Leaders' Technology Adoption in Digital Collaboration: An Affordance Perspective

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Abstract: As digital collaboration platforms and advanced technologies such as artificial intelligence can help large teams' work, this article examines the experiences of leaders in embracing technology for digital online collaboration. Understanding how leaders adopt technology for temporary digital knowledge co-creation on digital collaboration platforms with AI-enabled tools enables us to identify how technology adoption affects digital leadership in collaborative working processes in temporary groups. While digital leadership's impact on working has been explored in the fields of educational technologies and online customer service, amongst others, the understanding of its impact on digital knowledge co-creation on AI-supported digital collaboration platforms and affordances for leaders' rapid technology adoption remains scarce. By drawing on affordance theory and the perception of potential usages of the technologies available, I examine what digital collaboration platforms with AI-enabled tools afford for leaders of digital knowledge co-creation. For this a narrative inquiry method is employed and leaders' own perceptions of their adoption of technology is studied, thus helping to uncover the reasoning behind their technology use. Based on qualitative data generated during a four-week case study, I suggest that the adoption of technology can emerge and develop quickly among the leaders of temporary digital groups. The findings of this study reveal that collaboration technology afforded fostering transparency, communication, idea generating and innovative thinking for those in leadership roles, while limited time and lack of prior use hindered technology adoption. My study contributes to the research and practice of leaders' technology adoption in collaborative working processes.

Keywords: Technology adoption, Affordances, Digital knowledge co-creation, Artificial intelligence (AI), Digital leadership

1. Introduction

Digital collaboration platforms have become common for knowledge work in various collaborative online settings (Leonardi, 2021). In contexts of temporary collaboration, such platforms support flexible organising more efficiently than face-to-face meetings. However, when digital knowledge co-creation occurs in a temporary setting, collaboration technologies must be rapidly adopted by participants. Advanced technologies, such as artificial intelligence (AI), aid knowledge processes (e.g., knowledge co-creation) also in temporary network collaboration, and the opportunities they offer change the way of working, especially when time is limited, and cross-sectoral knowledge is to be combined. Hence, digital technologies can potentially enhance technology-enabled, large-scale organising for knowledge co-creation (Makarius et al, 2020; Malhotra et al, 2021). Crucially, leaders can support individuals' learning (Edmondson and Harvey, 2018), and such support is essential for those unfamiliar with collaboration technologies. While leaders themselves adapt to using novel ways of working with digital tools, they are expected to set an example for others in their use of technology. When leaders employ technologies it supports technology adoption by group members, which is important for successful knowledge co-creation. Although prior studies on technology adoption have been conducted in online customer contexts and in the use of educational technologies, to date we lack understandings of this type of knowledge work by large teams (Gefen et al, 2003; Kim and Kang, 2023). Moreover, the experience behind digital leadership's impact on digital knowledge co-creation remains an underexplored theme.

The flow of knowledge plays a key role in interactions and reaching the goals of digital collaboration efforts: digital knowledge co-creation requires individuals to transform tacit knowledge into explicit knowledge, and technology mediates interactions in working via digital collaboration tools. Knowledge flows emerge during collaboration in online communities, for example as chains of comments. Due to digital technologies, these knowledge flows are not restricted by time and space but are asynchronously available when each participant in online interactions has time to read, work, or other ways contribute. As tacit knowledge flows in online communities differ from those observed in face-to-face communication, understanding technology adoption in online collaboration becomes crucial (Faraj et al, 2016). Typically, the effects of technology adoption and quantitative study of relevant factors have been explored via the technology acceptance model TAM and its applications, including the more sophisticated versions like Unified Theory of Acceptance and Use of Technology UTAUT (Zhou et. al, 2024) However, the aim here is to understand the experiences that occur prior to technology use, and I therefore turn to affordance theory, applying this to narrative inquiry that is employed to analyse the data. Before the study presented in this paper, a pilot study on technology adoption in large-scale digital collaboration was conducted – the pilot study's findings about technology adoption and roles motivated this study. While participants recognised potential for action provided by AI, they chose not to adopt it for their own

use. Some of the participants further revealed that they would have wished for help—for example with summarising, which would have been possible by using the AI-enabled tools on the digital collaboration platform—as they failed to recognise such potential during the collaboration. Such missed opportunities in using AI observed from the pilot study resulted in questions revolving around the technology adoption in emergent technology-mediated collaboration. Also, regardless of their role, participants in the pilot discussed the possibilities of technology in a similar fashion, yet those in leadership roles were more proactive in utilising AI.

Debate in studies on digital leadership's impact and collaboration, including on the effect of AI on knowledge co-creation (Sarker, Susarla, Gopal, et al. 2024) has revolved around effectiveness, employee engagement, leadership and digital tools, various leadership styles in digital surroundings, and the effects of digital leadership on organisational culture. For instance, Abbu (2022) finds that digital leadership needs to build trust to achieve a more open and innovative organisational culture. Musaigwa and Kalitanyi (2024) argue that studying digital leadership centres on leadership styles and technology usage, and Crisp and Jarvenpaa (2013) discuss how the development and formation of trust by leaders are crucial in virtual teams. Despite conflicting insights into the impact of digital leadership on employee engagement, studies largely agree on the importance of leadership in temporary organisational contexts (Lin, 2024; Sacavém, et al, 2025).

This, then, leads me to ask how leaders' technology adoption that influences other participants as well as the knowledge processes – happens. Thus, the research question is as follows *What is the perceived technology-based potential for action as recognised by the leaders within emergent digital network collaboration?*

2. Theoretical Approach

2.1 Leadership and Digital Platform Collaboration

Jarvenpaa and Keating (2012) have highlighted that leaders play a key role in technology acceptance and adoption. Leaders must develop strategies for fostering trust and consistently clarifying project goals and guidelines within digital teams (Zuofa and Ochieng, 2021). Yet to do this, leaders themselves first face the challenge of adopting technology. In large-scale collaboration, experts jointly generate knowledge to tackle challenging, open-ended tasks (Blomqvist, 2022; Mikalsen et al. 2021) and successful project delivery by digital teams requires efforts to achieve objectives through effective communication and adopting the appropriate technology. Leaders' actions based on technology affordances impact collaboration participants' technology usage. These actions are based on perceived affordances, which can be either digital or social in nature and exist in physical and phenomenal realities (Gibson, 1979; Leonardi 2013). In digital contexts, the physical technology and phenomena of organising and social conventions are also those dimensions studied by scholars utilising affordance theory in digital environments. New social and digital affordances emerge when working practices with new technologies are created (Gaver, 1996).

2.2 Affordances as the Basis for Digital Leadership

To study digital collaboration and the leaders' technology adoption in a collaboration initiative, this study draws on affordance theory, which helps to reveal how the potential of technology is perceived (Fromm et al, 2020, p. 8): "The affordance concept is considered a promising concept for theorizing IT-associated organizational change that acknowledges both the materiality of IT artifacts and their human interpretation". To date, however, insufficient understandings exist in the prior literature that clarifies the impact of digital leadership in cross-boundary collaboration, its affordances for digital ways of working, and how the affordances of a digital collaboration platform and digital working practices are perceived by collaboration leaders (Tigre et al 2025).

Affordance theory explicates actions based on perceptions and has been applied to study the use of information systems, as well as for theorising how the perceived action potential of a given technology is linked to interaction and organisational processes (Majchrzak and Markus, 2012; Volkoff and Strong, 2013). This study focuses on the perceived action potential as recognised by the leaders of digital collaboration. Importantly, affordances are not the functionalities of the technology itself but the perceptions of action potential (Fromm et al, 2020).

Treem and Leonardi (2012) recognise four digital affordances commonly used in the literature: visibility, editability, persistence, and association. However, these affordances stem not only from technology but also from a leader's exemplary usage, i.e., and leaders' actions further afford action potentials for participants. Beyond this, the dynamism of digital network environments affects how leadership in a digital network of experts differs from that in less dynamic forms of working (Schreyögg and Sydow, 2010; Treem and Leonardi, 2012). Leaders have fewer permanent structures upon which to draw, and the nature of their interactions differs

from experiences generated in more familiar settings. However, before leaders can provide an example for technology use their own technology adoption needs to take place.

2.3 Approaches to Technology Adoption

Zhou et al. (2024) conclude that the most widely used approach to the adoption of new technologies are the TAM and the more sophisticated version, the UTAUT, which are well suited for generating insights into the usage and acceptance of technology. UTAUT provides a more comprehensive model than TAM for understanding technology acceptance and usage in various contexts, elaborating the factors that influence technology adoption as psychological, social, facilitating conditions, and system. TAM, on the other hand, can be employed to gain insight into perceived ease of use and the perceived usefulness of a technology. In terms of technology adoption's quality and efficiency, findings in the literature have been mixed when studied in an educational setting, that is, a setting close to digital collaboration and knowledge co-creation in the context of work (Zhou et al, 2024). Additionally, specific information systems are perceived as related to other experiences when using technology (Venkatesh and Bala, 2008). "Not unlike numerous technologies before AI that came with extraordinary promise, the ground reality tends to be far different. A major hurdle to garnering benefits is the adoption and use of any technology. AI tools are and will continue to be no different." (Venkatesh, 2022, p. 642)

3. Methods and Data Analysis

3.1 Context

This study builds on observations made in the context of a collaborative effort between seven organisations building a consortium for a research project that was based on work and research proposals in a pre-existing group, which the collaboration sought to develop further. Work was conducted as a temporary online network and aimed at building a robust application for research funding. Collaboration unfolded within a limited time frame on a digital platform equipped with functions supportive of knowledge co-creation, several of which were AI-enabled. This study's main informants were the two individuals who led the collaboration. A working model for a community to tackle challenging and open-ended tasks was applied and adjusted to enable collaboration amongst the consortium's builders. The model has four main phases according to specific weeks: problem formation (Week 1), ideation and focusing (Week 2), synthesis (Week 3), and finalisation of the concept (Week 4) (Blomqvist, 2022).

3.2 Narrative Inquiry

To understand the way the coordinator and principal of the collaboration perceived their own technology adoption, narrative analysis was engaged. By conducting an in-depth analysis of network leaders' experience, I became able to recognise their experiences and form narratives on their technology adoption. The approach here assumed that individuals' understandings of reality are constructed through language and that narratives are recollections of events that reflect the way in which individuals experienced these (Davis, 2023; Eriksson and Kovalainen, 2008; Pentland, 1999).

The data were analysed by using the inquiry narrative method (Eriksson and Kovalainen, 2008, p. 210-226), a qualitative research approach that focuses on "the stories and experiences of individuals to understand complex phenomena". This method is used to uncover meanings, and I aimed at forming narratives based on what emerged from the data, recognising the various themes mentioned by the informants in various sequences of the collaboration process. For the analysis, four data types were utilised: interview data, focus team discussions, recorded meetings, and field notes (see Table 1). When using affordances in empirical studies, the optimal approach is to conceptualise how the features of a specific type of technology changes organisational practices—and these features provide the action potential that constitute affordances. The actual usage of a given technology is termed 'affordance actualisation', and the outcomes of such actualisations are the leaders' technology adoption. The analytical power of affordances lies in optimally explaining technology in organisational processes (e.g., knowledge co-creation) that leads to change in that technology's specific areas of application (Fromm et al, 2020; Strong et al, 2014). The data analysis was conducted by coding those actions and potentials related to technology usage that were discussed by the principal lead and coordinator; and these thematic codes formed the basis for understanding what the various collaboration technologies on the digital platform had generated for them. Narratives were constructed based on the codes. Additionally, based on the data, I recognized which phase of the collaboration each code belonged to.

Table 1: Data types in the study

Interview Data	Recorded Meetings	Field Notes	Focus Group Data
Before and after the collaboration semi-structured interviews (N=4) were conducted via Teams. Data were gathered by focusing on cross-boundary collaboration and collaboration tools to remain sensitive to interviewees' voices and experiences.	Before and during the collaboration, planning meetings were recorded for use in understanding the narratives of both coordinator and principal lead. (N=5)	Observations on how informants discussed collaboration technologies during the knowledge co-creation process were recorded to recognise if their perceptions changed during the 4 weeks.	Focus group discussions between the coordinator, principal lead, and professional facilitator were recorded for reflections after the collaboration.

Platform data and feedback surveys were used as secondary sources and enabled to sequence the time, actions, and events that occurred across the beginning, middle, and end of the collaboration.

4. Narratives on Leaders' Technology Adoption

Two narratives were formed to answer the research question. They highlight those perceived potentials for actions, i.e., affordances, that influence leaders' decisions to choose applications from the range of choices offered by collaboration technologies.

4.1 The Coordinator's Narrative

The coordinator had acquired previous experience in using the collaboration platform at hand. She believed that the combination of her positive experiences with other organisational processes related to the task and working model could be leveraged to work more efficiently with the international cross-boundary group. During collaboration she expressed hesitations about the platform as the best choice due to scepticism amongst participants. However, some participants were enthusiastic and expressed satisfaction over this way of working. Despite finding the AI-enabled features useful, the coordinator found using these was impossible in the given time frame. These hesitations notwithstanding, she was initially enthusiastic and content with the way of working.

In the **problem formation** phase, the coordinator's perceptions of the chosen technology were influenced by conflicting feelings and concerns about the schedule: *"The process is done in parts, and then we compile them one by one. But it would be clearer if we could see that we are progressing here."* Her observations reveal the importance of visibility and structured workflows in collaborative platforms.

In the **ideation and focusing** phase, the coordinator relied on facilitators to manage certain tasks, noticing that, for herself, familiarity with communication methods such as email formed an all-but-automatic choice for her interactions: *"I noticed that although I was involved in the work, it was very different from the usual email-based work."* This reliance on facilitators serves to stress the role played by human support in technology adoption.

In the **synthesis** phase, the coordinator further emphasised the importance of visual elements in communication, saying that *"I always prefer visualised content because people do not necessarily have the patience to read long texts."* This preference for visual communication suggests that platforms should provide diverse content features to meet different users' needs.

When the work was completed—that is, in the **finalisation of the concept** phase—she referred to the AI-enabled features of the platform as being useful, although she noted that using them effectively within the given time frame was challenging: *"Technically, it's very easy once you learn how to do it, but there wasn't enough time to organise everything."* This, then, reflects the need for adequate time and training to utilise advanced technological features fully.

In summary, the coordinator's experiences highlight the complexities of novel technology adoption in cross-boundary collaboration. While the platform afforded valuable potential, the combination of time constraints, a degree of hesitation, and the need for human facilitation influenced the experience of technology adoption. The coordinator's reflections generate valuable insights into the role of technology in facilitating collaboration, as well as the importance of addressing users' needs and preferences.

4.2 The Principal's Narrative

A principal lead who was unfamiliar with the collaboration platform headed the four-week-long collaboration. Being sceptical yet hopeful about the platform's potential, he doubted experienced users' suggestions and preferred technologies they had used earlier, such as a word processor embedded in the platform for writing

together. He expressed a degree of gratitude over the AI-generated summaries of the transcriptions of meetings. By the end of the project, he recognised the significant potential of the platform in terms of collaborative knowledge creation and improving outcomes. This experience transformed his perspective, leading him to identify potential in the collaboration platform for future projects and acknowledge its value for efficient and effective collaboration.

The **problem formation** phase provoked both uncertainty and curiosity in the principal lead, and he described the usage of the platform as initially chaotic: *"All the possibilities were not used because the new platform was not familiar enough."* Despite these challenges, there was a sense of openness to exploring the potential of the new tool. Highlighting the importance of prior familiarity in easing the transition, he said that *"if I knew the platform before, it would have been different—my own experience is important".*

The phase of **ideation and focusing** on the task revolved around becoming acquainted with the collaboration technology. As the network began to use the new technology, some issues emerged that needed addressing. Asynchronous work was meant to take place on the platform, but the principal lead mentioned that *"asynchronous work did not take place on the platform but via email".,* partially due to the lack of time to clarify roles: *"Clear roles and guidelines [were] needed."*

By the **synthesis** phase, he had begun to use the digital collaboration platform, discovering that its transparency was superior to that of other digital collaboration forms. The principal lead appreciated the platform's interactivity, stating that it was *"more interactive than other digital tools used before",* yet he found comments and tracking changes to be too unfamiliar: *"Finding comments was hard." Hence, emails continued to be used for reminders and personal communication".* Despite such challenges, the platform facilitated better transparency and communication within the team, as the principal lead observed: *"Transparency and communication [were] better with this technology."*

The **finalisation of the concept** phase brought about the principal lead's recognition of fresh potential as he grew accustomed to the platform and began to identify its opportunities: *"This platform would have possibilities if it was a familiar tool and could be better prepared in advance."* Furthermore, the platform encouraged new ways of thinking and working, and the collaborative environment fostered creativity and innovation, resulting in valuable outputs. The principal lead repeatedly referred to graphics produced by one team, thus highlighting that this novel way of working was beneficial for a process in which a team's idea could be shared with others for comments and subsequent use: *"Using the novel way of working in digital environment added value."* Nevertheless, he recognised the need for greater facilitation and moderation to activate asynchronous work, "*More facilitation could have activated asynchronous work.*" Following his own familiarisation, he arrived at the same conclusion as the coordinator: *"Dividing big tasks and documents into smaller parts is good."*

4.3 Summary of the Findings

The aim of this study was to understand what novel technology's adoption is like for the leaders of a digital knowledge co-creation process. More importantly the analysis revealed what was the leaders' reasoning of the action potentials, i.e., affordances they perceive while using a collaboration platform. Figure 1 illustrates the phases of the collaboration that took place, as well as how technology use was framed in the narratives of the principal lead and coordinator in each phase. Positive past experiences and openness to new technologies can facilitate technology adoption, while hesitance or scepticism and preference for familiar tools can hamper it. Observing benefits can transform resistance into acceptance, thus highlighting the importance of perceived ease of use during the adoption process. The data reveal that individuals using technology for rapid cross-boundary collaboration, as opposed to the tools they used before, to some extent questioned the practicality of using a collaboration platform with novel technologies (e.g., AI) for knowledge co-creation. However, their understandings of the technology shifted over the course of the knowledge co-creation process. Here, based on the coordinator's narrative I identify the aspects of wishing for technology use, prioritising its ease of use, generating ideas and questions, exploring the platform's potential, and communicating via the platform. These represent the perceptions of the collaboration technology recognised by the coordinator. The technology-related aspects that can be identified in the principal lead's narrative include experiencing uncertainty, fostering curiosity, getting used to collaboration technology, using the collaboration platform, and recognising novel potential. Furthermore, technology use was actualised according to this narrative, although not without contradictory perceptions. Both the coordinator and principal lead reasoned that it may be difficult to use technologies that are new to participants in a technology-mediated collaboration. In this way, our findings align with the notion that familiarity can outweigh novel action potential in the context of technology adoption. This highlights the importance of social and digital affordances for enabling us to perceive the usefulness of a given

technology. Following Venkatesh (2022), when novel technologies emerge, technology adoption in practice does not cleave to all that technology's envisioned opportunities. This became evident in the narratives of the principal lead and coordinator, both of whom mentioned the AI-enabled tools, but their willingness to use them was affected by the lack time available to grow acquainted with them. This notwithstanding, the professional facilitator did make use of many AI-based tools during the collaboration. The coordinator's narrative highlights the actual usage of the collaboration platform in greater detail than the principals: her prior experience with using the platform implies that familiarity plays a key role in persuading individuals to adopt a particular technology and enable them to act (Jarvenpaa and Keating, 2024).

Despite initial challenges, the coordinator and principal lead acknowledged the platform's affordances of *fostering transparency, communication, idea generating and innovative thinking*. The process of affordance actualisation led to a transformative perspective, which highlighted the platform's value in terms of collaborative knowledge creation and improving outcomes.

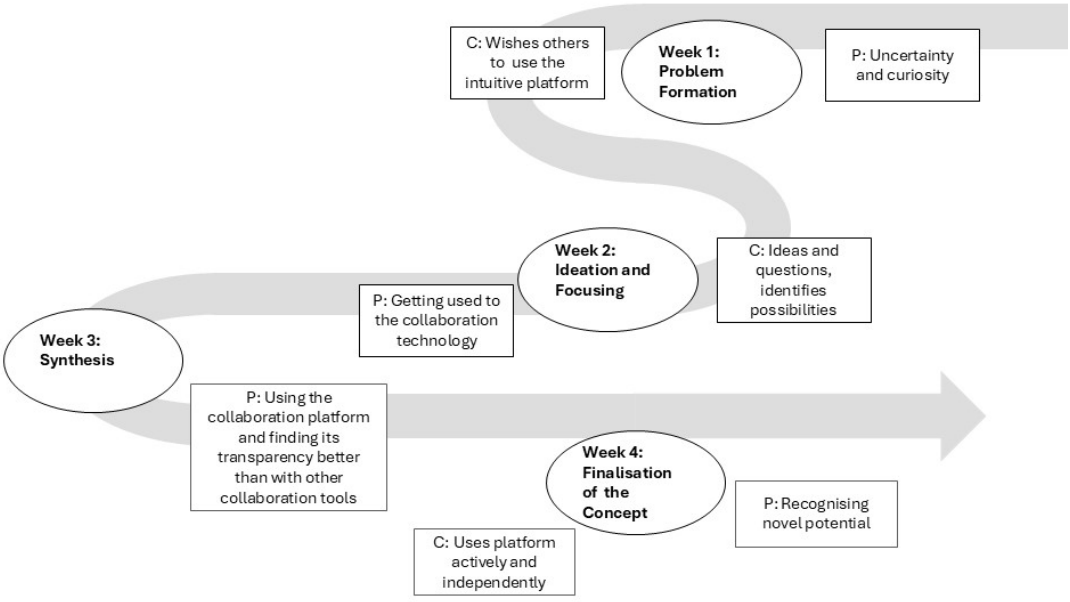

Figure 1: Technology use and perceptions of technology's potential of the coordinator (C) and principal lead (P) in different phases of the collaboration

1. Discussion

Both the affordances identified in the principal's and coordinator's narratives align with extant literature on technology adoption, discussing antecedents and factors influencing it. The findings on technology adoption highlighted similar elements affecting knowledge flows and digital co-creation with collaboration platforms featuring AI-enabled capabilities, as UTAUT's psychological, social, facilitating conditions, and system factors, and TAM's perceived ease of use and perceived usefulness (Zhou et al., 2024). Additionally, digital collaboration participants can also experience technostress caused by excessive technology use and a leader's role can be understood as lying in adjusting the message about technology adoption so that the burden experienced by employees in a community or network of experts can be mitigated (Ertiö et al., 2024). Importantly, this serves to emphasise that the role of a leader in digital collaboration and technology usage differs from that in face-to-face collaboration. Practical implications of this study underscore the importance of ensuring leaders and team members are adequately familiarised with novel digital collaboration platforms through comprehensive training sessions to reduce uncertainty and enhance technology adoption. Moreover, leaders should be encouraged to recognise the affordances of new technologies. Building trust within the team, as highlighted by Abbu (2022) and Crisp and Jarvenpaa (2013), is crucial for knowledge co-creation in digital collaborative environments which was here discussed via hesitations and their potential to hinder technology adoption. Leadership styles, digital fatigue, inclusivity, and potential miscommunication are avenues for future research. Particularly, research is

needed on how AI provokes thoughts and feelings related to an individual's expertise, and how leaders' technology adoption affects affordances for knowledge co-creation in digital environments.

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AI declaration: AI tool (Grammarly) was used for drafting text and to ensure correctness in grammar and spelling.

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