

# Job Vacancy Information System Based on SMS Gateway as Part of Tracer Study Alumni of UPI Cibiru Campus

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## Abstract

The waiting period for graduates of an educational institution to get a job can be a benchmark for the quality of the institution in carrying out the educational process for its graduates. One thing that indicates the success of the educational process in an institution is the absorption of graduates from that institution in the world of work. To achieve this, an educational institution requires a system that can provide services and specific attention to its graduates in obtaining information related to work by their scientific fields quickly and sustainably. In this paper, an information system based on SMS Gateway technology is designed as a medium that can provide information directly to graduates rapidly and sustainably according to the needs of graduates. The method that we used in this research is the Rapid Application Development method as an information system design method, and Black Box Testing as a test of information system applications that have been developed. This system was built as part of the Tracer Study for alumni of the UPI Cibiru Campus, to provide information on job vacancies by the scientific fields of its graduates.

**Keywords:** SMS Gateway, Alumni, Information Systems, Rapid Application Development, Tracer Study Indo-JC, Journal, MS.Word template.

## Abstrak

Masa tunggu lulusan suatu institusi pendidikan dalam mendapatkan pekerjaan dapat menjadi sebuah tolok ukur dari kualitas institusi tersebut dalam menyelenggarakan proses pendidikan bagi para lulusannya. Salah satu indikator keberhasilan proses pendidikan dalam suatu institusi adalah ketersediaan lulusan institusi tersebut dalam dunia kerja. Untuk mencapai hal tersebut sebuah institusi pendidikan memerlukan suatu sistem yang dapat memberikan layanan serta perhatian khusus bagi para lulusannya dalam mendapatkan informasi terkait pekerjaan sesuai dengan bidang keilmuannya secara cepat dan berkelanjutan. Dalam paper ini dirancang sebuah sistem informasi berbasis teknologi SMS Gateway sebagai media yang dapat memberikan informasi secara langsung kepada lulusannya dengan cepat dan berkelanjutan sesuai dengan keperluan lulusannya. Metode yang akan digunakan pada penelitian ini adalah metode *Rapid Application Development* sebagai metode perancangan sistem informasi, dan *Black Box Testing* sebagai pengujian aplikasi sistem informasi yang telah dikembangkan. Sistem ini dibangun sebagai bagian

dari *Tracer Study* alumni Kampus UPI Cibiru, untuk memberikan informasi lowongan pekerjaan yang sesuai dengan bidang keilmuan lulusan UPI Kampus Cibiru.

**Kata Kunci:** SMS Gateway, Alumni, Information Systems, Rapid Application Development, Tracer Study.

## I. PRELIMINARIES

**F**INDING information that is effective and efficient is one of the success factors in the era of industrial revolution 4.0. That also applies to college graduates obtaining information related to job vacancies following their respective scientific fields. The level of success of a college graduate is a shared responsibility between the individual graduates themselves and the extent to which the college pays attention to each of its graduates in achieving success. A university also has an important role in the career development of its students after graduation. That is because alumni are elements that cannot be separated from universities and are representatives of universities. The career development of alumni is very important to be tracked and recorded because their success in the community is also the success of universities. Their feedback also can provide benefits in helping universities to improve the education system and management, especially for standard 3 Form of the National Accreditation Agency of Higher Education (Badan Akreditasi Nasional Pendidikan Tinggi/BAN-PT). By knowing the existence of alumni, universities can measure the extent of success in educating students until they are ready to work. In addition, in the UPI strategic plan for 2016 - 2020, it is written: "the waiting period for graduates to work under three months reaches 70%" (UPI Strategic Plan 2016 - 2020) [8]. So, efforts from UPI as a higher education institution to provide the best service for UPI alumni are required, so that they can immediately get jobs according to their scientific fields.

One of the solutions to the problem of alumni tracer study of a university is to build a better information system that can assist college graduates in obtaining job vacancies information under their scientific fields. In addition to using a complete information system related to tracer study alumni, this research combines the information system using SMS Gateway technology. SMS or Short Message Service is a form of text communication via mobile devices. SMS is one of the most widely used media today. Apart from being cheap, the process is very fast and direct to the destination [4]. Along with the development of SMS technology, now with the SMS Gateway technology, one can send messages not only between one user to another but also directly to several people without a limit on the number of recipients. Initially, the use of SMS Gateway technology was widely used in the business and banking sectors. For example, currently almost all National and Private Banks already use SMS Gateway to provide information to customers. So that customers get detailed information about the amount of balance or withdrawal of their money. The choice of SMS Gateway technology in this study is due to the wide range of signals from smartphones which has become a tendency for everyone.

This article is a development of previous research that the author did, entitle "Implementation of SMS Gateway as a Media for Spreading Academic Information at UPI Cibiru Campus" [6]. This article discusses an academic information dissemination system at the UPI Cibiru campus developed using SMS Gateway technology. From that article, the author thought of developing the idea to create a tracer study information system using a system similar to the system but its implementation is expanded, so that students who previously experienced the system during college, could feel the benefits of the previous information system when they became alumni. Several studies that have been carried out related to the implementation of SMS Gateway are the following: P. Jumri who discusses the Monitoring System for Student Academic Guidance Consultation with SMS Gateway-Based Real-time Notifications in 2012 [5]. T. Husain discussed the application of the SMS Gateway-based adhan time reminder in 2017 [5]. Since SMS Gateway technology continues to develop, the authors implement SMS Gateway technology with an information system that can routinely provide messages

related to job vacancies to alumni of the UPI Campus in Cibiru as a continuation of SMS Gateway technology research in spreading information in the academic environment.

## II. RESEARCH METHOD

In this section, there are two methods that the author uses to complete this paper. The first method is the use of Rapid Application Development (RAD) as an application design method and the data retrieval process carried out by the author.

### A. Application Design Method

The methodology used is Rapid Application Development (RAD) (Pressman, R., S., 2012), with stages consisting of Business Modeling, Data Modeling, Process Modeling, Application Generation, Testing, and Turnover to system testing using the black box method testing. The method was chosen because the RAD method has several advantages, including [9]:

- a. Changes in accommodated system requirements;
- b. Measurable progress;
- c. Short evaluation time due to using automation equipment;
- d. Development time efficiency;
- e. Integration done early can make troubleshooting more and easier.

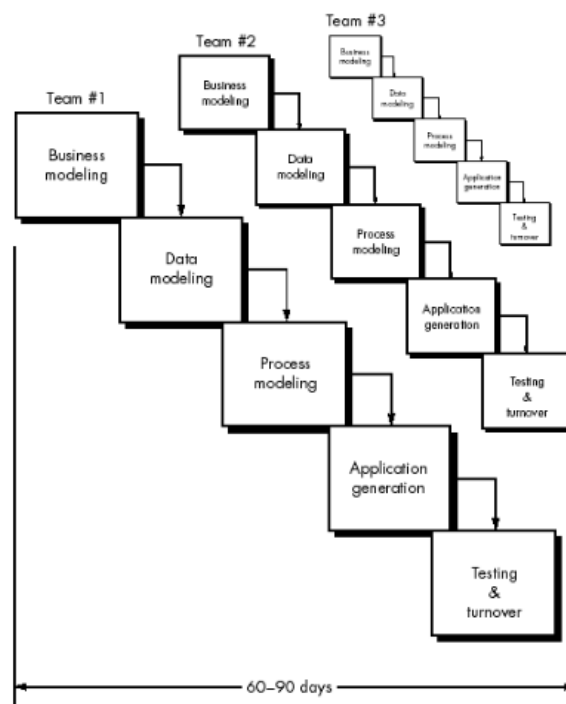


Figure 1. Rapid Application Development Model[8].

In introduction, the context of the study and state the precise objective should be explained. An Introduction should contain the following three parts: background, the problem, and proposed solution. In explaining the background, authors have to make clear what the context is. Ideally, authors should give an idea of the state-of-the-art of the field the report is about. The problem also need to described clearly so that readers able to

understand why they should proceed reading. Authors also need to describe the proposed solution so that readers able to point out what are the novel aspects of authors work. Authors should place the paper in proper context by citing relevant papers.

Figure 1 describes the stages of the Rapid Application Development method that the author uses. The following is an explanation of the stages that the author uses in this study:

**i. Bussiness Modelling**

Business Modeling is the initial stage of RAD. This stage is carried out to determine the identification of components related to research. The results of the identification of these components produce systems flowcharts of ongoing business processes and systems flowcharts of proposed business processes and the Software Requirement Specification (SRS) design of the application development project. In this stage, the author collects several literature reviews related to the study tracer information system based on SMS Gateway which contains job vacancies that are in accordance with the academic background of alumni of UPI Campus in Cibiru with the result that the author will get the primary data source, namely job vacancies from <http://jobsdb.id/> and <http://jobstreet.co.id> . That is because these two sites are included in the two best job search sites in 2019 according to <https://technology.id> [1]wahyuningrum

**ii. Data Modelling**

The second stage is Data Modeling. At this stage, further analysis of the Business Modeling stage is carried out by developing the business processes generated in the previous stage. As for this study, primary data related to the source of job vacancies for alumni of UPI Campus in Cibiru requires several settings in the application of job vacancies. This is done so that job vacancy information can be arranged according to the needs that the author needs as a primary data source. For example, because currently, alumni of the UPI campus in Cibiru are prospective Elementary School and Early Childhood Education (PAUD) teachers, the authors set the job vacancy they are looking for is as a teacher. The following are some of the settings that the author sets in the <http://jobsdb.id/> and <http://jobstreet.co.id> applications which can be seen in Figure 2 and Figure 3.

**My LiNa profile**

Job Alert Title

Email Alert Frequency  Daily  Weekly  Unsubscribe

---

**Job Preferences**

Keyword

Location

Specialization

Figure 2. Notification settings related to job vacancies as teachers every week from <http://jobstreet.co.id>.

Figure 3. Notification settings related to job vacancies as teachers every week from <http://jobsdb.id/>.

After setting up the account, the author gets an email every week regarding job vacancies as teachers throughout Indonesia which are very much needed by Alumni of UPI Campus in Cibiru. Here are some examples of incoming email notifications when setting up the <http://jobsdb.id/> and <http://jobstreet.co.id> accounts that the author has obtained as basic data in the form of job vacancies information that will be tested in the system that the author developed.

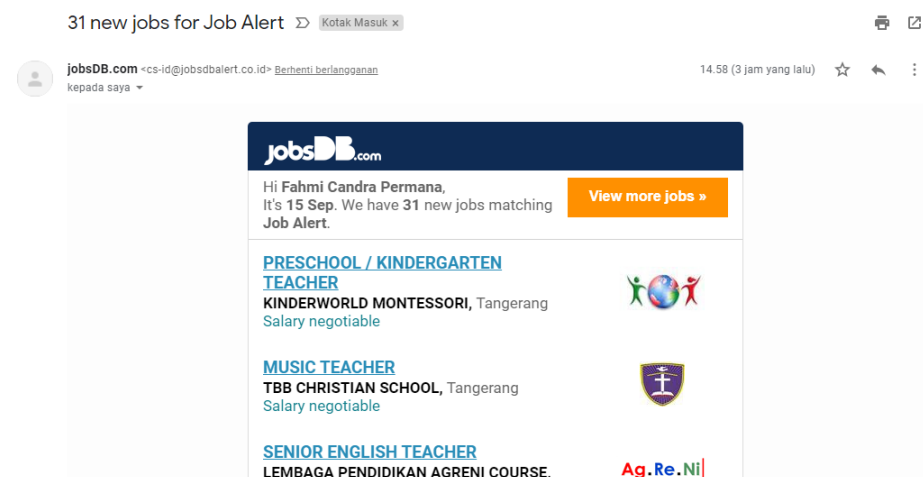


Figure 4. Job vacancies notification from <http://jobsdb.id/>.

Figure 4 shows that the job vacancy notification as a teacher will be forwarded in the SMS gateway application that the author developed.

**iii. Application Generation**

The next stage is Application Generation. At this stage, all the results of the Data Modeling are implemented into a programming language by designing the menu structure and designing the display to produce a beta version of the information system that can be tested for software.

**iv. Testing and Turnover**

The last stage is Testing and Turnover. At this stage, the information system that has been generated from the Application Generation stage is tested using the black box testing method only in functional areas [10].

*B. Data Collection Process*

One of the processes that the author did after the system was formed was the process of retrieving the data of recipients of information in the developed system, then the authors carried out data classification of Alumni of UPI Campus in Cibiru. This is done because some job vacancies have specific characteristics and prerequisites related to graduates from the Primary School Teacher Education (PGSD) or Early Childhood Education Teacher Education (PGPAUD) study programs. In classifying the list of recipients of information from the system that the author is developing, the author classifies them as in Table 1.

Tabel 1. Classification of Recipients of Job Vacancies at UPI Campus in Cibiru

Group Name
Alumni of PGPAUD Class of 2013
Alumni of PGPAUD Class of 2014
Alumni of PGPAUD Class of 2015
Alumni of PGSD Class of 2013
Alumni of PGSD Class of 2014
Alumni of PGSD Class of 2015

Since 2018 the Indonesian Education University has had a student database called the Student Directory System (SIDIMAS), in SIDIMAS the head of study programs can access all student data in full. Although currently SIDIMAS still has many weaknesses, SIDIMAS still continues to improve in terms of data quality and completeness. So currently SIDIMAS is still the primary data source of the system that the author built. But to make sure the data from SIDIMAS is valid, the author performs several validation steps related to the data that has been taken in SIDIMAS. The following is an example of the data contained in SIDIMAS in Figure 5.

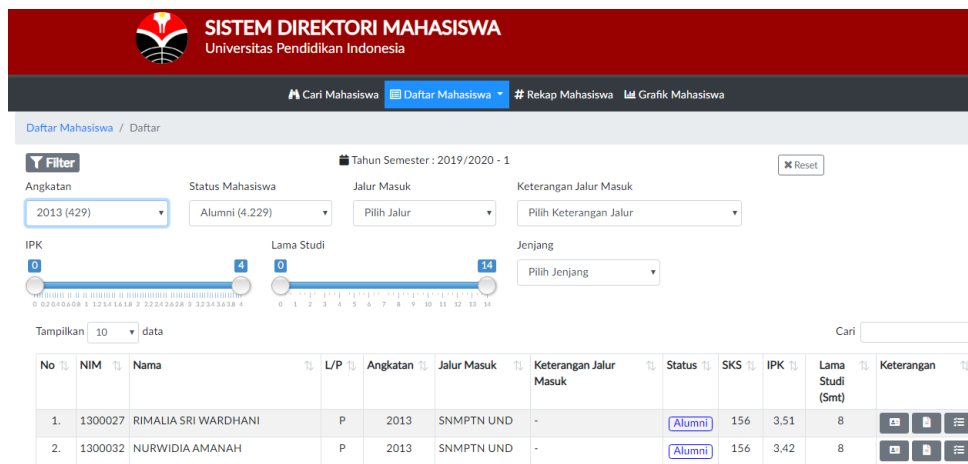


Figure 5. Source of primary data system from SIDIMAS

The data that we collect in this study are the names and cellphone numbers of the Alumni of UPI Campus in Cibiru from the 2013 to 2015 batches who have gone through the data validation process. This validation process was carried out directly by students and several alumni who participated in carrying out this research, in order to obtain data that had been validated and classified as follows:

Tabel 2. Collected and Classified Data Recap

Group Name	Data from SIDIMAS	Validated Data
Alumni of PGPAUD Class of 2013	48	18
Alumni of PGPAUD Class of 2014	22	20
Alumni of PGPAUD Class of 2015	69	57
Alumni of PGSD Class of 2013	407	114
Alumni of PGSD Class of 2014	67	66
Alumni of PGSD Class of 2015	116	115
	729	390

One of the obstacles that the author experienced in this study was the lengthy data validation process. That is because some alumni are already very difficult to contact for various reasons, such as having changed numbers or numbers that are no longer active, so that in this validation process, out of 729 telephone numbers and the number of alumni of the UPI campus in Cibiru class 2013, 2014, and In 2015, there were only 390 numbers whose existence was validated. In other words, this system can only send messages to 54% of alumni of UPI Campus in Cibiru.

### III. RESULTS AND DISCUSSION

After completing the application design and data retrieval process, the next step is testing the system that has been designed and built using the Rapid Application Development (RAD). This application is web based application and until now still using localhost systems for testing use on 2019-2020 academic year.

#### A. System Testing Stages

Testing the black box method is a test of the input/output functionality of the software. The examiner defines a set of input conditions and then performs several tests on the program to produce an output whose value can be evaluated [9]. Module Testing is done by testing the application login module, which is testing when the user is wrong or not registered.

#### B. Modul Testing

Table 3. Testing Application Login Form

Cases and Test Results on the Application Login form			
Data Masukan	Expexted Results	Observation Result	Conclusion
username	The system validates the account with the registered username and will access the system	An error notification appears if the username is not registered, and the user cannot access the system	OK
password	The system validates the account that will access the application by checking the input password	An error notification appears if the password is incorrect and the user cannot access the system	OK
Username and password	The system validates the account that will access the application by checking the registered and input usernames	The user will enter the main page, to access the system if the username is correct and the password is correct	OK



Figure 6. Application Login page filled with incorrect username / password.

Figure 6 shows the results of the case test if the username/password is wrong and or not registered, then after that, a notification will appear like Figure 7 that shows the user does not have access because the username and password input is wrong in the system.

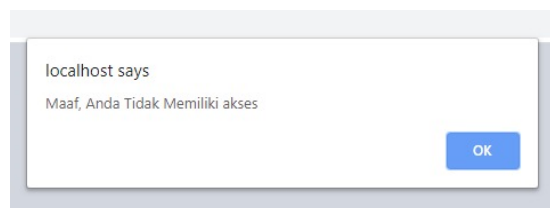


Figure 7. Notification if wrong username/password input

The result of this research is an information system based on SMS Gateway that can be used as a medium for spreading job vacancies for Alumni of UPI Campus in Cibiru. So it is hoped that the process of spreading job vacancies information for Alumni of UPI Campus in Cibiru will be faster, more effective, and help the tracer study process for Alumni of the UPI Campus in Cibiru. The following are the results of the application design that has been built from this research, starting from Figure 8 which shows the start page when the information system is opened.





Figure 8. Application Login Page

The first page that opens is the application login menu, a login menu in the application is required so that only certain people can use this application, on this page, only someone who has a username and password can enter/login on this application.

No	Nama Group	Action
1	Alumni PGPAUD Angkatan 2013	[Edit] [Delete]
2	Alumni PGPAUD Angkatan 2014	[Edit] [Delete]
3	Alumni PGPAUD Angkatan 2015	[Edit] [Delete]
4	Alumni PGSD Angkatan 2013	[Edit] [Delete]
5	Alumni PGSD Angkatan 2014	[Edit] [Delete]
6	Alumni PGSD Angkatan 2015	[Edit] [Delete]

Figure 9. Classification of Recipient Groups in the UPI Campus in Cibiru.

In order for information to be delivered on target, a special group must be formed as a method of classifying recipients of academic information within the UPI Campus in Cibiru based on the status of each recipient. The list of classifications of recipients of academic information in the UPI Cibiru Campus can be seen in Figure 9.

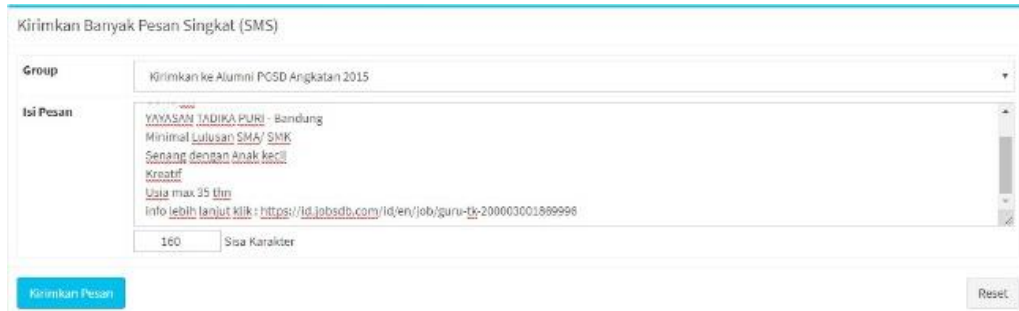


Figure 10. Writing the content of the message to be sent

After selecting the short message recipient list, the next step is to write down the contents of the message to be sent, as shown in Figure 10.

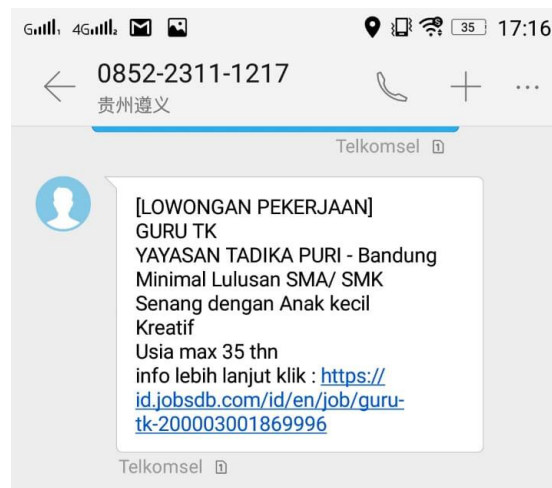


Figure 11. Messages that have been sent and received by Alumni of UPI Campus in Cibiru.

Figure 11 shows the message received by Alumni of UPI Campus in Cibiru after the message was sent by the application admin. One of the advantages of SMS Gateway technology is that there is no limit to the number of recipients who will receive the message to be sent. So if the data has been collected completely, the system we built can easily send messages to all alumni who are registered in the system. Based on the results of system testing using the black-box testing method, it shows that the system can display error notification information on the system that the author developed. This shows that the system has been running well following the expected results.

## V. CONCLUSION

By using the Rapid Application Development (RAD) method in designing and testing the system, as well as job vacancies data from <http://jobsdb.id/> and <http://jobstreet.co.id> in this study an information system has been built. The information system functions as an effort to develop the careers of alumni of the UPI Campus in Cibiru in obtaining information related to job vacancies that are needed according to the scientific field of alumni of the UPI Campus in Cibiru.

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