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Development of E-Learning System Using Codeigniter Framework and Prototype Model on MTs Negeri 1 Musi Banyuasin

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Abstract

Based on the 1945 Law, article 31 paragraph one states that every citizen has the right to be taught. So that every educational institution is obliged to provide services under any conditions, including in emergencies such as Covid-19. One solution to overcome this problem is to develop all learning media such as e-learning. With the existence of learning media through e-learning, it is hoped that the learning process will continue to run normally. The problem as mentioned certainly occurs in MTs. Negeri Bumiayu is one of the schools in Musi Banyuasin Regency. To achieve the goal to overcome these problems, namely developing e-learning using the Codeigniter framework and Prototyope model. The results of the development show that the e-learning produced has features that can overcome the learning process well as evidenced by e-learning features such as materials and tasks in the learning process.

Keywords: E-learning, CodeIgniter, Prototype, MTs

1. INTRODUCTION

Given the development of education in general, education in Madrasahs, especially in this area, as an aspiration and anticipation of further progress and development, the Head of the Office of the Ministry of Religious Affairs of South Sumatra Province, Musi Banyuasin Regency as the initiator to open classes far from MTs. Negeri Bumiayu. In addition, the possibility that was taken into consideration was also suspected that there were no MTs. Negeri 1 Musi Banyuasin was centered in the city, namely the city of Musi Banyuasin at that time. So at the end of 1993 it was decided that MTs Negeri Bumiayu opened a remote class in Musi Banyuasin, for the 1993-1994 school year. The distant class occupies the former location of the 4-year Religious Teacher Education which was closed in 1981, the former building and land owned by the 4-year PGA was the forerunner of the location of MTs. Negeri 1 Musi Banyuasin Standing. MTs Negeri 1 Musi Banyuasin, cannot be separated from the role of surrounding community leaders, among them are: Mr. H. Yaumuddin, A. Kadir, A. Rahman BA, Sirajuddin, and many other figures

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who cannot be mentioned all here. Madrasah Tsanawiyah Negeri Sekayu was officially established as the current MTs Negeri 1 Musi Banyuasin, which was separated from the MTs of Bumiayu State in 1993, based on the Decree of the Minister of Religious Affairs of the Republic of Indonesia, which numbered: 244 of 1993, dated October 25, 1993. The land area owned by MTs. Negeri 1 Musi Banyuasin is waqf land with certificate number: 109 Musi Banyuasin villages, with a land area of 8,373 M2 (front width = 48 M and length = 200 M). MTs 1 Negeri Musi Banyuasin is geographically located on jalan merdeka, sekayu district, serasan jaya village no. 4.

Education is a continuous process that contains elements of teaching, guidance, training, and leadership with the typical objective of transferring various knowledge, values, religions and cultures as well as useful skills to be developed (applied) by individuals to individuals who need that education more. Everyone needs education, both family, school and social education, the field of education is one of the most important steps in efforts to increase human resources in Indonesia in general, and human resources in Musi Banyuasin in particular, because human education can develop potential. The role and mission of education for humanity will continue to be considered by the government. It is not an exaggeration if those responsible for education rely on the field of education to develop and optimize all individual potentials so that they can develop optimally. Therefore, it is appropriate for every citizen to have the same opportunity to receive education according to their abilities.[1]

The main foundation for the existence of the national education system is Constitution 45 Chapter XIII, Article 31, paragraph (1) Which states that: Every citizen has the right to be taught. This implies that the national education system must be able to provide the widest possible learning opportunities to every citizen. Thus, in accepting a person as a student, there is no justification for different treatment based on the type of religion, race, ethnicity, social background and level of economic ability, compulsory education programs in Indonesia have been initiated since 1950. In Law number 4 of 1950, Law number 12 of 1954 has stipulated that every child aged 8-14 years is compulsory to learn. However, the compulsory education program launched by the government has not been able to run as it should, due to the constant political upheaval [2].

From the learning process, the world of education will never be separated from materials and tasks, because it has proven to be effective and efficient as a means of education and communication [3]. Therefore, the E-learning system must be developed as one of the installations that serves the purpose of educating the nation's life. E-learning is an important part and has a major influence on the quality of education. Technology is a kind of science designed to be able to create a set of tools, process and extract the movement of objects, as well as prepare

products for continuity and comfort in the human environment [4]. The development and advancement of information technology is currently needed in a company. With the existence of web-based information technology, it can certainly facilitate the process of teaching and learning activities. Technology has a very important role to support educational activities. Related to the development of information technology, many educations want to improve educational performance through an all-computerized system tailored to the needs of education. One of them is work that can be done easily and quickly in terms of teaching and learning at MTs Negeri 1 Musi Banyuasin, because it still uses a face-to-face system where if the teacher is unable to attend, the learning process cannot be carried out or delayed either giving material or assignments so as to make students not get material or assignments to study again at home, a solution that researchers can take to create a system called e-learning.

E-learning is a new way of learning and teaching, helping the learning process easier, and from the point of view of convenience and efficiency for its users. E-learning is its foundation in the application of technology the logical consequences of the development of information and communication technologies today. through e-learning, teachers can teach one or more students not having to sit in class to listen directly to each teacher's statement. e-learning can also shorten the teaching time, of course, it can reduce the number of costs that must be borne by the manager, so that teaching can be more effective, in addition to that during the Covid-19 pandemic like now e-learning is needed for the teaching and learning process which has a composition of 60% online and 40% meetings so that it can help the distance teaching and learning process.

2. RESEARCH METHODOLOGY

2.1. Research Object

The research site was carried out at MTs Negeri 1 Musi Banyuasin located on Jl. Merdeka No. 43 Kayu Ara, Sekayu, Kayu Ara, Sekayu, Musi Banyuasin Regency, South Sumatra 30711. This research involves several tools and materials, namely some software and hardware, software is software contained in a program run by a computer and as a device that inhibits user and computer interaction. While hardware or hardware is a component and physical element in compiling a computer system. Here are the research tools and materials:

1. Hardware consists of Laptops, Cellphones, Printers, and Pendrives
2. The Software consists of codeigniter frameworks, bootstrap, Xampp, MySQL, and Microsoft Word 2013.

2.2. Research Method

The method used in this study is that the descriptive method is one of the ways of research by describing and interpreting an object according to the existing reality, without exaggeration [5]. According to [6] descriptive research is research that only describes what is or happens in a particular scene, field, or region. Descriptive research is often referred to as non-evidence, so to speak because this research a person who examines does not manipulate variables and always puts facts first, so this researcher purely explains and describes them. A method that describes systematically, factually, and accurately the actual information according to the facts encountered in the field.

2.3. Data Collection Method

The data collection methods used are:

1. Interview Method According to, according to [7], Interviews are used as a data collection technique by conducting preliminary studies to find problems that must be studied, and if researchers want to know things from respondents that are more in-depth, and the number of respondents is small / small.
2. The Library Study Method, according to [8], the literature study method is used to obtain data by reading and studying books related to research discussions. In this study, sources were obtained from the internet, journals, and books.
3. The Observation Method, according to [9], the observation method is the collection of data by making direct observations of the problem being studied, with the intention of comparing the information obtained with reality. In this method, the observation made is to observe the flow of the process of teaching and learning activities.

2.4. Application Development Method

The method used to build this system is the Prototype Model. According to [10], Prototype is a system development method that uses an approach to create a program quickly and gradually so that it can immediately be evaluated by the user. The following are the stages in the prototyping method as shown in Figure 1.

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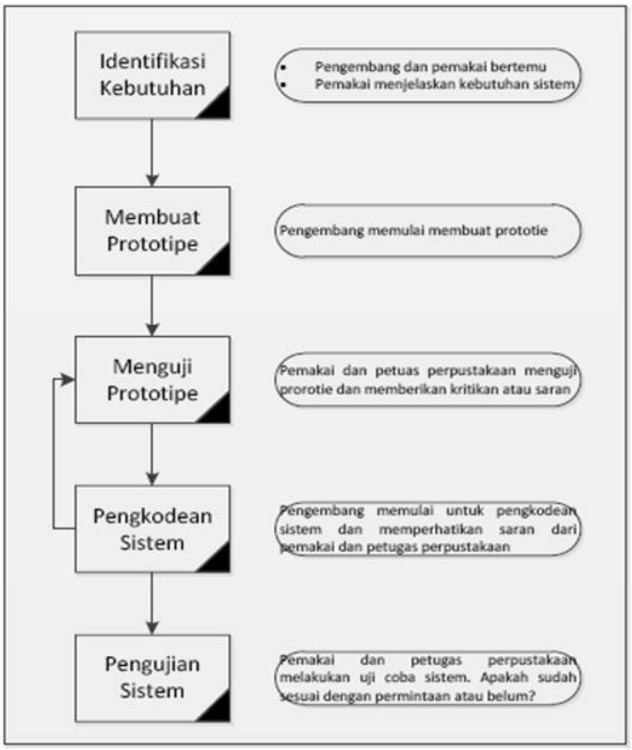

Figure 1. Prototype Method [11]

Stages of prototyping:

1. Identify the needs of the wearer, this stage is the initial stage, which is to identify the needs of the user. At this stage, communication will be carried out between developers, admins, and leaders to identify the needs needed to build the system, from data needs, both primary data and secondary data.
2. Building prototyping, after obtaining data from various sources, the next step is initial prototyping, as the image of the system to be built.
3. Testing prototyping, after building prototyping, then the picture of the system to be built is evaluated with the aim of getting suggestions and input from users. If at this stage there is still a revision, improvements must be made.
4. System coding, in this stage the agreed prototyping is then translated into the appropriate programming languages namely PHP, WAP and databases using MySQL.
5. Testing the system, after completion of the construction with programming, then the system testing process is carried out, carried out by the Admin and Leader.

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3. RESULTS AND DISCUSSION

3.1 Requirement Identification

Identify the blindness of the system to be developed using unified modeling language (UML). unified modeling language (UML) is a system design tool that is oriented towards OB UML based on the concept of object oriented (OO) modeling concepts, because this concept is a real-life-like system dominated by objects and annotated in specific symbols, object oriented (OO) has a standard process and is independent. Unified modeling language (UML) diagrams have the goal of helping project development teams communicate, explore design potential, and validate software architecture designs or program makers. UML notation is derived from 3 (three) pre-existing components, namely Grady Booch, OOD (Object-Oriented Design), Jim Rumbaugh, OMT (Object Modelling Technique), and Ivar Jacobson OOSE (Object-Oriented Software Engineering). Unified modeling language (UML) has three main categories, namely structure diagrams, behavior diagrams and interaction diagrams, where each of these categories has diagrams that explain the architecture of the system and are integrated with each other. For this reason, the following can be described the modeling carried out for each type of diagram [12]. The diagram used is a use case diagram is part of the modeling behavior diagram is a modeling that is made to provide an abstraction picture of the information system to be generated. One of the diagrams in the behavior diagram is the use case diagram. Figure 2 can be seen identifying the needs of the system [13].

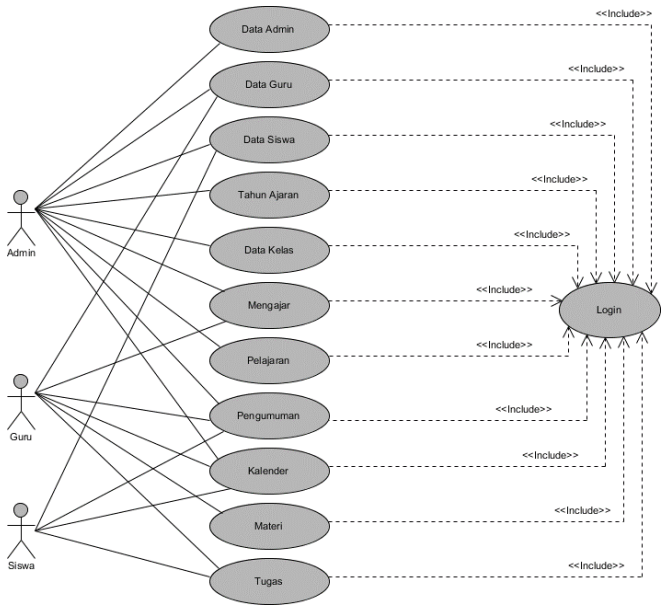

Figure 2. System requirements

Based on Figure 2, it can be known that there are three actors, namely: Admin, Teacher, and Student. Admins, teachers, and students must first log in to enter the main page. Admins can manage admin data, teacher data, student data, school year, class data, teaching, student, announcements, and calendars. Teachers can view teacher data, teach, view announcements, view calendars, manage materials and assignments. Then students can view student data, view announcements, view calendars, view materials, view assignments and upload assignments.

3.2 Prototype Development

To illustrate how the prototype of the system to be built is used structural modeling. Structure diagram modeling is a modeling used to see how the structure of an information system is created [14]. For this reason, in modeling the information system of the Web-Based E-Learning System Using the Codeigniter Framework at MTS Negeri 1 Musi Banyuasin, a class diagram is used as one of the diagrams in the structure diagram. The diagram class itself is formed from three main components, namely the class name, class attributes and class methods, where the class name is used as the class identity, the class attribute is used as the class identity and the class method is used as an action that the class can perform [15]. Figure 2 can be seen as a class diagram created for a Web-Based E-Learning System Using the Codeigniter Framework at MTS Negeri 1 Musi Banyuasin.

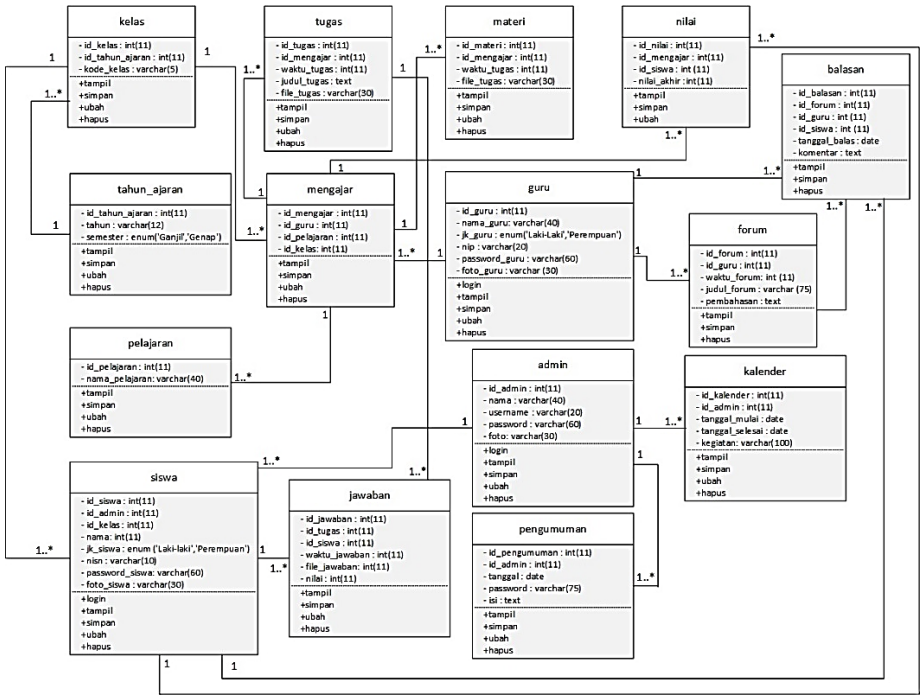

Figure 3. E-Learning System Diagram Class

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3.3 Testing prototypes and re-coding

Testing prototypes and re-coding is the process of creating a system and then checking. If the results of the check are stated to have errors or deficiencies, then re-coding is carried out. However, if the prototype results of the Web-Based E-Learning System Using the Codeigniter Framework at MTS Negeri 1 Musi Banyuasin are declared perfect or according to needs, it can be continued to the system testing stage. The Codeigniter framework is part of the MVC technique in programming methods [14]. The following can be explained the results of the Web-Based E-Learning System Using the Codeigniter Framework at MTS Negeri 1 Musi Banyuasin which was successfully developed.

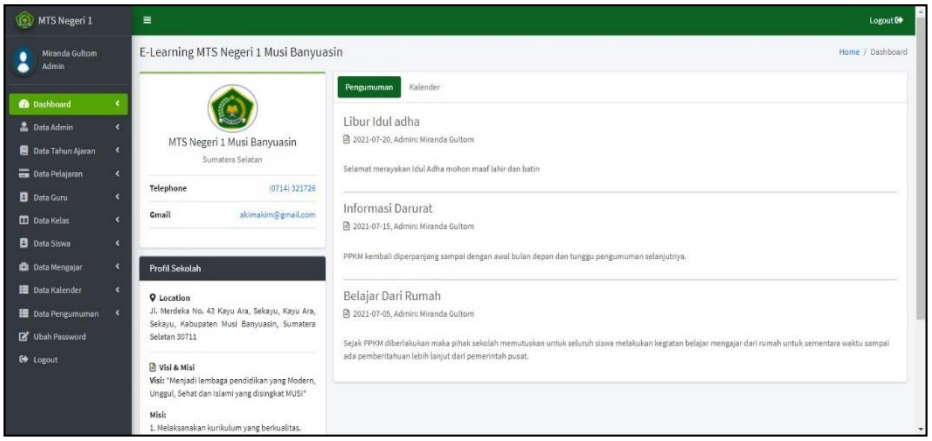

Figure 4. System Main Page View

Figure 4 is a view of the main page of a Web-Based E-Learning System Using the Codeigniter Framework at MTS Negeri 1 Musi Banyuasin. The main page of this system can be accessed after the user has logged in and it is declared successful as shown in Figure 5. The main page of this system also has various menus for users to intercation as an online learning medium. The interactions that users can perform are like teaching data as shown in Figure 6.

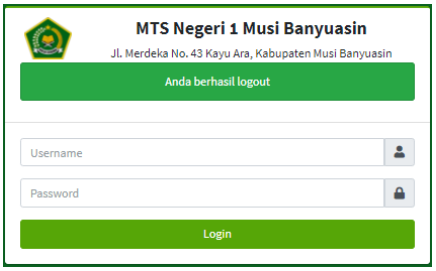

Figure 5. Login Form

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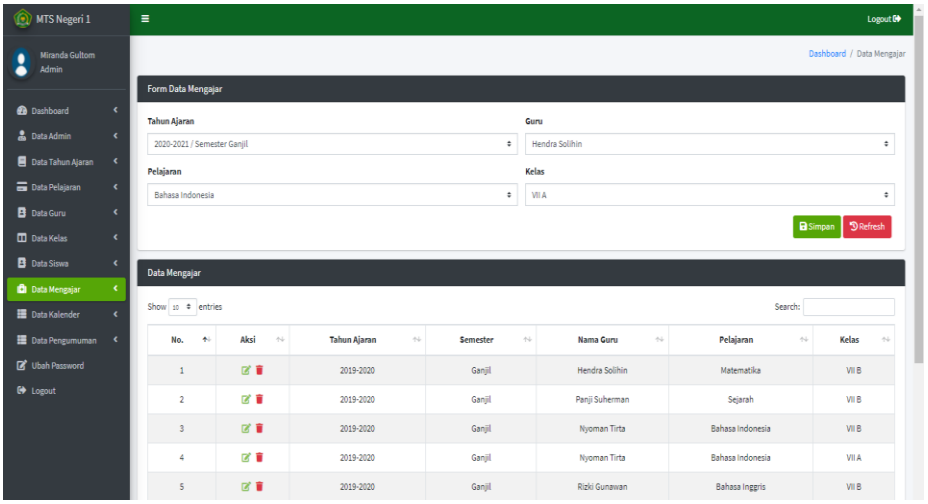

Figure 6. Teaching Data View

In addition to teaching data as shown in Figure 5, there are also various other page views, namely material page views. The page display of this material contains information on the subject matter that is intended by the teacher and can be seen by students to carry out learning as shown in Figure 7.

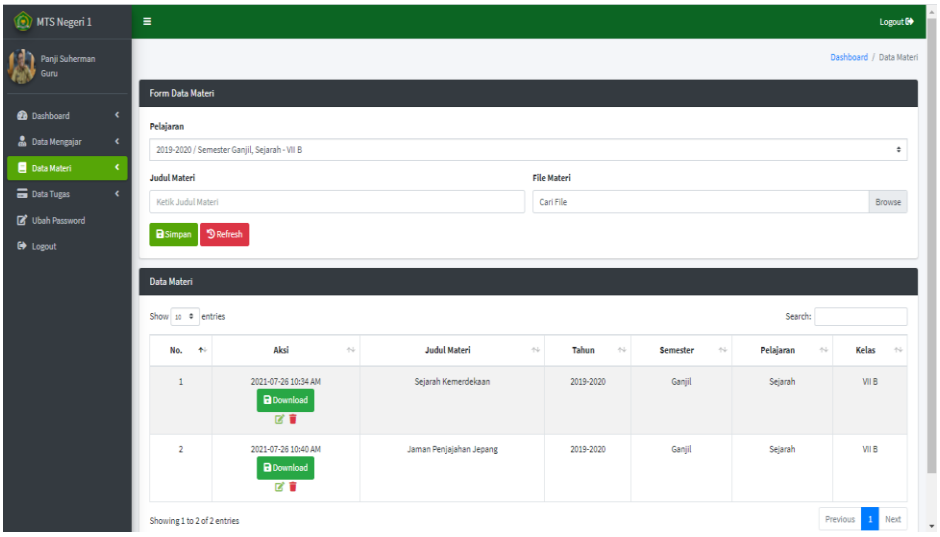

Figure 7. Material Page Views

Apart from learning materials that can be accessed by students, there is also an assignment page. Where on this page students can see the assignments given by the teacher and can also directly do the assignments. The task page view of the task is as shown in Figure 8.

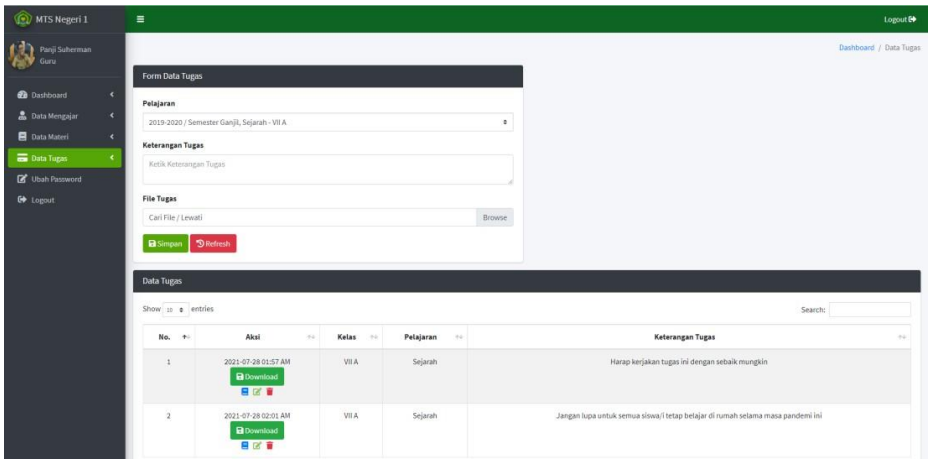

Figure 8. Task Page View

3.4 System Testing

After the system creation process is complete, system testing is carried out. Testing this system is carried out using black box testing which evaluates only from its appearance and functions, without knowing what exactly is happening in the detailed process or only knowing the output results. Table 1 You can see the results of testing the system.

Table 1. Test Results

No.	Component	Information	Test Results
1	Login	In the login form, the user enters the correct username and password then clicks the login button.	The test at the time of successful login will display the main menu based on the access rights of each user.
		In the login form, the user enters the wrong username and password then clicks the login button.	The system returns on the login page and requests to re-login.

No.	Component	Information	Test Results
2	Menu Data Admin	During the process of saving admin data, the admin inputs admin data then clicks the save button.	Admin data is saved. succeed
		When doing the process of changing admin data, the admin selects the change button and makes data changes, then clicks the save button.	Admin data is changed. succeed
		When carrying out the process of deleting admin data, the admin selects the delete button on the data to be deleted.	Admin data deleted succeed
3	School Year Data Menu	During the process of saving school year data, the admin inputs the school year data then clicks the save button.	The school year data was successfully saved.
		When doing the process of changing the school year data, the admin selects the change button and makes data changes, then clicks the save button.	The school year data was successfully changed.

Design and Build a Web-Based E-Learning System Using Codeigniter Framework in MTs Negeri 1 Musi Banyuasin, using a usecase design to analyze user needs, Activity Diagram shows system activities in the form of a collection of actions, Sequence Diagram overview step by step, including a logical chronology (sequence) of changes, Class Diagram is used as a set of objects that have the same attributes and behavior, and table design and system display design.

Design and Build a Web-Based E-Learning System Using the Codeigniter Framework at MTs Negeri 1 Musi Banyuasin provides results that can make it easier for users to manage an e-learning system that is useful for supporting online learning activities, facilitating calendar and teacher interactions regarding assignments and assignments, making it easier for admins to manage data related to the e-learning system which becomes more effective and efficient.

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4. CONCLUSION

Based on the research that has been conducted by the author on MTs Negeri 1 Musi Banyuasin, the following conclusions were obtained:

1. This research resulted in the Design and Build of a Web-Based E-Learning System Using the Codeigniter Framework in MTs Negeri 1 Musi Banyuasin.
2. Web-Based E-Learning System in MTs Negeri 1 Musi Banyuasin there are 3 users, namely Admins, Teachers, and Students
3. The web-based learning system that is built simplifies the learning process that can be done through the internet, making it easier for students and teachers to interact with the provision of materials and assignments.

REFERENCES

[1] T. P. NINGRUM, "Peran Perpustakaan Dalam Pembelajaran Siswa Di Sekolah Madrasatsanawiyah Negeri Sekayu," UIN Raden Fatah Palembang, Palembang, 2014.

[2] Normina, "Partisipasi masyarakat dalam pendidikan," *Ittihad,* vol. 26, no. 14, 2016.

[3] P. Sari, "Memotivasi belajar dengan menggunakan e-learning," *Ummul Qura,* vol. 2, no. 6, 2015.

[4] F. S. Susan Dian Purnamasari, "Implementasi Usability Testing dalam Evaluasi Website Sekolah Studi Kasus: SMK Negeri Sumsel," *Jurnal SISFOKOM (Sistem Informasi dan Komputer),* vol. 3, no. 9, pp. 420 - 426, 2020.

[5] S. Andri, "Sistem Informasi Penentuan Guru Terbaik Berbasis Kinerja pada Pondok Pesantren Qodratullah," *Jurnal Teknologi Informasi & Komunikasi Digital Zone,* vol. 1, no. 11, pp. 108-119, 2020.

[6] B. T. Firamon Syakti, "Implementasi Simple Multi Attribute Rating Technique Dalam Pemilihan Minat Ekstrakurikuler Siswa," *Jurnal Informatika,* vol. 1, no. 20, pp. 1-12, 2020.

[7] A. S. T. C. Ervinda Olivia Privana, "Identifikasi Kesalahan Siswa dalam Menulis Kata Baku dan Tidak Baku pada Mata," *Jurnal Pendidikan Bahasa,* vol. 1, no. 11, 2021.

[8] I. S. H. L. A. A. I. S. D. Unik Hanifah Salsabila, "Pemanfaatan Aplikasi Quizizz Sebagai Media Pembelajaran Ditengah Pandemi Pada Siswa SMA," *Jurnal Ilmiah Ilmu Terapan Universitas Jambi,* vol. 2, no. 4, 2020.

[9] M. Fitrah, Metodologi penelitian: penelitian kualitatif, tindakan kelas & studi kasus, CV Jejak (Jejak Publisher), 2018.

[10] B. Sudradjat, "Penerapan Metode Prototype Sistem Informasi Peminjaman Ruang Meeting," *REMIK: Riset dan E-Jurnal Manajemen Informatika Komputer,* vol. 2, no. 5, pp. 222-228, 2021.

[11] A. I. Mira Afrina, "Pengembangan Model Sistem Informasi Perpustakaan Dengan Teknologi Informasi Berbasis Wireless Aplication Protocol (WAP) Pada Universitas Sriwijaya," *Jurnal Sistem Informasi (JSI,* vol. 1, no. 4, pp. 425-436, 2012.

[12] S. Andri, "Pengembangan Aplikasi Lelang Karet Berbasis Mobile Sebagai Pendukung Akses Informasi Lelang," *Edumatic: Jurnal Pendidikan Informatika,* vol. 2, no. 4, pp. 85-94, 2020.

[13] F. P. Susan Dian Purnamasari, "Pengembangan Aplikasi E-Reporting Kerusakan Lampu Jalan," *Jusikom : Jurnal Sistem Komputer Musirawas,* vol. 1, no. 5, pp. 59 - 69, 2020.

[14] A. Suyanto, "Implementasi Rapid Application Development Dalam Pengembangan Aplikasi Pelaporan Kerusakan Jalan," *JIPI (Jurnal Ilmiah Penelitian dan Pembelajaran Informatika),* vol. 2, no. 5, p. 89 – 97, 2020.

[15] B. T. Hutrianto, "Pemodelan Aplikasi Booking Tiket Menggunakan Unified Modeling Language," *Jusikom : Jurnal Sistem Komputer Musirawas,* vol. 2, no. 5, pp. 106-115, 2020.

[16] I. E. Ahmad Syazili, "Implementasi Model View Controller (Mvc) Pada Pengembangan Sistem Informasi Pengaduan Masyarakat Pada Polres Pagaralam," *Jurnal Informatika,* vol. 2, no. 20, pp. 199-208, 2020.