Designing E-Commerce Sales Of Footwear Using The Waterfall Method

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Abstract .

E-Commerce's quick growth and Indonesia's growing footwear industry offer expanding opportunities.A website-based E-Commerce Information System to promote varied Indonesian footwear brands is proposed to boost their market exposure nationally and globally.The structured Waterfall technique emphasises system development step-by-step for greater control and completion of each stage before moving on. E-Commerce software offers safe payment choices and better order management to streamline sales. It promotes using technology and data analysis to improve business and marketing decisions. This E-Commerce system's Waterfall-based strategy promises efficient online footwear sales management. Successful implementation requires careful integration and completion of developmental stages..

Keywords : *E-commerce, . footwear, Waterfall and Website.*

I. INTRODUCTION

Particularly in the realm of information systems technology, the rate of technical innovation is rising at an alarmingly rapid rate [1], [2]. It is possible to feel and observe this evolution by observing the growing number of users who use the internet not only to obtain the most recent news and to connect with other people on social media, but at present, the internet is also used as a trading medium between businesses and commercial entities and their customers[3]–[5]. This is something that can be observed and felt.An enormous variety of market opportunities can be found through the use of the internet for business transactions, which is also referred to as e-commerce in some circles[6]–[10]. To grow and widen the marketing of their products on a worldwide scale, rather than only reaching out to a specific region, it would be a shame to miss out on this chance. This is especially true for businesses or organizations that have the intention of expanding and broadening their marketing efforts. Additionally, the growth of native footwear crafts in Indonesia is taking place at a rapid rate throughout the country.

There are a vast number of indigenous Indonesian footwear brands that make items of a quality that is comparable to that of worldwide names. These brands produce footwear in a variety of categories, including shoes, sandals, and socks.Taking into consideration the significant growth of e-commerce as well as the local Indonesian footwear crafts, the author identifies the possibility of constructing an E-Commerce Information System that is based on a website. In the context of electronic commerce, this system would include local Indonesian footwear items from some companies that are based in Indonesia and produce footwear. As a consequence of the availability of an e-commerce information system that is based on a website and contains footwear items that are manufactured in Indonesia, the author has great hopes that the marketing and prospects for local Indonesian footwear crafts would grow and thrive. This is because the author believes that the system will be able to include footwear items that are created in Indonesia. Furthermore, it is projected that the marketing scope would encompass the totality of Indonesia. This is a significant development.

II. METHODS

In this research, the E-commerce Information System development method used is the Waterfall model method. The waterfall model method is a sequential system development process that flows like a waterfall through all stages of a project, where each stage must be completed first before proceeding to the next stage so that each stage cannot be carried out simultaneously[11]–[14]. The stages used in this waterfall model method are:

1. Communications

At this Communication stage, what must be done is to search and analyze user needs and look for the data needed to develop this E-Commerce information system.

2. Planning

The next stage is the planning stage. At this stage, it explains activities for determining resources, detailed costs, and work scheduling, and explains estimates of technical tasks that will be carried out. The goal is for development to be in accordance with user needs.

3. Modelling

Then, at this modeling stage, what is carried out is designing and modeling the system that will be developed, such as the design process using Use Case Diagrams, Activity Diagrams, Sequence Diagrams, and Class Diagrams, as well as designing the User Interface of the system that will be developed.

4. Construction

This stage is the development stage and testing stage of the e-commerce information system that has been designed. At this stage, system development and design uses Odoo software.

5. Deployments

This stage is the final stage in creating the system. After carrying out analysis, design, and coding, the finished system will be used by the user. Then, the system that has been created must be maintained periodically

III. RESULTS AND DISCUSSION

1. Communication Stage (Needs Analysis)

At this Communication stage, what must be done is to search and analyze user needs and look for the data needed to develop this E-Commerce information system. The following are the needs of users who will use this system.

Table 1. Visitor Needs

No.	Actor	System Requirements
1.	Visitors	1. Can see the product catalog 2. Can see product details 3. Can search for products 4. Can see ratings and reviews on the products you view 5. Can create an account 6. Can see promos 7. You can see the how-to-buy menu

Table 2. Buyer Needs

No.	Actor	System Requirements
2.	Buyer	1. Can log in 2. Can log out 3. Can see the product catalog 4. Can see product details 5. Can search for products 6. Can see ratings and reviews on the products you view 7. Can provide ratings and reviews on products that have been purchased 8. Can create an account 9. Can see promos 10. You can see the how-to-buy menu 11. Can make purchase transactions 12. Can see the purchase basket 13. Can choose the payment method 14. Can verify payments 15. Can edit account profile data

Table 3. Admin Requirements

No.	Actor	System Requirements
3.	Admin	1. Can log in 2. Can log out 3. Can add, delete, edit, and manage product data 4. Can add and manage product categories 5. Can add, delete, and manage website page data 6. Can manage purchasing data 7. Can manage customer data 8. Can carry out maintenance on the system

2. Planning Stage (determining resources, cost details, work scheduling)

At this stage, it explains activities for determining resources, detailed costs, and work scheduling, and explains estimates of technical tasks that will be carried out. The goal is for development to be in accordance with user needs.

Table 4. Resource planning

Human Resources	Quantity
Project Manager	1
Business Analyst	1
UI/UX developer	1
Web developer	1
Quality Assurance	1
Digital Marketing	2

Table 5. System Development Schedule

Human Resources	**July 2022**				**August 2022**				**September 2022**				**October 2022**				**November 2022**				**December 2022**			
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
Project Manager																								
Business Analyst																								
Ui/ux Designer																								
Graphic Designer																								
Web Developer																								
Quality Assurance																								

Table 6. Details of the Project Manager Schedule

HR	**July - 1**	**July - 2**	**July - 3**	**August - 2** **September - 2** **October - 2** **November - 2** **December - 2**
Project Manager	Determine human resources	Detailing expenditure costs	Create a system development schedule	Monitor work progress

Table 7. Details of Business Analyst Schedule

HR	**July - 4**	**August - 1**
Business Analyst	User research	Finding out user needs

Table 8. Details of UI/UX Designer Schedule

HR	August 2	August 3	August 4	September 1	September 2	September 3	September 4	October 1	October 2
UI/UX Designer	Designing the login UI	Designing the sign-up UI	Designing the homepage UI	Designing a catalog UI	Designing product detail UI	Designing a how-to-buy UI	Designing UI Cart	Designing Transaction UI	Designing a system prototype

Table 9. Graphic Designer Schedule Details

HR	August - 2	August - 3
Graphic Designer	Create a logo	Create icons

Table 10. Details of Web Developer Schedule

HR	October 3	October 4	November 1	November 2	November 3	November 4	December 1	December 2
Web Dev	Login implementation	Implementation of sign up	Homepage implementation	Catalog implementation	Implementation of product details	Implementation of how to buy	Cart Implementation	Transaction Implementation

Table 11. Details of Quality Assurance Schedule

HR	August – 2 To November - 4	December - 2
Quality Assurance	Monitor the System development process	Testing the system

3. Modeling Stage (System Design and Modeling)

3.1. Use Case Diagrams

In making this Use Case Diagram, there are 3 actors, namely visitors, buyers, and admin. Apart from that, there are 25 use case activities which are divided into 6 visitor activities, 7 buyer activities which include login and logout activities, and 12 admin activities which do not include login and logout.

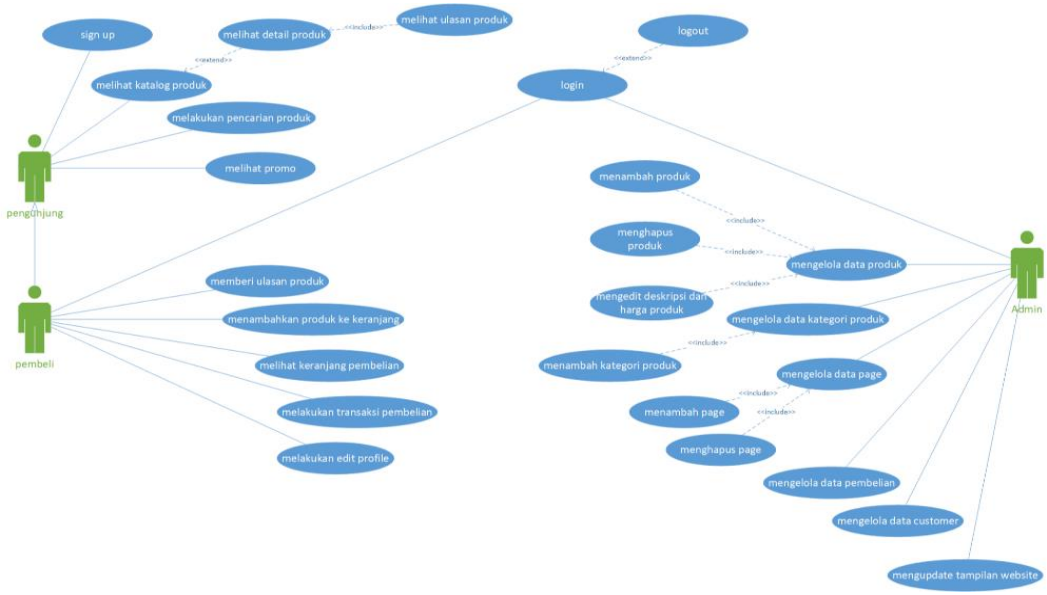


Fig 1. Use Case Diagram

3.2. Activity Diagrams

Based on the 25 use case activities in the Use Case Diagram, this Activity Diagram consists of 25 activities in the use case.

1. Activity Sign Up

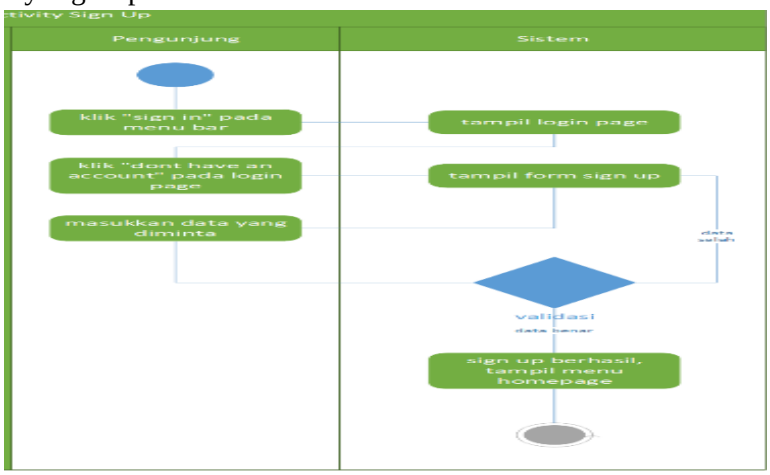


Fig 2. Activity Sign Up

2. Activity View the Product Catalog

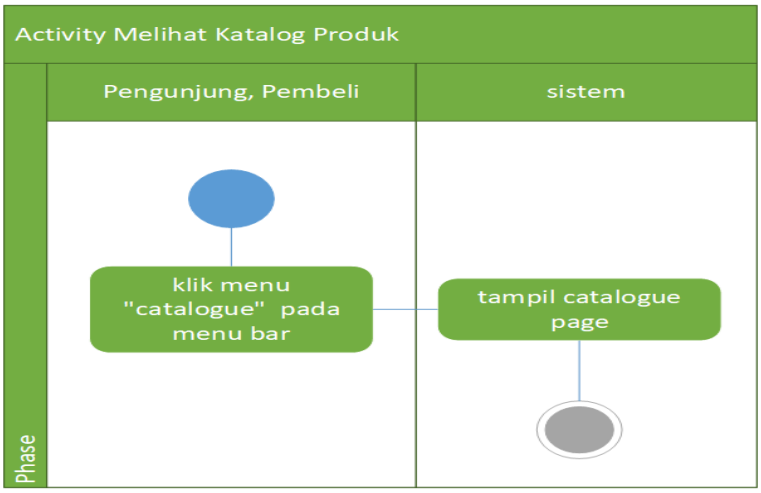


Fig 3. Activity Viewing Product Catalog

3. Activity View Product Details

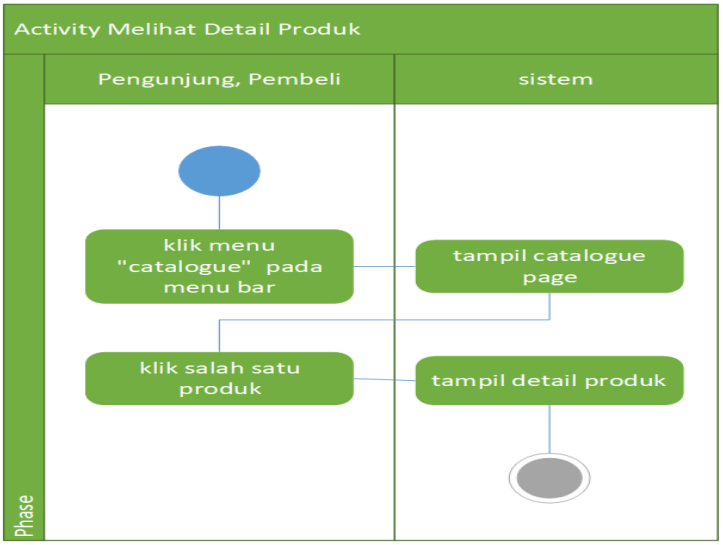


Fig 4. Activity Viewing Product Details

3.3. Sequence Diagrams

Based on the activities in the Activity Diagram, some Sequence Diagrams can be created using Activity Diagrams.

1. Sequence Sign up

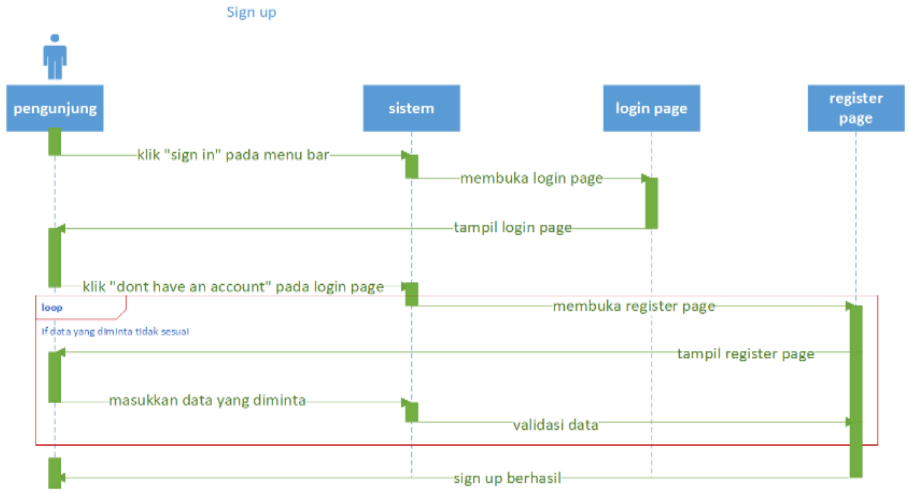


Fig 5. Sign up sequence

2. Sequence View the product catalog

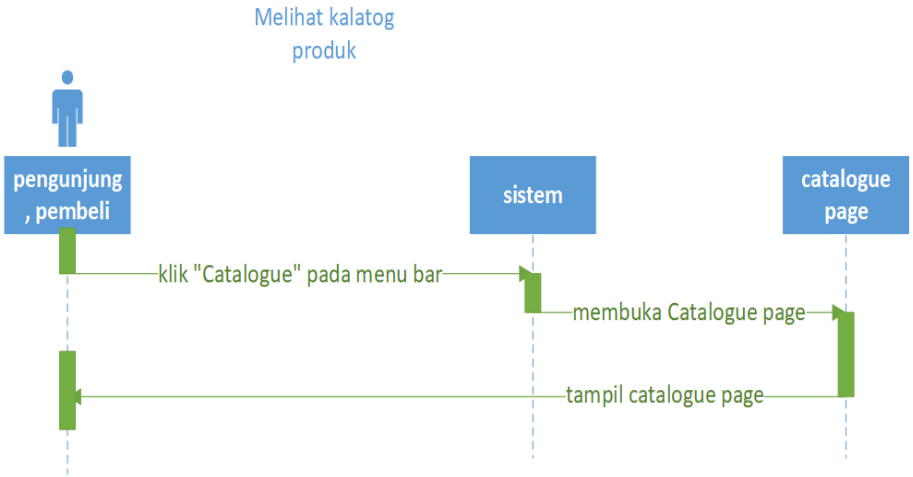


Fig 6. Sequence Viewing the product catalogue

3. Sequence Sequence View product details

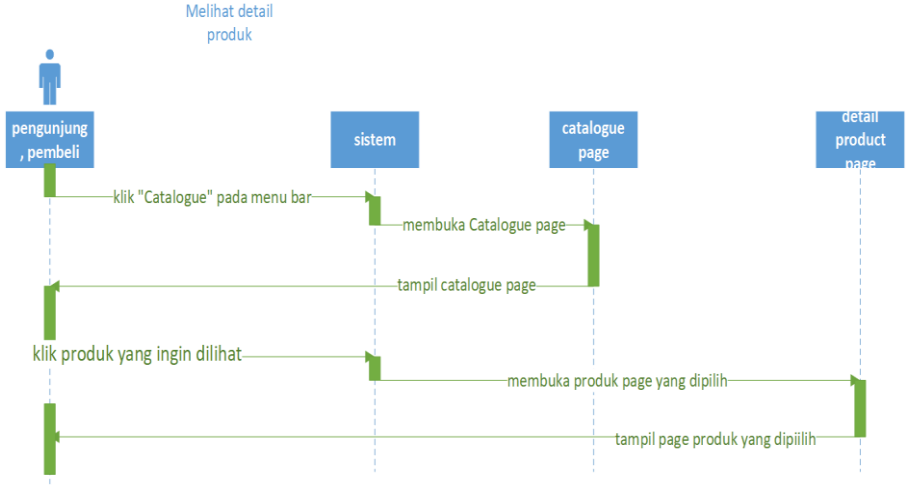


Fig 7. Sequence View product details

3.4. Class Diagrams

The following is a class diagram of ASAKI e-commerce

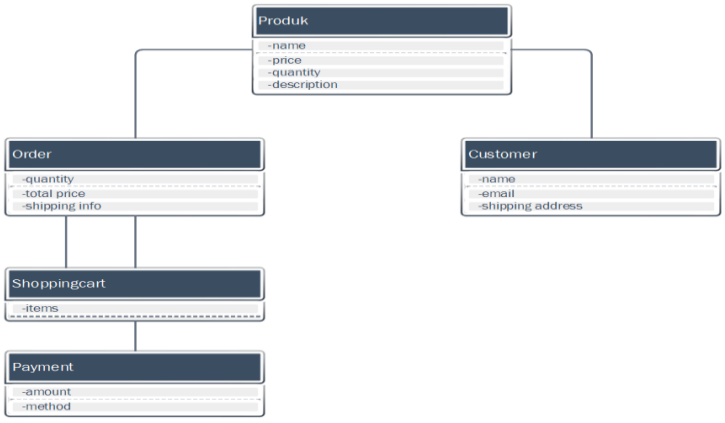


Fig 8. Class diagram

4. User Interface

The following is a display of the User Interface of our E-Commerce Information System.

1. homepage

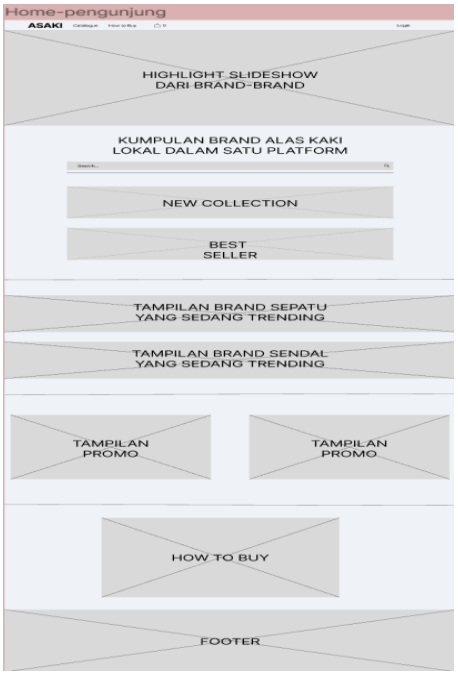


Fig 9. User Interface Homepage

2. catalog

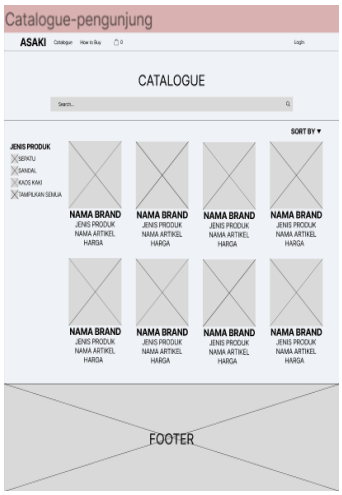


Fig 10. User Interface Catalog

3. Visitor product details

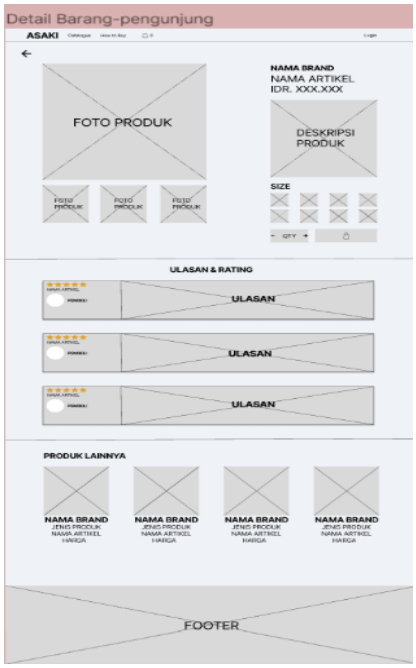


Fig 11. Visitor product details

4. How to buy

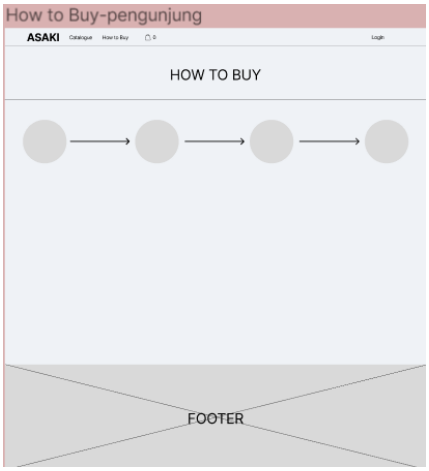


Fig 12. User Interface How to Buy

5. Visitor cart

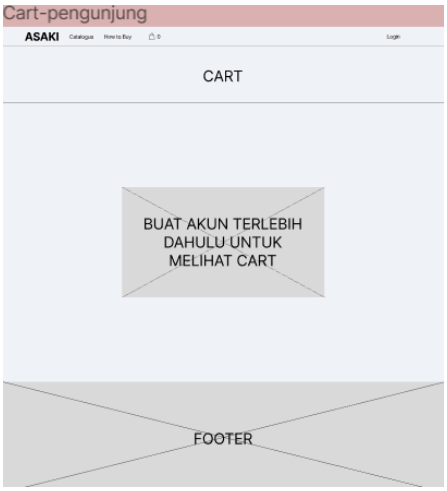


Fig 13. Visitor Cart User Interface

6. Buyer's product details

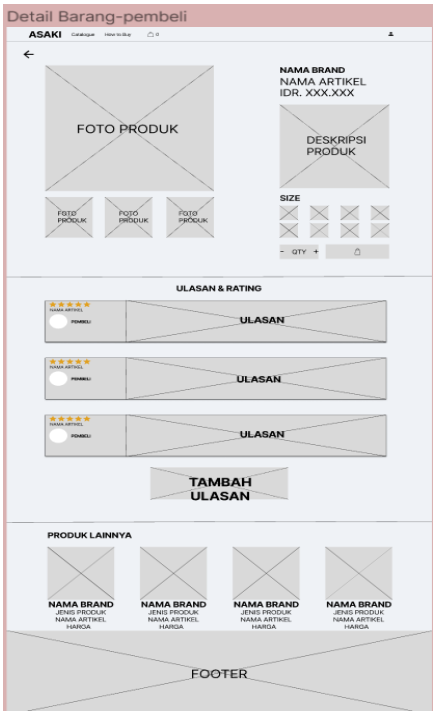


Fig 14. User Interface for buyer product details

7. Buyer's cart

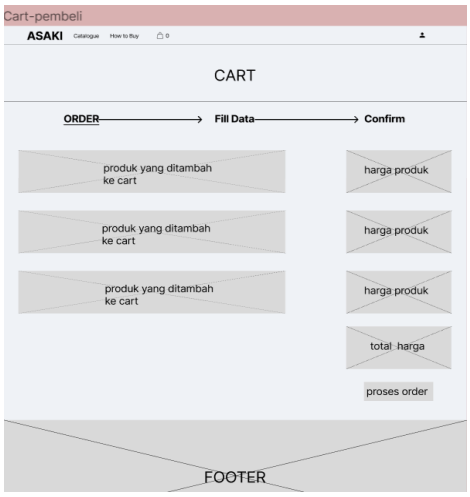


Fig 15. Buyer cart user interface

8. Buyer cart form

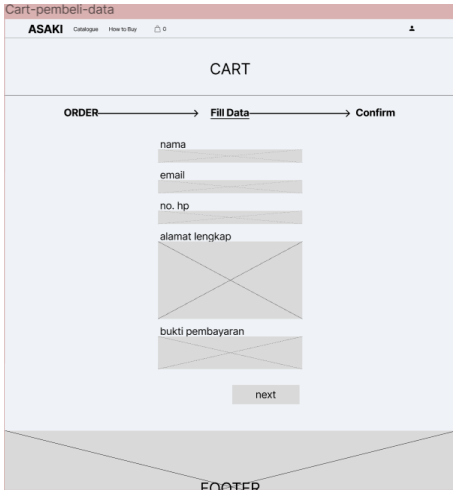
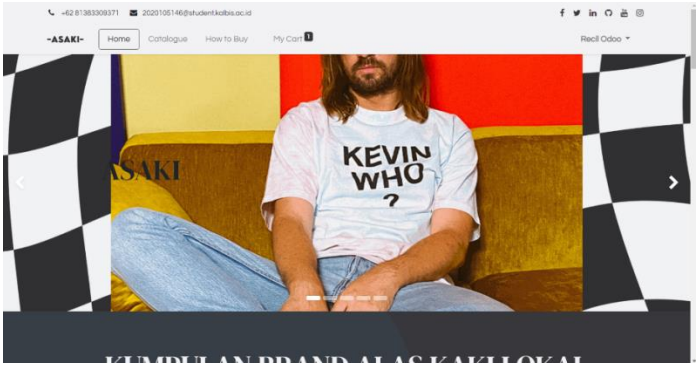
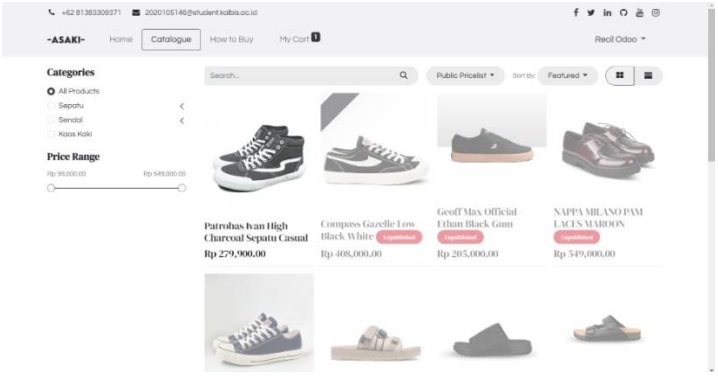
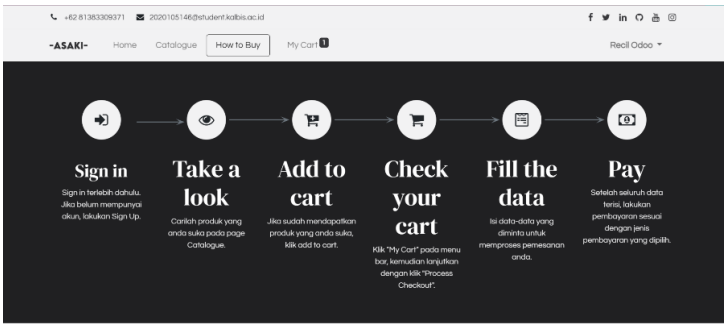


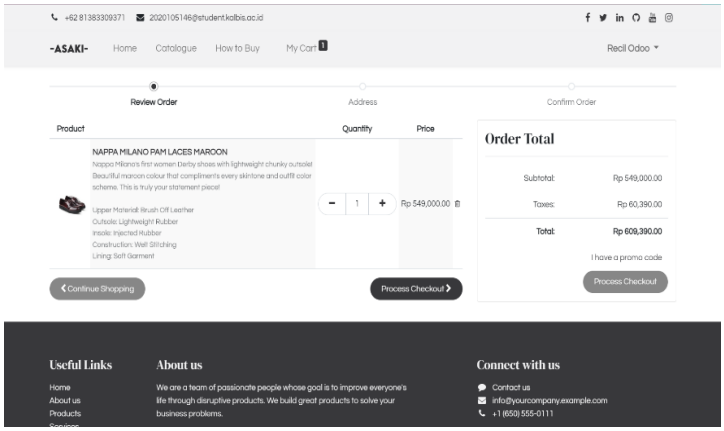
Fig 16. Buyer cart user interface

5. Modeling Stage (Design Implementation)









IV. CONCLUSION

Creating an e-commerce platform for selling footwear on a website using the Waterfall method can enhance the management of sales processes by following a clear and sequential development approach. This method ensures strict control over each stage of development, ensuring completion before moving forward.

Utilizing e-commerce systems allows companies to efficiently handle products and orders while enhancing the customer experience through features like shopping carts and secure payment gateways. Additionally, leveraging technology and data analytics enables better marketing strategies and informed business decisions. In summary, employing the Waterfall method to design an e-commerce information system for online footwear sales can notably improve efficiency and effectiveness. However, companies must ensure meticulous completion and integration of all development stages before implementation.

V. ACKNOWLEDGMENTS

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