PerfectC^{2}MIS: A perfect FileMaker r-database based comprehensive Class cum Course Management Information System

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Abstract-As most of us are unaware that we have a very effective and efficient relational database with the name FileMaker which falls under the category of less known Relational Database Management System (RDBMS) to develop and deploy all types of computer applications to manage the business of a Small and Medium Enterprises (SME's). Our research paper presents a time tested computerized information system designed to manage class/department for Cihan University, Erbil. The main objective of this research paper is to offer an automated, faster and efficient system to the end-user in order to process faster and increase the overall efficiency in the overall cycle. As of now the system has been deployed for single entity i.e. teacher. Later on we would extend it to the usage of Head of the Department (HOD) & the office secretary as well. Our objective of this practical research would be to focus on the design part as well as the functionality of the application software.

Keywords: RDBMS, ICT, Information Technology

1. INTRODUCTION

These days the database has become one of the most important tools for storing, analyzing complex information and large amount of data as per the figure 1 below:-
A well designed database structure has several plus points like fast, accurate, real-time access, perfect reporting, highly scalable, and error free etc. It is one of the most common tools in business houses, banks, government, industries, and schools, colleges globally to process the data & use the processed information as a result. Information technologies are the result of knowledge explosion. These include hardware & software technologies and facilitate teaching learning process. Using Information Technologies learners are now able to participate in learning communities throughout the world. They are independent and free in choice of their programmes of study and access to the resources. They may learn collaboratively, share information, exchange their learning experiences and work through cooperative activities in virtual learning communities [2].

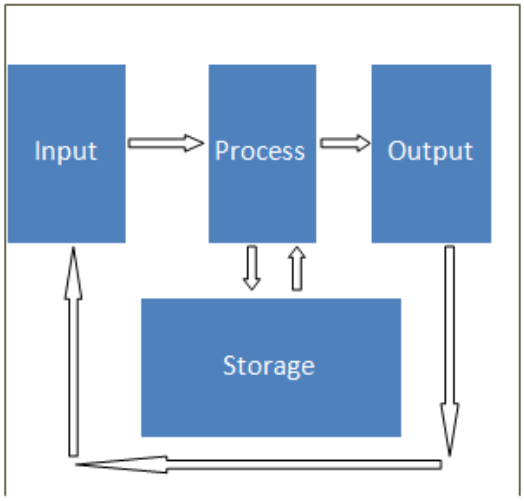

Figure 1- The data-information cycle

All over the world the schools have already deployed their business oriented information management system to the best of their

knowledge as per the data-information cycle shown in Figure 1 above. As a result these schools have been able to perform overall much better than those without it. A typical Class Management System is the usage of a large database comprising of smaller table spaces which can be used to manage any class perfectly well. It consists of recording & retrieval of all the activities of students on day to day basis. This information is extremely useful at time like Parent Teacher Meeting (PTM) etc. We can have a standalone system or a multiuser system that can be accessed by many users at the same time. In other words we can say that our application is a supporting tool which can be accessed in one of the many ways like –

- Standalone
- Local Area Network (LAN)
- Wide Area Network (WAN)
- Web

This paper deals with the development and deployment of such Information Technology (IT) based Management Information System at Cihan University, Erbil.

2. MOTIVATION

Further, this processed information can be conveniently accessed & shared with the authorized users at any point of time. This type of user access control program has been projected for a future release. Everything becomes so easy to process & prepare the flexible management information system reports in a fraction of second with the press of a button.

Actually Cihan University is working on an action plan which aims at a maximum usage of Information & Communication Technology (ICT) in almost all the operations at all the levels. Information and communication technologies (ICTs) are a group of technologies and tools which, at one hand are useful for learners by facilitating them with global access, library services and communication with experts, resource persons, researcher, professionals, and peers; on the other hand important for teachers in course design, developing course materials and in research. ICTs are important in distance education due to their potential in teaching-learning, to increase flexibility of learning with tools like Virtual Learning Environments, and Course Management Systems like Moodle, aTutor, online discussion boards, wikis, chat rooms, MOOCs and blogs. The major advantages of using technologies in distance education are cost effectiveness, time saving, improved quality of education, access to a larger population, teaching a no. of students simultaneously, and finding a lot of educational resources [3]. Therefore, their needs moved towards Class Management Systems (CMS) as a best fit solution for managing any data related to students, employees, teaching processes etc. Such an automated system can make life peaceful and easier for any end user. Using PerfectC^2MIS, finding student's information is fast and fluid which otherwise could have taken a much longer duration. At the end of each semester, printing students' overall performance statement including attendance, grades, notes becomes just a few seconds job which otherwise could have taken a much longer time without using our application.

With the initiative of the management of the Cihan Educational Group and the whole hearted support of the concerned departments a project team was formed for the design and implementation of the automated system. The primary objective of our project was to develop an automated computer based system for Cihan University to computerize all the teaching procedures &

practices being followed in the management of the classes conducted at Cihan University.

3. SYSTEM DEVELOPMENT

PerfectC^{2}MIS is being used at a standalone system at the present time. Later on we would migrate our application to Client-Server environment. Client-Server computing uses local processing power-the power of desktop platform. It changes the way enterprise accesses, distributes, and uses data. With this approach, data is no longer under the tight control of Seniors Managers and MIS (Management of Information Systems) staff; it is readily available to middle-rank personel and staff. They can actively involve in the decision-making and operation on behalf of the company. The company becomes more flexible and gives a faster response to the changing business environment outside. In addition, if one machine goes down, the company will still function properly [5]. At the present time we can execute our application on a standalone module although the same application has been tested to work on Local Area Network (LAN) as well. In this scenario we have just one drawback that our database cannot be centralized. All the users are unable to share the information between them. Later on with the purchase of server edition of FileMaker we would be able to map it to the server edition as well. Further we have very efficient & fast file servers at the backend to manage the show. Our application should be hardware and software independent as well. Figure 2 below shows the screenshot of the main screen of the application PerfectC^{2}MIS.

Figure 2 - Screenshot of the main screen of PerfectC^{2}MIS

3.1 Analysis and Definition

A detailed session of discussions and meetings was carried out with the potential users of the system as well as concerned staff. Based on these inputs a detailed SRS (System Requirement Specifications) document was prepared. This consisted of existing hardcopies of forms and reports served as a good reference for the best possible solution of the final SRS. Paper documentation serves as a rich input to understand the existing procedures/activities performed within the department. Failure projects are those ones that do not meet the original time, cost and quality requirements criteria. The common cause of software project failure: absence of well-defined requirements.

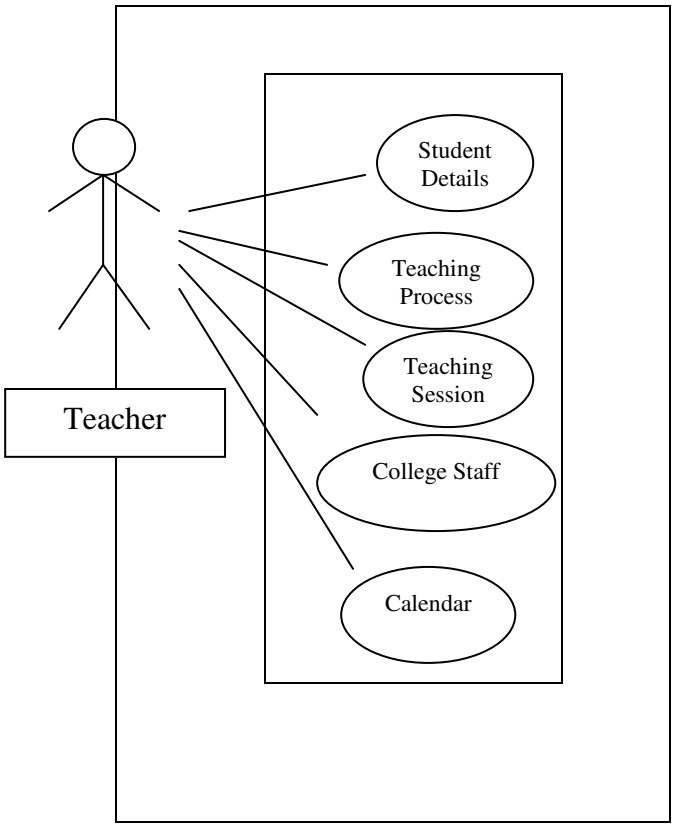

Figure 3: User-case Diagram

With some hardships we were able to understand the required system from the end user as well as the cooperation from the administrative staff. All the inputs were collected with just point in the mind that was to streamline the system to the maximum. Figure 3 above shows the User-case Diagram for one user i.e. the teacher. Later on we would work on to release updated modules for:

- ✓ Head of the Department
- ✓ Secretary
- ✓ Students

It has been found that the end users are not fully versed with the complete requirements of the system. Henceforth it becomes very important for the analyst to understand the complete System Requirement Specifications (SRS) with the designated in charge. The output of the requirements phase of the software development process is Software Requirements Specification (SRS) (also known as requirements document). This document lays a foundation for software engineering activities and is created when entire requirements are elicited and analyzed. SRS is a formal document, which acts as a representation of software that enables the users to review whether it (SRS) is according to their requirements. In addition, it includes user requirements for a system as well as detailed specifications of the system requirements [4]. Initially we face some resistance from the end users in using the system but later on they would be able to accept it. Further we also need to note that if our application does not help and facilitate the user's work they will be reluctant to use it. We need handle such situations tactfully.

3.2 Software Design

As we all know that software design is the most critical element of any project. The success of any project lies in the quality of software design. Software Design is the study of the modern methods, technologies, languages, principles and practices that make it possible to conceive, create, validate and evolve complex software systems [1]. It consists of understanding user requirements completely & correctly. Further we need to complete the paperwork like SRS, DFD's, and ERD's as well. Making a complete sketch of Data tables & their fields is again a very important part of software design.

3.2.1 Data Model

The first step in the data modeling module is defining a good consistent structured database. This model of our project is represented by the data model which

consists of various entities as shown in figures below:-

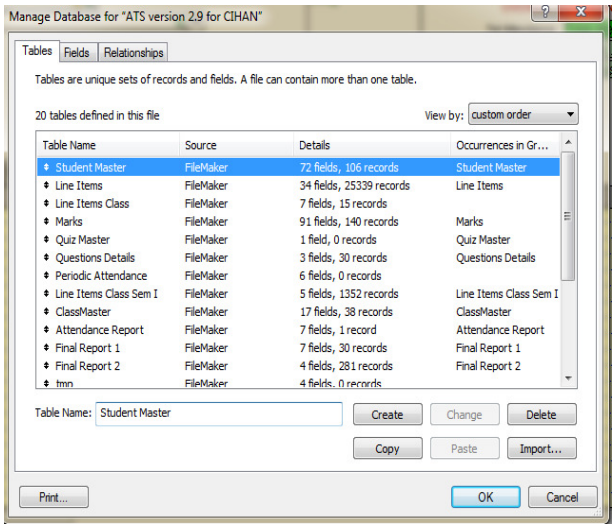

Figure 4: A typical Table space

The figure 4 shows a typical Table space in the FileMaker. Like this we have other database structures as well. We just need to link them together as per our requirement.

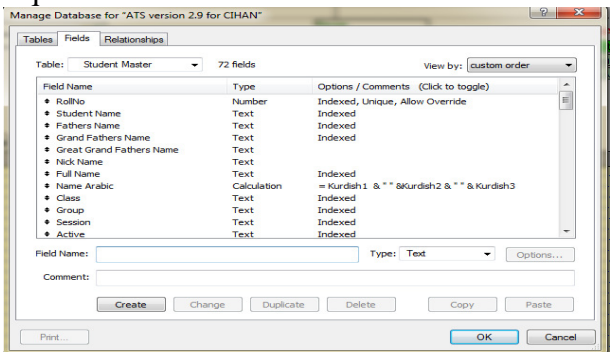

Figure 5: A typical FileMaker Table structure

The figure 5 shows the concerned fields in a particular table i.e. Student Master in this case. As we all know this is the basic building block of any database application. We need to sit down and workout the best possible database avoiding data redundancy

In figure 6 above we show the most important entities of the model and their relationships as defined & used in a typical at all stages. In this manner all the possible tables are worked out. It is always better to work out the entire plan on a piece of paper before starting to do it on the machine.

There is a need to establish a relationship between the various fields associated with the tables. Tables as we all know are the basic building blocks of any RDBMS based application.

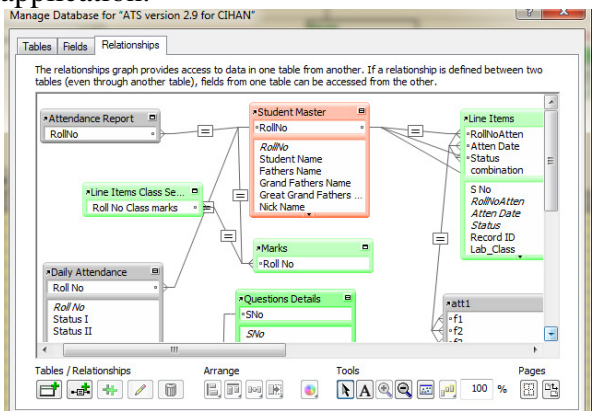

Figure 6: A typical Entity-Relationship diagram in FileMaker

During the designing of the database, we need to make right decisions to make the best use of an effective and efficient system. A well worked on database takes less time and efforts to process and produce end results. For the reason a lot of the success of the project depends on the designing of the data model. It should be scalable with the options to modify as and when required. It should be easy to understand & user-friendly. We need to take care of data redundancy. Further our application should be flexible so that it can be used anywhere with no hardware or software limitations and should work perfectly well with changing requirements with minimum efforts.

class/session in our Cihan University. Our whole project is usually based on this ER diagram (Entity-relationship) diagrams.

3.3 Implementation

The next step is the implementation of the application software which has been developed as a constructive effort of the entire team. The communication between the database and the software includes:

- Storing data/information in the database
- Modifying data/information as and when required
- Retrieving the required data/information as required

4. CONCLUSIONS

The need of managing the information electronically has been growing man folds in all areas of the Kurdistan region. As we all know that education is considered to be very essential for the development of any nation. Therefore, Class Management Systems like PerfectC^{2}MIS have been suggested as the best option to manage information in the schools/colleges.

The PerfectC^{2}MIS application software has been built based on actual procedures and practices being followed in Cihan University. Therefore, this system may be considered as a very critical step aimed towards implementing digitally based information management in Schools/Universities.

5. ACKNOWLEDGEMENT

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