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Organizational Continuity and Human-Centered AI: Rethinking Governance in Aging Digital Economies

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Abstract

INTRODUCTION: Digital transformation is often associated with technological sophistication, data availability, automation, and Artificial Intelligence (AI)-mediated coordination. However, organizations may preserve more information while losing the human and institutional capacity to interpret, govern, and use that information over time. This risk is especially relevant for small and medium-sized enterprises (SMEs), where tacit knowledge, contextual judgment, and governance memory are often concentrated in experienced professionals.
OBJECTIVES: This paper reframes digital transformation as an organizational continuity governance problem. It aims to explain how AI-mediated coordination, demographic aging, distributed work, and concentrated tacit knowledge may generate continuity asymmetry, understood as the gap between increasing technological coordination capacity and insufficient human-centered mechanisms for preserving interpretive continuity.
METHODS: The study develops an integrative conceptual analysis based on selective theoretical synthesis. It connects digital transformation, organizational memory, knowledge transfer and knowledge loss, sociomateriality, human-centered AI, AI governance, aging workforce research, and productive longevity to build a sociomaterial continuity perspective.
RESULTS: The paper distinguishes informational continuity from interpretive continuity and conceptualizes experienced professionals as continuity actors who sustain tacit knowledge, relational memory, contextual judgment, and governance understanding across time. It proposes the Sociomaterial Continuity Governance Framework, organized around four mutually reinforcing governance functions: knowledge risk and memory mapping, continuity actors and intergenerational transfer, human oversight of AI-mediated coordination, and modular continuity routines and audits for SMEs. The paper also formulates theoretical propositions to guide future empirical research.
CONCLUSION: Sustainable digital transformation depends not only on expanding technological capability, but also on preserving the interpretive conditions through which organizational knowledge remains meaningful, transferable, and governable. The article contributes by positioning organizational continuity as a sociomaterial governance achievement and by offering a conceptual framework for reducing continuity asymmetry in AI-mediated and aging SME environments.

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1. Introduction

Organizations can now preserve more information than ever before. This does not mean that they preserve the human capacity to interpret, govern, and use that information over time [1–3].

Digital transformation is often presented as a pathway to organizational renewal, with digital technologies reshaping strategy, organizational routines, leadership practices, organizational agility, and value creation processes [4–7]. Recent bibliometric evidence

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also indicates that digital transformation research has moved from technology-led perspectives toward more human-centric approaches that emphasize digital skills, resilience, leadership, sustainability, and ethical human-machine collaboration [8]. Through data infrastructures, automation, cloud platforms, and Artificial Intelligence (AI)-mediated systems, organizations are expected to become more agile, scalable, responsive, and capable of generating business value [3]. Yet the expansion of digital capability does not necessarily produce organizational continuity. Organizational knowledge remains dependent on transfer mechanisms, social interaction, institutional memory, and sociomaterial arrangements that cannot be reduced to technical integration alone [1, 2, 9–11].

This issue becomes especially relevant in small and medium-sized enterprises (SMEs). Unlike large organizations, which often possess formal governance structures, specialized departments, and redundant knowledge systems, SMEs frequently operate with less formalized governance arrangements, limited managerial redundancy, and concentrated forms of tacit knowledge [9, 12–14]. In these settings, AI implementation often requires the orchestration of limited technological, managerial, and human resources [15]. Strategic judgment, relational knowledge, operational memory, and contextual interpretation may therefore be held by a small number of experienced professionals. When such knowledge is weakly embedded in formal routines, member turnover can generate significant organizational knowledge loss [16, 17].

Demographic aging reinforces this vulnerability. Aging populations are reshaping labor markets, organizational participation, and institutional sustainability in many aging economies [18, 19]. Within organizations, experienced professionals often carry tacit knowledge, contextual judgment, relational memory, and institutional understanding that are difficult to codify or replace. Organizational research on aging workforces also suggests that sustainable participation in later working life depends on organizational practices that recognize the value of experienced workers rather than treating aging only as a labor supply problem [19]. In SMEs, this means that retirement or reduced participation may remove not only individual expertise, but also part of the interpretive infrastructure through which organizational memory remains actionable.

At the same time, work is increasingly mediated by digital infrastructures. Remote and hybrid arrangements have altered the informal conditions through which knowledge is transferred, observed, and socially reproduced [20–22]. By reducing everyday encounters, these arrangements can weaken mentoring, proximity-based learning, informal observation, organizational socialization, and shared sensemaking unless organizations deliberately recreate interaction spaces and knowledge-sharing routines [23–25]. These changes do not imply that digital technologies are harmful in themselves. They indicate that organizational continuity is increasingly produced through sociomaterial arrangements in which people, technologies, routines, and governance mechanisms are mutually entangled [10, 11].

The central problem is that digital transformation may strengthen informational continuity while weakening interpretive continuity. Digital systems can store documents, retrieve data, support decisions, and coordinate distributed work. They may therefore create the appearance of continuity by making organizational information more persistent and accessible. However, organizations do not simply need access to past information. They need the capacity to understand why that information matters, how it should be interpreted in changing circumstances, and how it should inform present decisions. When these interpretive conditions weaken, systems may become more integrated while organizational understanding becomes more fragmented [1, 2, 10, 26].

Existing literature provides important elements for understanding this problem, but these elements remain insufficiently integrated. Digital transformation research explains how digital technologies reshape strategy, capabilities, and value creation [4–6]. Organizational memory and knowledge transfer research explains why knowledge depends on retention, transfer mechanisms, social interaction, and interpretability across contexts [1, 2, 9]. Sociomateriality and human-centered AI research show that technologies do not operate outside organizational life, but become entangled with practices, accountability, oversight, and human agency [10, 11, 27, 28]. Recent work on AI governance further shows that responsible AI adoption requires attention to who is accountable, what is governed, when governance occurs, and how it is implemented through frameworks, tools, policies, and organizational mechanisms [29]. Yet these debates have not been sufficiently connected to the specific question of how organizations preserve continuity when AI-mediated coordination expands while tacit knowledge remains concentrated in experienced professionals.

This gap is analytically and practically important for SMEs. If SMEs adopt AI-mediated systems while losing the people who sustain contextual judgment and institutional memory, they may become digitally more capable and organizationally more fragile [3, 30, 31]. Prior work on human-centered and socially aware AI has shown that technical performance alone is insufficient when systems affect users, reshape accountability, and require interpretation within social contexts [27–29, 32]. A similar concern arises in organizational continuity. The question is not whether AI can store and retrieve more information. The question is whether organizations can preserve the

human and institutional conditions through which such information remains meaningful, governable, and useful over time.

This paper addresses that gap by developing a sociomaterial continuity perspective on digital transformation. The core argument is that sustainable digital transformation depends not only on adopting advanced technologies, but also on preserving the human and organizational mechanisms through which knowledge remains interpretable, transferable, and governable. From this perspective, organizational continuity is not treated as a passive outcome of digital maturity. It is treated as a governance capability produced through the interaction between institutional memory, experienced professionals, AI-mediated infrastructures, and human-centered knowledge governance mechanisms.

The paper therefore proposes a human-centered knowledge governance framework for SMEs in AI-mediated and aging organizational environments. The framework is built around the notion of continuity asymmetry, understood as the gap between increasing technological coordination capacity and insufficient human-centered mechanisms for preserving interpretive continuity. This asymmetry helps explain why organizations may appear digitally mature while remaining vulnerable to institutional fragmentation, especially when tacit knowledge is concentrated, intergenerational transfer is weak, and AI-enabled coordination expands faster than organizational capacity to govern meaning, judgment, and memory.

The article makes three conceptual contributions. First, it clarifies the concept of interpretive continuity and distinguishes it from informational persistence. This distinction reframes digital transformation as a continuity governance problem rather than only a technological adoption problem. Second, it conceptualizes experienced professionals as continuity actors who support the reproduction of tacit knowledge, contextual judgment, and governance memory in aging digital organizations. Third, it develops a human-centered knowledge governance perspective for SMEs, identifying mechanisms through which organizations may reduce continuity risks while benefiting from AI-enabled coordination.

Together, these contributions respond to the need for a more operational conceptual model of organizational continuity in AI-mediated environments. Rather than presenting older professionals as a residual labor category or AI systems as neutral repositories of knowledge, the paper positions continuity as a sociomaterial governance achievement. This perspective creates a foundation for future empirical research on continuity actors, knowledge risk mapping, intergenerational transfer, AI oversight roles, and continuity audits in resource-constrained organizations.

The remainder of the paper is organized as follows. Section 2 presents the conceptual approach and theoretical foundations of the study. Section 3 defines the core constructs of the sociomaterial continuity perspective. Section 4 analyzes the continuity challenge faced by SMEs in AI-mediated and aging organizational environments. Section 5 develops the human-centered knowledge governance framework and formulates theoretical propositions for future research. Section 6 discusses the theoretical and practical implications of the proposed framework. Section 7 concludes by summarizing the main contribution, limitations, and future research opportunities.

2. Conceptual Approach and Theoretical Foundations

This section clarifies the conceptual status of the article and the analytical logic through which its argument is developed. It positions the paper as a conceptual article based on selective theoretical integration and explains why adjacent research streams must be connected to theorize organizational continuity in AI-mediated and aging SME environments.

2.1. Conceptual Article Logic

This article develops a conceptual analysis based on selective theoretical integration. Rather than presenting empirical findings or a systematic review, it synthesizes adjacent theoretical streams to build a theoretical explanation for a problem that is increasingly visible in organizational practice but remains insufficiently theorized in the literature. The problem is that organizations may expand digital and AI-mediated coordination while weakening the human and institutional conditions through which knowledge remains interpretable, transferable, and governable over time.

The gap addressed in this paper is therefore conceptual. Existing research provides important insights into digital transformation, organizational memory, sociomateriality, human-centered AI, AI governance, and aging workforces. However, these insights are rarely integrated around the specific question of organizational continuity in AI-mediated and demographically aging environments. Following the logic of conceptual article design, the paper uses theory synthesis and model building to connect adjacent literatures, clarify core constructs, and develop a framework that can guide future empirical research [33].

This approach is appropriate because the object of analysis is a theoretical relationship between technological mediation, organizational memory, tacit knowledge, human interpretation, and governance. These elements cannot be adequately explained from a single empirical setting without first clarifying the

conceptual mechanisms that connect them. The article therefore develops a conceptual framework and a set of propositions that explain how SMEs may preserve interpretive continuity while adopting AI-mediated coordination systems.

2.2. Five Theoretical Streams

The first stream is digital transformation and information technology (IT) governance. This literature establishes the organizational context in which the continuity problem emerges. Digital transformation research shows that digital technologies increasingly reshape strategy, organizational routines, capabilities, and value creation [4–6]. Recent work further indicates that digital transformation outcomes depend on leadership, organizational agility, and digital strategy rather than technological adoption alone [7]. This is consistent with recent bibliometric evidence showing that human-centric digital transformation sits at the intersection of technologies, organizations, and people, and that its effects depend on strategy, leadership, structure, culture, and capability development [8]. It explains why organizations are pressured to become more agile, data-driven, scalable, and technologically integrated. However, this literature tends to focus on transformation, capability development, innovation, and technological adoption. It provides less direct explanation of how organizations preserve interpretive continuity when digital infrastructures expand faster than the human and institutional mechanisms required to govern knowledge across time.

The second stream concerns organizational memory, knowledge transfer, and knowledge loss. This literature provides the conceptual basis for distinguishing information preservation from interpretive continuity. Organizational memory has been understood as stored information from an organization's history that can influence present decisions [1]. Later work on knowledge transfer and organizational learning shows that knowledge remains valuable only when it can be interpreted, transferred, and situated in social practice [2, 9]. This is especially important when knowledge is tacit, organization-specific, and weakly embedded in formal routines. Research on knowledge loss further clarifies why member turnover can become strategically damaging when departing individuals hold knowledge that is difficult to codify or replace [16, 17].

The third stream is sociomateriality. Sociomaterial research challenges the separation between technological systems and organizational life by showing that practices, technologies, routines, and institutional arrangements are mutually constituted [10]. This lens is central to the present argument because continuity cannot be treated either as a property of individuals alone or as a property of information systems alone. It is produced through arrangements in which human interpretation, digital infrastructures, work routines, and governance mechanisms interact. Recent work on AI-in-the-making reinforces this point by showing that AI systems are enacted through sociomaterial practices rather than operating as neutral technical objects outside organizational contexts [11]. Related systems-theoretical work also suggests that AI affects organizations through decision communication, system memory, interaction systems, and reflection loops, which makes its organizational effects communicative and interpretive rather than merely computational [34].

The fourth stream concerns human-centered AI and AI governance. Human-centered AI emphasizes human agency, interpretability, accountability, and meaningful oversight in technologically mediated environments [27, 28]. AI governance research complements this by examining who is accountable for AI systems, what is governed, when governance occurs, and how governance is implemented through frameworks, tools, policies, and organizational mechanisms [29]. Recent consensus-based work on trustworthy AI further shows that governance concerns increasingly extend across the full AI lifecycle, including design, development, validation, deployment, monitoring, traceability, usability, robustness, and explainability [35]. Prior work on socially aware AI also indicates that technical performance is insufficient when systems affect users, reshape accountability, and operate within contexts of social meaning [32]. These contributions help position AI adoption as a governance problem rather than a purely technical implementation problem. This interpretation is consistent with information systems research that treats managing AI as a managerial challenge involving communication, leadership, coordination, control, autonomy, learning, and inscrutability [36]. It is also consistent with research on AI capability, which shows that organizations need non-technical resources such as human skills, leadership, team coordination, organizational culture, governance strategy, and AI-employee integration to benefit from AI adoption [37].

The fifth stream concerns aging workforces and productive longevity. Demographic aging changes how organizations sustain expertise, participation, and knowledge transfer across generations [18, 38]. Research on aging workforces indicates that later working life should not be understood only in terms of retirement, labor supply, or individual decline. Organizational practices can support the continued contribution of experienced professionals and recognize the value of accumulated knowledge [19]. Productive longevity further suggests that longer working lives require more flexible and multi-stage forms of participation rather than abrupt withdrawal from organizational life [39]. Recent work on multigenerational knowledge management also emphasizes that intergenerational learning,

adult learning principles, and age-diverse collaboration can support knowledge creation, sharing, transfer, storage, retrieval, and application in contemporary digital workplaces [25]. This stream is necessary because the continuity problem becomes sharper when experienced professionals who carry tacit knowledge, relational memory, and contextual judgment retire, reduce participation, or leave without adequate transfer mechanisms.

2.3. Why Theoretical Integration is Necessary

Each of these streams explains part of the problem, but none is sufficient on its own. Digital transformation research explains technological change, but it does not fully theorize the human mechanisms through which organizational knowledge remains meaningful over time. Organizational memory and knowledge transfer research explain retention, transfer, and knowledge loss, but they do not fully address the ways in which AI-mediated infrastructures reshape organizational cognition and coordination. Sociomateriality explains the entanglement of technology and practice, but it does not by itself specify why aging workforces and concentrated tacit knowledge create continuity risks for SMEs. Human-centered AI and AI governance explain oversight, accountability, and responsible adoption, but they rarely frame these concerns as problems of organizational memory and continuity. Aging workforce research explains later-life participation, but it is not usually connected to AI-mediated governance and digital transformation.

The contribution of this paper emerges from connecting these partial explanations. The continuity problem is not located in any single stream. It appears at their intersection. SMEs may adopt digital systems to improve coordination and information access, while their tacit knowledge remains concentrated in a small number of experienced professionals. They may become more technologically integrated while becoming less capable of interpreting past decisions, informal routines, relational knowledge, and accumulated organizational judgment. In such conditions, continuity is not secured by information storage alone. It depends on whether organizations can preserve the human and sociomaterial arrangements through which knowledge remains actionable.

This integration produces two conceptual insights that guide the rest of the paper. The first is the notion of continuity actors. Experienced professionals are not treated merely as older workers, residual labor, or sources of task expertise. They are conceptualized as actors who help reproduce interpretive structures, institutional memory, relational knowledge, and governance judgment. The second is the notion of continuity asymmetry. This refers to the gap between increasing technological coordination capacity and insufficient human-centered mechanisms for preserving interpretive continuity. Together, these concepts help explain why organizations may appear digitally mature while remaining vulnerable to institutional fragmentation.

2.4. Analytical Lens for Integration

The integrative lens developed in this paper is a sociomaterial continuity perspective. This perspective extends sociomaterial reasoning from the analysis of technology and practice to the problem of continuity across time. It treats continuity as an organizational achievement produced through interactions among people, technologies, routines, memory structures, and governance mechanisms. Continuity is therefore not understood as the passive persistence of information. It is understood as the capacity to keep organizational knowledge meaningful, transferable, and governable under changing technological, demographic, and institutional conditions.

This perspective is organized around four analytical principles. First, continuity is interpretive rather than merely informational. Organizations do not only need records, documents, or repositories. They need the capacity to make sense of knowledge across time. Second, continuity is produced through human-technology entanglements. Digital infrastructures can support memory and coordination, but they can also weaken tacit transfer when they displace social interaction, mentoring, and situated participation. Third, continuity requires intergenerational transfer mechanisms. This is particularly important in aging SMEs, where experienced professionals often carry knowledge that is difficult to codify. Fourth, continuity is a governance capability rather than a technological outcome. It must be designed, monitored, and sustained through organizational routines, roles, and accountability mechanisms.

This analytical lens prepares the conceptual work developed in the next section. Section 3 defines the core constructs of the sociomaterial continuity perspective, namely informational continuity, interpretive continuity, continuity actors, continuity asymmetry, and sociomaterial continuity. These constructs provide the vocabulary for analyzing the continuity challenge in SMEs. They also establish the conceptual basis for the human-centered knowledge governance framework developed later in the paper.

3. From Organizational Memory to Sociomaterial Continuity

This section develops the conceptual vocabulary of the sociomaterial continuity perspective. The previous

section explained why digital transformation, organizational memory, sociomateriality, human-centered AI, AI governance, and aging workforce research need to be integrated. This section now moves from that integrative lens to the core constructs that support the argument. It distinguishes informational continuity from interpretive continuity, conceptualizes experienced professionals as continuity actors, defines continuity asymmetry, and explains why organizational continuity should be understood as a sociomaterial achievement.

3.1. Informational Continuity and Its Limits

Organizational memory research provides a natural starting point for theorizing continuity. Walsh and Ungson define organizational memory as stored information from an organization's history that can influence present decisions [1]. This definition remains important because it establishes that organizations carry traces of past experience, decisions, routines, and interpretations into present action. However, it also creates a conceptual risk if memory is understood primarily as storage. In digitally mediated organizations, the capacity to store documents, preserve records, retrieve information, and maintain data repositories may create the appearance that continuity has been secured.

This paper refers to this condition as informational continuity. Informational continuity is the persistence and accessibility of organizational information across time. It includes records, documents, databases, procedures, communication histories, and digital traces that allow organizations to preserve formalized knowledge. It is a necessary condition for continuity, but it is not sufficient. Organizations can retain large volumes of information while losing the practical capacity to interpret why that information matters, how it should be used, and how it relates to changing organizational circumstances.

The limitation of informational continuity becomes especially visible when knowledge is tacit, contextual, or weakly codified. Knowledge transfer research shows that knowledge does not move across people and units as if it were a neutral object. Its value depends on transfer opportunities, motivation, absorptive conditions, social interaction, and the capacity to interpret knowledge in context [2]. Nonaka and Takeuchi similarly emphasize that organizational knowledge creation depends on interaction between tacit and explicit knowledge rather than on formalized information alone [9]. For this reason, continuity cannot be equated with the preservation of information. It also requires the preservation of the interpretive conditions that make information actionable.

3.2. Interpretive Continuity

Interpretive continuity refers to the organizational capacity to preserve meaning, judgment, and contextual understanding across time. It concerns the ability to know not only what was done, but why it was done, how decisions were interpreted, which assumptions guided action, and how accumulated experience should inform present judgment. While informational continuity preserves traces of the past, interpretive continuity preserves the human and organizational capacity to make those traces meaningful.

This distinction is central to the argument of the paper. Digital systems may improve informational continuity by making knowledge more persistent, searchable, and accessible. They may also support coordination, workflow execution, and decision support. Yet these systems do not automatically preserve the situated judgment through which organizational knowledge becomes meaningful. A procedure can be documented without preserving the practical reasoning that made it appropriate. A decision can be archived without preserving the informal constraints that shaped it. A dataset can be retained without preserving the organizational knowledge required to interpret its limits.

Interpretive continuity therefore depends on more than information repositories. It depends on social interaction, organizational participation, mentoring, shared routines, and governance practices that allow knowledge to be interpreted across contexts [2, 9, 10]. When these mechanisms weaken, organizations may become informationally stable but interpretively fragile. This fragility is not a rejection of digital transformation. It indicates that digital transformation must be governed in ways that preserve the human structures through which memory, judgment, and organizational meaning remain actionable.

3.3. Continuity Actors

The construct of continuity actors is developed in this article to explain how interpretive continuity is sustained in practice. Building on research on organizational memory, knowledge transfer, knowledge loss, and aging workforces, continuity actors are conceptualized as organizational members who preserve and reproduce tacit knowledge, contextual judgment, relational memory, and governance understanding across time. They are not defined only by age, tenure, or formal authority, but by the function they perform in sustaining the organization's capacity to interpret its own knowledge.

Experienced professionals often occupy this role, especially in SMEs. In this context, experience refers not only to age or tenure, but also to the accumulation of organization-specific knowledge, relational networks, and contextual judgment that are not yet codified. In

such organizations, formal governance redundancy is often limited and routines may remain partly informal [12–14]. Knowledge may also be concentrated in a small number of individuals, especially when tacit and organization-specific knowledge has not been sufficiently codified into routines, roles, or procedures [9, 16, 17]. This means that the departure of experienced professionals can remove more than technical expertise. It can remove historical interpretation, relational knowledge, informal coordination patterns, and the memory of why certain decisions, routines, and practices emerged.

Continuity actors should therefore not be understood as passive repositories of experience. They actively connect past and present organizational understanding. They explain historical decisions, interpret informal norms, recognize weak signals, translate organizational memory into current judgment, and support the transfer of tacit knowledge to less experienced members. In aging organizations, these actors become especially important because retirement, reduced participation, or late-career transitions may weaken the continuity structures through which knowledge is reproduced. The challenge is not simply to retain older workers. It is to recognize and govern the continuity functions they often perform.

This reconceptualization also changes how intergenerational transfer should be understood. Transfer is not only a matter of documenting what experienced professionals know. It is a matter of creating organizational conditions in which less experienced members can participate in interpretation, observe judgment in context, and understand the meaning behind routines. Continuity actors therefore operate at the boundary between organizational memory and future adaptation. They help organizations change without losing coherence.

3.4. Continuity Asymmetry

Continuity asymmetry refers to the gap between increasing technological coordination capacity and insufficient human-centered mechanisms for preserving interpretive continuity. This construct captures a specific risk of digital transformation. Organizations may expand digital systems, automate coordination, increase data availability, and improve process integration while failing to preserve the human and organizational mechanisms that make knowledge meaningful across time.

The risk is not that digital technologies necessarily damage continuity. Rather, the risk is that technological capability may grow faster than interpretive capacity. AI-mediated systems can support retrieval, recommendation, workflow orchestration, and decision support. They can also encourage cognitive offloading, where cognitive work is delegated to external systems [26]. In organizational settings, such offloading may be useful when it reduces routine burden. However, it becomes problematic when organizations externalize coordination and decision support without maintaining human oversight, contextual interpretation, and institutional memory.

Continuity asymmetry is especially relevant for SMEs. These organizations may adopt digital tools to compensate for limited resources, but they may lack the governance capacity to examine how those tools reshape memory, judgment, and knowledge transfer. If tacit knowledge remains concentrated in experienced professionals, and if intergenerational transfer mechanisms are weak, then digital integration may coexist with institutional fragmentation. The organization appears more coordinated because systems are connected, but it becomes less capable of interpreting its own accumulated knowledge.

This construct helps explain why digital maturity and organizational continuity should not be treated as equivalent [3, 34]. A digitally mature organization may still be vulnerable if it lacks mechanisms for preserving interpretive continuity. Conversely, an organization with modest technological sophistication may preserve continuity more effectively if it maintains strong routines of mentoring, reflection, knowledge transfer, and human oversight. Continuity asymmetry therefore differs from broader accounts of digital transformation tensions because it focuses specifically on the temporal gap between technological coordination and the human capacity to sustain meaning, judgment, and memory across time. It reframes digital transformation as a governance problem rather than a purely technological progression.

3.5. Sociomaterial Continuity

Sociomaterial continuity brings these constructs together. It refers to the emergent capacity of an organization to preserve meaningful, transferable, and governable knowledge through the interaction of human actors, digital infrastructures, routines, memory structures, and governance mechanisms. This concept extends sociomaterial reasoning to the temporal problem of continuity. If organizational action is produced through entanglements between social and material elements [10], then continuity is also produced through such entanglements. It is not located only in people, documents, systems, or routines. It emerges from the way these elements are arranged and governed over time.

This perspective avoids two reductions. The first is informational reduction, in which continuity is treated as the persistence of records, documents, data, or procedures. The second is humanistic reduction,

in which continuity is treated only as a property of individual experience. Sociomaterial continuity instead recognizes that organizational memory is reproduced through arrangements that connect people, technologies, routines, and governance practices. AI systems may become part of these arrangements, but they do not replace the need for human interpretation. They change the conditions under which interpretation occurs.

In AI-mediated organizations, sociomaterial continuity requires attention to how systems support or displace human judgment. Recent sociomaterial research on AI emphasizes that AI systems are enacted through organizational practices and institutional arrangements rather than existing as neutral tools outside organizational life [11]. This matters because continuity depends on how AI is embedded into work, how decisions are interpreted, how accountability is assigned, and how human actors remain capable of questioning, contextualizing, and governing technological outputs. From a decision communication perspective, this also means that organizations need reflection loops through which AI-supported decisions can be reviewed, interpreted, and reconnected to organizational memory [34].

The concept also provides a bridge toward human-centered knowledge governance. If continuity is sociomaterial, then it cannot be secured only by documentation, data retention, or technology adoption. It requires governance mechanisms that identify continuity actors, map knowledge risks, support intergenerational transfer, define AI oversight responsibilities, and maintain routines through which organizational memory remains interpretable. These mechanisms are developed in Section 5. Table 1 summarizes the five constructs developed in this section and clarifies how they organize the sociomaterial continuity perspective.

The constructs summarized in Table 1 should be read as analytical categories rather than empirically validated variables. They provide the conceptual vocabulary for the remainder of the article and prepare the analysis of the continuity challenge in SMEs. The next section applies these constructs to AI-mediated and aging organizational environments before the governance framework is developed in Section 5.

Table 1. Core constructs of the sociomaterial continuity perspective

Construct	Working definition
Informational continuity	The persistence and accessibility of organizational information across time, including records, documents, procedures, data repositories, and digital traces.
Interpretive continuity	The organizational capacity to preserve meaning, judgment, and contextual understanding across time so that information remains actionable.
Continuity actors	Organizational members who sustain tacit knowledge, contextual judgment, relational memory, and governance understanding across time.
Continuity asymmetry	The gap between increasing technological coordination capacity and insufficient human-centered mechanisms for preserving interpretive continuity.
Sociomaterial continuity	The emergent capacity to preserve meaningful, transferable, and governable knowledge through interactions among people, technologies, routines, memory structures, and governance mechanisms.

4. The Continuity Challenge in AI-Mediated and Aging SMEs

The previous section defined the core constructs of the sociomaterial continuity perspective. This section applies those constructs to SMEs, where continuity risks are intensified by limited governance redundancy, concentrated tacit knowledge, demographic aging, distributed work, and the adoption of AI-mediated coordination systems. The aim is not to present empirical cases, but to clarify why SMEs constitute a particularly exposed organizational setting for continuity asymmetry.

4.1. SMEs as Low-Redundancy Continuity Environments

SMEs are not simply smaller versions of large organizations [40]. Their size, resource structure, and managerial configuration often create a different continuity environment. Large organizations may rely on specialized departments, formal succession routines, documentation practices, and overlapping expertise. SMEs, by contrast, frequently operate with limited managerial slack, fewer specialized roles, and lower redundancy in knowledge and governance structures [12–14, 40]. This makes digital transformation more dependent on

the orchestration of constrained technological, managerial, and human resources [15]. Recent review evidence on AI adoption further indicates that SMEs and large firms differ in implementation dynamics because of variations in resources, expertise, cost structures, and support systems [30].

This low-redundancy condition matters for organizational continuity. When knowledge is distributed across several units, formal roles, and documented routines, the departure of one individual may be disruptive but not necessarily destabilizing. In many SMEs, however, strategic judgment, customer knowledge, operational memory, supplier relationships, and informal problem-solving routines may be concentrated in a small number of people. Under these conditions, continuity actors are not peripheral. They often sustain the interpretive infrastructure through which the organization understands its own history, routines, constraints, and possibilities.

The continuity challenge therefore begins before AI is adopted. It is rooted in the way organizational memory is held, transferred, and governed. If knowledge is tacit, organization-specific, and weakly embedded in formal routines, turnover can generate significant knowledge loss [16, 17]. This risk is not limited to the loss of technical know-how. It also concerns the loss of contextual judgment, relational memory, and interpretive capacity. In such settings, the organization may retain documents, procedures, and records while losing the human capacity to interpret their meaning.

4.2. AI-Mediated Coordination and the Risk of Interpretive Displacement

AI-mediated systems can be valuable for SMEs. They may support information retrieval, workflow coordination, customer communication, decision support, forecasting, and operational automation. For resource-constrained organizations, these capabilities can reduce administrative burden and increase responsiveness. However, from a sociomaterial continuity perspective, the relevant question is not only what these systems make more efficient. It is also what forms of human interpretation, oversight, and tacit coordination they may displace.

This risk is particularly visible when AI systems are introduced into organizations where knowledge is already concentrated and weakly formalized. If an AI system retrieves previous decisions, summarizes customer histories, recommends actions, or coordinates workflows, it may improve informational continuity. Yet this does not mean that the organization has preserved interpretive continuity. The system may retrieve what was written without preserving why it was written. It may recommend an action without explaining the relational, historical, or contextual assumptions that made similar actions appropriate in the past.

This is where continuity asymmetry becomes organizationally significant. Technological coordination capacity may increase while human-centered mechanisms for interpretation and oversight remain underdeveloped. Cognitive offloading may reduce routine cognitive burden, but it can also weaken the organizational practice of interpreting decisions when human actors become dependent on system outputs without maintaining contextual judgment [26]. Human-centered AI and AI governance research therefore become relevant because responsible adoption requires attention to oversight, accountability, interpretability, and organizational mechanisms of control [27–29].

The continuity risk is not that AI is inherently opposed to organizational memory. The risk is that AI may be adopted as a substitute for human interpretation rather than as a support for it [3, 36]. In SMEs, where governance capacity is often limited, this distinction is critical. Without explicit continuity mechanisms, AI-mediated coordination may make the organization appear more integrated while reducing the everyday occasions through which tacit knowledge is questioned, transmitted, and renewed.

4.3. Aging, Turnover, and Weak Intergenerational Transfer

Demographic aging adds a further layer to this challenge. Aging workforces are reshaping organizational participation, career trajectories, and knowledge transfer across generations [18, 38]. In SMEs, this demographic shift can become a continuity issue because experienced professionals often hold knowledge that is accumulated through long exposure to customers, suppliers, routines, crises, informal norms, and strategic decisions.

The contribution of experienced professionals should not be reduced to labor availability or task execution. Research on aging workforces suggests that organizations can support later working life through practices that recognize the value of experienced workers and enable continued contribution [19]. Productive longevity also implies that longer working lives may require more flexible, multi-stage forms of participation rather than abrupt withdrawal from organizational life [39]. For SMEs, these insights are particularly relevant because continuity may depend on whether experienced professionals can remain involved in mentoring, interpretation, review, and knowledge transfer even when their operational role changes.

The risk is strongest when retirement, reduced participation, or member turnover occurs without structured intergenerational transfer. Recent empirical work on knowledge protective capacity similarly shows

that ageing workforces, employee mobility, turnover, and weak retention strategies can intensify tacit knowledge loss when organizations lack knowledge-driven retention practices [41]. In such cases, the organization may document tasks but fail to transmit judgment. It may preserve procedures but fail to explain exceptions. It may maintain digital records but lose the practical memory of why a client is approached in a certain way, why a supplier is trusted, or why a routine exists despite appearing inefficient. These losses are difficult to detect because they do not always appear as immediate operational failures. They often emerge later, when new actors face ambiguous situations without access to the interpretive resources that previously guided organizational action.

Distributed work can intensify this problem. Remote and hybrid arrangements may reduce the informal encounters through which observation, mentoring, and situated learning occur [20]. Recent work on multigenerational knowledge management similarly notes that remote and hybrid work have made knowledge management more important, especially when organizational memory and intellectual capacity are distributed across age-diverse workforces [25]. In AI-mediated workplaces, generative AI productivity tools may support individual skill development and collaborative knowledge sharing, but their learning value depends on supportive organizational cultures and socialization processes [42]. For SMEs, where knowledge transfer is often informal, this can weaken the social conditions that support interpretive continuity. The issue is not that remote work prevents continuity. The issue is that continuity must be more deliberately governed when proximity-based transfer can no longer be assumed.

4.4. Illustrative Continuity Scenarios

Three analytical scenarios help clarify how continuity asymmetry may appear in SMEs. These are not empirical cases. They are conceptual vignettes designed to show how the constructs developed in Section 3 operate in organizational settings.

In the first scenario, a small manufacturing firm adopts an AI-enabled planning tool to improve scheduling, stock control, and production responsiveness. The system integrates data from previous orders, supplier delays, and production cycles. Informational continuity improves because the firm can retrieve and process more operational data than before. However, the production manager who historically interpreted machine constraints, supplier reliability, seasonal variation, and informal worker capabilities retires without structured knowledge transfer. The firm becomes more data-rich but less capable of interpreting exceptions. This is a continuity asymmetry. Technological coordination increases, while the interpretive capacity required to use that coordination well declines.

In the second scenario, a professional services SME introduces an AI-assisted knowledge base to support proposal writing, project documentation, and client communication. The tool stores templates, past deliverables, and meeting summaries. New employees gain faster access to information, but the senior consultant who understands the relational history behind key clients reduces participation. The system can retrieve what was delivered, but it cannot fully explain which promises were informal, which tensions shaped the relationship, or which organizational judgments guided past decisions. The firm preserves informational continuity, but interpretive continuity weakens.

In the third scenario, a small health or social care organization uses AI-mediated coordination to manage appointments, internal communication, and service documentation. The system improves operational visibility and reduces administrative pressure. At the same time, hybrid work reduces informal interaction among professionals, and experienced staff members have fewer opportunities to explain situated judgment to newer colleagues. The organization maintains records of actions taken, but the reasoning behind sensitive decisions becomes harder to reproduce. In this setting, continuity depends not only on digital documentation, but on preserving mentoring, reflection, and human oversight within technologically mediated routines.

These scenarios show that the problem is not the presence of AI-mediated systems. In each case, the technology can create real value. The continuity challenge emerges when improved informational access is mistaken for preserved organizational understanding. SMEs may become more efficient, more connected, and more responsive while becoming less capable of sustaining the interpretive conditions that make knowledge meaningful across time.

4.5. From Continuity Risk to Governance Need

The continuity challenge in SMEs therefore arises from the interaction of several conditions. Knowledge is often concentrated in a limited number of continuity actors. Governance redundancy is low. Intergenerational transfer mechanisms may be informal or absent. Remote and hybrid work can reduce opportunities for situated learning. AI-mediated systems can improve coordination while also encouraging cognitive offloading and interpretive displacement. They may also change how organizations construct system memory and decision communication, which reinforces the need for explicit reflection mechanisms [34]. Together,

these conditions create an environment in which informational continuity may increase while interpretive continuity weakens.

This analysis also clarifies why continuity should be treated as a governance problem. If continuity depended only on information preservation, then documentation, databases, and AI-enabled retrieval would be sufficient. If continuity depended only on individual experience, then retaining experienced workers would be sufficient. The sociomaterial continuity perspective suggests that neither solution is adequate on its own. Continuity must be governed through arrangements that connect people, technologies, routines, and accountability mechanisms.

For SMEs, this means that the central question is not whether they should adopt AI. The question is how they can adopt AI without weakening the human and organizational conditions through which knowledge remains interpretable, transferable, and governable. The constructs developed in Section 3 help diagnose this problem. The next step is to identify governance mechanisms capable of reducing continuity asymmetry. Section 5 addresses that task by developing a human-centered knowledge governance framework for SMEs.

5. Human-Centered Knowledge Governance: Framework and Propositions

The previous section showed that SMEs are especially exposed to continuity asymmetry when AI-mediated coordination expands under conditions of concentrated tacit knowledge, limited governance redundancy, aging workforces, and weak intergenerational transfer. This section develops the main conceptual contribution of the article: the Sociomaterial Continuity Governance Framework. The framework is designed to explain how SMEs can reduce continuity asymmetry by governing the relationship between organizational memory, continuity actors, AI-mediated infrastructures, and human-centered oversight.

The framework treats continuity as a sociomaterial governance capability. It connects four mutually reinforcing functions: identifying where knowledge and memory are vulnerable, mobilizing continuity actors and intergenerational transfer, preserving human oversight of AI-mediated coordination, and institutionalizing lightweight routines and audits. These functions are designed to work together because continuity depends on the interaction between knowledge risk, human interpretation, technological mediation, and governance routines. In SMEs, this interaction must be governed through modular and feasible mechanisms, since resource constraints limit the adoption of complex governance architectures.

5.1. Framework Logic

The Sociomaterial Continuity Governance Framework is organized around four dimensions. The first is knowledge risk and memory mapping. This dimension identifies where critical organizational knowledge is located, how it is held, whether it is codified or tacit, and what continuity risks may arise if key actors leave or reduce participation. The second is continuity actors and intergenerational transfer. This dimension focuses on the people who sustain contextual judgment, relational memory, and institutional interpretation, and on the mechanisms through which their knowledge can be shared with other members. The third is human oversight of AI-mediated coordination. This dimension defines how organizations preserve accountability, interpretation, and review when AI systems support retrieval, recommendation, workflow orchestration, or decision support. The fourth is continuity routines and audits for SMEs. This dimension translates the framework into recurring practices that can be sustained in resource-constrained organizations.

Figure 1 summarizes the logic of the framework. The four dimensions should not be read as a rigid sequence that every organization must implement in the same way. Rather, they represent mutually reinforcing governance functions. The solid arrows indicate how these functions contribute to reducing continuity asymmetry, while the dashed circular arrows indicate their reciprocal influence. The dashed vertical connection links the outcome of reduced continuity asymmetry to the underlying sociomaterial governance capability, understood as the joint governance of people, technologies, routines, memory structures, and accountability mechanisms. Knowledge risk mapping identifies where continuity is vulnerable. Continuity actors and intergenerational transfer preserve the interpretive resources that make knowledge actionable. Human oversight ensures that AI-mediated coordination remains accountable and context-sensitive. Continuity routines and audits institutionalize these practices so that continuity does not depend only on individual initiative.

5.2. Knowledge Risk and Memory Mapping

Knowledge risk and memory mapping is the first governance dimension because organizations cannot govern continuity risks that they do not recognize. In many SMEs, critical knowledge is not evenly distributed across formal roles, documents, or systems. It may be concentrated in experienced professionals, informal routines, customer relationships, supplier histories, technical exceptions, and accumulated judgment. Research on knowledge loss shows that turnover becomes especially damaging when departing members hold tacit, organization-specific, or weakly codified knowledge [16, 17]. This is consistent with work on

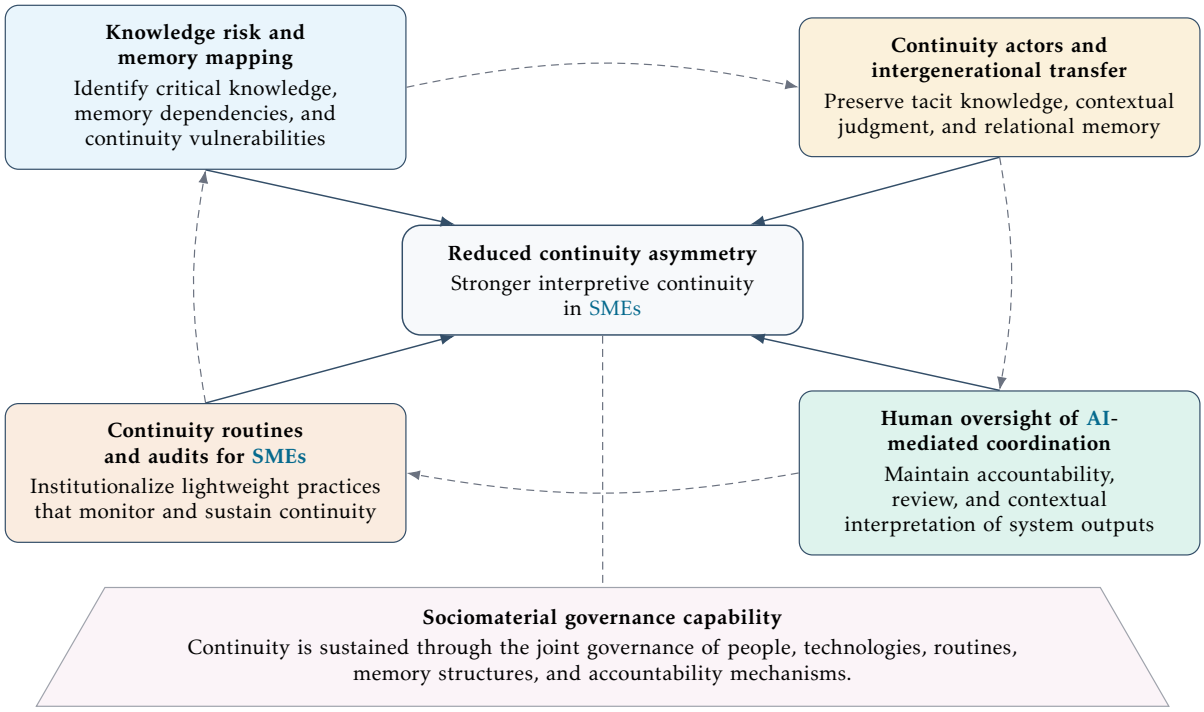

Figure 1. Sociomaterial Continuity Governance Framework

knowledge protective capacity, which emphasizes that organizations need deliberate retention and knowledge transfer practices to mitigate the loss of enterprise-specific tacit knowledge [41]. For this reason, continuity governance should begin by identifying where such knowledge resides and how vulnerable it is to loss.

This mapping should not be limited to inventories of documents or skills. It should identify the interpretive dependencies that sustain organizational action. These include who understands the reasons behind recurring exceptions, who can explain informal customer expectations, who knows why certain procedures exist, and who can interpret past decisions in light of present circumstances. This form of mapping extends ordinary knowledge management because it focuses not only on what knowledge exists, but also on whether the organization can still interpret and govern that knowledge over time.

For SMEs, the mapping process must remain proportionate. It can be organized around a small set of questions: which decisions depend on undocumented judgment, which relationships depend on a small number of people, which routines are performed without shared understanding, which AI-mediated processes depend on historical data that few people can interpret, and which departures would create the greatest continuity risk. These questions help convert continuity from an implicit vulnerability into an explicit governance object.

Proposition 1. *SMEs that systematically map critical knowledge, memory dependencies, and continuity actors will be better able to identify continuity asymmetry before turnover, retirement, or AI-mediated coordination produces interpretive fragmentation.*

5.3. Continuity Actors and Intergenerational Transfer

The second dimension concerns continuity actors and intergenerational transfer. The previous sections conceptualized continuity actors as organizational members who sustain tacit knowledge, contextual judgment, relational memory, and governance understanding across time. In SMEs, such actors are often experienced professionals, but they are not defined only by age or tenure. They are defined by the continuity function they perform. They help the organization understand why knowledge matters, how routines should be interpreted, and how accumulated experience should inform present judgment.

The governance task is not simply to retain these actors indefinitely. Retention may be valuable, especially when experienced professionals remain willing and able to contribute. Research on aging workforces and productive longevity suggests that later working life can be supported through organizational practices that recognize the value of experienced workers and enable flexible participation [19, 39]. However, continuity governance also requires transfer. If continuity depends only on the continued presence of one person, the organization remains vulnerable. The

aim is therefore to transform individual experience into shared interpretive capacity.

Intergenerational transfer should be understood as more than documentation. It involves structured opportunities for less experienced members to observe judgment in context, discuss exceptions, understand informal norms, and participate in reflective interpretation. Mentoring, after-action reviews, paired decision making, transition interviews, job shadowing, post-retirement knowledge contracting, and periodic memory sessions can serve this purpose. These mechanisms are consistent with retention-oriented knowledge management practices that seek to reduce knowledge loss by linking human resource management (HRM) practices to knowledge transfer and protection [41]. In AI-mediated settings, these practices also help organizations decide which knowledge should be codified, which knowledge should remain subject to human interpretation, and which system outputs require experienced review. This is particularly important because generative AI tools can reshape both formal and informal learning pathways, team cohesion, and knowledge-sharing practices within organizations [42].

Proposition 2. *The negative relationship between turnover, retirement, or reduced participation of experienced professionals and interpretive continuity will be weaker in SMEs that identify continuity actors and implement structured intergenerational transfer mechanisms.*

5.4. Human Oversight of AI-Mediated Coordination

The third dimension concerns human oversight of AI-mediated coordination. AI governance research emphasizes that responsible adoption requires attention to accountability, governed objects, lifecycle moments, and implementation mechanisms [29]. This is consistent with lifecycle-oriented approaches to trustworthy AI, which emphasize traceability, usability, robustness, explainability, deployment, and monitoring as governance concerns rather than purely technical properties [35]. Human-centered AI similarly emphasizes interpretability, meaningful oversight, human agency, and accountable system design [27, 28]. From a continuity perspective, these concerns are not only ethical or regulatory. They are also organizational. AI-mediated coordination can reshape how organizations remember, retrieve, recommend, decide, and justify action.

Oversight should therefore focus on the continuity effects of AI systems. When an AI tool summarizes client histories, recommends operational actions, or retrieves prior decisions, it participates in organizational memory. The question is whether human actors remain able to interpret the output, question its assumptions, and connect it to situated organizational judgment. Without such oversight, AI systems may strengthen informational continuity while weakening interpretive continuity. They may also encourage cognitive offloading, where human actors delegate interpretive work to external systems without maintaining the capacity to evaluate their outputs [26].

For SMEs, human oversight should be practical rather than bureaucratic. This is particularly important because AI capability depends not only on technical infrastructure, but also on human skills, leadership, governance strategy, and AI-employee integration [37]. It may involve assigning responsibility for reviewing AI-supported decisions, defining when experienced professionals must validate recommendations, documenting why system outputs are accepted or rejected, introducing reflection loops around AI-supported decisions, and periodically examining whether AI-mediated routines are reducing opportunities for tacit knowledge transfer. Such reflection loops are important because AI can affect organizations through the recursive relation between decisions, decision premises, system memory, and interaction systems [34]. The aim is not to slow down digital transformation. It is to ensure that AI systems augment organizational interpretation rather than replace it.

Proposition 3. *SMEs that assign explicit human oversight roles for AI-mediated coordination will be less likely to experience interpretive displacement than SMEs that treat AI outputs as self-sufficient substitutes for contextual judgment.*

5.5. Continuity Routines and Audits for SMEs

The fourth dimension concerns continuity routines and audits. If continuity is a governance capability, it must be sustained through recurring practices rather than one-time interventions. This is especially important for SMEs, where formal governance structures may be limited and where continuity risks often remain invisible until a key actor leaves, a system fails, or a new employee faces an ambiguous situation without interpretive support.

Continuity routines are lightweight practices that preserve interpretive continuity over time. They may include quarterly reviews of critical knowledge dependencies, structured conversations between experienced and less experienced workers, documentation of exceptions and decision rationales, review of AI-supported workflows, reflection loops around AI-supported decisions, and periodic assessment of whether digital systems are changing how knowledge is transferred. Continuity audits are more focused evaluations that assess whether the organization can still explain, transfer, and govern critical knowledge. In AI-mediated environments, such audits should also examine whether data limitations, system assumptions, output rationales, and monitoring responsibilities are sufficiently documented

and transparent, since weak documentation and limited visibility into data constraints can undermine responsible use and accountability [35, 43]. They ask whether key routines depend on undocumented judgment, whether AI systems are being used without adequate interpretation, whether departures would expose memory gaps, and whether newer members understand the reasoning behind important practices.

These routines and audits should be modular. SMEs do not need complex governance programs that replicate the structures of large organizations. They need manageable practices that can be integrated into existing meetings, project reviews, onboarding processes, and technology governance routines. The value of such practices lies in making continuity visible and discussable before it becomes a crisis.

Proposition 4. *SMEs that institutionalize modular continuity routines and periodic continuity audits will be better able to preserve interpretive continuity during digital transformation than SMEs that rely only on informal knowledge transfer.*

5.6. Reducing Continuity Asymmetry

The four dimensions of the framework operate together. Knowledge risk and memory mapping identifies where continuity is vulnerable. Continuity actors and intergenerational transfer preserve and distribute interpretive capacity. Human oversight of AI-mediated coordination prevents technological systems from displacing contextual judgment. Continuity routines and audits institutionalize these mechanisms in ways that remain feasible for SMEs. Together, these dimensions reduce continuity asymmetry by aligning technological coordination capacity with human-centered mechanisms for preserving meaning, judgment, and memory.

This integrated logic is important because partial interventions may leave the continuity problem unresolved. Documentation without transfer may preserve information but not interpretation. Retaining experienced professionals without structured transfer may postpone continuity loss but not reduce dependence. Introducing AI oversight without mapping knowledge risks may protect individual decisions but miss broader memory dependencies. Audits without continuity actors may identify vulnerabilities without mobilizing the people who can explain them. The framework therefore proposes that continuity governance should combine these mechanisms rather than treat them as isolated practices.

Proposition 5. *The combined implementation of knowledge risk mapping, continuity actor identification, structured intergenerational transfer, human oversight of AI, and modular continuity audits will be associated with lower continuity asymmetry in SMEs.*

5.7. Toward Empirical Validation

The propositions developed in this section are theoretical and require empirical validation. Future research could examine whether SMEs that adopt these governance mechanisms experience lower knowledge loss after turnover, stronger interpretive continuity during AI adoption, or better organizational resilience when experienced professionals reduce participation. Qualitative studies could investigate how continuity actors perform interpretive work in digitally mediated environments. Survey research could operationalize continuity asymmetry by measuring the gap between technological coordination capacity and perceived interpretive capacity. Longitudinal research could examine whether continuity routines and audits reduce fragmentation over time.

The framework should therefore be read as a conceptual model rather than a validated managerial instrument. Its contribution is to translate the sociomaterial continuity perspective into a set of governance dimensions and testable propositions. This prepares the discussion that follows, where the theoretical and practical implications of the framework are considered in relation to digital transformation, AI governance, organizational memory, and SME management.

6. Discussion

This article began from a tension that is increasingly visible in digitally mediated organizations: organizations can preserve more information than ever before, but this does not mean that they preserve the human capacity to interpret, govern, and use that information over time. The proposed Sociomaterial Continuity Governance Framework addresses this tension by reframing digital transformation as a continuity governance problem. The framework does not reject digital transformation, AI-mediated coordination, or knowledge codification. Rather, it clarifies the conditions under which these developments may support organizational continuity instead of producing a gap between informational persistence and interpretive capacity.

The discussion advances this argument by clarifying what the framework adds to adjacent literatures and to organizational practice. Theoretically, it shows that organizational continuity cannot be reduced to digital maturity, knowledge storage, human-centered AI, or AI governance considered separately. Continuity depends on the preservation of interpretive capacity across sociomaterial arrangements that connect people, technologies, routines, memory structures, and accountability mechanisms. Practically, this perspective reframes SMEs as organizations that require lightweight but deliberate mechanisms for mapping knowledge risk, mobilizing continuity actors, sustaining human oversight, and institutionalizing continuity routines under

resource constraints. The section also identifies implications for aging workforce policy and future empirical research.

6.1. Theoretical Implications

The first theoretical implication concerns digital transformation research. Existing work has shown that digital technologies reshape organizational strategy, routines, capabilities, and value creation [4–6]. This article extends that debate by arguing that digital transformation should also be assessed through its effects on continuity. This extension is aligned with the recent shift toward human-centric digital transformation, in which digital transformation is increasingly understood through the interaction of technology, people, organizational capabilities, leadership, and ethical human-machine collaboration [8]. The central issue is not only whether digital technologies improve efficiency, scalability, or responsiveness. It is also whether they preserve the interpretive conditions through which organizational knowledge remains meaningful and governable over time. This shifts attention from digital transformation as a capability-building process to digital transformation as a continuity governance challenge.

This shift is particularly important because digital maturity can create an appearance of organizational stability. Integrated systems, searchable repositories, AI-assisted summaries, and automated workflows may improve informational continuity. Yet they do not necessarily preserve the practical reasoning, contextual judgment, and institutional memory that allow organizations to understand what stored information means. The construct of continuity asymmetry captures this risk. It explains why organizations may become more technologically coordinated while becoming less capable of interpreting the knowledge on which coordination depends. In this sense, continuity asymmetry adds a temporal and interpretive dimension to digital transformation theory.

The second implication concerns organizational memory and knowledge transfer. Organizational memory theory has long emphasized that organizations carry traces of past experience into present decisions [1]. Knowledge transfer research further shows that knowledge depends on mechanisms, motivation, social interaction, and interpretability across contexts [2]. The present article builds on these insights but distinguishes more sharply between informational continuity and interpretive continuity. This distinction matters because digital systems can preserve traces of past actions without preserving the human capacity to understand why those traces matter.

The framework, therefore, extends ordinary knowledge management by focusing on the governance of interpretation. Traditional knowledge management often emphasizes capturing, storing, sharing, or transferring knowledge. These activities remain important, but they are insufficient when knowledge is tacit, organization-specific, and weakly codified. In such situations, the main continuity risk is not only that knowledge disappears. It is that knowledge remains available as information but loses its interpretive context. This is why knowledge loss induced by turnover becomes particularly relevant for SMEs, where knowledge may be concentrated in a small number of experienced professionals [16, 17].

The third theoretical implication concerns sociomateriality and AI. Sociomaterial research challenges the separation between technology and organizational practice by showing that action emerges through entanglements among people, technologies, routines, and institutional arrangements [10]. Recent work on AI-in-the-making reinforces this point by showing that AI systems are enacted through sociomaterial practices rather than operating as neutral tools outside organizational life [11]. The present article extends this reasoning to the temporal problem of continuity. This extension is also consistent with systems-theoretical work on AI and decision communication, which suggests that AI affects organizations through decision premises, system memory, interaction systems, structural coupling, and reflection loops [34]. If organizational action is sociomaterial, then organizational continuity is also sociomaterial. It is produced through the arrangements that connect human interpretation, digital infrastructures, routines, memory structures, and governance mechanisms over time.

This view also modifies how human-centered AI and AI governance are interpreted. Human-centered AI emphasizes human agency, meaningful oversight, interpretability, and accountability [27, 28]. AI governance research emphasizes accountable actors, governed objects, lifecycle moments, and implementation mechanisms [29]. The framework developed here adds that these concerns are also continuity concerns. Oversight is not only a matter of ethical compliance or technical risk control. It is also a mechanism through which organizations preserve the capacity to question, contextualize, and govern knowledge when AI systems participate in retrieval, recommendation, coordination, or decision support.

The fourth implication concerns aging workforce research. Demographic aging is often discussed in terms of labor supply, retirement, health, or participation [18, 38]. Research on later working life and productive longevity shows that organizations can support the continued contribution of experienced professionals through appropriate practices and more flexible forms of participation [19, 39]. This article adds a continuity perspective to that debate. Experienced professionals are not only labor resources or holders of expertise. In

many SMEs, they may function as continuity actors who sustain tacit knowledge, relational memory, contextual judgment, and governance understanding.

This reconceptualization avoids two reductions. It avoids treating older professionals as residual labor whose value is mainly operational. It also avoids treating experience as an individual attribute detached from organizational systems. Continuity actors matter because they connect organizational memory to present interpretation and future adaptation. Their contribution becomes especially important when AI-mediated coordination expands, because the organization must decide which knowledge can be codified, which outputs require human review, and which forms of judgment must remain socially transmitted.

6.2. Practical Implications for SMEs and Technology Leaders

The framework has direct implications for SME managers. The first implication is that continuity risk should be made visible before it becomes a crisis. Many SMEs only discover knowledge dependencies when a key employee retires, a manager leaves, a supplier relationship breaks down, or a new system fails to reproduce tacit routines. Knowledge risk and memory mapping provide a practical starting point. Managers should identify which decisions depend on undocumented judgment, which routines depend on a small number of people, which client or supplier relationships are sustained by relational memory, and which digital or AI-mediated processes rely on historical data that few people can interpret.

The second implication is that experienced professionals should be governed as continuity actors, not only as operational resources. This does not mean that organizations should depend indefinitely on a small number of senior individuals. On the contrary, the framework suggests that dependence should be reduced through structured transfer. Mentoring, paired decision making, transition interviews, after-action reviews, and periodic memory sessions can help convert individual experience into shared interpretive capacity. For SMEs, the practical challenge is to make these mechanisms lightweight enough to fit existing routines. This also means that AI-supported learning should be designed as part of organizational socialization and knowledge-sharing practice, rather than treated as an individual productivity benefit alone [42].

The third implication concerns technology leaders and those responsible for AI adoption. This is important because managing AI involves not only technical deployment, but also managerial decisions about communication, coordination, control, autonomy, learning, and inscrutability [36]. It also requires attention to the human and organizational resources through which AI capability is developed, including skills, leadership, coordination, culture, governance strategy, and AI-employee integration [37]. In SMEs, AI governance should not be treated as a separate compliance exercise detached from organizational memory. Whenever AI tools summarize information, recommend actions, retrieve prior decisions, or coordinate workflows, they participate in the organization's memory environment. Technology leaders should therefore ask whether human actors can still explain why outputs are accepted, rejected, or modified. They should also examine whether AI-mediated routines are reducing opportunities for tacit knowledge transfer and whether the assumptions, data limitations, and monitoring responsibilities associated with those routines remain visible to human reviewers.

This implies a more situated understanding of human oversight. Oversight should not be limited to assigning formal responsibility for system use. It should include the capacity to interpret outputs, review assumptions, identify when historical data are misleading, and connect recommendations to contextual judgment. In small organizations, this may require simple but explicit practices, such as assigning review roles for AI-supported decisions, documenting reasons for overriding system recommendations, involving continuity actors in validation, and periodically reviewing whether automation is weakening mentoring or informal learning.

The fourth implication is that continuity governance should be modular. This is consistent with evidence from manufacturing SMEs showing that AI adoption and resilience depend on employee-centric mechanisms, leadership, data-driven culture, skills, competencies, agility, and risk management rather than technological resources alone [31]. SMEs are unlikely to adopt complex governance architectures designed for large organizations. The framework therefore proposes continuity routines and audits that can be embedded in existing practices. A quarterly continuity review, a structured handover before retirement, a short knowledge dependency map, or an AI output review meeting may be more realistic and useful than a comprehensive knowledge management program. The relevant criterion is not governance complexity. It is whether the organization can preserve interpretive continuity under changing technological and demographic conditions.

6.3. Implications for AI Governance and Aging Workforce Policy

The framework also has implications beyond individual firms. For AI governance, the argument suggests that responsible AI adoption should include organizational continuity as a governance concern. Current approaches to AI governance often focus on accountability, transparency, fairness, risk management, lifecycle

control, and trustworthy deployment [29, 35]. These concerns remain essential, but they do not fully address whether organizations retain the human capacity to interpret and govern the knowledge that AI systems process. A system may be accountable in formal terms while still contributing to interpretive displacement if organizational actors lose the capacity to question or contextualize its outputs, or if the assumptions, limitations, and data conditions behind those outputs are not sufficiently documented and transparent [43].

This is also consistent with socially aware approaches to AI. Technical performance alone is insufficient when systems affect users, reshape accountability, and operate within social contexts [28, 32]. The continuity perspective adds that the social context of AI includes memory, accumulated judgment, and tacit organizational knowledge. For this reason, AI governance in SMEs should include questions about knowledge preservation, intergenerational transfer, and the continuity effects of automation. This moves AI governance closer to organizational practice, where responsibility is exercised through routines, roles, and situated interpretation.

For aging workforce policy, the article suggests that productive longevity should be connected to digital transformation. Policies that promote longer working lives or later-life participation may have organizational value not only because they retain labor capacity, but because they preserve continuity actors. Experienced professionals may support mentoring, knowledge transfer, system validation, and contextual interpretation during digital transformation. This does not imply that older workers should be kept in place as static repositories of memory. It suggests that organizations can design phased, flexible, and knowledge-oriented roles through which experienced professionals contribute to continuity while supporting renewal. Such roles are also consistent with evidence that knowledge-driven retention practices, including job shadowing and post-retirement knowledge contracting, can support knowledge transfer and retention when organizations face aging, turnover, and tacit knowledge loss risks [41].

This implication is particularly relevant for aging economies in which SMEs constitute a major part of economic activity. If many small organizations depend on concentrated tacit knowledge, then retirement and digital transformation are not separate policy issues. They intersect in the continuity problem. Supporting SMEs in designing intergenerational transfer, knowledge risk mapping, reflection loops, and human-centered AI oversight may therefore contribute to both organizational resilience and responsible digital transformation.

6.4. Future Research Directions

The framework opens several directions for future empirical research. First, researchers can operationalize continuity asymmetry by examining the gap between technological coordination capacity and interpretive continuity. This could involve measures of AI-mediated coordination, perceived dependence on system outputs, knowledge concentration, human oversight practices, and the ability of organizational members to explain past decisions or routines. Such measures would help test whether digital maturity can coexist with interpretive fragility.

Second, qualitative research can examine how continuity actors perform interpretive work in practice. Future studies could also examine how algorithmic technologies reshape work structures, HR delivery activities, and human agency in organizations where continuity depends on tacit knowledge and experienced professionals [44]. Ethnographic and case-based studies could investigate how experienced professionals explain exceptions, mentor newer colleagues, validate AI outputs, preserve relational memory, and translate past experience into current judgment. Such research would be useful because continuity actors may not always occupy formal positions. Their contribution may be embedded in informal interactions, situated problem solving, and relational networks.

Third, longitudinal research can examine how continuity routines and audits affect knowledge loss over time. Studies could follow SMEs before and after retirement transitions, AI implementation, or hybrid work adoption. This would make it possible to observe whether knowledge risk mapping, structured transfer, human oversight, and continuity audits reduce interpretive fragmentation. It would also help identify boundary conditions, such as firm size, sector, regulatory exposure, technological maturity, and the degree of tacit knowledge concentration.

Fourth, future research can investigate how the framework applies outside SMEs. The present article focuses on SMEs because their low redundancy, concentrated knowledge, and limited governance capacity make continuity asymmetry particularly visible. However, large organizations may also experience similar risks in specialized units, expert teams, professional service groups, or operational areas where tacit knowledge is concentrated. Comparative research could examine whether the same governance mechanisms operate differently across organizational sizes and sectors.

6.5. Boundary Conditions

The proposed framework should be interpreted within its boundaries. It is a conceptual model, not an empirically validated instrument. Its propositions require empirical testing, and its mechanisms may

operate differently across sectors, technologies, and organizational cultures. The framework is likely to be most relevant where knowledge is tacit, experience-based, relational, and weakly codified. It may be less central in settings where work is highly standardized, knowledge is already distributed across formal systems, and interpretive dependence on a small number of actors is low.

The framework also does not imply that all AI adoption increases continuity risk. AI systems may support continuity when they improve access to knowledge, reduce routine burden, help identify patterns, and assist human actors in making better decisions. The risk arises when AI-mediated coordination is treated as a substitute for human interpretation, when oversight is weak, and when organizations fail to govern the continuity effects of technological mediation. The framework therefore offers a diagnostic and governance perspective, not a deterministic claim about technology.

Finally, the concept of continuity actors should not be read as a romanticization of experience or seniority. Experience can preserve valuable organizational memory, but it can also reproduce outdated assumptions or inhibit renewal if it is not subject to reflection and challenge. The purpose of human-centered knowledge governance is not to freeze organizational memory. It is to preserve the capacity to interpret, question, transfer, and revise organizational knowledge over time. In this sense, continuity and transformation are not opposed. Sustainable digital transformation requires both.

7. Conclusion

Digital transformation is often associated with technological expansion, data availability, automation, and AI-mediated coordination. This article has argued that these developments, although important, do not by themselves secure organizational continuity. Organizations may preserve more information while losing the human and institutional capacity to interpret, govern, and use that information over time. This distinction between informational continuity and interpretive continuity is the central claim of the paper.

The article developed a sociomaterial continuity perspective to explain this problem. It argued that continuity is not located only in documents, databases, systems, routines, or individual expertise. It emerges from the interaction of people, technologies, memory structures, work practices, and governance mechanisms. From this perspective, sustainable digital transformation depends on preserving the interpretive conditions through which organizational knowledge remains meaningful, transferable, and governable under changing technological and demographic conditions.

The main conceptual contribution of the article is the Sociomaterial Continuity Governance Framework. The framework explains how SMEs can reduce continuity asymmetry by combining four mutually reinforcing governance functions: knowledge risk and memory mapping, continuity actors and intergenerational transfer, human oversight of AI-mediated coordination, and modular continuity routines and audits. These mechanisms translate the sociomaterial continuity perspective into a set of governance dimensions that are sufficiently structured to guide future research, but also sufficiently practical to reflect the resource constraints of SMEs.

The article also reconceptualized experienced professionals as continuity actors. This does not mean treating older workers as static repositories of organizational memory. It means recognizing that some organizational members perform a specific continuity function by sustaining tacit knowledge, relational memory, contextual judgment, and governance understanding across time. In aging digital economies, this role becomes increasingly important. The challenge for SMEs is not merely to retain experience, but to transform individual experience into shared interpretive capacity through structured transfer, mentoring, review, and participation in AI oversight.

As a conceptual article, this paper has limitations. The proposed framework and propositions have not yet been empirically validated. The mechanisms discussed here may operate differently across sectors, technologies, firm sizes, and organizational cultures. The framework is likely to be most relevant where knowledge is tacit, relational, weakly codified, and concentrated in a small number of continuity actors. Future research should therefore test the propositions empirically, operationalize continuity asymmetry, examine the work of continuity actors in practice, and evaluate whether continuity routines and audits reduce interpretive fragmentation during AI adoption, retirement transitions, or hybrid work arrangements.

The broader implication is that continuity and transformation should not be treated as opposing organizational goals. Digital transformation becomes sustainable when organizations preserve the capacity to remember, question, interpret, and revise their knowledge while adopting new technologies. In this sense, the future of AI-mediated organizations will not depend only on how much information they can store or how efficiently systems can coordinate work. It will also depend on whether they can preserve the human-centered governance conditions through which organizational knowledge remains alive, accountable, and actionable.

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