11-payment gateway

by Uce Indahyanti

New student admission information system design with payment gateway

Alfitra Oktavian[1], Uce Indahyanti[2], Ika Ratna Indra Astutik[3]

[1,2,3]Faculty of Science and Technology, Universitas Muhammadiyah Sidoarjo

ARTICLE INFO	ABSTRACT
	Regarding the rapid phase of technological progress in all fields, as well as the pattern of people's lives that have been relatively advanced. The purpose of this research is to design a payment gateway-based student admission system at SMP Muhammadiyah 3 Waru using the waterfall method. Web-based information systems can be used as a means of improving information in the education department. In the existing research on the information system for new student admissions, payment processing is carried out manually by paying on the spot or transferring to the school accounts. It is required to confirm payments and utilize SMS gateways as an information forwarder to information. This system delivers complete information such as how to register, test, and payment gateway-based methods. The results obtained by all service menus on the system have been running well.

Corresponding Author:

Alfitra Oktavian,
Faculty of Science and Technology Informatics study program
Universitas Muhammadiyah Sidoarjo
Mojopahit No. 666 B, Sidowayah, Celep, Kec. Sidoarjo, Sidoarjo Regency, East Java
Email: alfitraoktavian@smpmugaru.sch.id

1. INTRODUCTION

Regarding the rapid phase of technological progress in all fields, as well as the pattern of people's lives that have been relatively advanced (Camelia, 2020; Ellyzabeth Sukmawati et al., 2022; Fitriani et al., 2021; Herranen et al., 2021; Naufal, 2021). Web-based information systems can be used as a means of improving information in the education department (Dayucos et al., 2019; Paul et al., 2021; Wolbrink et al., 2019; Yu et al., 2021). In the existing research on the information system for new student admissions, payment processing is carried out manually by paying on the spot or transferring to the school accounts. It is required to confirm payments and utilize SMS gateways as an information forwarder to information (Ocka Dharma Putra et al., 2020). The research carried out at SMP Muhammadiyah 3 Waru still uses manual registration forms or paper so that many things could be improved both on the officer's side and the prospective student's side in its implementations ("APLIKASI E-PAYMENT BERBASIS FINGERPRINT UNTUK PELAYANAN TRANSAKSI," 2020; Ayu Pradipta et al., 2021; Pargiyani et al., 2019). Regarding payment, it is also using manual cash or manual transfer with confirmation by Whatsapp and making the registration process long (Suryaningsih & Ainun Nisa, 2021; Syaifullah et al., 2021).

Therefore, technology becomes a solution to registration problems by utilizing the rest API so that payments can be made practically and quickly to make it easier for prospective guardians to register at school (Aldi, 2022; Ocka Dharma Putra et al., 2020; Raharjo et al., 2022). The process in this educational institution is useful for screening selected prospective students according to the criteria determined by the school. In addition, web-based information systems and payment gateways can also be a source of information its users can access.

SMP Muhamamdiyah 3 Waru, before the use of the registration system, used paper and must be re-collected, which is the web registration system is still not available (FITRIYANSYA, 2021). This registration information system service is expected to make it easier for schools to process new student data. It is also easy for the public to get complete information ranging from test information and payment forms and for prospective students to register themselves without coming to school. Based on the description above, the author is interested in analyzing the topic of the usefulness of web-based information systems connected to payment gateways as material for conducting an article entitled "The Admission of New Students through Payment Gateway-Based.

2. RESEARCH METHOD

The location of this research is conducted at SMP Muhammadiyah 3 Waru located in Kureksari Village, Waru District, Sidoarjo Regency. The research time will start in
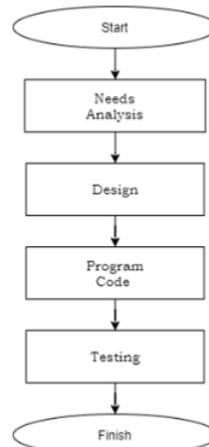

Figure 1 Research Framework

The stages in the Waterfall method are as follows:
  a. Needs Analysis
     The stage of collecting needs includes documents and interfaces to analyze/specify software needs so that the users can understand the requirements to determine the software solution used as a system computerization process.
  b. Design
     The creation design of software programs includes data structures, software architectures, interface representations, and coding procedures. At this stage, the author designs and creates programs with UML (Unitefed Modeling Language)

used, namely Activity Diagrams, Use Case Diagrams, Sequence Diagrams, and Deployment Diagrams and for database design authors using ERD (Entity Relationship Diagrams).

c. Program Code (Code Generation)
The design must be translatable into a soft test program. The result of this stage is a computer program according to the design made in the design stage.

d. Testing
Testing focuses on software in logic and functionality and ensures that all parts have been tested so that the output produced is as desired. At this stage, the author carries out the test using blackbox testing. This is a software testing method for an application's functionality without checking into the internal structure or how it works. This testing method can be applied virtually to any level of software testing: unit, integration, system, and acceptance.

e. Support or Maintenance (Support)
Defines development efforts for the system that is being made in anticipating developments and changes in the system.

3. RESULTS AND DISCUSSIONS

At this stage, identification problems in the Human Resources Development section and supporting information are carried out using interviews with the school people, which will later be involved in the system to get an overview in making the system based on interviews and identification conducted on the part of the SMP Muhamamdiyah 3 Waru school, which currently has problems including the registration of new students who still use paper as a registration medium. This has caused many omissions between the school and prospective guardians of students.

In this identification period, it is also found that the payment of new student registration still uses manual payments and online transactions of bank accounts by showing proof of payment, so that archives payments are still not neat, so payment with cash and transfer methods through automatic recording is required to minimize Human errors in new student registration

At this stage, the data collection process uses the interview and observation method to observe and analyze the ongoing process at SMP Muhamamdiyah 3 Waru to obtain the data and information needed. At this stage, the process of a system making is carried out in the next stage. Coding the program and testing the Information System created aims to ensure that the system is in accordance with the results of the analysis and design in the previous stage. When the system has run accordingly, it can be implemented in the real system. Here's an overview of system creation as follows:

An overview of the system workflow for the user will be shown in Figure 1. At the first stage, the user starts by accessing the registration page. Then, the user will go to the login page and fill in a brief biodata. After the user clicks save, it will be directed to the payment page by selecting a payment method.
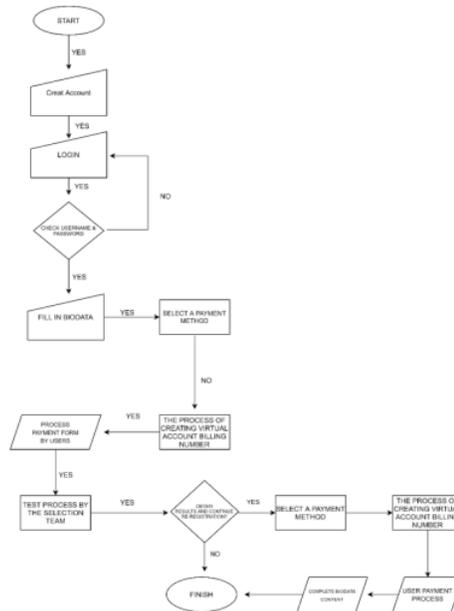
Figure 2. User Flow Chart

The users must choose one of the payment methods used and make payments according to the nominal payment. After making payments, prospective students are required to take a test first to determine the Pass or not, at the next stage after conducting the test, the prospective students make a registration payment with the payment method that matches to the selected one. After making the payment, the student fills in a complete biodata. After that, the user can log out and close with the terminator "Done" as a sign that the application stops.

An overview of the system workflow flowchart for the admin will be shown as in Figure 2. At the first stage, the admin starts by accessing the information system and move to the login page.
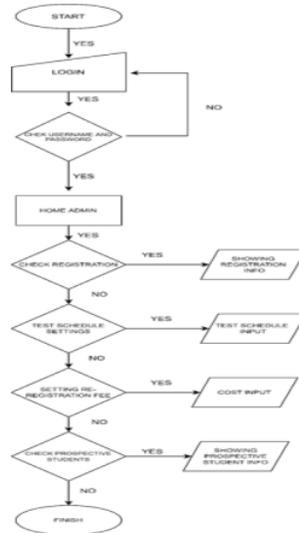
Figure 3 Admin Flow Chart

Then, the admin continues by filling in the Username and Password. If the login is successful, the admin is directed to the dashboard page or home page. If you enter the wrong Username and Password, the admin is expected to re-enter the correct username and password. In the dashboard or home views, the admin can see the students who registered on that day.

Then, the admin can change or edit the test schedule and the student registration fee. After that the admin can log out and close the terminator "Done" as a sign of the application stopping.

a. Use Case
    Use Case is a description or representation of the interaction that occurs between the system and its environment.

FiguFigure 4. Use Case

In the use case above, it can be described that the admin has access to login admin, check registration of prospective students, set student test schedules, input student financial data and make payments for students who make payments in cash, while users can only access the registration form, filling in data, making payments and checking data if there is incomplete data.

b. Activity Diagram

An Activity Diagram is a visual form of a work stream that contains activities and actions, which can also contain options, repetitions, and concurrency.
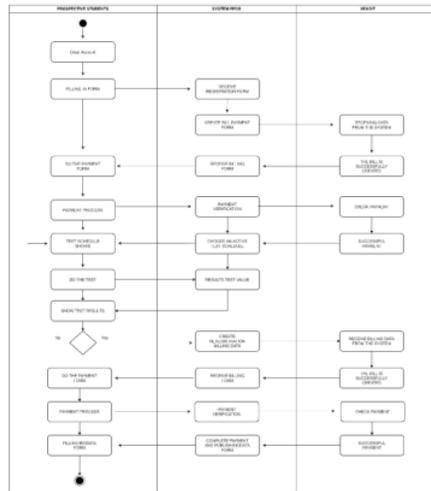

Figure 5. Activity Diagram

In the activity diagram above, it explains the order in which prospective students register by looking at the processes in the system, in that process students create accounts and fill in data briefly where the system accepts registration and creates a payment form. choose a payment method, after the payment is complete the system will verify the payment and send a callback to the system so that the test schedule appears on the student's part, if the test has been carried out, the student is directed to the registration payment page to make a full payment, the system will verify the payment and the student can fill out complete biodata.

c. Sequence Diagram

Sequence diagram or sequence diagram is a diagram used to describe and display interactions between objects in a system in detail.
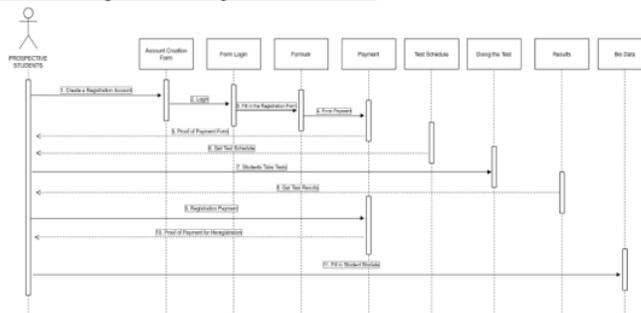

Figure 6. Sequence Diagram

In the sequence diagram stage, prospective students first create an account on the account form, which then students log into the account form, in the third stage,

prospective students fill out a short registration form. Fourth stage, make payment for the registration form. In the fifth stage, the system provides payment information to prospective students and provides information on student test schedules, in the next stage students carry out tests at this stage the system will send the value of the test results that have been input by the committee, the final stage students re-register and end up following bio data.

d.   ERD (Entity Relationship Diagram)
       Entity Relationship Diagram is the presentation of data using Entity and Relationship.
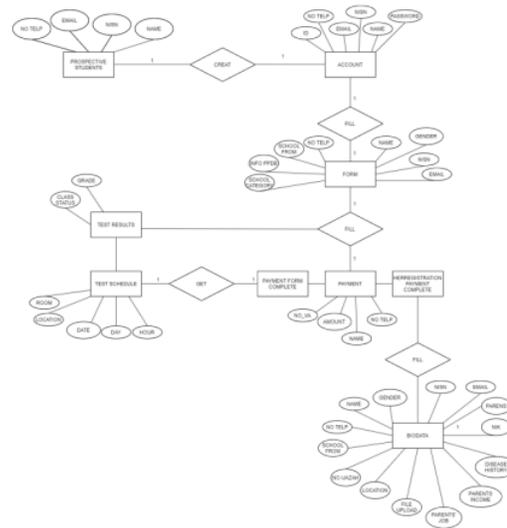
Figure 7. ERD

The ERD above describes the fields provided for modeling relatively complex structures and relationships between data. The existence of the Entity Relationship Diagram system is very important for companies in managing data that belongs to each field, where several fields are interconnected, as in the example above, the name field is related to the next stage.

e.   Relationships Between Tables
       Relationships between tables are used to synchronize data from one table to another by matching the primary key with the foreign key.

Figure 8. Relationships Between Tables

The biodata of the table above relates to one of the foreign Id_Forms to the Form Table. In the form field that relates is status_paid. This relates to the payment history table. Then, the id_schedule_test field relates to the Table of values and Test Schedules, Id_Wave relates to the Wave table, in the values of table the total value, the input will be calculated automatically and copy the data to the form table.
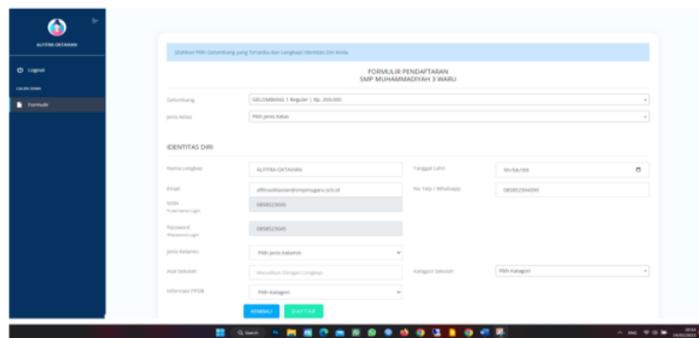
3.2 Interface Design
a.   Form fill page

Figure 9. Form Page

This page is about the brief identity of the prospective student to complete the registration and delivery requirements of the Rest API payment

b.   Payment Forms
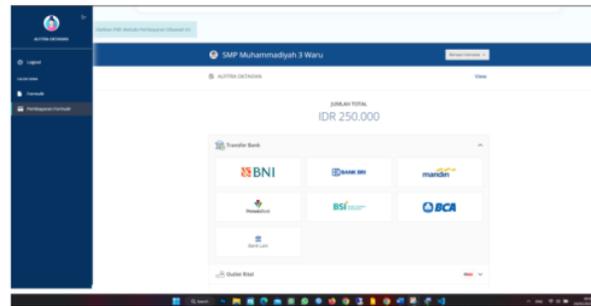
Figure 10. Form Payment Page

This page shows that the users can choose a payment method that can be used according to the bank channel owned by the user.

c.   Admin Page
Form Details Admin Page

Figure 11. Prospective Student Information Page

The form detail page is a page to find out the number of buyers and the schedule of student tests.

3.3 Testing and Evaluation
        The system testing process internally can be carried out either by verification or data validation and adjusted to the existing ones to anticipate the minimum possible test failure when tested by the user. The test method taken is the Black Box test method. This testing is a test of fundamental aspects of the system without regard to the internal logic structure of the software. This method is used to find out if the software is working correctly and running as expected.
        In the case of testing, there is an admin fee from the payment service provider which will later be charged to the school which will be arranged by the school treasurer.

The system of new student admission information has been tested successfully and it is found to be functioning properly. All the desired features and functionality could run smoothly. This system has been integrated with the payment gateway system. This integration test has shown that this system can integrate well with the payment gateway system in its performance by processing data generated from new student registration. This test shows that the system can process data quickly and accurately. In terms of security, it has been tested to see the level of security. This security test shows that the system has a high level of security and can protect student data from unauthorized access.

4 CONCLUSIONS

Based on the test results, it can be concluded that all service menus on the system can function properly. The payment gateway-based new student admission system also provides a better level of security because payments can be processed online and go directly to the school account.Through the payment gateway-based new student admission system, the registration process becomes faster and more efficient.Overall, the payment gateway-based new student admission system provides many benefits for schools, prospective new students, and parents of students. Thus, the use of this system can improve the efficiency and effectiveness of the new student admission process at school. In its development, the developer gives advice in the aspect of security needs to be improved and security evaluations need to be carried out periodically to ensure that the system is safe.

REFERENCES

Aldi, F. (2022). Web-Based New Student Admission Information System Using Waterfall Method. Sinkron, 7(1). https://doi.org/10.33395/sinkron.v7i1.11242

APLIKASI E-PAYMENT BERBASIS FINGERPRINT UNTUK PELAYANAN TRANSAKSI. (2020). Ubiquitous: Computers and Its Applications Journal. https://doi.org/10.51804/ucaiaj.v3i1.17-22

Ayu Pradipta, V., Sartini, S., Ariyati, I., & Retnoningsih, E. (2021). Metode Waterfall Dalam Sistem Informasi Pembayaran Administrasi Sekolah. Journal of Students' Research in Computer Science, 2(1). https://doi.org/10.31599/jsrcs.v2i1.637

Camelia, F. (2020). Analisis landasan ilmu pengetahuan dan teknologi. Susunan Artikel Pendidikan, 5(1).

Dayucos, A., French, L. A., Kelemen, A., Liang, Y., & Lanyi, C. S. (2019). Creation and evaluation of a preoperative education website for hip and knee replacement patients—A pilot study. Medicina (Lithuania), 55(2). https://doi.org/10.3390/medicina55020032

Ellyzabeth Sukmawati, Iwan Adhicandra, & Nur Sucahyo. (2022). Information System Design of Online-Based Technology News Forum. International Journal Of Artificial Intelligence Research, 1.2. https://doi.org/https://doi.org/10.29099/ijair.v6i1.2.593

Fitriani, P., Dani, U., & Prayogi, A. (2021). Jurnal informasi komputer logika. Jurnal Informasi Komputer Logika, 2.

FITRIYANSYA, A. (2015). SISTEM INFORMASI PENERIMAAN SISWA BARU BERBASIS WEB DAN SMS (SHORT MESSAGE SERVICE) GATEWAY DI SEKOLAH MENENGAH ATAS NEGERI I KELEKAR. AIDIL FITRIYANSYAH, 151, 10–17.

Herranen, J., Fooladi, E. C., & Milner-Bolotin, M. (2021). Editorial: Special issue "Promoting STEAM in education." In LUMAT (Vol. 9, Issue 2). https://doi.org/10.31129/LUMAT.9.2.1559

Naufal, H. A. (2021). LITERASI DIGITAL. Perspektif, 1(2). https://doi.org/10.53947/perspekt.v1i2.32

Ocka Dharma Putra, M., Dapiokta, J., Ki Ratu Penghulu Karang Sari No, J., & Selatan, S. (2020). Perancangan Sistem Informasi Penerimaan Siswa Baru Berbasis Web Pada SD Negeri 43 OKU. Intech, 1(2), 6–9.

Pargiyani, A., Priyambadha, B., & Arwan, A. (2019). Pengembangan Sistem Informasi Akademik Pada Sekolah Dasar Islam Terpadu Insantama (SDIT) Malang Berbasis Website. Jurnal Pengembangan Teknologi Informasi Dan Ilmu Komputer, 3(2).

Paul, C. R., Kerr, B. R., Frohna, J. G., Moreno, M. A., Zarvan, S. J., & McCormick, D. P. (2021). The Development, Implementation, and Evaluation of an Acute Otitis Media Education Website. In Academic Pediatrics (Vol. 21, Issue 7). https://doi.org/10.1016/j.acap.2021.04.001

Raharjo, M., Napiah, M., & Anwar, R. S. (2022). Perancangan Sistem Informasi Dengan PHP Dan MYSQL Untuk Pendaftaran Sekolah Di Masa Pandemi. Computer Science (CO-SCIENCE), 2(1). https://doi.org/10.31294/coscience.v2i1.689

Suryaningsih, S., & Ainun Nisa, F. (2021). Kontribusi STEAM Project Based Learning dalam Mengukur Keterampilan Proses Sains dan Berpikir Kreatif Siswa. Jurnal Pendidikan Indonesia, 2(6). https://doi.org/10.36418/japendi.v2i6.198

Syaifullah, J., Syaifudin, M., Sukendar, M. U., & Junaedi, J. (2021). Social Media Marketing and Business Performance of MSMEs During the COVID-19 Pandemic. Journal of Asian Finance, Economics and Business, 8(2). https://doi.org/10.13106/jafeb.2021.vol8.no2.0523

Wolbrink, T. A., Rubin, L., Burns, J. P., & Markovitz, B. (2019). The Top Ten Websites in Critical Care Medicine Education Today. In Journal of Intensive Care Medicine (Vol. 34, Issue 1). https://doi.org/10.1177/0885066618759287

Yu, C. W., Chao, C. M., Chang, C. F., Chen, R. J., Chen, P. C., & Liu, Y. X. (2021). Exploring Behavioral Intention to Use a Mobile Health Education Website: An Extension of the UTAUT 2 Model. SAGE Open, 11(4). https://doi.org/10.1177/21582440211055721

11-payment gateway

7 W Shaleh, Rasim, Wahyudin. "The System of Inventory Forecasting in PT. XYZ by using the Method of Holt Winter Multiplicative", IOP Conference Series: Materials Science and Engineering, 2018

Publication

1 %

8 Yayuk Ike Meilani, Jaka Purnama. "Object Oriented Programming of Application Admission of New High School Students", Sinkron, 2023

Publication

1 %

9 www.ijctjournal.org

Internet Source

1 %

10 Marko Milašinović, Aleksandra Radojević, Biljana Jovković. "Characteristics of the Board of Directors and Dividend Policy: A Case Study of Banks in Western Balkans", Naše gospodarstvo/Our economy, 2023

Publication

1 %

Exclude quotes	Off	Exclude matches	< 1%
Exclude bibliography	On		