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Smart health costing system

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ABSTRACT: Smart Health Costing provides the benefits of streamlined operations, improved management and control, superior patient care, strict cost control and improved productivity. HMS is powerful, flexible and easy to use and has been designed and developed to deliver real, conceivable benefits to hospitals. Most importantly, it is backed by reliable and dependable support. The Hospital Management System project is based on database, oriented and networking techniques. Because there are many areas where we keep records in the database we use SQL SERVER which is one of the best and easiest software to keep our information. This project uses C# as a front-end program which is object oriented programming and has a connection to SQL SERVER. The smart health costing system is specifically designed to meet the specific requirements of medium and large sized hospitals around the world. All required modules and features are specifically designed to suit your requirements. It covers all required modules right from patient registration, medicine details, doctor, wards, administrator, patient appointment, bill payment, discharge details etc. The human body is a very complex and developed structure consisting of millions of tasks. Man has understood all these complex functions, part by part from their research and experiments. With the advancement of science and technology, medicine has become an integral part of research. Gradually, medical sciences became a completely new branch of science. As of today, the health sector consists of medical institutions, such as hospitals, hospitals, etc., research and development institutions and medical colleges. Thus the health sector aims to provide the best medical facilities to the general public.

Keywords: smart health, health cost, Sql, Database

1. INTRODUCTION

Human Body is a very complex and sophisticated structure and comprises of millions of functions. All these complicated functions have been understood by man him, part-by-part their research and experiments. As science and technology progressed, medicine became an integral part of the research. Gradually, medical science became an entirely new branch of science. As of today, the Health Sector comprises of Medical institutions i.e. Hospitals, HOSPITALs etc. research and development institutions and medical colleges. Thus the Health sector aims at providing the best medical facilities to the common man. [1]

A Smart health costing system project was established because of the urgent need for it in health institutions, because nowadays the use of technology has become very important, so our project was created in order to solve the problems of paper handling in health institutions and also in order to save and retrieve data easily, as it facilitates the process of calculating patient costs since Admission to hospital until discharge from hospital.

A hospital is an organization that mobilizes the skills and efforts of a widely disparate group of professionals, semi-professionals and professional staff to provide high-level personalized services to patients. The main purpose of the hospital is to provide adequate care and treatment to people. Various operational works performed in the hospital include:

recording information about patients, issuing bills, recording information related to the diagnosis given to patients, keeping a record of vaccinations given to the patient, keeping information about various diseases and medicines available for their treatment, etc. . All this work is done in most hospitals on paper. The need for proper management of the health sector leads to the establishment of an electronic means of record keeping, discharge management and data query. [2]

An electronic hospital management program that contains many features that help facilitate and organize work. By using this program, you will completely abandon the traditional paper-based system of keeping auditors' information, there are many problems related to hospital management in all aspects (work organization, administrative organization, case follow-up). Therefore, you should pay attention to 3

the idea of designing a special program that helps to manage the work easily and smoothly because of its very useful features. [3]HMS can manage multiple users of the system and can have the right path assigned to them. It makes sure that all users work with the system according to the rights allotted to them and can get their work done in an efficient manner. A good management system should allow for input and output by providing a purpose for recording and compiling information. It must be able to quickly collect and edit data, summarize results, and adjust errors as well as correct them on the spot. [4]

References are designed for HMS that retrieve information from a database as quickly as one searches on the screen. Because there are many areas where we keep records in the database we use SQL SERVER which is one of the best and easiest software to keep our information. This project uses c# as a front-end program which is object-oriented programming and has a connection to SQL SERVER database.

2. RESEARCH OBJECTIVES

The objective of this project is to develop health cost management software based on Microsoft window application with Structured Query Language (Access as database) as hospital database back-end from file-based system to computer database system. This program will help them to be more efficient in handling the daily activities and registering their patients. The purpose of this project is to provide complete requirements documentation, design and implementation of the program. It also explains the different user interface, hardware, software, and models that can be used to develop software like this. But keeping track of all activities and their records on paper is very cumbersome and error prone. It is also a very inefficient and time-consuming process to monitor the ever-increasing population and number of people visiting the hospital. Recording and maintaining all these logs is highly unreliable, inefficient and prone to error. It is also not economically and technically feasible to keep these records on paper. Thus keeping the manual system work as the basis of our project. We have developed an automated version of the manual system, with the name The main objective of our project is to provide a paperless hospital of up to 90%. It also aims to provide reliable, low-cost automation of existing systems. The system also provides excellent data security at every level of user interaction with a system and also provides robust and reliable storage and backup facilities.

3. LITERATURE REVIEW

Hospital Management System (HMS) is designed for multispecialty hospitals, to cover a wide range of hospital administration and management processes of patient-centric system. It is an integrated end-to-end Hospital Management System that provides relevant information across the hospital to support effective decision making for patient care (medical records management and billings), and hospital administration, in a seamless flow. In existence, some researchers have contributed positively in the improving of health care institutions management systems. Therefore, we discuss in this section below, some of the related works done in hospital management system by researchers in the field.

The work of [8] focused on understanding the performance indicators of Hospital information systems (HIS), summarizing the latest commonly agreed standards and protocols like Health Level Seven (HL7) standards for mutual message exchange, HIS components, etc. However, the researchers identified several modules for the implementation of E-Hospital Management and Hospital Management System in which Emergency Management was one of them. The contents operation within this module excludes the incorporation and use of Biometric Fingerprint Technology. Thus, this indicates that emergency cases in the intensive units where the registration of patients is trivial cannot be handled adequately with respect to time. It was noted that the success factors of E – HMS/ HIS tend to vary depending upon leadership support, training, technology adoption, user friendliness, etc. within a country.

[1] identified the challenges existing in Mother-love Hospital, such as Data redundancy, data inconsistency, difficulty in accessing data, data isolation, integrity problems, atomicity problem, concurrent access anomalies, and some security problems. They cited [4] among others which pinpointed at techniques behind Database Management technologies, and thus overcome the existing challenges. The system is visualized as a web based application with three tier architecture. This architecture provides an increased degree of security because its multiple zones isolate protected healthcare data

making it difficult for a hacker to get system-level access to the database. The solution proffered by this system did not incorporate enabling technology to handle patients' in critical condition(s).

4. METHODOLOGY

Data storage is a database, which is a collection of tables with typed columns. SQL Server supports different data types, including primitive types such as Integer, Float, Decimal, Char (including character strings), Varchar (variable length character strings), binary (for unstructured blobs of data), Text (for textual data) among others. The rounding of floats to integers uses either Symmetric Arithmetic Rounding or Symmetric Round Down (fix) depending on arguments: SELECT Round(2.5, 0) gives 3.

Microsoft SQL Server also allows user-defined composite types (UDTs) to be defined and used. It also makes server statistics available as virtual tables and views (called Dynamic Management Views or DMVs). In addition to tables, a database can also contain other objects including views, stored procedures, indexes and constraints, along with a transaction log. A SQL Server database can contain a maximum of 231 objects, and can span multiple OS-level files with a maximum file size of 260 bytes (1 exabyte). The data in the database are stored in primary data files with an extension .mdf. Secondary data files, identified with a .ndf extension, are used to allow the data of a single database to be spread across more than one file, and optionally across more than one file system. Log files are identified with the .ldf extension.

Storage space allocated to a database is divided into sequentially numbered pages, each 8 KB in size. A page is the basic unit of I/O for SQL Server operations. A page is marked with a 96-byte header which stores metadata about the page including the page number, page type, free space on the page and the ID of the object that owns it. The page type defines the data contained in the page. This data includes: data stored in the database, an index, an allocation map, which holds information about how pages are allocated to tables and indexes; and a change map which holds information about the changes made to other pages since last backup or logging, or contain large data types such as image or text. While a page is the basic unit of an I/O operation, space is actually managed in terms of an extent which consists of 8 pages. A database object can either span all 8 pages in an extent ("uniform extent") or share an extent with up to 7 more objects ("mixed extent"). A row in a database table cannot span more than one page, so is limited to 8 KB in size. However, if the data exceeds 8 KB and the row contains varchar or varbinary data, the data in those columns are moved to a new page (or possibly a sequence of pages, called an allocation unit) and replaced with a pointer to the data.

For physical storage of a table, its rows are divided into a series of partitions (numbered 1 to n). The partition size is user defined; by default all rows are in a single partition. A table is split into multiple partitions in order to spread a database over a computer cluster. Rows in each partition are stored in either B-tree or heap structure. If the table has an associated, clustered index to allow fast retrieval of rows, the rows are stored in-order according to their index values, with a B-tree providing the index. The data is in the leaf node of the leaves, and other nodes storing the index values for the leaf data reachable from the respective nodes. If the index is non-clustered, the rows are not sorted according to the index keys. An indexed view has the same storage structure as an indexed table. A table without a clustered index is stored in an unordered heap structure. However, the table may have non-clustered indices to allow fast retrieval of rows. In some situations the heap structure has performance advantages over the clustered structure. Both heaps and B-trees can span multiple allocation units.

Buffer management

SQL Server buffers pages in RAM to minimize disk I/O. Any 8 KB page can be buffered in-memory, and the set of all pages currently buffered is called the buffer cache. The amount of memory available to SQL Server decides how many pages will be cached in memory. The buffer cache is managed by the Buffer Manager.

Either reading from or writing to any page copies it to the buffer cache. Subsequent reads or writes are redirected to the in-memory copy, rather than the on-disc version. The page is updated on the disc by the Buffer Manager only if the in-memory cache has not been referenced for some time. While writing pages back to disc, asynchronous I/O is used whereby the I/O operation is done in a background thread so that other operations do not have to wait for the I/O operation to complete. Each page is written along with its checksum when it is written. When reading the page back, its checksum is computed again and matched with the stored version to ensure the page has not been damaged or tampered with in the meantime.

5. RESULT

The results of the project are summed up that despite the many difficulties, whether software or otherwise, we were able to program a simple and basic program to manage a system that calculates patient costs in the hospital and knows almost all the details, whether for patients, rooms or staff. We can use and apply in Iraqi hospitals to support hospitals and

help from During the introduction of technology to hospitals as well as we can in the future work to develop this project to be better in all respects, as we explained in our research the problem that the project will address and people presented the problem and how the work was previously and how we try through our research to help, even with a small part of addressing the problem and pushing Technology is forward and assisting in introducing computers and their technologies to Iraqi hospitals, and this is an important matter. This situation is where all developed countries do not use papers in hospital records or in their financial transactions, but rather have moved to apply techno login to their hospitals and transfer them to the electronic system.

This project has been a rewarding experience in more than one way. The entire project work has enlightened us in the following areas:

a) We have gained an insight into the working of the HOSPITAL. This represents a typical real world situation.

b) Our understanding of database design has been strengthened this is because in order to generate the final reports of database designing has to be properly followed.

c) Scheduling a project and adhering to that schedule creates a strong sense of time management.

d) Sense of teamwork has developed and confidence of handling real life project has increased to a great extent.

e) Initially, there were problem with the validation but with discussions, we were to implement validations.

6. CONCLUSION

The Hospital Costing Management System project is dedicated to computerizing work in the hospital. The software takes care of all the requirements of any average hospital and is able to provide easy and efficient storage of information regarding patients who come to the hospital. Providing the patient's details and entering his ward, including patient**.**

In the future, we will work on developing our project and add the following ideas

1. A mobile application through which the patient can make a reservation or follow up on his health condition

2. A website linked with a group of health institutions in order to know the health status of each person who registered inside the hospital

3. Upload the site and the administrative program and make it online and offline

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CONFLICTS OF INTEREST

The author declares no conflict of interest.

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