MAY 28, 2017

Hospital Management System
Software Design Document

Asifa Noreen

Rollno .2303

MILLAT COLLEGE AHMADPUR EAST
2015-2017

Revision History

Date	Description	Author	Comments
<date>	<Version 1>	<Your Name>	<First Revision>

Document Approval

The following Software Requirements Specification has been accepted and approved by the following:

Signature	Printed Name	Title	Date
	Dr.	Supervisor, CSIT 21306	<date>

Table of Contents

1 Introduction

Design is the planning that portrays the basis for the making of every object or system. Design process can be defined as the management of constraints. An effective design will be fruit full only when it is able to serve the purpose besides the look. While designing the “HOSPITAL MANAGEMENT SYSTEM’’ the above words are given utmost priority. ”Colors have a pleasurable appeal”-this thought is incorporated while designing the system so that it brings liveliness in the format instead of continuous monotony .Throughout the project the robust effort is taken to fetch all the entities related to a hospital under one roof. The proposed system though mainly focuses on events regarding a Patient, will also keep track of other entities related to the Hospital. Project is implemented through GUI based software that will help in storing, retrieving the information through various user-friendly menu-driven modules.

1.1. Purpose

The purpose is to describe all the requirements for the Hospital Management System. The following are some of the stake holders:

- Administrative staff
- Doctors
- Nurses
- Surgeons
- Developers.

The hospital management and its team members uses this document as the primary means to communicate confirmed requirements to the development team. The development team expects many face-to-face conversations that will undoubtedly be about requirements and ideas for requirements. However only

the requirements that appear in this document or a future revision, will be used to define the scope of the system.

1.2. Project Scope

The scope of this SDD is covers only to the requirement documentation, design and implementation due to secrecy of the project from which this SDD is derived. Therefore, the clients who own this project, instructor specialists Hospital, only permit me discuss only the above mention part. Hence, the testing and installation are not included here as agreed upon by both of us. The product item is the Hospital Management System. The System will be utilized to apportion beds to patients on a need premise, and to allot specialists to patients in assigned wards as require emerges. Specialists will likewise utilize the System to monitor the patients appointed to them. Medical attendants who are in direct contact with the patients will utilize the System to monitor accessible beds, the patients in the diverse wards, and the sorts of prescription required for every patient. Specialists must make rounds to get patients' treatment cards so as to know whether they have cases to treat or not. The goals of the System are to lessen after some time pay and increment the quantity of patients that can be treated precisely.

1.3. Acronyms, and Abbreviations:

Acronyms and Abbreviations:-

PHN Personal Health Number on wellbeing card

Report A record of patients

Database Collection of data in an organized frame

Front Work area staff Administrative staff that work at front counter

Logon ID a client recognizable proof number to enter the system.

Password A word that empowers one to pick up induction into the system.

1.3.1 Electro-cardiogram (EKG)

A device that measures the electrical activity in a biological heart and measures heart rate.

1.3.2 Pulse dosimeter: A device that employs monochromatic light to measures percentages of oxygenated hemoglobin in blood.

1.3.3 Systolic blood pressure: The peak pressure in the arterial circulatory system.

1.3.4 Diastolic blood pressure: The pressure at which the heart's aortic valve closes.

1.3.5 Emergency medical technician (EMT).

A trained emergency healthcare specialist.

1.3.6 Oscilloscope monitor. A cathode ray tube capable of representing a beam of light that simulates a heart rhythm waveform.

1.3.7 (HIPAA) -The Health Insurance Portability and Accountability Act of 1996

1.3.8 (SDLC)-The Systems Development Life Cycle.

1.3.9 Non-Digitized Professionals. Health Care providers who have no access to digital records through lack of hardware, software, or preference to legacy flat file charting methods.

1.3.10 (AES)-Advanced Encryption Standard

1.3.11 (DSP) -Distributed Services Provider

1.3.12 (ASP) –Application Service Provider

1.3.13 (FAT32) - File Allocation Table 32 Bit

1.3.14 (TIFF) – Tag Image File Format

1.3.15 (JPEG) - Joint Photographic Experts Group

1.3.16 (DOB) – Date of Birth

1.3.17 Vendor A licensed and authorized agent of the development team or their vested remainder men.

1.3.18 ISO 8601. A standard format for representing date and time recommended by the International Organization for Standardization.

1.3.19 Initial patient information. Information normally gathered during a patient's first arrival in a healthcare provider's office or in an emergency room. This includes but not limited to name, address, Social Security Number and any health insurance numbers.

1.3.20 **(**fps) – Frames per second.

1.3.21 (CISDC) – Computer Information Society Design Competition.

1.4 Reference:-

1. W Hay - Chinese Hospitals, 2006 - en.cnki.com.cnThis article analyzes the concept and development of inn marketing and discusses the concept of inn marketing grouping **hospital**. The author also introduces how to implement inn marketing in **hospital** from survey, analysis of inn marketing, communication, training.

2. P CHEN, N FANG, H XU - Information of Medical Equipment, 2006 - en.cnki.com.cn In this paper, we introduce a new method about our **hospital management** of sugary depot. It's an open mode of management of two-level depot with the computer network. By man-machine conversation, the valuable medical disposable materials can be taken by self-service.

3. Y Qing - COMPUTER ENGINEERING AND APPLICATIONS, 2000 - en.cnki.com.cn According to the background of the **hospital management** information system builded,thispaper introduces the implementation plan of a **hospital management** information based on Client/Serverarehitecture.Using object-oriented technology, some methods about how to **.**

4. C Ping - Chinese Medical Equipment Journal, 2006 - en.cnki.com.cn the application of radio frequency identification (RFID) and wireless network to neonates' management can effectively avoid occupying infants by mistake. This technology can provide an advanced accessorial instrument in **hospital** management and upgrade thing Liu, TX Wu - Chinese Journal of Evidence-Based Medicine, 2003 - en.cnki.com.cn**...** 10, Han Peng,Chen

Yingyao,Tang Zhiliu.Department of **Hospital Managment**,School of Public Health,Fudan University(200032),Shanghai;The Application of ROC Curve to Evaluate the Prenatal Screening of Down's Syndrome in China[J];Chinese Journal of Health Statistics **.**

5. WK Ehrenfeld, RS Lord, RJ Stony, EJ Wylie - Annals of surgery, 1968 - ncbi.nlm.nih.gov**r** Nine months later the patient was readmitted to the **hospital** after three days of Melina without other gastro- intestinal complaints. **...** Case 3. A 50-year-old woman had several un- successful grafting operations for aorta-iliac co- collusion at another **hospital.**

6. RM Waters - Anesthesia & Analgesia, 1937 - journals.lww.com**...** 4nesthesia in America at the present time is to an extent "in the spotlight." A need for better service in anesthesia is felt by the surgeon, the remaining members of the **hospital** staff, the patient and the **hospital management**. Are they getting better service this year than last?

1.5. Overview

The Software Design Document will characterize and outline the general venture and its necessities both practical and non-useful. Moreover the SDD will characterize the clients and their individual attributes and also any imperatives to improvement that the group has distinguished. The arrangement of the SDD report will address the general venture first-incorporating capacities and targets in an outline. This segment will likewise address how this product interfaces with other legacy Systems as well as demonstrative gear associated with it. At that point the resulting areas will particularly addresses the segments of the bigger programming System. These areas depict particulars for each feature of the segments plan.

2. Design Considerations

2.1. Assumptions

2.1.1 The System depends on a Physician association with a healing center System with which he/she is a staff part.

2.1.2 The SDLC executed the System will be display driven and in light of ensuing variants to safeguard information trustworthiness and usefulness.

2.1.3 Due to report length limitations forced by CISDC, HIPAA controls will be entirely taken after yet kept as a remain solitary record.

2.2. General Constraints

2.2.1 The Health Insurance Portability and Accountability Act of 1996 (HIPAA) has commanded different norms on security, protection, exchange and code sets, and one of a kind medicinal services identifiers to which this System must follow.

2.2.2 Legacy Systems set up must be considered and altered to interface with the new System plan.

2.2.3 The time box which exemplifies the SDLC may constrain some usefulness of the System.

2.2.4 Both the doctor's facility and doctor database will require vast capacity abilities and a procedure to file obsolete information.

Note: Strategy and size of Database stockpiling TBD

2.2.5 Paper level document medicinal records should be delivered and put away to guarantee capacity to deal with non-digitized restorative experts.

2.3. System environment

Login module Description

This module records just client and secret word of the client.

Patient module Description It monitors all insights about both in-patient and out Patient. Persistent id, understanding name, address, conceded date, specialist name, and room no are entered in a frame and put away for future reference. Additionally specific patient points of interest can be seen in the table utilizing a different shape with a characteristic patient id.

This zone records the necessities that are depended upon to run the system adequately. The working system required for the structure to run fittingly, the interface to run the application, the driver for running Java web applications, the

composed change condition to add to the application, and the outcast mechanical assembly to adjust clarifications behind existing are as per the going with:

1. Working System: Windows (Vista/Windows 7) or MAC OS
2. Web Brower: Internet Explorer (at least 8.0), Mozilla Firefox (at least 3.0), or Google Chrome
3. Drivers: Java Runtime Environment
4. Untouchable Tool: Microsoft Word.

3. Architectural Design

3.1. Web Architecture

Archicture is base of nature functionality and processing the task .Sometimes we don't need an active server for processing of data. Just client side is able to process the data item.

On the other hand we need a active server for processing of task before web applications runs in a collorative manners. our web application is two tier archicture because half of the functionality is down on server side or half on client side.

3.1.2 Server

Server is responsible for:

Query processing
Transition management

And fragment ordering of different relations.

3.1.3 Client

Client side is responsible for management using interfaces it provides us a graphical user interfaces to interact with the entire system.

3.2 Data flow diagram:

Data Flow Diagram

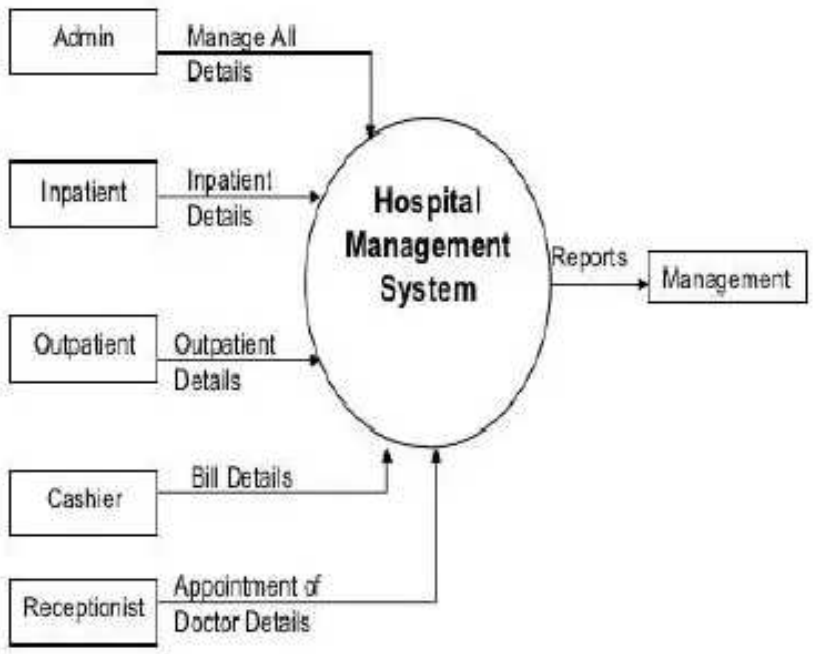


Figure 1

3.3 UML Diagram:

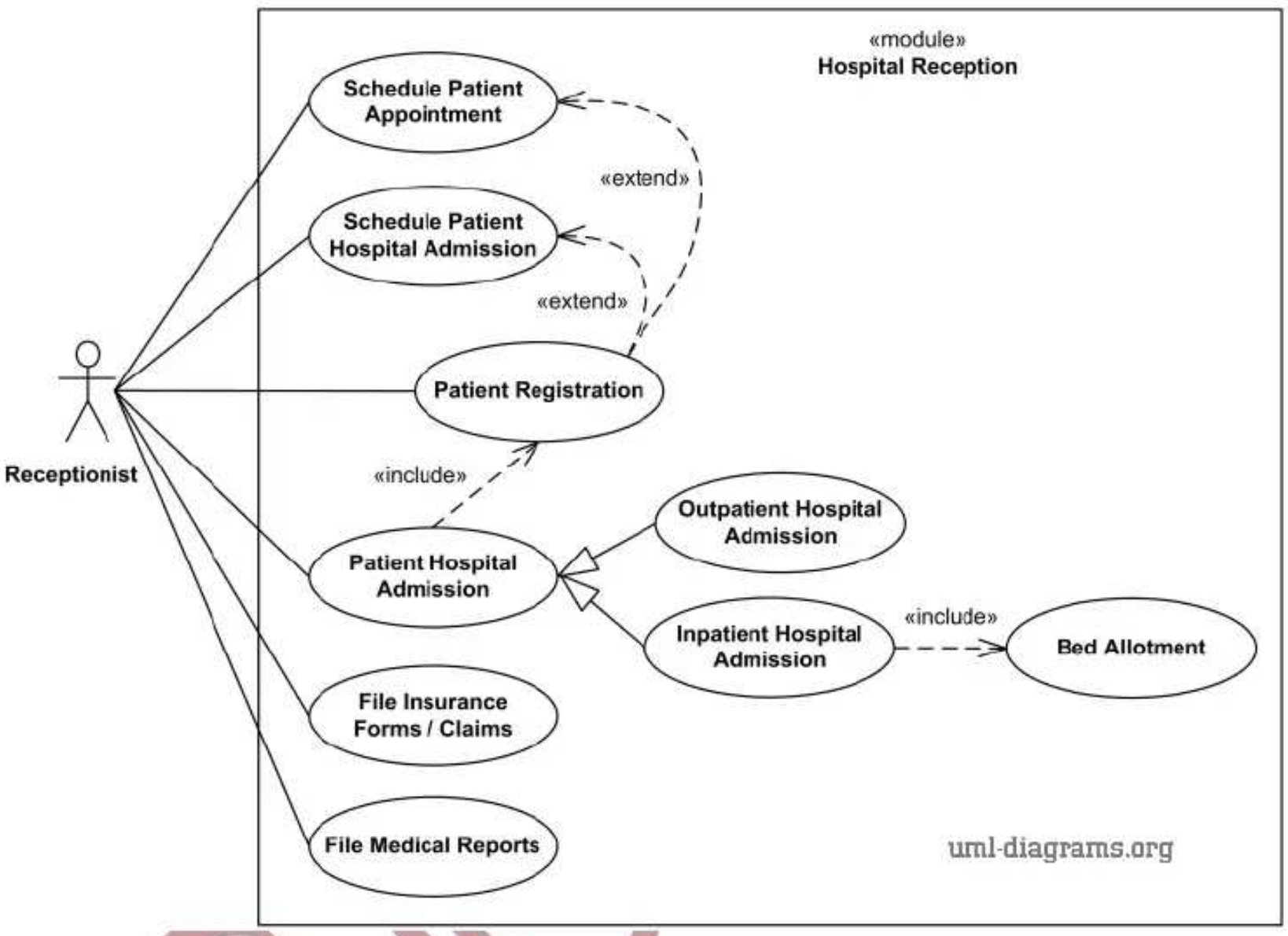


Figure 2

3.3. Data Design

3.3.1. Data Description

1. Description

A database is a collection of information and is systematically stored in tables in the form of rows And columns. The table in the database has unique name that identifies its contents. The database in turn is further described in detail giving all the fields used with the data types, constraints available, primary key and foreign key .Database design is used to manage large bodies of information. In this database we describe all the 4 tables available in the software, which are used to store all the records.2. Data types and its description: Fields in database table have a data type. Some of the data types used in database table are explained below. a)

Integer:-

One optional sign character (+ or -) followed by at least one digit(0-9). Leading and trailing blanks are ignored. No other characters allowed)

Varchar:-

It is used to store alpha numeric characters. In this data type we can set the maximum number of characters up to 8000 ranges by default SQL server will set the size to 50 characters largeHospital Management System

Date/Time:-

Date/Time data type is used for representing data or time.

3.3.2. Maps Database

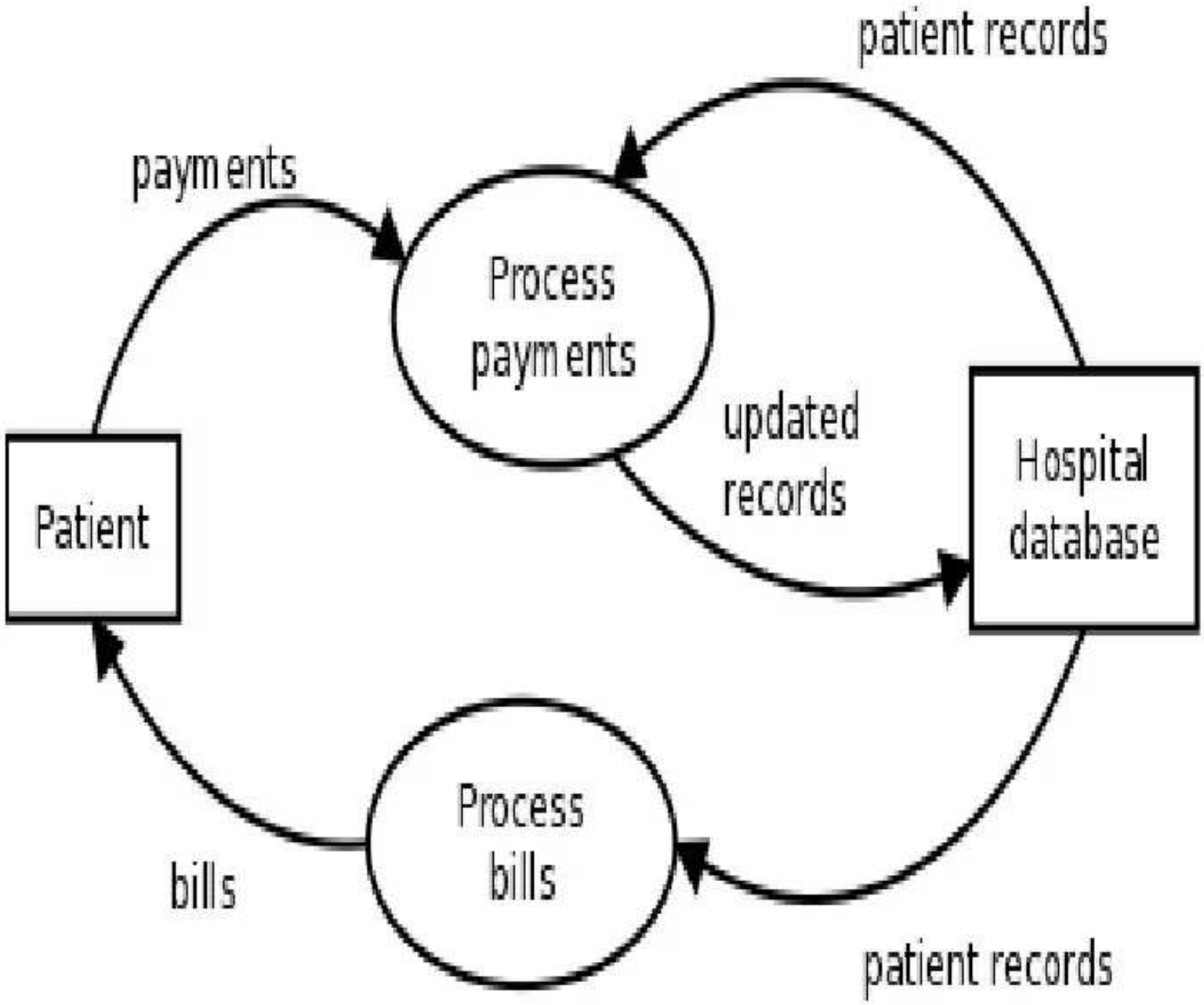


Figure 3

3 3.3.3 Data Dictionary of Maps table

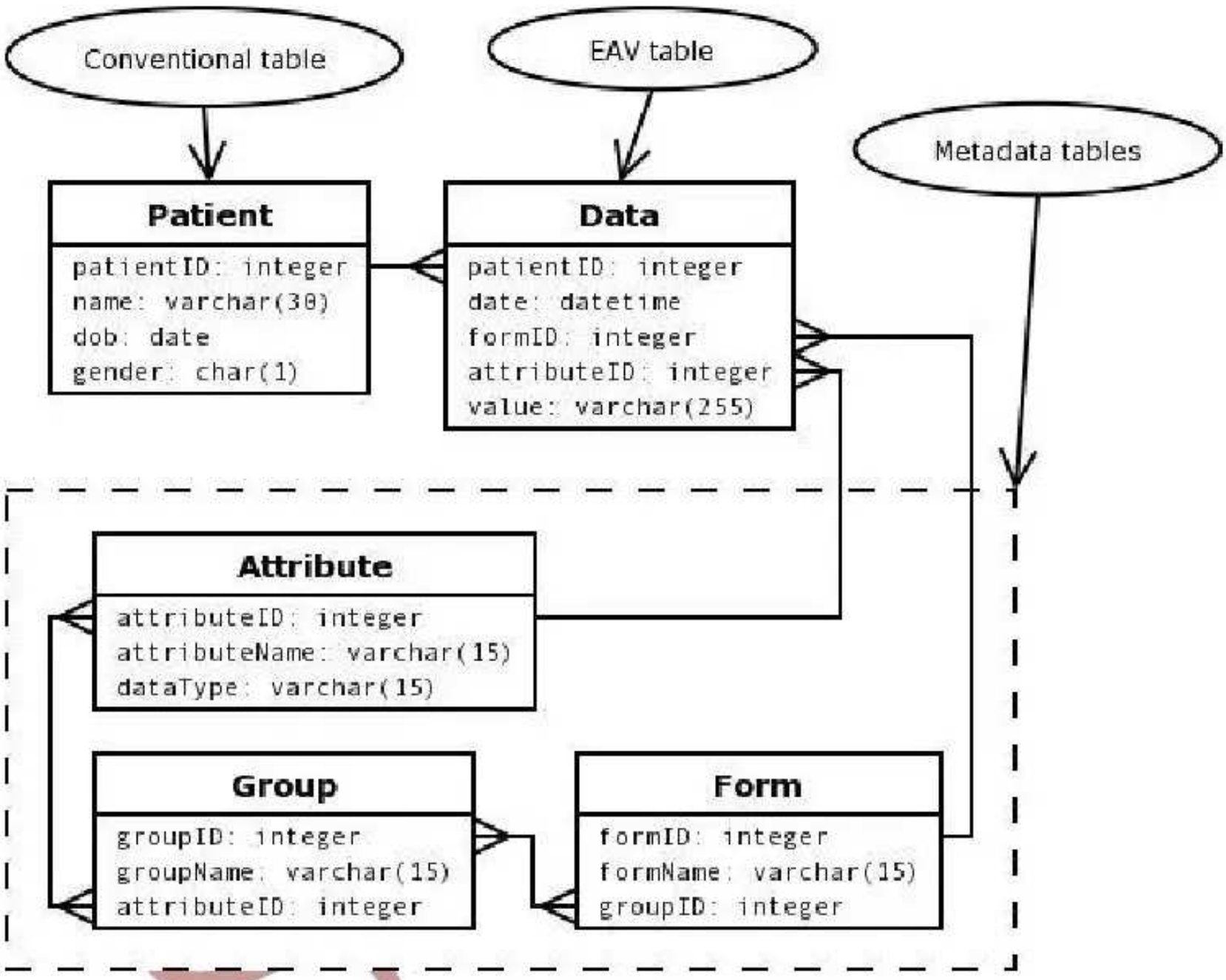


Figure 4

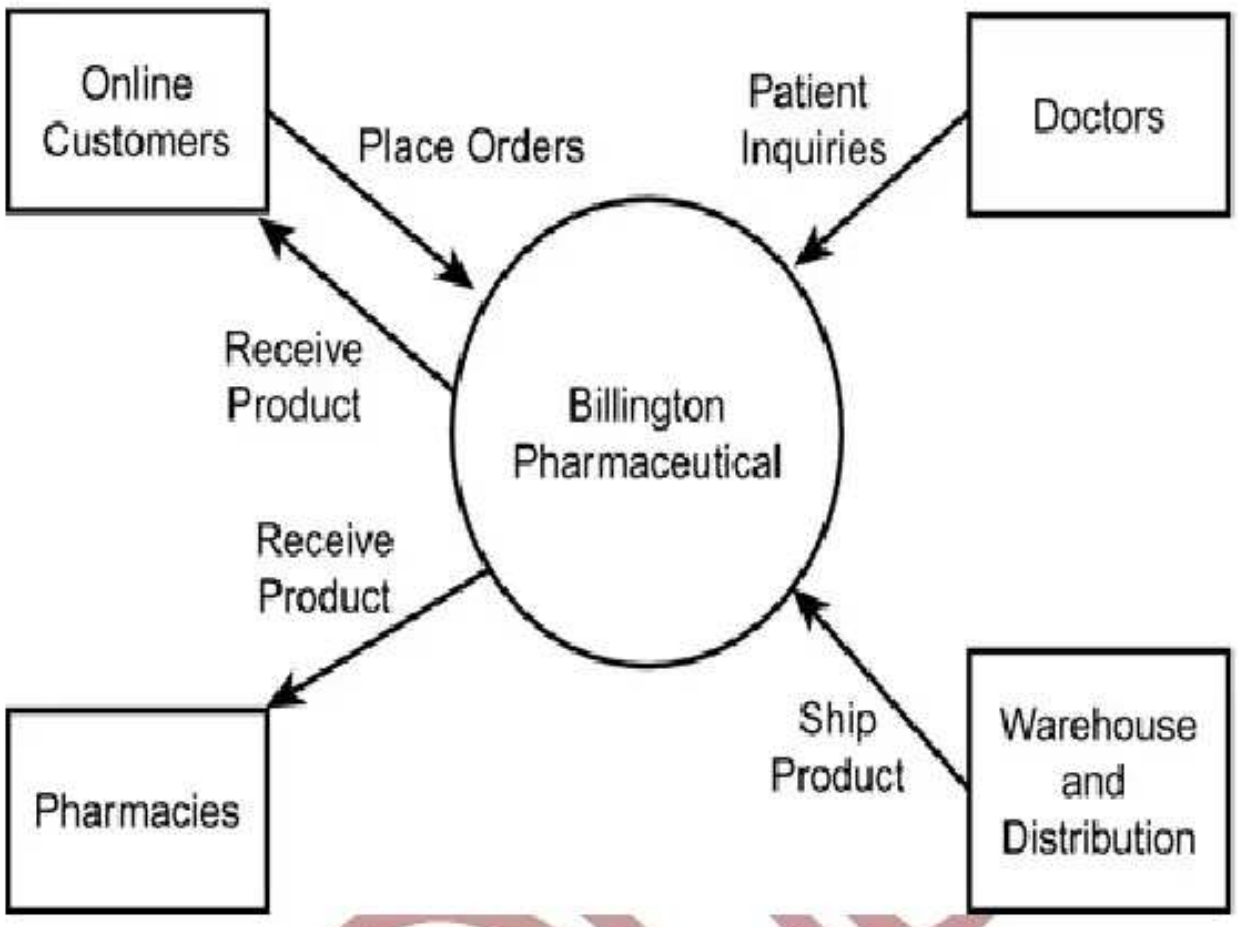


Figure 5

3.3.4. Blog Database:

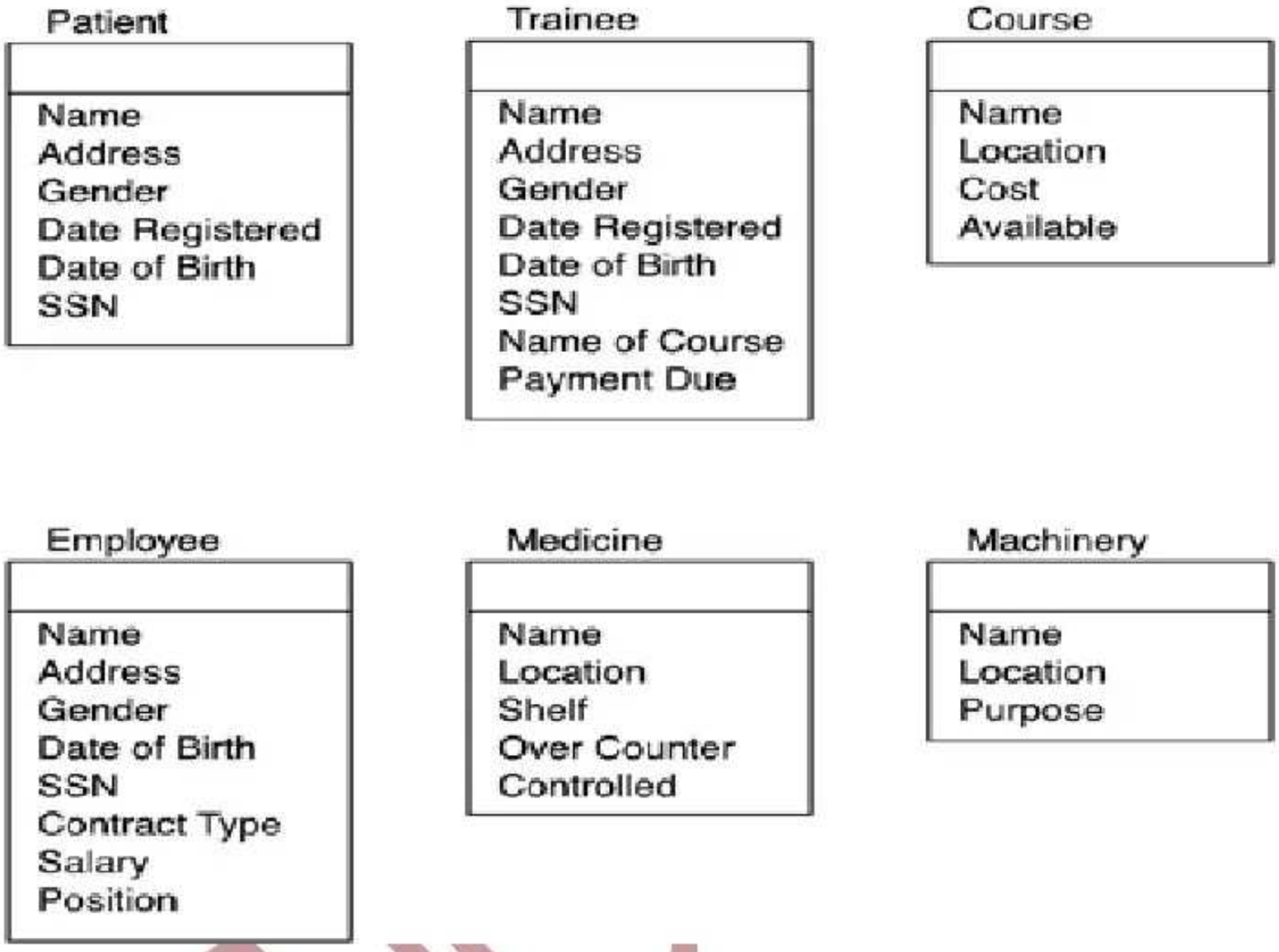


Figure 6

3.3.5 Descriptions

A use case diagram can do many things, but its main purpose is to represent users' interactions with a system. Lucid chart can help you build a use case diagram of your own to better understand its nuances. Start diagramming now!

Streamline communication in your organization with better software. Lucid chart is accessible from nearly any operating system, browser, or device; it's time to see what all the fuss is about

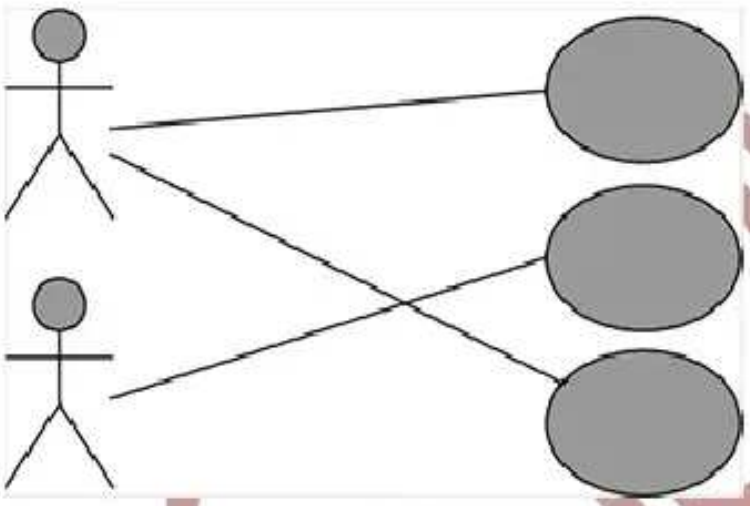
UML Use Case Diagram for Hospital Management System

No matter where you are, the process of getting medical attention can be confusing. Hospital administrators can improve the experience by using diagrams to chart relevant details. For example, this use case diagram for hospital management system (UML) shows how the receptionist, records system, and

doctor work together to file insurance claims, prescribe tests, schedule patient appointments, and much more. To make a use case diagram in Lucid chart, you can simply drag and drop elements onto the canvas and rearrange as necessary. The examples below will provide further inspiration!

Use case diagrams are typically used to model circumstances where your system or application interfaces with outside entities, which are known as actors. Your team can also employ use case diagrams to express or define the scope of a system. With Lucid chart, it's easy to create diagrams and solicit feedback for optimal results. Try our real-time collaboration to work simultaneously with clients or colleagues, or experiment with text and video chat in the editor. The template below is a perfect UML starting point!

Use Case Diagram for Hospital Management System (UML)



A use case diagram can do many things, but its main purpose is to represent users' interactions with a system. Lucid chart can help you build a use case diagram of your own to better understand its nuances. Start diagramming now!

3.3.6. Data Dictionary of Blog table:

6. Data Tables

1. Login Table:-

Field Name	Data Type	Description
User_Name	Text	
Password	Text	
Hint_Question	Text	
Hint_Answer	Text	
User_Type	Text	

2. Patient Detail Table:-

Field Name	Data Type	Description
Registration_No	Text	
Registration_Date	Date/Time	
Name	Text	
Address	Text	
City	Text	
TelePhone_Mobile_No	Text	
Marital_Status	Text	
Religion	Text	
Gender	Text	
Father_Husband_Name	Text	

Figure 1

Table Name:- Employee
Primary Key:- EmployeeId
Foreign Key:- DesignationId

Employee Table				
Fields	DataType	Size	Constraints	Description
EmployeeId	bigint	-	Primary key	AutoNumber
EmployeeFirstName	Varchar	50	-	It Identifies Employee FirstName
EmployeeLastName	Varchar	50	-	It Identifies Employee LastName
DesignationId	bigint	-	Foreign key	It Identifies Employee Designation Which Directly Connect From The Designation Table As ForeignKey
Qualification	Varchar	50	-	It Defines Qualification Of Employee
Address	Varchar	150	-	Address Of Employee
ContactNo1	Varchar	13	-	ContactNo Of Employee's Home

Figure 2

Label	Name	Data Type	Max Length
Address	address	string	40
Address2	address_2	string	40
Best Time To Call	best_time	list	1
Cell Phone	phone_cell	string	12
City	city	string	39
Country	country	string	2
DOB	dob	string	20
Email Address	email_address	string	60
First Name	first_name	string	25
Gender	gender	list	
Home Phone	phone_home	string	12
Last Name	last_name	string	25
Opt In	opt_in	bool	
State	state	string	2
Work Phone	phone_work	string	12
Zip Code	zip_code	string	8

Figure3

Figure 4

4. User Interface Design

4.1. Section Overview

Web mine is leading IT company which provides custom web application development service. HMS (Hospital Management Software) is one of the successful products of the company. The hospital management software or the

software for hospital management commonly incorporates various essential features which help to run smoothly the regular day to day basis operations of any hospital. The hospital or clinic management software is made such a way that it looks after the outpatients, inpatients, billings, database of the patients, and the hospital information including the availability of the doctors, their specialization, the payments to various members of the staff and the billing process. As a whole, the hospital information management system is very useful to taking care of all the aspects of running the hospital in the cost effective way.

4.2. Web Pages

4.2.1. Home Page

Figure 1

4.2.2Maps page

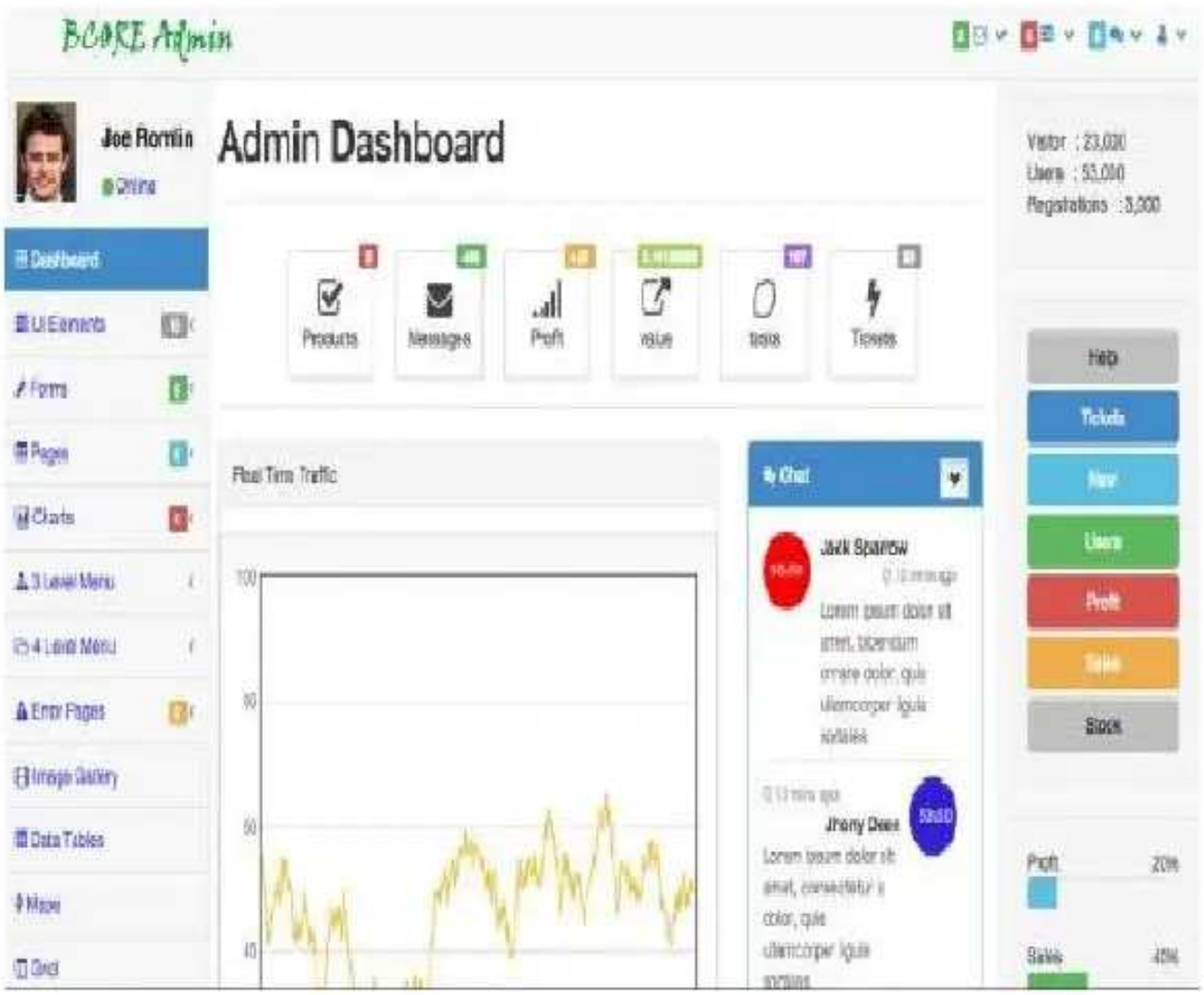


Figure 2

4.2.3. Blog (Web Log) Page

4.2.3.1. Recent Blogs


techdynamics.org/aspc/login/
Clinic
Management
System
SIGN IN
User ID
Passcode
Submit
Forgot password?

Figure 3

4.2.3.2. Record Explore

Figure 4

4.2.3.3. Admin Page

Figure 5

4.2.3.4 Descriptions

The Hospital Management System (HMS) is a computer-based system that establishes an orderly and systematic method of managing hospital and clinic patient records more effectively and efficiently for both out-patients and in-patients.

What are the main features of the Hospital Management System?

The system manages daily activities of the hospital/clinic in all its departments – Pharmacy, Laboratory, Radiology, Physiotherapy, Records, Out Patient Departments (OPD) and all wards – Medical & Surgical, Maternity, Intensive Care Unit (ICU), Operating Theatre, Special side wards and isolations wards.

5. Glossary

5.1. Acronyms and Abbreviations

Acronyms and Abbreviations:-

PHN Personal Health Number on wellbeing card

Report A record of patients

Database Collection of data in an organized frame

Front Work area staff Administrative staff that work at front counter
Logon ID a client recognizable proof number to enter the system.

Password A word that empowers one to pick up induction into the system.

1.3.1 Electro-cardiogram (EKG)

A device that measures the electrical activity in a biological heart and measures heart rate.

1.3.2 Pulse dosimeter: A device that employs monochromatic light to measures percentages of oxygenated hemoglobin in blood.

1.3.3 Systolic blood pressure: The peak pressure in the arterial circulatory system.

1.3.4 Diastolic blood pressure: The pressure at which the heart's aortic valve closes.

1.3.5 Emergency medical technician (EMT).

A trained emergency healthcare specialist.

1.3.6 Oscilloscope monitor. A cathode ray tube capable of representing a beam of light that simulates a heart rhythm waveform.

1.3.7 (HIPAA) -The Health Insurance Portability and Accountability Act of 1996

1.3.8 (SDLC)-The Systems Development Life Cycle.

1.3.9 Non-Digitized Professionals. Health Care providers who have no access to digital records through lack of hardware, software, or preference to legacy flat file charting methods.

1.3.10 (AES)-Advanced Encryption Standard

1.3.11 (DSP) -Distributed Services Provider

1.3.12 (ASP) –Application Service Provider

1.3.13 (FAT32) - File Allocation Table 32 Bit

1.3.14 (TIFF) – Tag Image File Format

1.3.15 (JPEG) - Joint Photographic Experts Group
1.3.16 (DOB) – Date of Birth

1.3.17 Vendor A licensed and authorized agent of the development team or their vested remainder men.

1.3.18 ISO 8601. A standard format for representing date and time recommended by the International Organization for Standardization.

1.3.19 Initial patient information. Information normally gathered during a patient's first arrival in a healthcare provider's office or in an emergency room. This includes but not limited to name, address, Social Security Number and any health insurance numbers.

1.3.20 (fps) – Frames per second.

1.3.21 (CISDC) – Computer Information Society Design Competition.

5.2. Definitions

A. Definitions terms:-

• An operator is an identifiable computational element that robotizes some part of assignment and performs basic leadership to profit a human substance.

• Intelligent specialists are objective driven and self-ruling, and can convey and interface with each other. The objective of these specialists is to play out the regular errand as indicated by the client's need.

• Intelligent specialists sense their condition and participate in basic leadership whereby they select activities, and execute their activities, which, thus, affect their condition . A developing programming smart specialist has learning capacities. They can learn new ideas, obtain capacities to adjust the ecological changes, and develop to perform better assignments in steadily evolving circumstances. In

programming terms a developing specialist ought to detect and procure changing/new necessities self-sufficiently, co-work to different operators and alter it to satisfy those prerequisites. In particular, they are relied upon to perform constantly three capacities: see dynamic natural changes; take action(s) to influence conditions in the earth; and utilize thinking to translate percepts, take care of issues, draw derivations, and

• **Cooperative agents:**

These agents communicate with other agents and act according to the results of their communication.

. • **Proactive agents:**

These agents initiate actions on their own and use their intelligence to accomplish a task.

• **Adaptive agents:**

These agents can learn from their experience and then change their nature automatically to adapt to the situation.

. • **Personal agents:**

These agents are proactive and they work in accordance with a particular user's need.

• **Collaborative agents:**

These agents are proactive and cooperate with other agents. III. THE HOSPITAL MANAGEMENT SYSTEM The manual hospital system includes registration of patients, storing their details in a file as a record and also the patients' bills of the hospital. Manually it is very difficult to manage the entire hospital system. It takes too much time to find out particular record of the user and is very difficult to manage number of records sequentially. Many problems have been experienced in such systems. Some of the problems are described below.

. • **Lack of immediate retrievals:**

It is very difficult to retrieve particular information like to find about patient's information or history, the user has to go through various record books and this process requires time and efforts.

. • **Lack of immediate information storage**:

The information generated by various transactions takes time and efforts to be stored at right place.

• **Lack of prompt updating:**

Changes are difficult to make as it involves heavy paper works that take too much time to update records.

. • **Error prone manual calculation**:

Manual calculations are error prone and take a lot of time and may result in incorrect information.

• **Preparation of accurate and prompt reports:**

It is a difficult task to collect information from various record books. The above mentioned problems may be minimized by developing a computerize system but these problems also hamper the computerization of the hospital management process. As mentioned before, development of a HMS is subject of this research. We expect the computerized hospital management system should prove beneficial and it would streamline operations, enhance administration & control, provide a better patient care with strict cost control and improved facilities. In addition the system may be powerful, flexible, and easy to use.

• **Doctor Agent:**

A doctor agent plays the role of a doctor. It's the main aim is to gather requirements of the doctor such as time saving approaches to deal with the patient and prepare report for developer. A doctor agent also collects the advisory requirements such as suitable treatment and medication for a particular patient.

. • Nurse Agent:

A nurse agent plays the role of a nurse. The design of nurse agent is similar to the doctor agent. A nurse agent helps a doctor agent and acts in coordination with doctor agents.

- **Environment Agent:**

The environment agent is responsible for the hospitality of the hospital. It maintains the arrangement of various hospital units such as wardrooms, ICUs and operating rooms. It is the part of user interface of the computerized HMS. An environment agent senses requirements related to user interface of the HMS software and helps doctors and patients in the selection of various hospital resources such as ICUs, operating rooms, and wardrooms. All these agents operate in coordination with each other. They are provided with learning abilities so, being a HMS constituent, they learn various requirements while the HMS is in operation. These agents work independently in gathering the requirements from HMS users as well from each other. Moreover, if required they co-operate among various agents and finalize tasks. Needless to say, each intelligent agent generates a report for developers of the HMS for the purpose of enhancing the HMS performance.