

**Project title: Developing a smart hospital management system for  
Tibebe\_Ghion Hospital**

**By**

Mathias Amare  
Yohannes Ayana

**Phone**

+251 918002646  
+251 925636099

## ABSTRACT

The paper work of the hospital that currently going on has a tremendous problem for the hospital staff, the patients as well in the efficiency of the whole management in the hospital. Our new developed system provides a lot more features that can solve those problems. Our system includes patient registration, by which information of a particular patient will be registered in the database. By searching ID of the patient, getting information of the registered patient is too easy. All data of a patient is available in register record. Our software is able to do the same for Patient admit too. The software has also registering platform for Staff members and to add new when someone new comes to the staff. A record is available in the system for the staff too. The billing mechanism is another feature that's included in our system. Appointment is also a part of the software the doctors can easily give appointments and find out the appointments using search method. History registration and Investigation (Laboratory and Imaging) are also part of our developed smart hospital management system.

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## 1. GENERAL BACKGROUND

### 1.1 Introduction

Human Body is a very complex and sophisticated structure and comprises of millions of functions. All these complicated functions have been understood by human themselves, part-by-part their research and experiments. As science and technology progressed, medicine became an integral part of the research. Gradually, medical science became an entirely new branch of science. As of today, the Health Sector comprises of Medical institutions i.e. Hospitals, research and development institutions and medical colleges. Thus the Health sector aims at providing the best medical facilities to the people.

Healthcare especially in the developed world is characterized by rapidly increasing use of information technology in patient care, increasing documentation, coding and billing, and management. Rise of health information technology worldwide is increasing the efficiency of health service delivery, reducing medical errors, improving quality of care and providing better information for patients and physicians .

The overall goal of the information management function is to obtain, manage, and use information to improve health care and medical services, performance, governance and management and support processes.

The importance of healthcare to individuals and governments and its growing costs to the economy have contributed to the emergence of healthcare as an important area of research for scholars in business and other disciplines. Information systems (IS) have much to offer in managing healthcare costs and in improving the quality of care. In addition, asserts that healthcare influences the quality of human lives and function in the society. Healthcare mistakes have serious consequences that can affect ability to carry out social and productive endeavors. Recent reports highlight the gravity of adverse events in hospitals and the dangers such events pose to individuals and the public. Healthcare information systems have changed the healthcare industry drastically over the last decade as well as the last few years.

The forces of competition and advancements in healthcare technology are pushing hospitals to follow the trend. Paperless healthcare systems have become inevitable and any healthcare institute that doesn't follow this trend will fall behind the rest of the industry.

Health information system is a must and the faster this is adopted the more successful the healthcare facility will be. Delone and Mclean being one of the most cited models in the fields of information systems seeks to provide a comprehensive understanding of information systems success by identifying , describing, and explaining the relationships between six success variables categories : systems quality, information quality, user, user satisfaction, individual impact, and organizational impact.

World Health Organization (WHO, 2008) cautions that, the goal of a health information system is often narrowly defined as the production of good-quality data. The ultimate goal is to produce relevant information that health system stakeholders can use for making transparent and evidence-based decisions for health system interventions. Health information management system performance should therefore be measured not only on the quality of data produced, but on evidence of the continued use of data to improve health system performance, respond to emergent threats, and improve health (WHO, Improving health information systems in terms of data availability, quality and use often requires interventions that address a wide range of possible 'determinants of performance' .

Health information systems recognizes that although new developments in technology, including the use of the internet and other modes of communication offer great potential in the flow of information amongst the providers and recipients regarding the provision and management of healthcare services, the Kenyan health sector remains far behind in taking advantage of such developments to improve reporting (HIS, 2008). Despite vast amounts of resources and time invested in the development and implementation of health information systems, health data is barely used by health workers for service delivery planning and decision-making. Performance is grossly under reported with developments to improve information management lagging behind other sectors improvement activities; the whole culture of information generation and use remain under-developed; and mechanisms for validating and assuring reliability are not optimally functional.

## 1.2 Problem Statement

The manual handling of the record in hospitals is tedious and time consuming which is highly prone to error. So that to solve this tiresome and error exposed paperwork, we came up with an idea of developing a software that makes the work more easy, fast and reliable.

## 1.3 Objectives of the project

### General Objective

The general objective of our project is to implement a hospital management system in Tibebe\_Gion Hospital.

Keeping track of all the activities and their records on paper is very cumbersome and error prone. It also is very inefficient and a time-consuming process Observing the continuous increase in population and number of people visiting the hospital. Recording and maintaining all these records is highly unreliable, inefficient and error-prone. It is also not economically & technically feasible to maintain these records on paper. Thus keep working of the manual system as the basis of our project. We have developed an

automated version of the manual system, named as “Smart Hospital Management system”

#### 1.4 Significance of the project

- Helps for evidence-based policy-making
- Informed decision-making during planning, implementation and evaluation of health programs
- For appropriate use of resources at all levels of the health system

### 2. SYSTEM DESCRIPTION AND ANALYSIS

#### 2.1 System description

Our software bases python3 language and sqlite3 database. The system will configure to a minimum requirements of 1.6MHZ processor and 1GB RAM with the computers through Local Area Network (LAN). We can implement in either of the two LAN connection ways (Either peer to peer or client\_server) depending on the interest of the Hospital.

## Features of our Hospital management system

### 1) Login Page

The system has login page with a username and password. This user name and password is known by the admin. So to access the features u should know the password and username. If passwords are forgotten by a user he/she can't login.



Fig1 Login page

### 2) Menu

The menu of our system with images of the actual Tibebe gion Hospital holds UI of the system with many tasks inside. Patient registration, Registration information, Admit registration, Admit information, Staff registration, Staff information, Registration record, Staff record, Bill record, billing, Appointment, History registration and Investigation.

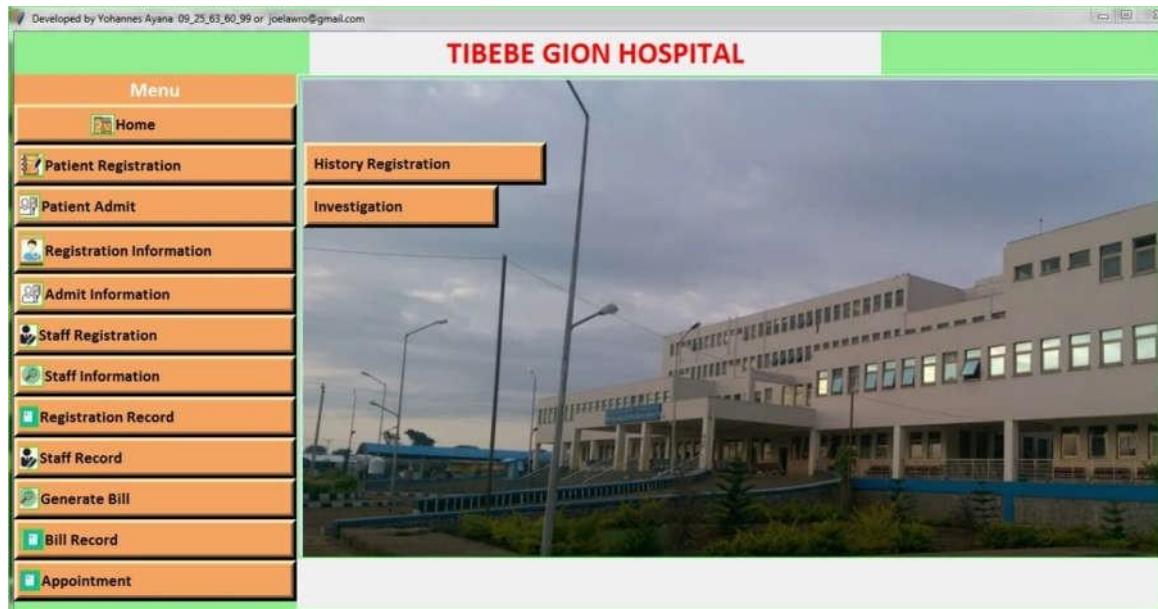


Fig2 Menu of the system (UI)

## Home

By pressing home button, the image for the building of the hospital will be displayed.



Fig3 image of Tibebe gion Hospital

### 3) Patient registration

The required data will be inserted to the patient registration screen. All information of the patient will be included to the database. If the patient needs his files a printed receipt can be given to him.

TIBEBE GION HOSPITAL	
Patient Registration	
Patient ID	
Name	
Gender:	<input type="radio"/> male <input type="radio"/> female
Age	
Phone	
Address	
Disease	
CheckIn	
Blood Group	
Doctor Name	
Room No	
	<b>ADD</b> <b>Receipt</b>

Fig4 Patient registration

#### 4) Registration Information

In this feature of our system the information of the patient that already added by registration format will be available after a search made by a user. Ids are used for searching method.

TIBEBE GION HOSPITAL		
Registration information		
<b>Input Patients ID</b>  <input type="text"/>  <b>Search</b>	<b>Patient ID:</b> <input type="text"/>	<b>Blood Group</b> <input type="text"/>
	<b>Name:</b> <input type="text"/>	<b>Doctor Name</b> <input type="text"/>
	<b>Gender:</b> <input type="radio"/> male <input type="radio"/> female	<b>Room NO</b> <input type="text"/>
	<b>Age</b> <input type="text"/>	
	<b>Phone</b> <input type="text"/>	
	<b>Address</b> <input type="text"/>	
	<b>Disease</b> <input type="text"/>	<b>Update</b>
	<b>Checkin</b> <input type="text"/>	

Fig5 Patient registration information

### 5) Patient admit

All necessary information's of admit will be filled in this area.

TIBEBE GION HOSPITAL	
Patient Admit	
Patient ID	
Name	
Gender	<input type="radio"/> male <input type="radio"/> female
Age	
Phone	
Address	
Disease	
CheckIn	
Bloodgroup	
Doctorname	
CheckOut	
RoomNO	
Room type	<input type="text"/>
Price.	
<b>ADD</b>	

Fig6 admit registration

## 6) Admit information

Information of admit patients can be accessed by searching using Ids.

TIBEBE GION HOSPITAL		
Admit information		
Input Patient's ID	Patient ID	
<input type="button" value="Search"/>	Name	
Gender	<input type="radio"/> male <input type="radio"/> female	
Age		
Phone		
Address		
Disease		
Checkin		
	Bloodgroup	
	Doctorname	
	Check Out	
	RoomNO	
	RoomNO	<input type="button" value="..."/>
	Price	
	<input type="button" value="Update"/>	

Fig7 Patient admit search screen

### 7) Staff registration

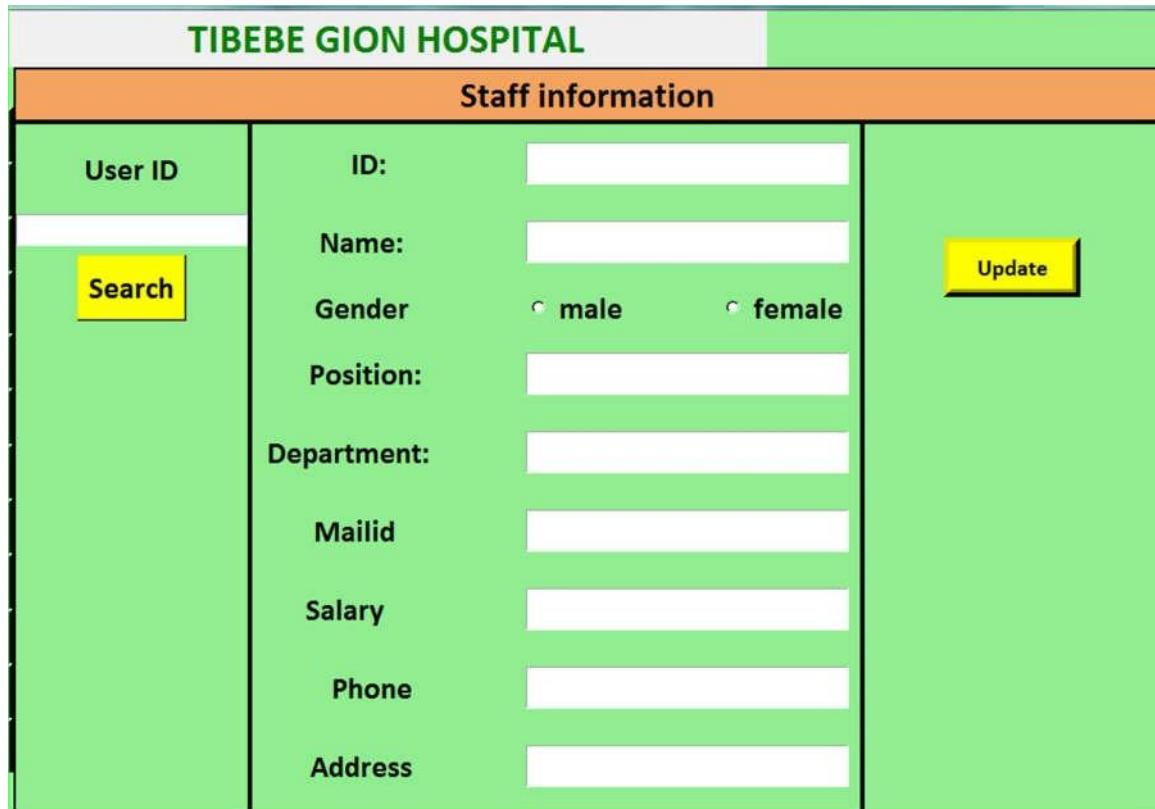
All staff members will be registered in staff registration. New comers will also be added in this system.

TIBEBE GION HOSPITAL	
Staff Registration	
ID	<input type="text"/>
Name	<input type="text"/>
Gender	<input type="radio"/> male <input type="radio"/> female
Position	<input type="text"/>
Department	<input type="text"/>
Mailid	<input type="text"/>
Salary	<input type="text"/>
Phone	<input type="text"/>
Address	<input type="text"/>

Fig8 Staff registration form

## 8) Staff information

Like Admit information hold admit registration and patient registration information holds data of patient registration by search method, Staff information also enables users to search the registered staffs.



The image shows a staff information form for Tibebe Gion Hospital. The form is divided into two main sections: a search section on the left and an information entry section on the right. The search section contains a 'User ID' input field and a yellow 'Search' button. The information entry section contains fields for 'ID', 'Name', 'Gender' (with radio buttons for 'male' and 'female'), 'Position', 'Department', 'Mailid', 'Salary', 'Phone', and 'Address'. There is also an 'Update' button in the top right corner of the information section.

Fig9 Staff information form

## 9) Patient registration record

The recorded data of patients will be available here. The whole information of the database registered as a patient registration form will be visible in a readable form.

TIBEBE GION HOSPITAL									
patientid	Name	Gender	Age	Phone	Address	Disease	CheckIn	Bloodgroup	Doctorname
2021-1433516	SAM	Male	22	1211	Addis	core	2/2/21	a	bhgh
2021-2619759	Yonas	Male	30	9123345	AA	fever	2/1/21	A	bahir Dar
2021-2866535	Dawit	Male	25	92164466	bd	coro	2/2/12	a	matias
2021-6334426	Abune	Male	29	934592836	YETEBABERUT, BAHIR D/	Anget	21/2/2021	O+	Kidist
2021-8358420	Remedan	Male	25	928474995	AA	Fever	2/2/21	A	Mathias
2021-9442409	ma	Male	33	222222222222	ffffd	asax	1/2/3	a	gghghg
2021-9780364	sam	Female	19	76767	AA	fever	2/1/21	A	Markos
2021-6671555	hab	Male	25	924473383	Bahir Dar	gunfan	1/2/21	B	tg
2021-3364122	d	Male	2	22	dd	ww	ww	ww	ww

Fig10 Patient registration record

## 10) Staff record

All the recorded things from the doctors and other staff will be available in this screen.

This is recorded from the information inserted in staff information

TIBEBE GION HOSPITAL								
ID	Name	Gender	Position	Department	Mailid	Salary	Phone	Address
Staff 2021-889	matt	Female	dr	midwifery	matt@gmail.com	55000	5555555	bdr
Staff 2021-661	Menge	Female	G.Dr	Mwry	Mengee@gmail.co	333333	9187878	bd
Staff 2021-559	Sam	Female	Dr.	Electrical	sam@gmail.com	22222	9665543	AA
Staff 2021-344	1	Male	1	1	1	1	1	1
Staff 2021-396	1	Male	1	1	1	1	1	1
Staff 2021-321	1	Male	1	1	1	1	1	1
Staff 2021-98	1	Female	1	1	1	1	1	1
Staff 2021-744	1	Male	1	1	1	1	1	1
Staff 2021-341	1	Male	1	2	1	1	11	1
Staff 2021-423	0	Male	1	1	1	1	1	1
Staff 2021-826	1	Male	1	1	1	1	1	1
Staff 2021-416	1	Male	1	1	1	1	1	1

Fig11 staff files record

## 11) Billing

Patients are required to pay money in return to services he gained

TIBEBE GION HOSPITAL			
Billing			
Identity:		Disease:	
Name:		Phone:	
Gender:	<input checked="" type="radio"/> male <input type="radio"/> female	Address:	
Age:		Doctor Name:	
Sr. No :	Particulars :	Amount :	
01 :	Doctor Charges :		
02 :	Lab Test :		
03 :	Treatment Charges:		
04 :	Procedure Charges :		
05 :	Other Charges :		
06 :	Miscelenous Charges :		
07 :	Room Charges :		
<b>Total:</b>			
		Save	Print

Fig12 Billing form

## 12) Generate bill

By searching using Id the bill that previously paid will be displayed in this page.

**TIBEBE GION HOSPITAL**

**Bill Record**

<b>Input Patient ID</b>	Identity: <input type="text"/>	Disease: <input type="text"/>
	Name: <input type="text"/>	Phone: <input type="text"/>
	Gender: <input type="radio"/> male <input type="radio"/> female	Address: <input type="text"/>
	Age: <input type="text"/>	Doctor Name: <input type="text"/>
Sr No:	Particulars:	Amount:
01:	Doctor Charges:	<input type="text"/>
02:	Labt Test:	<input type="text"/>
03:	Treatment charges:	<input type="text"/>
04:	Procedure Charges:	<input type="text"/>
05:	Other Charges:	<input type="text"/>
06:	Misceleneous Charges:	<input type="text"/>
07:	Room Charges:	<input type="text"/>
	<b>Total</b>	<input type="text"/>

**Search**

Fig13 generate bill

### 13) Appointment

Appointment is one of the features included in our system which can easily get by searching in either of some methods.

TIBEBE GION HOSPITAL						
Appointment:-				Appointment List:-		
Appointment No:	11			Search By: <input type="text"/> <input type="button" value="Search"/> <input type="button" value="Showall"/> <input type="button" value="Delete"/>		
Patient Name:	Abune			Number	Name	Gender
Gender:	<input checked="" type="radio"/> male <input type="radio"/> female			Age	Phone No.	Address
Age:	30			12/1/22	dd	
Phone No	93492836			23/2/20	bb	
Address:	BD			2/3/13	aa	
Time/Date:	21/3/2013					
<input type="button" value="Add"/>		<input type="button" value="Update"/>				

Fig14 Appointment

#### 14) History registration

History of a patient will be written and filled here.

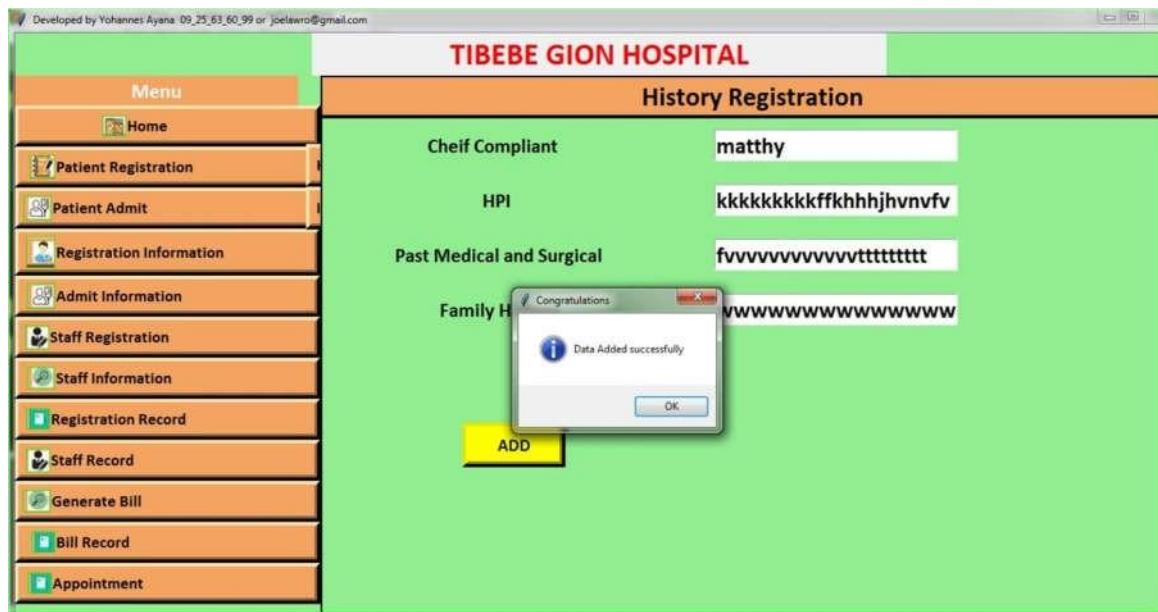


Fig15 History registration sample

## 15) Investigation

Investigation includes Laboratory and Imaging with details inside them.



Fig16 Investigation sample

