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RESEARCH ARTICLE

A Mechanism to Adjust the Updated Data and Recovery for School

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Abstract

Manual system which is used to manage the database represents a problem in the current time after the tremendous progress in the information technology field. Due to the increased number of peoples and their information has become not easy to deal with the classic manual system for that the solution is by use automated system, but a new problem is generated how to control the data update.

In the manual system, the update process done by the write-off or correction ink and this manner used for a limited number of updates. In the automated system, the problem is how to know if the data is updated or not, how to know how many updating and if there is ability of recovery or not.

The developed system in this paper performs the processes of the automated system as a substitute for manual system, as well as, that system provide solution for the control update problem by give the manager the ability of monitoring the modifications and capability to recover the old data.

I. INTRODUCTION

A database management system is a collection of program that manages the database structure and controls access to the data stored in the database, can be visualized structural structure of the databases at three levels, the level nearest to the user is the external level, where the user is dealing with the data stored, so this level focuses on how viewing the user, while the second level is the domestic level and focuses on how to store data on the disks. Between the user-level and file level there is a third level and is clear from the figure there is no direct correlation between the - the logical level. The basic part in develop every nation is education and it is the foundation stone for the civilization. Education is the diversity of its output effective tool to bring about economic and social change in any country seeks to progress. It is the need to keep the nation and citizens together to face the challenges of the future, education is the main objective and it is necessary for human development.

To development the community and its institutions, we should improve the educational institutions by use the modern methods to make the output of this institutions useful, the young who studying now they are leaders in the near future, development the education mean develop two parts in education they are teaching and the management

education. The main objectives of the management school in the process of organizing and facilitating the development of school, and aims to provide the appropriate atmosphere for a process appropriate the educational, teaching, social, and seek to achieve. One of development methods in education management is use technology in management of schools by use the Automation School Management System. In school management system, the tasks which performed are save and update the records (students, teachers, classes, and subjects, etc) with view the reports of students and the other information which needed to generate it.

A. The Purpose of Automation School Management System

There are many advantages of Automation School Management System, the School Management System make the user to return the information with high accuracy, fast, easy, security and the main advantage is to handle large volume of data. In brief School Management System allows users to store almost all of their school's information electronically. The advantage of School Management System only authorized users can access the information only.

B. Problem Statement

At the beginning, the develop phase of the information system of secondary school is consist of a series of important basic steps. These steps are defined and analysis of the problem, then found the sufficient solution for that problem. The problems are increasingly large numbers of students join to the school year by year, which makes it difficult to manage the educational process at school in classical manual systems, by introducing the automated systems that help us to solve the problems.

Manual system causing increasing cumulative errors resulting in problems may not appear in many times and if it appeared difficult to processing and handling, and a large number of errors in monitoring and assembled the marks. By manual system, it is very difficult to take quick decisions because we could not generate reports at the time of requirements. The documents are not secure sufficiently in the manual system, in the automated system nobody can login if he not have license to login.

But we have new problem in this case:

How could use assure the marks change and how we can know the original data before the modification and how many times the updated, as known, that no one can know if data modified or not. Let suppose that there is a mistake in the mark sheet modification for any reason by the authorized employs that is dangerous problem and very critical because of no one can know about that mistake.

C. Objectives

To develop a School Management System with the following modules:

- Develop module for registration system to enter, store, update and view the information of students.
- Develop module for staff of school enter, store, update and view the information of staff.
- Develop module to create users with determine the authorization for every users of "Automation School Management System"
- Design screen for monitoring the marks update which by it the manager can monitor the updating of students marks.
- Make the system able to recover the old marks which it modified.
- Develop module for generate reports.

D. Database Management System (DBMS)

Database management system is a program through which user can retrieve insert, modify or delete the data, the program where the link between a user and the database engine to perform that task.

In the case of the universe, there is a relationship between database tables called *the system of relational databases (Relational Database Management System - RDBMS)*. The main objectives of the databases is to focus on how to

organize the data and not on special applications. This means that the main objective of the database designer is to design data so that does not contain the frequency and can be retrieved, modified and added it without the problems that can occur with a frequency.

Degif Teka - June 2008 [1], “ School Management System -A Project paper submitted to Addis Ababa University” in this researches:

This project work automates school management system. In the system, two applications are developed, windows based (thick client) and web based (thin client).

The windows application takes most of the activities such as offline student registering, transcript and report card generation and producing the timetable. The web application facilitates attendance recording by the homeroom teachers, to view status of students by their parents and to view reports by kebele and kifle-ketema education bureau officials.

Mohamed Saleh M. Saleh [2] – 2010 ” Web-based School Management System” he said:

This study discusses the developing of school management system prototype as an electronic solution to the current manual file system that is practiced in most of the Libyan schools. The system was developed using PHP, MySQL Apache. The web-based School Management System (WSMS) is a web-based management system that enables school administrations in particular principals and teachers to manage resources, processes and co-ordinate routine school activities. It helps to enable the transfer of data at a much faster a rate. In the outdated manual file system, there is no central repository on student or staff particulars. Retrieving data from the manual files is both tedious and cumbersome. Developing a computerized information system helps to reduce teacher’s workload by automating most of the routine process. The school management system can speed-up retrieval of student, data staff, summarizes attendance and analysis student results. In a nutshell, the WSMS when fully utilized would not be a time saving efficient system but also about for reaching benefits to the overall administration of schools. In final analysis, greater efficiency in administration would facilitate more effective teaching and learning indexing (document details)”

In this paper, we developed an automated school management system that facilitates the various activities taking place at schools.

The system developed in the project consists of windows and web applications. These are two different applications on the same database. The windows application takes most of the activities such as offline student registering, transcript and report card generation and producing the timetable. The web application facilitates attendance recording by the homeroom teachers and to view reports, to view status of students by students, teachers and parents. Our solution of the timetabling problem is very simple. Data structures are used to implement the timetable designed. The scheduler selects a subject-teacher from the database, retrieves all the classes assigned to the teacher, calculates the load of the teacher which cannot be greater than the maximum load and selects one of the days randomly based on the number of lessons of the subject, searches a free appropriate time slot and assigns the slot to the lesson. The scheduler repeats the process until the load of the teacher becomes zero and all the teachers in the database are visited. Finally, the result generated is stored in a database.

The prototype has been tested with data from Kokebe Tsebah Secondary School. It has been shown that the system effectively registers students along with parental information, easily retrieves information about a student and generates the required reports such as transcript, report card and timetable. In addition to generating a feasible master timetable, it produces a timetable for each teacher. Further more it has been shown that the web application of the system helps attendance recording by the homeroom teacher and parents can view the status of their children using the Internet or Intranet of the school.

II. Proposed School Management System

Objective to identify the requirements is understanding the client's expectations and the user of the system (what can be done to the system, what can not performed). It may be an alternative system to be designed for a system or method used to perform specific task, or may be the new system provide a new service never provide it before. Each software system function certain, it determines what can be done in order to perform that function. The requirement statement is the first input which is given to the system analyst for building the intended system for any organization[3].

At this stage, gathering information accurately and then define the requirements and tasks to be performed by the program. These tasks are described accurately, also studying the feasibility of the desired program, for example, The user puts a vision for the program to perform certain operations.

- **Purpose**

Automate School Management System for secondary school instead of the classic manual system is easy to use and handle with safety and security.

- **Project Scope**

The system uses in the management of secondary schools to manage and organize the work of the school administration with its staff and students.

- **Intended Audience and Reading**

Administrators, teachers, guardian of students and students of secondary schools.

- **Document Conventions**

After visiting a group of secondary schools in Iraq and talk with persons who are responsible for the management of these schools and after display the idea of the system had their requests that the system is easy to use and the enables the user to add and retrieve data of students and teachers easily and fast and the manager able to control this system especially the students' marks because of dealing with it must be safely. Maytham Naim was Assistant Manager want the Almarkaza school in Basrah want the system easy to management of staff and students, either teammate Wael request that the system helps the administers by fast and accuracy but can not control the system in case of changing marks, In the other please was the request of the manager of Saiy secondary school that the system able to view the details for the marks of students when the guardian of student wants to view it. As for Assistant Manager of Excellence Secondary School in Basra has had a strong desire to use the automate management system in the management of the school instead of manual system.

A. Overall Description

- **Product Perspective**

Iraqi Ministry of Education, Public schools and Private schools.

- **Product Features**

That the system easy to use, security, users at four levels are teachers, staff manager and student can not be access for persons unauthorized marks system protected by method the manger is able to monitoring with ability to recover marks that have been modified and can know who is responsible for that badly update and give him appropriate punish for that mistake.

- **User Classes and Characteristics**

Administration, teachers, students in secondary schools.

- **Operating Environment**

Secondary school, computer inside the school.

B. Other Nonfunctional Requirements

- **Safety Requirements**

System is very safe, the database stored in safe storage, as for the marks of students can not be updated without the knowledge of manager and the manager can recover the previous marks after the update.

- **Security Requirements**

To access the system through login by a user name and password according to the specific privileges given by the manger of school.

C. Functional Requirements

The functional requirements of the system are:

1. Register a student.
2. Update the information of student.
3. Add and update the staff (teachers, employs).
4. Entering and update the marks of student.
5. Monitoring the updating of marks.
6. Recovery to the marks.

D. Non Functional Requirements [4]

Security requirements are important factors in this system as classified data will be stored in the database. User validation will be done during login to insure that the user is valid and that the user only has access to his or her permission data. General users will only have access through the user interface.

The system will have consistent interface formats and button sets for all forms in the application, will have a form based interface for all data entry and viewing formats. The determine the privileges is very important to control on the system and the users job. As well as, save the data that it was updated many time before.

System Analysis

System study aims at establishing requests for the system to be acquired, developed and installed. It involves studying and analyzing the ways of an organization currently processing the data to produce information. Analyzing the problem thoroughly forms the vital part of the system study. In system analysis, prevailing situation of problem carefully examined by breaking them into sub problems. Problematic areas are identified and information is collected. Data gathering is essential to any analysis of requests. It is necessary that this analysis familiarizes the designer with objectives, activities and the function of the organization in which the system is to be implemented.

Study of Existing System

Today in many schools the student details are entered manually. The student details in separate records are tedious task. Referring to all these records and updating is needed. There is a chance for more manual errors with slow in perform the management works.

Proposed System

By developing the system, we can attain the following facilities.

- Easy to handle and feasible.
- Security and control the update.
- Determine the privilege.
- Cost reduction.
- Fast and convenient.

E. Analysis Model

To produce a model of the system which is correct, complete and consistent we need to construct the analysis model which focuses on structuring and formalizing the requirements of the system:

A. Use Case Diagram [7]

Use case diagram is a collection of scenarios that describe the interaction between user and system. Scheme shows the use case diagram relationship between the actors and use cases. The two main components of the scheme of use case diagram two cases of the use of use cases and actors .

Use cases are the fundamental units of modeling language, in which functionalities are distinctly presented. The use case is a scenario based technique. Use cases help to identify individual interaction with the system. Use cases are extensively used for requirements elicitation. by designing the proper use cases for different scenarios major requirements of the system can be identified, as shown in Figure (1).

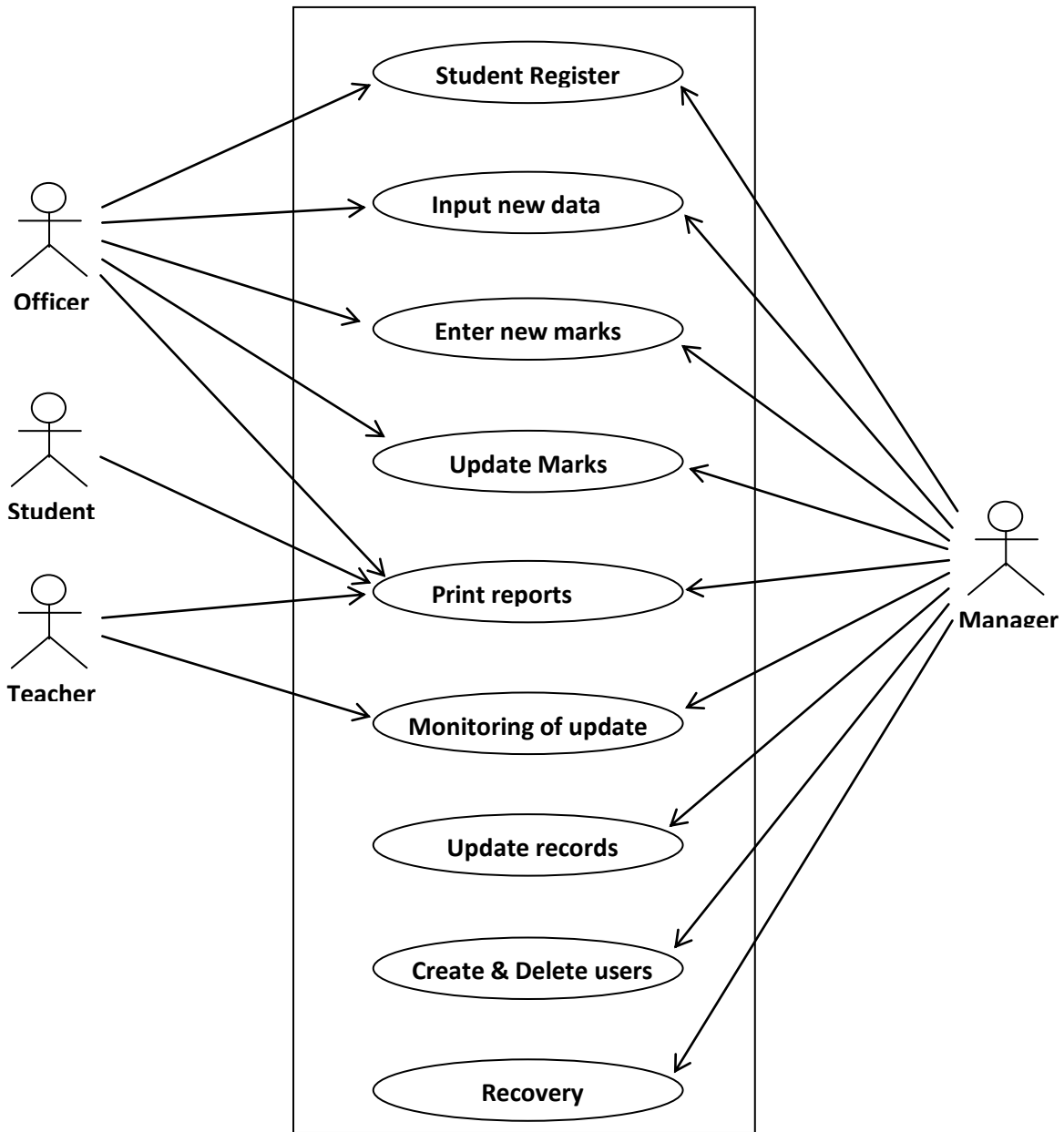


Fig. 1 Use case for (School Management System).

Actor Description

Name: Officer.

Description: A officer is a person who registers a student, input new information of (student, subject, update marks class, and staff).

Name: Manager.

Description: A manager is person who can do all functions in the system as well as create and delete users.

Name: Teacher.

Description: A teacher is the person who has privilege to monitoring the marks update and print report of his record.

Name: Student.

Description: A student is the person who has privilege to print the mark sheet that student.

Use Case Description

Name: Register Student.

Actors: Officer.

Description: To register as a student of the school.

Flow of Event:

1. Student wants to be registered as a student of the school.
2. Registration form will be given to the student.
3. The student completes the registration form that contains student's full name, address, parent name, and other detail information.
4. Officer of the school checks whether the contents of the registration form is properly completed.
5. Officer fills and submits the form to the system.
6. System registers.
7. Use case ends.

Post Condition: Student Registered.

Name: Store marks.

Actors: Officer.

Description: To store new marks to the subject marks table.

Flow of Event:

1. Teacher wants to store marks of student in the system.
2. Teacher give the marks to the officer.
3. Officer of the school type and save this marks in the system.
4. System store.
5. Use case ends.

Post Condition: store marks.

Name: Update marks.

Actors: Officer.

Description: To update old marks which are stored in the subject marks table.

Flow of Event:

1. Manager of school wants to update marks of student in the system.
2. Manager give new marks to the officer.
3. Officer change the old marks to new marks .
4. System update marks.
5. Use case ends.

Post Condition: update marks.

Name: Show marks update.

Actors: Teacher.

Description: To show the update of marks (before & after update).

Flow of Event:

1. wants to show the marks before update and after update.
2. Teacher open the window that use to monitoring the update marks.
3. Use case ends.

Post Condition: view update of marks.

Name: Recover marks.

Actors: Manager.

Description: To recover the marks before the modify .

Flow of Event:

1. Manager of school wants to the marks before the modify .
2. Manager open the monitoring window.
3. Make recovery marks.
4. Marks recovered.
5. Use case ends.

Post Condition: Marks recovered.

B. The Data Flow Diagram (DFD) [8]

The DFD serves two purposes:

1. To provide an indication of how data are transformed as they move through the system.
2. To depict the functions (and subfunctions) that transform the data flow. The DFD provides additional information that is used during the analysis of the information domain and serves as a basis for the modeling of function.

The DFD of the School Management System is explain by the tree levels which are follow in Fig.2, and Fig.3.

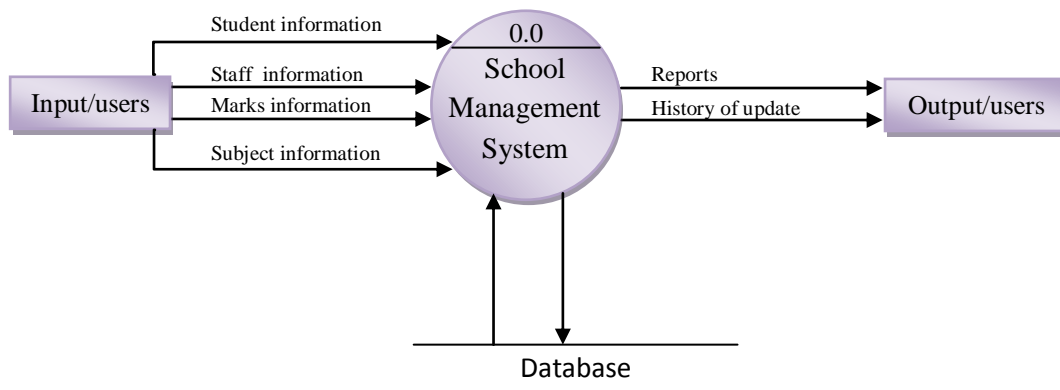


Fig.2 School Management System DFD (level - 0)

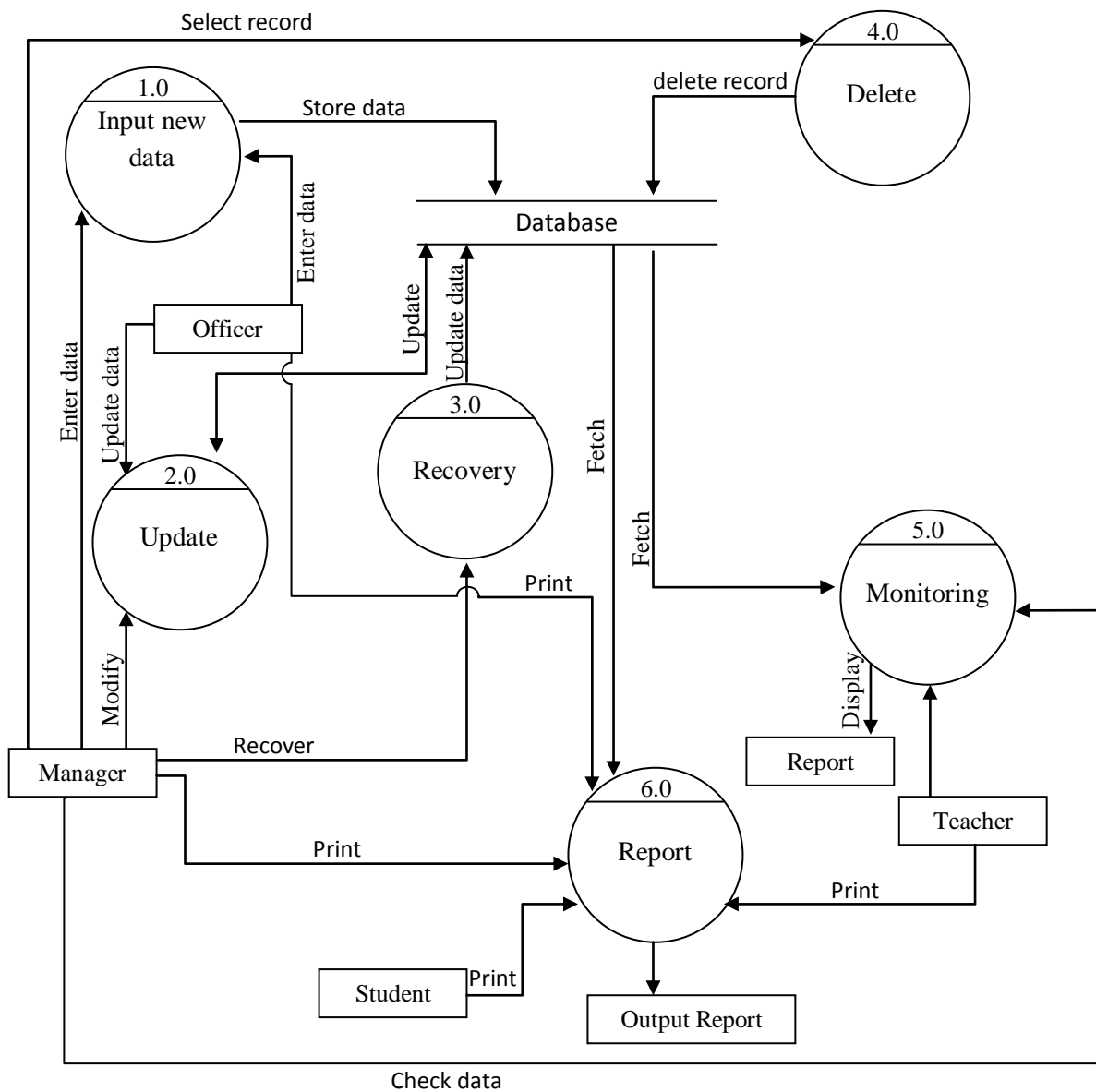


Fig.3 School Management System DFD (level - 1).

C. Flowchart [3]

A flowchart is graphical representation of algorithm or process, showing the steps as boxes of various kinds, and their order by connecting these with arrows. This diagrammatic representation can give a step-by-step solution to a given problem. Process operations are represented in these boxes, and arrows connecting them represent flow of control. Data flows are not typically represented in a flowchart, in contrast with data flow diagrams; rather, they are implied by the sequencing of operations. Flowcharts are used in analyzing, designing, documenting or managing a process or program in various fields. Flow charts, very important planning and working tools in programming.

The following is a basic descriptions and meaning, of the most common flowchart diagram symbols or business process map symbols, follow it the most important flowcharts of School Management System:

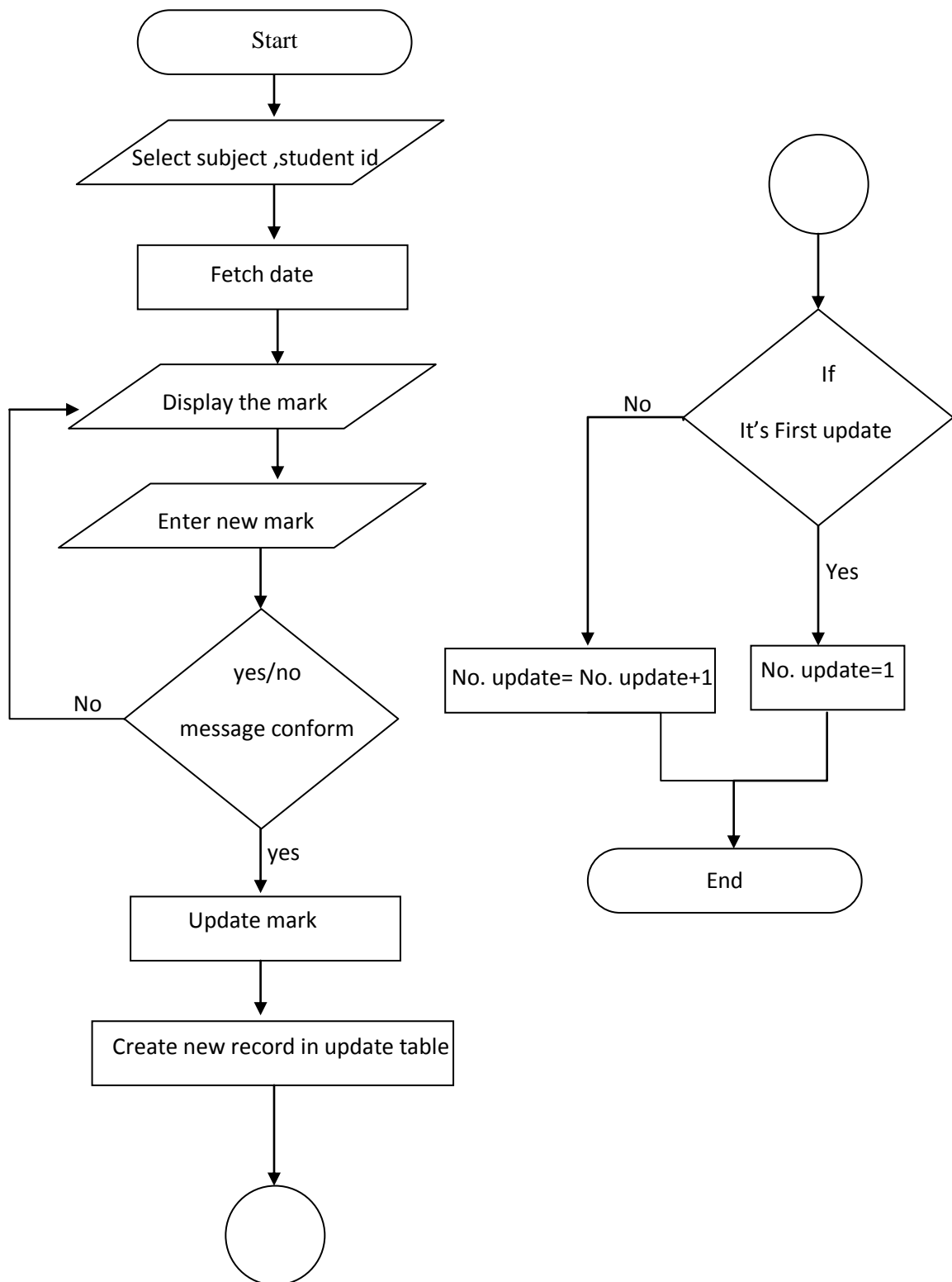


Fig.4 Update mark

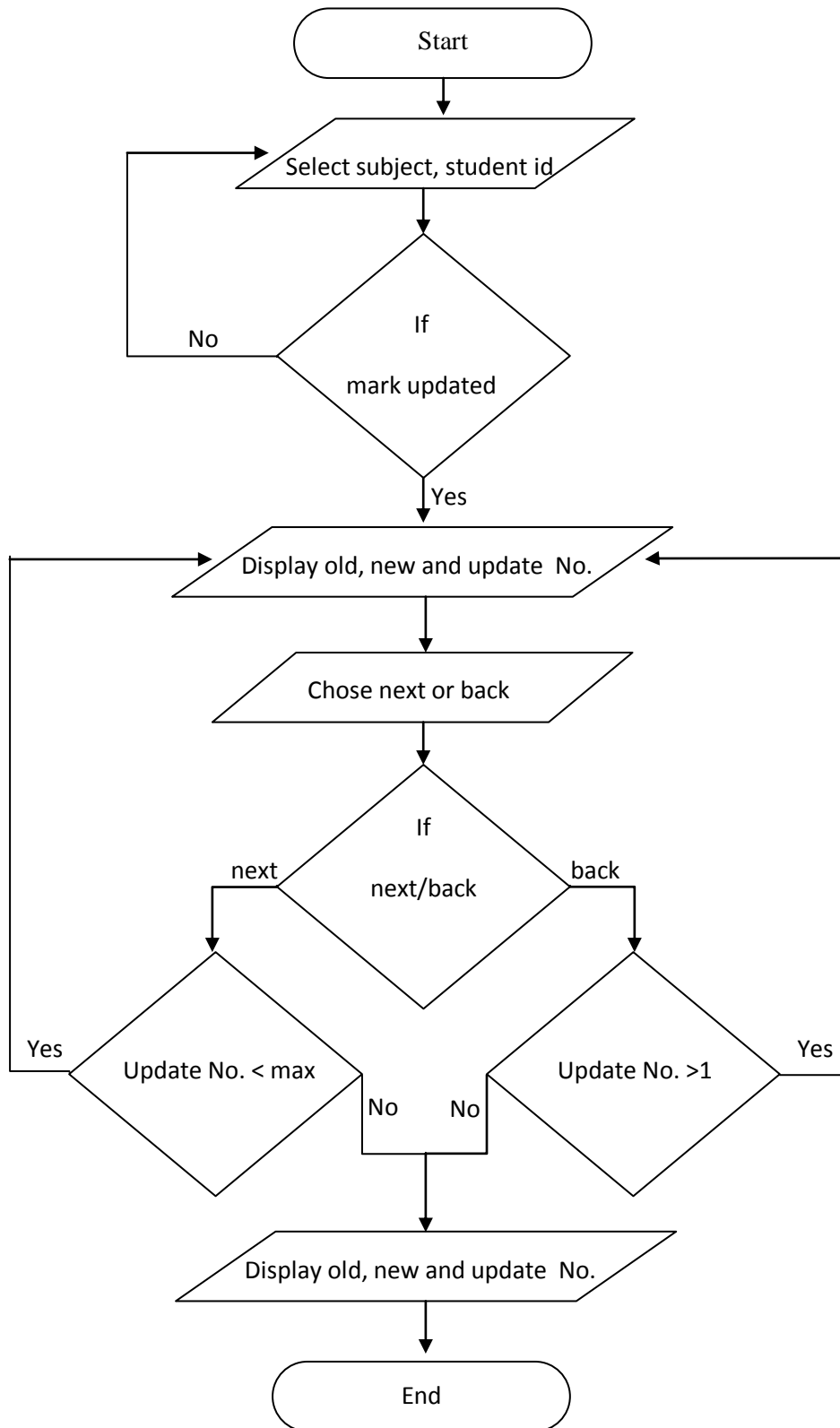


Fig.5 Update monitoring

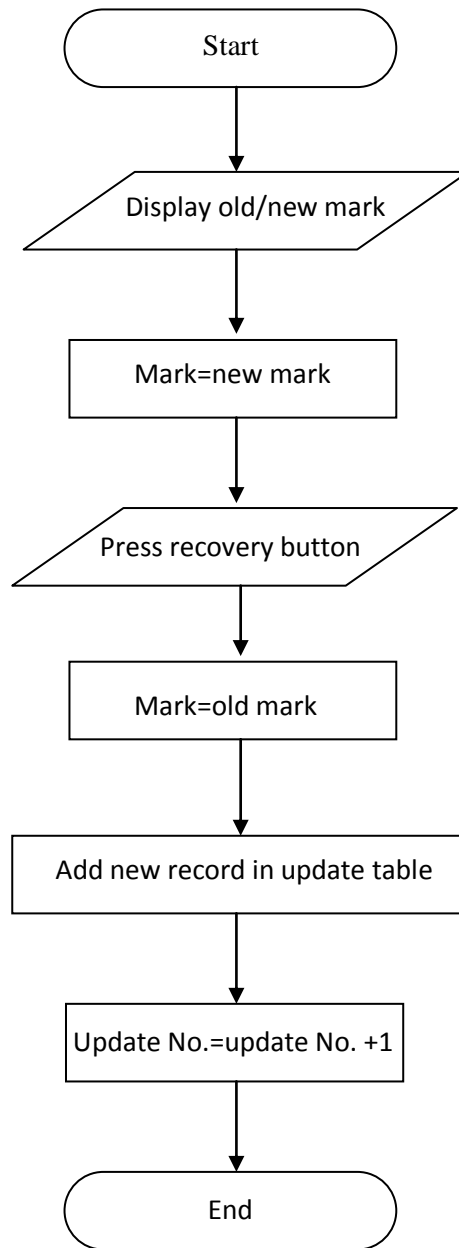


Fig.6 Mark recovery.

D. Entity-Relationship (ER) Diagram

An ER diagram model was originally proposed by Peter Chen in 1976, it is a specialized graphic that illustrates the relationships between entities in a database. A set of primary components are identified for the ERD: data objects, attributes, relationships, and various type indicators. The primary purpose of the ERD is to represent data objects and their relationships. ER diagrams often use symbols to represent three different types of information. Boxes are commonly used to represent entities. Diamonds are normally used to represent relationships and ovals are used to represent attributes.

The ER diagram of the “School Management System” are explained as following Fig.7.

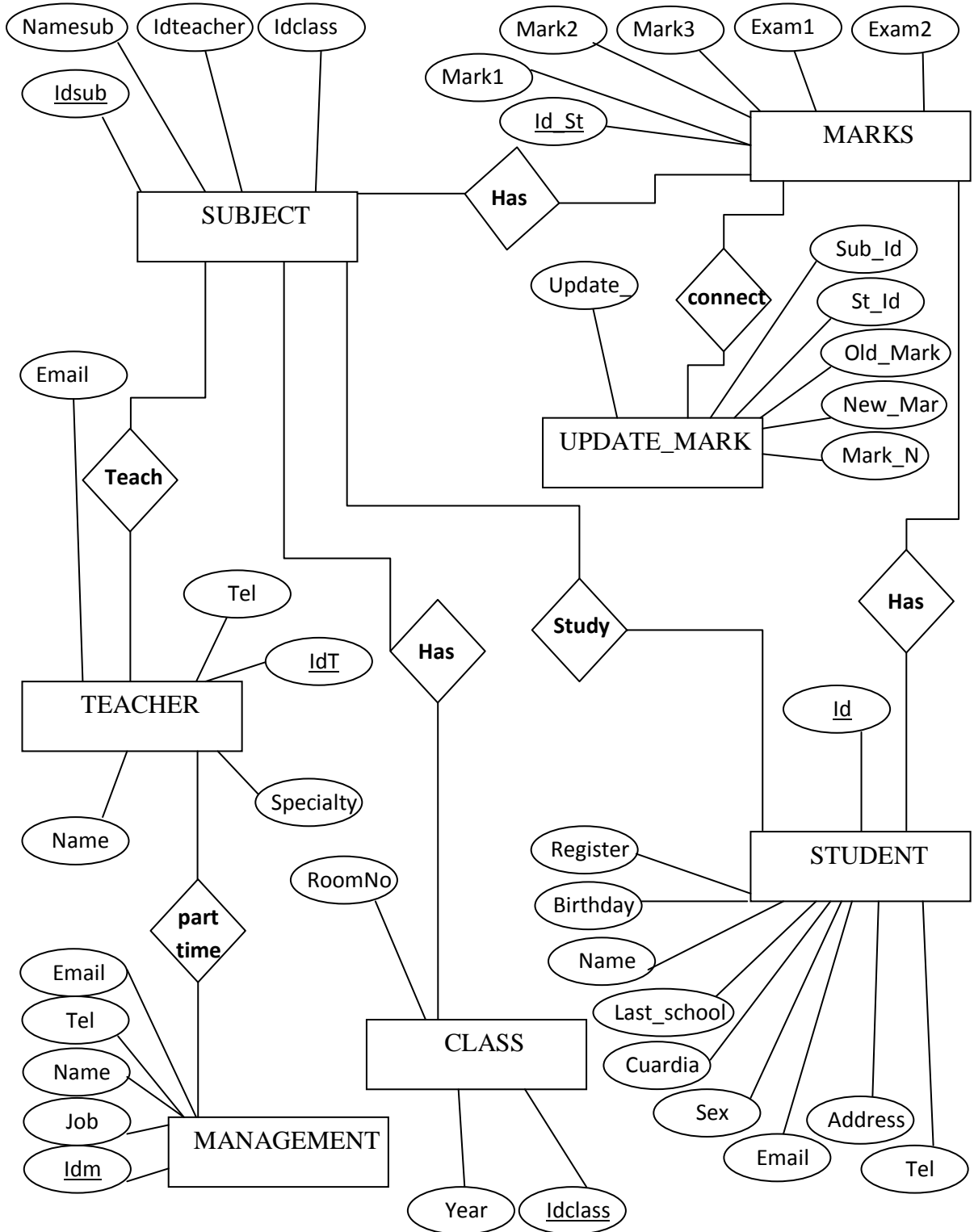


Fig.7 ER diagram of the school management system.

A. Database Design

Database is always designed to store a particular type of information. The database in any system consist of number of tables, these table are related to each other by using the keys. the tables that used in the database of the School Management System are explained as following:

B. The basic tables as following:

1. Student table has information of all students.
2. Mark table has information of all marks.
3. Update mark table has the information of mark which updated.

C. Extra tables:

Extra tables which created when every addition of new subject, each the table's name is same of the subject name, has the marks of students in that subject.

TABLE I STUDENT TABLE

Name	Type	Size	Description
IDS	VARCHAR	10	PRIMARY KEY
NAME	VARCHAR2	30	
MOTHER	VARCHAR	20	
SEX	VARCHAR	6	
ADDRESS	VARCHAR	40	
GUARDIAN	VARCHAR	20	
TEL	VARCHAR	15	
LAST_SCHOOL	VARCHAR	30	
IDCLASS	VARCHAR	10	FOREIGN KEY
REGISTER	DATE	15	
BIRTHDAY	DATE	15	
E_MAIL	VARCHAR	20	

TABLE II MARKS TABLE

Name	Type	Size	Description
IDS	VARCHAR	10	PRIMARY KEY
MARK1	NUMBER	3	
MARK2	NUMBER	3	
MARK3	NUMBER	3	
EXAM1	NUMBER	3	
EXAM2	NUMBER	3	

TABLE III UPDATE TABLE

Name	Type	Size	Description
ST_ID	VARCHAR	10	FOREIGN KEY
SUB_ID	VARCHAR	10	FOREIGN KEY
MARK_NO	VARCHAR	5	
OLD_MARK	VARCHAR	3	
NEW_MARK	VARCHAR	3	
UPDATE_NO	NUMBER	3	

III. System Testing

In the design and code phases errors are possible, hence the testing phase come to check and uncover errors, software testing is an activity performed to uncover error. It is a critical element of software quality assurance and represents the ultimate review of specification, design and coding.

The purpose of software testing is to ensure whether the software functions appear to be working according to specifications and performance requirements.

Testing Objectives

According to Glen Myers [7] the testing objectives are:

1. Testing is a process of executing a program with the intend of finding an error.
2. A good test case is one that has high probability of finding an undiscovered error.
3. A successful test is one that uncovers an-yet undiscovered error.

The major testing objective is to design tests that systematically uncover types of errors with minimum time and effort.

Test Our System

In this paper, developed system can by tested by applying the following steps:

1. Testing of the security

- a) **Login:** When the user want to login to the system the user must has username and password, then the user enter the user name and password in the login window, after test the login process by entering wrong username or wrong password the result is a worming message (sorry you cannot login) but when username and password are correct the main window is opened.
- b) **Multilevel of authorization:** The system give four levels of authorization they are the manager, officer, teacher and student level when login to manager level all the lists and buttons in the main window are active, but when login to another levels of authorization some of lists and buttons in the main window are not activated according to its authorization level.

2. Testing the usability

- a) **Data entering:** The system provide easy manner to entering data to the records of the students, staff, classes, subjects, marks and users after test by print and display the records all these records are correct without error. GUI are user friendly and the user can enter the data in a systematic manner.
- b) **Updating:** In this system, there are two types of update first for student, subject and user record, second for mark after test both types the update perform with no complex and when display it after updating the modify was done.

3. Displacing and printing:

When execute this tasks is clear without errors.

4. Testing of the monitoring

This testing to make the user monitor the update of the marks. These update for many times are recorded and displayed to the manager to view the marks before and after the update with the number of updates. All that work are done without any error.

5. Testing of recovery

This test to check the recovery process. After many update the user recover the previous value of the student marks correctly and in easy manner. When the process of recovery is completed the list of update was increased by one, that mean the recovery process completed successfully.

IV. RESULTS & DISCUSSION

In this section, all the result that produced by this paper will be determined and discussed in details, especially the main features that recognize this system from others system will get more attention. In the next section, the list of these resulted are mentioned.

- **The Results with Discussion**

After the development process of this paper is completed the following results are founded:

1. Project work with high security, the unauthorized person cannot login to the system.
2. The authorization level for each user is determined by the manager and only he can vanish this authorization.
3. The user can change its own password and nobody can know it.
4. The main objective of this system is achieved through its usability and unambiguity by using the GUI (Graphic User Interface), so every user can use it and can do all the processes like data entering, displaying data updating, monitoring and recovery.
5. The database was implemented by using Oracle 10g and many of advantages that available in Oracle are used in this project.
6. Programming language is “C #” in the environment of “.Net” which make the system can be maintained and developed in the future.
7. The process of monitoring and recovery of marks that updated many times can be performed simply by authorized user and this is a great feature to prevent mistakes that can be happened by the authorized user for updating, these mistakes may be happened because of many reasons as intended mistakes or through negligence and omissions.
8. The previous feature is the most important feature distinguishes the system from other management systems in general and especially in the schools management systems.

V. CONCLUSIONS

By using the “School Management System” has lot of advantages:

- The system is a user friendly.
- The system work with high security.
- The system provide levels of authorizations that determined by the manager, the unauthorized person cannot login to the system.
- The updating of data can control by the manager through monitoring the updating and recovery the old data if necessary.

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