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NATIONAL HOSPITAL INSURANCE FUND
REVIEW OF THE CURRENT SYSTEMS
AND RECOMMENDATIONS FOR
SYSTEMS SPECIFICATIONS

OCTOBER 1989

USAID/NAIROBI

Resources for
Child Health
Project

REACH



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DRAFT

NATIONAL HOSPITAL INSURANCE FUND

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1 MANAGEMENT SUMMARY

- 1.1 Introduction
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MANAGEMENT SUMMARY

v

Introduction

We have completed a preliminary investigation for a proposed computer based system to replace the current manual and batch-mode time sharing systems for the National Hospital Insurance Fund, Nairobi. When a successful system is developed (and we believe that highly likely), then the system will provide substantially improved support for both the Fund and its members.

By computerising time-consuming repetitive manual processes, the benefits of automation will result in increased worker/job satisfaction and higher morale. This in turn will feed the business success. Improving Members' satisfaction is equally dramatic. If the time it takes to perform a task is reduced through automation, then the Fund's business response time to Members can be proportionately reduced. Thus, Fund can increase quality and accountability through automatic checks, logs and other side benefits of automation. Members can even look for greater variety in packages and services knowing the Fund can produce more with available resources.

Problem Statement

The Fund's current database is shown below:

MEMBERSHIP	850,000
HOSPITALS	210
CLAIMS	120,000
EMPLOYERS	26,000

This is a large database. It is impossible to update and keep all records current when employing a batch-mode processing system on a remote time sharing computer facility that is already reaching full capacity.

The Fund has enormous paperwork and cannot process, store and retrieve information on a timely basis to support Membership and Claims processing. Other essential requirements in Actuarial and Accounting have also to be planned for implementation. The Fund will require a large computer to be self-sufficient in data automation.

Scope of the Report

This report reviews the current Membership, Claims, Actuarial and Accounting functions for the Fund. Proposed hardware and software packages to support these functions are outlined. Resources for additional work to complete specification and preparation of the request for proposal (RFP) are identified.

Constraints

A new computer system is required in approximately one year. The system will alter the existing file and report formats and operate in an on-line mode. The application software will consist of packages to process Membership, Claims, Actuary and Accounting preferably written in fourth generation languages (4GLs) and operate in relational database management systems environment. Additional professional staff will be recruited and trained to complement the present staff to operate the new computer facility.

Preliminary Alternatives

We have surveyed the market place and listed six US Vendors who are likely to provide a turnkey solution (hardware and software plus on-going maintenance).

Any final solution would be subject to an extensive identification and analysis of alternatives. The following list is not exhaustive, but serves as an indication of the suppliers who can provide the Fund with appropriate solution:

IBM
NCR
DEC
DG
WANG

Examples of relational database products are:

DB2
SQL/DL
FOCUS
ORACLE
DATACOM
PACE
INGRESS

Examples of software packages that meet the Fund's Membership and Claims processing are supplied by:

- 1) Genelco Inc.
- 2) Dyer, Wells and Associates
- 3) Armada Software Inc.

There are several suppliers of Actuarial Software Packages, including Management Data Inc.

Examples of Financial Accounting Packages that integrate with the Membership and Claims are:

MCBA
SOTAS

Recommendation

We highly recommend that this project be approved for systems specification. The results of user requirements and proposed technical solution would be the basis of writing the request for proposals (RFP) for the invited Vendors to bid.

The basis of our recommendation is that this system is essential to the business mission of the Fund. Unless Membership and Claims services, Actuarial and Accounting systems are dramatically improved, and the existing problems solved, it is likely that the new directives to expand membership, restructure premiums, provision of better benefit packages, long and short-term planning and control will fail.

We believe that you will agree that this system, because of its direct impact on streamlining Membership, Claims and Actuarial activities and the interface to the accounting function to support the Fund-wide business goals, should be a higher priority than most projects currently being considered.

Resource Allocation for Systems Specification

The detailed study of the current systems definition of user requirements and systems specification of a target solution will require the following personnel and timing:

- Actuarial consultant 2 weeks
- Systems Consultant 16 weeks

2 BACKGROUND

2.1 Introduction

2.2 Workload

2.3 Proposed Changes

BACKGROUND

Introduction

The National Hospital Insurance Fund (NHIF) was created in 1966 by Act of Parliament to provide access to private, higher quality Hospitals by the upper income population and all races in Kenya. For a monthly contribution of Kshs.20/=, the Fund covers upto 180 inpatient days per year per family. Contributions are mandated for adults (i.e. those over 18 years or older) earning at least Kshs.1,000/= per month, employed or self-employed. Married couples whose combined earnings are Kshs.1,000/= or more (even if individual earnings are less than Kshs.1,000/= per month) become compulsory members. Those earning less than Ksh 1,000/= per month may opt to become voluntary members.

Apart from permitting voluntary members beginning in 1982, virtually no substantive changes have been made in the membership categories, contribution schemes, benefits and organisational status of the Fund since its inception 23 years ago. Membership has increased from 40,000 in 1967 to more than 800,000 in 1989. Once comprised almost exclusively of relatively wealthy Kenyans, the Fund membership now is believed to include a large segment of the middle-income population because of the rising wages of the low income group. About half of the participants are civil servants. Voluntary contributors comprise less than 2 per cent of the Fund's total membership.

NHIF contributions are regressive in nature, and are paid entirely by the contributor. Employers are mandated to collect NHIF contributions by deductions from wages and salaries, and transfer these contributions in a timely manner to the Fund through the purchase of NHIF revenue stamps. Self employed buy stamps directly from the NHIF.

Hospitals, nursing and maternity homes are reimbursed at approved rates (Kshs.50-150). Some members pay the healthcare institutions and obtain reimbursement from NHIF.

NHIF is a department of Ministry of Health (MOH). It is headed by a Director. All its 400 employees are seconded from MOH and Ministry of Finance (MOF). Its annual operating budget is approved by Treasury each year. NHIF has operated with surplus funds. It cannot use its surplus to hire additional staff, purchase assets, or make necessary enhancements in the office space and automation without permission from the Treasury.

Workload

The Fund has 850,000 members. It processes 120,000 claims per year and 26,000 employers collect premiums on its behalf. 210 Hospitals provide inpatient treatment for the Fund's members. The information systems have substantial data volumes and currently make little use of computers. Membership and Claim processing is partly computerized. The Fund is unable to process membership and claims on a timely basis due to the lack of in-house computer system. It cannot project premiums and claims due in future period so that it may plan and control its operations.

Proposed Changes

Earlier this year, NHIF drafted legislation with the help from MOH. If approved by Government and enacted by Parliament, it would result in a total restructure of NHIF.

The new law sought would change NHIF into a state parastatal organization. Corporate status would provide NHIF with much greater autonomy; including control over its own budget and ability to charge higher premiums and improve benefit package. Additionally, it could hire personnel of its choice without having to depend on the personnel seconded to it from MOH and MOF.

It is not known when these changes will be effected. Designers of the new system should be aware of expected changes and design a flexible system that would incorporate these changes when necessary.

3 CURRENT SYSTEMS

CURRENT SYSTEMS

The Fund uses remote batch-mode computer time sharing facility at the Government Computer Centre to process Membership and Claims. Accounting is entirely manual.

The following equipment is installed for data capture and transfer to the Government Computer Centre for processing:

- 4 x IBM 3742 Dual Workstations
- 1 x IBM 3741 Single Workstation
- 1 x IBM 3717 Band Printer
- Diskette Media
- Magnetic Tape Media

Computer Division is headed by Assistant Director. There are three trainee programmers, 9 senior data capture machine operators, 12 data capture machine operators and 12 data capture machine operator trainees. The division operates two shifts, 7 a.m - 1 p.m and 1 p.m to 7 p.m.

Major problems identified are:

- Lack of in-house computer to process Membership, Claims and Financial Accounting
- Insufficient time available at the remote Government Computer Centre to process the Funds work on a timely basis
- Present staff level cannot cope with the workload
- Lack of trained staff to enhance current programs and carry out additional development work
- Batch-mode processing lacks the capability of instant updating and retrieval of Membership and Claims systems
- The Fund cannot provide better services to its Members, Employees and Hospitals due to lack of access to current and accurate information

To offset these problems, the Fund should be equipped with its own super-minicomputer system operating in an on-line mode for instant access to up-to-date information. The system should link the four area offices to the head office. Additionally, application software packages tailored to the Fund's requirements should replace current in-house developed programs. A relational database system should be implemented to replace the present file based system to support Fund wide processing (not only Membership and Claims as currently practised). Two systems analysts and two programmers should be recruited to strengthen the present staff.

4. OBJECTIVES OF THE NEW SYSTEM

OBJECTIVES OF THE NEW SYSTEM

The key objectives for the Fund's new computer system are:

- The new system should provide adequate processing capacity to support substantial future growth. It is anticipated that the volume of business transactions will grow to a maximum of four times the current level over the next five years, and staff numbers will double over the same period.
- The new system should incorporate on-line and telecommunication features and should substantially improve response time and provide faster processing, retrieval and printing. Current timings are unacceptably slow.
- The new system should be provided as a turnkey - hardware, software, implementation, training and maintenance supported by the vendor.
- Possess compatibility features across the entire product family for easy software migration from lower model to higher model without expensive and extensive conversion exercises.
- Be modular and support on-site expansion to support expected growth.
- Trace premiums by organizations, industry and region.
- Project premium and claims over a period of time in future.
- Trace claims by organization, region and hospital.
- Generate loss ratio's by organizations, type of coverage, age group, sex.
- Loss ratio's by hospital.

- Provide direct access to related information by a single enquiry instead of multiple enquiries.
- Provide improved system security through the use of passwords and detailed audit trails.
- Provide facilities for archiving of information.
- Incorporate a word processing facility which will allow the production of standard documents using data from the systems.
- Integrate Premiums, Claims, Actuary, Accounting, Word Processing, Graphics, Spreadsheet into the Funds operations.

5 HARDWARE FEATURES

HARDWARE FEATURE

Support Applications Load

The computer system should support current and presently identified future needs of the Fund (NHIF). The functional needs are summarized in Sections 8-18. The current data volumes and projected growth rates are described in Appendix A.

High Performance System

The computer system architecture should be modular and current. It should have state-of-the-art technology possessing high capacity and performance needed to process the entire workload including on-line and batch processing back-up files and house-keeping tasks.

Balanced Architecture

The computer system architecture should be based on a three-level structure to deliver superior system performance and capacity and allow balanced systems growth.

- The central processor unit should act as a system manager by distributing tasks and executing the end user component of systems processing.
- Intelligent input/output coprocessors should be present to improve system capacity by supervising information management access. They should manage all details of input/output operations leaving the central processor free to work on end user operations.
- Intelligent peripherals should perform various time and resource sensitive activities.

Central Processor Unit

The central processor is a key element in a successful computer systems architecture. The design should ensure high performance and growth capabilities.

The central processor unit should incorporate the following state-of-the-art features:

- High speed processor
- High speed arithmetic unit
- Cache memory
- Input/output coprocessors to support a large number of peripheral devices and communications links in a single interface
- Support for a wide range of mass storage peripherals like magnetic disks (minimum 1 gigabyte) and magnetic tapes.

5

Support for Peripherals

The computer should support the current and presently identified future needs of terminals and printers. The growth should be balanced and the incremental costs associated with the potential expansion of terminals and printers in numbers and/or versatility should be minimum, ideally the cost of terminals and printers. The requirement of terminals and printers by phase is given in Appendix B.

Network

Because of the Fund's (NHIF) need to link area offices to head office, networking technologies should enable users throughout the Fund to share hardware resources.

A high speed network connecting users to the hardware resources to share key central devices should be provided.

Hardware Upgrades

It should be possible to have a balanced upgrading of hardware (physical memory expansion, extra input/output processors, more on-line storage capacity, etc.). The incremental cost of adding additional hardware components should be minimum ideally the costs components being added.

The physical memory and on-line disk storage must initially support the present application load and must be capable of growing by addition of various components to support all presently identified future applications. The implementation of applications by phases is given in section

Hardware Growth

The hardware growth to the next series of processors should be compatible with the existing application software and data.

Terminal Characteristics

All terminals should have detached key board and support automatic user log-off incase of no activities over a pre-determined duration. It is desirable to have synchronous terminals with high transmission speed. Dual intensity is required.

Integrated Processing

The hardware should be capable of supporting 100 percent information, such as image, text, data, office automation, spreadsheet, graphics, etc. These applications must be fully integrated with the Fund's (NHIF) data processing applications.

High Availability

The Fund requires high availability systems.

The hardware must provide a high availability option with manual or automatic recovery in a short period of time in the event of hardware failures. The hardware should also support fault tolerant volume/file addressing mechanisms.

Back-up

Daily, weekly and monthly back-up on suitable media should be provided for in the design. This will ensure the Fund (NHIF) recovers its data in case of equipment failure.

Microcomputers

The microcomputers supplied as part of hardware configuration should have the following requirements:

- Main Memory 1MB
- Diskette Drive 5.25 or 3.5 inches
- Hard Fixed Disk 20MB

Remote Terminals

Hardware should facilitate connection of remote terminals to the central processing unit via telephone lines. Area offices of the Fund (NHIF) may be connected via telephone lines.

6 **OPERATING SYSTEMS SOFTWARE**

OPERATING SYSTEM SOFTWARE

The Fund is security conscious and the operating system should have full fledged security capabilities. Confidential data must be protected against unauthorised access.

System Security

The operating system should have facilities for identification of authorized system users and for protection of passwords. The system must safeguard against unauthorized creation of new user codes.

File Protection

Data files should be protected against unauthorized accesses even by authorized system users. The operating system must have facilities for limiting file access and preserving file integrity.

Security Violations

The system must log and control attempted security violations.

System Back-up

The system must have comprehensive facilities to back-up data either in its entity or only the changes made since the previous back-up. There should be facilities to confirm the validity of back-up data.

File Addressing

Fault tolerant file addressing mechanisms should be provided. If the system detects any possible problems in file addressing, it should warn the system operator so that he could initiate recovery procedures.

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Integrity of Transactions

The system should support transaction rollback to preserve the integrity of various related files.

Recovery of Data Files

The system should support transaction roll forward to enable recovery of data files.

Network Software

A large file system should be made available to all authorized and connected Fund users and support.

- Transparent file access to all disk volumes
- Non-interactive background processing and spooling across the network
- Remote logon within the network
- Full operator control on network management

Microcomputers on the Network'

The microcomputers on the network should be able to work as computer terminals to the main systems.

Growth Compatibility

It is expected that the systems will grow over the next five years. Hence, it is essential that the operating system and its utilities provide flexibility for future development. All systems software proposed must have upward compatibility.

Program Development Tools

The software must support all industry standard languages and they must conform to American National Standards Institute (ANSI) standards. It should support program development in the language used for the application software, including interactive text editor and symbolic debug facility.

Other Services

The operating system must support word processing and office automation besides data processing.

Memory Management

The system should have efficient memory management techniques and memory error detection and correction routines.

Data Compaction

The system should support data compaction to save disk space.

User Operations

The system should have a direct conversational interface between users and the system. Also, it should be possible to run batch jobs in the background mode from the user workstation.

7 SOFTWARE FEATURES

SOFTWARE FEATURES

Modular Design

The system should be modular in design, with modules addressing specific functional requirements. The modules must also intergrate into a cohesive robust system.

Phased Implementation

The system must permit phased implementation according to the Fund's (NHIF) priorities. It should be possible to implement individual modules on stand alone basis and they must integrate with other modules as and when they come on-line.

Information Pool Approach

The system should adopt an information pool approach and be organized around central databases. However, the system must support different levels of access, relating to physical terminal and user passwords and be structured such that restricted views of the information pool can be presented. Duplication of information within the system should be minimal.

Terminal Help Functions

The system should provide an on-line facility to aid the users. By entering "HELP" or by hitting a special function or entry being performed. Authorized users should be able to modify this description to suit the changing needs.

Access to the Systems

A password is required to gain entry into the system and authorized levels required to perform any action. Authorization codes should be set up and modified only by the system administrator. Passwords should not be displayed on the screen when they are entered.

Authorization could be at various levels including:

- The ability to enter, change, enquire and delete
- The ability to only enter data
- The ability to enquire
- The ability to print data.

It should be possible to allow or restrict users and terminals from the use of particular system functions.

It should be possible to allow a user to enquire only certain fields in the member index.

Confidentiality of Sensitive Data

NHIF information systems stored data of sensitive and confidential nature and hence the system must produce adequate safeguard to maintain confidentiality.

Quick Response Time for All On-line Applications

All on-line terminal oriented functions should respond quickly to all user requests. A response time of less than 2 seconds when system is at maximum loading should be the goal. All background operations that run in batch mode should also run efficiently. When it is required to do a time consuming task while in on-line mode, the workstation screen should indicate that the terminal is busy and how long the job is going to run. A blank screen, or a screen where nothing visual is happening, is very bad for user morale. Quick response time will help to ensure that users will operate the system properly.

Report Writer Package

A report writer package to provide NHIF data processing staff with the ability to access all data within the applications packages is required. This package should be user friendly. It should provide access to all master files within every application packages. Any data item should be capable of being used as the sort keys.

All reports should be either produced at a printer or displayed at an on-line terminal. When the report is on a screen, the system should allow user controlled scrolling up and down of the report. The user should be able to request that a report on the screen be printed.

Flexible Input Screen Design and Data Entry

It should be easy to change the screen layout and the field headings. User specified input edit conditions for each field should be easily incorporated including whether a field is mandatory or not.

Code Look-up Facility

During data entry the user should have the option to display the list of codes and descriptions and then select the appropriate code from the list.

Training Database

The system must include a training database for in training the NHIF staff. All the system functions must be executed in the same manner as the live database. However, any user working on the training database should not affect any of the actual NHIF information. Both the training and live databases could be in operation at the same time. There should be the facility to transfer certain data from live database to training database.

Test Database

The system should include a test database to test new applications as and when they are introduced. This database may also be used to test changes done to the system. It should be easy switch functions of a user from test mode to live mode.

Integrity and Consistency of Database

The system should provide simultaneous record retrieval access to any number, of users. However, the record must be locked to prevent concurrent updating, when access for any type of modification. The system should have routines to ensure the integrity of logical transaction units.

Transaction Logging and Recovery

The system should have the facility to tag all on selected transactions with user identification, terminal number, date and time. It should be possible to maintain single or duplicate transaction logs. The operational staff must be able to change placement of transactions logging files dynamically.

The system should have recovery routines to restore the database to the original status by using the previous backup and applying the records from the transaction log files in a logical manner. Note that this option will be used as a last resort, only when both live and duplicate data files become unuseable.

Application Software Development Tool

The system should have preferably been developed using a fourth generation application software development tool and database management system. The database management system must support a full fledged data dictionary and must have interfaces to standard languages, like COBOL. The file structures used for application data should be consistent with the native data management facilities of the operating system.

Terminal Access and Printing

Any system module must be capable of being accessed from any terminal in the system in the response time outlined above. Also terminals without printers should have access to printers in the network.

Documentation

The system, user and operations documentation must be available for each module and it must be simple and easy to use.

The system documentation should include the specifications for the new system, including the design of reports, screens, files, programs and procedures. It should include program design specifications such as structure charts, pseudocode, flowcharts, or decision tables. The logic used at the module level should also be specified. In addition, testing methods, test data, and test results should be documented. Manual procedures, such as data entry, should be carefully explained. Design documentation is essential to those who will ultimately become responsible for enhancing and modifying the system.

User documentation should be designed to provide users with the training they need to understand and use the new system. Users need to be familiar with data entry and validation procedures, interpretation of computer output, methods of dealing with errors, and procedures as follows during testing and conversion activities.

Finally, operations documentation should include a systems flowchart identifying programs and the order in which they are executed. The input files, processing requirements, output files and output reports for the system should be identified.

Operations documentation should include instructions for the distribution of output, and for run times and setup requirements. The name of the maintenance programmer responsible for handling problems, changes, and enhancement for the system and the user contact responsible for providing input should be included.

Log of System Use

The system log should contain user identification with applications accessed and operations performed.

Automation of Data Capture

Within the system, emphasis should be given to minimal keyboard data entry and rapid responses. Automated data capture should be supported where feasible.

Spreadsheet Analysis

A spreadsheet analysis capability with interfaces to files maintenance by application systems is desirable.

Interfaces to other Products

The application systems should have interfaces to word processing.

Menu Driver Approach

The system should be menu based with a flexible and easy to use menu generator to meet the system implementation requirements.

Error Messages

Error messages resulting from field validation must be reported interactively to enable the operator to complete the services effectively and efficiently.

8	MEMBERSHIP
8.1	Overview
8.2	Registration
8.3	Rejected Applications
8.4	Data Validation
8.5	Area Codes
8.6	Cumulative Log
8.7	Enquiries
8.8	Renewal
8.9	Data Attributes
8.10	Reports

MEMBERSHIP

Overview

The objective of the Membership system is to automate Membership registration and printing of Members cards thus eliminate clerical efforts currently required to register and maintain members file.

This module should integrate with the Accounts Receivable module and General Ledger. This module should support:

- Membership Registration
- Membership Card Printing
- Monthly Reports
- Premium Generation
- Interface with the Accounts Receivable and the General Ledger systems

Registration

The system should maintain details of Membership Registration in the Member Master File.

Members' Dependants File should keep track of Members' Dependants (spouse and children).

Employers File should provide information on members, the premium collected by employer, industry type, and employer area code.

Hospital File should provide information on the hospital number of beds, rate, Hospital code, Hospital area code, members hospitalised, diagnosis, claims paid, claims outstanding, total claims paid and outstanding.

During registration, the system checks the Member Master File and Employer File to verify whether or not the member was registered before.

Prompts on the workstation screen should guide data entry and validate all fields throughout the registration process. If system allows registration, it should automatically allocate a unique member number and update the Member Master File.

Before printing members cards, the system should print a list of members registered for review by the Fund's Supervisor.

When the Fund's Supervisor is satisfied, he should okay the system to print the membership cards.

For those applicants not in the system's database, but meeting all criteria for the Fund's membership registration, the system should treat them as new members and allocates them a unique member number.

Again, before printing members cards, the system should print a list of approved members for registration. This list should be reviewed by the Fund's Supervisor and when he is satisfied, should command the system to print members cards.

Rejected Applications

Applications not meeting the Fund's membership criteria will be flagged and the system will deny them registration.

A list will be printed for all applicants denied registrations showing reasons. The Fund's Supervisor should review the cases individually and if satisfied, request the system to issue individual letters to disqualified applicants. The letters indicate the reasons for denial.

Data Validation

Individual field validations should be incorporated into the system so as to eliminate all types of errors that could be made by the Fund's data entry personnel. In addition, an edit list should be printed for thorough checking before printing Membership Cards.

Area Codes

The system should provide a maximum of 999 allocations/areas. This field is sufficient to cover the Fund's current area offices and expected extension to district level.

Cumulative Log

At the end of the days processing a cumulative log should be printed to give the summary of different activities as well as individual entries.

Enquiries

Enquiries should be made on individual Member, by industry, by organization, by region, by Hospital, by type of coverage, by sex, by employer.

Renewal

The system should be capable of being triggered to print renewal cards on or before specific period.

Example of Data Attributes

MEMBERSHIP TABLE

NHIF NUMBER
MEMBER NAME
MEMBER ID
ADDRESS
AREA CODE
SEX
DATE OF BIRTH

DATE HOSPITALISED
DATE DISCHARGED
DIGNOSIS
DAYS HOSPITALISED
DAYS CLAIMED
AMOUNT CLAIMED
ACCUMULATED DAYS CLAIMED
AMOUNT CLAIMED TODATE

DEPENDENTS TABLE - SPOUSE

NHIF NUMBER
SPOUSE NAME
SPOUSE ID
ADDRESS
AREA CODE
SEX
DATE OF BIRTH
DATE HOSPITALIZED
DATE DISCHARGED
DAYS HOSPITALIZED
DIAGNOSIS
DAYS CLAIMED
AMOUNT CLAIMED TODATE
ACCUMULATED DAYS CLAIMED

DEPENDENTS TABLE - CHILD

NHIF NUMBER
CHILD NAME
CHILD ID
ADDRESS
AREA CODE
SEX
DATE OF BIRTH
DATE HOSPITALIZED

DATE DISCHARGED
DIAGNOSIS
DAYS CLAIMED
AMOUNT CLAIMED
ACCUMULATIVE DAYS CLAIMED
AMOUNT CLAIMED TODATE

EMPLOYER TABLE

NHIF NUMBER
EMPLOYER NAME
ADDRESS
AREA CODE
INDUSTRY TYPE
MEMBER NUMBER
DAYS CLAIMED
AMOUNT CLAIMED
DAYS CLAIMED TODATE
AMOUNT CLAIMED TODATE

HOSPITAL TABLE

HOSPITAL NAME
HOSPITAL ADDRESS
HOSPITAL NUMBER
AREA CODE
NUMBER OF BEDS
RATE
DATE RATE APPROVED
MEMBER NUMBER
DAYS CLAIMED
AMOUNT CLAIMED
DAYS CLAIMED TODATE
AMOUNT CLAIMED TODATE

REPORTS

The following reports should be printed on a monthly basis:

- Membership Register
- Employer, Areawise, Industrywise, Hospitalwise, Coveragewise, summaries
- Budget versus Actuals
- Contribution (Revenue) Report
- Renewal Cards

9	CLAIMS
9.1	Overview
9.2	Data Entry
9.3	Payment
9.4	Rejected Claims
9.5	Files
9.6	Claims Report
9.7	Transaction Register
9.8	Claims Master
9.9	Enquiries

CLAIMS

Overview

The objectives of the Claims system are to automate Claims processing and control payments to Hospitals and Members. The system will eliminate reference to the small cards used currently in verifying claims. It will project expected claims to alert the Fund's management of the needed cash.

The most controllable portion of the Fund's working capital is cash. And only intelligent management of the Fund's cash will ensure that resources are available for successful operations and future growth.

The system should put the state-of-the-art technology to work for the Fund, enabling it to maximize the availability of its cash, giving immediate and accurate information for better management decisions, reducing clerical effort and improving auditability.

This module should integrate with accounts payable and General Ledger systems and support the following:

- Claims Registration
- Claims Processing
- Reports
- Enquiries
- Interface with Accounts Payable.

Data Entry

Claims from Hospitals and Members should be validated and entered into the system.

Examples of Membership Data Attribute:

MEMBER NAME
MEMBER DATE OF BIRTH
MEMBER ID
EMPLOYER
EMPLOYER AREA CODE
DEPENDENT NAME
DEPENDENT SEX
DEPENDENT ID
DEPENDENT AREA CODE
DEPENDENT DATE OF BIRTH
DEPENDENT EMPLOYER
DATE ADMITTED
DATE DISCHARGED
DAYS CLAIMED
DIAGNOSIS
AMOUNT CLAIMED
DAYS TO DATE CLAIMED
HOSPITAL NAME
HOSPITAL NUMBER
HOSPITAL CODE
HOSPITAL BEDS NUMBER
HOSPITAL RATE

At the time of data entry of submitted claims, a variety of different validation checks are performed in the system. For example, date of lodging the claim has to be within the expiry period of 90 days after discharge.

The system checks if the member has utilized the 180 inpatient days, the correct Hospital rates, the correct Hospital number of beds, days claimable, diagnosis, amount claimed.

Analysis

Claims can be analysed according to:

- Loss ratios by the Hospital
- Loss ratios by organization, type of coverage, age groups, sex, industry, area, diagnosis.

Payment

This system prints the list of claims for payment. This list is reviewed by the Fund's Supervisor for authorization before payment is made.

When payment is processed and made, the claim is closed and no more transactions can be entered for that claim and the system flags it settled.

Rejected Claims

The system prints a list of claims rejected listing reasons for rejection. The Fund's Supervisor can review this list and if satisfied let the system print letters to individuals/Hospitals explaining reasons for refusing claims.

Files

Examples of the Data Attribute in the Claims Master File.

MEMBER NUMBER
AREA CODE
EMPLOYER
CLAIM DATE
DAYS CLAIMED

CUMULATIVE DAYS CLAIMED
DIAGNOSIS
AMOUNT CLAIMED
HOSPITAL CODE
HOSPITAL RATE

Example of the Claims Transaction File Data Attribute:

AREA CODE
CLAIM NUMBER
TRANSACTION NUMBER
TRANSACTION DATE
TRANSACTION AMOUNT

Claims Report

This report should list claims for a specified period - weekly, monthly, quarterly and yearly under different options:

Processed
Not Processed

Processed means there has been at least one transaction following the registration and Not Processed means claims without transactions.

Report should list the Claims Master in the sequence of claims number. In addition, it should print the previous history of claims. Looking at this register, one should be able to find out the total claims paid for that particular number.

Transaction Register

Should show a listing of all individual transactions during a specific period in different sequences:

- Claim Number
- Transaction Number

Claims Master

Claims Master information and all transactions pertaining to the Claims Master should be listed under different options:

- Paid Claims
- Outstanding Claims
- Paid and Outstanding Claims
- Summary of Claims paid in each fiscal year

Enquiries

On Claim Number (Hospital)

For this particular claim, the system should display claim details, all three transactions and total amount paid todate.

On Members Number

For a given Member's number, this enquiry should list the claim number, settled amount and date of hospitalisation, diagnosis, total claims paid todate.

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10 FINANCIAL ACCOUNTING

10.1 Overview

10.2 Requirements

FINANCIAL ACCOUNTING

Overview

The Fund operates an accounting department headed by the Chief Accountant.

The Fund will need to automate processing of financial data to prepare comprehensive financial reports including:

- Weekly cash summary report
- Monthly Income and Expenditure Report
- Balance Sheet
- Funds Flow Statement
- Monthly Management Reports including budgets, comparing performance to budget and highlighting resource utilization and costs

Requirements

A comprehensive accounting system with some flexibility to integrate with Membership and Claims processing is required. The systems to be automated are:

- Accounts Receivable
- Accounts Payable
- Fixed Assets and Depreciation
- Payroll
- General Ledger/Budget
- Spreadsheet

11 ACCOUNTS RECEIVABLE

- 11.1 Requirements
- 11.2 Cash Receipts
- 11.3 Customer Record
- 11.4 Receipt Record
- 11.5 Report Outlines

ACCOUNTS RECEIVABLE

Requirements

The system must allow complete customer file maintenance, with add, change, delete, and enquire options depending on user authorization levels. Customer lists must be printed on request for any range of customers.

Entry of customer transactions should be either interactive or in batch mode (on-line batches for control and auditing). The data entered should include:

- Customer Number, with automatic display of customer name.
- Document Number and Date
- Type of Document (Invoice, credit, debit memo)
- Amount

The above amounts may be distributed to one or more multiple General Ledger accounts.

On request, an edit list should be printed to audit all entered transactions. Transactions posting to accounts receivable open item file is either interactive (as and when transactions are entered) or in background. At the time of posting, a transaction journal should be printed.

Cash Receipt

Cash receipt entry and editing will be done on-line. Along with the amount received, the invoice number to which the payment applies will also be entered.

Non account receivable cash received may also be entered with general ledger account numbers to indicate distribution. The system should allow entry of cash receipt, from multiple locations.

On request or at the preset intervals, a cash receipt edit list should be printed in customer order, location (area) order or operator order. When desired, the cash receipts should be posted to accounts receivable open items file for cross-reference and matching. The cash receipts journal should be printed after posting.

- Interface with other systems
- Automatic interface to claims and General Ledger will be required
- Data Attributes

Examples of data items required are:

Customer Record

Customer Number
Customer Name
Customer Address
Area Code
Contact Person
Phone Number
Amount Paid
Balance Amount
Payment Due

Receipt Record

Receipt Number
Amount
Date
Cheque Number and Date
Bank Name

Report Outlines

Report provided by the system include the following:

- Account Receivable ageing report for all or selected customers either in summary or showing the ageing of each item.
- Customer Account enquiry which displays all or open items (optionally total payments year to date)
- Account Statements for any statement frequency or period, for selected or all customers (optional prints of ageing sub-total at the bottom of the statement)
- Debtors Ledger
- Accounts Receivable distribution to General Ledger report in detail or in summary
- Matched items deletion report
- Past year to date/Year to date purging report
- Revenue summary (monthly and year to date statistics from each charge procedure, and combined totals)

12 ACCOUNTS PAYABLE

- 12.1 Requirements
- 12.2 Process Supplier Invoices
- 12.3 Prepare Payments
- 12.4 Process Payments
- 12.5 Interface with other systems
- 12.6 Report Outlines

ACCOUNTS PAYABLE

Requirements

Supplier data should be maintained interactively. General Ledger expense account is assigned to a supplier so that invoices received from that supplier are automatically distributed. The numeric supplier list and alphabetic supplier list must be printable on request.

Process Supplier Invoices

The system must allow the interactive entry and editing of new accounts payable transactions. The data entered includes:

Supplier Number
User Purchase Number
Invoice Number and Date
Invoice Amount
Miscellaneous Charges
Payment Due Date

Specific items being paid for in the invoice will be entered manually, but if a purchase order system is operational, they must be automatically displayed from that system.

The system must permit entry and posting of supplier debit and credit notes, as well as cancellation vouchers.

For repaid vouchers, cheque number and date is entered to prevent additional entries in payment preparation statement.

On request, an edit list should be printed to review entered transactions. When desired, the new invoices should be posted to the Accounts Payable invoice file when supplier invoice journal is printed.

Prepare Payments

Payment preparation should be done by selecting all past due and/or all current invoices for any range of suppliers. Prior to selection of invoices for payments, the system must print an unmatched invoice detail list to show inventory items ordered and invoiced, but not fully received. It should also print invoice verification lists to show invoices that are deferred or all invoices for suppliers who have a hold payment status.

Process Payments

Cheque payment vouchers and manual payment vouchers will be entered interactively. Payments against invoices can be full or partial. The system should allow manually written as well as computer generated cheques and print.

Interface with Other Systems

Supplier invoices may be directly entered through the purchase order system. Accounts Payable should interface with Claims and General Ledger.

Data Attributes

Examples of data items required are:

Supplier

- Supplier Code
- Supplier Name and Address
- Contact Person
- Telephone
- Supplier Type
- Hold Payment
- Amount Due

Supplier Invoices

Invoice Number and Date
Supplier Code
Purchase Order Reference
Delivery Order Reference
Item Number
Quantity
Price
Other Charges
Payment Due Date

Report Outlines

Reports provided by the system to include the following:

Supplier Account enquiry (screen display of all invoices whether paid or not; supplier identification by supplier code or by full or partial name)

Payables open item report showing detailed or summary payment information for all or a range of suppliers. This could show ageing for user defined period by invoice or due date.

Cash requirements statement by supplier and summary

Pre-cheque writing report showing selected invoices and intended payment for each supplier

General Ledger distribution list in detail or summary

Cheque reconciliation report

Creditors Ledger

13 PAYROLL

PAYROLL

OVERVIEW

The Fund uses the Ministry of Finance computer for processing of employee salaries. The salary section within the Personnel Department fills the change details in predefined format for data entry and processing at the Ministry of Finance.

REQUIREMENTS

Computerised salary information system must work within the Kenyan environment, taking into account statutory deductions and tax calculations implemented in Kenya.

1. Provide standard input for each employee

Standard inputs regarding joining date, grade, etc will be either entered directly or transferred from the personnel system. A transaction ledger of standard inputs should be printed before posting for verification purposes.

2. Provide adjustment entries

Adjustments will be required on a monthly basis for leave, loan repayments, joiners and leavers, overtime (currently not used), etc. Strict edit controls and transaction listings are also required.

3. Compute payroll

Following calculation routines will be required:

- . Automatic calculation of earnings (including refunds) for a variety of standard items like overtime, leave pay, holiday and sick pay, special pay, on call allowance, etc.

- . Automatic calculation of deductions for savings, loans, taxes, etc.

- . Taxable and non-taxable deductions

Payroll calculations to be based on user defined arithmetic expressions and or tables, before applying non standard earnings and deductions.

4. Other requirements

There are several additional needs:

- . Satisfy Kenyan Government personal Income Tax regulations
- . Payroll slips to be user definable
- . Generate P9 forms for all employees annually
- . Allocate individual payroll costs to specific cost/profit centres within General Ledger by means of user definable percentage allocations
- . Provide for pension schemes, recording contributions and calculating payments
- . Payroll details to be available only to authorised personnel

5. Handle payments

Payments are made in one of the following modes:

- . Cash
- . Cheque
- . Direct credit to employees bank account

Automatic cheque printing should be supported with provision for pre-cheque lists

INTERACTION WITH OTHER SYSTEMS

The system should interface with general ledger to allocate individual payroll costs to specific cost centres for budget control and manpower planning purposes. Payroll will also interface with personnel for upto date employee payment status.

REPORT OUTLINES

Reports provided by this system to include the following:

- . Payroll register
- . Deductions register
- . Manual payroll transactions register
- . Payroll history
- . Payroll cheque register
- . Gross payroll cost summaries by cost/profit centres
- . Exception reports of low and high salaries
- . Standard savings register by saving type
- . Optional savings register by savings type
- . Tax deduction register, detail and summary

14 FIXED ASSETS AND DEPRECIATION

- 14.1 Requirements
- 14.2 Register Assets
- 14.3 Maintain Assets
- 14.4 Calculate Depreciation
- 14.5 Interface with other Systems
- 14.6 Report Outlines

FIXED ASSETS AND DEPRECIATION

Requirements

Register Assets Records

The system should allow interactive entry and editing of assets that are newly acquired or separated from a previously grouped item. After verifying the edit list, the acquisition will be posted to the assets file, at which time the asset acquisition register is printed.

The system should allow an initial assets register to build interactively.

Each asset record should include the following:

Asset Item Number
Division and Location
General Ledger code indicating General Ledger Account
Numbers
Straight Line Depreciation Method
Date of Acquisition
Capitalization Value
Total, Year to Date and Current Depreciation Values.

Maintain Assets

Changes will be made to assets information. The disposition of assets will be tracked in the system including the way in which it was retired. The system should print the assets change and asset retired registered and will keep track of all changes as part of the assets history.

Calculate Depreciation

The system must support straight line depression.

Interfaces with other Systems

The system should interface with the General Ledger and the distribution to the General Ledger report shows depreciation by General Ledger account.

Report Outlines

Reports provided by the system should include the following:

Fixed Assets Register with current status including book value

Fixed Assets Report by General Ledger Code

Fixed Assets Report by location

Assets Change History report

Projected Depreciation report.

15 **BUDGETING**

BUDGETING

The system should maintain budgets for selected accounts either for each accounting period or for the fiscal year.

The system should generate budget comparative (with the current and/or previous years) and variance statements by summarizing the relevant accounting transactions. On demand, worksheets with months, quarters and year and year to date totals should be printed.

The system should monitor the expenditure incurred against each budget head. It should also summarize the committed expenditure for each budget account by interfacing with Purchase Order and Fixed Assets systems.

16 GENERAL LEDGER

- 16.1 Requirements
- 16.2 Charts of Accounts
- 16.3 General Ledger Transaction
- 16.4 Recurring Journal Transactions
- 16.5 Transaction Summaries
- 16.6 Year End Procedures
- 16.7 Interface with other Systems
- 16.8 Report Outlines

GENERAL LEDGER

Requirements

All accounting transactions must be linked to accounting period which the Fund may define in a fiscal year. A fiscal year can have one (1) to 13 (thirteen) accounting periods. Data will be entered for any accounting period other than those already closed.

Chart of Accounts

Classification	Code
Assets	100 - 199
Liabilities	200 - 299
Revenues	300 - 399
Fixed Costs	400 - 499
Variable Costs	500 - 599

The account number must be flexible to accommodate area code by extending two more digits. Accounts will be identified as revenue and expense, balance sheet, etc. Account structure must permit hierarchy. On request, chart of accounts print-out should be printed for all, or a range of accounts.

General Ledger Transactions

General Ledger transactions will be interactively entered. Each transaction contains:

- Account Number
- Transaction Date
- Transaction Amount
- Debit/Credit Indicator
- Source
- Reference

Counter balancing entries of distributions to other accounts should be enterable.

On request, the system will print the General Ledger transaction edit list which can be reviewed, edited and posted to General Ledger file to print journal transaction register in account number order.

Recurring Journal Transactions

This will be set up either for fixed amounts or variable amounts.

Transaction Summarization

Transactions for selected accounts will be summarized by either date or accounting period.

Year End Procedures

Year end procedures should include the following:

Clear all revenue and expense Accounts

For balance sheet accounts, consolidate into one beginning balance transaction.

Update account period file, rolling the year-ending account total into last year comparative totals.

Interface with other Systems

The system should allow posting of transactions directly from receivables, payables, Fixed assets, payroll, claims, Membership and other systems. It must have routines to prevent posting of transactions more than once. It should be possible to generate journals of all postings.

Report Outlines

Reports provided by the system to include the following:

Trial Balance
Revenue and Expense
Balance Sheet
Source and Application of Fund
Comparative and Variance Statements by Account

On-line account enquiries should be available for:

Single account or group of accounts
Balance and/or all transactions
For any reporting period

There should also be spreadsheet capability for financial planning.

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7 ACTUARIAL/STATISTICAL REPORTING

ACTUARIAL/STATISTICAL REPORTING

Overview

Planning and monitoring the Fund's performance are important functions. Many of the information needs of the management related to the functions are not provided.

At present, very little demographic data is available for planning purposes. With the present manual premium and claims processing systems, many indicators are difficult and time consuming to calculate.

The Fund plans to setup an Actuarial Department to gather and interpret statistics. Reports compiled should provide a summary by benefit type of total claims, total not covered charges, total covered expenses for the member, spouse and dependents. Loss ratios by Hospitals, diagnosis, employers, industry type, sex and area.

Requirements

The system should provide management with a comprehensive, detailed picture of how benefit plans (claims) are being utilised and administered. The system should provide through ongoing reporting to answer the following questions:

- What plan features are being used and how much?
- Are the most cost-efficient health-care alternatives being used?
- Which providers are receiving benefit shillings?
- Are any plan features being over-used or abused?
- How efficient are claims inspectors?

Reporting

The system should support extensive database with built-in reporting versatility to support management decisions - easily accessible at all times.

Detailed Statistics

A summary of claim experience by benefit type - including total submitted charges, total non-covered charges, total covered expenses, total covered expenses by co-insurance factors for the member, spouse and dependents and a combined total by benefit type.

Denied Charges

Analysis by claim number of all the major areas of not-covered charges by different types.

Hospital Utilisation

A summary of Hospital claims for the facilities used by plan participants. The reports should list Hospitals in order to plan expenditure with a detailed analysis of the number of inpatient claims, room and board expenses for and the number of days spent in wards, diagnosis.

Inpatient

Tracking excess charges. Inpatient data should include a total of all claims, average length of stay in the Hospital and total charges. Daily Hospital admissions/discharges.

Interface with other systems

Actuarial/Statistical reporting will retrieve data from all Fund's applications. It must be able to interface with the Fund's financial systems.

19 PERSONNEL

PERSONNEL

OVERVIEW

The personnel information systems located at the Fund are manual and are based on service record cards filed by personal number. In addition to basic personal data, these cards contain service record (promotions and postings)

With the expected new autonomy of the Fund, all personnel administration matters including appointments, contracts, promotions, leave, training and retirement will be moved from the Ministries of Health and Finance to the Fund.

This department also looks after training needs of employees and is in the process of establishing a full fledged training centre.

REQUIREMENTS

1. Maintain detailed employee profiles

For every employee in the Fund, a personal record will be maintained. Data entered for each employee will be held under the following categories:

- . Basic personal data
- . Qualification/s
- . Experience (previous employment)
- . Service record (promotions)
- . Postings (transfer)
- . Training courses attended
- . Leave details

- . Housing and telephone details
- . Performance evaluation
- . Disciplinary actions
- . Termination/resignation/retirements/discharges/deaths

Whenever a new employee joins the Fund, a new record is created. Authorised users can modify the personal data and also update the other details.

The system will monitor the leave availability of each employee based on the eligibility and the already availed days.

For each employee, the professional qualifications and area of experience details should be maintained.

2. Update employee profiles

All employee related service data (promotions, transfers, leave, etc) will be entered in the form of transactions, with edit checks. On demand, the system should print an edit list of transactions, for verification. The verified data will be posted to the employee master file and various journals should be printed (either by personal number or by department).

The system should not have any restrictions on the number of entries under each category.

Whenever an employee leaves the Fund, the resignation/transfer/death retirement details will be updated.

3. Enquiry requirements

Following are some of the enquiry capabilities required.

- . For each employee (access to the employee record by personal number or by full/partial name)
 - . Personal details (including qualification and experience)
 - . Service record (start from the latest)
 - . Transfer record (start from the latest)
 - . Training record (start from the latest)
 - . Leave details (current eligibility, year to date availed, awaiting sanction)
 - . Performance evaluation summary
 - . Disciplinary action details
- . Current employee record displaying the latest status under each category
- . Employees by department and by designation
- . Number of employees in the order of grade/designation and/or department.

4. Provide limited access to personnel data for other departments

All departments in the Fund would require access to personnel data (in the form of enquiries and reports). Access must be restricted such that authorised users within each department will have access to selected information of that department's employees only. However, a few users in the Fund will have access to complete data of all employees.

5. Maintain and report recruitment data

The system should maintain basic recruitment data. Entries from the recruitment list should be removed when the recruits join the Fund.

6. Maintain and control allocated positions

The system should maintain sanctioned (or allocated posts) against actual and "on recruitment", at grade/designation level.

7. Produce action reports

The system must generate a variety of action reports to facilitate personnel department and the departmental heads to take action in time (for ex program driven promotion lists, transfer lists, retirement lists, etc)

8. Maintain financial data

The system must maintain history of medical reimbursement to self and family (either directly or through insurance companies), salary and other advances taken, etc.

9. Training

This subsystem should maintain the following:

Course data

- . Training courses code
- . Content of course
- . Duration
- . Eligibility.

Course Schedule

- . Course code
- . Course period (from - to)
- . Place
- . Instructor

Course Attendances

- . Employee number
- . Employee performance
- . Remarks

The reports required by this sub-system are:

- . Courses conducted by instructor
- . Employee by department trained
- . Training requirement of employees
- . Training history of employee

This sub-system should be fully integrated with personnel.

INTERFACES WITH OTHER SYSTEMS

The system should interface with payroll for current employee status.

DATA ATTRIBUTES

Examples of data items required for each 'Employee Personal Record' are:

Personal data

- . Employee number
- . Name (surname, first name, other names)
- . Sex
- . Date of birth
- . Place of birth
- . Nationality
- . Religion
- . Marital status
- . Number of children
- . Next of kin
- . Alternate next of kin
- . Languages known
- . Education details (schools attended, year/s, grades passed)
- . Date of joining
- . . Joining from (other institutions, etc)

Qualification data

- . Qualification code
- . Institution
- . Duration (from - to)
- . Date of qualification
- . Grade/Class qualification

Service data

- . New grade
- . Date of promotion
- . New designation
- . Posting indicator
- . Confirmation period
- . Actual date of confirmation
- . Confirmation indicator

Transfer/posting data

- . New Post
- . New unit/department/institution
- . Transfer out indicator

Leave data

- . Type of leave (includes absence without leave)
- . Leave period (from and to)
- . Sanctioned by/Authority
- . Medical certificate details

Training data

- . Training course code
- . Institution
- . Training period (from - to)
- . Expenses incurred (with currency code)
- . Performance

Performance evaluation data

- . Date reviewed
- . Reviewed by
- . Review criteria/s and grades obtained
- . Overall performance
- . Remarks

Disciplinary action

- . Type of offence

- . Date of occurrence
- . Action code

Termination data

- . Date of retirement/discharge/death/resignation
- . Termination type
- . Contact address
- . Superannuation details

Contact data for other staff

- . Home address
- . Home telephone number
- . Other place of work and contact number

REPORT OUTLINES

Reports generated by this system to include the following:

- . Employee distribution list by department, grade, religion, nationality, job title, etc.

Action Lists

- . Employees due for confirmation
- . Employees due for promotions

- . Employees due for transfers
- . Employees retiring in the next user definable months
- . Outstanding employees list
- . Employees turnover lists (current and expected).

Vacancy lists and ranking of eligible persons based on promotion criteria

Recruitment lists with latest Position

Exception reports

- . Employees disciplined by department
- . Absence without leave employees
- . Employees not returned from leave.

Employee Summaries

- . Number of employees by grade, designation, department and service.

Staffing level

- . Sanctioned/available/expected arrival summaries for each grade department/service unit.

Budget comparisons by department

19	PROJECT IMPLEMENTATION
19.1	Implementation Phasing
19.2	Assess Priorities and Determine Phases
19.3	Software Implementation Phases and Schedules
19.4	Hardware Requirements by Phases
19.5	Implementation Tasks
19.6	Software Implementation
19.7	Implementation Team
19.8	Training
19.9	Management's Role in Implementation

PROJECT IMPLEMENTATION

Implementation Phasing

Implementing computerised systems is a complex and demanding task, necessitating the setting up of priorities for implementation. However, any apparent delay in providing urgently needed facilities can lead to frustration among users and fragmented development. It is therefore necessary to provide, from the outset of the project, a clear implementation plan and associated time scales, so that the users will know what to expect and can appreciate the need for a realistic approach to implementation.

The two broad areas of implementation are environment preparation and hardware installation, and software implementation. The installation and testing of initial hardware, networking and systems software including environment preparation is expected to take nine months from contract signature to handing over of hardware.

Assess priorities and determine phases

For an organisation as complex as the National Hospital Insurance Fund, the assessment of priorities of applications for computerisation is a delicate task: staff from different disciplines will see their own areas as most urgent.

The priority criteria should take into account the existing constraints, the readiness of each area (in terms of well established and organised information flow) for computerisation, at the same time concentrating on areas where maximum benefits will be derived.

- . Proper and unique identification of Claim, Membership, Hospital, Employer is at the core of Fund systems

- . Computerisation would need changes in operational procedures
- . Analysis of financial data by computer will lead to better overall management of Fund's resources
- . Major improvement in effective use of revenue and expense projection
- . Reduction in time required to process claims
- . Logical build-up of applications after the implementation of core systems

Software implementation phases and schedules

The implementation of information processing requirements of the National Hospital Insurance Fund is divided into two phases.

Phases	Application areas	Time Scale in Months		
		Start		End
1	Membership and Claims			
	Spreadsheet and Word Processing	6*	-	18
2	Accounts Receivable	14	-	24
	Accounts Payable			
	Fixed Assets			
	Payroll			
	General Ledger			

* The implementation activities of phase 1 will commence six months after the 'contract sign date'

Hardware requirements by phase

Terminals and printers

This section sets out the recommended number of terminals and printers required to meet the software implementation schedules.

Phases	Terminals	Medium speed printers (400 cps)	High speed printers (1100 lpm)
1	30	14	1
2	20	6	1
Totals (1 & 2)	<u>50</u>	<u>20</u>	<u>2</u>

Physical memory

The memory requirement varies from one vendor equipment to another and depends to some extent on the memory management techniques of the operating system. However, the initial minimum requirement is expected to be 8 megabytes for phase 1, growing upto 16 megabytes at the completion of phase 2.

On-line data storage

The on-line data storage requirement depends on various factors:

- . Application software file structure
- . Native data management software
- . Current and projected data volumes
- . Data retention period

It is expected that the on-line data storage requirement will start around 1 gigabyte and grow to over 2 gigabytes at the completion of phase 2. A similar capacity is ideally required for the on-line data storage on the backup system.

Processor capacity

A large system capable of supporting all the identified needs of the Fund without performance degradation is required.

The suggested minimum requirements are:

- . CPU instruction time 120 nano seconds
- . MIPS rate 3.3
- . Cache memory 32KB

Hardware configurations

The above hardware requirement is only an estimate and the final configuration will depend on the vendor's software.

The precise locations of the terminals and printers have not been identified. This is based on the existing information flow and data entry locations.

One of the first tasks of the vendor's implementation team would be to agree with the Fund the precise physical locations of these terminals and printers. The cabling runs, signal boostings and tap requirements, and the need for other networking equipment like modems, multiplexers, etc will have to be finalised between the Fund and the vendor.

IMPLEMENTATION TASKS

A number of activities have to be coordinated and completed to ensure the successful implementation of the computer system at the National Hospital Insurance Fund.

The implementation tasks can be broadly classified as environment preparation and hardware installation, and software implementation

Environment preparation and hardware installation

Seven groups of activities are involved in environment preparation and hardware installation.

Computer room preparation

- . Finalise environmental specifications
- . Install false flooring and wall and ceiling cladding
- . Install uninterrupted power supply of the specified capacity
- . Install air-conditioning to the specified power BTU output and humidity control
- . Install fire detection/precaution systems
- . Install access security system to prevent unauthorised access to the computer suite
- . Full testing of all the above systems and full environmental monitoring.

Terminal siting and cabling

- . Finalise precise physical locations of terminals/printers
- . Finalise cabling runs and indicate signal boosting and other equipment requirements
- . Finalise tap lines
- . Lay trunks and or conduits for network cables
- . Install network backbone cables and draw signal tap lines
- . Prepare terminal and printer location area
- . Install power supply outlets
- . Install terminals and printers

Computer room ancillary equipment

- . Procure and install ancillary equipment like furniture, fireproof safes, storage racks, etc
- . Prepare hardware maintenance working area
- . Prepare working areas for data processing departmental staff.

Consumables

- . Estimate and procure initial supplies of paper, ribbons, etc

- . Estimate and procure initial supplies of magnetic media (tapes and disks)

Installation and testing

- . Install and test computer hardware and communication equipment.
- . Test network.
- . Close trunking covers and ceiling tiles to cover the network cables.

System utilities

- . Install and test system utilities.
- . Obtain hardware installation certificate.

Training

- . Determine the training requirements of the Fund's data processing staff from the system's manager to the computer operators
- . Finalise the training schedules
- . Organise training

Software implementation

There are nine groups of activities in implementing each applications system:

User coordinators

- . Identify user co-ordinator(s) for each application area and get the authority sanction for them
- . Organise intensive training of user coordinators, departmental managers and Fund's analyst(s)

Operational procedures

- . Draw detailed system operational procedures at departmental/inter-departmental level. This may require changes to existing manual procedures
- . Examine and identify new documents, changes to existing documents or discontinuance of some documents to suit the system operational procedures
- . Obtain approval for system operational procedures
- . Identify and install system controls and enforce responsibilities
- . Identify all users
- . Define and setup data access levels and operative menus for each user
- . Identify and install data security and confidentiality requirements

Software specifications

- . Examine detailed specifications of the application software.
- . Undertake minor changes in screen layout or reports
- . Incorporate edit checks and validation controls
- . Complete minor modifications if any

Initial set-up

- . Set up basic system parameter files
- . Set up system tables for various codes with descriptions (eg, Member Table, Dependant Table, Employer Table, Hospital Table, Area Codes).

Documentation

- . Customise the standard documentation to reflect the changes and operational procedures and control.

User training

- . Identify and organise training. Ensure that all users receive comprehensive training in the areas of the system which is appropriate to their work.
- . Set up training database for users to practice
- . Monitor and assess user performance
- . Give special emphasis to supervisors' training

Creation of masterfiles

- . Identify the work involved and organise masterfiles creation whenever appropriate (eg, Member file creation and initial Members take-on. Initial take-on of all existing Members)

Switch over to computerised systems

- . Determine and implement switch over strategy (should not affect day to day working)
- . Provide full time initial support

Live run phase

- . Provide day to day system operational support
- . Provide software maintenance support
- . Monitor performance of computer system with existing manual system (whenever relevant)
- . Monitor and tune application systems based on live run.

IMPLEMENTATION TEAM AND ITS RESPONSIBILITIES

Three groups of manpower are needed to ensure the successful implementation of computer systems at the National Hospital Insurance Fund.

- . A project control committee
- . A project task force provided by the Fund
- . A project task force provided by vendor staff

Project control committee

A strong and authoritative project organisation and control structure is needed to ensure the efficient implementation of the computer systems. Experience in such projects indicates that a clear decision making structure is crucial to ensure that time scales are adhered to, while the involvement of Fund staff in the implementation process ensures that the implementation proceeds smoothly and with the maximum level of acceptance from the users.

At the outset, a project control committee should be set up with the following responsibilities:

- . Decide overall scope of the project
- . Set up implementation plans, with target dates
- . Identify user co-ordinator(s) for each applications area
- . Ensure appropriate resources availability.
- . Monitor implementation activities and progress against plan

- . Keep application priorities under review and ensure that these continually reflect what is in the best interest of the Fund
- . Approve any necessary policy or major procedural and operational changes

The committee should not become involved in technical detail. Its primary concern should be resources and direction.

The committee should consist of:

- . Fund Director
- . Project co-ordinator (designated by the Director)
- . Financial controller
- . Head of Membership and Claims
- . Systems manager
- . Project manager (supplier)

This committee could co-opt other members as and when appropriate.

The committee should meet at least once in four weeks.

Project task force

Actual implementation will be carried out by a "Project Task Force" consisting of:

- . Fund staff
- . Vendor's implementation staff

Fund implementation team

The Fund will need some key data processing staff to assist and participate in the implementation of the project and ensure its successful co-ordination.

This team will consist of the following:

- . Systems Manager (or Data Processing manager) : 1
- . Computer Operations Controller : 1
- . Analyst (or Analyst/Programmer) : 1
- . Computer system operators : 4

This implementation team should be assembled and trained before the start of software implementation.

Each application area should have at least one user coordinator from the user departments. This person will be involved in all aspects of system implementation.

Vendors implementation team

The vendor should provide an implementation team headed by an experienced project manager.

This team will have the following three distinct parts:

- . Application system implementation team consisting of project leaders, analysts and programmers who would be responsible for the performance of tasks mentioned in section "Implementation tasks"

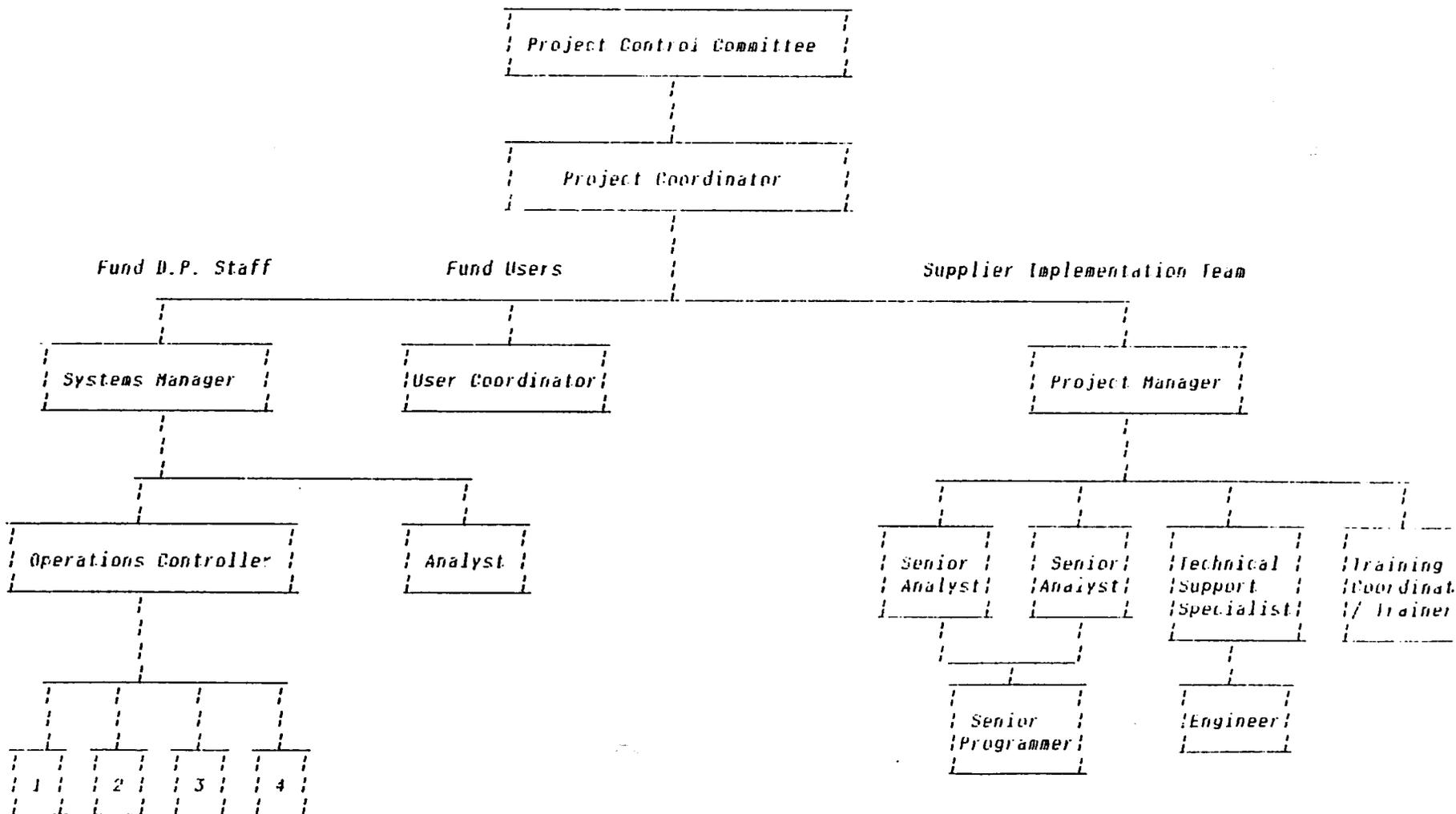
- . Technical support team consisting of hardware and system software specialists as would be necessary at any particular phase of the project and would be responsible for the computer communication links, installation and maintenance, etc.

- . Training co-ordinator to co-ordinate and conduct both formal and on-site training

The vendor's implementation team is likely to consist of the following:

- | | |
|---------------------------------|---|
| . Project Manager | 1 |
| . Senior Analysts | 2 |
| . Senior Programmer | 1 |
| . Technical Support specialist | 1 |
| . Hardware Engineer | 1 |
| . Training Co-ordinator/Trainer | 1 |

Organisation chart for National Hospital Insurance Fund computer system implementation



Responsibilities of the implementation team

The most important responsibilities, those of the project control committee, have already been identified in project control committee. Here other key responsibilities have been defined.

Project co-ordinator

The responsibilities of the project coordinator from the Fund will include:

- . Co-ordinate the activities of the systems manager user and the project manager
- . Provide an interface to the Fund director
- . Co-ordinate overall procedural/policy matters

Systems Manager

Note that the project co-ordinator provided by the Fund and the systems manager could be the same person. The system manager's responsibilities will include:

- . Co-ordinate all activities as mentioned under implementation tasks
- . Provide direct user interface to the supplier implementation staff
- . Arrange user meetings
- . Work in close liaison with the supplier team to gain application/systems knowledge
- . Management of Computer Department
- . Provide secretarial/administration services to the project

Operations Controller

The responsibilities of the computer operations controller from the Fund will include:

- . Complete operations management on computer system hardware handing over by the supplier
- . Co-ordinate and monitor engineering maintenance activities with supplier's engineers

Analyst

Duties of the Fund analyst will include:

- . Work in close liaison with the supplier's analysts to gain in depth knowledge of Fund systems (Membership, Claims and Accounting)
- . Provide post implementation operational support
- . Provide user support in other areas like WP, PC application package, etc.

Project Manager

The project manager supplied by the vendor will be responsible for many implementation tasks. In particular, as an experienced project manager, he will be responsible for giving guidance to the project control committee.

Training Co-ordinator

The responsibilities of the training coordinator supplied by the vendor will include:

- . Set up and maintain training database of Fund information

- . Prepare training courses depending upon implementation needs and operational procedures
- . Co-ordinate and/or conduct courses
- . Provide post training guidance

Team interaction and changes

There should be complete involvement of the Fund data processing staff in all implementation activities, so that the Fund may obtain self-sufficiency in managing the computer system at the end of each implementation phase.

Changes to the composition of the project team over the implementation phases are likely to include:

For the Fund team

- . Add one analyst at the end of Phase I
- . Add one operator at the end of Phase I

For the Vendor team

- . The technical support team structure after the installation and handing over of the hardware will depend on the type of maintenance contract.

TRAINING

The importance of user training in the implementation of health care insurance computer systems cannot be over emphasized. Any implementation will not succeed unless the users from operators to Fund Directorate, understand how to use the system. Extensive training of both the users at the Fund and of the data processing staff assigned by the Fund to participate in the implementation process must be ensured.

Training requirement

The training requirements can be broken down into six levels:

- . Senior administrators review (general systems overview)
- . Departmental heads/managers training
- . Departmental supervisors training
- . User training by department/function on specific areas of applications software
- . Computer familiarisation and keyboard training
- . Technical and systems training for the Funds computer department staff.

General system overview

This should be aimed at the Fund Director and senior departmental managers. It should be presented as follows:

- . Management role in implementation
- . Seminar and talks on the system and software highlights
- . Demonstration of the software features and implications

Each head of department must be encouraged to make the necessary time and to participate in the initial set up phase of his area. This in itself helps the department head to understand the computer system.

Departmental heads and managers training

This should be aimed at groups of departmental heads and managers in specific application areas and should cover:

- . Seminar and live demonstration of the whole system
- . Detailed review of specific application areas
- . Discussion on system features, implications and benefits
- . Discussion on operational procedures and implementation aspects

The departmental head/managers must participate in the pre/post implementation phases and work closely with the implementation team.

Departmental supervisors training

This should be aimed at departmental supervisors and cover:

- . General overview of the system to be covered by the supervisor
- . Individual 'hands-on' training in usage of the system
- . Follow up 'hands-on' experience in the training database
- . Review of operational procedures and implementation aspects

This training should be designed to enable individual supervisors become the source of expertise in their areas.

User training by department/function on specific areas

This should be given to all system users with particular system functions whose performance is their responsibility.

It should cover:

- . General introduction to their system
- . Specific 'hands-on' sessions
- . Follow up sessions on 'training database'
- . Tests and performance monitoring

The departmental supervisors must be involved in training appraisal

Computer familiarisation and keyboard training

This could be aimed at all users irrespective of their job function or seniority, who will in due course use a computer terminal.

This should cover:

- . Scope of usage of the proposed system in appropriate areas
- . Basic computer components and their operations
- . Hands-on keyboard familiarisation
- . Overview demonstration of the specific systems including WP and other specific PC packages for required users

Technical and systems training

This training is for the data processing staff of the Fund (other than computer system operators) and should cover the following:

- . Technical systems training (system administration, system software, program development tools, etc.)
- . 4th Generation language/database management system
- . Application software training both at user and system design/program level
- . Implementation training and experience

Training schedule

Pre-installation period

The training schedule must match the implementation priorities. However certain aspects of the training must be covered before installation of the system, including:

- . Site visits
- . Technical and systems training

Site visits by the Fund Director and Senior Departmental Managers. The purpose is to cover the overall system features and implications. The visit should cover at least two sites.

The senior data processing staff must be exposed to the operational environment of the existing Fund sites. They should also be trained on the application software both at user and system design, program level and this will include training on the database management system and 4th generation languages. The duration of the training is expected to be 20-25 days.

Installation period

During the hardware ordering, installation period the technical training of the data processing staff from the Fund should be arranged in the vendors premises.

During the same time, computer familiarisation and keyboard training for users in priority implementation areas could commence.

Implementation period

The rest of the training should be synchronised with the system implementations plans. In each application area the departmental managers and supervisors must be trained before training the operational users.

Vendors responsibilities

The vendor should should be responsible for the following training:

- . General system overview for senior management
- . Departmental heads/managers training
- . Technical and Systems training

It is advisable if the vendor is asked to provide first-line training in the remaining three areas also. The general practice is to agree on the mandays of training the supplier would provide as part of the implementation support. Any further training needs would have to be undertaken by the Fund staff themselves or by the supplier on a chargeable basis.

In-house training needs, met by the Fund

There is a need for a continuous program of reviewing user requirements and training needs.

This is because of the following reasons:

- . Staff turnover which will bring untrained users into contact with the system
- . Internal movements will put users into contact with new areas of overall system
- . The range of systems available will increase in time.

It is recommended that one member of the Fund staff is recognised as the central focal point for co-ordinating training and this be included as part of their job description. This person could be a member of the data processing department.

However, the long term intention of the Fund should be to reach a stage in each application area where the users themselves are self-sufficient in training so as to reduce and finally eliminate the need for support teams. For example, computer training must be part of the nurses' induction programme. Selected supervisors in each application area must receive a thorough training to accomplish this.

Computer training area:

Effective training requires 'hands-on' experience. Moreover, there should be an opportunity for the users to assimilate and put into practice what they have learnt, in a simulated environment. Hence, it is recommended that the Fund provide a training room with workstations and a printer. The supplier software must have facilities to establish a training database with real data to give a true feeling of the system to the users.

THE MANAGEMENT'S ROLE IN IMPLEMENTATION

Co-operation and commitment from the users at all levels is critical to the successful implementation of any computer system, especially projects of an extensive and complex nature, as the one to be undertaken by the National Hospital Insurance Fund. This commitment should also be supported by a clear and well understood decision-making structure throughout the Fund user departments involved in the project.

Present day 4th Generation Language application packages are flexible and parameter controlled. Modifying them to suit the changing requirements of a dynamic Fund environment is not difficult. However, even with all these facilities, computerisation would bring in the following changes in a user environment:

- . Streamlining of operations to suit the overall need of the Fund rather than localised departmental requirements
- . Changes to documentation
- . Better control and standardisation of operations
- . Effective monitoring of use of scarce resources

Computerisation could mean changes to working procedures. In areas where there are no proper working policies and procedures, it would mean defining them as well as formulating information flows and establishing controls.

It would also mean access by authorised users to processed information not previously available and in many cases denial of information which was otherwise available.

People resist changes due to various reasons. Involvement of users in the implementation process combined with relevant and comprehensive training is a pre-requisite for willing acceptance of the system by the users. However, the commitment of departmental managers and senior administrators in seeing through the changes is also essential for the success of computerisation.

20 OPERATING CONDITIONS

OPERATING CONDITIONS

Introduction

This section describes the operating conditions for the computer hardware.

Air-conditioning

The central processing unit and data storage devices including the data off-line devices should be in an air-conditioned environment. The ambient temperature control and humidity requirements will be indicated by the vendor.

Uninterruptible Power Supply (UPS)

An uninterruptible power supply should be provided to all the computer equipment in the computer room.

The UPS provides continuous power to all devices connected to it during a power outage. When an outage occurs, an alarm sounds at the system console and a message appears on the screen warning the system operator of the outage. This warning provides the opportunity to shut down the system in an orderly fashion so that the data is neither lost nor corrupted. The length of the time the UPS can supply continuous power varies depending on the number of peripheral devices in the system configuration and the rating of the UPS. If power is restored within the limits of the UPS configuration, the hardware will continue to operate.

Fire Detection and Precaution System

It is desirable if the computer room is provided with the fire detection and/or precaution systems to curb unexpected disaster.

Fire Proof Safe

Computer data is invaluable in addition to one live copies of data being maintained, it is necessary to off-line the data at regular intervals (at least once a day). The off-line data which is either on magnetic disks or tapes should be stored in a remote location. It is desirable to maintain more than one version of the off-lined data. At least one version (the latest) should be in a fire proof safe.

Computer Room Preparation

The Vendor must ensure the computer room is prepared as discussed below. Computer room should be prepared with false flooring for cabling and preferably have wall/ceiling cladding. The floor space should be 18 feet by 25 feet or longer in size.

A clean electrical power line should be provided directly from the distribution mains to the computer room solely for the equipment use. The AC power requirements depend on the Vendor's specific equipment proposed.

The computer room should be dust free. Air filtration or dust control facilities must be provided. Operating environment and humidity range depend on the Vendor's specific equipment proposed.

UPS should be connected to all computer equipment in the computer room.

Ducting for Cables

The network cables be laid in conduits or trunks either underground or in the ceiling. After the cables are drawn, the ceiling tiles and/or trunking covers will have to be replaced. Also access to ceiling voids should be provided. The cables within the building will normally be drawn on overhead trunks.

Terminals and Printers

The terminals and printers not in the computer room are expected to work in an environment without extremes of temperatures and dust.

21 EVALUATION

EVALUATION

Evaluation may be accomplished by weighting factors, example of this rating is shown in the following tables for Application Software Package and Hardware.

APPLICATION SOFTWARE EVALUATION

Parameter	Weighted Factors	
1. COSTS (30%)		
Price (50%)	.50 x .30	0.150
Implementation (50%)	.50 x .30	0.150
2. SUPPORT (20%)		
Maintenance (30%)	.30 x .20	0.060
Training (30%)	.30 x .20	0.060
Installation (40%)	.40 x .20	0.080
3. SOFTWARE FEATURES (30%)		
Record Generation (25%)	.25 x .30	0.075
User friendliness (30%)	.30 x .30	0.090
Querry Capability (20%)	.20 x .30	0.060
Documentation (25%)	.25 x .30	0.075
4. CAPACITY (20%)		
Record Volume (50%)	.50 x 0.20	0.100
Number of Active Files (50%)	.50 x 0.20	0.100

HARDWARE EVALUATION

Parameter		Weighted Factors
1. COSTS (50%)		
Price (50%)	.50 x .50	0.250
2. HARDWARE/COMPONENTS (20%)		
CPU (15%)	.15 x .20	0.030
Terminals (5%)	0.05 x .20	0.010
Printers (10%)	0.10 x .20	0.020
Disks (10%)	0.10 x .20	0.020
Compatibility within family (10%)	0.10 x .20	0.020
Capacity for Exapansion (10%)	0.10 x .20	0.020
Performance (10%)	0.10 x .20	0.020
High Availability (10%)	0.10 x .20	0.020
3. OPERATING SYSTEMS (30%)		
Compatibility with Family (10%)	0.10 x .30	0.030
Ease of use (20%)	0.20 x .30	0.060
Database (20%)	0.20 x .30	0.060
Development tools (10%)	0.10 x .30	0.030
Telecommunications (10%)	0.10 x .30	0.030
4. INSTALLATION/MAINTENANCE/TECHNICAL SUPPORT (30%)		
Installation (10%)	0.10 x .30	0.030
Maintenance (20%)	0.20 x .30	0.060
Technical Support (20%)	0.20 x .30	0.060
Training (20%)	0.20 x .30	0.060

APPENDICES

- A. Volumes
- B Terminal and Printer Distribution

Appendix A

DATA VOLUMES

VOLUMES

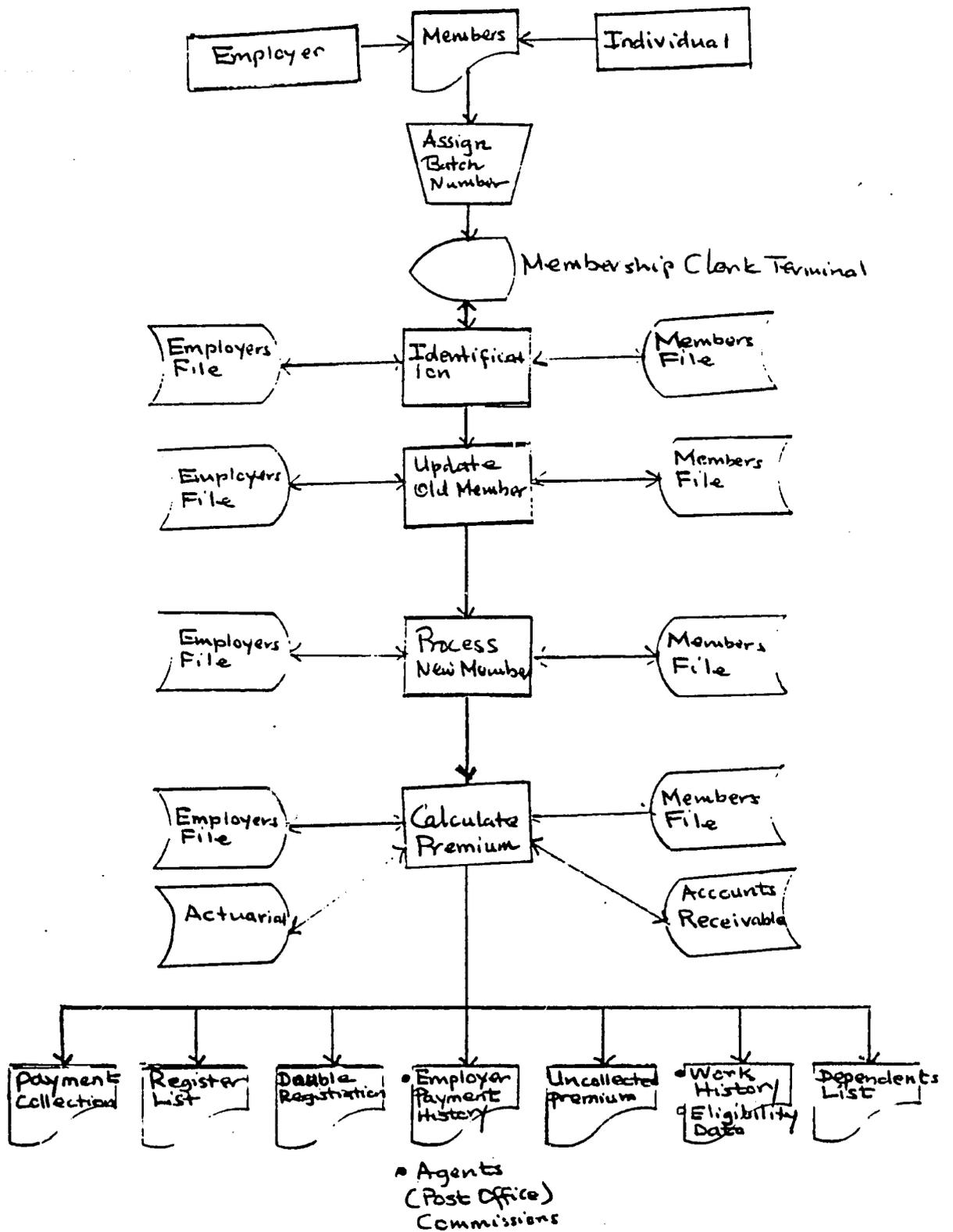
Members	850,000 per year
Claims	120,000 per year
Employers	26,000 per year
Hospitals	210 per year
General Ledger Accounts	400
Employees	400 per year

APPENDIX B : TERMINALS AND PRINTERS

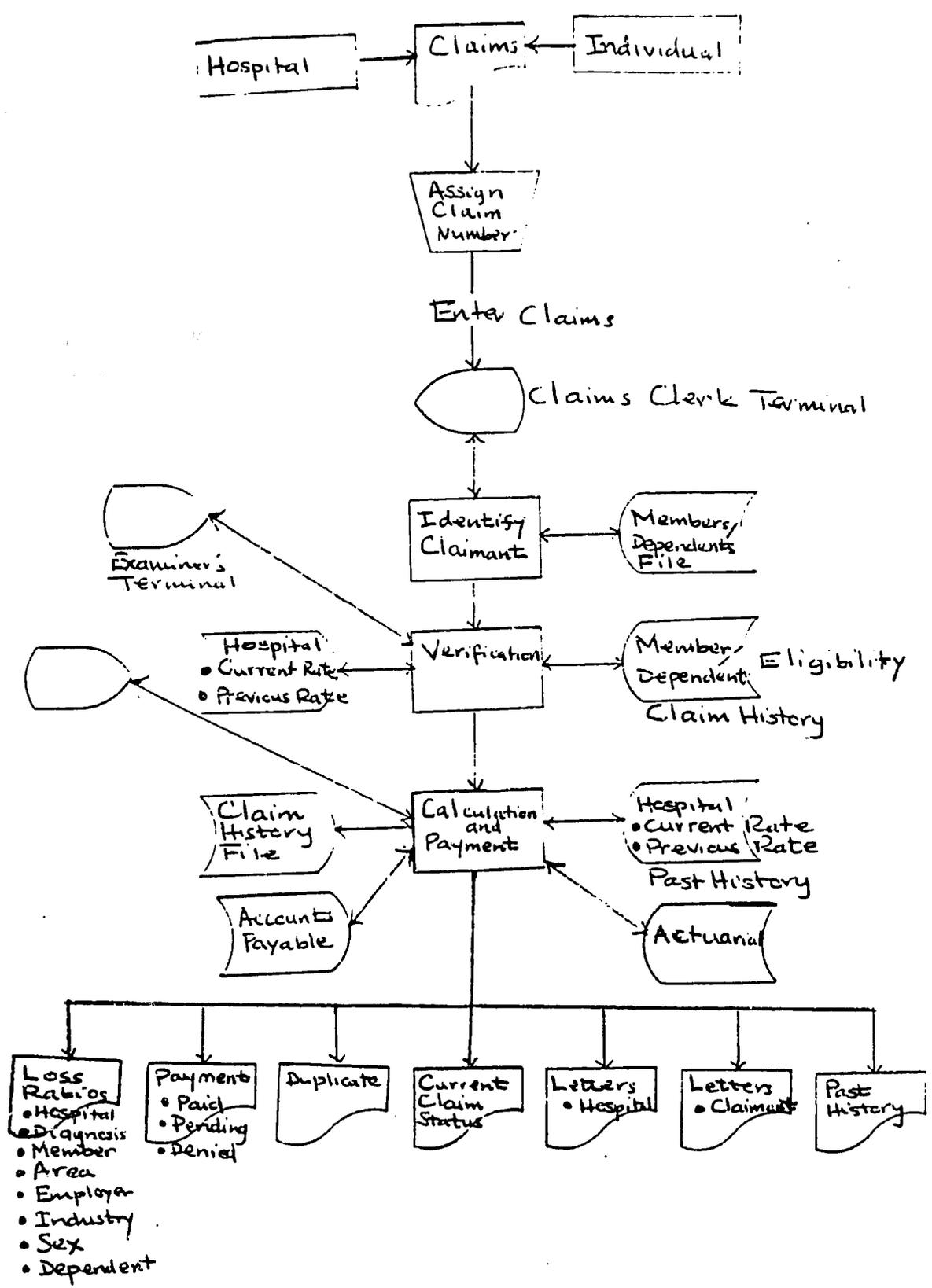
Office	Terminal (DP/WP)	Matrix-Printer (400CPS)	Letter-quality Printer (60CPS)	Band (1100LPM)
1. Director	2	-	1	-
2. Deputy	2	1	1	-
3. Chief Accountant	1	1	1	-
4. Senior Accountants	2	2	-	-
5. Data processing Managers	1	1	-	-
6. Computer Room	2	1	-	1
7. Data Entry	8	-	-	-
8. Inspection	1	1	1	-
9. Cash Office	2	2	-	-
10. Claims	3	3	-	-
11. General Administration	2	2	-	-
12. New Applications	1	1	-	-
13. New Card	2	2	-	-
14. Area Offices	4	4	-	-
Total	30	21	4	1

120

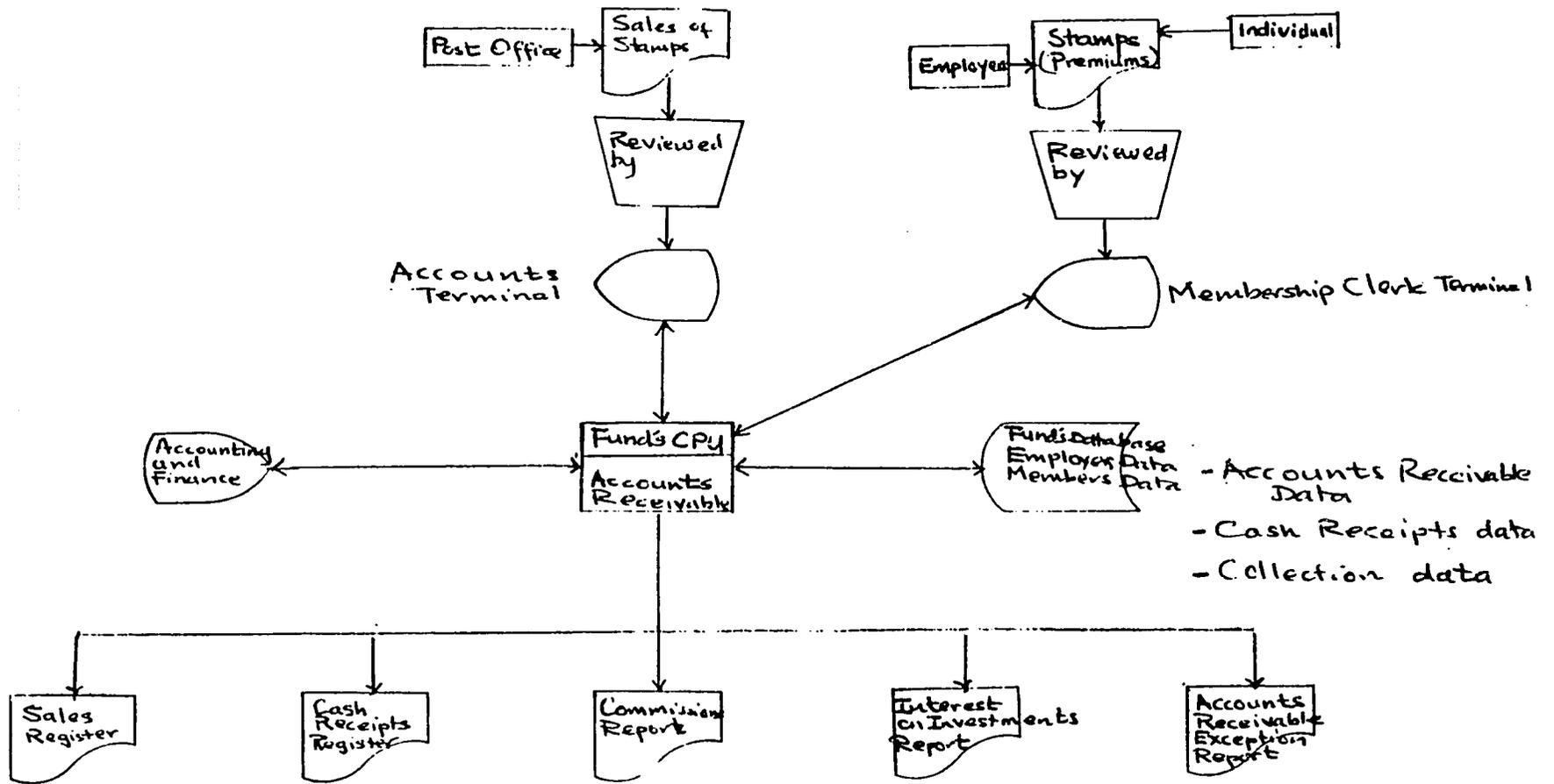
APPENDIX C : DATA FLOWS FOR THE NEW SYSTEM



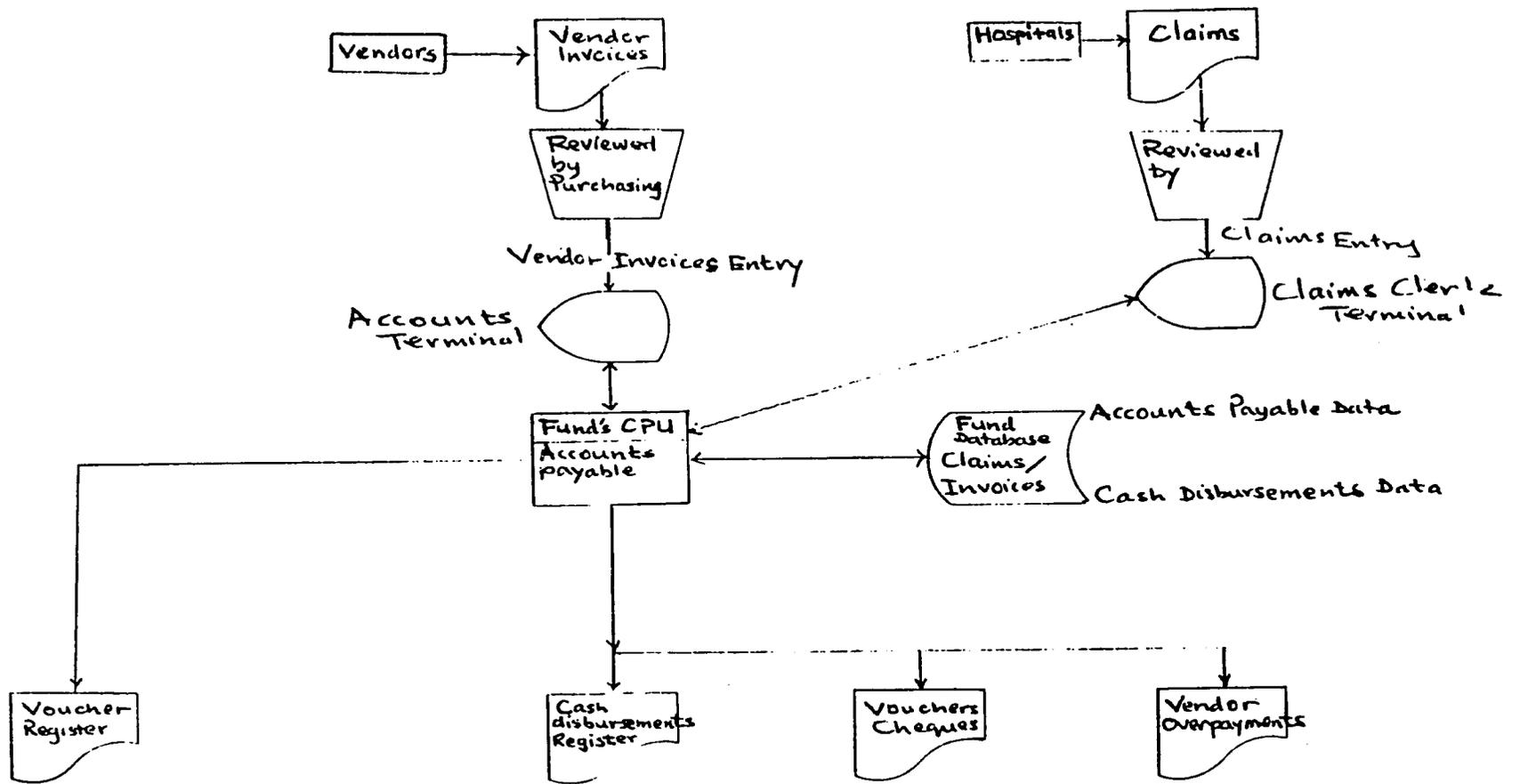
Membership System Data Flow



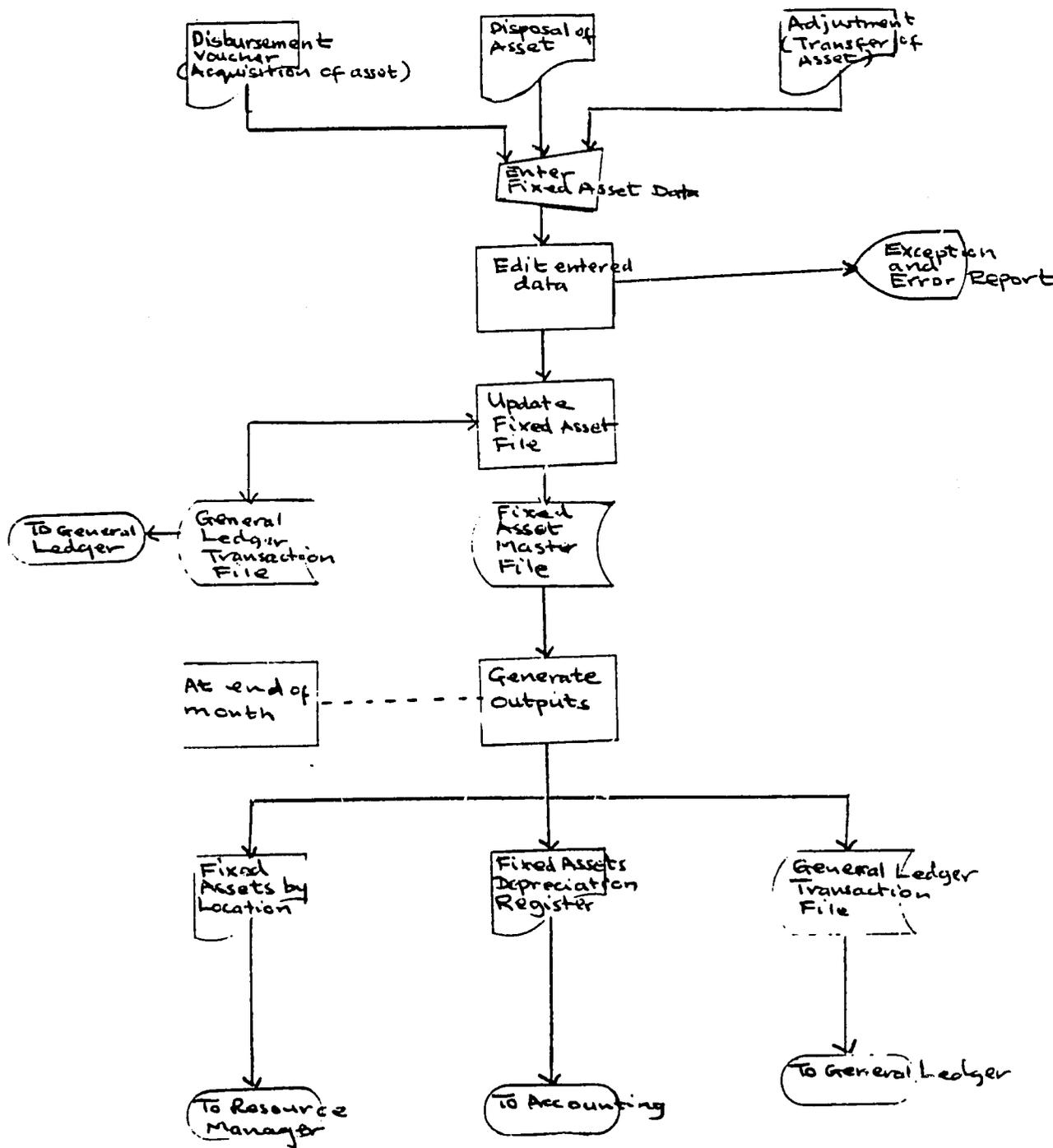
Claim System Data Flow



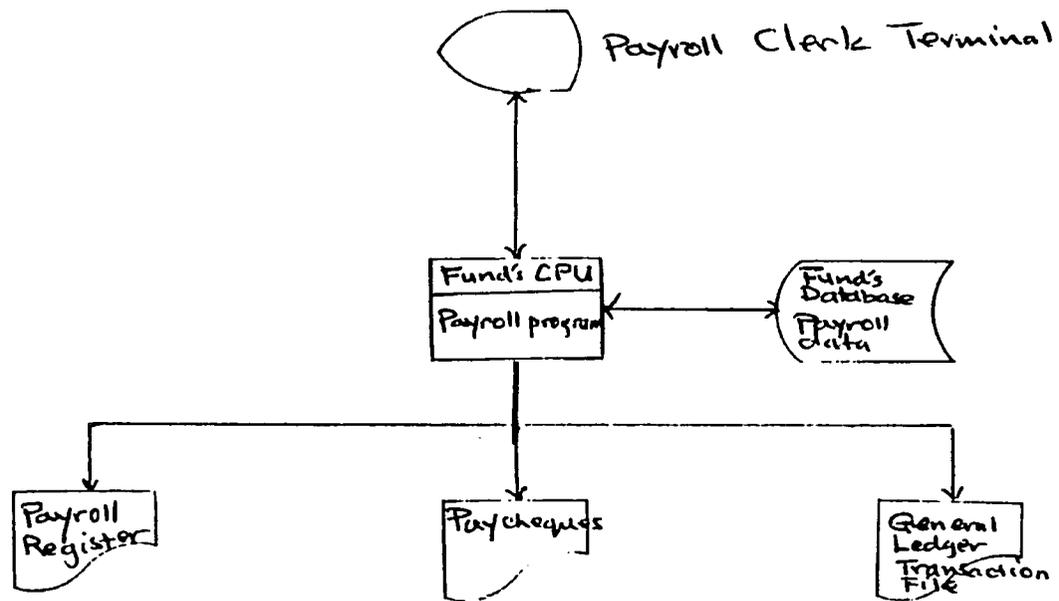
Accounts Receivable Data Flow



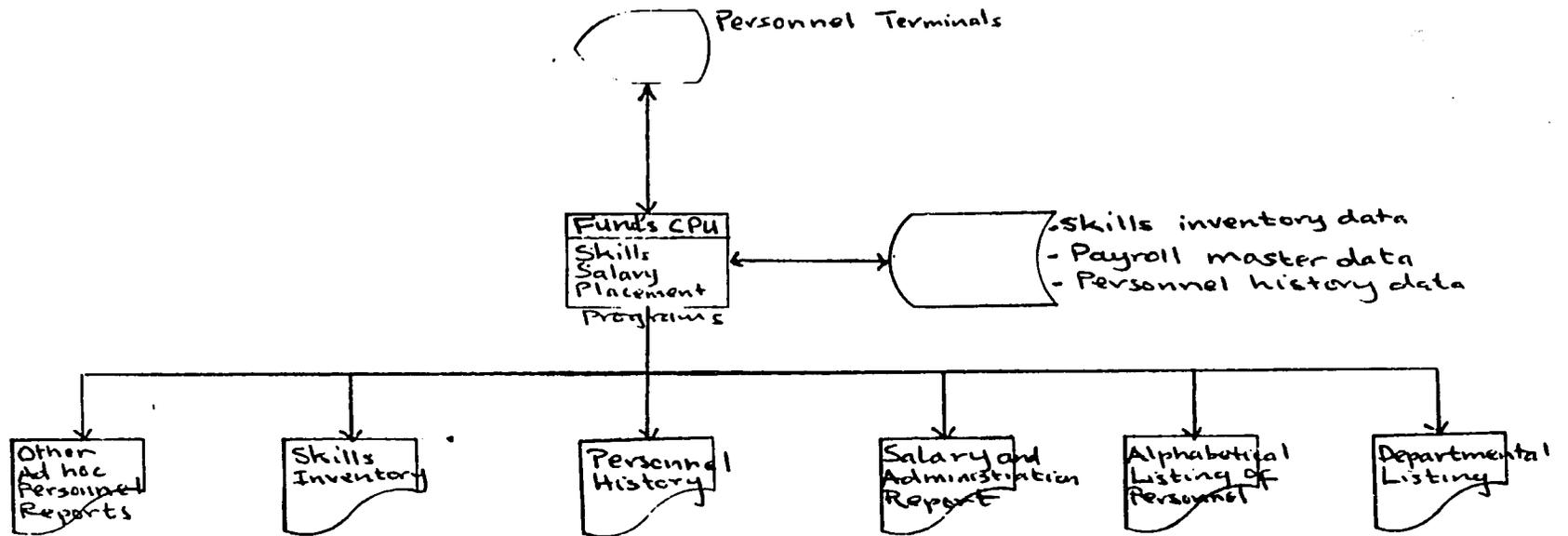
Accounts Payable and Cash Disbursements Data Flow



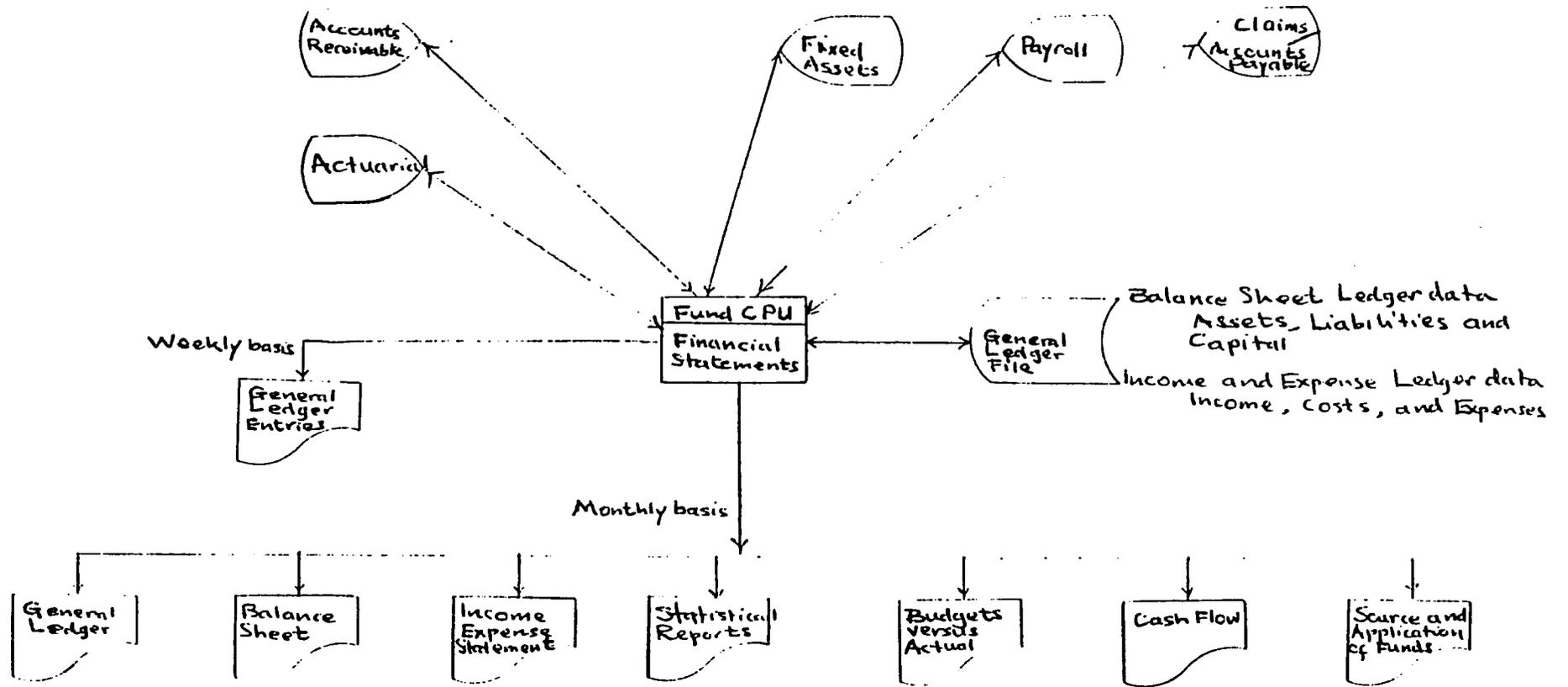
Fixed Assets Data Flow



Payroll Data Flow



Personnel System Data Flow



General Ledger Data Flow

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