Development of A Tracer Study Information System in Senior High School with DevOps Method Using Python Application and Django Framework

Dony Novaliendry[1] , Nathasya Utami Hakim[2]*✉,
[1]Electronic Department, Enginering Faculty, Universitas Padang, Indonesia
[2]Electronic Department, Enginering Faculty Universitas Padang, Indonesia
*Corresponding Author: nutamihakim@gmail.com

Article Information	ABSTRACT
	Technological developments are increasingly rapid so that it is no longer something that is not known to the public. The use of computers has developed, especially as an alternative in the assessment of school accreditation administration, including in the management of alumni data known as Tracer study. Tracer Study is an approach that allows institutions or higher education to obtain information about deficiencies that may occur in the educational process and learning process. Data management for alumni of Senior High School 1 Bukittinggi is dominated using paper media and data management is still difficult. By utilizing web technology, information can be accessed without any limitations of space and time. This is intended to facilitate the management of the alumni data list, which was initially still carried out using very commonly used applications, such as Microsoft being the Tracer Study system for Senior High School 1 Bukittinggi which will help manage alumni data. This system is designed using the Python programming language with the Django framework that utilizes the MVT architecture and is combined with the DevOps method, resulting in a system that can be used by schools to manage alumni data. This system provides several services, namely alumni search, filling out questionnaires, verifying reports, and exporting reports.

1. INTRODUCTION

Information technology widely introduces and provides the probability of accessing, processing, utilizing information quickly and accurately. Computer technology can be in the form of information systems that can facilitate the processing of the required information so that it can be delivered more quickly, clearly, easily, and completely. The design of information systems usually uses web technology. By using web technology,

information can be accessed without any limitations of space and time as is the case with programming methods in the construction of an information system.

Alumni are people who have completed or graduated from an institution, school or college (Almanfaluthi, 2009 in Anita Zet Nabila, 2020). The quality, contribution, and role of alumni in an educational institution are very important to know, track, and record because the success of alumni in the eyes of the community is the success of educational institutions, as well as the failure of alumni cannot be separated from the failure of educational institutions.

Alumni data is the most important part to extract information, to find out their existence after graduating from an educational institution that was taken previously. Information provided by alumni has an important role in the success and progress of the school. The use of alumni plays a role in determining the value of accreditation obtained by an educational institution.

Tracer Study is an approach that allows higher education institutions to obtain information about deficiencies that may occur in the educational process and the learning process and can be the basis for planning activities for future improvements. The specific objectives of the tracer study are to find out the relevance of the curriculum implementation that has been applied in universities to the needs of the labor market and professional development in the competence of the department.

In managing data, the alumni of Senior High School 1 Bukittinggi are dominated by the use of paper media and data management is still difficult. This is because the data that has been condensed is still done using applications that are very commonly used, such as Microsoft Word. The application requires retyping so that it often causes inaccuracies in typing, spelling, there are repeated typings, and errors in alumni data. In collecting data on alumni, Senior High School 1 Bukittinggi has not implemented a special information system that can help easily administer alumni data.

Senior High School 1 Bukittinggi is still experiencing difficulties in managing and organizing alumni data. This is because the data has not been managed properly. Placement of files carelessly and irregularly makes it difficult to find the required alumni data. In addition, the lack of available data causes schools to be unable to track alumni thoroughly. As a result, when alumni are invited to attend activities at the school, it does not run effectively considering the lack of alumni information. In filling out the questionnaire, Senior High School 1 Bukittinggi still uses paper media, causing the data recap process to take a long time. With the large number of graduates from Senior High School 1 Bukittinggi and the collection of alumni data is not optimal, alumni who are in the city of Bukittinggi or outside the city of Bukittinggi at least fill out alumni data to the school or via SMS or telephone.

In an effort to facilitate the improvement and development of alumni data management in the administration of tracer study data, alumni data, and tracer study

reports, a web-based alumni tracer study information system was designed using the Django framework.

2. RESEARCH METHOD

The design of the Tracer Study Information System for Senior High School 1 Bukittinggi uses the DevOps method. According to Raden Budiarto Hadiprakoso (2020), DevOps is a method that combines software development (Development or Dev) and IT operations (Operation or Ops). DevOps aims to shorten the system development cycle with high software quality. According to Mitesh Soni (2019), DevOps is a culture that focuses on people, processes and tools to automate the application cycle to produce high-quality software at a faster time to market to gain a sustainable and competitive business advantage. This method emphasizes more on communication, collaboration, and integration between developers and IT professionals, so that the development and operational divisions work closer (Galih, 2013). The research method used in this system is a software development method with a DevOps (Development and Operations) development model. This development model emphasizes more on communication, collaboration and integration between the developer and IT professionals. The purpose of DevOps is to shorten the system development cycle and provide features, fixes and updates that are in line with the objectives to be achieved. This model consists of several stages which can be seen in the figure. The following are the development stages of the DevOps method.
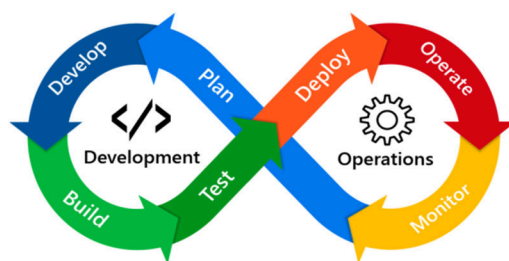

Figure 1. *DevOps Model*

Figure 1 states the stages that will be passed by the system using the DevOps model method.

Running System Analysis
Based on the results of observations of the BPM FT UNP document management process, several things are needed to help manage data for Alumni of Senior High School 1

Bukittinggi. An analysis of business processes, analysis of business rules, analysis of business actors, document analysis, to analysis of problems and solutions is carried out.

System Analysis Proposed

Based on the analysis of the problems and solutions found, a Tracer Study Information System is proposed to assist the data management of Senior High School 1 Bukittinggi alumni. In this system, the flow of document maintenance that was originally not managed optimally, can be faster and more precise. The following is a flowmap of the proposed system, which can be seen in the figure.
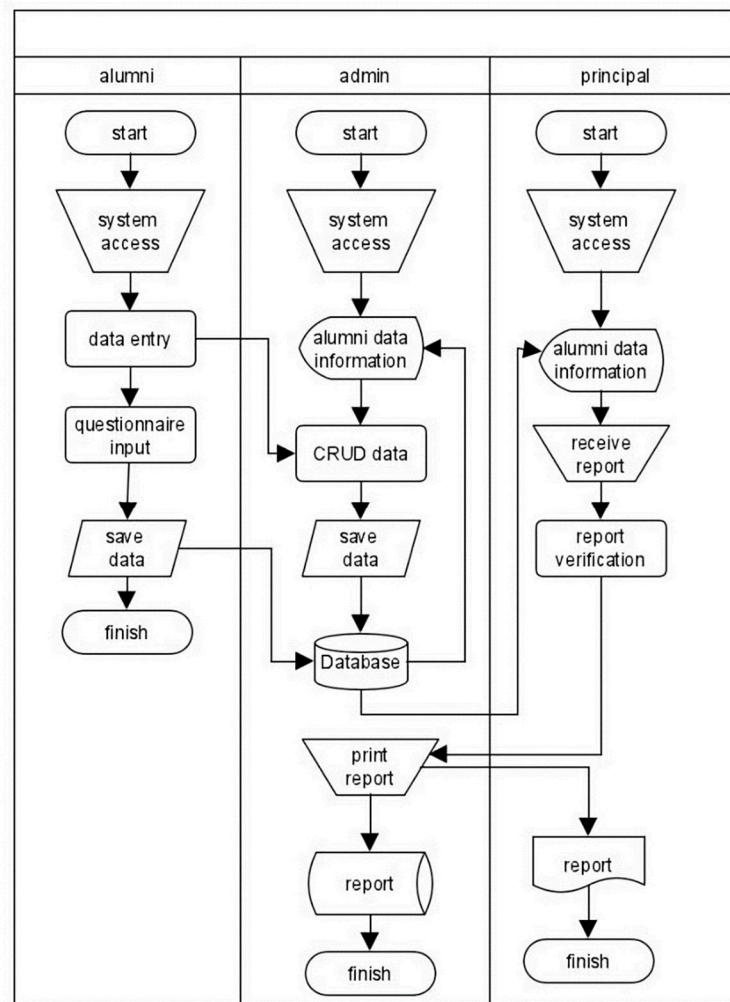

Figure 2. *Flowmap Proposed*

System planning

System design is carried out with the intention of providing an overview of the system to be made. The most dominant thing to do in system design is to model the needs of system users.

Use Case Diagrams

Use Case Diagrams describe the relationship between actors and what activities can be done on the system. The Tracer Study Information System will involve 3 actors with respective access rights according to the needs of each actor.
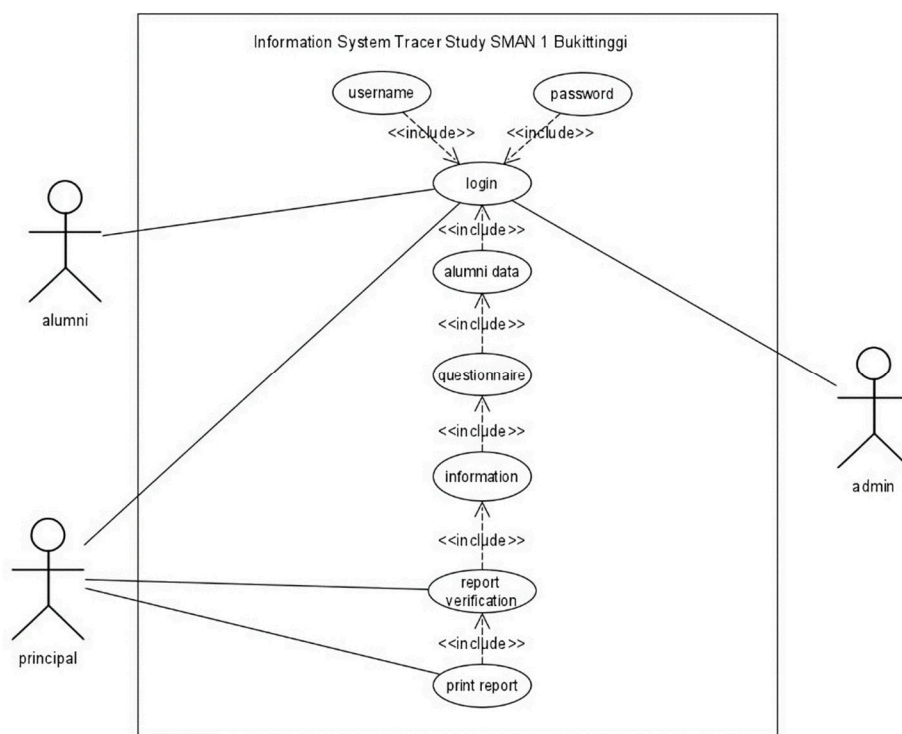

Figure 3. *Use Case Diagram*

3. RESULTS AND DISCUSSION

Starting from the interface design, then apply the design into the program code to be able to display a layout. The layout view can facilitate the interaction of the entire system interface. The following is the result of the display design for the Tracer Study Information System of Senior High School 1 Bukittinggi.

Dashboard Page

This page appears when you first access the system. This page is public, meaning that all users have the right to access this page, namely alumni, principal, and admin.
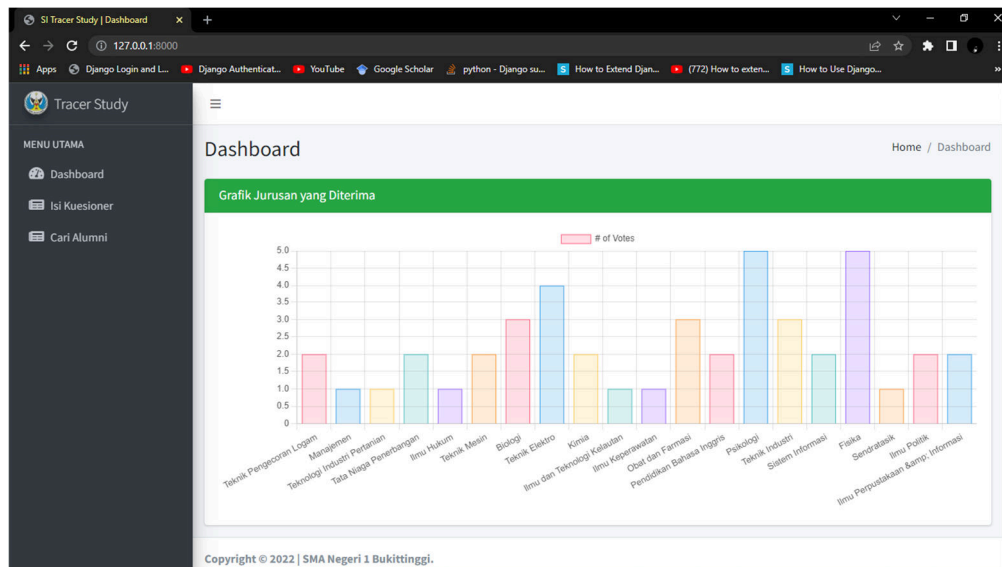

Figure 4. *Dashboard Page*

Search Result Page

This page displays alumni search results which all users have the right to access.

Figure 5. *Search Result Page*

Export Result File

This file is formed from the results generated from the questionnaire. The answers to each question will be grouped into each diagram.
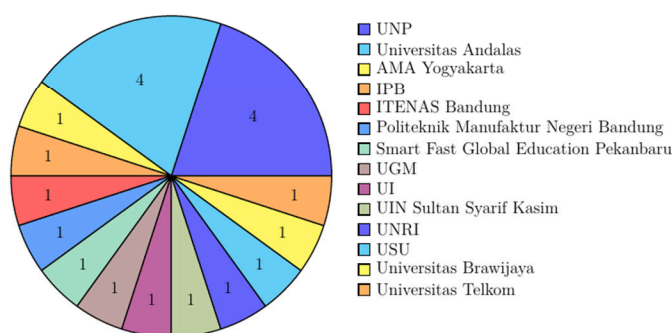

Figure 6: Partisi ulang respon-respon untuk pertanyaan 'Universitas yang didapat. (Jika tidak ada, kosongkan)'.

Figure 5. *Add Answer Form Page*

Discussion

The Senior High School 1 Bukittinggi Tracer Study Information System has several users, namely alumni, principals, and admins. Alumni users can access the page publicly to fill out the questionnaire. This system is designed to make it easier for schools to search and find alumni lists that could affect school accreditation by using the web-based Python programming language with the Django framework and several other tools such as MySQL, XAMPP, HTML, Javascript, Visual Studio Code. Python programming language was chosen because the syntax provided is easier to read, simple, and also provides so many adequate packages/modules.

4. CONCLUSION

This system provides user management features, questionnaire management, report management, report verification, and alumni search. This feature can be accessed by students of Senior High School 1 Bukittinggi, alumni, and one special access right for system admin entrusted by the school. This system was built to update the management of the alumni list which was originally done conventionally to become information technology and computer-based management. However, even so, this system still has

several drawbacks that need to be added further, namely it cannot export directly in pdf form because it must be generated first via the command prompt, cannot display graphs in real time, cannot import from excel to database.

REFERENCES

[1] R. F. Ahmad, & N. Hasti, "Sistem Informasi Penjualan Sandal Berbasis", Web. *Jurnal Teknologi Dan Informasi*, *8*(1), 67–72, 2018.

[2] R. Akbar, & M. Mukhtar, "Perancangan E-Tracer Study berbasis Sistem Cerdas", *Jurnal Sisfokom (Sistem Informasi Dan Komputer)*, *9*(1), 2020.

[3] H. Aminudin, & I. G. L. P. E. PriSenior High Schoolna, "Pengembangan Sistem Informasi Penilaian Portofolio Siswa (SIPPS) Berbasis Website Untuk Mengetahui Tingkat Kompetensi Siswa Di SMK 1 Driyorejo Gresik", *IT-Edu: Jurnal Information Technology and Education*, *5*(2), 584–591, 2020.

[4] M. Arif, "Pemodelan Sistem", Deepublish, 2017.

[5] Asnawati, & F. H. Utami, "Rekayasa Perangkat Lunak", Deepublish, 2015.

[6] M.A. Avila, & D. Kurniadi, "Rancang Bangun Sistem Informasi E-Office pada Tata Usaha Fakultas Teknik Universitas Padang", *Voteteknika (Vocational Teknik Elektronika Dan Informatika)*, *9*(1), 137–142, 2021.

[7] I. Carolina, & A. Supriyatna, "Penerapan Metode Extreme Programming Dalam Perancangan Aplikasi Perhitungan Kuota SKS Mengajar Dosen", *IKRA-ITH INFORMATIKA: Jurnal Komputer Dan Informatika*, *3*(1), 106–113, 2019.

[8] J. Enterprise, "Pengenalan HTML dan CSS", Elex Media Komputindo, 2016.

[9] M. Faizal, & S. L. Putri, "Sistem Informasi Pengolahan Data Pegawai Berbasis Web (Studi Kasus Di PT. Perkebunan Nusantara VIII Tambaksari", *Jurnal Teknologi Informasi Dan Komunikasi*, *12*(1), 28–42, 2017.

[10] R. B. Hadiprakoso, "Rekayasa Perangkat Lunak", 2020.

[11] A. Halim, & S. Hasan, "Sistem Informasi Pengelolaan Uang Komite Menggunakan Borland Delphi 7 Pada SENIOR HIGH SCHOOL 5 Kota Ternate", *IJIS-Indonesian Journal On Information System*, *2*(1), 2017.

[12] K. Harianto, H. Pratiwi, & Y. Suhariyadi, "Sistem Monitoring Lulusan Perguruan Tinggi Dalam Memasuki Dunia Kerja Menggunakan Tracer Study", MEDIA SAHABAT CENDEKIA, 2019.

[13] J. Hutahaean, "Konsep Sistem Informasi", Deepublish, 2015.

[14] H Kurniawan, W. Apriliah, I. Kurniawan, & D. Firmansyah, "Penerapan Metode Waterfall Dalam Perancangan Sistem Informasi Penggajian Pada Smk Bina Karya Karawang", *Jurnal Interkom: Jurnal Publikasi Ilmiah Bidang Teknologi Informasi Dan Komunikasi*, *14*(4), 13–23, 2020.

[15] A. M. A. Muhaimin, Y. Irawan, & Y. Devis, "Sistem Informasi Tracer Study Berbasis Web Pada Program Pascasarjana Fisip Universitas Riau", *Jurnal Ilmu Komputer*, *9*(2), 71–77, 2020.

[16] S. Mulyani, "Metode Analisis dan Perancangan Sistem", Abdi Sistematika, 2017.

[17] M. Muslihudin, & O. Oktafianto, "Analisis dan Perancangan Sistem Informasi Menggunakan Model Terstruktur dan UML", Penerbit Andi, 2016.

[18] A. Z. Nabila, "Perancangan Sistem E-Tracer Study Alumni SENIOR HIGH SCHOOLPGRI 1 Padang Untuk Outcome Pendidikan Berbasis Web Mobile", Universitas Padang, 2020.

[19] U. G. Salamah, "Tutorial Visual Studio Code", Media Sains Indonesia, 2021.

[20] V. Siahaan, & R. H. Sianipar, "JavaScript: Dari A Sampai Z (Vol. 1)", Sparta Publisher, 2018.

[21] M. Soni, "Agile, Devops, And Cloud Computing With Microsoft Azure", BPB Publications, 2019.

[22] L. Tambunan, & K. T. Sela, "Perancangan Sistem Informasi Pendataan Pemakaian Bahan Bakar Kendaraan Pada PT. Dahepa Damai Pratama Dengan Menggunakan Bahasa Pemrograman Visual Basic .NET Dan Database SQL Server", *Jaringan Sistem Informasi Robotik-JSR*, 2(2), 130–136, 2018.

[23]   A. Taryana, A.Fadli, & S. R. Nurshiami, "Merancang Perangkat Lunak Sistem Penjaminan Mutu Internal (SPMI) Perguruan Tinggi yang Memiliki Daya Adaptasi Terhadap Perubahan Kebutuhan Pengguna secara Cepat dan Sering. Jurnal Al-Azhar Indonesia Seri Sains Dan Teknologi", 5(3), 121–129, 2020.