Student Attendance Information System using Telegram Bot API and Visual Basic 6.0

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Article Info :	ABSTRACT
	Student delinquency is a form of student behaviour that deviates from school rules. One of them is truant or irregular entry. Skipping behaviour that is left will give a tendency for students to commit other violations such as brawls, using drugs, free sex and others. Monitoring trusting students is not easy because routine communication between parents and the school is needed. This study aims to create a system to facilitate communication between schools and parents by implementing a fire bot telegram using the long polling method. The system is made using Visual Basic 6.0, consisting of two main parts, namely the attendance system and bot telegram management. The attendance system handles student attendance consisting of fingerprint registration and attendance scans, while the telegram bot management handles the sending of attendance information consisting of telegram ID registration, attendance information and permit information. The test results show the process of taking and sending information via telegram bot runs fast, in the test register of the parent telegram ID the time required is an average of 5.6 seconds, sending scanned student attendance information 4.25 seconds and sending permit information on average 7, 07 seconds.

1. INTRODUCTION

Student delinquency is a form of student behaviour that deviates from school rules. One of them is truant or irregular entry. Skipping behaviour that is left will give a tendency for students to commit other violations such as brawls, using drugs, free sex and others. Monitoring truant students is not easy because routine communication between parents and the school is needed. This study aims to create a system to facilitate communication between schools and parents by implementing a fire bot telegram using the long polling method. The system is made using Visual Basic 6.0, consisting of two main parts, namely the attendance system and bot telegram management. The attendance system handles student attendance consisting of fingerprint registration and attendance scans, while the telegram bot management handles the sending of attendance information consisting of telegram ID registration, attendance information and permit information. The test results show the process of taking and sending information via telegram bot runs fast, in the test register of the parent telegram ID the time required is an average of 5.6 seconds, sending scanned student attendance information 4.25 seconds and sending permit information on average 7, 07 seconds.

2. THEORITICAL REVIEW

2.1. Telegram Bot Api

Telegram, as an instant messaging application, claims to be able to cover some of the shortcomings of Whatsapp. Telegram is a cloud-based application and encryption tool. Apart from that, Telegram also provides a platform for developers who want to take advantage of the Open API and Protocol provided through the development of Telegram bots which are documented on the official website.

Telegram bot has 2 communication methods, namely long polling and webhook. This system uses long polling, Long-Polling, as the name suggests, in theory this method will open a connection that is ready to accept requests as long as the bot server is running, for this method we do not need SSL or Domain names, because it can be run via a laptop or computer. connected to the internet, but the weakness of using this method lies in the speed of reading or replying to incoming requests because there will be a delay of several seconds to read and respond to requests sent by the bot client to the bot server.
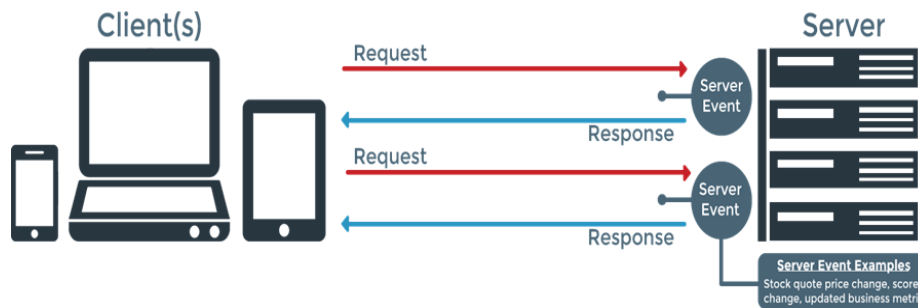

Figure 1 Long Polling Diagram

2.2. Development of the attendance system in Indonesia

The system for recording attendance has undergone changes and developments in its history, until different models for recording attendance have been discovered. The development of the attendance system in Indonesia includes:

1. Delivered orally
2. Recorded on paper
3. Using a checklock machine
4. Attendance using cards such as barcode cards, magnetic stripe cards, or RFID (contactless) cards
5. First generation fingerprint attendance (PC-Based Sensor)

3. METHOD

3.1. Research Methods

The method in this research uses a research and development (R&D) model.

a. Research and Data Collection (Research & Information Collecting)
At this stage, there are 2 things to do, namely literature study and field study. In the literature study, it was used to find concepts and tutorials related to the fire bot telegram and the problem of dealing with truant students. Apart from literature studies, field studies were also carried out or in other words referred to as measuring needs and research on a small scale (Sukmadinata: 2013), namely by analyzing information needs related to student attendance at school.

b. Planning
Formulate problems, determine goals, record the products produced, and develop a preliminary form of product, namely developing the initial form of the product that will be

produced in the form of using the fire telegram bot for information on truant students. In making the system design, the author will use the prototype method for software development. Prototyping is a fast development method by testing the working model (prototype) of a new application through an interactive and repetitive process that is usually used by information systems experts and business experts.

c. Preliminary field testing, namely conducting limited initial trials of software on a limited scale. The trial was carried out using the Blackbox and Whitebox test methods (Hanif: 2007).

d. Main product revision, This stage is an improvement from the results of initial field trials. At this initial product refinement stage, more of a qualitative product approach was carried out, namely by receiving input from the school.

e. Main field testing, limited field trials. In the form of sending messages requesting attendance information and sending image-based permission letters.

3.2. System Design

3.2.1 System Flow Design

At the design and development stage this system is depicted in the system diagram as follows:
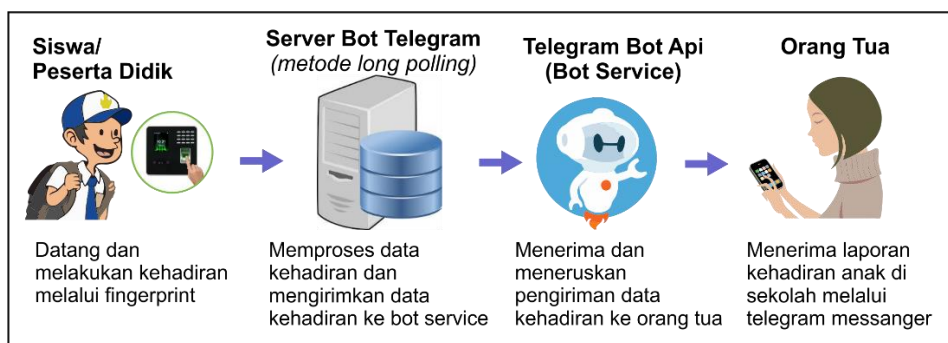

Figure 2 Diagram of the student attendance information system

From the diagram above, it can be seen that the way the student attendance information system works starts from students who come to school for the first time to confirm their attendance by scanning attendance on a fingerprint machine. The real-time finger machine will send attendance data to the telegram bot server computer at the school. Attendance data on the Telegram bot server will be processed and sent to the Telegram bot service to then be forwarded to the parent's Telegram application. Parents will receive an attendance report in the form of the date and time of the student's arrival.
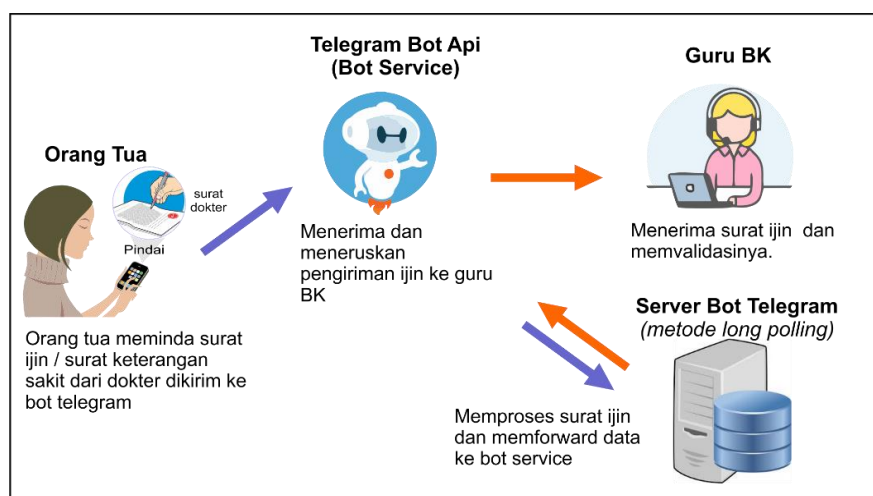

Figure 3 Diagram of sending student permission letters

The student's permission letter/doctor's letter is scanned using a smartphone camera via the Telegram Messenger application and sent to the school's Telegram bot. The message is then received by the telegram bot server at the school. Messages that enter the telegram bot server at the school are then processed and forwarded to the guidance and counselling teacher via the telegram bot service.

3.2.2 Telegram Bot Design

Telegram bot design begins with creating a bot from botfather. The name of the telegram bot created in this research is "Student Attendance Monitoring". The workflow of the Telegram bot is shown in Figure 4.
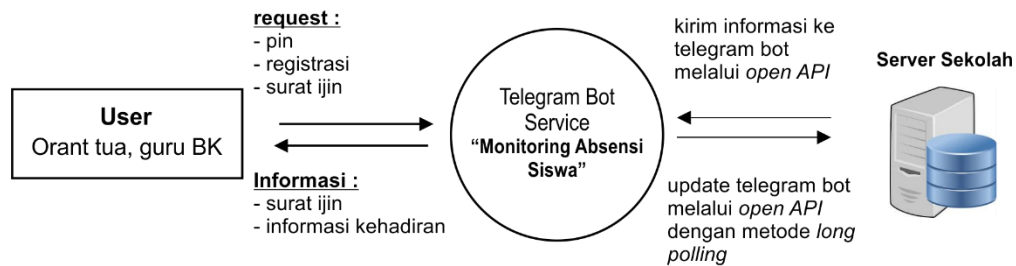

Figure 4 Telegram bot flow diagram

The diagram above explains that the performance of the Telegram bot involves two components, namely the school server and the user. Users can make requests or requests including pins for guidance and counselling teachers, registration and permission letters for students' parents. Users can receive information in the form of permission letters sent by parents to guidance and counseling teachers, and receive student attendance information. The school server component functions to update information on the Telegram bot via the long polling method. Long polls work with a certain period. In this research, long polling works once every 1 second. The information obtained from the telegram bot is then processed and the information obtained is sent back to the telegram bot.

4. IMPLEMENTATION AND DISCUSSION

4.1. Implementation

A student attendance information system using Telegram Bot API was created using a MySQL database for data storage and a desktop-based platform using VB 6.0. The system implementation consists of the main menu, master data, finger, attendance scan and telegram bot API service. The Master data section contains a sub-menu for inputting student data, guidance and counselling teacher data and configuring student attendance schedules. The telegram bot section contains a sub-menu for inputting the name of the telegram bot and its token, displaying incoming messages on the telegram bot and displaying outgoing messages on the telegram bot. The finger section contains a student fingerprint registration sub-menu and an attendance sub-menu for retrieving student attendance data. The report section contains a sub-menu for one-day attendance reports and a monthly attendance recap of student attendance. The Telegram bot API service section is a separate application specifically for taking incoming messages using the long polling method, processing incoming messages from Telegram and sending messages to users. This section is deliberately separated to get good performance in the application.

4.2 Discussion

This page contains menus and sub menus to run the features in this system.

Figure 5 Main page display

The next page is the registration page, this page is used to take samples of students' fingerprints before carrying out the fingerprint scanning process when they come and go home from school.

Figure 6 fingerprint registration page

This process begins by clicking the Student Data button, then searching for students whose fingerprints will be registered. After that, click the Start button to start fingerprint sampling. The fingerprint sampling process is repeated four times for each finger. When finished, click the Save button to save the finger sample to the database. The next page is the attendance page, used to scan attendance or return scans. The display during an attendance scan can be seen in the figure 7
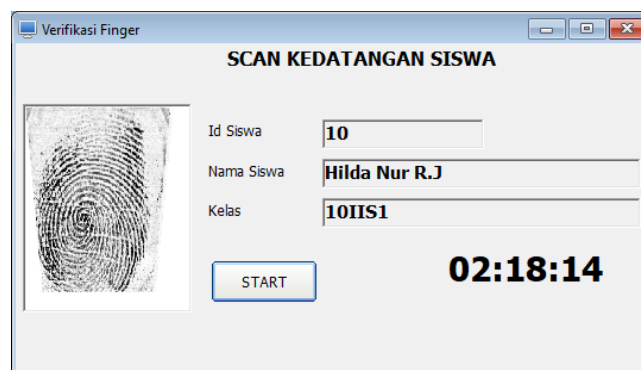

Figure 7 Display of the attendance page

When students scan attendance, the data is saved into the database in the attendance table. Apart from that, attendance data will be sent directly to parents' smartphones via Telegram bot. The information that parents get is in the form of the student's arrival/discharge date.

Figure 8 Example of student attendance information received by parents

Student parent telegram registration is required for the process of registering parent telegram data so that it can be recognized as representing a particular student. This registration process must be carried out first before the parent telegram receives attendance information or other information. If this process is not carried out, all orders sent will be rejected. This registration command uses the format:

/reg [space] nis [space] birth_date(yyyy/mm/dd)

The /reg command is the initial key, nis is the student's registration number and date of birth is the student's birth date in year/month/date format. An example of a registration command is /reg 3023 03/09/2010, the results of this command can be seen in figure 9.

Figure 9 results of the registration command on the Telegram bot

Meanwhile, BK teacher telegram registration is the process of registering telegram data as a BK teacher so that every permission letter sent by parents can be directly forwarded to the BK teacher. This registration command uses the format:

/pin [space] pin_code

The command /pin is the initial key, code_pin is the pin data that was previously created by the admin when inputting teacher data. An example of using this command is /pin 1212. The results of this command can be seen in Figure 10.

Figure 10 Example of telegram registration for a BK teacher

Sending a permission letter is the process of parents sending a photo of a permission letter or a doctor's certificate for their sick son or daughter. The process of sending this permission letter is carried out by taking a photo of the permission letter / doctor's certificate then giving a statement of Permit or Permit and followed by other information. An example of sending a permit letter can be seen in Figure 11.
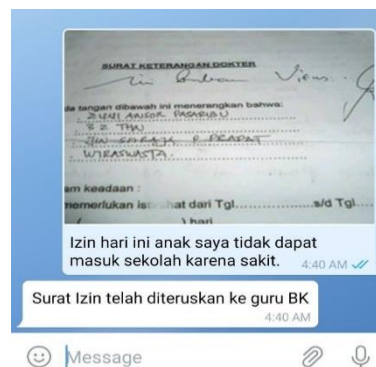

Figure 11 example of sending a permit letter

Figure 11 shows that after sending the permission letter you will get a reply from the telegram bot that the permission letter has been forwarded to the guidance and counseling teacher. Guidance and counseling teachers whose telegram data has been registered will receive the permit information as shown in figure 12.
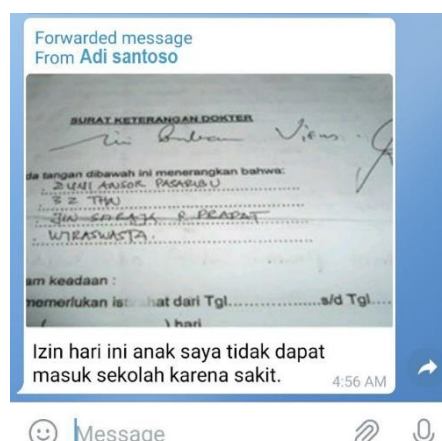

Figure 12 examples of permission letters received by guidance and counseling teachers

4.3 Telegram Bot Testing

In this test, 15 respondents were used, the test consisted of three stages, namely the registration stage, sending attendance information, and sending permission letters. The results of this test can be seen in table 1.

Table 1 results of parental telegram registration testing

Data	Process	Registration process time (second)	Attendance information processing time (second)	Permit processing time (second)
1	Successful	6	3	8
2	Successful	5	5	7
3	Successful	6	4	6
4	Successful	5	2	6
5	Successful	6	4	8
6	Successful	7	4	7
7	Successful	5	5	9
8	Successful	5	5	8
9	Successful	5	5	8
10	Successful	7	6	7
11	Successful	6	6	8
12	Successful	5	5	7
13	Successful	7	4	7
14	Successful	4	4	5
15	Successful	5	3	6

In registration testing the average processing time required is 5.6 seconds, in testing sending student attendance information the average processing time required is 4.25 seconds and in testing sending permits the average time required is 7.01 seconds. Sending attendance information has the fastest processing time because it has the shortest stages, namely sending data when students scan attendance and testing. Sending permission letters has the longest processing time because it requires the stages of sending an image, reading it by a telegram bot, then forwarding it to the teacher and reporting back to parents. Apart from that, the stage of sending a permit requires quite a lot of internet bandwidth because the data sent is an image.

5. CONCLUSION

The Student Attendance Information System consists of two main parts, namely the attendance system and the telegram bot management system. The attendance system records student

attendance via finger scans, while Telegram bot management is used to manage student attendance information. The results of telegram bot testing in the registration section showed that the average time required to register was 5.6 seconds, in the test of sending student attendance information 4.26 seconds and in the test of sending permission letters 7.07 seconds. The results of this test show that sending student attendance information can run well and efficiently.

Suggestions and recommendations that the author can give to readers and other researchers, to carry out further research related to the development of the fire telegram bot for other information besides student attendance information.

6.   ACKNOWLEDGEMENTS

7.   DECLARATION OF COMPETING INTEREST

We declare that we have no conflict of interest.

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