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Fullstack Implementation Using Angular Framework and Springboot in the Participant Admission Information System New Education (PPDB) (RA DAARUN Case Study - NISAA)

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ABSTRACT

RA DAARUN-NISAA is an educational institution situated in a specific area in Bandung. It annually admits new students. This university attracts many fans due to its engaging learning system that prevents students from feeling bored and its rigorous teaching system. Nevertheless, the admission process at RA DAARUN-NISA is still carried out manually. Due to the absence of a student admission data management system, the incoming data has yet to be integrated into the system. Since the student admission process has yet to be digitized, there are still instances of duplicate data.

Consequently, the operator must manually organize the data before inputting it into the central system. A design for an information system to accommodate new students was developed based on the issues identified in the research findings. The research methodology employed in this thesis is the descriptive analysis method. The system development method employed is the SDLC (Software et al.) method, which utilizes a waterfall model. The system was designed utilizing the Angular framework for the front end and Springboot for the back end, with PostgreSQL as the database. The research concludes that an information system has been developed at RA DAARUN-NISAA to facilitate the registration process for new students. This system allows prospective students to register more efficiently while enabling direct management and minimization of data during the registration process. the duplicate. Recommendations for researching student admission information systems involve creating and maintaining a system that operates efficiently and at its highest potential.

Keywords: Information Systems, Admissions, Students

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INTRODUCTION

The admission of new students (PPDB) is a crucial annual undertaking at every educational institution. This activity serves the purpose of determining the composition of students who will be studying at the institution in the upcoming academic year and evaluating the efficacy and efficiency of school management. RA DARUN-NISAA, an educational institution in Bandung, continues to admit new students manually. Prospective pupils and their parents must visit the school in person and provide the necessary documentation. They will then need to enter their personal information in the given ledger. Subsequently, the school administration will enter the data into the central system. Despite its longstanding nature, this approach has numerous substantial constraints and difficulties.

An inherent challenge in this manual procedure is the ineffective management of data. Data entered manually into ledgers is susceptible to human mistakes. Data duplication or loss, leading to administrative errors, commonly occurs when data is re-entered into the central system. These constraints impede the registration procedure's efficiency and augment the administrative personnel's burden. Annually, they must input data from numerous potential students, often reaching the thousands, necessitating additional work and exertion. Furthermore, physical registration forms necessitate supplementary expenses for printing and distribution, augmenting the institution's overall operational expenditures. (Swacha & Kulpa, 2023; Torres, Oliveira, Okimoto, Marcílio, Queiroga, Castor & Monteiro, 2023)

Another challenge encountered is the restricted availability of information. Prospective students and parents frequently need help acquiring information about registration status and the selection process due to the limited availability of information outside the institution. This condition creates trouble for individuals who must repeatedly travel to and from school to obtain up-to-date information. This circumstance results in the efficient utilization of time and energy but also diminishes their degree of contentment with the services provided by the school administration. (Sulis, Amantea, Aldinucci, Boella, Marinello, Grosso & Ambrosini, 2022; Pérez-Álvarez, Mos, Hanrahan & Adenuga, 2022)

Given these issues, it is evident that RA DARUN-NISAA needs an information system to enhance the efficiency and effectiveness of the new student acceptance process. An automated information system will facilitate online registration, thereby simplifying the process of filling out registration forms for potential students and parents, who can do so from any location without the need to visit the school physically. Furthermore, this information system can centrally manage data, minimize the possibility of data duplication, and provide secure data storage. By implementing this method, the

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duration of the data input procedure can be significantly diminished, alleviating the burden on administrative personnel and enhancing the operational efficiency of the school. (Luftensteiner, Mayr, Chasparis & Pichler, 2021; Chen, Wang, Ling, Liang & Li, 2021)

The PPDB information system at RA DARUN-NISAA will be developed using fullstack technology, incorporating Angular for the frontend and Spring Boot for the backend. Angular, a framework developed by Google, simplifies the creation of dynamic and responsive web apps. It offers features like two-way data binding, dependency injection, and modularity, making it ideal for complex online applications. Spring Boot, a Java-based platform, is designed for creating robust and scalable backend applications. It streamlines application configuration and deployment, offering a range of modules for rapid and effective development.

With the comprehensive fullstack solution, the PPDB information system will operate seamlessly, meeting user requirements effectively. The Angular-based front end will provide a user-friendly and adaptable interface, making it easy for prospective students and parents to complete registration forms. The Spring Boot backend will handle registration data, validate files, and provide additional services to facilitate the enrollment of new students, ensuring a smooth and efficient registration process.

This study aims to create and use an information system for the admission of new students at RA DARUN-NISAA, utilizing Angular and Spring Boot. This research will commence with a comprehensive needs analysis to ascertain the users' requirements and the specific specifications that need to be produced for the system. Subsequently, the system will undergo a process of system design, encompassing the creation of architectural design, database design, and user interface design. In the subsequent phase, the system development will involve implementing the information system using Angular for the front end and Spring Boot for the back end. Once the system is constructed, it will undergo system testing to verify its proper functioning and alignment with user requirements. The last phase involves implementing and evaluating the system, which will be implemented at RA DARUN-NISAA and assessed to determine its effectiveness and efficiency.

The deployment of the PPDB information system at RA DARUN-NISAA is anticipated to yield many advantages. Initially, this technology will enhance both time and energy efficiency by allowing the registration procedure to be conducted online and enabling automatic data input into the central system. Furthermore, implementing the information system will enhance data accuracy by minimizing human errors in data input and ensuring secure data storage. Furthermore, implementing digital forms will

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reduce school operational expenditures, as it would eliminate the expenses associated with printing and distributing physical forms. Furthermore, the online system will facilitate quicker access to information, allowing prospective students and parents to obtain details on registration status and the selection process. The reports and data analysis generated by the system will assist school administration in making more informed judgments about the admission of new students.

The construction of this information system also contributes substantially to the advancement of information systems in the education sector. RA DARUN-NISAA can serve as a model for other educational institutions to establish a highly efficient and effective PPDB information system by incorporating full-stack technology, such as Angular and Spring Boot. This technology facilitates the creation of online apps that are interactive and adaptable, as well as backend applications that are dependable and capable of handling increased demands in order to fulfill user requirements better.

In addition, this research can offer significant guidance to information system developers in selecting the appropriate technology for developing PPDB information systems. Angular and Spring Boot are a potent amalgamation for crafting intricate web apps, as they provide many functionalities and modules that streamline application development. Developers can enhance their decision-making process in selecting the most suitable technology for their project by comprehending the benefits and drawbacks of each technology. This study aims to create and use an information system for the admission of new students at RA DARUN-NISAA, utilizing Angular and Spring Boot. This research will commence with a comprehensive needs analysis to ascertain the users' requirements and the specific specifications that need to be produced for the system. Subsequently, the system will undergo a process of system design, encompassing the creation of architectural design, database design, and user interface design. In the subsequent phase, the system development will involve implementing the information system using Angular for the front end and Spring Boot for the back end. Once the system is constructed, it will undergo system testing to verify its proper functioning and alignment with user requirements. The last phase involves implementing and evaluating the system, which will be implemented at RA DARUN-NISAA and assessed to determine its effectiveness and efficiency.

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In addition, this research can offer significant guidance to information system developers in selecting the appropriate technology for developing PPDB information systems. Angular and Spring Boot are a potent amalgamation for crafting intricate web apps, as they provide many functionalities and modules that streamline application development. Developers can enhance their decision-making process in selecting the most suitable technology for their project by comprehending the benefits and drawbacks of each technology.

METHOD

This study employs a systematic approach to system development, comprising many stages, to guarantee that the newly constructed student admission information system (PPDB) satisfies user requirements and operates efficiently. The initial phase involves conducting a needs analysis, which entails reviewing the literature to gather knowledge about the PPDB process and the intended technology, specifically Angular and Spring Boot. In addition to that, we conducted firsthand observations of the PPDB process at RA DARUN-NISAA and interviews with administrative personnel and prospective students to determine their needs and the challenges they encounter.

The second phase is system design, encompassing the design of system architecture, database, and user interface. The system architecture is specifically built to seamlessly

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incorporate a frontend developed using Angular and a backend developed using Spring Boot. The database design was developed to centrally and securely store new student registration data. The user interface is intentionally designed to be straightforward and user-friendly, streamlining the online registration procedure and efficiently transmitting information to users.

The third phase entails developing the system. Currently, the front end is developed using Angular, which involves creating an online registration form and an information dashboard. The backend is developed using Spring Boot, encompassing registration data management, file verification, and automated notification services.

The fourth stage is system testing, which encompasses functional testing to verify the appropriate functioning of every system feature in accordance with user requirements and security testing to assure the secure storage of student data and protection against any security risks.

The fifth phase entails the implementation and evaluation of the system. The PPDB information system was deployed at RA DARUN-NISAA, and the administrative personnel were instructed in its usage. An evaluation is conducted to gauge the efficacy and efficiency of the system by gathering input from users and analyzing usage data. The purpose of this strategy is to guarantee that the development of the PPDB information system not only fulfills technical requirements but also delivers tangible advantages for RA DARUN-NISAA. These benefits include enhanced efficiency, accuracy, and convenience in the new student acceptance process.

RESULTS and DISCUSSION

System Analysis and Design

a. Business Process Analysis

An examination of the registration system at RA DAARUN reveals the current state of the NISAA as follows:

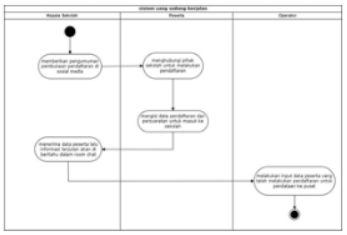

Figure 1. Business Process Analysis

b. Proposed New System

1. Use case diagrams

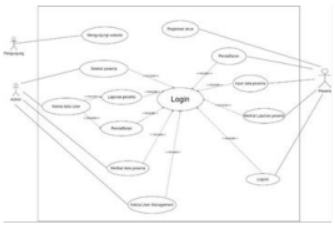

Figure 2. Use Case Diagram

2. Scenario Table

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Use case	Pendaftaran		
Actor	Peserta		
Precondition	Sistem menampilkan halaman *dashboard* setelah melakukan *login*		
Postcondition	Setelah melakukan pendaftaran data akan tersimpan dan *form* pendaftaran akan terisi sesuai data yang diinput		
Main flow of event			
Action Actor		*System response*	
1.	Memilih menu pendaftaran	2.	Menampilkan halaman pendaftaran
3.	Memilih tombol daftar	4.	Menampilkan form pendaftaran
5.	Mengisi *form* pendaftaran		
6.	Memilih tombol daftar	7.	Validasi data pendaftaran

Figure 3. Scenario Table

3. Activity diagrams

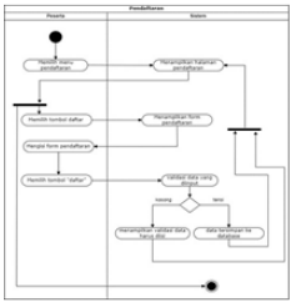

Figure 4. Activity diagram

c. System planning

1. Database Design

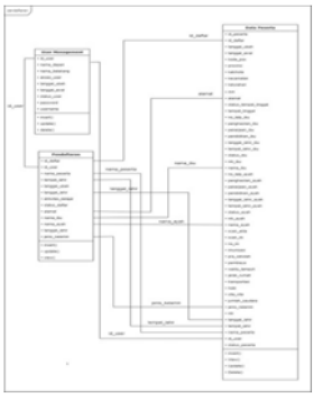

Figure 5. Database Design

2. Interface Design

Figure 6. Interface Design

System Implementation

System implementation refers to the process of developing and constructing the program by specifying the necessary hardware and software components.

1. Landing Page Display

Figure 7. Landing Page Display

2. Home Page/Dashboard Display

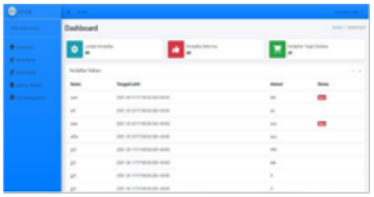

Figure 8. Home Page/Dashboard Display

3. Registration Page Display

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Figure 9. Registration page display

CONCLUSION

Given the previously indicated limits of the situation, the following conclusions can be inferred. This system is specifically developed to manage prospective student data efficiently. This technology facilitates admitting new students by allowing the school operator to confirm registration and monitor incoming data. Due to automated management, stationery is unnecessary for student registration throughout the admission process.

Researchers conducting future studies should consider the following recommendations: further development of the designed program to align with future technology requirements. The program's security mechanism can be enhanced to surpass its previous state regarding appearance and technological functionality.

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