LITERATURE REVIEW ASSIGNMENT

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Technological advancement makes our lives easier and every field is adopting technology to improve its functional capabilities. Many management systems are being used to minimize human efforts and resources and one of them is the Student Information System (SIS). It benefits both teachers and students. It makes learning easier and managing the resources and other tasks much convenient for both types of users. It helps in remote access to resources and even for assigning work and the submission of work. Much less paper is used due to softcopies being used widely for assignment and documentation purposes. Research is ongoing in this area for further improvements in these kinds of systems and we will discuss some of the research papers which are published on Student Information Systems.

Student Information Systems are software applications developed for the purpose of management of data between the students and teachers. However, other variants of these systems are also present which include Student Management System (SMS), Student Information Management System (SIMS) and Student Records System (SRS). These systems work using the internet for communication and sharing of resources. The activities which can be performed on these systems include maintaining the record of examinations, fee payment, marks, attendance and for the purpose of conducting online quizzes and assigning tasks.

Nowadays, in any educational institute, Student information Systems plays an important role. It is the core of the whole management function due to the vast functionalities and purposes it serves. It makes management easier and simpler. Large amount of data can be stored and retrieved quickly as compared to manual record keeping. Some benefits of these systems are described as follows:

Student Data Management:

Student information systems manage whole data of students like marks, attendance, fee payment, courses registration, assigning tasks, quizzes, personal information and all other information. A student can view any data of his/her by accessing the system and logging in. A teacher can take online attendance, evaluate performance of students, assign any task, conduct online quizzes, share resources related to the course such as slide etc.

Admission Process:

All admission processes can be implemented online from filling admission forms to sending notifications related to admissions. Student information system can reply to all admission related queries of students who want to apply using an artificial intelligence based chat bot.

During the admission period it can be used send admission letters and other details to students. Online fee payment option can also be implemented.

Accounting and Billing:

Most of the student information systems have features related to accounting and billing. Students can see their current fee statues and can generate receipts. The software maintains all the history related to accounting and billing of students. Fee challan are generated online which can be printed by the student and their payment status will change online automatically.

There are many publications on this topic and each serves a different purpose and share a different aspect. Different papers target different problems and provide different solutions. Some are focused on developing a web based portal and some focus on desktop applications, some are made for schools and colleges and others are made for universities. Different functionalities are also discussed in different papers. Some systems were design for the sole purpose of record keeping while others were used to provide all the management and accounting functionalities. Different methodologies were used, Software engineering principles like RAD were described, and tools like .NET framework, HTML, SQL and CSS were also stated under the section of methodology.

“Online college portal” research paper purposes a system which maintains information of students and teacher, and also provides a simple user interface for ease of use. The purpose of the researchers was to develop a website which has all the records and information of college and is easy to use. The system includes features like taking attendance online, tracking of any assignment / project, providing any information related to college and students. The object of this system is to save time of the college, because any college spends great amount of time and resources maintaining records manually. Data Flow Diagrams and Sequence Diagrams were implemented and followed for the designing of the system. HTML and CSS were used to provide responsive and simple user interface, JavaScript was also used along with HTML and CSS for the same purpose. SQL was used to fetch and insert data into database. The paper “Web based college admission system” purposes a system which will automate all the activities of an education institute which are done manually. The main purpose of the purposed system is to reduce the time consumption of educational institute which is consumed to maintain all records manually. Developed application will have almost the features which common student information system will have, along with security. The highlighted feature of the system is providing security and ease of use using unique ID. The system will provide a unique ID to every student who registers. The unique ID will work as identifier and provide security too. The data flow diagram and detailed flow graphs were used to design the application. The application primarily will be based on android smartphones. Easy to use user interface will be a core feature also. Where most of the applications are web base or desktop applications, this one will work on smartphones which is also unique and innovative.

The proposed Student Information System in the paper named “Development of Student Information System” was developed to record and update the data of students and institute, and to generate report for teachers. The report generated was of student’s status. A teacher could judge the progress of the student through that report. The system was developed to be used in Faculty of Electronics & Computer Engineering (FKEKK), Universiti Teknikal

Malaysia Melaka (UTeM). The application was developed using some previous forms and was a standalone system. Microsoft Visual Basic 6.0, Microsoft Access 2003 and SQL were tools used to develop the software. Software engineering principles were applied to develop the software. Survey was taken before developing the software in order to gather requirements, RAD (Rapid Application Design) Methodology was used in order to develop the project in iterations. Database concept was also used for avoiding damage to the data. At the end, the project objective was achieved. The paper named Intelligent Student Information System describes a project developed to manage academic data of students. The system stored the status of students like pass, fail, probation, dismiss. System generated student's GPA and CGPA based on the stored data so that one could plan and measure their academic performance. The project also included a portal for administration to oversee performance status of students. User interface and other coding was created using Microsoft Visual Basic 6.0. The database was stored in Microsoft Access 2000. The research paper named Mobile Student Information System describes a mobile application called Mobile Student Information System (MSIS) based on mobile computing and context aware application concepts. The objective of the system is to offer user centric information system to students of Norwegian University of Science Technology. The application keeps students about lectures, assignments, appointments and other regular activities. The paper provides details about related work on the same topic. A presentation of the system's fully functional prototype is also provided. The prototype is based on three essential parts. A small sized client application for mobile phone, a web based portal and a server for database purpose. The services of the system like schedule planner and mobile email are also briefly described in the paper. Their user interfaces are also provided.

"Design and Implementation of Student Information Management System" paper describes architecture design, system functionals, database design and functional modules of student information system. The paper provides details about tools and technologies used for developing student information system. The development environment named Visual Basic 6.0 is briefly described and is suggested to use, the tool's features are described. Basic and essential functional requirements are also stated. Both the database and structural designs are described using diagrams. The database design is described with the help of entity relationship diagram. Important tables of database and their attributes are also named. Instructions about Implementation of some modules are also provided. The paper "Web Based Student Information Management System" purposes a web application named Student Information Management System (SIMS). The application is embedded in college's general website. The system provides features like providing all sorts of student details, details about curriculum, batch, placement and courses. Proper Authentication will be done before providing access of the website to any person. The person's credentials will be checked multiple times. System Design is explained using data flow diagram and detailed flow diagram. Functional and non-functional requirements of a student management system are also stated. Performance, safety and security requirements are provided under the heading of non-functional requirements. The technologies used while developing the system were HTML, CSS, JavaScript, PHP and SQL. These technologies and their features are briefly described. HTML and CSS were used to develop simple and responsive user interface. JavaScript was used as scripting language, as it supported by almost all web browsers. PHP and SQL were used for designing backend.

Student Information Systems have improved along with time. Early initiatives could merely fix the communication gap between students and teachers. But nowadays these systems manage all the academic data of students as well as data of the institutes. These systems now provide full paper free environment as exams and assignments can be taken through a good Student Information System. The number of educational institutes who use these kinds of systems is increasing day by day because of the benefits the system provides. Extensive amounts of research have been done on the topic. Research on topics like security, authentication and ease of use in student information systems has impacted the implantation of these kinds of softwares. Research papers on effective implementation of these systems are also published in order to help organisations develop more effective applications. In the beginning, the systems developed were mostly web applications but nowadays mobile applications are also developed for the same purpose. Code refactoring and Usage of efficient algorithms are the future research problems suggested by the papers. Code refactoring is to make a project's code efficient, removing extra variables, implementing modular programming and other activities to make code run smoothly for a longer period of time. Using efficient algorithms is to use algorithms which have lesser space and time complexities as compared to previously used algorithms in student information systems.

Some research problems for future work may include the incorporation of Artificial intelligence in analysing the performance of students and teachers. Also keeping in view the current situations, meeting functionality could also be implemented in the SIS to make it easier to communicate. Most systems do not have the functionality of online payment through credit/debit cards and such sources which can also be implemented for the ease of fee payment.