Development of the Information System for the Studies Program
Information Engineering at USN Papua

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This article contributes to:
Highlights:
• The RAD methodology, emphasizing short development cycles, was used for system development. The process included requirement planning through observations and interviews, system design using Data Flow Diagrams (DFDs) and MySQL for database management, and the development phase focused on PHP and JavaScript.

Abstract
This study focuses on the development of a new information system for the Information Engineering Studies Program at Universitas Sepuluh Nopember Papua (USN Papua). The initiative arose from the need to replace an outdated system that had numerous user-reported issues. The primary objective is to enhance information dissemination among students and staff. Utilizing the Rapid Application Development (RAD) methodology, the project involved several phases: requirement planning, system design, development, and implementation. Data was collected through observations and interviews at USN Papua to inform system requirements. The new system features a multi-level access structure, including roles for admin, students, lecturers, and guests. Key functionalities include user registration, exam applications, event management, and information sharing. This system aims to improve user experience and operational efficiency within the program.

Keywords: Information system; Rapid Application Development; USN Papua; user experience; operational efficiency

1. Introduction
Internships, commonly referred to as "Kerja Praktik" in Indonesia, play a critical role in bridging the gap between academic learning and professional experience. These structured, short-term work experiences provide students with opportunities to apply their theoretical knowledge in real-world settings, thereby enhancing their practical skills and professional readiness.

The primary purpose of an internship is to offer students hands-on experience in their field of study. This experience helps them understand the practical applications of their coursework and gain insights into the daily operations of their chosen industry [1].
Internships can also provide valuable networking opportunities, allowing students to establish professional contacts that can be beneficial for future career prospects.

Internships are beneficial not only for students but also for employers. Companies can evaluate potential future employees in a real-world setting and benefit from the fresh perspectives and innovative ideas that interns often bring to the workplace [2].

As a student at Universitas Sepuluh Nopember Papua (USN Papua), I have reached the phase where I am enrolled in an internship program. This internship spans one month and takes place at USN Papua. During this time, I was tasked with developing a new information system for the Information Engineering Studies Program. This task was assigned because the previous version of the system was considered outdated and had numerous user-reported issues. The new system is being developed in the hope that it will assist the students and staff of USN Papua in effectively disseminating information.

2. Methods

The method to be used in this system development is the RAD (Rapid Application Development) method. The RAD (Rapid Application Development) software development method is a software development process that emphasizes short development cycles [3].

![Image: Rapid Application Development](image1.png)

Figure 1. Rapid Application Development

2.1. Requirements Planning

The requirement planning stage in the Rapid Application Development (RAD) method is a crucial initial phase that involves gathering and analyzing business needs, user requirements, and project constraints. This stage aims to establish a clear understanding of what the system should achieve and to define the project scope [4]. For this research data that is going to be used in this phase is collected through observation and interview that was conducted at USN Papua.

2.2. System Design

The system design phase in Rapid Application Development (RAD) is a critical stage where the initial prototypes are refined and detailed specifications are created to ensure the system meets user requirements and business goals. This phase is characterized by iterative development and close collaboration between developers and users [5].

The data that has been collected in the previous phases will then be used to build the data model, this model will be described in the form of DFD (Data Flow Diagram). A DFD is a modeling notation, which focuses on essential, functional aspects of such early software designs [6]. This diagrams will be made using YeD graph software.

Next the database scheme for this system will be build using MySql. MySQL is an open-source relational database management system (RDBMS) that is widely used for managing and organizing data. It is based on the structured query language (SQL), which is used for adding, accessing, and managing the content in a database. MySQL is known for its reliability, flexibility, and ease of use, making it a popular choice for web applications, data warehousing, and various other applications [7], since the system database will be managed in MySql server its only natural the database scheme will be build in MySql workbench.

The system UI will be build using 2 free bootstrap focused template AdminLTE for the admin side for the system, and eLEARNING - eLearning HTML Template from htmlcodex.com for the landing site design.
2.3. Development Phase
The development phase in the RAD (Rapid Application Development) method is a crucial stage where developers work intensively to build and code the application based on the previously created design. In this phase developers create functional prototypes of the system that allow users to see and test the core features of the application. These prototypes can be used to gather early feedback from users, which is then used to refine the system [8].

For this project the system will be build using CI4 framework which is focused on the PHP programming language, though for this project the system will be collaborated with a little bit javascript. Then as said before the database will be managed with MySql.

2.4. Implementation and Finalization
The implementation phase in the Rapid Application Development (RAD) methodology is where the fully functional system or application is deployed to the end-users. The finalization phase in RAD focuses on refining and optimizing the system after it has been implemented, before deployment, the system undergoes rigorous testing to identify and fix any bugs or issues. This includes unit testing, integration testing, system testing, and user acceptance testing [9].

3. Results and Discussion
This is is the result of the research that has been conducted in USN Papua during the time of internship.

A. Requirements Planning
Based on the research that has been conducted through observation and interview at USN Papua there are a couple of point that can be made, the main focus for the system is so that it will help the student in the university on applying for audience in the student’s exam, next the system will have 4 access level that is admin, mahasiswa, dosen, and tanu. Here are a more detailed explanation surrounding the system scopes, lastly the process of user registration will be using a waiting list system, this mean that anyone that register as a new user will wait for admin response before be given access to the system, also every new user will be provided with default user password.

1. Functional Requirements
As has been explained before the main purpose of the system will be to help students in the process of applying for student’s exam audience, other than that the system will also be the main public source of information surrounding the program studi Teknik Informatika at USN Papua, this’ll include news and other sort of academic’s information.

2. User Requirements
As stated, the system will have 4 level access, more detailed explanation will be presented below this paragraph.

Tamuguest:
This access level will provide the user only the public information surrounding Program studi Teknik Informatika, this include, access to various page such as the news page, gallery, profile page, staff page, students testimonial page, and contact page. Please be noted that this level doesn’t require a login process to access the system.

Mahasiswa(Students):
This level require a login process to access the system, after that then the user can access the system, the privileges that will be provided will be the same as the tamu access level with a little addition, here the user will have access to the events page where they can apply for an audience in students exam, also the user can access the exam page where they can apply for an exam themselves, there also will be a couple of user information that will be used for the students testimonial page that are directly to the users account.
**Dosen (Lecturer):**

Dosen have the same privileges as Mahasiswa, the only differences is that the user data that will be used for students testimonial section will be instead directed to the staff section.

**Admin:**

The admin will have the highest access privileges, this mean that the admin can access the admin side of the system where they can manipulate the data that will be used by the system, this include the user page, registration page, acara (events), ujian (exams), testimonial, and gallery.

**B. System Design**

The system design will be presented in three form, context diagram, data flow diagram (DFD), and mysql workbench database scheme.

1. **Context Diagram**

A context diagram, also known as a level 0 data flow diagram, is a high-level, visual representation of a system that shows the system as a single process and its interactions with external entities such as users, other systems, and external data sources. The primary purpose of a context diagram is to provide an overview of the system's boundaries and the flow of information between the system and its environment [10].

![Figure 2. Context Diagram](image-url)

2. **Data Flow Diagram**

A Data Flow Diagram (DFD) is a graphical representation used to visualize the flow of data within a system. It illustrates how data moves from one process to another, including inputs, outputs, storage points, and the routes between each destination. DFDs are useful for analysing and designing information systems, making them a crucial part of the system development lifecycle. [11].

![Figure 3. Data Flow Diagram](image-url)

3. **Database Scheme**

This scheme is made in MySql Workbench.
C. **Implementation**

The implementation of the system is presented below.

1. **Login page**

This is the page where the user access a higher level user access,

![Login Page](image)

2. **Registration page**

Here the user can register for new account, see figure 6. Also the admin side registration page where admin sent response regarding user registration, see figure 7.
3. **User page**
   
   User page consist of mahasiswa(students) page, dosen(instructor) page, and role page which each of them function as a way to manage user, see figure 8, 9, and 10.
4. **Testimonial page**

   This page consists of testimonial admin side where the data will be able to be manipulated by the admin, and the public side where the information is open to the public, see figure 11 and 12.
5. **Profile page**

This page also consists of admin side and public side, see figure 13 and 14.

6. **Gallery**

See image 15 and 16.
7. **Events page**

See figure 17 and 18. This page is where the users manage the appliance in students exam.
8. **Exams page**

See figure 19 and 20, this where the users can apply for exams themselves and for the admins to manipulate the exams details.

9. **News page**

See figure 21 and 22, this where the admin can manipulate the data that will be shared in form of news to the users publicly.
4. Conclusion

The development of a new information system for the Information Engineering Studies Program at Universitas Sepuluh Nopember Papua (USN Papua) has been successfully carried out as a solution to replace the outdated system that had numerous user-reported issues. By applying the Rapid Application Development (RAD) method, this project successfully navigated through various critical stages, including requirement planning, system design, development, and implementation. The new system is designed with a multi-level access structure that includes roles for admins, students, lecturers, and guests, and is equipped with various essential functionalities such as user registration, exam applications, event management, and information sharing. It is expected that this system will improve user experience and operational efficiency within the program, thereby supporting academic and administrative activities at USN Papua more effectively and efficiently.

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6. References


