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DESIGN THINKING FOR INCREASING BUSINESS PERFORMANCE: UI/UX DEVELOPMENT AND FEATURES INNOVATION IN THE E-PEKEN SURABAYA GOVERNMENT APPLICATION

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Abstract: The Surabaya Government developed the E-Peken to boost the MSME's performance. Unfortunately, negative user ratings show that the E-Peken program falls short of expectations and has several problems. Thus, this research creates solutions based on Android mobile applications to build a new User Interface/User Experience (UI/UX) by Design Thinking Method. The study results in eight new and more aesthetically user-friendly innovation features: delivery information, payment methods, reviews and ratings, filters, helpdesk, chat between sellers and buyers, store registration, and product returns. The research used a straightforward User Experience Questionnaire (UEQ-S) to conduct UI/UX development success tests for 20 buyers and sellers of the E-Peken users, such as supportive (Q1) easy (Q2), efficient (Q3), clearness (Q4), exciting (Q5), interesting (Q6), empowerment (Q7), and leading edge (Q8) indicators. The E-Peken's new appearance is far superior to its previous design by achieving excellent accreditation in terms of usage overall indicators. The exciting indicator (Q5) saw the biggest improvement, increasing by 57.9% (for seller) and 37% (for buyer). It causes sales to increase because the E-Peken is easier to use in business transactions.

Keywords: MSMEs, user interface, user experience, design thinking

INTRODUCTION

MSMEs are extremely important to the Indonesian economy. MSMEs serve as the backbone and engine of the country's economy. MSMEs work across a range of sectors and

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industries that foster the development of numerous job opportunities, as well as supporting initiatives aimed at raising individual income levels and significantly boosting the GDP which is the dominant measure of national wealth.

In addition to mounting demands to preserve MSMEs' significant contribution to the country's economy, these businesses also confront several obstacles (Pattanayak & Kakati, 2023). As a sign of their dedication to boosting the people's economy, MSME actors must have priority, protection, assistance, and numerous development chances. To promote sustainable economic growth and the welfare of MSME participants, governments are anticipated to play a bigger role in managing, fostering, and maximizing the potential of MSMEs (Kyal et al., 2022).

Surabaya as the second-biggest in Indonesia has difficulties in the MSME because of the development in digital marketing, so it had a 4.29% economic downturn in 2021. Consequently, MSMEs must be able to use technology and the digitalization process to react to changes in the environment (Iskandar et al., 2023; Kahrović & Avdović, 2023). In this case, MSMEs get an appreciation of the value of digital marketing from the Local Government, so the marketing reach of excellent items will be expanded, which will benefit MSMEs.

Moreover, the Surabaya Government enhances bureaucratic transformation that is effective, dynamic, and based on digital technology, as stated in Surabaya City Regional Regulation Number 4 of 2021 concerning the 2021–2026 Regional Medium Term Development Plan. As a provider of public services, Surabaya develops fully guarantee community satisfaction services. Providing digital services is the main goal of implementation through local creativity for MSME innovative services prospects and to boost their financial performance (Kumar & Singh, 2021; Memarista et al., 2022). It is also a preparedness and resilience strategy for MSMEs (Skouloudis et al., 2023).

The Surabaya Government created a new digitization and technological program to support the promotion of MSME products as shown in Figure 1. It is called "Empowerment and Economic Resilience Nang Suroboyo," or E-Peken Surabaya as an e-commerce application. Figure 1 displays the E-Peken seller & buyer application. Since October 31, 2021, Surabaya citizens have been using this program to purchase at grocery stores, MSMEs, and Surabaya Culinary Tourism, which is available in every sub-district of the city, for a variety of everyday requirements. This application is a development or modification from earlier programs, such as the E-Local Market and E-Diskon applications. There are three categories of E-Peken products such as fast food from the Culinary Tourism

Center (SWK), domestic MSMEs' processed products, and basic goods from grocery shops.

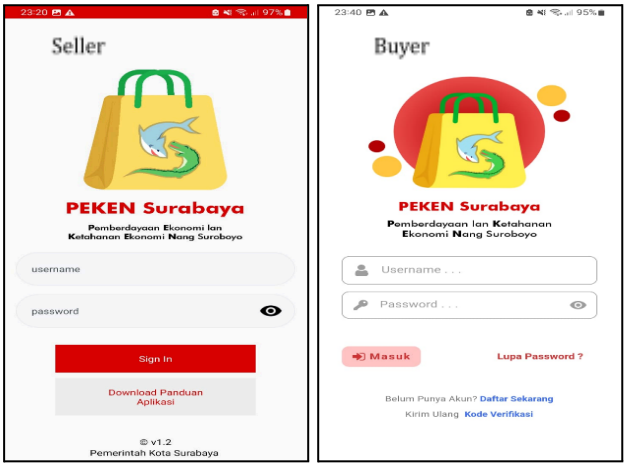

Figure 1 The Display of E-Peken Application from Seller & Buyer Points of View
Source: E-Peken Application

E-Peken Surabaya has collaborated with 4,034 different types of businesses, including 2,835 MSMEs, 200 SWK, and 999 grocery stores in 2021. E-Peken has completed economic transactions of 35 billion Rupiah by the end of 2022. By the end of 2023, the Surabaya Government stated that more commercial transactions were occurring with E-Peken. The Internet business actors managed to thrive and endure despite obstacles in the economic crisis (Utomo et al., 2019).

Despite having numerous merchant members, the E-Peken still has certain issues. Users of this program have complaints, that even after joining E-Peken for a year. The seller never gets orders since MSME products are not well-liked by consumers. Accessing applications is another issue frequently dealt with, as is the lack of Business Identification Number availability. Further, the E-Peken is difficult to use, particularly concerning its unattractive User Interface (UI) and User Experience (UX) as certain capabilities to interact with the program are not currently available or perform poorly. Among these features are the limited product filter function, unavailable features for product and store reviews, and inoperable customer support contact tools.

In addition, over 10,000 users have downloaded the E-Peken from the Google Play Store. Yet, the app has negative ratings and reviews about the lack of a helpline, a sluggish payment system for sellers, an unappealing layout, a tendency toward higher prices, the login display, a slow application, and challenges changing data. Negative evaluations from

10 users gave the E-Peken a 1-star rating and a star rating of 3.5 out of 5. To fix this issue and prevent future user complaints, the E-Peken needs to be upgraded and expanded in all areas that are presently lacking.

Thus, the purpose of this research was to apply design thinking to the development of UI/UX design and feature innovation for E-Peken. Innovation makes the company's performance grow (Memarista et al., 2023; Restrepo-Morales et al., 2019). For these purposes, the researchers will collaborate with several teams. First, The Surabaya City Cooperatives and MSMEs Department to develop the concept and goals for E-Peken. Second, The Surabaya City Communication and Information Service Department develops the features and maintenance of the application, and then MSMEs sell products and the community who bought the product. The application would be able to better serve user needs, enhance the online transaction experience, and solidify its place in a market that is becoming more competitive (Md Husin & Haron, 2020). Based on the problem formulation, this research will develop UI/UX design and feature innovation through the Design Thinking method in the E-Peken Surabaya application.

The User Interface (UI) shows the application's graphical visual elements facilitate communication between the user and the software (Putri et al., 2022). Easing users' access to the information on the application screen and utilizing the system are the goals of design thinking for innovation (Rösch et al., 2023). A well-designed UI was sought to produce an interactive and intuitive display. Graphical components such as points, lines, planes, space, arrangement, size, colour, texture, and lettering are all included in the scope of interface design. Balance, rhythm, attention, proportion, and unity are among the essential aspects of visual design that these components create.

User Experience (UX) is the term used to describe a person's interaction with a system, good, or service (Putri et al., 2022). The components control how users interact with a program's structure through visual displays to help users be satisfied (Joo, 2017). The interaction between the user and the product which encompasses elements like usability, user happiness, and the user's capacity to locate, comprehend, and use available information indicates the focal point of UX. It simplifies things for users, such as guaranteeing positive encounters, raising user pleasure, and hastening the accomplishment of user objectives. For example, boosting sales, quickening company expansion, and facilitating user interaction with products (Pillai & Balakrishnan, 2024).

A multitude of stages must be considered while assessing UX with some approaches and procedures employed during the application development process. User-Centered

Design (UCD), Design Thinking, Design Sprints, and Lean UX are a few of these techniques. While Design Thinking can be used iteratively without adhering to a set sequence, UCD requires a series of processes to be completed sequentially. For this research, the five phases of the Design Thinking method are the empathize, define, ideate, prototype, and test as the tools to aid in problem-solving since this method is adaptable for the UI/UX design process.

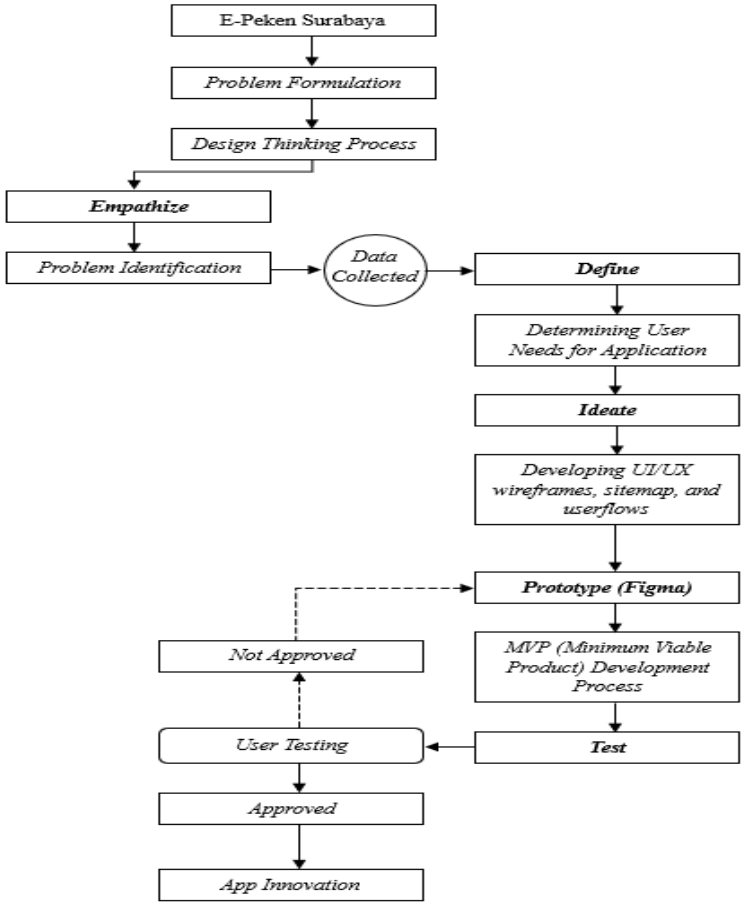

Figure 2 Conceptual Framework

Design Thinking is essentially a process or instrument that is applied to problem formulation, design development, and problem solutions. This method is human-centred as the primary focus of the problem-solving process technique. It is applied not only to tackle specific issues but also to help formulate and create new ones (Freitas da Silva, 2020). Every

stage of the design thinking process is directly tied to and centred around the requirements and viewpoints of people. It helps a variety of industries, including business, tourism, and education. Figure 2 shows the research framework of Design Thinking for the E-Peken application.

METHOD

The research will concentrate on UI/UX design processes used in the creation of the E-Peken Surabaya application using the descriptive research methodology. The researchers collected the data through surveys questionnaires and interviews with the respondents and observed the results later. By using design thinking as the research tool, the researchers focus on depicting the current state after the new design is approved. The goal is to solve design-related issues in novel ways. By focusing on the needs of the people who will be interacting with the program, this approach will solve problems.

Researchers employed the types of hardware in this study. The laptops consist of Processor Intel i7 Gen 9, RAM 8 GB, Internal Storage 458GB, Graphics CardNvidia GeForce GTX 1650. The smartphone consists of Processor Qualcomm Snapdragon 680, 6GB RAM, Internal Storage of 128 GB, and Android OS 12.

Exploring user perspectives, gathering different ideas through brainstorming, and going through several process steps are all ways that problems that may not have been identified can be solved. It needs to be solved, examined and handled to generate ideas, products, or prototypes by the five main steps of Design Thinking and the final product is an early prototype or design that will be put to the test. Table 1 shows the Design Thinking Method process.

Table 1 Design Thinking Method Process

No	Design Thinking Process	Method of Collecting Data
1	Empathize	Questionnaire and Empathy Map
2	Define	Determining User Needs
3	Ideate	User Flow, Sitemap, and Wireframes
4	Prototype	High-Fidelity Prototype
5	Test	User Experience Questionnaire

The five phases of empathy, define, ideate, prototype, and test are all included in this methodology (Putri et al., 2022). In the empathize stage, researchers will collect the primary

data using surveys from E-Peken users who have completed sales or purchases to gain a direct understanding of the issues and challenges that consumers are facing. Creating the application's concept, features, layout, visual design, user flow, site map, and application display framework are all part of this ideation step. The researchers will use Figma Software and consult some literature during this process. Then, the final design outputs will be sent to the prototype stage. The users will be requested to participate by completing an online survey to test and provide input on the generated application prototype.

First, the stage of empathy is a procedure used to gather information about the issues that consumers are facing through questionnaires and empathy maps (Joesphine et al., 2022). To identify issues with application use and learn about user expectations for the E-Peken, researchers at this point polled active users of the application who had made numerous sales and purchases over the previous two years to determine any issues that may occur when utilizing Surabaya's e-commerce program. The survey through six questions will be distributed online via electronic media platforms, particularly Google Forms. Following data collection will establish user demands and, at the ideate stage, generate concepts and solutions about issues that consumers may be facing, explain comprehension, and offer help during the decision-making process. Then, say, do, think, and feel are the four quadrants of the empathy map that will be completed using the questionnaire responses.

Second, in the define stage, it can be inferred from the data collected during the empathize stage by determining user needs. It is the primary issue the user wishes to resolve is not having an e-commerce application that will facilitate future purchases and increase revenues (Joesphine et al., 2022; Memarista et al., 2023). The active users hope that the application still needs some features to be upgraded and developed. In addition, users also find it challenging to get in touch with E-Peken support representatives. As a result, the suggested remedy is to create a mobile application that is intended to facilitate transactions between MSME buyers and sellers in Surabaya. The application's features are made with an emphasis on UI/UX.

Third, the ideate stage is utilized as a research object. Brainstorming at this stage to get relevant ideas and concepts (Muktamar B et al., 2023). To determine the application framework or concept, there is the development of user flows, sitemaps, and wireframes (Krisnanik & Rahayu, 2021): (1) User flow shows a user's journey through the visual application's sequence, to make it easier for application designers to structure usage flows and explain UI/UX ideas. To help them, user flow is typically depicted as a flowchart, (2) A sitemap is a stage in the creation of features, pages, and menus are arranged and grouped

according to a user flow that has already been established. It assists the UI design for multi-page apps and websites by producing diagrams that show how each page is connected to and the technology accessible by other pages, and (3) The researchers also create a wireframe as a simple visual representation to arrange various components on a page of an application, for example, text, graphics, layout, navigation, buttons, and more.

Fourth, creating a prototype based on the previous wireframe concept, after determining the features and flow structure. It is intended to create an application product, such as a display model for testing functionality and design. Before putting the program through user testing, developers test and assess its features and design using this visual High-Fidelity Prototype of the application (Muktamar B et al., 2023).

Fifth, during the testing phase, the application prototype design developed through the User Experience Questionnaire Short (UEQ-S) technique will be put through its paces in this research. Getting user feedback on the application experience is the goal of this testing phase. The test results will serve as assessment data for researchers to determine whether the application product output satisfies user needs. The UEQ-S is used to assess how well a program or application considers UX during design. Concerning application design, UEQ-S facilitates the measurement of UX by taking into 8 statements such as supportive (Q1) easy (Q2), efficient (Q3), clearness (Q4), exciting (Q5), interesting (Q6), empowerment (Q7), and leading edge (Q8) indicators with 7 Likert Scale. In addition, UEQ is used to test a product's UX and make improvements in certain areas, as well as to compare the UX levels.

In this study, the UEQ-S assesses broad assessment scales. Attractiveness assesses the application's extent and attracts user interest, both in terms of visual aspects and the overall experience provided. This aspect is a combination of pragmatic quality and hedonic quality. First, pragmatic quality evaluates the application goal achievement and meets user needs, such as perspicuity, efficiency, and dependability. Second, hedonic quality focuses on the experience of enjoyment and the level of comfort that users obtain in using the application, such as stimulation and novelty. Table 2 shows the indicators for two UEQ-S variables.

Table 2 Indicators for UEQ-S Variables

Question Number	Scale	Negative (Scale 1)	Positive (Scale 7)
1. Pragmatic Quality			
Q1	Supports transaction purchasing	Obstructive	Supportive
Q2	Easy to understand for purchasing	Complicated	Easy
Q3	Transactions are efficient	Inefficient	Efficient
Q4	Clear and does not confuse the users	Confusing	Clear
2. Hedonic Quality			
Q5	The appearance and usage are fun	Boring	Exciting
Q6	The appearance is visually attractive	Not Interesting	Interesting
Q7	An innovation for purchasing products	Conventional	Empowerment
Q8	The E-Peken is the leading application	Usual	Leading Edge

The UEQ will be distributed to several active customers who have completed sales and purchases through the E-Peken via a Google form. In this testing phase learn more about the common issues users have when utilizing the E-Peken as the Surabaya's e-commerce platform and to ascertain features users are hoping to see added in the future. These user expectations cover the features that are built and produced as output, as well as make the user's purchasing and selling experiences more comfortable during the buying and selling processes.

RESULTS

The research's participants from the online questionnaire are current E-Peken users, comprising 10 buyers and 10 sellers for MSME products and grocery stores in Surabaya who have transacted on the platform at least once in the last 24 months. Later, these respondents will learn about the issues encountered during the empathize stage, as well as ascertain the E-Peken application's test results and the relative worth of the application's appearance before and after its development. Additionally, they will receive feedback that will be utilized in the subsequent UI/UX iterative process. The intended functionality, the anticipated UI, and the simplicity with which sellers and buyers may conduct transactions without encountering any difficulties are all included in the application's output aspects. The following table 3 explains the questionnaire results.

Table 3 Respondent Questionnaire Questions and Answers Summarized

No	Questions	Answers
Questions Regarding Current Applications		
1	What are your thoughts when you see user barriers or issues with the E-Peken?	Sellers come from grocery stores, cuisine, fashion, and crafts MSMEs. Some of them are older and less comfortable with using technology to market their products. Meanwhile, buyers are having difficulty ordering things, and the costs remain rather high.
2	What problems do you face as a seller and buyer when using the E-Peken?	Problems as a buyer: 1. The shipping cost information is not displayed directly. 2. Buyers frequently shop at the wrong shop due to a lack of knowledge about which business sells the highest quality products. 3. Having difficulty paying through QRIS due to the requirement or payment confirmation via WhatsApp admin. 4. High shipping charges due to the inability to select the most convenient retail location. 5. Unable to contact help service or seller since the button redirects to WhatsApp error. Problems as a seller: 1. Users who are unfamiliar with online commerce may struggle to use the app. 2. The store registration process is difficult and time-consuming. 3. Unable to contact support or buyers directly due to a WhatsApp problem.
3	What do you do when facing various kinds of difficulties like that?	Ask for support from family or friends; if it is an application technical issue, usually contact the admin via WhatsApp to resolve the issue.
4	What do you think when using the E-Peken?	In terms of features and appearance, the E-Peken lags behind rival e-commerce platforms.
5	What do you say or feel after using the E-Peken?	The E-Peken is incredibly useful for conducting online purchasing and selling transactions because it will increase MSMEs' sales turnover.
User Needs Questions		
6	What improvements do you envision for the E-Peken regarding the appearance of new features?	1. The system should include shipping tools for cost and estimation calculations. 2. The E-Peken should provide a product or shop review tool to gather feedback from users. 3. Provides Cash on Delivery (COD) payment.

No	Questions	Answers
		4. Provides filters based on additional parameters for more specific searches.

The next step after distributing the questionnaire to respondents is to map the requirements and issues that users of the E-Peken application encounter in an empathy map. There are four primary quadrants in the process of making an empathy map: speak, do, think, and feel in Table 4 below.

Table 4 Empathy Map

No	Empathy Map Response
1	*Quadrant 1: Say* Buyer: a. Difficulty accessing shipping cost information. b. Quality products can be difficult to find in shops. c. Issues with QRIS payments and confirmation via WhatsApp. b. Difficulty reaching the help desk or sellers. Seller: a. The store registration process is complex and time-consuming. b. Inexperienced users may struggle with the application. c. Difficult communication with the support desk and buyers.
2	*Quadrant 2: Do* Buyer: a. "Contact us" for shipping cost details. b. Shopping without clear information about product quality. c. Avoid QRIS payments that require confirmation via WhatsApp. d. Utilize E-Peken, even with limited capabilities. Seller: a. Seek assistance from friends/family for technical issues. b. Contact the admin via WhatsApp for technical issues. d. The registration process takes time. d. Limited communication with buyers and support services.
3	*Quadrant 3: Think* Buyer: a. The shipping price was high because there is not the nearest store choice. b. It's hard to find a shop with quality products. c. QRIS ordering is confusing with WhatsApp confirmation. Seller: a. A complicated registration process can reduce seller interest. b. Limitations in application features and appearance can affect UX.
4	*Quadrant 4: Feel* Buyer:

No	Empathy Map Response
	a. Frustrating looking for shipping cost information.
	b. Confused about choosing a shop without clear quality information.
	c. Difficulty using QRIS for payments.
	d. The WhatsApp button doesn't work.
	Seller:
	a. Difficulty and anxiety using applications, especially unfamiliar ones.
	b. Stressed by the complicated registration process.
	c. Limited communication with buyers and support service.
	d. Satisfied because E-Peken increases the sales turnover of MSMEs in Surabaya.

The define stage comes after the empathize stage when information is gathered using an empathy map and questionnaire (Joesphine et al., 2022; Joo, 2017). During the ideate stage, mapping is done on user needs that were previously discussed. These user needs include the outcomes of problem statements (problems), causes of problems (reasons), and user needs (user needs) about Surabaya City residents' use of the E-Peken application for e-commerce. Using the problem description, the reason the problem happened, and the user's needs, the researcher will attempt to map the needs of the user at this point in Table 5.

Next, the ideate stage depicts a process in which ideas are produced and mapped by the findings of the preceding stage, to find creative solutions and handle recognized challenges. Researchers plan solution analysis, create user flow, sitemaps, and wireframes, and hold brainstorming sessions based on the previous step's user study (Joesphine et al., 2022). This step describes the solutions to the difficulties and user needs identified during the define stage. Researchers discover problems and needs based on user needs analysis and investigate problem solutions using the defined stage analysis results. Table 6 illustrates the suggested solution's conclusions based on the user needs analysis.

Layout refers to the placement of various elements in one plane. In UI/UX design, a successful layout can convey messages effectively to application users. In developing the E-Peken application, there are three layout patterns applied by researchers involving grids, navigation tabs, cards, and carousels, which are listed below in Table 7. Since there is a page limitation, kindly find the comparison of the old and new designs in the link of the appendix (https://bit.ly/Appendix_UIUX_E-PekenApps).

Table 5 Problem Statement & User Needs Analysis

No	Problem	Reason	Needs
1	Buyers must contact the seller via WhatsApp to inquire about shipping costs.	There is no shipping cost information on the application	A delivery method with complete information is required on the payment display
2	Buyers often shop at the wrong store and it does not match their expectations	Do not know the shop that sells the best quality products	A review and rating feature for a shop or product.
3	Buyers must confirm payment via WhatsApp admin.	Experiencing problems when paying via QRIS	Another payment method to make it easier for users to pay.
4	Buyers feel that product delivery costs are quite high	Cannot choose a shop at the nearest location	A shop filter feature is needed based on the closest location area
5	Buyers or Sellers cannot contact the help service on the application	The help and chat service directed to WhatsApp is an error	Improvements and feature development for help service for seller or buyer
6	The seller has difficulty using the application	Sellers are elderly and unfamiliar with technology	A more user-friendly application display is needed for all users
7	Store registration is complicated and takes a long time while waiting for the application process	To many requested documents and fill out the store application form offline	A faster store registration process is required and can be done within the application

Once the design process is finished, the concept idea is detailed, user needs are understood, user flow is determined, a sitemap is created, a design concept is developed, design components are determined, a Low-Fidelity wireframe is created, and a High-Fidelity Prototype of the E-Peken is developed for UI design.

Table 6 Solution Analysis Results

No	Needs	Solutions
1	A delivery method with complete delivery information is requested on the payment display.	Offering delivery methods with Grab, Gojek, JNE, and Pos Indonesia. This shipping method will show the buyer's shipping expenses as well as the product's expected delivery time.
2	A review and rating feature for a shop or product is needed.	Add review and rating features based on ratings from other users, such as star ratings and review categories from “very good” to “very bad”.
3	Another payment method is needed that makes it easier for users to make payments.	Add COD (Cash on Delivery) payment methods, so buyers pay cash without coming to the shop and bank transfers via virtual accounts.
4	A shop or product filter feature is needed based on the closest location area	Add a "near me" filter to find the nearest store, allowing buyers to make purchases in person or have them shipped for a reasonable cost.
5	Improvements and feature development to ensure the assistance service and seller/buyer chat function.	Improve and develop the support service and seller or buyer chat button capabilities that redirect to the direct chat section via the application without switching to WhatsApp.
6	A more user-friendly application display is needed for all users	Interface development uses Bahasa Indonesia, so various groups of users will be easier to understand. Changing typography, layout, icons, and colours to make it more comfortable.
7	A quicker store registration process and completed within the application.	Add an online shop registration function by completing steps until the shop is successfully approved to sell quickly and without delay.

The next step is to create a High-Fidelity Prototype based on the wireframe that has been prepared previously. It is a form of prototype design that is expected to become part of the final product by using materials or components. A High-Fidelity Prototype can be seen from the perfection of functions and features, the product's ability to interact thoroughly, can be tested by users for experiments, clearly describes the navigation scheme, displays a look and feel similar to the final application, and can be run and tested by the user. This prototype will be used at the prototyping and testing stages to get feedback from application users regarding the UI/UX that has been developed from the current application (Krisnanik & Rahayu, 2021). By referring to the previous design wireframe, a High-Fidelity UI/UX Prototype of the new design has been produced, and compared with the current E-Peken application design, which is listed below in Table 8. Kindly please also find the figure for the Development of the High-Fidelity Prototype E-Peken Application in

the following link (https://bit.ly/Appendix_UIUX_E-PekenApps).

Table 7 Layout of the New Design of the E-Peken Application

No	Layout	Function
1	Grids	The grid provides visual interest and a symmetrical perspective. It helps organize elements, distribute proportions proportionally, and maintain UI consistency.
2	Navigation Tabs	Navigation tabs are located on one page or function as page dividers to show the contents of each order/sales page arranged horizontally as a form of navigation.
3	Cards	Card refers to the visual and structural arrangement of interface elements to present certain information in the form of cards. It displays a list of products or transactions arranged in a grid arrangement.
4	Carousels	The carousel displays banners related to E-Peken in the header section of the application's main page. This carousel features several banners. It slides or rolls out horizontally to provide a dynamic look.

Table 8 The Development of High-Fidelity Prototype E-Peken Application

No	The New Design Explanation
1	At the beginning, a splash screen is created when the application is opened with an image and a brief introduction to E-Peken without waiting for a system update.
2	In the login section, a login method is added using a Google and Facebook account and changing the username to the user's email as identity verification when you forget the password.
3	The main user page has been developed in terms of making the layout better and reducing the number of arrow filter displays that are too many because it already has its feature.
4	The product details section uses a larger image size, displays reviews and ratings from users, and seller chat is no longer via WhatsApp. Apart from that, users can also order products directly without having to add them to their basket.
5	In the shop details or profile section, a seller chat feature is added, as well as a display of the shop's overall rating, products sold, and number of products sold.
6	In the filter or search filtering section, filters are added based on ratings, reviews, product availability, and nearby stores. The language used was also completely changed to Indonesian.
7	In the basket section, add a chat button directly with the seller without having to save the contact number. The colour display of the buttons has been made more colourful than before.
8	The notification section has created a more elegant appearance without using a lot of

No	The New Design Explanation
	colour play and added a history of notifications that the user has read.
9	The order form has various payment methods apart from QRIS, the delivery method can be chosen directly by the buyer, and can also contact the seller.
10	The order process is made differently in terms of layout, which is more flexible and not as rigid as before.
11	In the favourites section, the save icon has been changed to a heart icon. Each product catalogue displays a rating and the number of product stocks available.
12	At the end of the profile, a store registration feature is added and you can switch to the store page. The transactions and favourites sections are no longer needed because they are already in the bottom bar, while e-voucher transactions were never available before.
13	In the user's personal information section, a profile photo is added and it is made with a simple appearance without using many colours.
14	In the admin chat section, the help service has been repaired which previously experienced an error on WhatsApp. This feature has been developed so that users can chat directly within the application.
15	The seller's page is differentiated in terms of naming, added reviews, and chat with buyers, and order details can be seen on the next page of the shop profile.
16	In the order list or sales process section, a display is created that does not use many words because the details are provided in the continuation of each transaction.

After seeing the development between the current application design and the new design that has been created, researchers try to display feature innovations in UI/UX design. It is included in the main components to improve the UX during the testing phase. The following are several innovative features of the High-Fidelity Prototype E-Peken that have been developed which are listed below in Table 9. Kindly please find the figure of the application for the High-Fidelity Feature Innovation E-Peken Application Prototype in the appendix link (https://bit.ly/Appendix_UIUX_E-PekenApps).

The application's UI/UX prototyping phase is the next step after that. Testing how well the overall application design operates based on the created concept is the aim of the prototyping stage. Research was done throughout the prototyping phase by using Figma software to create a digital prototype. During the prototyping phase, researchers create an interactive, navigable application prototype that links every page and element to the UI/UX design.

Table 9 High-Fidelity Feature Innovation E-Peken Application Prototype

No	Feature	Note
1	Shipping Method	Added various delivery services that buyers can choose from, such as Grab, Gojek, JNE, and Pos Indonesia. The shipping method also displays the shipping costs that must be borne by the buyer and the estimated delivery time for the product.
2	Payment Method	Added a COD payment method where buyers can pay directly in cash without having to go to the shop and added bank transfer and e-wallet options via virtual account payments.
3	Reviews and Ratings	Add review and rating features to products and stores to help users choose products or stores according to their preferences based on ratings from other users. The review and rating feature is in the form of star ratings and review categories from "very good" to "very bad".
4	Filter	Added a "near me" filter to find the closest seller's store, so buyers can have the option to make purchases directly to the store or have them shipped at a low cost. Other filters are also added, based on ratings, reviews, and product availability.
5	Help Desk	Fixed the help service button feature which previously error when connecting to WhatsApp. This development directly focused on the conversation section with sellers and buyers.
6	Chat Seller/Buyer	Fixed the contact seller/buyer button feature which previously when connecting to WhatsApp, so the conversation section can be directly focused on the admin.
7	Shop Register	Adding an online shop registration feature to the application by following registration processes, starting from personal registration, shop data, and account, to shop verification can be approved easily without having to wait a long process.

Following the questionnaires to gather data, the review and processing of respondent data yielded analysis results. Data analysis of 10 respondents who purchased E-Peken revealed that 60% of respondents used the E-Peken application for less than 6 months, 30% for 6 months to 1 year, and 10% for 1 to 2 years. Meanwhile, data analysis of ten E-Peken seller respondents revealed that 50% used the E-Peken application for one to two years, 30% used it for less than six months, 10% of respondents used the E-Peken application for 6 months to a year, while 10% used it for more than 2 years.

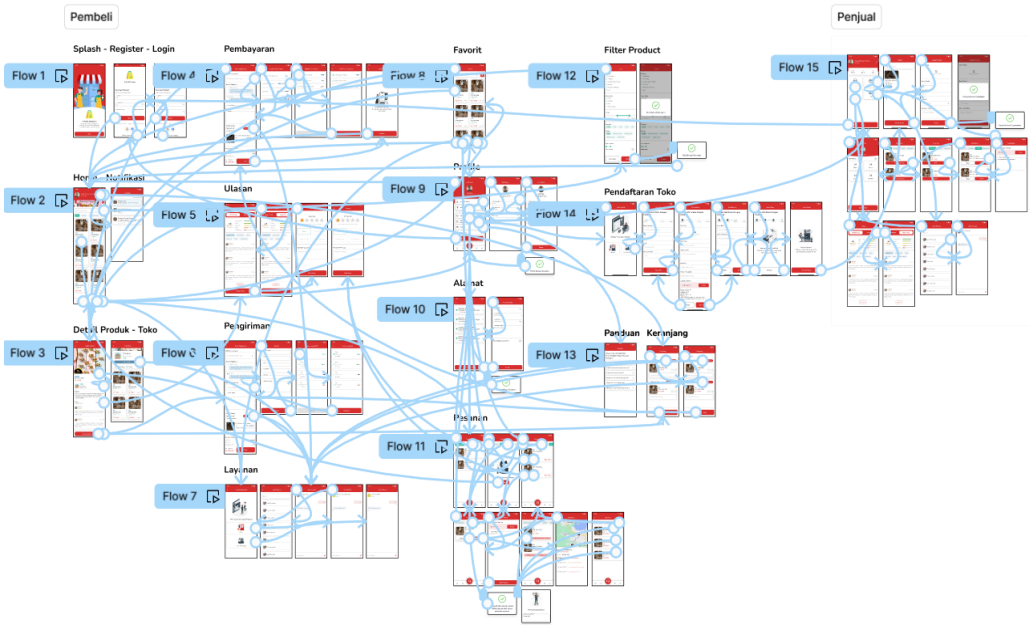

Figure 3 The E-Peken Application Prototyping

During the testing stage, researchers assessed the UI/UX design based on the new design from the prototype generated and the old design of the present application using the UEQ questionnaire utilizing UEQ Data Analysis Tools after using the application prototype for ten minutes. To obtain two distinct points of view, testing E-Peken application buyers and sellers. The analysis and data processing results from the disseminated questionnaire are in Table 10.

The researchers develop cutting-edge features and more aesthetically user-friendly mobile applications. The UEQ-S form was used to conduct UI/UX tests for 20 persons consisting of 10 buyers and 10 sellers, such as support, simple, efficient, clear, exciting, interesting, creative, empowerment, and leading indicators. The application's new look is far superior to its previous design by achieving excellent accreditation in terms of usage overall indicators. The exciting indicator saw the biggest improvement change, increasing by 57.9% (for seller) and 37% (for buyer).

Table 10 UEQ-S Variable Average Scale Results Comparison Between Buyer and Seller About The E-Peken

No.	Statements	Buyer			Seller		
		Old Look	New look	Changes	Old Look	New Look	Changes
1.	Supportive (Q1)	6	6.6	10 (%)	5.8	6.6	13.8(%)
2.	Easiness (Q2)	5.7	6.6	15.8 (%)	5.3	6.6	24.5(%)
3.	Efficiency (Q3)	5.1	6.4	25.5(%)	4.6	6.2	34.8(%)
4.	Clearness (Q4)	5.2	6.6	26.9(%)	5	6.2	24(%)
Average Pragmatic Quality		5.5	6.6	19.1(%)	5.2	6.4	23.7(%)
5.	Exciting (Q5)	4.6	6.3	37(%)	3.8	6	57.9(%)
6.	Interesting (Q6)	5	6.5	30(%)	5	5.8	16(%)
7.	Empowerment (Q7)	5.7	6.7	17.5(%)	5.3	6.4	20.8(%)
8.	Leading Edge (Q8)	4.8	6	25(%)	4.3	5.1	18.6(%)
Average Hedonic Quality		5.0	6.4	26.9(%)	4.6	5.8	26.6(%)
Average UEQ-S Overall		5.3	6.5	22.8(%)	4.9	6.1	25.1(%)

Iterative work is required to refine the UI/UX development outcomes following the testing phase. Application development issues or incompatibilities may arise from improper UI/UX design. To make continual adjustments and produce the best possible application development, the iterative approach uses an iterative design process (Putri et al., 2022). UI/UX testing conducted on E-Peken buyers and sellers yielded the iteration's results. Each development will undoubtedly still receive feedback from its users, even though the most recent E-Peken display received an Excellent grade in the UEQ benchmark findings.

Most respondents' evaluations of the E-Peken application, believe that the program should still be classified as ordinary because of its numerous flaws in comparison to other e-commerce apps like Tokopedia, Shopee, and Lazada. This assessment will be used to inform an iterative approach that will address user feedback on UI/UX design. The outcome of this iteration then leads to the following modifications to the UI/UX's look and usability in Table 11 in the following link (https://bit.ly/Appendix_UIUX_E-PekenApps).

Table 11 UI/UX Iterative Results

No	Information
1	Added a tracking feature for products sent using courier services, so buyers can track products directly without waiting for information from the seller. Meanwhile, sellers no longer need to order couriers manually by switching applications and do not always have to share information on the courier's position when delivering products to buyers.
2	Added a returns feature that is used to return purchased products if there is a defect or nonconformity with the product received. This feature is useful for buyers so they can get the product they purchased according to their expectations. Meanwhile, sellers can minimize the acquisition of bad ratings and reviews from buyers. During the return application process, the help service admin will become a third party to help resolve user transaction problems.

DISCUSSION

The descriptive statistical analysis shows the average score of all respondents exceeds a score of 5 for each statement in the questionnaire for the new look application. This indicates that respondents gave a positive assessment. Meanwhile, the UEQ components for the new display have experienced an improvement over the old display with the biggest improvement in the Exciting component (Q5) in the Hedonic Quality aspect. This indicates that sellers and buyers of the E-Peken that the new appearance is more pleasant to use. Comparison of UEQ components on the old and new displays experienced the largest change in the Exciting component (Q5) of 57.9% and 37% for the new display.

The results of data processing in the UEQ benchmark table show that the UI/UX design of the E-Peken application on the three UEQ scales, namely Attractiveness, Hedonic Quality, and Pragmatic Quality from buyer, increased by 22.8%; 26.9%; and 19.1% respectively. Meanwhile from the seller, it increases by 25.1%; 26.6%; and 23,7% respectively. Thus, the new display is higher than the old display and has improved the assessment results over the old display.

The measurement of the level of difference in value between buyer and seller respondents is greatest in the Hedonic Quality aspect at 26.9% and 26.6%. After going through the high-fidelity UI/UX prototype testing process, the design undergoes an iterative process where feedback from users is used as data to improve the UI/UX. The UI/UX design results were updated by adding a product tracking feature during delivery to provide product location information directly through the application, and a product return feature at the final stage of the ordering process to meet buyers' expectations for the

product received. This change increases sales because the user can use the E-Peken more easily to have a transaction on business (Memarista et al., 2023).

Conclusion, Limitations, and Suggestions

Based on the results of the research that has been carried out, several conclusions can be drawn as follows. The evaluation results of this problem are based on negative assessments from users and various obstacles that are often encountered when using the E-Peken application for online transactions. Some of the problems identified include an unattractive interface, help service admin numbers not listed, buttons that do not work, shipping information that is not yet integrated into the system, difficulty for users to differentiate between store quality, and so on. The proposed solution to meet user needs involves developing the UI/UX of the E-Peken application to increase effectiveness and efficiency in the entire sales and purchase transaction process.

The Design Thinking approach helps the process of developing a new UI/UX design for the E-Peken application by improving the old design. Through the Design Thinking process, the E-Peken application produces eight main features innovation, namely detailed delivery information (courier services, shipping costs, estimates, and tracking), payment methods (bank transfer and e-wallet), reviews and ratings, filters (ratings, reviews, availability, nearest stores), help services can be contacted, chat between sellers and buyers, store registration, and product returns. Each stage in Design Thinking provides detailed solutions and innovative ideas. So, the result is a UI/UX design that suits user needs and can increase the effectiveness and efficiency of online transactions (Raghuvanshi & Garg, 2018).

The results of UI/UX testing using a simple User Experience Questionnaire (UEQ-S) show that the average comparison value of each component of the Exciting UEQ (Q5) experienced the largest increase in buyer and seller respondents by 57.9% and 37%, so qualification for new display after development is accepted. The average value for E-Peken in the Attractiveness, Pragmatic Quality, and Hedonic Quality aspects for the new display values are much better with the largest percentage change in the Hedonic Quality aspect of 26.9% (buyer) and 26.6% (seller), respectively. Likewise, the overall benchmark comparison of the new application design obtained the qualification above the average, thus the development and innovative eight features are in use and have succeeded in improving the old design from buyers and sellers.

Based on the researcher's experience during the implementation of this research, several obstacles emerged. These obstacles need to be a main concern in future research to

improve the quality of future research. First, when carrying out the process of creating an empathy map, analyzing user needs, and designing user flow, the data obtained from the questionnaire only came from active users of the E-Peken Surabaya application who had made purchases and sales transactions. Direct interviews and analysis of developers and from other points of view are difficult to carry out. Second, the testing method at the testing stage in this research still uses a simple version of the User Experience Questionnaire method. Third, the number of respondents involved was only 10 E-Peken buyers and 10 E-Peken sellers. This is considered insufficient to provide relatively stable evaluation results. Fourth, during the data collection process, answers from respondents via questionnaires may not reflect actual opinions due to differences in understanding that can occur between respondents.

From the results of the research, there are several suggestions that the researchers would like to propose. First, at the stage of creating an empathy map, analyzing user needs, and designing user flow, it is recommended to collect more information, especially by conducting interviews with sellers and buyers to obtain data that support the user needs analysis process. Second, to conduct research sustainably, it is recommended to increase the sample size of respondents to at least 20 to 30 people, to increase data accuracy. In addition, it is better to use the other testing method which includes more questionnaire statements to produce more detailed conclusions. The statements conveyed through the questionnaire can be more detailed so that the understanding of all respondents who answer have the same point of view as each other so that the questionnaire can produce data that is more accurate and in line with the researcher's expectations.

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