Intelligent Hospital Management System (IHMS)

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Abstract-An intelligent hospital information management system was developed to assist the patient at the front desk of a hospital. The patient will be able to learn about the doctors, appointment times, relevant departments, laboratory tests and the specific medicine about his/her medical situation. System will provide an intelligent front desk information service for the patients at the hospital entrance. It will also provide software assistance for the doctors to diagnose easily and rapidly by using the program's decision mechanism.

Keywords-Intelligent, decision mechanism, information management, hospital front desk, diagnose.

Fig 1 A block diagram of IHMS system.

I. INTRODUCTION

Developed system is a comprehensive, integrated information system designed to manage the administrative, financial and clinical aspects of a hospital. As an area of medical informatics, the aim of the system is to achieve the best possible support of patient care and administration by electronic data processing. This encompasses paper-based information processing as well as data processing machines.

Laboratory information system is a class of software which handles receiving, processing and storing information generated by medical laboratory processes.

People generally do not know the procedures in hospitals. They do not know which department they should go for their specific medical complaints. So an intelligent system is required to assist them.

Patients will initially be registered in the system with a friendly question and answer menu. Once registration is completed they will select their medical complaints through a software menu. The menu driven software will present the patient with the right department , doctor name, appointment date and time, possible medication and laboratory tests subject to doctor's confirmation. Doctors examine the information provided by the patient and confirm the data once they examine the patient. A block diagram of the system is shown in Fig. 1.

II. PROCEDURE

Borland C++ Builder V6.0 Application Developer [1] is used to develop a menu driven software package to implement the system. MS SQL Server 2005 [2] database management system is also employed to store various hospital data which would be used in the
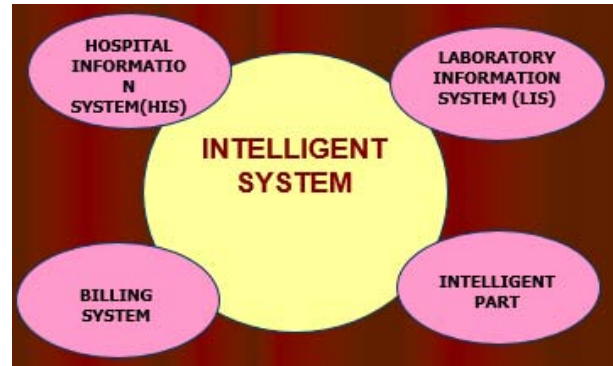
management system software. The intelligent part is added to the software package in decision making. This part included two sections; one section is used by the patients and the other section is used by the doctors. These Forms are specialized software objects where visual component library (VCL) and component library for cross platform are used. Forms generally appear as windows and dialog boxes in the running application. IHMS application contains 33 different Forms [3]. These are shown in Fig. 2.
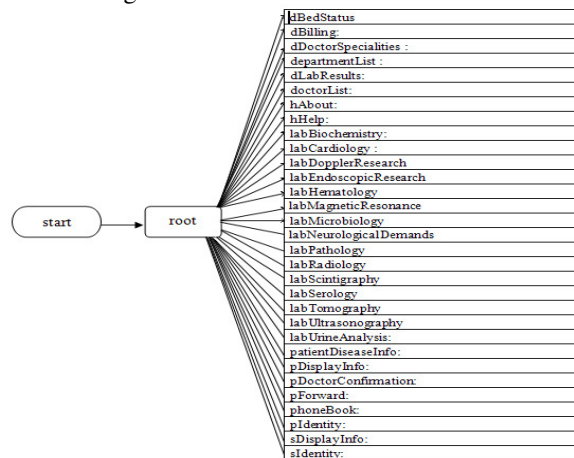

Fig. 2. Forms used in IHMS

The database is named as hospital. There are 39 tables in the database and each is linked to the hospital. They are used for data entries or data search.
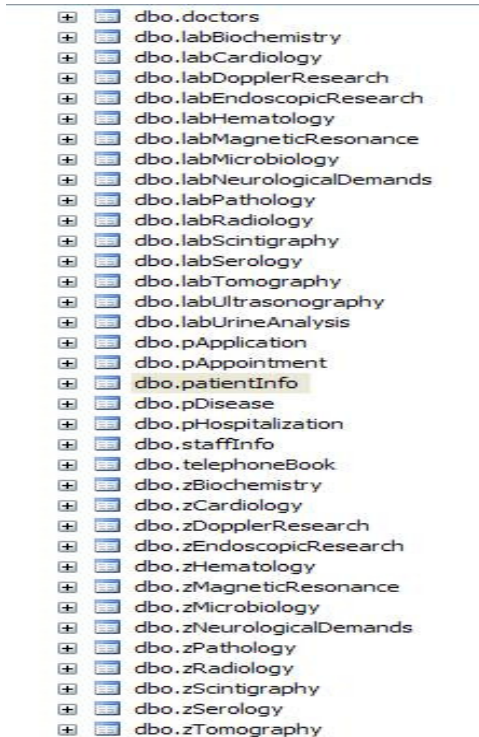
Fig.3. IHMS database tables

To provide consistency, tables have relationships by primary and foreign keys. 24 of them are related to each other by foreign keys. 15 of them store only predefined data which represent the test name of the laboratory. Management program receives the patients' medical complaints through various menus in the shape of C# Form. It compares them with the possible relevant data in the database and decides the best possible answer. The resultant answers are presented for the patient in menu forms.

III.   RESULTS

When patient arrives at the hospital front desk, he/she will register in the system through a straight forward question and answer menu. Patient then opens the menu defined as *Patient appointment and department determination menu* and selects the pre specified medical conditions from 4 combo boxes with names *1,2,3,4 causes*, Fig. 1.
Patient then clicks 6 decision buttons defined as:
Find the department to find the relevant department to be treated,
Find the doctor to find the appropriate doctor,
Appointment date&time to make an appointment, **Find the ward&bed** to allocate a location and a bed in the hospital,
Find required medicine to find the proposed medicine,
Required Laboratories to find the proposed laboratory tests.
Once all the proposed information is presented for the patient in combo boxes, the patient saves them by clicking the "**SAVE**" button, Fig. 4.
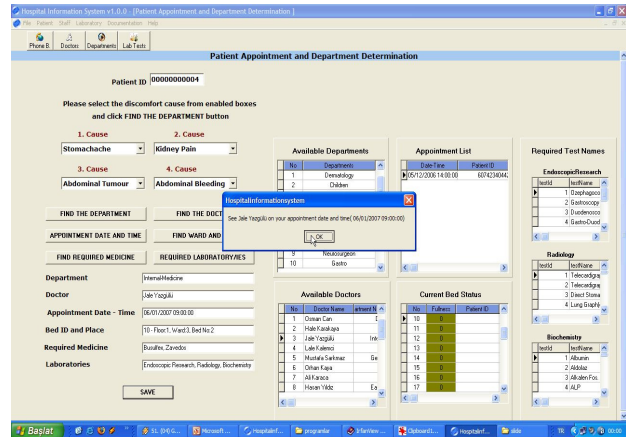

Fig.4 IHMS menu for patient

A message box is generated for the patient to remember the appointment information. In the second part of the management software, the patient information is summarized by a patient menu for the doctor, Fig. 5.
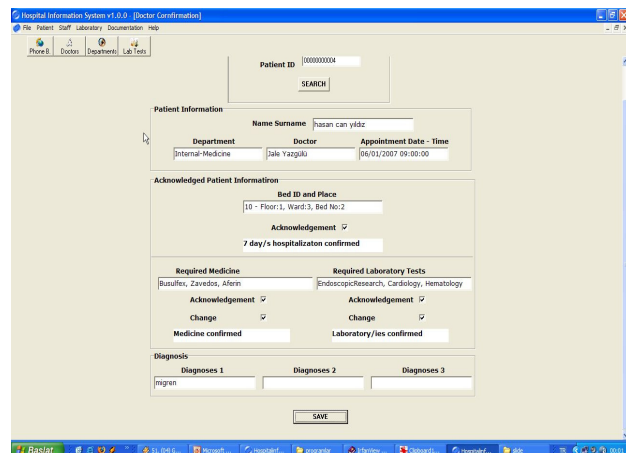

Fig.5 IHMS menu for doctor
The doctor enters the patient id number and all the relevant information about the patient is displayed in front of him. The doctor has the options to acknowledge or change the software proposed data. If there are changes then a new combo box is opened and the new data is entered. For example, if the management software suggests a particular laboratory test for a particular medical case and the doctor is not comfortable with it then the doctor can reenter the new laboratory test with the help of "change" button. This new data is also saved with the save button and replaced the old data in the database.

IV.   CONCLUSION:

There are many software packages about Hospital Information Management Systems in the world. This is a developing field and many researchers are interested to develop new features and apply them to the software. The technique developed here attempts to include the decision

factor in the software. The software decides for the patients where to go and what to do before they see a doctor. This saves a lot of time and helps the doctors to concentrate more on the patients. There are not many intelligent software packages similar to the developed one in the market. The software also has a querying system where it can ask various questions to the patient and give them a diagnosis. Many hospital information systems in literature manage inventory of the hospital [4]. This inventory includes patient and staff information, stores and medicines, billing and report generation. This complex application communicates with a background database server and manages all information related to hospital logistics. But our software engages the patients and guides them with a querying mechanism which different and unique in itself. It suggests operational steps to the patients and doctors instead of simple management

This software is in modular form and can be adapted to any hospital or clinic. Eventually the developed software will be placed in the internet so that old and disabled patients can also have access to hospitals from the comfort of their homes

REFERENCES

[1] Borland Co, "C++ Builder 6.0 Enterprise, Edition Version 6", Borland Corporation, 1983-2006, web page: www.borland.com
[2] Microsoft Co, "Microsoft SQL Server 2005, Enterprise Edition", Microsoft Corporation, web page: www.microsoft.com
[3] http://www.functionx.com/bcb/index.htm
[4] http://sourceforge.net/projects/hospitalmanage/