PROPOSAL FOR

HOSPITAL MANAGEMENT SYSTEM

TECHNICAL DESCRIPTION

The Technical bid to develop the Hospital Management System in about 20 hospitals located in various districts of Himachal Pradesh is as enumerated below. As described in the technical bid it contains technical aspects of the project starting from hardware requirements followed by software requirements (Licensed by Microsoft or any other vendor) and ends with the System maintenance and any further requirement for upgrading of the system.

MINIMUM HARDWARE REQUIREMENT

<table>
<thead>
<tr>
<th>Hardware Required</th>
<th>Capacity</th>
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</thead>
<tbody>
<tr>
<td>Computer System</td>
<td>High Speed Desktop Computers</td>
</tr>
<tr>
<td>Hard Disc</td>
<td>160 GB</td>
</tr>
<tr>
<td>RAM</td>
<td>2 GB</td>
</tr>
<tr>
<td>High Speed LAN Cards</td>
<td>More than 100 Mbps</td>
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OPERATING SYSTEM

There will be two types of Operating System for Client and for Server based systems.
Server will be centralized which handles all the clients' machines. For Client Machine operating system will be licensed Microsoft Windows XP Professional Service Pack 2 and for Server, operating system will be licensed Microsoft Windows Server 2003/2008.

RDBMS- RELATIONAL DATABASE MANAGEMENT SYSTEM

The database will be licensed Microsoft SQL Server 2005/2008, which handle all the queries/requests as generated by different clients through network.

SOFTWARE LANGUAGE/FRONT END TOOLS

The system will be licensed version of Microsoft Dot Net 2005/2008 which comprises of VB DOT Net, C#DOT Net, ASP DOT Net 2005 etc. For customized reporting, system will use crystal reports for DOT Net 2005,farpoint spread sheet reporting tools.
BACKUP MANAGEMENT SYSTEM

System will provide job scheduling to take secure backup of the system, which provide backup (Manual /Automatic) to some other devices like hard Discs, magnetic tape or on optical media (CDs, DVDs) etc.

END-USER TRAINING PROCEDURE AND SUPPORT SERVICES

We will provide 24X7 online and telephonic support services for the System and provide well-mannered end user level training with help procedure on end user side.

RECURRING ANNUAL REQUIREMENTS AND MAINTENANCE

Any additional requirement of the system the company will charge 25% of the Cost of project as Annual Maintenance Contract (AMC)

PROJECT WORKING SCENARIO

Our system will work on Client/Server Architecture, which comprises one huge server to handle multiple client machine located in different departments/areas of the hospital/organization. We have two working paradigms for the required system which are as follows:-

Paradigm 1

![Diagram of Client/Server Architecture](image)

Fig-1
The first paradigm (Fig-1) shows the client machines (C1, C2, C3...... Cn) connected to the Main Server situated at head office of the organization. Clients shall be making request to the server through Internet based communication (same as in Banking System) and working on their own. This system is the Online System.

As a Meritorious system, it keeps the whole information updated on the spot in the server, which enables the designated authority to check the information regarding any zonal or tehsil level sector. This makes the system feasible and enormous work worth.

The system might be inoperative due to the unavailability of Internet Service, which can halt to the objective.

This paradigm require a dedicated server so that client machine access the Server globally and perform operations on the server.

**Paradigm 2**

![Paradigm 2 Diagram]

**Fig-2**
The second paradigm (Fig-2) is showing rectangle which represents the hospitals and client machines (C1, C2, C3…C6) connected to the Local Server situated in the Hospital premises. This system is a combination of Online and Offline features. The hospital will have its own database and client will be connected through LAN Connectivity. The Client will make requests to the local server that processes the submitted requests.

On cease work of that day or some other day, the whole updated information in local server will be updated to the Centralized server located in Head office. Each hospital will do the same operation and main server will contain the latest information, which works further as MIS (Management Information System).

As a Meritorious system, it is independent of Internet connectivity so it provides fast response to the client machine, which mobilises the Hospital Services. It will not halt the system.

**WHAT HMS DOES?**

- Effectively utilizes hospital facilities and improves inventory control
- Provides information required to support patient care
- Safeguards data integrity, security and accessibility
- Captures and analyses clinical data
- Captures the progress of treatment of individuals and gauges the response to treatment and drugs for groups of patients
- Makes data collected available for research purposes
- Generates MIS reports, which help the management in making policy decisions. Maintains records necessary for statutory requirements

**KEY POINTS OF PROPOSED SYSTEM**

As the proposed system is based on the Client/Server Architecture and the application will be run on client machine and server will handle their requests and will process them.

**KEY FEATURES PROVIDED BY THE SYSTEM ARE AS FOLLOWS**

**REGISTRATION**

The Registration module is an integrated patient management system, which captures complete and relevant patient information. The system automates the patient administration functions to have better and efficient patient care process.

- Patient Registration Details
- Inpatient and Outpatient Registration
- Medical Alerts Details
• Appointment Scheduling (Patient / Doctor wise)
• Doctors’ Schedule Summary
• Doctors’ Daily Schedule List
• Patient Visit History
• Medical Record Movements
• Appointments for Radiology tests and Operation Theatre
• Patient Visit Slip
• Sponsorship Details

It provides for enquiries about the patient, the patient's location, admission, and appointment scheduling and discharge details. Furthermore, this system even takes care of package deals for a patient for a fixed cost. Medical Record keeps an abstract of clinical data about patients. It allows easy retrieval of medical records on patients.

**ELECTRONIC MEDICAL RECORD**

The EMR Module is a fully integrated knowledge repository that caters to Medical and clinical records of patients in the hospital. The system supports medical professionals of various departments of the hospital with relevant information like medical examinations, diagnoses, treatment histories, test results and so on. The module provides access to critical and complete patient data that leads to high quality cost effective and efficient patient care. The EMR has the following features

• Patient Search with Various Search Strings
• Patient Demographic Viewing
• Previous Visit Details
• Medical History of the Patient
• Billing Details of Patient
In addition the user can view investigation requests, prescriptions, reports and other clinical details. The system provides separate access rights for each part of the EMR. The patient’s medical file can be securely retrieved from this module and sent across LAN and WAN and also can be E-mailed.

HELP DESK

The Help Desk Module automates the day-to-day functions of the Front office management of a hospital. This module helps in assisting patient with accurate information and supports in handling patient related enquiries efficiently. This module having excellent features and advanced search facilities improves the quality of services rendered to the user. It provides for queries relating to the following:

**Patient related enquiries**

• Bed Allotment
• Admission Details
• Demographic Details
• Payment Details and
Discharge Details.

Doctor related enquiries

- Availability Details
- OP Clinic Details
- Appointment Schedules
- Operation Schedules and
- Charge Details

BILLING

The Patient Billing module handles all types of billing for long-term care. This module facilitates cashier and billing operations for different categories of patients like Outpatient, Inpatient and Referral. It provides automatic posting of charges related to different services like bed charges, lab tests conducted, medicines issued, consultant’s fee, food, beverage and telephone charges etc. This module provides for credit partly billing and can be seamlessly integrated with the Financial Accounting Module. The billing module is extensively flexible by which each of your billing plans can be configured to automatically accept or deny. The system is
tuned to capture room and bed charges along with ancillary charges based on the sponsorship category. The Billing Screen is used for In-patient and Outpatient Billing and Invoicing. Further more the charges for various services rendered can be recorded through service module and this can be used for billing purposes.

- Payment Modes / Details
- Sponsorship Conditions Details
- Patient Billing Details
- Package Installment
- Approval from Sponsor
- Company Sponsorship Details
- Package Registration
- Sponsor Verification
- Retroactive Processing
- User-defined Billing cycles
- Automatic Room and Board charges
- Recurring Ancillary charge capability
- Auto-generated Codes and Billing Criteria
- Provision for Pre-billing
- Extensive third-party Billing

The system supports multiple reports utilizing various print options with user-defined parameters.
FINANCIAL ACCOUNTING

The Financial Accounting Module deals with Cash/Bank, Receipt/Payments, Journal Voucher and General Ledger etc. Books like Cashbook, Bankbook and Ledger book can be generated. This module generates reports like Trial Balance, Balance Sheet and Profit and Loss statement. The Financial Accounting describe about the Account Payable, Account Receivable and General Ledger. Also describe the activities related to IP, OP, Bank related activities and provision to clearing the Supplier Invoice and keep track of the Account Receivable and Revenue related activities. The services that are covered by the sponsor companies, Insurance Agencies, Family Accounts, Individual Accounts, sponsorship details of the patient, Health Card Insurance are recorded in the system.

FIXED ASSETS

The Fixed Assets Module deals with all the activities that are related to the Fixed Assets Part of Financial Accounting.

This describes activities that are related to:
- Identifying an item as a Fixed Asset
- Allocating depreciation
- Managing its movement
- Maintenance
PAYROLL

The Payroll & Personnel module deals with Pay (and deduction) calculation, printing of salary slip, salary certificates, and PF statements, Gratuity Statement and provides a monthly analysis.

It deals with the maintenance of employee bio-data, Attendance / Overtime details.

It also reports on absenteeism, leave encashment etc. The Personnel & Payroll department is responsible to Employee Related Activities like appointing the staff, maintaining the employee database, Fixing allowances and deductions, Leave entitlements, Leave sanctions, Loan, Termination Process, Maintenance of Hospital documents, Insurance details, Tenancy Contracts and Vehicle Registration.
OUTPATIENT (OPD) MANAGEMENT

The Outpatient module serves as an entry point to schedule an appointment with the Hospital Resident Doctor or Consultant Doctor for Medical Consultations and diagnosis. This module supports doctors to take better and timely consultation decisions by providing instant access to comprehensive patient information. Patient visits are divided into New, Follow-up and Review. This module also handles requests and results of laboratory tests and other examinations. External Doctor’s visit to inpatients can be defined as "Call on". Some patients may avail only the hospital facilities like Lab, Radiology, Nuclear Medicine, and Physiotherapy and so on.

- Medical Alerts Details
- Consultation Duty Roster
- Diagnosis Details
- Triage Parameters
- Patient’s Appointments
- Daily / Weekly Schedule Summary
- Appointment Scheduling / Rescheduling Facility
- Outpatient Medical Observation Details
- Investigation / Treatment History
- Clinical Service Details
- Group / Package Registration Facility
- Common Billing Clinical Services
- Doctor’s Diagnosis Statistics
- Patient Diet Chart

Furthermore, Confidentiality of Doctor’s Observation, Previous History of Patients Visit, Online Prescription, Online Request for Investigations and so on are the special features in Doctors’ Observation screen. This system calculates the cost for the services rendered to the patient and reflects in the billing module appropriately resulting in smooth billing process. The diet module handles the diet requirements of the patient as well as the instructions to the kitchen for preparation of the diet. A distribution list is also prepared.
INPATIENT MANAGEMENT

The inpatient module is designed to take care of all the activities and functions pertaining to Inpatient Management. This module automates the day-to-day administrative activities and provides instant access to other modules, which leads to a better patient care. It provides comprehensive data pertaining to Admission of Patients & Ward Management. Availability of beds, Estimation, Agreement preparation, Collection of advance, Planned admission, Emergency admission and so on. The Inpatient module also deals with Ward Management: Shifting from one ward to the other, Bed availability, Surgery, Administration of drugs, nursing notes, charge slip and so on.

- Admission Cost Estimation
- Admission Approval
- Admission Request
- Doctor Transfer Details
- Nursing Notes
- IP Medical Observation
- Pending Drug Request
- Surgery Scheduling Details
- Discharge Notification Summary
- Expected Date and Time of Discharge
The module tracks every visit made by the patient and caters to follow-up visits of patients, along with multiple appointments.

**GENERAL STORE & INVENTORY**

General Stores and Inventory module deals with Purchase of Items, Issue of Items, Maintenance of Stock, Automatic Reorder level Setting, Online request for stock from various sub-stores, Online stock transfer, maintenance of stock at different sub-stores, Physical stock verification and adjustment, Return of items to supplier etc.

- Stock management
- Multi UOM and Multi currency system
- Stock control
- Stock Purchase through Enquiry generation
- Sub stores issues and receipt of stocks
- External hospital stock issues and receipt
- Option to include and track gift or donation of stock
- Stock requisitions from sub-stores and corresponding management
- Quotations and Purchase Requisitions
- Purchase order generation and processing- LPO, Emergency Purchase order, Principal and Blanket PO
- Advance payment requisitions to Finance
- Goods Receipt Note and Purchase returns
- Automatic stock updates on receipt of goods
- Stock returns and destruction tracking
- Invoice verification
- Supplier management and supplier payment bucket facility available
- Supplier invoice management

**LABORATORY**

The Laboratory module automates the investigation request and the process involved in delivering the results to the concerned department/doctor of the hospital. Laboratory module starts with receiving the online request from doctors and also allows laboratory personnel to generate requests.

The Laboratory module supports to perform various tests under the following disciplines:

- Biochemistry
- Cytology
- Hematology
- Microbiology
- Serology
- Neurology
- Radiology

Tests are grouped under various sections and sample type (specimen). Based on the request the user can input the sample and generate the sample number. Results can be entered based on the sample type either to one test or multiple tests. If the test result requires approval, the supervisor has to approve the result
and it is made available to the concerned doctors. The lab module handles requests for various tests and makes the results available after verification. Reports can also be prepared.

- Sample Result Entry
- Test Report Entry
- Specimen Association Details
- Antibiotic Details
- Result Range for Test
- Investigation Request
- Bulk Sample Request
- Sample Details
- Samples Received from External Laboratory
- Samples Dispatch to External Reference Laboratory

INVESTIGATION AND TREATMENT HISTORY
Test report can be made confidential. Tests can be performed only after the billing is done. This rule is exempted when the case is declared as Urgent. In addition, this module facilitates investigations for referral patients.

BLOOD BANK MAINTENANCE SYSTEM
The system keeps the track of blood bank. It will generate automated reports keeping track of inventory for stock of bloods for different blood group and their Expiry. The system will make it much easier for the user to keep track of different activities in the blood bank. The system will maintain a detail database of different blood donors according to their blood group. When a need will arise for a certain group of blood donors then the system will produce name and other contact details of the blood donors related to that particular blood group. It will make it easier to contact them in emergency situation.

SERVICE
The service module deals with all the services available in the hospital and the charges for these services are stored through this module. There are various services that are available in the hospital and these can be seen in:

SERVICE MASTER: This master gives the details about package details, Group detail.

ROOM TYPE MASTER: This gives the details about Room Type (e.g. Private, Semi-private, Deluxe, ICU, Suite etc) and their charges.

CONSULTATION CHARGE MASTER: This gives the details about Doctor and the charges (like new visit, Follow-up, Review and Call-on).
REVENUE TYPE MASTER: This gives the predetermined charges for various services given by the hospital (Like Ambulance, Anesthetists Fee, Baby Cot etc).

USER MANAGER

The User Manager module basically deals with security through controlling the access to the information available in the application. Any user associated with a user group can access only those screens for which the user group has rights. It also deals with the System Related Activity like User Monitor, Creating User Group Master, User Master and view the User Group Lookup of employee database, Maintenance of company documents, User defined error message, Generating Daily Statistical Summary.

HOSPITAL RECORD

- Delivery and Birth Record
- Death Record
- Copper –T Record
- Generator Record
- D & C /MTP Record

HOSPITAL REPORTS

The hospital management software provide faculty to view and print all kinds of medical reports from date to date. These reports are prepared automatically and accurately.

- Death
- Daily Register
- Indoor Register
- OT Register
- Ambulance Register
- Delivery Register
- Death Register
- Copper-T Register
- Generator Register
- D&C/MTP Register
- Cast wise summary
- Village wise summary
- Doctor wise summary
- Month wise summary
- Day wise summary
- Old Cash Register

SUMMARY TEST RESULT PRINTING

In the hospital management software we can generate and print the following test results.

- Serum chemistry test
- Serum chemistry test
- Seminal fluid test
- Stool test
• Hematology test  
• Thyroid function test  
• Urine test  
• Urine chemical  
• Serology test  
• Examination test  
• Sputum test  
• Pregnancy test

NEWS FORUM FOR FLASHING NEWS, ARTICLES AND IMPORTANT MEETINGS

The system will also provide a sort of 'Discussion Forum' to the users of the system through which they can communicate to each other. They can post articles and other important news related to their organization and field. They can convey important news to all the others in the organization through this channel.