Jimma University

Health Institute

Jimma Medical Ceneter(JMC)

Project Title : **Integrated HCI System**

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JMC-ICT

2019

Acknowledgment

First of all, we would like to thank our almighty God, who gives us love, patience, healthy, wisdom and ability to walk through all the problems and obstacles during the period of our proposal preparation. Secondly, We also thanks to our Mr. Alemayehu and Mr.Haile for their willingness of constrictive, invaluable information. And next for all jimma medical center Admin ICT staff who contributed in the development of this proposal.

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Approvalof the Project

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*Comment*_____

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Insurance Head: Name _____ ***Sign*** _____

*Comment*_____

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*Date:*_____

Executive Summary

Health care quality is the degree to which health care services for individuals and populations increase the likelihood of desired health outcomes. Quality of care plays an important role in describing the iron triangle of health care, which defines the intricate relationships between quality, cost, and accessibility of health care within a community. The domains to measure and describe quality of care in health are safe, effective, patient-centered, timely, efficient and equitable to provide medical resources of high quality to all who need them; that is, to ensure good quality of life, cure illnesses when possible, to extend life expectancy.

The Community Based Health Insurance (CBHI) is also a system that benefits part of the community who are engaged in the informal sector of the economy in urban and rural areas by involving them in supporting one another and minimizing the pressure of the cost of healthcare services when covered on individual basis. It is a system designed to keep the community from sliding into abject poverty.

To do this, Jimma medical center is currently agreed about 36 districts and 4 zones with CBHI, credit service and health care finance but the trend is progressive according to Ethiopian health insurance agency. All those insurance details recorded on huge amount papers and also that is difficult to prepare payment request reports to districts and organizations timely. And also the hospital has not been got its payment timely due to two main factors; error-prone reports and unavailable of on timely cash report. This problem of tedious and boring paper work would be worst or increasing while the number of organization and districts added to this health package.

As a solution, It is compulsory to use computer automated system improve health quality and by increasing hospital revenue , fast particular document retrieval, accurate and timely report ,low man power, concurrently accessing records and security. It is not optional according to the problem.

CHAPTER ONE

Introduction

Ethiopia is one of the fastest growing country in Africa having more than 104 million people (the second most-populace in the region). The features of public health problem of underdeveloped country such as communicable diseases(HIV, Malaria, Tuberculosis etc), maternal and child health problems(diarrhea & dehydration, pneumonia, Neonatal problems etc)and malnutrition account for majority of the public health problem but there is also significantly growing Non-communicable diseases (cardiovascular syndromes, cancers, mental illness etc) and injury.(Wikipedia).

There are around 234 hospitals in Ethiopia according to *Health and health related indicator EFY 2007*. So Jimma medical center is a one of public specialize hospital that found south-west region of Ethiopia established in Jimma university as teaching hospital to eradicate community health problems and teaching whose who mentioned above. The following health caser systems has been used in Jimma medical center based on agreement with regional districts and organizations via health care fiancé, credit service and community based health insurance(CBHI).

A. **Health care finance:-**The current Ethiopia health care financing strategy focus on financing of primary health care services in a sustainable manner. It envisions reaching universal health coverage by 2035. The prioritized initiatives are mobilizing adequate resources mainly from domestic sources, reducing out-of-pocket spending at the point of service use, enhancing efficiency and effectiveness, strengthening public private partnership and capacity development for improved health care financing. To operationalize the strategy, various reform measures were implemented. These reforms include: revenue retention and use at the health facility level; systematizing fee waiver system; standardization of exempted services; setting and revision of user fees; allowing establishment of private wing in public hospitals; outsourcing of non-clinical services ; and, promotion of health facility autonomy through establishment of a governance body; and establishment of health insurance system.

B. **Credit service:-**This type health service based on an agreement between the Hospital and other external body such as districts or organization. After a patient get health care

with health credit service the Hospital get a payment from agreed organizations or bodies. Example: Whose who had get treatment from this health service include university students, employee of university, hospital itself and other external originations.

C. **Community-based Health Insurance (CBHI):-** Pilot implementation initiated since 2011 in 13 districts in four big regions (Oromia, Amhara, Tigray and South nation and nationality). The aim is to reach and cover the very large rural an agricultural sector and smalls informal sectors in an urban setting. To give equitable, accessible and increased financial risk protection. Currently more than 36 districts and 4 zones are agreed with Jimma medical center with community-based health insurance.

Community based Health Insurance Design Features

- The Scheme is established at Woreda (district) level.
- The scheme is managed by three full-time CBHI Executive staff at Woreda level.
- There is a section of the schemes at each sub-district level.
- General Assembly and Board at woreda level serve as a governance structure.
- Regional and Zonal Steering Committees play a leadership role.
- Ethiopian health insurance agency play significant technical and capacity building role.

The main objective of CBHI in Ethiopia(Ethiopian Insurance Company)

- ✓ To remove financial barriers.
- ✓ To reduce catastrophic out of pocket expenditure(OOP).
- ✓ To increase health service utilization.
- ✓ To improve quality of care, by increasing resources for health facilities through strong .community involvement and ownership and strategic purchasing.
- ✓ To enhance equity in health.
- ✓ To Mobilize domestic resource.

Currently, Jimma medical center made legal agreement more than 36 woreda (districts) and 4 zones including jimma ,Bunobedle, Elibabora and Caffa zones with agreement of health care finance community based health insurance and health care finance. Meanwhile, 63% out of total catchment population get health care service by above health mechanisms. So that the hospital revenue or income more than half account for health care finance, CBHI and Credit service. The quality of health service based on income hospital from those health finance

system. The hospital insurance department prepared paper based report to inquiry payment from agreed districts and originations every quarter of the year. Due to absence of a well-established information system to keep records appropriately and fast retrieval with efficient report preparation has led to inconveniences that resulted in low health quality because no timely made payment to the hospital. This is the reason why preparing report manually is error-prone so that the agreed organization and districts have not been made their payment timely due to inaccurate payment report and delayed payment requests. Therefore, the problems are affecting our hospital directly or indirectly. To tackle down this problem, it is compulsory to use automated information system as software project.

1.1 Background

Jimma University teaching Hospital (JUTH) is one of the oldest public hospitals in the country. It was established in 1930 E.C by Italian invaders for the service of their soldiers. Geographically, it is located in Jimma city 352 km southwest of Addis Ababa. After the withdrawal of the colonial occupants, it has been governed under the Ethiopian government by the name of "Ras Desta Damtew Hospital" and later "Jimma Hospital "during Dergue regime and currently Jimma University Teaching Hospital.

Though old for its age, it had not made remarkable physical facility improvement for years. However in the later times it became evident that some side-wing buildings were constructed by different stakeholders at different times to respond to the ever-growing pressure of service demand and clinical teaching need derived from the public and Jimma University respectively. Especially, after transfer of its ownership to Jimma University, the university has made relentless efforts in extensive renovation and expansion work to make the hospital conducive for service, teaching and research.

Currently it is the only teaching and referral hospital in the southwestern part of the country, providing services for approximately 15,000 inpatient, 160,000 outpatient attendants, 11,000 emergency cases and 4500 deliveries in a year coming to the hospital from the catchment population of about 15 million people. Cognizant of the fast growing service and teaching role of the hospital, the federal government considered construction of a new and level- best 600 bedded hospital which' will be functional as of September 2015.(*https://www.ju.edu.et/)*

1.2 Statement of the Problem

The weakness of the existing system which includes over reliance on paper based work. Paper files consume a lot of the office space, slow recording, processing and retrieval of patient insurance details. Accessing and sharing of information by different departments is difficult due to poor information management and decision support system.

Jimma medical center is also currently agreed about 36 districts and 4 zones with CBHI, credit service and health care finance but the trend is progressive according to Ethiopian health insurance agency. All those insurance details recorded on huge amount papers and also that is difficult to prepare payment request reports to districts and organizations timely. And also the hospital has not been got its payment timely due to two main factors; error-prone reports and unavailable of on time report. This problem of tedious and boring paper work would be worst or increasing while the number of organization and districts added to this health package. Major problems I have been discovered by different techniques are;

- Slow recording, processing and retrieval of insurance payment details and patient folder.
- Boring and tedious: The existing system is not user friendly because the retrieval and storing of data is slow and data is not maintained efficiently.
- Difficult for decision making: they are generated with great difficulty reports take time to generate in the existing system.
- Manual operator control: It leads to a lot of chaos and errors.
- Paper-based: Existing system requires lot of paper work and even a small transaction require many papers fill. Loss of even a single paper led to difficult situation because all the papers are interrelated.
- Inaccurate reports. disagreement happen between JMC and agreed parties
- Difficult to get real information at real time.
- Accumulation of file consume huge amount of office space
- Difficult in conducting consistent reports.
- There is no fast and efficient way of *sharing critical* information.
- Inability of modification of data: Prompt updating is difficult unless changing paper.
- Not user friendly: Because the retrieval and storing of data is slow and data is not maintained efficiently.

- ❖ Lot of paper work: Existing system requires lot of paper work and even a small transaction require many papers fill.
- ❖ Inability of sharing the data: No two persons can use the same data in existing system at the same time.

1.3 Objective of the Project

1.3.1 General objective

The general objective of this project is, to develop a web based Integrated HCI system for Jimma Medical Center.

1.3.2 Specific objectives

The specific objective always derived from general objective. The specific objectives are:

- To design system that mostly replace paper work
- To design databases for patient and insurance details.
- To design attractive, user friendly and easily understandable graphical user interface.
- To implement System that can only managed by authenticated users or administrator.
- To solve the problems particularly those which are repetitive and labor intensive
- To avoid tedious and boring paper work.
- To collect data and identify the systems requirements
- To test and validate the system.
- To enable decision making and accurate monthly, quarterly and yearly payment reports with the system.

1.4 Methodology

1.4.1 Interview

One of data gathering methodologies or mechanism we used to collect information by making a formal meeting at which we are asked some questions to the members of finance head and other concerned bodies.

1.4.2 Observation

It is the second data gathering methodology we used to collect information by direct watching about the patient services of around triage nurse area.

1.4.3 Document Analysis

Document analysis is used to understand how the current system is working. We used this method to know all about current process on paper, patient insurance book, function and overall of their work in short and brief.

1.5 Framework

CodeIgniter is a powerful open source PHP framework with a very small footprint, built for developers who need a simple and elegant toolkit to create full-featured web applications. It is based on the Model-View-Controller development pattern. In practice, it permits your web pages to contain minimal scripting since the presentation is separate from the PHP scripting.

- **Model-View-Controller (MVC)** is an architectural pattern that separates an application into three main logical components: the **model**, the view, and the controller. Each of these components are built to handle specific development aspects of an application. MVC is one of the most frequently used industry-standard web development framework to create scalable and extensible projects.

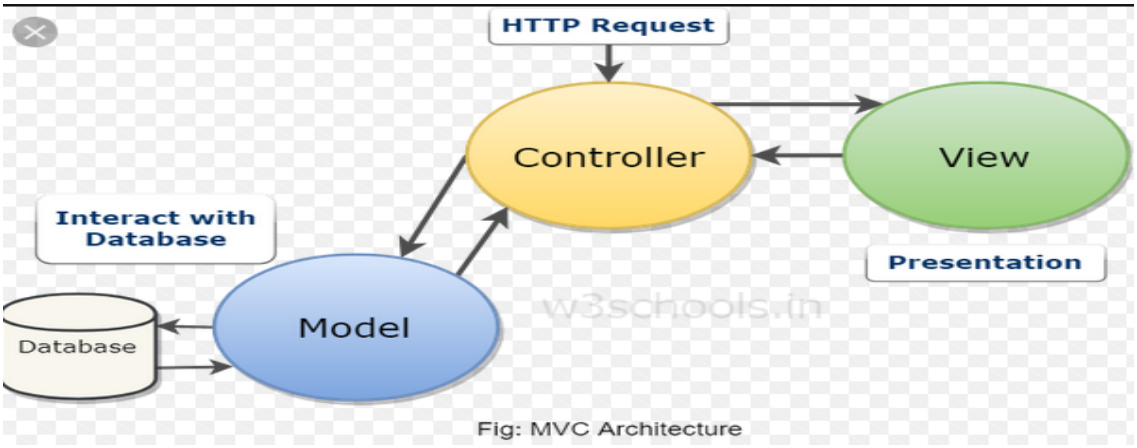

Fig: MVC Architecture

1.5.1 Model

The Model component corresponds to all the data-related logic that the user works with. This can represent either the data that is being transferred between the View and Controller components or any other business logic-related data. For example, a Customer object will retrieve the customer information from the database, manipulate it and update it data back to the database or use it to render data.

1.5.2 View

The View component is used for all the UI logic of the application. For example, the user view will include all the UI components such as text boxes, dropdowns, etc. that the final user interacts with.

1.5.3 Controller

Controllers act as an interface between model and view components to process all the business logic and incoming requests, manipulate data using the model component and interact with the Views to render the final output. For example, the user controller will handle all the interactions and inputs from the customer view and update the database using the customer model. The same controller will be used to view the customer data.

1.6 DEVELOPMENT TOOLS

The best suited tools that we are going to use for the final and implementation process include Hardware and software tools are:-.

1.6.1 Hardware Tools

- CD for backup the data.
- Labtop(Core i7 ,CPU 2.4GHz. RAM ,1TB)
- Printer and Projector
- Flash Disk

1.6.2 Software Tools

Activities	Tools /programs
Clint Side Scripting	HTML, JavaScript, CSS
Platform	MS windows /Linux
Database server	WAMP/XAMPP
Server-side scripting	PHP
Browser	Chrome, Mozilla Firefox 43.0, IE
Documentation	MS Word 2010,MS ppt
Framework	CodeIgniter
User Training/ presentation	MS power point
Schedule time	Gantt chart
Interface design/theme	Adobe photoshope

1.7 Feasibility

Feasibility study aims to objectively and rationally uncover the strengths and weaknesses of an existing business or proposed venture, opportunities and threats present in the environment, the resources required to carry through, and ultimately the prospects for success. Time, scope, and cost have an important relationship between them, for example, when the project scope increase, then the project will use more time to complete and the cost may be also increase. Therefore, we must consider these issues in feasibility study.

1.7.1 Economical Feasibility

Economically this system does not cost much more and also material to implement the system does not cost great amount of money. Here the tangible benefits are saving resources like paper, pen, human power and time wasted.

1.7.1.1 Tangible Cost

This cost contains the various types of costs in which you spent for the development of the project or the University sponsors some of the hardware, network services expenses. The following table lists the different miscellanies costs that have been used in the process of the development of the system.

#	Item Name	Qty	Cost	Remark
1	Labtop	01	ETB 23,000.00	Corei7
2	Flash	01	ETB 300.00	Sandisk
3	Proposal print	04	ETB 150 .00	25 page
4	External HDD	01	EB 2500.00	For backup

A. One-time cost: a cost associated with project start-up and development or system start-up.

These costs encompass activities such as:

- Systems development cost,
- New hardware such as server,
- User training,
- Site preparation, and
- Data or system conversion.

B. Recurring cost : a cost resulting from the ongoing evolution and use of a system

Examples of these costs include:

- Application software maintenance,

- Incremental data storage expenses,
- Incremental communications,
- New software and hardware leases, and
- Supplies and other expenses (i.e. paper, forms, data center personnel).

1.7.1.2 Development, Installation and Training Cost

Intangible or development cost is uncountable cost that to be acquired in developing the system . It comprises stakeholder knowledge, skill and effort. The project team effort and the project team themselves knowledge and effort apply to develop the system may be measureable in terms of hour.

Development Cost

#	**Developer**	Hour	Total months (3)	Total development time
1	Seid Moahmmed	16 hr/24 hr AM:6hr & PM :10hr	(480hr)3 60 days	#60 days 20 days = working hour and 40 days weekend and out of working hours.

Installation cost

		Role	End date	Final date	#Total days
2	Seid Mohammed	Programmer	16/05/2011	24/05/2011	9 days
3	Eliyase Deriba	Admin	16/05/2011	24/05/2011	9 days
4	Tsegawu	Technician	16/05/2011	18/05/2011	3 days
5	Abdulbasit Mohammed	Admin	16/05/2011	24/05/2011	9 days
6	Abdulsemon Ababiya	Admin	16/05/2011	24/05/2011	days

Training cost

	Training participants	Role	Start date	Final date	Total days
1	Seid Mohammed	Trainer	27/05/2012 - 28/05/2012 E.C (Wednesday and Thursday)		2 days
2	Abdulbasit Mohammed	Trainee/ Trainer			

3	Eliyas Deriba	Trainee / Trainer		
4	Abdulsemod Ababiya	Trainee / Trainer		
5	----------		29/05/2012 - 30/05/2020 E.C (Friday and Saturday)	2 days
6	----------			
7	----------			
8	----------			
9	----------			
10	----------			
11	----------			
12	----------			
13	----------			

1.7.2 Technical Feasibility

The work for the project is done with the current equipment and existing software technology. Necessary bandwidth exists for providing a fast feedback to the users irrespective of the number of users using the system. So that the project is also technically feasible because we have the hardware and software we need. As hardware we need computers and as software we need editors like notepad++ and we have the access to have them all. As server emulator we will be using either xamp or wamp to make test. We are familiar with the languages to program (code, debug and test). So the necessary technology and development tools are available to develop the system.

1.7.3 Time Feasibility

Once again the project is time feasible because we have been developing and designing for the last 5 months to complete the task. With in only one month we will finish first version software. The remaining will be merely on partial development and testing.

1.7.4 Operational Feasibility

This system will be implemented in Jimma medical center as a pioneer of Insurance management system project. This system solve several problems of the dialy work, patients and users from those the system also avoid data redundancy, fast search that saves time, avoids stress, delay, lose of data for insurance data.

1.8 Scope of the Project

The project is aimed at solving the major problems of health service delivery; healthcare finance, community based health insurance and credit service paper work difficulties. Based on statement of problem assessments, we will design and implement a system that could be applicable to Jimma medical center.

Specifically, the project focused on:

- ❖ Registration of CBHI, Credit service and Health care finance beneficiary full information.
- ❖ Search service a particular patient profile with MRN, Phone and personal ID Creating new encounter for new treatment with old registered patients.
- ❖ Collect Insurance payment details, credit service and health care finance information.
- ❖ Fast Monthly, quarter report generation with few clicks
- ❖ Creating user accounts and manages their profile.
- ❖ Monitoring user on the side system administrator.
- ❖ The system can manage user login sessions.
- ❖ Communication via system message with co-workers.
- ❖ The system contains notice boards that appears for all users
- ❖ Customizable system setting such as changing language, theme.

1.8.1 Limitations of the Project

- ➢ The system cannot accessed by agreed parties and insurance company externally.
- ➢ The system included only CBHI, health care finance and credit service beneficiary.

1.9 Significance of the Project

In business world there is no substitute for right information at right time. It is evident that in last couple of decade's attempts has been made to develop systems which make information more precise, readily available and easily accessible throughout the organization. The development and use of information systems is a modern trend which is primarily concerned with the collection, process and dissimilation of useful information that directs an organization for better planning, better decision making and ultimately the better results. With the introduction of new system, jimma medical center will achieve the following;

- ✓ It reduces work load on workers of insurance and finance department
- ✓ To minimize time and efforts needed to prepare report

- ✓ Easy decision making with respect to community based health insurance, health care finance and credit health service.
- ✓ Reduce cost such that new employee hire, stationary and printing.
- ✓ Concurrently accessing and multiple views of records.
- ✓ The Hospital collect revenue or income timely from different districts and organizations.

1.10 Work plan

A Gantt chart, commonly used in project management, is one of the most popular and useful ways of showing activities (tasks or events) displayed against time.

1.8.1 Work plan (Gantt chart)

Activities	Sep1 2012 E.C					
	Sep	Oct	Nov	Dec	Jan	Fub
Planning						
Proposal						
Analysis and Design						
Development						
Implementation						
Testing						

Figure1.1 Gantt chart

1.11 Business Rules

In every organizations or institutions there are rules and policy, which used to govern all actives in specified work flow and control the work flow, performed in the working environment? In other words, a business rule is a principle or policy in which the system operates accordingly. The following are the business rules found in the system. So the following rules and policy are maintained by JMC insurance fiancé system.

Rule#01 Patient pay for card 5 birr in normal time from Monday till Friday working hour as well as 10 in weekend.

Rule#02: No patient contains more than one medical record number or card.

Rule#03: In order to register into this system, the patient must submit their CBHI book or letter for health care finance, if credit service, submitting ID is compulsory.

Rule#04: The reports must prepared within a month or each quarter.

2.4 Proposed System

The success of a system depends largely on how accurately a problem is defined, thoroughly investigated and satisfying users need by providing user friendly environment. This system has been developed in order to overcome the difficulties encountered while using manual work with insurance, health care finance and credit service.

The most important feature of the new system is that it is an accurate, easy and efficient system to cope with existing problems. The proposed system will provide:

- **Efficient and fast recording:-** Since the proposed system uses database system, registering investigation files, and updating of progress files from the database will be easy and also there will not be loss of data.

- **Security:** since the proposed system requires verification of logon form, sensitive information's will not be accessed or modified by unauthorized users.

- **Fast Retrieval:** since the proposed system allows indexed search module that enable users to find particular patient data with some seconds or micro-seconds in single click.

- **Central administration:-** this is an important feature that enable concerned body to access data concurrently and multiple views are shared based on access privilege.

- **Increase Operational Efficiency:** The proposed system should help in reducing paperwork or records and making the back-office functions more efficient.
- **Data backup:** It is enable to daily back to safe and secured media from central database to cover data loss events.
- **Reduce stationary and printing cost:** After this system is operational, no paper or few paper works needed for report printout only.
- **Reduce budget Cost:** after implementing this system there will be decrease budget cost with respect to new employee hire irrespective of old reports.
- **Easy updating:** In existing system, so as to modify a particular record: it is difficult unless change original paper with new. But in proposed system, the user can easily modify by searching with MRN.

References

1. *http://www.codeigniter.com*
2. *http://www.javatpoints.com*
3. *http://www-128.ibm.com/developerworks/rational/library/3101.html*
4. *http://www.andrew.cmu.edu/course/90-754/umlucdfaq.html*
5. http://www.tutorialspoint.com/mysql
6. http://www.ju.edu.et
7. http://www.wikipedia