

Outdoor Equipment Rental Information System on Vexa Adventure

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Abstract— Current technology has helped users in doing various things and activities that are able to produce the latest and innovative technology in various fields. Many people get convenience to meet their information and communication needs with the internet. The background of the creation of the Outdoor Equipment Rental Information System at Vexa Adventure Based on the Web is the processing of data that is still manual (reporting is done by bookkeeping every month) values that can be at high risk of damage and loss. The purpose of this study is to be able to design and build an outdoor equipment rental Information System at Vexa Adventure based on the web, using PHP - MySQL. And to find out the impact of implementing the system. The type of research used is engineering research with a research method using the Waterfall method. The stages of the waterfall method are Communication, Planning, Modelling, Construction, Deployment. The design used in this study is DFD (Data Flow Diagram) modelling which consists of four main components, namely data input, data output, data storage, and processes. The Flow of Document (FOD) is used to describe the ongoing procedure. The results of this study are in the form of a Web-Based Outdoor Equipment Rental Information System. The impact of implementing this system is proven by user evaluations using Likert scale calculations which show a value of 80%, which means the impact of implementing this system can help Vexa Adventure admins and owners in carrying out rental transactions. Hiking or also called nature trekking or tracking generally refers to a long and enthusiastic journey that usually passes through small roads in the interior. In Indonesia, this hike is identical to the journey to the top of the mountain. This activity is generally carried out by nature lovers clubs. Sometimes during the hike the journey must go through dense forest, and must cut bushes to make a path that can be passed. This hike can take more than 1 day of travel. The background to the creation of the Web-Based Outdoor Equipment Rental Information System at Vexa Adventure is the manual data processing (reporting is done by bookkeeping every month) values that can be at high risk of damage and loss. The purpose of this study is to be able to design and build a web-based outdoor equipment rental information system at Vexa Adventure, using PHP - MySQL. And to find out the impact of implementing the system. The type of research used is engineering research with a research method using the Waterfall method. The stages of the waterfall method are Communication, Planning, Modelling, Construction, Deployment. The design used in this study is DFD (Data Flow Diagram) modelling which consists of four main components, namely data input, data output, data storage, and process. The Flow of Document (FOD) is used to describe the ongoing procedure. The results of this study are in the form of a Web-Based Outdoor Equipment Rental Information System. The impact of implementing this system is proven by user evaluation using a Likert scale calculation which shows a value of 80%, which means that the impact of implementing this system can help Vexa Adventure admins and owners in making rental transactions.

Keywords: Codeigniter, Outdoor Tools, Rental Information System, Vexa Adventure

I. INTRODUCTION

Today's technology has helped users in doing various things and activities that are able to produce the latest and most innovative technology in various fields [1]. Many people find it easier to meet their information and communication needs with the internet [2]. The Internet bridges the transfer of information from various places in a short time without being limited by space and time [3]. The positive impact of technology in the business world is now not only felt by large-scale businesses [4]. Micro, small and medium enterprises that are run by involving technology, information and communication also feel the convenience that supports their business activities [5]. The involvement of technology, information and communication makes business actors easier, faster and minimizes human error [6].

Vexa Adventure is a business engaged in the field of outdoor equipment rental services located in Magelang. Vexa Adventure provides equipment rental services to support mountain climbing activities or other outdoor activities. The requirements that must be considered in this rental are that the renter must be at least 17 years old with a maximum loan limit of 7 days. If the renter exceeds the maximum loan period, a fine will be imposed per day depending on the type of item rented and if damaged or lost, the renter must replace or pay the fine set by Vexa Adventure.

The rental recording system and information on the availability of equipment that can be rented at Vexa Adventure is still done manually by handwriting. Visitors still have to come directly when they want to rent the outdoor equipment they need. This makes the

process of renting equipment less practical and efficient. In this case, renting outdoor equipment as a service business will feel easier if it utilizes the development of technology, information, and communication in it. One alternative that can be used is the use of web-based information technology.

The web is an information medium provided via the internet so that it can be accessed by everyone using an internet network [7], [8]. The information system itself is not just a technological infrastructure, but is the heart of business operations to improve efficiency, decision making and competitiveness [9].

Based on the description above, this study was conducted to design and build an outdoor equipment rental website for Vexa Adventure. This system is expected to be able to manage rental data and information quickly and accurately as well as a digital promotional media. With this system, consumers also do not need to come directly to the rental place to get information on what equipment and supplies can be borrowed on a particular day.

II. RESEARCH METHODS

The research method explains the design of activities, scope or objects, main materials and tools, places, data collection techniques, operational definitions of research variables, and analysis techniques. The research method for the outdoor equipment rental information system at Vexa Adventure based on the web using the codeigniter framework is to use the waterfall method. Waterfall is a systematic system development method with a structured and well-organized development process model. [10]. The waterfall method has stages in system development including the communication stage, planning stage, modeling stage, construction stage, and system deployment, which ends with ongoing support for the resulting system. [11]. The research flow using the waterfall method is presented in Figure 1.

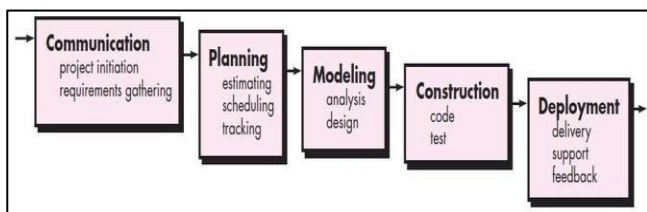


Figure 1 Research Flow with Waterfall Method

Based on the waterfall method in Figure 1, the flow in this research method is carried out in the following process:

a. Communication (Project Initiation & Requirements Gathering)

At this stage, problem identification and data collection related to the research conducted are carried out. In this stage, data collection is carried out using observation methods, interview methods and documentation methods.

b. Planning (Estimating, Scheduling & Tracking)

In this planning, problem analysis is carried out including the running method and the needs of the system being developed as well as problem analysis using PIECES analysis. In this stage, an analysis of the running procedure, process analysis, input and output analysis, problem identification analysis and analysis of the functional and non-functional needs of the system are produced.

c. Modelling (Analysis & Design)

At this stage, the system visualization stage is carried out using the data flow diagram (DFD), Entity Relationship Diagram (ERD) model and system interface design.

d. Construction (Code & Test)

At this stage, the system is coded using the PHP programming language and MySQL using the Codeigniter framework. The system developed is web-based and the system is tested using the blackbox testing method.

e. Deployment (Delivery, Support & Feedback)

At this stage, user evaluation is carried out to determine the utility value or impact of the application of the developed system. To measure this, the Likert scale method is used.

III. RESULT AND ANALYSIS

3.1 Communication (Project Initiation & Requirements Gathering)

At the communication stage, data collection and problem identification are carried out with several approaches. The methods used are as follows:

a. Observation Method

In data collection, direct observation was carried out on outdoor equipment rental activities at Vexa Adventure.

b. Interview Method

In this method, direct interviews were conducted with the owners and managers of outdoor equipment rentals at Vexa Adventure.

c. Documentation Method

The documentation method is carried out by collecting the necessary data and information from supporting documents related to the research being conducted.

3.2 Planning (Estimating, Scheduling & Tracking)

After carrying out the communication stage for the outdoor equipment rental process at Vexa Adventure, the following system requirements were obtained.:

a. Functional Requirements

In this case, functional requirements contain the processes that must be carried out by the system and the information that must be in the system to be developed [12]. The functional requirements of the system being developed are as follows:

- 1) The system is able to manage outdoor equipment rental data digitally such as user data, incoming equipment data, outgoing equipment data, rental data, customer data, report data and managing user profiles.
- 2) The system has a feature in the form of multilevel users including admin, Operator, Customer and owner. Where each user has their own access rights.
- 3) The system is equipped with user login session features and password encryption security.

a. Non-functional needs

Non-functional requirements include requirements outside the system being developed but are also requirements that must be met so that the system can run optimally. [13]. The needs are as follows:

- 1) Hardware requirements include, Device Intel(R) Core (TM) i5-2320 CPU @ 3.00GHz 3.20 GHz 64-bit operating system, x64-based processor, 8 Gb RAM and 500 Gb HDD.
- 2) Software requirements include XAMPP, Mozilla Fire Fox and Ms Visual Code.

3.3 Modelling (Analysis & Design)

System modeling is a further stage of system analysis and design that will be built before coding is carried out in a program. This serves to describe the sequence of steps to solve a problem well, simply, logically, and clearly, so that in the development process it can be carried out more effectively and efficiently which aims to produce output or output from the system design in detail [14]. In the visualization of system modeling using data flow diagrams (DFD). Context diagram is one of the diagrams in DFD which is a process and visualization of the scope of a system. The Context Diagram or DFD level 0 is presented in Figure 2.

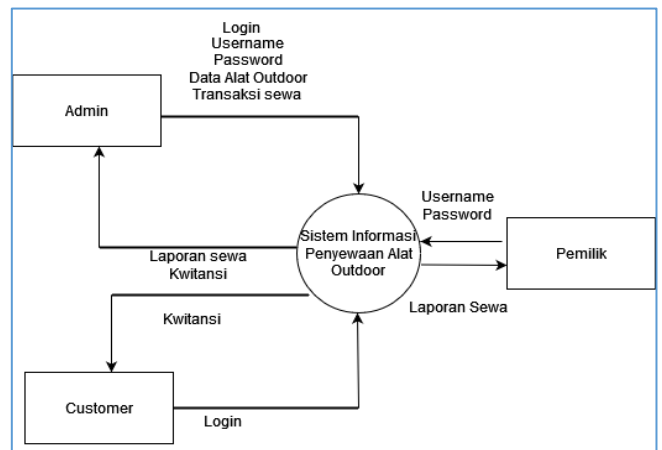


Figure 1. Context Diagram of the Web-Based Outdoor Equipment Rental Information System at Vexa Adventure

The data modeling of the outdoor equipment rental information system on the web-based Vexa Adventure displays the Entity Relationship Diagram (ERD) using the CodeIgniter framework. ERD is a network model that uses a data structure that is stored in the system abstractly [15]. The ERD e-archive for web-based educational institutions is presented in Figure 3.

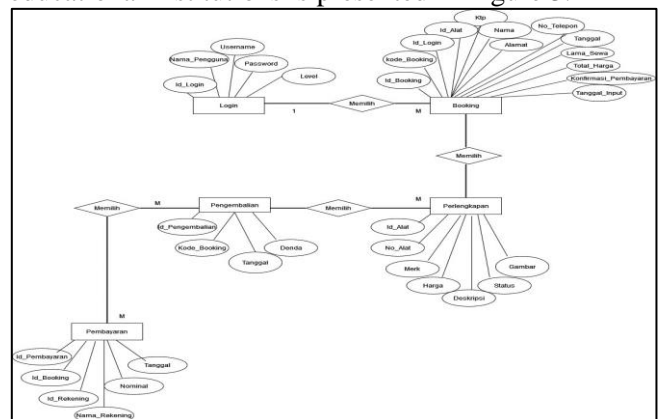


Figure 2 Entity Relationship Diagram (ERD) of Web-Based Outdoor Equipment Rental Information System at Vexa Adventure

3.4 Construction (Code & Test)

In the construction stage of the outdoor equipment rental information system at Vexa Adventure based on the web and system testing. The implementation of the developed system coding is as follows:

a. Home Page

The main page of the Outdoor Equipment Rental Information System on Vexa Adventure Based on the Web, users will be presented on the system's home page in the form of information related to tools and other needs of the system. The appearance of the main page is presented in Figure 3.

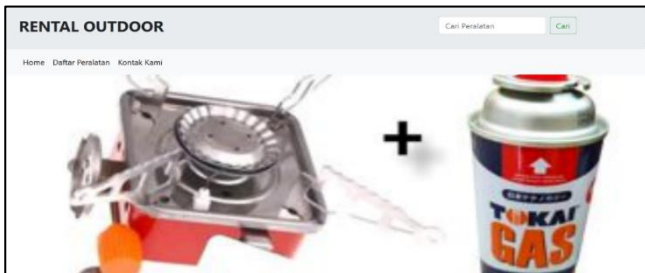


Figure 4 Main Page

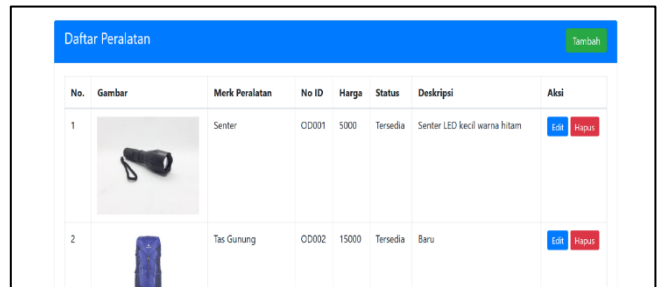


Figure 5 Tool Management Page

b. User Login Page

The login page on the Outdoor Equipment Rental Information System on the Web-Based Vexa Adventure, users will be asked to login to the system first. Users are asked to input data in the form of a username and password. Next, users will be presented with a user dashboard page according to the user level they have. The appearance of the main page is presented in Figure 4.

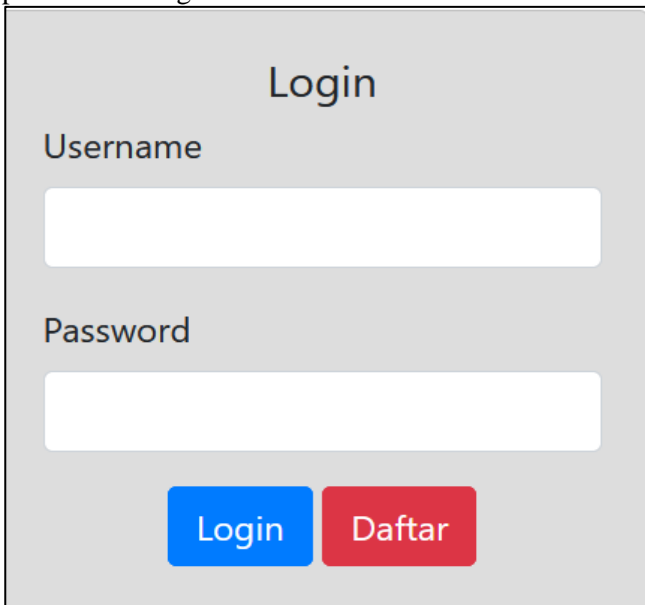


Figure 5 Login Page

c. Tool Management Page

The tool management page is used as a feature to manage outdoor tool data. In this feature, users are able to manage outdoor tool data including displaying a tool list, adding tool data, editing tool data and deleting tool data according to user needs. The data management page for the rented tools is presented in Figure 5.

d. Equipment Order Page

On the equipment order page, customers who have registered can order outdoor equipment directly. Customers will be asked to log in first and verify the equipment to be rented. The implementation of the equipment order page is presented in Figure 6.

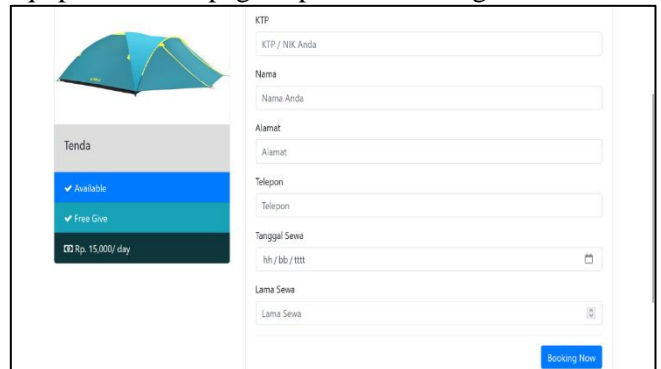


Figure 6 Equipment Order Page

e. Equipment Payment Page

On the equipment payment page, customers who have ordered outdoor equipment will be asked to make payments and verify the equipment to be rented. The implementation of the equipment order page is presented in Figure 7.

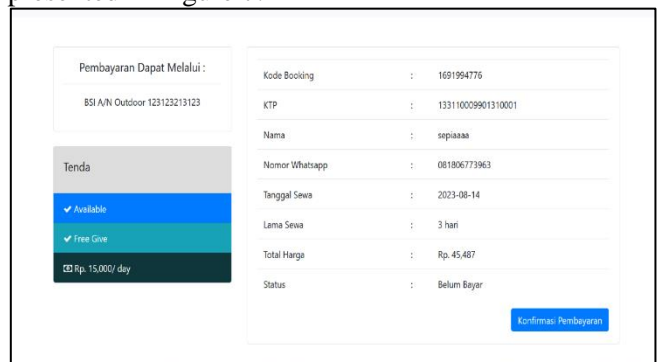


Figure 7 Payment Tool Page

3.5 Deployment (Delivery, Support & Feedback)

In this stage, system testing is carried out using the blackbox testing method to determine the functionality of the system. In the deployment stage, utility measurements are carried out to determine to what extent the information system that has been developed

has been effective in making changes and providing impact or utility value. [16]. The measurement was conducted using a Likert scale with a score of 5 = strongly agree (SS), score 4 = agree (S), score 3 = quite agree (CS), score 2 = disagree (TS), score 1 = strongly disagree (STS).

The calculation results of the user evaluation are as follows:

$$\text{Maximum score} = 5 \times 5 \times 2 = 50$$

$$\text{Minimum score} = 5 \times 1 \times 2 = 10$$

$$\begin{aligned} \text{Indeks Presentase} &= \frac{\text{Jumlah Skor}}{\text{Skor maksimum}} \times 100\% \\ &= \frac{40}{50} \times 100\% \\ &= 80\% \end{aligned}$$

The percentage of the total value of the user evaluation score is 80% of the expected score, so that the results of the user evaluation provide an impact or utility value in the good category.

VI. CONCLUSION

In this study, a Web-Based Outdoor Equipment Rental Information System has been successfully designed and built using the CodeIgniter framework with Vexa Adventure as a research sample. The system was developed using the waterfall method and designed using the Data Flow Diagram (DFD) visualization model which was then built using the PHP programming language and MySQL as its database management. Furthermore, the system was tested using the blackbox testing method with the test results showing valid or successful. To determine the utility value in implementing the system, an evaluation was carried out on respondents. The evaluation was carried out using a questionnaire media with the results of utility based on a Likert scale showing a percentage value of 80%. This shows that the implementation of the Web-Based Outdoor Equipment Rental Information System provides good utility value.

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