SAGA: Journal of Technology and Information Systems
Vol 3, Issue 1, February 2025, Page 394-405
ISSN: 2985-8933 (Media Online)
DOI: 10.58905/SAGA.v3i1.507

Website-Based Marketing Information System for UMKM Products at Asaul Store Using the ADDIE Method

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Abstract. MSMEs (Micro, Small, and Medium Enterprises) have an important role in the economy, but often face challenges in marketing their products widely. Marketing is a crucial aspect in the development of MSMEs, especially in today's digital era. However, many MSMEs still experience obstacles in reaching a wider market due to limitations in traditional marketing methods. Toko A'saul, an MSME business, uses a website-based information system to market its products, which effectively increases the marketing reach and competitiveness of its products. Website-based marketing has a positive impact on increasing the sales and market reach of MSMEs. In addition, this system allows MSMEs to compete better with larger businesses in the digital market. Through the implementation of a web-based marketing platform, MSMEs are expected to maximize their potential in attracting new customers, expanding market share, and improving overall business performance. In addition, the platform increases customer satisfaction by offering a better shopping experience and more responsive services.

Keywords: System Design, Information Technology, Digital Marketing, MSMEs (Micro, Small and Medium Enterprises)

1 Introduction

In today's digital era, MSMEs (Micro, Small, and Medium Enterprises) must adapt quickly to technological developments to remain competitive[1] . One of the increasingly important technologies is web-based information systems, which help MSMEs manage and market their products more effectively[2] . The development of web-based marketing information systems offers greater flexibility and efficiency compared to traditional marketing methods[3] . The utilization of the ADDIE (Analysis, Design, Development, Implementation, Evaluation) method is essential in this process, as it ensures structured and targeted development .[4]

Website-based information systems are very useful in maximizing the marketing potential of MSME products[5] . With this system, MSMEs can reach a wider market and increase their competitiveness in the digital era[6] . By using a website-based information system to market their products, which is effective in increasing marketing reach and product competitiveness[7] . This system not only speeds up the marketing process, but also minimizes the risk of failure that may occur during implementation[8] . In addition, this system's ability to perform data analysis helps Asa'ul Stores understand consumer behavior and adjust their marketing strategies accordingly.

The development of a website-based MSME product marketing information system with the ADDIE methodology can improve the quality and speed of development[9] . The ADDIE method emphasizes in-depth needs analysis, precise design, systematic development, measurable implementation, and ongoing evaluation[10] . With this approach, Asa'ul Store can customize their information system according to market needs and improve customer satisfaction.

A brief literature survey shows that the use of web-based marketing information systems provides many benefits for MSMEs. Case studies from various literatures show increased operational efficiency and decreased marketing costs. In addition, the integration of these information systems allows owners of MSMEs to monitor their business remotely. Research also indicates that the use of the ADDIE method in the development of information systems can speed up the development process and reduce the risk of failure .[11]–[14]

Therefore, this research aims to develop a Marketing Information System for MSME Products at Website-Based Asaul Stores using the ADDIE Method. Toko Asa'ul is one of the MSME businesses located in the city of Candi, which always strives to provide the best experience to customers. In an effort to improve operational efficiency and service quality, the development of a website-based marketing information system is the right solution. This system not only helps in processing product marketing quickly and accurately, but also enables more effective inventory management and in-depth data analysis. The use of the ADDIE method in the

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development of this information system is crucial to ensure the system runs smoothly.

By applying the ADDIE method in the development of MSME product marketing information systems for Asaul Stores, it is expected to maximize the added value provided to customers. ADDIE offers an adaptive and collaborative approach, which focuses on needs analysis, optimal design, structured development, efficient implementation, and continuous evaluation. Thus, developers can respond more flexibly to changing market needs and produce information system solutions that are more in line with user expectations.

2 Methods

The research method used in this research is ADDIE (Analysis, Design, Development, Implementation, Evaluation), which is aimed at designing and developing a website-based MSME Product Marketing Information System at Toko Asaul. ADDIE applies stages such as Analysis and Design to ensure the quality of the system developed[15] . Analysis helps in identifying system needs thoroughly, while the Design stage ensures that the structure and functionality of the system are designed appropriately. ADDIE also focuses on structured development and continuous evaluation, allowing researchers to test and improve the system iteratively[16] . By involving users in the Implementation and Evaluation stages, ADDIE helps ensure that the resulting system is relevant and suits the needs of users. Thus, ADDIE is effective in incorporating practices that improve quality, speed, and accuracy in information system development. The following is the flow of the ADDIE (Analysis, Design, Development, Implementation, Evaluation) method in Figure 2.1.

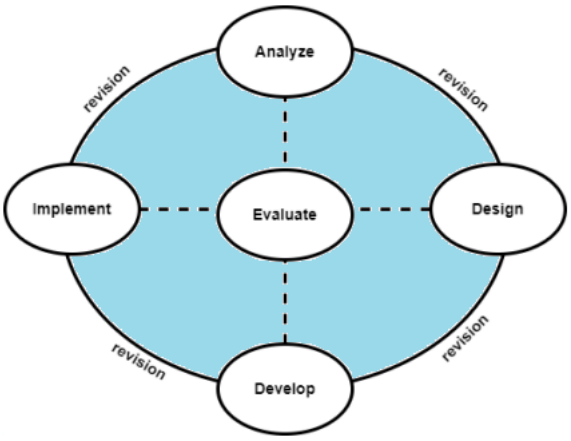

Figure 1. ADDIE Method

The research method applied in the development of this website-based MSME product marketing information system is the ADDIE method, which includes five stages: Analysis, Design, Development, Implementation, and Evaluation. The ADDIE method was chosen because of its systematic and structured approach, suitable for various types of applications, including web-based applications.

a. Analysis: This stage focuses on identifying user needs and application objectives through data collection from interviews, surveys, and literature studies. The data obtained is used to determine the features and technical specifications of the application.
b. Design: In this stage, the structure and interface of the application are planned. An initial design or prototype is created to cover layout, navigation, and user interaction, taking into account aspects of ease of use and user experience.
c. Development: The application is built according to the design that has been compiled. This process involves code implementation, component integration, and internal testing to ensure good functionality as well as technical documentation for future maintenance.
d. Implementation: The application is uploaded to the server and introduced to the users. Training and mentoring is provided to ensure effective usage, and monitoring is done to address any issues that may arise.
e. Evaluation: Evaluation is done through user testing and feedback to make improvements and enhancements to the application. This stage ensures that the application meets user needs and can continue to be used and developed.

By applying the ADDIE method, it is hoped that the development of this website-based MSME product marketing information system can take place in a structured and efficient manner, producing quality applications and in accordance with user needs.

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3 Results and Discussion

3.1 System Design

3.1.1 Flowchart

A flowchart is a visual representation of a workflow or process that illustrates the steps that must be taken to complete a task. Flowcharts make it easier to understand the flow of a process, identify potential problems, and improve efficiency, so they are very useful in planning, analyzing, and managing projects or systems. The results of this study there are 2 users, namely Admin and User.

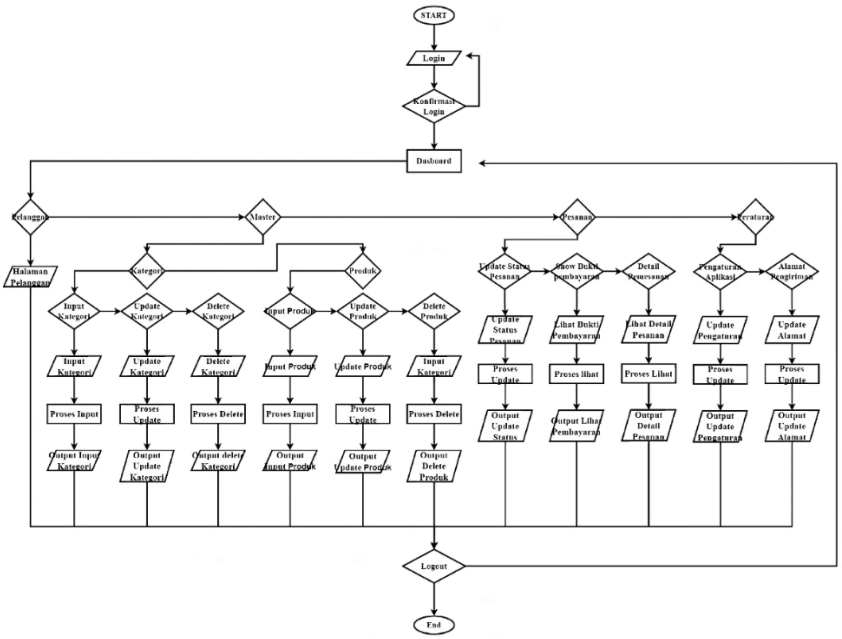

Figure 2. Flowchart Admin

Based on Figure 2 is a Flowchart on the admin user where the admin processes data from customer data, master data, Order data, and regulations. In the master data the admin manages Categories and Products where the admin does CRUD (Create, Update, and Delete).

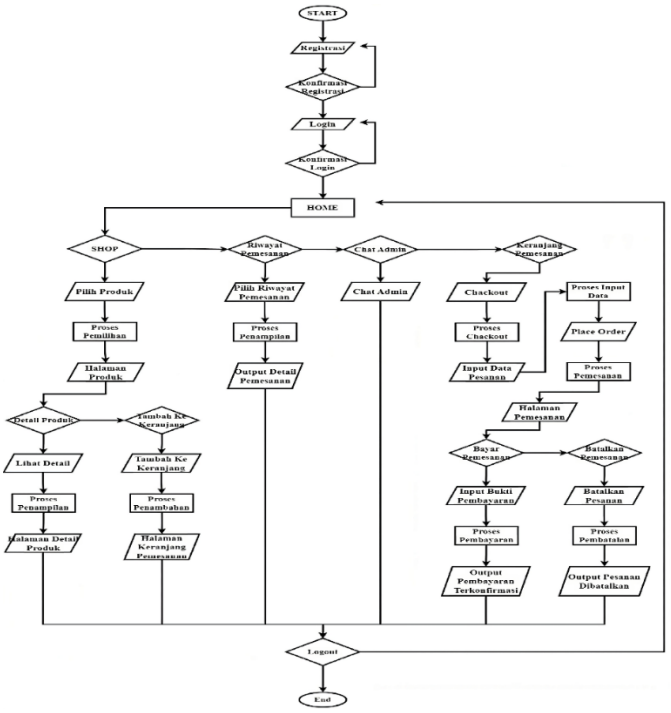

Figure 3. Flowchart User

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In Figure 3 is a flow of users where users can see products, order products, chat admin, and order baskets. Users can see products and put them in the order cart and can checkout goods and place orders.

3.1.2 Class Diagram

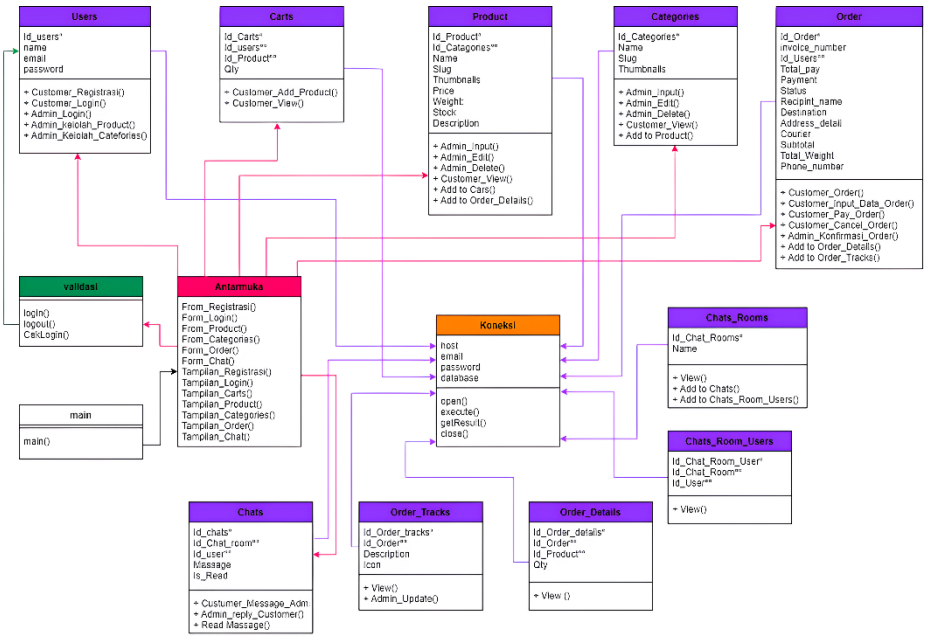

Figure 4. Class Diagram

Based on Figure 4 is a class diagram that contains classes such as Users, Carts, Products, Categories, Order, Order_Details, Order_Tracks, Chat, Chat_Room, Chat_room_users. as well as interfaces such as formLogin(), formProduct(), formOrder(), and others. Each class has different attributes and methods, and there are relationships between classes such as the association between the Carts class and the Users and Products classes,

3.1.3 Use Case Diagram

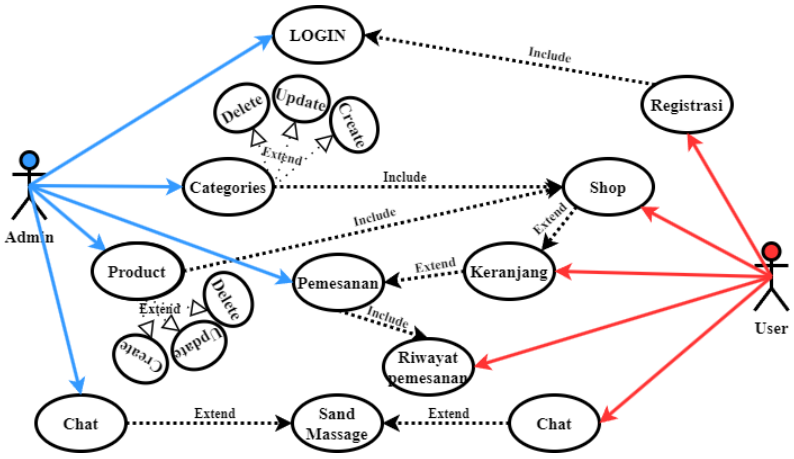

Figure 5. Use Case Diagram

Based on Figure 5, this use case diagram illustrates the interaction between Admins and Users in the Asaul store, where Admins manage products, categories, and users, while Users perform activities such as login, registration, viewing products, adding to cart, placing orders, and tracking shipments. Relationships between use cases show dependencies and extensions of functionality, such as ordering that requires a cart first and product management that includes creating, changing, or deleting. This diagram provides an overview of the basic functionality of the Asaul store, focusing on how activities interrelate and support the system as a whole, although it does not cover all the details that may exist in the actual Asaul store system.

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3.1.4 Sequence Diagram

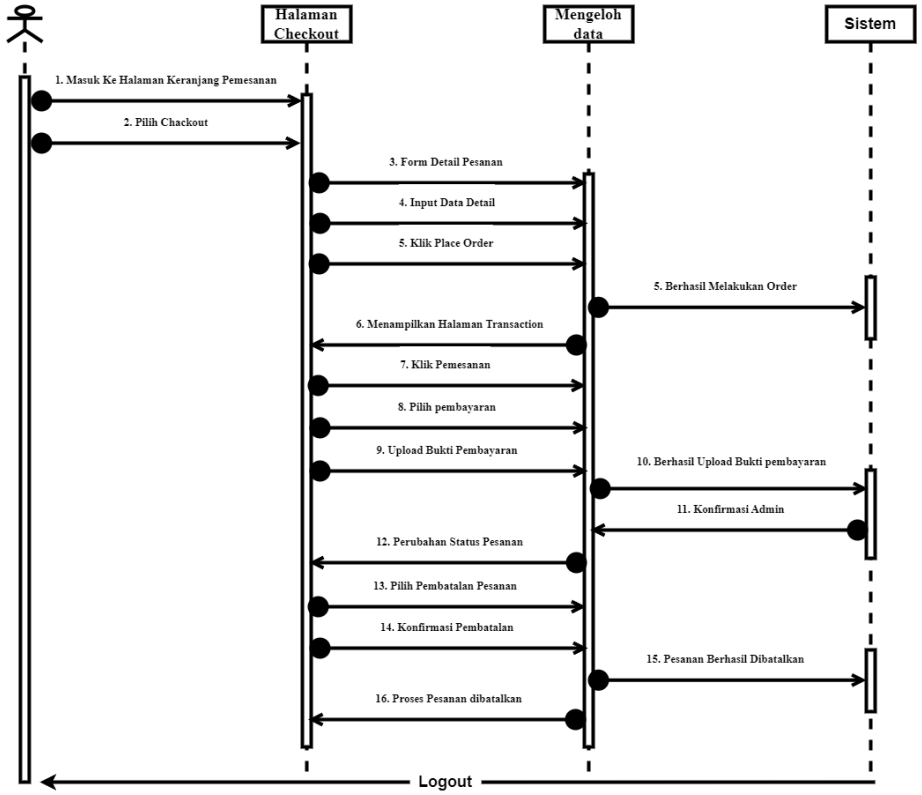

Figure 6. Sequence Diagram Chackout

In Figure 6, this sequence diagram shows the flow for the checkout process at the Asaul online store, starting from selecting items, filling in data, making payments, to confirming and canceling orders, with each step explained in detail and in a logical sequence.

3.2 Interface Design

3.2.1 Application for User

A. Login Page

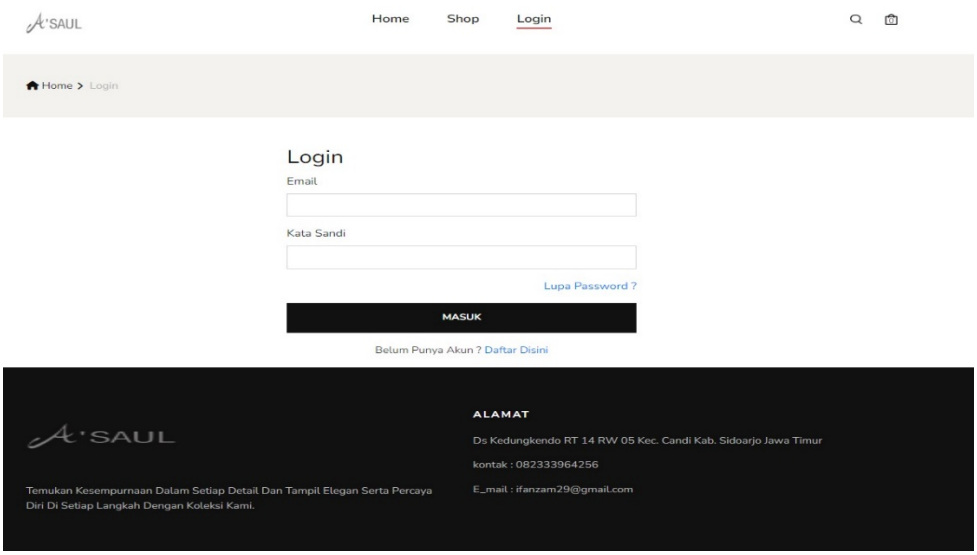

Figure 7. Login Page

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In Figure 7 is a login page where admins and users usually input Email and Password to log in.

B. Main Page

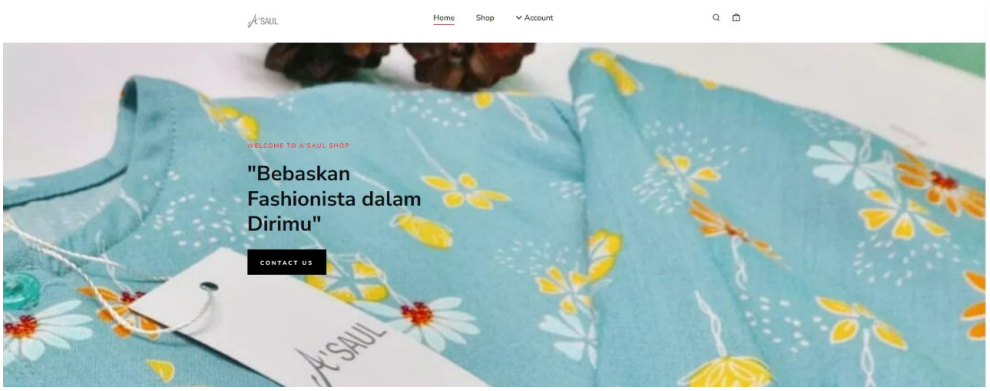

Figure 8. Main Page

Figure 8 is a display of the main page that will display Products, Prices, Stock items. On this page the user can also see product details.

C. Products Page

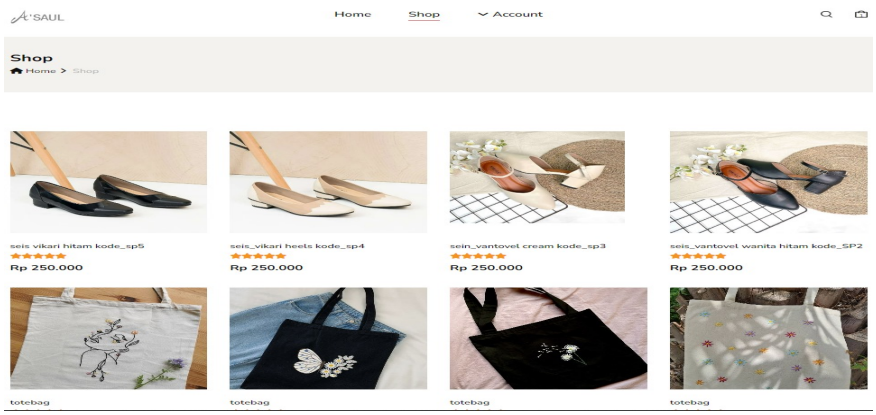

Figure 9. Product Page

In Figure 9 is the Product Page which displays the Product. On this page the user can see product details and also add products to the cart.

D. Carts Page

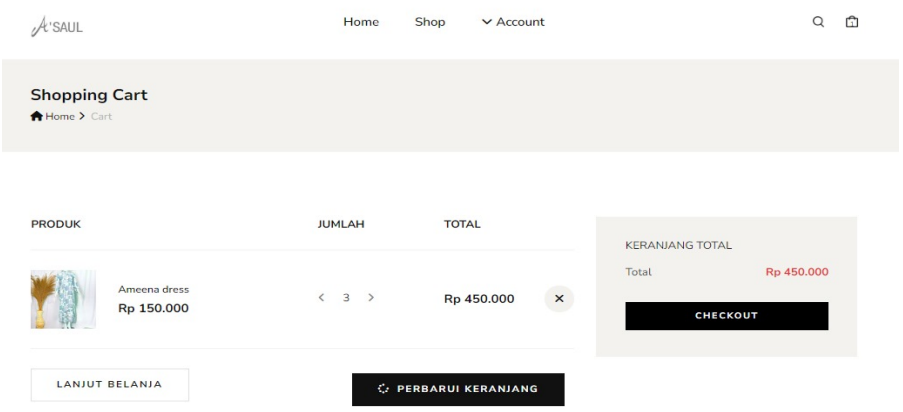

Figure 10. Carts Page

Figure 10 is a display of the Carts page which displays a basket containing products that the user has selected and can checkout orders.

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E. Transaction Page

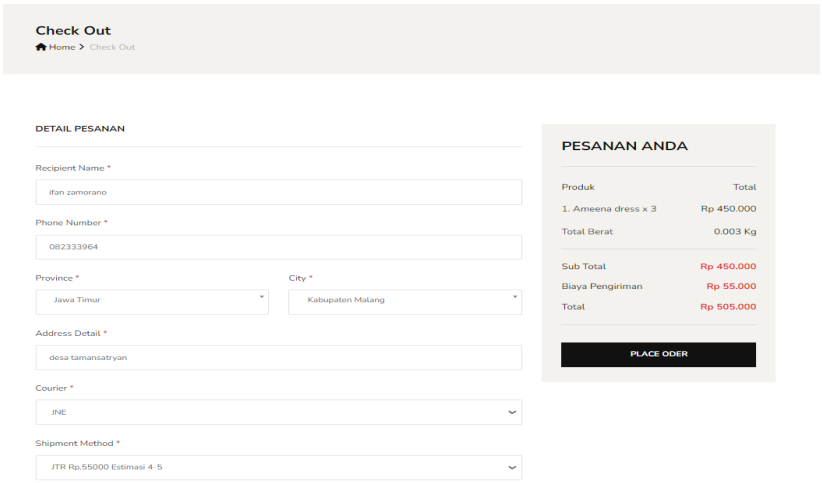

Figure 11. Oreders Trasaction Page

Figure 11 is a display of the transaction page that fills in data for shipping details and views user order data.

F. Bill page

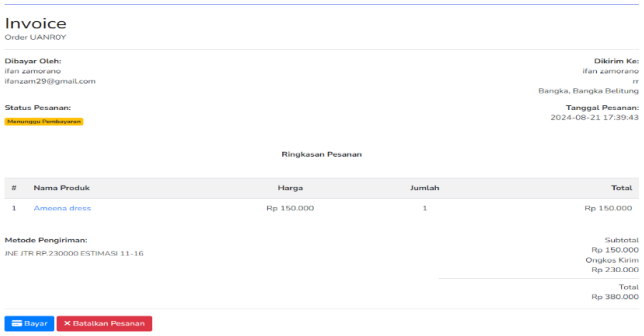

Figure 12. Bill page

Figure 12 is a payment bill page that contains order bill details. On that page you can choose payment and product cancellation.

G. Display of uploaded proof of payment

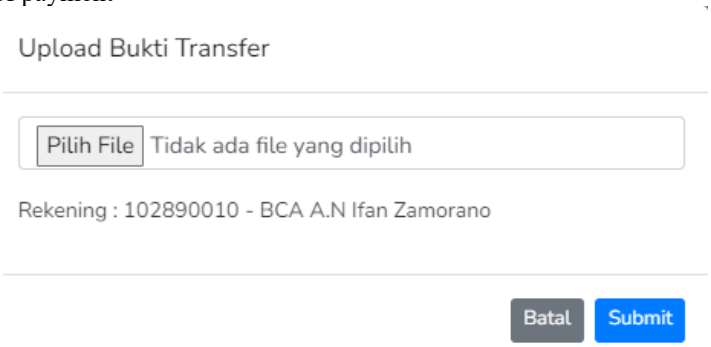

Figure 13. Proof upload display

Figure 13 is a page for making payments. By uploading proof of payment or proof of transfer.

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3.2.2 Application for admin

A. Admin dashboard page

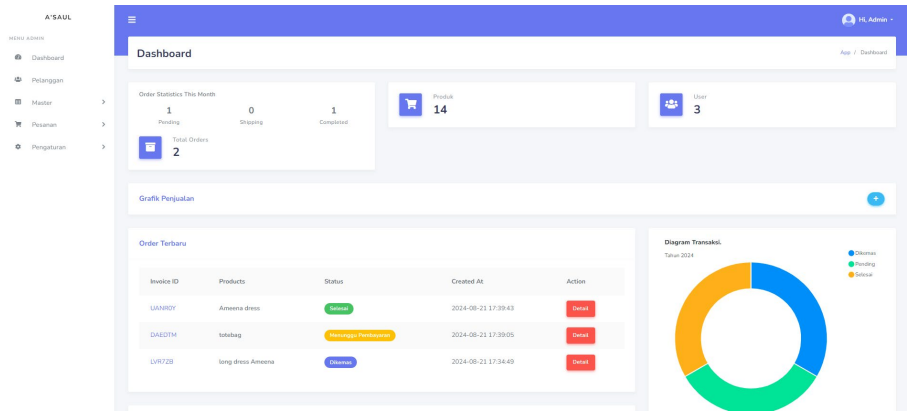

Figure 14. Admin dashboard page

Figure 14 shows the admin dashboard page which displays Chart data, Transaction Diagram, Order Status.

B. Customer page

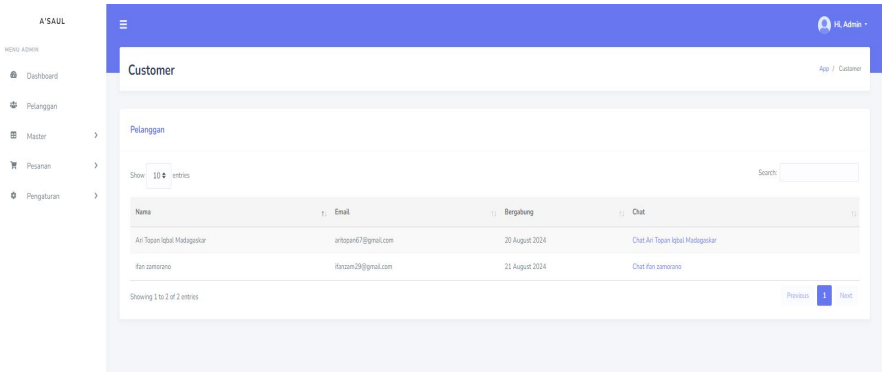

Figure 15. Customer page

Figure 15 customer page displays the name and email of the customer. On this page the admin can also reply to Chat from the user or Admin chat to the user.

C. Category page

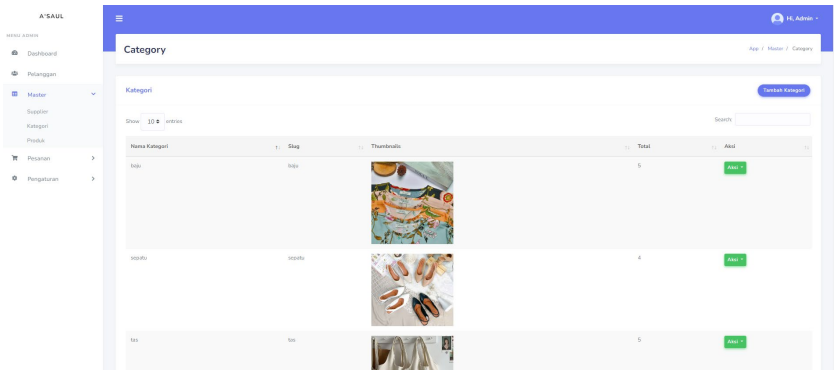

Figure 16. Category page

Figure 16 Is a category page where the admin can do CRUD (Create, Update, and Delete) on category data.

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D. Product page on admin

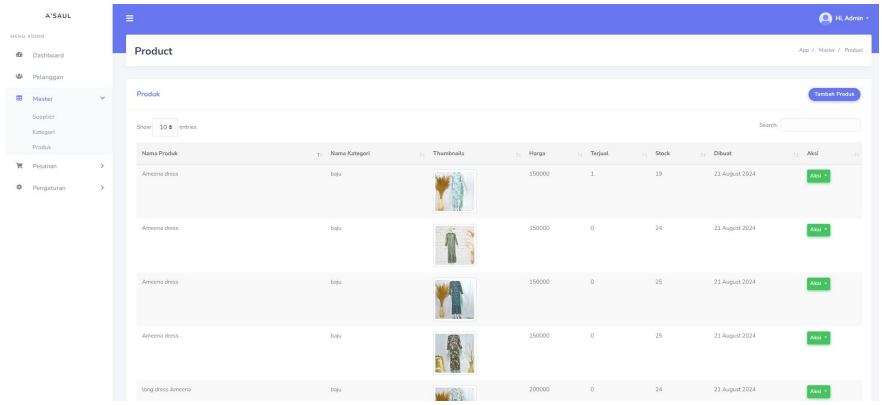

Figure 17. Product page

Figure 17 is a category page where the admin can do CRUD (Create, Update, and Delete) on Product data.

E. Admin order page

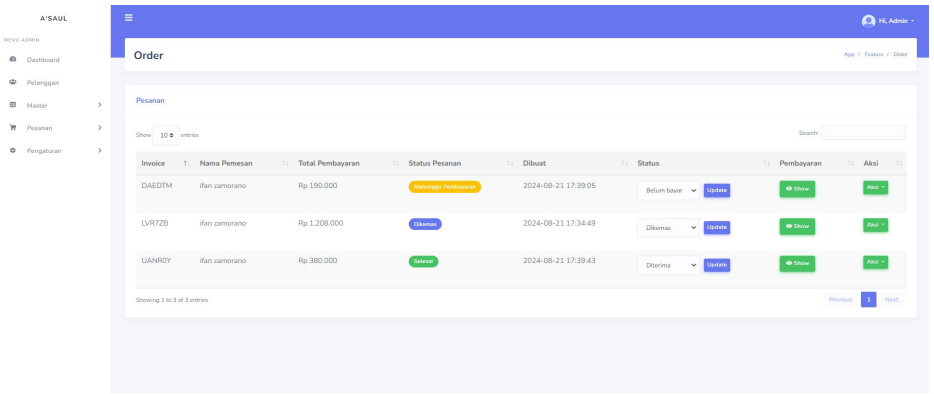

Figure 18. Order page

In Figure 18 is an order page used by the admin to confirm orders placed by users. And the admin can see proof of payment upload and display user Order Details.

F. Address setting page

Figure 19. Address setting page

In Figure 19 is a settings page to change the delivery address or location of the asaul shop.

3.3 Results of Acceptance Testing

Researchers use *Acceptance* testing which usually involves "*end-to-end*" scenarios to test various relevant features and functions of the system that has been developed. In addition, researchers can perform Load testing using locust.io to ensure that the system or application can handle the expected number of users and transactions without experiencing significant failures or performance degradation.

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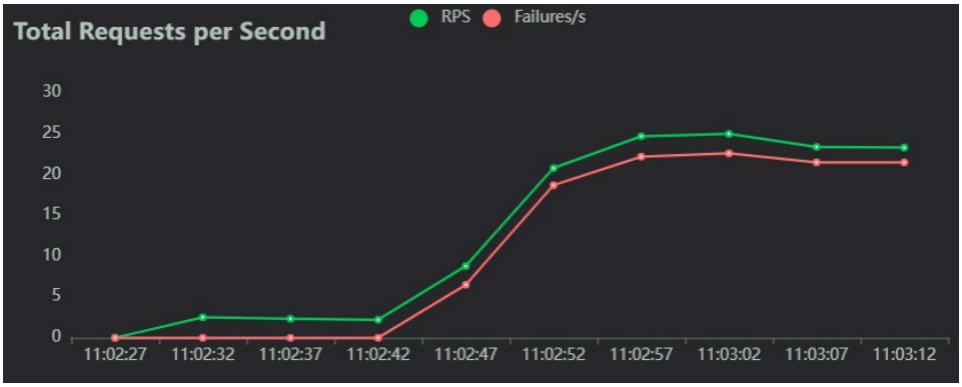

Figure 20. RPS Graph

Based on Figure 20 is a graph that shows RPS by conducting a trial with a simulation of 300 users accessing at an increase rate of 15 new users per second. It can be seen in the Request Graph at 11.02.47 to 11.02.52 there was an increase in Failures of 12.2% with an increase in RPS of 12.8%. and it can also be seen that the highest failures at 11.03.02 were 22.6%. The following is the result of the RPS Graph Can be seen in table 3.1 *Request Statistics.*

Table 1. Request Statistics

Type	Name	# Requests	# Fails	Median (ms)	Average (ms)	Min (ms)	Max (ms)	Average size (bytes)	Current RPS	Current Failures/s
GET	/	80	61	2000	5204.28	1455	35203	6198.51	2.4	2
GET	/account	70	68	2004.88	6547.86	2005	44586	264.11	1.9	1.9
GET	/app/chat/room/1	78	72	2016.7	8860.97	2017	39448	711.08	2.1	1.7
GET	/app/chat/user/1	83	79	2018.44	7358.08	2018	36358	445.49	1.9	1.9
GET	/cart	70	67	2010.58	6129.91	2011	40462	396.17	1.9	1.8
GET	/checkout	70	66	2010.65	6261.41	2011	44111	528.23	2.2	2.1
GET	/login	145	112	2000	5880.95	1205	37671	2103.81	2.7	2.5
GET	/product	79	61	2000	5181.83	946	35986	4813.06	2.3	2.2
GET	/register	81	65	2008.15	5287.77	2008	36402	1883.26	3	2.6
GET	/transaction/1	71	68	2013.49	6540.43	2013	34374	390.59	2.5	2.5
	Aggregated	827	719	2000	6286.27	946	44586	1858.62	22.9	21.2

Table 3.1 *Request Statistics* displays the results of a load test run on the server using Locust.io. This test was successful All requests were GET**.**

a. Number of requests:
   1. Total Requests: There were 827 requests in total.
   2. Request Distribution: Requests were fairly evenly distributed to various endpoints, such as */, /account, /app/chat/room/1,* and so on. Requests to */login* and */register* were high, indicating significant login and registration activity.

b. Request performance:
   1. Median Response Time: The majority of requests had a median response time of around 2000ms, indicating relatively stable performance.
   2. Average Response Time: The average response time is slightly higher than the median, indicating that some requests take longer.
   3. Minimum and Maximum Response Time: There is a considerable variation in response time, ranging from 946ms to 44586ms. This indicates a significant fluctuation in performance.

c. RPS (Requests Per Second):
   1. Average RPS: The overall average RPS is 21.2, meaning the system can process about 21 requests per second.
   2. RPS Variation: There are variations in RPS between the various endpoints. *The /login* and */register* endpoints have a higher RPS, indicating a higher load on those endpoints.

d. Request failures:
   1. Total Failures: There were 719 failures out of a total of 827 requests.
   2. Failure Percentage: The percentage of failures is quite high, indicating a problem in request processing.

4 Conclusion

This research highlights the importance of implementing a website-based information system to improve the marketing effectiveness and competitiveness of MSMEs (Micro, Small, and Medium Enterprises) in the digital era. Toko Asa'ul, as a case study, uses this system to expand market reach and increase sales. The ADDIE (Analysis, Design, Development, Implementation, Evaluation) method was used in the development of the system, ensuring a structured approach and in accordance with user needs.

System testing is done through Acceptance Testing, which involves end-to-end scenarios to ensure system functionality. In addition, Load Testing using Locust.io was conducted to test the system's ability to handle a large number of users simultaneously. The test results showed that although the system was able to handle a large number of requests per second, there was a significant percentage of failures, indicating a problem in request processing. This indicates the need for further improvements to enhance system stability and performance.

Overall, the development and implementation of a website-based marketing information system using the ADDIE method provides many benefits for MSMEs, including increased operational efficiency, expanded market reach, and improved customer satisfaction. However, the test results also show that the developers need to pay attention and fix performance issues to ensure the full success of this system in the long run.

5 Acknowledgments

Hopefully this paper will provide benefits and deep understanding for the readers. Thank you to all those who have participated in the process of writing and preparing this paper. The support and contributions provided by various parties during the research and writing stages are very meaningful. Without their help, this paper would never have been realized.

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