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PROPOSED MODEL TO CONDUCT AN EFFECTIVE CLASSROOM BASED ON SMART EDUCATION SYSTEM

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Abstract

The article explores the effective classroom system based on artificial intelligence, facial recognition, and other smart systems with proper security. The current smart learning environment is very familiar and appreciable all over the world. It has been a great challenge to implement with high accuracy over the years. Ensuring quality education is a must needed for the 21'st century. This study discusses the potential impact of a smart education system and describes the effective and innovative way of learning. The study considered the smart attendance-taking system using facial recognition with a modern approach such as measuring body temperature so that students can participate in the hassle-free & highly secured attendance system and also measuring body temperature for avoiding coronavirus. The study also considers the smart attendance tracking system using messenger BOT where the student can track their attendance percentage anywhere any time. This idea aims to construct a smart learning environment where all the necessary information of a student according to their education will be present which can monitor student and teacher simultaneously. Finally, Questioning Question Teaching Method have considered in this proposed idea where student and teacher will interact with each other both in a virtual and physical classroom. The proposed system should bring innovation to smart education. By integrating these features in the "Proposed Model to Conduct an Effective classroom based on Smart Education System", students and teachers will be benefited more than before and this study may contribute to improving the quality of education.

Keywords: Smart Education, Effective Learning, Smart Attendance, Virtual Learning

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Nowadays, a Smart learning environment is becoming more important where communication between student and teacher must be produced using different methods, structures, and practices (Powell et al., 2009). Do you know about the current approach to smart learning & environment? Smart education environment is an environment utilizing the Information Communication Technology (Kobayashi et al., 2017) to develop quality learning. In this decade, maximum institutions are conducting the virtual learning platform and they are inspired by mobile learning model (Al-Hunaiyyan et al., 2017). They all are trying to replace the traditional attendance system with the smart attendance-taking system and smart classroom is a smart learning environment that has resulted from the traditional classroom (Huang et al., 2012). So, what are the actual problems with the traditional system? The traditional system is more time-consuming and not an accurate system. Students are not able to track their attendance all the time, that's why they became confused about their percentage of attendance. In the traditional and virtual attendance system, there can do proxy and cheating. This proposed system provides a very smart solution and it is very effective for quality education. In this section, you will know more details about our proposed idea. We know the first 20 mins is the core time of any class time. If any student misses the first 20 mins of class, he/she will feel bored the whole class time. As a result, he would not complete his class attentively. This article proposed a smart attendance-taking system using facial recognition which will oblige to come students within the first 20 mins of class. Further, this study proposed a system where a student can track their attendance on their particular courses using messenger chat BOT. Not only that, a student can get all the notifications of course and class-related information. In this article we proposed an idea where a student will get the

notification of google classroom on their mobile phone. In this proposed idea we have considered the most effective learning approach the Questing Question Teaching Method (Q^2 TM) where students will able to ask questions to the teacher according to the course. The teacher will get the question before the classes and he will prepare the answer for the student and then they will discuss it in the classroom. From this study, a student will get access smart learning environment and hopefully, we will help to develop an innovative and effective education system. This paper is designed with another four parts. In the literature review section, a background study has been done on this particular sector. In the proposed system section, the main idea has discussed in detail. In the methodology, the proposed idea is visualized with data flow and use case diagram. Finally, in the conclusions, a summary and highlight of the learning have been displayed from this study.

Literature Review

Artificial Intelligence

Artificial intelligence is an approach of providing a computer or a robot or some machine to determine, information processing, and respond on their own. In simple words, Artificial Intelligence (AI) is providing the machines with the ability to think like a human (Charniak, 1985). AI includes several fields such as machine learning, neural networks, perceptions, statistics, deep learning which generally provides to be successful in various proceedings like research, prediction, robotics, security, transportation, and so on. The following are some sectors that are being worked with artificial intelligence:

Data mining - It is a process in which a huge portion of raw data is turned into a set of information by the uses of various algorithms of AI (Hand, 2007).

Genetic programming - It is a method for getting computers to solve a problem automatically which starts from a high-level statement of what needs to be done (Koza et al., 2005).

Pattern recognition - It is a process in which a machine-learning algorithm is used to reorganize patterns & it's also defined as the classification of data based on statistical information (Tou et al., 1974).

Facial Recognition

Biometric Facial recognition is a system of identifying or confirming identity individually using their face and this system can be used to identify human beings in photos, videos, or in real-time. It confirms biometric security. The technology is mostly used for security and law enforcement (Parmar et al., 2014). Facial recognition has many advantages. It can capture the faces of people in public areas, and facial recognition can be done without any physical contact, on the other hand, it can also give a clandestine or covert capability (Woodward Jr et al., 2003).

Smart Attendance Device

Smart Attendance device is a very useful device to take attendance but its maintenance system is quite difficult if it is done manually. It can be implemented using the various ways of biometrics to managing attendance and facial recognition is one of them. Fake attendance and proxies can be solved by using a smart attendance device. The main steps in this system are detecting the faces and recognizing peoples. This system will be an effective solution to maintain the attendance and records of students and teachers (Wagh et al., 2015).

Virtual Learning Environment

A virtual learning environment generally covers a set of courses, sometimes a full program, while a virtual learning environment can be used for smaller parts of a curriculum. It can be identified by many features and also absorbs different information and several communication technologies to live learning process and adjust to the requirements of students (Abdel-Basset et al., 2019). It is designed information and a social space where educational interactions occur in

the environment and turning spaces into places. Sometimes it overlaps with physical environments. Virtual learning environments accommodate heterogeneous technologies and multiple pedagogical approaches (Dillenbourg et al., 2002).

Mobile Technology & Mobile Learning

Mobile technologies have been alternative as being more than just a communication device. Researchers recognize that nowadays mobile technology is quickly being famous as a learning appliance (Hall B, 2008). Smartphones, tablets, and e-book readers are growing up as powerful assets for smart learning. This concept of "mobile learning" has been commenced to make connection two separate concepts "mobile" and "learning". It is proposed as an improvement in e-learning with a new and independent part of virtual learning (Cho SK, 2007). Researchers have attempted to show their knowledge of m-learning in various domains. Pedagogy, technological devices, context, and social interactions are the most known methods (Crompton H, 2013). Crompton (2013) said about mobile learning which is learning across multiple contexts using personal electronic devices, through social and content interactions, (p. 4) (Crompton H, 2013).

Q&A Learning Method

Sometimes questions distribute the purpose of the inspiring learner who will spend much time engaged in several learning practices, whether these involve studying, reading, discussing, or practicing and this objective is very important because sometimes learners extremely optimistic about what they will be able to remember that's why questions have beneficial effects whether they are presented before or after their particular learning assignments. Both pre-questions and post-questions provide the substantial benefits of repetition. Relevant questions can be more effective tools for the learner that focus on higher-order information—in contrast to minutiae and

trivia which are more powerful in producing learning. It can motivate learners to engage in learning activities so that learners can get a productive learning process (Thalheimer, 2014).

Proposed Model Workflow

In this paper, an innovative and better system has proposed to contribute to the quality of education. It will provide more security in their particular sectors and features. Here it is considered to improve some features:

Smart Attendance System: The attendance system will be taken by facial recognition and it will provide more security than other technology. Most importantly it will be designed in a very special way what we have mentioned earlier.

Improves Interaction and Calibrations: Our idea of a Smart & Effective Education System is proposed to encourage class participation giving more security on make sure quality education. Questing Question Teaching Method is more interactive than other typical methods.

Student and teacher Monitoring: This idea is the best solution for student and teacher monitoring. All the information will be saved in the database and it will be monitored through the human being and artificial intelligence both. Students and teachers will be tied in the same thread.

Punctuality: 20% of people have lost their job due to impunctuality in their particular sector. Our proposed system will contribute to making a punctual human being by attending the class on the dot.

Recently it has been seen that many organizations have used smart attendance-taking systems using Biometric Finger Print and also facial recognition (Maraphones, 2019). By considering the spreading of coronavirus, a fingerprint device is more harmful than facial recognition. In this paper, an idea has proposed where attendance will be taken automatically by facial recognition and with a unique and effective system. This idea tries to improve time-

consuming and give more security to effective learning activities. The proposed model aims to develop 4 different sectors to improve the smart learning environment.

Registration process

Students & teachers have to input their facial data during registration and it will be stored permanently as valid information in the registration database. After registration, the individual facial data will be stored in the student's & teacher's personal portal according to their organizational profile. These data can be fetched by the system or admin whenever they want.

Student-teacher attendance process

It has considered the first 20 mins as the core time of any class time. If any student misses the first 20 mins of class, he/she will feel bored the whole class time. As a result, he would not complete his class attentively. The attendance-taking device should set up inside the classroom. Before starting the class, the teacher has to input his/her ID (Identification Number provided by the organization) and Course code (provided by the organization) then he/she will input his/her first image using the device. After that, the class time will start automatically. From the first image of the teacher, all students have to input their first image within 20 minutes. After 20 minutes the device will be locked for the first input. After finishing the class, the teacher will input his second image. After that, students have to input their second image within 7 minutes. If any student can input their images within the first 20 mins (first input) further in the last 7 mins (second input), then the device will count as a valid attendance. The attendance will be saved into the database. If any student can't adequately do this, he/she will be not counted as a Presented student.

Messenger chatbot features

It is also considered the messenger chat BOT where student can see their progress. This idea to develop a BOT where student can see their current attendance on their particular courses by inputting their Student ID and Course Code. The Messenger Bot will provide the attendance information from the database, that's why a student can see their progress immediately. The student will get their course and organization-related announcement through this BOT. They will be notified by subscribing to the channel using their Student ID and Course Code. "Google Classroom" notifications on this Bot have also been considered in this idea. Sometimes students forget to check their google classroom but our Bot will notify them on the dot. Finally, Messenger BOT will retrieve & show users current from the main database.

Questioning Question Teaching Method (Q^2TM)

In this proposed idea Questing Question Teaching Method (Q^2TM) have considered more strongly. Pre-question and post-question are more effective and important on learning technology. It will make a big impact on the quality of education (Thalheimer, 2014). The teacher will get all the pre-questions from the Course Representative (CR) on behalf of the students of this course by the telegram channel. After that, the teacher will prepare the answer, and the next day they will discuss the problems in the classroom. This is the initially one-way interaction between the teacher and student. After finishing the class, the teacher will post the questions to the students through Google Classroom and it will be considered as a post question. Students will make their answers then they will discuss on the next day. So, Q^2TM is a very effective criterion in the education system.

Conclusions

In this proposed solution Effective and Innovative Smart Education System have proposed. Such a system has numerous benefits over traditional learning systems. An innovative idea has proposed to make sure quality of education. To make a punctual student this study will help a lot. The proposed idea has using more secured and smartest attendance-taking technology by facial recognition. This solution will tie in the same thread to student and teacher. This is the best solution for student and teacher monitoring. It has proposed the idea with the concept of punctuality, security, and more effectiveness. It considered the student flexibility on this proposed system. They can get free access to many special features in a row. This system has proposed the most efficient teaching technology which is the Questing Question Teaching method. However, the most challenging and interesting problem would be to control the student's agitation and maintaining the second face input in between 7 minutes.

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Figure Title: Graphical Abstract

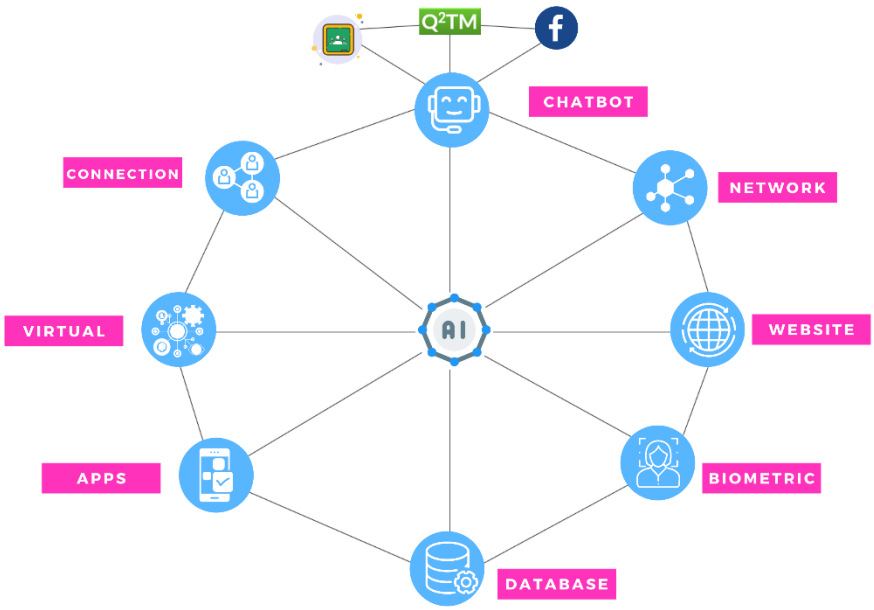

Figure Title: Student-Teacher Registration Process

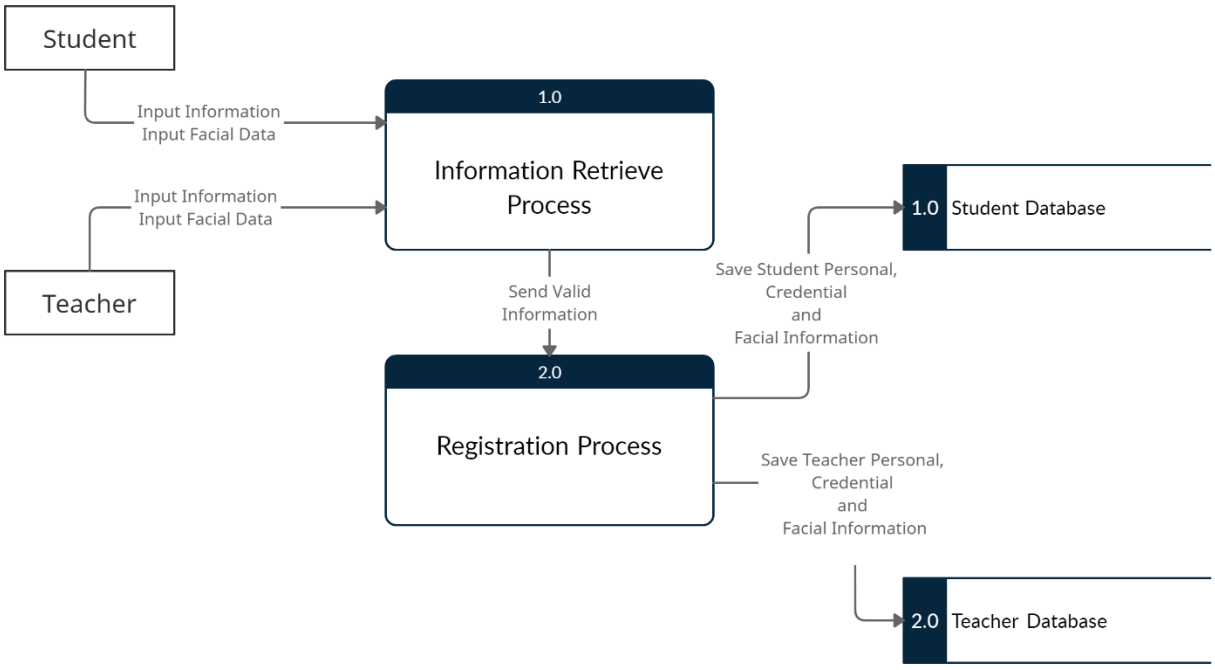

Figure Title: Attendance taking & retrieving process

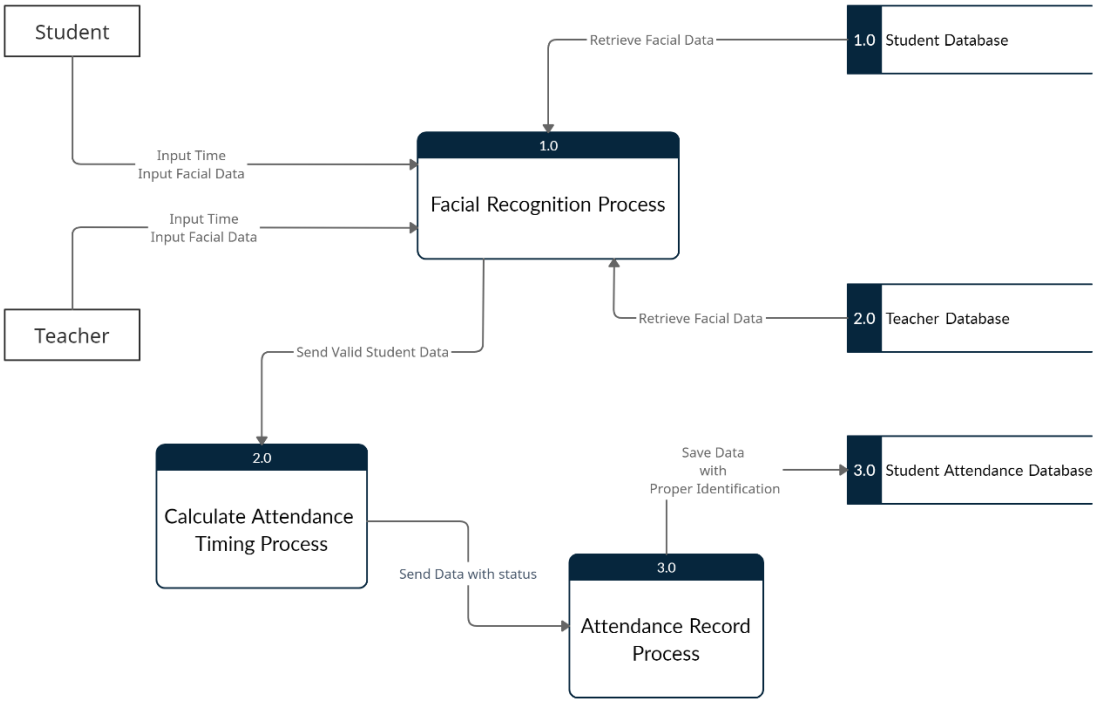

Figure Title: Data methodology & messenger bot access

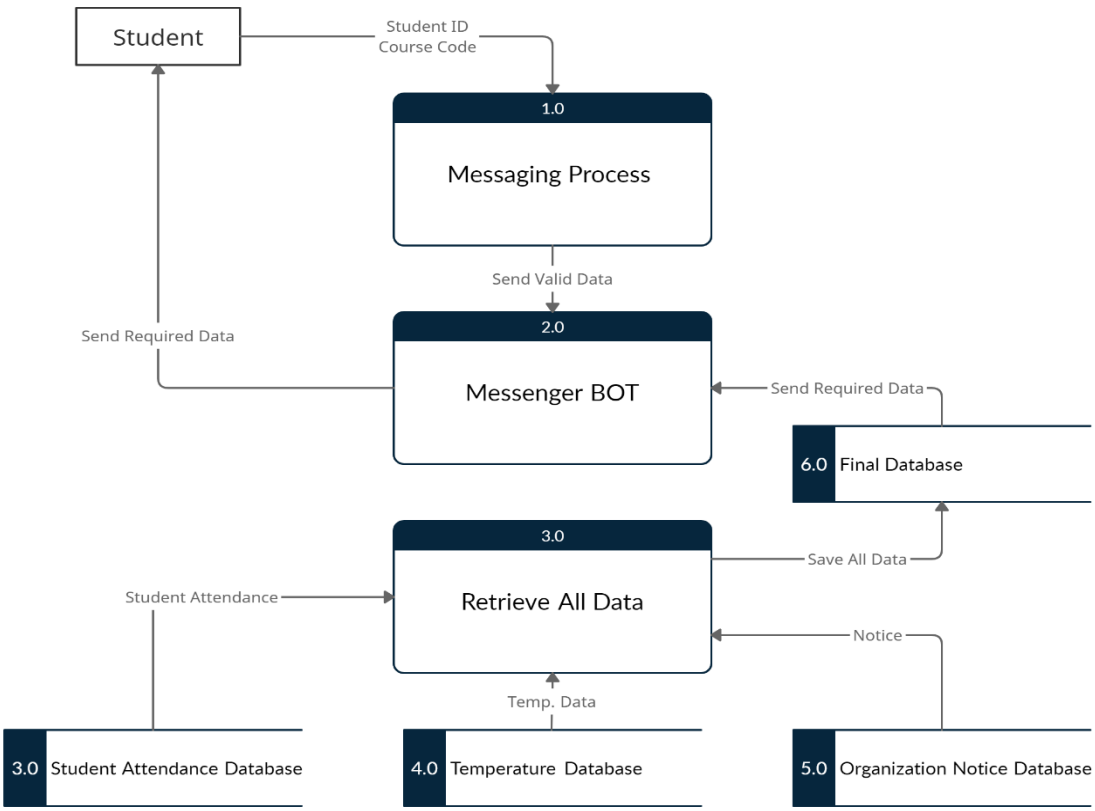

Figure Title: Proposed methodology: Questing Question Teaching Method (Q^2TM)