

Final Report: The Designed Financial Management Information Systems for Chogoria Hospital, Kenya

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ACRONYMS

AFS	-	APHIA Financing and Sustainability Project
CHD	-	Community Health Department
FMIS	-	Financial Management Information Systems
GRN	-	Goods Received Note
HAT	-	Hospital Administration Team
HMC	-	Hospital Management Committee
HOD	-	Head of Department
MSH	-	Management Sciences for Health
NHIF	-	National Hospital Insurance Fund

PREFACE

On 5th February 1999, Almaco Management Consultants Ltd, (The Subcontractor) and Management Sciences for Health (The Contractor) entered into a contract in which the subcontractor was to review and design Financial Management Information System (FMIS) at Chogoria Hospital in South Meru District. The output of the assignment are two reports; the Interim Report which documented the existing Financial Management Information Systems and highlighted the weaknesses and suggested improvements. The second output is the Final Report which details Designed Management Information Systems covering patient registration, accounting systems and suitable options together with the corresponding budgets.

We finalized the compilation of the Interim report and handed it to MSH on 22nd March 1999.

We have now compiled the final report, which include the designed FMIS systems the options and the budget requirements.

We are greatly indebted to our counterparts at MSH, the Management and Staff of Chogoria Hospital who immensely assisted us with information and suggestions in the course of this assignment.

EXECUTIVE SUMMARY

- 1.1 The purpose of this Consultancy was to review and design Financial Management Information Systems (FMIS) for Chogoria Hospital to allow for better planning, budgeting and departmental revenue and expenditure performance monitoring and analysis.
- 1.2 The Consultancy has been carried out in three phases as follows:
- Phase one involved the design of an appropriate questionnaire to be used to collect data and information from the hospital. This culminated in the production of an Institutional Fact Finding Questionnaire, which was approved by the AFS.
 - Phase two involved the actual collection of data and information through discussions and interviews with the hospital staff. This culminated in the Interim Report, which documented the hospitals existing Financial Management Information Systems; Findings and Recommendations. This was presented and approved by AFS.
 - Phase three, which is the final phase and the subject of this report is the production of a final report containing Design systems for Management Information, Selection of options including Technical specifications and Market based budgets.
- 1.3 At the completion of phase two, we documented the hospitals' existing financial management information systems. This covered Patient registration, Billing and debtors, Cash management, Stock management, Procurement and creditors, Payroll management, Fixed assets management, Budgeting and budget control, Costing and pricing and the General ledger. We also documented the accounting procedures for the community clinics and the income generating projects operated by the hospital. We explained the practice being used to allocate revenue and expenditure to cost centres. We documented the computerization progress to date and the corresponding technical skills in the

- hospital. Lastly, we identified and listed all reports the existing system is generating and how they are distributed.
- 1.4 A number of weaknesses were identified and tabulated, together with management comments and our recommendations. These recommendations were supposed to assist us design improved systems for Chogoria Hospital.
 - 1.5 We have now been able to design appropriate financial management systems for Chogoria hospital. The systems cover the outpatient and inpatient registration, billing and debtors system for both outpatient and inpatient, cash management, stock management, procurement and creditors, payroll management, fixed asset management, budgeting and budget control, costing and pricing, accounting for community clinics and projects and the general ledger. Part one of this report explains each system by way of narration and flowcharts. The designed system indicates the financial regulations, internal controls that are incorporated in each system and the reports that each system generates and their distribution.
 - 1.6 We had recommended three options for possible adoption by Chogoria hospital subject to the final detailed systems design requirements. These options included one HMIS, CCL-CHIPS and MS-Access; two POS-I-TILL, CCL-CHIPS and MS-Access and three MEDAX, CCL-CHIPS and MS-Access. Part two of this report details the features in each option module and how it meets the hospital's FMIS requirements. Also included is the technical specification for each option in terms of hardware equipment, networking, software and training. The market costs are also provided.
 - 1.7 We have assessed the options and have recommended option I which is HMIS, CCL-CHIPS and MS-Access whose total cost is Kshs. 3.6 million.

**PART 1; DESIGNED MANAGEMENT INFORMATION SYSTEM FOR
CHOGORIA HOSPITAL**

- 1.1 The designed management information systems for Chogoria Hospital aim at assisting management to make realistic and informed decisions in order to provide appropriate and affordable health care to the community. The system should also assist management to exercise adequate controls on revenue collection and expenditure while providing health care. Lastly, the system should ensure that the other income generating projects operate at a profit for that is what they are intended to achieve.
- 1.2 In order for the designed management information systems to achieve the aspects raised in 1.1 above, they must incorporate the following elements;
- Provide for registration of patient personal details and patient activities while in the hospital so that accurate and timely statistical reports are available to management.
 - Allow for capture and billing of all services provided by the hospital so that the hospital collects revenue for all services rendered.
 - Provide for recording of all hospital financial transactions and their processing to produce reports on actual performance for management information and action.
 - Allow for accurate costing of hospital services to facilitate setting of fee at appropriate levels.
 - Provide for adequate system internal control measures, which ensure that hospital assets are safeguarded and that liabilities are properly authorized incurred and recorded.
 - Provide for planning and control of hospital activities through budgeting.
 - Provide for a reporting system that gives a clear breakdown of how each cost centre/unit within the hospital is performing and gives up to date and accurate information to allow management to make informed and timely decisions.

- 1.3 The systems we have designed in this document cover Patient registration, Billing and debtors, Cash management, Stocks management, Procurement and creditors, Payroll management, Fixed assets management, Budgeting and budget control, Costing and pricing and General ledger.
- 1.4 Each system design is explained by both brief notes and flowcharts. The brief notes are intended to capture the salient features of each system. The flowchart traces the system in detail from the initiation of a transaction/activity to its completion. Where it is not possible to flowchart a system in a single flowchart without risking clarity, more than one flowchart are used.
- 1.5 To ensure that the readers follow the flowchart easily, the system title, flowchart number and the subsystem title shown on the heading identify each flowchart. Each operation in the system is briefly narrated in the first column and in the order operations follow one another. The operation number is shown on the 2nd column. The departments, sections or individuals that are involved in the system operation are plotted across the top of each flowchart so that the document flow under their control is recorded in the appropriate column. The flow of a document is indicated by a continuous line; vertical line shows the passage of time in the flow of a document while the horizontal line shows the passage of a document from one control area to another. The symbols that have been used in the flowchart together with their application are explained in the table of flowchart symbols.

2.0 **PATIENT REGISTRATION SYSTEM**

2.1 **Design Objective**

The patient registration system should cater for the registration of outpatients both at the hospital and community clinics and also for inpatients admitted in the hospital wards. It should assist management to capture the patient's personal details and activities while in the hospital and at the clinics.

System features

2.2 The patient registration procedures for outpatients, inpatients and community clinics are outlined in flowchart number 1,2 and 3 respectively. The main features of the patient registration will;

- Provide for allocation of unique registration patient numbers.
- Provide for allocation of Inpatient numbers.
- Provide for capture of inpatients personal details including name, date, sex, age, and location.
- Provide for capture of number of patients visiting the hospital and the community clinics.
- Provide for patient's activities including the diagnosed cases, procedures performed and their results at each service centre.
- Provide for registration of admissions, transfers and discharges.
- Maintain retrievable records for each patient.

2.3 **Reports**

The system provides for production of outpatient and inpatient statistical reports which include;

- Daily summary of inpatients by ward
- Monthly inpatients and outpatients statistics
- Monthly maternity reports
- Monthly diagnosed cases
- Monthly summary of visits by clinic
- Monthly Immunization clinic attendance
- Monthly family health clinic attendance

3.0 **BILLING AND DEBTORS SYSTEM**

3.1 **Design Objective**

The key objective of the billing and debtors system is to ensure that all services are captured at source, billed and up-to-date records maintained for follow-up.

System features

3.2 Flowchart numbers 4,5,6,7,8, and 9 details the procedures that will be followed in the billing of outpatients, billing of cash inpatients, billing of credit and prepaid inpatient, invoicing and debtors control, NHIF documentation and Akiba documentation respectively. The major features include:

- Providing for cost centre coding to facilitate revenue allocation.
- Billing of and paying for outpatient services up-front.
- Vetting patients with credit facilities and pre-paid arrangements to ensure that they qualify to be attended to on such terms.
- Ensuring that all inpatient services are properly captured and billed.
- Ensuring proper and up-to-date records for Akiba Plan, NHIF and institutions with credit arrangements are maintained through invoicing, account statements and debtors ledgers.
- Follow-up outstanding debtors.
- Reconciling the debtors ledger to the general ledger control account.

3.3 **Reports**

The system produces monthly reports which include:

- Outpatient billing listings.
- Inpatient billing listings.
- Akiba current membership status report.
- Staff debtors listing
- NHIF debtors listing
- Individual debtors listing
- Institutional debtor listing

4.0 **CASH MANAGEMENT SYSTEM**

5.0 **Design Objective**

The objective of the system is to ensure that all cash for services rendered is collected and accounted for.

4.2 **System Design**

The cash management system flowcharts numbers 10, 11, 12 and 13 cover cash receiving, cheque payment, petty cash and bank reconciliation procedures respectively. The system ensures that ;

- Receipts are issued for all cash paid to hospital cashier and a pre-list produced.
- Cashiers promptly account for and surrender cash collected at each collection point.
- Cash collected is banked intact.
- Approved invoices, GRNS, orders and delivery notes support cheque payments.
- Approved vouchers support petty cash payments and that reimbursements are properly supported and approved.
- Bank reconciliations are prepared, checked and approved.

4.3 **Reports**

Daily reports generated by the system include:

- Summary of cash collected at each cash point.
- Summary of bankings.
- Cash positions.

5.0 **STOCK CONTROL SYSTEM**

5.1 **Design Objective**

The key design objective of a stock management system is to ensure that all hospital stocks are properly accounted for.

5.2 **Design features**

Flowchart numbers 14,15 and 16 detail the procedures that are followed in receiving stocks, issuing stocks to user departments and issuing drugs to patients respectively. The procedures ensure the following important controls:

- All receipts are ascertained for quality and quantity before being accepted to stores.
- All receipts are properly documented by GRNS, stock cards and stock books.
- Goods are readily identifiable in the stores.
- All issues are properly authorized.
- All issues are properly recorded through issue requisitions, dispatch notes, stock cards and stock books.
- Dispensing to patients is properly accounted for through prescriptions.
- Stock counts are regularly carried out and reconciled to stock records.

5.3 **Reports**

The system produces reports for:

- Daily stock position
- Monthly stocks received
- Damages stocks
- Expired drugs

6.0 **PROCUREMENT AND CREDITORS SYSTEM**

6.1 **Design Objective**

The key objective for a procurement and creditors system is to ensure that procurement is competitive and that all liabilities are properly incurred and recorded.

6.2 **System features**

The major internal control in the system includes;

- Use of re-order levels to raise orders.
- Use of competitive prices to select the supplier.
- Approval of all orders by designated officers.
- Allocation of suppliers invoices with internal control numbers.
- Coding of all invoices to allow for cost allocations.
- Reconciling of the creditors ledger to general ledger

6.3 **Reports**

- Production of monthly creditors listing.
- Production of monthly outstanding orders.

7.0 **PAYROLL SYSTEM**

7.1 **Design objective**

The design objective is to ensure that only bona fide members of staff are paid for services provided.

7.2 **System features**

The payroll procedures are detailed in flowchart No.18 to this report. All payroll advices will be approved by the Hospital Administrator who then passes them to the Senior Accountant, The accountant initials the instructions and passes them to the payroll section.

- Each member of staff will be allocated a payroll number. The payroll will be prepared according to the hospital departments and cost centres.
- The payroll section will be responsible for preparation of the payroll and payment vouchers which they then forward to relevant sections for approval, issue of cheques and payment.
- The payroll section will prepare monthly payroll journals with appropriate cost centre codes and pass them for posting to the general ledger.

7.3 **Reports**

The payroll will generate useful reports which will include; payslips, bank transfer lists, deduction lists, payroll reconciliations, the list of new employees and list of departures.

8.0 **FIXED ASSETS MANAGEMENT**

8.1 **Design Objective**

The key objective for the design is to ensure that fixed assets are properly acquired, recorded and disposed.

8.2 **System features**

- The fixed assets will be managed through the application of a Fixed Asset Register. The procedures to be followed are contained on flowchart No. 19 to this report. The Register contain details of all assets including description, date of purchase, suppliers name, cost of the asset, identification number, location, depreciation rate, accumulate depreciation and book value.
- The hospital management authorizes all purchases and once acquired asset details are posted to the fixed assets register and to the general ledger.
- Assets donated to the hospital are valued at market prices and a journal voucher passed to update the fixed assets register and the general ledger.
- All disposals are authorized by the hospital management committee and sold by public advertisement. Once sold, the Senior Accountant passes an appropriate journal voucher which is used to update the fixed assets register and the general ledger.
- Routine inspection of the assets should be carried out once every year and a detailed report on the state of each asset stated to assist in maintenance and disposals.

8.3 **Reports**

The system will generate the following reports; fixed assets listing and values, schedules of assets acquired during the year, schedule of assets due for replacement, disposal or obsolete and lastly, schedule of fixed assets due for maintenance.

9.0 **BUDGETING AND BUDGET CONTROL**

- 9.1 Each of the proposed cost centre will be responsible for the preparation of their budgets that will include revenue, expenditure and capital budget. The procedures to be followed are as outlined in flowchart Number 20 to this report.
- 9.2 The Senior Accountant will design and develop appropriate budget specification sheets that will capture all the income, and expenditure items associated with a cost centre. At the same time, the Senior Accountant will provide the cost centres with the unit price for services rendered and costs for items purchased. The cost centre/unit will then be in a position to prepare and provide budget figures.
- 9.3 It will be the responsibility of the Senior Accountant to compile the overall hospital budget, present it to both the HAT and HMC for approval.
- 9.4 Once the budget has been approved, the figures should be posted to the general ledger so that they are compared to the actual performance on a monthly basis and reports with variances produced. The performance reports should then be passed to cost centre/unit heads to explain the variances.
- 9.5 The system ensures that management obtains performance report covering revenue achievements, cost containment and overall results for the hospital.

10.0 **COSTING AND PRICING**

- 10.1 Costing and pricing will be the responsibility of the Senior Accountant in consultation with heads of departments and Medical Officer In-Charge. The procedures to be followed are as outlined on flowchart Number 21 to this report.
- 10.2 The Senior Accountant will design and develop costing specification sheet for each of the service provided by the hospital. The specification sheet captures all the items; materials or labour that go into providing a unit service. It shows the quantity of each material and man-hours required.
- 10.3 The costing of each service should then be carried out monthly. The costing is done using the actual costs. Variances are analyzed by the Senior Accountant who then makes recommendations to the HAT for price reviews.

11.0 **COMMUNITY CLINIC ACCOUNTING**

11.1 Community clinic accounting for cash collection and accounting is as outlined under cash receiving flowchart number 10.

11.2 The clinics received drugs from the bulk store and family planning material from the CHD store. The requisition and dispensing procedures are outlined on flowchart number 15 and flowchart number 16 respectively. The clinics maintain drug sheets, which account for the drugs.

11.3 All transactions that take place in the community clinics are accounted for in the appropriate income, stocks and expense accounts in the general ledger. The clinics submit returns to the general office for accounting purposes.

12.0 **ACCOUNTING FOR PROJECT**

12.1 All project activities in the hospital are authorized at the head office.

12.2 Records for project transactions are submitted to the general office where they are processed through the hospital accounting system.

12.3 General ledger accounts are opened for each project, which record all project transactions including income generated, expenses incurred and assets provided to the project.

13.0 **THE GENERAL LEDGER SYSTEM**

13.1 A chart of accounts will be developed for the general ledger to cater for all balance sheet, income and expenditure items. The chart of account will indicate the account groups, account name and account code. The account code will cater for among other things department and cost centre.

13.2 The Senior Accountant before posting to the general ledger will approve monthly vouchers from all other ledgers.

13.3 The general ledger will provide for actual and budget figures, to facilitate performance analysis for income and expenditure item for each cost centre.

13.4 The general ledger will produce defined management reports by department and cost centre, which will be approved by the Senior Accountant before distribution to various users.

PART TWO; OPTIONS, TECHNICAL SPECIFICATIONS AND BUDGET

14.1 In our interim report, we indicated that we had selected three options which we hoped to examine in detail with a view to ranking them in the order in which they matched Chogoria's FMIS requirements. The options were;

- Option one; which is a combination of HMIS, CCL-CHIPS and MS- Access.
- Option two; which is a combination of POS-I-TILL, CCL-CHIPS and MS Access.
- Option three; which is a combination of MEDAX, CCL-CHIPS and MS Access.

14.2 **Option Selection Criteria**

This was the first selection stage in which we screened a number of packages and selected a few options that answered to the hospital's HMIS requirements. The criteria here was global and the parameters used ensured that the system provided for the following:

- Patient registration module that caters for both outpatient and inpatient register.
- General accounting modules that caters for; Debtors control, Stock control, Cash book, Creditors, Payroll, Fixed assets, Budgeting and budget control, Costing and pricing and the general ledger.
- Accrual method of accounting.
- Adoption of printed documents and reports to user designed specifications.
- System integration with the planned installation of Cash Registers at the hospital.
- Internal controls to prevent irregularities and outright fraud.
- Security features to limit access to authorized persons only.
- System linkages through Local Area Network.
- Possible linkages between the outpatient and inpatient database and the accounting system to provide for a cost benefit analysis for treatments, list of procedures by each doctor and prescription patterns of clinicians.

- Implementation of the modules on stand-alone basis.
- User friendly features and easy training for both operating and maintenance of the system.
- Multi-users.
- Existing and recognized users particularly other hospitals.
- Competitive and cost effective.

15.0 **OPTION 1 – HMIS, CCL-CHIPS AND MS-ACCESS**

- 15.1 Option one will be the application of the HMIS modules to cater for the patient registration system, the billing system, debtors control system, stock control system, creditors system, cash book system, personnel system and the general ledger system. The HMIS system will be complemented by two other systems as follows; CCL-CHIPS to cater for the fixed asset module while the MS-Access will cater for budgeting and budget control, and costing and pricing systems.
- 15.2 HMIS system is developed and supported by Capital Software Ltd, a software developing company located in Nairobi with a sizeable support of system designers and programmers. The system is already being used by six hospitals namely; MP Shah, Mater Misericordiae, Metropolitan, Avenue, Equator and PCEA Kikuyu hospital.
- 15.3 The CCL-CHIPS is developed and supported by Computer Consultants Ltd, a software developing company based in Nairobi and with a reasonable support of system designers and programmers. Some of the users of their system include ABN Amro Bank, Fedha Management, Firestone (EA) Ltd, Utalii Hotel, Presbyterian Church of East Africa, Bain Hoggs Insurance Brokers.
- 15.4 MS-Access is developed by Microsoft and is supported locally by a number of computer houses with adequate support experts. The hospital will select one of the reputable software houses who will supply and support the system.

15.5 **Outpatient Register and Billing Module**

The outpatient and billing module provides for a number of features which include; outpatient register, credit vetting, on-line billing, laboratory test statistics, x-ray test statistics, diagnosis register, deaths register and linkages to the pharmacy, debtors ledger, cash book and general ledger modules. These features should cater for the hospital's outpatient registration and billing requirements outlined on flowchart nos. 1,3, and 4 above.

15.6 **Inpatient Hospitality and Billing Module**

This module include; inpatient register, admissions, bed transfers and discharges; bed occupancy reports, on-line billing, NHIF rebates; laboratory test statistics, x-ray test statistics, diagnosis register, deaths register and linkages to pharmacy debtors ledger, cash book and general ledger. The module will therefore assist hospital management to satisfy the inpatient registration and billing requirements depicted on flowchart nos. 2 ,5 and 6.

15.7 **Debtors Module**

This module features the following; account register, categorization of companies, credit limits, interest chargeable on old accounts, on-line statements of account, open item and balances forward type of statements, aged balances and linkages to inpatient billing, outpatient billing, cash book and general ledger. This module caters for the management requirements on flowchart number 7.

15.8 **General Store Module**

This particular module will handle the main and food store activities. It features the following; ordinary inventory control procedures, supports multi stores, categorization of items, item listing with costing and pricing, simplified identification of items, support issues to departments, automatic re-order level, purchases recommendations, stock valuation, stock level reports and linkage to general ledger. It therefore satisfies management requirements for the main and food store as described on flowchart nos. 14,15 and 17.

15.9 **Pharmacy Module**

The pharmacy module features inventory control procedures, support multi stores, drug list with costing and pricing, drug dispensing with simplified identification of drugs, prints labels, support issue to departments, automatic reorder level, purchase recommendation, on-line generation of LPOS, stock valuation, stock level reports, profitability reports, patients drug statements and linkages to inpatient billing, outpatient billing, cash book and general ledger. This module addresses management requirements on flowcharts nos. 14,15,16 and 17.

15.10 **Suppliers Ledger Module**

The suppliers module comprise suppliers register, categorization of suppliers, capture of suppliers invoices, on-line statement of account, open item and balance forward types of statement, aged balances, linkages to pharmacy, general store, cash book and general modules. This should satisfy the creditors system requirements on flowchart number 17.

15.11 **Cash Book Module**

The cash book module supports multi cash points; supports shifts, accounts for each cashier differently, receipts for all ledgers, prints receipts on-line, suppliers refunds and payments, generates cheques, linkage to all ledger, bank reconciliations and tight security. This system will support the hospital cash management requirements described on flowcharts nos. 10,11,12 and 13 above.

15.12 **Payroll**

This module comprises user defined earnings and deductions codes, user programmables tables, supports branches, departments and sections, upto 10,000 different earnings and deductions codes, advices on savings and loan balances, automatic calculations of interest on loans, cheque writing features, generates bank transfer schedules and links to the cash book and general ledger. The hospital management requirements for the payroll as depicted on flowchart number 18 will be catered for by this module.

15.13 **Fixed Assets**

The features of this module include; location of fixed assets, transfer, original cost, depreciation, revaluation costs, residue value, book value, insurance details, additions and disposals, history of repair. This addresses the management requirements in flowchart number 19.

15.14 **Budgeting and Budget Control, Costing and pricing**

This will be done on the MS-Access which will provide for management requirements as shown in flowchart number 20 and 21 and includes: design and development of budgeting costing specification sheets, provide for cost centres and compilation of both revenue and expenditure budgets, and actual costing of services.

15.15 **General Ledger**

The general ledger module caters for chart of accounts, supports cost centres and revenue centres, reports profitability by department, trial balance report, user defined management reports and linkages to all ledgers. This module supports management reports that will require to be cost centred and comparison of actual performance to budget.

15.16 **Technical Specifications and Budget**

The configuration of the hardware will include a file server, workstations with printers and be networked. The file server will be stationed in the general office. Workstations will be at the five cash points, three stores one at CHD and three others in the general office. The workstations will be networked so that information can be shared. The detailed location specifications and costs are as follows:

	Hardware	Location	Qty	Unit Price (Khs)	Total (Kshs)
1	File Server (see specification note)	General office	1	500,000.00	500,000.00
2	Work stations (see specification note)	1. Registration office 2. Laboratory cashier 3. Outpatient cashier 4. Inpatient cashier	1 1 1 1		

		5. NHIF cashier	1		
		6. Pharmacy	1		
		7. Main store	1		
		8. Food store	1		
		9. CHD	1		
		10. Creditors/payroll	1		
		11. Debtors/general ledger	1		
		11. CHIS	<u>1</u>		
			12	73,000.00	876,000.00
3	80 column Epson Printers (see specification note)	1. Registration office	1		
		2. Laboratory cashier	1		
		3. Outpatient cashier	1		
		4. Inpatient cashier	1		
		5. NHIF cashier	1		
		6. Pharmacy	1		
		7. Main store/food store	1		
		8. CHD	<u>1</u>		
			8	29,000.00	232,000.00
4	Epson DFX 5000 Printers (see specifications)	1. General office for creditors, debtors, CHIS, payroll, budget			
			1	139,000.00	139,000.00
5	One Inverter Charge	1. General office	1	210,000.00	210,000.00
6	Networking		1	776,617.00	776,617.00
	Total Hardware Cost				2,733,617.00

Notes

- i) The fixed assets, payroll, budgeting and budget control, costing and pricing, debtors, creditors, and general ledger will share one printer.
- ii) The main store and food store will share a printer.
- iii) The projects and community clinics will continue to be manual.
- iv) Prices are exclusive of VAT and one US\$ is converted at Kshs. 65.00

v) **File Server Specifications**

Pentium II 400 MHz Processor

128 MB memory (expandable to 512)
12.9 GB SCSI Hard Drive
512 KB Cache
1.44 MB Floppy diskette drive
CD ROM Drive
Back-up Tape
6 I/O Slots –2 PCI and 4 PCI/EISA expansion slots
10/100 Mbps network card
14" colour monitor
Keyboard and mouse
3 year on site warranty

iv) **Workstations Specifications**

Pentium II 300 MHz with MMX Technology
32 MB RAM
1.3 GB Hard Disc Drive
PCI Motherboard
104 Enhanced Keyboard
14" Colour Monitor
CD ROM Drive
Pre-installed Windows 98
Network Card
Eighteen (18) workstations

v) **Networking Specifications**

For distances of more than 90 metres from the General Office where the Server will be located, optical fibre cable will be used. The Network Operating System will be Windows NT. The hospital will be responsible for digging of trenches where the underground cables will be routed. The networking components are as follows:

Windows NT Server Standard Edition (12) Clients)
100 metres Optical Fibre cable @380/- per metre
One 34 HU cabinet

One 60 ST Fibre Optics Panel (19 inch)
 One 24 Port Twisted Pair patch Panel
 22 ST Duplex Adapter (multimode)
 100 ST Fibre Optic Connectors
 Four Universal Splice Tray
 12 Fibre Optics Patch Cord 2ST
 30 3Metres UTP Patch Cords
 305 Metres FTP Cable Roll
 Ten 1.5 Metres Patch Cords
 Ten Single Patch Cords
 One 2HU Cord Organizer
 One 4RJ45 Fibre Share Mini-Hub
 One Fibre Optics Transceiver module+ Port Hub
 Cable termination and testing

15.17 Software, Implementation and Training

The software modules, their suppliers, costs, implementation and training are given on the table below. The developer will be responsible for implementation and training of one member of staff per module.

Module	Supplier (Kshs)	Licence/Cost (Kshs)	Implementation (Kshs)	Training (Kshs)	Total (Kshs)
Inpatient Registration and Billing	Capital Software	65,000.00	10,000.00	10,000.00	85,000.00
Outpatient Registration and billing	Capital Software	55,000.00	10,000.00	10,000.00	75,000.00
Pharmacy Inventory and dispensing	Capital Software	55,000.00	10,000.00	10,000.00	75,000.00
General stores	Capital Software	40,000.00	10,000.00	10,000.00	60,000.00
Debtors ledger	Capital Software	35,000.00	10,000.00	10,000.00	55,000.00
Suppliers ledger	Capital	45,000.00	10,000.00	10,000.00	65,000.00

	Software				
General ledger	Capital Software	55,000.00	10,000.00	10,000.00	75,000.00
Cash book	Capital Software	55,000.00	10,000.00	10,000.00	75,000.00
Payroll	Capital Software	35,000.00	10,000.00	10,000.00	55,000.00
Fixed asset	CCL- CHIPS	72,00.00	10,000.00	10,000.00	92,000.00
Budgeting, costing and pricing	Microsoft	121,000.00	10,000.00	10,000.00	141,000.00
Total		633,000.00	110,000.00	110,000.00	853,000.00

15.18 **Summary of Costs**

The total cost for hardware, networking, software modules, implementation and training summary is as follows:

<u>Item</u>	<u>Amount (Kshs)</u>
Hardware	2,733,617.00
Software	633,000.00
Implementation	110,000.00
Training	<u>110,000.00</u>
	3,586,617.00
	=====

16.0 **OPTION 2: POS –I-TILL, CCL- CHIPS, MS- ACCESS**

16.1 Option 2 will involve the application of POS-I-TILL modules to cater for the patient registration system, billing and debtors system, cash management system, stock management system, procurement and creditors system and the general ledger system. The payroll and fixed assets register will be handled by the CCL-CHIPS modules while Budgeting and budgetary control and costing and pricing will be handled by the MS-Access.

16.2 POS-I-TILL package has been developed by a South African Company and is marketed and supported locally by Trans Business Machines Ltd, a Company based in Nairobi. This is an integrated point of sale and accounting system. It is currently being used at the Coast Provincial General Hospital.

16.3 The CCL-CHIPS and MS-Access background information has been provided under 15.3 and 15.4 above.

16.4 **Point of Sale Module**

This module provides for five levels of passwords, process cash sales, and cash returns and debtors transactions and support cash drawers and processes various reports. These features will meet the hospital billing and cash receiving requirements which include; billing and receiving cash at various points, raising bills and producing reports.

16.5 **Stock Control Module**

The stock control module provides for stock location identification, user definable stock codes. Multiple prices, multiple stores, re-order levels and various stock reports. The module will therefore cater for management stock control requirements as follows; receiving stocks at various stores, generating documents, updating documents, inter-departmental transfers; and producing reports.

16.6 **Debtors Control Module**

The debtors control module features the following elements; invoicing, user definable account numbers, generates account statement and produces various reports. This module meets the invoicing and debtors ledger requirements as follows; invoicing of patients, maintenance of the debtors ledger, generating statements and producing reports.

16.7 **Cash Book and General Ledger**

The module integrates to the other modules, allow for multiple companies multi bank accounts, process bank reconciliations user definable accounts and produces reports. It will therefore meet the following cash book and general ledger requirements; recording receipts and payments, prepare bank reconciliations and produce performance reports.

16.8 **Payroll**

The payroll module caters for employee number, department and other personal details, user defined payment and deductions and monthly reports. It therefore caters for the payroll requirements which include; allocation of payroll accounts, process payroll and produce payroll reports.

16.9 **Budgeting and Budget Control, Costing and Pricing**

This module will cater for design of specification sheets, cost centres, compilation of revenue and expenditure budgets and costing of services.

16.10 **Technical Specifications and Market Budgets**

The hardware system will include a central server to be positioned in the general office. There will be five cash registers at each cash point. Workstation will be in each of the three stores one at CHD and three others at the general office to cater for invoicing, creditors, payroll, budgeting and general ledger. The system will be networked . The detailed locations, costs and specifications are as follows:

	Hardware	Location	No. of pieces	Unit Price(Kshs)	Total cost (Kshs)
1	IBM Server 325 (see specification notes)	General office	1	500,000.00	500,000.00
2	Cash Registers IBM (see specification notes)	1. Registration office 2. Laboratory 3. Outpatient cashier 4. Inpatient cashier 5. NHIF cashier	1 1 1 1 <u>1</u> 5	165,000.00	825,000.00
3	Workstations (see specification notes)	1. Pharmacy 2. Main store 3. Food store 4. CHD 5. Creditors/general ledger 6. Debtors/payroll 7. CHIS	1 1 1 1 1 1 <u>1</u> 7	73,000.00	511,000.00
4	Epson DFX 5000 Printer		1	139,000.00	139,000.00
5	Epson LQ 2170 Printer		1	50,000.00	50,000.00
6	One Inverter Charger		1	210,000.00	210,000.00
7	Networking		1	776,617.00	776,617.00
	Total				3,011,617.00

Notes

- i) All projects, community clinics will continue with the manual system.
- ii) There will be one heavy printer in the general office to cater for creditors, debtors, budgeting and general ledger.
- iii) The general office will have two workstations to be shared by debtors, creditors, payroll, and general ledger.
- iv) Prices are exclusive of VAT.
- v) The US\$ converts at Kshs. 65.00 per dollar.

- vi) **IBM Server 325 Specifications**
- Pentium II 400 MHz Processor
 - 128 MB Memory (Expandable to 512)
 - 11.5GB SCSI Hard Drive
 - 512 KB Cache
 - 1.44 MB Floppy diskette drive
 - CD ROM Drive
 - Back-up Tape
 - 5 I/O Slots –2 x PCI and 3 x ISA expansion slots
 - 10 Mbps ISA Ethernet card
 - 14" SVGA colour monitor
 - Keyboard and mouse
 - 20 Users
 - System view – system management software
 - 3 year on site warranty

- vii) **IBM Sureone (POS) Specifications**
- Pentium 180 MHz
 - 16 MB RAM
 - Vacuum fluorescent display 20 x 2
 - Credit card reader
 - Cash Drawer 5.1" H x 13.0" W x 18.7" D
 - Receipt printer 40 col
 - Ethernet LAN card
 - ISA bus architecture
 - 105 programmable keyboard
 - 850 MB Hard Disc
 - 10 (10) IBM Sureone

- viii) **Workstations Specifications**
- Pentium II 300 MHz with MMX Technology
 - 32 MB RAM
 - 4.3 Hard disc Drive
 - PCI Motherboard

104 Enhanced Keyboard
 14" Colour Monitor
 1.44 MB Floppy Disc Drive
 CD ROM Drive
 Pre-installed Windows 98
 Network Card
 Eight (8) Workstation

ix) **Networking Specifications**

The details have already been indicated on 15.16 (v) above.

16.11 **Software, Implementation and Training**

The software modules, implementation and training costs are tabulated below.

The vendor will implement and train one person per module.

	Module	Supplier	Licence/ Cost (Kshs)	Implementation (Kshs)	Training (Kshs)	Total (Kshs)
1	Point of sale	TBM				
2	Stock control	TBM				
3	Debtors control	TBM				
4	Creditors	TBM				
5	Cash book and general ledger	TBM				
	1-5		450,000.00	50,000.00	30,000.00	530,000.00
6	Fixed assets	CCL	72,000.00	10,000.00	10,000.00	92,000.00
7	Payroll	CCL	72,000.00	10,000.00	10,000.00	92,000.00
8	Budgeting and costing	Microsoft	121,000.00	10,000.000	10,000.00	141,000.00
	Total		715,000.00	80,000.00	60,000.00	855,000.00

16.12 **Summary of Costs**

The summary of hardware, Software, implementation and training costs is as follows:

<u>Item</u>	<u>Amount (Kshs)</u>
Hardware	3,011,617.00
Software	715,000.00
Implementation	80,000.00
Training	<u>60,000.00</u>
	3,866,000.00
	=====

17.0 **Option 3: MEDAX- CCL-CHIPS, MS Access**

17.1 Option 3 involve the application of MEDAX modules to cater for the patient registration system, billing and debtors system, cash management system, stock management system, procurement and creditors system, fixed assets system and the general ledger system. The payroll is to be handled by CCL-CHIPS while budgeting and budget control and costing and cost is to be handled by MS Access.

17.2 While option three appear to be probably the most sophisticated hospital developed package, it may not be the most suitable for Chogoria hospital taking into account the costs involved, the environment in which Chogoria operated and the hospitals immediate and compelling needs. The option is both too expensive and most of its features will be rendered redundant at Chogoria hospital. We are therefore dropping it and proceeding with option one and two.

18.0 **DETAILED MODULE ASSESSMENT**

Having selected two options that are suitable for application at Chogoria Hospital, we proceeded to carry out a second assessment, which was intended to assist us rate, the two options with a view to recommending the most suitable one. We listed those basic features that each module must incorporate in order to meet the hospital's FMIS. Those basic features and the assessment are tabulated in the following table;

19.0 **THE RECOMMENDED OPTION**

Using both the criteria set out in paragraph 14.2 on option selection criteria and paragraph 18.0 on module assessment, we are recommending that the hospital adopt and implement option one, which comprises HMIS, CCL-CHIPS and MS Access.

- The HMIS modules are designed for application in hospitals unlike the POS-I-TILL system, which will require substantial customization.
- HMIS has been around for close to ten years and is already being used by six recognized hospitals in Nairobi. It has been described as performing satisfactorily and has potential for growth. POS-I-TILL is operating at Coast Provincial General Hospital and even then, it is only serving cash management system
- HMIS is developed locally. This is again important because it will enable users to access the developers easily and at less costs if and when they need to customize the modules. POS-I-Till will require that developers from South Africa are flown in.
- Chogoria requires a highly developed inpatient and outpatient registration system that is capable of capturing patient details and patient statistics at every service area so as to produce detailed statistics required in preparation of annual reports. HMIS system registration system is most suitable
- HMIS system is less costly compared to POS-I-TILL and is therefore preferable.