



## Development of an Ordering Application for Ayek Jerangan Shop in Tanjung Bunut Village Using the Waterfall Method

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### Abstract

The development of information technology has improved efficiency in various sectors, including clean water distribution. In Tanjung Bunut Village, ayek jerangan (boiled or refillable drinking water) is a primary water source, but its ordering and distribution system remains conventional, causing irregular supply and fake orders. This study aims to design a web-based ordering application to improve efficiency, transparency, and accessibility for residents. The application is expected to help manage demand and distribution in a more structured manner and enhance service quality for the community.

*Keywords:* Ayek Jerangan; Website; Water Distribution; Online Ordering

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### 1. Introduction

The development of information and communication technology has brought changes and conveniences to various sectors of life, such as education, health, and the economy. Technological developments can simplify the operation of existing business systems. The technological facilities provided by companies provide services that can provide convenience for consumers. For example, the Ayek Jerangan shop in Tanjung Bunut village is one of the businesses that provides drinking water to Tanjung Bunut villagers. Most of the villagers depend on the Ayek Jerangan shop's supply (water sold by local entrepreneurs) to meet their daily household consumption needs. However, the existing Ayek Jerangan shop's ordering and distribution system is still very conventional or outdated and has not yet utilized technology to its full potential. Given these conditions, there is an urgent need to develop a website-based water ordering application that can optimize water distribution, increase ordering efficiency, and make it easier for residents to obtain clean water supplies according to their needs. According to [1], a website is an information page provided via the internet, making it accessible globally as long as there is a network connection. This application not only facilitates public access but also helps water suppliers manage demand and distribution in a more structured and transparent manner. According to [2], water that has been boiled meets health safety standards because it is free from bacteria and viruses. In some areas, the term water supply can also refer to refilled water sold locally. The development of a website-based water ordering application in Tanjung Bunut Village is the focus of this thesis, with the aim of creating a technology-based solution that can address the problems faced by residents and water supply providers. With this website, it is hoped that a more efficient, organized, and transparent ordering system will be created, which will ultimately improve the quality of life of village communities by fulfilling their water needs better and more easily accessible.

### 2. Theoretical Review

#### 2.1. Understanding Design and Construction

Design is the creation and creation of an application or system that does not yet exist in an agency or object. Design is also the depiction, planning, and sketching or arrangement of several separate elements into a complete and functional unit [3]. Design is the depiction, planning, and sketching or arrangement of several separate elements into a complete and functional unit. Thus, the definition of design is the process of developing a system to create a new system or replace or improve an existing system, either in whole or in part [3].

#### 2.2. Understanding Orders

Ordering is an activity undertaken by consumers before purchasing [4]. Ordering is the process of gathering information from customers about their needs and preferences, and then using that information to produce and deliver the desired product or service [5].

### 2.3. Understanding Ayek Jerangan

Ayek jerangan, or boiled water, meets health safety standards because it is free of bacteria and viruses. In some areas, the term "ayek jerangan" can also refer to refilled water sold locally [6]. The term "jerangan" is not specifically defined in the Indonesian Dictionary (KBBI). However, it is more commonly used colloquially to refer to heated water or water used for specific purposes, often associated with traditional water treatment processes [2].

### 2.4. Understanding the Waterfall Method

Waterfall is a software system development method; software developers often apply the waterfall method in their work. The waterfall model is often referred to as the linear sequential model. It's often considered an outdated model, but it's widely used. It's called the waterfall model because each stage must wait for the previous stage, progressing sequentially [7].

### 2.5. Understanding PHP (Hypertext Preprocessor)

PHP (Hypertext Preprocessor) is a server-side programming language used to translate a program's codebase into machine code that can be understood by computers and is appended to HTML [8]. PHP is an abbreviation for PHP (Hypertext Preprocessor). PHP is a server-side scripting language commonly used to create dynamic web applications [9].

### 2.6. Understanding XAMPP

XAMPP is free software that supports multiple operating systems and is a compilation of several programs. It functions as a stand-alone server (localhost), consisting of the Apache program, HTTP Server, MySQL database, and a language translator written in the PHP programming language [10]. XAMPP is open-source (free) web server-based software and supports various operating systems, including Windows, Linux, and Mac OS. XAMPP is used as a standalone server, commonly referred to as localhost. This simplifies the editing, design, and application development processes [11].

### 2.7. Understanding UML (Unified Modeling Language)

UML is a structure and technique for modeling object-oriented program designs and their applications. Creating a UML model requires a set of rules. The elements in the model must be interconnected and adhere to UML standards, not just diagrams but also contextual explanations [12]. The conclusion above is that UML (Unified Modeling Language) is a standard modeling language used to design and describe software systems, particularly object-based ones. UML provides clear and structured visual graphics, enabling software developers to describe complex systems in a simpler and more organized manner.

## 3. Research Methods

In this study, a qualitative approach was chosen because it aims to deeply understand specific phenomena or experiences experienced by the research subjects. Qualitative research is a research process for understanding human or social phenomena by creating a comprehensive and complex picture that can be presented verbally, reporting detailed insights obtained from informant sources, and conducted in a natural setting [13]. Qualitative research is the process of investigating social phenomena and human problems. Qualitative research is also defined as a strategy for searching for meaning, understanding, concepts, characteristics, symptoms, symbols, and descriptions of a phenomenon. It is focused and multi-method, naturalistic and holistic, prioritizes quality, uses multiple methods, and is presented narratively in scientific research [14]. The brief conclusion above is that the researcher chose a qualitative approach because it can deeply explore the experiences, perceptions, and perspectives of individuals or groups regarding a phenomenon. This method is highly suitable for understanding the social, cultural, and value contexts underlying behavior or processes.

### 3.1. Methods of Data Collection

The research method used in this study is a qualitative approach, involving observation, interviews, and literature review.

1. Observation  
This observation was conducted to directly observe all activities taking place in Tanjung Bunut Village and also to determine the system requirements.
2. Interview  
Interviews are one of the techniques used to collect data or facts from respondents. The interviews were conducted by the author with informants from Toko Ayek Jerangan.
3. Literature Review  
A literature review is a method used to collect data or sources related to the research topic. Literature reviews can be obtained from various sources such as journals, books, documentation, the internet, and libraries.

### 3.2. Data Source Type

1. Primary Data Sources  
Primary data is information obtained firsthand, collected directly from the source. This primary data is the most original in nature and has not undergone any statistical processing. To obtain primary data, researchers must collect it directly.
2. Secondary Data Sources  
Secondary data is data obtained indirectly from the research object. Secondary data is obtained from an internet site or from a reference source similar to what the author is researching.

## 4. Proposed Use Case Diagram

The following Use Case Diagram is a graphical representation (Actors) of all those involved in this application, and the interactions between one another that introduce this application.

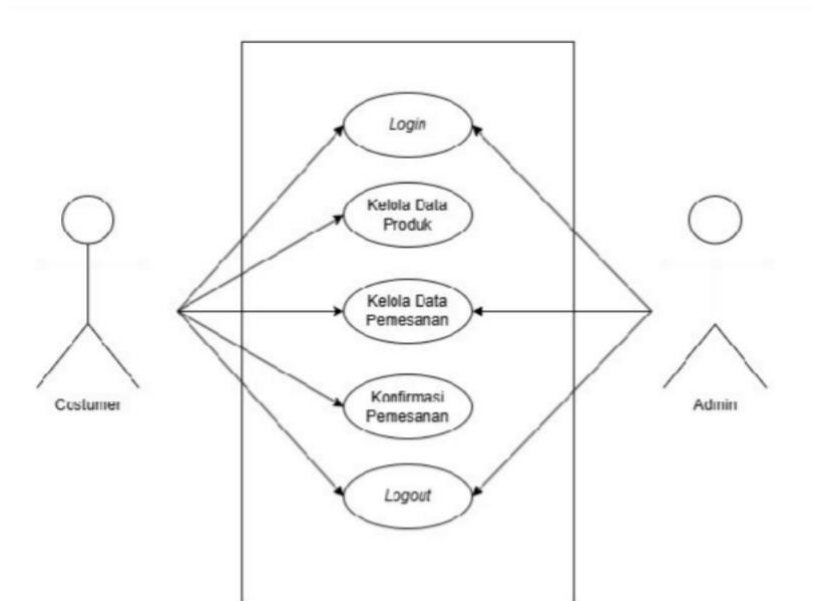


Fig. 1 : Proposed Use Case Diagram

## 5. Implementation And Testing

### 5.1. Interface Implementation

Interface implementation, in this case, involves creating the display that the user will see by designing the interface on a form on the website. The interface implementation must align with the user's requirements so that the program can be used immediately. Interface implementation includes the following:

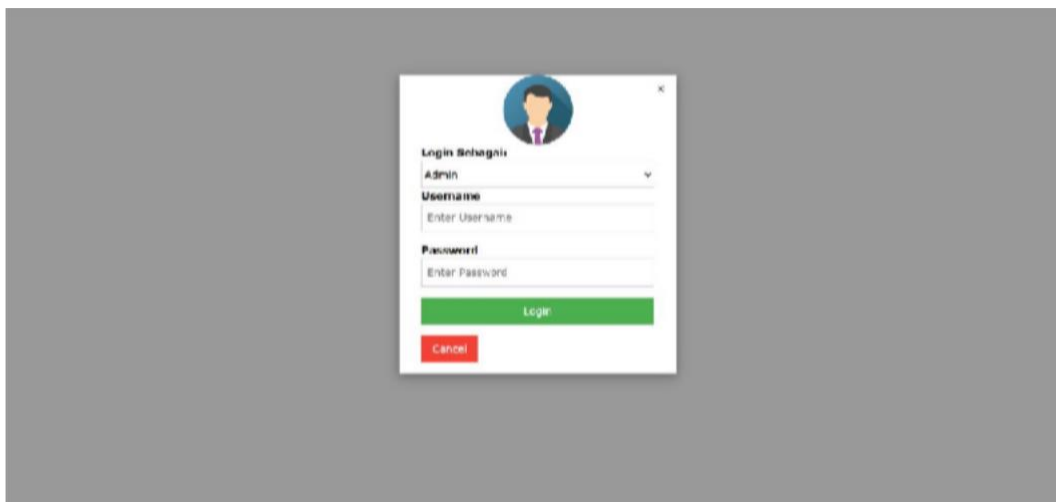


Fig. 2 : Admin Login Page

The admin login page functions to verify users to be able to access the website as admin based on the username and password that have been registered in the database with several special features.

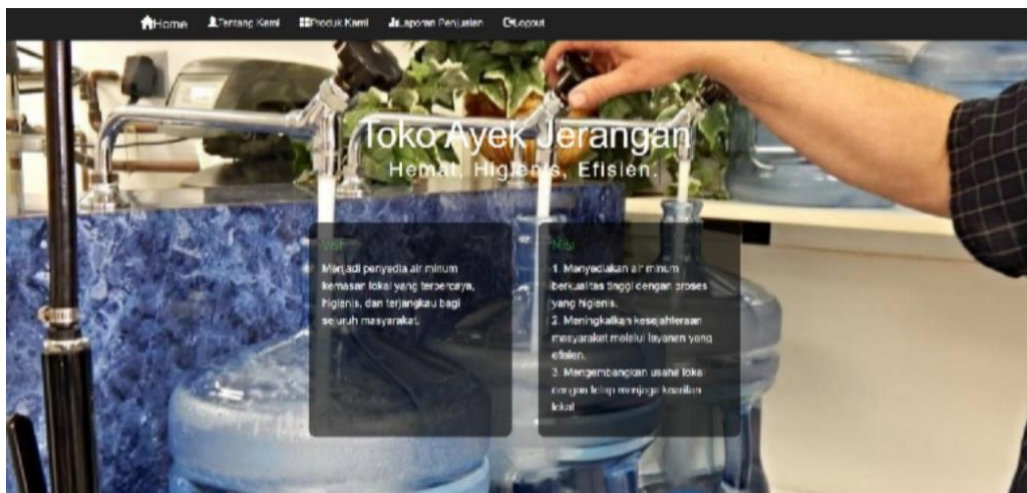


Fig. 3 : Admin Home Page View

On this page is the homepage and main page of the Ayek Jerangan shop website, on this page the admin can see the homepage of the Ayek Jerangan shop website which displays the shop name and motto of the Ayek Jerangan shop.

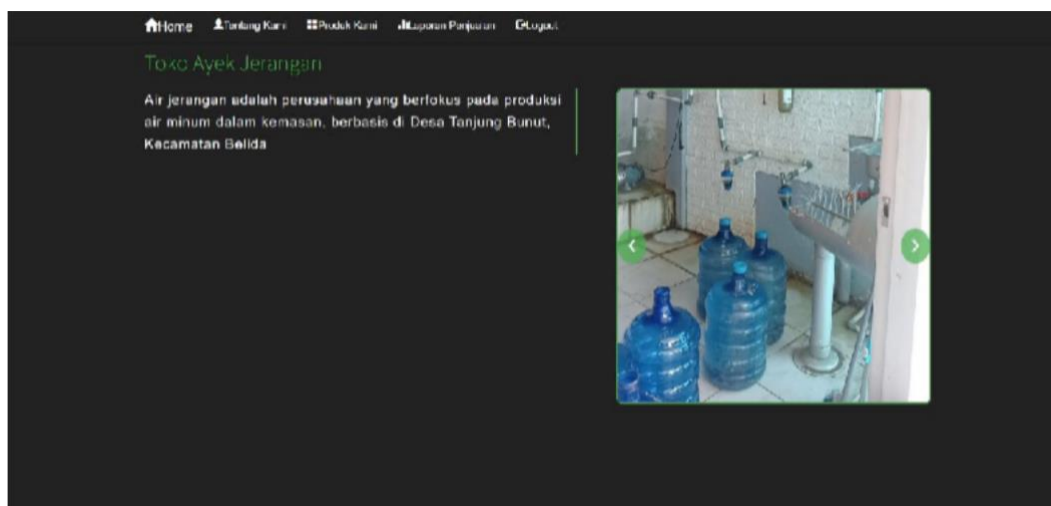


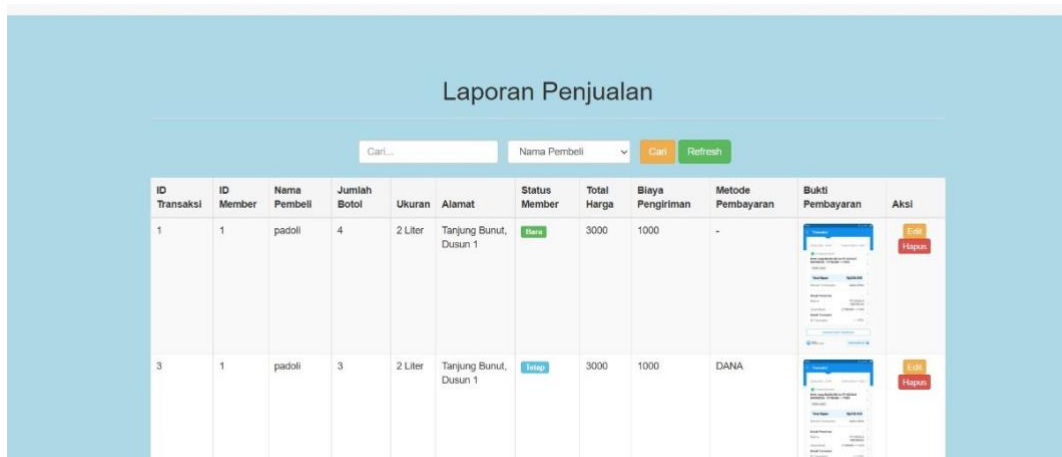
Fig. 4 : About Us Page Views

This page contains information about the Ayek Jerangan shop, where the admin can see the vision, mission, organizational structure, history and other information from the Ayek Jerangan shop.





Fig. 5 : Our Product Page View Admin

This page contains the purchasing features of the Ayek Jerangan shop. On this page, the admin is responsible for checking, maintaining and updating according to user needs.



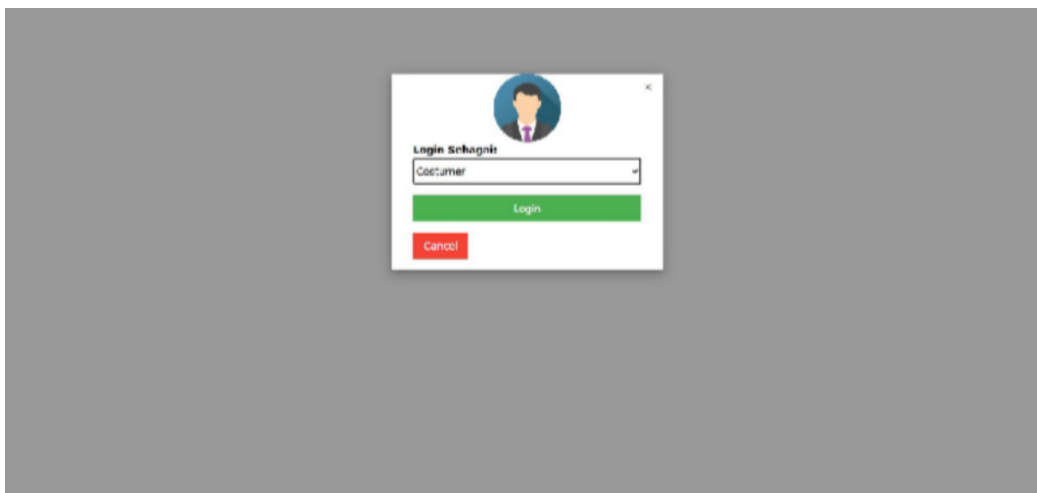
**Laporan Penjualan**

Cari...  Nama Pembeli  Cari Refresh

ID Transaksi	ID Member	Nama Pembeli	Jumlah Botol	Ukuran	Alamat	Status Member	Total Harga	Biaya Pengiriman	Metode Pembayaran	Bukti Pembayaran	Aksi
1	1	padoli	4	2 Liter	Tanjung Bunut, Dusun 1	<span style="color: green;">Berita</span>	3000	1000	-		<span style="color: red;">Edit</span> <span style="color: red;">Hapus</span>
3	1	padoli	3	2 Liter	Tanjung Bunut, Dusun 1	<span style="color: blue;">Tidak</span>	3000	1000	DANA		<span style="color: orange;">Edit</span> <span style="color: red;">Hapus</span>

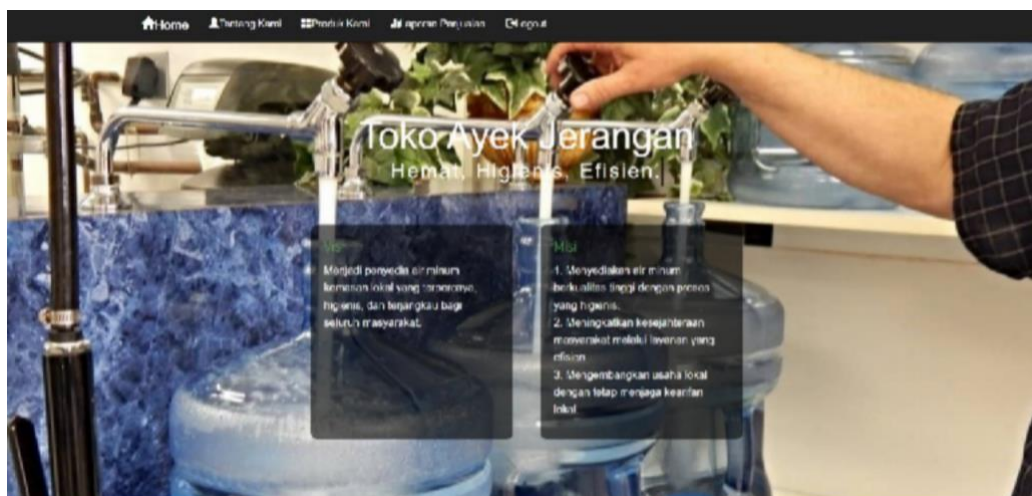
**Fig. 6 :** Admin Sales Report Page View

The sales report page is a page that can only be accessed by the admin and cannot be accessed by customers. This page contains sales reports such as name, number of orders, size, address, etc. On this page, the admin is responsible for checking data and correcting data if there are errors in orders by customers.



**Fig. 7 :** Customer Login Form Display

The customer login form page functions as the customer's initial access, on this page the customer must log in first before entering the Ayek Jerangan shop website.



**Fig. 8 :** Customer Home Page View

On this page is the homepage and main page of the Ayek Jerangan shop website, on this page customers can see the homepage of the Ayek Jerangan shop website which displays the name of the shop and the motto of the Ayek Jerangan shop.

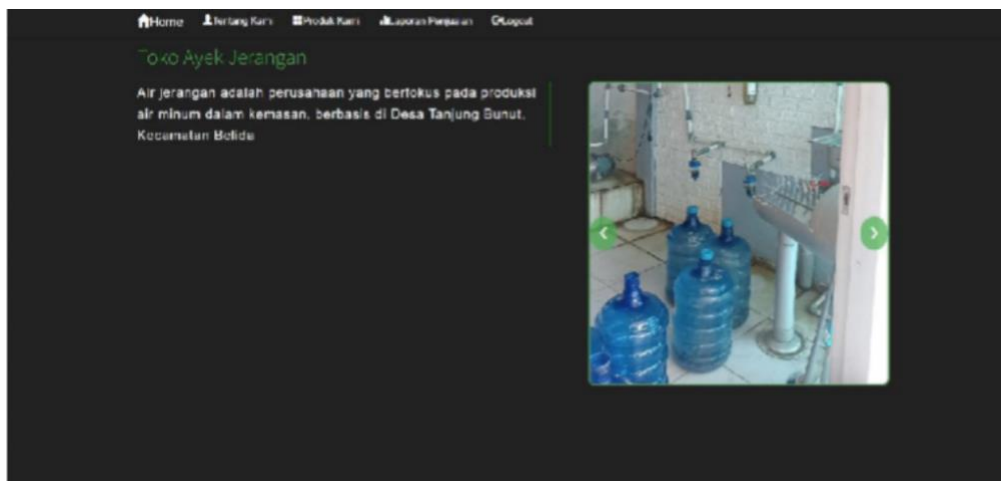


Fig. 9 : About Us Page View Customer

This page contains information about the Ayek Jerangan shop, where customers can see the vision, mission, organizational structure, history and other information from the Ayek Jerangan shop.



Fig. 10 : Our Product Page View Customer

This page contains the main features of the Ayek Jerangan shop website, where on this page customers can order Ayek Jerangan online by entering their name, number of bottles, size and address.

## 5.2. System Testing

System testing is the stage carried out after the interface is implemented. It involves testing the website and existing features to ensure they meet user needs. After conducting the testing, the author concluded that the interface implementation test was functional and running according to design.

## 6. Conclusion

Ayek Jerangan Shop is a shop specializing in ordering drinking water through a traditional cooking process, often consumed for daily needs. Currently, ordering drinking water at Ayek Jerangan Shop is still done manually, with information about the shop spread by word of mouth, and customers must come directly to the shop to purchase the water. This results in ineffective and inefficient customer service. Therefore, to provide the best service to a wider customer base, a website is needed for Ayek Jerangan Shop to facilitate access to information and ordering drinking water. The following conclusions can be drawn:

1. The web system design for Ayek Jerangan Shop in Tanjung Bunut Village uses the waterfall method with the UML design model, supported by design tools such as use case diagrams, activity diagrams, and class diagrams, using PHP programming language and the XAMPP database.
2. The system design is a website that can provide information about ordering Ayek Jerangan in Tanjung Bunut Village, thereby making services provided to the public more effective, efficient, and accurate.

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