Design of the SILELE Application Prototype Using the User-Centered Design (UCD) Approach

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Abstract

The SILELE application was designed to assist catfish farmers in marketing their products and to serve as an information platform connecting farmers and buyers. The application was developed using the User-Centered Design (UCD) method to ensure that the interface aligns with user needs and expectations. This study applies the UCD approach to design an interactive prototype using Figma, a cloud-based collaborative design tool. Figma enables UI/UX designers to create and refine web and mobile application interfaces collaboratively in real time. The SILELE prototype demonstrates how a user-oriented design process can enhance system usability, functionality, and accessibility for both farmers and consumers engaged in the catfish trade.

How to Cite

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Introduction

Technological advancement has become one of the defining characteristics of the modern era, fundamentally transforming human life across education, communication, commerce, and governance. The pervasive integration of technology has not only improved operational efficiency but also reshaped social interactions and economic systems. In today's interconnected world, digital literacy and access to information systems are essential for individuals and communities alike. People from all backgrounds—students, professionals, and entrepreneurs—rely on digital tools for learning, decision-making, and business operations. As a result, technology is no longer viewed merely as a convenience but as an indispensable infrastructure supporting societal development and economic resilience.

Over the past decade, the agriculture and aquaculture sectors have begun embracing technological innovation to increase productivity, optimize supply chains, and expand market reach. The integration of digital systems into these industries aligns with global efforts to enhance sustainability and competitiveness in the face of evolving market dynamics. However, despite these advancements, many small-scale farmers and fish cultivators continue to face significant barriers in accessing digital resources, particularly in rural areas where technological adoption remains limited. Challenges include inadequate digital marketing platforms, lack of technical knowledge, and minimal exposure to e-commerce ecosystems. These constraints hinder their ability to promote, distribute, and sell products efficiently, thereby reducing their income potential.

Within this context, catfish farming holds a particularly important place in Indonesia's local economy. It serves as a primary source of livelihood for many rural households, especially in regions with abundant water resources and favorable aquaculture conditions. Yet, catfish farmers often struggle to reach broader markets due to the absence of integrated digital platforms that connect them directly with buyers, suppliers, and consumers. Existing market mechanisms rely heavily on intermediaries, leading to limited profit margins and inefficient distribution chains. This condition underscores the urgent need for a digital solution that can facilitate marketing, information exchange, and transactional transparency for the catfish aquaculture community.

The SILELE application is designed as a technological innovation aimed at bridging this digital gap by offering a dedicated marketing and information platform for catfish farmers and buyers. The system provides features that enable farmers to promote their products, share cultivation information, and interact directly with consumers in a structured and efficient manner. To ensure that the platform meets the real needs of its target users, the study adopts the User-Centered Design (UCD) approach—a design philosophy that emphasizes iterative development based on user feedback, behavior analysis, and usability evaluation. The UCD methodology ensures that system functionality and interface design reflect users' perspectives, capabilities, and expectations, thereby improving acceptance and long-term sustainability.

According to Muhyidin et al. (2020), effective technological development—both in education and business—requires not only functionality but also usability and efficiency. A system that fails to consider user interaction patterns often leads to low adoption rates and costly redesign efforts. Therefore, effective design communication between developers, UI/UX designers, and stakeholders is vital to prevent misinterpretation and ensure that the final product aligns with user goals. In this regard, the use of prototyping tools plays an essential role in visualizing system concepts and facilitating collaborative design reviews before

full-scale implementation. Prototypes serve as tangible models that enable stakeholders to provide early feedback, refine requirements, and minimize design errors.

Among various prototyping platforms available, Figma offers a cloud-based, collaborative environment that supports real-time co-creation among designers, developers, and clients. This tool allows teams to develop interactive interface mockups that can be accessed, commented on, and modified simultaneously, thereby reducing iteration cycles and enhancing coordination. By integrating Figma with the UCD methodology, this study develops a high-fidelity prototype of the SILELE application, focusing on three primary design objectives: usability, aesthetic appeal, and accessibility. These principles are crucial for improving the digital marketing experience of catfish farmers, ensuring that the resulting system not only fulfills functional requirements but also empowers local aquaculture communities to participate more actively in the digital economy.

Methodology

Research Approach

The research adopts the User-Centered Design (UCD) methodology, a systematic process that involves users throughout the design and development stages to ensure the final product meets their requirements. UCD relies on creativity, iterative feedback, and user engagement to achieve optimal usability and satisfaction. The stages of the UCD method are illustrated conceptually in Figure 1.
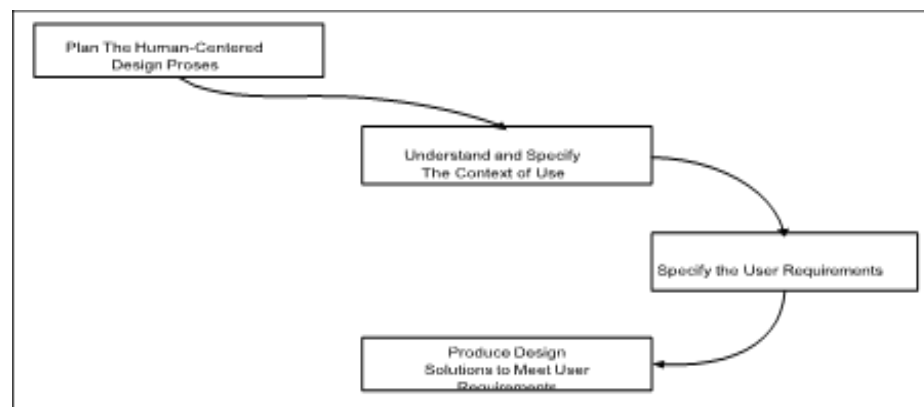

Figure 1. Stages of the User-Centered Design (UCD) Process

UCD Development Stages
The UCD process applied in this study consists of four key stages:
1. Plan the Human-Centered ProcessAt this stage, discussions were conducted among project team members to establish a shared understanding of user-centered principles. The commitment to involve users at the beginning and end of the project was emphasized. The project team also studied relevant literature and participated in training on UCD methodologies to ensure consistency in implementation.

2. Specify the Context of UseThis phase identifies the individuals who will use the application, their goals, and the conditions under which they will interact with the system. In this case, users include catfish farmers who market their products and buyers who seek fresh fish through online transactions.

3. Specify User and Organizational RequirementsUser and organizational requirements were gathered through structured interviews and field observations. Farmers expressed a need for a platform that simplifies product listing and communication with buyers, while buyers sought features that allow product comparison and secure transactions.

4. Produce Design Solutions to Meet User RequirementsBased on the collected data, design solutions were created using Figma to generate wireframes, mockups, and interactive prototypes. These visual representations guided the design evaluation and refinement process.

UI and UX Design Concepts

According to Rizky (2019), User Interface (UI) design focuses on the visual components of an application that users interact with, such as buttons, layouts, and typography. Meanwhile, User Experience (UX) refers to the overall experience users have when navigating the application, encompassing usability, efficiency, and satisfaction.UI ensures aesthetic coherence, while UX ensures that interactions are intuitive and effective. Together, they determine the success of a digital product.The Figma tool was chosen for its real-time collaboration features, enabling multiple designers and developers to work simultaneously on the same project. Figma's cloud-based nature ensures accessibility and version control across devices and locations.

Results

The SILELE prototype was successfully designed using Figma, focusing on usability and functionality for both catfish farmers and buyers. The system structure comprises multiple user-facing pages, each tailored to support specific activities.
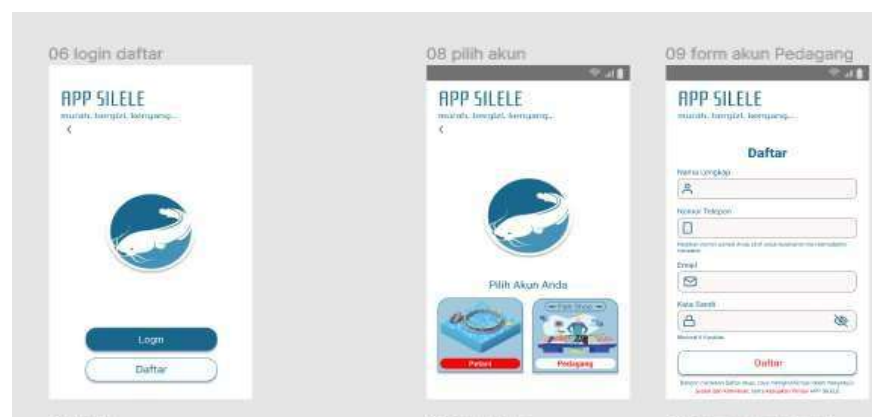

Figure 2. Mockup of the SILELE Application Interface

The resulting prototype incorporates a clean layout and intuitive navigation structure. Visual hierarchy and consistent typography enhance readability, while responsive design principles ensure accessibility across devices.

Discussion

The implementation of the User-Centered Design (UCD) approach in developing the SILELE prototype proved to be an effective strategy for ensuring that the system design aligned closely with the actual needs, expectations, and digital literacy levels of its end users—namely, catfish farmers and buyers. UCD emphasizes the importance of user participation throughout the design process, positioning users not merely as recipients of technology but as active contributors to its development. This study applied iterative design and evaluation cycles in which user feedback was continuously collected, analyzed, and incorporated into subsequent design revisions. As a result, the final prototype exhibits high usability and functional relevance, minimizing the risk of user frustration or rejection once the application is deployed.

Throughout the iterative design process, multiple user testing sessions and feedback loops were conducted to evaluate interface elements such as navigation structure, color scheme, iconography, and labeling clarity. Feedback from both farmers and potential buyers revealed that users preferred a simple and visually clean interface that minimized unnecessary complexity. Accordingly, the design was refined to prioritize clarity, consistency, and simplicity, ensuring that even users with limited technological proficiency could easily operate the system. The streamlined layout of the dashboard, combined with intuitive button placement and easily recognizable icons, enhances the discoverability of key features such as product posting, order tracking, and communication between sellers and buyers. This approach aligns with the usability principle that systems should "match the real world" by reflecting familiar user experiences and predictable patterns of interaction.

The UCD framework facilitated an iterative and dynamic interaction between user input and design evaluation, thereby reducing the likelihood of post-deployment usability issues. Each design iteration focused on validating core functions, ensuring that both functional and aesthetic aspects met the expectations of end users. The prototyping and evaluation stages revealed that the SILELE application effectively supports essential activities in catfish marketing, including the posting of product information, price negotiation, and transaction management. By integrating communication and commerce into a single digital platform, the prototype provides a seamless experience that reduces dependence on intermediaries and manual market processes. Furthermore, the inclusion of an information-sharing feature allows farmers to access educational resources and cultivation tips, strengthening the application's value as both an economic and knowledge-sharing tool.

The adoption of Figma as the primary design and prototyping tool significantly enhanced collaboration and workflow efficiency between the design and development teams. Unlike traditional design methods that rely on static wireframes, Figma's cloud-based real-time collaboration feature enabled multiple stakeholders—including designers, developers, and domain experts—to interact synchronously within the same project environment. This capability fostered a transparent and iterative design culture where feedback could be incorporated instantly, reducing turnaround time and minimizing redundant revisions. The use of Figma also facilitated remote usability testing, allowing users to interact with clickable

prototypes directly from their own devices. This feature proved particularly beneficial in accommodating geographically dispersed participants, such as farmers located in rural areas, who were able to provide valuable feedback without requiring in-person sessions.

The outcomes of this study are consistent with prior research by Pratiwi et al. (2018) and Yatana Saputri et al. (2018), who found that the application of the User-Centered Design approach enhances usability, efficiency, and overall user satisfaction in both business and academic contexts. Their findings support the notion that UCD not only improves system intuitiveness but also ensures a more sustainable adoption process by reducing the cognitive and operational barriers for end users. In line with these studies, the integration of UCD and collaborative prototyping tools in the development of SILELE demonstrates that a participatory design process can yield more inclusive and contextually appropriate technological solutions, particularly for users with varying levels of digital competency.

In summary, the discussion confirms that combining User-Centered Design methodology with modern design platforms such as Figma creates a powerful synergy that improves both the usability and development efficiency of digital systems. The resulting SILELE prototype demonstrates how a well-structured, user-driven design approach can empower small-scale aquaculture producers by connecting them directly with buyers through an accessible and intuitive interface. Beyond its immediate utility as a marketing tool, the SILELE application also contributes to the broader goals of digital inclusion and economic empowerment in rural communities. Future development stages should incorporate broader usability testing, accessibility audits, and integration with payment gateways or logistics systems to further enhance the platform's functionality and impact.

Conclusion and Recommendations

The SILELE application prototype was successfully designed using the User-Centered Design (UCD) method with Figma as the primary design tool. The following conclusions can be drawn: The SILELE prototype integrates user input effectively through each stage of the UCD process. The design emphasizes simplicity, usability, and accessibility to ensure positive user experience. The resulting prototype includes essential features such as user authentication, product listings, and transactional support. The SILELE system provides a functional platform for catfish farmers to market products efficiently.

Further development should focus on implementing the prototype into a fully functional mobile application available through the Google Play Store. Future enhancements may also include payment gateways, push notifications, and improved data analytics features.

Disclosure Statement

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References

Abdulloh, R. (2016). Easy and simple web programming. Jakarta: Elex Media Komputindo.

Alfian, & Damayanti. (2020). E-marketplace application for selling catfish harvests (Case study: Pringsewu Regency, Pagelaran District).

Babich, N. (2017, November 1). Storyboarding in UX design. Adobe Creative Cloud Blog. https://blogs.adobe.com/creativecloud/storyboarding-in-ux-design.

Iyan, M., Agung, P., & Iqbal, M. (2019). *Graphic design and multimedia* (1st ed.). Bogor: LPPM Universitas Pakuan.

Intetics. (2017). *The main steps of the user interface design.* Retrieved from Intetics.

Kalyani, H. M. (2019, February 28). *What is a persona?* Medium. https://medium.com/learnfazz/apa-itu-persona-2e3d2cab00ba

Lam, T. (2016). Six steps in a common UX design process.

Muhyidin, M. A., et al. (2020). UI/UX design for My CIC academic information service application. Edumatic: Jurnal Pendidikan Informatika, 10(2), 208–219.

Mulia, A. H. (2016). Development of Astofit application interface using the User-Centered Design approach. Malang: Universitas Brawijaya.

Nidhom, A. M. (2019). Human–computer interaction (p. 118).

Nurdin, A. A. (2020). Analysis and design of a web-based car wash salon information system (Case study: Excellent Car Wash & Ceramic Coating). Universitas Mercubuana.

Pratiwi, D., Saputra, M. C., & Wardani, N. H. (2018). Application of the UCD method in redesigning the Psychology Department web portal, FISIP Universitas Brawijaya. Jurnal Pengembangan Teknologi Informasi dan Ilmu Komputer, 2(4), 2448–2458.

Suryadi, & Kurniawan. (2019). Academic briefing activity information system (Case study: Universitas Bina Darma Palembang).

Suryaningsih, S., et al. (2020). Indonesian waqf application based on blockchain. *Edumatic: Jurnal Pendidikan Informatika, 4*(2), 20–29. https://doi.org/10.29408/edumatic.v4i2.2402

Thalion. (2020, August 17). *What are user flows?* UX Misfit. https://uxmisfit.com/2020/08/17/what-is-a-user-flow-everything-you-need-to-know/

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