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**SOFTWARE PROJECT MANAGEMENT**

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**REPORT- TOPIC ANALYSIS AND SYNTHESIS**

**Topic 106: Getting users involved as early as possible.**

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GitHub Link: [https://github.com/sanketshinde07/SOEN\\_6841\\_TAS.git](https://github.com/sanketshinde07/SOEN_6841_TAS.git)

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**Abstract:**

Producing meaningful and usable software that meets the end users' needs is the goal of every software development process. To achieve this, there is a need for involving end users into the software development process in a collaborative way. This research delves into the critical significance of early user involvement in software development projects, challenging the conventional approach of gathering requirements in secrecy. The traditional method, characterized by developing software behind closed doors, has proven ineffective, often leading to misalignments with user expectations and costly modifications post-project completion. Recognizing the drawbacks of this approach, the study advocates for the early engagement of users to proactively identify and address issues in the developmental stages. The research emphasizes the multifaceted benefits of this approach, including heightened project success rates, reduced costs associated with late changes, and elevated levels of user satisfaction. Recommendations for project managers are provided to facilitate effective user involvement, aligning development practices with a more collaborative and user-centric paradigm.

**Keywords:** Early User Involvement, Software Development projects, User Requirements, Project Success Rates, Cost Reduction, User Satisfaction, Collaborative Development, Proactive Issue Identification.

## **1 Introduction:**

### **1.1 Motivation:**

Consider the process of creating a mobile banking app—the traditional approach involved developers working in secret and surprising users with the finished product. However, this often resulted in confusion and missing essential features. Now, envision a different scenario where users are engaged from the start, offering insights during design and testing. This exploration delves into the concept that early user involvement can prevent issues and lead to an app that's user-friendly, efficient, and tailored to people's banking needs. Motivated by the recognition that past practices had shortcomings, the investigation advocates for a shift towards a collaborative model in software development. Understanding the crucial role of early user involvement is the key focus, aiming to contribute to a paradigm where software solutions not only function but enhance the user experience by addressing specific needs and preferences.

## **1.2 Problem Statement:**

The problem at the core of this investigation lies in the historical secrecy surrounding software development, where user requirements were gathered discreetly, resulting in a mismatch between user expectations and the final product. The unveiling often fell short of eliciting the desired reactions from users, and late-identified changes incurred high costs and delays, impacting project timelines and budgets.

## **1.3 Objectives:**

The objectives of this research are to redefine software development through early and continuous user involvement, fostering a paradigm shift that prioritizes user satisfaction. By emphasizing the importance of identifying and addressing issues in the initial stages, the investigation aims to optimize project efficiency, showcasing how early user involvement minimizes recoding and retesting efforts, contributing to streamlined timelines. Additionally, the focus is on mitigating costs by demonstrating the economic advantages of early issue resolution, relieving the financial burden associated with post-development revisions and maintaining cost baselines. The investigation also aims to facilitate user-centric decision-making, utilizing real-world examples to underscore the significance of considering user interactions and avoiding disruptions to workflow caused by seemingly minor programming decisions. Ultimately, the investigation seeks to benefit a spectrum of stakeholders, including developers gaining insights into user needs, project managers benefiting from more efficient timelines, and end-users enjoying software that aligns closely with their expectations.

## **2 Background:**

In the historical evolution of software development, a distinct contrast arises between conventional, secretive approaches and the contemporary trend towards more inclusive and user-centric methodologies. Historically, projects were characterized by secrecy, involving discreet gathering of user requirements and concealed development processes. This conventional method often resulted in a gap between user expectations and the final software product, leading to dissatisfaction and usability issues. In response to these challenges, a paradigm shift has occurred, acknowledging the limitations of traditional practices. The current focus is on early and collaborative user involvement, recognizing the importance of identifying problems and enhancements in the initial stages. This shift also addresses the adverse effects of late changes on project timelines and costs, underscores the consequences of neglecting user-centric decision-making, and highlights the efficiency gains linked with proactive user involvement. Overall, this historical context lays the groundwork for investigating early user participation in software development, with the goal of bridging historical gaps and adapting methodologies to better align with user needs and expectations..

### **3 Methods and Methodology:**

In dealing with the issues of traditional software development, our method revolves around carefully looking at the move towards user-focused methods. Recognizing the limitations of the traditional approach, which often involves developing software in secrecy and revealing the final product to users, we prioritize a more inclusive and collaborative model. This shift acknowledges the critical importance of early user involvement in shaping a product that genuinely meets user needs and expectations. To implement this user-centric methodology, we employ a variety of techniques aimed at engaging users from the early stages of development.[1]

#### **3.1 Surveys and Questionnaires:**

1. Develop surveys or questionnaires to gather user preferences, expectations, and pain points.
2. Use online survey tools to reach a wide audience efficiently.
3. Include open-ended questions to capture qualitative insights.

#### **3.2 User Interviews:**

1. Conduct one-on-one interviews with representative users to delve deeper into their experiences and preferences.
2. Use open-ended questions to encourage users to express their thoughts freely.
3. Record and analyze interview responses for valuable insights.

#### **3.3 Focus Groups:**

1. Assemble small groups of users to facilitate group discussions.
2. Encourage participants to share their opinions, preferences, and potential improvements.

#### **3.4 Prototyping Workshops:**

1. Create prototypes or mock-ups of the product and involve users in hands-on workshops.
2. Allow users to interact with prototypes, providing real-time feedback on design elements.

### 3.5 Usability Testing:

1. Develop a prototype or early version of the product for usability testing.
2. Observe users as they interact with the product to identify usability issues.

### 3.6 Beta Testing Programs:

1. Release early versions of the product to a selected group of users for beta testing.
2. Collect feedback on functionality, performance, and user experience.

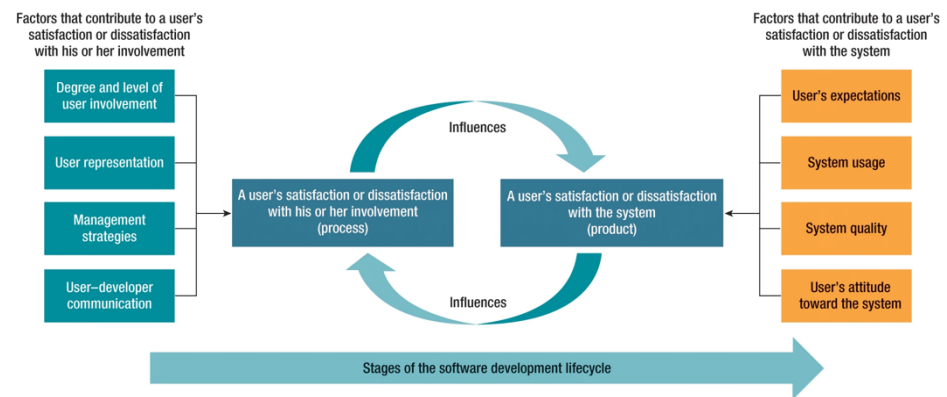


Fig. 1. Involvement of End Users in Software Development [15]

## 4 Results:

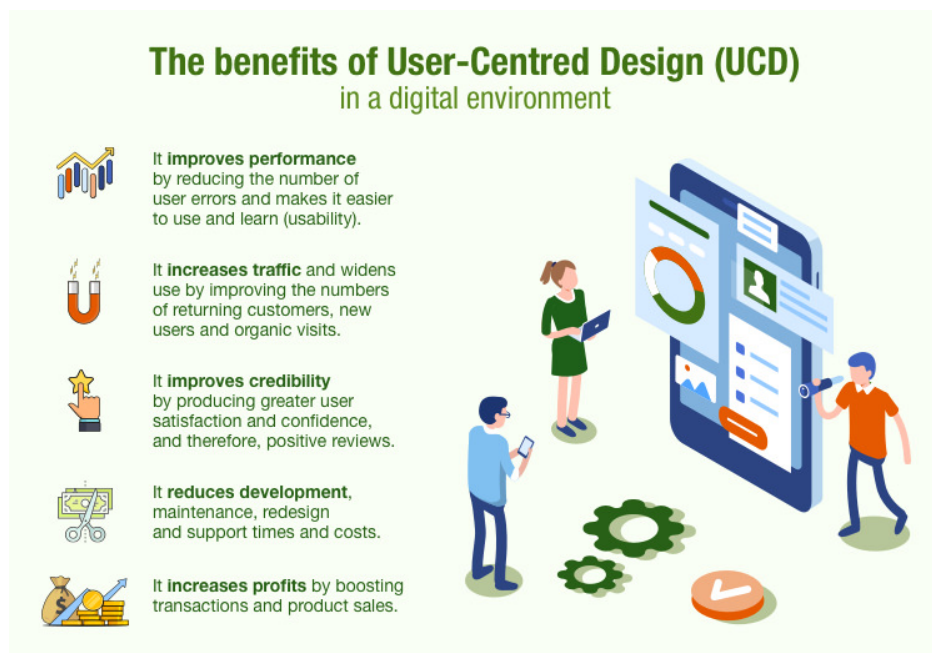
The obtained results underscore the significance of early user involvement in software development, particularly in contrast to traditional practices.

**Cost-Efficiency:** Early user engagement in development and design minimizes costs by pre-emptively addressing issues. User feedback aids in efficient adjustments, avoiding extensive rework and optimizing resource allocation, benefiting both designers and end-users.[13]

**Innovation Boost:** User involvement acts as a catalyst for innovation in development. By seeking user insights, designers understand audience needs, crafting standout products. Instagram's success exemplifies this, where user research identified a niche, leading to a revolutionary photo-sharing app and showcasing the power of involving users in the design process.

**Increased Performance:** In design and development, involving users allows real-world testing before launch. Pinpointing and rectifying issues enhances product reliability, speed, and usability. This proactive approach ensures positive user experiences, fostering satisfaction and brand loyalty. Prioritizing user feedback empowers designers to align product performance closely with user expectations.

**Informed Design Decisions:** User involvement in design is instrumental for informed decisions based on real user needs. Gathering feedback provides insights into effective and user-friendly design elements, elevating user satisfaction and contributing to a successful design.



**Fig. 2.** The benefits of User-Centered Design (UCD) [6]

## 5 Critical Thinking:

### 5.1 Issues/Challenges:

Challenges involved in transforming to user centered design,[4]

**Resistance to Change:** Transitioning to early user involvement faces resistance within development teams accustomed to traditional practices, requiring cultural shifts.

**Communication Barriers:** Effective communication between developers and users is crucial but challenging to establish and maintain.

**Cultural Adjustment:** Adapting to a user-centric paradigm demands a cultural shift within development teams, overcoming ingrained practices.

**Time-Consuming:** The UCD process, involving extensive user research, prototyping, and iterative testing, can be time-consuming. This may not align well with tight project schedules, especially in fast-paced industries.

**Implementation Costs:** Implementing UCD, with its focus on thorough user research and iterative testing, can incur higher upfront costs. This may be a challenge for projects with limited budgets.

### 5.2 Supporting Arguments:

The shift towards early user involvement is substantiated by compelling arguments:

**Enhanced User Satisfaction:** Early user involvement ensures that user expectations are considered from the start, leading to higher user satisfaction.

**Cost Reduction:** Identifying and resolving issues early significantly reduces costs, avoiding extensive rework and post-development revisions.

**Improved Project Efficiency:** Early user involvement minimizes recoding and re-testing efforts, improving project efficiency, and ensuring timely software delivery.

### 5.3 Empirical Evidence:

Empirical evidence substantiates the benefits of early user involvement:

**Comparative Analysis:** Comparative analyses between projects with early user engagement and those developed in secrecy offer empirical insights. Projects involving users early consistently demonstrate higher success rates, reduced costs, and increased user satisfaction compared to their traditionally developed counterparts.



**Economic Analysis:** Economic analyses quantifying the advantages of early issue identification and resolution provide empirical evidence of the financial implications. The cost-benefit analysis reveals tangible savings associated with proactive problem-solving in the developmental stages, supporting the argument for early user involvement in mitigating financial burden.

## 6 Conclusion:

In the discussed papers, involving users early in the software development process emerges as a fundamental element for achieving project success. This early engagement ensures a thorough understanding of user requirements and challenges, enabling developers to create solutions that better match user expectations. Establishing transparent communication channels facilitates a more effective exchange of ideas and the identification of subtle user needs.

Early user involvement significantly reduces the need for extensive post-development redesigns, as user feedback is incorporated during the development phase. This approach saves time, effort, and resources. Furthermore, engaging users at the outset fosters a sense of ownership and acknowledgment, leading to higher levels of user satisfaction with the final product. Aligning the software with user environments from the beginning increases the likelihood of product adoption and success. Collectively, the consensus across the papers emphasizes the pivotal role of early user involvement, enhancing product quality, relevance, and user acceptance while streamlining the development journey.

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## 8 Appendix:

Prompts used to take reference/help from ChatPdf, Perplexity and ChatGpt:

1. From your viewpoint, what underlies the background and imperative for engaging users early in the stages of project management?
2. In your perspective, what factors could inspire a study on the early integration of user input in software development?
3. What potential challenges might arise in the process of early user involvement?
4. What arguments can you present in support of these challenges based on your knowledge?
5. What can be the disadvantages of User centered Development?
6. From your understanding, how can effective communication channels be established and maintained between developers and users during the early stages of a project?