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# Testing of Usability and Correctness Aspects in Marketing and Ordering Information Systems

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**ABSTRACT**

**Purpose:** This research systematically evaluates the quality of the web-based marketing and ordering information systems at UD. Percetakan Citra Satria by focusing on the aspects of usability and correctness, aiming to determine the effectiveness of the system in meeting user needs.
**Methods/Study design/approach:** Data collection was conducted through observation and questionnaires. Observations aimed to identify problems during the use of the company's marketing and ordering information system, while a questionnaire, using a Likert scale, involved 8 employees and 70 customers to assess usability and accuracy. The system was implemented and tested by allowing users to interact with it, with evaluations analyzed using the McCall model. The testing focused on usability, reflecting ease of use, and correctness, ensuring information accuracy, both critical for enhancing user experience and operational effectiveness.
**Result/Findings:** The test results indicate that the overall quality of the web-based marketing and ordering information system achieved a score of 85% for the usability aspect and 85.3% for correctness. These scores are classified as very good according to the quality factor percentage scale.
**Novelty/Originality/Value:** This study introduces novelty in applying quality testing for a web-based marketing and ordering information systems using the McCall method, focusing on two main aspects: usability and correctness. The novelty lies in its specific application context, namely in the printing industry as well as the use of questionnaires to directly incorporate the perspectives of employees and customers.



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## 1. INTRODUCTION

The development of science and technology has brought significant changes to the social and economic patterns of society, including in the business sector, affecting both large companies and micro, small, and medium enterprises [1]. Information and communication technology enables SMEs to compete in the global market at lower costs through digital marketing, e-commerce platforms, and data-driven management [2]. However, this development also demands greater adaptability and digital literacy, allowing business actors to effectively manage technology to support the growth and sustainability of their enterprises [3].

One of the benefits of technological advancements is the convenience it provides for people in carrying out various daily activities, such as communicating, shopping, placing orders, and conducting transactions using a single device [4]. The function of the internet has also expanded, not only as a source of

information but also as a medium for various activities. Today, online shopping has evolved into a part of the lifestyle of internet users [5].

Online marketing facilitates interactions between producers, intermediaries, and consumers, while also enabling businesses to monitor consumer needs [6]. Consumers are now more independent in making purchasing decisions based on online searches [7]. Additionally, e-commerce, as an online business activity, aims to achieve profit through sales, purchases, information services, and trade conducted over the internet [8]. Along with the advancement of the business world and the increasing level of competition, entrepreneurs are becoming more aware of the importance of working harder in managing their companies [9].

UD. Percetakan Citra Satria is a printing company located in Makassar, founded by Sugianto Djalal in 1994. This company operates in the production and distribution of various printing products, such as invitations, banners, stamps, brochures, t-shirts, and more. Along with the development of technology and digitalization trends, the printing business must also adapt to remain competitive in an increasingly challenging market.

The McCall model is a framework that outlines the factors influencing software quality or the software itself. This model consists of three main perspectives: product operation (the operational characteristics of the software), product revision (the software's resilience to changes), and product transition (the software's adaptability to new environments). In the product operation perspective, several factors are considered, such as usability (ease of use), integrity (completeness), reliability, and correctness (accuracy) [10].

This study focuses on two factors to be tested: usability and correctness. The McCall model is known for its highly comprehensive criteria due to its accuracy and detail, making it particularly useful in the context of testing and ensuring the quality of information system software [11]. This study aims to evaluate the quality of the web-based marketing and ordering information system using the quality factors of the McCall method.

## 2. METHOD

The process and steps to be carried out in this research are:

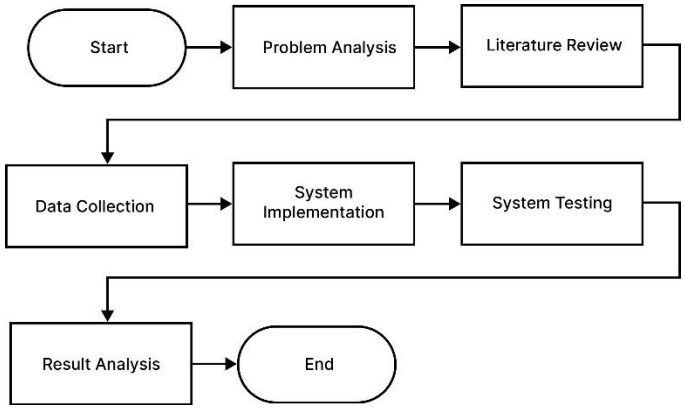


Figure 1. Research flow diagram

### 2.1 Problem Analysis

Problem analysis is carried out to identify the obstacles faced by the company. Based on the results of the analysis, it was found that the company did not have a proven printing information system. Some of the weaknesses in the old system include marketing that is still done conventionally through printed media, an ordering process that requires customers to come directly to the printing location, and the absence of a real-time order tracking feature which causes a lack of transparency for customers. To overcome these problems, the development of a web-based marketing and ordering information system is proposed, which will be tested using the McCall method to evaluate the quality of the developed system.

### 2.2 Literature Review

This stage is the process of searching for and collecting references relevant to the McCall method in testing web-based marketing and ordering information systems. The aim of this process is to provide insights

and guidance for new researchers so they can take appropriate steps aligned with the research objectives based on the theories and guidelines gathered [12].

### 2.3 Data Collection

Data collection is carried out using two methods [13], namely:

1. Observation Methods
   This stage aims to conduct direct observation of the use of the web-based marketing and ordering information system and to identify various challenges and issues that may arise during its use.
2. Questionnaire Methods
   A questionnaire is conducted to collect data from users of the web-based marketing and ordering information system as respondents, consisting of 8 employees of the printing company and 70 customers, using a likert scale instrument.

### 2.4 System Implementation

The existing system is then tested, and users will try the system and provide evaluations. The results of the evaluations will be calculated using the McCall method. The first thing to do is determine the weight (w) according to importance. (0,1 <= w <= 5) based on the company. A scale of 0,1 is very unimportant to a scale of 5 is very important. Usability and correctness have a weight of 0,5.

To calculate the quality by using the McCall method can applied the following equation [14]:

$$Fa = W_1C_1 + W_2C_2 + W_3C_3 + \cdots + W_nC_n$$

Fa = Software quality factor
W = Weight dependent on quality and the importance to the company
C = Value for criterion 1

Then, all Fa quality factor values are converted into a percentage (%). This percentage is used to evaluate the feasibility of the aspects studied. The maximum desired value is 100%, while the minimum value is 0% [15]. The final step is to calculate the percentage of responses from several respondents regarding functional aspects, resulting in the total McCall ( $\sum$ ) quality as follows:

$$\sum = \frac{(0{,}5xFa1)+(0{,}5\text{x}Fa2)}{Maksimum\ Value} x100\%$$

$\sum$ = Total quality

Fa = Software quality factor

There are five categories on the scale to account for the percentage range. The minimum value is 0% (very poor), and the maximum is 100% (very good).

### 2.5 System Testing

The system tested using the McCall method focuses on two aspects: usability and correctness. These aspects are chosen because they relate to user experience and the accuracy of the information presented by the system [16]. In the context of a marketing and ordering information system, usability is crucial as ease of use affects how comfortable users (both customers and employees) are in operating the system, particularly in the processes of ordering and managing products.

### 2.6 Result Analysis

At this stage, the measurement results obtained from data collection through questionnaires are analyzed to assess the system's quality based on usability and correctness aspects. This analysis aims to determine whether the system meets the expected quality standards or if there are specific aspects that require further improvement. The results of this analysis then serve as the basis for drawing conclusions about the system's feasibility for users [17]

## 3. RESULTS AND DISCUSSIONS

The interface of the web-based marketing and ordering information systems at UD. Percetakan Citra Satria can be seen in the images below:

### 3.1 Login Page

The login page displays a form containing a username and password that must be filled in to access the system. Additionally, users can log in using a Google account.

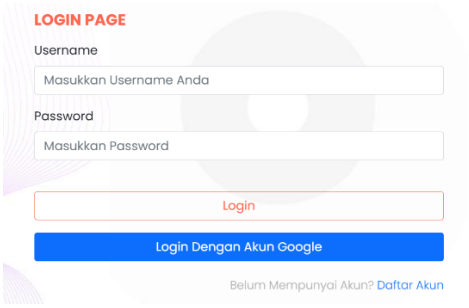


Figure 2. Login page

The login form is placed in the center of the page to ensure that the user's focus is directly on the main element. This position is designed to minimize distraction and make it easier for users to access the system. The color of the login button is designed to be prominent (e.g. blue or green) to distinguish it from other elements. This increases visibility and makes it easier for users to recognize the main action to take.

### 3.2 Admin Dashboard Page

The dashboard page contains several menus that can be managed by the admin. The available menus include user or customer data, product category data, product data, transaction data, a track orders page, and an order completed page.

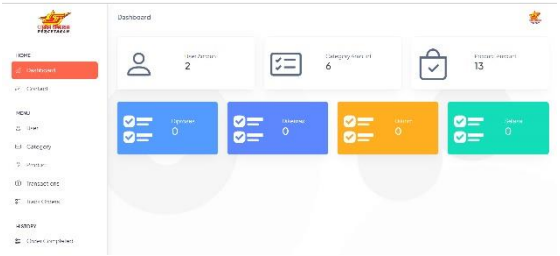

Figure 3. Admin dashboard page

The main menus such as customer data, product categories, and order tracking are organized vertically or horizontally in areas that are easily accessible to admins. This ensures quick navigation between frequently used key functions. Each menu also features relevant icons to enhance visual understanding and reduce the time required to find a particular menu.

### 3.3 Contact Page

This page contains customer contact information, including name, WhatsApp number, order subject, and a message detailing the customer's desired order. The contact form includes validations to ensure the data entered is accurate, such as ensuring the WhatsApp number is valid and the message is not empty, which supports correctness.

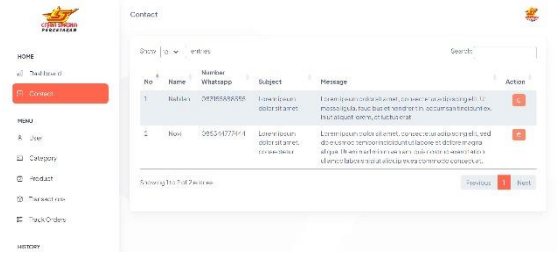

Figure 4. Contact page

### 3.4 Customer Data Page

The image below shows the user interface on the user page, which contains data of customers who have registered.

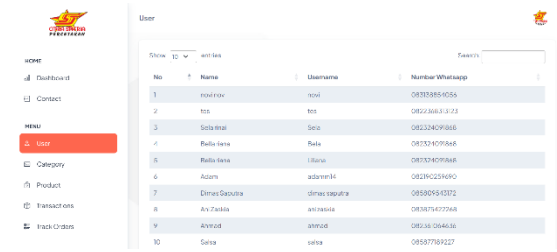

Figure 5. Customer data page

### 3.5 Product Category Page

This page contains several categories of available printing products. The admin can also add new categories, edit, or delete product categories. The add, edit, and delete buttons are placed close to the data to be manipulated, so users do not need to perform additional navigation, similar to the product data display. This design reduces work time and increases efficiency. The system provides input validation to ensure the product and category data entered is correct, in accordance with the correctness aspect. For example, ensuring product prices are not empty or categories are not duplicates.

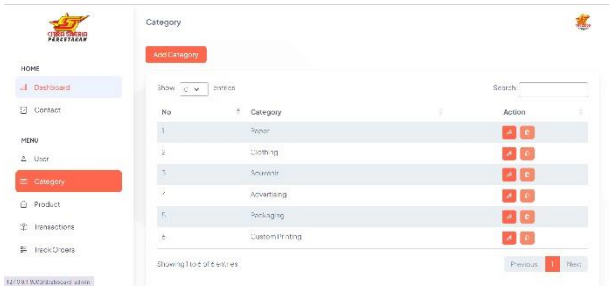

Figure 6. Product category page

### 3.6 Product Data Page

This page contains several available printing products. The admin can also add new products, edit, or delete products.

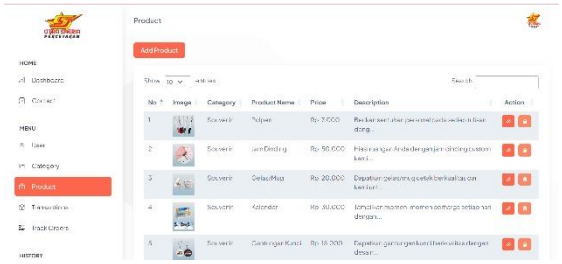

Figure 7. Product data page

### 3.7 Transaction Data Page

This page contains the transaction history of customers, and once a customer has made a transaction, the order status will be processed. Transaction data is organized in tables with clear order statuses, such as “Processing” or “Completed,” using different colors (e.g. yellow for pending and green for completed) to aid quick identification. The system is designed to ensure the transaction data displayed matches customer input and payment records, maintaining the accuracy of the information.

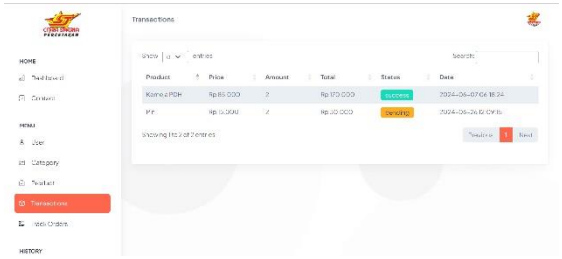

Figure 8. Transaction data page

### 3.8 Order Tracking Page

This page displays the order tracking interface, which shows the order status. Order status is visualized in an easy-to-understand format, such as green text for completed and yellow for pending. This color selection is designed to make it easier for customers to recognize information quickly. The page is designed to provide an instant response when a customer loads a new status, supporting a better user experience.

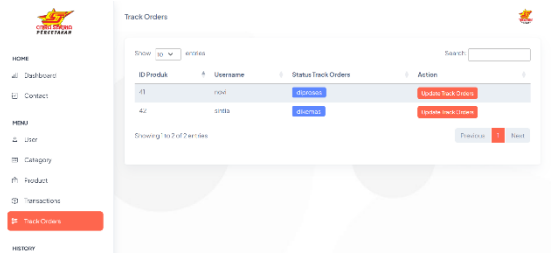


Figure 9. Order tracking page

### 3.9 Our Contact Page

This page contains the admin's contact information and a form for customers to fill in order details. It also includes the admin's WhatsApp number, the printing company's email address, and the printing location. The contact form elements are placed in the appropriate order. This order is designed based on the user's needs, ensuring all necessary information is clearly available.

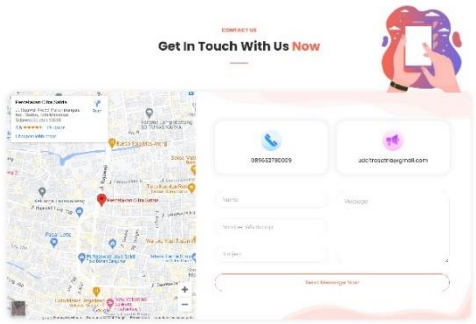


Figure 10. Our contact page

### 3.10 Testimonials Page

This page contains testimonials from customers regarding the printing products they have ordered. Customer testimonials are placed in easy-to-find locations to increase user confidence in the printing service.

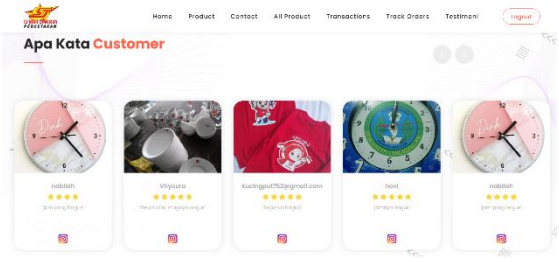


Figure 11. Testimonials page

### 3.11 Product Order Page

The order form displays the product, price, quantity, and description in one view to make it easier for customers to understand product information before making a purchase. The “Order” button is designed with a color that is striking and different from other elements, such as green, so that it is easily recognized as the main action.

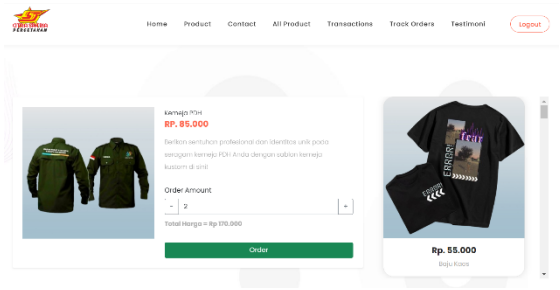


Figure 12. Product order page

### 3.12 Payment Methods Page

The payment methods page is for customers who make payments after ordering products. It offers several payment options that customers can choose from. All payment methods are presented in a dropdown format to make it easier for customers to select the desired option. This also reduces the risk of input errors.

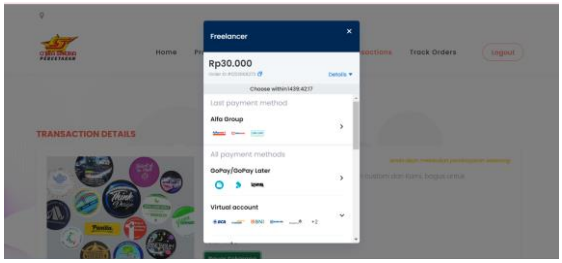


Figure 13. Payment methods page

### 3.13 Order Completed Page

The order completed page displays the report data of orders that have been completed. The completed order report is displayed in a table format with complete and accurate information, including date, product details, and payment status. This ensures that the data presented meets the correctness aspect.

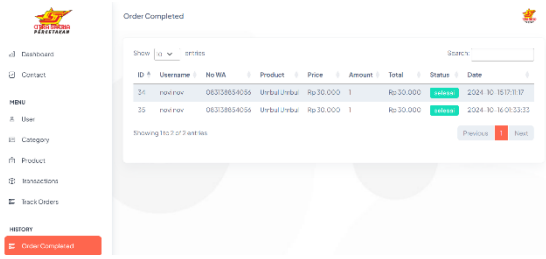


Figure 14. Order completed page

The following are the results of the software quality assessment along with the details of the questions or statements. Consists of 30 statements for customers totaling 70 people and 30 questions for employees totaling 8 people. Respondents were asked to fill in answers on a scale of 1 to 5, where 1 is very unfavorable and 5 is very good.

Table 1. Quality assessment from customers

| No. | Indicators | Information | Weight | Criterion Value |
|---|---|---|---|---|
| 1. | ***Usability*** 0,5 | **a. *Operability* = 0,5** 1. The interface of the website is easy to understand. | 0,1 | 4,4 |
| | | 2. The colors and fonts used on the website are easy to see. | 0,1 | 4,5 |
| | | 3. You feel comfortable using this website to place an order. | 0,3 | 4,5 |
| | | 4. The language used on this website is easy to understand. | 0,2 | 4,5 |

| | | | | |
|---|---|---|---|---|
| | | 5. This website can easily provide information regarding the status of the booking. | 0,4 | 4,5 |
| | | **b. *Training* = 0,4**<br>6. Navigation on the website is easy to use. | 0,1 | 4,5 |
| | | 7. The information presented on the main page is easy to find. | 0,1 | 4,5 |
| | | 8. The payment process on this website runs smoothly. | 0,4 | 4,5 |
| | | **c. *Communicative* = 0,5**<br>9. This website has a quick response when changing pages. | 0,1 | 4,5 |
| | | 10. This system provides admin contact services. | 0,2 | 4,6 |
| | | 11. This website provides an effective search feature. | 0,1 | 4,5 |
| | | 12. The layout of the elements on the website makes it easier for you to use the website. | 0,1 | 4,6 |
| | | 13. This website is well accessible on other devices (e.g. smartphones). | 0,3 | 4,6 |
| | | 14. The website is quite responsive to user interactions. | 0,1 | 4,5 |
| | | 15. This website is quite easy to change the quantity or variant of the product you want to buy. | 0,2 | 4,6 |
| 2. | ***Correctness*** **(**0,5) | **a. *Completeness* = 0,5**<br>1. The product information displayed on the website is accurate and up-to-date. | 0,3 | 4,5 |
| | | 2. Product price information is already listed on the website. | 0,1 | 4,6 |
| | | 3. The product description is already listed on the website. | 0,1 | 4,6 |
| | | 4. The booking system on the website works correctly. | 0,4 | 4,6 |
| | | 5. The payment methods available on the website work properly and correctly. | 0,3 | 4,6 |
| | | 6. The stock of products displayed on the website is accurate. | 0,1 | 4,6 |
| | | 7. All the links and buttons on the website work well and point to the correct page. | 0,1 | 4,6 |
| | | 8. The information provided about product availability is always up-to-date. | 0,2 | 4,6 |
| | | 9. The account registration process on this website works correctly. | 0,3 | 4,5 |

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| | | | | |
|---|---|---|---|---|
| | | **b. *Consistency* = 0,4**<br>10. The display design is consistent on every page. | 0,1 | 4,6 |
| | | 11. The price of the product displayed is consistent with the actual price at the time of checkout. | 0,3 | 4,6 |
| | | **c. *Treaceability* = 0,5**<br>12. Booking notifications and confirmations are accurate. | 0,1 | 4,6 |
| | | 13. The booking tracking feature provides correct and accurate information. | 0,1 | 4,6 |
| | | 14. The booking status displayed in the user's account is always updated appropriately. | 0,1 | 4,7 |
| | | 15. The contact information on the website is accurate and can be contacted. | 0,3 | 4,6 |

After determining the criteria values and weights, the next step is to calculate the total value of Fa based on the quality factors in the McCall method. The calculation is made according to the following criteria:

Calculate the total values of Fa1 and Fa2.

a. Usability

So the Fa1 value is settled through the method below:

$$\text{Fa1} = \frac{operability+training+communicative}{3}$$

$$= \frac{4,9+2,7+5}{3} = \frac{12,7}{3} = 4,2$$

Through the calculation results for the Fa1 value above, a change is made to the percentage through the following formula:

$$\text{Percentage} = \frac{\text{value earned}}{\text{maximum value}} x\ 100\% = \frac{4,2}{5} x\ 100\% = 84,7\%$$

This website has a very good usability level with a score of 84.7% from customer ratings. The interface is easy to understand, the colors and fonts are comfortable to look at, and the language used is clear. Website navigation is easy to use, information on the main page is easy to find, and the payment process runs smoothly. The layout of the elements on the website makes it easy for users, and the website is responsive to various devices. In addition, the admin contact and search features effectively support the user experience. In conclusion, the usability aspects of this website have met the needs of users in a practical and efficient manner.

b. Correctness

So the Fa2 value is settled through the method below:

$$\text{Fa2} = \frac{completeness+consistency+treaceability}{3}$$

$$= \frac{8,7+1,8+2,8}{3} = \frac{13,3}{3} = 4,4$$

Through the results of the calculation for the Fa2 value above, a change is made to the percentage through the following formula:

$$\text{Percentage} = \frac{\text{value earned}}{\text{maximum value}} x\ 100\% = \frac{4,4}{5} x\ 100\% = 88,5\%$$

This website shows a very good level of accuracy with a score of 88.5%. The product information displayed is accurate and up-to-date, including prices, product descriptions, and stock availability. The ordering system runs correctly, payment methods work well, and all links and buttons work as intended. In addition, notifications, order confirmations, and tracking features provide correct and accurate information. The consistency of the display design and price suitability are also maintained on each page. In conclusion, the correctness aspect of this website is very adequate to provide a reliable experience to users.

Thus, the total software quality of the customer is obtained as follows:

$$\sum = \frac{(0{,}5x4{,}2)+(0{,}5x4{,}4)}{5} x\ 100\%$$

$$\sum = \frac{2{,}1+2{,}2}{5} x\ 100\%$$

$$\sum = \frac{4{,}3}{5} x\ 100\% = 86{,}6\%$$

Based on the previous total percentage, the web-based marketing and ordering information system on UD. Percetakan Citra Satria is very good for customers, because the percentage is in the range of 81%-100%.

Table 2. Quality assessment from employees

| No. | Indicators | Information | Weight | Criterion Value |
|---|---|---|---|---|
| 1. | **Usability** 0,5 | **a. Operability = 0,5** 1. How easy is it for you to add or update printing service information on this website? | 0,3 | 4,1 |
| | | 2. What is your experience in managing the navigation and menu structure on this website? | 0,1 | 4,1 |
| | | 3. How do you assess the ability of this website to display the changes you make in real-time? | 0,2 | 4,1 |
| | | 4. Are you having trouble setting up products, prices, or promotions on this website? | 0,1 | 3,9 |
| | | 5. What is your experience in managing and monitoring orders through the admin dashboard of this website? | 0,4 | 4,4 |
| | | 6. How do you rate the page loading speed on this website? | 0,1 | 4,1 |
| | | 7. Do you find the filter and product category features on this website helpful in product management? | 0,1 | 3,9 |
| | | **b. Training = 0,4** 8. Do you find it easy and quite savvy in managing this website? | 0,4 | 4,4 |
| | | 9. How quickly can you correct errors or update the content on this website? | 0,1 | 3,8 |
| | | 10. Do you feel you need technical support to manage this website effectively? | 0,2 | 4,0 |
| | | **c. Communicative = 0,5** 11. Is the website easy to use for uploading and editing products? | 0,3 | 4,1 |
| | | 12. How intuitive is the website admin interface for you to perform your daily tasks? | 0,4 | 3,9 |
| | | 13. How easy is it for you to find and use the search feature on this website? | 0,1 | 3,9 |
| | | 14. How effective is the look and layout of the admin page in supporting your task? | 0,1 | 3,8 |

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| | | | | |
|---|---|---|---|---|
| | | 15. Is the use of language on this website easy for you to understand? | 0,2 | 4,5 |
| 2. | **Correctness (**0,5) | **a. Completeness = 0,5**<br>1. Does the order management system ensure that all incoming orders are recorded correctly? | 0,3 | 4,0 |
| | | 2. How accurate is this system in sending order and payment notifications to customers? | 0,3 | 4,0 |
| | | 3. Do you often encounter inconsistent data or errors in the reports generated by the system? | 0,1 | 3,5 |
| | | 4. How do you handle errors in product information or prices listed on the website? | 0,1 | 4,5 |
| | | 5. Can you easily search for order history from customers? | 0,1 | 4,1 |
| | | 6. Do all the features available in the system already have all the functions of everything? | 0,4 | 3,9 |
| | | 7. Can all completed orders be recorded properly in this system? | 0,1 | 4,0 |
| | | **b. Consistency = 0,4**<br>8. Does the payment system integrated with the website always work properly and securely? | 0,4 | 3,6 |
| | | 9. Is the stock and availability information of the product always accurate and up-to-date on the website? | 0,3 | 4,1 |
| | | 10. Does the website often receive reports from customers regarding bugs or technical issues? | 0,1 | 3,9 |
| | | 11. Is customer data and order information always recorded correctly and completely in the system? | 0,3 | 4,1 |
| | | 12. Are the features and buttons on each page consistent? | 0,1 | 3,8 |
| | | 13. How well does this system handle updates and upgrades without disrupting existing services? | 0,1 | 3,9 |
| | | **c. Treaceability = 0,5**<br>14. How often do you need to perform manual checks to ensure the accuracy of order data? | 0,1 | 3,9 |
| | | 15. How accurate is this system in recording and tracking the status of order delivery? | 0,3 | 4,1 |

After determining the criteria values and weights, the next step is to calculate the total value of Fa based on the quality factors in the McCall method. The calculation is made according to the following criteria:

Calculate the total values of Fa1 and Fa2.

a. Usability

So the Fa1 value is settled through the method below:

$$\text{Fa1} = \frac{operability+training+communicative}{3}$$

$$= \frac{5,4+2,9+4,5}{3} = \frac{12,8}{3} = 4,3$$

Through the calculation results for the Fa1 value above, a change is made to the percentage through the following formula:

$$\text{Percentage} = \frac{\text{value earned}}{\text{maximum value}} x\ 100\% = \frac{4,3}{5} x\ 100\% = 85,3\%$$

The usability aspect scored 85.3%, reflecting the ease of use of this website by employees. The admin interface is considered intuitive enough to support daily tasks, with easy navigation and a helpful layout. Employees feel comfortable in managing content, updating information, and monitoring orders through the dashboard. The process of managing the website was also rated as easy to understand, although some employees felt the need for technical support for certain tasks. In conclusion, the usability aspect of this website is very good, with features that support efficient operational management.

b. Correctness

So the Fa2 value is settled through the method below:

$$\text{Fa2} = \frac{completeness+consistency+treaceability}{3}$$

$$= \frac{5,6+5,1+1,6}{3} = \frac{12,3}{3} = 4,1$$

Through the results of the calculation for the Fa2 value above, a change is made to the percentage through the following formula:

$$\text{Percentage} = \frac{\text{value earned}}{\text{maximum value}} x\ 100\% = \frac{4,1}{5} x\ 100\% = 81,8\%$$

S

This website has a correctness level of 81.8%, which indicates that the correctness aspect of the system is good. The order management system ensures that orders are recorded correctly, and order and payment notifications also work well. The features of the system mostly function well, although there is still room for improvement. Overall, the correctness aspect is sufficient to support operations, although some technical improvements are still needed to improve accuracy and consistency.

Thus, the total software quality of the customer is obtained as follows:

$$\sum = \frac{(0,5x4,3)+(0,5x4,1)}{5} x\ 100\%$$

$$\sum = \frac{2,15+2,05}{5} x\ 100\%$$

$$\sum = \frac{4,2}{5} x\ 100\% = 84\%$$

Based on the previous total percentage, the web-based marketing and ordering information system on UD. Percetakan Citra Satria is very good for customers, because the percentage is in the range of 81%-100%. The overall result of customer and employee assessments for the usability aspect was 85% and for the correctness aspect which was 85,3%.

## 4. CONCLUSION

Based on the testing results, the web-based marketing and ordering information system at UD. Percetakan Citra Satria has excellent quality. Testing using the McCall method showed that the usability aspect scored 85%, while the correctness aspect reached 85.3%. These results indicate that the system is suitable and easy to use for users.

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## CREDIT AUTHORSHIP CONTRIBUTION STATEMENT

**Nabilah Faqita Masyora:** Conceptualization, Methodology. **Nahrun Hartono**: Software, Writing – original draft. **Rahman**: Writing – review & editing.

## DECLARATION OF COMPETING INTERESTS

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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