.3 and Appendix A
17	CEBCAA	Inaccurate software costs for rates-- who pays for development and maintenance	Appendix A
18	CEA	Deficiencies regarding general rate-setting	Sections 5.3.2.1 and 7.3.2.4
19	BA	Lack of customer acceptance and perceived benefit of system for customer control	Appendix A
20	BCBB	Within ARSTAF and HQDA need more emphasis to user info resources more efficiently	Sections 5 and 7
21	BCBA	Within ARSTAF and HQDA need more emphasis on system as mgmt tool not just acct. system	Sections 5.2 and 7.7.2
22	BCA	Failure to begin drafting charter for the proposed system	Sections 8 and 9
23	AE	Lack of justification re: benefit cost conclusions and recommendations	Sections 8 and 9
24	AA	Inadequate statement of Army's objective for charging system	Section 4
25	ABEB	Inadequate system environment description Incomplete architectural design to use as guide in system design and development	Sections 5, 6, and 7
26	ABEC	Inadequate system environment description Need to consider resources available within the government	Sections 5.4 and 7.4

Strategic Event Groupings From Sage Combined Group (Cont'd)

Figure A-1

APPENDIX B

COST REPORTING AND RECOVERY DEVELOPMENT METHODOLOGY

SECTION 1. DEVELOPING A COST REPORTING AND RECOVERY CAPABILITY

The purpose of this appendix is to present a generic step-by-step approach accepted within the industry for implementing cost reporting and recovery techniques in Federal organizations. The approach is based on the experience of Vance, private industry, and Government agencies.

Described are the steps that are required to implement cost reporting and recovery techniques. The specific procedures for each step are provided in Section 6. As the sequence of steps indicates, the rate-setting and billing activities are developed in parallel since initial outputs from one can improve the development of the other. For example, initial usage reports from the billing activities provide an important source of data for preparing usage forecasts needed to establish rates in the rate-setting activities.

1.1 Develop Strategy

The first task that an organization must accomplished is to develop an implementation strategy. To develop this strategy, the following activities are required:

- o Identify a proponent for the cost reporting and recovery techniques at the top organizational level. The proponent should be responsible for integrating and coordinating all of the activities related to the development and implementation of the cost reporting and recovery techniques. Whenever problems arise in completing the activities the proponent should be consulted.

- o Obtain an understanding of the concepts presented in this document and all applicable Federal regulations.

- o Prepare a project plan. At a minimum, this plan should cover the following topics:

  - Statement of Objectives

  - Tasks to be Completed

    Some of the tasks which must be completed include: making key policy decisions, studying the affected service elements and users, and developing detailed specifications for the rate-setting and billing subsystems.

  - Project Schedule

    It should be noted that the tasks and project schedule will need to be updated as the project evolves over time. Additionally, the amount of material and time required to complete the project plan are dependent upon the size, number, and complexity of the information technology facilities (ITF).

1.2 Define t[illegible] Environment

A thorough knowledge of the current information services environment is needed by

the development team at the start of the project. This knowledge establishes a baseline in terms of: existing system to support data collection and analysis, cost accounting, usage tracking, etc. The agency should identify all organizations and ITFs involved in providing and using information services. The environment should be defined from both a user and provider perspective. A list of questions that must be answered and information that must be compiled to support the development effort is shown in Figure B-1. A thorough definition will provide necessary information and make enhancements in the future easier.

1.3 Identify Resources

Resources include those items required to provide information service support to the organization (hardware, software, personnel, etc.). All resources that an organization uses should be described in detail. The eight resource categories that should be included in the calculation of full costs for information service operations are clearly defined in OMB Circular A-130. Figure B-2 lists these resource categories and identifies subcategories. The list of subcategories should be reviewed and expanded as necessary to meet specific facility requirements.

1.4 Compile Current Costs

In this step, the costs associated with all of the resource categories previously identified should be compiled. It is recommended that cost estimation techniques be used to supplement available accounting data so that initial cost reporting and recovery techniques can be implemented in a reasonable timeframe. Cost estimation techniques involve the use of data that is not part of the official accounting system and employment of estimation algorithms. For example, detailed equipment and software costs can often be obtained from contracts with vendors. Space costs can be estimated by multiplying standard charges per square foot of space times the area assigned to the relevant functions. Supply and phone costs can be based on typical rates charged by suppliers. Personnel costs can be estimated by using average step rates within each grade and applying standard fringe benefit factors from OMB Circular A-76 entitled "Performance of Commercial Activities."

In compiling current costs for information services, the following guidelines should be followed:

- Establish a clear definition of which costs will be included and which costs will be excluded. In general, all costs necessary to provide information services should be included except those costs paid by user organizations (e.g., user purchased terminals).

- Use simple accounting techniques. In calculating depreciation for purchased equipment and software use a straight line method based on expected life. For example, if a computer purchased for $160,000 is expected to last eight years, a figure of $20,000 should be included. Vance recommends a depreciation period of five to eight years for information equipment.

1.5 Establish User Account Structure

An appropriate user account structure is a prerequisite for usage accounting. A key question that must be answered early in the development of the cost reporting and recovery techniques is "who pays the bill?" Budgetary and accountability

CURRENT ITF ENVIRONMENT

1. Describe the ITF hardware and software configuration.

2. Provide an organization chart which includes high level functional descriptions of work performed by ITF personnel.

3. Describe the various types of processing done (local applications, batch, on-line, real-time, etc.).

4. What are the staffing levels for the ITF: (Provide numbers of management personnel, programmers, analysts, operators, etc.).

5. Provide an inventory listing of the ITF's hardware/software. How often is the inventory updated?

6. Explain how the center supports the various components within the agency, and provide numbers for the various types of users within each component.

7. Does the ITF provide services to any outside users? If so, how many outside users are there and what percentage of the ITF workload does each comprise?

8. How are costs reimbursed for services provided to outside users?

9. How is the acquisition of ITF resources funded (i.e., locally or centrally, or a combination of both)?

10. Have ITF costs been isolated within the budget? To what level of detail? How are budget estimates derived?

Information Needed To Define Current Environment

Figure B-1

CURRENT ITF ENVIRONMENT

11. What type of capacity planning currently is done? What are workload estimates based on? How often are these estimates updated?

12. Describe current cost accounting procedures.

13. Is any type of labor accounting done? If so, describe.

14. Does the ITF use a standard user ID structure?

15. To what level does the user ID track usage (e.g., individual, group, application)?

16. Are any job accounting reporting packages installed at the ITF?

17. Are any other resources (e.g., disk storage) tracked, and how?

18. Are any usage reports generated? If so, provide samples of each.

19. Are usage reports distributed to users? At what level?

20. Provide a copy of long range plans and projections for the ITF for the next two to five years, including upgrades, new procurements, and workload increases.

Information Needed To Define Current Environment

Figure B-1 (CONT'D)

RESOURCES

- **Personnel**
  - Civilian salaries
  - Civilian overtime
  - Civilian fringe benefits
  - Civilian training
  - Civilian travel
  - Military salaries
  - Military training
  - Military travel
- **Equipment**
  - Depreciation
  - Lease
  - Maintenance
- **Software**
  - Depreciation
  - License
  - Maintenance
- **Intra-agency Services**
- **Interagency Services**
- **Supplies**
  - Office
  - Disks
  - Tapes
  - Paper
  - Miscellaneous
- **Contractor Support**
  - Technical/consulting
  - Data entry
  - Operations
  - Facility management
  - Network Support
- **Space Occupancy**
  - Rental/lease
  - Furniture
  - Facility maintenance
  - Utilities
  - Telephones
  - Power conditioning/ distribution
  - Building services

Resource Categories

Figure B-2

responsibilities for information services can be placed at organizational levels ranging from very large components to individual users. If higher levels are chosen, the process is simpler but the goal of improved accountability is not fully achieved. The reverse is true as budgeting/accounting mechanisms are implemented at lower levels in the organization.

The appropriate level for budgeting/accountability for each category of usage should then be determined. The primary criterion should be that responsibility must be established at a level where resource usage can be controlled. User managers should be allowed to define their own user levels. The development team must ensure that the desired levels can be incorporated into a user ID and that the user ID will be accepted by the usage accounting capability.

In the initial cost reporting and recovery techniques, methods such as user account mapping tables may need to be established. Such tables provide expansion of the existing user account structure by relating available information and other needed data. For example, if only user initials are employed in the current environment, a table can be established which relates each set of initials to the organization to which the user belongs and the application on which the user works. In addition, manual procedures may need to be implemented to help ensure that users correctly employ assigned accounts.

1.6 Identify Services

Services (computer processing, communications, analyst support, printing, payroll, graphic arts, etc.) and service units (CPU seconds, messages sent, analyst hours, lines printed, checks, charts prepared, etc.) form the foundation of the entire cost reporting and recovery capability. One or more similar services may be grouped logically together to form a service center for the purpose of developing billing rates. A key factor in determining services is that they must be meterable by the metering capabilities.

There are several decisions to be made in implementing a service structure:

What type of service unit should be used?

The two methods of establishing service units are:

- o Resource-based: A service unit based on the resources used to provide the service (CPU time, disk tracks, print lines, etc.);
- o Product-based: Service units based on output (checks/reports produced, charts prepared, messages sent, reports produced, pages printed).

The decision regarding which services to charge for and how (resource- or transaction-based) should be based on what makes the most sense given the current product environment. It is important to keep in mind that changes can be made rather easily if the organization determines that it needs to do so.

Should the same services be defined for all facilities included in the charging system?

A single set of services should be used by all similar facilities. This provides for standard billing reports and allows for comparing usage among facilities.

Standardization factors can be used to account for differences in facility operations (e.g., use of CPU's with varying levels of processing power).

How extensive should the list of services be?

The major trade-off to be considered in developing the list of chargeable services is between simplicity and accuracy. As the number of services increases, accuracy is improved but the cost reporting and recovery techniques become more complex. At one end of the spectrum, there is the option of using a single aggregate service. In this approach, an algorithm is employed to include a range of usage measures and users are charged for their consumption of "system resource units". At the other extreme, any service that can be measured is included and a very detailed list is established.

Between eight and ten services should be defined in the initial implementation of a charging system. A suggested list of automation services is presented in Figure B-3. This list should be reviewed and refined based on specific characteristics of the facilities included in the capability. Services should be added if they constitute a major output of the facility.

1.7 Develop and Implement Usage Accounting (Metering) Capability

A method for associating usage of each service with specific user ID's should be developed in this step. Ideally, usage accounting can be accomplished by use of off-the-shelf software packages. Most computer hardware vendors offer capabilities to automatically track services such as CPU time, connect time, tape mounts, and print lines. Separate packages are sometimes available to track disk and tape storage.

Labor accounting generally requires special consideration. Most analysts and programmers do not record their time spent in support of specific organizations or applications. Planning for actual labor accounting should be started as early as possible in the cost reporting and recovery implementation process, since this type of accounting radically changes current methods. Initially, labor costs may have to be prorated based on actual usage of some directly measured service so that implementation of the techniques is not unduly delayed.

1.8 Forecast Usage

Initial usage forecasts for each service should be based on analysis of historical data with user involvement in the forecasting process deferred until the enhancement phase. If a sufficient base of historical data is available, trend analysis should be used. This approach assumes that the patterns of change measured in the past will continue into the future. The general approach is to determine a projection line which "best fits" the historical data. One of three different patterns is generally used in making projections of usage for data processing services. The three patterns generally used are linear, compound, and life cycle.

The linear pattern assumes that usage will continue to change by the same amount each year. The compound pattern assumes that workload will continue to change by the same percentage each year. The life cycle pattern is based on studies which show that a traditional information service workload pattern involves initial rapid growth followed by stabilization.

SERVICE	UNIT	COMMENTS
CPU	Hours	Includes memory and input/ output resource components
Disk Storage	Million Bytes x Months (MB-Month)	Includes disk mount resource components
Tape Storage	Reels x Months (Reel-Month)	
Connect	Hour	Includes terminals provided to users
Port Charge	Port	
Print	1000 Lines	
Technical Labor	Hour	Includes application development and maintenance personnel only (systems and operations personnel resources are included in other services)
Clerical Labor	Hour	Includes application related support (e.g., data entry) only (overhead support is included in other services)

Services Example

Figure B-3

If historical data are not available, less sophisticated techniques must be used initially. Such approaches involve establishing a current "workload snapshot" that covers as long a period as possible and applying a typical growth factor to estimate future workload. The snapshot can be obtained by performing usage accounting or reviewing logs and manual records for a short period of time. If the billing subsystem is developed in a timely fashion, this will provide a suitable source of data for workload forecasting.

1.9 Forecast Costs

The major sources of data for cost forecasting will be agency budget estimates, long range plans, and historical and projected usage. In developing initial information service cost forecasts these sources should be used in conjunction with known cost increases (e.g., government personnel salary increases, changes in maintenance costs, impact of inflation on supplies).

1.10 Identify Work Areas

Work areas include the types and levels of work performed by the information service organization and can usually be identified according to the existing organizational structure. The work area hierarchy consists of areas of management responsibility at the highest level, work functions at the middle level, and subfunctions at the lower level. For example, the data processing facility can be viewed as a high level work area or "area of management responsibility"; the operations section can be viewed as a middle level work area or "work function"; and the tape library or computer operation can be viewed as the lower level work area or "sub-function".

In defining work areas, one alternative is to mirror each facility's local organizational structure. The other alternative is to develop a single standard work area structure for use by all organizations. The first approach is conceptually appealing, because users and managers will be more familiar with these local structures. However, experience has shown that this approach makes rate-setting complicated because standard guidelines cannot be established. In addition, automation of the rate-setting procedure is virtually impossible unless standard work areas are defined. FGAP4 and FIPS PUB 96 provide more guidance on identifying work areas.

Therefore, identifying standard work areas across all facilities is recommended. Figure B-4 provides a work area structure that has been found to have applicability for many agencies. Again, this list should be used as a starting point and tailored to the agency environment. This will provide information for a comparison of operating efficiencies in similar organizations and facilities.

1.11 Calculate Rates

Figure B-5 shows a simple example of the procedure used in the rate-setting subsystem. The basic procedure is built around three matrices that provide a mechanism for distributing costs.

The first of these is the resource distribution matrix. The resource distribution matrix allocates total resource costs to specific work areas (identified in Section 1.10). In the example shown, three work areas are defined: Management, Applications Development, and Operations. Certain resources such as software are

WORK AREAS

Management and Administration

Systems

- o General System Support and Supervision
- o System Software
- o System Configuration
- o System Communications

Applications/Users

- o General User Support and Supervision
- o Application Development and Maintenance
- o User Access

Operations

- o General Operations and Supervision
- o Processing
- o Online Storage
- o Offline Storage
- o Output
- o Communications
- o Tape Handling

Work Areas

Figure B-4

RESOURCE DISTRIBUTION

RESOURCES	TOTAL	WORK AREAS		
		MANAGEMENT	APPLICATIONS DEVELOPMENT	OPERATIONS
Hardware	$ 100,000		$ 1,000	$ 99,000
Software	$ 35,000			$ 35,000
Personnel	$ 66,000	$ 9,000	$ 37,000	$ 20,000
Space	$ 7,700	$ 900	$ 1,800	$ 5,000
Supplies	$ 1,300	$ 100	$ 200	$ 1,000
TOTAL	$ 210,000	$ 10,000	$ 40,000	$160,000

WORK AREA DISTRIBUTION

WORK AREAS	SERVICES	
	CPU	ANALYST
Direct		
Applications Development		$ 40,000
Operations	$160,000	
Indirect (Allocated)	80%	20%
Management	$ 8,000	$ 2,000
Total	$168,000	$ 42,000

BILLING RATE DISTRIBUTION

SERVICES	YEARLY COST	YEARLY WORKLOAD	RATE
CPU	$168,000	840 Hours	$ 200/Hour
Analyst	$ 42,000	1680 Hours	$ 25/Hour

Rate-Setting Example

Figure B-5

allocated to a single work area. Others, such as personnel, span multiple work areas.

The work area distribution matrix reallocates the total costs for each work area to the services provided. Some work area costs provide a direct service. In the example, all costs associated with the Applications Development Work Area are expended to provide the Analyst Service. Other work areas such as Management are needed to provide multiple services. Costs for these indirect work areas are allocated to specific services based on the ratios of direct costs.

The billing rate distribution matrix combines the allocated service costs and workload projections to establish billing rates. Projected yearly costs for each service are divided by projected workload to derive a resultant rate.

It is recommended that the rate-setting calculation process be automated. This approach is preferable to manual calculation methods because it is:

- More accurate and less labor intensive since calculations are performed automatically.
- Easier to accomplish because distribution matrix concepts which are difficult to understand become transparent (procedure automatically generates matrices).
- More useful since data stored in automated form can be applied to other tasks such as inventory management.
- Much easier to refine in subsequent years.

1.12 Develop and Implement Cost Reporting Capabilities

In a complex information service environment, the assignment of responsibilities for usage/cost reporting among the various facilities must be decided. Options range from a centralized approach in which a single facility produces and disseminates all billing reports using inputs from other sites, to a distributed approach in which each facility produces its own billing reports. The centralized approach offers reduced costs for software package support (i.e., only one copy of a reporting package needs to be purchased and maintained), reduces the processing load on all but the central site, ensures standardized billing outputs, and facilitates the production of management summaries that include information on usage across all facilities. While this approach increases interface and data transmission requirements between facilities, and increases the processing load at the central site, it is generally the most effective approach.

Initially, high level (e.g., computer center totals) usage reports can be generated. These reports should provide input into the usage forecasting process and support the establishment of billing rates. Once rates are established, these reports should be expanded into complete usage/cost reports as detailed below.

1.13 Memo Bill

A complete set of usage/cost reports should be produced on a monthly basis. Five types of reports should be included in the initial charging system implementation.

- Information Service Cost Reports: These usage/cost reports should provide the basic outputs from the techniques. Usage of each service (e.g., CPU time, disk storage) should be shown along with associated charges based on billing rates. A separate report should be produced for each set of user initials within a given organization for a given system.

- Year to Date Reports: These reports should provide year-to-date charge figures for each user within a given organization for a given system. Charges for each service should be itemized for each of the three months in the current fiscal quarter, for each quarter in the fiscal year, and for total fiscal year-to-date.

- Computer Utilization Costs by Organization: These reports should provide information to managers on the specific breakdown of charges associated with their organization. Individual service charges should be itemized for each user and each application system associated with the organization.

- Computer Utilization Costs by System: This report should provide information on the charges for application systems (e.g., Standard Logistics System) across all centers. Bottom line charges should be detailed at the user level, summarized at the organizational level, and further summarized by facility.

- Grand Totals Report: This report should provide a summary of usage and charges for each information facility.

1.14 Redistribute Funds

The organization will need to develop a mechanism by which information facilities can distribute their appropriated funds to the users. Funds should begin to be distributed after at least 12 months of memo billing. It will take approximately this long to collect sufficient data on user expenditures and calculate how much each user should receive.

1.15 Develop and Implement Cost Recovery

In this phase, the charging system transitions from being a mechanism for reporting service costs to users to being the system which supports cost recovery. The following three steps must be accomplished to implement cost recovery:

- Develop an operational concept

- Modify the budget process

- Build accounting interfaces

1.15.1 Develop Operational Concept. The establishment of an agreed-upon operational concept for cost recovery is needed as the basis for all subsequent tasks. While the principle of cost recovery is clear, there are many issues that must be examined prior to implementing cost recovery within an information service environment. Figure B-6 presents a list of key issues, and options to be considered.

1.15.2 Modify the Budget Process. The information service organization must support the development of revised budget instructions consistent with the concept

ISSUE	OPTIONS
o Handling aborted work or spoilage	- Credit user automatically - Review work to determine cause of abort and credit user if ITF is at fault
o Adjusting for over or under recovery	- Adjust rates multiple times each year using techniques such as moving averages - Provide rebates or assessments as necessary
o Handling of expenditures exceeding budgets	- Discontinue service when expenditures equal budget - Provide only most basic service (e.g., overnight processing) when expenditure projections exceed budgets

Cost Recovery Issues

Figure B-6

of cost recovery. These instructions must provide user organizations with guidance for including projected information service expenditures in their budget.

To implement cost recovery, new funding mechanisms must be established. An ideal cost recovery funding mechanism will allow the organization to include all information service costs including depreciation in the rate-setting process and to acquire upgrades using accumulated funds. It permits shifting of funds to return profits or recover losses from previous years and allows for reimbursements from users without regard to the source (appropriation, etc.) of funds.

The following illustrates how such a mechanism would operate. Users request services from the ITF. On the basis of these requests, the ITF uses working capital to finance the cost of performing the work, which can be done by either inhouse or contracted staff and facilities. All requests accepted by the ITF are charged out at a cost based on a schedule of rates for units of the resources actually used. Reimbursement is made on a monthly basis. These monthly payments are used to finance continuing operations, much as sales receipts are used by a commercial enterprise.

Users reimburse the ITF on the basis of rates or prices for individual services which are determined annually. These rates are established to:

- Recover estimated operating expenses to be incurred by the facility for the applicable fiscal year.
- Return profits or recover losses from previous years.
- Provide sufficient working capital for acquisition of fixed assets.

In determining rates, the goal is to have the revenues equal costs at the end of the fiscal year for which the rates have been established.

In establishing an appropriate cost recovery funding mechanism a coordinated agency effort is required. Various approaches, including the establishment of a Revolving Fund, must be analyzed by agency representatives from Technical, Budget, Accounting and Legislative organizations. Once a consolidated position is reached, action must be taken to implement the funding mechanism. This will require changes to the budget process and may require the enactment of new legislation.

1.15.3 Build Accounting Interface. Changes to accounting systems and procedures will be necessary to support cost recovery. Modifications to the accounting system must be made so that bills output by the cost reporting and recovery techniques can be automatically input to create accounting transactions. The charges associated with each user organization should be used to debit an appropriate account or to indicate that a payment is due. Depending on decisions made in developing the operational concept, a payment tracking capability may also be required.

An interface between the accounting system and the information funding system must also be established. Generally, the fund will be established as an appropriation. Credits (i.e., user payments) and debits (e.g., vendor bills) against this appropriation should be tracked.

1.16 Enhance the Cost Reporting and Recovery Capability

Improvements should be made to improve rate-setting and billing precision. In addition, the system should be enhanced to provide users with options for reducing their bills. Figure B-7 identifies enhancements that should be implemented over time.

ENHANCEMENTS

- Establish an information cost accounting system and replace cost finding figures with accounting data.
- Develop charging system reports that support cost and usage forecasting.
- Develop a usage forecasting procedure that includes user projections of future workload.
- Expand the service list as appropriate and evaluate the applicability of using transaction based services.
- Develop a rate structure that provides users with a means to reduce billing. Consider variable rate (e.g., lower rates for off-peak processing), service level agreements, and volume discount approaches.
- Establish a complete user accounting structure and software controls over account utilization.
- Develop actual usage tracking capabilities for services such as labor that were previously prorated.
- Develop additional report types to support cost recovery, such as actual versus budget comparisons and projected expenditure summaries.
- Offer online billing information at the close of each user session.

Enhancements

Figure B-7

APPENDIX C

COST ASSUMPTIONS

SECTION 1.0 COST ELEMENTS

This sub-section provides a definition of terms used in this cost analysis of the Army's new techniques for managing IMA services. Non-recurring and recurring costs are first defined followed by the individual cost categories defined in FGAP 4.

1.1 Non-Recurring costs

Identified as costs made on a one-time basis. Normally these include expenditures for investments and include all costs associated with the acquisition of equipment, real property and non-recurring services. Additive costs are unprogrammed or unbudgeted costs of acquiring new resources.

1.2 Recurring costs

Identified as operation costs, are those costs that are incurred on a periodic basis throughout the project period. Such costs are generally acquired each year and also may be additive or nonadditive. They include civilian and military personnel services, materials, operating supplies, utilities and equipment maintenance.

1.3 Cost Categories

The cost categories included in the cost analysis are based on the definitions in FGAP4.

1.3.1 **Personnel.** Funded and unfunded costs of regular salaries, overtime, and fringe benefits for people who manage and operate information technology functions. This includes work such as development and upkeep of computer software, operations and management of in-house information technology facilities, data preparation, electronic output reproduction and distribution, equipment maintenance, and contract management. Also included are personnel performing information technology related custodial services, security, and building maintenance, and other personnel-related costs for training, travel, and recruiting.

1.3.2 **Hardware.** Non-recurring expenditures for the acquisition and recurring costs for rental, leasing, and depreciation (pro rate acquisition cost) of computers, associated on-line and off-line ADP equipment as well as equipment related to other information technologies (e.g., telephone switches, printing presses, film projectors, etc.), and special purpose information technology furniture.

1.3.3 **Software.** Non-recurring expenditures for acquisition, development, and conversion and recurring expenses for rental, leasing, and depreciation (pro rata acquisition cost) of all types of software including operating, multipurpose, and application.

1.3.4 **Space Occupancy.** Funded and unfunded costs for rental, lease, and depreciation of buildings and general office furniture, building maintenance, regular telephone service and utilities, and custodial services and security.

1.3.5 **Supplies.** Expenditures for non-capital office supplies and general- and special-purpose information technology materials. Special-purpose supplies are those prepared for one or a few applications. ADP tapes and disk packs may be considered either supplies or items of equipment. Items should be considered items

of equipment where the inventory value is large enough to distort costs if expended in a given accounting period.

1.3.6 Contracted Services. Expenditures and contracting expenses for the following items:

- o Technical and consulting services for agency-operated information technology facilities and equipment, including equipment maintenance; security and custodial service for information technology facilities; and advice on the acquisition, selection, and use of information technology facilities or software.
- o Information technology system services and off-line equipment services such as for key data entry and report reproduction.
- o Analysis, design, programming, documentation, and testing for development, modification, conversion, and upkeep of computer software.
- o Data communications network services, associated telecommunications line charges, channel lease and rental, equipment rental and maintenance, and telecommunications system analysis and design.

1.3.7 Inter-Agency Services. The costs of other governmental agencies or organizational elements for those services cited under Contracted Services.

1.3.8 Intra-Agency Services. The costs of normal agency support services and overhead, either billed or allocated, and the costs of central information technology management, policy, and procurement services.

SECTION 2.0 ASSUMPTIONS

This section outlines the assumptions Vance made to develop the costs of the cost reporting and cost recovery techniques. The assumptions are in two parts: general assumptions and specific assumptions.

2.1 General Assumptions

The cost analysis provides the Army an estimate of the costs that will be incurred to develop, implement, and operate the new techniques for managing IMA resources recommended in this document. It is not meant to be a precise identification of all costs. Additional analyses will be required after more data becomes available. For example, in order to obtain an exact count of DOIMs, each MACOM will be polled. Also, each DOIM should be interviewed to get a better estimate of his or her personnel, equipment, and other resource requirements needed to operate under this new environment.

The cost assumptions are based on the implementation plan detailed in Section 6. The implementation plan reflects Vance's recommendations that the Army implement separate cost reporting and cost recovery techniques for each major categories of IMA services and that the Army integrate all of the separate techniques into a cost reporting and recovery system. Furthermore, Vance recommends that the Army conduct certain activities that are common to all disciplines including obtaining services from non-Army sources, marketing, operating IMA resources through a revolving fund, capacity planning, cost recovery activities, and training.

Vance developed four scenarios that represent different approaches that the Army could take to implement Vance's recommendations. All scenarios assume the implementation of the new management techniques, but they represent different combinations of two variables. The variables are (1) whether or not the Army would manage IMA resources out of a revolving fund, and (2) the amount of non-Army services the users would buy. The following discussion outlines each scenario and the general assumptions made to develop the cost estimates for each scenario.

2.1.1 Scenarios. The Army indicated to Vance it decided to develop IMA cost reporting and cost recovery techniques; therefore, Vance did not analyze the null scenario of no change in the Army's current techniques for managing IMA resources. All scenarios assume that the Army will implement new techniques for managing IMA resources.

Under Scenario 1, Vance assumes that most IMA services will be obtained from Army providers without the use of a revolving fund. ISC should receive direct funding for all strategic and tactical IMA services and for some minimal sustaining base services. ISC should receive the bulk of its sustaining base funds by reporting and recovering costs from the users. The reported costs should not include depreciation costs.

Under Scenario 2, Vance assumed that most IMA services will be obtained from Army providers with the use of a revolving fund. As with Scenario 1, ISC should receive direct funding for all strategic and tactical IMA services and for some minimal sustaining base services. ISC should receive the bulk of its sustaining base funds by reporting and recovering costs from the users. The reported costs should include depreciation costs.

Under Scenario 3, Vance assumes that most IMA services will be obtained from non-Army providers, and that the IMA services obtained from Army providers will be accomplished without the use of a revolving fund. As with Scenario 1, ISC should receive direct funding for all strategic and tactical IMA services and for some minimal sustaining base services. ISC should receive additional, but minimal sustaining base funds by reporting and recovering costs from the users. The reported costs should not include depreciation costs. The remaining sustaining base funds should be included in the user's appropriations for payment to the non-Army sources.

Under Scenario 4, Vance assumes that most IMA services will be obtained from non-Army providers, and that the IMA services obtained from Army providers will be accomplished with the use of a revolving fund. As with Scenario 1, ISC should receive direct funding for all strategic and tactical IMA services and for some minimal sustaining base services. ISC should receive additional, but minimal sustaining base funds by reporting and recovering costs from the users. The reported costs should include depreciation costs. The remaining sustaining base funds should be included in the user's appropriations for payment to the non-Army sources.

2.1.1 Cost Estimates. Many of the cost assumptions are based on the professional experience of Vance in developing, designing, and implementing cost reporting and recovery techniques. For purposes of costing, Vance assumes that operation of the cost reporting and cost recovery techniques will not begin until FY89 when all categories of information services will have memo billing capabilities. Vance assumes that operations will continue at a consistent rate through FY92. However, a fully operational, integrated system may not be in place before FY93. For costing purposes, Vance assumes that development or operations activities will begin or end on October 1. Furthermore, Vance assumes that all non-recurring acquisitions of hardware, software and supplies will be incurred in FY88 and that the only non-recurring costs for years FY89-92 will be for personnel and contracted services associated with the development and implementation of the new techniques for managing IMA resources.

Vance assumes that the centralized capacity planning activities will be performed at five sites located geographically across the United States (three sites), Europe (one site), and the Far East (one site). Time did not permit the polling of all Army MACOMs to determine the exact number of DOIMs. Therefore, based on the Army's non-quantified estimate, Vance assumes that there are 200 DOIM organizations Army-wide. For calculating the present values of each scenario, Vance assumed a 10% discount rate and assumed year zero is FY87. Vance assumes that there are four CNMAs: ASIMS, ISEC, APPA, and ARCCO.

Overall assumptions for each cost category are as follows:

- Personnel

  - Vance assumes that the annual cost for each category of personnel (clerical, technical, and management) will be at the following levels: Clerical - GS5, Step 5; Technical, GS12, Step 5; Management, GS14, Step 5. The pay rates are defined in the Office of Personnel Management, General Schedule Pay Rates, effective January 1987. Vance assumes that the burden rate for employee benefits (retirement, health and liability insurance, etc.) is 1.3585. The rate is established in OMB Circular A76,

Transmittal Memo (8/12/85) and Memo 2 (4/10/86), and is the average of all grades, step 5. Estimates for technical and general and administrative (G&A) overhead costs are included under the intra-agency services cost category.

- oo In estimating personnel costs, Vance assumes that only Army civilian employees will be involved in the development and operation of the new techniques for managing IMA resources proposed in the design and implementation plan. However, Vance recognizes that military personnel may be involved throughout the life cycle of this system.

- o Hardware

  - oo Based on experience, Vance estimates that the average per system cost of a PC will be $3,000. This cost estimate includes a computer, hard disk, modem, and printer as the defined system.

- o Software

  - oo Based on experience, Vance estimates that the cost of software needed for micro computers will be $1,500. This estimate assumed a need for word processing, spread sheets, DBMS, and miscellaneous utility packages available for PCs.

  - oo Vance estimates that the software licenses required for the capacity planning (modeling, analysis, and other capacity planning tools) activities will be approximately $100,000 per year.

  - oo Vance estimates that the software licenses required for software capable of processing metering data will be $10,000 per year, per location.

- o Space Occupancy

  - oo Vance assumes the average, United States rent rate of $14.06 per square foot for office space. Vance obtained this value from the General Services Administration, Public Building Service. Rent rate was formerly referred to as a standard level user charge (SLUC).

- o Supplies

  - oo Based on experience, Vance assumes that non-recurring supplies, including furniture, will cost $1,000 per year, per system employee identified under recurring costs. Vance assumes that the cost estimate for recurring supplies will be $2,000 per year, per site, and $12,000 per year for each capacity planning group.

- o Contracted Services

  - oo Based on experience, Vance assumes that the cost of contractor support will be an average, burdened rate of $45 per hour. This rate is based on the assumption that the Army will require contractors with a high level of technical expertise and experience to assist the development, implementation, and operation of these new procedures.

- o Inter-Agency Services

  - oo Vance assumes that no non-Army governmental agencies or organizational elements will be involved in the design, implementation, and/or operation of these capabilities.

- o Intra-Agency Services

  - oo Vance estimates that overhead, general and administrative and other related costs will be 15% of the total costs to design, implement, and operate the new techniques for managing IMA resources. The percentage estimate is based on Vance's experience with other government agencies.

  - oo Vance assumes that the intra-agency processing is available to the DOIMs and CNMAs at a rate of $1,000 per year for computer time. Vance assumed that intra-agency processing is also available to the capacity planning groups at a rate of $20,000 per year. These estimates are based on Vance's experience, but are rough estimates since the design is not at the level of detail required for greater accuracy.

2.2 Specific Assumptions

This section describes the specific cost analysis assumptions. The assumptions are divided into (1) non-recurring and recurring cost catagories, (2) rate-setting and billing activities, and (3) detailed cost catagories. Vance makes these assumptions based on the activities it recommends in this document. This section first defines the assumptions that are common to all scenarios, then defines the assumptions that are unique to each scenario.

2.2.1 Non-Recurring. The following section outlines the specific non-recurring cost assumptions. Some of the major activities of the implementation plan that apply to all categories of IMA services, i.e., marketing, sources of services, are not considered a rate-setting or billing function. However, this analysis evenly assigns costs of developing these activities between the rate-setting and billing cost estimates. For example, Vance assumes one Army position to develop the marketing plan, the cost of which is divided between the IMA cost reporting and recovery techniques for rate-setting and billing.

2.2.1.1 Rate-Setting Activities. This section includes Vance's assumptions for estimating non-recurring costs for all activities and procedures required to develop the rate-setting activities. IMA capacity planning will be performed at five locations, with the DOIM and CNMA organizations performing the usage and cost forecasting activities. The capacity planning groups will provide technical assistance to the individual IMA services on an ad hoc basis and cost estimates are included in this analysis, but they cannot be considered as part of the integrated system until all categories of IMA services are implemented. The integrated system will also include a centralized group overseeing the calculation of standard rates and user budgeting activities for all IMA services. However, no cost estimates were calculated for the centralized rate-setting and budgeting group since Vance assumes that these functions cannot be performed until the cost reporting and recovery techniques for each category of IMA services are integrated. Vance assumes that the integration will not occur until after FY92. Vance makes the following assumptions in developing the non-recurring costs for the rate-setting activities.

2.2.1.1.1 Common Assumptions. The following assumptions are common to all scenarios.

Personnel: Vance assumes that all development and implementation of rate-setting activities for ASIMS, APPA, ISEC, and ARCCO will be done by the respective CNMAs and will require .5 technical positions for each CNMA, a total of two positions. Vance assumes that all development and implementation of rate-setting for the following IMA disciplines and activities common to all disciplines will be done by ISC: Tier 2 automation, local telecommunications, TCCs, other telecommunications, local printing, visual information, sources of services, marketing, capacity planning, and cost recovery. Vance assumes that ISC will require .5 technical positions for each activity for a total of five additional ISC positions. In FY91 and FY92, Vance assumes that one technical position at HQDA will be required to develop and implement the rate-setting activities of the system integration plan. Vance assumes that no additional Army personnel will be required at the DOIM, or IMA capacity planning groups. Vance also assumes that whatever work is required by any other Army organization will be minimal and could be performed by existing personnel or by the additional operations personnel that are defined under recurring costs. In accordance with the implementation plan outlined in Section 6, Vance assumed that personnel levels will drop as major development activities are completed. The development of the marketing plan will be completed in FY88. The development of the capacity planning and cost recovery plans will be completed in FY89. Therefore, Army personnel cost estimates decrease in FY89 and FY90 and remain constant for FY91 and FY92 reflecting Vance's assumption that some part of the remaining activities will continue to be developed throughout the life cycle.

Hardware: Vance assumes that additional equipment must be acquired by the Army for the conduct of the rate-setting activities. Vance assumes that an average of one PC will be required for each of the DOIM personnel (total of 300) and CNMA (total of four) personnel identified under recurring costs. Vance assumes that three PCs will be needed at each capacity planning site (for three people at each of five sites) for a total of 15 PCs. Finally, Vance assumes that ISC will be able to perform its development and operations activities on existing equipment; therefore, no hardware costs are included for ISC.

Software: Vance's assumes that a standard set of software packages will be needed for each PC. 319 sets of software packages are costed.

Space Occupancy: Vance assumes that no additional space will be required for the development and implementation of rate-setting activities. Vance assumes space is available and that any additional Army personnel and equipment will occupy existing space.

Supplies: Vance assumes that additional supplies will be required for each additional DOIM, CNMA, and IMA capacity planning operations personnel that are identified (a total of 319 positions) under recurring costs. No additional supplies are required for ISC since Vance assumes that sufficient supplies will be available.

Contracted Services: Vance assumes that for every Army position required to develop rate-setting techniques for each major category of information services

or develop activities common to all disciplines, three contractors will be required to support the Army in developing the new techniques for managing IMA resources. Therefore, if ISC requires a total of five Army positions to develop the rate-setting and other activities, then 15 contractors will be required to support ISC in its development efforts. Vance assumes that no contractor assistance will be required in FY89 when most of the development work should be completed. However, beginning in FY90, fielding activities for each major category of information services will begin and Vance assumes that the Army will require contractor assistance to field the cost reporting and recovery techniques at the same one to three ratio. Most fielding activities will take one year to complete, but the cost estimates assume that Tier 2 automation and Sources of Services fielding will take two years. For FY91 and FY92, Vance assumed the same three to one ratio will be required to assist the HQDA in developing and implementing an integrated rate-setting system that will be part of the cost reporting and recovery system.

Inter-Agency Services: Vance assumes no costs will be incurred for this category.

Intra-Agency Services: Costs reflect the overhead and G&A associated with the purchase of hardware, software, and supplies, hiring additional personnel, and contracting for and managing the contracted services. No other intra-agency cost estimates are included. In order to highlight the administrative cost estimate, Vance displays the estimate on a separate line entitled "Administration."

2.2.1.1.2 Unique Assumptions. There are no assumptions unique to any of the scenarios.

2.2.1.2 Billing Activities. This section includes Vance's assumptions for estimating non-recurring costs for all procedures required to develop the billing activities. These activities include metering services; reducing the metered data; reporting the usage and developing the reports, invoices, and bills; preparing the backup data; and recovering the costs. As previously stated this cost analysis does not include the cost for developing a centralized data reduction methodology since Vance assumes that the Army will not integrate all of the separate systems before FY93. Finally, the customers will be paying ISC for all installation users via the local F&AO and the 1080 process. Vance makes the following assumptions in developing the non-recurring costs for the billing activities of all scenarios.

2.2.1.2.1 Common Assumptions. The following assumptions are common to all scenarios.

Personnel: Vance assumes that all development and implementation work for ASIMS, APPA, ISEC, and ARCCO will be done by the respective CNMAs and will require .5 technical positions for each CNMA for a total of two positions. Vance assumes that all development and implementation work for the following activities will be done by ISC: Tier 2 automation, local telecommunications, TCCs, other telecommunications, local printing, visual information, sources of services, marketing, capacity planning, and cost recovery. Vance assumes that ISC will require .5 technical positions for each activity. For FY91 and FY92, Vance assumes that one technical position at HQDA will be required to develop and implement the billing activities of the system integration plan. Vance assumes that no additional Army personnel will be required at the DOIMs.

Vance also assumes that whatever work is required by other Army organizations will be minimal and could be performed by existing personnel or by the operations personnel defined under recurring costs. In accordance with the implementation plan outlined in Section 6, Vance assumes that personnel levels will drop as major development activities are completed. The development of the marketing plan will be completed in FY88. The development of the capacity planning and cost recovery plans will be completed in FY89. Therefore, Army personnel cost estimates decrease in FY89 and FY90 and remain constant for FY91 and FY92 reflecting Vance's assumption that some part of the remaining activities will continue to be developed throughout the life cycle.

Hardware: Vance assumes an average of one PC will be required for each DOIM personnel identified under recurring costs for a total of 300 PCs. This estimate assumes that some DOIMs do not have print plant or visual information activities. Vance assumes that no additional equipment will be required for the CNMAs, ISC, or the installation F&AOs since Vance assumes that any additional processing can be performed on existing equipment.

Software: Vance assumes that a standard set of software packages will be needed for each PC. A total of 300 sets of software packages is costed. For the automation discipline, Vance assumes metering and reporting capabilities already exist in the ASIMS environment thus no estimates are included. Vance recommends that the Army research and find a labor accounting system and modify it for use in ISEC. Vance assumes that $100,000 will be required to modify the labor accounting system. Vance assumes that most of the Army computers will have metering capabilities. Vance assumes an additional $500,000 for installation and training of URS II will be required for Tier 2 automation for usage reporting. Vance estimates that ARCCO will require $100,000 to develop and implement an interface into the metering capabilities of the local PBXs in order to meter long-haul telecommunications below the installation level. For TCCs and other telecommunications, Vance assumes zero cost for metering software since usage should be based on a flat rate, per usage basis. For local telephone metering software, Vance assumes $100,000. However, most of the metering costs are being incurred via the different, on-going upgrade programs. For printing and publications, rather than pay for the license rights to RAMIS, Vance assumes that the Army should develop another RAMIS type system and keep the licensing rights. Therefore, Vance assumes that the software cost for the printing and publications discipline will be $100,000 each for APPA (departmental printing) and local printing to develop similar metering (usage accounting) capabilities. For the visual information discipline, Vance assumes that the software costs will be $100,000 for the modification of WOMS and/or AVLS. No software for metering is required for mail. Finally, Vance assumes that some modifications to the Army's existing cost accounting system will be required. At this time, the exact requirements are unknown; therefore, no cost estimates are included.

Space Occupancy: Vance assumes that no additional space will be required for the development and implementation of billing activities. Vance assumes space is available and that any additional Army personnel and equipment will occupy existing space.

Supplies: Vance assumes that additional supplies will be required for each DOIM, CNMA, and F&AO position identified (a total of 408 positions) under

recurring costs. No additional supplies are required for ISC since Vance assumes that sufficient supplies will be available at ISC.

Contracted Services: Vance assumes that for every .5 Army position required to develop billing techniques for each major category of information services or develop activities common to all disciplines, three contractors will be required to support the Army in developing the new techniques for managing IMA resources. Therefore, if ISC requires a total of five Army positions to develop the rate-setting and other activities, then 15 contractors will be required to support ISC in its development efforts. Vance assumes that no contractor assistance will be required in FY89 when most of the development work should be completed. However, beginning in FY90, fielding activities for each major category of information services will begin, and Vance assumes that the Army will require contractor assistance to field the cost reporting and cost recovery techniques at the same one to three ratio. Most fielding activities will take one year to complete, but the cost estimates assume that Tier 2 automation and Sources of Services fielding will take two years. For FY91 and FY92, Vance assumes the same three to one ratio will be required to assist the Army Headquarters in developing and implementing an integrated rate-setting system that will be part of the cost reporting and recovery system.

Inter-Agency Services: Vance assumes no costs will be incurred for this category.

Intra-Agency Services: Costs reflect the overhead and G&A associated with the purchase of hardware, software, and supplies, hiring additional ISC personnel, and contracting and managing the contracted services. No other intra-agency cost estimates are included. In order to highlight the administrative cost estimate, Vance displays the estimate on a separate line entitled "Administration."

2.2.1.2.2 Unique Assumptions. The following unique assumptions are for Scenarios 2 and 4, under the Personnel and Contracted Services cost categories.

Personnel: For Scenario 2, Vance assumes two Army positions will be required at USAFAC for the activities associated with developing a revolving fund: developing a charter, lobbying for approval, collecting data on available resources, developing and implementing appropriate accounting systems, and implementing a revolving fund strategy. For this cost analysis, Vance assumes that a revolving fund will be established by the end of FY89. For Scenario 4, Vance assumes one Army position at USAFAC will be required. Vance assumes one less position because under Scenario 4 because most of the services would be provided by non-Army sources of services thus the revolving fund should be much smaller and easier to develop and implement.

Contracted Services: For FY88 and FY89, under Scenario 2, Vance assumes three contractors for every one Army position, or six contractors, will be required to assist the Army in developing and implementing a revolving fund. For FY88 and FY89, under Scenario 4, Vance also assumes three contractors for every one Army position, or three contractors, will be required to assist the Army in developing and implementing a revolving fund.

2.2.2 Recurring. The following section outlines the specific recurring assumptions. The activities are divided into rate-setting and billing activities with each activity further subdivided into detailed cost categories.

2.2.2.1 Rate-Setting Activities. This section includes Vance's assumptions for estimating the recurring costs of the rate-setting activities for each scenario. The assumptions are divided into common and unique assumptions.

2.2.2.1.1 Common Assumptions. The following assumptions are common to all scenarios.

Personnel: Beginning in FY89 when all major categories of information services will be able to memo bill, Vance assumes additional Army personnel will be required to operate the rate-setting activities. Vance assumes that 1.5 Army positions at each DOIM (total of 300) will be required to operate the rate-setting activities of up to six major categories of information services including Tier 2 automation, local telephone, other telecommunications, TCCs, local printing and visual information. Vance assumes that each CNMA will require one Army position (total of 4) to operate the CNMA (ASIMS, ARCCO, APPA, ISEC) rate-setting activities. Vance assumes that each IMA capacity planning group will require three Army positions for a total of 15; however, since the development and establishment of the capacity planning organization charter will not be completed until FY89, personnel costs are not included in FY88. Furthermore, Vance assumes that technical skills will be required for the rate-setting activities; therefore, the personnel costs will be at a GS12, step five, rate. As the system's operations settles out, Vance assumes that some adjustment to the number of positions related to this system may be required.

Hardware: Vance assumes that computer time will be made available from in-house sources; therefore, no additional hardware will be required.

Software: Vance assumes that no additional software will be required for the rate-setting activities for the DOIMs, CNMAs, and the centralized rate-setting group. Vance assumes that any software requirements (probably spread sheet, DBMS type tools) will be obtained in-house. However, Vance assumes that the Army does not have modeling software for the centralized capacity planning activities. Therefore, Vance assumes that $100,000 per year for the five capacity planning groups for these tools will be required.

Space Occupancy: Vance assumes that additional space requirements for the DOIMs and CNMAs will be negligible. For the capacity planning groups, Vance assumes that an additional 2,000 square feet of office space will be required. These estimates are based on Vance's experience.

Supplies: Vance assumes that each DOIM and CNMA site will require additional supplies to operate the rate-setting management techniques. Vance assumes that the capacity planning groups will also require additional supplies. These estimates are based on Vance's experience.

Contracted Services: Vance assumes that contracted services will differ among the scenarios. See Section 2.2.2.1.2 for the particular cost assumptions.

Inter-Agency Services: Vance assumes no costs will be incurred for this category.

Intra-Agency Services: Vance assumes that equipment services will be available in-house for the processing of rate-setting work. Vance assumes that the DOIMs and CNMAs will each require processing time. Vance also assumes that each capacity planning group will require processing of their modeling and forecasting activities. Other processing may be required for the Army organizations, but the design is not at a level of detail required for better estimation of requirements. In order to highlight the administrative cost estimate, Vance displays the estimate on a separate line entitled "Administration."

2.2.2.1.2 Unique Assumptions. The following unique assumptions are for Scenarios 1 through 4, under the Personnel and Contracted Services cost categories.

Personnel: Beginning in FY89 when all major categories of information services will be able to memo bill, Vance assumes that under Scenarios 3 and 4 Army contracting positions will be required for each DOIM and CNMA to aid them in negotiating contracts for the services obtained outside of the Army. Furthermore, Vance assumes that technical skills will be required for the contracting activities; therefore, the personnel costs will be at a GS12, step five, rate. As the system's operations settles out, Vance assumes that some adjustment to the number of positions related to contracting may be required.

Contracted Services: Beginning in FY89, for Scenarios 1 and 2, Vance assumes one contractor, per year, at a rate of 1,700 hours per year to provide operations support for the rate-setting activities that will be required for each DOIM and CNMA. Vance assumes that each capacity planning group will require a three to one ratio of contractors to Army positions at a rate of 1,700 hours per contractor per year. Vance assumes that contractor support will be required since the Army has few, if any, additional positions available to perform the rate-setting activities. Vance assumes that no contracted services will be required under Scenarios 3 and 4 since Vance assumes that most services will be acquired outside of the Army and, thus, will require little contractor support for operations.

2.2.2.2 Billing Activities. This section includes Vance's assumptions for estimating the recurring costs of the billing activities for each scenario. The assumptions are divided into common and unique assumptions.

2.2.2.2.1 Common Assumptions. The following assumptions are common to all scenarios.

Personnel: Beginning in FY89 when all major categories of information services will be able to memo bill, Vance assumes additional Army personnel will be required to operate the billing activities. Vance assumes that 1.5 Army positions at each DOIM (total of 300) will be required to operate the billing activities of up to six major categories of information services including Tier 2 automation, local telephone, other telecommunications, TCCs, local printing and visual information. Vance assumes that each CNMA will require one Army position (total of four) to operate the CNMA (ASIMS, ARCCO, APPA, ISEC) billing activities. Vance assumes that one Army position will be required at each DOIM and CNMA installation's F&AO. Vance assumes that the F&AO

activities will be primarily data entry activities and, therefore, will require clerical personnel. Since most of the disciplines will not have cost recovery capabilities until after FY89, cost estimates for F&AO personnel begin in FY90. Furthermore, beginning in FY90, Vance assumes that each DOIM and CNMA installation's F&AO will require one technical position to either interface with the revolving fund (in the case of Scenarios 2 and 4) or handle the additional reimbursable orders (in the case of Scenarios 1 and 3). Again, Vance assumes this additional cost will begin in FY90, after the cost recovery procedures have been defined and implemented.

Hardware: Vance assumes no equipment costs for the DOIMs, CNMAs, USAFAC, and the installation F&AOs. Vance also assumes that any billing activities that will be performed by these organizations will be done on equipment already available to the Army.

Software: Vance assumes that the Army has no software capable of processing metering data for the DOIMs and CNMAs. Therefore, Vance assumes this type of software must be acquired by the Army for which the Army will have to pay an annual license. Vance assumes that the installation F&AOs and USAFAC will not require additional software.

Space Occupancy: Vance assumes that additional space requirements for the DOIMs, CNMAs, USAFAC, and installation F&AOs will be negligible.

Supplies: Vance assumes that the additional supplies for billing activities will be negligible and, therefore, did not estimate costs for this category.

Contracted Services: Vance assumes that no contracted services will be required. Vance assumes that the billing activity operations will be performed in-house.

Inter-Agency Services: Vance assumes no costs will be incurred for this category.

Intra-Agency Services: Vance assumes that no intra-agency computer time will be required for the DOIMs, CNMAs or USAFAC to process the work to support the billing activities. Vance assumes that computer time will not be required for the installation F&AOs since Vance assumes that most of the work will be manually imputed into the existing financial and accounting systems. These cost estimates are based on Vance's experience, but are rough estimates since the design is not at the level of detail required for greater accuracy. In order to highlight the administrative cost estimate, Vance displays the estimate on a separate line entitled "Administration."

2.2.2.2.2 Unique Assumptions. The following unique assumptions are for Scenarios 2 and 4, under the personnel cost category.

Personnel: For costing purposes, Vance assumes that the revolving fund will be established by FY90. Therefore, beginning in FY90, for Scenario 2, Vance assumes ten additional technical positions will be required at USAFAC to handle accounting activities and for establishing revolving fund policy, procedures, and guidelines. Beginning in FY90, for Scenario 4, Vance assumes five additional technical positions at USAFAC. No additional USAFAC position are costed under Scenarios 1 and 3 since Vance assumes that the system will

not operate through a revolving fund under these scenarios.

APPENDIX D

COST ANALYSIS WORKSHEETS

SCENERIO 1
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
NON-RECUR: RATE SETTING

COST CATEGORY	1988	1989	1990	1991	1992	TOTAL COSTS
PERSONNEL						
DOIM						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	0	0	0	0	0
MANAGEMENT	0	0	0	0	0	0
CNMA						
CLERICAL	0	0	0	0	0	0
TECHNICAL	100,288	100,288	100,288	100,288	100,288	501,440
MANAGEMENT	0	0	0	0	0	0
IMA CAPACITY PLANNING						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	0	0	0	0	0
MANAGEMENT	0	0	0	0	0	0
ISC						
CLERICAL	0	0	0	0	0	0
TECHNICAL	250,720	225,648	175,504	175,504	175,504	1,002,880
MANAGEMENT	0	0	0	0	0	0
HQDA						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	0	0	50,144	50,144	100,288
MANAGEMENT	0	0	0	0	0	0
HARDWARE						
DOIM	900,000	0	0	0	0	900,000
CNMA	12,000	0	0	0	0	12,000
IMA CAP PLANNING	45,000	0	0	0	0	45,000
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
SOFTWARE						
DOIM	450,000	0	0	0	0	450,000
CNMA	6,000	0	0	0	0	6,000
IMA CAP PLANNING	22,500	0	0	0	0	22,500
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
SPACE OCCUPANCY						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
IMA CAP PLANNING	0	0	0	0	0	0
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
SUPPLIES						
DOIM	300,000	0	0	0	0	300,000
CNMA	4,000	0	0	0	0	4,000
IMA CAP PLANNING	15,000	0	0	0	0	15,000
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
CONTRACTED SERVICES	1,965,600	0	702,000	842,400	631,600	3,791,600
INTER-AGENCY SERVICES	0	0	0	0	0	0
INTRA-AGENCY SERVICES	0	0	0	0	0	0
SUBTOTAL COSTS	4,071,108	325,936	977,792	1,168,336	607,536	7,150,708
ADMINISTRATION	610,666	48,890	146,669	175,250	91,130	1,072,606
TOTAL	4,681,774	374,826	1,124,461	1,343,586	698,666	8,223,314

SCENERIO 1
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
NON-RECUR: BILLING

COST CATEGORY	1988	1989	1990	1991	1992	TOTAL COSTS
PERSONNEL						
DOIM						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	0	0	0	0	0
MANAGEMENT	0	0	0	0	0	0
CNMA						
CLERICAL	0	0	0	0	0	0
TECHNICAL	100,288	100,288	100,288	100,288	100,288	501,440
MANAGEMENT	0	0	0	0	0	0
INSTALLATION P&AO						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	0	0	0	0	0
MANAGEMENT	0	0	0	0	0	0
ISC						
CLERICAL	0	0	0	0	0	0
TECHNICAL	250,720	225,648	175,504	175,504	175,504	1,002,880
MANAGEMENT	0	0	0	0	0	0
HQDA						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	0	0	50,144	50,144	100,288
MANAGEMENT	0	0	0	0	0	0
HARDWARE						
DOIM	900,000	0	0	0	0	900,000
CNMA	0	0	0	0	0	0
INSTALLATION P&AO	0	0	0	0	0	0
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
SOFTWARE						
DOIM	450,000	0	0	0	0	450,000
AUTOMATION						
ASIMS	0	0	0	0	0	0
ISEC	100,000	0	0	0	0	100,000
TIER 2 AUTOMATION	500,000	0	0	0	0	500,000
TELECOMMUNICATIONS						
ARCCO	100,000	0	0	0	0	100,000
TCC	0	0	0	0	0	0
LOCAL TELEPHONE	100,000	0	0	0	0	100,000
OTHER TELECOM	0	0	0	0	0	0
PRINTING AND PUBS						
APPA	100,000	0	0	0	0	100,000
LOCAL PRINTING	100,000	0	0	0	0	100,000
VISUAL INFORMATION	100,000	0	0	0	0	100,000

SCENERIO 1
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
NON-RECUR: BILLING

COST CATEGORY	1988	1989	1990	1991	1992	TOTAL COSTS
MAIL	0	0	0	0	0	0
SPACE OCCUPANCY						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
INSTALLATION F&AO	0	0	0	0	0	0
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
SUPPLIES						
DOIM	300,000	0	0	0	0	300,000
CNMA	4,000	0	0	0	0	4,000
INSTALLATION F&AO	204,000	0	0	0	0	204,000
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
CONTRACTED SERVICES	1,965,600	0	702,000	842,400	281,600	3,791,600
INTER-AGENCY SERVICES	0	0	0	0	0	0
INTRA-AGENCY SERVICES	0	0	0	0	0	0
SUBTOTAL COSTS	5,274,608	325,936	977,792	1,168,336	607,536	8,354,208
ADMINISTRATION	791,191	48,890	146,669	175,250	91,130	1,253,131
TOTAL	6,065,799	374,826	1,124,461	1,343,586	698,666	9,607,339

SCENERIO 1
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
RECURRING: RATE-SETTING

COST CATEGORY	1988	1989	1990	1991	1992	TOTAL COSTS
PERSONNEL						
DOIM						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	15,043,200	15,043,200	15,043,200	15,043,200	60,172,800
MANAGEMENT	0	0	0	0	0	0
CNMA						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	200,576	200,576	200,576	200,576	802,304
MANAGEMENT	0	0	0	0	0	0
IMA CAPACITY PLANNING						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	752,160	752,160	752,160	752,160	3,008,640
MANAGEMENT	0	0	0	0	0	0
HARDWARE						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
IMA CAP PLANNING	0	0	0	0	0	0
SOFTWARE						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
IMA CAP PLANNING	0	100,000	100,000	100,000	100,000	400,000
SPACE OCCUPANCY						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
IMA CAP PLANNING	0	140,600	140,600	140,600	140,600	562,400
SUPPLIES						
DOIM	0	400,000	400,000	400,000	400,000	1,600,000
CNMA	0	8,000	8,000	8,000	8,000	32,000
IMA CAP PLANNING	0	60,000	60,000	60,000	60,000	240,000
CONTRACTED SERVICES						
DOIM	0	15,300,000	15,300,000	15,300,000	15,300,000	61,200,000
CNMA	0	306,000	306,000	306,000	306,000	1,224,000
IMA CAP PLANNING	0	382,500	382,500	382,500	382,500	1,530,000
INTER-AGENCY SERVICES	0	0	0	0	0	0
INTRA-AGENCY SERVICES	0	304,000	304,000	304,000	304,000	1,216,000
SUBTOTAL COSTS	0	32,997,036	32,997,036	32,997,036	32,997,036	131,988,144
ADMINISTRATION	0	4,949,555	4,949,555	4,949,555	4,949,555	19,798,222
TOTAL	0	37,946,591	37,946,591	37,946,591	37,946,591	151,786,366

SCENERIO 1
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
RECURRING: BILLING

COST CATEGORY	1988	1989	1990	1991	1992	TOTAL COSTS
PERSONNEL						
DOIM						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	1,504,320	1,504,320	1,504,320	1,504,320	6,017,280
MANAGEMENT	0	0	0	0	0	0
CNMA						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	200,576	200,576	200,576	200,576	802,304
MANAGEMENT	0	0	0	0	0	0
INSTALLATION F&AO						
CLERICAL	0	0	4,655,280	4,655,280	4,655,280	13,965,840
TECHNICAL	0	0	10,229,376	10,229,376	10,229,376	30,688,128
MANAGEMENT	0	0	0	0	0	0
HARDWARE						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
INSTALLATION F&AO	0	0	0	0	0	0
SOFTWARE						
DOIM	0	2,000,000	2,000,000	2,000,000	2,000,000	8,000,000
CNMA	0	40,000	40,000	40,000	40,000	160,000
INSTALLATION F&AO	0	0	0	0	0	0
SPACE OCCUPANCY						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
INSTALLATION F&AO	0	0	0	0	0	0
SUPPLIES						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
INSTALLATION F&AO	0	0	0	0	0	0
CONTRACTED SERVICES						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
INSTALLATION F&AO	0	0	0	0	0	0
INTER-AGENCY SERVICES	0	0	0	0	0	0
INTRA-AGENCY SERVICES	0	0	0	0	0	0
SUBTOTAL COSTS	0	3,744,896	18,629,552	18,629,552	18,629,552	59,633,552
ADMINISTRATION	0	561,734	2,794,433	2,794,433	2,794,433	8,945,033
TOTAL	0	4,306,630	21,423,985	21,423,985	21,423,985	68,578,585

SCENERIO 2
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
NON-RECUR: RATE SETTING

COST CATEGORY	1988	1989	1990	1991	1992	TOTAL COSTS
PERSONNEL						
DOIM						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	0	0	0	0	0
MANAGEMENT	0	0	0	0	0	0
CNMA						
CLERICAL	0	0	0	0	0	0
TECHNICAL	100,288	100,288	100,288	100,288	100,288	501,440
MANAGEMENT	0	0	0	0	0	0
IMA CAPACITY PLANNING						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	0	0	0	0	0
MANAGEMENT	0	0	0	0	0	0
ISC						
CLERICAL	0	0	0	0	0	0
TECHNICAL	250,720	225,648	175,504	175,504	175,504	1,002,880
MANAGEMENT	0	0	0	0	0	0
HQDA						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	0	0	50,144	50,144	0
MANAGEMENT	0	0	0	0	0	100,288
HARDWARE						
DOIM	900,000	0	0	0	0	900,000
CNMA	12,000	0	0	0	0	12,000
IMA CAP PLANNING	45,000	0	0	0	0	45,000
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
SOFTWARE						
DOIM	450,000	0	0	0	0	450,000
CNMA	6,000	0	0	0	0	6,000
IMA CAP PLANNING	22,500	0	0	0	0	22,500
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
SPACE OCCUPANCY						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
IMA CAP PLANNING	0	0	0	0	0	0
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
SUPPLIES						
DOIM	300,000	0	0	0	0	300,000
CNMA	4,000	0	0	0	0	4,000
IMA CAP PLANNING	15,000	0	0	0	0	15,000
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
CONTRACTED SERVICES	1,965,600	0	702,000	842,000	281,600	3,791,600
INTER-AGENCY SERVICES	0	0	0	0	0	0
INTRA-AGENCY SERVICES	0	0	0	0	0	0
SUBTOTAL COSTS	4,071,108	325,936	977,792	1,168,336	607,536	7,150,708
ADMINISTRATION	610,666	48,890	146,669	175,250	91,130	1,072,606
TOTAL	4,681,774	374,826	1,124,461	1,343,586	698,666	8,223,314

SCENERIO 2
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
NON-RECUR: BILLING

COST CATEGORY	1988	1989	1990	1991	1992	TOTAL COSTS
PERSONNEL						
DOIM						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	0	0	0	0	0
MANAGEMENT	0	0	0	0	0	0
CNMA						
CLERICAL	0	0	0	0	0	0
TECHNICAL	100,288	100,288	100,288	100,288	100,288	501,440
MANAGEMENT	0	0	0	0	0	0
INSTALLATION P&AO						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	0	0	0	0	0
MANAGEMENT	0	0	0	0	0	0
ISC						
CLERICAL	0	0	0	0	0	0
TECHNICAL	250,720	225,648	175,504	175,504	175,504	1,002,880
MANAGEMENT	0	0	0	0	0	0
HQDA						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	0	0	50,144	50,144	100,288
MANAGEMENT	0	0	0	0	0	0
USAPAC						
CLERICAL	0	0	0	0	0	0
TECHNICAL	100,288	100,288	0	0	0	200,576
MANAGEMENT	0	0	0	0	0	0
HARDWARE						
DOIM	900,000	0	0	0	0	900,000
CNMA	0	0	0	0	0	0
INSTALLATION P&AO	0	0	0	0	0	0
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
USAPAC	0	0	0	0	0	0
SOFTWARE						
DOIM	450,000	0	0	0	0	450,000
AUTOMATION						
ASIMS	0	0	0	0	0	0
ISEC	100,000	0	0	0	0	100,000
TIER 2 AUTOMATION	500,000	0	0	0	0	500,000
TELECOMMUNICATIONS						
ARCCO	100,000	0	0	0	0	100,000
TCC	0	0	0	0	0	0
LOCAL TELEPHONE	100,000	0	0	0	0	100,000
OTHER TELECOM	0	0	0	0	0	0

SCENERIO 2
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
NON-RECUR: BILLING

COST CATEGORY	1988	1989	1990	1991	1992	TOTAL COSTS
PRINTING AND PUBS						
APPA	100,000	0	0	0	0	100,000
LOCAL PRINTING	100,000	0	0	0	0	100,000
VISUAL INFORMATION	100,000	0	0	0	0	100,000
MAIL	0	0	0	0	0	0
SPACE OCCUPANCY						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
INSTALLATION F&AO	0	0	0	0	0	0
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
USAFAC						
SUPPLIES						
DOIM	300,000	0	0	0	0	300,000
CNMA	4,000	0	0	0	0	4,000
INSTALLATION F&AO	204,000	0	0	0	0	204,000
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
USAFAC						
CONTRACTED SERVICES	2,246,400	280,800	702,000	842,400	281,600	4,353,200
INTER-AGENCY SERVICES	0	0	0	0	0	0
INTRA-AGENCY SERVICES	0	0	0	0	0	0
SUBTOTAL COSTS	5,655,696	707,024	977,792	1,168,336	607,536	9,116,384
ADMINISTRATION	848,354	106,054	146,669	175,250	91,130	1,367,458
TOTAL	6,504,050	813,078	1,124,461	1,343,586	698,666	10,483,842

SCENERIO 2
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
RECURRING: RATE-SETTING

COST CATEGORY	1988	1989	1990	1991	1992	TOTAL COSTS
PERSONNEL						
DOIM						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	15,043,200	15,043,200	15,043,200	15,043,200	60,172,800
MANAGEMENT	0	0	0	0	0	0
CNMA						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	200,576	200,576	200,576	200,576	802,304
MANAGEMENT	0	0	0	0	0	0
IMA CAPACITY PLANNING						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	752,160	752,160	752,160	752,160	3,008,640
MANAGEMENT	0	0	0	0	0	0
HARDWARE						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
IMA CAP PLANNING	0	0	0	0	0	0
SOFTWARE						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
IMA CAP PLANNING	0	100,000	100,000	100,000	100,000	400,000
SPACE OCCUPANCY						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
IMA CAP PLANNING	0	140,600	140,600	140,600	140,600	562,400
SUPPLIES						
DOIM	0	400,000	400,000	400,000	400,000	1,600,000
CNMA	0	8,000	8,000	8,000	8,000	32,000
IMA CAP PLANNING	0	60,000	60,000	60,000	60,000	240,000
CONTRACTED SERVICES						
DOIM	0	15,300,000	15,300,000	15,300,000	15,300,000	61,200,000
CNMA	0	306,000	306,000	306,000	306,000	1,224,000
IMA CAP PLANNING	0	382,500	382,500	382,500	382,500	1,530,000
INTER-AGENCY SERVICES	0	0	0	0	0	0
INTRA-AGENCY SERVICES	0	304,000	304,000	304,000	304,000	1,216,000
SUBTOTAL COSTS	0	32,997,036	32,997,036	32,997,036	32,997,036	131,988,144
ADMINISTRATION	0	4,949,555	4,949,555	4,949,555	4,949,555	19,798,222
TOTAL	0	37,946,591	37,946,591	37,946,591	37,946,591	151,786,366

SCENERIO 2
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
RECURRING: BILLING

COST CATEGORY	1988	1989	1990	1991	1992	TOTAL COSTS
PERSONNEL						
DOIM						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	1,504,320	1,504,320	1,504,320	1,504,320	6,017,280
MANAGEMENT	0	0	0	0	0	0
CNMA						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	200,576	200,576	200,576	200,576	802,304
MANAGEMENT	0	0	0	0	0	0
INSTALLATION P&AO						
CLERICAL	0	0	4,655,280	4,655,280	4,655,280	13,965,840
TECHNICAL	0	0	10,229,376	10,229,376	10,229,376	30,688,128
MANAGEMENT	0	0	0	0	0	0
USAPAC						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	0	501,440	501,440	501,440	1,504,320
MANAGEMENT	0	0	0	0	0	0
HARDWARE						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
INSTALLATION P&AO	0	0	0	0	0	0
USAPAC	0	0	0	0	0	0
SOFTWARE						
DOIM	0	2,000,000	2,000,000	2,000,000	2,000,000	8,000,000
CNMA	0	40,000	40,000	40,000	40,000	160,000
INSTALLATION P&AO	0	0	0	0	0	0
USAPAC	0	0	0	0	0	0
SPACE OCCUPANCY						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
INSTALLATION P&AO	0	0	0	0	0	0
USAPAC	0	0	0	0	0	0
SUPPLIES						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
INSTALLATION P&AO	0	0	0	0	0	0
USAPAC	0	0	0	0	0	0
CONTRACTED SERVICES						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
INSTALLATION P&AO	0	0	0	0	0	0
USAPAC	0	0	0	0	0	0
INTER-AGENCY SERVICES	0	0	0	0	0	0
INTRA-AGENCY SERVICES	0	0	0	0	0	0
SUBTOTAL COSTS	0	3,744,896	19,130,992	19,130,992	19,130,992	61,137,872
ADMINISTRATION	0	561,734	2,869,649	2,869,649	2,869,649	9,170,681
TOTAL	0	4,306,630	22,000,641	22,000,641	22,000,641	70,308,553

SCENERIO 3
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
NON-RECUR; RATE SETTING

COST CATEGORY	1988	1989	1990	1991	1992	TOTAL COSTS
PERSONNEL						
DOIM						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	0	0	0	0	0
MANAGEMENT	0	0	0	0	0	0
CNMA						
CLERICAL	0	0	0	0	0	0
TECHNICAL	100,288	100,288	100,288	100,288	100,288	501,440
MANAGEMENT	0	0	0	0	0	0
IMA CAPACITY PLANNING						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	0	0	0	0	0
MANAGEMENT	0	0	0	0	0	0
ISC						
CLERICAL	0	0	0	0	0	0
TECHNICAL	250,720	225,648	175,504	175,504	175,504	1,002,880
MANAGEMENT	0	0	0	0	0	0
HQDA						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	0	0	50,144	50,144	0
MANAGEMENT	0	0	0	0	0	100,288
HARDWARE						
DOIM	900,000	0	0	0	0	900,000
CNMA	12,000	0	0	0	0	12,000
IMA CAP PLANNING	45,000	0	0	0	0	45,000
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
SOFTWARE						
DOIM	450,000	0	0	0	0	450,000
CNMA	6,000	0	0	0	0	6,000
IMA CAP PLANNING	22,500	0	0	0	0	22,500
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
SPACE OCCUPANCY						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
IMA CAP PLANNING	0	0	0	0	0	0
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
SUPPLIES						
DOIM	300,000	0	0	0	0	300,000
CNMA	4,000	0	0	0	0	4,000
IMA CAP PLANNING	15,000	0	0	0	0	15,000
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
CONTRACTED SERVICES	1,965,600	0	702,000	842,400	281,600	3,791,600
INTER-AGENCY SERVICES	0	0	0	0	0	0
INTRA-AGENCY SERVICES	0	0	0	0	0	0
SUBTOTAL COSTS	4,071,108	325,936	977,792	1,168,336	607,536	7,150,708
ADMINISTRATION	610,666	48,890	146,669	175,250	91,130	1,072,606
TOTAL	4,681,774	374,826	1,124,461	1,343,586	698,666	8,223,314

SCENERIO 3
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
NON-RECUR: BILLING

COST CATEGORY	1988	1989	1990	1991	1992	TOTAL COSTS
PERSONNEL						
DOIM						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	0	0	0	0	0
MANAGEMENT	0	0	0	0	0	0
CNMA						
CLERICAL	0	0	0	0	0	0
TECHNICAL	100,288	100,288	100,288	100,288	100,288	501,440
MANAGEMENT	0	0	0	0	0	0
INSTALLATION P&AO						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	0	0	0	0	0
MANAGEMENT	0	0	0	0	0	0
ISC						
CLERICAL	0	0	0	0	0	0
TECHNICAL	250,720	225,648	175,504	175,504	175,504	1,002,880
MANAGEMENT	0	0	0	0	0	0
HQDA						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	0	0	50,144	50,144	100,288
MANAGEMENT	0	0	0	0	0	0
HARDWARE						
DOIM	900,000	0	0	0	0	900,000
CNMA	0	0	0	0	0	0
INSTALLATION P&AO	0	0	0	0	0	0
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
SOFTWARE						
DOIM	450,000	0	0	0	0	450,000
AUTOMATION						
ASIMS	0	0	0	0	0	0
ISEC	100,000	0	0	0	0	100,000
TIER 2 AUTOMATION	500,000	0	0	0	0	500,000
TELECOMMUNICATIONS						
ARCCO	100,000	0	0	0	0	100,000
TCC	0	0	0	0	0	0
LOCAL TELEPHONE	100,000	0	0	0	0	100,000
OTHER TELECOM	0	0	0	0	0	0
PRINTING AND PUBS						
APPA	100,000	0	0	0	0	100,000
LOCAL PRINTING	100,000	0	0	0	0	100,000
VISUAL INFORMATION	100,000	0	0	0	0	100,000

SCENERIO 3
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
NON-RECUR: BILLING

COST CATEGORY	1988	1989	1990	1991	1992	TOTAL COSTS
MAIL	0	0	0	0	0	0
SPACE OCCUPANCY						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
INSTALLATION F&AO	0	0	0	0	0	0
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
SUPPLIES						
DOIM	300,000	0	0	0	0	300,000
CNMA	4,000	0	0	0	0	4,000
INSTALLATION F&AO	204,000	0	0	0	0	204,000
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
CONTRACTED SERVICES	1,965,600	0	702,000	842,400	281,600	3,791,600
INTER-AGENCY SERVICES	0	0	0	0	0	0
INTRA-AGENCY SERVICES	0	0	0	0	0	0
SUBTOTAL COSTS	5,274,608	325,936	977,792	1,168,336	607,536	8,354,208
ADMINISTRATION	791,191	48,890	146,669	175,250	91,130	1,253,131
TOTAL	6,065,799	374,826	1,124,461	1,343,586	698,666	9,607,339

SCENERIO 3
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
RECURRING: RATE-SETTING

COST CATEGORY	1988	1989	1990	1991	1992	TOTAL COSTS
PERSONNEL						
DOIM						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	15,043,200	15,043,200	15,043,200	15,043,200	60,172,800
MANAGEMENT	0	0	0	0	0	0
CNMA						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	200,576	200,576	200,576	200,576	802,304
MANAGEMENT	0	0	0	0	0	0
IMA CAPACITY PLANNING						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	752,160	752,160	752,160	752,160	3,008,640
MANAGEMENT	0	0	0	0	0	0
CONTRACTING						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	10,229,376	10,229,376	10,229,376	10,229,376	40,917,504
MANAGEMENT	0	0	0	0	0	0
HARDWARE						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
IMA CAP PLANNING	0	0	0	0	0	0
SOFTWARE						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
IMA CAP PLANNING	0	100,000	100,000	100,000	100,000	400,000
SPACE OCCUPANCY						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
IMA CAP PLANNING	0	140,600	140,600	140,600	140,600	562,400
SUPPLIES						
DOIM	0	400,000	400,000	400,000	400,000	1,600,000
CNMA	0	8,000	8,000	8,000	8,000	32,000
IMA CAP PLANNING	0	60,000	60,000	60,000	60,000	240,000
CONTRACTED SERVICES						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
IMA CAP PLANNING	0	0	0	0	0	0
INTER-AGENCY SERVICES	0	0	0	0	0	0
INTRA-AGENCY SERVICES	0	304,000	304,000	304,000	304,000	1,216,000
SUBTOTAL COSTS	0	27,237,912	27,237,912	27,237,912	27,237,912	108,951,648
ADMINISTRATION	0	4,085,687	4,085,687	4,085,687	4,085,687	16,342,747
TOTAL	0	31,323,599	31,323,599	31,323,599	31,323,599	125,294,395

SCENERIO 3
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
RECURRING: BILLING

COST CATEGORY	1988	1989	1990	1991	1992	TOTAL COSTS
PERSONNEL						
DOIM						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	1,504,320	1,504,320	1,504,320	1,504,320	6,017,280
MANAGEMENT	0	0	0	0	0	0
CNMA						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	200,576	200,576	200,576	200,576	802,304
MANAGEMENT	0	0	0	0	0	0
INSTALLATION P&AO						
CLERICAL	0	0	4,655,280	4,655,280	4,655,280	13,965,840
TECHNICAL	0	0	10,229,376	10,229,376	10,229,376	30,688,128
MANAGEMENT	0	0	0	0	0	0
HARDWARE						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
INSTALLATION P&AO	0	0	0	0	0	0
SOFTWARE						
DOIM	0	2,000,000	2,000,000	2,000,000	2,000,000	8,000,000
CNMA	0	40,000	40,000	40,000	40,000	160,000
INSTALLATION P&AO	0	0	0	0	0	0
SPACE OCCUPANCY						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
INSTALLATION P&AO	0	0	0	0	0	0
SUPPLIES						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
INSTALLATION P&AO	0	0	0	0	0	0
CONTRACTED SERVICES						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
INSTALLATION P&AO	0	0	0	0	0	0
INTER-AGENCY SERVICES	0	0	0	0	0	0
INTRA-AGENCY SERVICES	0	0	0	0	0	0
SUBTOTAL COSTS	0	3,744,896	18,629,552	18,629,552	18,629,552	59,633,552
ADMINISTRATION	0	561,734	2,794,433	2,794,433	2,794,433	8,945,033
TOTAL	0	4,306,630	21,423,985	21,423,985	21,423,985	68,578,585

SCENERIO 4
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
NON-RECUR: RATE SETTING

COST CATEGORY	1988	1989	1990	1991	1992	TOTAL COSTS
PERSONNEL						
DOIM						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	0	0	0	0	0
MANAGEMENT	0	0	0	0	0	0
CNMA						
CLERICAL	0	0	0	0	0	0
TECHNICAL	100,288	100,288	100,288	100,288	100,288	501,440
MANAGEMENT	0	0	0	0	0	0
IMA CAPACITY PLANNING						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	0	0	0	0	0
MANAGEMENT	0	0	0	0	0	0
ISC						
CLERICAL	0	0	0	0	0	0
TECHNICAL	250,720	225,648	175,504	175,504	175,504	1,002,880
MANAGEMENT	0	0	0	0	0	0
HQDA						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	0	0	50,144	50,144	0
MANAGEMENT	0	0	0	0	0	100,288
HARDWARE						
DOIM	900,000	0	0	0	0	900,000
CNMA	12,000	0	0	0	0	12,000
IMA CAP PLANNING	45,000	0	0	0	0	45,000
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
SOFTWARE						
DOIM	450,000	0	0	0	0	450,000
CNMA	6,000	0	0	0	0	6,000
IMA CAP PLANNING	22,500	0	0	0	0	22,500
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
SPACE OCCUPANCY						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
IMA CAP PLANNING	0	0	0	0	0	0
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
SUPPLIES						
DOIM	300,000	0	0	0	0	300,000
CNMA	4,000	0	0	0	0	4,000
IMA CAP PLANNING	15,000	0	0	0	0	15,000
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
CONTRACTED SERVICES	1,965,600	0	702,000	842,400	281,600	3,791,600
INTER-AGENCY SERVICES	0	0	0	0	0	0
INTRA-AGENCY SERVICES	0	0	0	0	0	0
SUBTOTAL COSTS	4,071,108	325,936	977,792	1,168,336	607,536	7,150,708
ADMINISTRATION	610,666	48,890	146,669	175,250	91,130	1,072,606
TOTAL	4,681,774	374,826	1,124,461	1,343,586	698,666	8,223,314

SCENERIO 4
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
NON-RECUR: BILLING

COST CATEGORY	1988	1989	1990	1991	1992	TOTAL COSTS
PERSONNEL						
DOIM						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	0	0	0	0	0
MANAGEMENT	0	0	0	0	0	0
CNMA						
CLERICAL	0	0	0	0	0	0
TECHNICAL	100,288	100,288	100,288	100,288	100,288	501,440
MANAGEMENT	0	0	0	0	0	0
INSTALLATION P&AO						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	0	0	0	0	0
MANAGEMENT	0	0	0	0	0	0
ISC						
CLERICAL	0	0	0	0	0	0
TECHNICAL	250,720	225,648	175,504	175,504	175,504	1,002,880
MANAGEMENT	0	0	0	0	0	0
HQDA						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	0	0	50,144	50,144	100,288
MANAGEMENT	0	0	0	0	0	0
USAPAC						
CLERICAL	0	0	0	0	0	0
TECHNICAL	50,144	50,144	0	0	0	100,288
MANAGEMENT	0	0	0	0	0	0
HARDWARE						
DOIM	900,000	0	0	0	0	900,000
CNMA	0	0	0	0	0	0
INSTALLATION P&AO	0	0	0	0	0	0
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
USAPAC	0	0	0	0	0	0
SOFTWARE						
DOIM	450,000	0	0	0	0	450,000
AUTOMATION						
ASIMS	0	0	0	0	0	0
ISEC	100,000	0	0	0	0	100,000
TIER 2 AUTOMATION	500,000	0	0	0	0	500,000
TELECOMMUNICATIONS						
ARCCO	100,000	0	0	0	0	100,000
TCC	0	0	0	0	0	0
LOCAL TELEPHONE	100,000	0	0	0	0	100,000
OTHER TELECOM	0	0	0	0	0	0

SCENERIO 4

ARMY TECHNIQUES FOR MANAGING IMA RESOURCES

NON-RECUR: BILLING

COST CATEGORY	1988	1989	1990	1991	1992	TOTAL COSTS
PRINTING AND PUBS						
APPA	100,000	0	0	0	0	100,000
LOCAL PRINTING	100,000	0	0	0	0	100,000
VISUAL INFORMATION	100,000	0	0	0	0	100,000
MAIL	0	0	0	0	0	0
SPACE OCCUPANCY						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
INSTALLATION F&AO	0	0	0	0	0	0
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
USAFAC						
SUPPLIES						
DOIM	300,000	0	0	0	0	300,000
CNMA	4,000	0	0	0	0	4,000
INSTALLATION F&AO	204,000	0	0	0	0	204,000
ISC	0	0	0	0	0	0
HQDA	0	0	0	0	0	0
USAFAC	0	0	0	0	0	0
CONTRACTED SERVICES	2,152,800	187,200	702,000	842,400	281,600	4,166,000
INTER-AGENCY SERVICES	0	0	0	0	0	0
INTRA-AGENCY SERVICES	0	0	0	0	0	0
SUBTOTAL COSTS	5,511,952	563,280	977,792	1,168,336	607,536	8,828,896
ADMINISTRATION	826,793	84,492	146,669	175,250	91,130	1,324,334
TOTAL	6,338,745	647,772	1,124,461	1,343,586	698,666	10,153,230

SCENERIO 4
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
RECURRING: RATE-SETTING

COST CATEGORY	1988	1989	1990	1991	1992	TOTAL COSTS
PERSONNEL						
DOIM						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	15,043,200	15,043,200	15,043,200	15,043,200	60,172,800
MANAGEMENT	0	0	0	0	0	0
CNMA						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	200,576	200,576	200,576	200,576	802,304
MANAGEMENT	0	0	0	0	0	0
IMA CAPACITY PLANNING						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	752,160	752,160	752,160	752,160	3,008,640
MANAGEMENT	0	0	0	0	0	0
CONTRACTING						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	10,229,376	10,229,376	10,229,376	10,229,376	40,917,504
MANAGEMENT	0	0	0	0	0	0
HARDWARE						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
IMA CAP PLANNING	0	0	0	0	0	0
SOFTWARE						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
IMA CAP PLANNING	0	100,000	100,000	100,000	100,000	400,000
SPACE OCCUPANCY						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
IMA CAP PLANNING	0	140,600	140,600	140,600	140,600	562,400
SUPPLIES						
DOIM	0	400,000	400,000	400,000	400,000	1,600,000
CNMA	0	8,000	8,000	8,000	8,000	32,000
IMA CAP PLANNING	0	60,000	60,000	60,000	60,000	240,000
CONTRACTED SERVICES						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
IMA CAP PLANNING	0	0	0	0	0	0
INTER-AGENCY SERVICES	0	0	0	0	0	0
INTRA-AGENCY SERVICES	0	304,000	304,000	304,000	304,000	1,216,000
SUBTOTAL COSTS	0	27,237,912	27,237,912	27,237,912	27,237,912	108,951,648
ADMINISTRATION	0	4,085,687	4,085,687	4,085,687	4,085,687	16,342,747
TOTAL	0	31,323,599	31,323,599	31,323,599	31,323,599	125,294,395

SCENERIO 4
ARMY TECHNIQUES FOR MANAGING IMA RESOURCES
RECURRING: BILLING

COST CATEGORY	1988	1989	1990	1991	1992	TOTAL COSTS
PERSONNEL						
DOIM						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	1,504,320	1,504,320	1,504,320	1,504,320	6,017,280
MANAGEMENT	0	0	0	0	0	0
CNMA						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	200,576	200,576	200,576	200,576	802,304
MANAGEMENT	0	0	0	0	0	0
INSTALLATION P&AO						
CLERICAL	0	0	4,655,280	4,655,280	4,655,280	13,965,840
TECHNICAL	0	0	10,229,376	10,229,376	10,229,376	30,688,128
MANAGEMENT	0	0	0	0	0	0
USAPAC						
CLERICAL	0	0	0	0	0	0
TECHNICAL	0	0	250,720	250,720	250,720	752,160
MANAGEMENT	0	0	0	0	0	0
HARDWARE						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
INSTALLATION P&AO	0	0	0	0	0	0
USAPAC	0	0	0	0	0	0
SOFTWARE						
DOIM	0	2,000,000	2,000,000	2,000,000	2,000,000	8,000,000
CNMA	0	40,000	40,000	40,000	40,000	160,000
INSTALLATION P&AO	0	0	0	0	0	0
USAPAC	0	0	0	0	0	0
SPACE OCCUPANCY						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
INSTALLATION P&AO	0	0	0	0	0	0
USAPAC	0	0	0	0	0	0
SUPPLIES						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
INSTALLATION P&AO	0	0	0	0	0	0
USAPAC	0	0	0	0	0	0
CONTRACTED SERVICES						
DOIM	0	0	0	0	0	0
CNMA	0	0	0	0	0	0
INSTALLATION P&AO	0	0	0	0	0	0
USAPAC	0	0	0	0	0	0
INTER-AGENCY SERVICES	0	0	0	0	0	0
INTRA-AGENCY SERVICES	0	0	0	0	0	0
SUBTOTAL COSTS	0	3,744,896	18,880,272	18,880,272	18,880,272	60,385,712
ADMINISTRATION	0	561,734	2,832,041	2,832,041	2,832,041	9,057,857
TOTAL	0	4,306,630	21,712,313	21,712,313	21,712,313	69,443,569

APPENDIX E

ACRONYMS

AC^2MP - Army Command and Control Master Plan
ACSIM - Assistant Chief of Staff for Information Management
AIA - Army Information Architecture
AIME - Army Information Management Environment
AMC - Army Material Command
AMSCO - Army Management Structure Code
APPA - Army Printing and Publications Activity
AR - Army Regulations
ARCCO - Army Commercial Communications Office
ARPMIS - Automation Resource and Planning Management Information System
ASAFM - Assistant Secretary of the Army for Financial Management
ASIMS - Army Standard Information Management System
AVLS - Audio Visual Library System

BASOPS - Base Operations
BOA - Basic Ordering Agreement

CA - Commercial Activities
CDR - Call Detail Report
CNMA - Central Network Management Activity
COB - Command Operations Budget
COE - Corps of Engineers
CONUS - Continential United States
CTMP - CONUS Telephone Modernization Program

DBP - Deutches Bundes Post
DCP - Direct Customer Payment
DCS - Defense Communication Systems
DCSIM - Deputy Chief of Staff for Information Management
DCSLOG - Deputy Chief of Staff for Logistics
DDN - Defense Data Network
DISC4 - Director for Information Systems, Command, Control, Communications, and Computer
DOIM - Director of Information Management

E-Mail - Electronic Mail
EOR - Element of Resource
ETS - European Telephone System

F&AO - Finance and Accounting Office
FCA - Functional Cost Accounting
FEDSIM - Federal Computer Performance Evaluation and Simulation Center
FGAP - General Accounting Office Technical Pamphlet
FIPS PUB - Federal Information Processing Standard Publication
FOA - Field Operating Activity
FTS - Federal Telephone System

GAO - General Accounting Office
GOCO - Government Owned, Contractor Operated
GSA - General Services Administration

HQDA - Headquarters Department of the Army
HQMA - Headquarters Management Activities

IM - Information Manager
IMA - Information Mission Area
IMMP - Information Management Master Plan
ISC - Information Systems Command
ISEC - Information Systems Engineering Command

JCS - Joint Chiefs of Staff
JTU - Japan Telephone Upgrade

KTU - Korean Telephone Upgrade

MACOM - Major Army Command
MIPR - Military Inter-departmental Procurement Request
MPA - Military Personnel, Army

NGPA - National Guard Personnel, Army

OCONUS - Outside Continential United States
O&M - Operation and Maintenance
OMB - Office of Management and Budget
OSD - Office of the Secretary of Defense

PBAC - Program Budget Advisory Committee
PEO - Program Executive Officer
PBG - Program Budget Guidance
PM - Program Manager
POM - Program Objective Memorandum
PPBES - Planning, Programming, Budgeting and Execution System

RAMIS - Reprographics Automated Management Information System
RDAISA - Research and Development Acquisition Information Supply Agency
RDC - Regional Data Center
RPA - Reserve Personnel, Army
RPMA - Real Property Management Activity

SBNA - Sustaining Base Network Activity
SBNO - Sustaining Base Network Office
SLUC - Standard Level User Charge
SMDR - Station Message Detail Recorders
STAMMIS - Standard Army Multicommand Management Information System
STANFINS - Standard Finance System

TASC - Training and Audio Visual Support Center
TCC - Telecommunications Center
TRADOC - Training and Doctrine Command

USAISC - United State Army Information Systems Command
URS - Utilization Reporting System

WCF - Working Capital Fund
WOMS - Work Order Management System
WWMCCS - World-Wide Military Command and Control System

APPENDIX F

GLOSSARY

Area of Management Responsibility - An Area of Management Responsibility (AMR) is an organizational grouping of work areas managed by one individual within the information technology facility. Costs are accumulated by areas of management responsibility in order to obtain a better understanding of the costs of operating the facility. "Income" from billing for service usage may also be calculated for each AMR by backtracking through the distribution matrices, and compared to the cost to help evaluate management performance. Examples of AMR's are administration, computer processing operations, and software development and maintenance.

AVLS - AVLS allows the TASCs to track all video tapes, films, equipment, and expendable devices. It is an on-line, real-time system utilizing data entered from CRTs located throughout the TASC. Located at Fort Sill, this system can also track the labor and material resources consumed to provide the visual information services.

Billing Period - The billing period is the period of time for which the charges for service usage are calculated. This time period varies widely between, and even within, information technology facilities, from as short as a per job basis to as long as a fiscal year.

Billing Rate - The billing rate is the amount that is charged to the users for utilizing each unit of service.

Buyer/Seller Relationship - A buyer/seller relationship exists when buyers (users) are required to pay for the services received, and sellers (providers) are financially dependent on obtaining orders from users. Reliance on a buyer/seller relationship to stimulate efficiency is based on two fundamental tenets. When users pay for what they receive, they are motivated to order only what they need. When providers agree to do a specific job at a specific price, they are motivated to improve cost estimations, cost control, and to minimize inefficiencies and waste.

Costs - Costs are the funded and unfunded expenses incurred by the information technology facility for the resources needed to provide services to the users. Examples of the costs which could be incurred for a CPU resource are lease or purchase expenses, maintenance, depreciation, delivery, and installation. FGAP 4 provides guidance on the procedures for cost accumulation and accounting.

Disciplines - Disciplines are element of the IMA: automation, telecommunications, printing and publications, visual information, records management, and mail. For purposes of this document, most of the disciplines are further defined into categories of services: automation - ASIMS, Tier 2 Automation, software development; telecommunications - ARCCO, local telephones, TCCs, other telecommunications; printing and publications - APPA and local printing; visual information; and mail.

Distribution Matrices - The distribution matrices, viewed as the nuclei of the rate-setting techniques, are the mechanisms by which the costs of the resources are proportioned to the services and a billing rate is calculated for each of the services. The use of a series of matrices, instead of some other allocating mechanism, is recommended, because matrices provide the clearest, easiest technique for tracking the large volume of information required to calculate the billing rates.

IMA Resources - IMA resources are the resources employed in the acquisition,

development, transmission, use, integration, retention, retrieval, and management of IMA information associated with the automation, telecommunications, printing and publications, visual information, and records management disciplines. IMA resources are used to provide IMA services. See "resources" for further definition of resources.

IMA Services - IMA services are the outputs generated with the resources of the automation, telecommunications, printing and publications, visual information, and records management disciplines. IMA services are supplied by the providers and utilized (consumed) by the users. See "services" for further definition of services.

Information - Information means any communication or reception of knowledge such as facts, data, or opinions, including numerical, graphic, or narrative forms, whether oral or maintained in any medium, including computerized data bases, paper, microform, or magnetic tape.

Information Technology - Information technology means the hardware and software used in connection with government information, regardless of the technology involved, whether computers, telecommunications, micrographics, or others. Automatic data processing and telecommunications activities related to certain critical national security missions, as defined in 44 U.S.C. 3502 (2) and 10 U.S.C. 2315, are excluded.

Information Technology Facility - An information technology facility is the organizational entity that obtains and utilizes resources to provide services to a user or group of users. Circular A-130 applies to Federal facilities that a) are operated by, or on behalf of, a Federal agency; b) provide service to more than one user; c) operate one or more general management computers; and d) exceed $3,000,000 per year for the full cost of operation. An information technology facility organizationally defines a set of personnel, hardware, software, and physical facilities, a primary function of which is the operation of information technology.

Provider - A provider is an organization or programmatic entity (whether a single person, a government agency, or private industry) responsible for consuming resources in the creation and delivery of information technology services to the users.

Rate Period - The rate period is the period of time for which the costing reporting and recovery system's billing rates are being set. Thus, if the billing rates are being determined for the next fiscal year, then the rate period is the next fiscal year.

Resource - A resource is any item used by the information technology facility to provide services. In order for a resource to be included in the calculation of billing rates, the facility must incur a cost for obtaining or using the resource. The primary categories of resources, defined in Circular A-130 and FGAP 4, are personnel, equipment, software, supplies, contracted services, space occupancy, intra-agency services and overhead, and inter-agency services. Resources can be further differentiated between direct, indirect, and overhead. Indirect resources are resources associated with all of the work areas because there is only a logical and not readily measurable relationship between them. Space is typically categorized as an indirect resource. Direct resources are resources associated with one or more work areas because there is a distinct logical and measurable relationship between them. Computer equipment and application programmers are typically categorized as

direct resources. Overhead resources are resources that can be associated with all of the work areas but only by management fiat, because there is neither a logical nor measurable relationship between them. Management personnel are typically categorized as overhead resources.

RAMIS - RAMIS is used to track the costs of operating Army print facilities. Currently in operation at only nine installations, but is scheduled for fielding at other TRADOC installations, it facilitates the allocation of total, actual print facility costs to specific jobs. At Fort Leavenworth, RAMIS is used to manage the costs of both the local print plant and the visual information activity.

Service - A service is any work done by the information technology facility for a user or group of users. In order to be formally classified as a service, the facility's work must be measured by a single metric (called a service unit) which has a billing rate associated with it. A service can be as simple as a CPU service, for which a service unit is a CPU second, or as complex as a payroll service, for which a service unit is a printed check.

Service Suite - A service suite is a logical grouping of one or more similar services for the purpose of developing billing rates for the services. Services are grouped into service suites in order to (a) normalize between services that use similar resources with different capabilities (e.g., two processing services that use different CPUs); (b) apply surcharges and discounts to services; and (c) charge for different classes of the same service (e.g., applying a different charge for high, medium, and low priority use of a processing service). The numerical value of the billing rate for each service, within a given service suite, is a function of the reason for grouping the services into that service suite and the cost of the service suite. The total amount charged for the utilization of all the services of a given service suite, over a given rate period, should not exceed the cost to the information technology facility, for the rate period, of providing that service suite.

Service Unit - A service unit is the metric used to measure the amount of service received by the users. Only one service unit can be associated with each service. Examples of service units are CPU seconds, for a CPU service; lines printed, for a printing service; and checks processed, for a payroll service. The service unit selected should be an accurate metric of the dominant type of work performed by the service. If a single unit cannot be determined, then the possibility of dividing the work into two services should be considered.

Subfunction - A subfunction is a discrete work area for which costs can be accumulated and work measurements made. A group of similar machines whose use is measured by a common unit can be considered a subfunction. A work function is usually made up of one or more subfunctions, and a subfunction is always contained within one work function. Costs are accumulated by subfunction in order to obtain a more detailed understanding of the costs of operating the DP facility and to distribute the costs to the service centers. Examples of subfunctions for a computer operations work function are central processing unit, core memory, storage devices, channels, and spooling functions.

Tier 1 Automation - Tier 1 of the Army automation architecture provides regional support services required by a wide range of customers or that benefit from economies of scale or data sharing opportunities provided by large, central facilities. Currently, Tier 1 comprises the five RDCs of ASIMS. The ASIMS RDCs support 47 data processing installations and operate the bulk of the Army's STAMMIS workload.

Tier 2 Automation - Tier 2 of the Army automation architecture is the installation level facility. There are currently 1800-2200 data processing installations (depending on the definition) world-wide providing general installation support or dedicated to specific functions, installation tenants, or associated operating agencies. A special class of the latter category are the dedicated data processing installations, such as the FORECAST and RDAISA systems, that operate in direct support of the Headquarters Army Staff or Army Secretariat functions. In general, the DPIs operate local applications as well as some STAMMISs.

Tier 3 Automation - Tier 3 of the Army automation architecture is the user interface equipment. The interface equipment consists primarily of terminals and microcomputers. They are typically dedicated to a single user.

User - A user is an organizational or programmatic entity (whether a single person or an entire agency) that receives information technology service. A user, in the context of this document, is the entity responsible for utilizing, causing the utilization of, or has the ability to control the utilization of IMA services. A user may also be either internal or external to the agency responsible for the information technology facility.

WOMS - WOMS, located at Fort Sill, provides workorder tracking. The system identifies the branch, section, and individual assigned the workorder. All information, including completion percentage, and up-to-date costs of labor and materiel, is included in the system. It is an on-line, real-time system utilizing data entered from CRTs located throughout the TASC.

Work Area - Work areas are the types and levels of work performed by the information service organization. The work area hierarchy consists of areas of management responsibility at the highest level, work functions at the middle level, and subfunctions at the lower level.

Work Function - A work function is a work area for which costs can be accumulated and work measurements made. An area of management responsibility (AMR) is made up of one or more work functions, and a work function is always contained within one AMR. Costs are accumulated by work function to obtain a more detailed understanding of the costs of operating an information technology facility. Examples of work functions are administration, computer operations, reporting, technical support, and software development.

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