Digital Transformation and Collaborative Strategy: A Research Agenda for Strategic Management

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Abstract
This editorial advances a research agenda on collaborative strategy in the digital age. We discuss how Industry 4.0 technologies and digital infrastructures—APIs, cloud platforms, modular interfaces, and open standards—reconfigure representation, connectivity, and aggregation of information, shifting collaboration from firm-level choices to ecosystem architecture and governance. Organizing six themes, we highlight: (1) architecture-as-governance and modularity; (2) data sharing, governance, and trust; (3) value creation and capture in ecosystems and coopetition; (4) algorithmic coordination and AI's reallocation of decision rights; (5) boundary redesign via industry clouds, consortia, DAOs, and joint data ventures; and (6) institutions, standards, and societal impact. We outline theoretical opportunities (e.g., dynamic openness, governance agility, trust pluralism, equity-aware surplus metrics) and empirical strategies (e.g., field and natural experiments, multilevel analyses, agent-based models). The agenda urges treating openness, control, and accountability as tunable levers to build innovative, resilient, and equitable ecosystems. Finally, we introduce the articles that address these themes in this Special Issue.

Keywords
Digital collaboration; platform governance; modularity and architecture; data governance and trust; algorithmic coordination and AI; ecosystems and coopetition

Collaboration, or the organization of joint efforts among actors to achieve a shared goal (Castañer & Oliveira, 2020; Salvato et al., 2017), has moved to the strategic foreground in the digital age. Industry 4.0 technologies (e.g., artificial intelligence (AI), blockchain, internet of things (IoT), quantum computing, and machine learning) expand the volume, variety, and velocity of data, reshaping how individuals and organizations work together. Application programming interfaces (APIs), cloud platforms, modular interfaces, and open standards enable new collaboration channels and reconfigure representation, connectivity, and aggregation of information (Adner et al., 2019; Hund et al., 2021; Yoo et al., 2010). These shifts remove bottlenecks, enable scalability under uncertainty, and push modular, distributed strategies. However, they also intensify tensions between openness for generativity and control for value capture, calling for revised theories, governance models, and evidence (Bharadwaj et al., 2013; Hanelt et al., 2021; Hinings et al., 2018; Nambisan, 2017; Nambisan et al., 2017; Tilson et al., 2010; Vial, 2019; Verhoef et al., 2021). Digitalization thus reshapes the structuring, management, and governance of collaboration and the coopetition it entails (Hoffmann et al., 2018), creating new formats and advantages as well as new divides while raising fundamental questions for strategic management research and practice (Lumineau et al., 2021; Malhotra et al., 2021; Rumelt et al., 1994; Teece, 2020).

This editorial for the Special Issue on *Digital Transformation and Collaborative Strategy* examines how digital transformation reshapes the structure, governance, and outcomes of collaboration. We organized our research agenda around six themes. First, digital infrastructure and modularity make "architecture-as-governance" a first-order strategic choice, reframing firm boundaries and coordination logics (Baldwin & Clark, 2000; Woodard et al., 2013). Second, data sharing, governance, and trust align incentives while managing privacy, quality, and security risks (Tiwana et al., 2010; Nambisan et al., 2019). Third, platform pricing, ranking, exclusivity, and interoperability, which redistribute surplus and

shape bargaining power and equity of outcomes, drive cooperative value creation and capture in ecosystems (Tiwana et al., 2010; Yoo et al., 2024). Fourth, algorithmic coordination and AI reallocate decision rights via matching, forecasting, and autonomous agents, altering power, learning, and fairness; consequently, explainability and auditability emerge as adoption levers (Hund et al., 2021). Fifth, boundary redesign highlights new, digitally enabled ways of organizing that mix markets, firms, and communities—such as platform ecosystems, industry clouds, consortia platforms, decentralized autonomous organizations (DAOs), and joint data ventures—using shared tools for identity, coordination, payments, and security to support distributed innovation (Nambisan et al., 2017). Sixth, institutions, standards, and societal impact connect collaboration to public goals, whereby interoperability and portability mandates, standard-setting choices, and responsible AI and sustainability requirements reshape collaboration incentives and competitive advantage (Hanelt et al., 2021).

Our editorial process proceeded in three steps. First, we developed each of the six themes, highlighting theoretical opportunities and empirical strategies for future research. Next, we proposed an integrative framework that lays the foundation for a research agenda on strategic collaboration in the era of digital transformation. Finally, we introduced the articles that address these themes in this Special Issue and explained how they address them, both individually and collectively, by advancing concepts that illuminate collaborative strategies in the digital age.

Strategic Collaboration in Digital Transformation: A Thematic Exploration

The six themes presented in this paper explore the evolving dynamics of collaboration in the age of digital transformation, highlighting key theoretical and practical challenges across diverse domains. Each theme addresses critical aspects of digital collaboration, including

infrastructure, governance, value creation, algorithmic coordination, organizational forms, and societal impacts. Table 1 provides a synthesis, connecting these themes to actionable research opportunities and practical case studies.

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Theme 1: Digital Infrastructure, Modularity, and the Architecture of Collaboration

Digital infrastructures are reshaping collaboration by making architecture and governance central strategic choices (Wang et al., 2022). APIs, cloud platforms, modular interfaces, and open standards act as boundary resources that determine who can join an ecosystem, how knowledge moves, and where value accumulates (Hund et al., 2021; Yoo et al., 2010). This shift towards the use of boundary objects to enable open collective structures challenges fundamental strategic assumptions regarding the boundaries of firms, coordination, and competitive advantage, replacing the old integration-versus-outsourcing tradeoff with a tension between openness for generative collaboration and control for value capture. Future research should treat collaboration quality, inclusivity, and resilience as outcomes that are jointly produced by interface design and governance rules.

Theoretically, we need clearer models of architecture-as-governance. Interface choices (e.g., API granularity, access tiers, schema design, deprecation rules, and observability) organize participation, search breadth, and extend modularity and design theory (Baldwin & Clark, 2000; Woodard et al., 2013). Work that links interface "thickness" and standardization to partner diversity, coordination costs, and value capture can synthesize resource-based, modular-systems, and platform-governance perspectives (Malhotra et al. 2007; Tiwana et al., 2010). Moreover, dynamic openness should be further investigated, with openness being staged and adjustable as ecosystems mature and regulations evolve (Nambisan et al., 2019; Yoo et al., 2024). Research should also identify capabilities for

"governance agility" that allow orchestrators to tighten or loosen access, pricing, and IP while preserving trust and continuity. Third, modularity introduces a persistent paradox, as it accelerates recombination and parallel search yet risks fragmentation and loss of systemic coherence (Hund et al., 2021; Yoo et al., 2024). Drawing on complex adaptive systems and paradox theory, strategy scholars can specify when modularity supports exploration (vs. when it undermines integrative value) and identify practical mechanisms that keep systems aligned, such as reference implementations, compatibility test suites, and coherence budgets (Ciriello et al., 2019; Tilson et al., 2010). Finally, algorithmic governance now mediates collaboration. Specifically, rate limits, automated compliance, and ranking systems influence perceptions of fairness, voice, and willingness to contribute. Developing constructs for explainable governance and appeal processes can connect social boundary resources to control mechanisms (Woodard et al., 2013).

Empirically, digital ecosystems offer abundant quasi-experiments. Platform changes to APIs using platform telemetry, GitHub dependency networks, and app-store submissions (e.g., quota shifts, endpoint deprecations, and pricing updates) can reveal effects on developer entry/exit, integration latency, defect rates, and innovation output (Tiwana et al., 2010; Yoo et al., 2024). Comparative studies of consortia adopting open versus proprietary standards can link institutional arrangements to collaboration outcomes by analyzing meeting records, proposal threads, integration tickets, and repositories (Hanelt et al., 2021). Field experiments are also feasible to test whether documentation quality, deprecation notice periods, and escalation paths affect pull-request acceptance, time-to-merge, partner churn, and incidents. Cross-level analyses should connect micro-API usage and contribution patterns to meso governance mechanisms (e.g., licensing, certification, and compliance systems) and macro dynamics (e.g., concentration, complementor profitability, and resilience to shocks) (Nambisan et al., 2017; Tiwana et al., 2010). Simulations and agent-based models can

explore how varying modularity and interoperability under different demand and regulatory scenarios shape co-creation rates, coordination loads, and failure cascades, offering boundary conditions for field findings. Finally, equity and inclusion audits can test how architectural choices reallocate bargaining power and economic outcomes, especially in small firms and the global south (Yoo et al., 2024).

Together, this agenda positions architecture as a first-order strategic variable and shows how design and governance can be tuned to foster innovative, equitable, and resilient collaboration.

Theme 2: Data Sharing, Governance, and Trust in Digital Collaboration

Data acts as a double-edged sword in digital collaboration, representing both a strategic asset and a liability. Effective collaboration depends on managing rights, quality, privacy, and security through governance that builds trust (Nambisan et al., 2017). Ecosystem partners face misaligned incentives to share, risks of misappropriation, and compliance burdens, yet they must preserve innovation potential. These tensions elevate the role of governance mechanisms, including data trusts, clean rooms, federated learning, and smart contracts, in aligning incentives and creating credible commitments for sharing sensitive data (Nambisan et al., 2019; Wang et al., 2022).

Theoretically, the field of strategy needs to clarify how governance mechanisms structure data access, safeguard proprietary advantage, and sustain trust under uncertainty (Lumineau et al., 2023). Treating data governance as architecture-as-governance reframes familiar tradeoffs between openness and control (Tiwana et al., 2010). Clean rooms and smart contracts can standardize queries, permissions, and auditing. Federated learning, without centralizing raw data, allows for joint model building. This shifts the locus of advantage from exclusive datasets to model quality and coordination capability. Future work should identify

when these mechanisms expand the feasible set of collaborations versus when they introduce friction or entrench gatekeeping. Perceptions of data quality, lineage, and bias are strategic variables in partner selection and durability (Hund et al., 2021). Transparency can build credibility but risk revealing sensitive processes. Thus, research should specify relational and contractual safeguards that protect privacy while enabling verifiability, such as differential privacy budgets, lineage attestations, and tiered disclosure. Trust formation over time remains central. How do governance choices alter beliefs about opportunism, and what combinations of technical controls and shared oversight (e.g., joint boards, dispute resolution protocols) stabilize expectations?

Empirically, the data governance–trust nexus invites designs that isolate causal effects of specific mechanisms. Pilot field experiments can be designed to test the effects of clean rooms among healthcare or mobility partners, randomizing access tiers, query constraints, or audit frequency to measure joint analytics performance, defect rates, satisfaction, and continuation. Federated learning trials can manipulate aggregation cadence, privacy noise, and contribution attribution to observe participation and model accuracy. Regulatory shocks, such as GDPR and CCPA, enable difference-in-differences analyses of data-sharing intensity, alliance formation, and innovation outcomes across sectors with differing exposure (Hanelt et al., 2021). Multi-method case studies of emerging data trusts in agriculture or urban mobility, that is, studies that combine bylaws, access logs, and dispute archives with interviews, can explicate templates for balancing control and openness and trace how governance choices propagate to partner behavior (Nambisan et al., 2019). Cross-level models that link micro-level data access events and lineage attestations with meso-level governance rules and macro-outcomes (e.g., ecosystem concentration, complementor profitability, and resilience) can clarify mechanisms (Nambisan et al., 2017; Tiwana et al., 2010). Designing governance for

collaborative advantage means treating data controls as strategic levers that determine who collaborates, under what terms, and with what risks and rewards.

A research agenda that integrates experiments, natural experiments, and comparative cases can identify when governance enhances or suppresses innovation and inclusion. These insights can guide managers and policymakers to create data-sharing systems that preserve privacy and security while enabling credible, high-quality, and equitable collaboration in the digital economy.

Theme 3: Value Creation and Capture in Digital Ecosystems and Coopetition

Digitalization amplifies complementarities and network effects while blurring lines between collaborators and competitors (Nambisan et al., 2017), whereby value creation and capture hinge not only on a firm's own contributions but also on ecosystem position, control of key interfaces, and the pricing of access and data (Tiwana et al., 2010). Coopetition—that is, simultaneous collaboration and competition—intensifies these tensions, as firms must cooperate to generate surplus yet compete to appropriate it. Understanding how governance levers, dependency strategies, and ecosystem health metrics shape value distribution is, therefore, central. Further, ecosystems now include customers who are actively engaged in value creation through digital platforms and various mechanisms (e.g., customer communities and crowdsourcing challenges) (Majchrzak & Malhotra, 2020; Nambisan, 2002)

Theoretically, digital ecosystems challenge standard assumptions about advantage. Platform governance tools (e.g., pricing schemes, ranking and recommendation algorithms, exclusivity clauses, data and API access rules, and interoperability mandates) reallocate surplus among orchestrators, complementors, and users (Baldwin & Clark, 2000). Research should clarify how specific levers shift bargaining power and outside options. Exclusivity may strengthen the orchestrator but weaken complementor independence, whereas

interoperability may broaden participation and reduce switching costs yet dilute control over critical interfaces. Firms' dependency-management strategies deserve closer study. Multihoming, interface redesigned to reduce lock-in, selective data withholding, and contractual safeguards can improve bargaining positions in asymmetric relationships (Hund et al., 2021). We also need frameworks for assessing equity in value distribution beyond aggregate performance. Metrics that combine partner survival, ecosystem innovation, innovation spillovers, revenue shares, and accessibility for smaller or late-entering actors can better capture ecosystem health and fairness than traditional metrics (Feldman et al., 2022; Guerrero & Siegel, 2024; Pidun et al., 2021; Yoo et al., 2024).

For value creation, firms collaborate with their customers, and the customers themselves engage in collaboration. Governance of such external collaboration becomes key to its successful outcomes. A "participatory governance," in the form of instructions and parameters for how collaboration should occur, has been suggested in literature (Safadi et al., 2025; Zaggl et al., 2023). More research is needed to determine how "non-traditional" governance of customer collaborations can be refined and "standardized." Research is also needed on the contexts in which more "non-traditional" forms of governance are required.

Empirically, several approaches can advance this agenda. Panel data from app stores and platform ecosystems can identify the effects of governance changes—such as revenue-share adjustments, steering policies, or ranking tweaks—on complementor entry, survival, innovation quality, pricing, and multihoming. Difference-in-differences designs can exploit staged policy rollouts or jurisdictional changes to strengthen causal inference. Structural models using transaction-level data in B2B marketplaces can estimate bargaining power and surplus division, enabling counterfactual simulations of alternative governance regimes and their consequences for concentration, investment, and innovation (Hanelt et al., 2021). Network-based analyses can track how interoperability mandates or API access reforms

reshape network centrality, partner churn, and spillovers, while synthetic control methods can benchmark treated ecosystems against suitable comparators. Mixed-method case studies of coopetition episodes (e.g., shifts from open to selective access or the introduction of exclusivity tiers) can link rule changes with partner perceptions and strategic responses, enriching quantitative findings (Tiwana et al., 2010). Quasi-experiments can be conducted using an action research method to study the effects of various governance mechanisms for collaboration amongst customers and stakeholders (Majchrzak & Malhotra, 2020; Malhotra et al., 2017).

Designing ecosystems for collaborative and competitive advantage requires treating governance as a strategic instrument. Orchestrators and complementors alike must calibrate pricing, access, and ranking to encourage generative participation while preserving incentives to invest. Managers should monitor dependency indicators, including share of demand intermediated by a single platform, switching costs embedded in interfaces and data portability to avoid fragile power imbalances (Chen et al., 2022). Strategy scholars can contribute by developing actionable, equity-aware metrics and by identifying governance bundles that sustain innovation and fair surplus division. As digitalization advances, a research program that integrates panel analysis, structural modeling, and network experiments can illuminate how coopetition, governance, and position jointly determine who creates value, who captures it, and how ecosystems can remain both dynamic and inclusive (Baldwin & Clark, 2000; Hanelt et al., 2021; Hund et al., 2021; Nambisan et al., 2017; Tiwana et al., 2010; Yoo et al., 2024).

Theme 4: Algorithmic Coordination, AI, and the Reallocation of Decision Rights

Algorithmic tools (e.g., matching algorithms, forecasting models, recommender systems, and autonomous agents) are redrawing decision boundaries in digital ecosystems. They reallocate

who decides what, when, and how across organizational interfaces, thereby reshaping power, learning, and trust (Kellogg et al., 2020). While these systems can raise efficiency and scale, they introduce opacity, new dependencies, and the risk of eroding relational confidence. The strategic challenge is to calibrate delegation to algorithms with transparency, accountability, and alignment mechanisms (Tiwana et al., 2010).

Theoretically, delegating decisions to AI reframes classic questions of control and trust (Cao & Lumineau, 2015). A key task is to map which collaboration decisions (e.g., contract negotiation, partner matching, demand forecasting, incident triage) are automatable without undermining perceived fairness or increasing unmanaged risk. Explainability and auditability may moderate the adoption and performance of automated methods of decision-making. Traceability and contestability may improve accountability, but tradeoffs such as raw predictive accuracy may have to be considered (Hund et al., 2021). Research should specify when explainability enhances or slows cross-firm coordination. Choices between shared and proprietary AI systems also carry strategic path dependencies. Specifically, shared models lower cost and enable collective learning but may weaken differentiation and heighten exposure to common shocks, whereas proprietary models build firm-specific capabilities but can impede interoperability and raise switching costs. Scholars should theorize on how these choices affect adaptive capacity, learning spillovers, and the durability of competitive advantage (Yoo et al., 2024). Finally, AI reshapes decision rights. Orchestrators might centralize choices via platform-level agents. Alternatively, decision-making authority may be distributed to edge agents controlled by orchestrator partners. We need theory on how these allocations evolve; how they influence bargaining power, partner retention, and coordination quality; and how governance can rebalance rights after performance or fairness failures.

Empirically, algorithmic coordination invites experimentation and quasi-experimental inference. Lab-in-the-field studies can assemble cross-firm teams to use AI tools for negotiation or forecasting with varying transparency, autonomy, and escalation rights. Measurement of speed, surplus division, error rates, and perceived legitimacy can then reveal the performance of the AI tools (Nambisan et al., 2019). Longitudinal field studies of federated forecasting in retail or mobility can trace how such systems influence bullwhip effects, stockouts, cost-to-serve, dispute incidence, and partner churn while capturing renegotiation cycles as trust and performance evolve. Quasi-experiments can leverage exogenous shocks (e.g., model outages, API deprecations, or regulatory interventions) to observe temporary reallocation of decision rights from algorithms back to humans, measuring recovery time, coordination losses, and changes in governance contracts (Hanelt et al., 2021). Structural and network analyses can quantify how ranking or matching algorithms modify shift exposure, traffic, and surplus across partners, and whether transparency disclosures mitigate perceived unfairness. Mixed-method cases can connect algorithm audits, incident postmortems, and board minutes with strategic adjustments in oversight and access control (Tiwana et al., 2010).

Designing AI-mediated ecosystems for coordination and trust requires treating algorithms as strategic actors embedded in governance. Practical design questions include when to mandate human-in-the-loop checkpoints, how to provision explanation and appeal rights, how to allocate data and model ownership, and how to stage autonomy as relationships mature. A research agenda that integrates lab experiments, longitudinal panels, and shock-based designs can identify conditions under which algorithmic coordination enhances resilience, innovation, and fairness. By clarifying the interplay between AI systems, decision rights, and relational dynamics, strategy scholarship can guide managers and policymakers in

leveraging AI while mitigating opacity, dependency, and inequity (Hanelt et al., 2021; Hund et al., 2021; Nambisan et al., 2017; Tiwana et al., 2010; Yoo et al., 2024).

Theme 5: Boundary Redesign – New Organizational Forms for Digital Collaboration

Digitalization is spawning new organizational forms for collaboration, including industry clouds, consortium platforms, DAOs, and joint data ventures. These organizational forms blend market, hierarchy, and community governance (Nambisan et al., 2017). Embedded digital infrastructures for identity, payments, and security within each of these organizational forms further alter decisions about asset specificity and make–buy–ally choices (Tiwana et al., 2010). As these hybrids diffuse, firms must decide when to adopt each model and how to transition as ecosystems mature, standards solidify, and regulations evolve. Further, in many of the new digital collaboration forms, customers are intensively involved in value creation. While customer-intensive platform-based collaboration has been argued to be generally positive, such a mode of digital collaboration does pose critical challenges.

Theoretically, these forms challenge boundary and governance theories rooted in stable firm-centric architectures. New contingencies, including uncertainty, asset specificity, data sensitivity, interoperability needs, and regulatory pressure, determine the most appropriate collaboration model (Baldwin & Clark, 2000). Industry clouds with shared compliance and infrastructure may suit moderate uncertainty, whereas DAOs can enable decentralized rule-making in volatile, fast-moving domains (Hund et al., 2021). Research should specify the decision rules and thresholds that trigger shifts across forms, as well as the tradeoffs among flexibility, control, and scalability. Shared services embedded in platforms reduce transaction and compliance costs but increase dependency on orchestrators, thus altering appropriation risks and bargaining power. Scholars can examine how identity, payment, and cybersecurity services reconfigure asset specificity and influence value capture

strategies and switching costs (Yoo et al., 2024). Microfoundations matter, as skills in interface stewardship, ecosystem contracting, and community governance, along with modular participation and exit routines, enable firms to reconfigure portfolios from alliances to consortia to DAOs and back. Understanding how firms build these capabilities—and under what conditions they confer adaptability—can connect organizational design with dynamic advantage (Nambisan et al., 2019).

Empirically, these emergent forms invite diverse methods. Configurational analyses (QCA) can identify combinations of uncertainty, specificity, data sensitivity, and regulatory constraints that predict adoption of industry clouds, consortia, DAOs, or traditional alliances (Hanelt et al., 2021). Embedded ethnographies of consortium buildouts can trace role evolution (orchestrator vs. complementor), allocation of decision rights, dispute resolution, and the social processes behind standard-setting. Blockchain data enable a fine-grained study of DAO governance (Lumineau et al., 2025). Token distributions, proposal rules, quorum thresholds, and voting behavior can be linked to measures such as ease of partner entry, retention, and throughput. Such measures can facilitate the comparison of the performance of DAOs versus conventional organizational forms. Longitudinal panels of industry cloud participants can track the effects of shared services on partner dependence, innovation rates, exit, and multihoming. Quasi-experiments related to policy shocks (e.g., privacy mandates, interoperability requirements, or cybersecurity directives) can reveal the shift in governance choices due to exogenous constraints.

Designing organizational forms for digital collaboration requires a framework that links contingencies to governance choices, clarifies the role of embedded services in value capture, and specifies the microfoundations that enable switching across forms. A research agenda that integrates QCA, ethnography, blockchain analytics, and longitudinal causal designs could provide actionable guidance. As ecosystems evolve, firms will need to time

their transitions, manage dependencies on shared services, and invest in boundary-spanning capabilities. A strategy scholarship can help by showing when industry clouds deliver scale and compliance benefits without undue lock-in, when consortia balance inclusivity with coherence, and when DAO mechanisms genuinely enhance adaptability and fairness, thereby advancing both innovation and equitable participation.

Theme 6: Institutions, Standards, and Societal Impact

Regulations, standard settings, and societal expectations related to privacy, security, sustainability, and ethical AI now shape who collaborates with whom, on what terms, and with what advantage in digital ecosystems. Interoperability and data portability mandates lower switching costs and open markets to new entrants, thereby reshaping competition and alliance patterns (Nambisan et al., 2017). Choices about standards (i.e., open, proprietary, or semi-open) affect the speed and safety of innovation and its diffusion. At the same time, sustainability and responsible AI requirements influence partner selection, supplier development, and disclosure practices, tying ecosystem strategy to public goals (Tiwana et al., 2010). These forces create a moving boundary between public policy, market behavior, and private governance.

Theoretically, interoperability and portability mandates challenge firm-centric views on advantage by redistributing bargaining power and changing network positions within ecosystems (Hund et al., 2021). Strategy research should explain how these rules rewire ecosystem structure, identifying when increased competition complements or crowds out collaboration. Different standard-setting strategies pose various classic tradeoffs. Open standards can speed adoption and expand participation but dilute incentives to invest in differentiated features. Meanwhile, proprietary standards can drive intense innovation but risk lock-in and slower diffusion. Finally, although semi-open models aim to balance innovation

and risks, they raise questions regarding governance as it relates to access, fees, and veto rights (Baldwin & Clark, 2000). We need contingency theories that predict which approach best balances innovation speed, diffusion, and safety across different technological and regulatory environments. Sustainability and responsible AI introduce new selection criteria and monitoring demands. Firms face short-term compliance costs but may gain long-term resilience, risk reduction, and legitimacy (Yoo et al., 2024). Research should map how these requirements shift collaboration strategies, supplier upgrading, and disclosure equilibria, as well as when "green" and "responsible" standards become sources of durable advantage.

Empirically, policy evaluations can leverage staggered rollouts of interoperability mandates (e.g., open banking or healthcare APIs) to estimate the effects on entry, switching, pricing, and alliance networks (Hanelt et al., 2021). Mixed-methods studies can unpack standard setting by linking consortia minutes, proposal threads, patent pools, and participation records to subsequent adoption and firm performance (Nambisan et al., 2019). Comparative analyses of ESG-aligned supply chains can test whether shared carbon data platforms or AI risk registries reduce emissions or harms—and at what cost—using outcomes like emission intensity, compliance spend, defect incidents, and partner churn. Natural experiments related to privacy or AI accountability laws can reveal how disclosure and audit mandates alter data sharing, model deployment, and partner selection. Network analyses can trace the different ways in which standard choices change centrality and spillovers, while structural models can simulate counterfactual regimes (e.g., stricter portability) and their effects on value distribution.

Designing ecosystems for societal impact means treating regulations and standards as strategic design variables rather than as mere constraints. Managers can use open interfaces to expand participation while deploying certification, auditing, and safe sandboxes to maintain trust and safety. Policymakers can target leverage points (e.g., portability, interoperability,

transparency) that enhance both competition and collaboration. A research agenda that integrates policy evaluation, mixed-methods standard-setting studies, and ESG comparisons can show how to align innovation, competitive dynamics, and societal goals, thereby enabling ecosystems that are both dynamic and responsible.

From Traditional to Emergent Collaboration for Digital Transformation: Rethinking Partnerships in the Digital Age

Our discussion of the six themes presented here underscores how digital collaboration necessitates a reconceptualization of collaboration modes to embrace emergent, digitally enabled approaches that fundamentally differ from traditional models (El Sawy et al., 2010). In traditional collaboration, firms typically face a binary choice: they can either establish ongoing, open collaboration with a limited set of partners with whom they have strong, established ties, or they can engage in episodic, controlled collaboration for specific purposes and timeframes with a broader set of partners with weaker ties. These approaches are rooted in the physical and organizational constraints of pre-digital environments, where collaboration was bounded by limited data sharing and high transaction costs.

In contrast, emergent collaboration modes (see Figure 1), enabled by advances in digital technologies, are characterized by their flexibility, scalability, and dynamic nature. Firms can now make collaboration choices that transcend the rigid dichotomy of traditional approaches by leveraging data exchange and varying degrees of openness.

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For example, in one emergent mode (upper left quadrant of Figure 1), firms may engage in controlled yet continuous collaboration with partners with strong ties. Here, collaboration is governed by the selective sharing of data, allowing firms to cooperate deeply while retaining the ability to compete where necessary (Malhotra et al., 2007). This mode is

particularly suited for fostering trust and long-term value creation within ecosystems while maintaining strategic control over sensitive information. Over time, such collaborations can evolve to become broader (spanning multiple markets) and deeper (involving richer data exchange) as the relationship matures, and digital infrastructures facilitate seamless interaction.

Another emergent form of digital collaboration arises when firms choose to openly collaborate with a larger and more diverse set of partners with whom they have weak ties (lower left quadrant of Figure 1). In this mode, firms can share rich, purpose-specific data to address episodic opportunities, such as entering new markets or co-creating innovative services for existing markets. Importantly, this openness is made possible by digital technologies, such as APIs and blockchain, which enable efficient, secure, and scalable data sharing and interoperability (Jarrahi & Malhotra, 2024; Lumineau et al., 2025; Malhotra et al., 2022). These technologies reduce the friction traditionally associated with building trust and managing data exchange, allowing firms to collaborate more fluidly across organizational boundaries.

Notably, this emergent mode of collaboration is not static; rather, it has the potential to evolve into a more traditional collaboration model. Over time, episodic partnerships may give rise to enduring relationships, as firms identify mutual value in addressing recurring opportunities or co-developing new capabilities. However, even in these cases, the nature of collaboration continues to be shaped by digital technologies, which enable firms to tailor the depth and scope of data sharing to specific purposes, thereby maintaining agility while fostering innovation.

In sum, emergent collaboration modes are inherently dynamic, enabled by the unprecedented capabilities of digital technologies to reconfigure how firms share data, interact, and create value. These new modes challenge traditional collaboration paradigms,

offering firms the ability to navigate complex ecosystems with greater flexibility and responsiveness.

We proposed an integrative framework that establishes the foundation for a research agenda on strategic collaboration in the era of digital transformation (Figure 2). As illustrated in Figure 2, our research agenda synthesized key issues discussed across the six themes in a transversal manner structured around the 5W and H framework (Who, What, When, Where, Why, and How). This approach provides a holistic perspective on the actors, core phenomena, dynamics, contexts, strategic rationales, and design moves driving collaboration in digitally transformed environments.

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Positioning the Contributions of this Special Issue

Maric et al. (2025) offered a dynamic lens on platform evolution by tightly coupling governance regimes with shifting coopetitive tensions. Their pendulum metaphor is especially compelling. The authors suggested that rather than a single best design, initial governance choices set in motion tensions that demand periodic recalibration between centralization and decentralization. The authors' theorizing reframes governance as a precursor to coopetition at the ecosystem level and clarifies why shared governance so often struggles in practice. Supporting our Theme 3 on value creation and capture, the article shows how platform control, access, and ranking co-evolve with cooperation–competition intensity to reallocate surplus and reshape outside options. The article also reinforces our Theme 5 related to boundary redesign by spotlighting governance agility as a critical capability for navigating path dependence and sustaining ecosystem health.

Schilke et al. (2025) reimagined organizational trust for modular, digitally enabled structures. By differentiating within- and between-module trust, they reveal "trust pluralism"

as a central, often overlooked coordination challenge for boundary spanners. Their claim that trust both shapes and is shaped by modular design is novel and generative, yielding actionable guidance for maintaining coherence without sacrificing agility. Advancing Theme 1 on digital infrastructure and modularity, the article ties interface partitioning, schema choices, and coupling directly to trust formation and maintenance across modules. It also advances Theme 4 on algorithmic coordination by showing how explainability, observability, and role design complement technical interfaces to preserve legitimacy and coordination quality.

Verbeke and Yuan (2025) compellingly flipped the script to a complementor-centric view, assembling a rigorous safeguard playbook rooted in transaction cost theory and bounded reliability. They uncovered a striking bias, suggesting that complementors overestimate platform reliability due to bounded rationality, leading to underinvestment in protection. The authors introduced the MIDAS model to structure remedies such as multihoming, contractual safeguards, and data/control rights. This contribution injects much-needed nuance into debates on resilience and value appropriation in asymmetric ecosystems. Primarily enriching Theme 3 on value creation and capture, the article details micro-strategies that counter dependency and boost surplus retention amid evolving platform rules. It further advances Theme 6 on institutions and standards by tracing how distance and information asymmetries skew reliability assessments, highlighting the roles of disclosure norms, interoperability, and auditability in realigning incentives and promoting more equitable collaboration.

Shijaku and Hurtado (2025) used competitive network theory to explain how firms as nodes in a network can adjust their position in the network by varying the bonds (edge ties) between other nodes in the network, thereby pursuing cooperation and competition simultaneously. Instead of focusing on firm competitiveness, they posit that firms'

competitiveness is embedded in the competitiveness of firms' networks. Their view of network competitiveness is centered on technological convergence as the catalyst for collaboration in networks to enhance the competitiveness of networks. They deviate from the traditional focus on technological divergence as the basis of differentiation. Instead, they draw attention to technological convergence and the mechanisms underlying convergence (i.e., periphery–core migration, multiplexity, collaboration synergies, and structural brokerage). Their research aligns with Theme 1 regarding modularity and architecture of collaboration as a basis for boundary redesign (Theme 5) and Theme 2, which highlights the effect of modularity and architecture of collaboration on integrative value-creation in an ecosystem.

Finally, consistent with Theme 3 related to value creation, Maruping and Yang (2025) raised the question of whether the rush to open data flows as a basis of value creation is always beneficial. They pointed to the competitive benefits of closed data flows in the age of AI and algorithms. Going further, they proposed that open and closed data flows (Theme 2) are strategic levers that can be used in combination for value creation in digital platforms and ecosystems. They posited that a move towards balkanized data flows underlies the emergent tensions between stakeholders in collaborative platform ecosystems. In addition, the resolution of such tensions is needed to optimize value creation and capture. To this end, they outlined a framework for digital platform strategies to overcome the tensions between open collaborative value creation and the use of the data that firms accumulated to individually capture value in collaborative value creation.

Conclusion

Overall, we advanced a collaborative strategy agenda suited for the digital age. By foregrounding architecture-as-governance, data sharing and trust, ecosystem value dynamics,

AI-mediated coordination, new organizational forms, and institutional forces, we operationalized collaboration as a design problem with societal stakes. The articles of this Special Issue collectively move beyond a static optimal point towards more dynamic arguments that link micro interfaces with macro-outcomes. We invite strategy scholars and practitioners to further treat openness, control, and accountability as tunable levers, measure equity alongside efficiency, and build capabilities for governance agility that sustain innovation, resilience, and responsible value creation.

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Table 1 - Collaborative Strategy in the Digital Age: Themes, Research Agenda, and Real-World Examples

Themes	***Research questions***	***Illustrations***
#1. Digital Infrastructure, Modularity, and the Architecture of Collaboration	- How do API granularity, access tiers, and deprecation rules shape participation, coupling, and value capture? - When should openness be staged or recalibrated; what capabilities enable governance agility? - Under what conditions does modularity enhance exploration vs. cause fragmentation; which mechanisms (reference implementations, test suites, coherence budgets) sustain systemic coherence? - How do algorithmic rate limits, automated compliance, and ranking affect perceived fairness and contribution?	- By tightening API access, social platforms (Twitter/X, Reddit) force third-party developers to renegotiate roles or exit, shifting who can co-create and who can capture audience value. - App store fees and rule changes review (Apple, Google) alter participation cost for app partners, influencing multihoming and investment in platform-specific features. - Interface changes of cloud providers (Amazon, Microsoft, Google) alter dependency and switching costs for partners, shaping long-term bargaining power.
#2. Data Sharing, Governance, and Trust in Digital Collaboration	- Which governance mechanisms (data trusts, clean rooms, federated learning, smart contracts) expand feasible collaborations vs. entrench gatekeeping? - How do perceptions of data quality, lineage, and bias shape partner selection and durability, which safeguards (differential privacy budgets, lineage attestations) balance verifiability and secrecy? - How do trust beliefs update after shocks, which mix of technical controls and shared oversight stabilizes expectations? - Empirically: What are the effects of GDPR/CCPA/DPDP on alliance formation, sharing intensity, and innovation; how do federated learning design choices influence participation and accuracy?	- Retail media “clean rooms” let brands and retailers analyze shared audiences without exposing raw data, creating joint value while preserving secrets; partners strategize over who owns insights. - Hospital networks' training models allow federated learning without pooling patient data; governance choices determine who benefits from the model and who bears liability. - Automotive data spaces (e.g., manufacturers and suppliers) coordinate repair and diagnostics data, improving service while redefining who monetizes downstream services.
#3. Value Creation and Capture in Digital Ecosystems and Coopetition	- How do pricing, ranking, exclusivity, data/API access, and interoperability shift bargaining power and outside options? - Which dependency-management strategies (multihoming, interface redesign, selective data sharing, contractual safeguards) improve complementor outcomes? - How should ecosystem health and equity be measured beyond aggregate performance? - Empirically: What are the effects of revenue-share changes, self-preferencing limits, or interoperability mandates on entry, survival, innovation quality, and multihoming?	- By allowing alternative payments or lower fees, app stores change how developers split revenue with platforms, affecting where developers launch their app first and whether they multi-home (launch it on multiple platforms simultaneously). - Messaging interoperability in Europe pushes rivals to connect, expanding user reach for smaller players while weakening incumbent lock-in; firms reassess where to differentiate. - “Buy with Prime” pressures brands on Shopify to co-sell with Amazon’s logistics; merchants weigh access to Prime customers against losing data and margin control.

#4. Algorithmic Coordination, AI, and the Reallocation of Decision Rights	- Which collaboration decisions can be automated without eroding perceived fairness or increasing unmanaged risk; when does explainability aid or hinder coordination? - What are the strategic tradeoffs between shared vs. proprietary models for learning, differentiation, and exposure to common shocks? - How should decision rights evolve after failures; what governance rebalances authority? - Empirically: Do transparency/audit features change surplus division, partner churn, or incident rates? What are the effects of outages or API changes on the re-humanization of decisions?	- By adjusting matching/ranking, marketplaces (Uber, Airbnb) alter partner visibility and income, prompting drivers/hosts to organize feedback councils or switch platforms—reshaping governance voice. - By adopting AI coding assistants, enterprises add review gates between vendor AI and internal teams, redefining who approves changes and how IP risk is shared with tool providers. - By using AI to share demand forecasts with suppliers, retailers shift planning authority outward to suppliers; explainability and appeal channels determine supplier buy-in and stockout risk.
#5. Boundary Redesign: New Organizational Forms for Digital Collaboration	- Under what contingencies (uncertainty, specificity, data sensitivity, regulation) do industry clouds, consortia, DAOs, or alliances dominate; what triggers switching across forms? - How do embedded identity, payments, and security services alter asset specificity and value capture; what dependencies arise? - Which microfoundations enable portfolio reconfiguration? - Empirically: Which configurations predict adoption; how do DAO voting rules affect throughput and retention vs. traditional consortia?	- Industry-specific clouds (e.g., healthcare cloud) let many hospitals share compliance tools and data pipelines, lowering costs but increasing dependence on the orchestrator's rules and fees. - DAOs that fund open-source infrastructure let contributors co-govern budgets and roadmaps; token design affects who participates and whether value accrues to core vs. peripheral contributors. - Open tech foundations (e.g., Linux Foundation projects) pool R&D across competitors, speeding standard adoption but raising questions about who steers roadmaps.
#6. Institutions, Standards, and Societal Impact	- How do interoperability/portability mandates rewire ecosystem structure and bargaining power; when do they complement or crowd out collaboration? - Which standard strategies best balance innovation speed, diffusion, and safety? - When do sustainability and responsible AI requirements yield a durable advantage vs. compliance cost? - Empirically: Effects of open banking/healthcare APIs on entry, switching, and pricing; do carbon data platforms or AI risk registries reduce harms at reasonable cost?	- Interoperability rules in Europe require large platforms to open, enabling smaller services to connect and compete; incumbents must redesign collaboration terms and compliance processes. - Open banking lets customers port financial data to budgeting apps, expanding bank–fintech partnerships but challenging incumbents' control over customer relationships and fees. - Carbon reporting and AI transparency laws push firms to share supplier data and model documentation; companies build coalitions to set audit norms, influencing industry-wide collaboration costs and trust.

Figure 1 - Collaboration Modes for Digital Transformation

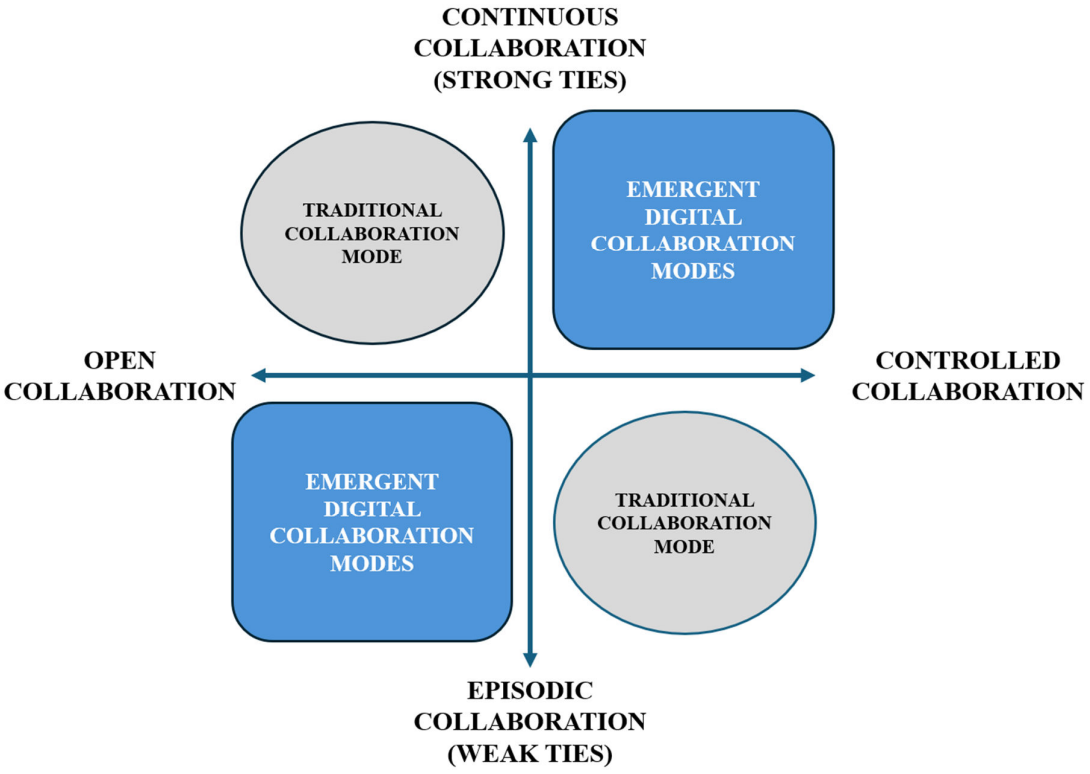

Figure 2 - Digital Transformation and Collaborative Strategy: An Integrative Framework and Research Agenda