TERM PAPER - UPDATES

DBMS FOR BREAST CANCER PATIENTS

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1   ABSTRACT

Breast cancer patients' data was analysed utilising a new upgraded computerised database based on breast cancer risk variables such as age, race, breastfeeding, hormone replacement therapy, family history, and obesity.system of management MySQL (My Structural Query Language) is chosen as the database administration application.a method for storing patient data collected from Malaysian hospitals Incorporated into the programme is an automatic calculating tool. This technology is designed to aid with data analysis. The findings are automatically plotted, and a user-friendly graphical user interface is provided.is being created to govern the MySQL database. Breast cancer is most common among women, according to case studies.Malay women are the most common, followed by Chinese and Indian women.Breast cancer is most common between the ages of 50 and 59. The findings imply that the risk of breast cancer is higher in older women and lower in women who breastfeed. Weight status may have a different impact on breast cancer risk. More research is needed to corroborate these findings.

2   INTRODUCTION

Many hospitals throughout the world have established a computerised database management (CDM) system to provide for proper management of medical records for various types of cancer patients (Ann et al. 2003). Due to the expensive installation and implementation costs, as well as a shortage of experienced technicians for maintenance, only a few hospitals in Malaysia have adopted a CDM system.Medical data is required in any health-care institution in order to avoid medical errors and erroneous decisions. To meet the growing demand for medical information accessibility, CDM-based management solutions have been created.

The goal of this study is to develop a CDM system that is appropriate for breast cancer patients in Malaysian hospitals, though the product can be modified to other patients or countries. The first section of the paper explains how to set up an analytical database management system. The system includes features including storing and retrieving patient data, inputting new patient data, updating or removing data, and scheduling appointments.For this, an automated computation tool is being developed in the analytic database management system. Age, race, breastfeeding, hormone replacement therapy, family history, and obesity are all investigated as breast cancer risk factors.

Microsoft Access and MySQL are the tools that can be used to implement the relational database management system. Relational database is a collection of data items where the data are organized into the table form, and data can be accessed in many different ways without reorganizing the database tables (Allen 2006). This database management system has the capability to gather, store and transmit the medical record information from different sites of hospital to a centralized database system Microsoft Access is a well-known data management programme that allows you to store information or data in tables that it manages from your local hard drive (Paul 2011). Microsoft Access can create a 'back-end' database that holds the needed data while still providing a user-friendly 'front-end' interface.Microsoft Access is a well-known data management tool that lets you store data or information in tables that it manages from your local hard disc (Paul 2011). Microsoft Access can establish a 'back-end' database that stores the necessary information while also providing a user-friendly 'front-end' interface.

3 ISSUES IN EXISTING PRACTICE IN MALAYSIA

There are a lot of patients seeking diagnosis and medical treatment of breast cancer in hospitals every day. As an example, at the Melaka General Hospital (MGH), the current practice is to handle the huge amount of data through the hardcopy format.The patient registration process begins with a hardcopy format. If visible symptoms are identified, the physician will undertake a breast examination and recommend a relevant breast screening test such as a mammography, ultrasound, or breast biopsy. A hardcopy report containing a description of the patient's condition and the type of screening test is submitted to the hospital's radiology department.. Following the test, the photos and results, which are also available in hardcopy format, will be sent to the physician, who will then decide on the next course of action. The documentation area houses all of the hardcopies. Apart from security considerations,

physical transfer reports is time consuming. When a medical report is required quickly, this might be a significant issue. In Furthermore, due to the high amount of data recorded,intricate layout in the documentation room of records that can obstruct retrieval, updating, or modification It's difficult and time-consuming to keep track of the records.Furthermore, when medical reports are lost or damaged, it is almost impossible to retrieve the lost information. Unlike a computerised system which can perform routine partial checks, human errors incurred in filling the medical forms and reports are more difficult to be detected by the system, since the report must be seen by another person before the abnormally can be discovered.Furthermore, when medical reports are lost or damaged, it is practically hard to retrieve the lost information. Unlike a computerised system which can run routine partial checks, human errors made in filling the medical forms and reports are more difficult to be caught by the system, since the report must be seen by another person before the abnormally can be discovered

4 AN ANAYLTIC DATABASE MANAGEMENT SYSTEM FOR BREAST CANCER PATIENTS - THE OBJECTIVE

An analytic database management system is presented to solve the constraints of the existing system, allowing data to be conveniently collected, saved, updated, and retrieved. The recommended solutions to address the mentioned challenges are detailed in Table 1.

5 Details of design

The system is specifically built for easily and comfortably processing and organising medical information such as personal details and diagnosis reports used in breast cancer departments, as well as essential data analysis. Large databases are used to collect and preserve medical records.A graphical user interface (GUI) is a user-friendly 'front-end' interface that controls the 'back-end' database and acts as a communication link between the user and the database. Table 2 lists the elements that have been incorporated into the database management system architecture.

6 Data and database

The type of data kept and the manner of data gathering have a big impact on database design. Patient information and diagnosis reports were used in this endeavour.are must be kept in the manner stated in Table 3.MGH provided a total of 1057 patient data for breast cancer (mostly in hardcopy format) for this project. A patient who undergoes an MRI examination has the data saved in the digital image and communications in medicine (DICOM) format, which is a standard for managing, storing, and transferring information in medical imaging. DICOM files can be shared between two entities, for example, to get images or obtain patient information. Because the forms of the data differ, a standardized data format is

required. A text file is created for data that is kept in hardcopy format in order to transform it.converting the patient's information to a softcopy format On the contrary,The contents of the DICOM file must be retrieved.and saved in a text file alongside the relevant MRI diagnosis report that has been converted to a softcopy version The DICOM files must be read in order to be read.As seen in the example, the MATLAB programming language is employed.1st Figure

The database is a method of storing and managing information that is methodical and well-organized. Because of its low cost and appropriate security, MySQL was chosen as the essential system software to

Table 1 Descriptions of proposed system

Criteria	Descriptions	Proposed features
High security	Require username and password in order to gain access into the system.	User login page
	Provide differential accessible level for the user, where not all functions can be performed by some users.	Main menu page
	Indicate dates of modifications and updates.	Patient personal details and diagnosis report page
Time saving	Link several computers in the hospital together in order to allow the transfer of reports or data.	Server and client network
	Provide a feature that can rapidly view, retrieve, update and modify the database.	Patient personal details and diagnosis report page
Low cost and less man power	Low cost as all data are stored in the database rather than on hard copies.	MySQL database
	Require less man power as the database can be easily handled.	MySQL database
Unlimited storage	The MySQL database has near unlimited storage capability.	MySQL database
Less human error	All the data are stored in the permanent database with back-ups. Data will not be easily lost or erased.	MySQL database
	Feature allows user to insert the new patient data during patient registration and there is a notification given for missing information.	New patient registration page
Fast and easy to perform data analysis	Automatic calculation tools to assist data analysis and output graphs are plotted automatically.	Data analysis page

Table 2 Features of analytic database management system

Features	Description
User login	• Provide different level of accessible users such as staff and doctors, with password requirement.
New patient registration	• Allow the registration of new patient to be done digitally without filling any hardcopy form. The information is stored directly into the database.
Patient personal details	• Enable the viewing of all details in the department.
	• Provide update, edit, and delete functions which allow modifications to be done.
Patient diagnosis report	• Hold the diagnosis reports for all patients.
	• Allow the authorized user to view, edit or update the diagnosis reports for certain patients
Appointment	• Allows the search and view appointments.
	• Assist staff to arrange appointments for patients and doctors.
Data analysis	• Distribution of patients based on their age and race.
	• Perform analysis on patients with or without breast cancer.

Table 3 Overall patient data

Data	Content
Personal details of patient.	Registration number, identification card number, name, age, marital status, section, race.
Patient's background.	Breastfeeding, family history, hormone replacement therapy.
Noticeable symptoms of breast cancer found.	Pain, mass, discharge.
Type of screening tests that had been performed.	Mammogram, ultrasound, MRI, breast biopsy.
Type of image guidance device for breast biopsy.	Ultrasound, stereotactic mammography, hook wire.
Type of operations to be performed if needed.	Biopsy, mastectomy, excision.
Diagnosis reports.	Mammogram report, ultrasound report, MRI report, breast biopsy report.

implement the system database. MySQL provides an authorised user with a fast, flexible, secure, and consistent means of retrieving, updating, and entering data into the database. Using a structured query language (SQL) and statements that are part language, part mathematics, the developer can construct and manipulate the data in any way they choose. The output of the LOAD DATA command is shown in Figure 3. The text file's data has been successfully transmitted.

7 Concept of GUI

The graphical user interface (GUI) serves as a communication link between the user and the database, allowing users to interact with the database with ease. For example, by simply clicking on specific features in the GUI such as a button or a checkbox, the user can easily update records, insert new records, or delete existing records in the MySQL database. There is no requirement to learn programming. Figure 4 depicts the notion of a graphical user interface.

On the left, there is a list of tools that you can use. To design the GUI, drag the desired tools from the toolbox to the form side, such as a button, text box, group box, and list view. Figure 5 shows a list of the tools that can be found in the toolbox. The Window Application Form 1 has a properties box in the lower right corner. It allows you to change the size, text, font, colour, and visibility of the tool. Figure 6 depicts the properties box that occurs after dragging a button onto the form side.

8 Main menu page

The main page has a collection of connections to several pages, such as the patient registration page, personal information, diagnosis report, statistical analysis, and appointments. The level of access to the pages is determined by the user type. For example, a nurse or staff member can view the information, but only the physician can add or change the patient report.

9 Design of assessibility

By selecting the appropriate button, the user can navigate to the desired page. The main menu page is made up of buttons that are grouped and framed within a group box. The visibility of the group box for the main menu feature is initially set to "false"in the properties box. The visibility is adjusted to "true"once access is granted.

10 Patient registration

Only the nurse or staff has access to this page, which is used to enter new patient records into the database. When vital data is not inserted, a message is sent to decrease human mistake and prevent data loss. There are various checkboxes that allow the user to choose the patient's background and breast cancer symptoms. If the button is activated, it sends all of the entered data to the MySQL database. To create the new patient registration page, all input controls are enclosed with a group box.

11 Codes

The visibility of the group box in the properties box is initially set to false. When the user clicks the button to access this page, the group box visibility is set to true in the codes, whereas the group box visibility for the main menu page is set to false. The patient's data is entered into the appropriate input text boxes and checkboxes. When the insert button is pressed, a series of actions are initiated. The textboxes for entering some vital patient data are first checked. If any of the text boxes are left blank, a message box appears as a reminder to fill in the blanks. While waiting for the delayed response, a delay system is applied.

12 Personal details and diagnosis report

A further enhancement for the security of analytic database management system is accomplished through recording date and time that the patient data are updated or edited in MySQL database and then
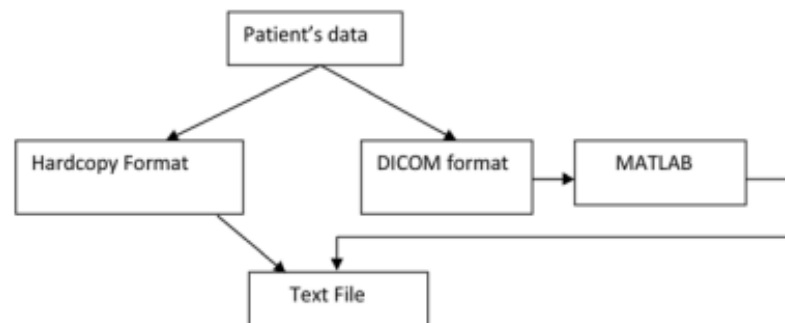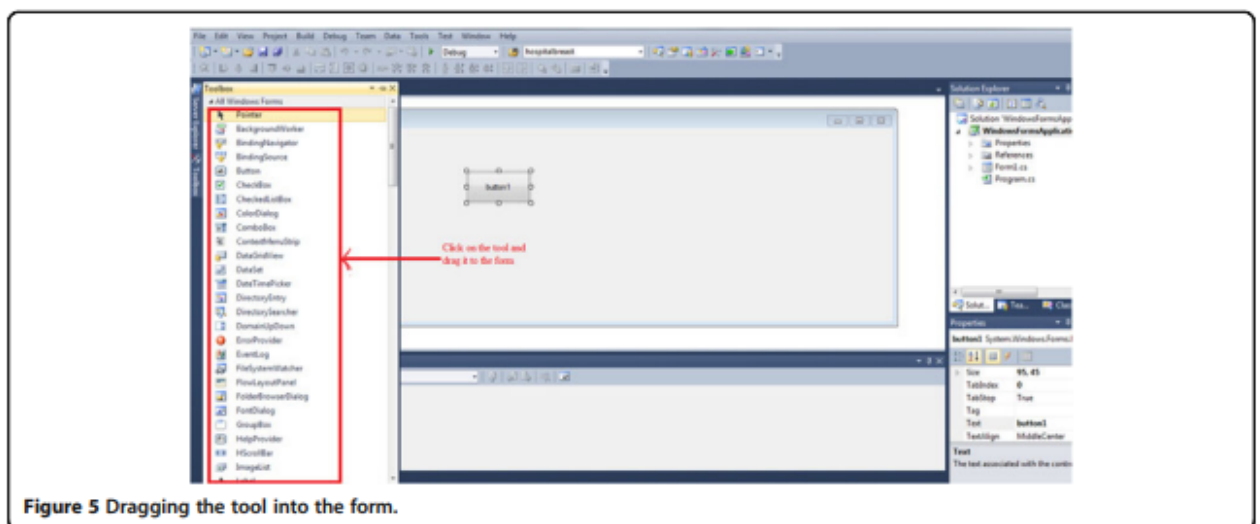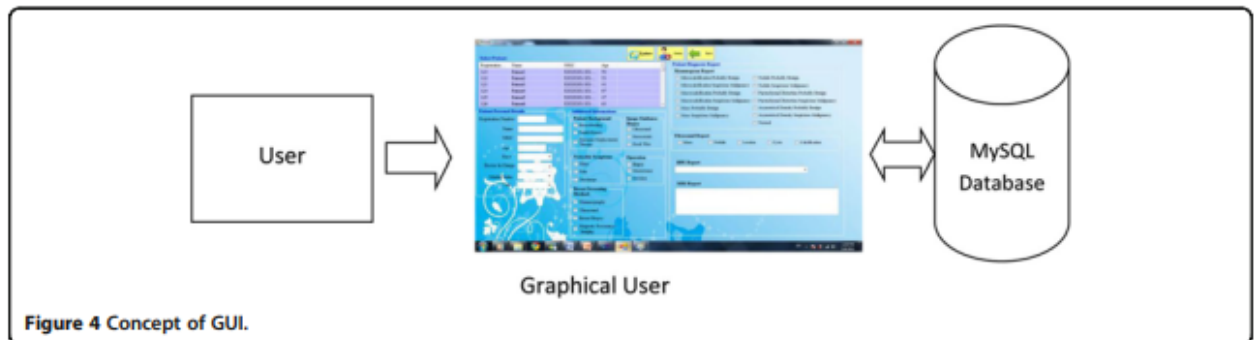
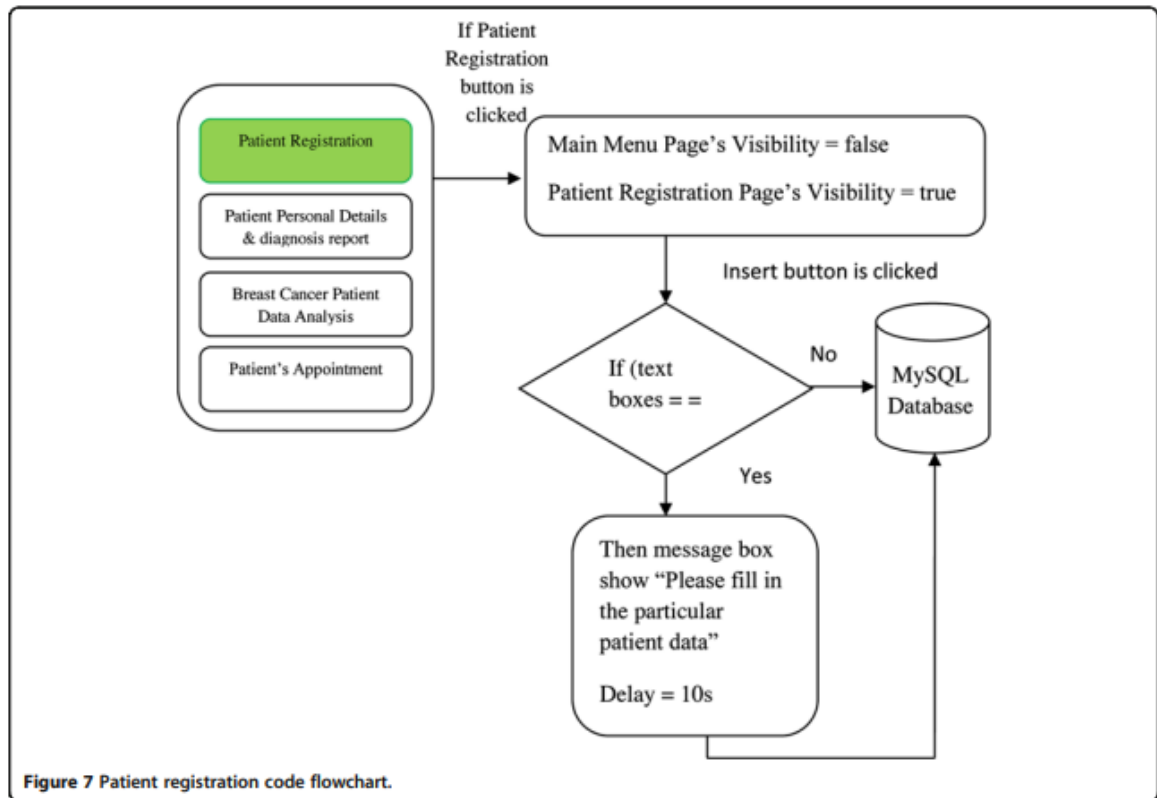**Figure 1** Block diagram for creating a text file.

Figure 2 The text file created.

Figure 3 MySQL database.

Figure 4 Concept of GUI.

Figure 5 Dragging the tool into the form.

Figure 6 Properties box.

Figure 7 Patient registration code flowchart.

displayed on the GUI. Figure 8 shows the patient personal details and diagnosis code flow

13   Design

The user can pick the patient's name from the list view to view, update, and edit functions of the patient's personal details and diagnosis report. The data from the selected patient will be displayed in the text boxes and check boxes.To make changes to the patient's personal information and the diagnosis report,Text boxes' contents can be changed or updated, and Checkboxes can be checked or unchecked. Following that,modifications The update button is used to save the information.information into the MySQL database that has been updated

14   Breast cancer patient data

The function enables for patient distribution depending on their age and race, as well as groupings based on their diagnosis reports. There is also information about nursing, family history, and hormone replacement therapy. According to the body mass index determined using Eq. (1) and guided by Table 5, the patients' weight status is divided into three categories: normal weight, overweight, and obesity.

15   Client network

The analytic database management system is placed on various computers throughout the hospital to allow for multiple accesses and task execution. For example, at the patient registration counter, the analytic database management system is used to enter new patient information into the database. After completing the registration process, the doctor can access the new patient information from the system installed on his or her PC. A centralised MySQL database system allows multiple computers to have direct network access to the database for storing, retrieving, and updating data. As shown in Figure 10, this is accomplished by setting up a computer as the MySQL database server.

   The MySQL database server machine and each of the clients can be readily joined together using wireless local area network (LAN) technology. The unique IP address of the server is declared in the

Figure 8 Benign breast change analysis result – age.
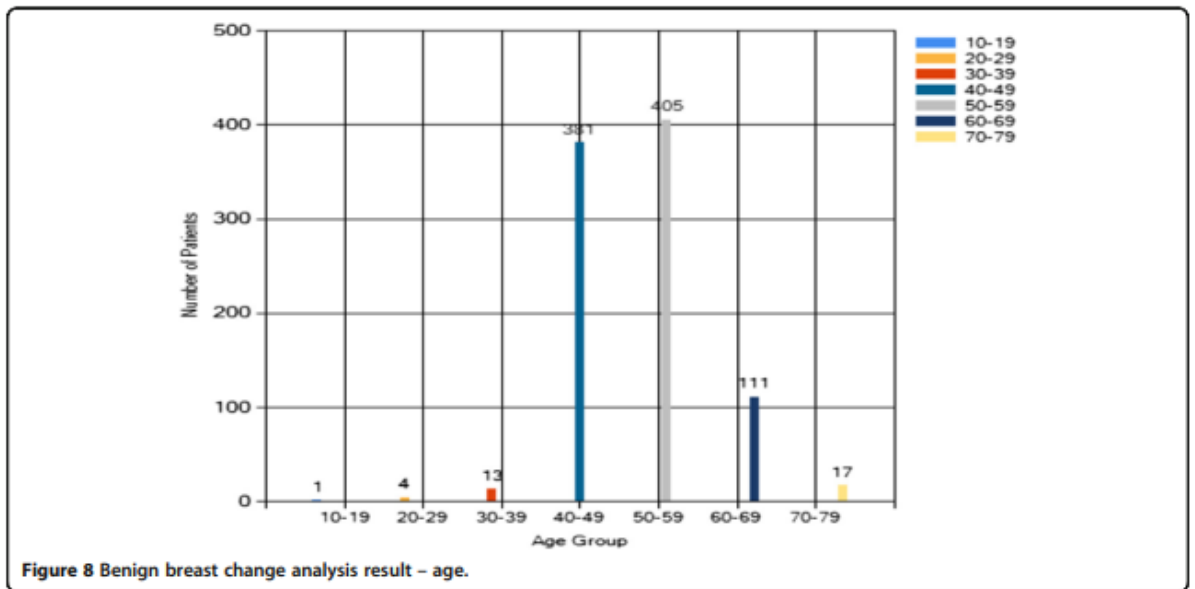
system programming portion loaded in each client, allowing access to the MySQL database on the server.