Hospital Management System

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A PROJECT REPORT

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Department of Computer Applications

Bonafide Certificate

Certified that this project report titled **Hospital Management System** is the bonafide work of **Mr.Anup.T.A** who carried out the research under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

Project Guide

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Submitted for the University Examination held on 29/06/2006

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TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr.ANUP.T.A**, final year **MCA** student of **KUMARAGURU COLLEGE OF TECHNOLOGY** has successfully completed his projectwork titled **HOSPITAL MANAGEMENT SYSTEM** to our full satisfaction from 02nd January 2006 to 1st June 2006.

We appreciate his initiative and hard work during the project period.

We wish him all the best for his future endeavors.

For i-Tech Solutions.

M.Jayakumar
Project Manager

ABSTRACT

The project fully goes through the various process that are undertaken to manage a hospital and a detail study is done from the data acquired and information gathered. The system is being developed as per the demand of the organization and end user requirement needs.

This project entitled "Hospital Management System" developed in Visual basic and MS-Access was done for I-Tech Solution. The system helps to manage the overall activities of the hospital. It was designed keeping in mind today complex processing requirements. It easies various hospital management activites, supported by numerous report.

The project has been divided into seven modules such as:

- In-Patient
- Out-Patient
- Ward Management
- Room Management
- Doctor Management
- Billing
- Services

ACKNOWLEDGEMENT

I express my grateful thanks to our Principal, Dr.Joseph.V.Thanikal and former Principal, Dr.K.K.Padmanabhan, Kumaraguru College of Technology, Coimbatore, for giving me an opportunity to take up this project.

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CHAPTER 1

INTRODUCTION

1.1 PROJECT OVERVIEW

This project has been developed to control the over all activities of hospital. This system facilitates storage, retrieval, processing and reporting of all related data for hospital activity. With the help of the reports hospital management can know the performance of the hospital.

The hospital management system was developed to control the over all activities of the hospital. The system is used to computerize the over all activities of the hospital. It is designed keeping in mind today complex processing requirements. It helps to view each and every activity that has been taken place in the hospital. It easies various hospital management activities and supported by numerous reports. It helps for the future reference of the hospital.

The system maintains the records of Doctors, patients (Inpatient & Outpatient), Lab details, Room/ward details and Bill Details. Through this system we can easily view the required information in a particular category easily and quickly. It makes tedious work very easily. It contains various master modules and transaction modules. It mainly deals with different kinds of reports.

- Obtaining the final design.
- Coding the project.
- Testing the system.
- Implementing the project.

1.2 COMPANY PROFILE

I-Tech Solutions was incorporated in the year 1996 by Messer's K.Ravichandran and R.Suresh with the objective of providing total and quality solutions to industry and trade. I-Tech Solutions has more than 200 clients in various segments like Engineering, Textiles, Health Care, Finance, Cement, Paper, Sugar, Automobiles and Trading.

Currently I-Tech Solutions is operating at SEI Capability Maturity Level-II and pursuing towards capability maturity Level-III. The current thrust areas are Internet / Intranet solutions and Client Server Technology.

I-Tech Solutions has implemented and established various business application systems for several environments.

I-Tech Solutions has a dedicated team of technical staff besides 3 administrative staff. The combined professional experience of the technical team is over 100 man-years. There are two Pentium based servers at I-Tech Solutions.

CHAPTER 2

SYSTEM STUDY AND ANALYSIS

2.1 PROBLEM STATEMENT

Aim is to develop a flexible and fast response system which provides the benefits of elegant operation, enhanced administration & control, superior patient care, cost control & improve the profits of a hospital.

2.2 EXISTING SYSTEM

The existing system is a manual one where all the details of operations in the hospital are entered into different registers which are maintained for the purpose. The hospital employs a non-standardized approach to maintain Patient Details, Managing the Wards, Scheduling Appointments, providing adequate service to the patients, etc.

2.3.1 Drawbacks of the Existing System

The drawbacks of the existing systems can be summarized as below:

- Time Consuming.
- Data Redundancy.
- Data Inconsistency.

2.4 PROPOSED SYSTEM

The objective of implementing the proposed system is to reduce the overhead incurred by the employees of the hospital and to make the whole process simple and efficient. It has been decided that the proposed system will have computerized entry for all the operations carried out in the hospital.

2.4.1 Advantages of the Proposed System

The expected benefits of the Proposed System are as follows:

- Intuitive and easy to use.
- Flexible and scalable.
- Easy and quick implementation.
- Data from a single source ensuring integrity.
- Various reports can be generated as per the requirement.
- Data Standardization.
- Improved decision making.
- Retrieval of historical patient records will be much simpler

2.5 FEASIBILITY ANALYSIS

Feasibility analysis is the measure of how beneficial or practical the development of Information System will be to the Organization. Once the problem is explained information is gathered about the system to test whether the system is viable

2.5.1 Technical Feasibility

Technical Feasibility is the measure of practicality of a specific technical solution and the availability of technical resources and expertise. It centers on the existing computer system (hardware, software, etc.) and to what extent it can support the new addition.

The proposed system is to be developed using Visual Basic and MS Access 2003 as the back-end. These resources are already available with the organization along with the hardware resources that might be needed for the proposed system. Hence technically the system is feasible.

2.5.2 Operational Feasibility

Operational Feasibility asks if the system will work when it is developed and installed. It checks for the support of the management, the current business methods, user's involvement and their attitude towards the proposed system, etc.

The proposed system has found encouraging support from the management as it will be of great use to them. The employees of the organization are also committed to have the system operational as it will save time and reduce their workload. Also since the Doctors can have easy access to patient information they are very much in favor of implementing the system.

The proposed benefits of the system will outweigh the costs to be incurred during system developed since the system does not require procurement of additional hardware facilities it is economically feasible. In addition capability of the system to incorporate future enhancement will improve the performance to suit the future need of the hospital.

2.6 USERS OF THE SYSTEM

The users of the proposed Hospital Management system have been categorized as below and each of the user categories will have a set of rights which manage their use of the proposed system.

- Administrators
- Receptionists
- Doctors
- Office Staff
- Lab In charge
- Cashier

Administrator is authorized to make changes to all data available in the system, add users, remove users and assign permissions to each user. Administrator is a staff with a superior rank. The administrator can change the overall appearance of the system.

Doctors use the system to view patient details and the history of the patients along with their appointments for the day. Also they can enter the prescriptions and the next appointment schedule of the patient.

Office staff enters general configuration details regarding the hospital which include number of rooms, beds, doctors and their specialty etc.

Lab in charge use the system to enter details regarding the various services offered to the patients.

Cashier generates bills and enters bill payment details.

CHAPTER 3

DEVELOPMENT ENVIRONMENT

3.1 HARDWARE SPECIFICATION

Processor	:	Pentium IV
RAM	:	Minimum 256 MB
Hard Disk	:	20GB or more
Monitor	:	SAMTRON 56 V(SVGA)
Keyboard	:	107 Keys
Mouse	:	Logitech scroll mouse
Floppy Drive	:	1.44 MB

3.2 SOFTWARE REQUIREMENTS

Language	:	Visual Basic 6.0.
Operating System	:	Windows XP
Front End	:	Visual Basic 6.0

3.3 PROGRAMMING ENVIRONMENT

3.3.1 Visual Basic 6.0

Visual basic is a powerful programming system for developing sophisticated, graphical applications for Microsoft windows environment. Its productivity has been enhanced by adding of a complete set of tools to simplify rapid application development.

"Visual" refers to the method used to create the graphical user interface (GUI) that the user illustrations, rather than writing numerous lines of code to describe the appearance, function and location of interface elements. "Basic" refers to the BASIC Programming language, a widely preferred language by many programmers for its simplicity. Visual Basic has evolved from the original BASIC language and now contains several hundred statements, functions, and keywords, many of which relate directly to the windows GUI.

Visual Basic 6.0 introduces us to the new world of Active X technology, an unique way harness the internet. Visual Basic offers many salient features to aid in the development of full – featured applications including:

- Data access functionality allows creating of front-end applications that can work on most of the popular database systems.
- Active X technology allows usage of the functionalities provided by other

3.3.2 MS-Access

Microsoft Access is a powerful relational database application with which a desktop user can efficiently create and manipulate database systems. Access offers a similar appearance and functionality to that found in the popular Microsoft Word and Excel applications. For general business users, Access provides easy-to-use wizards throughout, such as the Database Wizard for getting up and running quickly, and the simple Query Wizard for easily finding information from the data base. More advanced users appreciate the power behind the Microsoft Visual Basic for Applications (VBA) programming language, programmable toolbars, and the freely distributable run-time version of access available with the Office Developer Edition. The combination of ease of use and power in Access makes it the top choice among developers who frequently use Access as a front end to SQL Server in a client-server scenario.

Access has two major components. The first contains an application development environment for Visual Basic Applications programmers that include forms technology, reports, and database administration.

The second component in Access, and the main topic of this paper, is the data engine. Before Access 2000, users and developers were using the Jet data engine, whether they knew it or not.

There are different types of database management systems like Oracle, SQL-server,

CHAPTER 4

SYSTEM DESIGN AND DEVELOPMENT

4.1 ELEMENTS OF DESIGN

System Design is the most creative and challenging phase in the development of a software system. Design implies to a description of the final system and the process by which it is developed. The first step is to determine what input data is needed for the system and then to design a database that will meet the requirements of the proposed system. The next step is to determine what outputs are needed from the system and the format of the output to be produced.

During the design of the proposed system some areas where attention is required are:

- What are the inputs required and the outputs produced?
- How should the data be organized?
- What will be the processes involved in the system?
- How should the screen look?

The steps carried out in the design phase are as follows:

- Modular Design
- Input Design

4.1.1 Modular Design

It is always difficult for any System Development team to grasp a system without breaking it into several smaller systems. These smaller systems will be a part of the original system yet they will be independent in the sense that they will incorporate within them the major functionalities of the proposed system.

A software system is always divided into several subsystems which make it easier to develop and perform tests on the whole system. The subsystems are known as the modules and the process of dividing an entire system into subsystems is known as Decomposition.

The modules identified for the proposed Hospital Management System are as below:

- In-Patient
- Out-Patient
- Ward Management
- Room Management
- Doctor Management
- Billing
- Services

In-Patient

This module is concerned with In-Patients alone. In this module we capture Patient

Out-Patient

This module is concerned with Out-Patients alone. In this module we capture Patient Details, Search Patient History, schedule Appointments with doctors and schedule any services required by them.

Ward Management:

This module is concerned with managing the wards. In this module we allocate patients to respective wards and allot beds to them we can also query for free beds for allotment.

Room Management

This module is for patients who prefer to have rooms instead of wards here we can allot rooms to the patients as per their needs, we can also search for details of room. Services availed by the patient such as telephone charges, extra bed etc., are entered here.

Doctor Management

This module captures the details about the Doctors who are working in the Hospital. Here we enter the Schedules of the Doctors based on which patients are allotted appointments with them.

Services

This module tracks all the services available in the Hospital. Here we can schedule services for respective patients who require them. These services include Laboratory services, Scan services, Physiotherapy, Diet control etc.

4.1.2 Input Design

The input design is the process of converting the user-oriented inputs into computer-based format. The goal of designing input data is to make sure that the automation is easy, logical and free from errors.

The input design requirements such as user friendliness, consistent format and interactive dialogue which provide users with timely help and correct messages are given high priority.

The input forms of the Setup module are as below:

- User Login Form
- Doctor Details Entry Form
- Medical Services Entry Form
- Patient Details Entry Form
- Doctor Appointment Entry Form
- Services Appointment Entry Form

The User Login form is used by the various users of the system and the system restricts access to the data based on the type of user logged in.

The Doctor Details form allows us to provide a unique identification number to the doctor and enter all the details about him.

The Medical Services entry form allows us to enter the details regarding the services that are available with the Hospital. This entry is made once and further additions are made only if any new services are installed at the hospital.

Patient Details entry form captures the details of both in-patients as well as out-patients. Both the category of patients has separate set of forms at their disposal.

Doctor appointment form allows the user to schedule appointments for the patients with Doctors they intend to meet. The form also has the provision of canceling the appointment if needed.

Services appointment form allows the user to allocate the respective services to the patients when needed. This is done so that the patients do not undergo any inconvenience in utilizing the services.

Treatment details entry form allows the doctors to enter the details regarding the treatment carried out on the patients this allows the doctors to view the historical records of the patients whenever needed for further prescription.

Doctor Scheduling form allows the user to schedule the time during which the doctor will be available in the hospital for attending to his patients. This is done so that appointments can be provided to the patients who wish to meet the doctor.

Room management allows us to enter the details of the allotment of rooms to the patients.

Ward Management allows us to allot a patient to a particular ward and allot a bed in that ward to the patient.

4.1.3 Output Design

The output screens contain data in data grids. The contents of the grid can easily be printed out as provisions are provided for them. The various output screens generated are:

- Doctor Details View
- Medical Services View
- Patient Details View
- Doctor Appointment View
- Services Appointment View
- Treatment Details View
- Bill Details View
- Doctor Scheduling View

Patient details form helps to show both In Patient and Out Patient details and also to search for particular patient details.

Doctor Appointment View form helps to view particular doctor's appointment schedules.

Service Appointment View form helps to show Appointments for Particular Medical Services.

Treatment Details view form helps to show the treatment given for each out patients.

Bill details view form helps to show the bill offered to in-patients and out-patients. It shows the Doctor charges, hospital charges, service charges, for each patient.

Doctor Schedule View form helps to show the schedule details of each doctor.

Room/ward detail view form helps to give information about rooms and wards. It shows the availability of rooms and wards and shows which room/ward occupied by which patient.

4.1.4 Database Design

A database is a collection of inter-related data stored with minimum redundancy to serve many users quickly and efficiently. The general objective of database design is to make the data access easy, inexpensive and flexible to the users. An elegantly

The tables are normalized so that they can provide better response time, have data integrity, avoid redundancy and be secure.

The tables for the Hospital management system have been normalized up to the Third Normal Form (2NF).

4.2 TABLE STRUCTURE

Table 4.1: Doctor Details

Column Name	Data Type	Key	Allow Nulls
Doctor_ID	Text	Primary Key	-
Doctor_FName	Text	-	-
Doctor_LName	Text	-	-
Doctor_Sex	Text	-	-
Doctor_HPhone	Number	-	Allows
Doctor_MPhone	Number	-	Allows
Doctor_Address	Text	-	-
Doctor_Qualfication	Text	-	-
Doctor_Specialization	Text	-	-
Doctor_Type	Text	-	-
Doctor_VCharge	Number	-	-
Doctor_Notes	Text	-	Allows

Table 4.2: Doctor Schedule

Column Name	Data Type	Key	Allow Nulls
Doctor_ID	Text	Foreign Key	-
Doctor_In	Date/Time	-	-
Doctor_Out	Date/Time	-	-
Doctor_AvaiDate	Text	-	-
Schedule_Notes	Text	-	Allows

Table 4.3: Out Patient Details

Column Name	Data Type	Key	Allow Nulls
Patient_ID	Text	Primary Key	-
First_Name	Text	-	-
Last_Name	Text	-	-
Gender	Text	-	-
Address	Text	-	-
Telephone	Number	-	Allows
Notes	Text	-	Allows

Table 4.4: Out Patient Treatments

Column Name	Data Type	Key	Allow Nulls
Patient_ID	Text	Foreign Key	-

Table 4.5: In Patient Details

Column Name	Data Type	Key	Allow Nulls
Patient_ID	Text	Primary Key	-
Patient_FName	Text	-	-
Patient_LName	Text	-	-
Patient_DOB	Date/Time	-	-
Patient_Sex	Text	-	-
Patient_HPhone	Number	-	Allows
Patient_MPhone	Number	-	Allows
Patient_Address	Text	-	-
Patient_Height	Number	-	-
Patient_Weight	Number	-	-
Patient_Blood_Group	Text	-	-
Patient_Notes	Text	-	Allows

Table 4.6: Admission Details

Column Name	Data Type	Key	Allow Nulls
Admission_ID	Text	Primary Key	-
Patient_ID	Text	Foreign Key	-
Guardian_ID	Text	Foreign Key	Allows
Room_Ward_ID	Text	Foreign Key	-

Table 4.7: In Patient Discharge

Column Name	Data Type	Key	Allow Nulls
Discharge_ID	Text	Primary Key	-
Admission_ID	Text	Foreign Key	-
Discharge_Date	Date/Time	-	-
Discharge_Time	Date/Time	-	-

Table 4.8: Services Details

Column Name	Data Type	Key	Allow Nulls
Service_ID	Text	Primary Key	-
ServiceName	Text	-	-
Duration_Of_Service	Number	-	-
Charge_For_Service	Number	-	-
Service_Notes	Text	-	Allows

Table 4.9: Service Schedule Details

Column Name	Data Type	Key	Allow Nulls
Service_ID	Text	Foreign Key	-
Service_Starts	Date/Time		

Table 4.10: In Patient Services

Column Name	Data Type	Key	Allow Nulls
AdmissionID	Text	Foreign Key	-
Hospital_Service_ID	Text	Foreign Key	-
Service_Date	Date/Time	-	Allows
Service_Time	Date/Time	-	Allows
Discount	Number	-	-
Total	Number	-	-

Table 4.11: Doctor Appointment

Column Name	Data Type	Key	Allow Nulls
Appointment_ID	Text	Primary Key	-
Patient_ID	Text	Foreign Key	-
Doctor_ID	Text	Foreign Key	-
Appointment_Date	Date/Time	-	-
Appointment_Time	Date/Time	-	-

Table 4.12: Service Appointment

Column Name	Data Type	Key	Allow Nulls

Table 4.13: Room Details

Column Name	Data Type	Key	Allow Nulls
Room_ID	Text	Primary Key	-
Room_Type	Text	-	-
Room_Desc	Text	-	Allows

Table 4.14: Ward Details

Column Name	Data Type	Key	Allow Nulls
Ward_ID	Text	Primary Key	-
Ward_Name	Text	-	-
Ward_Rate	Number	-	-
Ward_Desc	Text	-	Allows

Table 4.15: Bed Details

Column Name	Data Type	Key	Allow Nulls
Bed_ID	Text	Primary Key	-
Room_Ward_ID	Text	Foreign Key	-
Available	Number	-	-
Admission_ID	Text	Foreign Key	-
Bed_Desc	Text		Allows

Table 4.16: Appointment Bill

Column Name	Data Type	Key	Allow Nulls
Appointment_Bill_ID	Text	Primary Key	-
Appoinment_ID	Text	Foreign Key	-
Bill_Date	Date/Time	-	-
Appointment_Charge	Number	-	-
Grand_Total	Number	-	-
Discount	Number	-	-
Net_Value	Number	-	-

Table 4.17: In Patient Bill

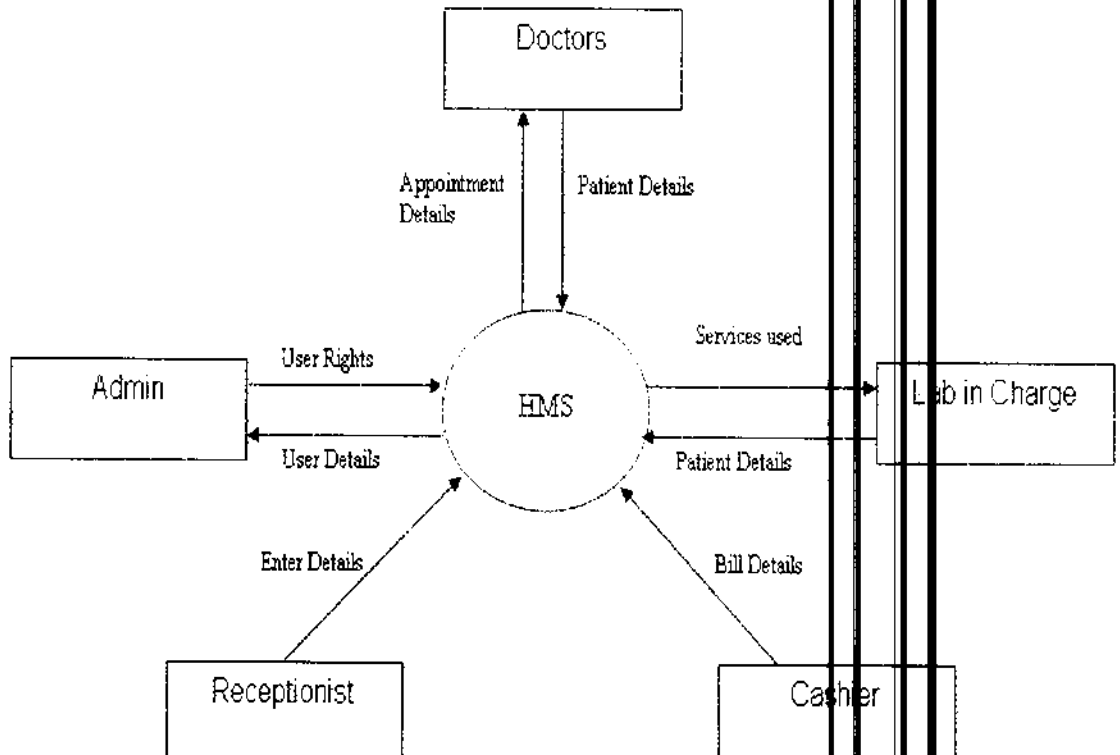
Column Name	Data Type	Key	Allow Nulls
Patient_Bill_ID	Text	Primary Key	-
Admission_ID	Text	Foreign Key	-
Doctor_Charges	Number	-	-
Services_Charges	Number	-	-
Room_Charges	Number	-	-
Hospital_Charges	Number	-	-

Table 4.18: Service Appointment Bill

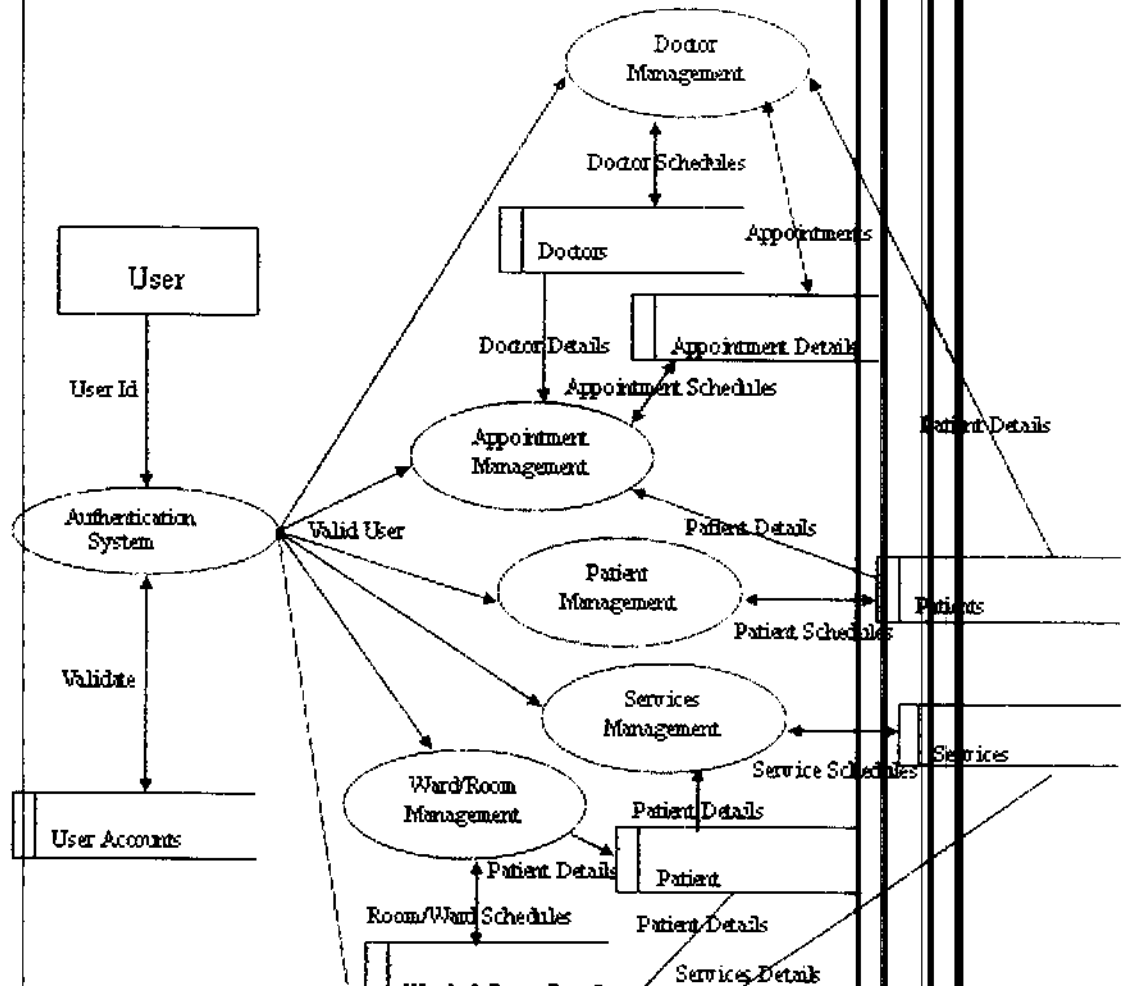
Column Name	Data Type	Key	Allow Nulls
Appointment_Bill_ID	Text	Primary Key	-
Appoinment_ID	Text	-	-
Bill_Date	Date/Time	-	-
Appointment_Charge	Number	-	-
Net_Value	Number	-	-
Discount	Number	-	-
Grand_Total	Number	-	-

4.3 DATA FLOW DIAGRAMS

Data flow diagrams are graphical representation depicting information regarding the flow of control and the transformation of data from input to output. The DFD may be used to represent the system or software at any level of abstraction. In fact, DFD can be partitioned into levels. A Level 0 DFD called Context Level Diagram represents the entire software system as a single bubble with its interactions. As we go further into the levels the



The Level 1 DFD will explain the major modules in the whole system i.e., how the data flow between each of these modules. The flow from once a user logins to entering measurement criteria, entering data, conducting reviews, audits etc., is shown in level 1 of the data flow diagram. The interaction of each process with the corresponding tables is also shown.



Level 2 of DFD shows the detailed processing in these modules. The setup module has been depicted in the Level 2 of the DFD starting from Perspective processing to entering of strategic initiatives.

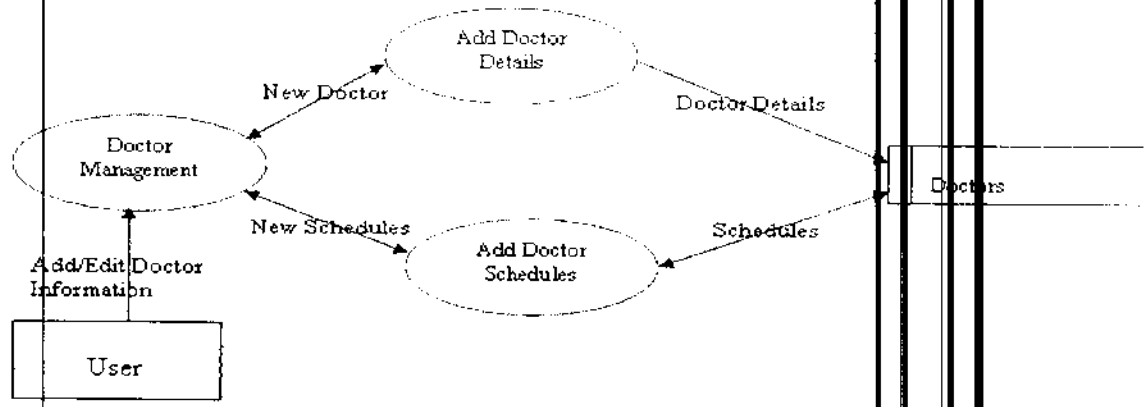
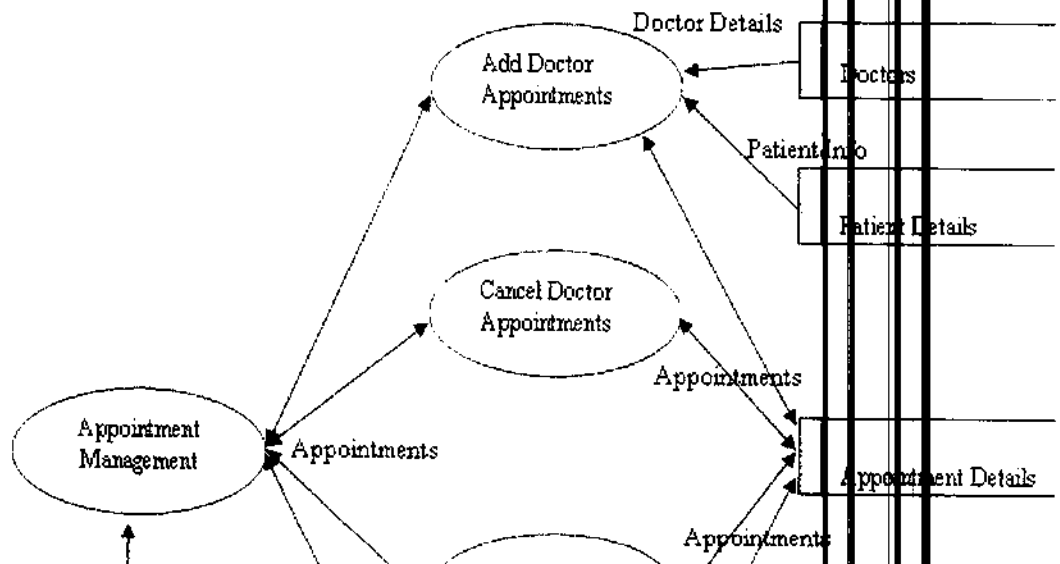


Figure 4.3: Level 2 Doctor Management Module Diagram



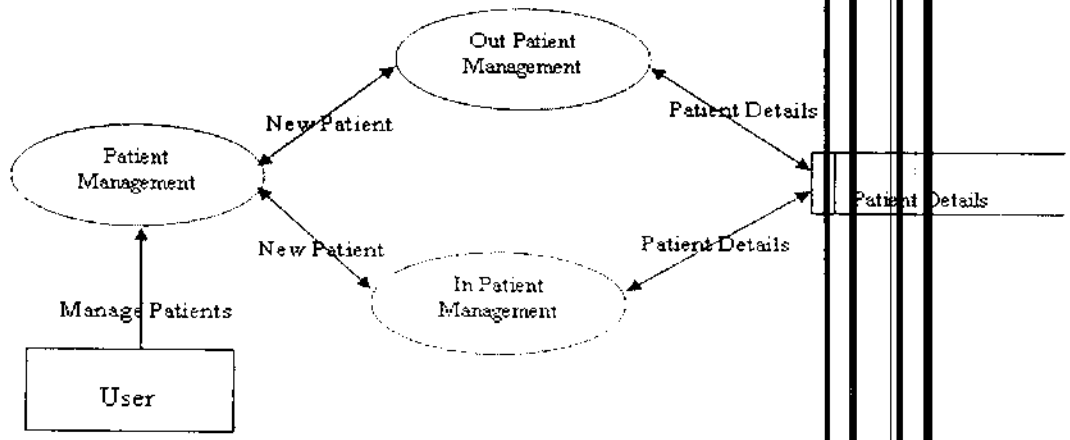


Figure 4.5: Level 2 Patient Management Module Diagram

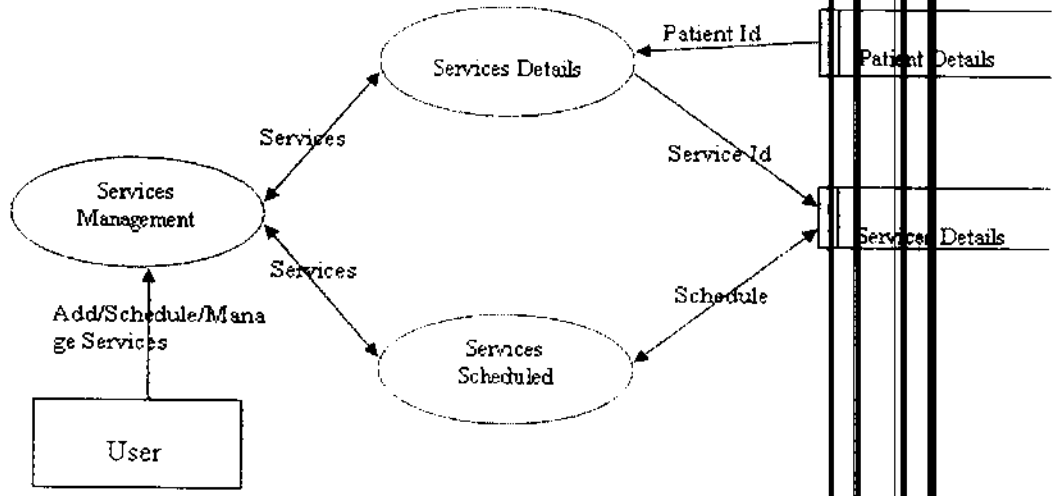


Figure 4.6: Level 2 Service Management Module Diagram

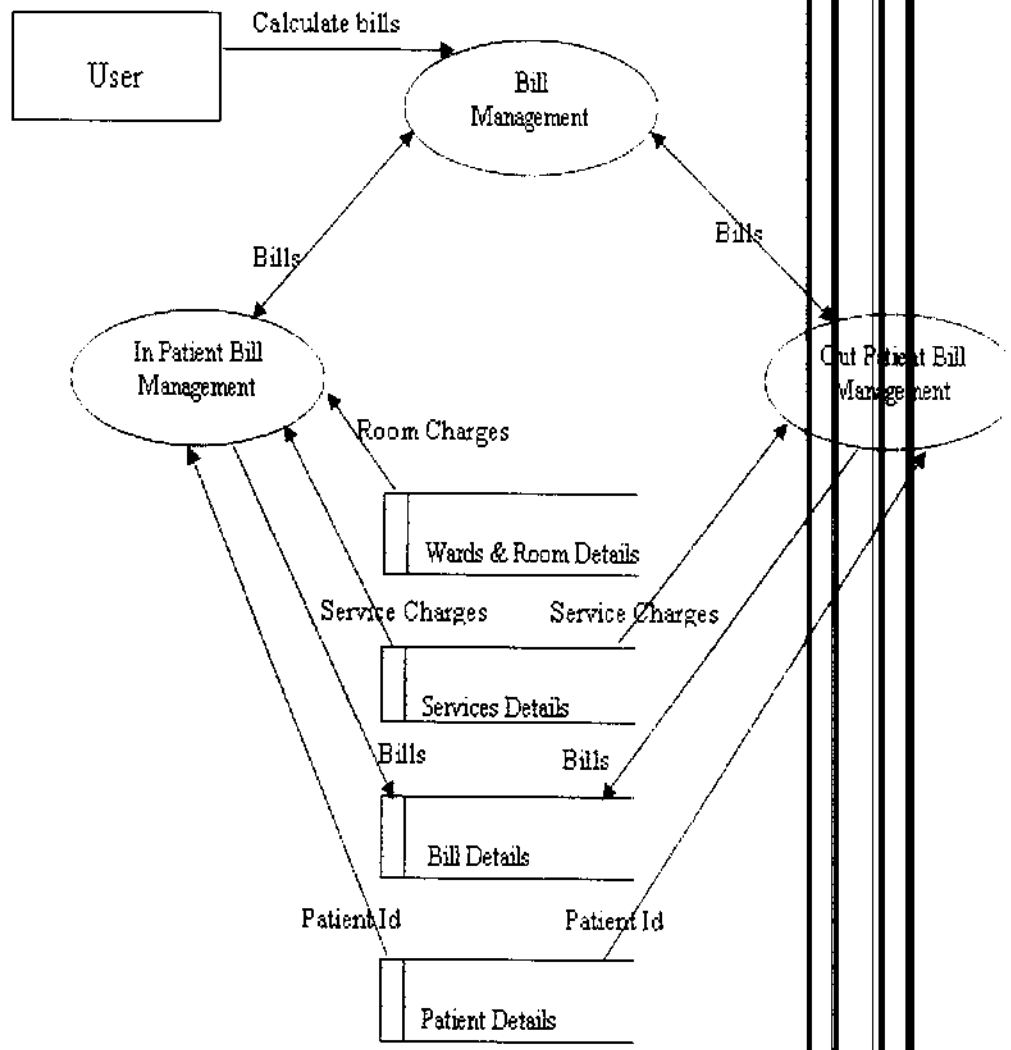


Figure 4.8: Level 2 Bill Management Module Diagram

CHAPTER 5

IMPLEMENTATION

System Implementation is the part of the software engineering life cycle, where, the design artifacts are converted to a working application. Coding is done in this stage using an apt framework and programming language, which would solve the specific problem the best way. Once the design is coded into a working application, it has to be verified, validated and tested in detail. The tested product if successful is deployed in the user environment.

5.1 SYSTEM VERIFICATION

System Verification includes the review of interim work steps and interim deliverables during a project to ensure they are acceptable. Verification also determines if the system is consistent, adheres to standards, uses reliable techniques and prudent practices, and performs the selected functions in the correct manner. In data access, it verifies whether the right data is being accessed, in terms of the right place and in the right way.

For e.g., the drop downs gather data from the database, so each dropdowns should be verified whether they are bound to the correct database field. It is done during development of the key artifacts. Verification is a demonstration of consistency,

5.2 SYSTEM VALIDATION

Validation checks whether the developer is moving towards the right product, whether the development is moving towards the actual intended product that was agreed upon in the beginning. Validation also determines if the system complies with the requirements and performs functions for which it is intended and meets the organization's goals and user needs. It is traditional and is performed at the end of the project. In data access, it checks whether we are accessing the right data, in terms of data required to satisfy the requirement.

Functional validation is done in HMS to check whether each of the functions is done correctly as expected in every page. Each control in a Screen is designed to do some function. These functions are checked against the requirements stated for them. For e.g., clicking 'Update' button should take the corresponding action of updating the details in the database. Clicking the Edit icon should allow one to edit the contents that are being currently displayed. This level of validation can continue to all the controls in the system. This checking is usually done after the system is developed so that all activities that are affected can be checked.

Field level validation is done in HMS to check whether each of the fields either accepts the data as expected and do the client side validation of data entered. For e.g. a field level validation on a text box would check against the type of data entered and follow rules such as length of entry, data type etc.

5.3 TESTING

Testing is a critical element of software quality and assurance and represents the ultimate review of specification design and coding. It is a vital activity that has to be enforced in the development of any system. This could be done in parallel during all the phases of system development. The feedback received from these tests can be used for further enhancement of the system under consideration. The testing phase conducts test using the Software Requirement Specification as a reference and with the goal to see whether the system satisfies the specified requirements.

Standard procedures have been followed in testing HMS. Test cases are generated for each screen. These test cases will cover every possibility which could result in both positive and negative results. These test plans are maintained for any further testing done on the system. The test plan stores information such as, the test script/input, expected output, actual output, comments and the name of the tester. This plan will be followed for all types of testing done in the system.

The main types of tests carried out on HMS are:

- Unit Test
- Integration Test
- System Test

5.3.1 Unit Testing

Module or Unit Testing is the process of testing all the program units that [illegible]

a page, each control is further tested in unit testing. The process is done in all the pages of the system. Once the errors are rectified, the testing procedure is repeated with same test cases to ensure this hasn't produced new errors. Hence this is a continuous process.

5.3.2 Integration Testing

Integration testing tests the process of integrating the various modules to form the completed system. Integration starts with a set of units each individually tested in isolation and ends when the entire application has been built. Integration testing verifies that the combined units function together correctly. It facilitates in finding problem that occur at interface or communication between the individual parts.

HMS followed bottom-up integration testing. Modules from the bottom most level are taken up individually, tested, integrated, and again tested. For e.g. The Doctor Details Entry screen is tested first, then 'Search Doctor' screen is tested. Then they are integrated together and again tested. The Doctor whose details are added in the first page should be properly displayed when searched in the 'Search Doctor' page. This indicates proper flow of information in the project module. The same procedure is followed in other modules in the same level at first. Then the upper level is taken into action. The flow of data through the whole module in the upper level is taken and executed. A change of data made in one screen should have reflected in all other screens.

This process is continued from the page level to module level, finally to the system

5.3.3 System Testing

System testing is actually a serious of different tests, whose primary purpose is to fully exercise the computer-based system. This helps in verifying that all the system elements have been properly integrated and perform the allocated functions. It verifies the entire product after having integrated all software and hardware components, and validates it according to the original project requirement. The system testing takes into consideration the hardware, and the software. That is, HMS should be able to be run on the specified hardware for variety of cases. The HMS is tested against recovery from errors.

5.3.3.1 Security Testing

Security testing is important in system testing. The system in no way shall be accessible to unauthorized users. Testing is done to ensure that a user with respective rights can only view the HMS and if users try to perform something beyond his assigned rights corresponding messages should be displayed. The HMS in such cases redirects the user back to the main entry page in such a case.

Another security issue involves the sensitive data in the system. The system is highly secure with access provided only to the administrator for highly secure data.

One more level of security is concerned with user rights. Each user is assigned specific rights which restrict his control over the usage of HMS.

CONCLUSION

The Hospital Management system has been developed in such a way as to satisfy all the needs of the Management.

The system provides features which make it easier for the user of the system to work with it while providing them with a good interface.

The system computerizes all the operations in the hospital right from entering the details of a patient to generating bills. It also has provisions to backup data by a single click thus, making it easy to store data at various places.

The system has been developed in such a way that there is future scope of improvement by adding modules that take care of the pharmacy operation as well as manage the payment of employees of the organization.

The system comes with security features and provides provision for the user to change the appearance, use a calculator, take notes etc, thus making the system useful in a number of situations.

Appendix

Fig A.1 Login Screen:

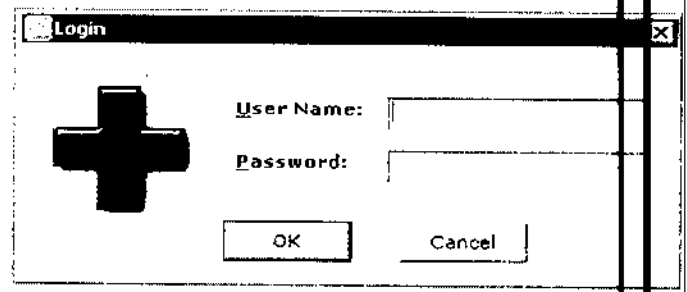


Fig A.2 Main screen:

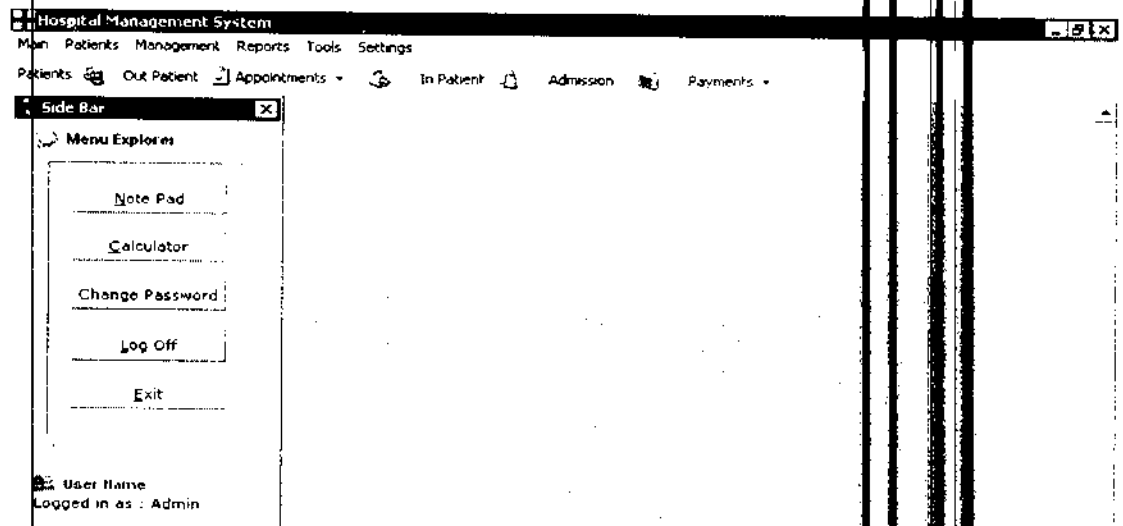


Fig A.3 Add doctor Screen:

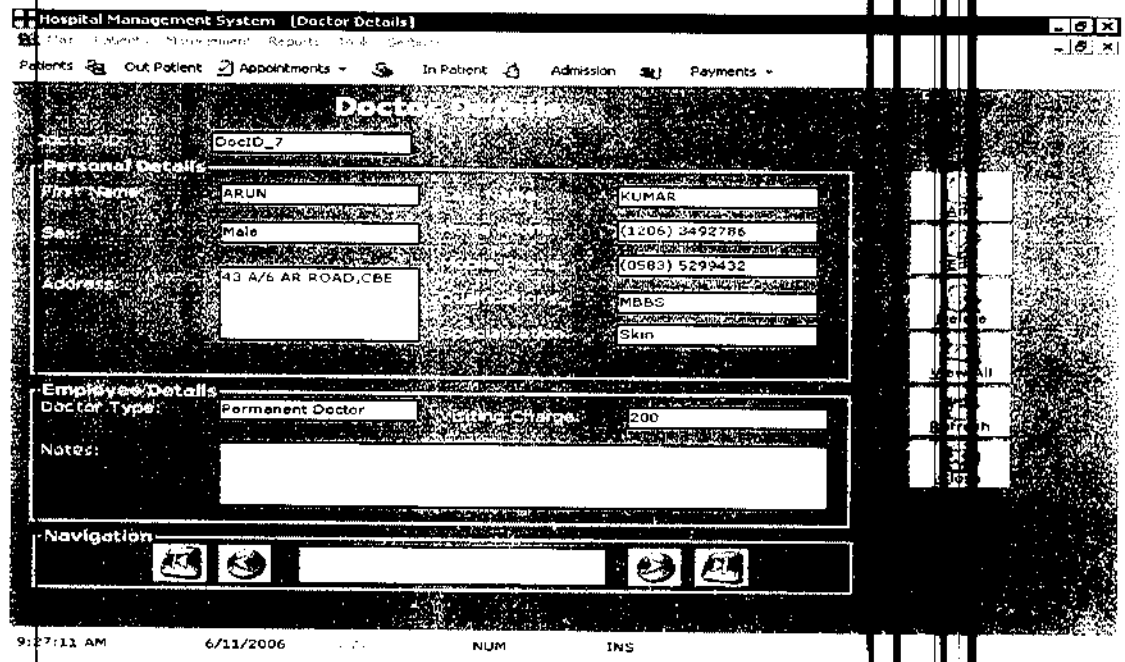


Fig A.4 Add Medical Services Screen:

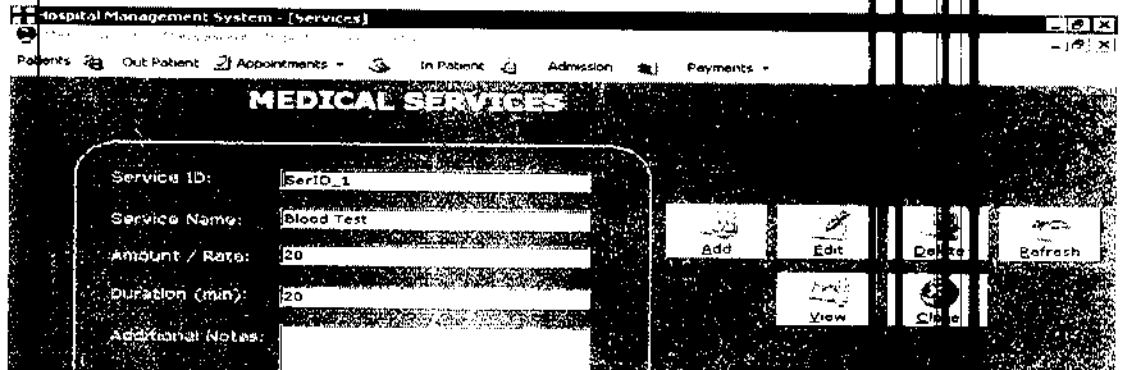


Fig A.5 Add Out patients Screen:

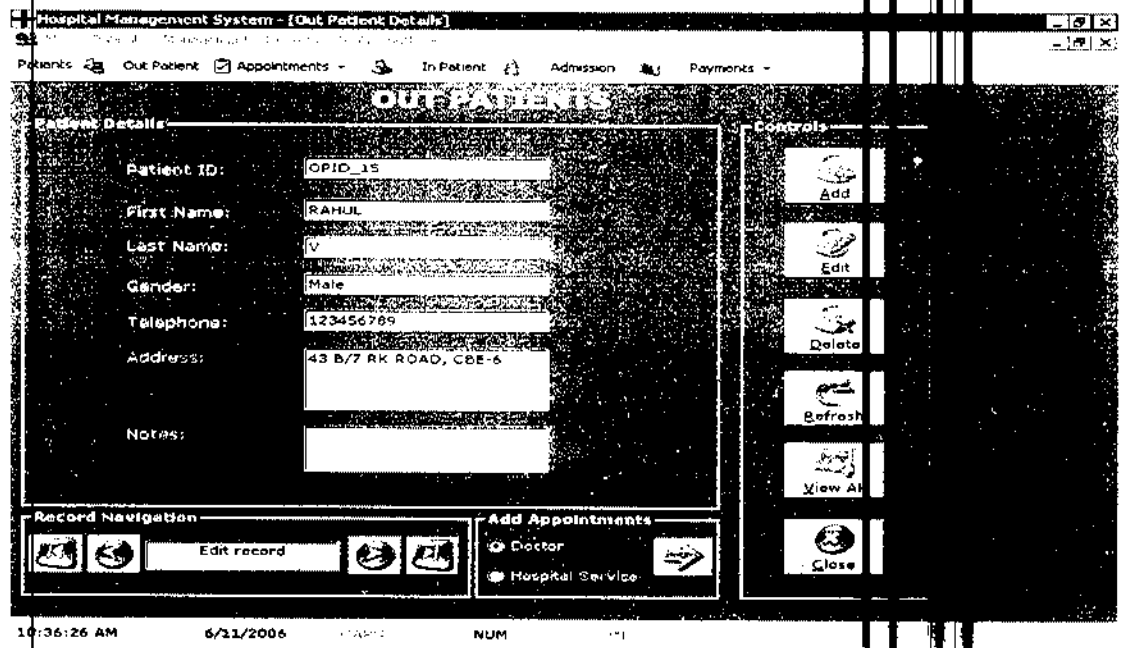


Fig A.6 Add Doctor Appointment Screen:

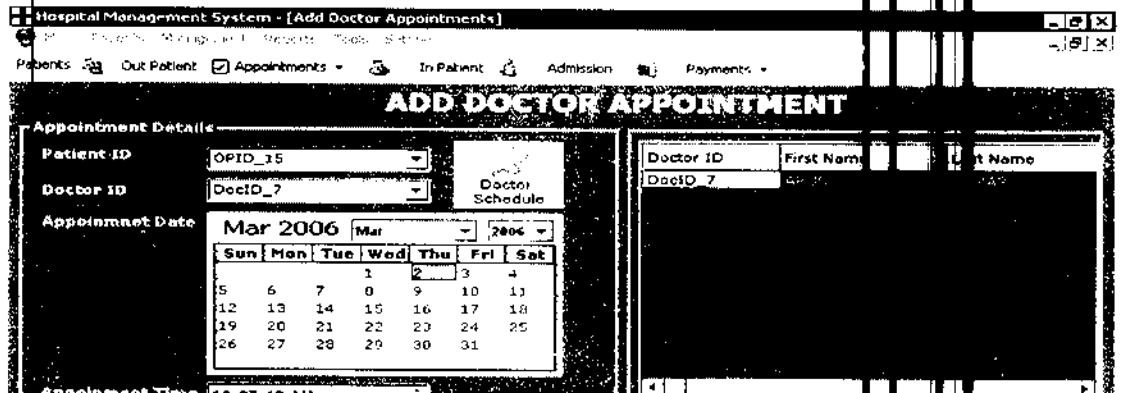


Fig A.7 Add Hospital Service Appointment Screen:

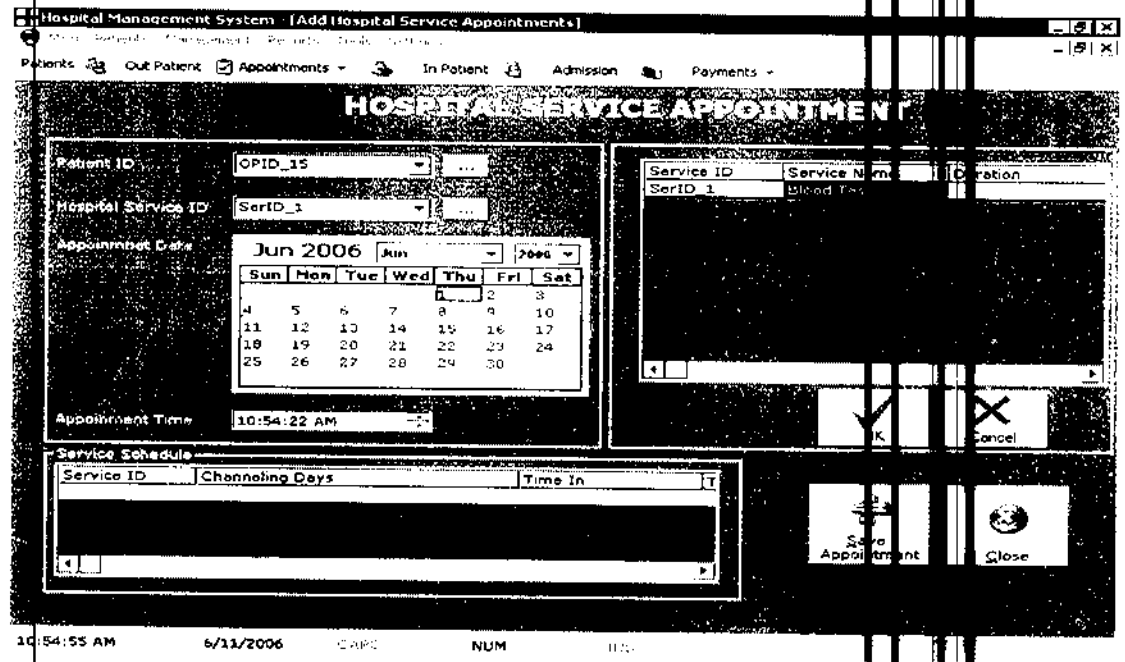


Fig A.8 Add Out Patient Treatment Screen:

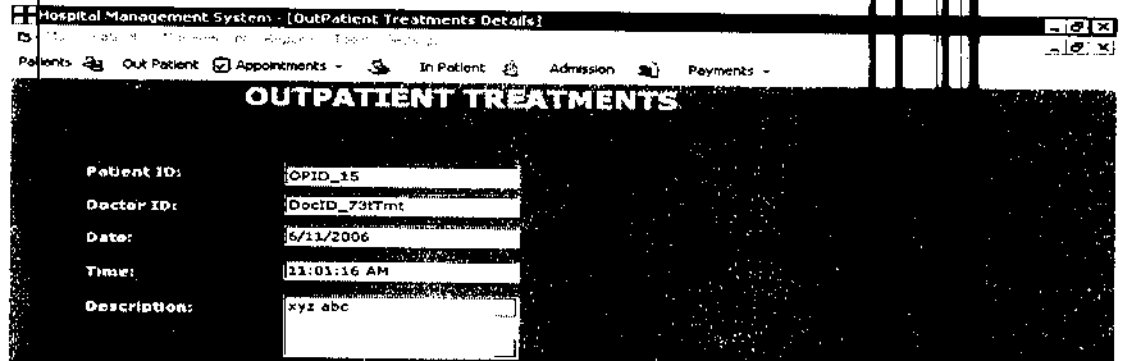


Fig A.9 Out Patient Doctor Appointment Bill Payments Screen:

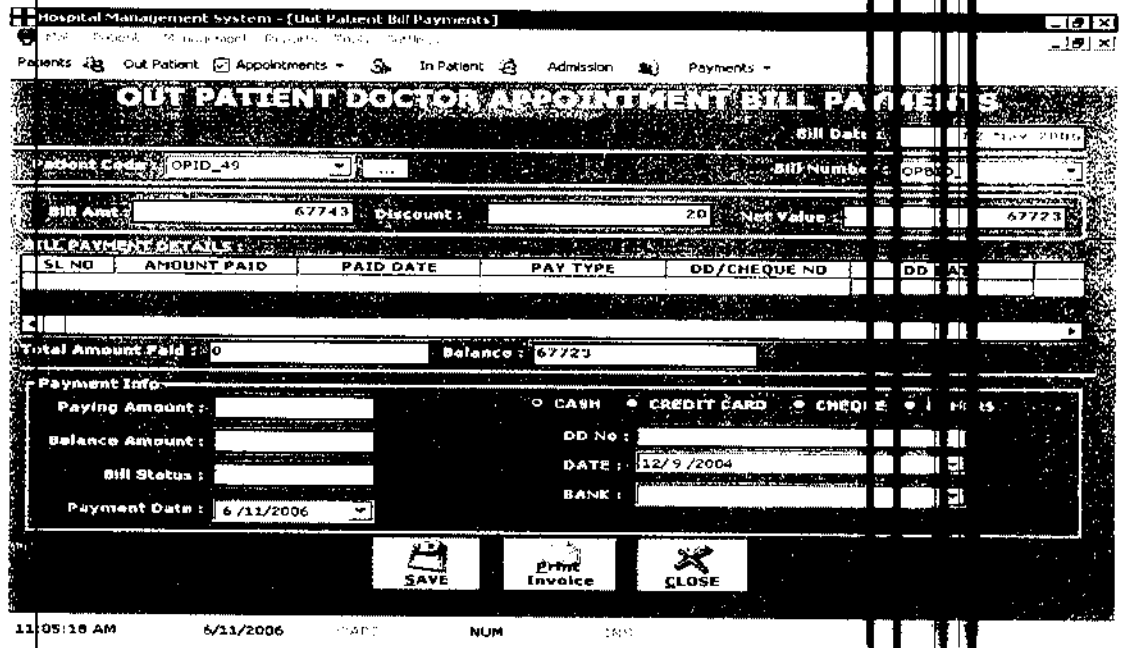


Fig A.10 Out Patient Medical Service Appointment Bill Payments Screen:

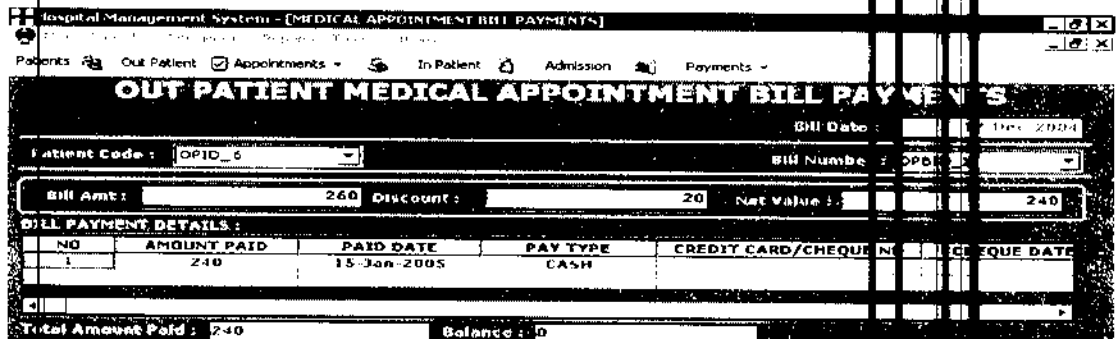


Fig A.11 Add In patient Screen:

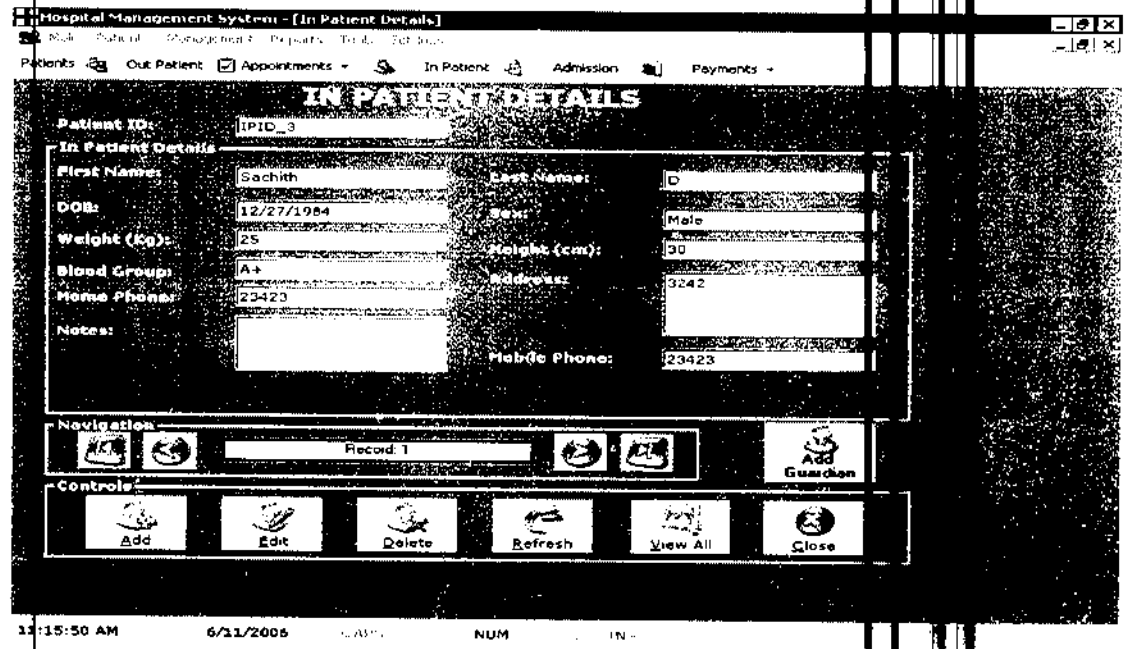


Fig A.12 Add Admission Screen:

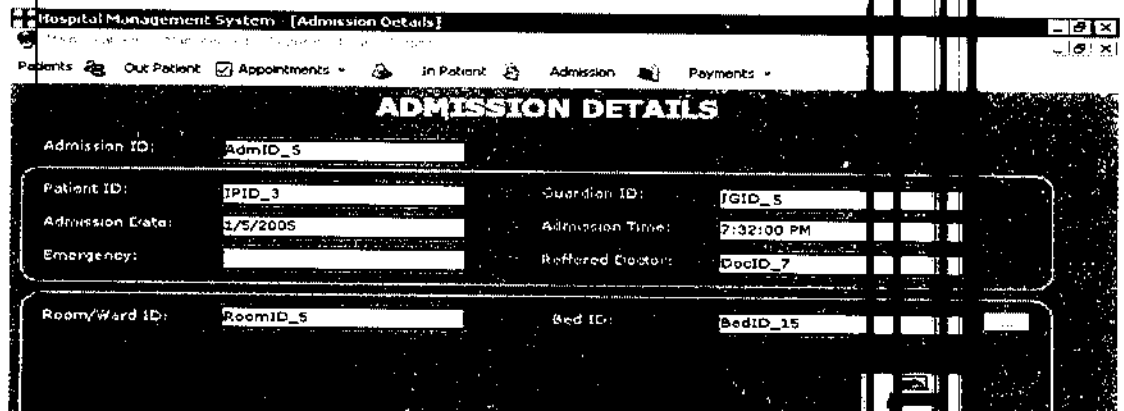


Fig A.13 Add In Patient Hospital Service Screen:

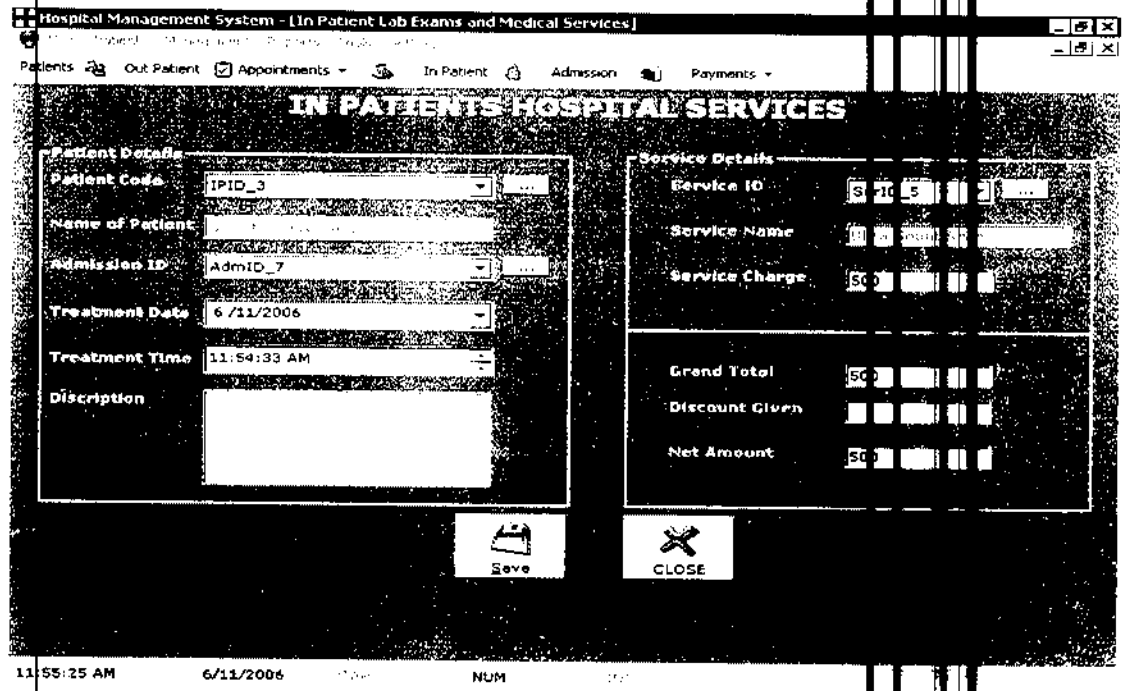


Fig A.14 In Patient Discharge Screen:

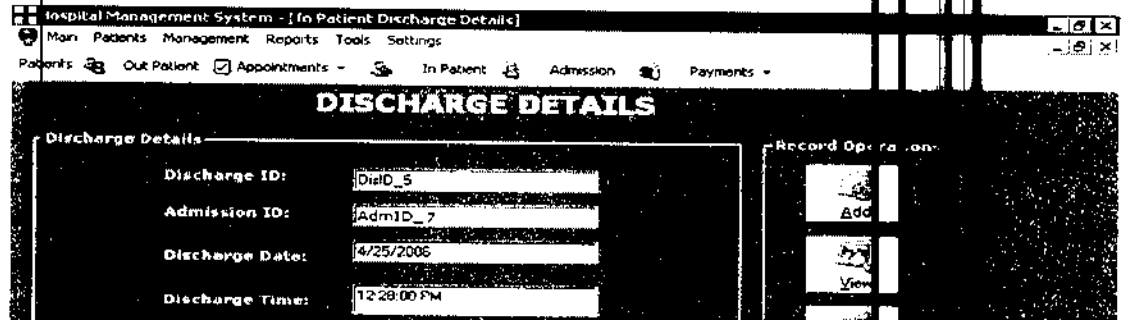


Fig A.15 In Patient Bill Payments Screen:

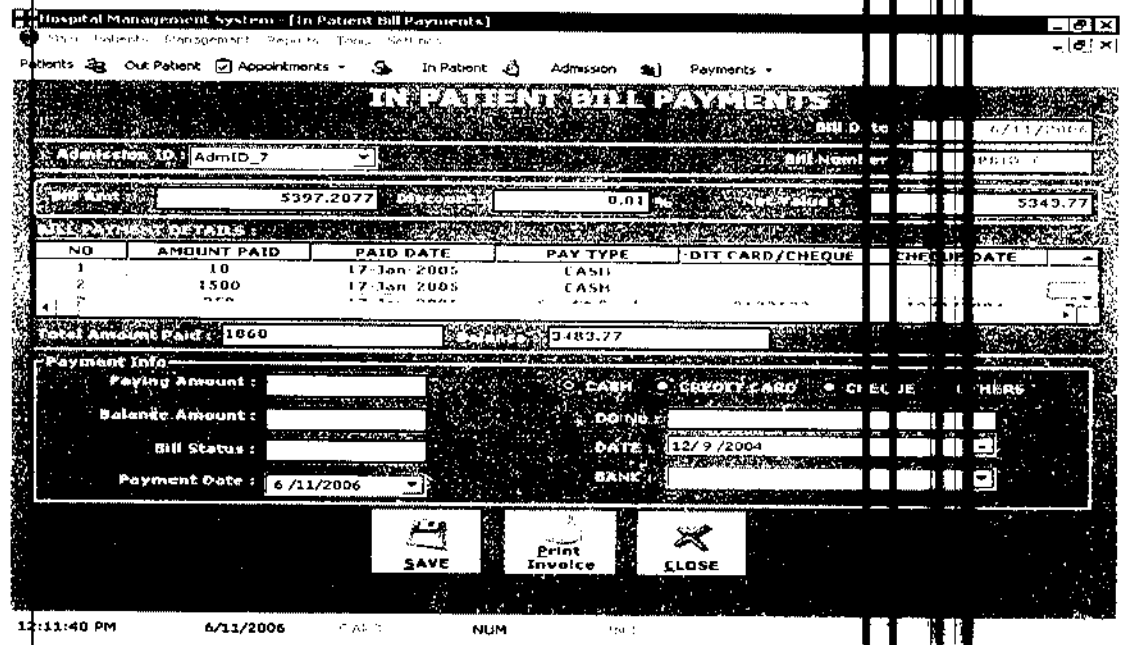


Fig A.16 Add Doctor Appointment Scheduling Screen:

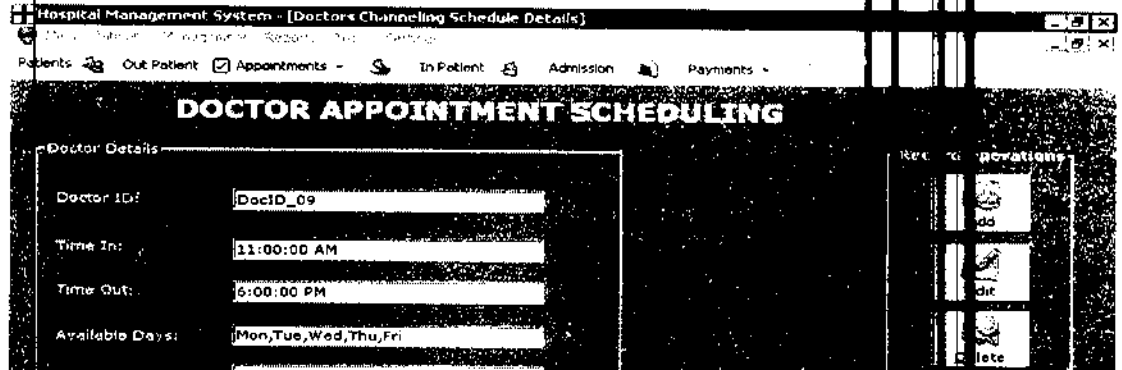


Fig A.17 Hospital Services Schedule Screen:

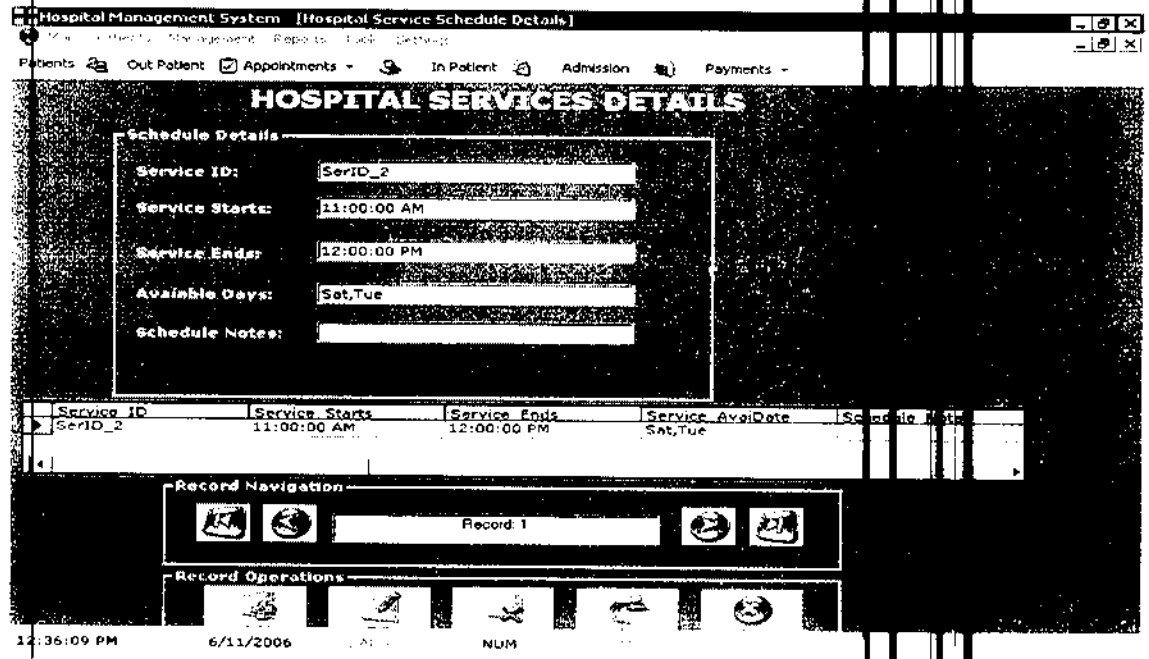


Fig A.18 Add Room Details Screen:

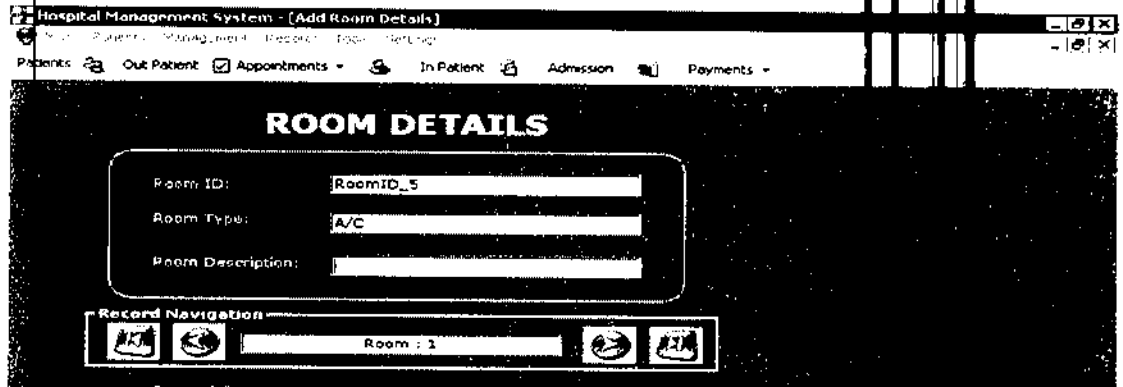


Fig A.19 Add Ward Details Screen:

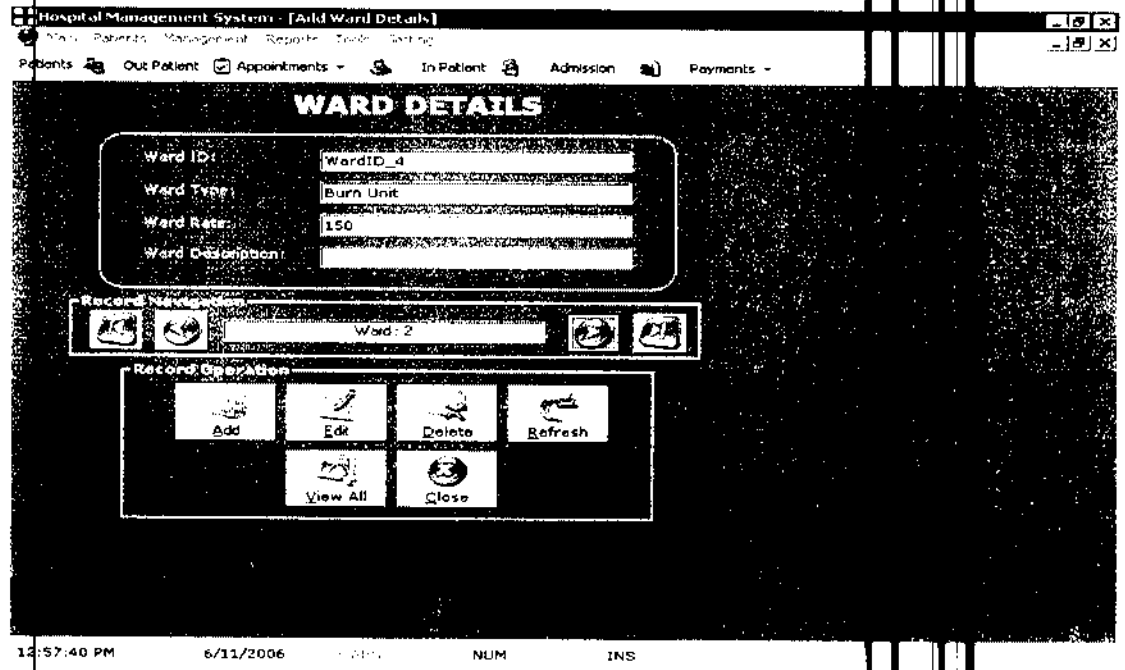


Fig A.20 Add Bed Details Screen:

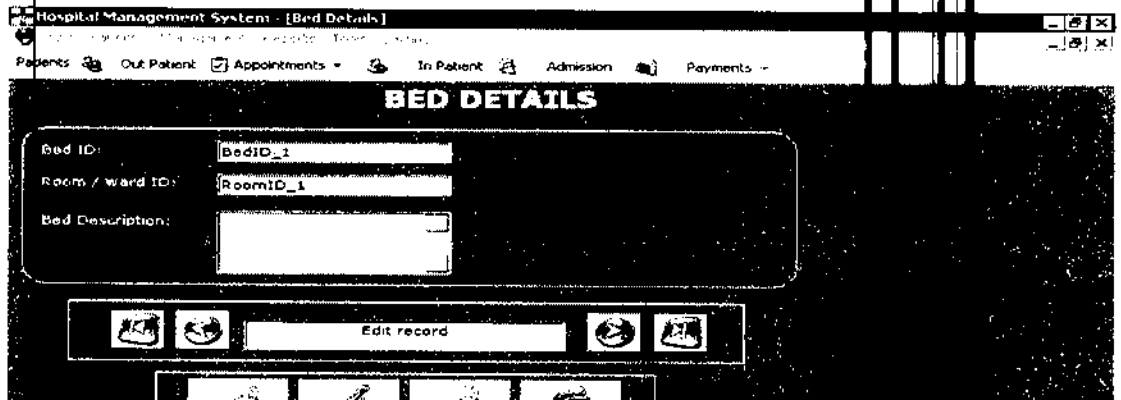


Fig A.21 Doctor Appointment Reports:

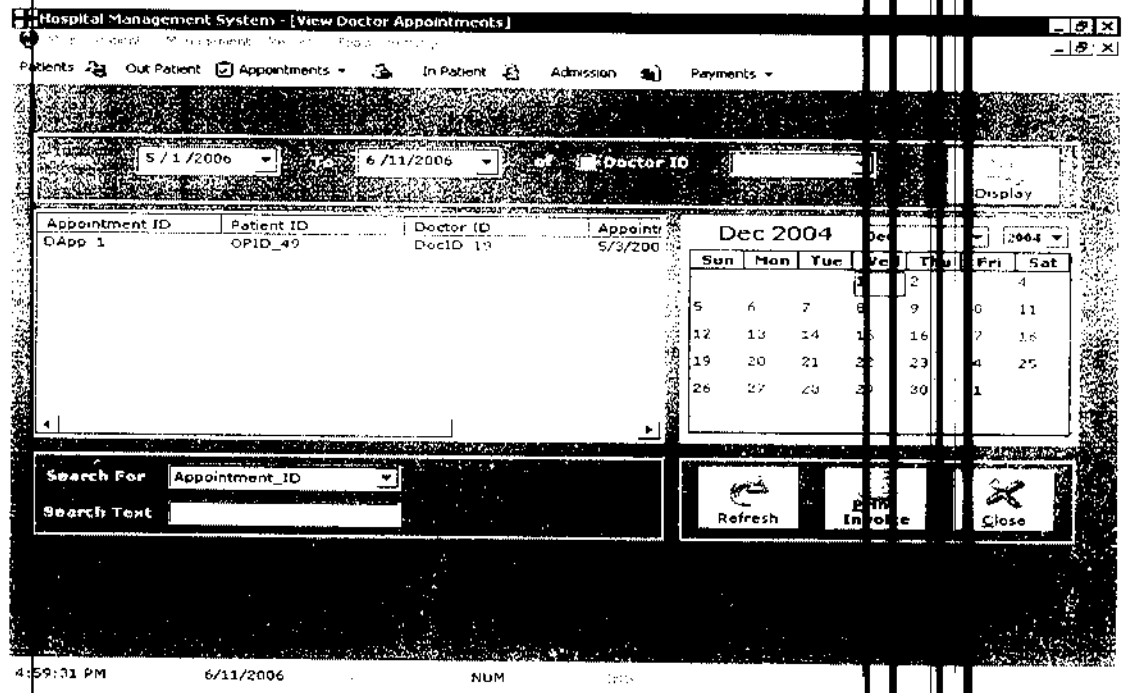


Fig A.22 Service Appointment Reports:

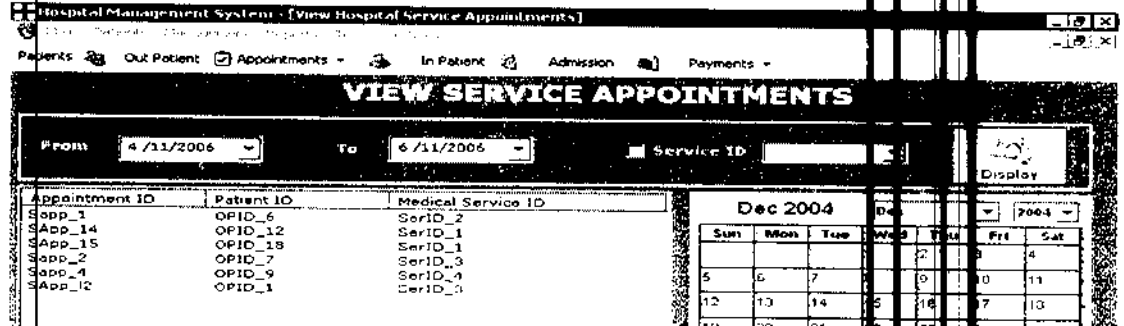


Fig A.23 Out Patient History Reports:

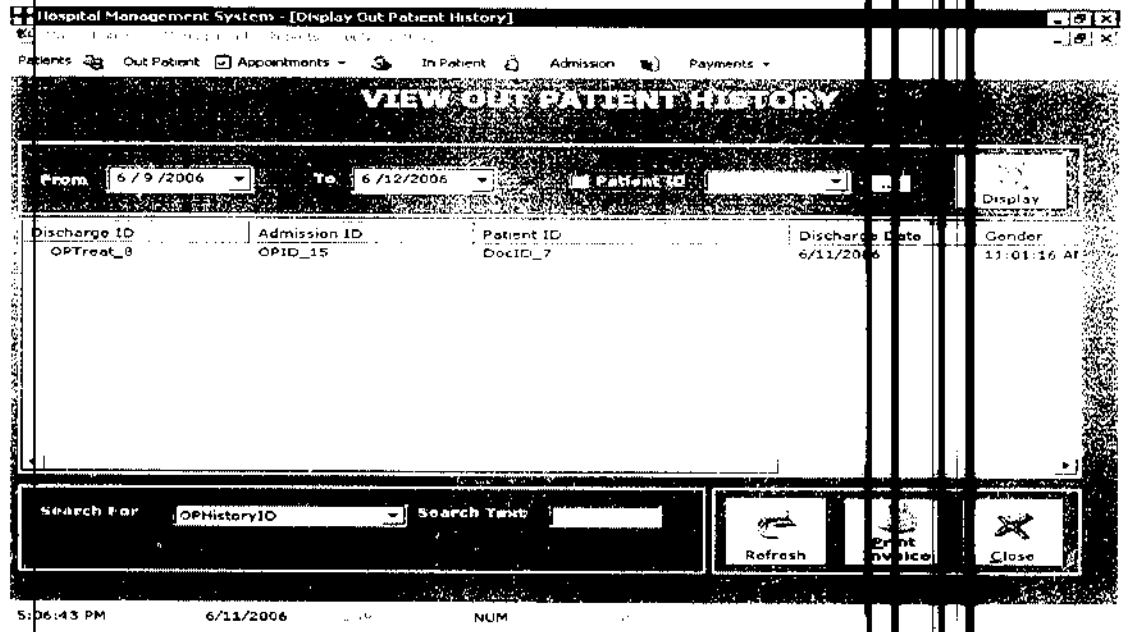
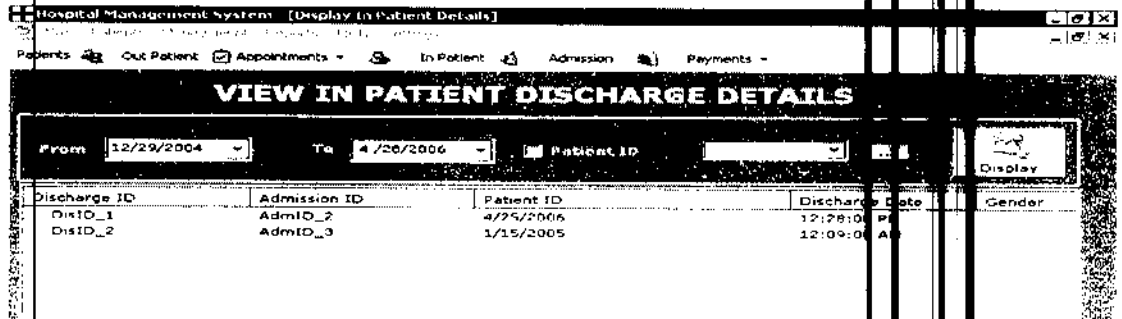


Fig A.24 In Patient Discharge Reports:



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