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USER INVOLVEMENT APPROACH IN AGILE SOFTWARE DEVELOPMENT: A SYSTEMATIC LITERATURE REVIEW

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Abstract:

This systematic literature review paper aims to identify and analyze the issues of managing users during requirement elicitation within agile software development (ASD) in the existing studies. The study employs a comprehensive search strategy to identify relevant articles published in peer-reviewed journals and conference proceedings. The findings reveal that the current literature focuses on various issues related to user involvement, communication, and collaboration during requirement elicitation. The paper identified 8 different issues related to managing users during requirement elicitation within ASD: user availability, lack of user involvement, long users' feedback loops, lack of user expertise, ineffective product owner, lack of user communication skills, lack of process regarding user involvement, and lack of motivation. By identifying these issues, practitioners can overcome the issues of user involvement during requirement elicitation within ASD, and resolve conflicts to ensure a successful requirement elicitation process. The paper concludes by identifying the gaps in the existing literature and suggesting future research directions to address these gaps. The research provides valuable insights into the issues of managing users during requirement elicitation within ASD.

Keywords:

User Involvement, Requirement Elicitation, Agile Software Development, Systematic Literature Review.

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Introduction

Agile software development has gained significant popularity over the years, and one of its core principles is user involvement. The idea is to involve users throughout the software development process and allows for continuous feedback to ensure that the resulting software product meets their requirements, and delivers value to the business (Tam, Jóia, et al., 2020). User involvement is a key aspect of agile software development.

User involvement begins from the initial stages of software development, where users are involved in creating user stories and developing the product backlog (N. Iivari, 2009).

User involvement is a critical success factor for a system to succeed, and in agile software development, this involvement is not limited to early phases of development but extends throughout the whole development process (Schön, Thomaschewski, et al., 2017). Involving users in the development process ensures that their requirements are understood, and their needs are addressed, which can lead to higher satisfaction with the final product.

Similarly, involving users throughout the development process allows the development team to get feedback on the product at regular intervals, ensuring that the final product meets their needs and expectations. This approach helps to reduce the risk of building a product that does not meet the user's requirements. Project risks are those risks that affect the project schedule or resources, as it facilitates the process of managing their needs which can result in costly rework or even project failure (Atkin & Skitmore, 2008). Compared to traditional approaches, where user involvement is limited to the initial stages of development, agile software development emphasizes ongoing collaboration and feedback from users throughout the development process.

For more than five decades, it has been proven that user involvement in software development can ensure the successful development of the system (Bano & Zowghi, 2015a). User involvement is closely related to the success of a software development project, so projects become more successful with higher user involvement. Project success is defined by time (i.e. within-time delivery), cost (i.e. within or under budget), and quality software (Ahimbisibwe et al., 2015).

Requirements are fundamental to the development of software products, and as a result, Requirements Engineering (RE) plays an important role. Unlike traditional RE approaches, which use a requirements specification document, Agile RE uses a prioritized list of requirements called the Product Backlog (Schön, Winter, et al., 2017). The different RE activities, including elicitation, documentation, validation, negotiation, and management, are not clearly separated in Agile RE. These activities are repeated each iteration; only the necessary information is elaborated before the next iteration begins.

According to Inayat et al. (2015) agile requirements engineering addresses the initial ambiguity of agile requirements not by adhering to documentation standards but by using methods such as face-to-face communication or prototyping. Grau et al. (2018) describe agile requirements engineering as collaborative, with just enough documentation, conducted just-in-time, and sustainable. Overall, user involvement is a crucial component of agile software development.

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The article presents the results of a Systematic Literature Review (SLR) focused on managing user involvement in requirement elicitation within agile software development.

The structure of the paper is as follows: Section 2, a brief background to the context of user involvement. Section 3 outlines our research objective and question, and describes our review method, including the search strategy, selection process, quality assessment, data extraction, and analysis. Section 4 summarizes the main findings of our study, providing an overview of the included studies and answers to our research question. Section 5 discusses the implications of our findings and the limitations of this study. Finally, Section 6 concludes and suggests directions for future work.

Background

Agile software development is a methodology that emphasizes collaboration and flexibility in the software development process. It places a strong emphasis on involving users throughout the development process to ensure that the resulting product meets their needs and expectations. However, managing user involvement in agile software development can be challenging as it requires a delicate balance between meeting user needs and maintaining project timelines and budgets (Buchan et al., 2017).

The effective management of user involvement in agile software development is essential for project success. For five decades, researchers have been interested in exploring the concept of positive user involvement and its relationship to system success (Ives et al., 2010).

Software development organizations face multiple challenges, such as new customer needs, market dynamics, integration, and technology innovation (Börjesson & Mathiassen, 2005). These challenges are driving software developers to adopt agile software development methodologies to improve their responsiveness to change and shorten delivery time (West et al., 2010).

Hoda et al. (2011) mentioned that agile methodology a high level of collaboration between the team and users, focusing on delivering software functionalities that provide business value in each increment. Most agile methods mandate user involvement in practices such as "*planning, prioritizing, reviewing, and providing feedback*".

However, achieving user involvement in Agile software development is not always easy and poses a constant challenge for software development teams (Larusdottir & Gulliksen, 2017). These challenges arise for various reasons (Bano & Zowghi, 2014).

Psychological reasons, such as a lack of user motivation who may not want to get involved (Doll et al., 1989) or the user's approach toward their work can lead to behavioral challenges (Barki & Hartwick, 1989; He & King, 2008).

Management circumstances, such as time constraints or lack of management support can also hinder user involvement (Harris et al., 2009).

Additionally, methodological reasons, such as identifying a product owner, can present wide-ranging challenges for software development teams (J. Iivari & Iivari, 2011).

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Cultural and political must also be considered (Bano & Zowghi, 2014). For example, this may be due to the implementation of new software that leads to changes in the work environment (Carayon and Technology, 2000).

Assuming that users are eager and capable of being involved during agile adoption is a challenge. Agile adaptation requires close collaboration between users and the development team for the ongoing success software development.

In agile software development, involving users throughout the development process in regular iterations can be challenging. Users who are impacted by the requirements or system changes may not be effectively involved. E.-M. Schön et al. (2017) reported from agile software development practitioners stated *"that in one of our projects, product owner does not know the real requirements of the user. Even early user interface (UI) prototypes were tested by the wrong users, which headed to risks of conflict and failure"*.

Therefore, it is worth reconsidering how software practitioners can involve users who may be reluctant and/or incapable of strict collaboration (Fabio et al., 2022).

Methodology

The systematic literature review was conducted following the appropriate guidelines, including the guidelines for Systematic Literature Reviews (SLRs) in Software Engineering by Kitchenham and Charters (Kitchenham & Charters, 2007). Our SLR consisted of three main phases. Fig. 1 illustrates the key stages of each phase. To effectively manage the extensive number of retrieved studies, we utilized Mendeley software and Excel sheets for efficient information management.

Figure 1: Phases of SLR

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Planning the Review

This review was planned by formulating research questions aligned with our research objective. The search strategy, search string, and inclusion/exclusion criteria were all explicitly defined. We provide a more detailed explanation of these components below:

Objective and Research Question

Our objective is to evaluate the existing body of literature on requirement engineering by investigating user involvement in agile software development. Accordingly, we formulated one research question (RQ) as follows:

RQ1: What are the issues of the existing studies on managing users during requirement elicitation?

Search Strategy

The systematic literature review was conducted in accordance with the appropriate guidelines for SLRs in Software Engineering by Kitchenham and Charters(Kitchenham and Charters (2007). To encompass a wide range of relevant publications, we opted to search the following well-known and extensively used electronic databases: Scopus, Web of Science, IEEE Xplore, Science Direct, and Springer Link. These databases were chosen due to the availability of high-quality research papers accessible through the UTM Library.

The papers were retrieved from electronic databases and further analysed to identify more additional relevant research through reference searches(snowballing). This complementary approach aimed to include valuable research papers that might have been overlooked. Subsequently, the inclusion and exclusion criteria were applied to the retrieved research papers in two separate rounds, as explained in section 4.

Search Criteria

The search criteria for this systematic literature review paper have three parts C1, C2, and C3, defined as follows:

- C1 is a search string composed of keywords connected to user involvement such as “user”, “involvement”, and “user involvement”.
- C2 is a search string composed of keywords connected to agile software development methods such as Scrum, XP (Extreme Programming), agility, and agile.
- C3 is a search string composed of keywords connected to requirement engineering, such as: “requirement”, “user story”, “feature”, and “requirement engineering”.

Eq. (1). Boolean expression search criteria

C1 AND C2 AND C3 (1)

From the research questions, we derived two primary search keywords used in the electronic databases: “user involvement”, and “Agile requirement engineering”. Based on these primary search keywords, we formulated the alternative keywords. By combining these keywords, we constructed the following search strings.

User involvement AND (Scrum OR XP OR agility OR agile) AND (“requirement engineering” OR “user story” OR “feature” OR “requirement engineering”).

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We manually constructed the search string for each database based by utilizing the search functionality provided by the respective database. We approached the search process for each database as a learning and experimental endeavour.

Inclusion and Exclusion Criteria

To decide whether or not a study should be included, the following inclusion and exclusion criteria were used: Inclusion criteria: (I1) research papers under peer review; (I2) the research papers published only in the English language; (I3) it is connected to the search keywords such as: "user", "involvement", "user involvement", Scrum, XP (Extreme Programming), agility, and agile, "requirement", "user story", "feature", and "requirement engineering"; (I4) empirical research paper or conference paper; (I5) the research papers published from 2012 to 2022 to retrieve the latest research papers in the field.

Exclusion criteria: (E1) research papers that were not focused on agile software development; (E2) research papers that do not discuss user involvement and requirement engineering in agile software development; (E3) research papers whose full text is not available; (E4) research papers which their findings already published; (E5) chapters, viewpoint, keynote, editorials, comments, tutorials, and presentations in slide formats without any associated research papers.

Conducting the Review

In this section, we demonstrate the results of our search and extraction of information from relevant sources and databases.

Study Search and Selection

By adopting the search strategy already explained in section 2, the selected electronic databases were searched, and we retrieved 2342 research papers in the first search, as shown in Table 1.

Table 1: Search Results

S/No	Database Name	Retrieved Results
1	Scopus	35
2	Web of Science	27
3	IEEE Xplore	10
4	Science Direct	2123
5	Springer Link	147
Total Retrieved Result		2342

Our research paper selection process has two rounds (round1. Title scanning and round2. Abstract scanning). In the title scanning round, we scan for the pre-defined search string composed of keywords in the title and select those titles which include the predefined search string composed of keywords and exclude all other research papers from the selection process. After the title scanning round, we included 133 research papers from the first round, shown in Table 2.

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Table 2: Summary of Title Scanning Round

S/No	Database Name	Title Scanning Results
1	Scopus	17
2	Web of Science	11
3	IEEE Xplore	03
4	Science Direct	81
5	Springer Link	21
Total Title Scanned Result		133

In the second round, the "abstract scanning round ", 133 research papers' abstracts were studied for the pre-defined search string composed of keywords that are already explained in section 3. i.e., “user involvement”, “requirement engineering”, and “agile software development”. The final number of research papers we retrieved after scanning the abstract of each research paper and removing duplicates and irrelevant research papers from our search is 24 shown in Table 3.

Table 3: Summary of Abstract scanning Round

S/No	Database Name	Abstract Scanning Results
1	Scopus	04
2	Web of Science	06
3	IEEE Xplore	02
4	Science Direct	09
5	Springer Link	03
Total Abstract Scanned Result		24

Quality Assessment

We utilized a quality checklist adopted from the study by (Schön, Thomaschewski, et al., 2017) to evaluate the individual studies included in our analysis. The checklist comprised five items, each with three possible answers, as presented in Table 4. The objective of the checklist was to assess the quality of the studies based on specific criteria related to proposal validation, approach description, personal opinion, citation, and clarity of study aims. The checklist was employed to evaluate the included studies and ascertain their overall quality.

Data Extraction and Analysis

Following the guidelines proposed by Kitchenham and Charters'(Kitchenham & Charters, 2007), we established a data extraction form. To streamline this process, we utilized Mendeley, reference management software, to highlight relevant text passages and assign ratings. Mendeley was also employed for extracting data based on the predefined attributes outlined in the protocol.

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Table 4: Quality Assessment

Item	Assessment Criteria	Score	Description
QA1	Is the proposal validated?	-1 0 1	No, it is not validated Partially, some aspects of the proposal have been verified in a laboratory Yes, proposal has been validated or confirmed through a research method.
QA2	Does the study present a detailed description of the approach?	-1 0 1	No, details are missing Partially, if you want to use the approach, you need to read the references Yes, the approach can be used with presented details
QA3	QA3 Does the study present a personal opinion piece or viewpoint?	-1 0 1	Yes, it does. Partially, since related work is explained and paper is set into a specific context No, the paper is based on research
QA4	Has the study been cited by other authors?	-1 0 1	No, no one cited the study Partially, between 1-5 articles cited the study Yes, more than 5 articles cited the study
QA5	Includes the paper a clear statement of the aims of the study?	-1 0 1	aims are not described. Partially, aims are described but unclearly Yes, aims are well described and clear

This systematic approach facilitated the extraction of pertinent information from the included studies and allowed for structured recording for further analysis.

The extracted data encompassed essential information about the research papers, including the title, authors, publication date, DOI (Digital Object Identifier), and URL (Uniform Resource Locator) of the paper. These details are crucial for the identification and proper referencing of the paper.

Additionally, the publication data of each research paper, such as the journal or conference name, publication or presentation date (in the case of conferences), publisher (if applicable), volume and issue numbers (for journals), page numbers, keywords, and an abstract describing the paper's content, were recorded.

Access to this information proved vital for comprehending the context and relevance of the research paper, as well as for citation and future reference purposes.
In conjunction with using Mendeley, the authors created a data collection form in Excel to systematically extract the following data from the included studies:

- Study characteristics: research question, research method, participants, sample size, data collection methods, and analysis techniques

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- Results: key findings and conclusions
- Quality assessment: scores on the quality checklist for each study
- Additional notes: any relevant comments or observations about the study that may be useful in the analysis or interpretation of the results.

The use of a data collection form in Excel allowed the authors to organize and manage the data in a structured manner, facilitating the analysis and synthesis of the results.

During the data extraction process, we considered all identified papers. However, it was not always possible to extract data in line with the predetermined format due to the way some studies were reported.

Results

Our work involved the inclusion of 24 relevant studies. Firstly, we provide a description of the characteristics of these studies, including quantitative data such as the publication channel, research method, or overall quality. Secondly, we present our findings that are relevant to the research questions.

Summary of Studies

Regarding the publication channel, they were either presented in conferences or published in scientific journals. Out of all the studies that were included, 16 of them (66.67%) were presented in scientific journals, while only 8 papers (33.33%) were published in conferences.

This means that a large majority of the studies were presented in scientific journals rather than being published in conference as shown in Table 5.

Table 5: Distribution of Studies According to the Publication Channel

Database Name	Journal	Conference
Scopus	2	2
Web of Science	4	2
IEEE Xplore	-	2
Science Direct	7	2
Springer Link	3	-

Table 6 presents the distribution of research methods used in a particular study, along with the number of papers that employed each method and the corresponding percentage. According to Table 5, the most commonly used research method was "Mixed method" which was employed in 23.81% of the papers. This was followed by "SLR" and "Qualitative" methods which were used in 19.05% and 14.29% of the papers respectively.

The other research methods such as "Case study", "Survey", "Model Driven", "Delphi study", "Metamodel", "Systematic Mapping study", and "Grounded theory" were used less frequently, with each method being used in less than 5 papers or less than 5% of the total papers.

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Overall, the table 6 presents a comprehensive overview of the distribution of research methods utilized in the study. This information aids readers in comprehending the research design and methods employed by the authors in their analysis.

Table 6: Distribution of Studies According to Research Methods

Research Method	Paper total	Percentage
Model Driven	1	4.76%
Delphi study	1	4.76%
Metamodel	1	4.76%
Systematic Mapping study	1	4.76%
Grounded theory	1	4.76%
SLR	5	23.81%
Mixed method	4	19.05%
Qualitative	3	14.29%
Case study	3	14.29%
Survey	1	4.76%

In summary, the article suggests that research on user involvement approach in agile software development is predominantly conducted in real-life contexts, closely aligned with existing work practices within companies. However, it is important to acknowledge that the findings of a single case study may not be directly applicable to other settings, which should be taken into consideration when interpreting the results.

To assess each study, we employed the quality checklist provided in Table 4. Figure 2 illustrates the overall outcomes of the quality assessment.

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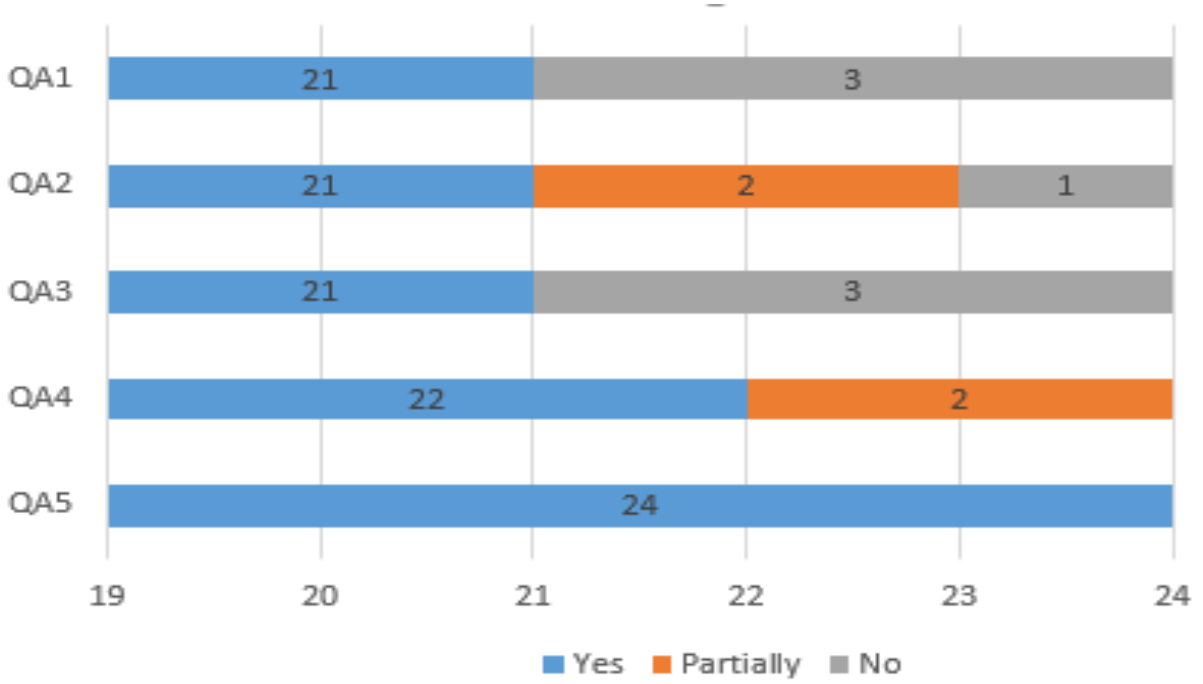

Figure 2: Quality Assessment

The first criterion (QA1) evaluated whether the proposal of the 24 reviewed papers were validated. Among them, 21 papers utilized a research method to validate their proposals. While three papers lacked validation.

To evaluate if the studies provided a detailed description of their approaches, we employed QA2. Out of the 24 papers reviewed, 21 presented a comprehensive explanation of the approach with sufficient details for other researchers to utilize. However, two papers required additional references for a complete understanding, and one paper lacked important details.

QA3 assessed whether the studies offered a personal opinion or viewpoint. Among the 24 papers reviewed, 21 were based on a clearly defined research design, while three studies did not sufficiently describe the research methods.

QA4 relied on the number of citations from Google Scholar as of April 08, 2023, to determine the frequency of citations for each study. Among the 24 papers, eight studies had more than a hundred citations, 12 students between 10 and 95 citations, two papers had been cited in 1-5 articles, and one paper had below 10 citations, specifically seven.

The fifth criterion (QA5) determined whether the objectives of the studies were clearly stated in the papers. In 24 articles analyzed, the objectives were well-defined and easy to comprehend.

In summary, 21 papers met all the quality criteria. However, it is important to note that the results may have differed at the time of publication of this systematic literature review due to the varying number of citations required for the assessment of QA4.

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(RQ1) What are the issues of the existing studies on managing users during requirement elicitation?

We have identified 8 different issues related to managing users during requirement elicitation within Agile software development. The following comprehensive list of issues reflects the findings from all 24 studies analyzed. Table 7 provides information on the frequency of occurrences and the studies that reported on each issue.

Table 7 offers specific details on the frequency of each observed issue and the corresponding studies that discussed them. Below, we describe all 8 issues concerning user involvement during requirement elicitation within agile software development.

Table 7: Summary of the Issues and the Respective Studies that have Investigated them

Issues	Freq.	Studies that reported the issue
User availability	3	Hugo Ferreira Martins (2019), Muneera Bano (2016), Irum Inayat (2015)
Lack of user involvement	4	Eva-Maria Schön (2017), Muneera Bano (2016), Primadhika Marnada (2021), Carlos Tam (2020)
Long users' feedback loops	1	Puji Rahayua (2016)
Lack of user expertise	3	Vandana Gaikwad (2017), Raffaele Fabio Ciriello (2022), Muneera Bano (2015)
Ineffective product owner	3	Eva-Maria Schön (2017), Julian M. Bass (2014), Muneera Bano (2015)
Lack of user communication skills	3	Primadhika Marnada (2021), Irum Inayat (2015), Muneera Bano (2015)
lack of process regarding user involvement	2	Sezin Yaman (2020), Susanna Martikainen (2014)
Lack of motivation	1	Muneera Bano (2015)

User Availability

Agile methodologies assume and promote user availability, but in reality, this expectation can be unrealistic. Empirical studies have shown that user availability and accessibility are generally challenging (Inayat et al., 2015).

Despite the recognition that user involvement in requirement determination can expedite the development process, actual user availability is often limited and hindered by factors such as time, cost, and workload. Consequently, many agile teams resort to proxy users, such as product owners, to fulfill the customer's role (Racheva et al., 2010). Another approach is to have an "onsite developer", a representative located at the user's site.

Bano (2015) also reported encountering situations where staff members were unavailable due to various types of leave, resulting in project delays and difficulties involving users.

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According to a health software developer from the United States who participated in empirical studies (Martins et al., 2019), the most capable users are often too occupied with their organizational responsibilities or they may not be permitted by their superiors to join the development team full-time. The developer further emphasized that even having these users on the team part-time can still present challenges based on their availability. In summary, the developer believes that involving the most qualified users involved in development projects can be challenging due to organizational constraints and busy schedules.

Lack of User Involvement

Agile software development emphasizes continuous collaboration and communication between the development team and stakeholders, including end-users. However, the absence of user involvement in agile software development can lead to various negative consequences, such as limited feedback, misunderstood requirements, inefficient development, and decreased user satisfaction (Bano et al., 2017).

Agile development relies on user feedback to validate and enhance the product incrementally. Without user involvement, the development team may lack critical information about product usage and required improvements (Tam, Moura, et al., 2020).

We highlight some potential reasons for the lack of user involvement: Lack of user involvement in agile software development can result in various potential outcomes. These consequences include:

- Misunderstood requirements: User involvement is crucial for clarifying and refining requirements. Without user input, there is a higher risk of misinterpreting their needs, resulting in a product that fails to meet requirements (Schön, Winter, et al., 2017).
- Inefficient development: When users are not involved, the development team may allocate resources to developing features that are unimportant or unnecessary. This can lead to inefficiencies and wasted effort (Azadegan et al., 2013).
- Decreased user satisfaction: Ultimately, the goal of software development is to create a product that meets user needs. When users are not involved, their satisfaction with the final product may diminish, reducing their likelihood of using it (Bano et al., 2017).

To avoid these negative outcomes, it is important to ensure that users are involved in the agile software development process from the beginning.

Long Users' Feedback Loops

In agile software development, long users' feedback loops occur when there is a delay in receiving feedback from users. This often happens when feedback is only obtained after the software is deployed to users, leading to changes being made at a later stage of development (Rahayu et al., 2017). Such delays can result to inefficiencies and a product that may not fully meet user needs. To avoid long users' feedback loops, it is crucial to establish clear communication channels with users, solicit feedback at regular intervals, and incorporate that feedback into the development process as soon as possible. This allows for a more iterative and responsive approach, ultimately resulting in a product that better meets the user's needs.

Lack of User Expertise

The absence of user expertise in agile software development can challenge in understanding user needs, providing relevant feedback, and participating effectively in the development

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process. When users lack sufficient knowledge of the technology or the development process, they may struggle to effectively communicate their needs or provide actionable feedback to the development team. This can lead to a product that does not fully meet user requirements or a development process that is less efficient and effective (Inayat & Salim, 2015).

To mitigate this issue, it is beneficial to raise **users'** awareness of agile practices, manage their expectations regarding incremental deliveries, and encourage their involvement in refining requirements and validating features through product demos (Gaikwad & Joeg, 2017). Additionally, involving users with varying levels of expertise can help ensure that the product caters to a diverse user base.

Ineffective Product Owner

In the Scrum methodology, there are three key roles: the self-organizing team, the scrum master, and the product owner (Scrum Guides, 2020). The product owner is particularly important as they are responsible for facilitating communication between the user and development teams throughout the software development process, according to Hoda (2011).

The product owner has the responsibility of creating and managing the product backlog, which is a collection of user stories outlining the project's requirements. However, some product owners may lack adequate expertise in requirements engineering best practices (Bass, 2015).

Ineffective product owners can result in end-user representatives being unaware of user pain points or incorrect users being involved in testing early UI prototypes, leading to conflicts and potential project failure (Schön, Winter, et al., 2017).

A competent product owner should understand the significance of the system and its role in the business process, possess at least basic computer skills. However, practitioners in certain context have encountered challenges with product owners to be ineffective in providing timely feedback and requirements, while others have struggled with representatives lacking knowledge of Agile practices (Hoda et al., 2011).

Lack of User Communication Skills

Effective communication among team members and users is critical in agile software development. However, it is not uncommon for some team members or users to lack adequate communication skills, which can lead to misunderstandings, delays, and project failure (Inayat et al., 2015).

When team members lack communication skills, they may struggle to express ideas, provide feedback, or articulate concerns effectively resulting in miscommunication, task delays, and decreased team productivity (Bano & Zowghi, 2015a).

Similarly, if users lack communication skills, they may face challenges in providing clear requirements or feedback, leading to misunderstandings and a product that does not meet their needs (Marnada et al., 2021).

Lack of Process Regarding User Involvement

The absence of a clear process for user involvement in development activities can cause confusion and delays. Additionally, bureaucratic hurdles, such as acquiring the necessary

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permits to contact users, can hinder the development process (Yaman et al., 2020). Agile software development emphasizes involving users throughout the development life cycle (Hinderks et al., 2022). To address this, agile teams can establish a user involvement process that outlines the roles and responsibilities of users and the team throughout the development process (Martikainen et al., 2014). This process can include gathering user requirements, conducting user testing, and soliciting user feedback at key project phases. Additionally, the process can define how user involvement will be facilitated, such as through user workshops, interviews, or surveys (Inayat & Salim, 2015).

Having a well-defined process and guidelines for user involvement helps ensure that user needs are considered throughout the development process, improving the chances of project success.

Lack of Motivation

Lack of user motivation presents a significant problem in agile software development. Agile practices prioritize collaboration and communication between development teams and users to ensure the software meets the user requirements (Bano & Zowghi, 2015b). However, without user motivation, achieving this level of collaboration and communication becomes difficult, potentially resulting in a product that fails to meet user needs.

When users are motivated, it positively impacts their level and extent of participation in the development process. To address this issue, it is essential to provide users with feedback and recognition for their contributions. This can be achieved by acknowledging their ideas and feedback, providing regular updates on software progress, and highlighting their contributions in the final product (Zowghi & Rimini, 2015). By fostering user motivation, agile teams can enhance user involvement and improve the likelihood of developing a software product that fulfills user requirements.

Discussion

In this section, we present the results of our systematic literature review (SLR) based on the analysis of 24 relevant studies. We will first discuss the significance of the findings related to our research question, followed by the identification of the limitations of our study.

Meaning of Findings

General Findings

The results of the SLR shed light on the challenges associated with managing users during requirement elicitation in agile software development. It is evident that this is an important research area with a wide range of aspects studied in literature, highlighting the complexity and cross-functional nature of this field. Furthermore, the close relationship between this research field and real-life work practices in companies is notable, as many studies analyzed aspects in practical contexts. Overall, the paper provides valuable insights into the challenges for managing users during requirement elicitation. We emphasize the necessity of adopting a systematic approach to ensure the success of the requirement elicitation process. This paper serves as a useful guide for product owners and other users involved in the requirement elicitation process, offering actionable insights to enhance the effectiveness of the process.

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Findings Related to RQ1

Addressing the first research question, we found that the current literature on managing users during requirement elicitation lacks a clear focus and is dispersed. The existing studies primarily highlight the challenges and barriers encountered during the process. Based on our SLR, we identified eight prominent challenges of managing users during requirement elicitation within agile software development. The most frequently reported challenges include user availability, lack of user involvement, lack of user expertise, ineffective product owner, and lack of user communication skills. These challenges can impede software development practitioners from effectively managing users during requirement elicitation within agile context. However, there is a dearth of systematic approaches and frameworks to address these challenges.

Threat to Validity

While the systematic literature review conducted in this study aimed to be comprehensive, it may not have covered all studies related to managing users during requirement elicitation. The vast amount of published literature and specific search terms or databases used could have resulted in the omission of relevant studies. Nonetheless, we followed a rigorous search strategy and adhered to a predefined protocol to ensure the completeness of our study. The selection process of research papers was primarily performed by the first author of the paper, a PhD student. This approach may have introduced some subjectivity into the selection process. However, in cases where difficult decisions arose, the first author consulted with others to minimize subjectivity.

Another potential limitation of our review is the potential bias towards certain types of studies or sources, which could impact the validity of the findings. For instance, if the search terms used were limited to a certain field or language, relevant studies from other areas or languages might have been overlooked. Therefore, the findings of the review may not be generalizable to all contexts, as different organizations and industries may have unique requirements and challenges related to user management.

We acknowledged that certain features of the reviewed studies, such as artifacts and methods, may have been inadequately reported, which could have influenced the obtained results. To address this issue, we conducted a thorough quality assessment of the included studies. However, it is possible that if the studies had been reported more accurately, our findings might have been different.

Conclusions And Future Work

This systematic literature review aimed to identify and analyze the challenges associated with managing users during requirement elicitation within ASD. Following the guidelines provided by Kitchenham and Charters (Kitchenham & Charters, 2007), we conducted a rigorous search and selection process. Initially, we identified a total of 2342 papers and proceeded with multiple rounds of screening to narrow down our findings. After careful evaluation of titles, we included 133 research papers from the first round, In the second round, the "abstract scanning round ", 133 research papers' abstracts were studied, the final number of research papers we retrieved after scanning the abstract of each research paper and removing duplicates and irrelevant research papers from our search is 24. We conducted a quality assessment of each paper, and then classified the findings based on the publication channel and research method. The studies included in this review were published between 2012 and 2022.

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This review has important implications for both researchers and practitioners in the field. Our qualitative analysis of the included studies revealed that establishing a shared understanding of the user perspective is not well-established in ASD. Furthermore, we observed a limited number of papers investigating the presence of the user perspective in Agile Software Development.

The review identified several critical issues related to managing users during requirement elicitation, including user availability, lack of user involvement, long users' feedback loops, lack of user expertise, ineffective product owner, lack of user communication skills, lack of process regarding user involvement, and lack of motivation. The findings suggest that product owners can facilitate this process.

In conclusion, this review highlights the need for more empirical studies focusing on managing users during requirement elicitation within agile software development, considering different project settings, such as different Agile methodologies, scaling, or geographical distance among team members. It is also important to investigate the impact of cultural and organizational factors on user involvement during requirement elicitation as well as explore the roles of other stakeholders, including developers and project managers, in facilitating effective user involvement. Addressing these research gaps will further enhance our understanding of how to effectively manage users during requirement elicitation and contribute to the success of agile software development projects.

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