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Establishing a System for Tracking Files and Managing Student Data

Mr. R. Raja¹, P. Amirthavarshini², M. B. Sri Pranavya³ and H. Thanga Snegha⁴

¹Assistant Professor, Department of Computer Science and Engineering, Velammal Institute of Technology, Panchetti, Chennai, India

²UG Scholar, Department of Computer Science and Engineering, Velammal Institute of Technology, Panchetti, Chennai, India

³UG scholar, Department of Computer Science and Engineering, Velammal Institute of Technology, Panchetti, Chennai, India

⁴UG Scholar, Department of Computer Science and Engineering, Velammal Institute of Technology, Panchetti, Chennai, India

ABSTRACT: Finding records is the most difficult issue in all educational institutions now a days. Time is wasted in glancing through records, energy is wasted seeking after mistakenly spelled archives, deadlines are missed. This paper presents a global positioning framework for organising the student's record along with file tracking. The global positioning framework is a web application that helps regulating stream of records effectively and beneficially. The Rijndael algorithm works by using substitution-permutation technique with multiple rounds to produce cipher text. Each of these rounds requires a round key, but since only one key is inputted into the algorithm, this key needs to be expanded to get keys for each round, including round 0. By using AES, this application will secure the assignments and marks. Since Rijndael algorithm is secure, it is in the worldwide standard. All of the records, for instance, reports, decisions, requesting, updates and others can be dealt with and can be similarly followed by the structure at whatever point. The arrangement of this application will surely assist the college will reduce the wastage of time going to every division for some data.

KEYWORDS: Global positioning framework, Rijndael (AES), Web application, CIAP and College students

I. INTRODUCTION

Organizing and Tracking students' data is the most difficult issue. Traditional System which was mainly paper-based, required large amount of space to store information. It limits the exchange of information, updating and causes loss of documentation. A collaborative work in this system becomes rigid and degrades performance. This project on student information management system is one complete information management solution for students and staff of any educational institution [2]. Educational informatization innovation leads educational modernization. One of the contents in the construction of educational informatization is the improvement of information literacy of college students. Good information literacy is closely related to construction of educational informatization and the application of educational achievements. Information literacy has been hot topic for many years. In recent years, the promulgation of many documents in China has highlighted the importance of college students' information literacy [7]. Smart college management system is an android based application which is the new technical way to manage all department related jobs. Smart college management system is useful for students as well as colleges [4]. This system will have many advanced features like communicating with each other online anytime, exchanging study materials and all college related news and attendance system updated student's records adding notices and post to groups or forums. This system will have local backups and the main database will be maintained on cloud services for all kinds of devices. This system will have a few types of accounts like admins, staffs and students [1].

The main idea behind this project is that due to the covid crisis all colleges were shut, and many colleges were not able to carry out the daily operation that they used to perform on the floor [3]. File Tracking system (FTS) also called file tracking and the monitoring system (FTMS) is used to monitor movement of files and receipt and assist in their easy tracking. This system will pave a way towards adoption of complete e-governance wherein paperless file processing and its tracking is possible [8]. The AES algorithm has an own particular structure to encrypt and decrypt sensitive data and is applied in hardware and software all over the world. AES is majorly used to secure the sensitive materials [9]. This paper is organised as follows, Section 2 describes the related works. In Section 3 we describe the proposed method and Section 4 displays the experimental results. The conclusions are given in Section 5.

II. RELATED WORKS

The construction of college student data management is an important issue that cannot be ignored, which falls under the category of ordered proposition problem. In view of the insufficiency that the construction of the college student data management system cannot be processed based on the evidence theory, a kind of method for the construction of the college student data management system that is dependent on the association rule algorithm is put forward in this paper, which aims to solve the problems in the construction of the college student data management system and so on. Based on the association rule algorithm, the pre-processing of the college student data management system is established. In addition, dependent on the characteristics of the association rule algorithm, the related centroid is calculated, and the centroid is taken as the representative information of the cluster.

Lei Qin in his work explored that, the basic probability assignment is carried out in accordance with the generalized triangular fuzzy membership function, and the evidence is formed after the assignment, thus completing the construction of the college student data management system. The simulation results show that the method put forward in this paper is effective and can be used to carry out reasonable evaluation on the college student data management system [5].

S. M. Soliman, B. Magdy and M. A. Abd El Ghanyin their work considered throughput, area and power optimized designs for the advanced encryption standard algorithm. The presented designs are suitable for the encrypt-only AES-128 algorithm. Both designs integrate pipelining and iterative architectures in one design. This is achieved through applying the concept of partial loop unrolling where iterations and multistage pipelining are used to optimize area, throughput and dynamic power consumption. Also, AES offers better security [6].

S. Hokao, H. Tanaka, M. Yoshihama, T. Furukawa and M. Ohchiin their work focusses on the fact that managing course results in present universities need complicated procedures in many cases. As a solution to these problems, there is a system so that professors could access to the server, where data are accumulated, from the computer by which they input course result data. In this paper, the authors propose such a management system using Java and PostgreSQL. The authors have implemented the fundamental functions in the management system for student course records[10].

III. PROPOSED METHOD

The architecture of our system is illustrated below. Figure 1 shows the overall architecture of the system. The major components of our system are Principal, HOD, Staff and Student.

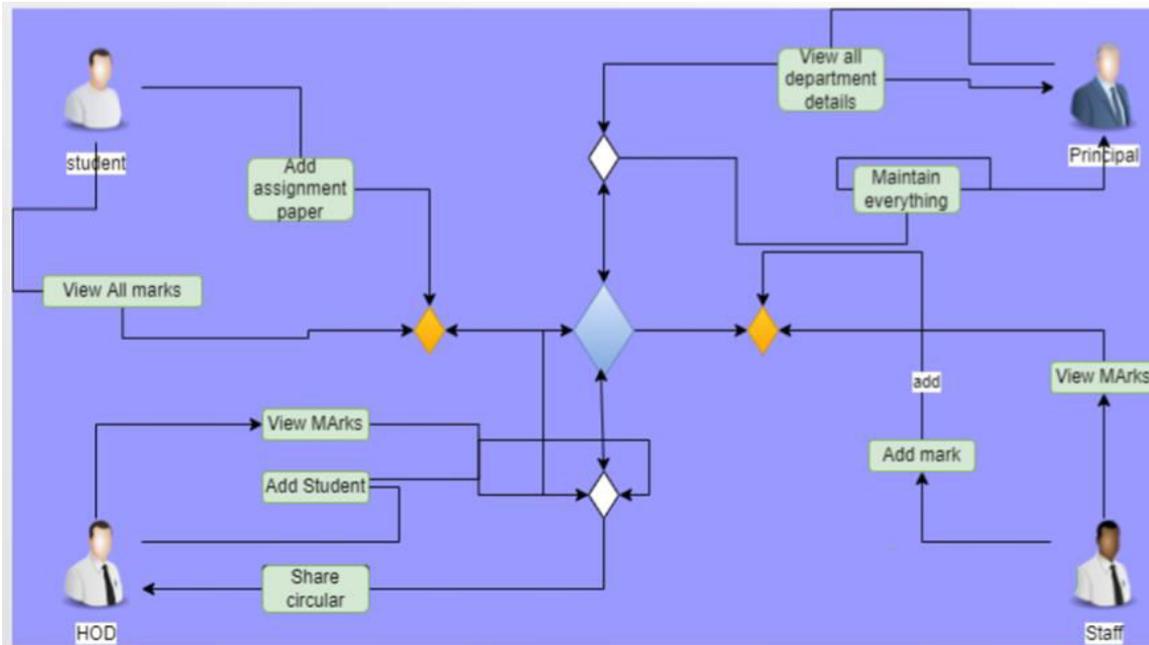


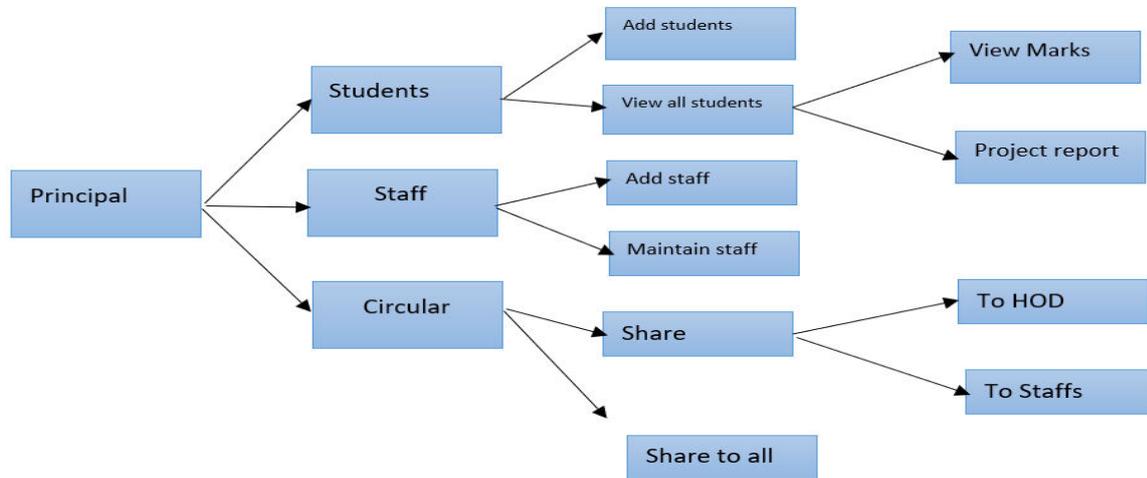
Figure 1. Architecture of file tracking and data governance

3.1. DESCRIPTION

3.1.1 PRINCIPAL

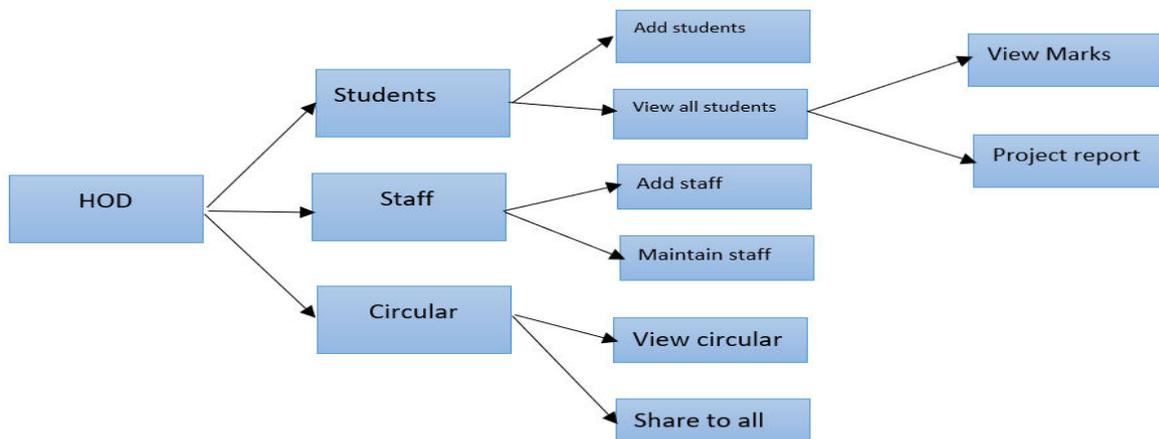
The commander here is none other than the principal who creates the entire workspace. The principal is responsible for creating, maintaining and suppliance of the message to the entire team. The principal has all the rights and visibility on

every student's database. If any information is to be shared, the principal takes the responsibility and send it to the HOD, in term the HOD passes to staff and then to the students. The principal can also view the update and progress of every student, staffs, HOD.



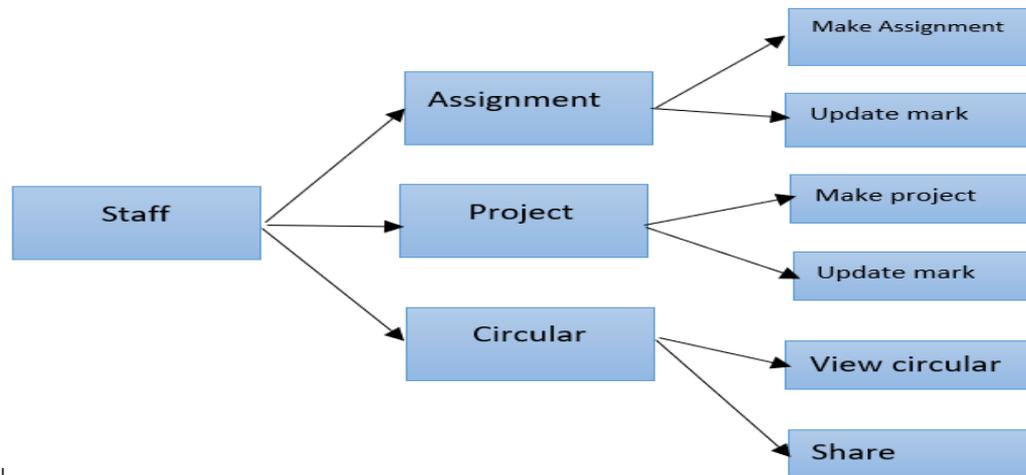
3.1.2. Head Of Department (HOD)

The HOD ensures adding every staff to the application. Once after everyone are added HOD can recheck by viewing the list of people added to the database. The circular can be seen by the staffs and students only if the HOD gives the access to them. The HOD can also view the progress of every student by the marks allotted by the staffs.



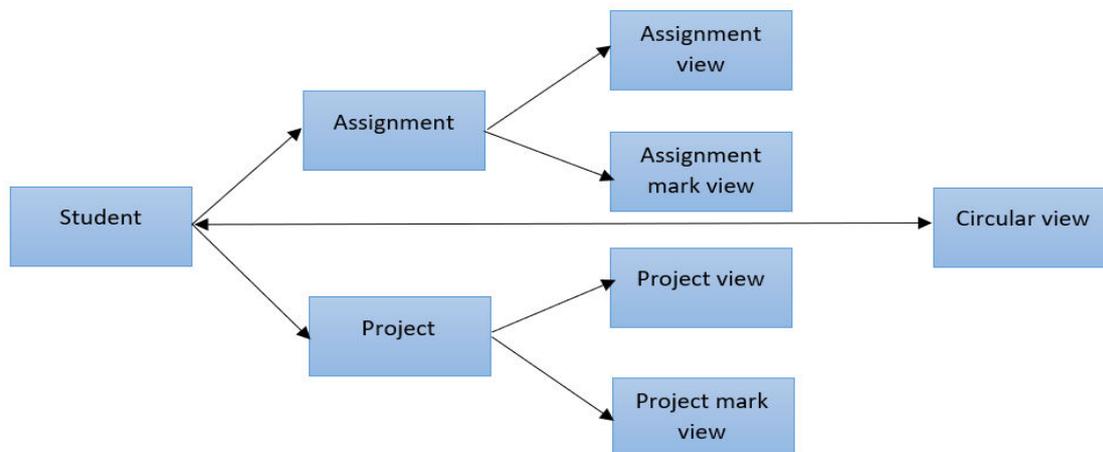
3.1.3 STAFF

The staff can create the assignment transmit box where the students can upload their task/project. The staff can view the status of the task/project in their unique portal. According to the scale of completion, marks will be allocated to the particular student. Circular sharing is done by the staff to the students.



3.1.4. STUDENT

Students can view the task/assignment which has been sent by the staff. If there is a need for deadline, it will also be updated by the respective staff. The completed assignment is sent to the staff’s portal and marks will be assigned which can be viewed by the students with their visibility access. The staff/Principal can in turn view the number of students who have visited the mark portal. The key role of the student is to upload the necessary work given by the staff.



3.2. Algorithm

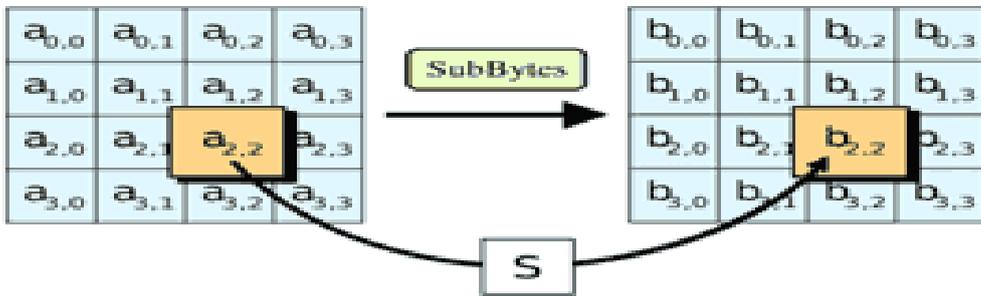
3.2.1. AES ALGORITHM

The AES algorithm (also known as the Rijndael algorithm) is a symmetrical block cipher algorithm that takes plain text in blocks of 128 bits and converts them to cipher text using keys of 128, 192, and 256 bits. Since the AES algorithm is considered secure, it is in the worldwide standard. The AES algorithm uses a substitution-permutation, or SP network, with multiple rounds to produce cipher text. The number of rounds depends on the key size being used. A 128-bit key size dictates ten rounds, a 192-bit key size dictates 12 rounds, and a 256-bit key size has 14 rounds. Each of these rounds requires a round key, but since only one key is inputted into the algorithm, this key needs to be expanded to get keys for each round, including round 0.

STEPS IN AES:

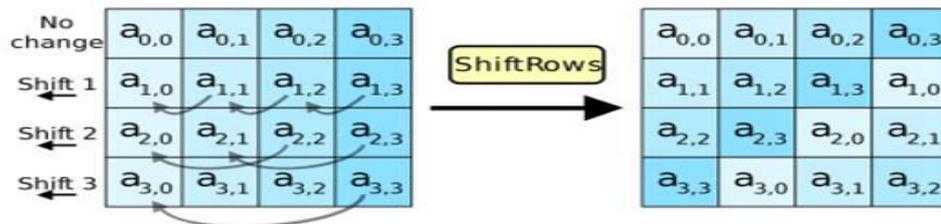
1.Substitution of Bytes:

In the first step, the bytes of the block text are substituted based on rules dictated by predefined S-boxes (short for substitution boxes).



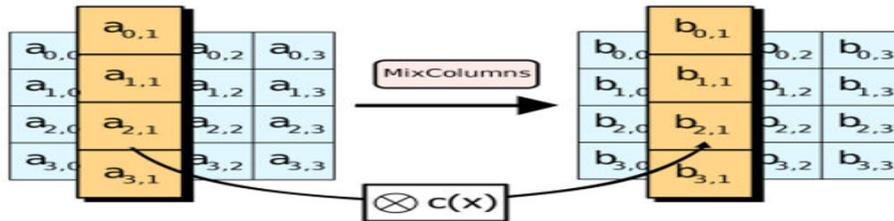
2. Shifting the Rows:

Next comes the permutation step. In this step, all rows except the first are shifted by one, as shown below.



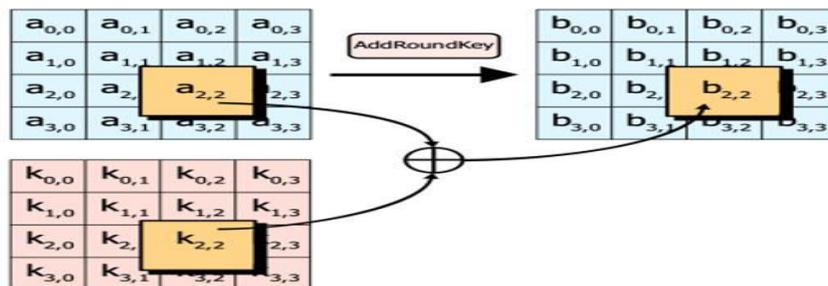
3. Mixing the columns:

In the third step, the Hill cipher is used to jumble up the message more by mixing the block's columns.



4. Adding the Round key:

In the final step, the message is XORed with the respective round key.





IV. CONCLUSION AND FUTURE ENHANCEMENT

This paper has discussed about a web application which aims to serve the officers that has to do with paperwork, especially universities, in the best way possible. The goal of this web application is to improve file management, increase staff efficiency, save staff energy and time, reduce cost and improve work efficiency by using AES.

The admin faculty or the student will perform all the tasks very easily and in a more convenience way. The application offers reliability, security, time savings and easy controls. It can be used as a base for creating and enhancing application for viewing results, marks and tracking circular for colleges. The application will greatly simplify and speedup the result preparation and management processes. The proposed system decies the worktime of the admin as well as the faculty. This will bring more perfection to the work.

For future works, we will use the system and find issues in order to improve either system architecture. Also, we will try Implementing a genuine information base framework. Also, there are other ideas like Improving the productivity of conventions, as far as number of messages traded and concerning their sizes also and implementing using two or more algorithm.

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