

# Web Development of Maria Bakery Tayu Based on Qris Using Waterfall Method

Marcellino Kevin Hariyanto<sup>1</sup>, Agus Cahyo Nugroho<sup>2</sup>, Thecla Brenda Chandrawati<sup>3</sup>

<sup>1,2,3</sup>Department of Information Systems, Computer Science Faculty, Soegijapranata Catholic University

Jl. Pawiyatan Luhur IV No.1, Bendan Duwur, Kota Semarang, Jawa Tengah 50234

<sup>1</sup>marcellino@gmail.com

<sup>2</sup>cahyo@unika.ac.id,

<sup>3</sup>brenda@unika.ac.id

**Abstract**— A website is a page that contains certain information and can be accessed easily by anyone, anytime and anywhere via the internet. With the rapid development of technology, websites are also often used as a place to buy and sell online, whether food products, goods or reservations and much more. To place an order through the website, it is necessary to have a system that supports ordering, order processing and payment. This research uses the waterfall method to create an online ordering web from a bakery called Maria Bakery. The rapid development of technology it allows us to be easier to order or buy something because it is much more efficient and can also be done anywhere and anytime.

**Keywords**— online purchase, online sales, online payment, waterfall method, bakery.

## I. INTRODUCTION

Maria Bakery is one of the bakeries located on Jalan Panglima Sudirman No.3 Tayu. In the midst of this increasingly advanced era, technological advances have brought significant changes in various aspects of life, including in the business world. Especially in the retail industry, stores are now increasingly adopting the presence of websites as a platform to facilitate the ordering and payment process.

With a website, consumers are no longer limited by time and location constraints when they want to obtain

information about products or make purchases. The only thing needed is a smart device, such as a smartphone, which can be accessed anytime and anywhere at the user's convenience. In the context of payments, the use of the QRIS method has become a popular choice, as it provides convenience and flexibility for consumers in making payments in various places.

In this situation, stores, including Maria Bakery, are faced with the challenge of staying relevant and competitive in an increasingly competitive market. Therefore, innovation is key to increasing sales and providing a better experience to customers. In this case, the website builder of Maria Bakery understands the importance of adopting new innovations to improve efficiency and convenience for customers.

By providing various types of bread and market snacks, Maria Bakery wants to give customers many choices. However, simply providing quality products is not enough. Building and managing a website is a strategic step taken to answer the demands of the times and meet the increasingly diverse needs of customers.

Through the website, customers can easily access store-related information, such as product lists, prices, and the latest promotions. In addition, they can also place orders more practically and efficiently, without having to come directly to the physical store. The use of payment features through QRIS also

provides greater flexibility in making transactions.

With this initiative, Maria Bakery hopes to increase sales by reaching a wider range of potential customers, even beyond the local area. By utilizing technology, Maria Bakery wants to provide a better shopping experience and ease the interaction between the store and customers.

In conclusion, the role of innovation and technology cannot be ignored in today's business world. Maria Bakery realizes the importance of adopting change and utilizing the advantages offered by QRIS websites and payments. By bringing ease of access, ordering, and payment, the store hopes to increase its competitiveness and provide loyal and potential customers with a better shopping experience.

## I. LITERATURE REVIEW

### 2.1 Website

A website is a collection of pages in a domain that contains a lot of information that allows users to read and view via the internet through a search engine or what is often called a search engine. In this website, we can find various types of information, such as images, videos, text and can be used for various purposes. The initial purpose of creating a website was to make it easier to get and exchange information. Then on April 30, 1993 the website was officially released for free [1].

### 2.2 Waterfall Method

The Waterfall method is the oldest method for software development due to its natural nature. In this Waterfall method, there are several sequences, starting from the planning, analysis, design, and implementation of the system. This method can be done by taking a systematic approach starting from system requirements, analysis, design, coding, testing, and finally, maintenance. All of the above stages are carried out in order one by one, and therefore, this method is nicknamed the Waterfall Method [2]. The

use of the waterfall method or model was first introduced by Herbert D. Benington at the Symposium on Advanced Programming Method for Digital Computers on June 29, 1956 [3].

### 2.3 MySQL

PHP (Hypertext Preprocessor) is a language for web-based programming. PHP is a server-side script language and not a client. PHP scripts can only be accessed on the server, and then the server will respond in HTML. PHP supports a lot of databases, one of which is MySQL. And MySQL itself is a useful tool for database servers. MySQL is widely used because it is ideal for both small and large-scale applications. And also, MySQL is available for many operating systems, including Windows and Linux. The advantage of MySQL is that it is free to use [4]. At first, PHP was short for Personal Home Page (Personal site). PHP was first created by Rasmus Lerdorf in 1995. At that time, PHP was still called Form Interpreted (FI), which was in the form of a set of scripts used to process form data from the web [5]. MySQL was originally created in 1979 by Michael "Monty" Widenius, a Swedish computer programmer[6].

### 2.4 HTML

HTML (Hypertext Markup Language) is a programming language used to create the structure of a website. HTML consists of a combination of text and symbols stored in a file. With HTML, we can organize a website from headings, paragraphs, images, links, and many others. HTML itself was first released in 1991. Initially, HTML was created to make it easier to access one document with another document. Then in the following year, HTML itself began to be used in general [7].

### 2.5 QRIS

QRIS (Quick Response Code Indonesian Standard) is a standardization by Bank Indonesia for all companies that use financial technology, such as Gopay, OVO,

ShopeePay, and others. QRIS is a combination of various types of QR codes. This causes the digital buying and selling process to be more precise in terms of payments to be safer, faster, and easier [8].

## II. METHODOLOGY

### 3.1 Location And Research Subject

This research was conducted at Maria Bakery Tayu, Pati City, Central Java. What is the reason for choosing this location? Because this website was created for Toko Maria Bakery Tayu in order to increase sales and make it easier for customers to order, sell and pay.

### 3.2 Method of Collecting Data

The technique that will be used in collecting this data is Quantitative Research Techniques. Quantitative research is divided into three parts, namely:

#### 1. Interview

Interviews are a process of obtaining information for the purpose of a study, usually conducted by two people by means of questions and answers between the interviewer and the informant.

#### 2. Questionnaire

A questionnaire is a way to collect data or information by means of a survey to obtain data from respondents. Questionnaires can be sent to respondents via e-mail, social media, and others.

#### 3. Observation

Observation is a way of collecting data and information by observing, recording and also interpreting data and information. This observation can be interpreted as the concentration of attention on an object.

### 3.3 Application Development Method

The method used in this research is Waterfall Method. The Waterfall Method is carried out by means of a systematic approach, starting from the stages of

system requirements, analysis, design, coding, testing, and maintenance [9].

The Waterfall method has a 5 stages, namely:

#### 1. Requirement Analysis

Requirement Analysis is an important part of the product development process that aims to determine and identify the needs needed to build an effective and efficient product or system. This process involves a series of activities aimed at ensuring that the product to be created matches the needs and expectations of users [10]. The needs analysis process begins with communication with users or stakeholders. The purpose of this communication is to understand their expectations and needs for the product to be created. Requirements analysis also requires an understanding of the business environment and context relevant to the product to be created. This helps in determining the technical specifications and features required to meet user needs and achieve business goals.

After conducting a requirements analysis, the analyst creates a document that describes the product specifications and the needs to be met. This document becomes the basis for the development team to create a product that meets the expectations and goals of the users. It also helps in planning and controlling the project and ensuring that all the required resources are available.

#### 2. System And Software Design

System Design is the process of determining how a system will work and solve existing problems, through planning and designing. This includes identifying and selecting the components to be used in the system, determining how those components will work together, and designing the overall system architecture. The goal is to ensure that the system meets the needs and helps achieve business goals.

Software Design is the process of planning and designing software, to ensure that the software meets specifications and can solve the specified problem. It involves identifying and specifying software functionality, designing the software architecture, and selecting appropriate technologies. Software Design also includes creating documentation, such as flowcharts, specifications and user interface designs, to ensure that the software can work properly.

### 3. Implementation And Unit Testing

Implementation and Unit Testing are two crucial stages in software development. Implementation is the process of creating code and building software applications or systems in accordance with predetermined specifications and designs. Meanwhile, Unit Testing is the process of testing the code created at the implementation stage to ensure that each part of the application or system works as expected and meets predetermined specifications. These two stages are very important to ensure the quality and reliability of the software developed. The Unit Testing process helps in finding and fixing problems before the application or system is widely used and ensures that the software meets the expected quality standards [11].

### 4 Integration And System Testing

Integration and System Testing is a testing process carried out to ensure that the parts of a software system function properly together and according to the specified specifications. Integration Testing concentrates on testing how the parts of the system work together, while System Testing aims to verify that the system as a whole meets the expected specifications. Both types of testing are important to ensure that the software system works properly and helps in finding and fixing problems before it is launched.

### 5 Operation And Maintenance

Operation and Maintenance (O&M) are actions to ensure that systems, equipment, or infrastructure are working properly and efficiently. It includes tasks such as inspection, routine maintenance, upkeep, installation, and repair to ensure that systems and equipment function according to established specifications and operating standards. The goal of O&M is to ensure that systems and equipment work properly and meet quality criteria, as well as minimize the level of downtime and maintenance costs.

## III. DISCUSSION

### 4.1 Business Issues

The problems that exist in Maria Bakery Tayu are related to sales and purchases that cannot be done online. Nowadays, everything is done online, and even sales and purchases are also made online in many places. In the absence of an online buying and selling process at Maria Bakery Tayu, it causes an impact on revenue; there is no increase in product sales. With the process of selling and purchasing goods online, it is expected that in the future, it can help increase the profits of Maria Bakery Tayu. Of course, with the online sales and purchase process at Maria Bakery Tayu, it will make it easier for customers from Maria Bakery Tayu to be able to order and buy, of course, also pay for the product that the buyer wants. Online product sales are very beneficial for the business owner of the Maria Bakery Bakery.

In addition, according to the recognition of the owner of Maria Bakery Tayu, in the absence of sales and purchases made online at Toko Maria Bakery Tayu it is difficult to disseminate about the products in Maria Bakery Tayu. And also the owner of Maria Bakery Tayu said that it was difficult to increase profits because there were no online sales and purchases.

## 4.2 Application Design

### 1. Database Design (ERD)

ERD (Entity Relationship Diagram) is a diagram that describes the entities associated with a system [12]. ERD is generally used to design a system, especially in the database section.

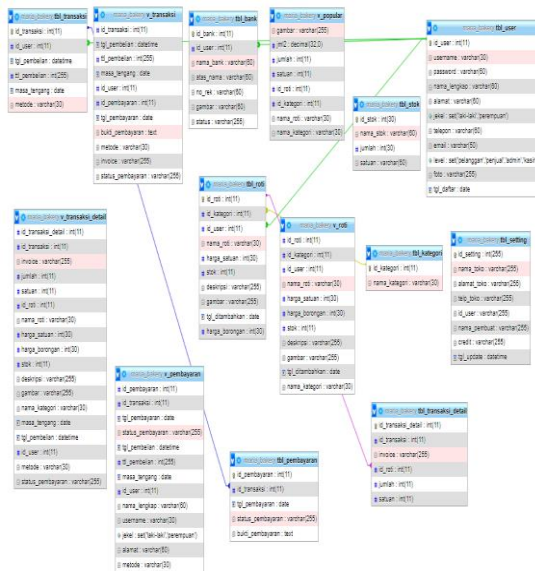


Figure 4.1 Entity Relationship Diagram Maria Bakery Tayu

### 2. Flowchart

The flowchart is a diagram representing an algorithm, work process or workflow in the form of graphical symbols [13]. The function of the flowchart itself is to describe and facilitate a series of processes so that it is easy to understand. The following is a Flowchart from Toko Maria Bakery Tayu.

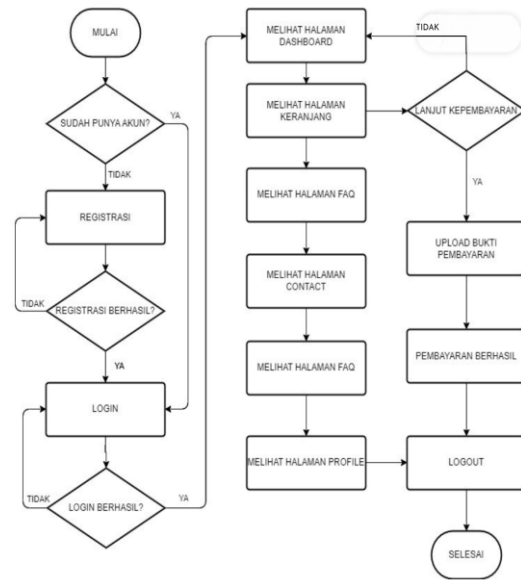


Figure 4.2 Flowchart Maria Bakery Tayu

Figure 4.2 shows that to access the home page as a user; we must have an account. If the user does not have an account, then they must create an account first; if they have created an account, then the user can log in to access the home page. After successfully entering the home page then, the user can choose the product to be purchased, and after that, the user can enter the cart page and make an online payment via Qris. If the user has made a payment, then the user must upload the proof of payment to the place provided.

### 3. Use Case Diagram

A Use Case Diagram is a diagram that is made based on the flow that exists in the use case [14]. The flow is in the form of interaction between actors and users on the system to be created. The purpose of making a Use Case Diagram is to find out what functions can be carried out by actors. We can see the Use Case Diagram of Toko Maria Bakery Tayu in Figure 4.3.

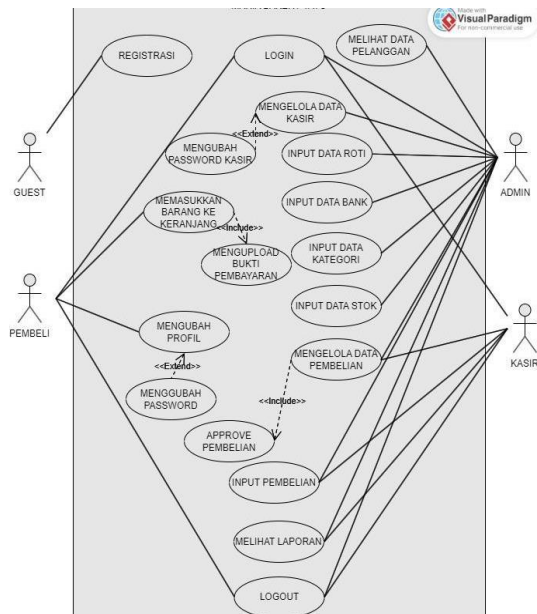


Figure 4.3 Use Case Diagram Maria Bakery Tayu

In Figure 4.3, there are four actors namely Guest, Customer, Cashier, and Admin, who have access rights for their respective functions on the system.

Guest or new customers who do not have an account are actors who have the lowest access rights. They can only see the Dashboard page without being able to select products to make purchases. Guests must register an account first so they can log in as a customer.

Meanwhile, customers themselves are those who already have an account to be able to log in and order products. There are many functions that can be performed by these customers, such as ordering products, and entering the cart that already contains the products that customers will buy. Then customers can make payments and also upload proof of payment to the place provided. Then customers can also see their profile in the profile section.

Cashiers have the right to be able to manage purchase data and also approve purchases that have been made; Cashiers also have the right to input purchases and can also see sales reports that have been made.

Meanwhile, the Admin is the actor in charge of managing the contents of the website. Admins can add categories for

bread, add types of bread, manage customer data, manage bank data for payments, manage purchases that customers have entered, and can also see the results of sales reports.

### 4.3 Application Development

#### 1. Backend Development Preparation

In the process of developing this website, researchers used a PHP framework. The reason why researchers use ordinary PHP is that researchers are used to using ordinary PHP, and also ordinary PHP is easier for researchers to understand. And also, this ordinary PHP is often used by many people, making it easier for people to understand.

#### 2. Frontend Development Preparation

For the preparation process of application development in the Frontend section, researchers use the admin dashboard template on Google or on Github, which is free to download for free without spending money or which is open source. The reason for using this template is that we don't need to make it ourselves from scratch, making it easier for researchers to develop websites. And also, according to researchers, it is easy to search on various platforms.

### 4.4 Application Testing

Application testing is a very important stage in application development. The existence of this application testing is to ensure that every feature that has been made is as expected. This test must go through 2 stages, namely technical testing and business testing.

#### 1. Technical Testing

This technical testing is done using the Black Box testing method. This test is a method for testing the function of an application with a focus on the output produced without paying attention to the program code [15]. By using this feature,

each feature will be tested based on its function or the resulting output.

## 2. Business Testing

Business testing is carried out in direct interviews with users, namely admins, cashiers, and also visitors, to find out the effects that occur after the system is used. In addition, the direct observation process is also carried out to find out the user's reaction to using the system. Training is also conducted to the administration to ensure that they understand the system used. After that, the administration was asked to conduct their own experiments on the system that had been made.

After the process of implementing this system, we can know that the purchasing and sales process can be better controlled and can print the results of purchases and sales. The administration can also see the results of purchases that have been recorded by the system; this is very helpful in the sales and purchase process and also the data collection process.

Broadly speaking, this system is able to accommodate all the problems experienced; it's just that habituation and adaptation to the new system are still needed so that the use of the system can run smoothly and optimally.

## IV. CONCLUSION

### 5.1 Application Development

Application testing is a very important stage in application development. The existence of

1. The implementation of this system is very helpful for buyers in terms of ordering and also buying products in stores. This happens because buyers can place orders and also purchase online. Buyers can see what bread is available in the store online. With this system, it can make it easier for buyers to make payments because this system is done online through the QRIS system.
2. The implementation of this system

also helps the owner in making sales online. The owner can see the sales results that have been sold. The owner can analyze the revenue that has been obtained by logging in in the admin section. Obviously, this makes a great contribution to the store owner in increasing sales and also allows them to analyze the results that have been achieved. In addition, it is also very helpful for owners to manage their stores more effectively.

3. With the existence of online payments using QRIS, of course, it is very helpful for buyers and sellers. The advantage of this is, of course, that buyers can make payments online because, at this time, people prefer to use E-Money in making all transactions. This also benefits the seller in making online sales.

### 5.2 Advice

The following are some suggestions that can be used as a reference in conducting further research:

1. Improve the appearance of the web to make it more attractive and also easier to use by users. This will certainly be very helpful to boost sales from a store because it has an attractive and effective web display.

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