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A Computerized Hospital Management System

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Abstract: A large number of individuals rely on electronic processes. The global environment of the internet has been broadly used for superior patient care nowadays. since it's a scheme of accommodating & advanced methods that enhances administration & control to eliminate the problems of keeping inappropriate data, inaccurate reports, and time-wasting in storing, processing, and retrieving information encountered by the manual system. The software includes all tasks in one platform by being an automated system to improve the quality of medical care facilities by improvising information processing and information storage subsystem management level of hospitals and efficiency of the organizational maintenance. This computerized system is handling - employee details and allocation, patient identification information, history; staff, room, diagnostics, and pharmaceutical department management. There are many customized versions of HMS worldwide and have adopted several practices in their HMS and HIS implementation. this HMS is made up of many software programs that are integrated to handle the workflow of everyday medical services, record data in certain hospital departments, and help manage financial, administrative, and clinical data. It is also flexible that can be modified as per the needs and requirements. Existing survey data records and the history of patients ensure data integrity and reduce inconsistency by having effectively utilized HIS.

IndexTerms **- Electronic–Hospital management solutions (E – HMS), Management system, Hospital Administration, EMR, infrastructure module, System design methodology.**

Abbreviation and Acronyms:
HMS – hospital management system
HIS - hospital information system

I.INTRODUCTION

A hospital management system is a software build method of improving patient flow efficiency to enhance health care and resource usage. This is an infrastructure module that is more efficient with effectively managing patient information and its administration and also other departments rely on proper functioning, operation & maintenance. Healthcare perception is rapidly evolving. This paper is covering the need for HMS before being divided into sections that each comprise all necessary modules and are explained in the corresponding sections and situations. The methods of analysis of other modules such as those for patient registration, medication details, diagnostics details, bill payment, record modifications, discharge details, etc. Multiple users of the system may be managed by HMS, and each user may have the right track given to them. It ensures that every user interacts with the system by the privileges granted to them and may do their work effectively. A good management system enables input and output by offering a goal for gathering and documenting data. Most hospitals still have a manual system and unskilled staff who could use the computerized system, our project is made up of simple functions and more efficient moves. Following that, the depiction of actions and their results were divided among multiple departments. The technical elements of data modeling and validation are covered in detail in the chapters.

1.1Objectives of the system

This computerized system is aimed to develop a system that can maintain the day-to-day state of patient's admission or discharge, list, and details of all employees, billing, etc. Objectives of this system are:

- To define, implement and build a system that offers support for the hospital management that can be fulfilled only through achieving the secondary objectives that will be presented next.
- To develop a database that keeps all records.
- To computerize all details regarding patients, doctors, or other stuff.
- To create a search module for both present and old patients, medicine, lab tests, etc. data.
- To make a printing system of patient details, medicines, billing, and discharge information.

1.2 Need for HMS

This innovative initiative and upon some management problems that must then be resolved besides precision of servicing patients and staff at a standard level in a short time. To enable the hospital staff to complete the hospital tasks.

1.3 Purpose

Computers have all the data that can be removable, editable, and updatable in a secure manner. Also plan to facilitate the generation of reports in a faster way. To make sophisticated and developed systems that give user-friendly backgrounds, and functions that are simpler to use.

II. BACKGROUND OF ANALYSIS

2.1Background of the Study

Introduction

HMS software-oriented project paper specifies evaluating the management system as an automation module. To provide patients with personnel services inside hospital administration, this project aims to automate daily duties such as new patient admission, patient discharge, assigned doctors, and eventually bill computation. to offer the public the best medical facilities. It can quickly gather and modify data, describe findings, and promptly adapt and correct errors.

Background of the Study:

Optimized hospital operations change the management system with technology to give high-quality facilities and equipment. Accuracy of records keeping, satisfied medical personnel treatment, and managing patients' records addresses specific issues involved in information.

"To be manageable and effective, a quality management system that is compliant with LAW 9000 should: be easy to manage and involve minimal or no allocation of additional security and work in tandem with existing initiatives, system, and structure" (York, 2015).

Problem statement

The manual system that most hospitals have faced many problems such as – time-consuming issues in searching patient lists, any particular patient's information, lists of medicine are in stock or out of the pharmacy, and registration forming in papers. The mistake people make mistakes while writing in forms, medicine names, and reports of diagnostic tests, and more complex than having the right files and giving them to the right patients. Lose of files, and information, destroyed many old files, space needed for keeping papers, not secured since files can be editable. Misdiagnose issues in lab tests or false records keeping or prone editing additional records in papers.

2.2 Advantages

The HMS is a low running cost-based project that can handle multiple departments inside any hospital and has many advantages.

1. Automation of the entire system will improve efficiency.
2. Recording information about the patients.
3. No loss of files and information.
4. Data findings with a simple search box and overcome the delay in communication.
5. Details are secured by providing a unique ID, and password.
6. Time-saving system.
7. Less complexity and files can be edited by the receptionist since they have permission.

2.3 Case Study

2.3.1 CGI Sovera ECM

With its user-friendly interface, the American healthcare software company CGI Sovera ECM Suite makes it simple to handle everything from billing to finances to inventories. Its capabilities include point-of-service template development, risk assessment metrics and alerts, electronic medical records (EMR), and electronic health records (EHR).

2.3.2 Medixcel HMS

Any style of facility, from big community hospitals to tiny practices and even one-doctor clinics, may use Medixcel EMR, another comprehensive EMR solution. Billing, electronic health records, electronic medical records management, patient information systems, and enterprise resource planning are all part of it (ERP). Users get access to the most recent research on treatment procedures as well as patient education materials, and they may access their data at any time and from any location. As upgrades or add-ons, numerous other modules are also for sale.

2.3.3 IBM and Kaiser Permanente

Both IBM and Kaiser Permanente collaborated to create an e-health program. With the idea of subsequently extending it, they created and launched the program for a single area. The first phase's introduction in Hawaii required doctors to put in an additional 30 to 75 minutes per day to finish an excessive number of straightforward tasks since the system was too complex to accommodate their demands. Before expanding to other areas of the country, Kaiser canceled the agreement with IBM and teamed with Epic Systems, a leading provider of electronic health records (EHRs). Since then, Kaiser has introduced an HER.

2.3.4 Healthcare.gov

The U.S. Government launched HealthCare.gov, a health insurance exchange website operated under the United States federal government under the provisions of the Patient Protection and Affordable Care Act (ACA, often known as 'Obamacare'). The site couldn't handle the traffic and crashed. It has received much criticism since its launch for its inability to withstand traffic and has been plagued with site errors preventing users from setting up accounts and even misplaced submissions.

Also, the site was taken down shortly after launch for maintenance and put back up, but not without glitches. News broke shortly after the launch that the site wasn't tested properly before launch and that there were red flags, but they launched the site anyways.

2.3.5 Apollo HMS

This system was developed by Amalgam in 2012, located in Kenya. It wasn't user-friendly because of not have an input option for any information and some abilities, was complex for new users and search for any queries about patients or anything, and costly and used a manual system for generating receipts.

Iii. Methodology

3.1 Methodology: Project planning and scheduling

The main aim was to ascertain how extensively hospitals use HMS and identify any obstacles to its implementation in hospitals worldwide. The majority of hospitals continue to employ exclusive systems, which frequently only serve one area. After viewing various HMS initiatives, we decided to use simpler programming languages to develop modules. Simple software with various departments that is easier to use allowed us to incorporate many processes under a variety of unique guidelines. After numerous failed trials, we eventually achieved the desired outcome for both this creative endeavor and some management issues that still need to be fixed. It is finished with the help of users' input into the system requirements, assistance at all levels, adequate software and hardware evaluation, and usage of change agents throughout implementation.

3.2 Problem Introduction

A theoretical study of the problem. Problems with conventional system:

Utter lack of immediate retrievals:
The information that is stored on the paper is very difficult to retrieve and also to find particular information. This inconvenience & wastage of time.

Utter lack of immediate information storage:
The information generated by various transactions takes more time and effort to be stored in place.

Utter lack of prompt updating:
Various changes to information of patient details are difficult to make as paperwork is involved.

Error-prone manual calculation:
The manual calculation takes a lot of time and is also error-prone with incorrect information.

Compilation of quick, accurate reports:
Preparation of accuracy becomes difficult as information is difficult to collect from various registers.

3.3 Scope of the Project

1. It allows admin and hospital administrators who can perform all the activities.
2. Increase in flexibility and speed of activities.
3. The software gives efficiency with the help of modules throughout searching existing patients, adding new patients with details, and other information whenever patients have their information stored freshly.
4. Allocating available rooms, doctors, and nurses' schedules, clearing or editing or adding new data, removing patients for discharge, and generating bills and receipts.
5. An improvement in management planning and control.

IV. Requirements and Implementation

4.1 Software Specification

Hardware Requirements:

- **Processor** : Core i3 or above
- **RAM** : 2GB or above
- **Hard Disk** : 50GB or above
- **Input Devices** : Keyboard, Mouse
- **Output Devices** : Monitor

Software Requirements:

- **Operating System** : Windows 7 or above
- **Frontend** : HTML, CSS, Bootstrap, JavaScript
- **Backend** : Python (Flask), SQLite
- **Local Host** : Python Flask Local Server
- **Browser** : Google Chrome, Microsoft Edge, Mozilla Firefox
- **To convert the bill into PDF** : wkhtmltox
- **Database** : SQLite

4.2 Implementation

Tools:

- Hypertext Markup Language (HTML)
- Python (Flask)
- JavaScript
- Cascading Style Sheets (CSS)
- Flask SQLAlchemy
- Structured Query Language lite (SQLite)

SQLite

SQLite is an embedded, serverless relational database management system. It is an in-memory open-source library with zero configuration and does not require any installation. In this project, we used SQLite for the Project database management system.

Why SQLite?

SQLite is a good choice for a hospital management system for a final year project because of the following reasons:

Ease of setup: SQLite is a file-based database, making it easier to set up compared to a server-based database like MySQL.
No server requirement: SQLite does not require a separate server to run, which eliminates the need for complex setup and maintenance.
Portable: SQLite is a portable database, meaning it can be easily moved from one environment to another, making it a good option for small to medium-sized projects.
Lightweight: SQLite is lightweight and efficient, making it a good choice for projects with limited resources or hardware.
Cost-effective: Since SQLite is free and open-source, it is a cost-effective option for small to medium-sized projects, especially for students working on final year projects.
In conclusion, for a medium-level hospital management system for a final year project, SQLite is a good option as it is easy to set up, requires no server, is portable, lightweight, and cost-effective.

Flask

Flask is also a Python-based microframework that is used for web application development. It was introduced by Armin Ronacher in the year 2011 as a trial method of joining two solutions i.e., Werkzeug (a server framework) and Jinja2 (a template library)
Flask is categorized as a micro framework because it does not depend on external libraries to perform the tasks of a framework. It has tools, technologies, and libraries to support the functionalities of web application development.

HTML, CSS, and JavaScript

HTML is used to create webpages but does experience limitations when it comes to fully responsive components. Therefore, HTML should only be used to add text elements and structure them within a page. For more HTML can be combined with cascading style sheets (CSS) and JavaScript (JS) for more complex features file can link to a cascading style sheet or JS file -- usually at the top of the document with a specified file path -- which will contain information about which colors to use, which fonts to use, and other HTML element rendering information. JavaScript also allows developers to include more dynamic functionality, such as pop-ups and photo sliders, in a webpage. Tags called class attributes are used to match HTML elements to their corresponding CSS or JS elements.

For example, if a user wants the color of a certain amount of text to be read, they can write code in the CSS file with an accompanying class attribute that turns the text red. Then they can place the associated class attribute on all the pieces of text they want to be red in the HTML sheet. The same basic method applies to JS sheets, with different functions.

Separating information about how a page is structured, and the role of HTML, from the information about how a webpage looks when it is rendered in a browser, is a software development pattern and best practice known as separation of concerns.

V. FEATURES AND TASKS

5.1 Users Characteristics:

This HMS maintains two levels of users,

- Administrator Level
- User Level

Administrator Level

The administrator or admin has access to all the features. An admin has full control over the entire system, whereas the other user would only have limited access.

User Level

Under this, users have limited access. Every user interacts with the system by the privileges granted to them and may do their work effectively. It maintains a total 7 types of users:

1. Doctor
2. Nurse
3. Receptionist
4. Laboratory
5. Accounts
6. Pharmacy
7. Staff

5.2 Modules:

The entire project consists of 7 modules,

1. Patient Management
2. Status Details
3. Medicine Store
4. Diagnostic Service
5. Billing
6. Employee
7. User Logs

5.2.1 Patient Management Module:

- Register Patient
- Update Patient
  - View Patient
  - Edit Patient
- Delete Patient

5.2.2 Status Details Module:

- All Patient
  - View Patient
  - Edit Patient
- Active Patient
  - View Patient
  - Edit Patient
- Search Patient

5.2.3 Medicine Store Module:

- Add Medicine
- Issue Medicine
- Medicine Status
- Update Medicine
- Delete Medicine

5.2.4 Diagnostics Service Module:

- Issue Diagnostics
- Diagnostics List
- Add Diagnostics
- Update Diagnostics
- Delete Diagnostics

5.2.5 Billing Module:

- Patient Billing
  - Adding discount
  - Pay Bill
  - Generate Bill
  - Provide Billing Copy
- Doctor Visit
  - Add Doctor Visit
- Doctor Fees
  - Add New Doctor Fees
  - Edit Charge
  - Delete Charge

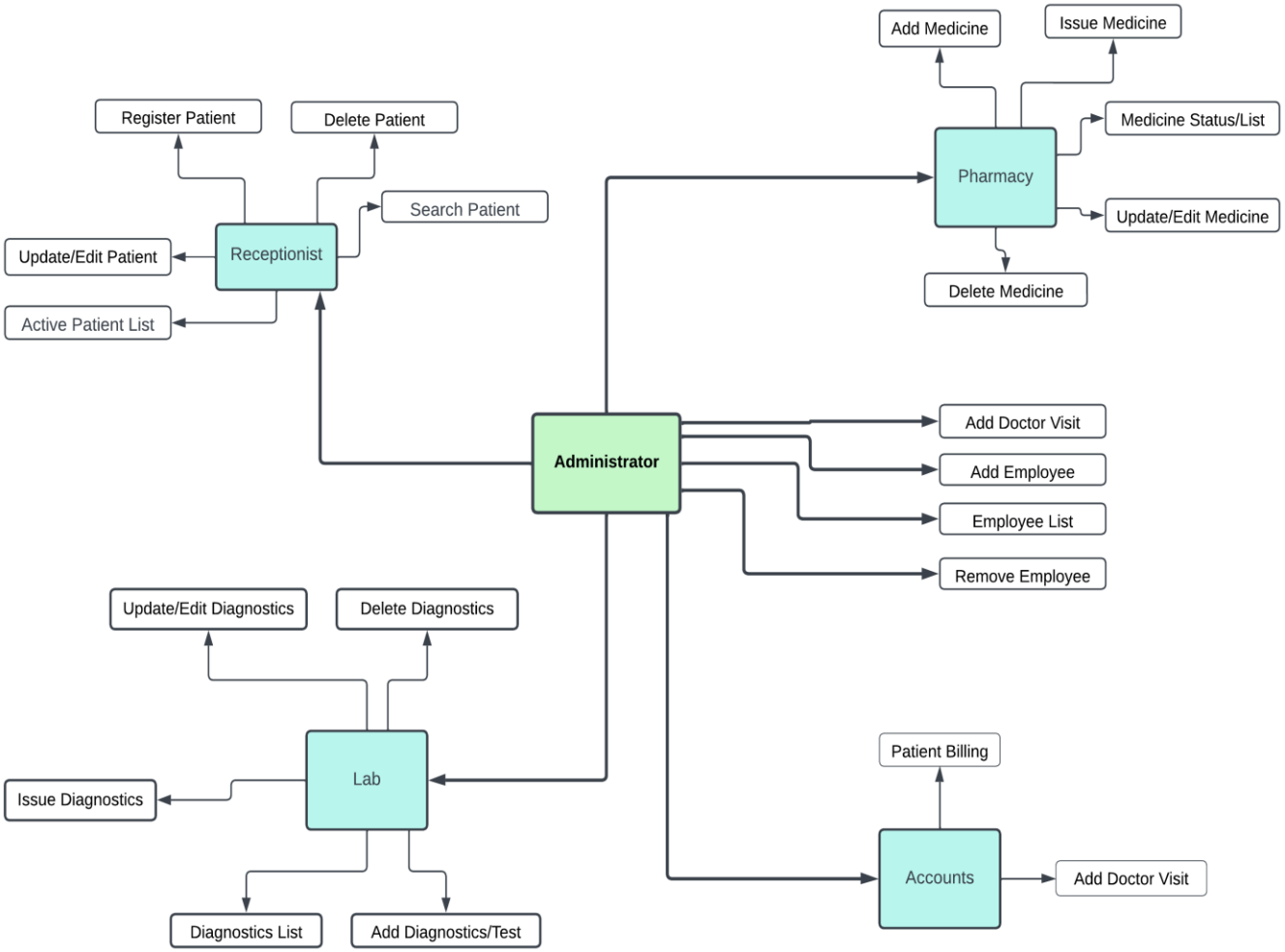
5.2.6 Employee Module:

- Add Employee
- Employee List
  - View Employee Details
  - Edit Employee Details
- Remove Employee

5.2.7 User Logs Module:

The user Logs plugin allows the administration to monitor user activity on the system.

5.3 Block Diagram:



VI. Results and Discussion

Introduction

The result section contains a descript of the main findings of the project, whereas the discussion section interprets the results for readers and provides the significance of the findings.

Nomenclature

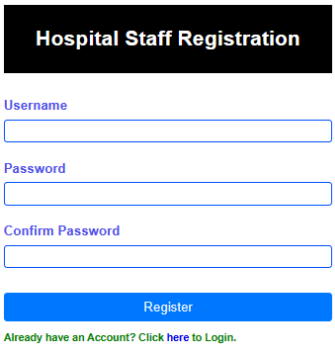
This management system is titled as **"Abul Khair General Hospital".**

Results and Discussion

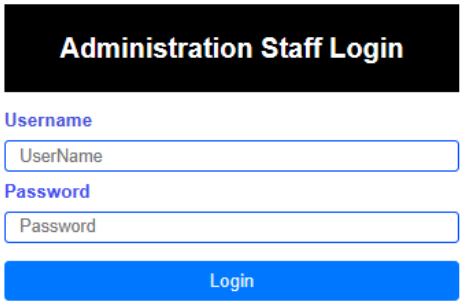
6.1 Login and Home Page:

6.1.1 Registration Page/ Admin Panel:

This page is for the admin panel to register a new admin account. A new admin account can be registered by username and password.



6.1.2 Login Page:
A same page for every group of users.

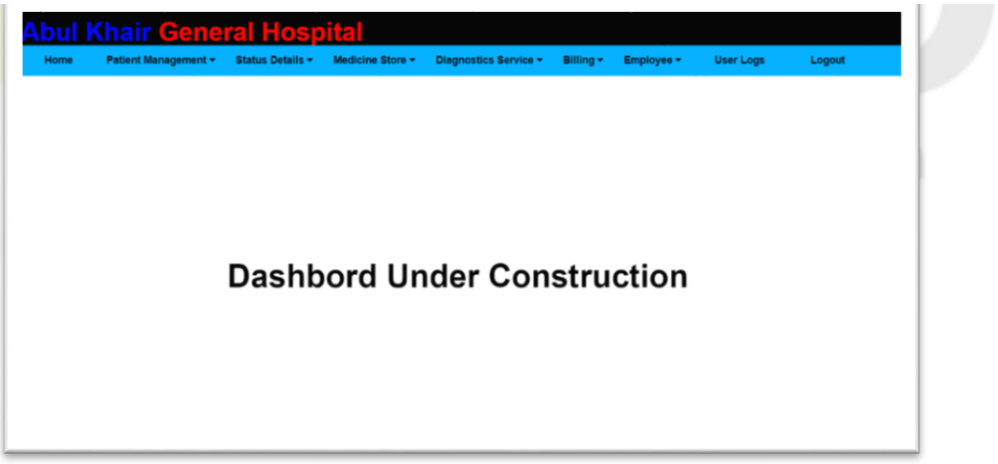


6.1.3 Home Page:

After login into the system admin has access to all of the features.

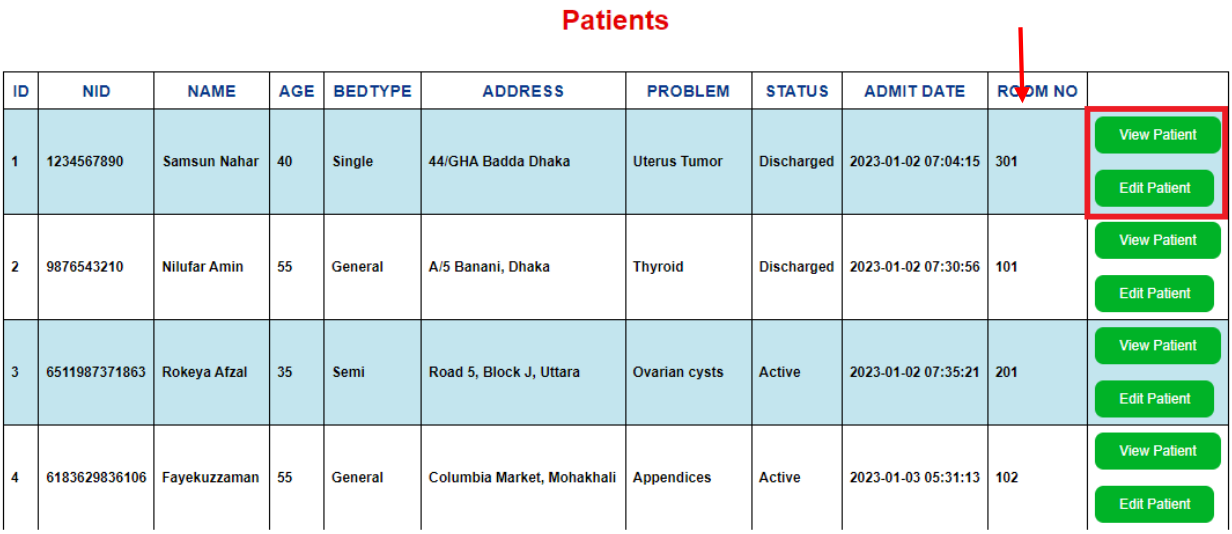
6.2 Patient Management Module:

6.2.1 Patient Registration:



Management can register or add patients to the database through this page. They have to fill in all the details mentioned on this page for new patient registration.

6.2.2 Update Patient:



Patients

ID	NID	NAME	AGE	BEDTYPE	ADDRESS	PROBLEM	STATUS	ADMIT DATE	ROOM NO	
1	1234567890	Samsun Nahar	40	Single	44/GHA Badda Dhaka	Uterus Tumor	Discharged	2023-01-02 07:04:15	301	View Patient Edit Patient
2	9876543210	Nilufar Amin	55	General	A/5 Banani, Dhaka	Thyroid	Discharged	2023-01-02 07:30:56	101	View Patient Edit Patient
3	6511987371863	Rokeya Afzal	35	Semi	Road 5, Block J, Uttara	Ovarian cysts	Active	2023-01-02 07:35:21	201	View Patient Edit Patient
4	6183629836106	Fayekuzzaman	55	General	Columbia Market, Mohakhali	Appendices	Active	2023-01-03 05:31:13	102	View Patient Edit Patient

On this page, by clicking "**View patient**" management can see the patient's information, and by clicking "**Edit Patient**" management can update or edit the patient's details.

6.2.3 View Patient:

Patients Details

Nilufar Amin

Patient ID	2
Age	55
Address	A/5 Banani, Dhaka
NID	9876543210
Contact	01712345678
Associated Contact	01612345678
Issue	Thyroid
Date	2023-01-02 07:30:56
L Date	2023-01-02 07:30:56
Room	General
Bed Type	General
Assigned Bed	101
Status	Discharged

Paid History

#	Room	Diagnostic	Doctor	Medicine	Paid	Discount	Date
1	2000	1450	0	160	0	0	2022-12-31 10:35:25

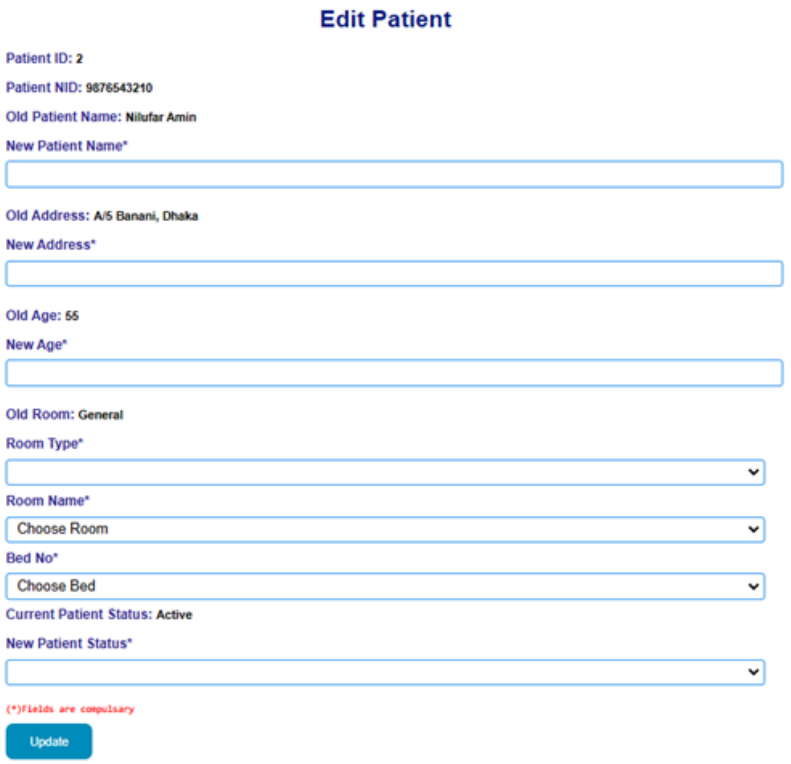
Issued Medicines

#	Name	Medicine No.	Rate	Q Issued	Date
1	LOSECTIL V 20MG Cap	104	5	10	2023-01-03 06:17:12
2	BISLOL 5MG Tab	108	11	10	2023-01-03 06:17:20

Diagnostics

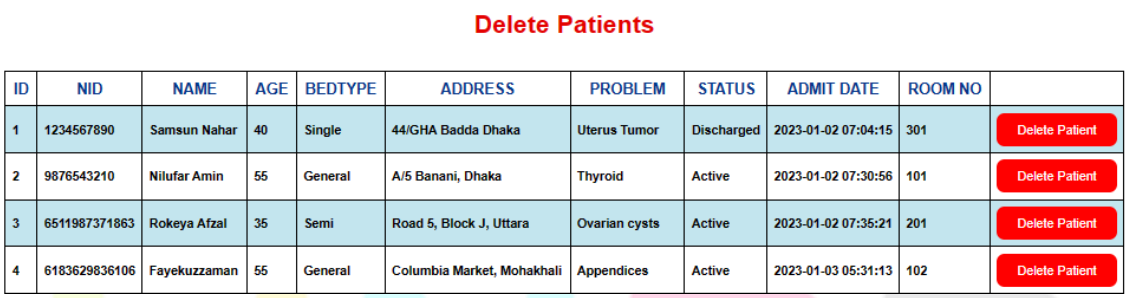
#	Test Name	Test ID	Tear Charge	Date
1	Dengue IgG	113	500	2023-01-03 06:12:27
2	T4 (Thyroxine)	102	450	2023-01-03 06:17:55
3	Thyroid Scan (Tc-99m)	104	500	2023-01-03 06:18:00

6.2.4 Edit Patient:



On this page, management can update or edit patients' details. Management does not have to edit all the information on this page, they can edit the information they need to and it will be updated and the other information will remain the same.

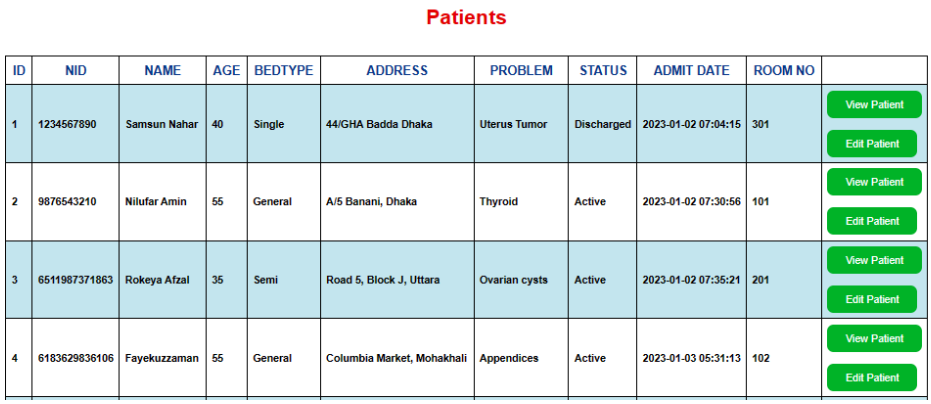
6.2.5 Deletion of Patient's Information:



Management can delete a patient's details on this page by clicking "**Delete Patient**". All the information of that individual patient's information will be deleted by the primary key "**ID**".

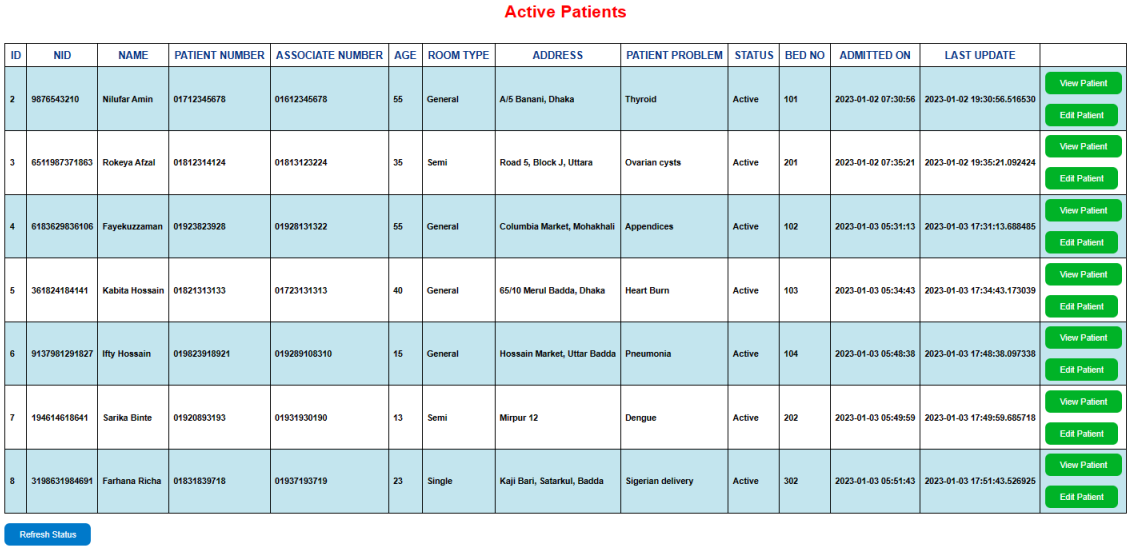
6.3 Status Details Module:

6.3.1 All Patients:



This page is to see all the active and discharge patient lists in one place. And also can see patients' ID, NID, name, age, and other general information.

6.3.2 Active Patients:



Active Patients

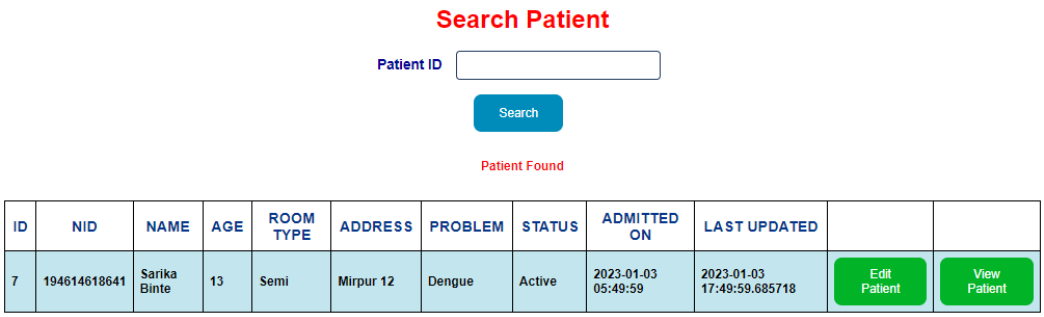
ID	NID	NAME	PATIENT NUMBER	ASSOCIATE NUMBER	AGE	ROOM TYPE	ADDRESS	PATIENT PROBLEM	STATUS	BED NO	ADMITTED ON	LAST UPDATE	
2	9876543210	Nilufar Amin	01712345678	01612345678	55	General	A/5 Banani, Dhaka	Thyroid	Active	101	2023-01-02 07:30:56	2023-01-02 19:30:56.516530	View Patient / Edit Patient
3	6511987371863	Rokeya Afzal	01812314124	01813123224	35	Semi	Road 5, Block J, Uttara	Ovarian cysts	Active	201	2023-01-02 07:35:21	2023-01-02 19:35:21.092424	View Patient / Edit Patient
4	6183629836106	Fayekuzzaman	01923823928	01928131322	55	General	Columbia Market, Mohakhali	Appendices	Active	102	2023-01-03 05:31:13	2023-01-03 17:31:13.688485	View Patient / Edit Patient
5	361824184141	Kabita Hossain	01821313133	01723131313	40	General	65/10 Merul Badda, Dhaka	Heart Burn	Active	103	2023-01-03 05:34:43	2023-01-03 17:34:43.173039	View Patient / Edit Patient
6	9137981291827	Ifty Hossain	019823918921	019289108310	15	General	Hossain Market, Uttar Badda	Pneumonia	Active	104	2023-01-03 05:48:38	2023-01-03 17:48:38.097338	View Patient / Edit Patient
7	194614618641	Sarika Binte	01920893193	01931930190	13	Semi	Mirpur 12	Dengue	Active	202	2023-01-03 05:49:59	2023-01-03 17:49:59.685718	View Patient / Edit Patient
8	3198631984691	Farhana Richa	01831839718	01937193719	23	Single	Kaji Bari, Satarkul, Badda	Sigerian delivery	Active	302	2023-01-03 05:51:43	2023-01-03 17:51:43.526925	View Patient / Edit Patient

Refresh Status

Management can see all the active patient lists and some general information on this page. Also can view and edit their patient's details.

6.3.3 Search Patients:

On this page, any patient can be searched by their patient id or their name.



Search Patient

Patient ID

Search

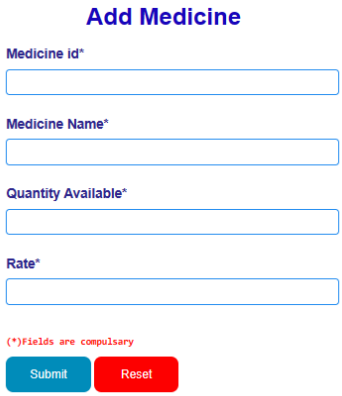
Patient Found

ID	NID	NAME	AGE	ROOM TYPE	ADDRESS	PROBLEM	STATUS	ADMITTED ON	LAST UPDATED		
7	194614618641	Sarika Binte	13	Semi	Mirpur 12	Dengue	Active	2023-01-03 05:49:59	2023-01-03 17:49:59.685718	Edit Patient	View Patient

After putting the patient id or any letter on the search bar, some auto-suggests will be shown, and management can select the patient from them or directly search them by their ID. After finding the desired patient ID, the system shows the patient's general details, e.g. status, admission date, and last update time the patient. Management can view and edit their patient's details.

6.4 Medicine Store Module:

6.4.1 Adding Medicine:



Add Medicine

Medicine id*

Medicine Name*

Quantity Available*

Rate*

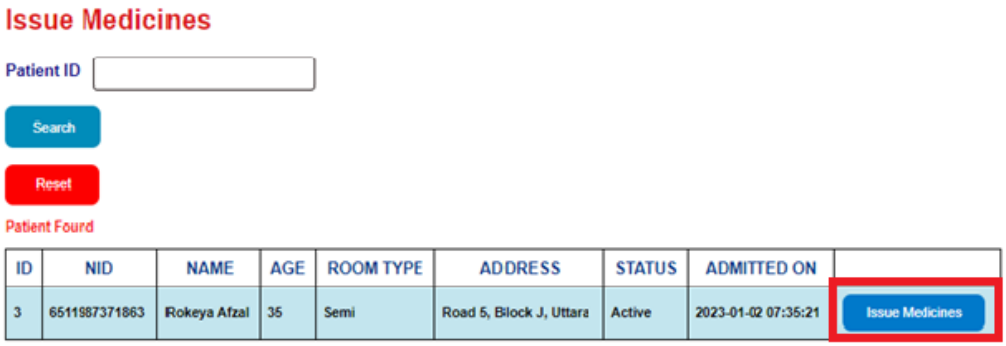
(*)Fields are compulsary

Submit Reset

Management can add medicine on this page. They have to put a medicine id, name, quantity, and rate of the medicine. And then submit it to the system database.

6.4.2 Issue Medicine:

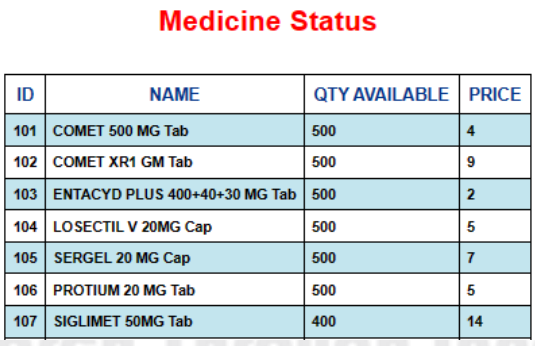
To issue medicine management have to put the patient's id on the search bar:



Then after finding the patient, medicine can be issued by clicking "**Issue Medicine**". After that next page will be:

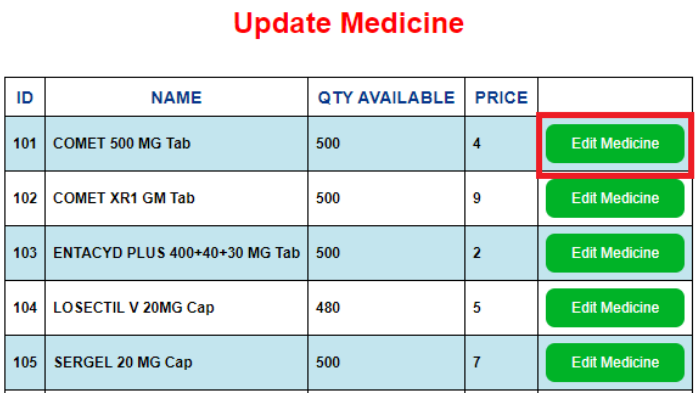
On this page, management can issue medicine to a patient by searching by name.

6.4.3 Medicine Status:

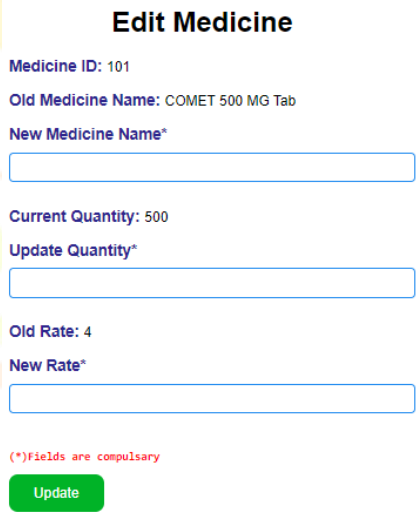


This is the page for medicine status or showing the details of all the medicine e.g. available quantity, and medicine rate.

6.4.4 Updating Medicine Information:

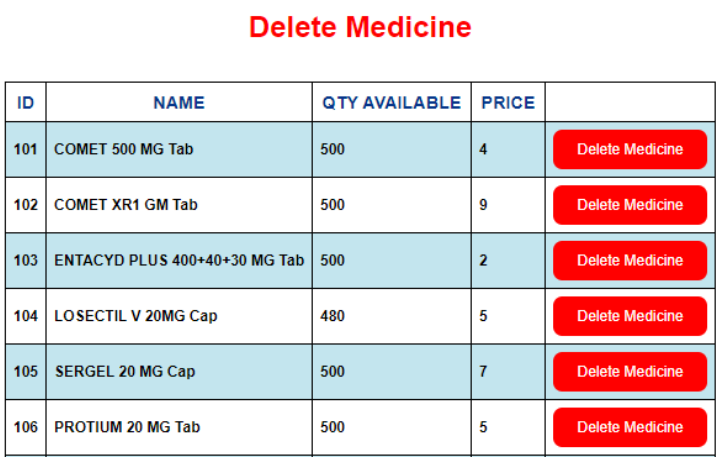


Management can update or edit medicines details by clicking "**Edit Medicine**". The page will be:



For updating medicine's details management have to change or put information in every field.

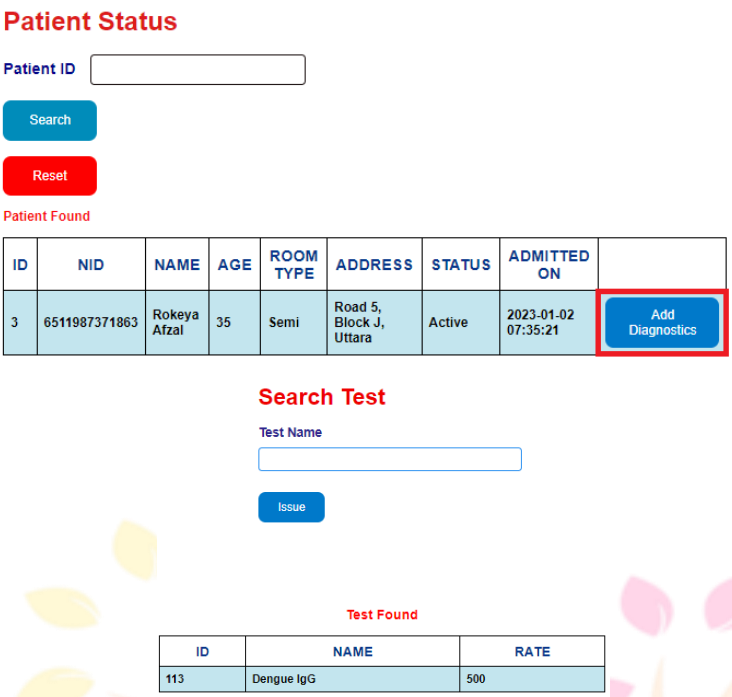
6.4.5 Delete Medicine:



On this page, management can delete medicine from the database.

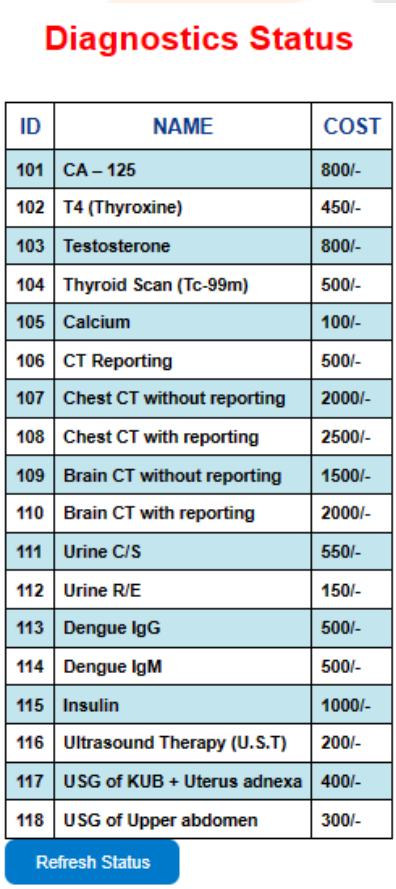
6.5 Diagnostic Service Module:

6.5.1 Issue Diagnostics for Patient:



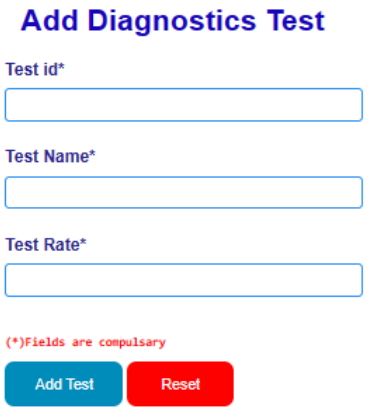
To issue diagnostics to a patient, the user first has to search patients by their name or ID. If the patient is found, then clicking "**Add Diagnostics**" will lead the user to the "Search Test" page where the user has to search for the diagnostics test and can issue it.

6.5.2 List of Diagnostics:



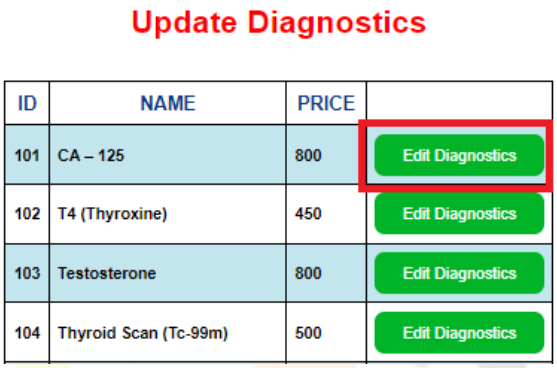
On this page, users can see the diagnostics list and the cost of the tests.

6.5.3 Addition of Diagnostics:

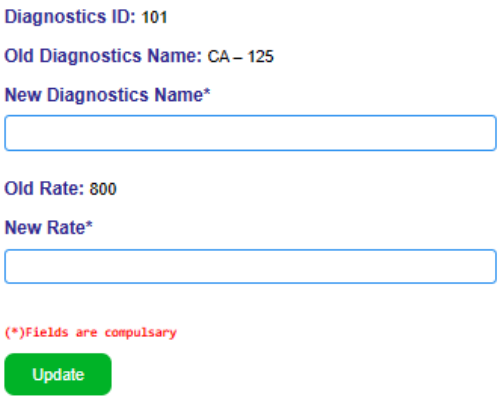


Management can add diagnostics tests and cost to the database.

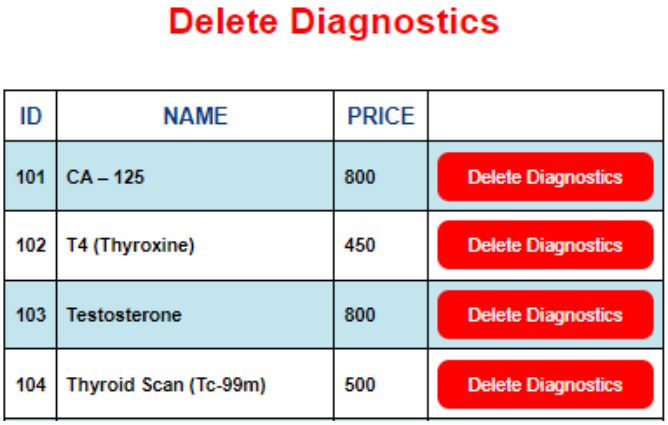
6.5.4 Updating/Editing Diagnostics Information:



Management can update diagnostics details from the "**Update Diagnostics**" page and the next page will be:



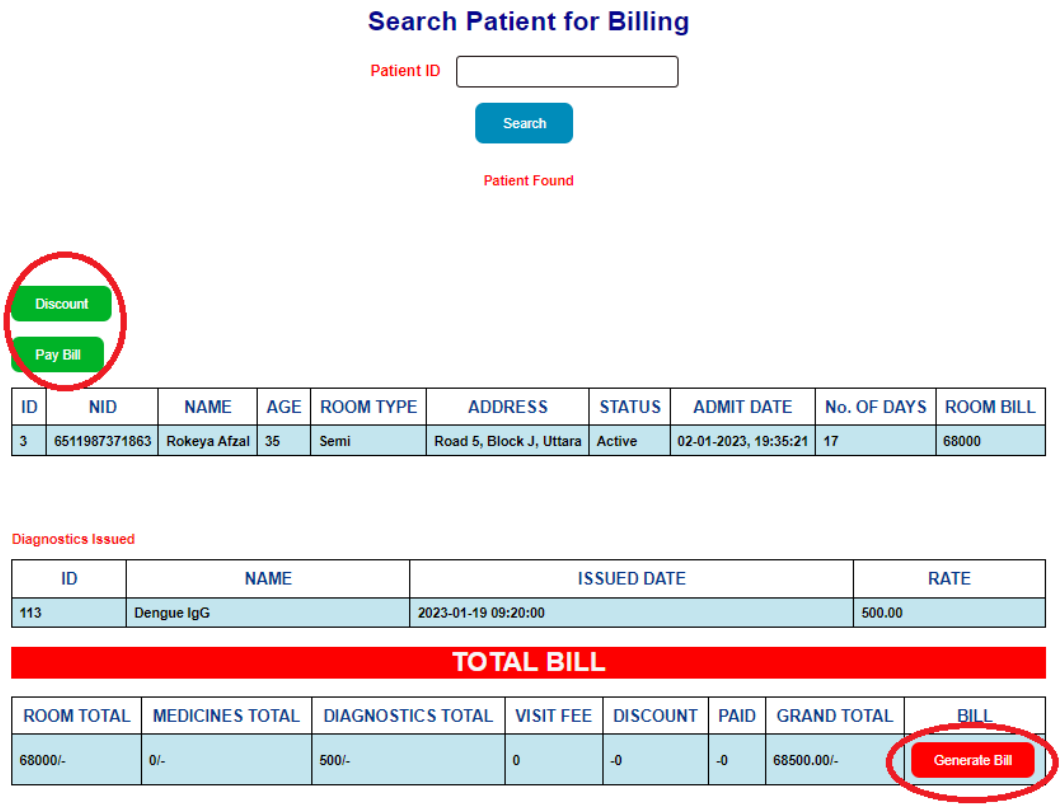
6.5.5 Remove Diagnostics:



On this page, diagnostics can be deleted.

6.6 Billing Module:

6.6.1 Patient Billing:



On the patient billing page, management can generate bills and add discounts too.

6.6.2 Billing Copy:

Abul Khair General Hospital

House 0, Road 0, Block 0, Mirpur DOHS, Dhaka-1200 Contact Number: 01xxxxxxxx

Patient Name: Nilufar Amin — Date: 2023-01-02
Patient Age: 55
Admission Date: 02-01-2023, 19:30:56 — **Discharge Date: 2023-01-02**
Contact Number: 01712345678

Patient Details

ID	NAME	AGE	ROOM TYPE	ADDRESS	ADMIT DATE	No. OF DAYS	ROOM BILL
2	Nilufar Amin	55	General	A/5 Banani, Dhaka	02-01-2023, 19:30:56	1	2000

Medicines Issued

ID	NAME	QUANTITY ISSUED	ISSUED DATE	RATE	TOTAL
104	LOSECTIL V 20MG Cap	10	2023-01-03 06:17:12	5.00	50 /-
108	BISLOL 5MG Tab	10	2023-01-03 06:17:20	11.00	110 /-

Diagnostics Issued

ID	NAME	ISSUED DATE	RATE
113	Dengue IgG	2023-01-03 06:12:27	500
102	T4 (Thyroxine)	2023-01-03 06:17:55	450
104	Thyroid Scan (Tc-99m)	2023-01-03 06:18:00	500

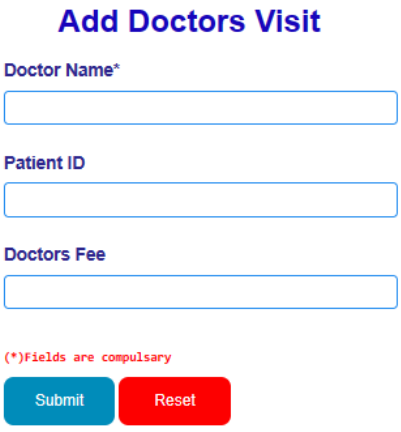
TOTAL BILL

ROOM TOTAL	MEDICINES TOTAL	DIAGNOSTICS TOTAL	DOCTOR TOTAL	DISCOUNT	PAID	GRAND TOTAL
2000/-	160/-	1450/-	0	-0	-0	**3610/-**

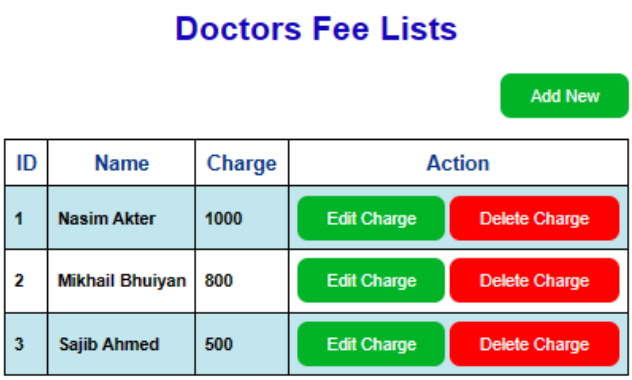
Signature

This is an example of the patient billing copy. This billing copy can be downloaded as a **PDF** file.

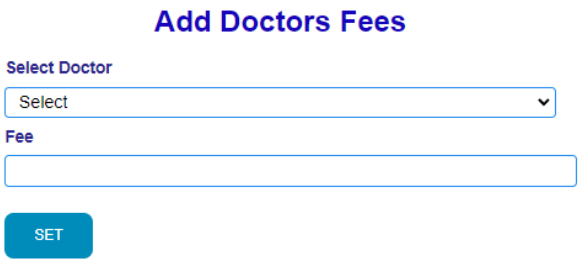
6.6.3 Adding Doctors Visit:



6.6.4 Doctor's Fees List:

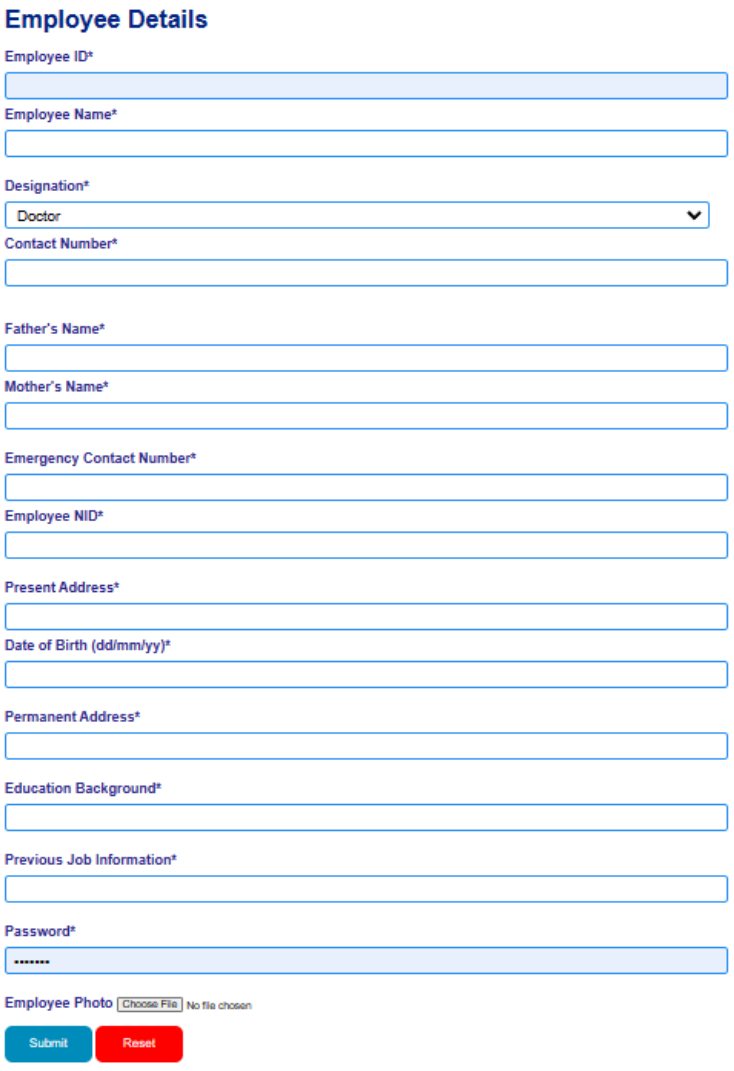


6.6.5 Adding Doctors Fees:



6.7 Employee Module:

6.7.1 Addition of Employees:



6.7.2 List of Employees:

Employee lists

Photo	Employee ID	Name	Designation	Contact	Action
	10001	Nasima Akter	Doctor	01831371983	View Employee Edit Employee
	1002	Mikhail Bhuiyan	Doctor	0181938193	View Employee Edit Employee
	10037	Sajib Ahmed	Doctor	9137193710	View Employee Edit Employee
	1310930	Najma Begum	Nurse	31310301	View Employee Edit Employee

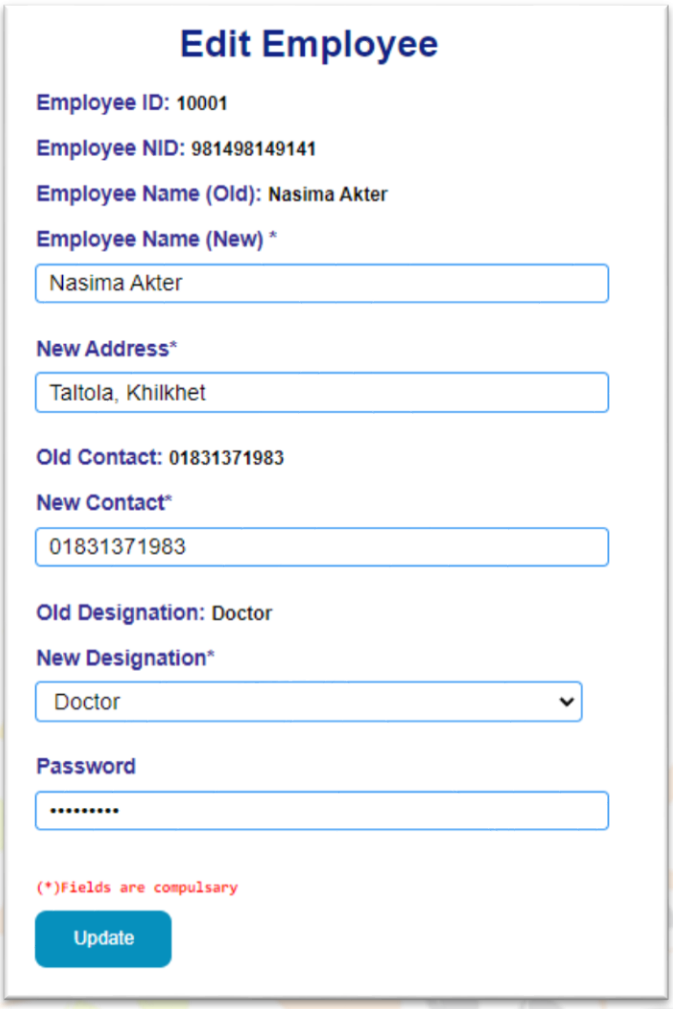
6.7.3 View Employee Details:

Employee Details

Nasima Akter

Employee ID	10001
Designation	Doctor
Contact	01831371983
Date of Birth	23/06/1985
Father's Name	Nasim Ullah
Mother's Name	Asia Begum
NID	981498149141
Address	Taltola, Khilkhet
Permanent Address	Taltola, Khilkhet
Educational Background	MBBS, MD in OB/GYN
Previous Job	AMJ Hospital

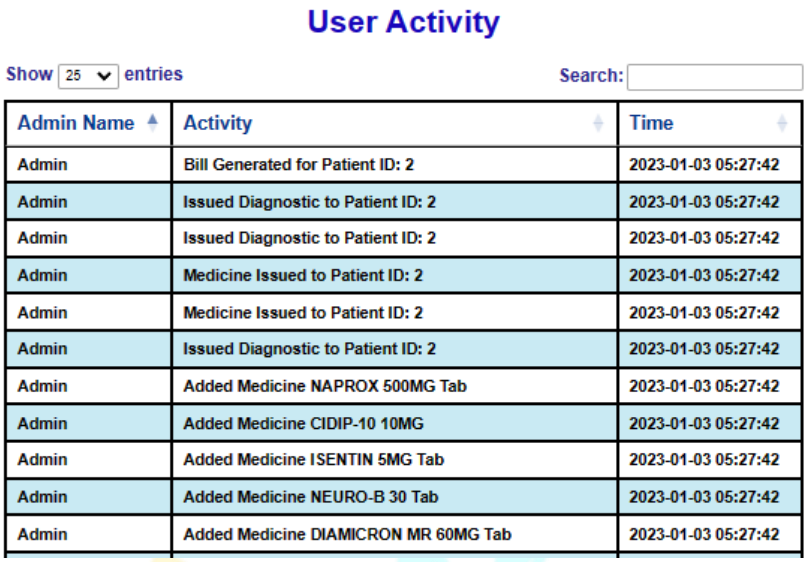
6.7.4 Edit Employee Information:



Employee details can be edited, and can only edit the information that has to be changed.

6.7.5 Deletion of Employees:

6.8 User Logs



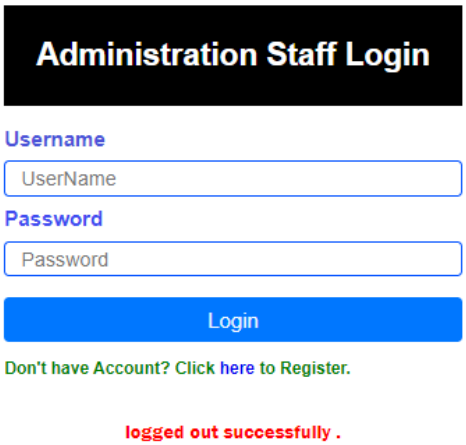
User Activity

Show 25 entries Search:

Admin Name	Activity	Time
Admin	Bill Generated for Patient ID: 2	2023-01-03 05:27:42
Admin	Issued Diagnostic to Patient ID: 2	2023-01-03 05:27:42
Admin	Issued Diagnostic to Patient ID: 2	2023-01-03 05:27:42
Admin	Medicine Issued to Patient ID: 2	2023-01-03 05:27:42
Admin	Medicine Issued to Patient ID: 2	2023-01-03 05:27:42
Admin	Issued Diagnostic to Patient ID: 2	2023-01-03 05:27:42
Admin	Added Medicine NAPROX 500MG Tab	2023-01-03 05:27:42
Admin	Added Medicine CIDIP-10 10MG	2023-01-03 05:27:42
Admin	Added Medicine ISENTIN 5MG Tab	2023-01-03 05:27:42
Admin	Added Medicine NEURO-B 30 Tab	2023-01-03 05:27:42
Admin	Added Medicine DIAMICRON MR 60MG Tab	2023-01-03 05:27:42

Management can monitor other users' activity on this page.

6.9 Logout



Administration Staff Login

Username

UserName

Password

Password

Login

Don't have Account? Click here to Register.

logged out successfully .

VII. SOFTWARE TESTING

7.1What is Software Testing?

Software testing is the process of evaluating and verifying that a software product or application does what is supposed to do. A properly tested software product ensures dependability, security, and high performance, which leads to time savings, cost-effectiveness, and customer satisfaction.

7.2Why Software Testing is Important?

When a software development project is going on, you need to know that errors may appear in any phase of the life cycle. Few of them are known to be undiscovered. Thus, the importance of **Quality Assurance** cannot be ignored. Do tool bars work properly? Are all menu functions and pull-down sub-functions properly listed? Is it possible to invoke each menu function using a logical assumption that if all parts of the system are correct, the goal will be successfully achieved? A properly tested software product ensures dependability, security, and high performance, which leads to time savings, cost-effectiveness, and customer satisfaction.

This creates two problems,

- Time delay between the cause and appearance of the problem.
- The effect of the system errors on files and records within the system.

The system testing aims to consider all the likely variations to which it will be suggested and push the systems to limits. The testing process focuses on the logical intervals of the software ensuring that all statements have been tested and on the functional interval conducting tests to uncover errors and ensure that defined input will produce accrual results that agree with the required results.

7.3Testing Strategy

There are two major types of testing,

- White Box Testing
- Back Box Testing

White Box Testing

White box sometimes called "Glass box testing" is a test case design that uses the control structure of the procedural design to drive the test case. Using white box testing methods, the following tests were made on the system.

- All independent paths within a module have been exercised once. In our system, ensuring that the case was selected and executed checked all case structures. The bugs that were prevailing in some parts of the code were fixed.
- All logical decisions were checked for the truth and falsity of the values.

Black Box Testing

Black box testing focuses on the functional requirements of the software. This black box testing enables software engineering to derive a set of input conditions that will fully exercise all functional requirements for a program. Black box testing is not an alternative to white box testing rather it is a complementary approach that is likely to uncover a different class of errors than white box methods.

- Interface errors.
- Performance in the data structure.
- Performance errors.
- Initializing and termination errors.

VIII. CONCLUSION AND FUTURE ENHANCEMENT

8.1 Conclusion

This project focuses on building a system that reduces the complexity of hospital maintenance activities. This software package includes multiple interlinking systems of various departments of a hospital within a computerized management structure. "In the modern world, a user-friendly interface is a key element" (Coronel, 2015). For clarification on the criteria for implementing healthcare systems. To specifically fulfill the needs of mid and large-sized hospitals worldwide, HMS is created to order, to meet a hospital's needs. It's increasing the use of information technology, computer-operated database documentation systems, medical governance, and support processes. Becoming an inevitable system, this software is planned to advance by innovating all the hospital departments. In the future, numerous progressions or enhancements can be attached by changing the current modules or including new modules according to future demand.

8.2 Future Enhancement

- Modify as a web application targeting all doctors, nurses, lab technicians, pharmacists, and accountants.
- A mobile application to make things easy for doctors and others.
- Cloud storage for saving patients' test reports, etc.
- Hospital statistics dashboard for hospital authority.
- Separate billing system for pharmacy.

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