APPLICATIONS DEVELOPMENT OF OUTDOOR ABSENT OUT USING FINGERPRINT SENSOR AND GPS BASED ON ANDROID FOR OFFICER IN LAPAS SUKAMISKIN BANDUNG

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ABSTRAK

Process absences on duty outside is still in the form of a text message or telephone media to confirm that officers who are tasked out has being in a place that was assigned, and this poses some problems. The first problem detection is the officer assigned to served out already in place that was assigned, the fact that no officers were in the area assigned. The next problem is the process where the outside service attendance is not practical, as well as between the time of the recording of attendance and absences performs the less accurate. On the basis of some of the problems that have been exposed, then application development needs to be done outside the Department for employee absences Lapas Sukamiskin Bandung expected later applications to be built can overcome the solution. On the results of the analysis and implementations on this final task can be aware that application was fulfilled, Since the system already built can be used as appropriate. Then these applications had already reached the goal, that help the process of attendance to be more practical, and minimize the possibility of cheating at a time when the process of absences on duty outside.

Keyword: Absences, fingerprint, GPS.

1. INTRODUCTION

1.1 Lapas Sukamiskin Profile

Sukamiskin penitentiary in Bandung is a first class correctional facility in Indonesia, and is the Government agency that serves as a House of detention. It was built in 1817 by the architect of the Netherlands, named Prof. CP Wolff Scjoem, currently the building has at least 120 employees of which employees and shift staff. The system of work at the Sukamiskin Penitentiary in Bandung is divided into two, in and outside the Office. Dinas in intended for employees who work in the area or in the Office, while on duty outside the intended for officers who are ready to accept commands work outside the area, town, province even as it convenes in the Office area, carrying out training, escort inmate to hospital or court, and others [1].

Based on the results of interviews with one of the staff person who manages the staffing data, Surahman, S. H., absences on duty outside as long as it is still in the form of a text message or telephone media to confirm that officers who are tasked out has been in place assigned, and this poses some problems. The first problem is the detection of fraud by means of confirm text message or via the phone's media that the officer assigned to served out already in place that was assigned, the fact that no officers were in the area assigned. The next problem is the process of recording data on absences on duty outside that proved cumbersome and less accurate.

On the basis of some of the problems that have been exposed, then application development needs to be done outside the Department for employee absences Lapas Sukamiskin Bandung expected later applications to be built can overcome the solution. On the research of this android-based mobile applications built, since android is the operating system of the phone are very common and easy to use. While the back-end application dioprasikan by admin web-based.

1.2 Goal And Purpose

The purpose of this research is to build applications outside sensor utilizing the service absent fingerprint and GPS-based android for officer Lapas Sukamiskin Bandung. While the goal will be achieved in this research are as follows:

1. Be able to minimize and avoid cheating absences that occur when the officer served outside.
2. Can make the process of attendance outside service become more practical and accurate.

2. THE CONTENT OF RESEARCH

2.1 business rules that run

The rules of running a business is done by the method of interview and observation to the Sukamiskin Pemasyarakat Bandung Institute to get

a complete overview about the system that is running at the moment. Operations performed outside office procedures include the following:

1. Before performing tasks outside the Office, the officer comes to the lapas beforehand to discuss strategies outside service tasks with the staff person who manages the staffing data.
2. The officer on duty outside the mandatory set of strategies the escort for the sake of anticipating the possibility of an urgent and another delay to the place of destination, and not leaving the place.
3. Officers who will serve outside the given mail command.
4. The officer on duty outside generally amounted to 1 person plus a driver, but adakala done more than 2 people.
5. Service beyond the performed 2 people or even more generally occur on a training assignment.
6. Mandatory use full service outfit during the implementing tasks.
7. while performing duty outside, officers must be on duty outside the service area.
8. Prohibited until late at the destination, and is expected to come at least 15 minutes prior to the start of service beyond the time specified in the warrant.
9. Prohibited Conduct escort outside the goals listed in the warrant and does not go beyond the time of rebellion have been determined.
10. Start and complete service beyond the performed according the hours listed on the warrant.
11. Officer on duty outside of the required to provide the information when arriving at your destination and you're done doing an outside agency.
12. The information about the start or completion of the external service tasks has been reported by a representative if the task service beyond the performed more than 1 person.
13. The Representative reported on the outside agency-related information, conducted by officers with first-order referring to the warrant.
14. The information reported to the staff section of the staffing data manager.
15. The outside agency do the task Finishes right back to the lapas.

2.1.1 The outside Agency business rules for the system to be Built

1. Setting the service beyond the performed by admin (staff Manager staffing data) through the web platform.
2. Mobile applications used by officers who get service beyond duty.
3. Mobile application displays a notification when getting the assignment.
4. Mobile application displays a guide line to a location outside the Office.
5. The officer must reside in the specified area to do attendance started and finished the task on duty outside.
6. In order not to disturb the outside service and minimize the occurrence of the delay: attendance entry done before starting. While the attendance in out done after completion of the appropriate time listed on the warrant.
7. Application displays tasks only for data that is appointed as Chairman of the trip outside.
8. Absentee Applications cannot be used if the officers have yet to get the assignment.
9. When an outside agency officers have conducted activity absences outside service in or out, then attendance in or out buttons can't be used again.
10. The officer may not use similar Fake GPS application.

2.2 Analysis

2.2.1 GPS Analysis

GPS technology on Smartphones to get used to the location of the users that have these devices in real-time. In this application, to be able to do activities outside service, attendance officer should really be in the outer office locations that have been defined and limited by the admin, the employee attendance data will be sent via the Android-based smartphones will identified the existence of the position of the officer.

Determination and demarcation of the central point of the location of the Office beyond prescribed by admin of the webservice, starting from the coordinates of the location of the external service which consists of latitude and longitude, the coordinates are taken from Google Maps. The restriction in question was the only officer who was in the area of the specified location that can perform the activity of the absentee, if GPS identify the existence of the position of the officer in outdoor location specified, then the authorities can't do attendance Office activity outside.

2.2.2 Architecture Analysis

This step is the stage to get a general overview of the system back-end and front-end that will be built. Be it the description of a web-based back-end system that is operated by the admin as well as an overview of front-end systems for users of mobile applications at Sukamiskin Lapas Bandung. In this architecture, analysis does is describe and menjeleskan how the system on the back-end and front-end runs.

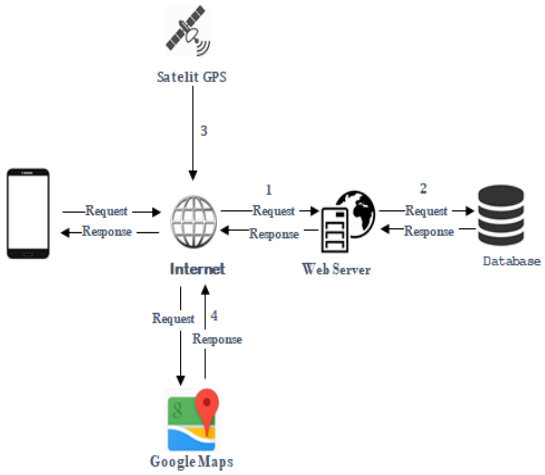


Figure 1 Architecture analysis of mobile platforms

The following is a description of an overview analysis of the architecture on the android platform:

1. Mobile devices do request absentee data to the web server.
2. If the server receives a request absentee data, then the server will retrieve data from the database and provide the requested type of data to mobile devices in the form of JSON.
3. GPS satellite reading existence outside service officer location via mobile phone. If the officer is outside the tolerance area outside service attendance, then the process can not be done.
4. Request to Google Maps is done to get a guide to travel outside.

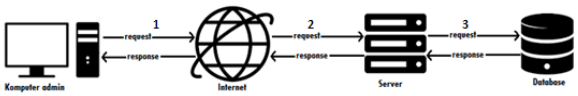


Figure 2 Architecture analysis of web platforms

The following is a description of the architecture analysis overview on web platform:

1. admin's computer via the internet, connect to the database through the internet to perform the request.
2. Server accommodates the request data and retrieve data from the database.
3. After getting the data from the database, then the data will be sent to the admin's computer over the internet.

2.2.3 Geofencing Analysis

Geofencing technology application of absence on duty outside is used to restrict the location of the service outside. So officers know the tolerance of outside service area specified by the admin, and by the time officers entered the office location has been marked by geofencing, will get a notification that the officer enters the area outside service.

2.2.3.1 The Mechanism Of Determining The Point Geofencing Area

The latitude and longitude coordinates of the point of the area that will be given Geofencing, with how to enter the address of the place of the outside service, then latitude and longitude will automatically didapatakan with the help of Google Maps. Then has a diiunputkan to limit the attendance area of tolerance.

2.2.4 Fingerprint Analysis

Fingerprint technology used in the outer Office of absentee applications, is to mengautentifikasi about the accuracy of the employee's identity through fingerprints. To be able to use applications that are built on this, at least the version of android is Marsmallow 6.0 and have a fingerprint sensor. For the minimum SDK on Android studio is 2.43, and then to use the fingerprint should be adding code permissions USE_FINGERPRINT.

2.2.5 Analysis Of User Needs

Analysis of user needs is a process of analysis that explains that the user is involved in the use of the system. Based on table data that will be explained below, the user needs analysis required android mobile application operation capabilities of the officer on duty outside and admin as the people who manage the settings-the settings are available on the website to manage a trip outside, such as add, update and view the data. The following table of characteristics of an existing user:

Table 1 Analysis Of User Needs

No	User	Existing capabilities	The required capabilities
1	Admin	Understand the use of the computer and understand the use of the internet.	Understand how to select officers, determine the location of the outside service, the addition of data on a website, create, update and delete.
2	The Officer On Duty Outside	Understand the use of mobile applications on android	Understand how to search an object and understand application settings

2.2.6 *Use Case Diagram*

Here is a Use Case diagram, Timesheet Application Service Outside Sensor Utilizing Fingerprint and GPS-based Android for Employees Lapas Sukamiskin Bandung:

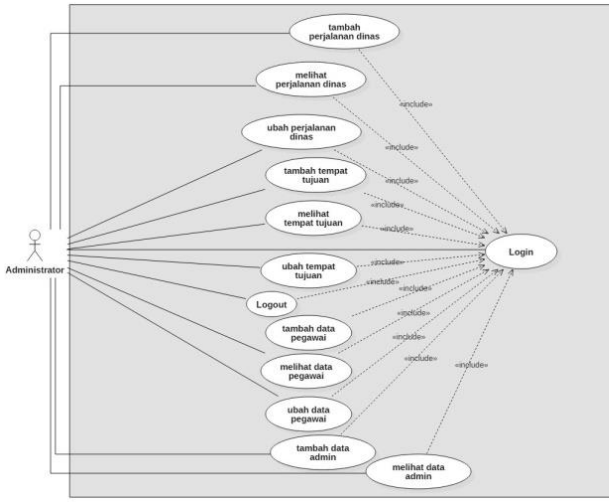


Figure 4 Back End Use Case Diagram

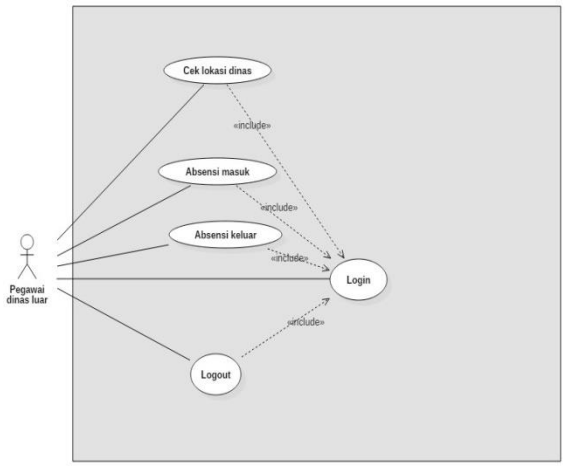


Figure 3 Front End Use Case Diagram

2.2.7 Relation Table

Below is a table relation is found in the outer Office of absentee applications development at Sukamiskin Lapas Bandung:

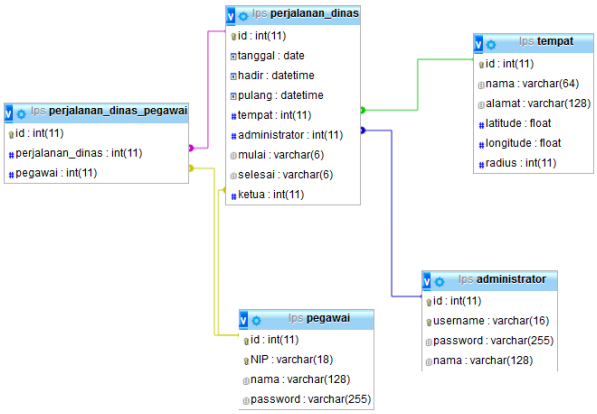


Figure 5 Relation Table

2.3 Implementation

2.3.1 Hardware Implementation

Hardware that implemented in application development Course Outside Office in Bandung Sukamiskin correctional facility utilizing technology geofancing. As for the hardware used is a Laptop and a Mobile phone as follows:

Table 2 Laptop hardware specifications

Device on a laptop		
No	Hardware	Spesification
1	Processor	Intel core i3
2	RAM	4 GB
3	Harddisk	500 GB
4	Monitor	14 inch

Table 3 Mobile phone hardware specs

Device on a Mobile Phone		
No	Hardware	Spesification
1	Processor	Octa-Core 1.40 GHz
2	Memori	2 GB Ram, 16GB ROM
3	Jaringan	4G
4	Monitor	5.0 inch

2.3.2 Software Implementation

The software implemented in the outer Office of Absentee Applications Development at the Sukamiskin Penitentiary in Bandung as follows:

Table 4 Laptop Software Implementation

The software on the laptop		
No	Operation System	Spesification
1	OS	Windows 7 32bit
2	*Web browser*	Mozila firefox, Google Chrome

Table 5 Implementation of Mobile Phone Software

Software On Mobile Phone		
No	Software	Spesifikcation
1	Sistem operasi	Android 6.0 Marshmallow

2.4 Testing System

Testing of these systems is an important stage in the development of the software. The purpose of the testing system is to find out whether applications built worthy or not, so it can be known whether the systems meet the appropriate criteria of purpose and the purpose of the construction of the system. Here is an application development testing plan absent on duty outside sensor utilizing fingerprint and GPS-based android for officers in Lapas Sukamiskin Bandung.

2.4.1 Scenario Testing

This test scenario presents sequences as well as anything that was tested on the backend and the frontend application. The following is a scenario of exposure is done:

1. **Scenario testing on Back End**

On this test describes a test on the backend applications or websites operated by Admins. Here is how to add a trip out on the back end applications.

Table 6 Trip Table Structure

No	Grain Testing	Types Of Tests
1	Add the data service tasks outside	*Blackbox*

- **Tesing the Add Data Service Task Outside**

Add test data to travel is a test done to test field on the add form data as shown in the following figure:

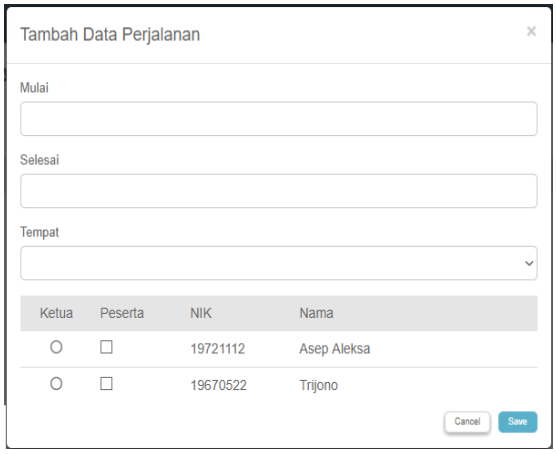


Figure 6 Form "Tambah Data Perjalanan"

Based on the above picture, further testing done on 2 field that is started and finished.

A. Field Testing "Mulai"

Data input rules A1: must consist of 12 digits consist of the Tanggal, Bulan, Tahun and Jam of the start.

Table 7 Add Test Results "Tambah Data Perjalanan" A1

Input	The expected results	Ouput	Conclusion
27-02-2018	False	True	Fail
27-02-2018 23:00	True	True	Success
23:00	False	True	Fail

Rule A2: input data can not be added to the letter.

Table 8 Add Test Results "Tambah Data Perjalanan"A2

Input	The expected results	Ouput	Conclusion
27-02-2018 23:00 PM	False	True	Fail
27-02-2018 23:00	True	True	Success

B. Field Testing "Selesai"

Data input rules B1: must consist of 12 digits consist of the Tanggal, Bulan, Tahun and Jam of the start.

Table 9 Add Test Results "Tambah Data Perjalanan" B1

Input	The expected	Ouput	Conclusion

	results		
28-02-2018	False	True	Fail
28-02-2018 22:00	True	True	Success
22:00	False	True	Fail

Data input B2: rules could not be added to the letter..

Table 10 Add Test Results "Tambah Data Perjalanan"B2

Input	The expected results	Ouput	Conclusion
28-02-2018 22:00 PM	False	True	Fail

2. Scenario testing On Front End

On this test describes a test on a mobile application that will be used by officers who served outside.

Table 11 Testing Scenario On Front End

No	Grain Testing	Types Of Tests
1	Absensi Masuk	*Blackbox*
2	Absensi Keluar	*Blackbox*

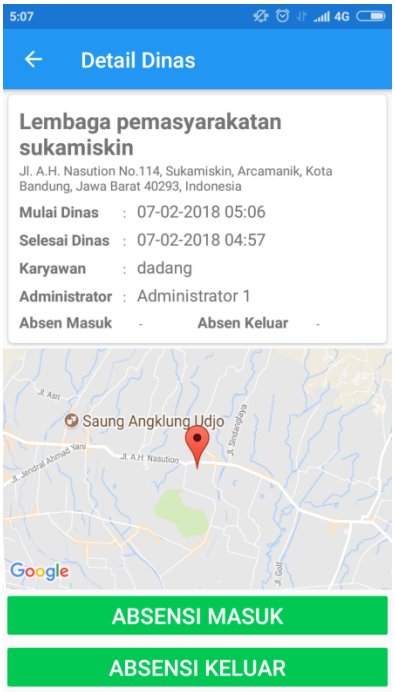


Figure 7 "Absensi" Testing

Table 12 "Absensi" Testing

Activity	The expected	Result	Conclusion
Do "absensi" activities as incoming/out going	success	Success	success
Do "absensi" activities as incoming/out going but not in place of duty service outside	fail	fail	Success

2.3.2 Beta Testing

Beta testing is done at the actual users, i.e. testing performed at the Sukamiskin Penitentiary in Bandung. The user doing the assessment through interviews and questionnaires. The method of interview and a questionnaire was conducted in order to determine whether the application is in compliance with the purpose or not.

2.3.2.1 Interview

Interview conducted using this type of open-ended questions to test application development absent on duty outside sensor utilizing fingerprint and GPS-based android for officers in Lapas Sukamiskin Bandung. Interview about the results of the development of this application to Mr. Surahman, S.H. as a data manager staff personnel

who act as admin back end applications or the web. Here is the interview:

1. According to you, whether this application can minimize the possibility of cheating while on duty outside the absentee process?
   Answer:
   Yes, the application can minimize the possibility of cheating.
2. According to you, whether the application is able to make the process as being more practical?
   Answer:
   Yes, for a absences in external service process is quite practical.
3. According to you, whether the application is easy to understand and use?
   Answer:
   Initially it is indeed less understandable, but after given some direction, the application is quite easy to use.

2.3.2.2 Questionnaire

A detailed questionnaire made addressed to officers who get service beyond duty in Sukamiskin Penitentiary in Bandung to do tests to find out the feasibility of on on mobile applications to be built. Responses on the questionnaire likert scale is made using with a percentage of response as follows:

Table 13 Likert scale percentage value

Answer	Point Assessment
Sangat setuju	5
Setuju	4
Ragu-ragu	3
Tidak setuju	2
Sangat tidak setuju	1

Table 14 Question

No	Question	SS	S	R	TS	STS
1	Whether this application can help the occurrence process of absences on duty outside?	4	6	2	1	0
2	Whether the application is quite easy to understand to use?	2	8	2	1	0
3	Whether in the direction of travel of the task provide recommendations on duty outside this application enough help?	2	6	4	1	0
4	Whether the application is able to give you an idea of the place and the location of the outsic service that is accurate?	2	7	3	0	1
5	Setujukah you, that this application can minimize the occurrence of fraud proceedings outside Office of attendance?	4	7	1	1	0

2.3.1.3 The Conclusion Of The Beta Test

Based on results from beta testing, so some conclusions can be drawn as follows:

1. This application can minimize the possibility of cheating at a time when attendance Office outside.
2. attendance at this application Process is quite practical, as well as the process of activity can help attendance Office outside.
3. This application is pretty easy to use.
4. This application is quite helpful in recommending travel routes out.
5. This application simply gives an accurate picture about the location of the service outside.

3. CLOSING

3.1 Conclussion

Based on the results of the analysis and implementation was done on the task. Then it can be taken a few conclusions from the attendance Office application tujuanpembangunan this out, among other things:

1. Application development absent on duty outside sensor utilizing fingerprint and GPS for android berbasi officer at Bandung Sukamiskin Lapas quite fulfilled, since the system already built can be used as appropriate.
2. The development of these applications had already reached the goal, that help the process of attendance to be more practical, as well as to minimize the possibility of cheating at a time when the process of absences on duty outside.

3.2 Advice

As for a few suggestions to supplement the deficiencies that exist in the outer Office of the absentee application development utilizing fingerprint sensor and GPS for android berbasi officer at Sukamiskin Lapas Bandung, among others:

1. The addition of real-time tracking feature to monitor employees who are performing service outside.
2. Fingerprint Data can be called up and sent to the database via mobile applications.

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