Application of Information System on Students’ Presence in Industrial Working Practice Activity at Vocational High School Using Short Message Service-Based Report

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ABSTRACT

Academic information using technology of Short Message Service or SMS here is used in view of its excellences in practicality and simplicity in use. Short Message Service (SMS) is the most preferable and widely used technology among any realms. This technology, in addition, is present with a relatively more affordable for the facility of sending message data or for transferring information in little capacity in comparison to voice service. The information system application for the students’ presence in industrial working practice (locally abbreviated as PRAKERIN) using SMS-based report uses the system design. SMS Gateway Gammu and MySQL have been used for its application. Information System on the presence of vocational high school (SMK) students doing industrial working practice (PRAKERIN) Prakerin using SMS report was designed as an information provider for supervisors and instructors about the presence of students in the implementation of Industrial Working Practice.

Keywords: Information System, Industrial Working Practice (PRAKERIN) of SMK students, SMS Gateway, MySQL.

A. Background

Vocational high education is education at the high-level education level prioritizing the development of students’ competency for the implementation of certain occupation (Rivai, 2010: 91). Its objective is more focused on (1) preparation for working, (2) career determination, (3) competency development and (4) provisions
from experience that support for work transition from one position to another (Billet, 2011). To prepare the medium level labor force, the role of vocational high education is very strategic and significant. In the context of this perspective, the development of quantity and the improvement of quality of vocational high education (SMK) come to be requirement for the availability of labor force that is expected to be capable of playing a role as the development assets.

The implementation of Industrial Working Practice (PRAKERIN) is a part of Multiple System Education (PSG), an innovation of SMK (Vocational High School) in which the students do a working practice at company or industry. In SMK, it is becoming an integral part from the process of education and training. Industrial working practice as stated in the Book of *Broad Lines of Vocational High Education of 2005* is a form of practice of the implementation of vocational education that systematically and synchronously combines education program school and the learning program through a direct working activity in a relevant, directed work field in order to achieve the comprehension of certain skill. Industrial Working Practice is a process of consolidation and development of individual competency in term of knowledge, skill and attitude to obtain, improve and/or increase the quality of work to be more meaningful.

The implementation of PRAKERIN is not simple so – it requires a preparation for any conditions that enable it applicable at best. In preparing the program of PRAKERIN, there is a need to analyze the competence that must be mastered by students in accordance with the standard of basic competence as stated in syllabus. Yet, socialization of its implementation under the supervision of school, supervisor and instructors in field is becoming the core part that must be well concerned. In addition, good cooperation to control the activity of students in PRAKERIN, started from the provision of task description, direct involvement in the work process to the composition of final report of its implementation. This is started from the monitoring of students’ attendance at the place of traineeship that has been indicated not well regulated. The industry, as the traineeship place accepting the students as the participants of PRAKERIN in a quite large number from any various schools, find it difficult to detect the level of students’ attendance one by one. Similarly, the difficulty is also faced by the officials at school that send the participants of PRAKERIN in several groups in any companies or industries. The supervisor, in this case, is responsible for managing several groups of students in PRAKERIN, yet in the implementation of monitoring its activity; it is limited merely in delivering the students, supervision in the middle of implementation and in picking up the students at the end of program. The presence of students is only found out through the attendance sheet prepared in the place of traineeship. This practice is so prone for indiscipline acts that break the work discipline.

SMS-based system using cellular phone media is aimed to facilitate, accelerate, and economize the information access required by students, supervisors and instructors. The well scheduled implementation of PRAKERIN program can be performed without any hinderance caused by the absence of the students. The presence of the students in the PRAKERIN program is tightly related to the scheduled activities arranged by the industrial party that indirectly has involved many parties
comprising object divisions, preparedness of informants/ PRAKERIN counterparts and direct communication about the continuity of PRAKERIN followed by the students to the school.

B. Objectives
The objective of making the SMS – based information system for the presence of the SMK students as the participants in PRAKERIN is to make a SMS-based application that can serve the request of information about the development of students’ activity and the agenda of any parties and can also manage the registration system, schedule, assessments and the data of supervisors and students. By doing so, students are able to be accessed anytime.

C. Information System of Presence
Information system of presence is a part of a system that manages the academic data and results in information in the form of the presence of participants in an activity. The hindrances in the implementation Industrial Work Practice activity held at SMK often found such as in monitoring the presence of students as the PRAKERIN participants in which it is a responsibility of related parties, namely school (SMK) and institution where this practice is held. The students as the participants of PRAKERIN are expected to be able to show a discipline attitude in implementing the PRAKERIN program by doing the tasks given by industry. This then means that there is a demand that the presence of students during the PRAKERIN program can be fulfilled.

Information System of presence is an application that integrates all processes of PRAKERIN implementation supported by the advanced technology. The application of this information system can comprehensively influence service quality both in service related to the parties outside the educational institution (Front Office) and service related to the internal educational institution itself (Back Office).

The main components in information system of presence using SMS–based report include:

C.1. SMS (Short Message Service)
Short Message Service (SMS) is one of GSM features developed and standardized by ETSI (European Telecommunications Standards Institute) to send or receive short message. SMS refers to text-based short message service using media of cellular phone communication. The mostly used text message is in the form of letter, number or alphanumeric characters. The capacity of one packet of text message is as many as 160 Latin characters. SMS consists of basic service: Short Message Mobile Terminated with the ability of GSM system to deliver short message sent from Service Centre (SC) to one Mobile Station (MS), and result in an information about the sending either in the form of delivery report or in the form of status report with certain mechanism (Nugroho, 2005).
a. **SMS Gateway**

*SMS Gateway* is a platform providing a mechanism to send and receive SMS from mobile devices (HP, PDA phone, and so on) using certain keyword. It is two-way SMS communication and one of functional developments owned by SMS. In general, *SMS Gateway* is a system used to facilitate an individual or an institution of a company to send an equal SMS text at the same time to many people (fig.1). In addition, for being more advanced function of SMS, *SMS Gateway* can also be used to other purposes such as polling, transaction with a system, monitoring and so on.

![Figure 1. SMS Gateway System](image)

**b. Advantages of SMS Gateway**

*SMS Gateway* is a gateway for spreading information using SMS. It can spread a message to hundred numbers automatically and quickly connected only to database of cellular phone numbers without any need to type the hundred numbers and messages in the cellular phone. It is because all numbers will be taken automatically from the database; thus it is very timesaving. In addition, the need for *SMS Gateway* is not exceeding since it only needs a PC using a cellular phone, data cable, GSM card, and a program that can be built as a message sender. *SMS Gateway* can customize the messages that will be sent. A message sender, by using an additional program that can be made by him/herself, can be more flexible in sending information as the message that is sent commonly is various for each receiver.

**c. SMS Gateway Mechanism**

1. Receiving SMS based on the determined keyword
2. Doing certain logical function towards the data received from SMS gateway.
3. Sending information to user based on the keyword in accordance with request.

**C.2. MySQL**

Each user can freely use MySQL but, with the limitation of software, it cannot be used as a commercial derivative product. MySQL principally is a derivative of one of
main concepts in the precious database; namely SQL (Structured Query Language). SQL is a concept of database operation, particularly for selection and data entry that enables the data operation to be automatically used.

C.3. Apache
Apache is an open-source server-side application. Its main task is to result in a correct webpage to the client (requester) based on the code of PHP written by the webpage maker. If necessary, also based on the code of written PHP, it is possible that a database is firstly accessed (e.g. in MySQL) to support the produced content of the webpage.

C.4. Gammu
Gammu is a tool to develop an application of SMS Gateway that is quite simple to be implemented and free of charge. The special qualities of Gammu from the tool of other SMS gateway gateway include: 1). It can be run in both Windows and Linux; 2). Many devices or cellular phone that are going well with Gammu, 3). Gammu uses MySQL database and it can use the application of desktop and interface web-based; 4). Gammu can help to use the features available in cellular phone more efficiently; 5) Both data cable of USB and SERIAL are compatible in Gammu.

C.5. XAMPP
XAMPP is a free software that supports many operational systems. It is a compilation from several programs. It is functioned as a server, in this case, as localhost that consists of programs of HTTP Apache server, MySQL database, and a language translator written in the form of programming languages of PHP and Perl. XAMPP stands for X (four operational systems), Apache, MySQL, PHP and Perl. The program, available and free in General Public License, is a web server that is simple in use and can serve any dynamic display of webpage (Kadir, 2009).

D. PLAN AND SYSTEM MECHANISM
D.1. System Design
Information in terms of the presence of the participants was performed using a very simple method in the use of hand phone and its conformity also could be confirmed between supervisor and instructor in field at the determined time. If there is an absence of the participant, the information given will be supported by the reason of the absence. Finding out the presence of the participants punctually and receiving their daily report indicate a discipline attitude and obedient to order in accordance with the demand of the workplace.

D.2. Work Mechanism of SMS Gateway of Daily Presence
SMS Gateway of Daily Presence is equipped with the scheduled SMS and Auto Forward SMS. The scheduled SMS refers to the facilities made to send SMS to the PRAKERIN students in accordance with the time that has been determined in the menu of scheduled SMS. The content of scheduled SMS is the reminder to the PRAKERIN students to do the SMS Presence with the format that has been
The SMS Presence that has been sent by the students, afterward, will be processed by server automatically to be displayed in the table of recapitulation of daily presence of students.

To validate the SMS Presence sent by the students, the server will forward this SMS of Presence from students to instructor in the industry (SMS Auto Forward). The instructor is asked to send SMS of Clarification to server. In this way, it is possible to the server to process and determine the status of SMS of Presence from student whether it has been in line with the information from the instructor in the industry. The SMS of Presence from the students corresponding to the clarification from the instructor will be soon displayed in the table of daily presence and the students will be sent SMS of Notice that the process of SMS of presence has been complete. However, if the SMS of Presence from the students does not correspond to the clarification of the instructor, the server then will send SMS of Notice asking the student to repeat the presence and coordinate with the instructor in industry. To make it clearer, the flow of Daily Presence SMS is presented in the following diagram.

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1. Notice that the presence of students has been given as instructed by Instructor.
2. Notice that SMS of presence from students is incorrect according to instructor and student is asked to repeat the presence.
The server requires windows-based computer to run the program of SMS Gateway Daily Presence program. In addition, the server also must be connected to the hand phone or modem used to send SMS.

To do management of schedule of sending SMS of Reminder, some following steps must be done:

- Determining the group that will be sent with SMS of Reminder by selecting the box of “Pilihan Penerima SMS” (Selection of SMS receiver).
- Determining time to send SMS of Presence reminder and daily report in the box “Setting Waktu Pengiriman SMS” (Time setting for sending SMS)“.
- Lastly, clicking the button “Aktifkan” (activate) to activate the system and until the set time, the SIMONEV program will send SMS reminder to the group that has been determined.

**Fig 2. Display when SMS reminder has been set**
To see the database from SMS of students’ presence, click the menu of SMS Presensi, then click the sub-menu of Data Presensi.

When there are many data of SMS of Presence in database and consist of data of students, there is a facility to display data SMS only from the students that will be sought that is by using the facility of Cari Data Presensi or Finding out the Presence Data.

The data of SMS of Presence displayed in the program of SIMONEV, furthermore, can be printed to be used as a written report.
E. Closure

E.1. Conclusion

Based on the result of the test and analysis that have been tested in small group, some conclusions can then be drawn as follows:

1. Given the IT-based presence, it can facilitate the academic and administrative management in the implementation of Industrial Working Practice (PRAKERIN) in Vocational High School (SMK).

2. Given the SMS-based information system, it can facilitate the school, in this case, supervisor and administrative staff (server) in implementing academic management that previously has been performed manually.

3. By the creation of this system, it can facilitate the delivery and saving the academic information system available both in Vocational High School (SMK) and in paired institution (du/di) through a well computerized system.

E.2. Recommendation

From several conclusions drawn, it is possible to give a recommendation that will be very helpful to assist the further development of this software. To do so, it can be by improving the display for a better display.

For further development, it is expected to be integrated to other system related to academic matters in Vocational High School such as digital library, e-learning and so on.
F. References


