

Analysis and Development of Academic Information System Applications in Developing Education Quality

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ABSTRACT

Significant developments presented by the industrial revolution 4.0 and society 5.0 began to be adapted in various fields of work, because it could simplify and speed up their work. As is the case in educational institutions that have begun to apply technology in various activities. The purpose of this research is to produce an application that can be used to manage data and information in educational institutions. The type of research used is Research and Development which adopts the work steps of Borg and Gall. The subjects in this study consisted of validators from media experts and material experts, as well as field test subjects. Based on the results of expert validation and field trials of the developed application, it shows that the application that has been developed can provide benefits, is easy to operate, and is easily understood by users so that it can be concluded that the application is feasible to use in managing education administration.

Keywords: *academic information systems, data and information, education*

1. INTRODUCTION

The development of technology in Indonesia is increasing day by day [1], [2]. This is due to the presence of the industrial revolution era 4.0 and society 5.0 [3], [4]. In its development, the industrial revolution 4.0 is here to integrate the online world with the production line, where the internet is the main support for the running of a production [5], [6]. Meanwhile, society 5.0 comes with the concept of using modern-based science (AI, Robot, Iot) for human needs, so that humans live comfortably [7]. Actually the two revolutions do not have a significant difference. In this case, the industrial revolution 4.0 uses artificial intelligence in its main component, while society 5.0 relies on humans as the main component in using modern technology.

Significant developments presented by the industrial revolution 4.0 and society 5.0 began to be adapted in various fields of work. This can be seen in the surrounding community who began to use technology in various fields of work, both in the fields of science, banking, agriculture, animal husbandry, industry, and other fields [8]–[10]. All community activities, began to switch to utilizing technology with the aim of simplifying and accelerating their work [11]. In addition, the presence of the internet allows the transfer

of information to be done in a matter of seconds, thus making work done faster. This also applies to the world of education. Even in educational administration activities, currently almost the entire process is carried out by utilizing information technology [12].

Information technology is a set of tools that help human work and can perform tasks related to information processing [13]. So that by utilizing information technology it can be used to build communication networks, maintain data and information, create and manage databases, help employees solve problems with their computers or mobile devices, or perform various other jobs to ensure the efficiency and security of information systems [14], [15].

As a small example, if previously the process of accepting new students was carried out by visiting schools, now online registration is starting to be implemented because it is considered more effective and efficient. So that the use of technology in education today does not only function as a complement or addition, but has become a necessity in supporting educational activities [16]. In its development, information and communication technology has also become a benchmark for the progress of an educational institution [17]. Not infrequently to be at the forefront

and win the competition, an educational institution must always update its information technology. So it can be said that information technology is something that must be implemented in educational institutions.

The quality of an educational institution can also be identified based on its services and administrative management [18]. This is because the slow management and distribution of administrative information data can result in slow decision or policy making. In addition, a poor administrative system will also have an impact on good quality control of educational institutions. So that good administrative management is created, namely by having an effective and efficient working mechanism, both vertically and horizontally. As for managing administration so that it is effective and efficient, it can be done through the use of technology, information and communication [19].

An information system is an integrated set of components to collect, store, and process data with a view to providing information, knowledge, and digital products [20], [21]. Based on the sociotechnical point of view, information systems are composed of four components, including tasks, people, structures or roles, and technology [22]. In another definition, it is stated that an information system is a collection of hardware and software designed to transform data into useful information. Meanwhile, in its development, information systems are often accessed using computers with software installed in them, so that a computer information system can be defined as a system consisting of people and computers that interpret or process information [23].

In another study mentioned that, information systems is an academic study of a system with special reference to accessing information and networks [24]. In this case the information system is equipped with hardware and software that people and organizations use to collect, filter, process, create, and also distribute data. Academic information system in its development can provide new information on a regular basis, so as to increase the effectiveness and efficiency in processing information data [25]. In addition, the academic information system can also present data and information of an educational institution in a practical, easy, fast and accurate manner [26].

In an educational institution, information systems are very helpful in managing student data, managing teacher data, managing student grades, and being able to manage other activities at school [27]. As is the case in

the Galon Mulya Sejati Education and Social Foundation, Malang Regency, which requires an academic information system to manage school administration effectively and efficiently. The school actually uses computers to manage school administration, but the applications used are still limited to worksheet applications which are still being processed manually. This of course will require a lot of time and energy in the work process. Based on these problems, the researchers intend to develop applications to facilitate the work of school administration at the Galon Mulya Sejati Education and Social Foundation, Malang Regency. It is hoped that through the development of the application, it can help work in the administrative field in providing services to school residents and the general public.

2. METHOD

This research is a development research using the Research and Development (RnD) approach, which adopts the work steps of Borg and Gall [28]. Development research is a process or work step in developing a new product or perfecting an existing product [29]. In this case the product in question is not limited to software and hardware development in computer programs, but the development of educational models, learning evaluation, training management, and various other forms that can only be referred to as development research.

However, in its application the researcher modifies the work steps that are tailored to the needs. In addition, the limited time, effort and cost also led to the modification of work steps. The steps used in this research are: 1) Collecting data and information related to the problems and potentials that exist in the research area, namely the Galon Mulya Sejati Education and Social Foundation, Malang Regency; 2) Product development that is adapted to the problems that exist in the research area in the form of academic information system applications; 3) Applications that have been developed by researchers are then tested for feasibility by expert validators; 4) Revision of products adapted to criticism and suggestions from expert validators; 5) Product trials on research subjects, namely the administration section of the Galon Mulya Sejati Education and Social Foundation, Malang Regency; 6) Products that have been tested are then revised based on criticism and suggestions from research respondents; 7) The product is ready to be used in managing school administratio

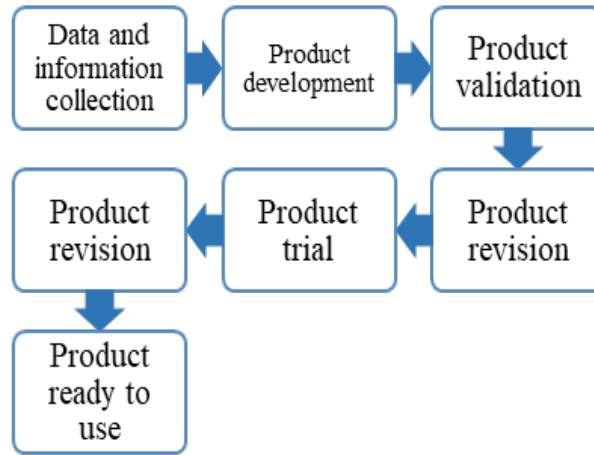


Figure 1. Research Step

In this study, data collection was carried out by means of observation, distributing questionnaires and interviews with the school. The subjects of the study were media experts and the administrative division of the Galon Mulya Sejati Education and Social Foundation, Malang Regency. The data in this study include quantitative and qualitative data obtained through drawing conclusions based on general opinions as well as criticisms and suggestions given. While quantitative data were obtained from expert validation questionnaires and questionnaire data from users who were in the administration section. Furthermore, the data were analyzed using a descriptive method with a percentage to show the level of feasibility of the application that has been developed

3. RESULTS AND DISCUSSION

The product resulting from this research is an academic information system application (ASIA). Academic information system is a system developed by researchers to assist and facilitate educational institutions in processing academic information, and various other educational data. The research was conducted at the Galon Mulya Sejati Education and Social Foundation, Malang Regency. The development of this research adapts the work steps of Borg and Gall which begins with data and information collection. Based on initial information, it is known that the Galon Mulya Sejati Education and Social Foundation currently still uses worksheets in managing school administration. So that data and information are managed separately which makes work less effective and efficient.

Based on the data and information that has been obtained, the research team then developed a product in the form of an academic information system which included data on students, classes, study groups, homeroom teachers, students and their teachers. The applications used in building this system are

Dreamweaver, XAMPP as localhost and MySQL as the database. Dreamweaver is a software produced by Adobe Systems which is used to edit or create web pages [30]. Dreamweaver is widely used by developers because it has interesting features and is easy to use.

As for operating this academic information system, users must install the XAMPP application, then open the Apache and My SQL modules in the start position. To make it easier for users to operate the application, the research team also made usage videos and application operation manuals. Furthermore, the results of the application system display that has been designed by researchers for the design of an academic information system application at the Galon Mulya Sejati Education and Social Foundation, Malang Regency web-based are as follows:

1. Login page view

This page is used by the admin to login to the system that has been developed. To enter this system. Admin must have username and password

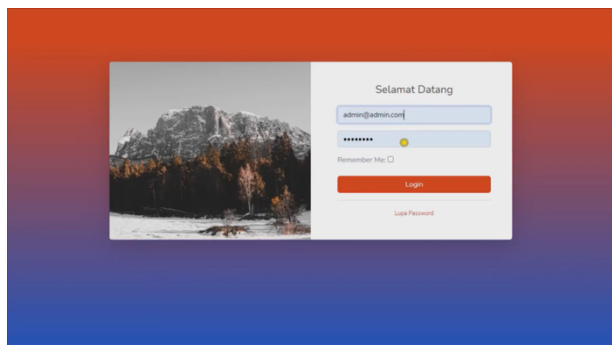


Figure 2. Login Page

2. Main menu page display

The main page of the academic information system is in the form of a dashboard that will display the school year and school information, the main menu.

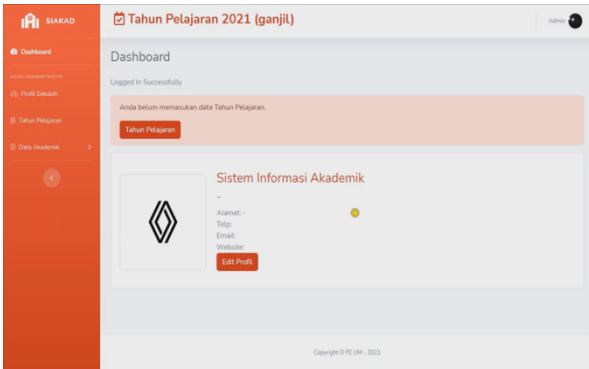


Figure 3. Main Menu Page

3. Institution profile form menu display

Display menu form pro This page is used to fill in the identity or profile of the institution concerned, starting from the name of the school, address, to the school logo. All data entered will appear on the dashboard page.

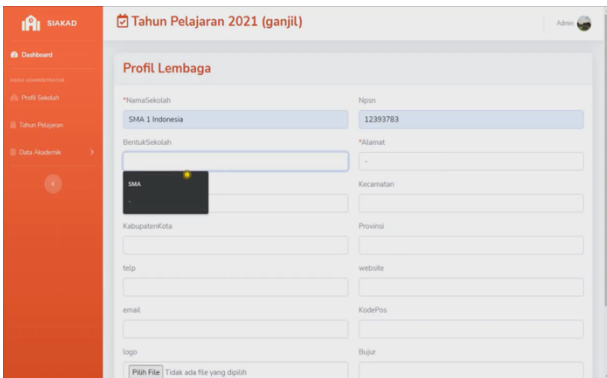


Figure 4. Institution profile page

4. Display the school year menu

This page is used to fill in the current school year. After the school year is changed, the header or title of the administrative document in the system will follow that year

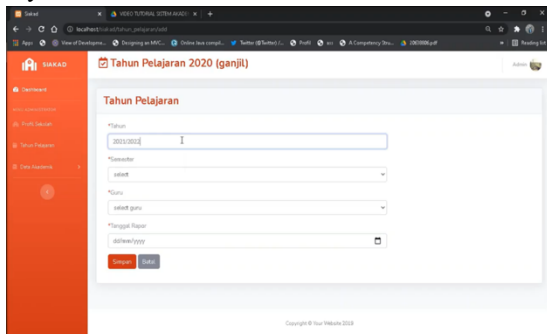


Figure 5. Scholl year filling page

5. Academic data menu display

On this page users can manage student data, classes, study groups, homeroom teachers, teachers, subjects and teachers.

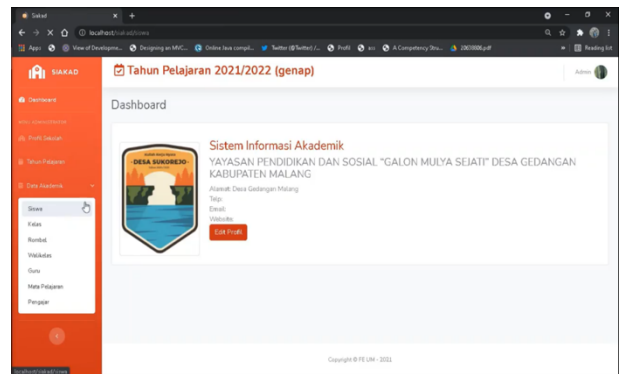


Figure 6. Academic menu page

Applications that have been developed are then validated to determine the feasibility of the application as an academic information management system. The feasibility of this application is carried out by media experts and material experts through system demonstrations in front of Judgment Experts. In this validation process, media experts are tasked with assessing the design and interface of the system. While the material expert is tasked with assessing the completeness of the information contained in the system.

The feasibility of the academic information system application developed by the research team was obtained from the indicators that have been achieved based on the validation of media experts, including in terms of usefulness. The academic information system developed by the researcher is able to provide economic efficiency, time and save data storage space. In addition, the system design has also used a proportional size and form of writing. Researchers also pay attention to color composition, background design, and navigation placement. In terms of operation, this application is also easy to operate, besides that it can also protect the system from unauthorized access, and there is a conformity between the output and the requested input.

Meanwhile, based on material expert validation, indicators that have been achieved include the quality of information. The academic information system that has been developed has the accuracy of the information content with the purpose of the system, besides that the information produced is also in accordance with user requests. The information generated in the system is also quite complete. Meanwhile, in terms of operation, the work order format in the application is easy to understand. An application that is developed must have an attractive design, interactive and easy to understand by users, so that the system developed can be utilized optimally [30].

The results of the validation of the academic information system application carried out by media experts, material experts, and trials on the school administration section as a whole were in the form of qualitative data and quantitative data. The assessment carried out by expert validators and field test subjects was carried out by filling out a Likert scale questionnaire with an interval of 1-5. In the test or trial step, there are two kinds of media trials that must be passed, namely (1) individual tests including material experts and media experts; and (2) Field test. This validation trial is used to describe the quality and feasibility of the results of the web-based information system application that has been developed. In the following, the validation quantitative data and small group test subjects are presented in Table 1 below:

Table 1. Validation result data

No	Validation	Percentage	Validation Criteria
1	Media expert	92%	Very valid
2	Material expert	87%	Very valid
3	Field trial	89%	Very valid
	Average	89,3%	Very valid

Source: Validated data

Based on Table 1, it is known that the average percentage of expert validation and field trials is 89.3%. This shows that the educational information system application that has been developed by the researcher is declared "Very Valid" and suitable for use for school administration activities at the Galon Mulya Sejati Education and Social Foundation, Malang Regency. The developed application is said to be valid if the percentage of values obtained are in the valid category based on the assessment indicators achieved.

4. CONCLUSION

This research and development resulted in the application of an academic information system for the Galon Mulya Sejati Education and Social Foundation. In addition, manuals are also provided for users in the form of pdf and videos. Based on the results of validation by experts along with field trials on applications that have been developed, the percentage results are 89.3%. This shows that the application developed is very valid and feasible to use in managing school administration..

AUTHORS' CONTRIBUTIONS

No	Name	Writer's Position	Contributions
1	Buyung Adi Dharma	First Writer	Activity design and final alignment
2	Madziatul Churiyah	Second Writer	Prepare research instruments and

			problem analysis
3	Andi Basuki	Thirt Writer	Processing data
4	Dewi Ayu Sakdiyyah	Fourth Writer	Complete the data

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