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UI/UX Transformation of XYZ Retail Information System Through User-Centered Design Approach

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ABSTRACT

Retail information systems play a crucial role in enhancing efficiency and productivity, particularly in facilitating interactions between companies and suppliers. This study aims to redesign the user interface (UI) and user experience (UX) of the XYZ Retail Information System using a User-Centered Design (UCD) approach. UCD focuses on a deep understanding of user needs through a structured process involving user research, prototyping, testing, and iterative improvements. The implementation results demonstrate that the UCD approach significantly improves accessibility, operational efficiency, and user satisfaction. Key features developed include real-time notifications, a responsive design compatible with mobile devices, and an integrated automatic discount calculation system. These enhancements not only streamline user workflows but also increase the speed and accuracy of daily business decision-making processes. The findings highlight the importance of adopting a user-centered approach in information system development to ensure that the resulting solutions effectively address real-world user needs. By aligning system functionalities with user expectations and behaviors, the system becomes more intuitive and valuable in supporting business operations. This study contributes to the ongoing advancement of adaptive information systems that are designed not only for usability but also to support long-term business sustainability in dynamic retail environments.

Keywords: Retail Information System, User-Centered Design (UCD), UI/UX Transformation, Responsive Design, System Efficiency.

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INTRODUCTION

An efficient and intuitive information system is crucial in the modern retail industry. It not only serves as a liaison between the company and its suppliers but also plays a vital role in ensuring the smooth running of day-to-day business operations. With the increasing competition in the digital era, the need for information system solutions that can provide an optimal user experience is increasingly pressing. A well-designed system can increase productivity, reduce errors, and ultimately add value to the company.

However, despite the significant increase in the adoption of digital solutions in the retail industry, many existing systems fail to meet user expectations. And noted that limitations in the user interface (UI) and user experience (UX) are often the main causes of this problem. Systems with unintuitive UI/UX not only frustrate users, but can also hinder work efficiency, increase workload, and even decrease user satisfaction. As a result, companies often face challenges in integrating digital technologies that are truly effective and efficient.

The limitations faced by retail information systems create an urgency to adopt a more human-centered approach that focuses on user needs. The User-Centered Design (UCD) approach has emerged as a promising solution to address these challenges. UCD places the user at the center of the system design process, to create an interface that is intuitive, efficient, and meets operational needs. By

LITERATURE REVIEW

Digital-based information system transformation has become an essential need for retail companies to improve user experience. The User-Centered Design (UCD) approach is one of the dominant methodologies used in the development of user interfaces (UI) and user experiences (UX), placing users at the center of the design process to ensure their needs are met. This review discusses various studies related to the application of UCD in the context of UI/UX redesign.

Definition of User Interface (UI)

User Interface (UI) refers to the interface that connects users with software or systems, where users can interact with applications or websites through visual elements such as buttons, icons, menus, and layouts. UI is the visual and interactive aspect of a system that includes layout, colors, buttons, icons, and other design elements used by users to interact with the system. UI aims to make user interactions intuitive and visually appealing [1]. A good UI must pay attention to aspects of ease of use, visual aesthetics, and consistency in design so that users can easily understand how to use the system without confusion.

In UI development, common design principles include simplicity, consistency, and accessibility. A simple and intuitive UI allows users to complete tasks with minimal effort, while consistency in the use of design elements helps users build a better understanding of the system. Poor UI design can lead to confusion and frustration, which can hurt the overall user experience.

Definition of User Experience (UX)

User Experience (UX) encompasses the overall experience a user has when interacting with a product or service. UX encompasses not only the visual and interactive aspects offered by the UI but also emotional and functional factors [2]. that shape the user's perception of the product. For example, in addition to an easy-to-understand interface design, UX also encompasses convenience, responsiveness, system speed, and effectiveness in meeting user needs. Therefore, UX involves the entire user journey, from the first time they interact with the system to after they finish using the product.

Good UX can increase user satisfaction, strengthen loyalty, and encourage continued usage. UX consists of five main dimensions: strategic, functional, structural, interactive, and aesthetic. All of these dimensions work together to create a satisfying experience. Conversely, poor UX can cause frustration, decrease productivity, and even drive users to switch to a competitor's product or service.

Table 1. Differences between UI and UX

Aspect	User Interface (UI)	User Experience (UX)
Definition	A visual and interactive interface that allows users to interact with the system.	The overall experience a user feels when using a product or service.
Main Focus	Design visual elements such as buttons, menus, icons, and layouts.	Overall user satisfaction, including emotions, perceptions, and comfort.
Objective	Create an interface that is aesthetically pleasing and easy to use.	Increase user satisfaction through efficient and enjoyable experiences.
Main Dimensions	Aesthetics, layout, color, typography, and graphic elements.	Accessibility, functionality, speed, effectiveness and convenience.
Relationship with Products	Focuses on the physical appearance and function of the interface.	Focuses on how users feel and interact with the product as a whole.
Main Components	Technical elements of design such as wireframes, prototypes, and visual designs.	User research, product strategy, and user experience testing.
Final destination	Ensuring the interface looks professional and intuitive.	Ensuring products meet user needs and provide an optimal experience.

User-Centered Design (UCD)

UCD is a design approach that puts users at the center of the product development process. It involves deeply understanding user needs, preferences, and barriers through iterative research and testing. [3].

UCD produces designs that better meet user expectations, increasing system satisfaction, efficiency, and effectiveness.

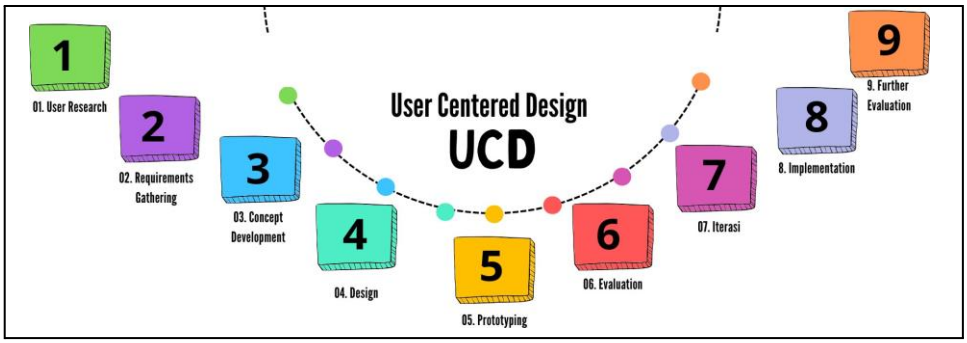

Figure 1. UCD Stages

UCD Stages:

1. User Research: Researching to understand users, including their needs, preferences, and challenges through interviews, surveys, and observations.
2. Requirements Gathering: Gathering information to define product requirements based on user understanding and business objectives.
3. Concept Development: Creating initial design concepts, such as sketches or wireframes, that illustrate how the product will function.
4. Design: Develop detailed designs, including visual elements and interactions, to create an optimal user experience.
5. Prototyping: Creating a prototype of a product for user testing, allowing early feedback to be gathered.
6. Evaluation: Identifying problems in the design through user feedback on the prototype.
7. Iteration: Making continuous improvements based on evaluation results to refine the design.
8. Implementation: Integrating the design into the final product and performing testing to ensure functionality.
9. Further Evaluation: Using user feedback to continuously improve the design [4].

Usability Testing

Usability testing is an evaluation method used to measure the usefulness, efficiency, and satisfaction of users in using a system. This process involves direct users to identify design problems and provide feedback.

Process:

1. Preparation: Designing the tasks that will be carried out by the user.
2. Data Collection: Engaging users to perform tasks, while the development team observes their interactions.
3. Analysis: Identify areas that need improvement based on observation and interview results.

Evaluation Method:

1. System Usability Scale (SUS): Used to measure the level of user satisfaction, as in the study by Anggraeni & Kristianto (2024), which noted an increase in SUS scores after UI/UX redesign.
2. The benefits of usability testing help ensure that the final design is intuitive and meets user needs, as produced by Hiu & Erlyana (2024) in the Datascrip Mall application.

METHODOLOGY

This study uses a comprehensive and systematic approach to investigate and implement improvements to the XYZ Retail Information System. A mixed approach was used, combining qualitative and quantitative methods to ensure a holistic understanding of user needs and system performance. Evaluating the UI/UX of banking applications using the User-Centered Design method. Data were collected through usability testing, interviews, and surveys, with statistical analysis to measure user satisfaction [5].

Data collection

1. Survey: Distributed to suppliers to understand common issues and areas of improvement in the system.
2. Interviews: Conducted with key stakeholders, including suppliers and internal IT teams, to gain in-depth insights into user challenges.
3. Usability Testing: Observing users interacting with a prototype to identify usability issues and areas for improvement.
4. provides detailed guidance for thematic analysis in qualitative research. This article highlights the importance of developing a rigorous framework for qualitative data analysis [6].

Analysis Method

Recommends innovations in mixed methods evaluation, including rapid qualitative and quantitative data processing techniques, to increase efficiency in implementation research [7].

1. Thematic Analysis: Used for qualitative data to identify recurring themes and user needs.
2. Statistical Analysis: Applied to survey data to measure user satisfaction and identify significant issues.

RESULTS AND DISCUSSION

The retail system transformation at XYZ company was carried out using the User-Centered Design (UCD) approach to ensure that the resulting solution can meet user needs and preferences. The following is the implementation of UCD with testing carried out using Maze and usability testing.

User Research

At this stage, interviews and surveys were conducted with potential users. Based on these findings, two main user personas were developed which can be seen in the following Table:

Table 2. User Persona

Users	Description
Staff (MD)	Users who are responsible for processing new product offers, carrying out PO approvals
Supplier	Make product offers, receive PO requests that come in through the Venditore system

Requirements Gathering

This stage produces a list of in-depth system requirements for reference or basis in developing system concepts. The following is a table showing user requirements:

Table 3. User Requirements

Need	Information	Priority
Attractive and intuitive interface	Using Material Design design principles	Tall
Account recovery feature	"Forgot Password" button	Tall
Real-time notification system	For new POs, invoices, etc.	Tall
Search filter with active indicators	Make it easier to search for items	Currently
Integrated PO and payment	Reduce switching between pages	Tall

dashboard		
Automatic discount calculation	Increase efficiency	Tall
Mobile application access	For users who work mobile	Tall
Clear status information	Use icons with supporting text and color codes for specific statuses.	Currently
Fast item selection process	Item search with auto-suggestion and dynamic filters.	Tall
Support FAQ and Help	Add interactive documentation, FAQs, or step-by-step guides	Currently
Automatic barcode input	Support for barcode scanning and bulk data upload via CSV files	Tall
Responsiveness on mobile devices	The system supports optimal viewing on a variety of screen sizes including mobile phones.	Tall

Concept Development

At this stage, system design ideas are developed with a focus on the following features:

1. Attractive and responsive interface
2. Account recovery (reset password)
3. Real-time notification system
4. Integrated dashboard
5. Automatic barcode input
6. Automatic discount calculation
7. FAQ and live chat support

Design and Prototyping

The design and prototyping of this system were created using Figma to test the initial design. Interactive testing was carried out on several stages, namely, login, forgot password, view notifications, access the Order and Product List menu, add products, and access FAQ and live chat.

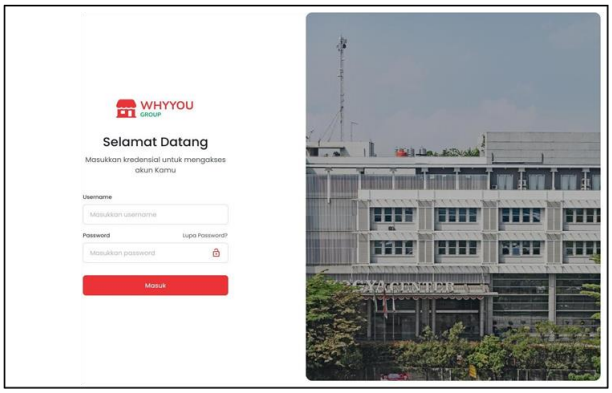

Figure 2. Login Page

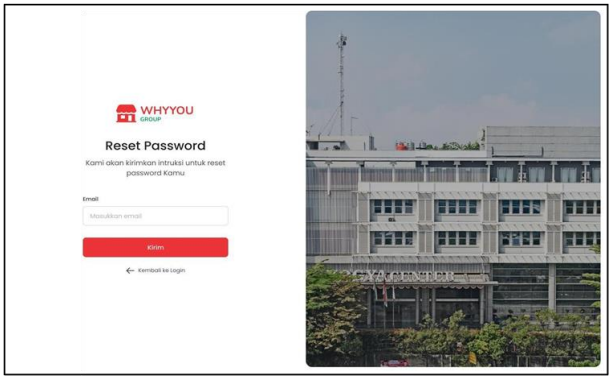

Figure 3. Forgot Password page

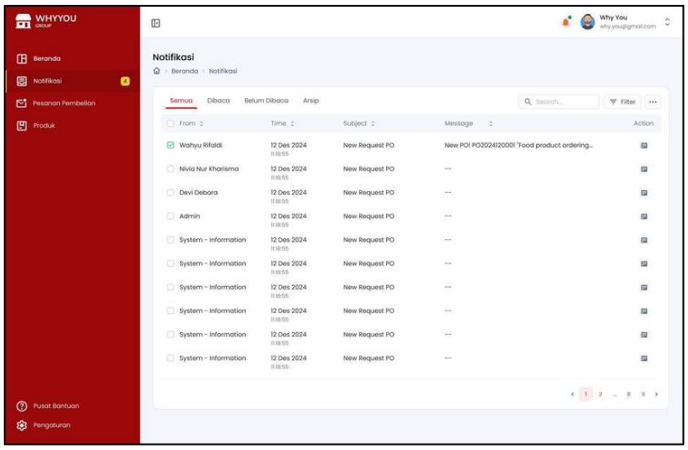

Figure 4. Notification Page

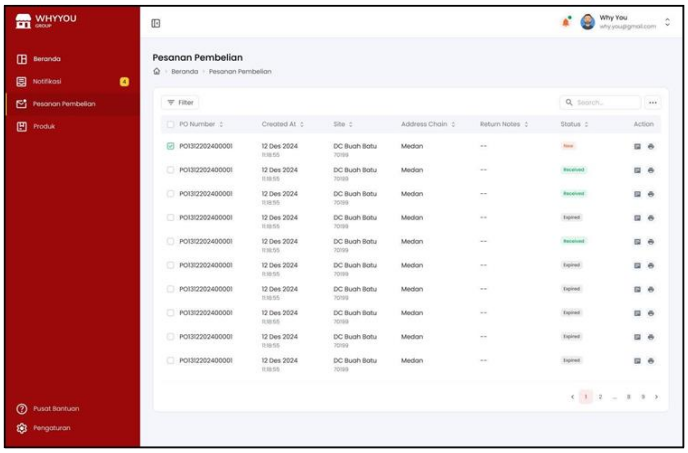

Figure 5. Order List Page

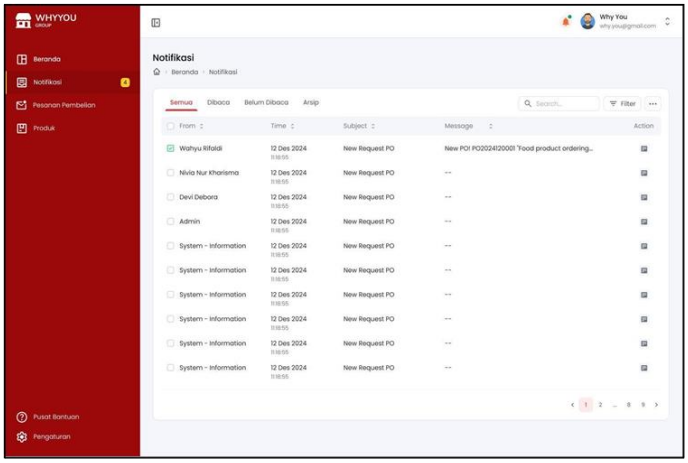

Figure 6. Add Product Page

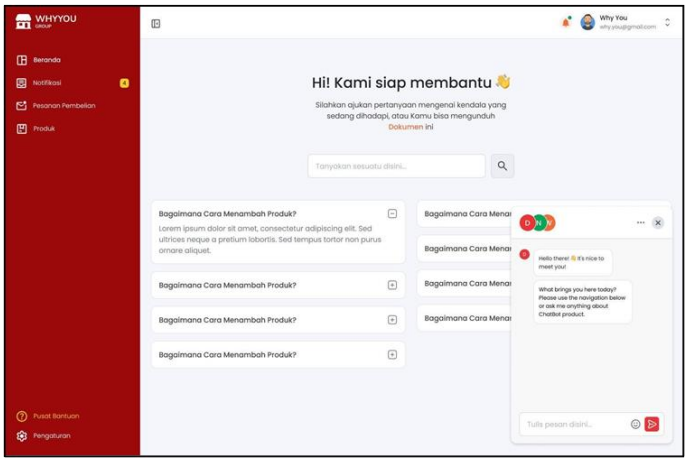

Figure 7. FAQ and Live Chat Pages

Evaluation and Iteration

At this stage, testing is carried out on the prototype system that has been designed using Maze. This method is a user-oriented evaluation technique, where the product or application is tested by individuals who have no previous experience with the system. The following is a table showing the results of testing with Maze involving 15 respondents:

Table 4. Maze Test Results

Mission	Success Rate	Drop-off	Misclick rate
Login	100	0	38.6
Forgot the password	100	0	17.1
Notification Access	100	0	8.3
Access Purchase Orders & Products	100	0	67.1
Adding Products	90	10	60.6
Access FAQ & Open Live Chat	72.7	27.3	70.2
Average	**93.78**	**6.21**	**43.65**

Judging from the data above, testing using Maze shows that system prototyping has a very high success rate on most missions, such as login, forget the password, notification access, and purchase order & product access, with a success rate of 100%. However, the mission of adding products and accessing FAQ & opening live chat requires more attention, because each has a lower success rate (90% and 72.7%) and a high misclick rate, namely 60.6% and 70.2%. In addition, the significant drop-off rate (27.3%) on the FAQ access & opening live chat mission indicates that there are obstacles in navigation or design in this section. After conducting direct product testing, at the end of the session, the respondents were given a survey which is part of Usability Testing using a Likert scale of 1-5 to determine the level of satisfaction specifically from the respondents. The following is a table showing the results of the survey that has been conducted.

Table 5. Usability Testing Results

Question	Average
Usability	
The login process is easy to use and not confusing.	4.65
The "Forgot Password" feature is easy to find and use without any hassle.	4.5
The notification information displayed is clear and easy to understand.	4.42
The feature to add products can be accessed easily	4.28
Average Usability	**4.46**
Learnability	
The instructions on the "Forgot Password" page are clear and easy to follow.	4.5
The process of accessing the purchase order and product pages is easy to understand from the first use.	4.28
Average Learnability	**4.39**

Satisfaction	
The notification interface display provides a pleasant experience.	4.57
I am satisfied with the experience of using the purchase order and product pages	4.14
Average Satisfaction	**4.35**
Efficiency	
The login process is fast without any technical issues.	4.28
The process of adding products is done in an efficient manner.	4.14
Help center & live chat are easily accessible	4.21
Average Efficiency	**4.21**
Memorability	
I think it will be easy to remember how to access notifications in this system.	4.5
After adding the product, I feel like it will be easier to remember the process in the future.	4.71
Average Memorability	**4.6**
Error	
The system provides clear error messages if a problem occurs during login.	4.21
I easily understand the error messages that appear when a problem occurs.	4.35
Average Error	**4.28**
Overall Average	**4.38**

Next, the usability testing results show that the system has an average usability of 4.38 on a scale of 5, reflecting a good level of quality. The usability aspect gets the highest score of 4.46, followed by memorability with 4.6, indicating that the system is easy to use and intuitive to remember. Learnability gets a score of 4.39, indicating the ease for new users to learn the system. Satisfaction reaches 4.35, reflecting fairly high user satisfaction with their interaction experience. However, the efficiency aspect with a score of 4.21, is the lowest although still good, indicating opportunities for improvement in increasing the speed and effectiveness of users when completing tasks.

Overall, these results indicate that the system is well designed and provides a positive experience, with efficiencies in the product add-on process and FAQ access as key areas for further development (iteration).

Implementation

After the iteration produces an optimal design based on user feedback, the next step is to compile specification documentation that includes details of the workflow, interface components, and user interactions. This design is then presented to the development team to ensure a comprehensive understanding so that it can be implemented into a real-life system to effectively support the operational activities of the retail company. Documenting the development and implementation process of virtual reality-based interactive workflows. Greatly influences user interaction mapping and iterative testing supports faster and more effective decision-making [8].

Ongoing Evaluation

The last stage is ongoing evaluation is carried out to ensure the sustainability of the quality and relevance of the system to user needs, emphasizing the importance of ongoing evaluation using Likert surveys, interviews, and user feedback analysis to identify areas of improvement. Iterations based on these findings improve system efficiency and user satisfaction [9]. Evaluation begins by collecting feedback from users through surveys, interviews, and interaction data analysis to identify strengths and areas of improvement. Based on these findings, iterations are carried out to refine suboptimal features or workflows. Developing an interface design simulation tool that provides automatic feedback to users on design principles. The importance of post-implementation evaluation to monitor system effectiveness. They found that after implementing usability testing-based changes, there was a significant increase in user satisfaction, task efficiency, and a reduction in user error rates. [10]. So this evaluation is carried out periodically, ensuring that the system can adapt to changing business and technology needs, and continues to support company operations efficiently.

CONCLUSION

This study concludes that the application of the User-Centered Design (UCD) approach has proven to be highly effective in improving the overall functionality and user experience of the XYZ Retail Information System. By placing users at the center of the design process—beginning from understanding their needs, behaviors, and pain points, to iteratively developing and refining system prototypes—this approach ensures that the resulting system is not only technically robust but also aligned with actual user expectations.

One of the most significant outcomes of the implementation is the noticeable increase in system usability. Users now interact with a more intuitive interface that minimizes learning curves and enhances task efficiency. The inclusion of real-time notifications allows users to respond quickly to operational updates, which is particularly valuable in dynamic retail environments. Additionally, the adoption of responsive design ensures accessibility across various devices, including mobile phones and tablets, making the system flexible for users who work on-the-go or in different operational contexts.

The redesign process has also contributed to improved system efficiency. Automated features such as the real-time discount calculation module have streamlined several manual processes, reducing errors and saving time. As a result, users reported higher satisfaction levels, and the system experienced fewer support requests and usability issues. These outcomes highlight how a thoughtful UCD approach can directly impact not just the interface aesthetics, but also the strategic goals of system performance and business operations.

Moreover, this research reinforces the importance of continuous user feedback in system development. Throughout the iterative design process, user evaluations played a critical role in shaping the system's evolution. This collaborative cycle allowed the design team to make evidence-based decisions, ensuring that the final product was both functional and user-friendly.

Despite the improvements achieved, this study also identifies opportunities for future development. As retail environments grow increasingly complex and data-driven, the integration of advanced technologies such as artificial intelligence (AI), machine learning (ML), and predictive analytics presents a promising direction for further research. These technologies could support advanced features such as customer behavior prediction, automated inventory management, and personalized marketing, further enhancing the value and competitiveness of the retail information system.

In conclusion, the findings of this study clearly demonstrate that the User-Centered Design methodology is an effective framework for system redesign and development in retail contexts. It not only improves technical features but also strengthens the alignment between the system and its end-users. By focusing on usability, accessibility, and real-time responsiveness, the redesigned XYZ Retail Information System now better supports users' needs and contributes to more sustainable business processes. Future system upgrades that incorporate intelligent analytics and AI-based components have the potential to elevate the system to a higher level of innovation and efficiency.

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