FORM - 2

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COMPLETE SPECIFICATION

(Section 10; rule 13)

A survival of Smart Classroom Integrated IoT used in Campus with Fully Cloud Computing

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Field of the Invention

The present invention relates to an e-learning classroom management system for delivering real-time instructions, specifically to a method and a system for monitoring real-time student attendance and real-time document sharing. The IoT paradigm in the teaching process with the integration of Cloud for education system. It is efficiently IOT and Cloud Infrastructure restructure the traditional education and learning methods

Summary of the Invention

In earlier the ordinary classroom the teaching methods are usally black board and later it conducted in OHP and LED projector using presentation slides. Now better technology used smart class room are nowadays highly equipped, with this students can learn through laptops, PC, tablets, smart phones etc. that are connected through distributed networks and servers that helps in effectively carrying out daily classroom activities in an automated manner.

In any case, in existing smart classrooms, the teachers need to follow the attendance manually for each class in an attendance register. The teachers possess to spare time for recording the class attendance. The undertaking of recording the attendance gets monotonous for a teacher wherein there is enormous number of attendance in a class. Likewise, circumstances wherein an teacher needs to convey guidelines in numerous classes makes it awkward for the teacher to separately follow participation for each class, subsequently expanding the odds of manual blunders in recording the attendance. Nowadays, Internet of Things and Cloud computing raise up the consideration of the colleges to create smart campus. Some peripherals, infrastructure and facilities are associated in a Smart Campus that gives smart campus light, security, following, proficient use of assets including labor, power, water and so forth. Customary study hall model requires equivalent chance to be spent on both instructing and dealing with the work process of the homeroom. Mentor and observing the scholastic related exercises of the understudy gets repetitive. Personnel and the administration of the foundation face obstacles to screen the understudy scholarly intently. Along these lines, so as to accomplish greatest usage of the class hours, another framework is expected to deal with the work process which exceptionally diminishes the hour of personnel not

to stay with administrative works and to expand the hour of instructing and communication with understudies. This paper shows an innovation that uses IoT alongside cloud innovation and application improvement stage to lessen the auxiliary work of humanity. This usage let personnel to zero in additional on the essential work that is, instructing and to zero in less on dealing with the work process of the classroom.

In this invention system is needed to give training that is exclusively customized to address the person's issues and learning styles may profit the participants by and large as every participant has a remarkable learning style. The instructor for the most part recognize what every individual participant needs so as to improve his/her advancement in the smart classroom , yet teachers regularly come up short on the time and assets to make individualized showing plans for every participant. The proposed IoT based cloud computing technology provide smart campus, security and maintenance system to help teaching, scientific research, management of staff and students, attendance monitoring, homework or assignment monitoring, online billing, finding of lost books, laptop or necessary objects. efficiently IoT and Cloud Infrastructure restructure the traditional education and learning methods using the cloud storage for handling smart application through which interaction between teacher and student, between the various objects and IoT Sensors.

Description of the Invention

While the invention has been disclosed with reference to certain embodiments, it will be understood by those skilled in the art that various changes may be made and equivalents may be substituted without departing from the scope of the invention. In addition, many modifications may be made to adapt to a particular situation or material to the teachings of the invention without departing from its scope. The invention in its various embodiments proposes a system referred to as “Classroom tablet program” (CTP). A main server is connected to the plurality of classroom servers wherein at least one of the plurality of classroom servers is connected to the main server. There is a plurality of smart devices wherein at least one of the plurality of smart devices is associated with an instructor and one or more attendees, wherein at least one of the

smart devices is connected to the classroom server; and an interactive board connected with at least one of the plurality of smart devices to display one or more documents, wherein at least one of the document is shared with at least one of the plurality of smart devices associated with one or more of the attendees of the classroom. The classroom is equipped with interactive board which is featured with real-time document annotation and the annotated document can be shared with attendees.

Internet of Things based Smart Classroom Environment system uses customized ARM Microcontroller. This system used for resource management, attendance monitoring, or faculty management. Using ID cards and wristbands, the location of the learner or guest was tracked. This smart classroom system also deals with intelligent parking system, dynamic ticketing system, etc.

Another system uses touch based interface and cloud-based structure storage system through RFID security system. These interfaces are given in each seat in the class through which the Students will cooperate with notebook which encourages them to take notes while tuning in to the class and it additionally help them for simple comprehension and asset virtualization. This new innovative progression prompted an adjustment in education system.

Understanding and grasping power of a student is primarily based on the learning style of the student. Each student differ in their learning style, if they are reached in their way then they excel in studies. Significant improvement is obtained if assignments, activities, tutorials are provided to the students in their learning style of preference, as they are able to understand and grasp the subject efficiently. Identifying each student's learning style is a challenging task and it should be done uniquely for each student. We focus on finger prints of the student as it is biometric data unique for every individual. These fingerprints are of 4 types of patterns namely arch, whorl, accidental and loop. In this invention, data of the students is stored in database which is classified based on their learning styles which can be either visual or auditory or kinesthetic style which varies for each student. Assignments are designed by the faculty based on the three types of students categorized by the learning styles i.e reading, writing and activities. These learning styles are analyzed based on the student's finger prints which are formed

during the formation of life in mother's womb. From the main database, three sub-databases are developed, one for each learning style set of students such that it becomes easy for the faculty to post the assignments or other teaching materials to the students. Automatic update of Student Attendance using facial recognition open.cv open source application is utilized. When the student enters the class, the camera will capture the face, extract the objects, produce 3D points from the camera video, compare with the database to find similar image from cloud server and mark their presence and absent status automatically. The student's attendance monitoring feature enable the faculty to check and track the daily, monthly and overall attendance. The faculty can add the reasons for their absence. The notification of the absence of a student is also sent to the parent or guardian. The Face authenticated Attendance system. The instructor is allowed to edit the status of attendance from absent to present during the following pre-defined events attendee's tab device not working, attendee has joined the class late, Attendee has discontinued the class, Any indefinable circumstances. If the attendance of full-day class mismatches with any of the period attendance, the class instructor and period instructor receives a notification about the mismatch with the list of student names.

.Whenever the student has to do assignment, he has to scan his finger prints using fingerprint scanner which is analyzed by the IoT based system. Proposed invention will be able to perform student identification and allotment of assignment is based on his learning style analyzed from the finger prints obtained from the scanner. In this period of smart classroom innovation, understudies are all the more requesting imaginative college grounds life, and ready to utilize inventive learning techniques. IoT and Cloud processing advances can give answers for savvy and manageable grounds to improve learning techniques for the understudies and improve the productivity of ordinary exercises in the Institution. In this technology center around the IoT worldview in the showing procedure with the incorporation of Cloud for instruction framework. IOT in training give understudy to learn new advancements that causes the understudies to make new thoughts and sensible for the social issues. IoT based cloud figuring innovation give insight framework, bound together grounds entry administrations, security and upkeep framework. The carefully associated grounds improves understudy

learning and natural maintainability. Understudies can utilize smart phones, PDA to get to their schoolwork tasks and test execution through online gateways. Video can be transferred in the cloud, on the web video Lecturing empowers Students to go to study hall addresses distantly. IoT gadgets are utilized to follow understudies who Skip their classes, send cautions help understudies to focus scholastic work regulary, and to discover lost individual things. Through Digital gadgets installments can be made simple at cafeteria, office and in other administrator exercises. The equipment segment of IoT comprises of microcontroller board, sensor module, remote and wired associations. Utilizing the product module the data to and from sensor modules is prepared and sent to distributed storage. This technology depicts how effectively IOT and Cloud Infrastructure rebuild the customary instruction and learning techniques.Also next time a student tends to do his assignment, submission history is checked by the IoT based system and allotment is done based on history of the student instead of once again analyzing the finger prints reducing the computational load of the smart system. For Optimizing Classroom Usage, A Smart Campus was developed that describes the implementation of IoT and AI Technologies. The system includes sensing methods for measuring class possession for the lecture halls across campus. The system features are collecting live occupancy, collecting attendance patterns for 250 courses over two sessions, identification of conducted, cancellation of lecture hour and tests. It also uses Artificial intelligence techniques for attendance prediction. The system has a methodology for an optimal classroom allocation by predicting students attendance. Allotment of assignment is done base on the pre storage of the data about the student which improves the productivity of the proposed system as a lot of time of the faculty is saved which is mostly spent in maintaining records of the student, their submission status, history of assignment to the student, scored marks etc. of every student individually of the class. Hence faculty can spend most of the time in preparing lessons and teaching aids such that student can enhance the learning experience in overall level. Modification of assignments allotted for the students increases their strength of learning and interest to excel in their academics. Attendance, homework, assignment management is easily implemented with this system. Faculty members will be authorized to post assignments with due dates. Notifications will be sent to student’s

registered email ID. Students can post their assignments answers in the cloud. List of Student names with their ID number who submit work on time will be automatically monitored and sent to the faculty Assignment allotment system and validation system are automated where the database of the students is prepared based on their group of learning styles. IoT based cloud computing technology provide smart campus, security and maintenance system to help teaching, scientific research, management of staff and students, attendance monitoring, homework or assignment monitoring, online billing, finding of lost books, laptop or necessary objects. Students and Faculty can use smartphones, PDA for teaching learning process. Through the smart campus system payments can be made easy at cafeteria, office and in other admin activities. Online / offline video Lecturing enables Students to attend classroom lectures remotely if they skip their classes. The hardware platform of the system consists of many sensor modules with wired, wireless communication and Information from the sensor is processed by the software module and stored in cloud. Smart networking devices like gateways, routers, switches, WIFI router are deployed as the core of cloud network. Distribution of assignments is recorded along with their progress in studies by choosing a specific assignment of learning style where submission history of assignment is taken into consideration.

Based on the marks scored and assignment submission history of two semesters consecutively, analysis is done for checking the grasping power of the student, only if improvement is visualized then the same learning style is continued else it is dropped and counseling is given to the student. Implementation of the proposed system is done by using Arduino Uno board which is able to interface with IoT module. Fingerprint is sensed using FPM 10A sensor, which is sent to the Arduino board for analyzing the fingerprint in order to identify the learning style.

Acquisition of data from the fingerprint scanner is stored in the database which is analyzed based on which the student is classified into one of the three groups namely visual learning style, auditory learning style and kinesthetic learning style for further processing. Students percentage preferring a particular learning style is provided to the faculty based on which they can change their ways of teaching in order to reach large portion of students in the class. The attendance is maintained in the database of main

server. The database is used for data storage of information related to attendance data, login and logout time data, and the like. The database can represent multiple datasets and can be used for the storage of a variety of data in support of the Classroom tablet program. The embodiments and implementations described above are illustrative examples and it should not be construed that the present invention is limited to these particular embodiments. Thus, various changes and modifications may be made by one skilled in the art without departing from the spirit or scope of the invention as defined in the appended claims.

Claims:

1. A system for learning and assessment in a classroom comprising: a main server; a plurality of classroom servers; wherein at least one of the plurality of classroom servers is connected to the main server; a plurality of smart devices

a) wherein at least one of the plurality of smart devices is associated with an instructor and one or more attendees, wherein at least one of the smart devices is connected to the classroom server;

b) an interactive hoard connected with at least one of the plurality of smart devices to display one or more documents, wherein at least one of the documents is shared with at least one of the plurality of smart devices associated with one or more of the attendees of the classroom.

2. This system will bring sincerity among student community to complete the work on time.

3. Faculty and the management can spend more time on teaching and learning instead of spending time with managing and monitoring the workflow of the classroom.

4. In the smart device associated with the instructor is configured to facilitate assessment of one or more of the attendees, wherein the assessment is conducted from amongst a plurality of pre-defined questions stored in a pre-defined repository and obtain responses to at least one of the pre-defined questions.

5. At least one of the plurality of classroom servers is configured to record the presence of an attendee in the classroom.

6. The users may be required to register the devices before getting access to the CTP module. The registration of the smart devices with the main server comprises:

a) The smart device entering the coverage area of the main server Wi-Fi;

b) Launching and executing CTP application in the mobile computing device;

c) The smart device connecting to the CTP infrastructure;

d) The main server recognizing the smart device is not yet registered and instructing the user to prompt for registration.

Abstract

In this invention smart class room encourages constant exercises to improve the learning norms. The brilliant study hall framework incorporates an intelligent board, smart class room, a work from home that is interconnected through a correspondence organization. In this IoT Smart class it is interrelated with the cloud server for teaching purpose. This invention will help us to create new ideas for the social issues. In smart class room student can access through smart mobiles to watch the online classes and upload and download class materials, videos. Exams are conducted through online, and student's assigned homework, online lecture assignments etc. Students can access campus own portal for download materials, homework, exam etc. It creates a new idea and technology used for student to save time for travelling school or college. Students are must attend online classes regularly based on attendance report students allowed to attend internal exam and semester exam or annual exams for school students . IoT based cloud computing technology provide intelligence system, unified campus portal services, security and maintenance system. In this smart class how IoT and Cloud are restructure the regular class and new teaching methods. The annotated document can be shared with the attendees in the classroom. The system allows the control and coordination of the interactive board, smart devices, and the servers to deliver an interactive setup in the classroom and facilitates the information transmission to and from the attendees.

Fig 1.Fig 2

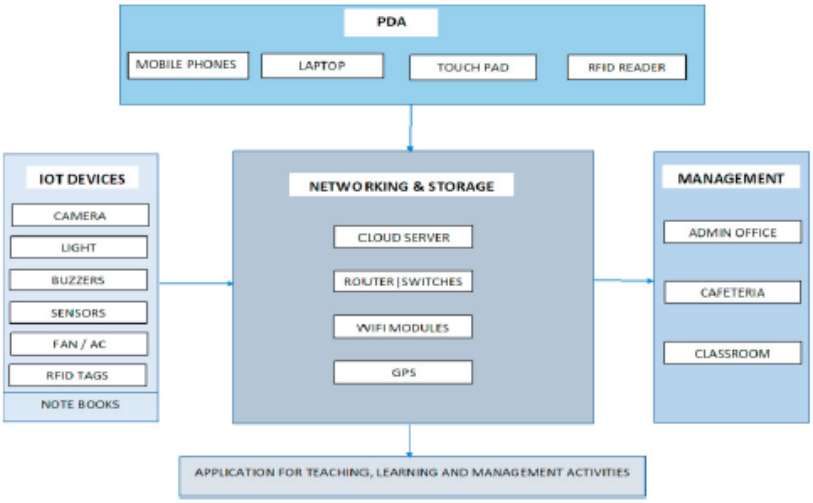

Fig 1 IoT based Cloud Integrated Smart Classroom

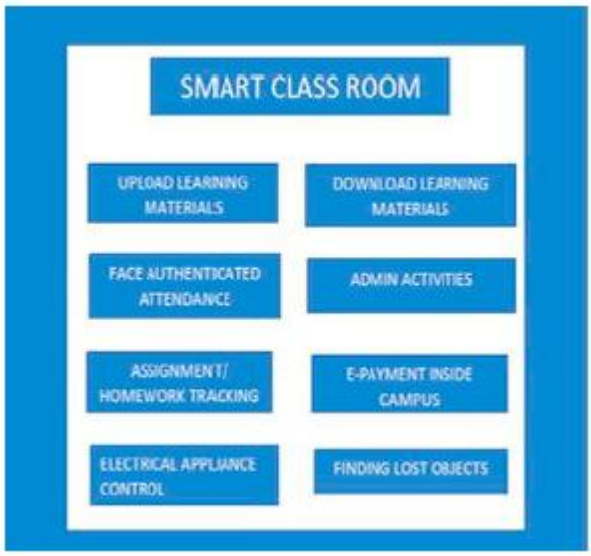

Fig 2 Proposed Application for Smart Classroom

Patent Search

Invention Title	A SURVIVAL OF SMART CLASSROOM INTEGRATED IOT USED IN CAMPUS WITH FULLY CLOUD COMPUTING
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Priority Number	
Priority Country	
Priority Date	
Field Of Invention	COMMUNICATION
Classification (IPC)	H04L 29/08

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