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Role Of Presence Systems From The Android-Based Learning Process

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ABSTRACT

The attendance system plays a crucial role in managing the presence and involvement of students in the academic environment. The author aims to implement a design of an presence system in the teaching and learning process using GPS-based Android technology, with the objective of enhancing efficiency and performance at the Surabaya Aviation Polytechnic. This attendance application is designed using the Laravel framework as the foundation for its web application development. The research methodology employed is the waterfall method, integrated with a system architecture design. Testing of the web-based presence system indicates that the application is capable of processing and recording attendance data as expected. The attendance data results can be easily accessed through the admin system on the web application. Based on the testing results, the implementation of this technology facilitates the efficiency of lecturers and administrative staff in monitoring student attendance, as well as executing accurate attendance processes. Furthermore, the adoption of this digital technology system has a positive impact on environmental sustainability by reducing paper usage and minimizing the time required for manual attendance processes. Thus, this Android-based attendance technology not only enhances efficiency but also supports environmental conservation efforts.

INTRODUCTION

In the university environment, the teaching and learning process occurs between the Cadets and the professors with the aim of enhancing the Cadets' understanding of a specific course or field of knowledge. In the teaching and learning process, the professor acts as the instructor or facilitator in the learning, and the Cadets act as the subjects who are learning. In the teaching and learning process, the professor is responsible for delivering course material or instruction to the Cadets using various effective teaching techniques and methods(Sulistyono et al., 2021). The list of students present or absent is often made on paper and the teacher mentions the name of each subject, but the presence cannot be separated from the learning activity, as the list of attendants will provide a lot of important information about the attendance of students whose students attend courses and exams(Darmawan et al., 2016). Considering the importance of attendance lists or records, we need a system that can manage absenteeism more accurately and efficiently. In both schools and universities, honesty and punctuality are crucial and influence the teaching and learning process(Nasihatun Hikmah et al., 2020).

GPS is an abbreviation of the Global Positioning System "GPS". It is a navigation system that uses satellite technology, is capable of receiving signals from satellites and is designed to provide three-dimensional position, speed and time information(Bhatti, 2020; O et al., 2019). The space segment consists of 24 satellites operating in six orbits at an altitude of 20,200 km for 12 hours, and the satellite returns to the same position in 12

hours(Budiawan et al., n.d.). Android is the mobile operating system used on many smartphone devices today. Designed for touch screen mobile devices like smartphones and tablet computers. Android can be one of the best solutions to implement GPS absence systems. Android as a mobile platform allows developers to create applications for a variety of mobile devices with open platforms. Therefore, as long as Android devices and internet connections are sufficient, one can use GPS anywhere and anytime(Makhfuddin Akbar et al., n.d.).

Today's competitiveness and development are heavily influenced by the use of modern information and communication technologies. An information system application is a system that performs storage processes, including presence(Salamah et al., 2021). An attendance system utilizing the Global Positioning System (GPS) and based on Android is an example of the use of information and communication technology(Chiang et al., 2022; Nurli Mat Bistaman et al., 2022). Based on this background, the researcher will design an attendance system and its role in the teaching and learning process.

RESEARCH METHOD

The research conducted is part of applied research, which means designing an application to solve a problem. As a result, the use of the waterfall method in this research enables the analysis, design, implementation, testing, and maintenance to be achieved through the application of the waterfall approach in the research(Elvis Pawan et al., 2021; Rachmawati Lucitasari & Shodiq Abdul Khannan, 2019). Each step must be done correctly, and then create a systematic plan to solve the problem. This research was conducted at the Surabaya Flight Polytechnic with the aim of solving the attendance system problem for Cadets and Professors(Suryadi & Zulaikhah, 2019).

Field studies, used to gather research data. Current problems, advantages and weaknesses of such presence or presence systems. This field study uses observation data collection techniques, which is to look directly at the location of the research object to observe the presence activity and collect the information necessary for the design of presence system to be made. The initial process of determining the software image to be created is to perform a need analysis.

The aim of this research is to study Absence Online designed with the Laravel system that will help the agency in carrying out the presence process on campus(Hendrian, 2022). The results show that the application is used as a key component in assisting the presence process of each cadets and lecturer. Using technology designed with Laravel on android devices, this research can speed up the process of presence. System test results that have been created and succeeded will soon be applied to Android smartphones.

Waterfall Method Flowchart

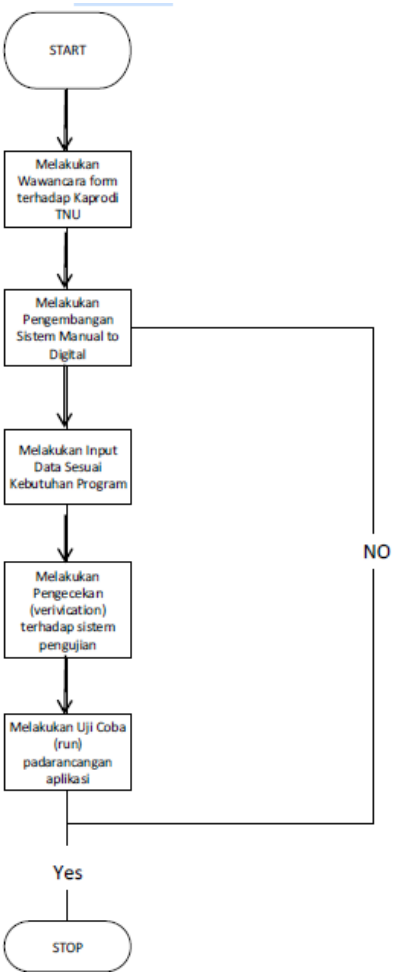

Figure 1. Flowchart Method

In Figure 3.4 above is a flowchart that describes the step-by-step design using the waterfall method. The first phase begins with conducting the interview survey phase by providing a question form to each of the respective study programmes, for example on the above picture presented to the representatives of the Air Navigation Engineering study program. Next is the development of a written manual presence to a digital system in online form. Programmatic data input and testing of application system design.

Presence System Work Plan Design

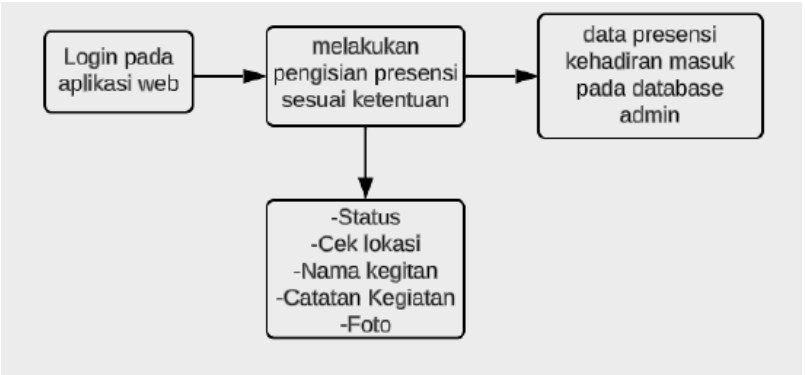

Figure 2. Design concept

The figure above shows how to use the attendance application. The first step is to

download the application through the link provided by the admin. Then, you enter the application and find a menu with several options that can be customized according to the situation of the cadets and professors when taking attendance.

Analysis GPS presence system design

a. Purpose and Needs
   Determining the campus's purpose to use the GPS absence system. As is the case, the campus may want to track the presence or optimize the use of working time.
b. Device Selection
   Select a GPS device that matches the needs of the instance. For example, whether the GPS device is to be installed on a cadets or campus mobile device.
c. System Design
   The system design should be integrated with the existing campus human resources management system (HRMS). This system should allow cadets to perform absences easily and accurately and allow management to access the absence data associated with cadets.
d. Application Selection
   Choose the GPS application that best suits the needs of the organization. For example, does this application enable real-time tracking, fastest route information, and secure storage of absence data?
e. Data Integration
   The integration of GPS data into Cadet's human resource management system will integrate the Cadets absence data management easily, including the management of late or unreasonable absences.
f. Testing
   Test the system to ensure that the system runs properly, GPS data is accurate, and the application runs according to the purpose and needs of the agency
g. Training
   Provide training to cadets on the use of GPS applications and absence systems, which is essential to ensure that cadets understands how to use the GPS absence system properly.

RESULTS AND DISCUSSION

The results of the research show that the use of GPS-based absences improves the effectiveness of tracking cadets and Docent presence significantly. The system allows the administrator to track cadet's presence more easily and accurately, reducing the time and effort required to collect presence data manually. In addition, it also helps in identifying absence and delay patterns, allowing the admin to advertise absences and delays.

1. Application System Testing
   The figure below is a website view of the application. Next, the user logs in by entering a nit or a nip and fills in the password that has been given and set.

Figure 3. Application website dashboard view

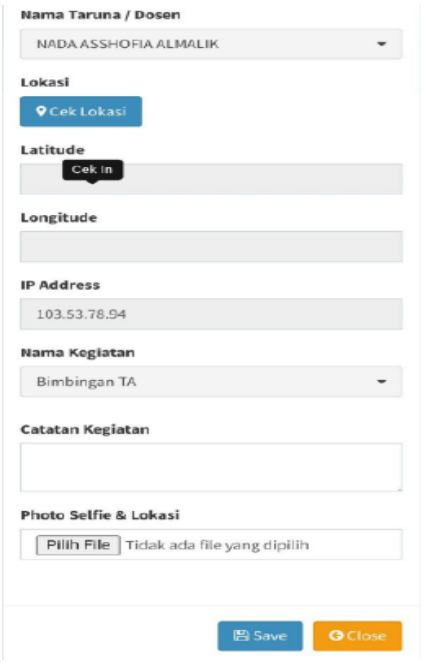

Figure 4. Application Form Feature

In the picture above are features presented on the absence web designed by the author and adapted to the needs of the digital absence system in the Aviation polytechnic of Surabaya.

2. Web Application Database
   The following figure shows that the author's web application design has an admin part database

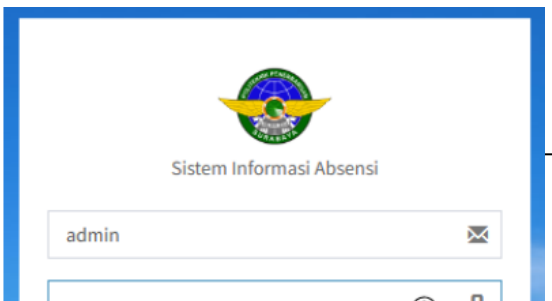

Figure 5. Login as admin

In the above image describes the login as an admin with the username and password that has been specified by the admin of the web application used

Figure 6. Master data menu

The master data menu, which consists of four sections for users, is described above. A place where users can be added to use a web application. There is also a menu for adding classes, scheduling classes and setting

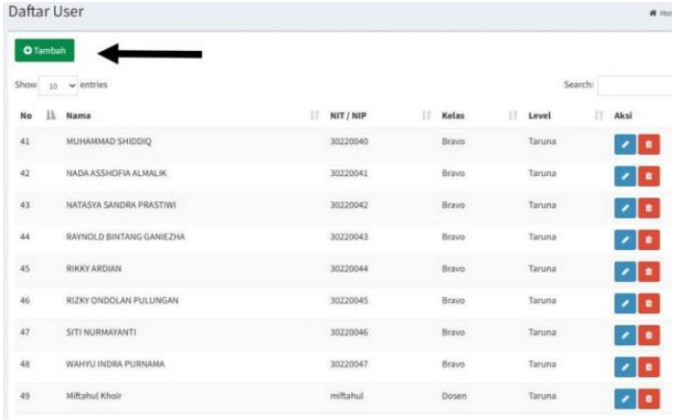

Figure 7. User List

The picture above is an example of the 4 features above which is a list of users of the web application, and in this menu the admin can also add the user of the application.

In the image below is the absence report menu that is useful as proof of the presence recording data to be submitted to the authority. In this menu you can also print the report results by selecting which parts you want to print and then click Print report.

Figure 8. Absence report

3. Evaluation of Effectiveness of Performance Compliance
   To evaluate the effectiveness of a GPS-based presence system on performance compatibility, the following steps can be used :
   a. The purposes of the evaluation and the criteria to be used to assess the suitability of the performance of a GPS-based presence system. We can consider the accuracy of users' arrival and return times, the reliability of systems, ease of use, or implementation costs.
   b. Relevant evaluation metrics to measure the effectiveness of the presence system. can use metrics such as percentage accuracy of the arrival time, percentages of accuration of the return time, or the number of absences properly detected.

Table 1. Summary of absence time

Presence/ Delay Time		
Arrived on time	More than 5 minutes	Not present
19	3	2
67,83%	20,43	11,74

From the above data can be drawn the conclusion that the rate of cadets delay in class more than 5 minutes in the process of less teaching learning activity is only 3 people or 20.43%. And cadets present on time has the highest presentation and is categorized at a safe level.

   c. Collection of data necessary for evaluation, such as presence data recorded by a GPS-based presence system, manual presence information.

LAPORAN ABSENSI

No	Tanggal	Nama Kegiatan	Mata Kuliah	Catatan Kegiatan	Status Kehadiran	NIT	Nama Taruna / Dosen	Kelas	Waktu	Approve
1	08/08/2023	Bimbingan OJT		melakukan pembelajaran lebih rinci terkait alat navigasi di	Hadir	30220007	FAHMI JALALUDDIN	TNU 13 A	14:18:33	✓

Figure 9. Absence Report data collection

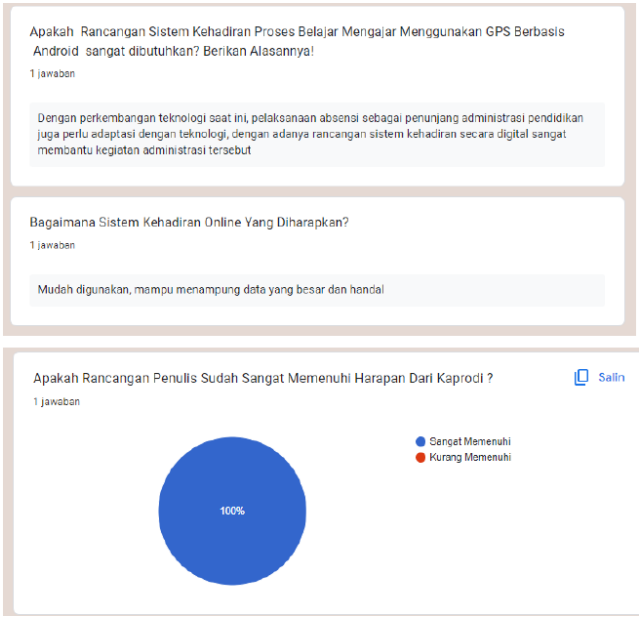

Figure 10. The result of the survey questionnaire.

The image above shows the results of the questionnaire survey given by the author to the program administrator and the head of the Air Navigation Engineering program.

d. Analysis of data collected to evaluate the effectiveness of the presence system. Compare presence data recorded by the system with manual or other source data to measure the accuracy of the system. Also, analysis of survey data to obtain user input about experience using the presence system

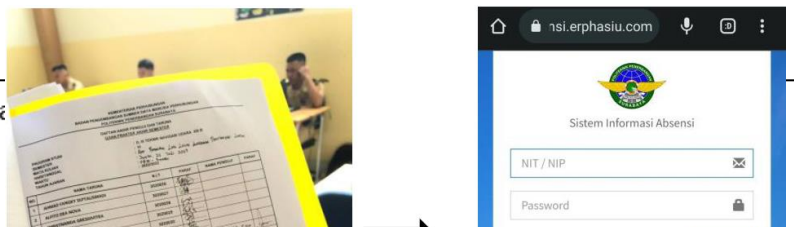

Figure 10. system comparison

The above picture shows that the data obtained from a digital system is more accurate because the digital system has real-time features.

e. Evaluation of the results

Evaluating the results of the analysis to understand the level of efficiency and suitability of the performance of the GPS-based presence system. Identifying the advantages and disadvantages of the system as well as areas that need to be improved. Also, pay attention to user input to understand the system experience and fix any weaknesses that may exist. With the presence of the above data can be said the application system has an important role to the teaching learning process. With the existence of the system application based on android with more integrated GPS features each administrator or lecturer can monitor the activities of the cadets so that it can anticipate when something unwanted happens and the absence of cadets in the learning process

CONCLUSION

This design technology can help faculty and administration monitor students accurately. The use of digital systems can also reduce the use of paper and the time required for manual absences, which has a positive impact on environmental sustainability. With the presence of an Android-based application system with more integrated GPS features, every administrator and lecturer can monitor the activities of the cadets so that they can anticipate when something unwanted happens and the absence of cadets in the learning process.

The presence system of the teaching learning process has been developed to become more modern and is expected after becoming a mobile application can be used to further facilitate the performance of cadets and Teachers. The features the author uses in this system are time, name, date, status, photo, location, description. Hopefully further research can be developed so that this system has more sophisticated features.

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