PUBLISHED BY
JR
EDUCATION

Available online at http://ijite.jredu.id

International Journal of Information Technology and Education (IJITE) 2 (4), (September 2023) 142-152

International Journal of Information Technology and Education (IJITE)

http://ijite.jredu.id

Implementation of School Management Information Systems at Vocational School State I Tomohon

Israel Yonatan Fredrik Kamu[1]*, Parabelem Tinno Dolf Rompas[1], Mario Tulenan Parinsi[1]

[1]Technology and Vocational Education Study Program Postgraduate of Universitas Negeri Manado, Indonesia

*Corresponding author: isseryonatan@gmail.com

ARTICLE INFO
Article history:
Received: July 20, 2023; Received in revised form: August 25, 2023; Accepted: September 07, 2023;
Available online: September 10, 2023;

ABSTRACT

This research discusses the implementation of the School Management Information System (SIMS) at SMK Negeri 1 Tomohon using the Rapid Application Development (RAD) method. School management, as a process of planning, organizing, directing, and controlling, is carried out by the school principal and his staff to achieve educational goals. The main goal of school management is to create an effective and efficient learning environment. Information systems, as entities with human, hardware, software, procedures, and data components, aim to collect, store, process, manage, and convey relevant information. SMK Negeri 1 Tomohon, as a vocational school in North Sulawesi, faces management challenges due to the use of conventional systems. Processes such as recording grades, registering students, compiling schedules, and collecting data on school fee payments often take time and are difficult. Therefore, this research is focused on implementing a School Management Information System using the programming languages PHP, HTML, CSS, and MySQL, with users consisting of Admin, Teachers, and Students, and using the RAD method. This research identifies problems in data management and school administration which are still manual, resulting in inefficiencies and potential errors. SIMS succeeded in making a positive impact with a structured interface, allowing easy access to information on grades, schedules, and learning activities. SIMS also facilitates systematic monitoring of student and teacher performance. This research concludes that SIMS can be an effective solution to support educational management at SMK Negeri 1 Tomohon with the potential for wider application in other school environments.

Keywords: information, school, system management

INTRODUCTION

School management is a process that involves planning, organizing, directing, and controlling carried out by the school principal and his staff to achieve educational goals. The main goal of school management is to create an effective and efficient learning environment for students, teachers, and school staff. This process involves managing all operational and administrative aspects of the school, including human resources, financial resources, and educational facilities. Effective school management can improve the quality of education, achieve learning goals, and create an environment that supports student growth and development.

Information systems, as entities consisting of humans, hardware, software, procedures, and data components, aim to collect, store, process, manage, and convey information that is relevant and useful for users. Information systems can be used in various sectors, including education, to support decision-making, business operations, and data management. Development and management of information systems requires a good understanding of organizational needs, selection of appropriate technology, adequate infrastructure settings, and effective security and data protection.

SMK Negeri 1 Tomohon, as a vocational school in North Sulawesi Province, faces challenges in school management due to the use of conventional systems. Processes such as recording grades, registering new students, preparing schedules, and collecting data on school fee payments often experience difficulties and take time. By looking at the context of the problem, researchers are interested in conducting research with the title "Implementation of school management information systems in vocational school negeri i tomohon." This research aims to create and analyze an information system that can be used for education management at SMK Negeri 1 Tomohon.

In limiting the problem, this research focuses on the use of PHP, HTML, CSS, and MySQL programming languages. The application created will be a School Management Information System with users consisting of Admin, Teachers, and Students. The development method used is RAD (Rapid Application Development). Some of the issues identified involve manual processes in data collection, processing, and management, which can lead to errors and inefficiencies. The lack of efficiency in data collection and management, the absence of an efficient information system at SMK Negeri 1 Tomohon, as well as anticipation to improve the quality of the school became the focus of problem identification.

It is hoped that the results of this research can provide benefits, both theoretically by producing new concepts in managing information systems and practically by increasing operational efficiency at SMK Negeri 1 Tomohon through the implementation of information systems that suit the needs and challenges faced by the school.

LITERATURE REVIEW

Understanding the System

A system is a collection of elements that interact with each other and work together to achieve certain goals. In a general context, a system is a unit consisting of components that are interconnected and interact regularly to carry out certain functions or achieve certain goals. A system is a series consisting of two or more components that are interconnected and interact with each other to achieve goals where the system is usually divided into smaller sub-systems that support the larger system(Romney and Steinbart, 2015).

Based on the understanding of the experts above, it can be concluded that a system is a series or collection of components that are interconnected and interact with each other in an organized transformation process. Systems can consist of sub-systems that support a larger system and can be viewed from a procedural and element perspective. In the context of information systems, a system is a collection of components in a company or organization that are related to the creation and flow of information. These components work together to achieve planned goals. Overall, a system is an entity consisting of elements that interact and influence each other to achieve goals and carry out an organized transformation process.

System Characteristics

In defining a system, some approaches can focus on procedures or elements/components. In principle, a system is a group of elements that are interconnected and work together to achieve certain goals. Some experts have different approaches to defining the system, namely,

According to Jeperson Hutahaean (2015:3) the system can be said to be a good system, it has characteristics, namely:

1. Components

A system consists of several components that interact with each other, which means they work together to form a single unit. System components consist of components in the form of subsystems or parts of the system.

2. System Limits (boundaries)

System boundaries are areas that limit a system to other systems or the external environment. These system boundaries allow a system to be viewed as a unit. The boundaries of a system indicate the scope of the system.

3. External Environment of the System (environment)

The external environment of the system is outside the boundaries of the system which affects system operations. The environment can be beneficial which must be maintained and detrimental which must be maintained and controlled, otherwise, it will disrupt the survival of the system.

4. System connector (Interface)

The system liaison is a connecting medium between one subsystem and another subsystem. This link allows resources to flow from subsystems to other subsystems. The output from a subsystem will become input for another subsystem via a link.

5. System Input (Input)

Input is energy entered into the system, which can be in the form of maintenance (Maintenance Input), and input signals (Signal Input). Maintenance input is the energy entered so that the system can operate. The input signal is the energy that is processed to obtain the output. For example, in a

computer system, a program is maintenance input, while data is an input signal to be processed into information.

6. System output (Output)

The system output is the result of energy that is processed and classified into useful output and waste. For example, computers produce heat which is waste, while information is the required output.

7. System Processing (Process)

A system is a processing part that will convert input into output. The production system will process raw materials into finished materials, the accounting system will process data into financial reports.

8. System goals

A system must have a goal or objective. The goals of the system determine the input the system needs and the output the system will produce.

System Classification

Several aspects of the system allow users to classify the system based on viewpoints. The system classification in question (Tyoso, 2016), namely:

1) Natural Systems and Man-Made Systems

a) Natural systems are systems that occur through natural processes, not created by humans, for example, the solar system, galactic system, reproductive system, and others.
b) Man-made systems are systems designed by humans. Artificial systems that involve human interaction, for example, accounting systems, information systems, etc.

2) Deterministic Systems and Probabilistic Systems.

a) A deterministic system is a system that operates with predictable behavior. The interaction of the parts can be detected with certainty so that the output of the system can be predicted, for example, a computer system, is an example of a system whose behavior can be determined based on the computer programs that are run.
b) A probabilistic system is a system whose future conditions cannot be predicted because it contains elements of probability, for example, human systems.

3) Open System and Closed System.

a) An open system is a system that is connected and influenced by its external environment. More specifically, it is also known as an automated system, which is part of a human-made system and interacts with control by one or more computers as part of the system used in modern society. This system receives input and produces output for other subsystems, for example, the human cultural system.
b) A closed system is a system that is unrelated and unaffected by its external environment. This system works automatically without any interference from outside parties. Theoretically, this system exists, but in reality, there is no truly closed system, there is only a relatively closed system (relatively closed, not truly closed).

Information

information is a collection of data or facts that are organized or processed in a certain way so that they have meaning for the recipient(Anggraeni and Irviani, 2017). Information is data that has been managed and processed to provide meaning and improve the decision-making process(Romney & Steinbart, 2016). information is data that is processed and useful for users(Suryantara, 2017). Information is data that has been processed and is intended for a person, organization, or anyone who needs it (Mulyani, 2016).

From the experts' explanations above, it can be concluded that information is the result of processing or organizing data or facts that have meaning or value for the recipient. This information has been processed so that it is useful and useful for the user or recipient of the information. Information can also be used to assist in decision-making or improve certain processes.

Information Cycle

The information cycle is a series of steps in processing information from beginning to end. Consists of four stages: input, processing, output, and feedback. Input involves collecting data from various sources. Processing involves manipulating data to produce meaningful information. Output involves the presentation of processing results to the user. Feedback involves evaluating output results and adjusting for improvement. The information cycle is important in processing information to produce useful information. Information processing, data is processed using a certain process model. For example, temperature in Fahrenheit is converted to Celsius through the use of a mathematical model in the form of a conversion formula (Japreson Hutaen, 2015). The data is processed through the model into information, which is then received by the recipient of the information. Recipients of this information then make decisions and take relevant actions, which in turn generate new amounts of data. This data then becomes input, processed again through the relevant model, and so on. This process is called the information cycle or data processing cycle.

Information Systems

An information system is an organized combination of people, hardware, software, communication networks, and data resources that collect, change, and disseminate information (Anggraeni & Irviani, 2017). An information system is a system created by humans and consists of components in an organization to achieve goals, namely presenting information(Suryantara, 2017). An information system is a system that is defined as collecting, processing, storing, analyzing, and disseminating information for certain purposes. Like other systems, an information system consists of input (data, instructions) and output (reports) (Gilang Ramadhan, et al, 2017).

Based on the understanding conveyed by several sources, it can be concluded that an information system is an orderly combination involving people, hardware, software, communication networks, and data resources. This system functions to collect, change, and disseminate information with a specific purpose. Information systems are also systems created by humans and consist of components in organizations that aim to present information. As a system, an information system has input (data, instructions) and output (reports), and involves the processes of collecting, processing, storing, analyzing, and disseminating information.

Information System Objectives

an information system aims to produce information from data that is processed into a form that is useful for its users (Nina Rahayu, Putri Sugiarti, and Siti Islamiyah, 2017).

1. Usefulness. The system must produce information that is accurate, timely, and relevant for decision-making by management and operating personnel within the organization.
2. Economy (Economic). All parts of the system including reports, controls, and machines must contribute a benefit value of at least the cost required.
3. Reliability. The system output must have a high level of accuracy and the system itself must be able to operate effectively even when the human component is not present or when the machine component is temporarily inoperative.
4. Subscription Services (Customer Service). The system must provide good or friendly service to customers. So that this system can be of interest to customers.
5. Simplicity. The system should be simple enough so that its structure and operation can be easily understood and the procedures easy to follow.
6. Flexibility. The system must be flexible enough to handle changes that occur, the importance of which is justified in the conditions in which the system operates or in the needs imposed by the organization.

School Management

School management is a way of doing work involving many people to achieve educational goals effectively (Daryanto, 2013). Daryanto also added that school management is viewed from a scientific perspective, so school management is an application of administrative science in the field of schooling.

METHODS

The research method used is the RAD (Rapid Application Civilization) method. The RAD model is a model used in the incremental software development process, especially for carrying out work in a short time (Rosa & Salahuddin, 2018). The RAD method is a method adapted from the waterfall model with a very high-speed version by using the waterfall model in the development of each software component. See Figure 1.

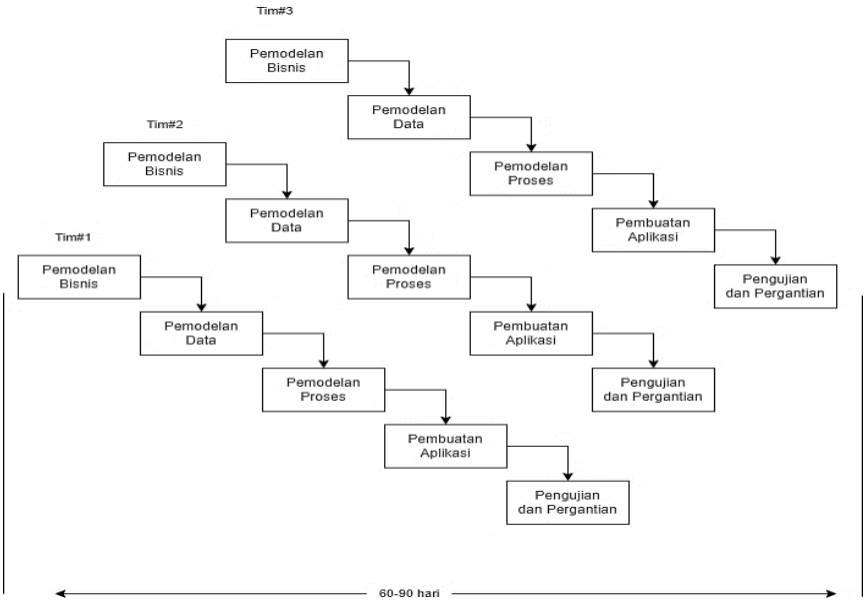

Figure 1. Rapid Application Development

The RAD method in system development includes five main stages. The following are the five stages of RAD in system development:

a. Business Modeling

In business modeling, manual flows and school management information systems to be developed are represented using business flowcharts.

b. Data Modeling

In data modeling, there are stages where the database design is created and the implementation results are compiled into the school management information system database.

c. Process Modeling

At this stage, which is a stage in the design process, business functions have been defined and are related to data definition. In this stage, researchers began to design a school management information system using UML (Unified Modeling Language) tools.

- Creation of Usecase Diagrams

At this stage, researchers will develop a system design based on the system requirements.

- Creation of Usecase Scenarios

At this stage, the use case that was created in the previous stage has been defined.

- Creation of Activity Diagrams

At this stage, the work sequence is designed from one activity to another. This stage is important to get a picture of parallel behavior or provide an explanation of the behavior in the use case diagram.

- Creating Class Diagrams

A class structure in a system that involves relationships between classes and explanations of each class in the design modeling (logical view) of a system.

- Creation of Sequence Diagrams

In this stage, the relationship between objects arranged in a time sequence is explained. Researchers pay attention to each stage in detail which has been developed to produce a better system.

d. Application Creation

In this stage, researchers integrate process modeling into the programming language stage.

e. Testing And Replacement

At this stage, researchers carry out trials with the aim of further understanding all the functions in the system being developed.

RESULTS AND DISCUSSION

The implementation of the management information system at SMK Negeri 1 Tomohon has produced a positive impact on the management process at the institution. Management information systems play an important role in managing information related to students, preparing lesson schedules, and school administration. Additionally, this system allows more effective use for teachers to provide feedback to students through the school management platform. Using SIMS can not only increase time efficiency but also make it easier to implement management systems in the school environment.

In developing the school management information system application, the Visual Studio Code text editor was used, as well as the PHP, HTML, and CSS (Bootstrap) programming languages, with support from the Codeigniter framework. This system uses a MySQL database and Apache server. The user interface of this school management information system is implemented by the process modeling at the Rapid Application Development (RAD) stage.

The Login page is the initial page for entering the school management information system following user authentication (admin, student teachers, and principal). See Figure 2.

Figure 2. Login page

The administrator page is a page for admins who have access rights to all menus and features contained in this school management information system. On this page, the admin can also add, edit, and delete data in the system. See Figure 3.

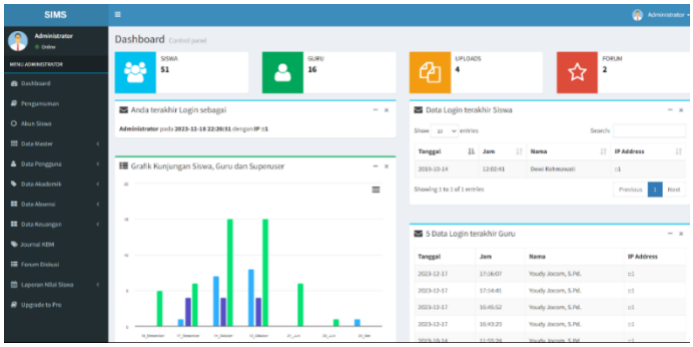

Figure 3. administrator page

The principal page is a page intended for the principal to control ongoing activities in the system. On this page, the school principal can also see reports about ongoing learning activities. See Figure 4.

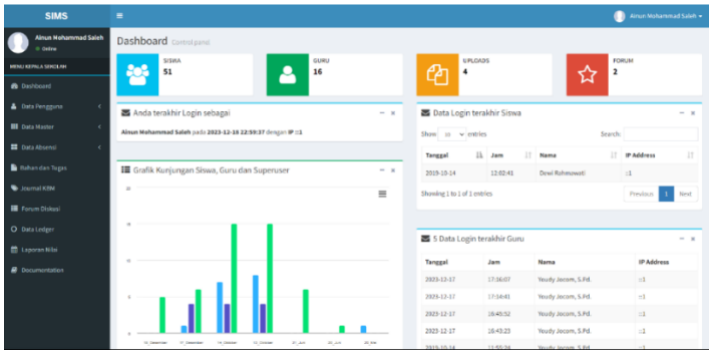

Figure 4. Principal's Page

The teacher page is a page intended for subject teachers to carry out learning activities. The features found on this page are inputting and recapping absences, uploading materials and assignments, and creating discussion forums. See Figure 5.

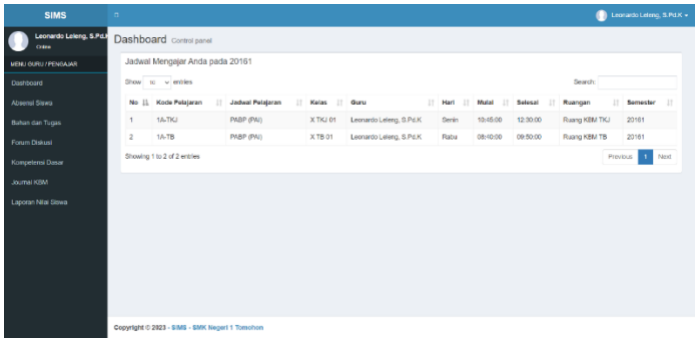

Figure 5. Teacher Page

The student page is the access given to each student to view grades, and subject schedules, view and send assignments, as well as to carry out activities in discussion forums opened by the admin or subject teacher. And via this page, students can see announcements from the academic section. See Figure 6.

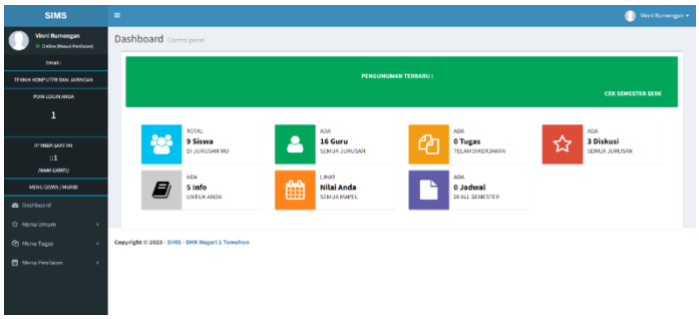

Figure 6. Student Page

CONCLUSION

School Management Information Systems (SIMS) make a significant contribution to increasing efficiency and transparency in school operations. The success of these applications depends on meeting functional standards, strict data security, and continuous development. SIMS allows the management of student data, attendance, and school finances to be more structured and easy to track. Monitoring student and teacher performance can be done more systematically through this platform.

Suggestions

Based on the conclusions above, several suggestions for maximizing the benefits of the School Management Information System (School SIM) are as follows:

1. There needs to be regular training for school staff to ensure a good understanding of the use of the School Management Information System. This will increase the efficiency of application use and ensure that all features are fully utilized.
2. The need for continuous development of the SIMS application. Update and add features as needs emerge over time. Make sure the application is always up-to-date and responsive to developments in the education system.
3. The a need for active involvement of all relevant parties, including teachers, students, and school staff. Creating a shared understanding of the benefits of SIMS will increase participation and support from the entire education community.
4. Increase awareness of data security among all users. Provide specific training on the importance of protecting student personal information and school data so that they can be accessed safely.

REFERENCES

Anggraeni, E. Y., & Irviani, R. (2017). Pengantar Sistem Informasi (Penyuntingan ke-1). Andi.

Romney, M. B., & Steinbart, P. J. (2015). Sistem Informasi Akuntansi (Edisi Salemba Empat). Jakarta: Salemba Empat.

Hutahaean, J. (2015). Konsep Sistem Informasi. Deepublish.

Tyoso, J. S. P. (2016). Sistem Informasi Manajemen. Yogyakarta: Deepublish

Romney, M. B., & Steinbart, P. J. (2016). Accounting Information Systems (Edisi 14). Pearson Education, Inc.

Suryantara, I. G. N. (2017). Merancang Aplikasi Dengan Metodologi Extreme Programmings. Jakarta: Pt.Elex Media Komputindo.

Mulyani, E. (2016). Sistem Informasi Akuntansi. Yogyakarta: Andi.

Ramadhan, G., Budiman, E., & Syakir, A. (2017). Pengembangan Media Informasi Pengenalan Lagu Daerah Kalimantan Timur Berbasis Web. Prosiding Seminar Ilmu Komputer Dan Teknologi Informasi, 2(1), 256-262.

Rahayu, N., et al. (2017). SWOT Analysis Recruitment: PT Indo Taichen Textile Industry. Jurnal Semnasteknomedia, 5(1).

Daryanto, M. (2013). Administrasi dan Manajemen Sekolah.

Jakarta: Rineka Cipta.

Rosa, A. S., & Shalahuddin, M. (2018). Rekayasa Perangkat Lunak Terstruktur dan Berorientasi Objek. Bandung: Informatika Bandung.