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Koptihub: A UI/UX Design for Transparent Procurement using a User-Centered Design Approach

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Abstract

The traditional procurement process faces significant inefficiencies and transparency issues, including low efficiency, limited oversight, and challenges in securing competitive supplier engagement and a stable soybean supply. To address these issues, this study aims to design and evaluate Koptihub, a prototype that enhances communication with importers, improves transparency in price comparisons, streamlines stock management, and optimizes transaction monitoring and decision-making. The research employs the User-Centered Design (UCD) approach, integrating User Experience (UX) principles and cooperative member feedback to develop a prototype using Figma. The system's effectiveness, clarity, and user-friendliness were assessed through usability testing with 15 participants using the System Usability Scale (SUS). The prototype incorporates key features such as notifications, incoming offers, price offer status, orders in process, order delivery status, payments, refunds, and a chat function for cooperative-importer communication. The usability test results yielded an SUS score of 82.17, classified as an A grade, indicating high usability and strong user acceptance. These findings confirm that the system effectively supports efficient price selection, order tracking, and enhanced transparency in procurement. This study introduces an innovative e-procurement solution tailored for cooperatives, demonstrating the potential of digital procurement platforms to transform cooperative procurement processes. The proposed model serves as a practical framework that can be adapted by similar cooperatives to improve procurement efficiency and supplier engagement.

Keywords: cooperative, e-procurement, system usability scale, UIUX design, user-centered design

1 Introduction

In the Small Industry Center of Somber (SIKS) in Balikpapan, PRIMKOPTI plays a vital role in supporting local tofu and tempeh producers. Despite its strategic function, the cooperative still relies on conventional methods for procuring raw materials—placing weekly orders via instant messaging platforms based on warehouse stock levels and member requests. While simple and widely adopted, this manual approach often leads to inefficiencies such as delayed coordination, unclear pricing, and minimal oversight throughout the procurement stages. It also limits supplier competition and undermines transparency and accountability in decision-making [1][2][3].

Although previous research has explored technology-based procurement systems, most studies focus on improving internal efficiency without considering collaboration with external parties, such as importers [4][5][6]. These systems often optimize isolated components like inventory tracking or order processing, while overlooking the need for transparency, centralized communication, and real-time interaction [7][8][9]. Numerous studies have emphasized that e-procurement systems can significantly enhance accountability, cost and time efficiency, and transparency—particularly when supported by strong organizational commitment and high-quality information systems [10][11][12][13][14]. Furthermore, factors such as leadership support, trust, and risk perception have been identified as critical drivers of successful e-procurement adoption [15][16][17]. However, little attention has been given to how interface usability and user-centered design influence the adoption and effectiveness of such systems, especially within cooperative environments.

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To address these issues, this study introduces Koptihub, a digital procurement prototype that emphasizes user interface (UI) and user experience (UX) design to support transparent, structured collaboration between PRIMKOPTI and its importers. Unlike full-scale system development studies, this research focuses specifically on front-end design—ensuring that the layout, navigation, and information flow are aligned with the actual needs and behaviors of cooperative stakeholders. Using the User-Centered Design (UCD) approach, the prototype was developed iteratively through stakeholder input, aiming to enable features such as real-time price comparison, transaction tracking, and simplified communication.

Accordingly, this research presents Koptihub as a UI/UX-driven prototype designed to bridge this critical gap. Rather than focusing on full system architecture or backend engineering, the study emphasizes how a user-centered interface can foster greater transparency and operational efficiency in procurement processes. By directly involving cooperative members throughout the design phase, the resulting prototype not only delivers practical and intuitive features, but also aligns closely with users' actual workflows—supporting wider digital adoption in cooperatives such as PRIMKOPTI.

2 Literature Review

Recent research on the digitalization of procurement systems in cooperatives has introduced various approaches to enhance efficiency, transparency, and supplier engagement. Studies have demonstrated that e-procurement optimizes supply chains by improving access to price information and real-time raw material availability [25][26][27]. However, many studies focus primarily on internal efficiency improvements, overlooking the involvement of external parties such as importers or large-scale suppliers, who play a strategic role in the supply chain [28].

Several studies have proposed integrated information system-based e-procurement models to enhance transparency and transaction speed [28][29]. However, implementing such systems in cooperatives remains challenging, particularly regarding technology adoption among users unfamiliar with digital systems. Research highlights that trust and transparency factors present significant barriers to digital procurement, especially when cooperatives continue to rely on informal communication methods, such as instant messaging, for routine transactions [30][31]. Additionally, studies emphasize that the success of e-procurement heavily depends on senior management support, the quality of provided information, and a structured communication system to facilitate negotiations between cooperatives and suppliers [31][32].

Although numerous studies have examined digital procurement system efficiency, few have explored the role of integrated communication between cooperatives and suppliers in price negotiations and direct transactions. Existing e-procurement systems primarily focus on inventory management or order processing, often neglecting the need for transparent price comparisons and documented transaction histories. Furthermore, limited studies incorporate suppliers' or importers' perspectives in system design, despite their crucial role in digital procurement adoption.

This study focuses on developing an e-procurement system that not only automates stock management but also establishes a transparent communication mechanism between cooperatives and suppliers. The proposed system enables real-time price comparisons, facilitates structured negotiations, and provides broader accessibility for suppliers to view requests, process shipments, and receive payments within a unified digital platform. By adopting this approach, this research addresses a gap in existing literature, which has not extensively explored how digitalization can enhance collaboration between cooperatives and suppliers. Ultimately, this study aims to improve transparency, efficiency, and the overall competitiveness of cooperatives in the market.

3 Research Method

This study adopts a User-Centered Design (UCD) approach, focusing specifically on the design of the user interface (UI) and user experience (UX) for a digital procurement prototype named Koptihub. Unlike full system development research that involves architectural modeling and database engineering, this study limits its scope to the front-end aspect of system development. The objective is to ensure that the interface aligns closely with users' needs and workflows within the cooperative context. The UCD process in this research follows four iterative stages[18][33], as shown in Figure 1:

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Figure 1. Research method

a. Understanding Context of Use

To assess the potential benefits of the application, semi-structured interviews were conducted with stakeholders including cooperative administrators, and procurement department. The interviews lasted 30–45 minutes and explored technological, social, organizational, and user perspectives on procurement challenges. Insights from this phase guided the prototype's initial design [19].

b. Specify User Requirements

Focus Group Discussions (FGDs) were held with cooperative representatives to identify user needs, pain points, and feature expectations [20]. The results were translated into wireframes and user flows, which served as the basis for interface prototyping.

c. Design Solution

The prototype was developed using Figma, with an emphasis on usability principles such as learnability, efficiency, memorability, and user satisfaction [21]. The design incorporated real-time interaction features, including price comparison, order tracking, and communication elements, tailored to PRIMKOPTI's procurement process.

d. Evaluate against Requirement

The prototype was assessed from the viewpoint of cooperating users utilizing the System Usability Scale (SUS). This strategy, acknowledged for its simplicity and efficacy even with limited sample sizes, yielded validated usability insights [19]. Participants in the study evaluated the prototype according to 10 SUS statements (Table 1), as outlined in Table 1, on a five-point Likert scale from "Strongly Disagree" to "Strongly Agree". Respondents may choose the median point (neutral) on the assessment scale if they find the provided scale alternatives inadequate [22]. The questionnaire has been modified to conform to the terminology and criteria of the system being examined.

Table 1. SUS questionnaire statements

No.	Statements
1.	I plan to use this software frequently.
2.	I found the app to be overly complicated when it could be simplified.
3.	I found the app easy to use.
4.	I required technical assistance to utilize the app.
5.	I thought the app's functionality to be properly integrated.
6.	I found there were a lot of inconsistencies in the app.
7.	I think most users will be able to learn the app quickly.
8.	I found the app very complicated to use.
9.	I am very confident that I can use the app.
10.	I still have a lot to learn before I can utilize the app.

The System Usability Scale (SUS) results are calculated using a specific methodology [23]. For odd-numbered questions, the given score is reduced by 1 (e.g., a score of 4 for question 1 is adjusted to 3). For even-numbered questions, the score is subtracted from 5 (e.g., a score of 1 for question 2 is adjusted to 4). The adjusted scores for all questions are then summed, and the total is multiplied by 2.5 to determine the final SUS score.

The formula for determining the SUS score is as follows:

$$\text{SUS Score} = ((Q1-1)+(5-Q2)+(Q3-1)+(5-Q4)+(Q5-1)+(5-Q6)+(Q7-1)+(5-Q8)+(Q9-1)) \quad (1)$$

The Total System Usability Scale (SUS) score is derived by computing the mean of the SUS values. The SUS score can thereafter be classified into the following categories (Table 2).

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Table 2. SUS grade

SUS Score	Grade
> 80.3	A
74 – 80.3	B
68 – 74	C
51- 68	D
< 51	F

The SUS questionnaire evaluates system usability and measures user approval levels. This evaluation clarified the characteristics of the assessment and determined user acceptance of the system. The scores obtained from the SUS questionnaire reflect the usability level of the product. The final results are categorized into three classifications: Unacceptable (0 to 50.9), Marginal (51 to 70.9), and Acceptable (71 to 100) [24]. Figure 2 presents a visual summary of these categories along with their corresponding score ranges.

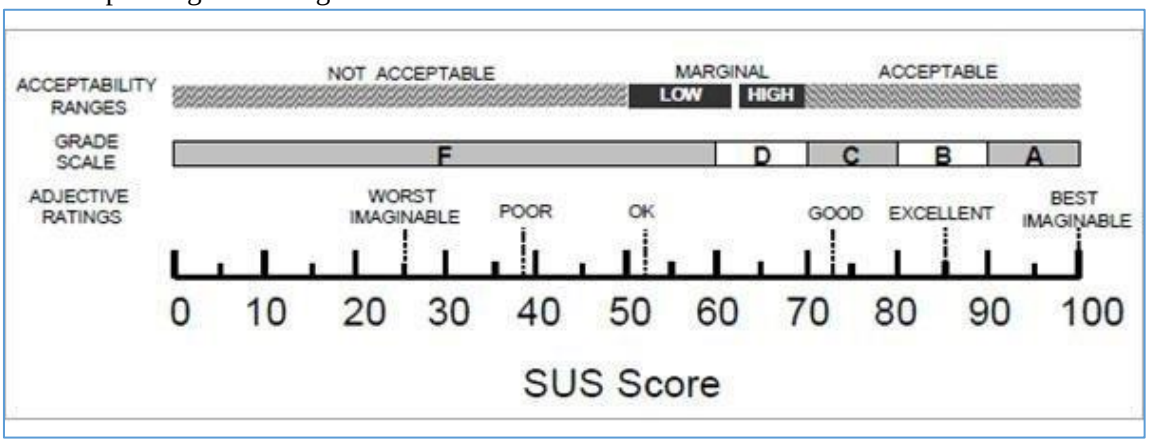

Figure 2. Acceptance rankings and ranges for SUS score

4 Results and Analysis

A. Use of Applications

Based on interviews with PRIMKOPTI's management and procurement staff, several challenges in the current procurement workflow were identified, such as unstructured price negotiations, lack of visibility in order progress, and limited supplier communication. These findings confirmed the need for a centralized platform that prioritizes transparency, real-time access, and simplicity of use for cooperative members—leading to the development of essential features such as pricing comparison, shipment tracking, payment management, and refund processing.

B. User Requirements

To translate these needs into a practical design, a user flow was developed based on insights from Focus Group Discussions (FGDs) with PRIMKOPTI stakeholders. The flow represents a typical user journey, beginning from the login screen. Users who do not yet have an account are prompted to create one at the outset. Once logged in, users are directed to the main dashboard, which provides access to core features such as notifications, today's summary, incoming offers, price offer status, order processing, delivery tracking, payment status, refund requests, chat, and user profile. These features are grouped into intuitive sections to enhance usability, efficiency, and accessibility. The user flow serves to clarify both the structure and progression of the application interface, ensuring that each function aligns with the cooperative's procurement activities. The full layout of this flow is illustrated in Figure 3.

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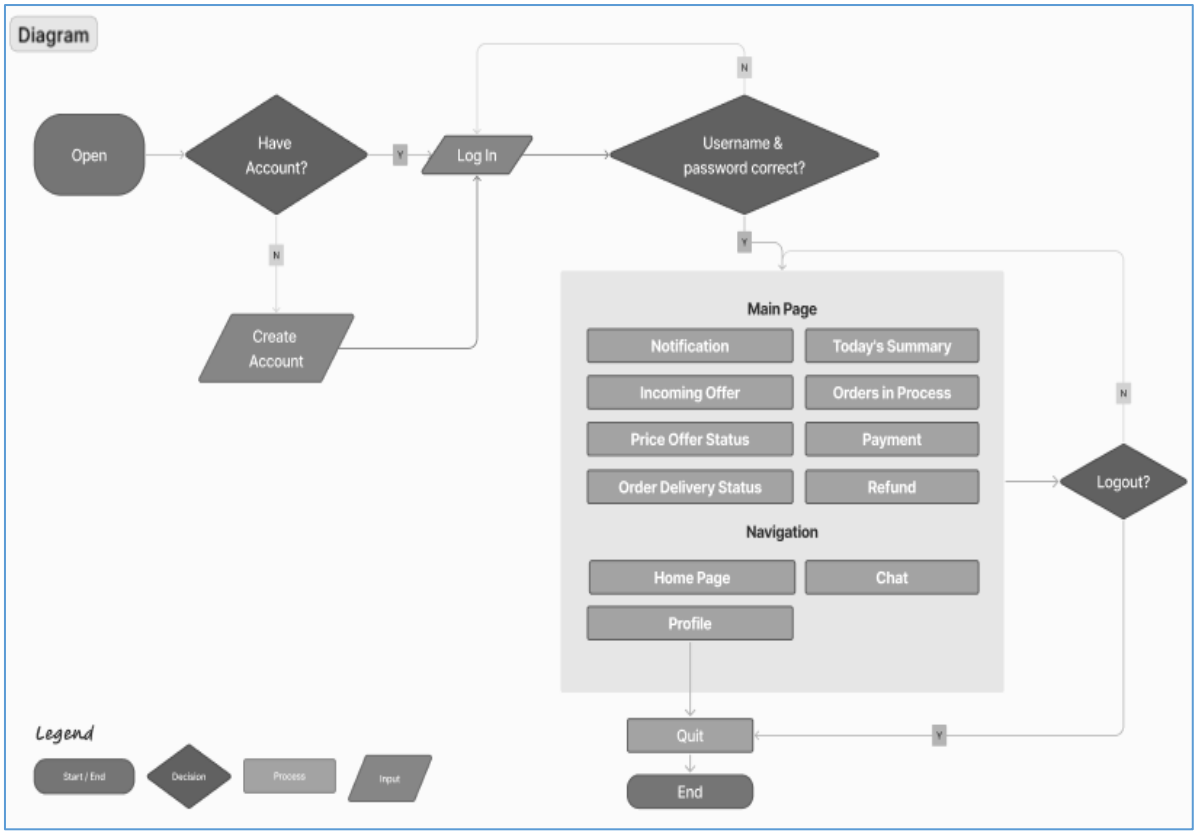

Figure 3. Main menu user flow

C. Prototype Design Solution

A high-fidelity prototype was developed using Figma to visualize the intended user experience based on the previously defined user flow. The interface design adhered to key UI/UX principles, including visual clarity, functional grouping, and responsive navigation. Informal feedback from cooperative members was incorporated iteratively throughout the design process to refine usability and relevance. Particular attention was given to creating a clean layout, readable typography, and consistent iconography to support intuitive interaction across all screens.

1) Login and Create Account Features

Users required to input their email address, role, and password in order to access the application page. The user can create an account by clicking "Create Your Account" if they do not already have one. Refer to figure 4 for illustration.

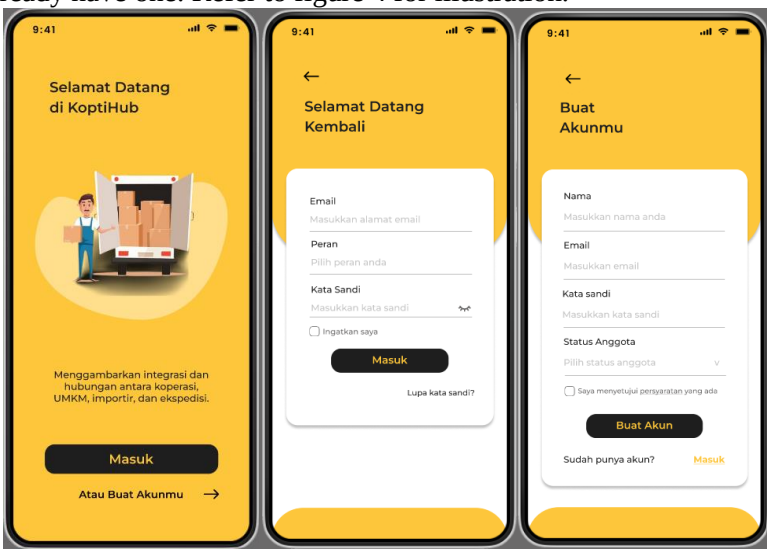

Figure 4. Login page

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2) Home Page Features

On the main page, users can view a summary of today's activities, notifications, incoming offers, price offer status, orders in process, order delivery status, payment received, and refunds. Additionally, the navigation menu comprises profile and message capabilities. Refer to figure 5 for an illustration.

Figure 5. Homepage

3) Incoming Offer Feature

The following display appears when the user accesses the incoming offer feature. This feature primarily allows the user to view the offers they have received and to enter the price they wish to propose. A "Send" button is available to transmit the entered offer price to the Administrator. Furthermore, users have the option to view the specifics of the orders by selecting the "Details" button. Refer to figure 6 for an illustration.

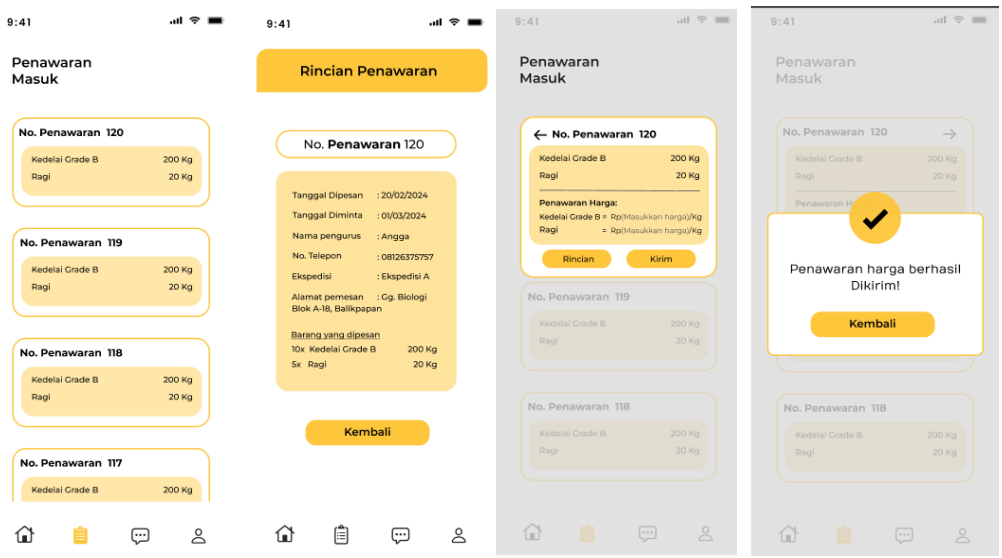

Figure 6. Incoming offer feature

4) Price Offer Status Feature

This feature allows users to check the status of the price offer they have submitted to the administrator. This feature's display is segmented into three sections: the price offer status, which includes "Unconfirmed," "Accepted," and "Rejected." The price offer status display includes a notification feature that allows users to receive updates on the acceptance or

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rejection of a price offer. When the price offer status is accepted, the user will receive a memo from the administrator, which can be found in the "Accepted" section. Furthermore, users have the option to directly process the order by selecting the "Process order" button. Refer to figure 7 for an illustration.

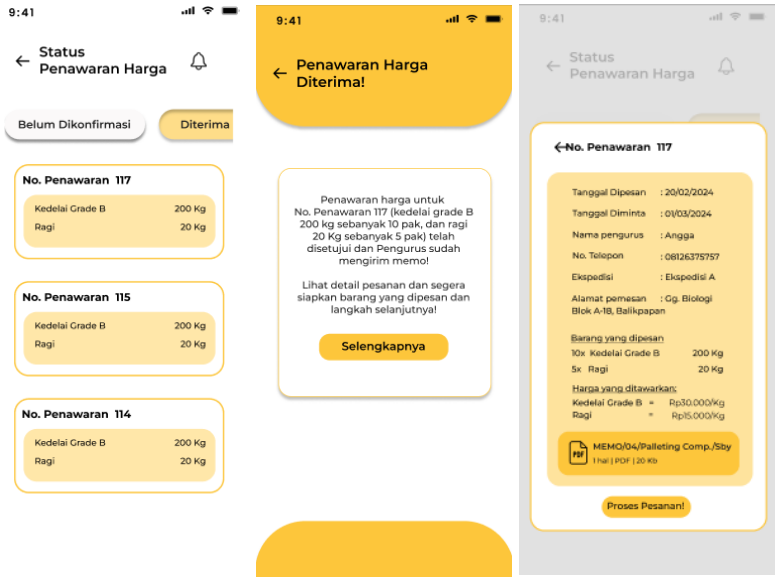

Figure 7. Price offer status feature

5) Order in Process Feature

This function is employed to execute orders that have been approved by the administrator in terms of their price proposals. The order process entails the creation of an order invoice, as well as the verification of the memo and the ordered items. The order can be processed by users by selecting the "Prepare!" icon in the "Prepare Shipping" section. In addition, this feature can be employed to verify to the administrator that the order is prepared for shipment by providing proof in the form of photographs and sending an invoice. This function can be executed by selecting the "Confirm" button in the "ready to ship" section. Refer to figure 8 for an illustration.

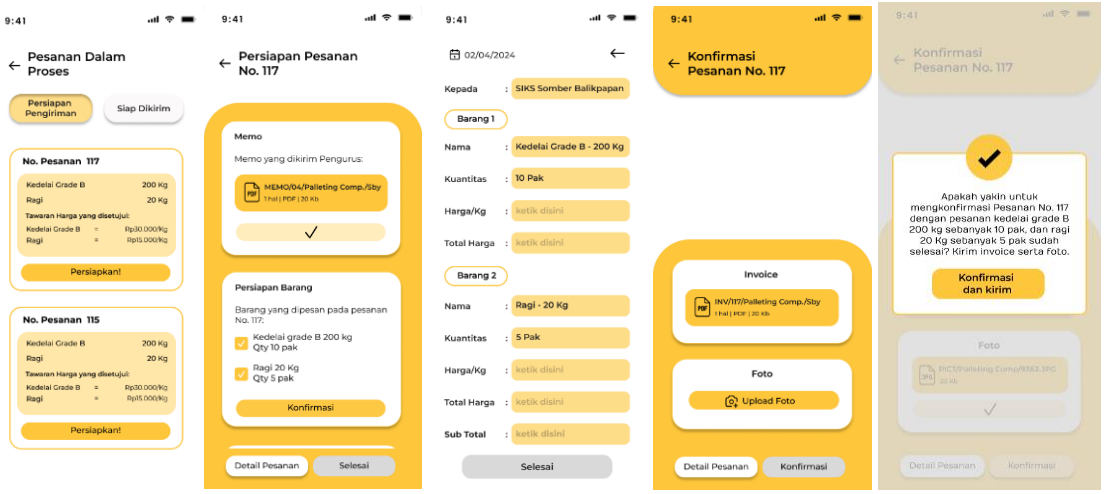

Figure 8. Order in process feature

6) Order Delivery Status Feature

This feature allows users to monitor the status of their orders in real time until they are delivered to their destination. The order number and the present status of the order are displayed in the initial display of the order delivery status feature. By selecting one of the

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orders displayed on the initial screen of this feature, users can access information regarding the status of the transaction. In the event that an issue arises with the order, such as a shortage of orders, the user can promptly follow up by clicking on the text "see more" and viewing the status. Refer to figure 9 for an illustration.

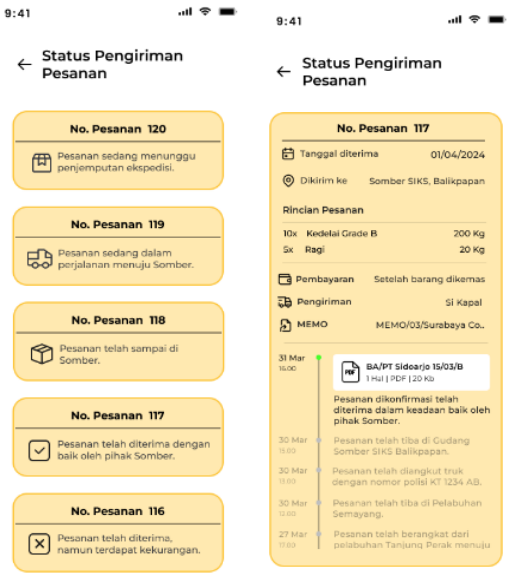

Figure 9. Order delivery status feature

7) Payment Receipt Feature

This function is employed to monitor the status of invoices that have been delivered to the cooperative. This feature is divided into two sections: "Unpaid" and "Already Paid." The order number and invoice that have not been paid are displayed in the "Unpaid" section. Furthermore, users have the option to follow up with the ordering party to ensure that a payment is made promptly. This payment can then be transmitted to the expedition team via the chat feature. In the meantime, the "Already Paid" section displays the invoice number, payment date, and order number. Proof of payment is also automatically provided to users. Refer to figure 10 for an illustration.

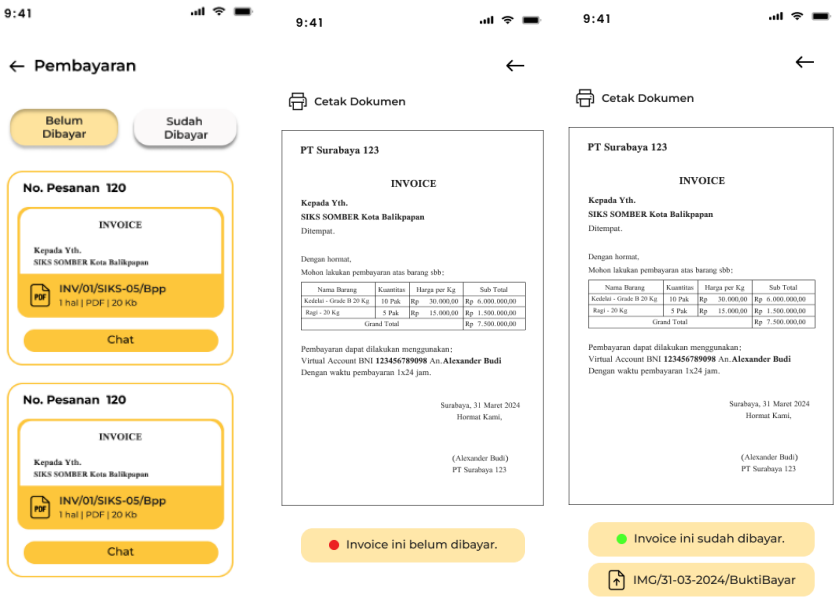

Figure 10. Payment receipt feature

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8) Refund Feature

This feature allows for the processing of a refund for an order that has been verified to have an issue. The interface displays the specifics of the problematic order along with the total funds that need to be refunded. Users may verify their refund by providing a photo of the transaction receipt. Additionally, this feature allows users to view details of the history of previously made refunds. Refer to figure 11 for an illustration.

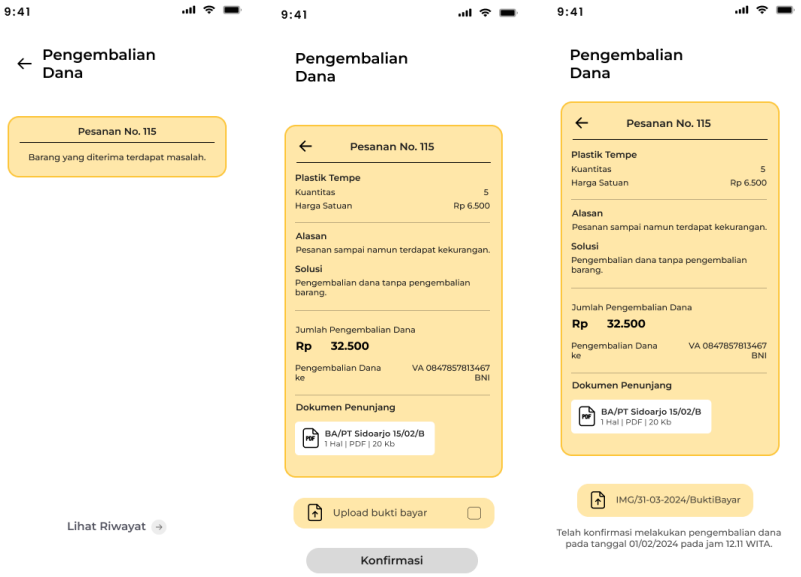

Figure 11. Refund feature

D. Evaluation

The prototype was tested by 15 cooperative administrators using the System Usability Scale (SUS) questionnaire. This method enables a comprehensive assessment of the prototype's strengths and areas for improvement. The tabulated results of the SUS evaluation scores are presented in table 3 below.

Table 3. SUS tabulation

Res	Data Respondents										Score Total	SUS Score
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10		
1	4	2	5	2	4	2	5	2	5	1	34	85
2	3	1	4	1	3	2	2	2	3	2	27	67.5
3	5	2	4	1	4	2	2	1	5	2	32	80
4	5	2	4	1	4	1	5	1	5	1	37	92.5
5	5	2	4	1	4	1	5	1	5	1	37	92.5
6	5	2	5	3	5	1	3	1	5	1	35	87.5
7	5	2	4	1	4	2	2	1	5	2	32	80
8	5	2	5	3	5	1	3	1	5	1	35	87.5
9	5	2	5	2	4	2	3	2	5	2	32	80
10	5	2	5	3	5	1	3	1	5	1	35	87.5
11	5	2	5	2	4	2	3	2	5	2	32	80
12	5	2	4	1	4	2	2	1	5	2	32	80
13	5	2	4	1	4	2	2	1	5	2	32	80
14	4	2	5	2	4	2	5	2	5	1	34	85
15	3	1	4	1	3	2	2	2	3	2	27	67.5
										Average SUS Score		82.17
										Grade		A

The prototype achieved an average System Usability Scale (SUS) score of 82.17, corresponding to a Grade A classification. This indicates a high level of user satisfaction and confirms the

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effectiveness of the interface in supporting procurement-related tasks. Respondents agreed that the application met usability standards and was well-accepted. They particularly appreciated the visual design and color scheme, noting that it was both appealing and suitable for the cooperative's operational context. The features were perceived as easy to use and sufficiently comprehensive, though several participants suggested that further simplification could improve usability even more. Additionally, one notable insight from the feedback was the importance of streamlining the purchasing process, especially in cases where payment to importers must be made upfront before goods are received.

These results demonstrate that the UI/UX-focused prototype successfully addresses the core challenges of PRIMKOPTI's traditional procurement process—from receiving offers to tracking orders—through an intuitive and accessible user interface. While the study did not extend to backend development or system architecture modeling, the interface alone proved sufficient in enabling key procurement functions.

Furthermore, the findings validate the relevance of applying a User-Centered Design (UCD) approach in cooperative environments, where varying levels of digital literacy and the need for simplicity are crucial factors. The development of Koptihub shows that even a prototype-level solution, when grounded in real user needs and feedback, can deliver a transparent and efficient procurement experience.

5 Conclusion

This study successfully developed Koptihub, a UI/UX-focused procurement prototype for PRIMKOPTI, using the User-Centered Design (UCD) methodology. The prototype integrates key features such as incoming offers, price offer tracking, order processing, delivery status updates, payment receipt, refund handling, and a built-in chat function to facilitate transparent communication between the cooperative and importers.

The development process involved cooperative stakeholders at each design stage to ensure that the interface reflected real user needs and workflows. Usability testing with 15 cooperative administrators using the System Usability Scale (SUS) produced an average score of 82.17, classified as Grade A, indicating high usability and strong user acceptance.

The findings confirm that even in the absence of back-end implementation, a well-designed user interface can effectively support procurement transparency, especially in cooperative environments where digital literacy levels vary. This research highlights the potential of applying UCD principles to create accessible and intuitive digital tools that meet both functional and usability expectations. Future studies may expand this work by developing the full system architecture and assessing long-term user adoption in operational settings.

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