Analysis of New Student Admission Application for Bina Warga High School in Palembang

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Abstract

The manual admission process at Bina Warga 2 High School Palembang poses significant challenges, including inefficiencies in registration, limited accessibility for prospective students, and increased administrative workload. To address these issues, this study analyses the requirements for an online student admission system designed to streamline registration, facilitate efficient report generation, and serve as a promotional platform for the school. By adopting the Prototyping method for system development, the process ensures active collaboration between developers and stakeholders, enabling iterative refinement based on user feedback. The proposed system eliminates the need for prospective students to visit the school physically, thereby enhancing accessibility and scalability. Furthermore, it automates administrative tasks, reducing manual effort and improving overall efficiency. This analysis highlights the potential of an online admission system to transform the registration process, expand the school's outreach, and establish a robust digital presence for future growth.

Keywords

System, Information, Community Development, Online

Introduction

The rapid advancement of information technology, driven by breakthroughs across various scientific domains, has facilitated the creation of innovative applications that were previously unattainable. In today's digital era, computer technology has become a cornerstone of progress in sectors such as economics, education, business, and technology (Nair et al., 2021). The adoption of computer-based systems in these fields offers numerous advantages, including enhanced data accuracy, improved operational efficiency, superior service delivery, and expanded accessibility to critical information (Segun-Falade et al., 2024). As a result, organizations increasingly rely on technology to meet their information processing and management needs.

Bina Warga 2 High School in Palembang, a provider of upper secondary education, exemplifies an institution poised to benefit from technological advancements. Currently, the school manages its new student admission process using Microsoft Word and Excel. While functional, this

approach has proven to be inefficient, time-consuming, and prone to errors, resulting in delays and inaccuracies in managing student data (Naveed & Khan, 2022). These challenges underscore the need for a more robust and efficient system that can meet the growing demands of data management in educational settings.

To address these limitations, this study focuses on requirement analysis for developing a web-based student admission system tailored for Bina Warga 2 High School. The proposed system will transition the school from manual processes to a fully computerized platform, enhancing the accuracy, efficiency, and speed of the admission process. Leveraging the Prototyping method, this approach enables iterative development with active stakeholder involvement, ensuring the system meets user requirements effectively (Jensen & Steinert, 2020).

To structure and guide system development, the research employs the Unified Modeling Language (UML) as a tool for visualizing system architecture and workflows. UML provides a clear and accessible framework for both developers and stakeholders, fostering better collaboration and understanding throughout the development process (Challapalli et al., 2023; Daniel et al., 2024). The importance of this initiative is reinforced by successful implementations of similar systems in educational institutions, where automation has significantly improved data processing, reduced errors, and optimized administrative workflows (Mukred et al., 2021). For example, Ng et al. (2021) highlight the transformative impact of computerized systems on admission processes, demonstrating enhanced operational efficiency and accuracy in educational environments.

By implementing this web-based admission system, Bina Warga 2 High School aims to streamline its processes, reduce inefficiencies, and set a benchmark for modern educational administration. This initiative not only addresses immediate operational needs but also positions the school as a forward-thinking institution embracing the benefits of digital transformation.

Methodology Research

In the realm of software development, the Prototyping method stands out as a highly effective approach for system design and user interaction (Hoggenmüller et al., 2021). This method, characterized by the iterative creation and refinement of software models, facilitates a direct and collaborative relationship between developers and users. Such interaction is crucial for identifying user needs and aligning the system's functionality with its intended goals, thereby enhancing the overall quality and relevance of the software developed (Chazette & Schneider, 2020).

The prototype model is an interact've development process whereby a preliminary version of the software is constructed, tested, and refined based on continuous user feedback (Szabó & Hercegfi, 2023). This method contrasts sharply with traditional waterfall models that often lead to discrepancies between user expectations and the final product due to a lack of user involvement at early stages. By incorporating user feedback early and frequently, the prototype model mitigates the risk of those discrepancies.

Stages of the Prototype Development Model

1. **Identifying User Needs:** Initially, system analysts conduct detailed feasibility studies and analyze user requirements, which encompass interface designs, procedural methods, and the underlying technology. This stage is critical for setting the direction of the prototype and ensuring that it aligns with user expectations and technical specifications.
2. **Prototype Development:** During this stage, system analysts collaborate with developers to construct an initial prototype. This model serves as a tangible representation of the system under development, allowing users to evaluate its functionality and provide immediate feedback.
3. **Prototype Evaluation:** Here, system analysts assess how well the prototype meets user needs based on feedback. This evaluation determines whether the prototype requires minor adjustments or a comprehensive redesign to better meet user expectations.
4. **Prototype Implementation:** Finally, the approved prototype is handed over to programmers for full-scale implementation. This phase marks the transition from a developmental model to a functional system, integrating all agreed-upon modifications.

One of the paramount advantages of the Prototyping method is the opportunity it presents for users to "test drive" the software before its full implementation (Saez-Perez, 2023). This preview not only ensures that the software meets their needs but also significantly reduces the chances of costly post-implementation changes.

Furthermore, recent studies underscore the strategic impact of prototyping in software development. Research by Atoum (2023) highlights that projects utilizing prototyping tend to achieve higher user satisfaction and system usability, which are critical predictors of software success.

Results and Discussion

Systems Design

In the field of software engineering, the design phase plays a crucial role in bridging the conceptual and practical elements of application development. At the core of this phase is the use of Unified Modeling Language (UML), a comprehensive 3odelled3 language that goes beyond mere diagramming to encapsulate the entire context of system design. UML is recognized not just as a standard in 3odelled3 language but as a robust framework that facilitates a deeper understanding and communication of system structures and behavior.

UML operates primarily on object-oriented (OO) 3odelled3 principles. These principles are based on real-life scenarios where systems are viewed as collections of interacting objects, each characterized by specific properties and behavior. By using symbols and notations that are universally recognized, UML diagrams offer a standardized way to visualize and design complex software architectures.

UML diagrams serve as a vital communication tool among project stakeholders, including developers, project managers, and clients. They help to clearly outline system components and their interactions, ensuring that all parties have a consistent understanding of the project requirements and design proposals.

UML provides a sandbox environment where designers can experiment with different architectural configurations. This flexibility allows teams to assess the feasibility and impact of various design choices, enabling more informed decision-making in the development process.

Through UML's diverse set of diagrams—such as use case diagrams, sequence diagrams, and class diagrams—developers can validate the logical and structural integrity of the software architecture. This validation is crucial for ensuring that the software will perform as intended and is scalable, maintainable, and secure.

As a standardized language, UML helps maintain consistency in software documentation, making it easier for new team members to understand the architecture and for ongoing projects to ensure continuity in design principles.

A. Use Case Diagram

A use case diagram is a design tool used to find out what users use called actors. Meanwhile, what actors do to the system is called a use case. Use Case or Use Case Diagram is 4odelled4 (behavior) of the information system to be created, The use case diagram consists of several actors and use cases. Actors are people who use the system. Actors in this study consisted of 3 actors, namely Admin, prospective students, and school principals, while use cases are what actors do with the new student admission system, as shown in Figure 1.
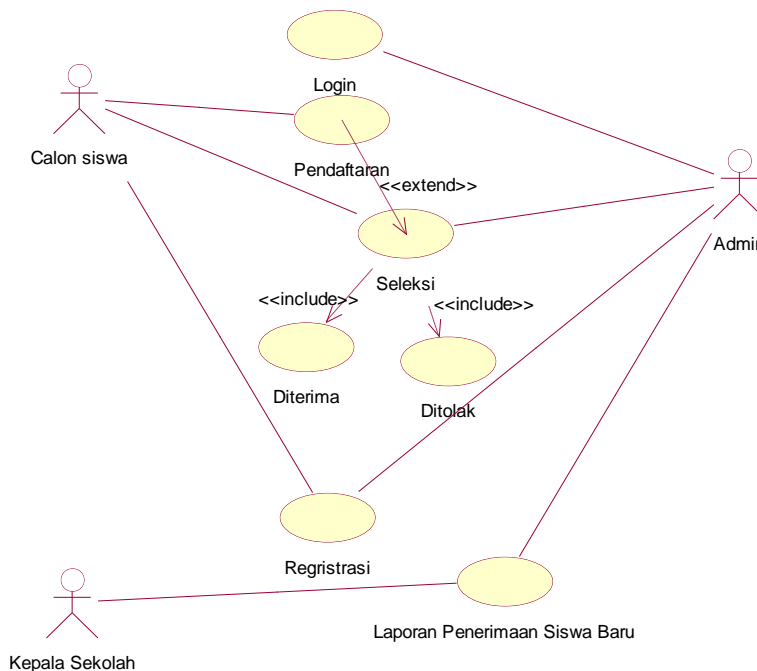

Figure 1.   Use case Diagram

B. Activity Diagram

An activity diagram is a diagram that describes the activities of system users from the entire menu in the system. The activity diagram below is a sequence of depicting a new student admission system based on actors. If the use case diagram describes what is done by the actor, the activity diagram describes what activities will be carried out by the actor in the system to be created.
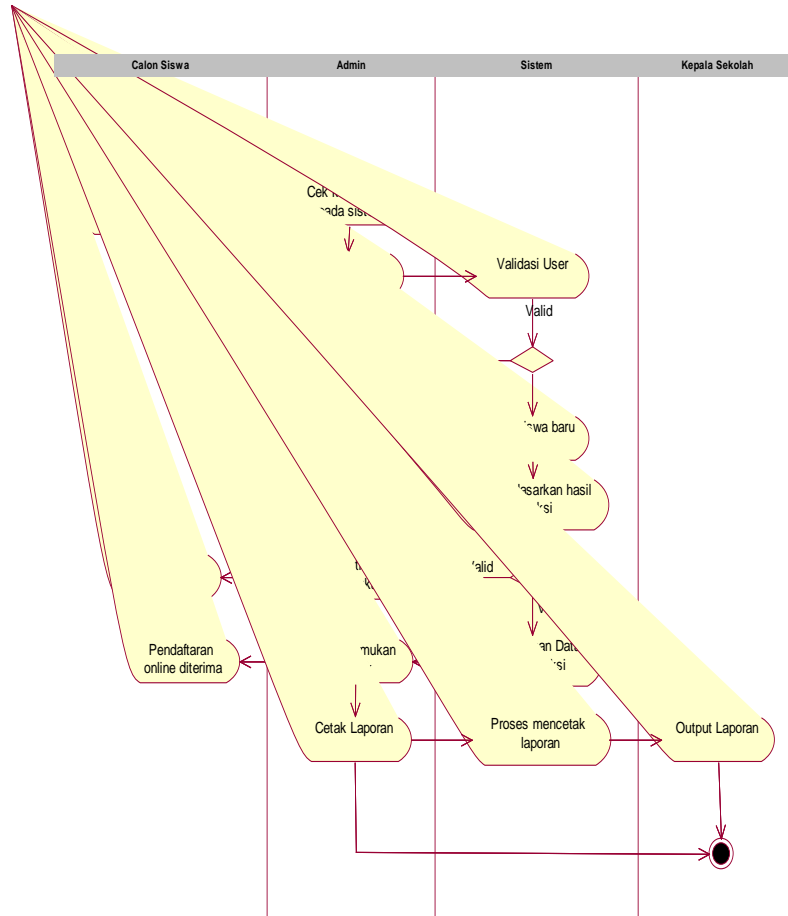

Figure 2.   Activity Diagram

C. Sequence Diagram

A sequence diagram is a type of interaction diagram that shows how processes operate with one another and in what order. It's a constructive tool for depicting the interactions between objects in a system.
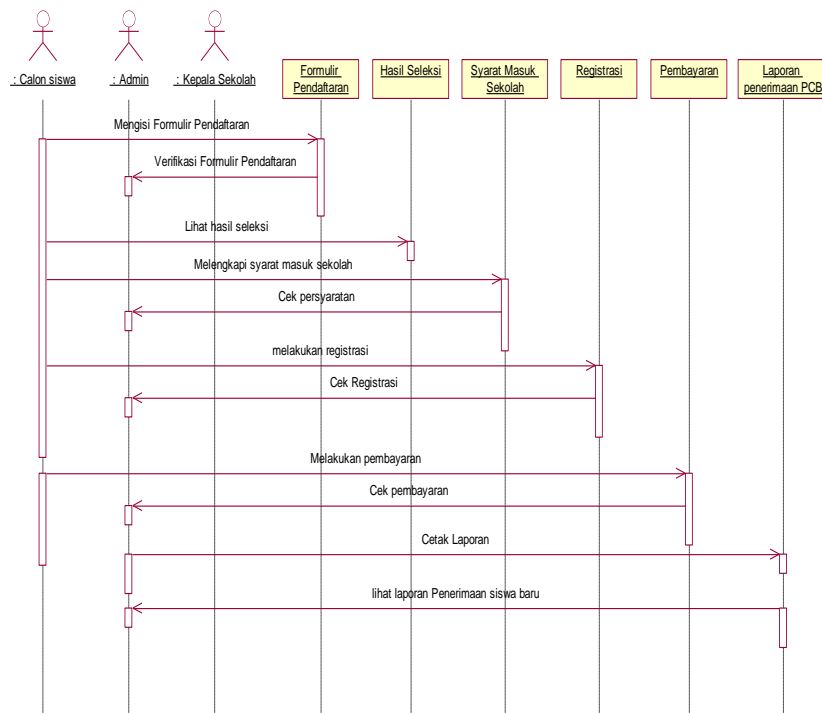
Figure 3.   Sequence Diagram

Figure 3 is a UML (Unified Modeling Language) sequence diagram, which is a type of interaction diagram extensively used in the field of software engineering. This diagram illustrates how processes operate with one another and the order in which these interactions occur. Sequence diagrams are particularly useful for visualizing the flow of operations in a system, showing how and when components interact.

At the top of the diagram, actors and objects are usually depicted. Actors are external entities interacting with the system, while objects are internal system components that perform or receive actions. Each object has a lifeline, represented by a vertical dashed line that indicates the object's presence over time. Activation bars, or rectangles along a lifeline, depict when an object is actively performing a process.

Communication between objects is shown with horizontal arrows called messages. These can be synchronous, where the sender waits for a response (solid line arrows), or asynchronous, where the sender continues operations without waiting (dashed line arrows).

The sequence starts with an actor initiating a process, such as filling out a registration form, as shown in your diagram under "Formulir Pendaftaran." This action triggers a series of subsequent operations, including selection results ("Hasil Seleksi"), school entry requirements ("Syarat Masuk Sekolah"), and the actual registration process ("Registrasi"). Each of these steps is sequentially dependent on the completion of the previous one, highlighting a chain of tasks that unfold as the interaction progresses.

Towards the end of the sequence, the diagram often includes operations that finalize the process, such as payment verification ("Pembayaran") and the generation of final reports or confirmations ("Laporan penerimaan PCB"). Each arrow not only represents an action or a method call between objects but also delineates the direction and flow of information through the system.

By using sequence diagrams like the one you have provided, developers and system architects can gain insights into the timing, sequential order, and interdependencies of interactions within the system. These diagrams are crucial during the design phase to ensure that the system's behavior aligns with the intended functionalities and to identify and resolve potential issues in the system's logic or flow.

Database

Database and table design are crucial aspects of developing a robust software system, particularly when dealing with functionalities that involve multiple user roles and content types, such as admin, student candidates, gallery, and guest book features. Each of these components has unique data requirements that must be carefully 7odelled to ensure the integrity and efficiency of the database.

A. Admin Table

The admin table is used to store admin data. This admin table has the following attributes, as shown in Table 1.

Table 1.   Admin Table Design

Name	Type	Size	Description
id_admin	*Int*	10	Admin Code
nama	*Varchar*	25	Name
alamat	*Varchar*	50	Address
Jns_kelamin	*Varchar*	2	Gender

B. Student Candidate

This table is used to store data on prospective students who register with the following attributes, as shown in Table 2.

Table 2.   Admin Table Design

Name	Type	Size	Description
NIS	*Int*	10	NIS
nama	*Varchar*	45	Name
jenis_kelamin	*Varchar*	10	Gender
alamat	*Varchar*	50	Address
Telp	*Varchar*	15	Telephone
agama	*Varchar*	15	Religion

C. Gallery Table

The gallery table should be designed to manage images or media files that are uploaded to the system, allowing for easy management and retrieval.

Table 3.　　　Gallery Table Design

Name	Type	Size	Description
Id_galeri	*int*	15	Id_galeri
gambar	*Varchar*	45	Picture
tanggal	*date*		Date
Id_kategori	*Int*	10	Category_ID
keterangan	*text*		Description

D. Guest Book Table

A guest book allows visitors to leave comments or messages. This table should include fields to capture these entries along with visitor information.

Table 4.　　　Guest Book Table Design

Name	Type	Size	Description
Id_bt	*Varchar*	100	GuestBook_ID
tgl	*Date*		Date
nama	*Varchar*	25	Name
email	*Varchar*	25	Email
pesan	*Text*		Message

Results

After conducting research and creating a program, the results achieved in this study are a web-based system that can be used in registering new students at Bina Warga 2 Palembang High School and, at the same time, can promote the School more widely. The programming language used in building this system is PHP (Hypertext Processor). The layout *of* the program is:

A. Views

The login form is a menu that is used so that not just anyone can open the program. The display is as follows, as shown in Figure 4.

Figure 4. Login Form

B. PSB Welcome Menu Display

In this program, there is a main menu consisting of 2 options in the form of menus, namely the School Profile Menu containing History, Vision and Mission, Work Programme, and Photo Gallery. The Main Menu contains Registration, Accepted Students, Terms and Conditions, and Schedule of Activities. The Administrator Menu contains the Login Form Menu.

Figure 5. New Student Admission Website

C. New Student Admission Website

This form serves to input the initial registration data when first registering as a new student at Bina Warga 2 Palembang High School. The following is the display of the Registration Data Form.

Figure 6.   Registration Form

D. Display Received Student Data Report

This report can be seen on the PSB website of Bina Warga 2 Palembang High School. The following is the display of the accepted student data report.

No	No. Induk	Nama Calon Siswa	Asal Sekolah	NUN	Cetak
1	42143	Sholeha	smp negeri 55	95	
2	141192	desi	Smp Negeri 77	86	
3	14121	jobpie	Smp Negeri 41 Palembang	100	
4	2329	mail	Smp mandiri	100	

Figure 7.   Accepted Student Data

E. Display of Accepted and Rejected Student Data Reports

Report of accepted and rejected student data: this report can be seen on the PSB website of Bina Warga 2 Palembang High School. The following is the display of the accepted and rejected student data report.

Figure 8.   Accepted and Rejected Student Data

F. Print Display of Accepted Student Report

Report on student data received by PSB SMA Bina Warga 2 Palembang. The following is the display of the accepted student data report.

Figure 9.   Print Accepted Student Data

Discussion and Analysis

The research aimed at developing a web-based system for Bina Warga 2 Palembang High School has yielded a multifaceted platform that not only facilitates the registration of new students but also enhances the school's visibility online. The system, built using PHP (Hypertext Processor), incorporates various user interfaces designed to streamline administrative processes and improve user experience. Below is a detailed discussion and critical evaluation of the different components and designs of the system, highlighting the UI/UX aspects.

The login form serves as the gateway to the system, ensuring that only authorized users can access administrative functions. The design, as depicted in the uploaded image, features a straightforward layout with fields for the user ID, password, and a unique code for added security. This form follows standard security practices by including a password field, which should ideally mask input to protect user information. The user interface is simple and utilitarian, which is suitable for administrative interfaces, but could benefit from more modern aesthetics to improve user engagement.

PSB Welcome Menu Display component acts as the central hub for navigation within the system, offering direct links to important sections like the School Profile and Main Menu, which

includes Registration and Accepted Students. The design of the welcome menu is crucial as it sets the first impression for the user interaction with the system.

The new Student Admission Website Form is likely the most frequently used feature by new users. It should be designed to be user-friendly while capturing all necessary data efficiently without overwhelming the users.

The system's design across all these functionalities should adhere to a consistent theme and interactive elements to unify the user experience. Attention to detail in the UI can significantly enhance usability and satisfaction. Additionally, regular updates based on user feedback and technological advancements are essential to keep the system relevant and efficient.

This research provides a valuable framework for understanding how educational institutions can leverage web technology to enhance administrative efficiency and student engagement. The critical evaluation suggests areas for further improvement, particularly in modernizing the UI and enhancing the UX to meet current standards.

Conclusion

This web-based Online New Student Registration information system is one of the right solutions for Bina Warga 2 Palembang High School. From the process and results of this research, researchers can conclude:

Provide convenience for students in inputting registration data by the registration form that has been provided and, after that, registering registration.

Facilitate employees in accessing the system, which has often experienced obstacles in viewing new student registration information, which takes a little time and cost.

Providing complete information to the public about Bina Warga 2 Palembang High School, from the profile, teachers, registration fees, scholarships, and others.

The use of program used in this system is the PHP MySQL program because this program can build a database that interacts with each other, and the use of this program is not too difficult in making web design.

For the system to be made even better, what can be suggested is the use of this registration application, which must have human resources who master the *computer* to support the application being built. Users should copy data regularly because the system uses a computer that is vulnerable to human error or virus attack. clients

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