From "We Need Better UX" to "We Don't Have Time": A Qualitative Study of UX Practitioners' Challenges and Methods in Software Projects

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Abstract

Background: User eXperience (UX) concerns the quality of the relationship between people and technology, which has become increasingly important to the success and long-term adoption of software products. Although UX is widely recognized as important and supported by established methods and roles, its application in the software industry remains challenging due to organizational and contextual constraints. **Aim:** Investigate how practitioners implement UX practices during their daily work, the challenges they face, and how they adapt and use UX methods in practice. **Method:** We conducted a qualitative study based on semi-structured interviews with ten UX practitioners working in companies with different organizational contexts. We analyzed the collected data using Grounded Theory techniques. **Results:** Our results indicate recurring challenges in the application of UX practices, such as limited access to end users, time constraints, work overload, and organizational barriers. We also found that practitioners rely mainly on classical methods such as usability testing, heuristic evaluation, and questionnaires, which practitioners often adapt to real-world constraints and commonly frame within Design Thinking approaches. Organizational conditions, together with practitioners' adaptation and application of UX methods, shape UX and directly influence how UX practices are conducted. **Conclusion:** By emphasizing the ongoing challenges and limitations that practitioners encounter in their daily work, this paper enhances understanding of how UX is currently implemented. In addition, the findings provide an empirical basis for future interventions aimed at improving UX practices.

Keywords

User Experience, Software Quality, Qualitative Study, Practitioners Perspective, Software Industry

1 Introduction

As software systems have become increasingly embedded in everyday activities, their success no longer depends only on technical quality, but also on the quality of users' interactions with them [3]. From a human-centered design perspective, User eXperience (UX) goes beyond interface aesthetics, encompassing how people understand, feel, and act when interacting with technology in real-world situations [33]. Therefore, UX has become a key determinant of software success, influencing user satisfaction and engagement [50]. This growing relevance has also increased the prominence of UX professionals in software organizations, where they help shape products around users' needs and contexts of use [9].

In practice, UX professionals apply user-centered approaches to understand users and stakeholders, define and validate requirements, refine design solutions, and evaluate usability and user experience throughout development [2, 23]. The integration of UX practices has a direct impact on system performance and business outcomes, as inadequate UX design can increase users' cognitive load and error rates, negatively affecting efficiency and safety in interactive systems [47]. In digital products such as e-commerce platforms, poor UX is also associated with reduced conversion rates and higher abandonment, directly impacting organizational results [38]. Under these conditions, neglecting UX throughout the software development process results in usability issues and measurable negative consequences for both users and organizations.

Despite its recognized relevance and the availability of established methods and specialized roles, the application of UX practices in industry remains consistently challenging. Evidence from recent systematic reviews and empirical studies indicates that integrating UX into software development environments continues to be difficult in practice, particularly under organizational, cultural, and process-related constraints [5, 14, 19, 30]. Moreover, recent research suggests that uncertainty in UX practice arises from the complex and dynamic conditions of real-world software development environments, including shifting stakeholder priorities, evolving team dynamics, and organizational constraints [42].

While prior work highlights these challenges, it still provides limited understanding of how UX is actually carried out in everyday industrial settings, particularly in terms of how practitioners organize their work, adapt methods, and make decisions under real-world constraints. To address this gap, we investigate current

UX practices in the software industry by examining practitioners' routines, challenges, and methods. In this sense, we define the following Research Questions (RQ) to guide our investigation:

- **RQ1**: What challenges do UX practitioners face when carrying out UX practices in software projects?
- **RQ2**: Which UX methods and practices do UX practitioners adopt in software development projects?

We conducted a qualitative study based on semi-structured interviews with ten UX professionals working in different organizational contexts in Brazil. We analyzed the interview data using Straussian Grounded Theory procedures [44]. The qualitative, grounded approach adopted in this study is suitable for Software Engineering (SE) because it enables the investigation of complex socio-technical practices through practitioners' experiences, capturing organizational, technical, and contextual influences that are not readily accessible through purely quantitative approaches [12]. We then compared the emergent findings with prior studies to support the discussion.

Based on the analysis of the interview data, we observed that practitioners recognize UX as an important component of software development, contributing to product quality and supporting decision-making in projects. At the same time, the findings reveal that carrying out UX work in practice is consistently challenging. Practitioners reported recurring difficulties, especially limited access to end users, time constraints, work overload, and organizational barriers that hinder effective UX practices. In response to these conditions, they rely mainly on classical methods, which are often adapted to real-world constraints and frequently framed within Design Thinking approaches.

This paper contributes to SE by advancing the understanding of how UX work is carried out in software projects under real-world constraints. More specifically, we provide a grounded characterization of the recurring challenges practitioners face, show how they shape the selection and adaptation of UX methods in practice, and highlight the organizational conditions needed to support more mature UX work. In doing so, our paper moves beyond normative descriptions of UX methods and offers evidence on how UX is performed in everyday software project settings.

2 Background

Usability and UX. Key concepts in the design and evaluation of interactive systems. Usability is commonly defined as the extent to which a system, product, or service can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use [1]. Although usability is often discussed alongside UX, the two concepts are not equivalent: while usability is primarily concerned with task-oriented aspects of interaction, UX encompasses broader experiential dimensions, including users' emotions, perceptions, and the meanings they construct during and after use; this broader scope is also reflected in the everyday work of UX professionals, who apply UX methods to improve both functional interaction quality and the overall experience perceived by users [45]. UX, therefore, goes beyond task completion, reflecting how interaction fulfills users' psychological needs and contributes to the overall value of the experience [21].

UX Methods. Systematic approaches used to support the design and evaluation of interactive systems by generating insights about users, contexts of use, and the quality of interaction [40]. They are applied across different stages of development to evaluate design solutions, from early concepts to implemented systems, helping teams identify usability and user experience issues and inform design improvements [23, 34]. In software development practice, these methods contribute to improving both usability-related outcomes, such as task success and performance, and broader experiential qualities, such as comfort, trust, and engagement [1]. This diversity is reflected in the wide range of available methods, including methods aimed at eliciting users' emotional responses, such as *Emocards* [16], and standardized instruments like *AttrakDiff*, which assess pragmatic and hedonic qualities of interaction [22].

3 Research Design

In order to understand how UX practice unfolds in the software industry, we conducted a qualitative study based on semi-structured interviews [41] with UX professionals working in different organizational contexts in Brazil. To capture diversity in real-world conditions, we recruited practitioners from distinct teams and projects; overall, the data cover professionals from seven different companies, including one organization represented by multiple teams. Although these teams belonged to the same organization, they operated independently, with no direct collaboration, as they were involved in different projects and contexts. We anonymized all organizations and participants due to confidentiality concerns. All interviews were conducted in the native language, and the excerpts and results reported in this paper were translated into English while aiming to preserve their original meaning and intent.

3.1 Data Collection

We designed an interview guide composed of 5 open-ended questions focused on UX practices and challenges. The questions were planned in collaboration with a senior researcher with 16 years of experience in qualitative analysis to improve clarity and ensure alignment with the study goals. The first interview was conducted as a pilot to assess the clarity of the interview guide. After evaluation by the most experienced researcher, no changes were deemed necessary, and the interview was retained as valid data. Although the interview guide included a predefined set of core questions, the interviews followed a semi-structured format. The order of the questions was not randomized because the interview guide was designed to follow a coherent progression, allowing participants to first describe their UX practices and then discuss related challenges and outcomes. Thus, additional participant-specific questions were introduced whenever relevant topics emerged, enabling deeper exploration of each practitioner's context. In practice, interviews often resembled a conversation about professional experiences, allowing participants to describe concrete examples, decision-making rationales, and day-to-day challenges. An initial practitioner was identified based on the researchers' prior knowledge of their background as a UX practitioner and was contacted by email. Recruitment then proceeded through snowball sampling [8], with participants being asked to recommend other UX professionals with potential to join our study.

The core interview questions were:

(1) Which UX methods have you applied in your projects?
(2) How often do you perform UX activities?
(3) What are the main difficulties you face when applying UX activities?
(4) How do you evaluate whether UX activities have produced results?
(5) In your experience, what changed in the product after UX application?

To address ethical requirements, participants received an informed consent form prior to each interview session, describing the study goals, data usage, and confidentiality procedures. Participation was voluntary. All interviews were conducted online by the first author. The interview schedule was agreed upon individually with each participant, allowing the interviewer to adapt to their availability and minimize interference with their routines. Before each session, we informed participants that the interview would last up to 60 minutes, and the interviews were kept within this duration to reduce possible participant's fatigue. This project is supported by the Ethics Committee, according to the approval of CAAE: 79890324.2.0000.5020.

3.2 Participants Characterization

Table 1 summarizes the participants' background data. The first column identifies participants by ID, and the second column identifies their respective organizations. The third column indicates the organization size, categorized into medium-sized (100 to 499 employees) and large (500 or more employees) organizations. The fourth and fifth columns present, respectively, the years of experience and professional level of the participants as UX practitioners. The sixth and seventh columns indicate the type of software project and the work setting of each participant, respectively.

Table 1: Participants characterization.

P.	Org.	Size	Exp.	Level	Type of Project	Setting
P1	Org. 1 (A)	Large	1	Intern	Mobile / Web	R&D
P2	Org. 2	Medium	2	Junior	Mobile	Industrial
P3	Org. 1 (B)	Large	1	Junior	Mobile / Web	R&D
P4	Org. 4	Medium	1	Intern	Mobile / Web	Industrial
P5	Org. 3	Large	2	Junior	Mobile / Web	Industrial
P6	Org. 5	Medium	5	Mid	Mobile	Industrial
P7	Org. 6	Medium	4	Mid	Mobile / Web	R&D
P8	Org. 1 (C)	Large	4	Mid	Embedded vehicle software	R&D
P9	Org. 7	Large	4	Senior	Mobile / Web	Industrial
P10	Org. 1 (D)	Large	7	Mid	Embedded vehicle software	R&D

*R&D: Research and Development.

3.3 Data Analysis

We analyzed the interview data using Straussian Grounded Theory (GT) procedures [44], adopting them strictly as an analytical framework focused on qualitative categorization rather than building a formal theory. We followed an iterative coding process involving constant comparison between data excerpts, codes, and emerging categories. The first author performed open coding to extract initial codes grounded in participants' statements. Next, we conducted axial coding incrementally, with review and support from two senior researchers with 16 and 7 years of experience in qualitative analysis, respectively, thereby providing complementary perspectives during the analysis. The axial coding stage was particularly important for identifying relationships between the challenges reported by participants and the UX practices they described. The research team held online meetings once a week to validate and refine the open and axial coding procedures. These researchers collaborated in refining categories, identifying relationships between them, and interpreting the results throughout the process. Whenever disagreements arose regarding code interpretation, grouping, or category refinement, the researchers discussed them until reaching consensus.

During the coding process, we observed, by approximately the ninth interview, no substantially new codes or categories emerged, suggesting that the dataset had reached a sufficient level of analytical saturation for this study. This iterative refinement aimed to consolidate the findings into grounded qualitative structures connecting codes and categories, reflecting practitioners' experiences and challenges in practice. The codebook used in the qualitative analysis, and the informed consent form, are available in our supplementary material [1]

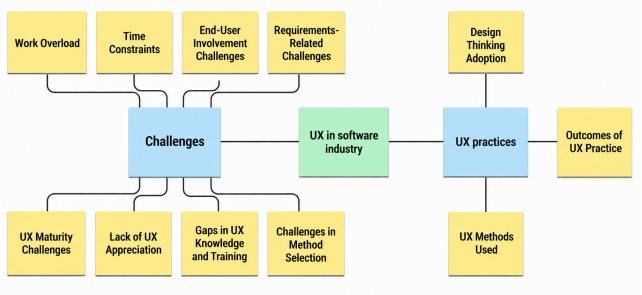

Figure 1: Qualitative categories related to challenges and how UX is carried out in industrial software projects.

4 Results

Figure 1 illustrates the two main categories that emerged during our qualitative analysis: **Challenges** and **UX practices**. These categories are aligned with our research questions, where challenges are mainly associated with RQ1, focusing on difficulties in applying UX in software industry, while UX practices are related to RQ2, describing how UX is carried out in everyday work. Overall, we found that relevant challenges include *Work Overload*, *Time Constraints*, *End-User Involvement Challenges*, *Requirements-Related Challenges*, *UX Maturity Challenges*, *Lack of UX Appreciation*, *Gaps in UX Knowledge and Training*, and *Challenges in Method Selection*. As for UX practices, *Design Thinking Adoption*, *UX Methods Used*, and *Outcomes of UX Practice* categories emerged. In the following subsections, we detail each category and its respective findings. Figure 2 represents a synthesis of the findings, showing how the identified challenges affect UX practices and shape their adaptation in real-world project contexts.

[1] Available at: https://doi.org/10.6084/m9.figshare.31901920.

We present the results according to the categories and subcategories derived from the qualitative analysis. Each subsection represents a **category**, while the elements highlighted in **bold** correspond to **subcategories**. Participants' quotations, shown in *italic*, ground each interpretation in empirical evidence. The text then discusses potential interpretations by articulating participants' reports with the identified analytical structures. In the following subsections, we describe each category, its subcategories, and the relationships between them in detail. The answers to the research questions are presented in the Discussion section.

4.1 Work Overload

This category captures how practitioners described situations of work overload when performing UX activities in their projects.

Number of Professionals. We found that UX responsibilities are often concentrated in a small number of professionals, sometimes in only one practitioner. P7 explained that, although companies often claim to have a department dedicated to the project, in practice *"what they have is one person dedicated to the interface"* and *"what they want is for this same person to do everything"*. It suggests that, in P7's context, their organization often centralizes different design-related activities in the same professional, rather than distributing them across specialized roles. P7 further emphasized that it is *"very rare to see ... one specific person focused only on [user] research and not working on other related activities"*, indicating that this concentration of responsibilities persists even when UX is formally present in the organization.

This scenario also appeared in the account of P5, who described experiencing it. As the participant reported, *"as I was an intern, and I was the only design person for UX and UI, I didn't have anyone there as a reference to help me with some problems ..."*. It indicates that the limited number of UX professionals may reduce opportunities for guidance and support, especially for less experienced practitioners. Together, these reports show that having too few UX professionals can intensify workload concentration and make UX practices harder to address.

Number of Activities. Another factor contributing to work overload is the number of activities, particularly when practitioners have to manage multiple demands and deliverables simultaneously. P2 reported having to move across different activities at the same time, with pressure coming from both developers and product leadership, explaining that *"... we would work on something from functionality X, and at the same time there was something from functionality Y that we needed to address. And all of that at the same time, with the developers waiting and with the product owner sending the demands"*. It suggests that work overload may stem from the parallel management of multiple activities and simultaneous delivery expectations.

Beyond handling multiple activities in parallel, participants also described a buildup of work that required them to perform different types of UX activities within the same workflow. P5 reported combining activities such as interviews, testing in real environments, and the production of multiple design artifacts in *Figma*, explaining that *"I was elaborating [user interface designs], doing interviews, testing the environment, and going into Figma, trying to make everything as official as possible so I wouldn't waste development time ... I had to do animations, I had to create vectors, I had to do everything in Figma, because we also didn't have fast feedback"*. This indicates that work overload may also be associated with the need to combine heterogeneous activities, such as user requirements, testing, and design production, within the same process. These findings suggest that the number of activities may intensify work overload, particularly in contexts where UX responsibilities are concentrated among a small number of professionals.

4.2 Time Constraints

This category captures how practitioners described time constraints when performing UX practices in their projects

Company-imposed Time Pressure. A common challenge affecting how UX practices are conducted is time pressure. Practitioners described organizational environments marked by rapid delivery cycles, constant urgency, and limited time to perform activities with the desired level of depth. P4 summarized this pressure by stating that *"sometimes it is really complicated. They want things for yesterday, and well done"*. It suggests that organizations often expect quick delivery while maintaining high quality standards, which can make UX work particularly challenging

This perception also appeared in descriptions of an accelerated work pace and limited opportunities to explore problems in depth. P2 explained that *"everything was very rushed in our work stream [...] we ended up not being able to do that much [user] research"*, indicating that company-imposed time pressure may limit the possibility of conducting user research activities consistently. These reports show that company-imposed time pressure acts as a structural constraint on UX practices, affecting both the depth of investigation and the overall organization of practitioners' activities.

Influence of Time Constraint on the UX Process and Methods. Participants report on how limited time directly affects the way UX activities are carried out in practice. Rather than representing only a general sense of urgency, time constraints were described as shaping which activities could be performed, when they could be performed, and how deeply they could be explored. In this sense, participants reported that limited time often leads practitioners to prioritize delivery over deeper investigation and to adapt UX practices to project deadlines. P4 illustrated it by stating that *"it turns out that this UX part is left for 'if there is time'"*, suggesting that UX activities may be treated as conditional or secondary rather than as an integral part of the software development.

Participants also described situations in which UX practices had to be carried out within highly compressed timeframes. P3 reported that *"we had two days to run usability tests. In one day we were preparing the script, and the next day we were already going to do the visit"*, showing that UX activities may be executed in very short and tightly scheduled timeframes.

Another consequence involves the challenges practitioners face in securing dedicated time for UX practices within their team. P4 described this dynamic as *"a kind of war between the leader and the designer to be able to apply it, to be able to get the time"*, indicating that time constraints may generate conflicts over allocating time for UX activities. Similarly, P3 noted that *"I am still a bit stuck in the UI part, but I would like to have more time to apply these [UX] methods"*, indicating that limited time may narrow practitioners' work to UI-focused tasks and restrict the use of a broader range

of UX methods. Overall, these reports show that time constraints make it difficult to secure time for UX practices, reinforcing a focus on UI tasks and limiting the application of UX methods in practice.

Challenges in User Engagement Time. This constraint limited direct interaction with users and affected how UX practices could be carried out. Participants reported that the limited availability of both practitioners and end users often reduced opportunities for communication, making it harder to clarify needs and deepen understanding of the product. P4 illustrated this situation by explaining that *"not long ago, I only received a spreadsheet to transform into a system, and I couldn't talk to the user ... I had to translate it and understand it alone, because even the users themselves didn't have time to explain it to me"*. It suggests that limited time with end users may force practitioners to proceed without direct clarification, increasing uncertainty in the UX process. Overall, these results suggest that limited time with end users can weaken the user-centered nature of UX practices, as practitioners may be required to move forward with reduced opportunities for interaction, which may limit their understanding of users' needs.

4.3 End-User Involvement Challenges

This category captures how practitioners described challenges related to involving end users in UX activities.

Limited Access to End Users. Participants described limited access to end users as a difficulty that constrained the execution of UX practices in software projects. Rather than involving a single barrier, this limitation appeared in different forms, including logistical restrictions, project-specific characteristics, and organizational routines that made direct contact with end users difficult to sustain. P2, for example, explained that *"we couldn't bring people to the company headquarters to do [user] research... it wasn't possible to do that"*. This example suggests that access to end users may be constrained both by practical limitations and by the nature of the project itself.

When direct access was not feasible, participants reported relying on internal substitutes for user feedback. P3 explained that *"I ask for opinions and we end up testing among ourselves [UX practitioners]. Unfortunately, I don't really have that contact with the end user"*, indicating that limited access to end users may lead teams to replace user participation with internal evaluation practices. Participants also reported difficulties in continuing validation over time. P2 noted that, after making improvements based on user input, *"it became very difficult to go back and validate again whether what we changed actually improved"*, suggesting that restricted end-user access may hinder the continuity of iterative validation.

Participants also described situations in which contact with users happened only after substantial development work had already been completed. P2 explained that *"we developed almost the entire functionality, and then we went there just to see what they thought about something already done"*. It suggests that when user access is delayed, validation may occur too late to effectively shape earlier UX decisions. In some cases, opportunities for direct contact only became possible after repeated misunderstandings. P5 reported that *"after so many errors and misunderstandings about what the objective of that product really was, [the manager] said: okay, I will let you interview the people"*, indicating that user involvement may only be authorized after problems accumulate, rather than being treated as part of the normal process from the outset.

Another challenge highlighted by participants concerned user recruitment itself. Participants reported difficulties in recruiting users for testing. P7 explained that, even after using Nielsen's recommendation that five users can be sufficient to uncover many usability issues [31], *"it is very difficult to get these five people, even if it is only five people"*. P7 also noted resistance from stakeholders, explaining that *"usually, the product owner thinks that they already know everything about the product ... so it is very difficult to convince them to involve more people"*. These reports indicate that the challenge is not limited to contacting users, but also involves convincing stakeholders of the value of involving them at all. In addition, P8 reported that *"we didn't get to test with a developed product"*, because *"there was no hardware for that"*, showing that constraints in access may also prevent validation under realistic conditions of use.

In response to these limitations, participants described adapting their practices to what was feasible in each context. As P4 stated, *"that's why we adapt. And then we build something according to what we can manage to do"*. These findings show that limited access to end users affects whether and when users are involved, how UX is conducted, and the level of confidence practitioners place in the outcomes of UX practices.

Consequences of Limited End-User Feedback. Participants highlighted how limited user input during development can have consequences for both the software development process and the resulting product. P10 described a case in which an entire solution was developed based on assumptions about its target audience, but was later rejected once end users were finally involved. As the participant explained, *"they [the software development team] made an entire product focused, for example, on salespeople ... and then, after they tested it, they realized the salespeople hated the product. It was not useful for them at all"*. P10 further noted that *"this was not seen before, the end user's pain was not considered earlier"*, indicating that limited end-user feedback may allow fundamental mismatches between product assumptions and real user needs to remain unnoticed until late in development.

These findings suggest that the consequences of restricted user feedback go beyond the execution of isolated UX activities In this sense, limited end-user feedback may delay the detection of critical issues, making them harder and more costly to address. It suggests that restricted feedback from end users can shape software outcomes by reinforcing organizational assumptions, weakening early validation, and exposing serious problems only in later stages of the process.

4.4 Requirements-Related Challenges

This category captures how requirements-related issues affect UX practices.

Participants described situations in which they had to reinterpret and adapt predefined requirements for their own use in UX practices, instead of directly applying the original specifications. P3 explained that *"many times what reaches me are client requirements, and my job is to adapt these requirements using heuristics and the UX/UI concepts that I know"*, indicating that UX practitioners

may be positioned as adaptors of predefined requirements rather than contributors to their initial formulation. In such cases, the role of UX work becomes one of translating externally defined demands into solutions that are more consistent with usability and user experience principles.

Another difficulty reported by participants concerned the incompleteness or inaccuracy of requirements. P8 explained that *"because the correct or complete requirement didn't really come, some things we do in the dark"*, suggesting that poorly defined requirements may leave practitioners without enough information to guide activities. The same participant added that, after the team managed to define the requirements more properly and continue testing, *"we realized that what the requirement asked for did not make sense,"* and *"we ended up proposing something different that worked better for the user"*.

It suggests that requirements may not adequately capture UX-related aspects, leaving practitioners to make decisions that may not fully align with user needs. These findings indicate that requirements practices may not sufficiently account for UX concerns, forcing UX practitioners to compensate for missing or inadequate information and to reinterpret predefined demands. As a result, UX practices may focus on adapting or correcting requirements, increasing the risk of misalignment with user needs.

4.5 UX Maturity Challenges

This category captures how UX maturity in organizations shapes the execution of UX practices.

Influence of Low UX Maturity on UX Practice. Participants pointed out that the current level of UX design maturity in their organization is still below what they consider ideal. In this context, UX design maturity refers to the level of integration, organizational capability, and support for UX practices across the organization [46]. P3 noted that *"it is still not at the level of design maturity that I consider ideal, so it affects a bit the frequency of UX practices that we carry out"*. It suggests that lower levels of UX design maturity may affect how frequently UX practices are applied.

Participants also associated low UX maturity in organizations with the way decisions are made. Rather than being grounded in user feedback, decisions were sometimes described as relying on assumptions or hierarchical preferences. P4 explained that *"it's more like a lot of assumptions. Sometimes the P.O. or the project leader, says: 'I think this is better', and that's it. And sometimes we just have to accept it to preserve our job"*. This indicates that, in low-maturity settings, decisions may rely more on assumptions and hierarchical preferences than on UX input, limiting the contribution of UX to software development.

Some participants related these difficulties to organizational culture. P2 stated that *"I wouldn't blame the design team, but I would say that maturity as a whole impacted the UX practice"*, suggesting that limitations in UX practice are not only individual or team-level issues, but also reflect broader organizational conditions. P2 also noted that *"I focused a lot on screens, and that's why I didn't apply UX techniques that much"*, indicating that, in such contexts, UX practices may become concentrated on interface-related activities, which may limit the use of a wider range of UX methods.

Influence of Leadership Maturity on UX Practices. Participants described leadership maturity as another factor shaping how UX is incorporated into projects. In this context, participants highlighted how leadership influences the conditions under which UX practices are carried out.

This was particularly evident in accounts about the role of the Product Owner (P.O.) in restricting practitioners' participation. P4 explained that *"depending on the P.O. who is leading the project activities, they allow design to be included or not in that stage of system development"*, indicating that leadership may directly influence whether UX practices are included in key project stages. The same participant added that, when designers are involved earlier in software projects, *"you can bring ideas, do some validations with users, suggest things, and that helps a lot later"*, suggesting that leadership support for early UX participation may create better conditions for validation and support later project activities. Overall, these reports suggest that leadership maturity with respect to UX practices may influence both the level of autonomy granted to practitioners and the degree of integration of UX activities within the project development process.

4.6 Lack of UX Appreciation

This category captures how limited appreciation of UX in organizations affects its execution.

Participants described organizational contexts where design is often reduced to aesthetics, rather than understood as a broader set of practices. P10 noted that *"they don't see the importance of design at all"*, indicating that design is often perceived in a superficial way.

This limited appreciation also became evident in how organizations value the work performed by practitioners. P10 explained that, even when practitioners try to apply UX knowledge in interface design, *"they [leaders] don't value the other processes of [user] research and the other kinds of UX practices, even in planning"*. This indicates that certain UX activities may be undervalued within organizational contexts. As a result, different aspects of UX practices may not receive the same level of recognition.

Participants further indicated that this lack of appreciation can interfere with the continuity of UX methods during projects. P7 described a usability test that had been planned with ten participants, but was interrupted after the sixth because *"the client asked us to stop the test because they already wanted to see the interface"*. Later, when the same client asked about the interview data, the team had to revisit incomplete material and *"try to extract something from it"*. It suggests that requests to prioritize interface-related outcomes may lead to the interruption of user-centered activities, even when those activities were initially planned.

A similar perception was expressed by P2, who stated that *"there were our efforts as designers, but there wasn't the appreciation of us as designers, and not only as designers, but for [user] research itself, for research with users"*. According to the participant, *"there isn't that vision for UX methods"*, suggesting that this lack of appreciation affects both designers and UX practices. P4 reinforced this point by explaining that, even when the importance of UX is made explicit, *"we don't always win, because what matters in the end is delivery. That's where the money comes from"*. This indicates that delivery priorities may take precedence over UX practices.

4.7 Gaps in UX Knowledge and Training

Participants described challenges related to education and training when explaining how they learn UX methods. P1 argued that design education often emphasizes only a narrow set of well-known methods, stating that *"in design [undergraduate course], people only know usability testing, interviews, and questionnaires"*. This account suggests a gap between what academia teaches and what industry expects from UX practitioners, as professionals may enter the field with a limited methodological repertoire.

P1 also pointed to the lack of accessible and consolidated references outside academia, explaining that *"I don't think there is ... at least not something popularized, a place where we can go and search for methods, something consolidated that everyone knows, outside academia"*. It suggests that the limited visibility of structured resources may make it harder for practitioners to identify a broader range of UX methods. Although catalogs and repositories for UX methods, such as UXNator [35], UX4ALL [7], and the UX Methods Repository by the Experience Research Society [18], have been proposed to support method discovery and selection, participants' descriptions suggest that such resources may still not be widely known among practitioners.

Another issue raised by participants concerns the contrast between academic training and industry conditions. P4 observed that *"in university, sometimes we feel like we have all the time in the world to work on design ... but in reality, you have one month, and you have to make it work"*. It suggests that academic settings may foster expectations about time that do not align with the time-constrained reality of industry. These results suggest limitations related to gaps in training, limited access to practical references, and differences between academic and industry contexts, which may hinder the effective use of UX practices.

4.8 Challenges in Method Selection

This category captures how the selection of UX methods is influenced in practice.

Participants reported that the selection of UX methods is often influenced by prior familiarity and academic experience. When explaining how they choose UX methods in practice, participants frequently referred to approaches they had already learned or previously used. P2, for example, summarized this tendency by stating *"the ones I've already used in college,"* while P1 noted that *"usually I go for the ones I am more familiar with"*. It suggests that method selection may often rely on familiarity and prior exposure.

Participants also indicated that they do not always control the choice of UX methods. P8 explained that *"we end up running a usability test because the client only knows that method, [clients] they want to see the [user] research results in that format"*, indicating that clients' expectations and limited knowledge of UX methods may influence which methods are adopted. In such situations, the selected method may reflect what stakeholders already recognize and accept, rather than what would necessarily be the most appropriate for the project context.

Limited control over the choice of UX methods may lead to a more routine-based use of methods. As P1 explained, *"I do what he[leader] asks and then we kind of keep following this pattern"*, suggesting that practitioners may follow decisions made by others and continue repeating the same pattern over time. In this sense, difficulties in UX method selection appear to be associated with the combination of familiar academic references and external influences that favor already known UX methods. As a result, method selection may become more dependent on routine, which can limit variation in how UX methods are used across different situations.

4.9 UX Methods Used

This category presents the UX methods used by practitioners, focusing on how these methods are applied in practice.

Participants described UX methods mainly in terms of evaluation activities that support validation and problem identification in projects. Among them, *usability testing* [39] stood out as the most dominant method. P3 emphasized this centrality by stating that *"I think usability testing is the main one"* and further reinforced this preference by explaining that *"if I could choose only one, I would say usability testing, because it provides broader coverage of everything we need to improve and it helps validate whether we are on the right track"*. These reports indicate that usability testing is frequently treated as the primary UX method for supporting validation and guiding UX practices in software projects.

Alongside usability testing, participants mentioned other classical UX methods in their daily work, including heuristic evaluation based on Nielsen's heuristics [32], interviews, questionnaires, A/B testing [6], and benchmarking [29]. However, their descriptions suggest that they do not always apply these methods in a strict or consistent way. P1 explained that *"I use Nielsen's heuristics as a guide, but not in a very faithful way"*, indicating that practitioners adapt well-known methods in practice. P4 described *"a kind of 'deconstructed' usability test"*, and P3 explained that *"it is not exactly an interview; it is more like a validation during a call"*. These examples suggest that UX practitioners use and adapt classical UX methods in practice, rather than following them strictly.

4.10 Design Thinking Adoption

When discussing the UX methods practitioners apply, participants referred to practices associated with Design Thinking (DT), explicitly relating DT to UX. The data suggest that DT can be understood as a mindset, a process, and a toolbox associated with UX practices [10].

Design Thinking as user-centered mindset. Participants highlighted the importance of understanding user needs before proposing solutions. P2 explained that *"before you start drawing anything, you also need to understand the user's problem"* and that *"it is always very good before you start anything to understand the problem ... before you start drawing anything"*, suggesting that UX practices reflect a user-centered mindset by prioritizing users' problems first.

Design Thinking as a process. Participants described DT in terms of structured phases that organize UX practices, explicitly referring to the Double Diamond [15], which frames the process into stages such as discovery, definition, development, and delivery. P10 explained that *"at the beginning we strongly used Design Thinking, the Double Diamond, precisely for idea generation and pain-point research, and also ethnographic research"*.

Design Thinking as a toolbox. Participants described DT as a toolbox and associated it with ideation and collaborative problem solving. P3 described the use of *"design critiques, workshops, ideation, and brainstorming"*, explaining that these practices *"are not directly UX methods, but they help with ideation and with solving experience-related problems"*. It suggests that participants draw on a broader repertoire of collaborative and exploratory practices to support UX work, even when these are not framed as formal UX methods. In this sense, practices such as workshops [36], brainstorming [49], design critique [4], and user journey mapping [48] appear to function as supportive resources for aligning teams and exploring experience-related problems.

4.11 Outcomes of UX Practice

While describing their daily routines and challenges, participants also naturally reported the perceived outcomes of applying UX practices. Although perceived outcomes were not explicitly part of the main research questions, this category was included to contextualize the practical relevance and value of UX practices within the software industry.

Observed Results. Participants described outcomes mainly in terms of visible improvements in both the product and the work process. P5 indicated that involving end users reduced rework, reporting *"a huge drop in the number of errors, in the amount of things to redo."*. It suggests that UX practices may contribute to reducing errors and rework.

Participants also associated UX inspections with a clearer understanding of where updates were needed. P9 explained that *"UX is the best thing, because I can identify where I need to focus and make changes"*, suggesting that UX practices can help identify areas that require improvement. The same participant also connected UX work to gains in learnability, explaining that *"the user will understand the system, and not just memorize where things are"*. This indicates that UX practices may contribute to improving users' understanding of the system.

Expected Results. Participants described expected outcomes in relation to what they consider successful UX results, even when such expectations cannot always be fully verified in practice. P6 explained that interfaces following principles such as user control and guidance are often regarded as usable, but also noted that *"that is not necessarily true, because we do not test that much with end-users ... we cannot truly confirm that it is usable if the user does not use it and say it is good"*. It suggests that practitioners form expectations about usability principles, while recognizing that confirmation depends on user feedback.

Participants also framed UX outcomes in broader terms, relating them to value and impact on people's experience. P5 described delivering a product as *"a way to improve people's lives"* and added that *"it was even satisfying to see people's opinion changing over time"*, indicating that successful UX practices are also perceived through changes in user perceptions. Overall, these results suggest that practitioners associate UX practices with expected usability and changes in user perceptions, even when such outcomes cannot always be fully validated.

5 Discussion and Comparison with the Literature

In this section, we discuss our findings by directly answering our research questions and positioning this study within the broader context of Software Engineering. As highlighted in the Introduction, our comparison with prior studies was conducted after the empirical results had fully emerged, serving to support the discussion.

Answering RQ1: What challenges do UX practitioners face when carrying out UX practices in software projects? UX practitioners reported recurring challenges related to limited access to end users, time constraints, work overload, and organizational barriers that hinder effective UX practice. These barriers include issues such as low UX maturity, limited appreciation of UX practices, requirements-related difficulties, gaps in UX knowledge, and constraints affecting method selection. These challenges show that UX work is shaped by technical decisions, along with organizational, temporal, and contextual constraints that influence how practitioners are able to carry out user-centered activities in practice.

Answering RQ2: Which UX methods and practices do UX practitioners adopt in software development projects? UX practitioners reported relying mainly on classical UX methods, particularly usability testing, heuristic evaluation, interviews, and questionnaires. These methods are often adapted to fit real-world project constraints, rather than being applied in a strictly formal manner. In addition, participants described using related practices commonly associated with DT, such as brainstorming, workshops, ideation, design critique, and user journey mapping. These findings indicate that UX practice in industry is characterized by the continued use of established methods, and by their adaptation and combination with complementary practices to support UX practices under practical constraints.

UX methods and their adoption in industry. The findings indicate that UX practice in industry remains strongly grounded in classical methods rather than novel approaches. This is consistent with prior research showing that well-established UX methods continue to dominate UX practices, with usability testing as one of the most widely adopted techniques [24].

At the same time, participants reported that these methods are rarely applied in a fully formal manner, being instead adapted, simplified, or partially implemented to fit project constraints. It suggests that UX practices combine the continued use of classical methods with their adaptation to real-world conditions. While prior work highlights the persistence of established methods, our findings show that these methods are routinely adjusted to contextual constraints, in line with [27], who argue that factors such as limited time, resources, and the need for lightweight approaches shape UX practices.

Overall, practitioners appear to rely less on new methods and more on the flexible adjustment of existing ones, suggesting that adaptation to contextual constraints is a central characteristic of UX practices in the software industry.

Constraints affecting UX practice. The results of our study connect with the findings of [13], who argue that UX practices in software startups is influenced by organizational needs that are often only partially addressed, leading teams to rely on a limited set

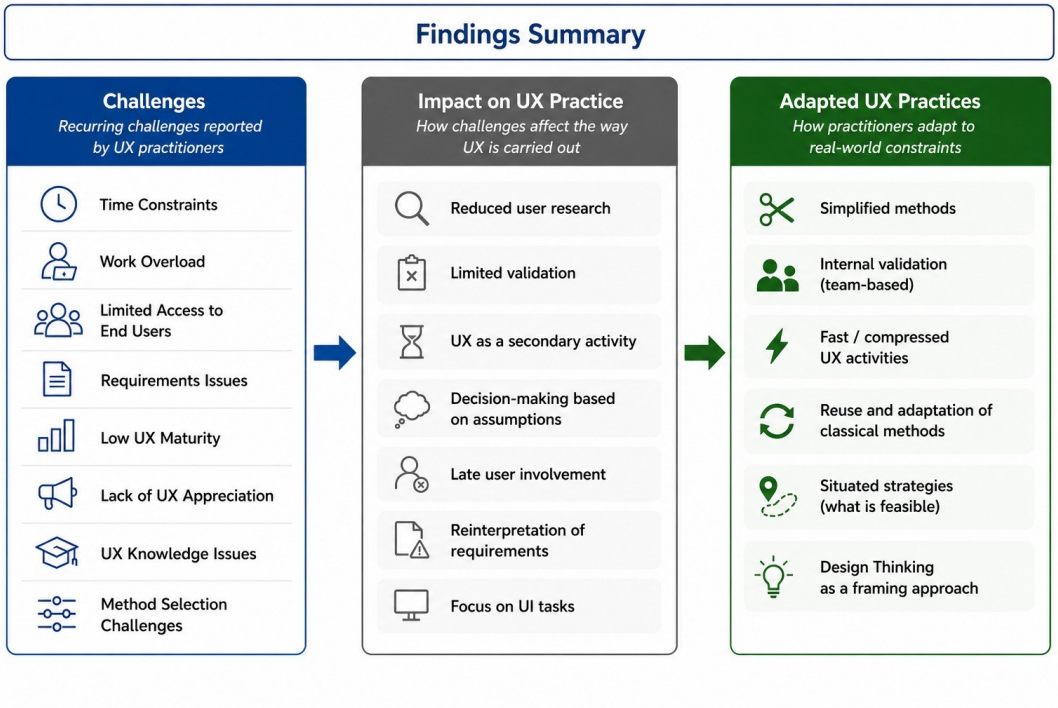

Figure 2: Findings Summary illustrating how challenges influence UX practices.

of practices. Our findings extend this perspective by showing that such limitations affect not only which practices are adopted, but also how they are carried out in practice, shaping their execution through simplification and adaptation.

While these authors emphasize the need to better support UX practices, our results suggest that, in the absence of such support, practitioners compensate through pragmatic adaptations. As a result, UX practices become highly dependent on contextual constraints rather than being systematically integrated into the software development.

Our findings suggest that differences in UX maturity are associated with the contextual conditions identified in our analysis. When these conditions were more favorable to UX practices, participants described higher levels of UX maturity, whereas more restrictive contexts were associated with lower levels of maturity. Thus, our data characterize conditions associated with different levels of UX maturity rather than establish direct causal explanations. Further research could examine how these contextual conditions contribute to the development of UX maturity across organizations.

The role of Design Thinking. Participants frequently described their work using concepts associated with DT. This is coherent with studies that highlight the integration of DT practices in agile environments [11, 28]. An important observation is that these practices are often not explicitly classified as UX methods by practitioners. Instead, they are treated as part of the natural workflow, indicating that DT operates as an implicit framework guiding UX activities.

The absence of AI usage in UX practice. An unexpected finding of this study is that none of the participants spontaneously reported the use of Artificial Intelligence (AI) tools to support their UX activities. It is important to note that the interview script did not include explicit questions about AI, as its adoption was not part of our original research goals. Therefore, we do not interpret this absence as definitive evidence of non-adoption. However, given that participants discussed their daily work routines, challenges, and UX methods in considerable detail, the lack of spontaneous mentions remains a noteworthy finding.

Recent evidence shows that AI is already widely used by developers in tasks such as implementation, testing, and documentation [20]. Evidence of AI adoption is also emerging in UX Research, where leaders have been adapting their teams' workflows and adopting AI cautiously and intentionally [17].

One possible explanation for this asymmetry is that existing AI tools often prioritize technical or implementation-oriented activities, while providing limited support for UX activities [26]. Although recent studies highlight the growing development of AI to support UX activities, including design support and automated evaluation methods [25, 43], our participants did not bring up such approaches. This potential gap highlights an opportunity to better disseminate and integrate AI-based tools into UX practice, and to analyze AI tool adoption among UX practitioners.

6 Limitations

Following Seaman's recommendations for qualitative research in SE [41] and the *Empirical Standards for SE Research* [37], validity was approached as an ongoing concern during both data collection and analysis. To strengthen the credibility of our findings, we

adopted data source triangulation by involving participants with different educational backgrounds and organizational settings. Two senior researchers with extensive experience in UX iteratively refined the coding and categorization, ensuring multiple perspectives during interpretation. When disagreements arose regarding code interpretation, grouping, or category refinement, the researchers discussed these issues until they reached consensus. In parallel, we conducted participant validation (member checking) by keeping communication channels open with interviewees to confirm key interpretations and clarify uncertain points.

As with most qualitative research, the outcomes of this study are not intended for statistical generalization, but rather provide analytical insights that may be transferable to similar industrial software development contexts. However, transferability should be interpreted with caution. All participants were drawn from the same national context, and factors such as local organizational culture, professional training, and the way UX is positioned within companies may have influenced the reported challenges and practices. In addition, our sample is skewed toward early- and mid-career practitioners, which may have increased the visibility of issues such as limited autonomy, reliance on familiar methods, and reduced influence on organizational decision-making. More senior practitioners might report different strategies, levels of authority, or perceptions of the same constraints. However, because less experienced practitioners are often less institutionalized into long-established organizational routines, their accounts offer a highly critical perspective on how these processes affect UX work in practice. Consequently, we interpret our findings as transferable primarily to similar software development settings characterized predominantly by junior and mid-level UX practitioners.

Additionally, snowball sampling may introduce selection bias by favoring similar professional networks; however, we mitigated this by diversifying our sample across seven organizations and project contexts. Nevertheless, including a broader range of organizations and project contexts could provide a more comprehensive and in-depth understanding of UX practices and challenges. Although the interviews were limited to approximately 60 minutes to reduce participant fatigue, the length of the sessions may still have affected the depth or level of detail of responses to questions asked later in the interviews. Finally, interview translation may introduce subtle shifts in meaning. To ensure fidelity to the participants' intent, all translated quotations were discussed and validated among the researchers.

While researcher bias can never be fully eliminated, the collaborative nature of the analysis, the involvement of multiple researchers in reviewing the coding, and the continuous validation of emerging categories helped reduce subjectivity in interpretation [37].

7 Conclusion

This paper investigated how UX is carried out in industrial software projects Brazil, based on a qualitative study with semi-structured interviews with ten UX professionals from different organizational contexts. This study highlights what practitioners do in their daily work, and organizational conditions that shape how UX work is executed in practice.

Our results show that UX professionals face recurrent organizational challenges that affect their ability to perform UX practices as intended. In particular, participants reported difficulties related to time constraints, work overload, and low UX appreciation inside projects. Additionally, participants described issues such as limited access to end users, low UX maturity, and constraints that influence how UX methods are selected, adapted, or even replaced by more feasible alternatives.

Despite these difficulties, participants consistently recognized the importance of UX and associated them with meaningful outcomes, such as improved learnability and usability, reduced rework, and higher perceived product quality. These findings suggest that even under constrained conditions, practitioners see UX practices as valuable and impactful for both end-users and teams.

Furthermore, our findings can serve as a basis for identifying opportunities for future interventions aimed at addressing the challenges practitioners reported. By making these difficulties explicit, our work provides a foundation that can support researchers and practitioners in designing strategies, tools, or organizational changes to improve UX practices in real-world settings.

As future work, we intend to investigate potential solutions to the challenges identified in this study. This includes examining how contextual conditions contribute to the development of UX maturity across organizations, and how AI tools are adopted and integrated into UX practice.

Artifact Availability

The artifacts associated with this study, including the codebook, the informed consent form, and supplementary documentation, are publicly available on: https://doi.org/10.6084/m9.figshare.31901920.

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