Understanding, Usefulness and Recognition of UX Artifacts: Crossing Boundaries between Agile and UX Practitioners

Luka Rukonić
Université catholique de Louvain,
Louvain-la-Neuve, Belgium
luka.rukonic@uclouvain.be

Pierre Fastrez
Université catholique de Louvain,
Louvain-la-Neuve, Belgium
pierre.fastrez@uclouvain.be

Suzanne Kieffer
Université catholique de Louvain,
Louvain-la-Neuve, Belgium
suzanne.kieffer@uclouvain.be

Abstract

Artifact-mediated communication supports knowledge exchange about users and system design in user-centered agile software development (UCASD). While prior research documents the use of UX artifacts in UCASD, little is known about how practitioners interpret their content and perceive their usefulness. This study adopts a practitioner perspective and explores the role of UX artifacts through the lens of boundary objects theory to identify how they bridge disciplinary gaps. We used a questionnaire and a retrospective think-aloud protocol with nine agile and four UX practitioners, focusing on six commonly used UX artifacts. Findings show that storyboards and user journey maps support communication, persona and wireframe act as boundary objects between agile and UX teams, and affinity diagram and user test report serve local purposes. We conclude by providing practical recommendations for UCASD teams and directions for future research.

Keywords: artifact-mediated communication, user experience, agile user-centered design, UX artifacts, boundary objects.

1. Introduction

User-centered agile software development (UCASD) is an interdisciplinary approach that requires practitioners to collaborate closely in delivering software that is both usable by end-users and valuable to the organizations developing it (Ardito et al., 2014; Brhel et al., 2015). UCASD practitioners include developers, engineers, agile team members, and professionals in user experience (UX). Agile roles such as product owners or team facilitators focus on iterative planning, team coordination, and value delivery (Beck et al., 2001). UX roles include researchers and designers who elicit user needs, specify user requirements, and design and evaluate solutions (MacDonald et al., 2021).

A communication gap between UCASD practitioners arises from differences in jargon, developers' limited UX knowledge, and contrasting worldviews (Ardito et al., 2014; Choma et al., 2015; Kashfi et al., 2019). For example, engineers are system-centered and problem-solving, while UX practitioners are human-centered and problem-seeking oriented (Rose & Tenenberg, 2015). Verbal explanations of UX findings can lead to misunderstandings between teams (Choma et al., 2015). Furthermore, agile and UX practitioners often face challenges communicating across boundaries of their respective professions due to their differing objectives (Gulliksen et al., 2003; Salah et al., 2014; Visescu et al., 2024). Agile practitioners focus on delivering working software to customers that satisfies business goals. UX practitioners focus on designing systems that satisfy user needs.

Previous research reports on the capability of UX artifacts to facilitate communication and collaboration between practitioners (Garcia et al., 2017, 2019). UX artifacts serve various purposes: personas document typical representations of users, storyboards depict stories about users' interaction with the system, and user journey maps show the touchpoints and phases of interactions with a system or service. Similarly, practitioners use prototypes to demonstrate functionalities, persuade stakeholders, gather feedback, and negotiate requirements (Lauff et al., 2020). Some artifacts, such as wireframes, support multiple roles but fulfill different purposes: designers use them to test and validate ideas with users, while developers use them to assess feasibility and estimate the effort required to implement the system (Garcia et al., 2019).

Yet, artifact-mediated communication remains underexplored, despite extensive literature on methodologies supporting UCASD practices (Kashfi et al., 2019; Salah et al., 2014). Existing studies mostly offer descriptive accounts of how UX artifacts are used, without examining how agile and UX practitioners perceive their value for communication and collaboration. For example, while personas help foster user focus, agile practitioners may question

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their usefulness or credibility (Blomkvist et al., 2015), particularly due to their presentation (Putnam et al., 2016). Moreover, agile practitioners often prioritize system functionality over understanding users' goals and motivations (Zaina et al., 2021).

While prior research documents the practical use of UX artifacts, little is known about how UCASD practitioners actually understand, recognize, and interpret them. In particular, it remains unclear whether shared understanding is necessary for UX artifacts to support communication and collaboration, or whether they still function effectively when interpreted differently. UX artifacts are often employed to support coordination between cross-functional teams. However, their capacity to bridge disciplinary boundaries depends on the distinct practices of agile and UX practitioners, which requires studying the contexts in which they are used and the roles they play within communication and collaboration flows. This leads us to our research question: *Can UX artifacts help bridge disciplinary gaps in UCASD, or do teams need consensus on their meaning to communicate and collaborate in practice?*

To answer our research question, we adopted a practitioner-centered perspective to examine how UX artifacts mediate communication and collaboration in UCASD. We focused on understanding, usefulness, and recognition dimensions, by asking nine agile and four UX practitioners to examine six common UX artifacts and interpret their content. We combined questionnaire responses with retrospective think-aloud data to compare how both groups understand, recognize and assess the usefulness of these UX artifacts for cross-disciplinary collaboration. This study fills a gap in prior research by going beyond descriptive accounts of UX artifact usage and providing self-reported evidence on how practitioners perceive these UX artifacts in UCASD settings.

2. Background

User Experience. UX is grounded in user-centered design (UCD) and describes users' perceptions and responses to a system (ISO 9241-210, 2019), including pragmatic attributes such as usability and functionality, and hedonic attributes such as stimulation and novelty (Hassenzahl, 2003). UX practitioners apply UCD as an iterative process based on principles such as user focus, active user involvement, and early and continuous prototyping, that place the user at the center of development (Gulliksen et al., 2003; ISO 9241-210, 2019). UX design builds on these principles and extends them to address users' needs and create systems that support positive experiences (Kashfi et al., 2019).

Communication in UCASD. Agile teams favor informal, synchronous communication such as face-to-face discussions, stand-up meetings, and chat (Ahmad et al., 2018). Code documentation remains the main communication artifact, but most communication targets the customer rather than internal coordination (Ahmad et al., 2018). Agile values direct interaction, minimal documentation, and flexibility. Teams self-organize and choose their own methods to implement agile principles (Cockburn & Highsmith, 2001). These practices emphasize short-term planning and delivering functional software quickly, often at the expense of comprehensive knowledge sharing.

In contrast, UX practitioners communicate to share user insights, align with team members, persuade stakeholders, and collect feedback (MacDonald et al., 2021). They communicate with various audiences, including internal teams, leadership, and clients, using planned methods (e.g., meetings, presentations, workshops), impromptu techniques (e.g., critiques, informal conversations) and UX artifacts (e.g., personas, wireframes) (MacDonald et al., 2021).

Difference in communication style, timing, and tools hinder collaboration in UCASD. Agile teams may overlook or deprioritize UX contributions, while UX practitioners struggle to integrate UX processes into agile cycles (Visescu et al., 2024). Sharing user knowledge and involving agile teams in UX activities can improve communication, but requires added effort and intentional coordination (Visescu et al., 2024).

Artifact-mediated communication is a UCASD principle that promotes the use of tangible and up-to-date artifacts to document and share product and design concepts across stakeholders (Brhel et al., 2015). These artifacts support collaboration between designers and developers and help capture the needs of users and customers (Brhel et al., 2015; Choma et al., 2015). Practitioners use them throughout the project lifecycle, including planning, discovery, iterative development, and review meetings (Garcia et al., 2017).

During early design phases, teams often rely on low-fidelity prototypes or mockups, while wireframes support creating and testing interface flows (Garcia et al., 2019; Zaina et al., 2021). To document user needs, practitioners use user stories to define features, scenarios to describe interactions, and personas to represent typical users. Prototypes play a central role in iterative cycles to show design progress and support UX evaluation with users (Garcia et al., 2017). UX designers also use these artifacts in internal meetings to secure executive buy-in and in external presentations to demonstrate the system to clients (Lauff et al., 2020).

UX artifacts are not standalone objects, as their

creators need to explain or contextualize them for the team (McCarthy et al., 2020). UX practitioners use them to mediate communication between diverse stakeholders, including the core team, project managers, executives, and customers. For example, they use personas during planning and development to build shared understanding of users and their needs (Garcia et al., 2019). Artifact-mediated communication thus plays a key role in aligning perspectives and supporting collaboration across disciplinary boundaries.

2.1. UX artifacts as boundary objects

Boundary objects are objects that practitioners from different professions use without consensus on their meaning or purpose (Star, 2010; Star and Griesemer, 1989). Boundaries represent space limits and sociocultural differences within which practitioners work, defined by the shared action and common objects the group uses (Akkerman and Bakker, 2011). They are characterized by their (1) interpretive flexibility—the potential for different interpretations without needing consensus on the meaning, and (2) retention of identity and practices across professional contexts (Star, 2010). Conceptualizing UX artifacts as boundary objects means agile and UX practitioners extract and hold different domain-specific understandings of the same artifact.

The research on UX artifacts as boundary objects is scarce. However, three studies have investigated the role of artifacts as boundary objects in the context of knowledge transfer between agile and UX practitioners. Leinonen and Roto (2023) explored knowledge transfer in service design projects, and identified two types of boundary objects exist: spanning and utility. Spanning boundary objects transfer knowledge between teams or over time, while utility boundary objects transfer knowledge within teams or during one phase. Utility boundary objects such as wireframes, prototypes, and personas, aiming at solving knowledge transfer problems such as amount and communication quality between designers and developers. In Blomkvist et al. (2015), six UX practitioners reported during interviews that personas and scenarios functioned as user research documentation rather than boundary objects. McCarthy et al. (2020) found that artifacts such as journey maps and personas, despite being boundary objects, might still require explanation and function as communication aids between team members rather than being used standalone. Hence, due to expertise differences, agile and UX practitioners might interpret UX artifacts differently depending on their knowledge and priorities (Garcia et al., 2017, 2019).

3. Methodology

This study took place within the software development department of an automotive organization specializing in navigation systems and connected vehicle services. We used a mixed-method approach involving retrospective think-aloud (RTA) protocol and a questionnaire. We asked participants to look at six UX artifacts and to complete a questionnaire regarding each artifact. After, we conducted the RTA and they commented on their visual exploration of the artifacts.

Participants. This study involved 13 participants: 9 agile and 4 UX practitioners. The sample included 9 men and 4 women, aged 27-50 (M=38, SD=8.97), with 14.3 years of work experience on average (Table 1). Their profiles ranged from user research and design to software development and project management, typical of UCASD projects. Agile practitioners included profiles such as product owners, technical leads, and embedded systems engineers, involved in software development activities. UX practitioners included profiles such as UX designers and leads, involved in UX activities. All participants signed a consent form before participating in the study. Considering the early stages of UCASD practices integration in the organization, participant recruitment was defined by the organizational constraints, such as limited availability of UX roles. We used selective sampling to recruit all UX practitioners and those agile practitioners who worked on projects in which UX activities were conducted.

UX artifacts studied. We sampled six UX artifacts from three ongoing projects within the organization. These artifacts were created and used by UCASD teams as part of their regular design and evaluation activities. We selected them based on three criteria: (1) they are commonly used in UX practice (Brhel et al., 2015; Garcia et al., 2017, 2019); (2) they span the full product development lifecycle, from early ideation to post-test reporting; and (3) all except the user test report were collaboratively produced by UCASD teams. The user test report was created after user testing by the UX team and was not co-constructed with agile practitioners. To reflect typical organizational UX workflows, we grouped the artifacts into three stages:

- Early-stage ideation and abstract interface design: persona to represent typical users, user journey map to describe the current experience and identify pain points, and storyboard to envision new use cases and improved scenarios.
- Mid-stage design and testing: wireframe to represent user interfaces, conduct user tests, and guide handoff to developers.

Table 1. Demographic information of the study participants. * in years

ID	Job Title	Education	Gender	Experience*
		Agile Practitioners (N=9)		
P1	HMI developer	MSc in industrial electronics	M	5
P2	Machine learning expert	PhD in physics	M	26
P3	Software engineer	MSc in engineering	M	16
P4	Technical lead / Product Owner	MSc in industrial engineering	M	26
P5	Embedded systems engineer	MSc in engineering	M	21
P6	Scrum master / Product Owner	MSc in business and engineering	F	5
P7	Natural language processing engineer	MSc in linguistics	M	2
P8	Embedded systems engineer	MSc in electronics	F	5
P9	Product Owner	BSc in electronics science	M	21
		UX Practitioners (N=4)		
P10	UX lead	MSc in industrial engineering	F	10
P11	UX researcher	MSc in communication	F	1
P12	UX designer	MA in visual arts	M	10
P13	Head of UX	BSc in communication and journalism	M	10

- Late-stage analysis and reporting: affinity diagram to analyze user test data and user test report to document test protocols, UX findings, and redesign proposals.

Questionnaire. Participants completed the questionnaire shown in Table 2 after viewing each UX artifact for up to three minutes. We developed the questionnaire drawing on boundary objects theory (Akkerman & Bakker, 2011; Star, 2010). The understanding dimension captures the extent to which participants interpret artifacts within own contexts, with *understanding* defined as the self-reported level of content comprehension after viewing the artifact. Usefulness captures the perceived value of artifacts in coordinating activities across groups, defined here as the extent to which practitioners believe the UX artifact supports communication and collaboration. Recognition captures participants' familiarity with the artifact, measured by whether they have seen it before and whether they can identify it by name. Collectively, these dimensions align with the theoretical criteria for artifacts to function effectively as boundary objects in interdisciplinary work: an artifact must be understandable, useful, and familiar enough to participants to serve as a means of translation between disparate groups. We first assessed the internal consistency of the questionnaire dimensions using Cronbach's α. We then computed descriptive statistics, including mean scores for understanding and usefulness per artifact. To explore relationships between participants' perceptions, we conducted Spearman's rank-order correlations between content understanding, perceived usefulness, and recognition. We analyzed each artifact separately to examine differences in interpretation and evaluation. We consider Spearman correlations as exploratory indicators of how the three dimensions are related, specific to this study.

Retrospective think-aloud. After viewing all six artifacts, we conducted a retrospective think-aloud protocol with the participants to (1) understand their reasoning about the UX artifacts' content, and (2) clarify their questionnaire responses. They viewed each artifact on a computer screen and verbalized their thoughts. To prompt deeper reflection, we asked what they focused on, why, and what they found important, useful, or unclear. We also asked them to elaborate on their questionnaire responses to gain insight into their understanding, usefulness, and recognition of UX artifacts. We analyzed transcripts using a six-phase thematic analysis approach by Braun and Clarke Braun and Clarke (2006): familiarizing with data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. Using an inductive approach, two researchers independently coded portions of transcripts, then reviewed and refined codes together to create a codebook. After coding all data, they grouped the codes to develop themes and mapped them onto three dimensions: understanding, usefulness, and recognition.

Table 2. Questionnaire structure with items per dimension and rating scales.

Dimension	Item	Statement	Scale
Content Understanding	Q1	I feel comfortable presenting this artifact to an audience	5-point Likert scale (Please indicate your level of agreement)
	Q2	I think this artifact presents the data clearly	
	Q3	I understand the content of this artifact	
Perceived Usefulness	Q4	I think this artifact is relevant to present data efficiently	
	Q5	I think this artifact is useful to be presented to project stakeholders	
	Q6	I would use this artifact in a meeting	
Recognition	Q7	Have you ever seen this artifact before?	Yes/No
	Q8	What is the name of this artifact?	Text input

4. Results

4.1. Questionnaire construct reliability

The Cronbach's α for the questionnaire's understanding ($\alpha = .865$) and usefulness ($\alpha = .912$) dimensions demonstrated strong internal consistency, supporting their applicability within the context of this study, and providing a basis for their transferability to future research (Table 3). Item–total correlations further confirmed that individual items were strongly associated with their respective dimensions. The questionnaire yielded 78 responses.

Table 3. Questionnaire reliability analysis results.

Scale	Item	α	Item-Total Correlation	If-Item Deleted α
Understanding	All	0.865	–	–
	Q1	–	0.754	0.800
	Q2	–	0.807	0.747
	Q3	–	0.678	0.868
Usefulness	All	0.912	–	–
	Q4	–	0.807	0.887
	Q5	–	0.844	0.856
	Q6	–	0.819	0.876

4.2. Questionnaire data analysis

After validating the internal consistency of the two questionnaire dimensions, we calculated the mean understanding and usefulness values for each UX artifact and practitioner group, based on their respective items and dimensions (Figure 1). Responses to Q8 in the recognition dimension were coded as correct or incorrect to support the correlational analysis. In the following paragraphs, we describe the understanding, usefulness, and recognition results in detail.

Understanding (Q1-Q3). Agile practitioners rated the affinity diagram lowest (3.22), followed by storyboard (3.33), user test report (3.48), wireframe (3.59), user journey map (3.67), and persona (4.41). UX practitioners also rated the affinity diagram lowest (3.50), followed by the user test report (3.50), storyboard (3.75), wireframe (4.25), user journey map (4.50), and persona (4.92). Participants in both groups understood best the user journey map and persona.

Usefulness (Q4-Q6). Agile practitioners rated the user test report lowest (2.78), followed by the storyboard (2.96), affinity diagram (3.00), wireframe (3.48), user journey map (3.78), and persona (4.04). UX practitioners rated the user test report lowest (3.25), followed by the affinity diagram (3.33), storyboard (3.42), user journey map (4.50), and wireframe and persona (4.75). Both participant groups rated the persona as most useful, followed by the wireframe and user journey map. Despite containing prototype evaluation data, the user test report was rated as least useful for communication with stakeholders.

Recognition (Q7-Q8). As expected, UX practitioners showed high recognition of UX artifacts, while agile practitioners had lower recognition rates. Regarding Q7, all participants, except one developer, had seen the persona before (N=12), followed by the affinity diagram and user test report (N=11), wireframe (N=10), and storyboard and user journey map (N=7). Regarding Q8, participants correctly named the affinity diagram (N=9) and persona (N=8), followed by the storyboard and wireframe (N=7), user test report (N=6), and user journey map (N=5). However, common misidentifications included: user journey map as "storyboard" or "scenario", user test report as "research article" (as it contained statistical data), affinity diagram as "storyboard" or "test summary", and persona as "CV" or "summary" (although most participants had seen it).

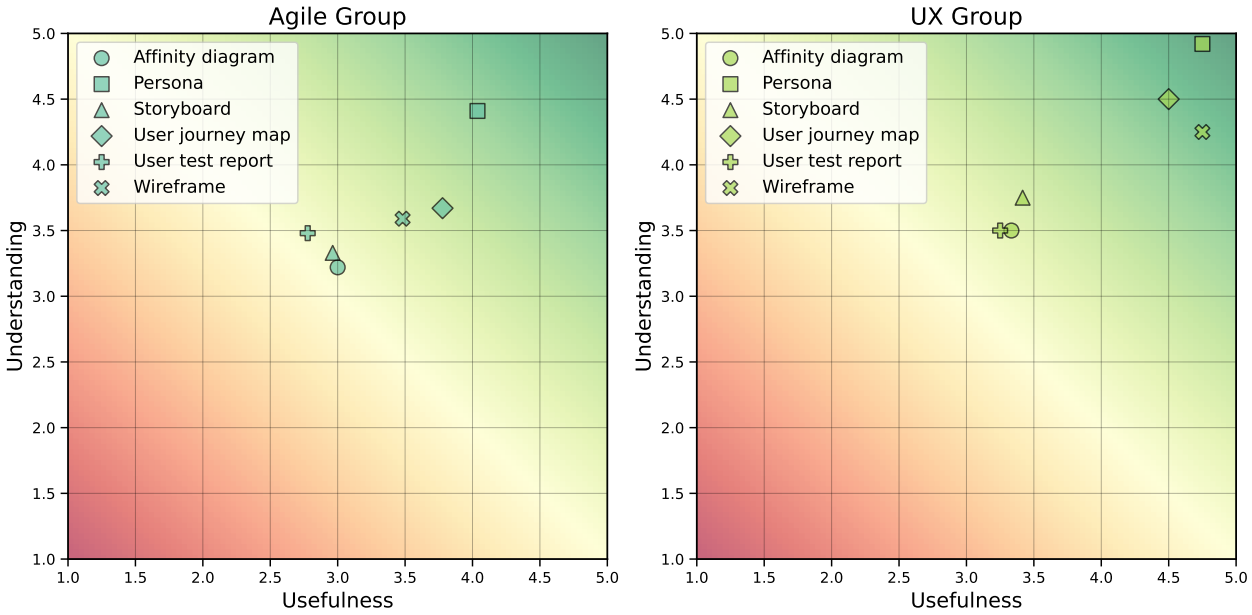

Figure 1. Mean understanding and usefulness scores for all UX artifacts per participant group.

4.3. Differences between practitioner groups

Although both groups positively rated the UX artifacts in both dimensions, the agile group reported lower understanding and usefulness scores, compared to the UX group. Specifically, UX practitioners rated all artifacts higher on understanding (M=4.07, SD=0.94) and usefulness (M=4.03, SD=1.11) compared to agile practitioners' understanding (M=3.62, SD=1.12) and usefulness (M=3.34, SD=1.13). In both groups, two clusters of UX artifacts emerged (Figure 1): 1) lower-rated: user test report, storyboard, and affinity diagram, and 2) higher-rated: persona, user journey map, and wireframe. Notably, wireframe and user journey map had large between-group differences, suggesting that agile practitioners may need more context or different framing to find them useful. Persona was the highest-rated artifact by both groups for both understanding (M=4.56, SD=0.57) and usefulness (M=4.26, SD=0.85). In contrast, the lowest-rated artifacts on usefulness were the user test report (M=2.92, SD=1.17), affinity diagram (M=3.10, SD=1.02), and storyboard (M=3.10, SD=1.26).

4.4. Correlations between understanding, usefulness, and recognition

Correlations between understanding and usefulness scores were generally strong, suggesting that better-understood artifacts were also rated as more useful (Table 4). The strongest correlations were for the user test report ($\rho = .916, p < .001$), user journey map ($\rho = .915, p < .001$), and storyboard ($\rho = .906, p < .001$). All correlations in this variable pair, except the wireframe, were significant ($p < .05$).

Correlations between understanding and recognition were generally weak and non-significant across artifacts (ρ = -0.062 to 0.312, $p > 0.1$). This suggests that recognizing an artifact did not strongly influence participants' comprehension. Nevertheless, their recognition might have produced various levels of understanding among the participants.

Correlations between usefulness and recognition were weak, with the persona ($\rho = .557, p = .048$) and wireframe ($\rho = .734, p = .004$) showing moderate and strong correlations. Participants who recognized those artifacts also rated them as more useful, suggesting that prior familiarity may influence perceived usefulness. However, recognition did not consistently predict perceived usefulness across artifacts. These results highlight that understanding and usefulness are closely linked, while recognition has a limited, artifact-specific role in shaping participants' perceptions.

4.5. Qualitative analysis of verbal data

Table 5 shows the main findings related to the three dimensions (recognition, understanding, usefulness). Personas and wireframes emerged as boundary objects, given the interpretive flexibility in how agile and UX practitioners understood them. UX practitioners viewed personas as structured, credible representations

Table 4. Spearman's ρ correlation coefficients and p-values. **: strong correlation, *: moderate correlation.

UX Artifact	Understanding–Usefulness (ρ/p)	Understanding–Recognition (ρ/p)	Usefulness–Recognition (ρ/p)
Affinity Diagram	**0.829 / 0.000****	0.272 / 0.369	0.403 / 0.172
Persona	**0.630 / 0.021****	0.224 / 0.463	**0.557 / 0.048***
Storyboard	**0.906 / 0.000****	-0.062 / 0.084	0.000 / 1.000
User Journey Map	**0.915 / 0.000****	0.281 / 0.353	0.447 / 0.125
User Test Report	**0.916 / 0.000****	0.271 / 0.370	0.125 / 0.685
Wireframe	0.489 / 0.090	0.312 / 0.299	**0.734 / 0.004****
All	**0.796 / 0.000****	0.182 / 0.111	0.284 / 0.012

of typical users to ground design decisions in user needs and support the user-centered approach. Agile practitioners used personas as a reference to align development efforts and build common understanding of users in the team despite their simplified or technically skeptical views. Wireframes functioned as boundary objects between UX and agile teams, with the user interface representation acting as their common identity. While both groups recognized and used wireframes, they valued different perspectives. UX practitioners emphasized conceptual design and user flows, whereas agile practitioners used them as input for the user interface implementation and technical feasibility assessment. Wireframes were not deemed suitable for stakeholder presentations by both groups, but rather for internal use to coordinate design and development work. Storyboard was a boundary object candidate. UX practitioners focused on its visual flow and reported quick understanding of the content, relying on images to follow the scenario and less on reading text labels. They considered it ideal for storytelling when communicating with stakeholders. Agile practitioners relied on the text and sequence to interpret the story, which helped them understand user context and grasp the technical requirements. Despite focusing on different parts (text vs. images), both groups understood the artifact, demonstrating its structural robustness. User journey map was a boundary object candidate. Both practitioner groups understood it as a visual summary of key UX insights, but UX practitioners focused on user emotions and communication with other stakeholders, while agile practitioners focused on user tasks and overall UX to identify whether system improvements are needed. Affinity diagram did not function as a boundary object as both practitioners groups considered it as a local working tool for the UX team's data analysis purposes. Its high information density made it unsuitable for demonstrations, presentations, or cross-disciplinary communication. While it lacked immediate understanding across disciplines, UX practitioners saw it as a powerful synthesis tool, and agile team members required mediation and effort to understand it, and did not find it useful for their work. User test report did not function as a boundary object as it failed to cross disciplines and it was difficult to understand for agile practitioners due to its text-heavy nature and UX-specific terminology. UX practitioners, however, saw it as a standard internal deliverable, but rarely read by team members, and not suited for presentation to project stakeholders.

5. Discussion

Reflecting on the artifact-mediated communication principle, our findings challenge the role of UX artifacts as purely communication tools. While some artifacts support communication (i.e., information exchange to reach a common understanding of the system being designed), others support coordination of work between UCASD practitioners (i.e., UX artifacts are useful within their work domain without requiring their common understanding), similar to the spanning and utility boundary object types in Leinonen and Roto (2023). We categorized the UX artifacts in three groups: 1) artifacts supporting communication, 2) artifacts as boundary objects, and 3) artifacts used locally.

Storyboard enabled communication between agile and UX teams through storytelling to describe how a user would use a system. These discussions allowed UX teams to present ideas about UX design, while agile practitioners provided feedback regarding technical requirements and constraints for the system implementation. User journey map was understood similarly by both practitioner groups, focusing on the communication of main UX issues and the identification of system problems to be solved.

Persona and wireframe functioned as boundary objects, due to a lack of consensus on their meaning across practitioner groups while retaining a stable structure that each group could use locally.

Table 5. Qualitative analysis findings.

Scope	Artifact	Recognition (UX)	Recognition (Agile)	Understanding (UX)	Understanding (Agile)	Usefulness (UX)	Usefulness (Agile)
Boundary objects	Persona	Recognized; commonly used UX artifact	Often misinterpreted as "CV"	Structured, credible representations of real users	Reference for development, simplified user representations	For building a common understanding of users and stakeholder presentations	For presenting user types; some uncertainty regarding credibility
	Wireframe	Recognized; commonly used UX artifact	Recognized but described in terms of user interface functionality	Early stage representation of a user interface	Representation of a user interface	For showing user interface ideas and test user flows	For early feedback and team discussions; coding input
Artifacts for communication	User Journey Map	Recognized; commonly used UX artifact	Mixed recognition; confused with storyboard	Visual summary of key user experience insights	Visual summary of key user experience insights	For storytelling and sharing UX issues with stakeholders	For focusing on problems in the user experience
	Storyboard	Recognized correctly	Recognized correctly	Visuals aid understanding of user context and problems	Visuals appreciated but additional explanation is required	Supports storytelling when communicating with stake-holders	Yes when layout/order is clear; otherwise confusing
Artifacts used locally	Affinity Diagram	Recognized; commonly used UX artifact	Mixed recognition	User feedback summary; high information density limits quick understanding	Unclear due to high inform-ation density and lack of quantification	For internal UX team synthesis, not presentation	For internal analysis; not suitable for stakeholders
	User Test Report	Recognized correctly as a research or report document	Recognized correctly as a research or report document	Detailed prototype evaluation summary; requires time to read	UX-specific terminology and format limit quick understanding	Valid source of evidence but not suitable for meetings or presentations	Text-heavy format limits use in agile; prefer visual summaries

In the wireframe, agile practitioners emphasized interface functionality and coding effort, whereas UX practitioners focused on design ideas and user testing. Persona maintained its stable structure depicting a user profile with goals, behaviors, and frustrations. Yet, UX practitioners valued its grounding in user research, while agile practitioners viewed it as a shorthand for user types. This robustness enabled coordination without requiring renegotiation of persona's definition.

Affinity diagram and user test report exposed limitations in boundary-crossing utility. They were useful locally to the UX teams as tools to support data analysis and synthesis. Agile practitioners perceived them as overly detailed, lacking actionable synthesis, or using unfamiliar UX terminology. This reduced their cross-disciplinary usefulness and impeded their ability to serve as shared artifacts or boundary objects.

Our findings suggest that the capacity of UX artifacts to function as boundary objects in UCASD is shaped by four practice-level factors. Recognition and co-creation enhanced interpretive flexibility, as UX artifacts co-produced by participants (e.g., personas) were quickly recognized and supported discussion. Visual clarity and summarization supported structural robustness, with concise UX artifacts such as journey maps improving cross-disciplinary communication, whereas dense ones like affinity diagrams or user test reports constrained understanding. Embeddedness in agile workflows increased relevance for developers, as UX artifacts explicitly linked to backlog items or implementation discussions (e.g., wireframes, journey maps) became actionable inputs. Finally, brief framing or contextualization in multidisciplinary meetings helped transform otherwise opaque UX artifacts into usable resources. These factors explain why some UX artifacts consistently operate as boundary objects across communities, while others require contextualization.

Building on these results we formulate three recommendations for practitioners who use UX artifacts in a UCASD context. First, UX artifacts should be

selected according to their communication purpose: structured and visual artifacts such as personas or user journey maps are most effective for cross-disciplinary alignment, whereas affinity diagrams or user test reports are more suitable for internal UX discussions. Second, when UX artifacts are brought into multidisciplinary meetings, they should be explicitly contextualized to enhance shared understanding and to direct attention to key takeaways, also found by McCarthy et al. (2020). Finally, UX artifacts that serve a strong communicative function, particularly storyboards and user journey maps as highlighted in this study, benefit from being developed through co-creation workshops, which foster both clarity and ownership among stakeholders.

6. Conclusion

Communication and collaboration in UCASD teams relies on practitioners' domain-specific interpretations of UX artifacts. Our results show that UX artifacts serve various roles, ranging from communication tools, to boundary objects used differently by agile and UX practitioners, and internal tools used only by the UX team. Domain-specific interpretations should be encouraged, instead of insisting on creating shared understandings of UX artifacts. We encourage practitioners to consider interpretive flexibility and shared structure of UX artifacts when co-creating them and using them in workshops, discussions, and meetings. This could facilitate not only better collaboration between UX and agile practitioners, but also possibly remove friction and reduce the gap between the two disciplines. While the general idea that UX artifacts serve distinct purposes in collaborative work (communication, coordination, or neither) seems transferable to other research contexts, the specific artifacts that support these purposes may vary depending on organizational culture, team dynamics, or project goals. In addition, further studies using the methods introduced here could address this issue. Specifically, promising directions include longitudinal research tracking the evolution of UX artifacts usage in a project lifecycle, and investigations into their role in distributed (remote or hybrid) and in-person work settings.

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