

Perceived value of UX in organizations: a systematic literature review

Louis Amant¹[0009–0003–3561–458X], Luka Rukonić^{1,2}[0000–0003–1058–0689], and Suzanne Kieffer¹[0000–0002–5519–8814]

¹ Université catholique de Louvain, Institute for Language and Communication, Louvain-la-Neuve, Belgium

² AISIN Europe, Connected and Sharing Solutions, Belgium
{louis.amant,luka.rukonic,suzanne.kieffer}@uclouvain.be

Abstract. This systematic literature review (SLR) examines what factors affect the perceived value of user experience (UX) in organizations. Integrating UX activities into organizational processes and software development is a widely addressed topic in the literature. However, although the social perception of the UX integration process is key for its successful execution, we do not have a concise understanding of this concept. To bridge this gap, we conducted an SLR answering two research questions: 1) What factors influence the perceived value of UX in organizations? and 2) What are the existing tools to measure or evaluate the perceived value of UX? Database search retrieved 49 publications, and we analyzed the content of 14 papers published between 2012 and 2023. The results are divided into six themes, each describing the positive and negative impacts on the perceived value of UX: understanding UX, UX resources, UX culture, perceived UX value, UX management, and UX work organization. Also, we found that the concept of the perceived value of UX is not yet developed in the HCI literature, and no tools have been developed to measure it. Therefore, further research on defining this concept is needed to understand better how social perception of UX affects its integration.

Keywords: User experience · UX perceived value · UX maturity · UX culture · Systematic literature review.

1 Introduction

The perception of organizational agile software development (ASD) practices by employees has been studied extensively, mainly due to a lack of empirical studies that could illustrate the quantitative benefits of agile practices [18]. For instance, team members’ perception of agile team productivity relates to the mature use of iteration planning and development agile practices [13]. Implementing the continuous delivery practice benefits customers and clients, from improved product quality and productivity to smoother collaboration and communication between them [20]. Therefore, the perception of organizational practices might influence

organizational outcomes, commitment to organizational goals, and project success. This paper focuses on the non-user experience (UX) staff (e.g., software developers, managers, project leads) perceptions of UX practices and the consequences their perceptions might produce. Specifically, we looked into literature on what barriers, misunderstandings, collaboration, and communication issues happen and what solutions, strategies, and frameworks exist to integrate UX and ASD practices in organizations from the social perspective.

A survey of User-Centered Design (UCD) practitioners in the industry [42] showed that they believe UCD practices improve product usefulness and usability. However, they lacked measures and evaluation criteria to show UCD's effectiveness and often relied on internal measures, such as customer satisfaction or enhanced ease of use. Later work on the return on investment of UX (UX ROI) [4] is divided into three types: social, internal, and external. Although UX work is expensive, indicators such as competitive advantage, increased user satisfaction, reduction of development costs, reuse of design principles, or innovations brought forward by UX research represent useful justifications for the investment in UX activities [4]. Nevertheless, direct revenues from UX work are difficult to calculate and precise methods to do so do not exist.

Issues impeding high UX maturity include blocking factors leading to strategic planning issues include the lack of management support and resistance among engineers and/or management to usability [35] and the lack of sensitivity and responsivity among developers toward the work of usability practitioners [43]. Cost-justifying usability can help overcome these issues [4, 30]. However, struggles remain when integrating UCD or UX into formal software development models because various social aspects influence the context in which the integration happens [2, 10, 37].

UX capability/maturity models (UXCMMs) offer structured solutions for step-by-step integrations of UX practices into organizations. UX maturity refers to how consistently an organization implements UX processes to achieve UX goals [36]. UXCMMs enable assessing software engineering organizations' UX capabilities and maturity. Based on these assessments, such models recommend moving toward a higher UX maturity level, i.e., optimizing UX processes and their ROI [9, 10, 36]. See [26] for a systematic literature review (SLR) about UXCMMs.

To the best of our knowledge, neither the implementation of the UCD approach nor the integration of UX practices in organizations has been studied from the social perception perspective. Concretely, integrating UX and UCD practices into software development processes affects how developers, designers, and managers execute their work tasks and might change their perception of contributions toward achieving business goals. Understanding how stakeholders perceive UX practices can provide insights into the organizational culture, collaboration dynamics, and the overall effectiveness of UX integration. Although some papers draw attention to the social aspects of stakeholders' perception of UCD or UX [3, 21], little is known about the social ROI of UCD or UX.

To identify and synthesize the relevant published research on the social ROI of UX, we conducted an SLR. Specifically, we aim to answer the following research questions:

- **RQ1:** What factors influence the perceived value of UX in organizations for UX and non-UX-trained staff?
- **RQ2:** What are the existing measures and tools to evaluate the perceived value of UX?

The contribution of this paper is to define a baseline or to identify avenues for future research regarding the increase of social ROI of UX while integrating UX. The increase in social ROI and UX perceived value would, we believe, significantly facilitate and improve the integration of UX into software development models, as well as help organizations in their quest to increase UX maturity.

2 Background and related work

2.1 User experience

The concept of UX emerged from closely related disciplines such as usability engineering, UCD, and human-centered design (HCD) [14, 16]. These approaches share a common thread in placing the user in the center of the development process and designing systems based on user needs, guided by user research data.

The International Organization for Standardization [19] defines UX as “a person’s perceptions and responses that result from the use or anticipated use of a product, system or service“. Thus, UX is context-dependent and subjective, allowing designers to only design for desired experiences without guaranteeing that the target users will live them. The definition deliberately excludes any dimension associated with the practice of design. The definition articulates UX in terms of the dynamic interaction between the user and a system across various temporal dimensions. We fully endorse this definition and assert that design shapes UX. In this context, UX is intricately connected to the essence of the system, and the design of the system can exert a notable influence, either positively or negatively, on the overall UX.

Hence, we rely on specific processes and practices to design for UX, using the process reference model (PRM) [22] as our primary reference. The PRM delineates four UX processes: analysis, design, formative evaluation, and summative evaluation. Additionally, it incorporates a suite of supporting UX methods designed to address these processes, ensuring the achievement of expected outcomes.

2.2 UX integration

In the ever-intensifying landscape of competition, organizations often rely on products’ UX as a pivotal differentiator, influencing product quality and, consequently, business success [15, 39]. However, organizations opting to integrate UX

activities into their established ASD processes, like Scrum, Extreme Programming, Kanban, or Crystal, must accommodate time and resources to conduct them to achieve UX integration [22]. Due to their shared characteristics, including constant collaboration, iterative approaches, swift testing, adaptability, and stakeholder involvement, UX and ASD are frequently combined [40]. Despite their theoretical compatibility, organizations often encounter challenges in this integration venture [11, 21, 38]. To overcome these difficulties, several integration strategies have been used in industry and documented in the literature. A literature review [3] addressed this issue by creating a framework listing different integration mechanisms in five main categories: practices integration, process integration, technology integration, people integration, and social integration. In a comprehensive literature review [6], the authors adopted the classification established by [3], shedding light on the constituent principles of UX and ASD integration. Their research underscores a growing interest within the research community in the social dimension of UX ASD integration.. UX maturity assessment implies using UXCMs to evaluate both UX capabilities and maturity within software engineering organizations. Each UXCMM describes an incremental path from lower to higher maturity levels, where competencies and capabilities increase at each level. Various maturity indicators identified in the literature include the timing of UX involvement, UX expertise and resources, the use of appropriate techniques and deliverables, UX-aware leadership and culture, the integration of UX processes with other corporate processes, resource availability, and user involvement [9, 10].

As UXCMs assume an incremental improvement of the aforementioned maturity indicators, UX maturity is inherently linked to the level of UX integration in an organization and the mindset of individuals in it. Reaching higher levels of UX maturity requires individuals to have a strong awareness of the UX ROI, develop a user-first mindset, and contribute toward building positive perceptions and attitudes about UX activities. Thus, enhancing the perceived value of UX (social ROI) is posited to correlate directly with a positive impact on UX maturity. This correlation, in turn, fosters a more robust organizational UX culture, facilitating the transition from intermediate to advanced stages of maturity. Existing literature identifies these transitional phases as intricate milestones to effectively integrating UX principles [45].

2.3 UX return on investment

Given that UX is grounded in UCD [27], metrics to assess the ROI of UCD also apply to UX. Examples of metrics include increased sales and revenues, reduced development time and costs, or reduced technical support and training needs [44]. The ROI is broken down into internal, external, and social. Internal ROI refers to the improvement of the system development lifecycle resulting from better UCD practices and, therefore, can be attributed to the UCD staff (i.e., UX designer, UX researcher, UX lead, UX strategist, UX analyst, UX evaluator, UX manager, field study specialist, or interaction designer [8]). External ROI refers to the improvement of the system and thus affects users and customers.

Social ROI refers to the organizational benefits stemming from improving the attitudes, beliefs, and perceptions of non-UCD staff toward UCD, UCD staff, and users. The authors specify that the credibility of UCD practitioners may depend as much on perceptions of ROI as on actual ROI metrics. Social ROI is characterized by buy-in from management, the belief that UCD is beneficial, and a supportive network that will allow UCD processes to reach their highest possible capability.

2.4 UX culture

Combining previously mentioned theoretical concepts, building organizational UX culture is a key strategic goal to achieve good UX integration. Previous studies [9, 12] found that building an organizational UX culture takes years. Evangelizing UX practice to stakeholders and teaching UX skills to colleagues showed a fruitful enhancer toward UX-oriented cultures organizations. The flow of competence from individual UX staff to other stakeholders can be achieved through sharing UX knowledge and raising awareness of the successful contributions of UX staff to product development. Additionally, organizing workshops to teach UX concepts, educating management on the importance of user testing and UX design, and building an internal stakeholder supporter base all contribute toward building a stronger UX culture [9]. Moreover, building UX capacity through hiring UX staff, dedicating budget to UX, and investing in materials and infrastructure results in a more UX-oriented culture where the organization understands the value of UX and is ready to integrate UX practices into its software development processes [29]. We drew on these concepts to build our search queries and define the hypotheses for this SLR. Finally, building a UX culture requires a holistic approach to UX practices, making them part of the organization's strategic goals and including all participating stakeholders in the UX work rather than just a small team of UX practitioners [17].

3 Methodology

We followed Kitchenham's methodology [24] to conduct the SLR. This methodology covers three phases (Figure 1): planning, conducting, and reporting. The planning phase is covered in this paper's introduction and background sections, laying out the reasons for conducting this SLR and formulating the research questions. The conducting phase is explained in this section, while the reporting phase is covered in section 4.

3.1 Conducting the literature review

Search process. We consider UX to form part of human-computer interaction (HCI), a research discipline building on top of (1) behavioral sciences such as psychology, anthropology, sociology, ergonomics and cognitive sciences; (2) design such as graphic design, information design and interaction design; (3) computer

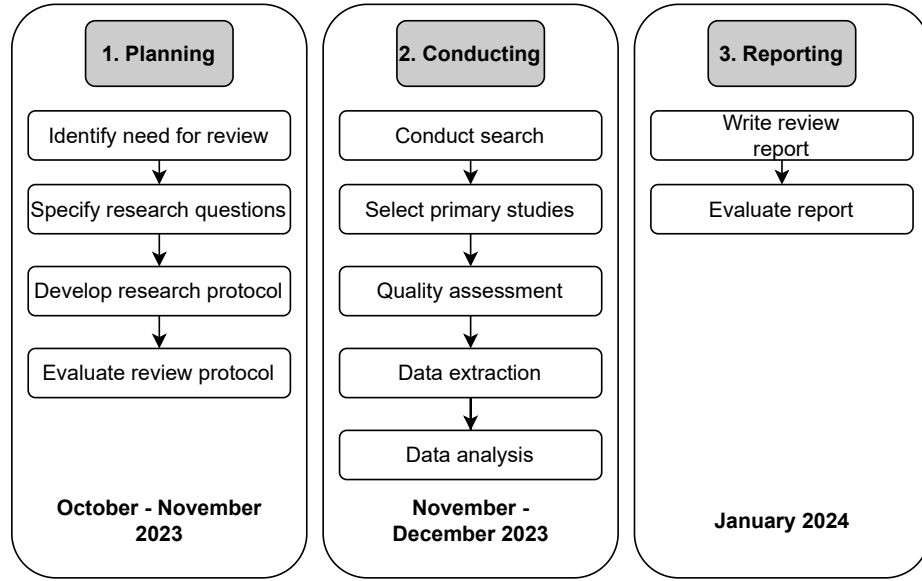


Fig. 1. SLR Process by [24]

science such as computer graphics and computer vision. To avoid retrieving duplicates, we looked for results in Scopus and ACM Digital Library (ACM DL), which index publications in HCI from other relevant databases like IEEE and ScienceDirect. We referred to the works of key authors [4, 6] to determine our query keywords. However, queries involving keywords "perceived value" and "social ROI", being less common in HCI literature, yielded no results, and despite testing various queries with synonyms, none proved fruitful. Therefore, we expanded our query to include concepts such as UX maturity, UX awareness, and UX culture. Although guidelines for conducting an SLR recommend consulting various sources, such as digital libraries, journals, grey literature, magazines, conferences, research registers, and internet sources, we focused only on databases that index peer-reviewed academic literature to examine the scientific understanding of the issue. Accordingly, we designed this query for Scopus:

TITLE-ABS-KEY ("ux maturity" OR "ux culture" OR "ux transformation" OR "ux integration" OR "ux awareness").

We modified the query to fit ACM DL's search engine design and extracted the articles from both databases on November 8, 2023.

Study selection and eligibility criteria. First, as our study specifically focuses on UX, we only considered papers explicitly mentioning UX, excluding those discussing solely usability engineering, UCD, or HCD. Second, we established the inclusion and exclusion criteria while identifying concepts and key-

words for the query. The iterative task of refining the query to achieve the desired outcome is a crucial means of delineating what is considered outside the scope of the study. This process aids in defining eligibility criteria (Table 1) for guiding the subsequent screening. Using Microsoft Excel, we screened the content of the retrieved articles in two steps:

1. title, keywords, and abstract screening;
2. full-text screening.

Table 1. Inclusion and exclusion criteria

Criteria	Inclusion	Exclusion
1) Language	English or French	other
2) Peer-reviewed	yes	no
3) Document type	conference paper or article	conference proceedings preface, workshops, posters, magazine articles, tutorials, and non-primary studies (systematic mapping and systematic, narrative, and semi-SLRs).
4) Content criteria	discussing perceived value of UX within an organization	not discussing the perceived value of UX within an organization
5) Content criteria	focusing on the perceived value of UX processes for different stakeholder type	focusing (only) on product perception for users
6) Content criteria	focusing on system development by adopting UX processes and practices	focusing on system development without considering the adoption of UX processes and practices

The third author acted as a final decision-maker when the two first authors disagreed on including or excluding a paper. We recorded all disagreements and their reasons throughout both screening steps. We defined two types of eligibility criteria: metacriteria and content criteria. The first three are metacriteria and are applied using database filters, except for language in ACM DL. The remaining three are content criteria and helped us select primary studies during the screening process. To identify and remove duplicates, we applied Excel’s *conditional formatting* to the authors’ information and the article title, and then applied *highlight cells*, followed by *duplicate values* feature. This allowed us to double-check the presence of any duplicates within our results. Two duplicates occurred in our results. These co-occurrences are due to the presence of each of these papers in the two databases queried. We only retrieved papers from selected databases to limit duplicates, avoiding overlaps in what each indexed, as explained in section 3.1. We excluded one paper from the analysis as the full text was inaccessible.

Quality assessment. The first and third authors conducted the quality assessment (QA) similarly to another SLR [23] for assessing the eligibility of the retrieved papers. Their QA methodology relies on *QualSyst*, a tool developed by [25]. This is a standardized checklist for evaluating primary research from different fields. The tool proposes an adapted version for qualitative and quantitative research and a concrete guide in appendices on applying the QA checklist. As the retrieved papers contain mainly qualitative results, we decided to use the *Checklist for assessing the quality of qualitative studies* presented in table 2 of [25] without criteria 10 due to its irrelevancy in HCI. Each checklist criteria was rated according to fulfillment level (2 = yes, 1 = partial, 0 = no) defined in *QualSyst*. Criteria not applicable to a specific study design were labeled 'n/a' and not considered when calculating the final score. The overall score was calculated by dividing the total points earned by the study on the checklist by the maximum possible points. For example, if there is one 'n/a', the maximum possible score is 16 points (9 criteria x 2 points = 18 points). To maintain a high-quality standard, we excluded papers scoring less than 75% from this study according to the QA scoring procedure outlined by [41]. Therefore, we excluded five papers at this stage.

Table 2. Average QA scores (2 reviewers) per paper (column 1) across nine criteria from [25]. Ref. stands for reference, Max. for the maximum score possible, n.a. for non-applicable.

Ref.	1	2	3	4	5	6	7	8	9	Total	Max.	%
[1]	1	2	2	2	2	1.5	2	2	2	16.5	18	91.60
[2]	2	2	2	2	2	2	2	2	2	18	18	100.00
[3]	2	2	2	2	2	2	1.5	2	2	17.5	18	94.40
[8]	2	2	2	2	2	1	2	0	2	15	18	83.30
[9]	2	2	2	2	2	2	2	2	2	18	18	100.00
[17]	2	2	2	2	2	2	2	2	2	18	18	100.00
[21]	2	2	2	2	2	2	2	2	2	18	18	100.00
[28]	1.5	2	2	2	2	2	2	2	2	17.5	18	94.40
[29]	2	1.5	2	2	n.a.	n.a.	n.a.	2	2	11.5	12	95.80
[31]	2	2	2	2	2	2	2	2	2	18	18	100.00
[32]	2	2	2	2	2	2	2	2	2	18	18	100.00
[33]	2	2	2	2	1.5	2	2	2	2	17.5	18	94.40
[34]	2	2	2	2	2	2	2	2	2	18	18	100.00
[45]	2	2	2	2	2	2	2	2	2	18	18	100.00

Data extraction. We extracted the following data for each study: title, keywords, abstract, study type (i.e., theoretical, empirical, model construction), methodological choices (i.e., interview, survey, observation), research questions or study objectives, and main research findings.

Deviation from the SLR protocol. We decided to manually include two papers that were not found by the query we ran on databases:

- Study [3] was authored by productive authors within the realm of the perceived value of UX and the social capital associated with UX. It was not indexed by the databases we searched in.
- Study [17] was found while selecting keywords for our query. We could not incorporate keywords from this paper into our search query for Scopus and maintain a reasonable number of papers for screening. Neither the title, the abstract, nor the keywords of this article match our query because the authors use the keyword "organizational culture" instead of "UX culture."

Data analysis. The two first authors analyzed the data using the thematic analysis (TA) method from [5]. We chose TA because this methodology is known for its application flexibility regarding sample size, research questions, and meaning generation approach. This flexibility should comply with the iterative SLR process. To a greater degree, we believe this methodological choice is suitable to deliver both outcomes of this SLR, i.e., identification of factors influencing the perceived value of UX and identification of its measurement tools. Using TA allowed us to create themes and discuss key aspects of the perceived value of UX using inductive open coding established from the first full-text reading of the included primary studies. This process is, therefore, a bottom-up process.

We generated an initial set of codes during the second screening step according to the TA methodology [5], i.e., "Familiarizing yourself with your data" and "Generating initial codes". After data extraction, we coded the papers by thoroughly reading the full text and searching for data relevant to our research questions. For example, ideas, results, or data related to the perceived value of UX were extracted into an Excel sheet and assigned one or multiple codes. While coding, we discussed codes by sharing codebooks and analyzed potential similarities and differences, thus continuously adapting the codes according to phases 3, 4, and 5 of the TA methodology, respectively "Searching for themes", "Reviewing themes", and "Defining and naming themes". We present phase 6 of the TA, i.e., "Producing the report", in section 4. Figure 2 presents the PRISMA flow diagram tracking the complete selection process of primary studies.

4 Results

Table 3 lists the 14 studies included in this SLR that passed the screening based on our eligibility criteria and QA. The articles were published between 2012 and 2023. The data analysis resulted in 25 codes. We consolidated 24 of them into 6 themes answering RQ1 and used the remaining one to answer RQ2 (section 4).

4.1 RQ1: What factors influence the perceived value of UX in organizations for UX and non-UX trained staff?

Theme 1: Understanding UX terminology, concepts, and metrics. Stakeholders' understanding of UX processes, UCD, and related concepts is essential

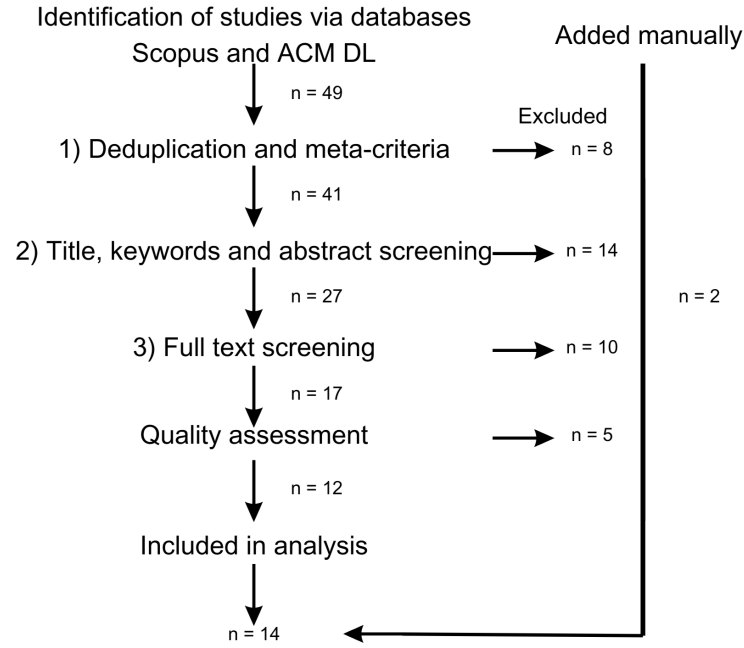


Fig. 2. PRISMA flow diagram/paper selection process

Table 3. Included papers. "CS" stands for Case Study.

Ref.	Year	Study type	Approach type
[1]	2020	Empirical	Mixed
[2]	2023	Empirical / double CS	Qualitative
[3]	2012	Theoretical + framework construction	Mixed
[8]	2018	Empirical / CS	Qualitative
[9]	2023	Empirical / multiple CS	Qualitative
[17]	2013	Empirical / CS	Qualitative
[21]	2019	Empirical / CS	Qualitative
[28]	2017	Empirical	Qualitative
[29]	2019	Theoretical + model construction	Qualitative
[31]	2023	Empirical / CS	Qualitative
[32]	2023	Empirical / CS	Qualitative
[33]	2015	Empirical / CS	Qualitative
[34]	2023	Empirical	Mixed
[45]	2020	Empirical	Mixed

for building a positive perceived value of UX. Knowing what UX practitioners do and how they can collaborate with other team members, such as developers, plays a vital role in valuing UX work [17]. Interestingly, developers can find it easy to connect with the wireframes provided by UX consultants and yet consider UX as a "black box" [8]. This aligns with other studies that also reported

stakeholders considering UX as a "black box" appearing before development [31, 32]. Furthermore, in low-UX maturity organizations, UX professionals must invest significant effort in educating both clients and colleagues about UX to get the necessary buy-in [2, 9, 17, 29]. Finally, the complexity and wide range of UX responsibilities makes it hard for organizations to understand and agree on the UX outcomes [8, 21].

We identified several strategies for improving the understanding of UX practices in organizations. For instance, ensuring that stakeholders have at least a theoretical understanding of UX positively affects the perceived value of UX. Poor understanding of UX results in considering it resource-intensive and might make UX work deprioritized [31] and UX practitioners isolated and misunderstood [28]. Additionally, knowledge transfer from UX practitioners to non-UX staff (i.e., developers, clients, management) helps improve organization-wide UX integration and understanding, leading to more willingness to do UX work and better team collaboration throughout projects [3, 29, 32]. Finally, organizing regular UX trainings [9, 31, 34] for developers and educating clients on UX [9] seem to produce good results for generating positive perception of UX.

Theme 2: UX resources. Numerous studies link the lack of UX resources to a deficiency in organizational UX strategy [9, 32, 33]. This lack of UX resources stems from negative perceptions of UX, further constraining available resources for UX activities [31], compelling UX staff to juggle multiple projects with tight deadlines [2], and posing challenges in scoping UX work for practitioners [28]. In addition, it manifests in UX activities occurring late in the development process [9], leading to bottlenecks and delayed outcomes [2].

Hiring UX staff is often the initial step toward advancing UX maturity. Typically, organizations increase the resources allocated to UX [33, 34] after achieving a successful buy-in by hiring UX staff, investing in UX infrastructure, and/or allocating time for conducting UX work [29]. However, hiring UX staff is often the most expensive investment in UX [29]. To expedite the integration of UX, it is crucial to involve management with a strong grasp of the significance of including users in the design process [28]. Nevertheless, integrating newly hired team members into existing structures can lead to tensions [3]. To address this challenge, [29] suggests prioritizing hiring UX staff with broad knowledge and skills capable of contributing to the development of organizational UX capacity. For instance, developers with an interest or background in UX can significantly enhance awareness of its importance.

Theme 3: Organizational UX culture. Developing a UX culture is essential to create favorable conditions for UX integration. UX culture or mindset stems from realizing that addressing user needs makes way for better products and gaining competitive advantage [9]. However, that does not always lead to immediate product redesigns [29].

There are multiple interventions that can help organizations build a UX culture. For example, active participation in UX activities results in higher aware-

ness of the day-to-day responsibilities of UX practitioners [9, 29, 17]. Similarly, observation of UX activities may help non-UX staff grasp the essence of UX, minimizing resistance to the new methods of working necessary for UX integration. Also, engaging in discussion about UX and producing educational materials for how UX could benefit product development helps to accept UX as a strategic asset [21]. Further, evangelizing UX wider than direct management, such as to marketing departments, is key for making UX institutionalized [9]. Other interventions include organizing company events where employees can attend field studies [29], creating dedicated UX teams [28], broadly sharing UX knowledge and results [29], and starting marketing campaigns to promote the experience with products organizations develop [21].

Theme 4: Perceived UX value. The value of UX is perceived as low in organizations that fail to acknowledge the importance of hiring UX professionals with formal UX practices and instead consider UX work as "soft skills" that everyone possesses [31, 34]. Giving UX practitioners a defined and stable job position with career prospects is a strong signal of UX strategy [34]. In addition, the fun experienced by UX practitioners while conducting UX activities also influences the perceived value of UX [31], which aligns with prior work [7]. Further, stakeholders' perceived value of UX can be either influenced by the external ROI (economic benefits) or by the internal ROI (process optimization), which is also in line with prior work [44].

One strategy to demonstrate the impact of external ROI on perceived UX value is to select a product that serves as a flagship for UX in the product line, ensuring a positive association between UX and its system-wide impact [17]. Another strategy lies in involving stakeholders in UX activities and colocating them in shared offices with UX practitioners can enhance internal ROI [31], aligning their mindsets, limiting the black box effect, and demystifying UX work for non-UX staff. Stakeholders' involvement strategy induces UX transversality across stakeholder groups, making them actors of UX integration [2]. Customers' high perception of UX value motivates, even enforces, organizational UX buy-in [21]. Finally, organizations that institutionalized UX exhibit higher perceived UX value [28]. For example, organizations recognizing the value of UX and allocating more UX resources increase UX maturity [45]. These findings underscore a direct connection between the value of UX and the themes explored in this SLR. Such insights should inspire UX practitioners to extend their efforts beyond simply raising awareness of UX among their colleagues.

Theme 5: UX management. Attitudes and behaviors of both UX and non-UX managers toward UX practices significantly impact UX integration in organizations. Non-UX managers' perceived UX ROI greatly impacts UX practices in corporate environments. Projects receive financial support accelerating positive outcomes when non-UX managers acknowledge UX ROI [9], whereas non-UX managers' negative perceptions of UX lead to individuals' resistance to UX [31]. To address such resistance, organizations could create a UX guild that brings

together UX representatives to ensure UX consistency across the organization and builds a common ground for structuring UX practices and management [21]. Such guild and UX representatives can embody the UX leadership to limit the feeling of "noise" and allow stakeholders to understand UX processes. This avoids the feeling of having "three captains on one ship" [9], which can be detrimental to perceived UX value as a serious, structured practice. It is crucial for executive managers to support UX practices, as their perceived value of UX shapes how employees approach UX. In case of high perceived UX value, UX managers can make decisions and document the decision-making process [2]. If there is no designated UX manager, employees who are well-liked and trusted can be identified to act as UX "flag holders" who spread a good perceived UX value [31]. UX flag holders know the organization's inner workings and unwritten rules and can facilitate UX integration.

Theme 6: UX work organization. One key finding lies in the value delivery from UX to development processes. As explained by [33], breaking down UX tasks and linking them to agile sprint goals can enhance the transparency of value deliveries to the development process. Consequently, understanding these processes can greatly improve the perceived value of UX and foster behaviors and attitudes conducive to adherence to the practice. When UX is integrated into an organization, UX processes have to fit in with pre-existing processes and the teams in place who operate these processes. For example, [9] suggest understanding organizational processes better by mapping the role of each of its stakeholders to identify the key supportive figures to become UX champions. Strategically, organizations can also opt for a pilot project to raise awareness of these processes and make existing teams understand the new UX-related practices by demonstrating them as easy and accessible [21]. This strategy diminishes the discovery effect and accompanies employees in their discovery to encourage the development of an attitude and behaviors inclined to embrace UX. In fact, a good understanding and visibility of the benefits of UX practices increases their perceived value, leading to greater acceptance and integration by employees. This awareness can also be raised by demonstrating the benefits of certain UX methods for information management, such as mock-up or storyboarding, which are simple, accessible, and impactful [21].

Finally, the second key finding touches on the lack of perceived value in UX, which often leads to a lack of prioritization in various aspects of the project. In fact, prioritization is a mechanism that manifests itself in the timing of processes, the prioritization of requirements (user and functional), the allocation of budget adapted to the research objectives (access to users, building prototypes for user testing, acquiring materials required to implement UX methods, etc.) and in the recruitment of human resources adapted to the research needs and to the performance of UX activities in the best possible circumstances (validity of results, workload, etc.). Indeed, UX in a low perceived value context is often disadvantaged. As reported in an observational study [2], it is not uncommon to witness a temporarily halted development cycle. However, for this to occur, it is

essential for the project manager to have a perceived value of UX that enables them to make choices regarding prioritization. To conclude, power dynamics and challenging communication between developers and UX practitioners are often cited as barriers to the integration of UX and the cohesion of teams toward successfully integrating both approaches to unleash their full potential. In this regard, [3] suggests utilizing meetings to announce and publicly emphasize instances where collaboration between the two teams has led to the success of system development. This strategy aims to diminish counterproductive behaviors toward UX practitioners by raising the perceived value brought by their contribution.

4.2 RQ2: Measures and tools to evaluate perceived value of UX.

We found only one study dealing with tools for measuring the perceived value of UX [1]. The author asked information technology practitioners to rate how much their organization values UX on a 7-point scale, where a higher rating meant a higher perceived value of UX. However, this was based on only one question in the survey, and it was not further described in the paper. All other studies in this SLR were qualitative and descriptive of the organizational UX strategy and employees' attitudes toward UX practices.

5 Conclusion

Perception of UX value is a complex construct determined by several factors. In low UX-maturity organizations, individual employees shed light on the importance of UX and start advocating for user-centered practices. Organizational buy-in happens after successful project contributions become clear to a wider scope of stakeholders, which primarily means convincing the management of its positive contributions. Often, UX work is perceived as a black box whose processes and practices are not understood by the organization and thus often underestimated in the time, staff, and budget required. The perception usually changes thanks to UX champions who promote UX and advocate for its strategic integration into organizational processes (i.e., evangelization). Nevertheless, both UX training and including non-UX staff in UX activities are key activities helping increase the positive perceived value of UX in organizations.

The key finding from this SLR is that understanding UX and its practices is the initial step toward enhancing perceived UX value and UX integration, which aligns with [2, 9, 21]. The six themes uncovered in this SLR provide a strong foundation for future work. This future work endeavors to construct a framework for assessing individuals' perceived UX value based on the six related influencing factors and their associated codes. The perceived UX value, being a continuum, will likely entail the utilization of a declarative scale questionnaire.

Finally, we raise two hypotheses regarding the struggles impeding UX integration: the successful integration of UX is correlated with the perceived value of UX (H1), and the high perceived value of UX in organizations generates social ROI (H2).

Acknowledgments. This research was funded by the Service Public de Wallonie, project UX-DI (grant number 8637) and AISIN Europe. We thank the anonymous reviewers for their comments on improving this paper.

Disclosure of Interests. All authors declared that they have no conflict of interest relevant to the content of this article. Luka Rukonić is an employee of AISIN Europe.

References

1. Alhadreti, O.: Exploring UX maturity in software development environments in Saudi Arabia. *International Journal of Advanced Computer Science and Applications* **11**(12) (2020). <https://doi.org/10.14569/IJACSA.2020.0111221>
2. Azevedo, D., Rukonić, L., Kieffer, S.: The Gap Between UX Literacy and UX Practices in Agile-UX Settings: A Case Study. In: Abdelnour Nocera, J., Kristín Lárusdóttir, M., Petrie, H., Piccinno, A., Winckler, M. (eds.) *Human-Computer Interaction – INTERACT 2023*. pp. 436–457. Springer Nature Switzerland, Cham (2023). https://doi.org/10.1007/978-3-031-42283-6_24
3. Barksdale, J.T., McCrickard, D.S.: Software product innovation in agile usability teams: an analytical framework of social capital, network governance, and usability knowledge management. *International Journal of Agile and Extreme Software Development* **1**(1), 52–77 (2012). <https://doi.org/10.1504/IJAESD.2012.048302>
4. Bias, R.G., Mayhew, D.J.: *Cost-justifying usability: an update for an Internet age*, vol. Second. Elsevier (2005)
5. Braun, V., Clarke, V.: Using thematic analysis in psychology. *Qualitative Research in Psychology* **3**(2), 77–101 (2006). <https://doi.org/10.1191/1478088706qp063oa>
6. Brhel, M., Meth, H., Maedche, A., Werder, K.: Exploring principles of user-centered agile software development: A literature review. *Information and Software Technology* **61**, 163–181 (2015). <https://doi.org/10.1016/j.infsof.2015.01.004>
7. Browne, J., Green, L.: The future of work is no work: A call to action for designers in the abolition of work. In: *Extended Abstracts of the 2022 CHI Conference on Human Factors in Computing Systems*. CHI EA '22, Association for Computing Machinery, New York, NY, USA (2022). <https://doi.org/10.1145/3491101.3516385>, <https://doi.org/10.1145/3491101.3516385>
8. Bruun, A., Larusdottir, M.K., Nielsen, L., Nielsen, P.A., Persson, J.S.: The role of UX professionals in agile development: a case study from industry. In: *Proceedings of the 10th Nordic Conference on Human-Computer Interaction*. p. 352–363. NordiCHI '18, Association for Computing Machinery, New York, NY, USA (2018). <https://doi.org/10.1145/3240167.3240213>
9. Buis, E., Ashby, S., Kouwenberg, K.: Increasing the UX maturity level of clients: A study of best practices in an agile environment. *Information and Software Technology* **154**, 107086 (2023). <https://doi.org/10.1016/j.infsof.2022.107086>
10. Chapman, L., Plewes, S.: A UX maturity model: Effective introduction of UX into organizations. *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)* **8520 LNCS(PART 4)**, 12–22 (2014). https://doi.org/10.1007/978-3-319-07638-6_2
11. Choma, J., Guerra, E.M., Alvaro, A., Pereira, R., Zaina, L.: Influences of UX factors in the agile UX context of software startups. *Information and Software Technology* **152**, 107041 (2022)

12. Gray, C.M., Toombs, A.L., Gross, S.: Flow of competence in ux design practice. In: Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems. p. 3285–3294. CHI '15, Association for Computing Machinery, New York, NY, USA (2015). <https://doi.org/10.1145/2702123.2702579>
13. Gren, L.: The links between agile practices, interpersonal conflict, and perceived productivity. In: Proceedings of the 21st International Conference on Evaluation and Assessment in Software Engineering. p. 292–297. EASE '17, Association for Computing Machinery, New York, NY, USA (2017). <https://doi.org/10.1145/3084226.3084269>
14. Hassan, H.M., Galal-Edeen, G.H.: From usability to user experience. In: 2017 International Conference on Intelligent Informatics and Biomedical Sciences (ICIIBMS). pp. 216–222. IEEE (2017). <https://doi.org/10.1109/ICIIBMS.2017.8279761>
15. Hassenzahl, M.: User experience (ux) towards an experiential perspective on product quality. In: Proceedings of the 20th Conference on l'Interaction Homme-Machine. pp. 11–15 (2008). <https://doi.org/10.1145/1512714.1512717>
16. Hassenzahl, M., Tractinsky, N.: User experience-a research agenda. *Behaviour & information technology* **25**(2), 91–97 (2006)
17. Heikkinen, M., Määttä, H.: Design driven product innovation in enhancing user experience oriented organisational culture in b-to-b organisations. In: 2013 IEEE Tsinghua International Design Management Symposium. pp. 127–135. IEEE (2013)
18. Holgeid, K.K., Jørgensen, M.: Benefits management and agile practices in software projects: how perceived benefits are impacted. In: 2020 IEEE 22nd Conference on Business Informatics (CBI). vol. 2, pp. 48–56. IEEE (2020)
19. ISO: Ergonomics of human-system interaction part 210: Human-centred design for interactive systems. Standard ISO 9241-210:2019, International Organization for Standardization, Geneva, CH (2019), <https://www.iso.org/standard/77520.html>
20. Itkonen, J., Udd, R., Lassenius, C., Lehtonen, T.: Perceived benefits of adopting continuous delivery practices. In: Proceedings of the 10th ACM/IEEE International Symposium on empirical software engineering and measurement. pp. 1–6 (2016)
21. Kashfi, P., Feldt, R., Nilsson, A.: Integrating UX principles and practices into software development organizations: A case study of influencing events. *Journal of Systems and Software* **154**, 37–58 (2019)
22. Kieffer, S., Rukonić, L., Kervyn de Meerendré, V., Vanderdonckt, J.: A process reference model for ux. In: International Joint Conference on Computer Vision, Imaging and Computer Graphics. pp. 128–152. Springer (2020). https://doi.org/https://doi.org/10.1007/978-3-030-41590-7_6
23. Kim, Y.M., Rhiu, I., Yun, M.H.: A systematic review of a virtual reality system from the perspective of user experience. *International Journal of Human-Computer Interaction* **36**(10), 893–910 (2020)
24. Kitchenham, B.: Guidelines for performing systematic literature reviews in software engineering. Tech. rep., EBSE Technical Report (2007)
25. Kmet, L.M., Cook, L.S., Lee, R.C.: Standard quality assessment criteria for evaluating primary research papers from a variety of fields. Tech. rep., Alberta Heritage Foundation for Medical Research (2004)
26. Lacerda, T.C., von Wangenheim, C.G.: Systematic literature review of usability capability/maturity models. *Computer Standards & Interfaces* **55**, 95–105 (2018). <https://doi.org/10.1016/j.csi.2017.06.001>
27. Law, E.L.C., Roto, V., Hassenzahl, M., Vermeeren, A.P.O.S., Kort, J.: Understanding, Scoping and Defining User Experience: A Survey Approach. *CHI 2009* **23**(1), 23–32 (2009). <https://doi.org/10.1145/1518701.1518813>

28. MacDonald, C.M.: "It Takes a Village": On UX Librarianship and Building UX Capacity in Libraries. *Journal of Library Administration* **57**(2), 194–214 (2017). <https://doi.org/10.1080/01930826.2016.1232942>
29. MacDonald, C.M.: User experience (UX) capacity-building: A conceptual model and research agenda. In: *Proceedings of the 2019 on Designing Interactive Systems Conference*. p. 187–200. DIS '19, Association for Computing Machinery, New York, NY, USA (2019). <https://doi.org/10.1145/3322276.3322346>
30. Nielsen, J., Berger, J., Gilutz, S., Whitenon, K.: *Return on investment (ROI) for usability* (2013)
31. Nielsen, S., Ordoñez, R., Skov, M.B., Jochum, E.: Strategies for strengthening UX competencies and cultivating corporate UX in a large organisation developing robots. *Behaviour & Information Technology* pp. 1–29 (2023). <https://doi.org/10.1080/0144929X.2023.2227284>
32. Nielsen, S., Skov, M.B., Bruun, A.: User experience in large-scale robot development: A case study of mechanical and software teams. In: *Human-Computer Interaction – INTERACT 2023: 19th IFIP TC13 International Conference, York, UK, August 28 – September 1, 2023, Proceedings, Part II*. p. 40–61. Springer-Verlag, Berlin, Heidelberg (2023). https://doi.org/10.1007/978-3-031-42283-6_3
33. Øvad, T., Larsen, L.B.: The prevalence of UX design in agile development processes in industry. In: *2015 Agile Conference*. pp. 40–49. IEEE (2015). <https://doi.org/10.1109/Agile.2015.13>
34. Phesto P. Namayala, T.S.K., Mselle, L.J.: The factors affecting user experience maturity in free and open source software community: An empirical study. *International Journal of Human-Computer Interaction* pp. 1–17 (2023). <https://doi.org/10.1080/10447318.2023.2262270>
35. Rosenbaum, S., Rohn, J.A., Humburg, J.: A toolkit for strategic usability: results from workshops, panels, and surveys. In: *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. p. 337–344. CHI '00, Association for Computing Machinery, New York, NY, USA (2000). <https://doi.org/10.1145/332040.332454>
36. Rukonić, L., Kervyn de Meerendré, V., Kieffer, S.: Measuring UX capability and maturity in organizations. In: *Design, User Experience, and Usability. Practice and Case Studies: 8th International Conference, DUXU 2019, Held as Part of the 21st HCI International Conference, HCII 2019, Orlando, FL, USA, July 26–31, 2019, Proceedings, Part IV*. p. 346–365. Springer-Verlag, Berlin, Heidelberg (2019). https://doi.org/10.1007/978-3-030-23535-2_26
37. Salah, D., Paige, R., Cairns, P.: A practitioner perspective on integrating agile and user centred design. In: *Proceedings of the 28th International BCS Human Computer Interaction Conference on HCI 2014 - Sand, Sea and Sky - Holiday HCI*. p. 100–109. BCS-HCI '14, BCS, Swindon, GBR (2014). <https://doi.org/10.14236/ewic/hci2014.11>
38. Salah, D., Petrie, H., Paige, R.F.: Towards a framework for integrating user centered design and agile software development processes. *Proc. Irish CHI 2009* (2009)
39. Sauro, J., Johnson, K., Meenan, C.: From snake-oil to science: Measuring UX maturity. In: *Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems*. p. 1084–1091. CHI EA '17, Association for Computing Machinery, New York, NY, USA (2017). <https://doi.org/10.1145/3027063.3053350>
40. Schön, E.M., Thomaschewski, J., Escalona, M.J.: Agile requirements engineering: A systematic literature review. *Computer standards & interfaces* **49**, 79–91 (2017). <https://doi.org/10.1016/j.csi.2016.08.011>

41. Van Cutsem, J., Marcora, S., De Pauw, K., Bailey, S., Meeusen, R., Roelands, B.: The effects of mental fatigue on physical performance: a systematic review. *Sports medicine* **47**(8), 1569–1588 (2017). <https://doi.org/10.1007/s40279-016-0672-0>
42. Vredenburg, K., Mao, J.Y., Smith, P.W., Carey, T.: A survey of user-centered design practice. In: *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. p. 471–478. CHI '02, Association for Computing Machinery, New York, NY, USA (2002). <https://doi.org/10.1145/503376.503460>
43. Wilson, C.E.: Please listen to me! or, how can usability practitioners be more persuasive? *Interactions* **14**(2) (2007)
44. Wilson, C.E., Rosenbaum, S.: Categories of return on investment and their practical implications. In: *Cost-justifying usability*, pp. 215–263. Elsevier (2005)
45. Young, S.W., Chao, Z., Chandler, A.: User experience methods and maturity in academic libraries. *Information Technology and Libraries* **39**(1) (2020). <https://doi.org/10.6017/ital.v39i1.11787>