OJT ATTRACK – ON THE JOB TRAINEE REMOTE ATTENDANCE MONITORING SYSTEM USING FACE RECOGNITION SYSTEM

EPIFELWARD NIÑO O. AMORA[1], KENNERY V. ROMERO[2], RENNAN C. AMOGUIS[3], EVANGELINE N. OLANDRIA[4], JOSEPH JAMES OLAVIDES[5]
https://orcid.org/0000-0001-7333-9134[1], https://orcid.org/0000-0001-9959-0941[2], https://orcid.org/0000-0002-1781-7290[3]
https://orcid.org/0000-0001-6554-5229[4], https://orcid.org/0000-0003-4051-464X[5]
ninyohamora2017@gmail.com[1], 042189@gmail.com[2], amoguis.rennan@gmail.com[3], evangeline.olandria@bisu.edu.ph[4], jjolavidesofficial@gmail.com[5]
Bohol Island State University – Candijay Campus, Cogtong, Candijay, Bohol, Philippines [1-5]

ABSTRACT

The checking and monitoring of On-the-Job Trainee's Attendance (OJT) faced several problems in the end of the OJT coordinators and the home institution. Some of the problems are checking the attendance of the OJT validation and verification of students' attendance, tracking the students' real-time OJT progress and generating up to date reports. It becomes even very alarming when the OJT Coordinators lost track the students' OJT progress. This study sought to investigate and implement a solution using technology innovation mainly the internet of things to make checking of attendance and monitoring of progress effective and convenient. Using the Agile: Scrum methodology of software engineering, the researchers conducted a series of stakeholder's meetings with the OJT coordinators to collect user stories. After the collection, the researchers developed a schedule of activities, staffing, hardware and software requirements in order to carry out all the tasks needed to deliver the fully functional product. To keep track the progress of the project, the Scrum master conducted a daily standup meeting with the team in order to express the points that might hinder the pace of the development. The team leader also communicates daily with the clients to give them a comprehensive update. Findings revealed that the current manual system used to check the OJT attendance and track OJT progress which is prone to fraud and tampering which causes record irregularities. Thus, there is a need to develop an internet of things based (IOT) based hardware and software application that checks the attendance and view reports in real-time. By this means, frauds on attendances and records were eliminated as the attendance system is secured.

Keywords: Face Recognition, Internet of Things, Microcomputing, OpenCV, CoVid Response

INTRODUCTION

One of the biggest concerns of educational institutions and on-the-job training (OJT) coordinators are the irregularities of student attendance and punctuality. It becomes even very alarming when the OJT Coordinators lost track of the student's OJT progress. Some of the students will not declare the actual number of times rendered for the purpose of evading requirements and responsibilities. In the current practice, the attendances of the OJTs are done via logbooks. This made the institution difficult to track the actual number of hours rendered by the students for his/her OJT. The validation for the actual number of hours is done after the student's returned to the school. This made

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245

the researcher to propose a remote attendance monitoring system using face recognition attendance system as a tool to help solve the concerns experienced by the OJT coordinators.

Face recognition is popular biometric technology, it is based on facial features, and face image recognition to identify the identity of the corresponding person. Face identity identification has been widely used in banking, transportation, company attendance, and other fields (Fengping Cao et al., 2018). Face recognition is an integral part of biometrics. In biometrics basic traits of human is matched to the existing data and depending on the result of matching identification of a human being is traced (Bhattacharya, S. et al.,2018). The biometrics is one method that is widely used in identifying someone. Fingerprints, iris, or faces are unique, so biometrics is one of the best alternatives to replace the old way how recognizing someone in digital images (Handaga et al., 2019)

However, the existing Face Recognition Attendance System does not send real-time data to a web server for real-time data monitoring. This study aims to develop a face recognition system specific to real-time OJT attendance tracking using openCV sensors, raspberryPi, web-server, and a web-based system.

OBJECTIVES OF THE STUDY

This study aimed to develop a Face Recognition Attendance System. Specifically, it aimed to determine the needs of the OJT Coordinators in terms of checking the attendance of the OJT; validation and verification of student's attendance; tracking the student's real-time OJT progress, and generating up-to-date reports.

METHODOLOGY

This used Agile: Scrum methodology of software engineering. It is a type of methodology that enables the researchers to deal with a task by breaking it into phases which includes consistent effort with project stakeholders and constant development and iteration in every phase.
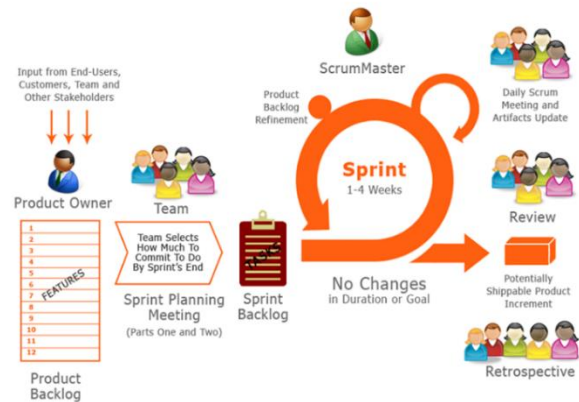

Figure 1: Agile:Scrum Methodology

The team sat with the Dean, Chairpersons, and OJT Coordinators to discuss the concerns encountered in the current OJT Attendance. The issues encountered by the OJT Coordinators were listed as project backlogs. Each the backlog was given priority according to the weight and the urgency of the needs. The stories were gathered and put in a tabular view with story numbers and the stories gathered which then became the basis for the features that must be included in the development. The collected stories served as the framework of the system and termed as the project backlogs. All of the backlogs present in the previous phase were given a schedule and the right staffing in order to realize the project. This resulted to another backlogs called sprint backlogs in which all the stories were given priorities and time span.

RESULTS AND DISCUSSION

1. User stories that show user needs

Table 1
User stories

Story No.	Story
1	I want an attendance system that is web based.
2	I want the system to have a webpage that displays reports regarding attendance of the OJT.
3	Face recognition.
4	The system must be capable of computing the real time OJT hours rendered by the students.
5	The system must be capable of printing OJT reports.
6	The system must feature an effective way of identifying the student's identification.
7	The system must be in up to date technology.

The series of talks with the stakeholders and the team resulted in the following user stories that show user needs:

- I want an attendance system that is web-based.
- I want the system to have a web-based system interface to display reports regarding attendance of the OJTs;
- Face recognition
- The system must be capable of computing the real time OJT hours rendered by the students
- The system must be capable of printing OJT reports.
- The system must feature an effective way of identifying the student's identification. The system must be in an up-to-date technology.

With the aim of delivering the user needs mentioned in the user stories, the team proceeded to the formulation of project backlogs. This shows the specific modules to be developed; the priority number of each task and the number of days the product will be delivered.

2. Product Backlogs

Table 2
Product Backlogs

Priority	Sprint Backlog Items	User Story No.	User Story
1	Selection of technology to be used	7	I want the system to be in an up to date technology
		1	I want the attendance system that is web-based
2	Server and database development using raspberry Pi, Phyton, server and OpenCV configurations.	6	The system must feature an effective way of identifying the students identification
		3	Face recognition
3	Face recognition development	3	Face recognition
	Web portal development for OJT coordinators	4	The system must be capable of computing the real time OJT hours rendered by the students
4		2	I want the system to have a webpage that displays reports regarding attendance of the OJT
		5	The system must be capable of printing OJT reports

Table 2 displays the product backlogs. The development of the project was scheduled to finish in 26 working days.

3. System Architecture Block Diagram of OJT AtTrack
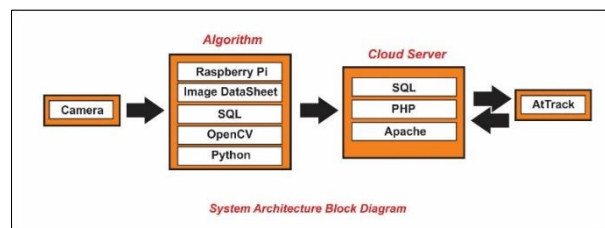

Figure 2: System Architecture Block Diagram

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Figure 2 above is the System Architecture Block Diagram of OJT AtTrack which describes how the system works from reading an object using the camera to the admin monitoring interface. To state, the system works by reading faces using the camera. The algorithm used will process the input and will try to compare if the data (face) is present in the database. If found, the system sends a confirmation and then records relevant information such as the time-in and out, remaining hours, and the establishment to the cloud server. The data in the cloud server can be accessed using the web application which enables the data to be viewed by the OJT Coordinator and the printing of reports as well.

4. Validation and verification of student's attendance

The present system validates and verifies the students' attendance manually. To close the gap, the researchers made the validation and verification of attendance in real-time using face recognition system. In this method, the attendance cannot be tampered.

5. Tracking the student's real-time OJT progress

The system sends real-time data into the server. Meaning, every login and logout counts are consolidated into the database. The consolidated data is displayed in the web portal such as total hours rendered and remaining hours.

6. Generating up to date reports

The system provides an easy access web portal which features a dashboard that displays real-time reports and statistics such as the actual number of hours rendered per student, attendances, OJT tardiness and other related reports.

CONCLUSIONS

The current manual system used to check the OJT attendance and track OJT progress which prone to fraud and tampering which causes record irregularities. There is a need to develop an internet of things (IOT) based hardware and software application that checks the attendance and view reports in real-time. By this means, the frauds on attendances and records were eliminated because the attendance system is secured. After the thorough review of the system from both stakeholder's and developer's end and pilot testing of the prototype, the system receives 100% satisfaction feedback and found that the system works according to its design and function.

RECOMMENDATIONS

Technology continues to innovate every now and then. It is very important to open ourselves to innovations that could potentially do our daily task efficiently. In order to further strengthen the system, the study must be continued for further enhancement if new needs will arise.

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248

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AUTHORS' PROFILE

Epifelward Niño O. Amora, is a faculty of Bachelor of Science in Computer Science in Bohol Island State University – Candijay Campus and a Technology Innovator of the said university. Expert in Embedded Systems and Microcomputing. Full Stack Developer. Member of the Philippine Society of Information Technology Educators (PSITE) and Philippines Schools, Universities, and Colleges Computer Education and Systems Society (PSUCCESS).

Kennery V. Romero, is a faculty of Bachelor of Science in Computer Science in Bohol Island State University – Candijay Campus. Full Stack Developer. Member of the Philippine Society of Information Technology Educators (PSITE) and Philippines Schools, Universities, and Colleges Computer Education and Systems Society (PSUCCESS).

Rennan C. Amoguis, is a faculty of Bachelor of Science in Computer Science in Bohol Island State University – Candijay Campus. Software Developer. Member of the Philippine Society of Information Technology Educators (PSITE) and Philippines Schools, Universities, and Colleges Computer Education and Systems Society (PSUCCESS).

Evangeline N. Olandria, is a Faculty and Chairperson of Bachelor of Science in Computer Science in Bohol Island State University – Candijay Campus. Member of the Philippine

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249

Society of Information Technology Educators (PSITE) and Philippines Schools, Universities, and Colleges Computer Education and Systems Society (PSUCCESS).

Joseph James A. Olavides, is a faculty of Bachelor of Science in Office Administration Department in Bohol Island State University – Candijay Campus. Experienced in Business Development. Member of the Philippine Society of Information Technology Educators (PSITE).

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250