Al-Hashmi Clinic System

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Abstract
Nowadays Information System role in business cannot be denied especially in medical industry. Most of the hospitals/clinics tend to use an automated system to reduce the problems occur when using a manual system. Using technology to automate and manage the patients' record will improve the workflow accuracy and service quality of the health institutions. "Al-Hashemi clinic for Chinese Medicine" is a newly opened clinic, and they need a fully automated system to manage their activities. The objective of this project is to develop a complete automated system to perform routine activities like booking an appointment and reporting system. I have focused more on the appointment system to fulfill the requirements of an Information Systems graduation project.

Keywords: Clinic system; management; information

1. Introduction

Information Systems has become a powerful tool in business, medical industry and almost all areas of different industries. Information Systems empowers organizations by supporting the business transactions increasing efficiency of the workflow and improve the quality of service [1]. Most of the organization tend to use an automated system to reduce the problems occur when using a manual system.

Information system is necessary for any ongoing business. The globalization of products services markets and competition has increased the need for flexibility, quality, cost, effectiveness, and timeliness [2]. And information system is the way to fulfill these needs. They add, "Information Sys-tem has revolutionized the business practices and plays a central part of business strategies." Also the literature explains that the size of the company is directly as-associated with the success of the Information System [3]

The reason behind delaying technology adoption in some business is due to the lack of knowledge about how to implement and operate an Information System. Consequently, the support from the external experts, lower the lack of technical knowledge regarding Information System implementation [4]. External experts and managerial support plays an important role in the effectiveness of Information System. Managers support Information System implementation because they have the best understanding of the business. Thus they can fit the Information System to serve the business objective

and strategies. Also they have the authority to offer the resources to install the Information System [5].

There are many information system tools for variety of functions and purposes such as, customer relationship management CRM a software that manage customers interaction with company, Executive information systems EIS allow top managers to access the company's primary databases [6].

Transforming a manual system into an information system using a technology can help centralizing the information sharing or exchange with the Ministry of Health and in some particular cases with the big hospitals for serious cases [7]. Also with the growing factor of Internet and technology information is turning into electronic bases information, which has evolved the concept of e-health. With the concept of e-health facilities a particular medical cases can be discussed with a team of specialized doctors in other countries to make a better and timely decision. Also it positively effects on the research growth in the field of medical sciences [8]

Hospital information system can receives, transmit, process, store, and present information. Also it must be able to support communication between who involved in patient care. And support basic information processing task such as reports and statics calculations [9]

In the hospital a patient must be correctly identified with his/her case identification. A unique number should be assigned to each patient after he/she is correctly identified. And it should be able to access all his previous documented in-formation with details [10]

Medical Information system is essential to select a subset of patent information from his file immediately and easily, to accessed and viewing by more than one user from the clinic member, to update with additional patient information. To recall patent data from records of his previous hospital stays, to be capable of storing data for a long time, to control peripheral devices and also for graphical display of patient data [11].

The paperless fully automated hospital is one of the challenges that IT projects being developed in the world. The core of complete e- hospital is the electronic medical record. That is the documents that contain the current and historical medical information about the patient. Those documents have essential information for any health institutions. Using technology to automate these record and mange them through a common goal is known as care quality. The benefits of these goals are workflow accuracy and service quality of the health institutions [12-14]

"Al-Hashemi clinic for Chinese Medicine" is a newly opened clinic in Jeddah, and they require a fully automated system to manage their activities in an efficient way. Thus, the authors took challenge to develop a complete system for "Al-Hashemi clinic for Chinese Medicine" as an Information system graduation project.

2. System Design

2.1 Software and Hardware Requirement

The development tool used for this work is Microsoft Visual Studio 2010. The database system was done using Microsoft SQL server 2008. The code language used was visualbasic.net. Windows 7 was used as operating system for the client and for server 2008. The hardware requirement is PC with windows 7, printer, receipt printer and servers with good space and speed. The overall entity-relationship diagram for the system is shown in Figure 1. The system will comprise of patient history, patient file, appointment, suggested treatment, users, invoice and etc.
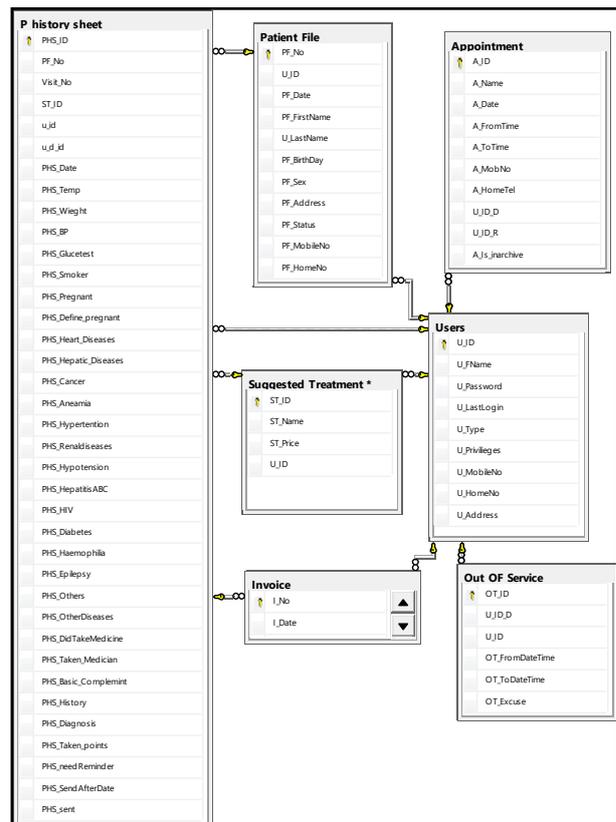

Figure 1: System entity-relationship diagram

2.2 System Architecture

The system architecture comprises of system database, server, intranet, system interface and clients. Figure 2 shows the system architecture. The create user and account flow is shown in Figure 3. The Patient files, invoices and reports DFD is shown in Figure 4.
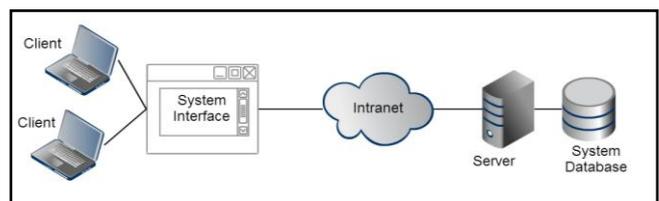

Figure 2: System entity-relationship diagram
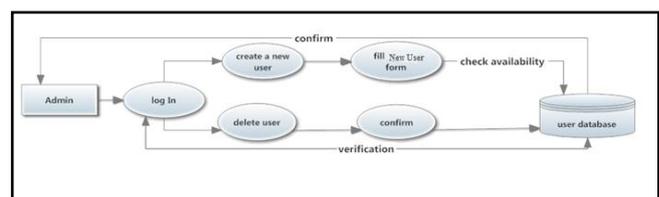

Figure 3: Accounts DFD
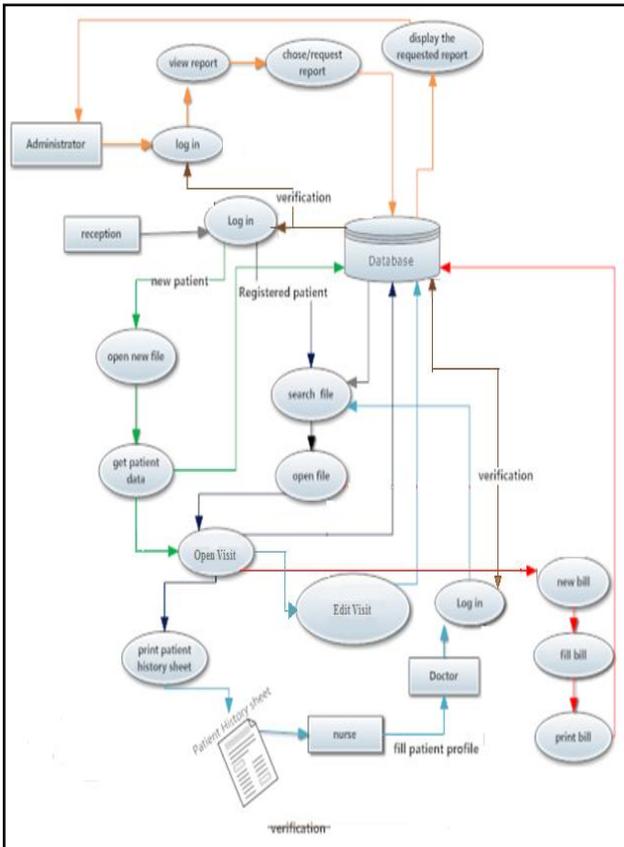
Figure 4: Patient files, invoices and reports DFD

2.3 System Prototype

System will be for intranet use only. The interface designed to accommodate English and Arabic languages and to be compatible with Windows Operating systems. Also it should be rich in graphics to ease the usage for the employees. System Interfaces are created by visual studio's using windows form. Figure 5 shows the interface of the system. Figure 6 shows User Form.
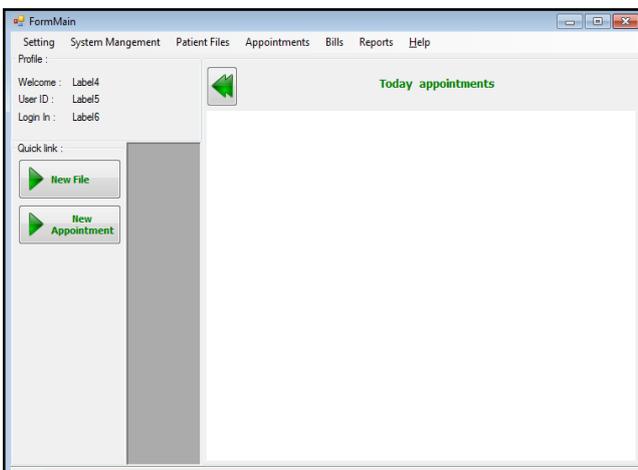

Figure 5: Interface of the system
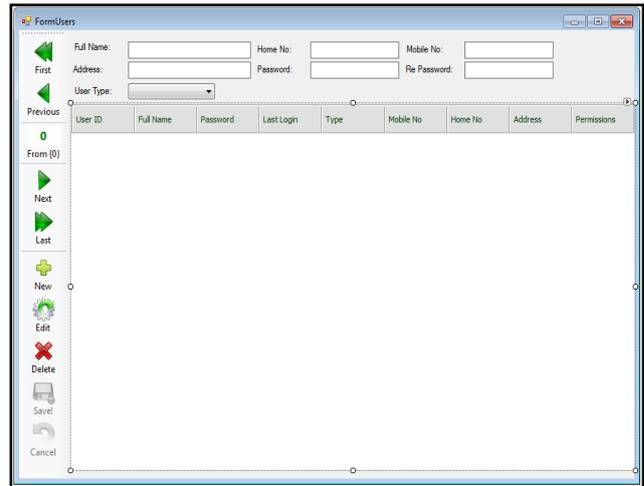
Figure 6: Users form

3. Result and Evaluation

3.1 Login Testing

Log in form is the starting interface for user to get into the system. Login form has 4 labels 2 textbox and 2 buttons. One label in the bottom left corner made to check if the application is connected to the database If it does then the label text change to success and the color change to be green as seen in Figure 7. Also the text boxes and the buttons will be enabling. Another label is for error message that appear when user click the log in button and the ID or password was empty, or incorrect Login button to login, And Cancel button to cancel logging in.
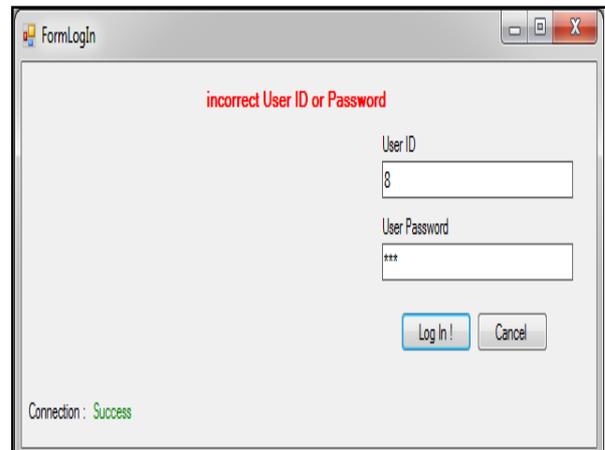

Figure 7: Login success connection

3.2 Main Form

Is the primary interface, user can open all the system interfaces from the main form. This form has 6 labels and all the important links of the system. Two Labels to display the user name for that user ID who logs in, two labels to display the new logging in date, and update it in the database, and another two label to display user ID. System management tools in the top, includes all main

links. Under setting are, Log out that takes the user to the log in form, and exit to exit the system. Un-der system management is treatment, Out of service and User Under patient file are patient files and search file. Under Appointment are new appointment and search appointment. Under bills is invoice. Under reports are report of users, list of invoices and reminder SMS. Each will be discussed below. Also there is two buttons as a quick links to new appointment and new file. In the right side there is a table of today's appointments, which can be hide by click on the top left button of that table.

3.3 Users

This interface used to add, edit or delete users. Figure 8 shows the user form interface. This form figure (49) has nine buttons. Data grid view and details view are inserted from the data Source. Four buttons are arrows to move between users, new buttons allows the user to add another user, edit buttons to edit in the selected user, delete button to delete the selected user. If the user did not select any user to delete, an appreciate message will appear. These buttons are enabling by default. But when the user pressed on edit or new they will be disabling. Another two buttons are saved and cancel. Save button to save data but if the fields name mobile password or type was empty, if the password is not matching the re password, or if the mobile number was not ten digit or not numeric, then it an error message will appear. Cancel to cancel the editing or the adding. Cancel and save buttons are untenable by default except if the user clicks add new or edit.The data grid view is only to view data and move between them. Editing or adding can be done only from the detail view.
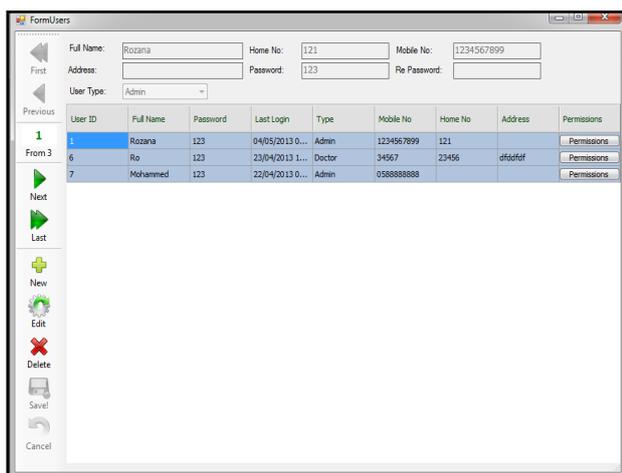
Figure 8: User form

3.4 Patient Appointment

This function is to insert new record in the database for making an appointment of a new patient. Supported features are to create a new appointment, save appointment cancel appointment and search appointment. Figure 9 shows patient appointment form.
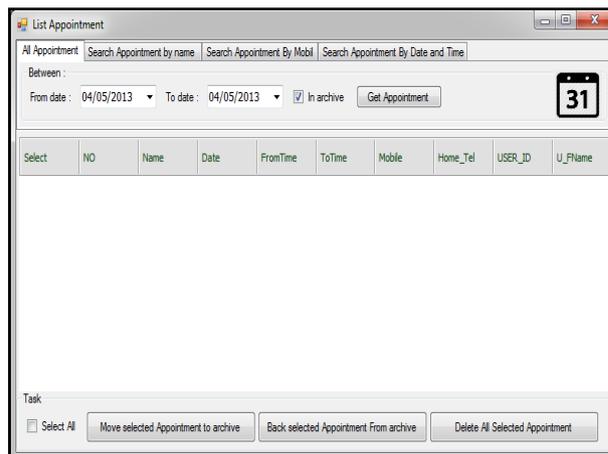
Figure 9: Appointment interface

3.5 Patient File

User can open a new file for patient by filling the patient file form Figure 10. This form has seven buttons, three labels, and detail view from the data source. User should click the new file button to fill the form. The first label suggest a file number that not exist, the second label calculate the date from the entered age.
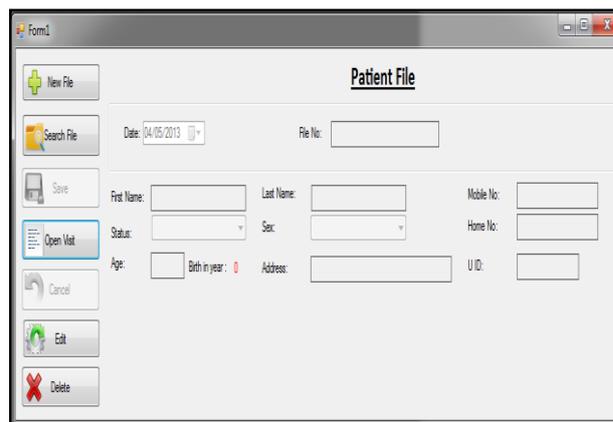
Figure 10: Patient file form

3.6 Invoices

This function allows the user to create invoice for each visit. User can create an invoice from the visit itself or from the main form. The invoice form has new, save and cancel buttons, a detail view from the data source and four text boxes. User should first enter the file number if he opened the invoice from the main form, so the visits related to that file that has no invoice before will appear in the visit combo box. Invoice number and the amount will be written automatically with the availability to change. Also the treatment, the patient full name, the date and who received the money. Figure 11 shows the invoice interface.

Figure 11: Invoice

3.7 Report

System can display three kind of report, list of Reminder SMS, List invoices, and report of users. Reminder SMS, to display all patient mobile number who needs reminder SMS after a specific date, user enter the date check that has been sent checkbox as shown in Figure 12.

Figure 12: SMS system

4. Conclusion

To summary, the aim of this project is developing a system for "al-hashmi clinic" that meets their requirements the developed system was implements to accomplish all main functions:

1. Accounts to create new and deleting accounts and log in.
2. For booking and checking appointments.
3. Patient records include patient history sheets.
4. Invoices.
5. Different kinds of reports, including SMS reminders report.

The system was developed with the availability to include more functions.

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