Database Information Retrival System

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Abstract – *Student Management System (SMS) provides user friendly services to any educational institution to maintain student information. It not only provides services to educational institution but also helps parents to know their ward (student) attendance and marks through online. Many parents did not know that their son/daughter marks/attendance details because that information is not available to parents until they make a visit to institution. Keeping this in mind, with a motive to make parents aware of their son/daughter academic information to parents SMS project is being designed. Though there are many software solutions are developed for this purpose but they are not in use, as they are not user friendly.*

Keywords – information retrievals, Data base storage system, Security, Expressive Keywords

I.   NTRODUCTION

The term Student Management Information was generally used in the past for maintaining student information in paper records like attendance register. Today it has expanded its scope and includes all minute details of the student. Apart from attendance it includes academic aggregate, backlogs, internal exam marks, exam dates, important
notices, Assignments, fee due, transport details.

In our view Student Management System maintains all the details of students in student portal so that parents can view their student information in student portal hosted by particular institution. Every student is provided with a username and password during their registration at university during joining. There after students/parents can view their student information through portal. Data is stored securely by storing the data in SQL servers managed by the college administration. This not only improves security for the data it also increases the efficiency of maintaining the college records, thereby decreasing the work hours needed to maintain the student information.

Previously institutions used paper records for this purpose. There are several drawbacks in maintaining student information in paper records. First, to convey student information to parents, he/she must visit to college and consult the class teacher or Head Of the Department to know their ward/student information. Second, Paper records once written cannot be modified easily, whole data must be transferred to a new record, and thus a lot of time is wasted in this process. Dynamic insertion cannot be done in paper records i.e. when a new teacher replaces the old one the whole record of that particular teacher must be changed and a new record must be maintained for new one. This SMS provides an easy interface to maintain student information, thus making this application user friendly to college/ institutions.

A.   PURPOSE

The purpose of designing this project is that, now a day's many colleges contain their own website so, why can't we use this website in maintaining student information. This paper mainly focuses on maintaining up-to-date student information on college portal, this includes students general information, contact information, attendance, marks, fee dues, assignments, transport related information that a college/institution should maintain for each student. This information is maintained by various users at various levels of controlling by assigning different roles to each user.

B. *OBJECTIVES*

- Providing a front end application to enter student details to college web-site.
- Providing online interface for students, faculty to view student details.
- Increase the efficiency and reduce the burden to faculty in maintaining student information.
- To maintain student information with more security.

Decrease the time spent in inserting and retrieving student details.

C. *ORGANIZATION OF THE PAPER*

The paper is organized as follows: Section II explains design of the system. Section III describes about the technologies used. Section IV covers screen shots, results and test cases. Section V conclusion and references.

II.   SYSTEM DESIGN

System design contains Data Flow Diagram, Flow Graph, requirement analysis, front end design, backend design of student management information.

A. *DATA FLOW DIAGRAM*

A Data Flow Diagram (DFD) is a pictorial representation of the flow of Student Management System. A data flow diagram can also b used for explaining the flow of data in Student Management System. DFD acts like a pictorial interface between the system and its users. DFD represents the flow of the system, as it represents the flow these are commonly used during the problem analysis phase. It represents the system as a function that transforms the given input into required output. Data movement through different transformations is clearly shown in Data Flow Diagram Fig.1.
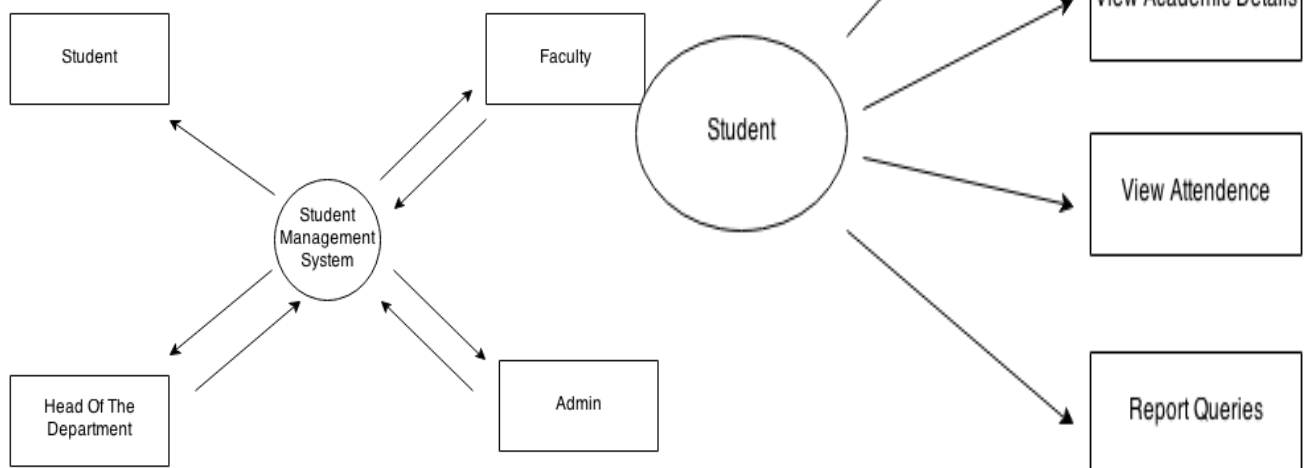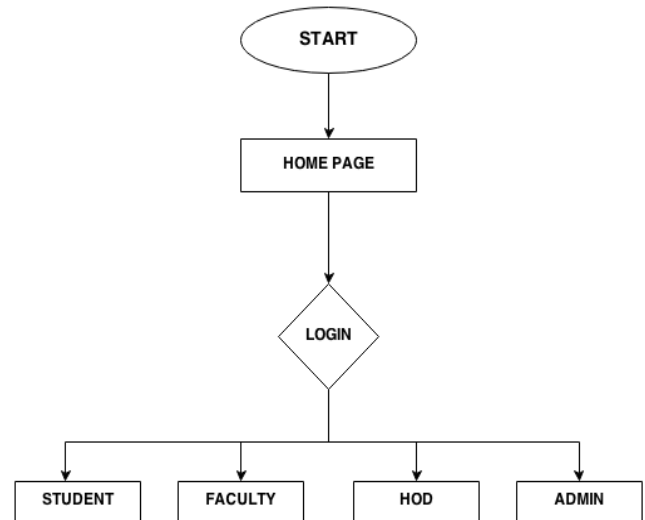
B. *DETAILED FLOW GRAPH*

The Detailed flow graph is shown in Fig.2. The design of Student Management System includes the design of the web page which acts as an interface for students and faculty to access student information. Every user i.e. student/faculty is provided with unique username and password by the institute admin/Head of the Department. The home page contains the login form through which an authenticated user can login into his portal by entering the username and password provided by the admin.
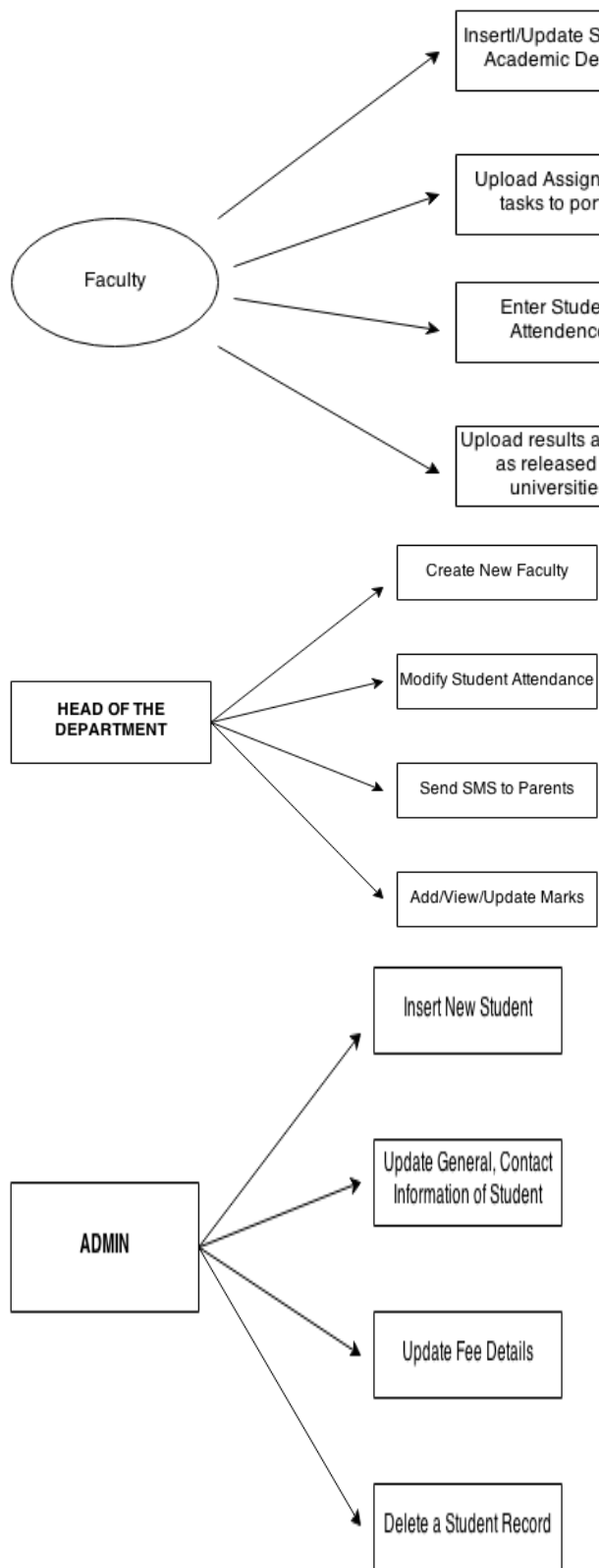

Fig. 1 Data Flow Diagram

Fig.2 Detailed Flow Graph

transport details. If any student wants to update contact and general information he/she need to approach admin, as the admin only can access contact and general information of students. To update academic related details he/she need to approach faculty. To update attendance and fee details he/she needs to approach Head of the Department.

FACULTY: Faculty also plays an important role in this system as only authorized user must write/update student details; here faculty is the authorized user, who can insert/update student academic details. Academic details include entering updating internal marks, uploading external marks to server, uploading assignments for the students. Faculty has a role to update student attendance, once the attendance is updated faculty cannot make any changes. Faculty has no right to modify student general, contact details.

HEAD OF THE DEPARTMENT: Head of the Department, this user must be created before creating user for Faculty, as Head of the Department is the only user who has rights to create new faculty. Role of Head Of the Department is to create/delete faculty. At the time of creating new faculty a default password is assigned to every faculty which can later be changed by respective faculty. HOD is the only user, who can modify attendance details of the students. HOD can report/inform student details to their respective parents through Short Message Service (SMS). HOD can assign a faculty as a class teacher to particular class, so that, that particular faculty can access that particular class details to which he/she(faculty) was assigned as a class teacher.

ADMIN: Admin is the 1st and fore-most user who will run this system, as admin can create new student and new HOD, there by HOD creating faculty thus, Admin is the 1st user. Role of admin is to insert student details into database as soon as a new student is admitted. Admin can create a new Head of the Department by assigning new user-id for HOD and default password which can later be changed by the HOD. If any student want to modify general/contact details student must approach admin to make necessary changes. Admin has also a task to update student fee details and inform them about the deadlines to make their payment.

All the above mentioned users except student will insert/update/delete student/faculty details through a front-end application, which is not web based. This front-end is connected to server and all the inserting/updating operations are done through this application. This front-end is not web based for two reasons; First reason is to provide more security for

STUDENT: Student is the main role in this System, because every institute contains students and main goal is to maintain student information. Every student can view their general information, contact information, marks, attendance, fee due details, assignments submission, record submission dates,

the application. If insertion/updating are done through web, and if the web-site is hacked then, hacker can easily modify the data present in database, for this reason all inserting/updating commands are carried through front-end application which is not web based. Second reason is that, it is the duty of faculty to mark attendance/marks in the college/university itself. If the inserting/updating are done through web, then there is a chance that faculty may take advantage of this and they may mark attendance from home/somewhere outside college/university.

C.   REQUIREMENT ANALYSIS

The basic requirements for the design of Student Management System are

- Every user must be authenticated.
- Every user must be authorized.
- Create login for HOD/FACULTY/STUDENT
- Faculty must update marks/attendance/academic details to server.
- Student can view their academic/general/contact information in the student portal, cannot make any changes.
- Head of the Department must check and notify student track record to parents.
- Admin must take care of notices that are to be displayed on web.

D.   FUNCTIONAL REQUIREMENTS

Student Management System mainly aims on increasing the efficiency of maintaining the student information and make the information available to all the users/parents in web server, so that parents can track their student details without making a visit to university/college. There are two major functional requirements in the system first one is Admin and the second one is Student.

The Admin will create a user Head of the Department, HOD creates Faculty, and there by Admin is the main functional requirement. Admin will make an entry into the database whenever a new student/faculty/HOD joins into the institution. Admin will delete an entry from database whenever any student/faculty/HOD leaves the institution. Students use this system to view their details in website and report to respective user to make any changes.

E.   NON-FUNCTIONAL REQUIREMENTS

- Performance Requirements:
  The system that is being developed will be used by the institutes/colleges/universities in maintaining the student information in database which is connected to web-site. Therefore, it must perform all functional requirements that are specified and perform effectively without any errors.

- Safety Requirements:
  Now-a-days many websites/web servers are being hacked and data may be manipulated by the hacker. Not only hackers attack, database may get corrupted at any time by virus attack. Therefore, it is recommended that data-base must be backed up regularly.

- Security Requirements:
  We are going to develop a secure system to maintain student information. It is our duty to keep the data in secure way. We achieve security by creating various users at various levels. Each user at each level will have different access rights and thus making data accessible to only authorized users. For example: A student can view data, but he/she should not be given a right to modify data. Faculty will have a right to mark attendance, but he/she do not have a right to modify the attendance. All users have a right to retrieve data from database.

F.   DATABASE DESIGN PROCESS

Database plays a critical role in almost all areas where information/data is stored in electronic devices. A database can explained as a collection of data that is related or collection of related data.

Every database has following implicit properties:

- A database represents some aspect of the real world, sometimes called the mini world, or Universe of Discourse. Changes to the mini world are reflected in the database.
- A database is a logically coherent collection of data with some inherent meaning. A random assortment of data cannot be correctly referred to as a database.
- A database is designed, built and populated with data for a specific purpose. It has an intended group of users and some preconceived applications in which these users are interested.

Database Management System (DBMS) is a collection of programs that enables users to create and maintain a database. DBMS is a general –purpose software system that facilitates the process of defining, constructing, manipulating, and sharing database among various users and applications. Defining a database involves the specifying the data types, structures, and constraints of the data to be stored in the database. The database definition or descriptive information is also stored in the database in the form of dictionary; it is called Meta data

constructing the database is the process of storing the data on the storage medium that is controlled by the DBMS.

Manipulating a database includes functions such as querying the database to retrieve specific data, updating the database to reflect in the mini-world, and generating reports from the data. Sharing a database allows a multiple users and programs to access the database simultaneously.

Application program accesses the database by sending queries or request for data to the DBMS. A query typically causes some data to be retrieved; a transaction may cause some data to be read and some data to be written into the database.

We used SQL Server Management Studio 2008 R2 to maintain database.

III. TECHNOLOGIES USED

C#.NET

We used C#.NET to develop front-end application which is connected to database. Though there are many technologies available to develop applications we used C# as it is Object Oriented Programming not only that C# had many advantages over many languages, C# makes it easy to develop software components through several innovative language constructs, including the following:

- Encapsulated method signatures called *delegates*, which enable type-safe event notifications.
- Properties, which serve as accessors for private member variables.
- Attributes, which provide declarative metadata about types at run time.
- Inline XML documentation comments.
- Language-Integrated Query (LINQ) which provides built-in query capabilities across a variety of data sources.

We used Visual Studio 2010 Professional to develop C# application.

HTML

HTML is Hyper Text Markup Language which is the backbone of any website. Every web site is built in HTML only. HTML contains many features that are necessary for the functioning of any website, but we cannot add graphical features with HTML alone. Adding graphical features will increase the readability and ease of use by any user. So to make the website more effective CSS is used along with HTML.

CSS

CSS Stands for "Cascading Style Sheet." Cascading style sheets are used to format the layout of Web pages. They can be used to define text styles, table sizes, and other aspects of Web pages that previously could only be defined in a page's HTML. The basic purpose of CSS is to separate the content of a web document (written in any markup language) from its presentation (that is written using Cascading Style Sheets). There are lots of benefits that one can extract through CSS like improved content accessibility, better flexibility and moreover, CSS gives a level of control over various presentation characteristics of the document. It also helps in reducing the complexity and helps in saving overall presentation time. CSS gives the option of selecting various style schemes and rules according to the requirements and it also allows the same HTML document to be presented in more than one varying style.

We used Adobe Dream Viewer to develop this HTML website.

Website developed using HTML+CSS display only static content i.e. content that is being displayed will not be changed and it is static for every user. Our motive is to change the content that is being displayed according to the user who logs in. So we make use of any Scripting language to make website dynamic in nature.

ASP.NET

ASP stands for "Active Server Pages". ASP is designed to produce dynamic web-pages. Using ASP.NET we can establish a connection between website and server, as the name states Active Server Pages. Whenever a user presses login button, his/her user-id and password must be matched with user-id and password in database. If the match was success then user must be logged in. All these validations can be done easily with ASP.NET. The content on the webpage must be changed dynamically according to the request made by the user. Dynamic content can be displayed on the web page using AS.NET technology. This is the reason why we used this technology.

ASP.NET includes:
- A page and controls framework
- The ASP.NET compiler
- Security infrastructure
- State-management facilities
- Application configuration
- Health monitoring and performance features
- Debugging support
- An XML Web services framework
- Extensible hosting environment and application life cycle management
- An extensible designer environment

We used Visual Studio 2010 Professional for developing ASP.NET website.

SQL

SQL Stands for "Structured Query Language". SQL lets us access and manipulate databases. SQL is an ANSI (American National Standards Institute) standard. SQL can execute

queries against a database ,retrieve data from a database, insert records in a database, update records in a database, delete records from a database, create new databases, create new tables in a database , create stored procedures in a database, create views in a database, set permissions on tables, procedures, and views.

We used SQL Server Management Studio 2008 R2 for developing and maintaining database.

IV.   RESULTS

Login Form:

Whenever any user runs the front-end application the system displays a login form where the authorized user can login and make further changes. Login Form is shown in Fig. 3

Fig. 3 Login Form

Registration Form:

When ever Admin Logs in successfully a form is displayed asking for add/delete student. Wherever Admin clicks on add button a new registration form will be opened. Admin can add/update student details through this form. Registration form is shown in Fig. 4

Fig. 4 Registration Form

Student Form:

When ever a student makes successful login into his portal he can view his/her details in the website through this form. And if any changes are to be made in the student details he/she must: approach admin to make changes in general/contact information,: approach faculty to make any changes in academic related modifications, :approach HOD to make attendance modifications. Student Form is shown in Fig 5

Fig. 5 Student Form.

Attendance Form:

After Faculty logs in successfully a form asks for marks or attendance, whenever faculty clicks attendance button attendance form is displayed where the faculty must enter absentees hall-ticket numbers separated by commas on respective class attendance row. Fig. 6 shows Attendance form.

Fig. 6 Attendance Form.

Faculty Registration Form:

A new faculty is added by the Head of the Department with the help of Faculty Registration Form. During the time of registration every faculty is

provided with a default password which can later be changed by the corresponding faculty. A list below the registration form shows already existing faculty. Fig. 7 shows Faculty registration Form.

V. CONCLUSION

This paper is published with a motive in automation of Student Management System. This is paperless and strain less work. Student Information can be monitored and controlled remotely through internet/ connection to a server. It reduces the number of hours spent in maintaining student information. Security is increased, so that errors can be reduced. With a single click all years students information can be accessed with in no time. At any time student/parent can view student information from anywhere. Data is stored in database and many intelligent operations can be performed on data so that relevant data can be retrieved easily with less effort. So, it is better to maintain student information electronically rather paper based information system. There is no way to backup paper based information other that writing whole copy again. Electronic data can be backed up regularly with single click. This system is essential in many of the universities/colleges in maintaining student information.

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