Web-Based Academic Information System

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Abstract. The purpose of this research is to build a web-based system for making the academic information system more effective and efficient in data processing in the field of formal education. The research method used was descriptive using structured and development methods using prototypes. While for programming languages used PHP and MySQL as the database. On implementation of this web-based academic information system in the class distribution process, scheduling, managing receipts, and managing student value data so that they are made temporary final report Value of knowledge and attitude by assessing using index systems (A, B, C, D). Influence The information system is very powerful in facilitating the collection of existing data, just by making it a system, we can reduce energy, time, and Human Resources. The final result of the assessment process is to make temporary report cards automatically. Therefore, this study provides several implications, including implications for planning and development curriculum that is useful for managing student, teacher, grades, scheduling, and so on. So The conclusion is, by analyzing, discussing and restoring the system for academics will produce many benefits that can be obtained and in achieving school goals.

1. Introduction
In the advent of an ever-increasing world, there is more connected as ever before there is wider recognition that further education is one of the areas most impacted to face unprecedented challenges [1]. Furthermore, in light of the declining pace of the increase of resources, the pertinence of harnessing the effectiveness and efficiency of core business processes has highlighted the importance of continuous monitoring of IT function through systemic evaluation of IT-based systems[2]. It is undeniable that with the advent of technology, every agency must utilize some form of information system in performing its activities, both in government and private institutions as well as educational institutions. Whilst implementing the technology, several institutions including educational institutions, have started using computer technology assistance in various tasks.

In agencies or educational institutions, information technology can help in processing information in the education system. Among the three government policies that have been established to make fundamental changes to the system in the field of education, one is to increase the requirement for compulsory education from 6 to 9 years. Changing the orientation of education to be more relevant to meet industrial demands and development, with information technology and encourage high school education to prepare more skilled workers. Hence, graduates do not view universities as the only alternative choice for their future.[3] High school students these days have a wide range of choices to pursue their future education where competition is keen, especially in a tight business economy.[4] In order to create a quality generation, educational institution, especially school, have to improve the information system, especially academic, thus the human resources produced by the school can have a
high use value. The use of IT in an educational environment will reflect directly or indirectly some learning models[5].

Based on preliminary observations, it was found that formal education institutions still had several obstacles in carrying out their academic activities such as there was no integrated evaluation system between teachers, classes, and subjects. To avoid double input of students' final grades, the presence of each student still uses writing on the book, which results in a buildup of files that makes data search slow and inefficient. This can result in damage and even loss of data because the process of making a reported value (report card) requires a long time because student data will be entered one by one into the final score report (report card). [6] This also often occurs in the scheduling process, conflicting class hours for less structured schedules. So from that the purpose of this study is to build a web-based system for the process of making academic information systems to be more effective and efficient in data processing in the field of formal education, the data obtained can be used as a representation of any object, which will then be processed to produce a useful information [7] which is expected to help improve the quality of services in schools and achieve school goals, one of which is data processing in the field of formal education

2. Method
In order to address these issues systematically, a research methodology was acquired.[15] In general, the research method enables a researcher to examine the data within a specific context carefully.[7] The goal of descriptive research was to describe a phenomenon and its characteristics and was more concerned with what rather than how or why something has happened.[8] The primary and secondary data sources were collected by the researcher to obtain the data required for the research object. Primary data sources were obtained by observing and interviewing, while secondary data sources were obtained through indirect data sources such as the internet.

2.1. System Approach and Development Methods
Researchers use a structured approach method. A technique or approach that breaks programs based on functions or procedures required is the meaning of a structured approach.[9] Researchers prototype modeling development methods are used for its development. This prototype modeling has 3 processes and all three processes will continue to repeat until the designed application functions properly, and all requirements are met (Figure 1).

2.2. Analysis and design tools
Flow Map, Context Diagram, Data Flow Diagram, Normalization, Data Dictionary, Table Relations, and Entity Relational Diagram are the tools typically used in a structured approach [10].
3. Results and Discussions
The description of academic information systems in the proposed web-based is focused on the process of class distributions, scheduling, presence recap processing, and student value data processing, thus creating the temporary report cards. The procedure used in this academic information system is illustrated by using context diagrams and data flow diagrams (DFD). A context diagram is considered as a diagram describing the scope of a system and consisting of a process. Context diagram generally describes the entire input to the system or the output of the system and is also considered as the highest level of the DFD, because generally, it provides an overview of the entire system.[11] Figure 2 shows the context diagram of an academic information system, while Figure 3 shows the level 1 data flow diagram of the academic information system (Figure 2).

Figure 2. Context Diagram

In representing a system or software, the researchers usually divide it into several levels of abstraction by using Data Flow Diagrams. By using DFD, each process from each level will be explained in more detail on representing information flow and its function.[12]

MySql database, which is an SQL database management system (DBMS) software, is used in this research. The results of this study will be in the form of a scheduling and assessment processing information system, which the implementation results can be seen in Figure 3. The class schedule page will appear based on class after logging in and accessing the scheduling menu.
Meanwhile, to do the assessment processing, usually the teacher must calculate the value of students with the ms.excel application but sometimes there is often a calculation error, but with the system later the teacher only needs to enter the student value data into the system which will be processed automatically and only need to print the student score report. so it does not take time and gives tangible results [13][14], it is necessary to access the assessment menu, and a display will appear as shown in Figure 4.
The final result of the assessment processing is the temporary report card as shown in Figure 5.

![Temporary Report Card](image)

**Figure 5.** Temporary Report Card

A, B, C, and D cover the final grades for the knowledge and attitudes assessment. In this research, the student's final grades are divided into 4 groups: (0-69) = D, (70-79) = C, (80-89) = B, (90-100) = A.

Besides, in designing this web must be built using a good and integrated security system to avoid misuse of data and hacking in ways such as[12]:

- a. The first step is to fulfill administrative documentation, as well as existing requirements in the company,
- b. The equipment and technology used (hardware) are installed properly and correctly and the software used is also well configured and always controlled,
- c. Draft complex information schemes as backups to external devices,
- d. Develop schemes that are designed to be more efficient by carrying out operational and centralized configuration management,
- e. Make regulations as a limitation in ensuring the protection of data, devices in systems especially servers, databases, and others
4. Conclusion
The conclusion is that with the use of this academic information system, it is expected to be able to help the assessment processing and reduce errors in calculating student grades and to facilitate in creating the assessment recap thus no delay in submitting the student’s final grade to the curriculum. The existence of an academic information system is expected to help better schedules processing and to reduce conflicts. Informing the schedule and student class data can be easier by using an academic information system.

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