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Design of a Web-Based Self-Reporting Information System for Teacher Professional Education

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ABSTRACT

The manual self-reporting process for students in the Teacher Professional Education (PPG) program leads to delays, data inaccuracies, and administrative complexities. This research focuses on personal information of PPG students, educational history, and assignment documents. Data collection methods included interviews, observations, and document studies. The system development method followed the waterfall approach, involving requirements analysis, system design, implementation using PHP as the primary programming language, testing, and evaluation. The resulting information system leverages web technology and PHP to facilitate self-reporting for PPG students. Key features include online reporting forms, student data management, and handling PPG-related documents. Evaluation results indicate improved efficiency, accuracy, and speed in administrative processes, along with increased student engagement in self-reporting. The conclusion of this research is that the implementation of the web-based PPG Self-Reporting Information System using PHP successfully addresses administrative challenges in the Faculty of Teacher Training and Education. This system contributes positively to data efficiency and accuracy, enhances the quality of academic services, and strengthens administrative transparency. Therefore, the application of web technology and PHP in the PPG Self-Reporting Information System can serve as a model for developing similar systems in other educational institutions.

Keywords: Information System, Teacher Professional Education, Web Technology, PHP

INTRODUCTION

The rapid advancement of information technology year after year presents a significant challenge for its users and drives every sector, whether formal or informal organizations or other institutions, to leverage it as a work activity support tool to produce fast, precise, and accurate information. To achieve this, other supporting resources, such as an information system, are necessary.

With an information system in place, organizations or companies can ensure the quality of the information presented and make decisions based on that information. Nowadays, information can be obtained more easily and quickly thanks to information technology and reliable software, along with human resources proficient in the technology itself.

One of the anticipated uses of information technology is the Teacher Professional Education (PPG) Self-Reporting Information System. Data collection for PPG registration has always been done in person. This process causes numerous limitations for students in the Teacher Professional Education program when self-reporting. Due to distance constraints, there are many obstacles for prospective participants in completing self-reporting in person. This method can be considered highly ineffective and inefficient, as the self-reporting process is still conducted traditionally using paper forms provided by the Faculty. Additionally, this approach complicates data management activities. Due to these issues, it is evident that there is a need for an information system that can facilitate and assist the Teacher Professional Education Program in its operations.

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LITERATURE REVIEW

Information System

An information system is a system within an organization that meets the needs of managing daily transactions, supports operations, is managerial in nature, and carries out strategic activities of the organization while providing specific reports required by external parties. It is a set of interconnected components within an organization that function to collect, process, store, and distribute information to support decision-making and control within the organization.

Teacher Professional Eduction

The Teacher Professional Education (PPG) is a program designed to prepare graduates of undergraduate education and non-education programs to acquire professional teaching competencies. Certification for teachers is achieved through a well-organized professional education program, provided either by the government or by private entities, one of which is PPG. The PPG program aims to enhance teachers' ability to select and master learning materials and to develop students holistically, including in terms of moral, religious values, and independence. According to the law, teaching is a professional occupation, and a person is considered professional if they can perform their duties professionally, including educating, nurturing, guiding, and shaping students' personalities to prepare and develop human resources.

Web Based Application

A web-based application is a computer program that uses a web browser and web technologies to perform tasks over a network or the internet. This type of application operates through a web browser and requires an internet connection to function. Web-based applications are developed using programming languages such as HTML, PHP, CSS, and JavaScript, and they require a web server and a browser to run. These applications can operate on both local networks and the internet and are characterized by interconnected pages that may include various media such as text, images, video, audio, and animations

Database

A database is one of the most crucial components in an information system, as it stores all the information to be processed and generated. A database is a collection of information stored in a computer in a systematic manner to retrieve information from it. A database is a collection of data stored in tables. Databases have become a part of almost every aspect of human life. Without a database, work would not be well-structured. Essentially, a database is a medium for storing data so that it can be accessed easily and quickly.

The application of databases in information systems is referred to as a database management system (DBMS). A database management system is an information system that integrates a collection of interrelated data to make it available for various applications within an organization.

RESEARCH METHODS

Design Concept

In this research, the design and development of the system involved several stages. System analysis and proposed system analysis are the most crucial steps in the planning and development process of the information system in this study.

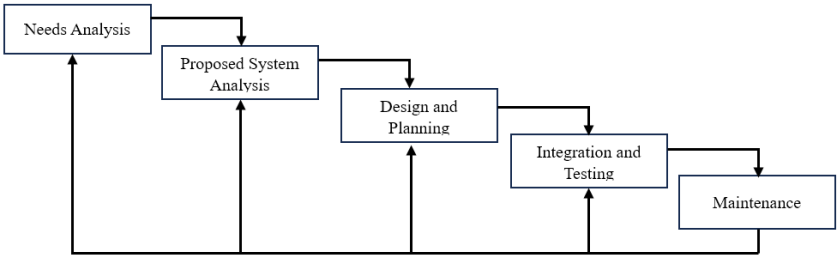

Figure 1. System Design and Development Concepts

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Current System Overview

The Professional Teacher Education (PPG) Reporting System at the Faculty of Teacher Training and Education, Malikussaleh University, currently uses computers but is not well synchronized. This lack of synchronization complicates processes and is time-consuming, resulting in ineffective data archiving, synchronization, and processing.

To address these issues, a two-month survey conducted in the Department of Natural Science Education at the Faculty of Teacher Training and Education provided the opportunity to analyze and develop a Web-Based Reporting System for the PPG program. This system aims to simplify data management and make the reporting process more efficient and effective.

Analysis of the Proposed System

The design of an information system involves developing a new system from an existing one or creating a completely new one. The goal is to resolve issues present in the old system with the new one. An important aspect to consider when designing a system or application is to tailor it to the needs of the users. Database design and system planning are carried out after analyzing the usage of the old system during and after its operation. System development requires several supporting components, including a database development component to support the management of data storage within a system component. In this case, the research and development of this system use a very familiar database component, MySQL.

RESULTS AND DISCUSSION

System Overview Schematic

A Data Flow Diagram (DFD) is a diagram that depicts the flow of data within a system to build the system in a structured manner. The Data Flow Diagram Level 0 (Context Diagram) provides a general overview of the system organization that will be developed. The context diagram also represents the overall data flow within the system and aims to identify the system to be created.

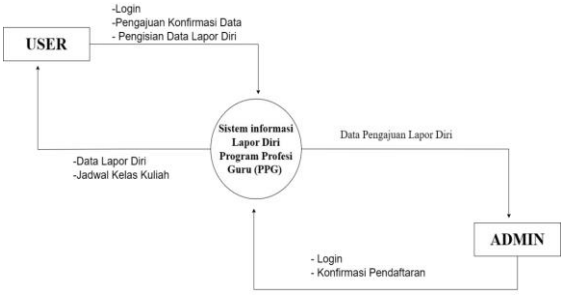


Figure 2. Context Diagram

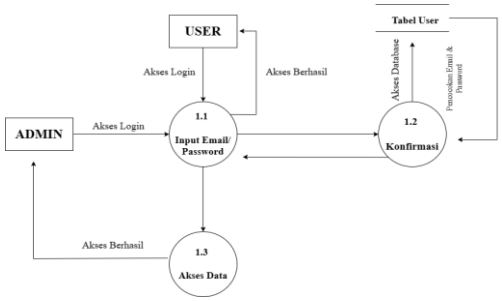
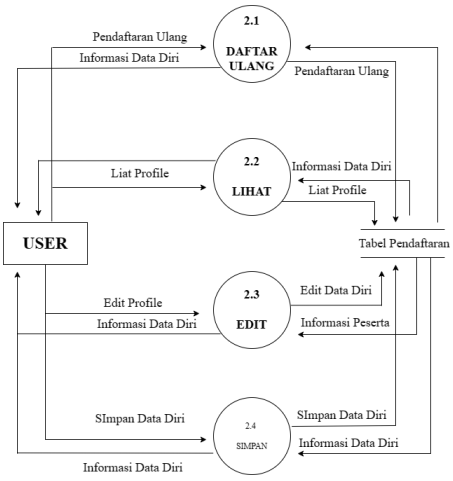


Figure 3. DFD Level 0 Login Process



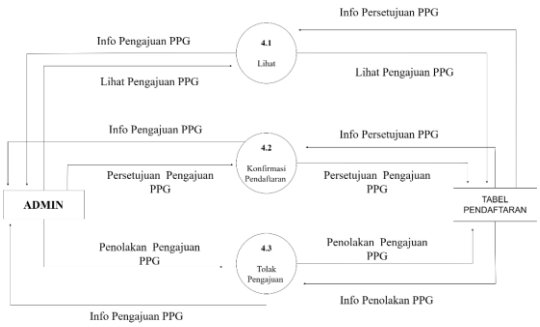


Figure 5. DFD Level 1 PPG Self-Report Verification Process

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Figure 4. DFD Level 1 Self-Report Process

Entity Relationship Diagram

An Entity Relationship Diagram (ERD) is a diagram that shows how information is created, stored, and used within a business system to display the relationships between entities or objects along with their attributes [10]. In other words, an ERD serves as a model to explain the relationships between data within a database, based on the fundamental data objects that have interrelationships.

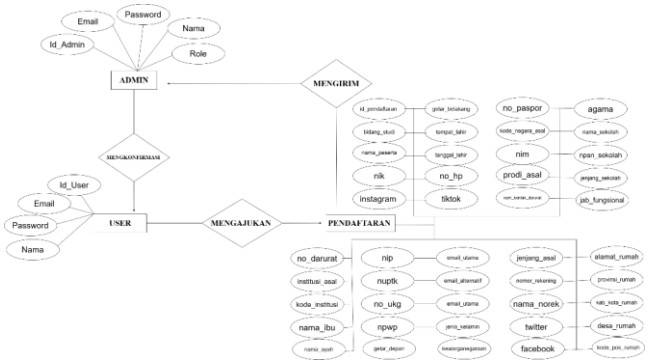

Figure 6. Entity Relationship Diagram

System Implementation

The main page of the system displays two primary functions for accessing the system. Login functions to validate the system user. On this page, there are options to register as a new user or participant and to log in to an account for both users and admins. The user simply needs to enter their username and password, then click the login button.

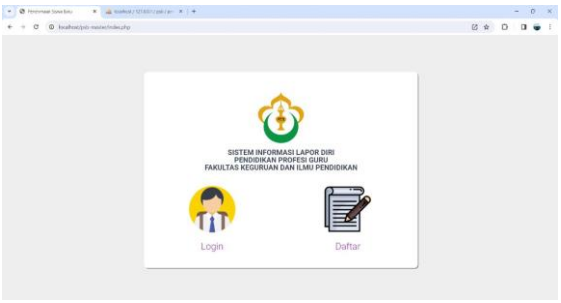

Figure 7. Main Page Display

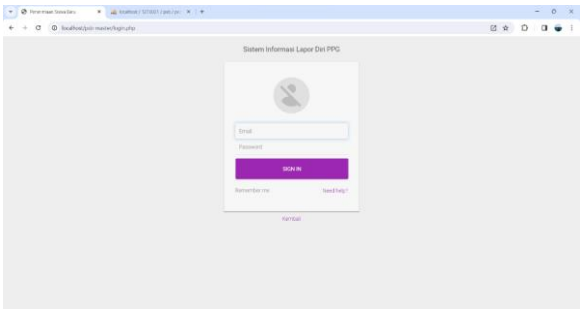

Figure 8. Admin and User Login Display

On the next page is the process for participants to complete self-reporting for PPG. This page follows the registration process. Participants are required to fill in all the requested information, which will then be sent to the database. This data will be managed and used for self-reporting needs.

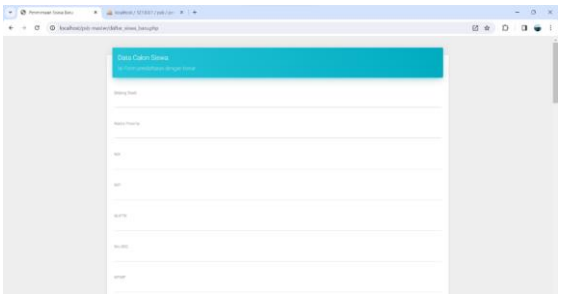

Figure 9. PPG Participant Self-Report Page

In the next step, which is a continuation of the PPG participant self-reporting page, participants are required to complete the necessary documents. After uploading the documents, the

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data will be promptly confirmed by the admin.

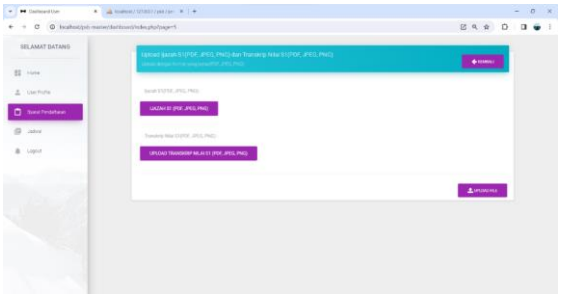

Figure 10. Document Upload Page

There are differences in the menu options on the main dashboard page for admins and users. On the admin's main page, there are menus for confirming and verifying the self-reporting data of participants in the system. On this page, the admin can print the data as an Excel output file. This is where all data will be processed further.

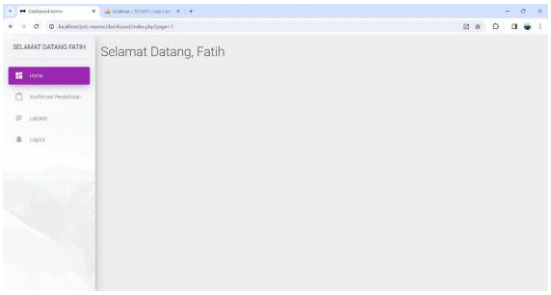

Figure 11. Admin Main Page Menu

On the data verification menu page, the admin will verify the accounts of users who have completed the self-reporting process. The data will then be stored in a data store and can later be printed as a comprehensive Excel file.

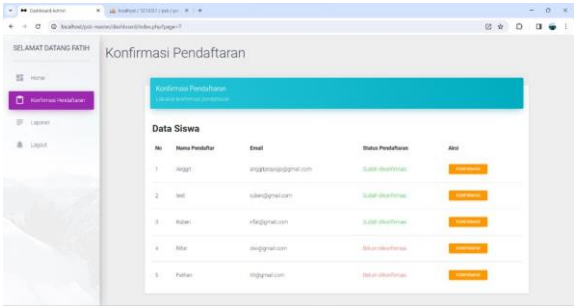

Figure 12. Data Verification Page

On the Excel print page in the Admin menu, the admin can generate output for each participant's self-reporting data for the PPG program. This output will be used as a reference for future data collection.

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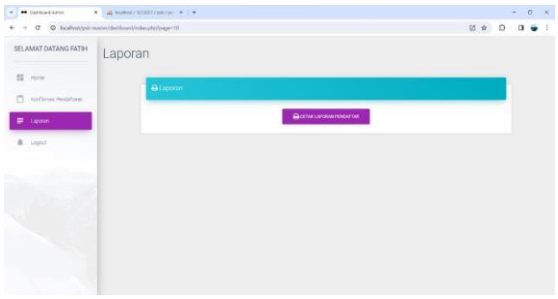

Figure 13. Excel Print Page

CONCLUSION

In the current system analysis, the process of managing self-reporting data for participants in the Teacher Professional Program (PPG) in the Department of Natural Sciences still uses Google Forms. Therefore, the author needs to build an information system to facilitate work and manage data in a well-structured manner. In designing the Self-Reporting Information System for the Teacher Professional Program (PPG), several stages must be carried out. These include formulating the existing problems, then designing and creating an information system capable of addressing these issues. The result of this system can ease the workload of employees and participants in the Teacher Professional Program by streamlining the self-reporting process. This, in turn, will expedite data synchronization for the department's data management staff.

The hope is that this research can serve as a reference for developing better information systems across various technological applications and can continue to be updated.

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