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Applying the design thinking methodology in ui/ux development: A case study of justeatss.id e-commerce platform

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ABSTRACT

This study demonstrates the effectiveness of the Design Thinking approach in developing the UI and UX of the Justeatss.id e-commerce website. The process followed five stages including empathizing, defining, ideate, prototype, and test which are focusing on user needs as the foundation for design. Qualitative data from interviews and usability testing identified key issues such as difficult navigation, unappealing visual design, and checkout obstacles. High-fidelity prototypes were developed to create an intuitive, engaging, and responsive interface. Evaluation using the System Usability Scale (SUS), User Acceptance Testing (UAT), and the Customer Satisfaction Index (CSI) showed significant improvements in usability, functionality, and overall user satisfaction, with the website receiving an "Excellent" SUS score, a perfect UAT score, and 100% CSI rating. These results highlight that a user-centered Design Thinking approach can effectively optimize aesthetics, functionality, and emotional satisfaction, providing practical insights for enhancing e-commerce platform performance.

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1. INTRODUCTION

E-commerce has experienced significant global growth in recent years, including within Indonesia [1], [2], [3]. According to [4], the sector accounted for 64.5 percent of Indonesia's digital economy in 2022, reaching a value of USD 77 billion. Despite this rapid expansion, many platforms still struggle to deliver a satisfying user experience, as reflected in high cart abandonment rates and low conversion levels. Issues such as confusing navigation, complicated checkout procedures, and unclear product information can discourage customers from returning and may harm a business's reputation. These challenges reinforce the importance of optimizing the user experience to sustain customer loyalty and improve conversion outcomes in e commerce environments [5]. Within this context, the Design Thinking approach offers a relevant framework for

enhancing both the interface and overall user experience. It emphasizes a deep understanding of user needs through the stages of empathy, problem definition, ideation, prototyping, and testing [6], [7], [8].

Previous studies illustrate varying degrees of progress in implementing this method. Study [9] successfully designed a website using Design Thinking, although it did not present quantitative measures of design effectiveness or describe how the proposed design was implemented in a fully functional system. Study [10], [11] also adopted a user focused Design Thinking framework supported by prototyping to improve UI and UX, and the evaluation using the System Usability Scale yielded an average score of 80.75, which falls within a very good category. Even so, the study did not provide a detailed explanation of the features that were ultimately applied in the operational system. Study [12] produced a user-friendly website using Design Thinking but did not include usability testing outcomes. In 2024, study [13] developed UI and UX designs based on Design Thinking and user centered principles to improve the quality of online store interfaces and contextualized the findings by comparing them to related literature. Overall, prior research tends to emphasize prototype development without fully examining the actual impact of design changes on user experience, although the findings consistently suggest that applying the five stages of Design Thinking can support effective design implementation and increase customer interest.

Justeatss.id is a micro business brand specializing in homemade food products, particularly bakery items such as pastries. At present, the brand does not have an operational platform with an optimized interface, which leads to inefficiencies in business processes and makes it difficult for customers to access product information or complete transactions comfortably. As a local brand, Justeatss.id has considerable potential to benefit from experience improvements supported by data driven design. Building on the literature review and the identified practical challenges, this study aims to develop a more effective user interface for the Justeatss.id e commerce website with an emphasis on responsive design across various devices. The research evaluates design improvements through qualitative methods, surveys, and usability testing while examining key variables including page load time, navigation clarity, and checkout success. The implementation adopts the Design Thinking methodology throughout the development process and assesses outcomes using the System Usability Scale, User Acceptance Testing, and the Customer Satisfaction Index. The scope of development focuses on the homepage, product catalog, and shopping cart, and the primary testing phase involves collaboration with the website owner to ensure alignment with business requirements. Prototypes are created using Figma and the website is developed with Next.js. The study aims to contribute theoretical insights to interaction design and offer practical guidance for e commerce businesses seeking to improve their user interface, user experience, and overall customer satisfaction.

2. METHOD

The research adopts a census sampling method, as the study focuses on a limited and specific population, namely the two owners of Justeatss.id. Both owners, being directly involved in the business operations, are considered highly relevant to the research objectives. Consequently, they serve as the complete study subjects, enabling comprehensive data collection from the entire population. This approach ensures that the insights gathered truly reflect the needs and perspectives of those who best understand the operations and vision of Justeatss.id. The website design process for Justeatss.id adopts the Design Thinking methodology, which includes five stages: Empathize, Define, Ideate, Prototype, and Test.

Design Thinking is an iterative, solution-focused process aimed at understanding user needs, challenging existing assumptions, and redefining problems to uncover innovative strategies and solutions that may not be immediately apparent. This approach emphasizes empathy toward users by analyzing their needs through aspects such as form, relationships, behavior, interaction, and emotion. As both a practical and strategic methodology, Design Thinking facilitates the creation of user-centered optimal solutions. It revolves around gaining a deep understanding of the target users for a product or service. By applying Design Thinking, designers can observe and develop empathy for users while critically examining problems, assumptions, and the interconnections among elements.

This approach is particularly effective for addressing complex or ambiguous problems by redefining them in a human-centered manner, generating multiple ideas through brainstorming, and developing and testing prototypes. The process involves continuous experimentation, including sketching, prototyping, testing, and iterating on concepts and ideas [5]. In the context of website design, Design Thinking fosters collaboration between designers and users, focusing on insights derived from users' thoughts, feelings, and behaviors. The method consists of five main stages: Empathize (building empathy), Define (problem definition), Ideation (idea

generation), Prototype (creating prototypes), and Test (conducting evaluations). Proper understanding and application of these stages enable designers to effectively solve complex user challenges [6].

Empathize Stage

This stage plays a pivotal role in shaping the overall success of the study. At this point, the researcher engages in interviews with the owners of Justeatss.id to explore how user interface (UI) and user experience (UX) influence the utilization of their e-commerce platform [14], as outlined in Table 1.

Table 1. Interview questions

Point 1: Identifying Needs
What difficulties do customers usually face when purchasing products like those offered by Justeatss.id?
What challenges do you face in running Justeatss.id without a centralized e-commerce platform?
Have you received feedback or complaints from customers regarding the purchasing process?
Point 2: Actions Taken
1. How do customers typically seek information about Justeatss.id products, and how do you respond?
2. How do you currently handle issues in ordering or payment?
Point 3: Problem-Solving Efforts
What strategies have you implemented to address recurring issues?
How do you manually manage orders, stock, and customer interactions, and which parts are inefficient?
Point 4: Expectations and Needs
1. What features should the e-commerce site have to improve the customer experience?
2. What functionalities would ease your business operations?
Point 5: Vision and Ideal Solution
1. What is your ideal vision of the Justeatss.id website, and how should it look or function?

Emphaty Map

An empthy map is a tool used to organize and visualize information about specific users. Its purpose is to uncover insights about users, foster collective understanding, and support decision-making. The structure of an empathy map consists of four quadrants representing key aspects observed in users during the research process. These four quadrants capture what users say, do, think, and feel. By using this approach, an empathy map helps provide a deeper and more comprehensive understanding of the user's experience [15]. The interview findings are mapped into four quadrants: Say, Do, Think, and Feel.

Define Stage

The define stage is a critical step in the design process that follows a thorough understanding of user needs. In this phase, insights and ideas gathered from the previous stage are refined and articulated into clear and structured problem statements. The primary objective of the Define stage is to establish a solid foundation for the subsequent development of a product or application. In this process, the Define stage serves as a bridge between the identified user needs and the goals and vision of the project [16]. The define phase analyzes insights from the empathize stage to identify key problems and opportunities for UI/UX improvements.

- User Insights: Interview data are analyzed to uncover user needs and pain points.
- Problem Statement: A clear, specific statement is formulated, e.g., "Users struggle to find certain products due to the lack of intuitive search features and confusing navigation."
- Research Focus: The scope is limited to UI/UX elements such as navigation, design aesthetics, interactive features, and customer access to product catalogs, shopping carts, and payment systems.
- Competitor Analysis: Comparison with Holland Bakery, Capital Bakery & Cake, and Mako Cake & Bakery highlights best practices such as structured catalogs, dynamic banners, intuitive navigation, and efficient checkout.
- Customer Journey Map: Defines stages, user actions, goals, channels, pain points, and potential improvements from the owners' perspective.

Ideate Stage

According to [17], [18] the ideate stage of application development, two critical elements to consider are the user flow and the sitemap. These components play a key role in designing optimal user experience and ensuring that the information architecture of the application or website is easily navigable for users. Based on the define stage, this phase produces a user flow to Mapping of user interactions with the application and a sitemap for structuring and organizing pages systematically for intuitive navigation.

Prototype Stage

The Prototype stage is a critical phase in the design process, focusing on the creation of visual and functional representations of the final product. In the context of application and website development, this stage aims to produce a high-fidelity prototype that closely resembles the appearance and functionality of the product. Such prototypes serve not only as visualization tools but also to test user interactions and gather valuable feedback prior to the official product launch.

A high-fidelity prototype is developed using tools such as Figma. The prototype mirrors the final product, including layout, interactive elements (buttons, forms, navigation), typography, and color scheme, enabling realistic usability testing [19].

Testing Stage

The testing stage in the design thinking methodology is a crucial phase aimed at evaluating and assessing the ui and ux designs developed in previous stages. During this phase, the system usability scale (sus) is employed as the primary method for collecting user feedback on their interactions with the created prototype. This process not only helps identify potential issues but also provides valuable insights for further design improvements. Two complementary evaluation methods were employed to assess the platform.

- System Usability Scale (SUS): A standardized ten-item Likert-scale questionnaire designed to measure system usability. The interpretive benchmarks are as follows: ≥ 80.3 indicates excellent usability, 68–80.3 represents good, 50–67 corresponds to fair, and scores below 50 reflect poor usability [20].
- User Acceptance Testing (UAT): A post-trial questionnaire administered to evaluate perceived usefulness, ease of use, and the relevance of system features.

Implementation Stage

The validated prototype is translated into a functional website. This phase focuses on implementing the approved UI/UX design into code, integrating navigation, visuals, and interactions into a fully operational system.

Customer Satisfaction Index (CSI) Analysis

The Customer Satisfaction Index (CSI) is an important metric used to assess customer satisfaction across various sectors, including hospitality, healthcare, and retail. CSI serves as a composite measure that aggregates customer feedback on multiple service attributes, enabling organizations to identify strengths and weaknesses in their service delivery [21]. This theoretical framework is grounded in various models and empirical studies that explain the factors influencing customer satisfaction and the methodologies for its measurement with the services provided by Justeatss.id. The evaluation framework encompasses five key dimensions, tangibles refer to the physical facilities, equipment, and overall appearance that shape a customer's first impression, while reliability reflects how consistently and dependably a service delivers on its promises. Responsiveness captures the provider's ability to address customer needs promptly and proactively, and assurance describes the degree to which the provider inspires trust and confidence through competence and professional conduct. Finally, empathy highlights the level of personalized attention and understanding given to each customer's specific needs, together forming a comprehensive framework for evaluating service quality.

Data was collected through questionnaires administered to the website owners. Responses were measured using a five-point Likert scale, with validity and reliability tests conducted to ensure the robustness of the instrument. This methodological approach provides comprehensive insights into the dimensions of service quality that influence customer satisfaction and contributes to the formulation of strategies for continuous improvement.

3. RESULTS AND DISCUSSIONS

Empathy Map

The Empathy Map analysis reveals that users experience multiple challenges and emotional responses when interacting with the e-commerce platform. Within the Says dimension, users articulate concerns related to

platform security, a confusing interface design, and inconsistencies in product information. The Thinks dimension indicates skepticism regarding product authenticity and frustration stemming from the difficulty of efficiently locating desired items. The Does dimension highlights behavioral tendencies such as searching for alternatives through Google, comparing products with competing platforms, and reattempting transactions despite previous negative experiences. Meanwhile, the Feels dimension demonstrates users' lack of confidence during transactions, frustration with complex navigation, and stress associated with an unintuitive interface. Taken together, these insights illustrate a suboptimal user experience and emphasize the need for enhancements in interface design, navigational structure, and informational transparency.

Define Stage

The define stage findings reveal that the Justeatss.id platform owner faces systemic usability challenges, particularly in product search, navigation efficiency, and delivery reliability. These issues not only disrupt the overall shopping experience but also undermine customer trust, which is essential for sustaining loyalty in e-commerce. The resulting problem statement underscores the urgent need for a more intuitive, streamlined, and reliable platform, highlighting that UI and UX improvements serve not only aesthetic purposes but also function as strategic interventions to enhance service quality, reinforce customer confidence, and strengthen the platform's competitiveness in the digital marketplace.

Costumer Journey Map

To systematically analyze the user experience, a Customer Journey Map (CJM) was developed to illustrate the sequence of interactions between users and the e-commerce platform. The CJM provides a structured overview of user actions, goals, channels, encountered problems, and potential improvement strategies at each stage of the shopping process. This framework enables a comprehensive understanding of critical pain points while highlighting opportunities for design enhancement and service optimization.

Table 2. Costumer journey map

Stage	User Action	User Goals	Channels	Problems	Ideas
Awareness & Initial Search	Accessing Justeatss.id social media or conducting a general online search.	Quickly identify needed products.	Social Media (Instagram/WhatsApp), Google Search	Product information on social media lacks detail; the website is unfamiliar to potential customers; confusing interface.	Improve website homepage layout; provide popular or "Best Seller" categories; integrate complete product information into the website.
Product Search & Consideration	Typing keywords in the search bar (on competitors), browsing categories, or asking via chat/DM.	Find specific products efficiently and understand product details.	Competitor Websites, Search Bar, Chat/DM (Justeatss.id)	Inaccurate search results; difficulty locating products; repeated chats required for detailed information.	Optimize search and filtering features; add product recommendations/feedback; standardize product details (ingredients, size, storage) with high-resolution images.
Product Detail Review & Selection	Reading product descriptions on social media, viewing images, confirming price and availability via chat.	Ensure product suitability and availability before purchase.	Social Media (Justeatss.id), Chat/DM	Incomplete or unclear product information on social media; lack of real-time stock availability; manual verification of price and stock is time-consuming.	Standardize product descriptions on the website (composition, weight, price); display real-time stock; provide a clear "Add to Cart" feature.
Adding to Cart & Purchase Preparation	Clicking "Add to Cart" (on competitors); sending order lists via chat to Justeatss.id.	Prepare purchases and confirm all items are selected.	Competitor Websites, Chat/DM	Few major issues (on competitors), but customers may be distracted or forget items if the process is not immediate; manual orders recap prone to errors.	Add shopping cart reminders for pending checkouts; simplify the checkout button and transition to payment.
Checkout & Payment	Filling in shipping details, selecting payment	Complete transactions easily and securely.	Competitor Websites, Bank Transfer (Justeatss.id)	Lengthy or confusing checkout process; limited payment options (as reported in interviews);	Streamline checkout process (1–2 steps); integrate payment gateway with multiple options (e-wallets, virtual accounts,

	methods, making bank transfers.			manual transfer verification required by owner; external factors may delay/cancel transactions.	credit cards); enable automated payment notifications for both owner and customers.
Delivery & Post-Purchase	Waiting for shipping updates, tracking orders, inquiring with the owner about status.	Receive products safely and on time; maintain confidence in order status.	Chat/DM (Justeatss.id)	Lack of real-time shipping updates; customer anxiety regarding product delivery; manual follow-up by owner with courier required.	Implement automated order tracking on the website; provide real-time delivery status updates; enable post-purchase feedback management.

Ideate Stage – User flow

In this study, the designated user is identified as the owner of *Justeatss.id*, who functions as the system administrator. The user flow delineates the sequence of activities undertaken during interactions with the website's backend system, offering a systematic representation of the processes required to manage and supervise the platform's online business operations. As presented in Figure 1, this user flow not only clarifies the administrative tasks but also provides a foundation for evaluating usability and identifying opportunities for UI/UX improvements and overseeing the platform's online operations, while also serving as a basis for evaluating usability and identifying opportunities for UI/UX improvements.

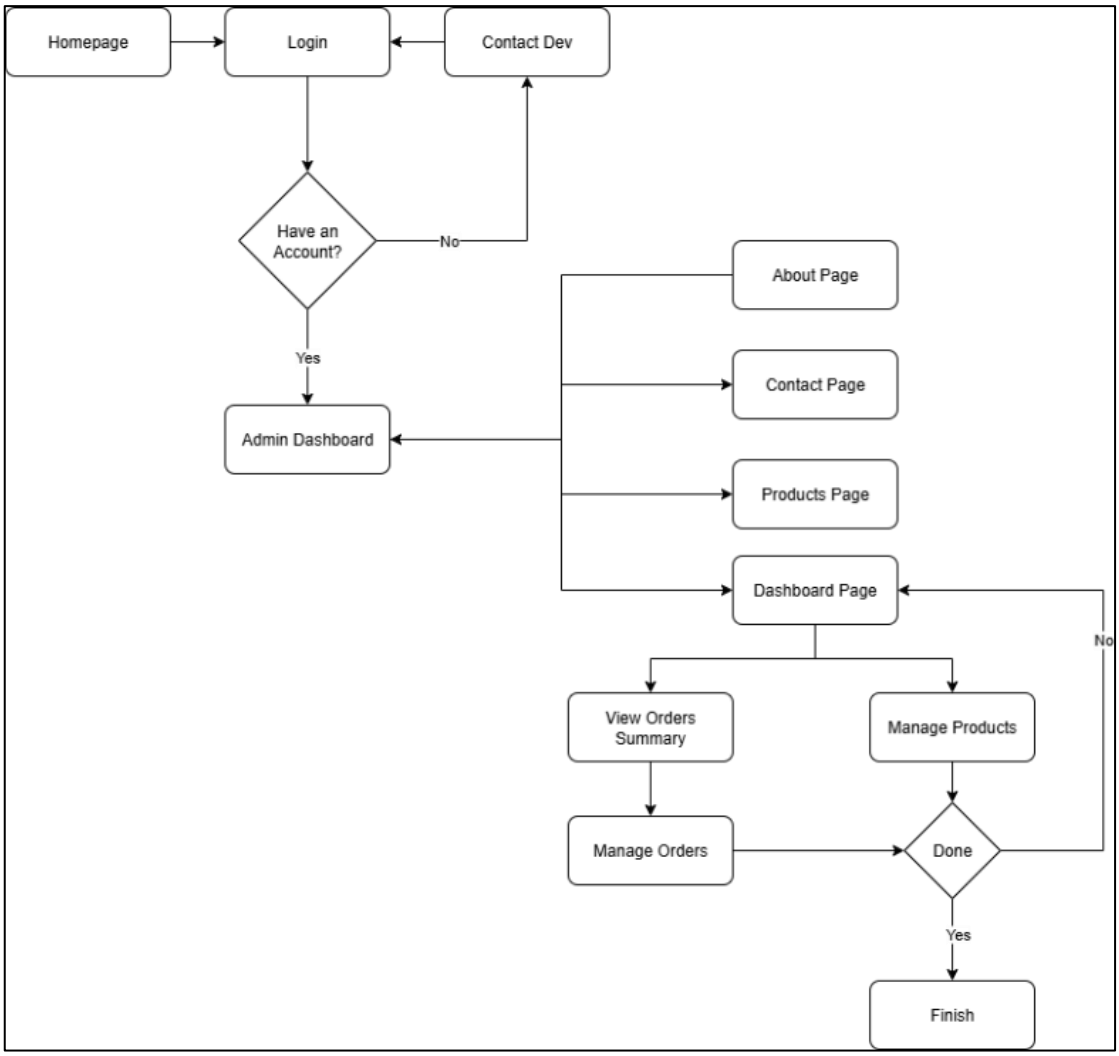


Figure 1. User flow diagram

Meanwhile, in Figure 2, the flow begins at the homepage, where users must either log in or register to access the main dashboard, which provides navigation to key sections such as the about page, contact page, and product listings. From the product page, items can be added to the cart, followed by the checkout process, with successful payment marking the completion of the transaction. This structured flow underscores the

importance of intuitive navigation in ensuring seamless interactions and enhancing the overall e-commerce experience.

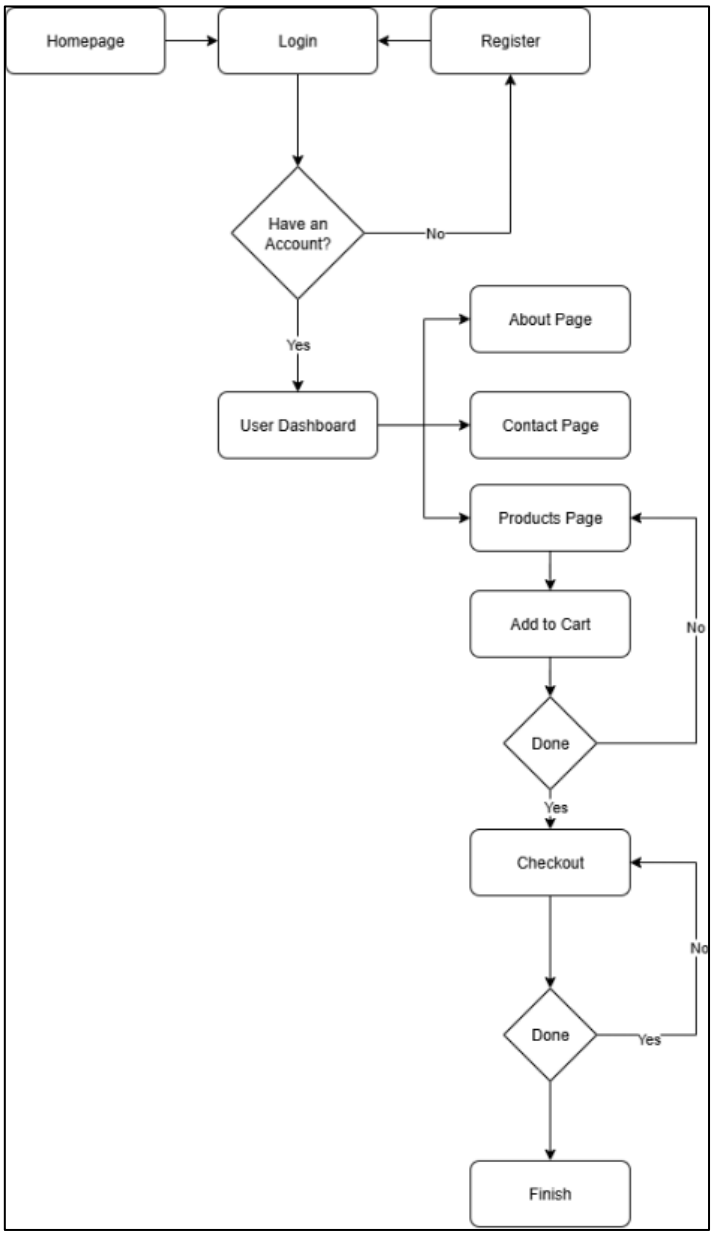


Figure 2. Customer flow diagram

Sitemap

The sitemap illustrates the application's user flow as envisioned by the owner, beginning at the homepage where users can choose to log in, register, or access the About and Contact pages. Upon successful login or registration, users are directed to the dashboard, which serves as the starting point for the main purchasing process. This process includes navigating the products page, adding items to the cart, proceeding through the checkout stage, and concluding at the finish stage, which signifies the completion of the transaction.

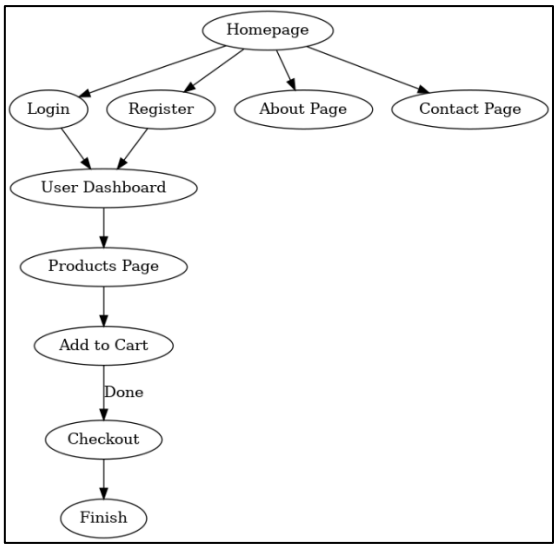


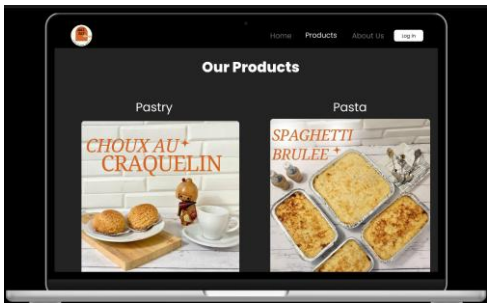
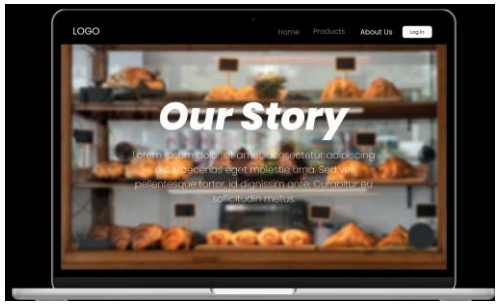
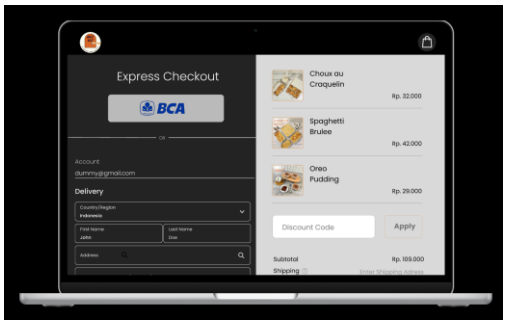
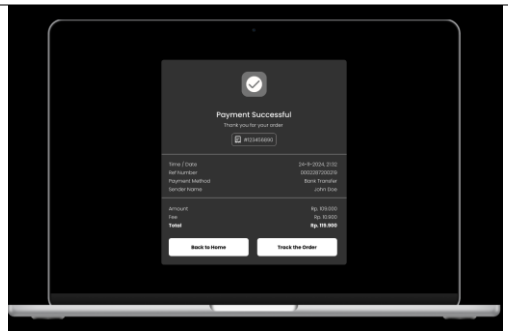
Figure 3. Sitemap

High-Fidelity Prototype

The high-fidelity prototype provides a realistic representation of the system, integrating refined interface elements, interactive features, and near-final content. This prototype enables usability testing and evaluation of navigation flow, ensuring that the design aligns with user needs and supports seamless interaction prior to full-scale development.

Table 3. Prototyping Result

Page	Prototype *(High Fidelity)*	Function
Home Page		Present the Hero Section as the initial interface upon system access.
Login Page		Provide a dedicated login interface for returning users.
Register Page		Provide a registration interface for new users.

Product Page		Display a product catalog page containing available items.
About Page		Present an informational page outlining the history of Justeatss.
Product Detail Page		Display a product detail page with comprehensive specifications.
Checkout Page		Provide a checkout interface to facilitate purchase transactions.
Payment Success Page		Present a transaction confirmation page indicating successful payment and summarizing transaction details.

Testing Stage

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The testing stage represents the final evaluation phase to measure the effectiveness of the Justeatss.id website implementation. At this stage, quantitative testing was conducted involving the owners of Justeatss.id as key participants. They were asked to perform a series of task scenarios on the website, followed by completing a structured questionnaire consisting of 20 items. The questionnaire was divided into three main sections: (1) the System Usability Scale (SUS) to assess usability (items 1–10), provide in Table 4, (2) User Acceptance Testing (UAT) to confirm system functionality and acceptance (items 11–15), provide in Table 6, and (3) the Customer Satisfaction Index (CSI) to evaluate overall satisfaction (items 16–20), provide in Table 7.

System Usability Scale (SUS)

The first section of the questionnaire (questions 1–10) is designed to evaluate the usability of the Justeatss.id website, provide in Table 4.

Table 4. SUS questionnaire

No	Question
1	I think I will use this system again.
2	I find the website unnecessarily complex. (R)
3	I find the website easy to understand and use.
4	I need technical assistance to be able to use this website. (R)
5	I find the features of this website to be well integrated.
6	I find the interface of this website confusing. (R)
7	I feel confident when using this website.
8	I find this system overly complicated. (R)
9	I find no obstacles in using this system.
10	I need to familiarize myself with this system before I can use it effectively. (R)

For odd-numbered statements (positive items), the score is calculated using the formula: (Respondent's Score – 1). For even-numbered statements (negative items), the score is computed as: (5 – Respondent's Score). All transformed scores from the 10 items are then summed, and the total is multiplied by 2.5 to obtain the final SUS score, ranging from 0 to 100. The statistical result is explained in Table 5.

Table 5. SUS Calculation Result Score

SUS CALCULATION RESULT SCORE											**Quantity**	**Value**
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10		**Quantity x 2.5**
R1	5	1	5	1	5	1	5	1	5	1	40	100
R2	5	1	5	1	5	1	5	1	5	1	40	100
Total												**200**
Average												**100**
Minimum Score												100
Maximum Score												100

The results of the System Usability Scale (SUS) calculation indicate that both respondents (R1 and R2) obtained a total transformed score of 40, which when multiplied by 2.5 resulted in a final SUS score of 100 each. Consequently, the overall statistical summary yielded an average score of 100, with both the minimum and maximum values also at 100. This uniformity across respondents demonstrates that the Justeatss.id website achieved the highest possible usability rating, reflecting an excellent level of ease of use, system integration, and user confidence without encountering any usability barriers.

User Acceptance Testing (UAT) Analysis

The second part of the questionnaire (questions 11–15) serves to confirm user acceptance of the system's functionality as displayed in Table 6.

Table 6. UAT questionnaire

No	Question	Average Score
1	I believe the core features of the Justeatss.id website can effectively support my business operations and objectives.	5
2	I find the process of managing products and orders on the website to be straightforward and easy to perform.	5
3	I am confident that this website will provide significant benefits for the future development of Justeatss.id's online business.	5
4	I am willing to integrate and utilize this website within my business operations once it becomes fully available.	5

5	I feel comfortable using this website to manage business activities and facilitate customer transactions.	5

The overall User Acceptance Test (UAT) yielded a mean score of 4.14/5, reflecting a high level of user acceptance. This result confirms that the website is both user-friendly and functionally reliable for real-world implementation.

Customer Satisfaction Index (CSI) Analysis

The final section of the questionnaire (questions 16–20) is designed to measure customer satisfaction with the Justeatss.id website. Each question represents one dimension of the Customer Satisfaction Index (CSI), namely: Tangible, Reliability, Responsiveness, Assurance, and Empathy. The result of CSI explained below in Table 7:

Table 7. Customer satisfaction index (CSI)

No	Dimension	Question	Average Score
1	Tangible (Design & Appearance)	How satisfied are you with the design and user interface (UI) of the Justeatss.id website?	5
2	Reliability (Speed & Performance)	How satisfied are you with the website's loading speed and page responsiveness?	5
3	Responsiveness (Ease of Use & Feature Functionality)	How satisfied are you with the ease of navigation and use of features on this website?	5
4	Assurance (Information & Trust)	How satisfied are you with the product information displayed on this website?	5
5	Empathy (Overall User Experience)	Overall, how satisfied are you with your initial experience using the Justeatss.id website?	5

The Justeatss.id website was evaluated across five dimensions: tangible, reliability, responsiveness, assurance, and empathy. Each dimension achieved the maximum average score of 5, resulting in an overall Customer Satisfaction Index (CSI) of 5 out of 5. These results indicate that users are highly satisfied with the website, and that all aspects including design, performance, usability, information quality, and overall experience meet user expectations.

4. CONCLUSION

The research and analysis indicate that the Design Thinking method is effective in developing the interface of the Justeatss.id e-commerce website. The five stages of design thinking, which include empathizing, defining, ideate, prototype, and test are provided with a clear structure that helped shape the UI and UX development with a strong emphasis on understanding user needs. Insights gathered from interviews and other qualitative methods offered valuable input for identifying problems and refining the design throughout the process. Qualitative data from interviews and usability testing allowed the development team to identify key issues such as difficult navigation, unappealing visual design, and checkout obstacles, resulting in a final design that is intuitive, engaging, and responsive across devices. Usability evaluations further demonstrated significant improvements in the user experience. The website received an "Excellent" score on the System Usability Scale (SUS), and the main functions achieved a perfect User Acceptance Test (UAT) score of 5 out of 5. Customer satisfaction, measured using the Customer Satisfaction Index (CSI), reached 100%, categorized as "Very Satisfied." These results indicate that a user-centered design approach can enhance aesthetics, functionality, and overall emotional satisfaction. Overall, the systematic application of Design Thinking has significantly optimized both the user interface (UI) and user experience (UX) of the Justeatss.id platform.

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