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Immersive Work in the Metaverse: An Integrative Review of Collaboration, Employee Outcomes, and Organizational Adoption and Discontinuance

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	Abstract
Junaid Babar PhD Scholar, Government College University Faisalabad. junaidkhan.edu7@gmail.com Farooq Ihsan Assistant Vice President, National Bank of Pakistan. farooq.ihsan@nbp.com.pk Asad Javed* PhD Scholar, Government College University Faisalabad GCUF. Corresponding Author Email: asadjaved657@gmail.com	Purpose. The enterprise metaverse, meaning immersive and spatial virtual workspaces for meetings, collaboration and training, was promoted as the future of work and then quickly dismissed. Research on it is split between laboratory studies of employee experience and surveys of organizational adoption intentions. This paper brings the two streams together and extends them to scaling and discontinuance. Design. An integrative review of 26 open-access, peer-reviewed sources published between 2018 and 2025, coded for platform type, level of analysis, setting, outcomes, adoption and discontinuance factors, theory and method. Findings. Immersive and spatial platforms consistently increase social presence, but presence does not translate reliably into better collaboration or well-being. The best-controlled experiment found collaboration comparable across physical, video and virtual settings, with higher cognitive load in immersive VR, and a week-long study found substantial well-being costs of working in VR. Motion data from headsets can identify individuals, raising new privacy concerns. At the organizational level, adoption is driven by culture, leadership, readiness and normative pressure, while implementation capacity determines whether adoption creates value. Discontinuance is widespread but barely studied. Originality. The paper applies an information systems typology of discontinuance to the enterprise metaverse, proposes an integrative framework linking adoption drivers, platform, employee experience, outcomes and organizational trajectory, and sets out four testable propositions and a Theory-Context-Characteristics-Methodology research agenda.
Keywords	Metaverse; virtual workplace; social presence; remote work; technology adoption; IS discontinuance; literature review

1. Introduction

Between 2021 and 2022 the metaverse was widely promoted as the future of work. Employees would meet as avatars in shared three-dimensional offices, onboard in virtual campuses and collaborate around holograms instead of video tiles. Multidisciplinary agendas from that period identified work and collaboration as one of the domains the metaverse could transform, alongside marketing, education and healthcare (Dwivedi et al., 2022).

Within two years, much of that enthusiasm had faded. Jacobides et al. (2024) describe how incumbent firms rushed into the metaverse to pre-empt disruption and protect their competitive position, which led to over-investment. At the same time, persistent technological shortcomings impaired the user experience, and users did not share the excitement of brands, Big Tech and investors. Yet organizations did not abandon immersive work altogether. Survey studies published between 2024 and 2025 continue to find managers and firms willing to adopt metaverse tools for remote work and inter-firm collaboration (Bekos et al., 2025; Chaiyasoonthorn et al., 2024; Shankar et al., 2025).

This paper focuses on what Nleya and Velempini (2024) call the enterprise metaverse: virtual workspaces and office collaboration, as distinct from the consumer metaverse for leisure and retail and the industrial metaverse for production. The enterprise metaverse raises questions that sit at the core of management science. Does immersive collaboration improve team processes compared with video calls? What does it cost employees in fatigue, discomfort and privacy? Why do some organizations adopt and scale these tools while others try them and walk away?

The literature that could answer these questions is split in two. Human-computer interaction (HCI) and psychology researchers run laboratory and field experiments on presence, cognitive load and cybersickness, but rarely examine organizational decisions. Information systems and management researchers survey adoption intentions, but rarely measure what happens to employees once the tools are in use. Both streams also tend to stop at adoption. Yet information systems research shows that discontinuance, in forms ranging from rejection to replacement, is a common and distinct phenomenon that adoption models do not fully explain (Soliman & Rinta-Kahila, 2020).

This paper brings the two streams together through an integrative review of open-access literature published up to 2025. It is guided by four research questions:

1. **RQ1.** How does immersive collaboration compare with face-to-face work and videoconferencing in its effects on team processes and task performance?
2. **RQ2.** What are its effects on employee well-being, including fatigue, cybersickness and privacy?
3. **RQ3.** Which factors drive organizational adoption of the enterprise metaverse, and what explains whether it is scaled or discontinued?
4. **RQ4.** Which theoretical lenses can integrate these findings, and what research agenda follows for management science?

The review makes three contributions. First, it links employee-level evidence from experiments with organization-level evidence from adoption surveys, showing that the two streams point to the same bottleneck: fit between the tool, the task and the organization. Second, it introduces discontinuance as an explicit outcome in metaverse-at-work research, drawing on the information systems discontinuance literature. Third, it proposes an integrative framework and a Theory-Context-Characteristics-Methodology (TCCM) research agenda.

Section 2 sets out the conceptual background. Section 3 describes the review method. Sections 4 and 5 present findings on employee outcomes and on organizational adoption and discontinuance. Section 6 introduces the theoretical lenses and integrative framework, Section 7 sets out the research agenda, and Section 8 concludes.

2. Conceptual background

2.1 From the metaverse to the enterprise metaverse

Mystakidis (2022) defines the metaverse as a post-reality universe: a persistent, multi-user environment that merges physical reality with digital virtuality. Park and Kim (2022) organize its components into hardware, software and content, and its uses into forms of user interaction, implementation and application. Nleya and Velempini (2024) divide the broader metaverse into three sectors: a consumer metaverse for leisure and retail, an industrial metaverse that links physical and digital production, and an enterprise metaverse for virtual workspaces and office collaboration. This review concerns the third.

The studies reviewed here use two quite different kinds of platform under the same label. The first is the immersive virtual reality (VR) workspace, accessed through a head-mounted display, in which employees meet as full-bodied avatars in a three-dimensional room. The second is the non-immersive spatial workspace, accessed through an ordinary browser or desktop, in which employees move a two-dimensional or three-dimensional avatar around a shared map and start conversations by moving close to colleagues. Both are compared, explicitly or implicitly, with videoconferencing. Table 1 summarizes the three.



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Table 1. Workplace collaboration platforms examined in the reviewed studies.

Platform type	Interface	Examples in the corpus	Typical advantage	claimed	Typical concern
Videoconferencing (baseline)	Screen with a grid of faces	Zoom (Fauville et al., 2023; Olt et al., 2024; Sánchez Rodríguez et al., 2025)	Low barrier to use; familiar		Nonverbal overload and fatigue
Non-immersive spatial workspace	Browser or desktop avatar on a shared map, with proximity audio and video	Gather (Aoki et al., 2025; Palos-Sanchez et al., 2023; Zhu et al., 2023)	Informal encounters, sense of presence, team cohesion		Distraction, privacy in sensitive conversations, organizational restrictions
Immersive VR workspace	Head-mounted display with embodied avatars	Horizon Workrooms (Olt et al., 2024); VR desktop work (Biener et al., 2022); immersive metaverse condition (Sánchez Rodríguez et al., 2025)	Higher immersion and social presence		Cybersickness, cognitive load, device comfort

The distinction matters because the two metaverse platform types differ in cost, ergonomics and the kind of presence they create. Findings about one should not be assumed to hold for the other.

2.2 Presence and social presence

Presence is the central psychological construct in this literature. Oh et al. (2018) define social presence as the feeling of being there with a real person, and distinguish it from telepresence, the feeling of being in a place, and self-presence, the feeling that a virtual body is one's own. Their systematic review of 233 findings from 152 studies shows that social presence is predicted by immersive qualities of the technology, contextual differences and individual psychological traits. They also caution that heightened social presence does not always improve the experience of a virtual environment.

2.3 Videoconference fatigue as the baseline

Because the enterprise metaverse is usually positioned as an alternative to video calls, the costs of videoconferencing form its natural baseline. Bailenson (2021) argues that video calls produce nonverbal overload through four mechanisms: excessive close-up eye gaze, the cognitive load of producing and interpreting nonverbal cues, constantly seeing oneself, and reduced physical mobility. In a sample of 9,787 participants, Fauville et al. (2023) found support for this theory. People who used videoconferencing more often, for longer and with fewer breaks reported more fatigue, as did those who experienced mirror anxiety, hyper-gaze, feeling physically trapped and the effort of producing and monitoring nonverbal cues. Women reported greater fatigue than men, largely because they experienced these mechanisms more strongly.

2.4 Adoption and discontinuance

The organizational studies in the corpus mostly rely on technology acceptance models: the technology acceptance model (TAM) and the unified theory of acceptance and use of technology (UTAUT), sometimes combined with the technology-organization-environment (TOE) framework and institutional theory (Chaiyasoonthorn et al., 2024; Guo et al., 2024; Shankar et al., 2025). These models explain the intention to adopt. They say less about what happens afterwards.

Soliman and Rinta-Kahila (2020) address this gap in their review of 55 studies on information systems discontinuance published between 1991 and 2017. They show that discontinuance can take at least five distinct forms over a system's life cycle: rejection, regressive discontinuance, quitting, temporary discontinuance and replacement. Their typology provides the conceptual tools to study what happens to enterprise metaverse initiatives after the pilot, a question the adoption literature largely leaves open.

3. Review methodology

3.1 Review design



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The study uses an integrative literature review, which Snyder (2019) recommends when a topic is new, spread across disciplines and not yet ready for meta-analysis. Kraus et al. (2022) treat such framework-building reviews as legitimate standalone contributions in management research. The metaverse at work fits this profile: the evidence is split between HCI, psychology and information systems, and the studies use different platforms, samples and outcome measures.

3.2 Eligibility criteria

A source was included if it met all five criteria below.

1. **Topic.** It addressed immersive or spatial virtual workspaces, their effects on employees or teams, their organizational adoption or discontinuance, or a closely related baseline such as videoconference fatigue.
2. **Period.** It was published between 2018 and 2025. Sources whose peer-reviewed version appeared in 2026 were excluded.
3. **Access.** Its full text was legally free to read, either as gold open access or as an author version in an institutional or preprint repository. Open-access status was checked individually for every source.
4. **Type.** It was a peer-reviewed journal article, peer-reviewed conference paper or peer-reviewed encyclopedia entry.
5. **Language.** It was written in English.

Practitioner reports, consultancy surveys, vendor white papers, theses and non-peer-reviewed preprints were excluded.

3.3 Search strategy

Searches combined four keyword blocks: ("metaverse" OR "virtual workspace" OR "social VR" OR "virtual reality") AND (workplace OR employee OR "remote work" OR collaboration OR meeting); ("metaverse" OR "enterprise metaverse") AND (adoption OR intention OR implementation); ("videoconference fatigue" OR "Zoom fatigue" OR cybersickness OR "social presence"); and (discontinuance OR abandonment) AND ("information systems" OR technology). Searches were run across open-access publisher platforms, the Directory of Open Access Journals, PubMed Central and university repositories, followed by backward snowballing from the reference lists of included studies.

3.4 Coding and synthesis

Each source was coded for platform type, level of analysis (individual, team or organization), setting (laboratory, field or survey), outcomes measured, adoption or discontinuance factors, theoretical lens and method. Codes were synthesized thematically into the findings in Sections 4 and 5. The research agenda in Section 7 follows the Theory-Context-Characteristics-Methodology (TCCM) logic widely used in management reviews.

3.5 Corpus profile

The final corpus contains 26 substantive sources, plus three methodological references used only to design the review. Twenty-two of the 26 were published from 2022 onward. Table 2 classifies them by study type.

Table 2. Review corpus by study type (n = 26).

Study type	Count	Sources
Experiments and behavioural data studies	4	Biener et al. (2022); Nair et al. (2023); Olt et al. (2024); Sánchez Rodríguez et al. (2025)
Surveys of employees, managers and organizations	6	Bekos et al. (2025); Chaiyasoonthorn et al. (2024); Fauville et al. (2023); Guo et al. (2024); Hysa and Piaszczyk (2024); Shankar et al. (2025)
Qualitative and mixed-methods case studies	5	Aoki et al. (2025); Lee et al. (2023); Palos-Sanchez et al. (2023); Wang and Yu (2024); Zhu et al. (2023)
Systematic, integrative and technical reviews	7	Caserman et al. (2021); Di Pasquale et al. (2024); Leutheuser et al. (2025); Nleya and Velempini (2024); Oh et al. (2018); Park and Kim (2022); Soliman and Rinta-Kahila (2020)
Conceptual and opinion papers	4	Bailenson (2021); Dwivedi et al. (2022); Jacobides et al. (2024); Mystakidis (2022)



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The profile reveals a structural gap. Most experiments take place in laboratories with participants who are not colleagues, while most organizational studies measure intentions rather than use. Only one study, Biener et al. (2022), follows people working in VR for longer than a single session, and none follows an organizational implementation from pilot to scale or abandonment.

3.6 Scope note

The corpus is purposive rather than exhaustive, because it was assembled from open-access sources through targeted searching and snowballing. Subscription-only studies fall outside it by design. The keyword blocks in Section 3.3 can be run in Scopus and Web of Science, with screening reported under the PRISMA 2020 statement (Page et al., 2021), to extend this work into a full systematic review.

4. Findings I: Immersive collaboration and employee outcomes

The employee-level evidence is summarized in Table 3. Its central pattern is that metaverse platforms reliably increase the sense of presence, but presence does not translate reliably into better performance or well-being.

Table 3. Empirical studies of collaboration and employee outcomes in virtual workspaces.

Study	Setting and sample	Platform	Main finding
Olt et al. (2024)	Laboratory experiment	Immersive VR meeting room vs. Zoom	Higher immersion, social presence and collaboration scores in VR
Sánchez Rodríguez et al. (2025)	Experiment, 103 participants, four conditions	Physical, video, non-immersive and immersive metaverse	Collaboration comparable to physical presence; immersive VR reduced concentration and raised cognitive load
Biener et al. (2022)	One working week in VR vs. one on a desktop, 16 participants	VR headset with virtual display	VR rated worse on most measures; two participants dropped out on day one
Palos-Sanchez et al. (2023)	Focus groups with company employees	Gather	Employees expected positive effects on teleworking team cohesion
Aoki et al. (2025)	Surveys and interviews, 13 practitioners in five software firms	Gather	Better presence, social interaction and communication; distraction, privacy and organizational restrictions as barriers
Zhu et al. (2023)	Mixed-methods pilot, 14 members of an academic lab	Gather	Informal communication and co-location not supported as planned
Hysa and Piaszczyk (2024)	Survey of 111 working individuals	Metaverse remote work generally	Higher engagement, less isolation, better training; work-life balance and data protection concerns
Wang and Yu (2024)	Interviews (8) and questionnaires (12) with knowledge workers	Metaverse office	Favourable view of the concept but a large gap between vision and practice
Lee et al. (2023)	Mixed-methods case, 20 undergraduate students	Gather vs. Zoom	Higher perceived teamwork on Gather, attributed to presence and mobility in space

4.1 Collaboration and team processes

In a laboratory experiment, Olt et al. (2024) compared an immersive VR meeting room with Zoom and found higher immersion, social presence and collaboration scores in the virtual environment. Participants also reported greater focus on tasks and team members. The authors caution that nonverbal communication and suitable usage scenarios need further study.

The most rigorous comparison in the corpus complicates this picture. Sánchez Rodríguez et al. (2025) assigned 103 participants to four environments: physical presence, videoconferencing, a non-immersive metaverse and an immersive metaverse. They combined behavioural measures with electroencephalography (EEG) indices of concentration, fatigue and relaxation. All virtual environments supported collaboration about as well as physical presence, but the immersive condition was associated with lower concentration and higher cognitive load, especially during passive learning. Device comfort and ease of use also shaped outcomes.

Spatial platforms show a similar mix of promise and friction. Company employees in focus groups expected virtual worlds to strengthen the cohesion of teleworking teams (Palos-Sanchez et al., 2023). Software developers reported that Gather improved presence, social interaction and communication and eased isolation, but also that playful elements distracted them, that sensitive conversations were hard to keep private and that organizational restrictions limited use (Aoki et al., 2025). In an academic lab, informal communication and a feeling of co-location did not emerge as planned, leading the authors to recommend explicit shared goals and norms for virtual interaction (Zhu et al., 2023). A student study found higher perceived teamwork on Gather than on Zoom, attributed to presence, mobility in space and social presence through avatars (Lee et al., 2023), though its student sample limits transfer to workplaces.

Surveys of working people echo these findings. Respondents in Hysa and Piaszczyk (2024) associated metaverse remote work with higher engagement, less isolation and better training, but also with difficulties in implementation, work-life balance and data protection; the sample was mostly aged 18 to 25. Knowledge workers interviewed by Wang and Yu (2024) liked the idea of a metaverse office but saw a large gap between its envisioned blueprint and its practical implementation.

4.2 Fatigue, cognitive load and cybersickness

The clearest well-being evidence comes from Biener et al. (2022), who asked 16 participants to work in VR for five days, eight hours a day, and compared this with a week in an equivalent physical desktop setup. VR was rated significantly worse on most measures, including task load, frustration, anxiety, eye strain, usability, flow, perceived productivity, well-being and simulator sickness. Two participants dropped out on the first day because of migraine, nausea and anxiety. Some measures improved over the week, suggesting partial adaptation.

Cybersickness is a known property of head-mounted displays. In a review of 49 studies published between 2013 and 2019, Caserman et al. (2021) found that current-generation headsets cause significantly less cybersickness than older ones, but that some symptoms remain as intense, with sensory mismatch and perceived motion as the leading causes. The experts interviewed by Leutheuser et al. (2025) likewise saw motion sickness as a limit on prolonged daily use.

These costs should be read against the videoconferencing baseline. Video calls impose their own nonverbal overload (Bailenson, 2021), and fatigue rises with meeting frequency, duration and lack of breaks (Fauville et al., 2023). Immersive platforms may remove some of these mechanisms, such as the constant self-view, but they add others, such as headset discomfort and sensory conflict. No study in the corpus compares the two forms of fatigue directly over a realistic working period.

Outcomes are also unevenly distributed. Fauville et al. (2023) found that women experienced more videoconference fatigue than men, and Sánchez Rodríguez et al. (2025) observed differences in attentional focus by gender and in task performance by age. Leutheuser et al. (2025) warn that people less familiar with digital technology, or unable to use headsets comfortably, risk being excluded.

4.3 Privacy and surveillance

Immersive work generates unusually rich behavioural data. Nair et al. (2023) showed that 55,541 VR users could be uniquely identified from head and hand motion alone. After training on five minutes of data per person, a model identified users with 94.33% accuracy from 100 seconds of motion and 73.20% accuracy from 10 seconds, making motion a biometric comparable to faces or fingerprints. In a workplace, this implies that routine telemetry could serve as a persistent identifier and a monitoring tool. Employees in the reviewed studies already raise privacy concerns (Aoki et al., 2025; Hysa & Piaszczyk, 2024), even without awareness of this deeper risk.

4.4 Training and onboarding

Training is the most consistently positive application. In a systematic review of VR for assembly and disassembly training, Di Pasquale et al. (2024) found limited but promising use, with potential to improve learning outcomes, productivity and safety and to reduce costs, but gaps in practical application in real industrial settings. Survey respondents also



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see better training as a benefit of metaverse work (Hysa & Piaszczyk, 2024). Training differs from everyday collaboration in that sessions are short and goal-directed, which limits exposure to the fatigue and sickness costs described above.

4.5 Synthesis

Across studies, presence is the benefit most consistently observed and the one most likely to be overestimated. Immersive and spatial platforms make colleagues feel closer, but the best-controlled experiment found no collaboration advantage over video and a cognitive cost for immersive VR (Sánchez Rodríguez et al., 2025), and the only week-long study found substantial well-being costs (Biener et al., 2022). The value of the enterprise metaverse therefore appears to depend on task: short, spatial, social or practice-based activities benefit most, while sustained individual knowledge work benefits least.

5. Findings II: Organizational adoption, scaling and discontinuance

5.1 What drives adoption

Four survey studies in the corpus model the adoption of metaverse tools for work. Their results, summarized in Table 4, converge on a clear message: organizational conditions and social pressures matter at least as much as perceived usefulness.

Table 4. Survey studies of metaverse adoption for work.

Study	Sample	Theoretical basis	Significant drivers
Chaiyasoonthorn et al. (2024)	341 executives and middle managers in multinational consumer goods firms	Extended TAM	Social influence, organizational culture, performance expectancy, leadership support, facilitating conditions
Shankar et al. (2025)	Business-to-business organizations	UTAUT, TOE and institutional theory	Organizational readiness, facilitating conditions, performance expectancy, normative and mimetic pressures; trust as mediator
Bekos et al. (2025)	431 organizations	Organizational excellence framework	Implementation capacity and willingness to change turn adoption intention into competitive advantage
Guo et al. (2024)	Construction workers	Extended UTAUT	Performance expectancy, effort expectancy, social influence, facilitating conditions; trust moderates the step from willingness to behaviour

Chaiyasoonthorn et al. (2024) found that social influence, organizational culture, performance expectancy, leadership support and facilitating conditions all significantly influenced the intention to use the metaverse for remote work. Culture also shaped employees' expectations about performance and effort, and the authors recommend that top management actively champion adoption and invest in network infrastructure and compatible hardware.

Shankar et al. (2025) combined UTAUT, the TOE framework and institutional theory. Organizational readiness, facilitating conditions, performance expectancy, and normative and mimetic pressures were significantly associated with adopting the enterprise metaverse, and trust mediated several of these relationships. An artificial neural network analysis ranked normative pressure as the most important predictor. In other words, firms adopted partly because they felt they were expected to.

At the employee level, Guo et al. (2024) found that performance expectancy, effort expectancy, social influence and facilitating conditions shaped construction workers' willingness to accept metaverse safety training. Facilitating conditions also affected actual behaviour directly, and perceived trust moderated whether willingness became behaviour.

5.2 From intention to value

Adoption intention does not guarantee value. Bekos et al. (2025) examined why some firms realize performance benefits from the metaverse while others do not. Using data from 431 organizations, they found that implementation capacity and willingness to change determine whether adoption intentions translate into a competitive edge. A fuzzy-set qualitative comparative analysis identified configurations of culture, structure, human capital and capabilities that enable effective implementation.



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The qualitative studies show what weak implementation looks like in practice. Organizational restrictions limited the use of Gather in software firms (Aoki et al., 2025). In an academic lab, the expected informal interaction did not appear without explicit norms (Zhu et al., 2023). Knowledge workers described a gap between the vision of the metaverse office and its reality (Wang & Yu, 2024). Across these cases, the tool was available but the working practices around it were not redesigned.

5.3 Discontinuance

The literature says much about why organizations adopt and little about why they stop. Jacobides et al. (2024) offer the most complete account at the industry level. Incumbents rushed in to pre-empt disruption, which led to over-investment; ecosystem orchestrators captured value in ways that discouraged contributors; and persistent technical shortcomings degraded the user experience until the bubble burst. The strong role of normative and mimetic pressure in adoption (Shankar et al., 2025) fits this account. Adoption driven by what peers are doing is likely to be fragile when peers retreat.

At the team and individual level, Aoki et al. (2025) are the only authors in the corpus to ask directly about abandonment, identifying distraction, privacy problems and organizational restrictions as reasons. Biener et al. (2022) document individual quitting in its most immediate form, with two of 16 participants leaving on the first day. Soliman and Rinta-Kahila's (2020) typology of five discontinuance forms can structure future work. Table 5 applies it to the enterprise metaverse. The first column follows their typology; the illustrations are this review's interpretation, linked to evidence where the corpus provides it.

Table 5. Forms of discontinuance applied to the enterprise metaverse.

Form (Soliman & Rinta-Kahila, 2020)	Illustration in the enterprise metaverse	Related evidence in the corpus
Rejection	Employees are given access to a virtual workspace but never adopt it for real work	Vision-practice gap (Wang & Yu, 2024)
Regressive discontinuance	Use narrows from everyday collaboration to a few occasions, such as training or social events	Training as the most stable use (Di Pasquale et al., 2024)
Quitting	Individuals or teams stop using the platform after trying it	First-day dropouts (Biener et al., 2022); abandonment reasons (Aoki et al., 2025)
Temporary discontinuance	Use pauses, for example until hardware improves or a project needs it again	Not yet studied
Replacement	Teams return to videoconferencing or move to another platform	Industry-level retreat (Jacobides et al., 2024)

5.4 Synthesis

Adoption research in the corpus explains intention well, but three findings point beyond it. Implementation capacity decides whether intention becomes value (Bekos et al., 2025). Institutional pressure is a strong driver of adoption (Shankar et al., 2025), which may make adoption sensitive to hype. And the working practices around the tools, such as norms, privacy arrangements and permitted uses, determine whether they are used at all (Aoki et al., 2025; Zhu et al., 2023). Together these findings suggest that discontinuance is often the result of adoption for the wrong reasons combined with implementation without redesign.

6. Theoretical lenses and an integrative framework

6.1 Theory use in the corpus

The two research streams rely on different theories and rarely meet. Organizational studies use acceptance and adoption models: TAM, UTAUT, the TOE framework and institutional theory (Chaiyasoonthorn et al., 2024; Guo et al., 2024; Shankar et al., 2025), with Bekos et al. (2025) adding an organizational excellence perspective on implementation. Employee-level studies use psychological constructs: presence and social presence (Oh et al., 2018) and nonverbal overload and cognitive load (Bailenson, 2021; Fauville et al., 2023; Sánchez Rodríguez et al., 2025). Discontinuance theory (Soliman & Rinta-Kahila, 2020) and ecosystem architecture (Jacobides et al., 2024) sit at the margins and have not yet been used to study metaverse work at the firm level.

6.2 Candidate lenses

Table 6 sets out the lenses available for integrating the two levels of analysis.



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Lens	Level	Core question	Status in the corpus
Social presence	Individual, team	When does feeling "with" others improve interaction?	Used (Oh et al., 2018; Olt et al., 2024)
Nonverbal overload and cognitive load	Individual	What makes virtual interaction tiring?	Used (Bailenson, 2021; Fauville et al., 2023)
TAM and UTAUT	Individual, organization	What predicts the intention to adopt?	Used (Chaiyasoonthorn et al., 2024; Guo et al., 2024)
TOE and institutional theory	Organization	How do organizational readiness and peer pressure shape adoption?	Used (Shankar et al., 2025)
Implementation capability	Organization	Why do some adopters realize value and others not?	Used (Bekos et al., 2025)
IS discontinuance	Individual, organization	Why and how is use abandoned, narrowed or replaced?	Available but not yet applied to metaverse work (Soliman & Rinta-Kahila, 2020)
Ecosystem architecture	Industry	How do platform rules and roles shape the rise and fall of a technology?	Applied at industry level (Jacobides et al., 2024)

Table 6. Theoretical lenses for studying immersive work.

Two further lenses from management research are well suited to the gaps identified here, although no study in the corpus uses them. Task-technology fit would formalize the finding that value depends on the match between platform and task. Job demands-resources theory would frame cognitive load and cybersickness as job demands and presence and cohesion as resources, allowing both to be studied together.

6.3 An integrative framework

Figure 1 integrates the findings of Sections 4 and 5. Adoption drivers determine which platform an organization deploys. The platform shapes employee and team experience through gains in presence and costs in cognitive load, cybersickness and privacy risk. These experiences produce collaboration, well-being and training outcomes, which in turn inform the organization's trajectory: scaling up, narrowing use, quitting or replacing the tool. That trajectory feeds back into later adoption decisions. Four conditions shape both the experience-to-outcome link and the outcome-to-trajectory link.

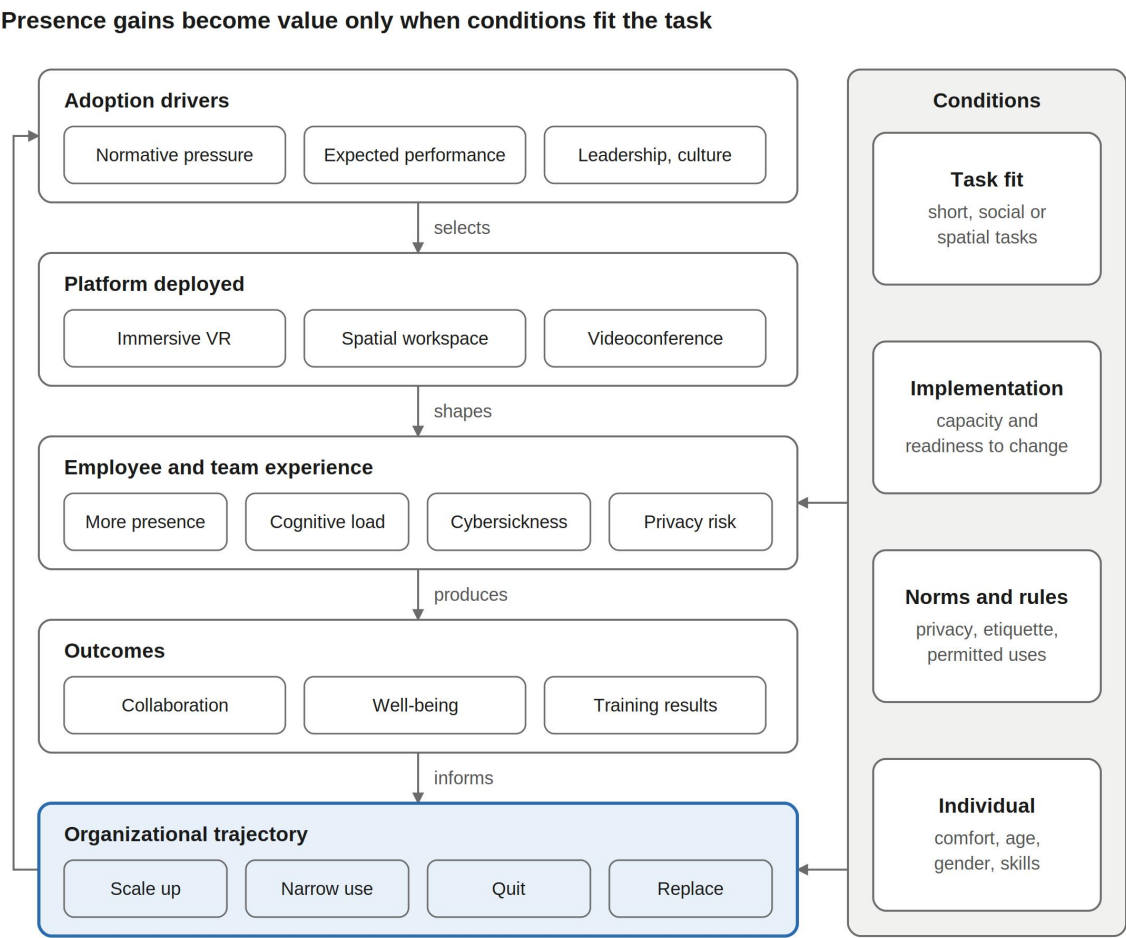


Figure 1. Integrative framework of immersive work, from adoption to organizational trajectory.

The framework yields four propositions for empirical testing.

- **P1.** Immersive and spatial platforms increase social presence, but the effect of presence on collaboration performance depends on the task. It is positive for short, social, spatial or practice-based tasks and neutral or negative for sustained individual knowledge work (Biener et al., 2022; Di Pasquale et al., 2024; Sánchez Rodríguez et al., 2025).
- **P2.** The well-being costs of immersive work rise with exposure time and fall unevenly across employees, depending on comfort, age, gender and prior experience (Biener et al., 2022; Caserman et al., 2021; Fauville et al., 2023).
- **P3.** Adoption driven mainly by normative and mimetic pressure is more likely to end in discontinuance than adoption driven by task-specific performance expectations (Jacobides et al., 2024; Shankar et al., 2025).
- **P4.** Implementation capacity and explicit norms, including privacy rules, moderate whether positive employee experiences translate into scaled organizational use (Aoki et al., 2025; Bekos et al., 2025; Nair et al., 2023; Zhu et al., 2023).

7. Research agenda

The agenda follows the TCCM logic: which theories to use, in which contexts, around which characteristics or constructs, and with which methods. Table 7 summarizes current gaps and priorities, and the subsections that follow set out research questions.

Table 7. TCCM research agenda for immersive work.

Dimension	Current state in the corpus	Priority for future research
Theory	Acceptance models at the organizational level and presence or load constructs at the individual level, rarely connected	Multi-level theories linking employee experience to organizational trajectory; task-technology fit; discontinuance; job demands and resources
Context	Laboratory participants, students, software teams and knowledge workers; mostly single organizations	Frontline and operational roles, small and medium-sized firms, emerging economies, hybrid teams across firms



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Dimension	Current state in the corpus	Priority for future research
Characteristics	Presence and intention widely measured; performance, long-term well-being, privacy and inclusion rarely measured	Validated measures of task fit, exposure, discontinuance form and privacy risk; outcomes disaggregated by employee group
Methodology	Cross-sectional surveys and short laboratory sessions; one week-long study	Longitudinal field experiments, multi-level designs, event-history analysis of adoption and abandonment, privacy-preserving telemetry

7.1 Theory

The main theoretical task is to connect the two levels of analysis. Acceptance models explain why firms say they will adopt (Chaiyasoonthorn et al., 2024; Shankar et al., 2025), while presence and load constructs explain how individuals experience the tools (Oh et al., 2018; Sánchez Rodríguez et al., 2025). Neither explains how individual experience aggregates into organizational decisions to scale, narrow or abandon use. Discontinuance theory (Soliman & Rinta-Kahila, 2020) and ecosystem architecture (Jacobides et al., 2024) offer starting points.

- **RQ-T1.** How do individual experiences of presence, fatigue and sickness aggregate into team-level and organization-level decisions about continued use?
- **RQ-T2.** Does the match between task characteristics and platform affordances explain collaboration outcomes better than platform immersion alone?
- **RQ-T3.** Which of the five forms of discontinuance are most common for enterprise metaverse initiatives, and do they have different antecedents from adoption?

7.2 Context

Most evidence comes from laboratories, students and software or academic teams (Aoki et al., 2025; Lee et al., 2023; Olt et al., 2024; Zhu et al., 2023). Operational roles appear only in training studies (Guo et al., 2024; Di Pasquale et al., 2024). Emerging economies, small and medium-sized firms and teams that span organizations are almost absent, although these are contexts where travel costs, infrastructure and digital skills differ most.

- **RQ-C1.** How do infrastructure constraints and hardware costs shape adoption and discontinuance in emerging-economy firms?
- **RQ-C2.** Do spatial workspaces benefit hybrid teams, in which some members are co-located and others remote, in the same way as fully remote teams?
- **RQ-C3.** How do frontline workers' experiences of immersive training compare with knowledge workers' experiences of immersive meetings?

7.3 Characteristics

The field measures what is easiest to measure. Presence and adoption intention appear in almost every study, whereas performance over time, well-being beyond a single session, privacy and inclusion appear rarely. Nair et al. (2023) show that motion data can identify individuals, yet no workplace study measures what employees know or accept about such data. Differences by gender and age in fatigue and attention (Fauville et al., 2023; Sánchez Rodríguez et al., 2025) call for outcomes to be reported separately for different employee groups.

- **RQ-CH1.** How should task fit and exposure be measured so that studies of immersive work can be compared?
- **RQ-CH2.** How do employees perceive and trade off the privacy risks of immersive telemetry against the benefits of presence?
- **RQ-CH3.** Which employee groups bear the highest well-being costs of immersive work, and which design or policy choices reduce them?

7.4 Methodology

Only one study in the corpus extends beyond a single session (Biener et al., 2022), and no study follows an organizational implementation over time. Longitudinal field experiments in real organizations, randomizing teams to immersive, spatial and video conditions for several weeks, would address the largest gap. Multi-level designs could link individual measures to team and firm outcomes. Event-history methods could model the timing of adoption, narrowing and abandonment across firms. Where telemetry is used, it should be collected with privacy-preserving methods given the identification risks documented by Nair et al. (2023).

- **RQ-M1.** What are the effects of immersive and spatial workspaces on team performance and well-being over several months in real organizations?
- **RQ-M2.** Which organizational and platform characteristics predict how long enterprise metaverse initiatives survive?
- **RQ-M3.** Do early experiences in pilots predict later scaling or abandonment decisions?

8. Implications, limitations and conclusion

8.1 Theoretical implications

The review shows that the enterprise metaverse cannot be understood through adoption intention alone. Employee-level studies reveal that presence gains come with cognitive, physical and privacy costs, and organization-level studies reveal that adoption is driven partly by peer pressure and realized only through implementation capacity. The integrative framework connects these findings and places the organizational trajectory, including discontinuance, at the end of the causal chain. This shifts the central question from "will organizations adopt the metaverse?" to "for which tasks, under which conditions, and for how long will it be used?"

8.2 Managerial implications

Five practical implications follow from the evidence.

1. **Match the platform to the task.** Immersive VR is best suited to short, spatial, social or practice-based activities such as training, onboarding and design review (Di Pasquale et al., 2024; Olt et al., 2024). Sustained individual knowledge work is better served by conventional tools, given the costs documented by Biener et al. (2022) and Sánchez Rodríguez et al. (2025).
2. **Limit exposure and offer alternatives.** Sessions should be kept short, with breaks and a non-immersive option for employees who experience discomfort (Caserman et al., 2021; Leutheuser et al., 2025).
3. **Set norms and privacy rules before rollout.** Clear expectations for when and how to use virtual spaces help informal interaction emerge (Zhu et al., 2023). Because motion data can identify individuals (Nair et al., 2023), policies on telemetry collection, retention and monitoring should be agreed with employees in advance.
4. **Adopt for task reasons, not peer reasons.** Normative pressure is a strong driver of adoption (Shankar et al., 2025), and hype-driven over-investment preceded the retreat described by Jacobides et al. (2024). Pilots should define in advance the performance criteria for scaling up or stopping.
5. **Build implementation capacity.** Culture, leadership support and readiness to change determine whether adoption creates value (Bekos et al., 2025; Chaiyasoonthorn et al., 2024).

8.3 Limitations

This review has five main limitations. First, the corpus includes only open-access sources, so relevant subscription-only studies are excluded by design. Second, it was assembled through targeted searching and snowballing rather than exhaustive database screening. Third, much of the evidence comes from laboratory settings and small or student samples, which limits generalization to organizations. Fourth, hardware changes quickly: Caserman et al. (2021) found that newer headsets cause less cybersickness than older ones, so findings based on earlier devices may overstate current costs. Fifth, coding was carried out by a single reviewer without an inter-rater reliability check.

8.4 Conclusion

The enterprise metaverse was oversold as a replacement for the office and then too quickly dismissed as a failed fad. The open-access evidence to 2025 supports a narrower but more durable conclusion. Immersive and spatial workspaces make colleagues feel closer and can support training, onboarding and some forms of collaboration. They also impose cognitive, physical and privacy costs that make them poorly suited to all-day work with current hardware. Whether organizations scale, narrow or abandon these tools depends less on the technology than on why they adopt it, which tasks they use it for and how well they redesign work around it. Studying those choices, over time and inside real organizations, is the main task ahead for management science.

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