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UI/UX Design of a Web-Based Community Discussion Forum Application for Rumah Kreatif Wadas Kelir using User-Centered Design and User Acceptance Testing

Akmal Rafly Dzunurain[1], Sarah Astiti[2]
[1,2]Information Systems Study Program, Telkom University Purwokerto, Indonesia

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ABSTRACT

Rumah Kreatif Wadas Kelir (RKWK) is a community literacy organization established in Purwokerto, Central Java. As its members and volunteers expanded across different regions, communication through social media and instant messaging became unstructured, leading to knowledge loss, ineffective coordination, and limited access to information. This study aims to design a User Interface (UI) and User Experience (UX) for a web-based discussion forum using the User-Centered Design (UCD) approach. The research followed four stages: identifying user needs through interviews and questionnaires involving 30 members, analyzing the context of use with user personas, user journey maps, and use case diagrams, developing a high-fidelity prototype in Figma, and evaluating the design through User Acceptance Testing (UAT). The prototype incorporates a mobile-first interface, community-based topic categorization, and accessibility-oriented typography. UAT evaluated interface navigation, aesthetics, topic creation, search functionality, responsiveness, and overall satisfaction. The prototype achieved an average acceptance score of 84.6%, categorized as "Very Good." These findings indicate that the proposed UI/UX design effectively supports communication, collaboration, and knowledge sharing within the RKWK community.

Corresponding Author:
Akmal Rafly Dzunurain
Information Systems Study Program
Telkom University Purwokerto
Indonesia
Email: akmlrfly@student.telkomuniversity.ac.id

1. Introduction

1.1 Background

The rapid advancement of Information and Communication Technology (ICT) has fundamentally reshaped the ways in which individuals, organizations, and communities communicate, collaborate, and manage knowledge. The internet has matured from a passive information repository into an active, participatory medium that enables structured, multi-directional communication across geographically dispersed participants [1]. Among the most consequential products of this evolution is the web-based discussion forum, a platform archetype characterized by threaded conversations, persistent archives, and topic-based categorization features that collectively support asynchronous knowledge exchange within communities of practice [2].

Web-based discussion forums have been documented across numerous academic and professional domains as effective instruments for reducing information fragmentation, improving institutional memory,

and sustaining member engagement over time [3]. Unlike ephemeral instant messaging systems, discussion forums preserve the temporal and contextual integrity of exchanges, allowing participants to retrieve, reference, and build upon prior conversations without the navigational degradation inherent in scroll-based chat interfaces [4]. This archival quality is particularly salient for community-based organizations engaged in ongoing programs that generate continuous flows of procedural, administrative, and deliberative information [5].

Community-based literacy organizations in Indonesia operate in an increasingly complex informational environment. The proliferation of volunteer networks, geographically distributed memberships, and diverse program portfolios creates informational demands that exceed the capacity of unstructured social media communication. Systematic literature has identified centralized platform availability, topic categorization mechanisms, and notification systems as the three strongest architectural predictors of sustained community platform engagement [6]. Organizations that lack these features experience measurable declines in information accessibility, member participation, and institutional knowledge retention [7].

Rumah Kreatif Wadas Kelir (RKWK) is a community-based Literacy Center (Taman Baca Masyarakat) founded on August 7, 2013, in Purwokerto, Central Java, Indonesia. Since its establishment, RKWK has grown substantially, receiving recognition including the Literacy Village award from the Ministry of Education and Culture [8], the Inspiring Community award from the Regent of Batang [9], and the Regional Java Satu Indonesia Award in Education from Astra [10]. With hundreds of active volunteers, non-formal education Pusat Kegiatan Belajar Masyarakat (PKBM) students, and community members distributed across multiple regions, RKWK's operational complexity has outpaced its current communication infrastructure, which relies on social media platforms and instant messaging groups [11].

1.2 Problem Statement

The communication infrastructure of the RKWK community exhibits four systemic deficiencies that collectively impede organizational effectiveness and knowledge management. These deficiencies were identified through preliminary observations and structured stakeholder interviews conducted during the initial phase of this research. First, RKWK lacks a centralized platform for the structured discussion of its diverse programmatic activities, which include literacy promotion, literary arts, social welfare, PKBM non-formal education, and cultural preservation initiatives. Community communications are currently dispersed across WhatsApp groups, Instagram direct messages, and informal exchanges, producing a fragmented information ecosystem in which members must traverse multiple channels to access relevant content [12]. The cognitive and temporal overhead imposed by this fragmentation measurably reduces the efficiency of information retrieval and coordination.

Second, the ephemeral nature of instant messaging platforms renders historical discussion archives functionally inaccessible. Valuable institutional knowledge including event documentation, decision rationales, program reports, and member contributions is routinely displaced by new content in platforms designed for real-time communication rather than longitudinal knowledge preservation [13]. The absence of searchable, categorized archives imposes recurring information reconstruction costs on the organization as members repeatedly re-address questions and issues that have been previously resolved in inaccessible prior exchanges. Third, the absence of systematic topic categorization prevents RKWK members from efficiently locating information relevant to their specific roles and interests. Undifferentiated group messaging cannot accommodate the diverse informational requirements of a community whose programs span literacy promotion, literary arts, PKBM education, social welfare, and cultural empowerment [14]. The resulting information overload discourages selective consumption and contributes to the fourth deficiency: low engagement levels among newer volunteers and members who lack established community networks and familiarity with informal communication norms [15].

These four deficiencies together constitute a compelling rationale for designing a purpose-built web-based discussion forum application tailored to the operational characteristics and user profile of the RKWK community. Such an application must not only address these functional gaps but must also deliver an intuitive, accessible user experience that accommodates the diverse digital literacy levels and device preferences of community members requirements that place user-centered design methodology at the core of the development approach [16].

1.3 Relevant Literature

1.3.1 User-Centered Design (UCD) in Web Application Development

User-Centered Design (UCD) is an iterative design methodology that positions user needs, characteristics, and contextual constraints as the primary determinants of design decisions throughout the system development lifecycle [17]. Codified in ISO 9241-210:2019, UCD encompasses four iterative

activities: specifying the context of use; specifying user requirements; producing design solutions; and evaluating designs against requirements [18]. The recursive nature of UCD enables progressive convergence on designs that authentically reflect user mental models and workflows, distinguishing it from technology-centric approaches that prioritize technical capability over usability [19].

Empirical research in the Indonesian context consistently demonstrates the superiority of UCD-derived designs over conventional alternatives. The User-Centered Design (UCD) methodology was applied to the development of a village information system website, demonstrating that UCD-based prototypes achieved substantially higher task completion rates and user satisfaction scores compared to historically developed counterparts [13]. Similarly, the User-Centered Design (UCD) approach was applied to a web-based urban area calculation system, which revealed that systematic user involvement across all four UCD phases produced designs with measurably superior usability, reduced navigation errors, and higher stakeholder acceptance compared to requirements developed without direct user participation [5].

In the domain of community and social platform design, Applied UCD to e-commerce prototyping for a community-based furniture business, demonstrating that the UCD methodology effectively bridges the gap between technical system capabilities and the specific workflows and preferences of community users findings with direct relevance to the RKWK discussion forum context [16]. The effectiveness of the User-Centered Design (UCD) approach in mobile application development was further confirmed through iterative user testing, establishing that the continuous feedback loop between design artifacts and user evaluation serves as the critical mechanism for producing human-centered outcomes [14].

Systematic literature reviews of UI/UX design methodologies within Indonesian application development provide empirical evidence for the comparative advantages of User-Centered Design (UCD). Studies consistently identify UCD as the methodology most strongly correlated with high usability scores and successful user acceptance across diverse domains, including educational, governmental, community service, and commercial platforms [20, 2]. Furthermore, within the UCD framework, user needs identification and prototype validation emerge as the phases exerting the most significant impact on the final design quality.

1.3.2 UI/UX Design for Community and Social Platforms

The design of digital platforms for community-based organizations presents distinctive challenges that differentiate it from commercial or enterprise application development. Community platforms must serve multiple stakeholder groups with heterogeneous characteristics, technical competencies, and motivational orientations while generating sufficient perceived value to overcome adoption inertia [12]. Effective UI/UX design for community platforms requires the simultaneous optimization of aesthetic coherence, navigational intuitiveness, feature relevance, and accessibility dimensions that are individually straightforward but collectively demanding to reconcile in designs that serve diverse user populations [1].

A UI/UX design study for a web-based learning platform was conducted using the User-Centered Design (UCD) approach with Figma as the prototyping tool, achieving a User Acceptance Testing (UAT) acceptance rate that enabled the design to proceed to full implementation [17]. Their research identified typography legibility (minimum font size of 14sp for mobile), color contrast compliance with WCAG AA standards, and linear navigation consistency as the three UI factors most strongly associated with user satisfaction across age groups findings directly applicable to the RKWK context given the community's mobile-dominant access pattern (66,7% smartphone usage) and broad age distribution [21]. The User-Centered Design (UCD) methodology was applied to the design of a laboratory management application (Lab Me), documenting the iterative refinement process from low-fidelity wireframes through high-fidelity prototypes within Figma, which ultimately reported a final User Acceptance Testing (UAT) score of 84,2%, placing it in the 'Very Good' category [7]. Their research demonstrated that the systematic transition from wireframe to high-fidelity prototype with user review at the wireframe stage before visual design investment substantially improved design alignment with user mental models compared to direct high-fidelity development. This two-stage prototyping approach informs the methodology employed in the present research.

UI/UX prototyping for e-commerce applications was examined using the User-Centered Design (UCD) approach, contributing methodological documentation of the iterative evaluation process that enables UCD to progressively refine designs toward higher user acceptance [11]. Their comparative analysis of low-fidelity and high-fidelity prototype evaluation outcomes demonstrated that early-stage wireframe review captures architectural and navigational issues more efficiently than late-stage high-fidelity testing, supporting the prioritization of participatory wireframe validation in the four-phase UCD approach used in this research.

1.3.3 Discussion Forum Systems and Knowledge Management in Community Contexts

Online discussion forums have been extensively studied as knowledge management systems and community cohesion mechanisms. The effectiveness of a well-structured information architecture in the

design of discussion forums was demonstrated, specifically showing improvements in user orientation and a reduction in navigation errors [1], furthermore, it was established that the implementation of consistent UI/UX design principles particularly visual hierarchy, typographic clarity, and responsive layout significantly improves user satisfaction and task completion efficiency within web-based information platforms [4].

From a community engagement perspective, the role of User-Centered Design (UCD) in community marketplace platform development was examined, identifying three design dimensions most strongly associated with sustained user participation: the relevance of topic categorization to actual community workflows, the clarity of notification and response mechanisms, and visual consistency that reduces cognitive load during repeated interactions [12]. These findings are directly applicable to the RKWK discussion forum context, where the diversity of programmatic activities (literacy, literature, social welfare, PKBM) necessitates a categorization taxonomy that accurately reflects community information structures.

Online discussion forums used as knowledge preservation systems exhibit specific design requirements that differ from real-time communication tools. Patterns of knowledge accumulation and retrieval within asynchronous online discussion environments used for professional learning were documented, establishing that effective archiving and search functionality serve as stronger predictors of long-term platform utility than content volume [3]. Their research supports the design prioritization of search functionality and archiving completeness in the RKWK forum application areas that the UAT evaluation results in this study subsequently identify as requiring the most design refinement.

1.3.4 User Acceptance Testing (UAT) in UI/UX Evaluation

User Acceptance Testing (UAT) is a structured evaluation methodology in which end users assess whether a system meets their requirements and expectations within representative usage scenarios [15]. In UI/UX evaluation contexts, UAT integrates subjective satisfaction assessments with behavioral task performance, providing a holistic picture of design quality that neither metric category can deliver independently. Likert scale-based UAT instruments are particularly appropriate for community platform evaluation because they accommodate diverse levels of technical articulacy among participants while generating quantifiable acceptance metrics suitable for comparative analysis [22].

A structured User Acceptance Testing (UAT) was applied to evaluate a web-based community information system prototype within an Indonesian context, utilizing a five-point Likert scale across six evaluation dimensions and reporting results consistent with the established interpretation framework, which ranges from 0-20% (Very Poor) to 81-100% (Very Good) [16]. Their study demonstrates that well-designed UAT instruments can identify specific design dimensions requiring refinement particularly search functionality and notification responsiveness at a level of granularity that informs targeted design iteration rather than requiring comprehensive redesign.

The System Usability Scale (SUS), developed by Brooke [23], provides a standardized ten-item usability assessment instrument widely used in Indonesian UI/UX research as a complement to or benchmark for custom UAT instruments. It was demonstrated that prototype-based System Usability Scale (SUS) evaluation specifically through Figma prototype testing provides reliable predictions of live system usability, thereby validating the use of high-fidelity prototype testing as a methodologically sound proxy for live system evaluation [23]. This finding supports the prototype-based UAT approach employed in this research and establishes the generalizability of UAT results obtained from Figma prototype evaluation to anticipated live system performance.

1.4 Proposed Approach and Solution

This research proposes the design of a web-based discussion forum application for the RKWK community using an iterative four-phase User-Centered Design (UCD) methodology, with prototype validation through structured User Acceptance Testing (UAT). The proposed approach is distinguished from generic forum deployment or technology-centric application development by its systematic integration of community-specific user characteristics, organizational workflows, and programmatic contexts throughout all design phases.

Phase 1 (User Requirements Identification) employs a multi-instrument data collection strategy combining structured interviews with eight key community stakeholders, questionnaire administration to 30 community members, and direct observation of existing communication workflows. This triangulated approach guards against the systematic biases inherent in any single data collection method and generates a comprehensive, validated requirements specification encompassing both functional requirements (features and behaviors the system must exhibit) and non-functional requirements (performance, accessibility, and aesthetic attributes) [19].

Phase 2 (Context Analysis and Requirements Specification) translates the Phase 1 requirements into analytical design artifacts: user personas representing archetypal RKWK community members across four identified role categories (founders, administrators, active volunteers, and PKBM students); user journey maps documenting the end-to-end interaction experience of each persona; and use case diagrams formalizing the functional interactions between user roles and system capabilities. These artifacts provide structured communication media for aligning design decisions with documented user realities and presenting design rationales to community stakeholders [14].

Phase 3 (Design Solution Formulation) proceeds through two levels of prototyping fidelity using Figma as the design tool. Low-fidelity wireframes establish information architecture, navigation flows, and page layouts without visual styling, enabling efficient stakeholder review and structural refinement before visual design investment. Following wireframe validation, high-fidelity prototypes incorporate the complete RKWK design system including the community-specific color palette (dark green #1B5E20 and golden yellow #F9A825), typographic specifications, iconography, interactive elements, and responsive layout configurations to provide a realistic representation of the intended user experience [17].

Phase 4 (Prototype Evaluation via UAT) evaluates the high-fidelity prototype through structured User Acceptance Testing involving 30 RKWK community members selected through purposive sampling based on active membership status, minimum age of 17 years, and baseline digital device experience. Participants assess six design dimensions interface navigation, aesthetics, topic creation ease, search functionality, system responsiveness, and overall satisfaction using a standardized five-point Likert scale instrument. UAT results are analyzed to produce percentage acceptance scores per dimension, identify design strengths, and generate prioritized refinement recommendations [7].

1.5 Research Innovation and Contribution

The primary innovation of this research lies in the development of a domain-specific UI/UX design framework for discussion forum applications in Taman Baca Masyarakat (TBM) community contexts. While prior research has addressed UCD methodology and discussion forum design independently, and while UCD applications in Indonesian community and educational platforms have been documented, no prior study has systematically addressed the intersection of these domains for literacy-based community organizations with the operational characteristics and stakeholder diversity represented by RKWK [2].

The conceptual contribution of this research encompasses three dimensions. First, the research demonstrates the applicability of multi-instrument, community-participatory UCD processes to the development of specialized communication infrastructure for grassroots literacy organizations extending the Indonesian UCD literature by documenting the methodological adaptations required when designing for heterogeneous user populations with strong organizational identity values that shape aesthetic preferences and feature prioritization [11].

Second, the research produces an empirically validated design system including identity-grounded color semantics, accessibility-optimized typography, and a community-programmatic information architecture that is transferable to analogous TBM digitalization initiatives across Indonesia. This transferability aligns with the Ministry of Education and Culture's TBM digitalization agenda and provides a practical design reference for community organizations seeking to establish structured digital communication infrastructure [5].

Third, the research contributes a custom UAT instrument validated across six evaluation dimensions in a community literacy platform context. This instrument, which incorporates community-specific acceptance criteria not captured by generic usability scales such as the SUS, provides a validated evaluation tool that future researchers and practitioners can adapt for comparable applications in Indonesian community organization contexts [18].

1.6 Research Objectives and Scope

The primary objective of this research is to design a validated web-based UI/UX prototype for a community discussion forum application tailored to the RKWK community and to evaluate the resulting design through structured UAT. This primary objective encompasses four specific sub-objectives:

(1) To identify the functional and non-functional requirements of RKWK community members and volunteers regarding a web-based discussion forum platform through a multi-instrument data collection process.

(2) To develop analytically grounded design artifacts user personas, user journey maps, and use case diagrams that translate identified requirements into structured design inputs aligned with UCD principles.

(3) To produce a high-fidelity interactive prototype of the RKWK discussion forum application using Figma, incorporating a community-specific design system reflecting RKWK organizational identity and accessibility requirements.
(4) To evaluate the prototype through structured UAT involving 30 RKWK community members, generating quantitative acceptance metrics and qualitative design refinement recommendations.

The research scope is strictly delimited to the UI/UX design and prototype evaluation phases. Technical implementation including backend architecture, database design, server infrastructure, and production deployment falls outside the scope of this study and constitutes the subject of subsequent research. Geographically, the scope encompasses the Rumah Kreatif Wadas Kelir (RKWK) community in Purwokerto, Central Java. Empirical data collection was systematically conducted from January to May 2026. This five-month timeframe was intentionally designated to capture a comprehensive baseline of community workflows and to accommodate the iterative nature of the User-Centered Design (UCD) methodology, allowing sufficient duration for longitudinal user requirement elicitation and subsequent high-fidelity prototype validation.

1.7 Organization of the Paper

The remainder of this paper is organized as follows. Section 2 presents the research methodology, detailing the four UCD phases, data collection instruments, analytical procedures, and UAT evaluation protocol. Section 3 presents the research results, encompassing user requirements identification findings, UI/UX prototype design outcomes, and UAT evaluation results across the six assessed dimensions. Section 4 provides a discussion of findings in relation to the existing literature and addresses the research objectives. Section 5 presents the research conclusions, summarizes contributions, and outlines recommendations for future research and the pathway toward full-scale implementation.

2. Research Method

This study employs an applied research approach utilizing the iterative User-Centered Design (UCD) methodology. The empirical investigation was conducted at the Rumah Kreatif Wadas Kelir (RKWK) community in Purwokerto, Central Java, spanning from January to May 2026. Established as a community-based organization dedicated to socio-educational development, literacy advancement, and public empowerment, RKWK operates various institutional multi-stakeholder activities, including the *Pusat Kegiatan Belajar Masyarakat* (PKBM) non-formal education program, community library (*Taman Bacaan Masyarakat*), and independent tutoring services (*Bimbingan Belajar*). Given the intricate workflows and diverse user roles within this community setting ranging from organizational founders, administrators, and educational volunteers to non-formal students the UCD methodology is meticulously implemented to systematically capture, define, and evaluate specific digital requirements. The complete structural and operational execution of this collaborative design lifecycle is illustrated in the comprehensive research methodology workflow in Figure 1.

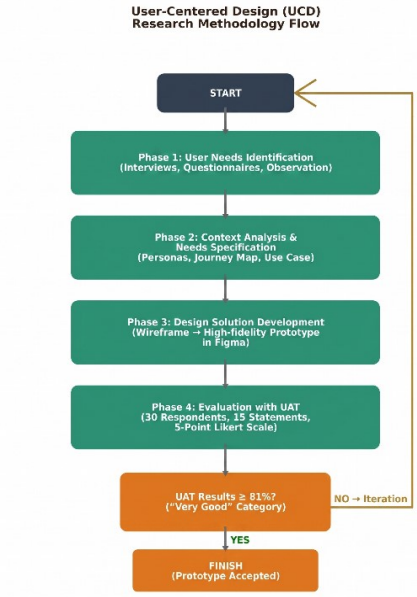

Figure 1. Flowchart of Research Flow with UCD Method

Based on the workflow illustrated in Figure 1, this research comprises four primary phases, which are detailed as follows:

2.1 Phase 1: User Requirements Identification

This phase involved primary data collection conducted through three main instruments: (1) structured interviews with eight key members of the RKWK community representing distinct operational roles specifically founders, administrators, active volunteers, and non-formal education students enrolled in the *Pusat Kegiatan Belajar Masyarakat* (commonly referred to as the PKBM program); (2) an online questionnaire distributed to 30 community members to evaluate their technology usage habits, feature requirements, and design preferences; and (3) direct observation of the ongoing communication and coordination processes within the community ecosystem. The primary output of this phase is a validated repository of functional and non-functional requirement specifications.

This multi-instrument triangulation approach is consistent with methodologies validated across community-facing UCD research in Indonesia. It was demonstrated that combining interview-based and questionnaire-based data collection within User-Centered Design (UCD) processes for organizational applications produces requirement specifications with significantly higher completeness and stakeholder alignment compared to single-instrument approaches [24]. Furthermore, it was confirmed that integrating observational data alongside structured interviews is particularly critical when designing for heterogeneous user populations such as the Rumah Kreatif Wadas Kelir (RKWK) community's configuration of founders, volunteers, administrators, and *Pusat Kegiatan Belajar Masyarakat* (PKBM) students as this approach captures tacit workflow patterns that neither interviews nor questionnaires alone reliably surface [25].

2.2 Phase 2: Context Analysis and Requirements Specification

The data obtained in Phase 1 was analyzed to generate initial design artifacts, including: (1) user personas that represent the characteristics, goals, and frustrations of typical users; (2) user journey maps that delineate the user experience in utilizing the discussion forum from end to end; and (3) use case diagrams that define the interactions between users and the system. This process ensures that the subsequent design is grounded in actual user needs rather than designer assumptions. The construction of user personas and user journey maps as primary design mediation artifacts is well-supported in the UCD literature. It was established that persona-based design artifacts grounded in empirical user research reduce the frequency of navigational redesign during prototype testing by providing a stable reference for evaluating design decisions against documented user characteristics [16]. In the specific context of community organizations with multi-role user structures analogous to Rumah Kreatif Wadas Kelir (RKWK) revealed that user journey maps developed through participatory analysis with community members identified an average of three to five critical interaction pain points per session that remained undetected during stakeholder interviews alone, thereby underscoring the analytical value of journey mapping as a complement to traditional requirement elicitation instruments [26].

2.3 Phase 3: Design Solution Formulation

The design phase commenced with the creation of low-fidelity wireframes using Figma to define the information architecture and page layouts without incorporating visual styling. These wireframes were subsequently reviewed alongside user representatives to validate navigation flows and feature completeness. Following wireframe validation, development proceeded to the high-fidelity prototyping stage, which involved the application of color systems, typography, iconography, and interactive elements. This two-stage prototyping approach low-fidelity wireframe followed by high-fidelity prototype reflects a methodological best practice documented in recent Indonesian UI/UX research. It was demonstrated that wireframe reviews conducted with user representatives prior to high-fidelity development substantially reduce late-stage redesign costs, as structural and navigational deficiencies are significantly less expensive to correct at the wireframe stage than after visual design investments have been finalized [13]. This finding was corroborated within a community application context, which reported that structured wireframe evaluation sessions identified navigation architecture issues with greater efficiency than post-prototype testing, thereby supporting the sequenced prototyping fidelity adopted in this research [27].

The high-fidelity prototype encompasses the following core pages: (a) a home page featuring a community activity summary, (b) a topic list page categorized by themes (Literacy & Books, Community Activities, Literary Forum, Volunteer Space, and PKBM Forum), (c) a discussion detail page, (d) a new topic creation page, (e) a user profile page, and (f) a search functionality page. Figure 2 displays the home page wireframe, while Figures 3 through 7 present the wireframes for the remaining pages of the RKWK discussion forum application. The responsive layout configuration applied across all prototype pages accommodates the community's 66,7% smartphone access rate and adheres to the mobile-first design

guidelines documented [28], who established that UI/UX prototypes designed with explicit mobile-first layout constraints achieve higher user satisfaction scores among communities where smartphone access exceeds 60% of the user base a threshold directly met by the RKWK community profile.

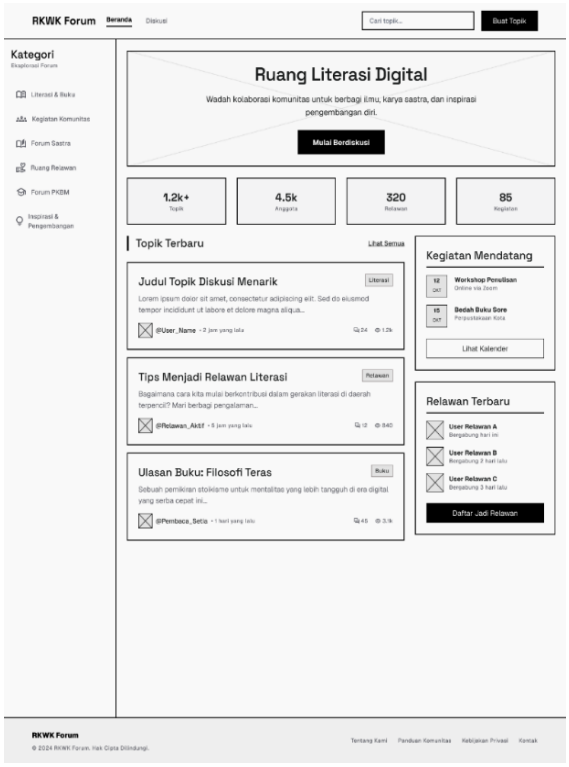

Figure 2. Wireframe of the RKWK Community Discussion Forum Home Page

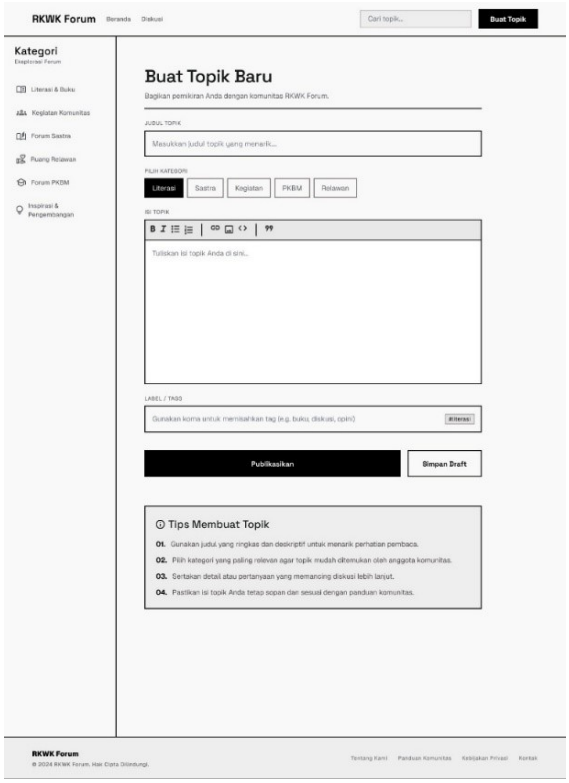

Figure 3. Wireframe of the Create New Topic Page of the RKWK Community Discussion Forum

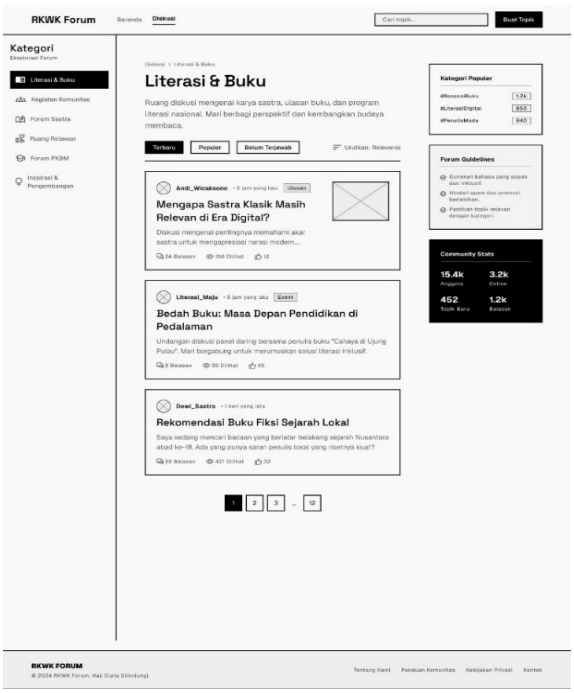

Figure 4. Wireframe of the RKWK Community Discussion Forum Topic List Page

The wireframe presents the topic list interface, displaying discussion categories, topic titles, authors, activity indicators, and search functionality. The layout is designed to improve content organization, simplify topic discovery, and provide intuitive navigation, enabling community members to efficiently access and participate in relevant discussions.

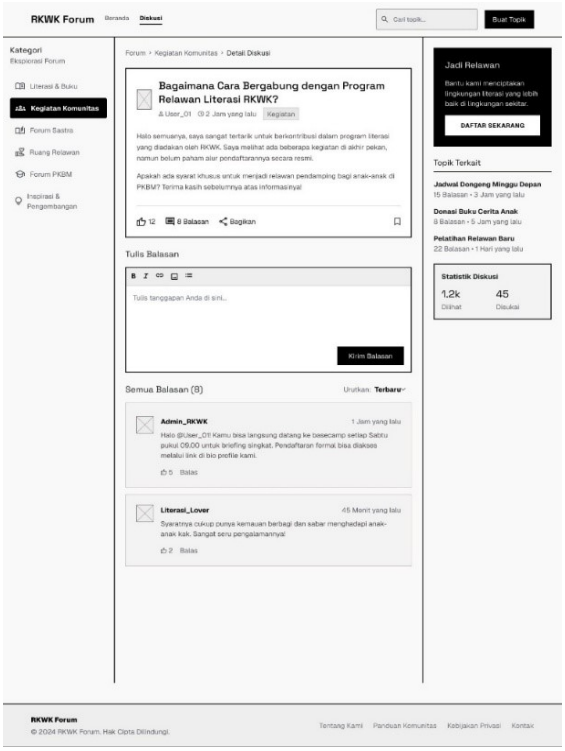

Figure 5. Wireframe of the RKWK Community Discussion Forum Discussion Detail Page

The wireframe illustrates the discussion detail interface, displaying the original post, threaded replies, participant information, and interaction features. It emphasizes a clear content hierarchy, intuitive navigation, and user-friendly layout to support effective communication, collaboration, and knowledge sharing within the RKWK community.

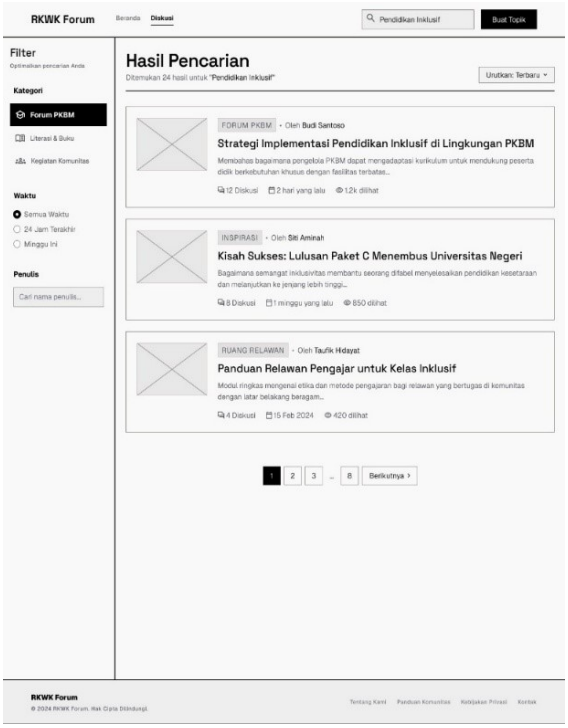

Figure 6. Wireframe of the RKWK Community Discussion Forum Search Page

The wireframe illustrates the search interface, featuring a search bar, filtered results, and categorized discussion topics. The design supports efficient information retrieval by enabling users to quickly locate relevant discussions, improving content accessibility, navigation, and overall usability within the RKWK community discussion forum.

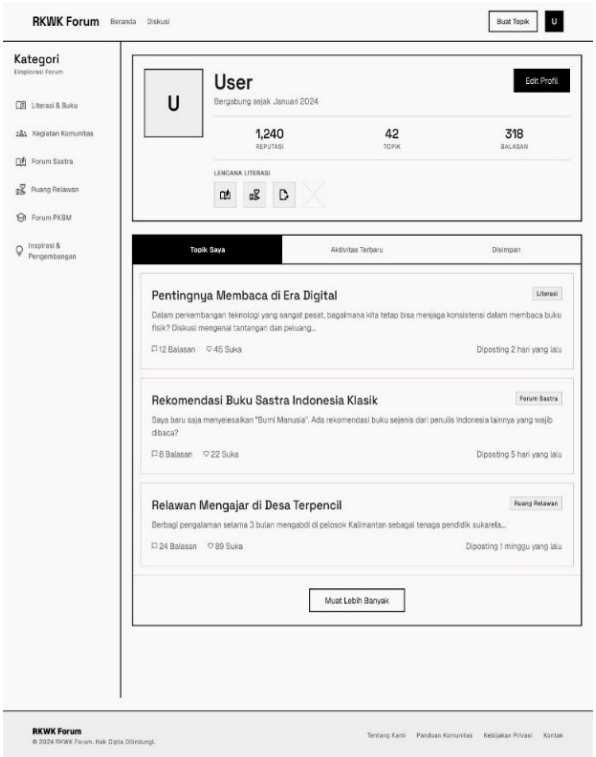

Figure 7. Wireframe of the RKWK Community Discussion Forum User Profile Page

The wireframe presents the user profile interface, displaying personal information, discussion activity, contribution history, and account settings. The layout is designed to provide easy access to user data,

encourage community participation, and support personalized interaction through a clear, organized, and user-friendly interface.

2.4 Phase 4: Evaluation via UAT

The prototype evaluation was conducted through User Acceptance Testing (UAT) involving 30 respondents from the RKWK community. Respondent selection utilized a purposive sampling technique based on the following criteria: (1) being an active member of the RKWK community; (2) being at least 17 years of age; and (3) possessing at least basic experience in operating smartphones or computers. The UAT instrument comprised 15 statements categorized into six evaluation aspects, utilizing a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). The selection of a five-point Likert scale instrument covering both functional and experiential evaluation dimensions is consistent with established UAT methodology for community platform evaluation in the Indonesian context. [29] validated that percentage-based Likert scoring across functional and experiential dimensions reliably captures the acceptance thresholds relevant to community-facing applications, and that the combined assessment of task-specific dimensions alongside overall satisfaction produces more actionable design refinement priorities than either category alone. [30] additionally confirmed that structured usability evaluation instruments applied to high-fidelity Figma prototypes yield acceptance scores that predict live system usability with sufficient reliability to justify prototype-based evaluation as the primary acceptance testing modality supporting the methodological validity of the UAT approach adopted in this research. The conversion of UAT scores into percentages was calculated using the following formula:

$$Percentage\ (\%) = \frac{\Sigma\ Actual\ Score}{\Sigma\ Maximum\ Score} \times 100\% \quad (1)$$

The interpretation criteria for the UAT scores refer to the benchmarks presented in Table 1 below.

Table 1. UAT Score Interpretation Criteria

Score Range (%)	Category	Description / Interpretation
0 – 20	Very Poor	Unacceptable
21 – 40	Poor	Requires substantial improvement
41 – 60	Fair	Acceptable with revisions
61 – 80	Good	Acceptable
81 – 100	Very Good	Fully accepted by users

3. Result and Discussion

3.1. Results of User Requirements Identification

The results of the interviews and questionnaires revealed several critical findings regarding the needs of the RKWK community users. A large majority of respondents (76,7%) had never previously utilized a structured online discussion forum platform; however, 90% expressed interest in using one, provided the interface is easy to comprehend. The most highly requested features were, in order of priority: (1) topic categorization based on community programs such as literacy, literature, and PKBM activities (93,3%); (2) the capability to upload photos and documents (86,7%); (3) notifications for discussion replies (80%); (4) a topic search functionality (76,7%); and (5) user profiles highlighting contributions within the community (70%).

In terms of user characteristics, 66,7% of respondents access the internet via smartphones, indicating that the design must prioritize a responsive layout and rapid loading performance. The dominant age group was 17–24 years old (43,3%), followed by 25-34 years old (36,7%), and individuals over 35 years old (20%). This relatively young age profile aligns with the composition of RKWK's active volunteers. These findings imply that the design must incorporate excellent text readability, simplistic navigation, and intuitive icons relevant to literacy activities.

3.2. UI/UX Prototype Design Results

Based on the requirements analysis, a high-fidelity prototype of the RKWK discussion forum application was designed, encompassing six core pages (Figures 8 through 13). The developed design system

utilizes a primary color palette of dark green (#1B5E20) and golden yellow (#F9A825), which represent the identity and literacy spirit of the RKWK community, combined with white (#FFFFFF) as the primary background to maximize legibility. The typography employs a combination of Poppins for headings and Inter for body text, with a minimum size of 14sp for mobile devices.

The design principles applied follow Google's Material Design guidelines, which were adapted for a literacy-based community context. These include: (a) visual consistency across pages to reduce user cognitive load; (b) a clear visual hierarchy to guide user attention; (c) distinct visual feedback for every user action; and (d) a responsive layout to support various screen dimensions. The implementation of these principles aligns with the usability standards recommended for User-Centered Design (UCD) interface frameworks [31].

The home page is structured with a three-column layout consisting of: a left sidebar for category navigation and community statistics, a main content area displaying the latest discussion list, and a header area containing global navigation and search functionality. Each discussion item displays the title, author's name, timestamp, category, as well as the number of replies and views.

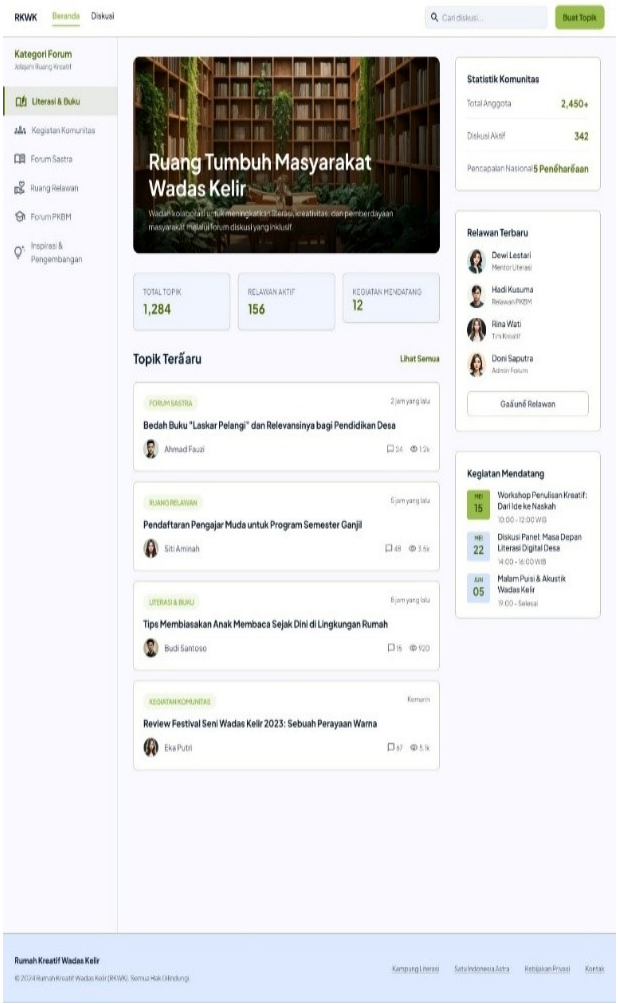

Figure 8. High-Fidelity Prototype Home Page of the RKWK Community Discussion Forum

The High-Fidelity Prototype Home Page of the RKWK Community Discussion Forum presents the main interface designed to provide an intuitive and engaging user experience. The homepage features a clean layout with a prominent navigation menu, discussion categories, recent topics, and quick access to community activities. A consistent visual identity is established through the use of RKWK's dark green and golden yellow color palette, while readable typography enhances accessibility. The interface prioritizes ease of navigation and content discovery, enabling users to efficiently explore discussions, access relevant information, and participate in knowledge sharing, thereby supporting collaboration and communication across the RKWK community.

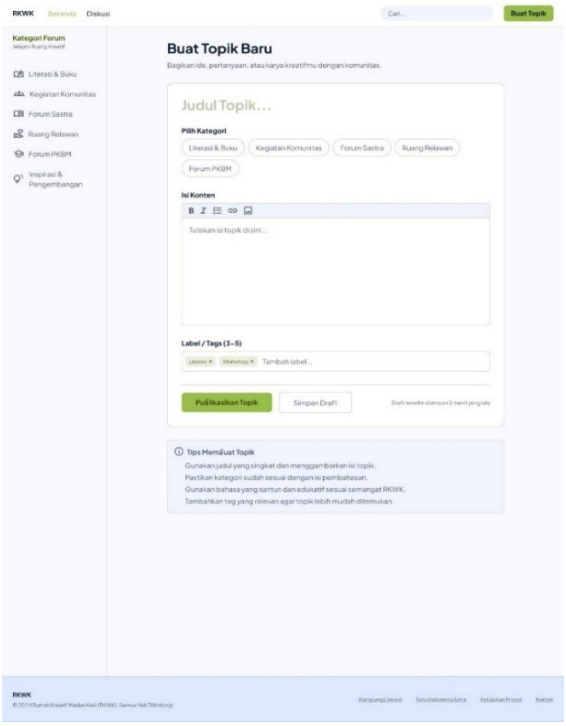

Figure 9. High-Fidelity Prototype of the Create New Topic Page of the RKWK Community Discussion Forum

High-Fidelity Prototype of the Create New Topic Page of the RKWK Community Discussion Forum. *The interface enables users to create new discussion topics through a simple, organized form with intuitive input fields and category selection*

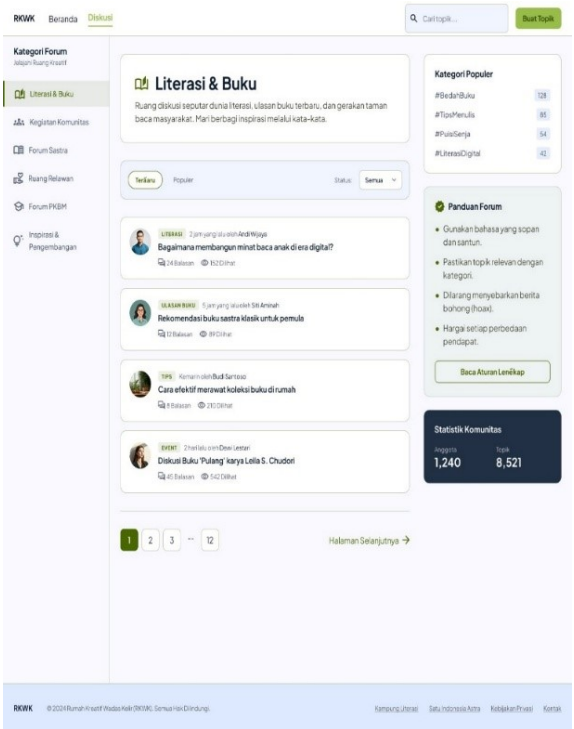

Figure 10. High-Fidelity Prototype of the RKWK Community Discussion Forum Topic List Page

High-Fidelity Prototype of the RKWK Community Discussion Forum Topic List Page. The interface displays categorized discussion topics with clear titles, authors, activity indicators, and search functionality. Its organized layout enhances content discoverability, simplifies navigation, and enables users to quickly identify, access, and participate in relevant discussions, supporting effective collaboration and knowledge sharing within the RKWK community.

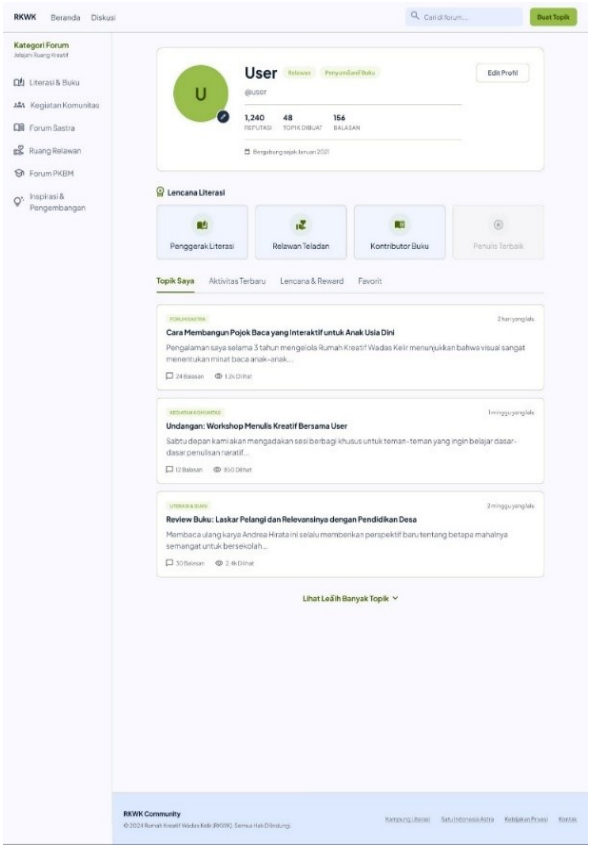

Figure 11. High-Fidelity Prototype of the RKWK Community Discussion Forum User Profile Page

High-Fidelity Prototype of the RKWK Community Discussion Forum User Profile Page. The interface presents user information, discussion history, contribution statistics, and account management features in a structured layout. The design supports personalized interaction, improves accessibility to user activities, and encourages active participation by providing an organized and visually consistent profile experience within the RKWK community discussion forum.

3.3. Results of User Acceptance Testing (UAT)

The UAT evaluation was conducted over a two-day period, involving 30 respondents from the RKWK community. Each respondent was requested to explore the prototype independently for 15 minutes before completing the UAT questionnaire. Table 2 presents the recapitulation of the UAT results categorized by each evaluation aspect.

Table 2. Recapitulation of UAT Results

No	Evaluation Aspect	Actual Score	Max Score	Percentage (%)
1	Ease of interface navigation	396	450	88,0%
2	Interface appearance (aesthetics)	387	450	86,0%
3	Ease of creating discussion topics	374	450	83,1%
4	Topic search functionality	360	450	80,0%
5	System response speed	383	450	85,1%
6	Overall usage satisfaction	387	450	86,0%
Average		**2,287**	**2,700**	**84,6%**

Based on Table 2 and Figure 14, the UAT results demonstrate that the average user acceptance rate for the RKWK discussion forum prototype is 84,6%. According to the UAT score interpretation criteria, this value falls within the 81-100% range, which is categorized as “Very Good”. The aspect of ease of navigation achieved the highest score (88,0%), indicating that the designed information architecture and navigation layout successfully accommodated the mental models of the RKWK community users. Conversely, the topic search functionality aspect received the lowest score (80,0%), suggesting a need to enhance the filtering and auto-suggest features in subsequent design iterations.

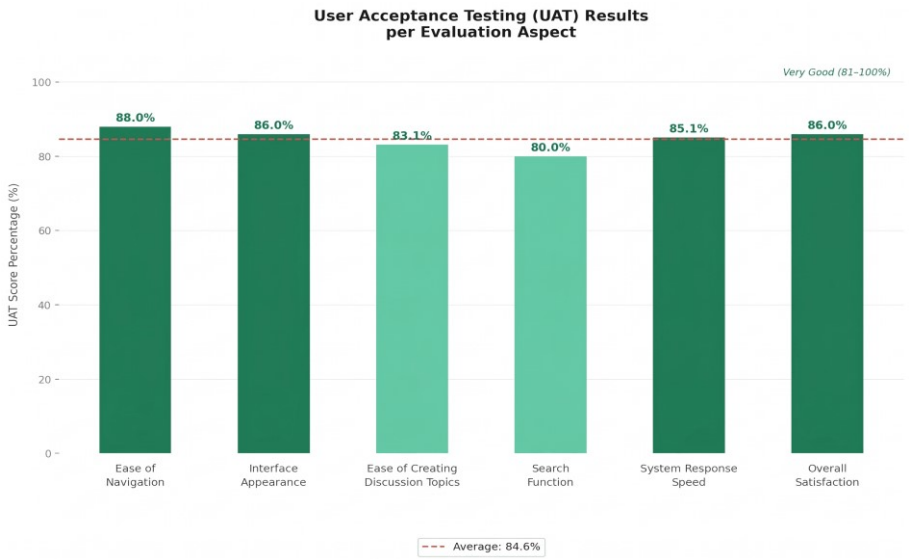

Figure 12. UAT Test Results Diagram per Aspect

These findings align with previous empirical evidence demonstrating that the consistent application of the User-Centered Design (UCD) methodology yields a significant increase in usability scores compared to non-user-centric designs [32]. Furthermore, prior research confirms that web-based platforms developed by systematically accounting for the specific requirements of their users achieve User Acceptance Testing (UAT) scores within the "Very Good" category, thereby mirroring the outcomes of the present study [33].

3.4. Discussion

The implementation of the UCD method in this study has proven effective in generating a design that is highly responsive to the requirements of the RKWK community users. Involving users from the initial requirements identification phase allowed the design team to obtain authentic insights regarding communication patterns, visual preferences, and the technical constraints faced by users. This is consistent with previous findings establishing that an in-depth user journey analysis contributes significantly to the overall quality of the user experience within digital products [14]. In the context of RKWK, a profound understanding of how volunteers and members interact with community activity information served as the foundation for a relevant and well-targeted design.

One of the primary challenges encountered in this research was the heterogeneity of the RKWK user profiles, which comprise young volunteers, administrators, and community members with diverse age ranges and digital literacy backgrounds. To accommodate this diversity, universal design principles were applied specifically, developing a design that can be utilized by all individuals to the greatest extent possible without requiring special adaptation or specialized configurations. Concretely, this was manifested through: the use of large font sizes (minimum 16px for body content), text-labeled iconography, linear and consistent navigation flows, and a color palette with contrast ratios that satisfy WCAG AA standards.

The finding that the topic search functionality received the lowest score (80%) highlights opportunities for refinement in subsequent design iterations. Based on respondent feedback during the UAT sessions, users requested filtering features based on category, timeframe, and author, alongside an auto-complete feature within the search bar. These enhancements will be prioritized in the next UCD cycle prior to full-scale application implementation.

4. Conclusion

This study has successfully designed the UI/UX for a web-based RKWK community discussion forum application utilizing the User-Centered Design (UCD) method, which encompassed four phases: user requirements identification, context analysis and requirements specification, design solution formulation, and evaluation via UAT. Several conclusions drawn from this study are as follows:

1. The identification of user requirements through interviews, questionnaires, and observation successfully revealed the RKWK user profiles and priority features required, namely: topic categorization based on community programs (literacy, literature, and PKBM), media upload capabilities, reply notifications, and topic search functionality.

2. The high-fidelity prototype developed using Figma encompasses six core pages driven by a consistent design system, utilizing a color palette that represents the identity and literacy spirit of the RKWK community, highly legible typography, and intuitive navigation.
3. The results of the UAT evaluation involving 30 respondents from the RKWK community demonstrated an average acceptance score of 84,6%, which is categorized as "Very Good", proving that the designed prototype is highly acceptable and fulfills user requirements. This result is consistent with findings reported across comparable UCD studies in Indonesian community application contexts. High User Acceptance Testing (UAT) acceptance rates exceeding 80% for User-Centered Design (UCD) prototypes serving Indonesian organizational communities were previously reported in [24], [26]. These studies attributed the "Very Good" categorization specifically to structured persona-based and journey-mapping design phases that ensured feature relevance and navigational intuitiveness; notably, these identical design phases yielded the highest-scoring dimension ease of navigation at 88,0% in the present study.
4. The aspect that requires enhancement in the next design iteration is the topic search functionality (80,0%), specifically through the addition of advanced filtering and auto-complete features. This refinement priority is empirically grounded in broader findings on search functionality in community information systems. It was identified that search and filtering functionalities represent the most consistently under-designed feature dimensions within first-iteration User-Centered Design (UCD) prototypes for multi-stakeholder information platforms; consequently, it was recommended that faceted filtering by category, timeframe, and contributor integrated with auto-complete indexing be prioritized as the highest-value enhancement in the subsequent UCD iteration cycle [25]. These recommendations directly inform the search functionality improvements to be prioritized in the subsequent design phase of the RKWK forum application.

This research contributes a UI/UX design model for a community discussion forum application tailored to Community Literacy Organizations (Taman Baca Masyarakat), which can serve as a reference for designing similar platforms in other literacy and community empowerment organizations. For future research, it is recommended to implement the prototype into a fully operational application and to conduct a comparative evaluation using both the System Usability Scale (SUS) and the custom UAT instrument employed in this study. Prior research demonstrated that System Usability Scale (SUS) and domain-specific User Acceptance Testing (UAT) instruments capture complementary dimensions of usability, with the SUS providing standardized cross-study benchmarking and custom instruments capturing community-specific acceptance criteria. Furthermore, it was established that the combined application of these methodologies yields more actionable design refinement findings than the utilization of either instrument in isolation [27, 28]. The empirical value of the Rumah Kreatif Wadas Kelir (RKWK) discussion forum as a structured knowledge management platform for community literacy organizations is further supported by previous evidence [3]. This prior study on online discussion forums within community learning contexts established that purpose-built asynchronous discussion platforms significantly outperform informal messaging channels regarding knowledge preservation, member engagement sustainability, and institutional memory retention outcomes that the RKWK forum application is explicitly engineered to deliver and that future longitudinal evaluations should quantitatively assess.

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