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Design Of Student Register Application Using Laravel 8 Framework

Abstract

Background - The advent of information technology and the internet has had a beneficial influence on education, including primary school. One area that is impacted is the re-registration process for prospective new students. This process is executed manually by completing written forms, consuming time and human resources and elevating the possibility of data inaccuracies.

Purpose - This study aims to develop a web-based application utilizing the Laravel framework to expedite and streamline the re-registration procedure for incoming students.

Design/Methodology/Approach - This qualitative study adopts a system design approach. The system design will address the problem from an object-oriented perspective and utilize the PHP programming language, MySQL as the database processor, and the Laravel Framework as the primary technology. The objective is to develop a highly efficient re-registration application using the Laravel framework, which will be evaluated by testing various possible workloads.

Findings - The system design results, along with various workload evaluations, indicate improved efficiency and accuracy in managing re-registration data and streamlining the process of admitting new students.

Originality - A web-based re-registration application using the Laravel framework has been developed to streamline the manual re-registration process in elementary schools. The findings contribute to developing the Laravel framework, which programming developers widely use. By utilizing the Laravel framework, this solution provides a modern and organized approach to addressing administrative challenges in elementary education.

Research - The study's constraint is that the execution and evaluation of the web-based re-registration application using the Laravel framework were limited to a single educational institution. This research limits the understanding of how the program will perform in different usage scenarios, including challenges related to scalability, internet connectivity fluctuations, and variations in user capabilities at other educational institutions with different technological resources and infrastructure.

Keywords: Application Design, Basic Education, Re-registration, Laravel Framework, Web-Based Applications

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The advancement of information technology and the internet has significantly transformed various parts of life, particularly in education. Various organizations and communities employ information technology to enhance effectiveness, output, and

decision-making. (Ardi & Andriani, 2023; Sahid & Nama, 2022) The education sector has experienced a wave of positive effects as a result of these technological improvements, instilling a sense of optimism and hope for the future of education.

Technological improvements in education have had a significant impact, prompting educational institutions to use technology for tasks including student admissions, re-registration, and distant learning. (Khasbulloh & Karim, 2023)

SDN Tegallega is an elementary school institution situated in Jl. Pelindung Hewan No. 3, Pelindung Hewan, Kec. Astana Anyar, Kota Bandung, West Java 40243. Student re-registration is an administrative procedure at educational institutions. Students admitted for a specific academic year must validate and authenticate their information and fulfill the required paperwork to become enrolled students.

Through interviews with the school administrators of SDN Tegallega, various results were uncovered on the existing student re-registration process and the difficulties they encounter. Currently, the re-registration process is conducted through a manual procedure, wherein parents physically visit the school premises and complete all the relevant papers, after which they submit the required documents. In addition, the school utilizes manual procedures for tasks such as collecting student documents and organizing student files. However, this reliance on manual methods accumulates documents and files, thereby elevating the likelihood of data input mistakes.

Given these findings, a solution must be provided to aid SDN Tegallega in carrying out student re-registration more effectively and efficiently. Hence, this study aims to develop a web-based application that can efficiently assist student re-registration and effectively handle registration data. This program aims to resolve the challenges in the student re-registration process, enhance the efficiency of school operations, and offer convenience to both parents and school authorities.

This research aims to develop an application that can streamline the re-registration procedure and enable the digital collection of documents.

Literature review

a) Design

Design " Development A Web-Based Student Internship Application Using Laravel Framework" (Nugraha et al., 2023) emphasizes the significance of the Waterfall Method in system design. This method provides a structured approach, aiding in the comprehensive understanding of the proposed system. Whether in the context of information systems or design in general, system design involves the identification and specification of the components that will be included in the design of the information system.

b) Re-registration

The project focuses on designing and developing a web-based information system for student re-registration at the State Polytechnic of Manado. The case study will examine the implementation and effectiveness of the system. As defined by KBBI (Indonesian et al.), registration refers to creating a list or entering names, addresses, and other details in a list. The study conducted by (Wahyudi et al., 2022)

c) Database

"Online Learning Service Application Design Using Flutter and Laravel Framework" According to (Kurnia & Aditya, 2022), a database is a structured collection of interconnected data groups designed for efficient and convenient reuse. Najaf et al., (2023) defines a database as a computerized system that organizes data for efficient and rapid retrieval.

d) XAMPP

"Development of an Internship Data Processing Information System (PKL) at the Public Relations Division of PT. Pegadaian" MADCOMS (2016) defines Xampp as a software package that includes Apache, MySQL, PhpMyAdmin, PHP, Perl, Filezilla, and other components. XAMPP simplifies the installation of PHP environments, typically composed of PHP, Apache, MySQL, and PhpMyAdmin. The publication's authors are (Nia Permatasari, 2018)

e) MYSQL

The MYSQL database is used to manage student data in the Information System at 02 State High School Bilah Hulu, which is web-based. MySQL is software that functions as a multithreaded, multi-user SQL database management system (DBMS) and has been installed in approximately 6 million locations globally. MySQL is open-source software distributed under the GNU General Public License (GPL), which means it is freely available to use and modify. MySQL is a variant of the fundamental notion of databases, known as SQL. SQL is a database management approach that facilitates efficient data selection and input, making data processes more convenient. (Irmayani & Munandar, 2020)

f) Web

Sadali & Sarkasih, (2018) defines a website or site as a compilation of interconnected structures that display various forms of information, such as text, images, animations, sound, or combinations thereof. These structures can be static and dynamic and are accessed through a network of pages.

g) PHP

PHP Hypertext Preprocessor is a scripting language mostly utilized for web servers. The practical application of this technology in the development of a web application for managing receivable information in business accounts underscores its relevance and usefulness. PHP possesses server-side scripting capabilities, hence necessitating the need for a web server for PHP execution. (Fauzia, 2020)

h) Visual Studio Code

The system is developed utilizing the SDLC method and is based on mobile technology. Visual Studio Code (VS Code) is a lightweight and dependable text editor developed by Microsoft for cross-platform operating systems, including Linux, Mac, and Windows. This text editor natively supports JavaScript, Typescript, and Node.js programming languages. It also allows for the use of other programming languages through the installation of plugins from the Visual Studio Code marketplace, such as C++, C#, Python, Go, Java, and more. Visual Studio Code offers a multitude of tools, such as Intellisense, Git Integration, Debugging, and extension possibilities that increase the functionality of the text editor. The functionality of Visual Studio Code will progressively expand with each subsequent edition. Visual Studio Code undergoes monthly updates, setting it apart from other text editors. The text editor of VS Code is open-source, allowing users to access its source code and contribute to its development. The source code of VS Code is also accessible on GitHub. These features, along with its user-friendly interface, make VS Code the preferred choice among application developers, since it allows them to actively contribute to the future development of the software.

i) Laravel Framework

"Designing a Web-Based New Student Admission Information System Utilizing the Laravel Framework" The Laravel Framework is a PHP framework that employs the Model View Controller (MVC) architectural pattern. Laravel is a PHP framework that facilitates the building of MVC-based websites. It enhances software quality by minimizing the expenses associated with initial development and maintenance. This is achieved through the use of a syntax that is expressive, clear, and efficient. In addition, developers do not need to duplicate the code to utilize it. Laravel streamlines code and offers numerous website creation modules, accelerating website-building. Some examples of the included modules include craftsmanship, authentication, and controller. (Khasbulloh & Karim, 2023)

j) Unified Modelling Language (UML)

"Design of a web-based marketplace application for micro, small and medium enterprises, with a specific focus on the purchase sub-module." UML, short for "Unified Modeling Language," is a visual modeling technique used for designing object-oriented systems. It is a standardized language widely used for visualizing, designing, and documenting software systems. Presently, UML has attained the status of a widely accepted and standardized language in

Method

The research methodology employed is the descriptive method. The data collection involves utilizing various strategies to obtain information and data for research purposes.

1. Observation

This data-gathering technique involves directly observing the ongoing student re-registration process at SDN Tegallega. As researchers, we are directly involved in the observation process, gathering data regarding the student re-registration procedure. The researcher will employ a checklist to systematically document the pertinent aspects observed during the study, ensuring a comprehensive understanding of the process.

2. interview

The data-gathering technique involves conducting structured interviews with the personnel of SDN Tegallega. These interviews are not just conversations, but comprehensive data gathering sessions. They are done to gather comprehensive information regarding the student re-registration procedure, the difficulties encountered, and the requirements and desires for the development of the Student Re-registration Application. The interview questions will specifically address topics that are pertinent to the student re-registration procedure, ensuring a thorough understanding of the process.

3. Literature Review

This data-gathering method involves reviewing pertinent literature and references regarding the design of student re-registration applications and the associated technology. Literature research is performed to acquire knowledge regarding the concepts, theories, and technologies required for application design. The data obtained from the literature review will serve as the foundation for developing theoretical knowledge and selecting suitable methods and technologies for application development.

System development methods

The system development methodology employed is object-oriented analysis and design (OOAD). This notion is derived from the citation provided by Setiawan, Saifuloh, and Bagas in 2019. The object-oriented analysis and design (OOAD) development method is utilized in the design process of social e-learning systems. This system design approach focuses on challenges from an object-oriented rather than a functional perspective, as seen in structured programming. The OOAD idea encompasses examining and creating a system using an object-oriented methodology, namely Object-Oriented Analysis (OOA) and Object-Oriented Design (OOD). OOA is an analytical approach that assesses the requirements of a system from the viewpoint of classes and objects within the institution's scope. Meanwhile, Object-Oriented Design (OOD) is a methodology used to guide software architecture development by manipulating objects within the system or subsystem. Object-oriented technology is gaining popularity in software development environments.

The system stages are as follows:

1. Determining the system requirements to be developed.
2. Concept visualization and domain model creation.

3. Describe the activities between classes through activity diagrams.
4. Implementing the classes (possibly interfaces) involved in the system through class diagrams.

Result and Discussion

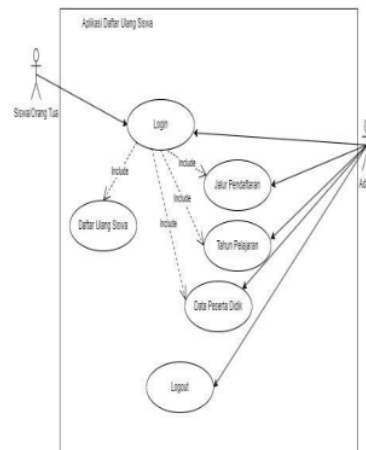
a) Current system analysis

The following is the system currently running:

- Parents of students: Re-register by coming to school and filling in the re-registration form and submitting the required files.
- School: Provides a re-registration form and collects re-registration files, checks the collected files.

Analisis yang diusulkan:

i. Usecase Diagram

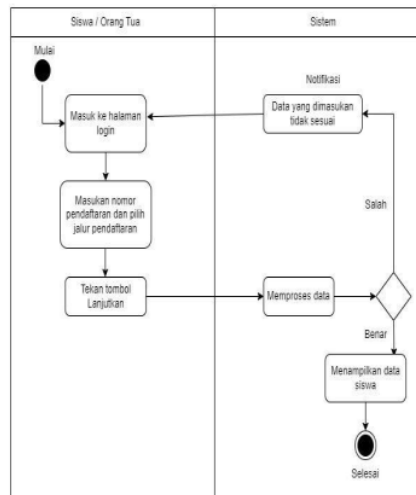


ii. Narrative Usecase

Use Case No. 1	
Judul Use Case	Login
Aktor	Siswa / Orang Tua
Deskripsi	Use Case ini menggambarkan proses Siswa / Orang Tua
Prasyarat	Siswa / Orang Tua sudah berada di halaman login
Langkah – Langkah / Scenario Utama	
Aktor	Sistem
1. Siswa / Orang Tua berada di	
2. Memasukkan nomor pendaftaran / NISN	
3. Siswa / Orang Tua menekan tombol “Lanjutkan”	4. Sistem memvalidasi data yang dimasukkan Siswa / Orang Tua
	5. Jika informasi login valid, sistem akan memberikan akses ke halaman Siswa / Orang Tua
	6. Jika informasi login tidak valid, sistem akan menampilkan pesan kesalahan dan meminta pengguna memasukkan data yang benar

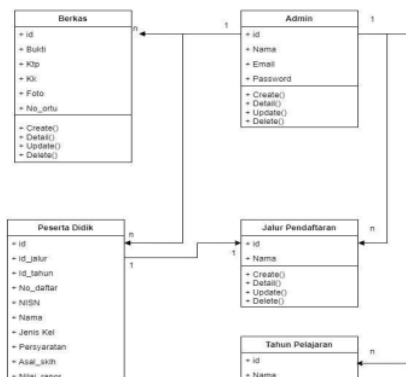
		7. Siswa / Orang tua dapat mencoba lagi untuk memasukkan informasi login yang valid dengan menekan tombol
Postkondisi	1. Siswa / Orang Tua berhasil login dan mendapatkan	8. Use Case selesai

iii. Activity Diagram

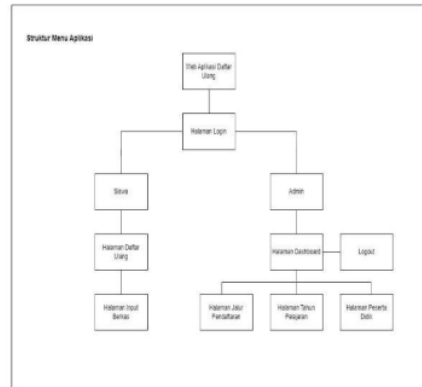


b) Database Design

i. Class Diagram



ii. Menu Structure Design



iii. Interface Design

Selamat Datang Calon Peserta Didik

Silahkan masukkan nomor pendaftaran dan jalur pendaftaran

Masukkan nomor pendaftaran

Pilih Jalur Pendaftaran V

Lanjutkan

Selamat Datang Calon Peserta Didik

Silahkan isikan form di bawah ini untuk melanjutkan daftar ulang

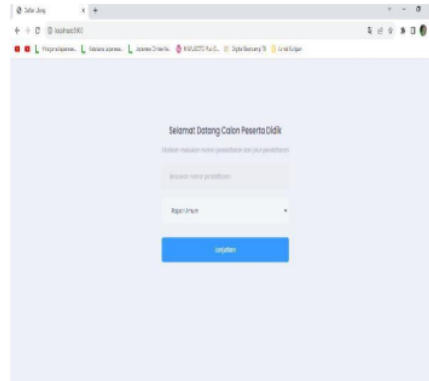
Nama Pendaftaran		JKR	
Nama Peserta		KTP/Keluarga	
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Jalur Pendaftaran		Filescanning maximal 500kb	
Status Daftar ulang			

Kirim

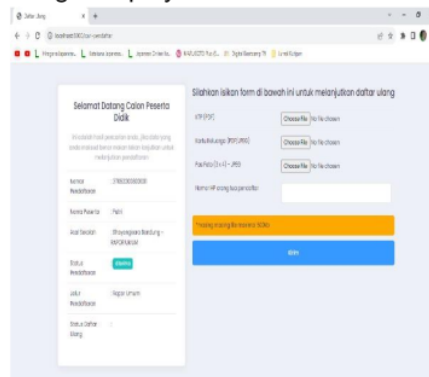
System Implementation

System implementation is the phase in which the previously created plans and application designs are transformed into a functional product or system that meets the specified requirements. The implementation results will yield a fully functional application.

i. Login Page Display



ii. Student Re-Registration Page Display



Conclusion

Based on the findings of this final assignment investigation, developing a student re-registration application utilizing the **Laravel** framework at **Tegallega Elementary School** offers numerous advantages and solutions for the student re-registration process. The following key findings have been extracted from this research:

1. Enhancing the Efficiency of the Student Re-registration Procedure: Implementing a student re-registration application developed using **Laravel** substantially improves the efficiency of the procedure. The data obtained from this study indicates a significant decrease in the time needed to re-register pupils. In the past, the manual re-registration of students was a time-consuming

and resource-intensive process due to the involvement of intricate administrative activities, such as document recording and collection. Nevertheless, by implementing this application, it is possible to automate these diverse operations, minimizing the possibility of human mistakes and expediting the process of gathering more precise data.

2. Data Accuracy: This program enables the SDN Tegallega school to access student data and files with precision and reliability. The program generates increasingly accurate and comprehensive data, the foundation for management to make more informed decisions. The research findings indicate that implementing this system improves the efficiency and organization of student re-registration and file verification processes. Previously, challenges in file processing hindered the efficiency of decision-making processes.

Other recommendations can be implemented to enhance and advance further:

1. Enhanced and comprehensive testing:
Extensive testing of this program will be conducted using diverse scenarios and workloads to guarantee exceptional performance and dependability in real-world conditions.
2. Data Security: Implement robust data security measures in this application to safeguard sensitive student and school data information from cyber security

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