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Web Based Information Management System for Departments

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Abstract - Web Based Information Management System provides a simple interface for maintenance of student and faculty information and also provides an interface for student faculty academic interactions. To rectify difficulties faced in management of data handled in the form of hard copies the proposal of creating an information system is kept forward. It can be used in other departments also to maintain the records of students and faculty easily. The creation and management of accurate, up-to-date information regarding a students' academic career is critically important in the university as well as colleges. Student information system deals with all kind of student details, academic related reports, college details, course details, curriculum, batch details, placement details and other resource related details too. It tracks all the details of a student from the day one to the end of the course which can be used for all reporting purpose, tracking of attendance, progress in the course, completed semesters, years, coming semester year curriculum details, exam details, project or any other assignment details, final exam result and all these will be available through a secure, online interface embedded in the college's website. It will also have faculty details, batch execution details, students' details in all aspects, the various academic notifications to the staff and students updated by the college administration. It also facilitate us explore all the activities happening in the college, Different reports and Queries can be generated based on vast options related to students, batch, course, faculty, exams, semesters, certification and even for the entire college. The aim of the project would be to design such a system for a department in a collage.

Key words: information systems, time study

I. INTRODUCTION

In today's scenario it is required to design comprehensive interactive online portals which help in making academic and official interactions between students and faculty members of various departments of colleges. By designing such a system faculty members and students of a department in a college will be able to make their academic and official dealings. The system utilizes user authentication, displaying only information necessary for the accessing user. In addition, each sub-system will have authentication allowing authorized users to enter, edit or update information in that subsystem. All data is thoroughly reviewed and validated on the server before actual record alteration occurs. In addition to a staff user interface, the system plans for student user interface, allowing users to access information and submit requests online thus reducing processing time. All data is stored securely to the database managed by an authorized administrator and ensures highest security level. The system features a complex logging system to track all users' access and ensure conformity to data access guidelines and is expected to increase the efficiency of the department's record management thereby decreasing the work hours needed to access and deliver information to users. So far all departments rely heavily on paper records manually for this purpose. While handling paper records is a traditional way of data management there are many drawbacks in this method. For example according to the current system, if the department wants to convey some particular information to a student it will have to be displayed on the notice board and the student will to visit the notice board to check the displayed information. This process is time consuming. Paper records are always difficult to handle and sort. The manual efforts required to store, alter, retrieve and re file paper records are time consuming.

This system would provide a simple interface for maintaining student and faculty information. It can be used by various departments or the entire colleges to maintain required records with ease. Achievement of this objective is tedious through a manual system because of information which is scattered. All such problems can be solved using an online management system. This will lead to management of accurate, up-to-date information regarding a students' academic career. Information system can deal with all kinds of student information, academic details, department details, course details, college details, batch details, placement details and other details. It helps in tracking all uploaded details of students and faculty members from the first day to the final day of the course which could be used for reporting purposes, attendance, course progress, semesters,

years, curriculum details, exam details, seminar or project details, final exam results and all such information could be accessed through the secure interface which may be embedded to the website. The paper mainly focuses on presentation of information in a casual and easy manner which would provide various facilities like registration and creation of student, faculty profiles thus reducing manual work and automation of record generation process in a department or institution. It will also have faculty details, batch execution details, students' details in all aspects, the various academic notifications to the staff and students updated by the college administration. It also facilitates us to explore different activities related to the college. Different analysed information can be accessed based on options related to faculty, students, admin, exams, placement, semesters.

A. PURPOSE

The purpose is to design a separate Web Based Information Management System for a department which could improve record management efficiency and data handling activities of the department.

B. OBJECTIVES

1. To identify a set of activities facing issues in a department due to manual handling
2. To design an online interface to rectify the identified activities facing issues
3. Conduct a comparative study between the conventional system and the new system

C. ORGANIZATION OF THE PAPER

The paper is organized as follows: Section II deals with literature review. Section III shows the analysis, findings and system design. Section IV explains the time comparative study
Section V shows the conclusion

II. LITERATURE REVIEW

A. INFORMATION SYSTEMS

The origin of the IT profession goes back to 1950s. Other professions go back to the dawn of civilization. However, the IT profession has come a long way fast and it is certain that the evolution of the corporate information factor will not stop where it is today. Information analysis has been carried out by scholars at least as early as the time of Abyssinian Empire [1]. As a science, however, it finds its institutional roots in the history of science [2] and by the 19th century the first signs of the information science emerged as separate and distinct from other sciences but in conjunction with communication and computation.

Around 1970 business journals started to publish articles on management decision systems and decision support systems Reddy et.al. [6]. The first use of the term decision support system was in Gorry and Scott-Morton's [7]. Sloan Management review article. They argued that Management information systems primarily focussed on structured decisions and suggested that the supporting information systems for semi structured and unstructured decisions should be termed 'Decision Support Systems' Bhardwaj et.al.[8]. In the mid to late 1970s, both practice and theory issues related to DSS were discussed at academic conferences including the American Institute for Decision Sciences Meetings Bhardwaj et.al. [8]. Steven Alter's research [9] expanded the framework for thinking about business and management DSS. Data management systems were recognized as an alternative for making manual works in all fields.

III. ANALYSIS, FINDINGS AND DESIGN

A. ANALYSIS AND FINDINGS

The area selected for study was mechanical department of Rajiv Gandhi Institute of Technology, Kottayam. In order to identify various problematic activities prevailing in the mechanical department a questionnaire survey was conducted among the students of the department. The questionnaire was prepared based on a list of activities. The questionnaire prepared was a structured one which is attached in the appendix. Questionnaire was prepared with questions regarding different activities of mechanical department of RIT. The purpose of circulating the questionnaire among students was to identify the problematic activities regarding the department, and to find out a suitable solution for it. The questionnaire was of 21 questions where three to four questions are asked exclusively based on a particular activity for which 10 vital activities were covered. The activities include Notes Handling, Forms Management, Grievance Reporting, Notice Updation, Feedback Management,

Attendance Management, Bio Information Handling, Placement Updation, Timetable Updation, Project and Seminar listing. Responses for all questions were asked for on a three point scale. The questions were divided into two sections namely academic and official for the convenience of later analysis. The study was conducted in the mechanical department of RIT which has a total of 6 classes including both B Tech and M Tech (4 B Tech classes and 2 M Tech classes). B Tech classes have a student count of around 70 on an average basis and M Tech classes have an average student count of 16. Hence the total population size of the student community under study in the department is found to be 320. For ease of calculation of sample size from the known finite population Krejcie and Morgan's table was used which gives us required sample size from various population sizes directly. From the table the required sample size for population of 320 according to our study was obtained as 175. For the purpose of collecting 175 responses 40 students were selected randomly from each B Tech class and 8 were selected from each M Tech class. The questionnaire was distributed to selected candidates and their responses were collected back.

Currently feedback submission is done by filling up feedback forms and submitting them. From their response it is quite clear that they would like to have an online system of submission of feedbacks 3 to 4 questions were included regarding each activity in the questionnaire to identify the response of students on those particular activities. The results of specific questions which got exact result of whether the specified activities were problematic or not are include in results given. The activities opted by students were identified based on the percentage of students who responded to those specific questions in a positive manner. On assignment submission query 45 % of students responded negatively and only 13 % of students responded positively which means majority of the students did not want to have an online system for assignment submission. Similarly in case of exam writing query only 8 % of students opted to write them online while 39 % of them didn't want to write it online. On the query of submission of project and seminar reports 54 % students did not want to submit them online while 4 % of them wanted to make their submissions online. For accessing stored data 45 % of students supported having an online system for it and 8 % of the students did not support having such an online system. In filling registration forms 59 % students wanted to do it online while 1 % of the student community wanted to continue with the conventional system. In grievance submission 45 % of students wanted to make their submission online and 10 % of them did not want to submit so. 55 % of students wanted to have a regular online attendance monitoring system while 5 % of them did not want it. 3 % students did not opt to have an online system where they could access various notifications while 52 % of them opted to have it. In case of feedback submission 64 % students wanted to do it online while 36 % of them wanted to continue with their conventional way. From the percentage of students saying yes or no the problematic activities were identified such that an alternative could be designed for them as a solution to the problem they face.

B. SYSTEM DESIGN

The design architecture mainly focusses on synchronising various problematic departmental activities which were identified through questionnaire survey and expert opinions. Simply identifying various problematic activities from different perspectives would be meaningless, hence the various features which were identified in a raw fashion were all taken and compared with each other and finally arrived at a platform which smoothly connects different activities identified from different perspectives.

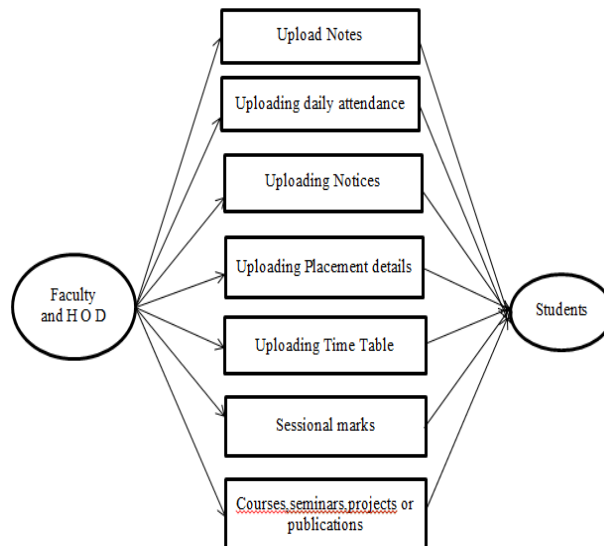


FIG. 1 FACULTY/H O D - STUDENT ARCHITECTURE

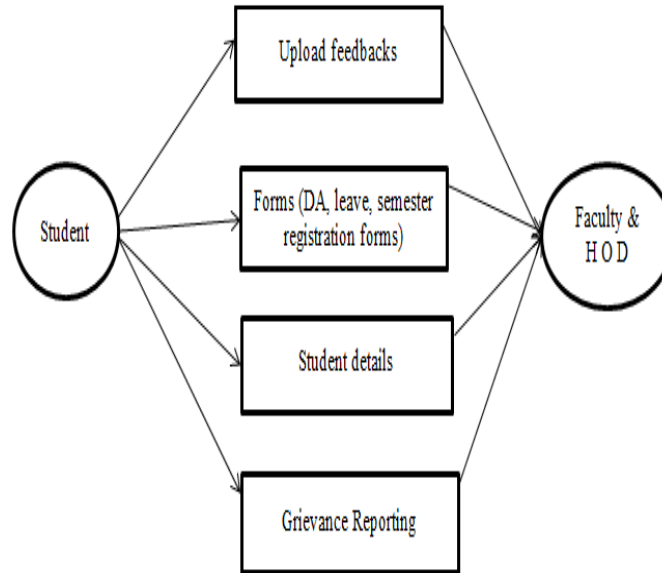


FIG. 2 STUDENT – FACULTY/H O D ARCHITECTURE

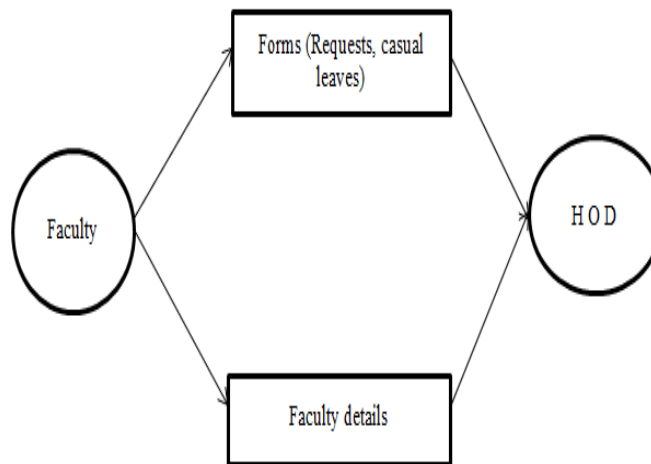


FIG. 3 FACULTY - H O D ARCHITECTURE

From the architectures created based on activities identified, the hierarchy of performance of activities can be understood. The three hierarchical combinations taken were as Faculty-student, student-faculty and Faculty-Admin. In figures 1 to 3 different functionalities which connect the above hierarchical combinations can be identified clearly. From figure 1 it can be seen that Notes, Notices, Placement details, attendance, seminars and sessional marks are functions where data gets uploaded by faculty members or admin and the data which is uploaded gets accessed by students. From figure 2 it can be seen that functions like uploading feedbacks, submitting forms, reporting grievance and entry of bio information are uploaded by students and accessed by faculty and admin. From figure 3 it can be seen that functions like entry of faculty bio information, submission of faculty related forms are usually uploaded by faculty members and accessed by Admin. So the architecture gives an overall idea about how the system would work related to faculty, students and admin which becomes very helpful in getting a clear picture of how the data flow diagrams should be created followed by designing the system.

C. DESIGNED SYSTEM

A few web pages have been presented here for better understanding and clarity of the work carried out. In the system there are mainly three modules with separate logins. The main modules are

- 1.Student
2. Faculty
3. Admin

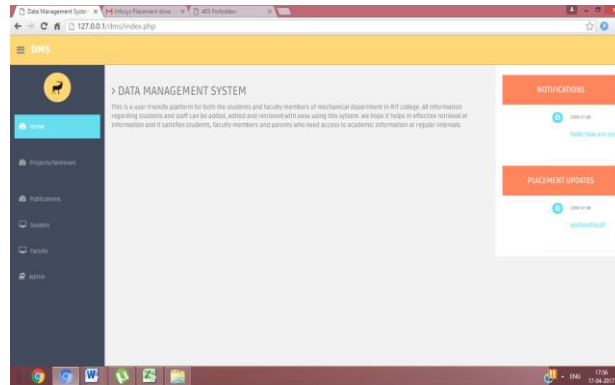


FIG. 4 HOMEPAGE

Fig. 4 shows the screenshot of the homepage of the system. In the home page various modules are displayed as mentioned above. Various functionalities can get accessed by logging into the main modules. In the homepage there mainly two scrolls which are regarding placement updates and notices. Anybody accessing the homepage will be able to see those updates.

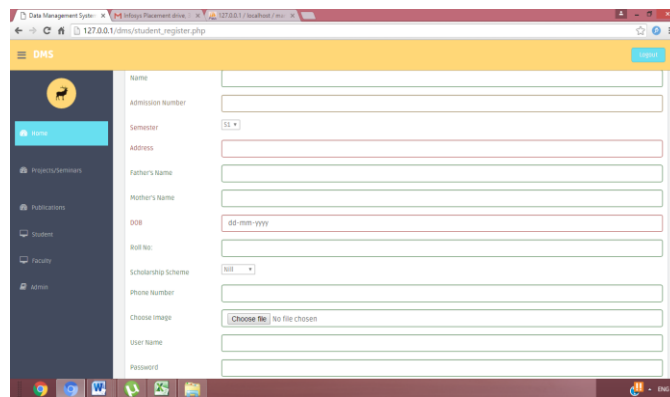


FIG. 5 REGISTRATION PAGE

Various details which are required for the registration are shown in the figure 5. They should be entered completely for the completion of registration. Once the registration process gets completed he would be able to access all other functionalities provided by the system.

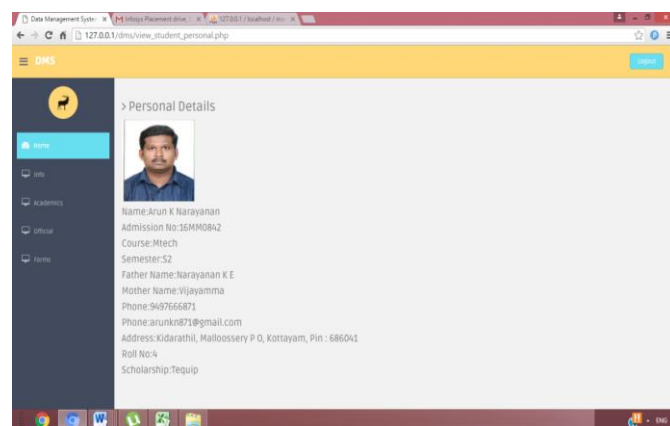


FIG.6 BIO INFORMATION

The personal details which were entered during the registration process gets saved to the database of the system which can be retrieved later according to requirements. This comes under the sub module 'info' as shown in figure 6. Students do get the

privilege of making necessary changes in the details which were entered by them during registration. Later on faculty members also do get access to the personal details which get entered by students.

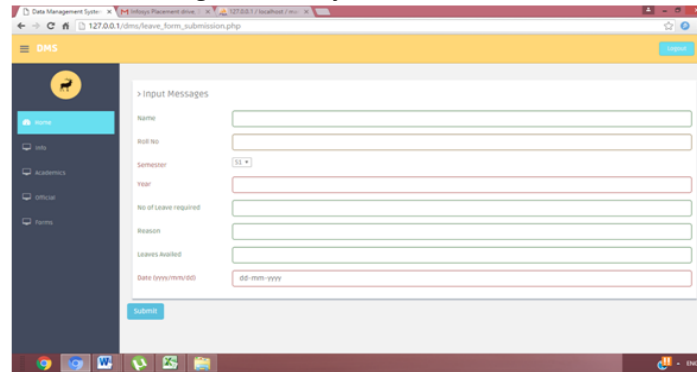
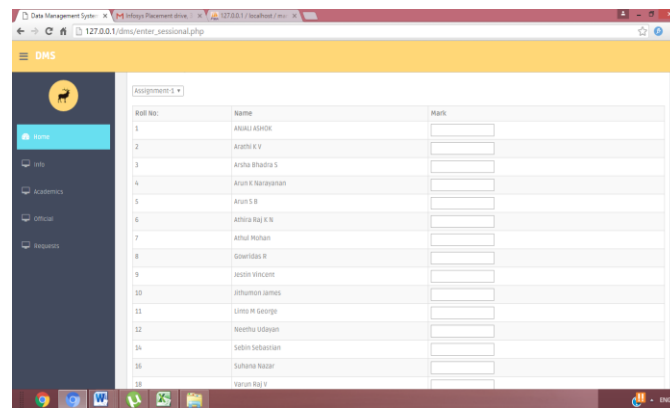


FIG 7 LEAVE FORM PAGE

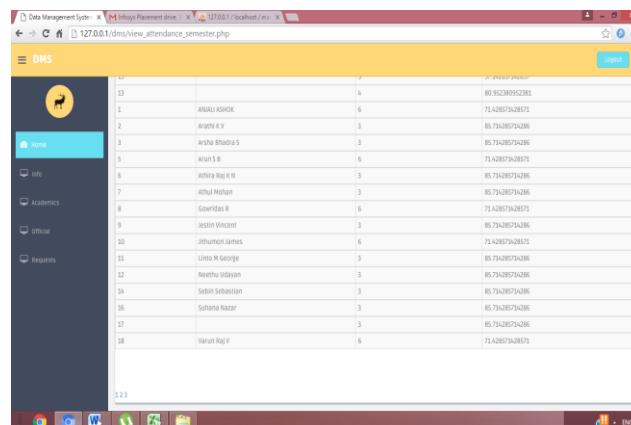
In this sub module students are given an opportunity to submit request forms to concerned authorities. Figure 7 shows the feature which helps a student to submit a leave form to concerned authorities.



Roll No.	Name	Marks
1	ANILU AGHOK	
2	ARATHI K V	
3	ARUNA BHADRA S	
4	ARUN K NARAYANAN	
5	ARUN S B	
6	ARTHA RAJ K N	
7	ARTHU MATHAN	
8	CHANDRASEKAR R	
9	CHANDU VINCENT	
10	CHITRAKANTH JAMES	
11	CHITHRA M GEORGE	
12	CHITHRA SUDHAN	
14	SUDIN SUDHAN	
15	SUBHANA NAZAR	
18	VARUN RAJ V	

FIG. 8 SESSIONAL ENTRY PAGE

Figure 8 shows the page of entry sessional marks of various students. Here initially the semester, batch and subject should be selected and the internal marks should be entered fulfilling the initial requirements. This is one of the most important features in the system. Sessional mark entry is one of the vital activities regarding faculties of a department. With this feature they can have a much more easy time in entering sessional marks of various students. Currently this work is done manually by listing down marks of different students then calculating the aggregate and then entering it into the register they keep. With this feature they can directly enter different marks of students which get calculated directly and get listed down in the system itself. The listed marks can be accessed by students and faculty members later on.



Roll No.	Name	Marks	ID
13	ANILU AGHOK	4	85.952389523895
1	ARATHI K V	5	71.428571428571
1	ARATHI K V	3	85.794285714286
1	ARUNA BHADRA S	3	85.794285714286
1	ARUN S B	3	71.428571428571
6	ARTHA RAJ K N	3	85.794285714286
7	ARTHU MATHAN	3	85.794285714286
8	CHANDRASEKAR R	6	71.428571428571
9	CHANDU VINCENT	3	85.794285714286
10	CHITRAKANTH JAMES	6	71.428571428571
11	CHITHRA M GEORGE	3	85.794285714286
12	CHITHRA SUDHAN	3	85.794285714286
14	SUDIN SUDHAN	3	85.794285714286
15	SUBHANA NAZAR	3	85.794285714286
17		3	85.794285714286
18	VARUN RAJ V	6	71.428571428571

FIG. 9 ATTENDANCE VERIFICATION PAGE

In addition to attendance entry there is a feature of attendance analysis which could be used for computing and calculation of attendance of various students of the department. Using the feature attendance sheets can be retrieved in accordance with semester, student or subject. There is another feature called attendance Updation which would help in updating attendance which is already entered. The page is shown in figure 9.

IV. TIME COMPARISON STUDY

After collection of feedbacks from students and staffs of the department for proving that the designed system would be a better alternative in carrying out the functionalities which were identified to be problematic. In order to make such a proof a time study was conducted by calculating times required perform various problematic activities in both the conventional way and through the newly designed system. For carrying out the time study with the help of students of the department times taken for different activities were calculated. Times were calculated using stop watch.

The first activity considered for time study was D A form submission for M Tech students. In the above mentioned activity a hardcopy form is to be filled by students and is to be submitted to their guides, which will be verified by them where the activity gets over. The alternative method done for the same activity can be done by filling of the form online and submitting it there itself. So it was found to take an average time of 765 seconds for submission of D A form in the conventional way under normal conditions. It was found to take an average time of 66 seconds for completion of the above mentioned activity, which shows that the submission via the online portal saves much more time than in submission through the conventional method. The next activity considered for study was attendance entry which is usually done by faculty members. Currently the system running in RIT is an online portal for attendance entry and calculation where attendance is initially collected in the form of hardcopies and later on entered to the system. The currently existing system is bit complex to use. From calculation of average times consumed for carrying out the functionality in both ways it was found that it took 76 seconds to complete the function with the help of our current system and it took only 32 seconds for completion of the function using the newly designed system. The obtained result shows that the newly designed system is more efficient in case of this particular functionality. The next functionality considered for study was notice accessing. The current system of accessing notices is by going to the department notice board and reading it. The main problem regarding this function is that there are chances of notices getting missed from the notice board. Hence in the newly designed system notifications do scroll through the homepage of all users. When time study was conducted it was seen to take 72 seconds for the conventional way and 30 seconds for the newly adopted way which explains that the newly designed system would be better. The next functionality under study was grievance reporting. In the conventional a student having to report a grievance will have to prepare a letter on a sheet of paper or take a print out of the prepared matter, go to the H O D and submit the letter. In the newly system he can prepare the letter online itself and submit it there which can be verified that very moment by the H O D. It took an average of 792 seconds for completion of the activity through the conventional way and 344 seconds for completion of it in the newly proposed way. The next function for study was notice Updation which is usually done by faculty members. In the current system of notice Updation matter should be prepared in the form of a soft copy which should be printed out and pinned to the notice bard. In the new system the matter is required to be posted online which avoids complications. The average time for notice Updation in the conventional way was observed to be 298 seconds and average time taken for the same through the new method was 119 seconds. The next function for study was Bio Information handling. In the conventional system Bio information forms get filled by faculty and students and get submitted to concerned authority which gets stored in the form of hardcopies for later use. In the newly designed system all such bio information forms get stored in the database which can be retrieved whenever required. It was observed that the time taken for sorting out a form from a bunch of hardcopies was about 172 seconds on an average basis which took only an average of 90 seconds for the same in the new system. The next function for study was attendance monitoring which are done by students. Students have to wait till the attendance sheet gets updated and displayed on the notice board for monitoring their attendance. Usually attendance sheets are published at regular intervals say 1 month. According to the new system each and every student can monitor their attendance daily through the portal. Once an attendance gets entered the student can access it. Here time calculation for attendance monitoring in the conventional way is not possible. The average time taken for monitoring of attendance through the newly designed system was found to be 58 seconds. The next function taken for study was time table Updation which again is not possible for calculation of average time for Updation. In the newly designed system periods of various semesters can be uploaded directly which can be accessed later by students. The average time calculated for an Updation of time table with the new system was calculated to be 172 seconds. The final activity taken for study was feedback calculation. It is usually a questionnaire which is distributed among students for feedbacks and later on collected. The statistics from the feedback forms are later on calculated manually. For experimental purpose a simple questionnaire was prepared and experimented through both ways. In the newly designed system the count of each option is obtained directly. On an average it took 674 seconds for calculation of counts conventionally while it took only 35 seconds for

the same calculation through the newly designed system. Some activities were not included since similar activities were experimented and obtained results from them. Project listing and Placement details Updation were those activities as they had similar activities like time table Updation and notice Updation.

From the results obtained in the study it was clear that the average times taken for conducting activities via the online portal were comparatively much lesser than the conventional system of performing those activities. Hence the in totality it can be inferred that the system which is designed is found to be efficient which performs much better than the conventional way of performing various activities.

V. CONCLUSION

This paper helps in automating various activities existing in a department of a college. For development of the system a questionnaire survey was conducted among 175 students along with expert opinions. Identifying the requirement of the system and activities to be embedded in the system it was designed. Later on a time comparative study was conducted regarding the existing system and newly designed system. Obviously it was found that the newly designed system took much less time in performing various activities than the existing manual system. From the studies conducted and system design it can be inferred that such systems can be developed for departments of the different colleges and in future such a system can be developed for the colleges completely so that all transactions can be done through the system eliminating all manual hard coy works. So such a system would be very effective for all academic institutions.

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