Digital Classroom Enquiry System

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Abstract: ***Digital world is the one wherein the ideas and the services are being exchanged through Online medium. In this digital world everyone can get connected with every other person for the process of communication. In the process of digitalization, we have emerged into a new concept of digital class room. This digitalization can be extended outside the classroom which shall make the digital classrooms even smarter. In this paper we propose a system which uses a digital touch screen placed outside a classroom. This touch screen is the communication medium between the students and the teachers. The display screen is designed in such a way that every detail regarding the classroom can be viewed on the display. Just a glance at this digital touchscreen enables the students to understand what is going on in the classroom. This screen is accessible to anyone. The home screen of the display is designed in such a way that it gives the glimpse of the events happening in the classroom.***

Keywords: Digitalization, Smart boards, CCTV camera, Smart classroom.

I. INTRODUCTION

Today we are living in a digital world. With the advancement in the technology everyone is becoming more switched to these technologies than ever before. Everything is getting digitalized. As the saying goes," Time and tide waits for none", similarly Digital transformation waits for no one. Digitalization has spread to every nook and corner of the world. There has been a revolution in the fields of industry, business, Banking and Education. This revolution in the field of Education has completely changed the look of the classroom. The way back black boards have now been replaced by the Smart boards with 3D visualization. This has overcome the problem of writing on the boards with the chalk pieces and erasing them, which was a time-consuming process and also the dust of the chalks was an issue to many of the teachers. The notice boards are also now been replaced by the digital noticeboards. Many a times the notices which were kept on the notice boards where torn or scrambled by the students and were not of any use to other students. This problem has been overcome by the digital notice boards. Even the exams are also being conducted taking online as the medium. This makes the process of evaluating the papers easier than the classical way of evaluation as the process becomes easier and simple. The ease of access of any information or the data which generated every day is the concept of digitalization. When everything relating to the classroom has been digitalized, the display board of the classroom can also be made a digital board, which completes a digital classroom. In this paper we propose a digital display board of a classroom which contains all the details of the classroom displayed on it.

Revised Manuscript Received on December, 30 2019.

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II. LITERATURE REVIEW

Since its inception there has been no display screen in a digital classroom which shows the timetable and other details of a particular classroom. This process of digitalization has great impact on the interest of the students.

Nitza Davidovitch & Roman Yavich examines the relationship between the traditional way of teaching and the advanced digitalized teaching and gives the results of how this transmission has enhanced the level of interests in the students, their level of satisfaction [1] in understanding the subject and also the variable of clarity with the introduction of digitalization in the field of education. The author lists three important characteristics of smartboard which are divergent learning, cognitive learning and interactive [2] learning. He also discusses the advantages and disadvantages of using Smart board which enhances the power of imagination and creative way of thinking in the students.

Soh Hon Mun and Abdul Halim Abdullah describe how smartboard [3] are used in the field of education. He describes how smart boards help students to learn and explore new concepts and things using the emerging technology [4] which helps in creating a dynamic learning experience. The author emphasizes on the visual effects, sounds [5], animations and other things which become the characteristic features digital learning and how digital screens can viewed as a powerful tool in learning. Prof. Rohini Temkar, Mohanish Gupte, Siddhesh Kalgaonkar describes an innovative approach [6] of using IOT in a classroom environment. Here the author uses a real time feedback to know the understanding level and capabilities of the student [7] such that students gets good learning experience. Usage of the smart boards, animated videos and graphics, cameras, sounds have completely changed the classroom experience. The author gives some practical scenarios of how IOT can be implemented in classes.

Jaiswal Rohit talks about the mass media communication which is the notice board. He describes how notice boards can be used in the public utility places for better communication. The author makes use of the technologies like GSM [8], Android and SMS for the purpose of displaying the notices on the digital notice boards. An LCD screen [9] in used as a digital notice board which gives a real time notice. Sunil Bhutada et.al [10] develops a sophisticated attendance management system which can be used to mark the attendance of both the teachers and the students. Here they make use of a microphone and Speech recognition technique to collect the data from the user and process it to the device or the interface. The technology used in this process in Raspberry Pi which is the interface that connects the devices in the classroom. This system is associated with the OTP based authentication to maintain the level of accuracy and thus having no scope of flaws in the records of the attendance.

III. PROPOSED SYSTEM ARCHITECTURE

The display is basically a touchscreen monitor placed at the entrance of the classroom. Any person entering the classroom can view the timetable of that particular class, which is the subject going on and also the topic of that subject. It also displays the details of the teacher teaching that subject, attendance of the class and also the occupancy of the classroom. The display is also customized with the video surveillance of the classroom. At the bottom of the display screen there is an advertisement box which scrolls the upcoming events, schedules, assignment submission dates, examination details, Results and other updates respective to that class. Just by looking at the screen any person just passing by the classroom can get the complete picture of everything happening inside the classroom also the students if any interested to listen to that particular lecture can also attend the lecture as a guest.

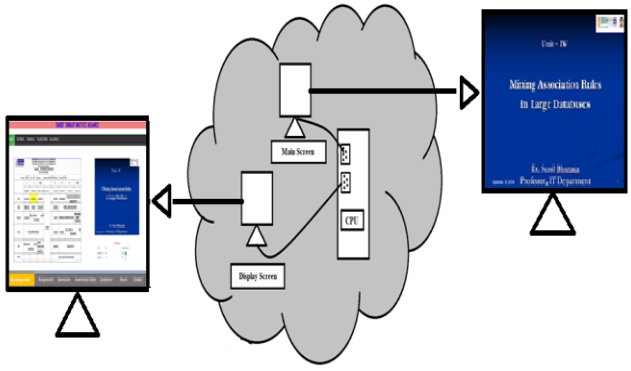

Fig 1 Dual monitor Setup

The main idea of this proposed model is the based on the concept of dual monitor setup (fig 1). The dual monitor setup allows us to connect two monitors to one CPU. We can display different things on the screens using this setup. The main screen inside the classroom is to be connected to the CPU via VGA port while the monitor outside the classroom which is our display screen is connected via DVI port. To display different thing on the screen we need to complete the setup. By right clicking on the main screen and selecting the display settings we get a display settings window, there we can change the choose multiple display and then save the settings. Once the setup is completed the screen inside the class is operated normally by the lecturer inside the classroom.

Digital Display Screen

Display board act as a gist (trailer) of the ongoing session what is happening in the class. It displays the timetable of the class highlighting the ongoing period. Besides the timetable we also have attendance, ongoing session and the scrolling of the events to come. Any inputs given by the teachers to the students shall also be displayed on the screen so that even the student who is absent can also take these inputs the next day. The screen outside should display the html page. The page displays the title “Classroom Enquiry System” (fig 2). We have Timetable to the left side and details of the ongoing session inside the classroom to the right side. At the bottom of the page we have scrolling of the upcoming events.

Below the title we have the navigation bar. On that we have links to different the options like

A Home
B Timetable
C Attendance
D Faculty details
E Surveillance.

By clicking on the links, we get navigated to that particular option. Below is the brief explanation of every individual item on the navigation bar

A. Home Screen

The home screen of the display is divided into 3 parts which contain

1. Timetable
2. Ongoing Session
3. Upcoming events
4. Attendance

B. Time table

The next option available on the navigation bar is the timetable. By clicking on the link, we get navigated to a page which displays the timetable of that class (fig 3). It highlights the ongoing class. This can be done by allocating the time for every period in the timetable using the concept of CPU scheduling. At regular intervals the highlighter shifts to the next hour on the timetable highlighting the current session.

C. Attendance

The next option available on the navigation bar is the attendance. By clicking on the link, we get navigated to a page which displays the attendance of that particular class. This page displays the total strength of the class, number of students present and the number absent. Based on the strength of the class the next teacher ready to come can plan his lecture. If the strength is not good, he can also postpone his lecture in case of an important topic to be discussed. This page also displays the presence of the teacher in the classroom. There is a checkbox present on the screen which indicates the occupancy of the classroom. If the teacher is present in the classroom the checkbox is filled with the green color else it will be filled with red color.

D. Faculty details

The page displayed by clicking this link displays the information regarding the lecturer, his specialization, subject he deals with, current chapter going on, title of the chapter. Ever teacher has a unique methodology of teaching. Subjects which are difficult to understand are also made simpler by some of the teachers. The displays of

faculty details help the students to get to know the teacher inside the class and the subject he is teaching. Any one just passing by if interested can attend the guest lecture of that faculty if he wants to gain knowledge on that particular subject.

E. Surveillance

Every smart classroom is equipped with a CCTV camera inside the classroom. Now a days it has become very common and mandatory thing to have a CCTV camera. The home screen of our display board has a surveillance link by clicking on which one can view the classroom from outside itself. If it is the higher authority on the floor to monitor the classes it becomes easy. If any student is late to the class, he can search for a seat without disturbing the entire class by viewing the CCTV footage.

IV. METHODOLOGY & RESULTS DISCUSSIONS

Methodology:

The moment any teacher enters the class the first thing he does is he will log in to his mail and open the slides which he has prepared to present in the class. This is a very common thing in case of a smart or digital classroom. So, our proposed also starts with the login by the admin who can be the class in-charge teacher or a student. By logging as the admin, the display screen can be viewed. Every teacher who enters the class will have to login as the users in the allotted sessions. If the teacher has continuous hours, he needs to login again for that particular session. Once the user is logged in first slide of the presentation which he is presenting in the class will be displayed outside the classroom on the display screen. Anyone outside the class can get to know what is happening inside the classroom by viewing the ongoing session part on the home screen of the display.

Algorithm for Digital Display Screen:

Input	Faculty Login
Output	Display of first slide and timetable on the display screen and the session slide on the main screen inside the class
Procedure	Start Initialize using admin login credentials Initialize the user login credentials. While time<50mins Display the first slide of the presentation on the display screen. End while End

Result discussions:

Digital screens which are used as the medium of mass communication are now a days being used to display personalized data in certain areas. For example, in OLA cabs, once we get in to the cab the display screen placed in front us is programmed such that it displays the details of our ride, fare and also the list of our favorite music which is customizable. In this project the digital screens are customized such that it displays the particulars regarding a classroom. The display screen is designed using HTML and CSS. In the backend we use PHP and MySQL database which will store the data in remote location. The databases maintain the particulars of the classroom and thus they can be maintained by the class in-charge or a student. XAMPP server is used which helps in running the application in the local computer. Since the database and updating the information are maintained by the teachers of that class, the whole network is connected through Intranet which gives fast and easier way of maintain and accessing the data. The data records for this project include the time-table data, attendance, surveillance, faculty details and the upcoming events.

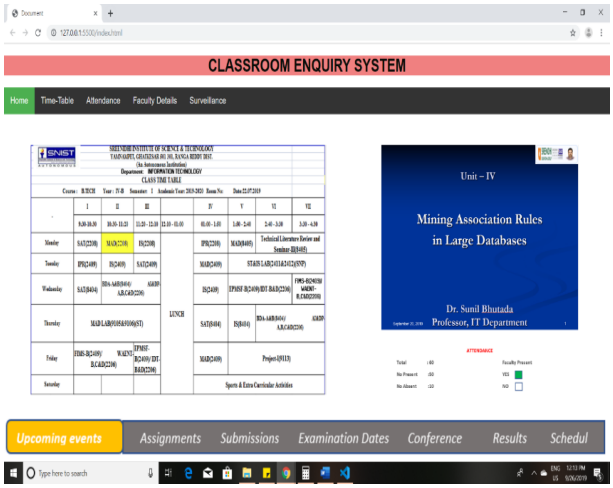

Fig 2 Image showing the home screen of the classroom Enquiry System.

The result of this project "Classroom Enquiry System" is shown in figure 2. The students can access this digital touch screen to get information of the ongoing session inside the classroom and also the details of the lecturer. Each person has his way of explanation and every person has different understanding capabilities. Some students may find it easier to understand difficult subjects which are explained by some faculty. Thus, this digital system enquiry system helps the student to get know which faculty is inside the class and the topic going on. If any student passing by is interested in listening to his lecture can attend the guest lecture for that particular class. The higher management of the institution can coordinate the classes and also can inspect the classes without disturbing the class using the surveillance option on the Enquiry system.

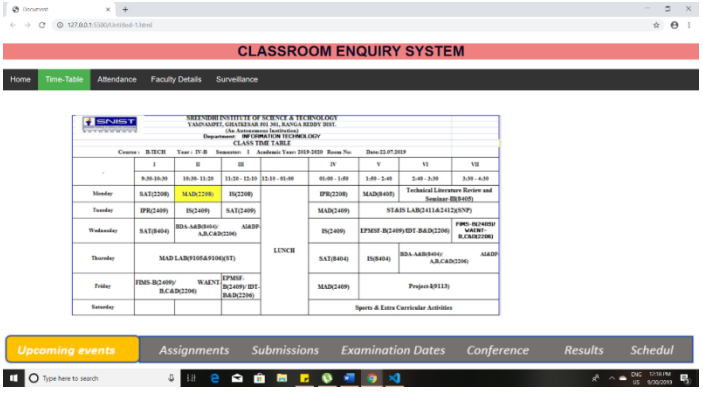

Fig 3 Image showing the timetable screen of the proposed system.

The Figure 3 shows the timetable of a class which is designed such that it highlights the current period.

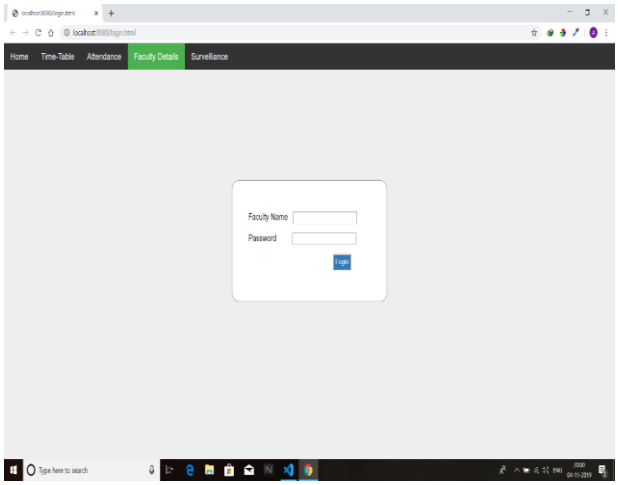

Fig 2 Image showing the login system of faculty details.

V. CONCLUSIONS

This Digital display screen shall make a complete Smart classroom which is done just replacing the display board of the classroom which shows the classroom number with a digital display screen. When everything in the classroom is digitalized and made interactive to the students it develops interest and enthusiasm in students to perform well in their academics. By displaying what is going on in the classroom a student will be eager to listen to the lecture and also makes sure that all the assignments are kept ready for submission in time. It also helps the students and faculty to attend a guest lecture of an interested subject as the screen shows the upcoming events as well as the ongoing session. As this process includes only one extra screen outside the classroom connected to the CPU inside the classroom this is a cost-efficient project and has more effect in bringing out interest of the student.

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