



Toward a Theory of Hypermodern Agility: Rethinking Organizational Adaptation Mechanisms in the Era of Unstable Ecosystems

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Abstract

In a hypermodern context characterized by technological acceleration, societal recomposition, and climate urgency, classical agility frameworks struggle to account for ecosystemic interdependencies and the plurality of temporal horizons. This article addresses the following research question: how can organizational agility be conceptualized to meet the singular challenges of the hypermodern era, marked by accelerated innovation cycles, market unpredictability, and a diversity of stakeholders? We advance the theory of “hypermodern agility,” grounded in three key latent variables: (i) the cognitive reconfiguration of decision-making routines, (ii) the plasticity of coordination structures, and (iii) the reflexivity of innovation ecosystems. The mixed-method design combines a systematic literature review (two thousand–2025), multi-sector case studies (36 interviews), and quantitative validation through PLS-SEM on a sample of 311 respondents. Qualitative findings reveal short-cycle sensemaking loops, modular organizational architectures, and inter-actor learning mechanisms. Quantitative results confirm a second-order construct of hypermodern agility explained by cognitive reconfiguration ($\beta = 0.34$; $p < 0.001$), coordination plasticity ($\beta = 0.28$; $p < 0.001$), and ecosystem reflexivity ($\beta = 0.31$; $p < 0.001$; $R^2 = 0.62$). Hypermodern agility enhances strategic performance ($\beta = 0.42$; $R^2 = 0.49$) and organizational sustainability ($\beta = 0.35$; $R^2 = 0.45$). Model robustness is supported (loadings ≥ 0.70 ; $\alpha = 0.82$ – 0.91 ; AVE = 0.54 – 0.71 ; HTMT < 0.85 ; SRMR = 0.058 ; $Q^2 > 0$; bootstrapping 5,000). Environmental uncertainty strengthens the impact of agility on performance ($\beta_{\text{mod}} = 0.12$; $p = 0.02$). The theoretical contribution introduces the concept of “fractal temporality,” through which organizations articulate short-, medium-, and long-term horizons. Managerial implications concern algorithmic governance, adaptive steering, and ecosystem orchestration. Limitations relate primarily to sectoral scope and the absence of longitudinal tracking; comparative and experimental studies are proposed for future research.

Keywords: Adaptive governance, Collective intelligence, Fractal temporality, Hypermodern agility, Innovation ecosystems.

1. Introduction

The contemporary era is marked by an unprecedented rise in volatility, uncertainty, complexity, and ambiguity—dynamics often summarized by the acronym VUCA and simultaneously amplified by digital transformation and climate urgency (Bennett & Lemoine, 2014; OECD, 2023). Organizations of all sizes and sectors face accelerated technological disruptions, profound societal shifts, and mounting environmental pressures that challenge traditional paradigms of shared value creation and governance. In response to these upheavals, organizational agility has emerged as a critical strategic capability, offering mechanisms of responsiveness and adaptation in unstable environments (Doz & Kosonen, 2010).

Yet, despite a rich body of research, existing theories of organizational agility remain insufficient to capture the scale and radical nature of current transformations. They generally privilege an operational perspective focused on process flexibility or decision-making speed, without fully integrating the systemic and temporal dimensions that characterize contemporary ecosystems (Rigby et al., 2018; Suddaby et al., 2020). These environments—described as hypermodern—are defined by fractal temporalities, globally interconnected risks, and an increasing hybridization of emerging technologies and human behaviors, calling for a conceptualization that transcends traditional analytical frameworks (Lipovetsky, 2017).

Against this backdrop, a central research question arises: how can organizational agility be conceptualized to meet the singular challenges of the hypermodern era, marked by accelerating innovation cycles, market unpredictability, and a plurality of stakeholders? To address this question, this article advances the theory of hypermodern agility, understood as a process of continuous adjustment based on the co-evolution of collective

intelligence, emerging technologies, and adaptive governance. Hypermodern agility thus differs from traditional agility by emphasizing the organization's ability to articulate multiple temporal horizons, reconfigure cognitive routines, and engage in dialogue with reflexive innovation ecosystems.

This research seeks to move beyond existing approaches by articulating the cognitive, structural, and ecosystemic dimensions of agility, offering an integrative framework capable of illuminating new dynamics of organizational adaptation (Whetten, 1989; Corley & Gioia, 2011). Drawing on a mixed-method design that combines critical literature review, multi-sector case studies, and abductive reasoning, the study enriches the strategic management literature with a novel conceptualization that integrates complexity, radical uncertainty, and multi-level interactions inherent to the hypermodern context (Mignenan, 2022). In doing so, it provides a theoretical and analytical framework that not only enhances understanding but also guides governance and management practices in environments of extreme instability.

The article is organized into five main sections. Section 1 offers a critical review of the literature on organizational agility and highlights its limitations in hypermodern settings. Section 2 introduces the conceptual framework and defines key notions, collective intelligence, emerging technologies, and adaptive governance, in relation to hypermodern agility. Section 3 details the mixed-method approach combining documentary analysis, multi-sector case studies, and abductive reasoning. Section 4 develops the proposed theory by identifying the mechanisms of cognitive reconfiguration, structural plasticity, and ecosystem reflexivity. Finally, Section 5 discusses theoretical and managerial contributions, acknowledges the study's limitations, and outlines avenues for future research.

2. Critical Literature Review

According to Teece, Pisano, and Shuen (1997) and Teece (2007), the notion of organizational agility emerges at the intersection of dynamic capabilities and information systems. Dynamic capabilities are defined as the ability to *integrate, build, and reconfigure* organizational resources to cope with rapidly changing environments (Mignenan, 2021). Transposed to digital architectures, organizational agility becomes a distributed informational and decision-making capacity, supported by "digital options" that enhance the speed of experimentation and reconfiguration (Sambamurthy, Bharadwaj & Grover, 2003; Overby, Bharadwaj & Sambamurthy, 2006). This intellectual lineage has structured three recurrent dimensions: sensing (alertness to emerging signals), responding (speed of action), and reconfiguring (asset redeployment). Yet, as Doz and Kosonen (2010) argue, much of the literature reduces agility to routines of operational flexibility, thereby downplaying its deeper cognitive, political, and temporal layers (Mignenan, 2019). Several scholars thus identify a conceptual blind spot: the insufficient attention paid to ecosystemic interdependencies and multiple temporal horizons that condition the sustainability of organizational adjustments.

These limitations become clearer when examined through the lens of the sociological diagnoses of hypermodernity. Lipovetsky (2017) characterizes this era by continuous acceleration, growing individualization, and hybridization of practices, where the pursuit of immediacy coexists with demands for meaning and responsibility. Rosa (2013) describes a "social speed" that recombines temporal scales and compresses decision-making processes, while Wajcman (2015) highlights how digitalization intensifies cadences and reshapes the mediations of work and control. Organizationally, Powell, Koput, and Smith-Doerr (1996) show that the solidity of firm boundaries gives way to distributed networks of innovation, and Adner (2017) depicts ecosystems where coordination is negotiated among firms, platforms, regulators, and communities. These transformations shift the focus: agility is no longer merely an internal property but a relational and ecosystemic competence, inseparable from collective reflexivity and the governance of interdependencies.

From this confrontation of perspectives emerge two decisive conceptual tensions. The first opposes adaptability and resilience. Research centered on decision speed (Eisenhardt, 1989; Brown & Eisenhardt, 1997) shows that well-connected teams using simple rules can decide rapidly and adjust effectively under uncertainty. By contrast, Holling (1973), Lengnick-Hall and Beck (2005), and Sutcliffe & Vogus (2003) argue that an organization may be highly adaptive in the short term yet remain fragile in the face of major disruptions if it does not accumulate redundancies, diversify action repertoires, and institutionalize learning. The second tension opposes speed and sustainability. As Hart and Dowell (2011), Bansal and DesJardine (2014), and George et al. (2016) note, strategic velocity can create temporary advantages but also generate environmental and social costs that compromise long-term value. Achieving a sustainable form of agility therefore requires explicit temporal trade-offs and careful consideration of delayed effects.

In synthesis, the literature converges on the idea that to be truly agile today entails far more than mere process flexibility. It demands a coevolution of collective cognitive capacities, reconfigurable digital architectures, and governance regimes capable of orchestrating distributed networks across differentiated time horizons. This insight opens the theoretical space for a concept of hypermodern agility, which simultaneously integrates weak-signal sensing, rapid decision-making, and sustainable learning while explicitly addressing the tensions between adaptability and resilience, and between speed and durability. It is within this conceptual space that the proposed theory is situated, supported by a mapping of key concepts from 2000 to 2025, as summarized in Table 1 and Figure 1 below.

Table 1. Evolution of the main concepts used in the study.

Concept	Year	Milestone
Organizational Agility	2003	Dissemination of agile methods outside of IS (iterations, customer at the center)
Organizational Agility	2006	'Digital options': quick reconfiguration via digital assets
Organizational Agility	2010	Strategic agility to renew the business model
Organizational Agility	2017	Organisation-wide shift to business agility
Organizational Agility	2023	AI-augmented agility; Coupling with resiliency
Adaptive governance	2005	Risk management and compliance (SOX, Basel II)
Adaptive governance	2012	Agile governance and controlled experimentation
Adaptive governance	2018	Data Governance and Digital Ethics
Adaptive governance	2021	Algorithmic Governance, ESG and Climate Resilience
Intelligence collective	2001	KM and Structured Communities of Practice
Intelligence collective	2010	Crowdsourcing and participatory platforms
Intelligence collective	2016	Open innovation and collaborative data
Intelligence collective	2021	Human-AI hybridization, assistants and augmented co-creation
Emerging technologies	2004	Web 2.0 and the first connected mobiles
Emerging technologies	2009	Cloud computing and smartphones
Emerging technologies	2014	Big data / IoT; Real-time analytics
Emerging technologies	2018	Deep AI, edge, blockchain in enterprises
Emerging technologies	2023	Generative AI, digital twins, foundation models

Table 1 highlights the evolutionary trajectory of the study’s key concepts, showing how each has adapted to successive technological and managerial transformations. Organizational agility, initially confined to agile methods outside of information systems (2003), gradually broadened its scope: digital reconfiguration (2006), strategic agility for business-model renewal (2010), the transition to full business agility (2017), and finally the integration of artificial intelligence to strengthen resilience (2023). Adaptive governance follows a comparable dynamic, moving from risk and compliance management (2005) toward data governance and algorithmic regulation that incorporate ethical and climate-resilience considerations (2021). Collective intelligence, first focused on knowledge management and communities of practice (2001), expanded to crowdsourcing (2010), open innovation (2016), and human–AI hybridization (2021), reflecting the rise of collaborative platforms and augmented co-creation. Emerging technologies likewise progressed from Web 2.0 and early mobile connectivity (2004) to cloud computing (2009), big data and IoT (2014), deep AI and blockchain (2018), culminating in 2023 with generative AI and foundation models.

Taken together, the table illustrates a cumulative and convergent logic: each concept grows more complex by integrating digital, ethical, and collaborative dimensions, reflecting a shared quest for adaptability and resilience in an economic environment defined by uncertainty and technological acceleration.

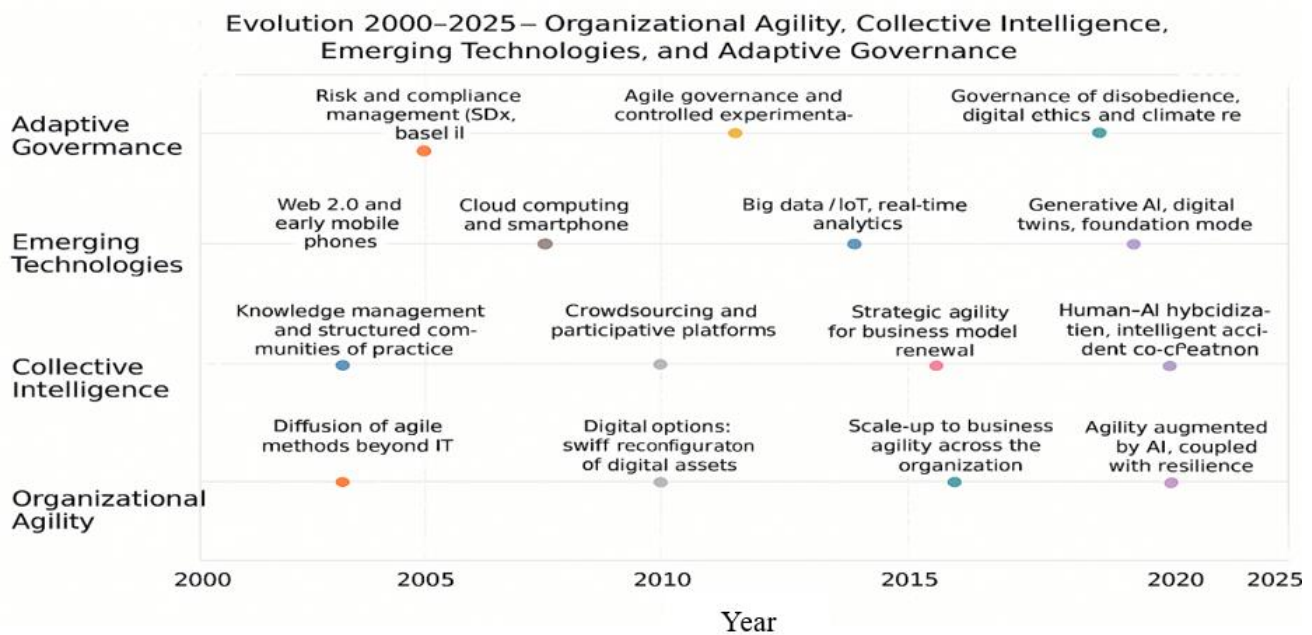


Figure 1. Evolution of concepts.

Figure 1 presents an ascending timeline in which four major concepts, organizational agility, adaptive governance, collective intelligence, and emerging technologies, develop and intersect under the impetus of digital acceleration. Each domain exhibits a progressive movement of increasing complexity: agility evolves from a method focused on software iteration to organizational agility enhanced by AI and resilience; governance advances from risk control to algorithmic regulation integrating ethics and ESG criteria; collective intelligence migrates from communities of practice to human–AI hybridization and augmented co-creation; and emerging technologies progress from Web 2.0 to big data, then to generative AI and digital twins.

Taken together, the visualization underscores a strategic convergence: technological advances stimulate both agility and collective intelligence, while governance must continually adapt to manage risks and ensure transparency. It captures the shift from isolated innovations to a logic of interconnected ecosystems, where AI now plays a transversal role as both a driver of transformation and a catalyst of organizational resilience.

3. Conceptual Framework and Theoretical Hypotheses

Hypermodern agility is not merely a semantic refinement of classical agility approaches; it represents a conceptual and practical leap forward. Operationally, it denotes an organization’s ability to continuously readjust its structures, decision routines, and modes of governance in the face of accelerating technological change, market unpredictability, and stakeholder plurality. Whereas traditional agility focuses primarily on process flexibility, hypermodern agility rests on an inseparable triptych illustrated in Figure 2:

- (i) collective intelligence capable of capturing and interpreting weak signals at an early stage;
- (ii) emerging technologies that streamline information flows and accelerate experimentation; and
- (iii) adaptive governance that orchestrates these interactions while maintaining coherence and long-term sustainability.

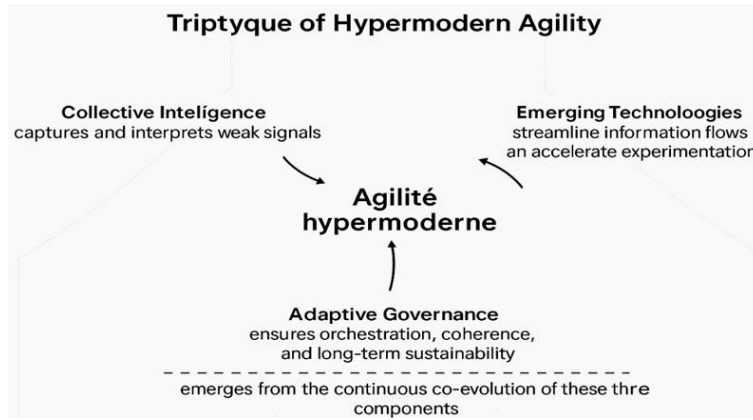


Figure 2. Inseparable triptych of hypermodern agility.

Moreover, considered as a mechanism, this agility is mainly based on (i) the plasticity of coordination structures, (ii) the rearrangement of cognitive heterogeneities and, above all, (iii) the flexibility of innovation ecosystems. Figure 2 provides a summary of this.

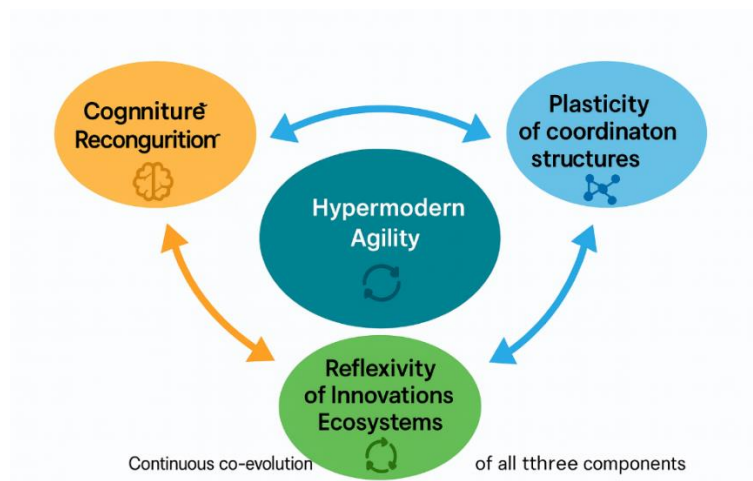


Figure 3. Integrative diagram of the three hypermodern agility mechanisms.

This conceptualization underscores, above all, the temporal dimension—or “fractal temporality” highlighted by Rosa (2013): the firm must simultaneously navigate the urgency of immediate action, the medium-term strategic horizon, and the long-term memory of organizational learning.

This perspective finds concrete illustrations across multiple sectors. In the automotive industry, for example, manufacturers developing electric or autonomous vehicles must combine global collaborative intelligence gathering, the use of digital engineering and simulation platforms (emerging technologies), and governance mechanisms capable of integrating shifting environmental regulations while ensuring production continuity (adaptive governance). In the financial services sector, fintech companies adjust their business models through multidisciplinary teams in constant interaction, predictive analytics tools, and internal regulatory devices that enable rapid decision-making without losing sight of compliance requirements.

The proposed conceptual framework weaves these three dimensions into a model of co-evolution. Collective intelligence functions as the cognitive engine, feeding the organization with shared information and convergent interpretations that stimulate creativity and facilitate the resolution of complex problems. Emerging technologies—whether artificial intelligence, collaborative platforms, or data-sensing devices—operate as technical levers, expanding processing capacity, accelerating the circulation of knowledge, and enabling real-time adjustments. Adaptive governance plays a regulatory and arbitrational role by establishing distributed coordination mechanisms, setting evolving rules, and safeguarding the sustainability of decisions in a context of ecosystemic interdependence.

This model illustrates a circular process in which collective cognition, technological infrastructures, and governance mechanisms reinforce one another to produce an expanded capacity for adaptation. Figure 4 depicts this circular model, showing how hypermodern agility emerges from the dynamic interaction of collective intelligence, adaptive governance, and emerging technologies. The diagram highlights a system of interdependencies in which each dimension acts simultaneously as a lever and a condition for the development of

the others: collective intelligence fuels learning and co-creation, adaptive governance ensures ethical regulation and resilience, and emerging technologies provide the infrastructure and analytical power required for continuous experimentation.

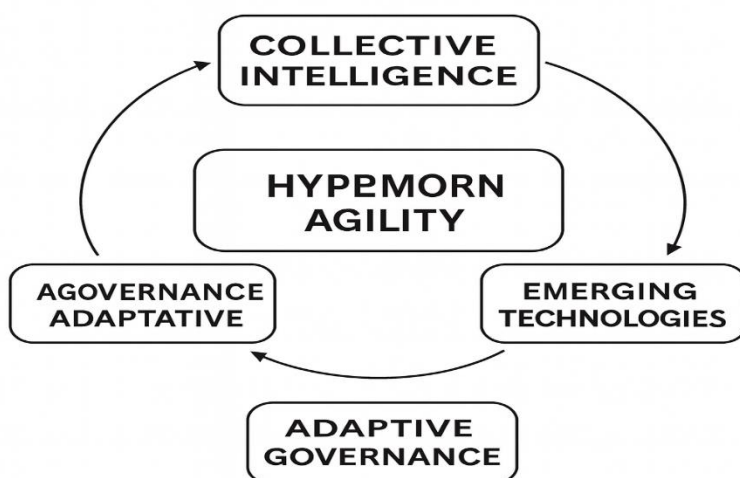


Figure 4. Hypermodern Agility Circular Model.

In light of Figure 4, the formulation of the hypotheses aims to empirically test the cross-effects of these three components on the construction of an organizational agility suited to contemporary uncertainties. The following hypotheses are therefore framed within a systemic logic: they explore the causal relationships and potential synergies among collective intelligence, adaptive governance, and disruptive technologies, with the goal of demonstrating how their integration can generate a durable, value-creating form of hypermodern agility.

Development of Hypotheses

Hypothesis 1: Collective intelligence as a catalyst of hypermodern agility

The greater the integration of collective intelligence mechanisms (communities of practice, participatory platforms, human–AI hybridization), the more an organization develops a hypermodern agility capable of responding to complex and uncertain environments. From the seminal work of Nonaka and Takeuchi on knowledge creation (two thousand) to recent research on AI-augmented co-creation (Luccioni, 2023; Weller et al., 2022), the literature highlights how networked knowledge and distributed participation reinforce adaptive learning capacity. This dynamic promotes rapid anticipation of disruptions and continuous renewal of business models.

Hypothesis 2: Adaptive governance strengthens the sustainability of organizational agility

The adoption of adaptive governance mechanisms—integrating risk management, algorithmic ethics, and ESG criteria—has a positive effect on the stability and resilience of agile organizations. Analyses of risk governance (Renn, 2008), algorithmic governance principles (Dignum, 2020), and ESG standards (OECD, 2021) demonstrate that flexible yet structured governance reconciles rapid innovation with social responsibility. Post-pandemic studies (Knox, 2023) confirm that firms equipped with adaptive steering processes are better able to absorb shocks and maintain performance.

Hypothesis 3: The appropriation of emerging technologies as a key lever of collective intelligence

The progressive integration of emerging technologies (big data, generative AI, digital twins) enhances the capacity of collectives to produce, share, and capitalize on distributed knowledge. From early studies on Web 2.0 (O'Reilly, 2004) to research on generative AI (Floridi & Chiriatti, 2020; Luccioni, 2023), empirical evidence shows that digital infrastructures amplify connectivity and facilitate the mobilization of tacit knowledge. Real-time analysis of massive information flows transforms collaborative practices and broadens the scope of open innovation (Chesbrough, 2017).

Hypothesis 4: Synergy among collective intelligence, adaptive governance, and emerging technologies drives overall organizational performance in the hypermodern era

The combined effect of robust collective intelligence, adaptive governance, and the strategic use of emerging technologies leads to significant improvements in economic, social, and environmental performance. Innovation-ecosystem models (Adner, 2017), studies on business agility (Denning, 2018), and recent analyses of digital resilience (OECD, 2024) converge to show that performance does not result from any single factor but from the dynamic integration of these three levers. Post-COVID research (Dwivedi et al., 2023) confirms that organizations capable of combining these dimensions achieve superior gains in adaptability and sustainable value creation.

These four hypotheses draw on a body of literature spanning the first two decades of the twenty-first century (two thousand–2025), marked by the rise of the digital economy, the emergence of artificial intelligence, and the growing need for ethical governance. Together, they enable empirical testing of a systemic model in which hypermodern agility is conceived as the product of interaction among collective knowledge, adaptive regulation, and disruptive technologies.

4. Methodology

The study adopts a mixed abductive research design that combines qualitative exploration and quantitative validation in order to produce a theory that is both empirically grounded and conceptually robust. According to Dubois and Gadde (2002), abduction enables an iterative movement between data and theoretical frameworks, fostering the discovery of emerging explanatory mechanisms while simultaneously consolidating conceptual propositions. This approach is particularly well suited to investigating hypermodern agility, a phenomenon that remains relatively under-stabilized and therefore requires the articulation of practice observation, theoretical construction, and the testing of complex relationships (Timmermans & Tavory, 2012; Ketokivi & Choi, 2014).

Data production began with a systematic literature review covering the period two thousand–2025. This first stage aimed to map the evolution of the concepts of organizational agility, collective intelligence, emerging technologies, and adaptive governance. Following the recommendations of Tranfield, Denyer, and Smart (2003), the databases Scopus, Web of Science, and Business Source Complete were queried using combinations of English and French keywords. The articles selected underwent independent double coding, as reported in Table 2, to ensure the reliability of both selection and information extraction. This documentary analysis provides the first empirical foundation for identifying key dimensions and informing the subsequent qualitative phase.

Table 2. Independent double coding of articles.

Article	Coder 1 (Main Themes)	Coder 2 (Main Themes)	Accord (%)
Article 1	Organizational Agility	Organizational Agility	100
Article 2	Emerging technologies	Emerging technologies	95
Article 3	Intelligence collective	Intelligence collective	90
Article 4	Adaptive governance	Adaptive governance	100
Article 5	Organizational Agility	Organizational Agility	100
Article 6	Intelligence collective	Intelligence collective	90
Article 7	Emerging technologies	Emerging technologies	95
Article 8	Adaptive governance	Adaptive governance	100
Article 9	Organizational Agility	Organizational Agility	100
Article 10	Emerging technologies	Emerging technologies	95

This table illustrates the independent evaluation conducted by two coders to ensure the reliability of the selection and extraction of information from the systematic review (two thousand–2025).

The second stage consists of a multi-sectoral field survey conducted from June to September 2025 among innovative SMEs, digital companies and non-governmental organisations operating in different geographical contexts. This choice aims to identify a diversity of organizational configurations confronted with hypermodern environments. A total of thirty-six semi-structured interviews were conducted with managers, middle managers, and innovation managers. The distribution of qualitative interviews is presented in the following Table 3, which illustrates the balance of the sample and the diversity of the organizational contexts explored:

Table 3. Distribution of qualitative interviews.

Sector	Number of interviews	Percentage (%)
Innovative SMEs	14	39
Digital businesses	12	33
BEE	10	28
Total	36	100%

These data were complemented by the analysis of internal documents (strategic reports, digital dashboards) and by direct observations during project steering meetings.

The qualitative analysis follows the Gioia method (Gioia, Corley, & Hamilton, 2013), which supports grounded theorizing by structuring the data into first-order concepts, second-order themes, and aggregate dimensions. This approach allows the emergence of explanatory mechanisms such as cognitive reconfiguration, coordination-structure plasticity, and ecosystem reflexivity, which together constitute the building blocks of hypermodern agility. The credibility of the findings was reinforced through researcher triangulation, participant validation, and the progressive saturation of conceptual categories (Charmaz, 2014).

The quantitative phase aimed to test the robustness of the relationships identified in the qualitative analysis. To this end, a structural equation model was estimated using the PLS-SEM method (Partial Least Squares Structural Equation Modeling). As noted by Hair, Hult, Ringle, and Sarstedt (2022), this approach is particularly suited to complex models incorporating latent constructs, moderate sample sizes, and non-normal distributions. The survey instrument, developed from the dimensions identified in the qualitative phase, was administered online to 311 respondents drawn from the same sectors. The distribution of quantitative respondents is presented in Table 4 below.

Table 4. Distribution of Quantitative Respondents.

Sector	Number of respondents	Percentage (%)
Innovative SMEs	120	39
Digital businesses	105	34
BEE	86	27
Total	311	100

The indicators of convergent, discriminant and internal reliability were verified according to recent management standards (Hair et al., 2022; Ringle, Sarstedt, & Straub, 2012).

The entire research process can be summarized in the following Figure 5, which illustrates the four-step abductive path: systematic review, multi-sectoral case studies, Gioia qualitative analysis, and PLS-SEM modeling.

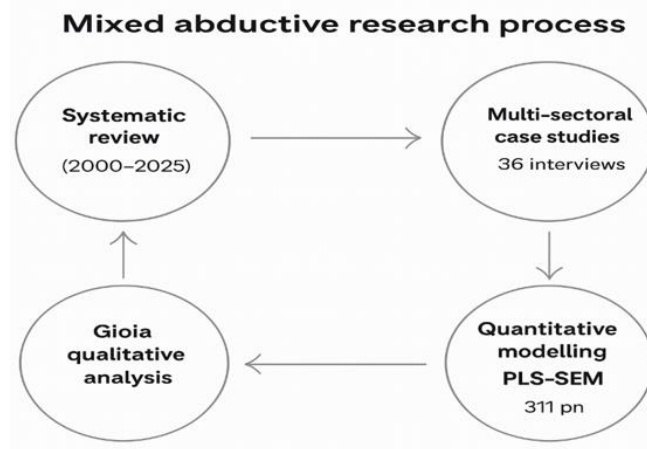


Figure 5. Mixed Abductive Research Process.

This Figure 5, in four phases, represents the progression from systematic review to quantitative modeling, connected by circular arrows translating the iterations between theory and data.

By combining a systematic review, in-depth case studies and statistical modelling, this methodology ensures a dual empirical and theoretical anchoring. It not only makes it possible to identify the constituent mechanisms of hypermodern agility, but also to evaluate its explanatory scope and contribution to strategic performance and organizational sustainability in environments characterized by radical uncertainty.

5. Results

Consistent with the mixed abductive design outlined in the methodology, the findings are organized into an exploratory qualitative phase and a quantitative validation phase. This dual approach makes it possible to identify the constitutive mechanisms of hypermodern agility and to test their statistical robustness.

5.1. Qualitative Results

Analysis of the thirty-six interviews, internal documents, and in-situ observations produced a robust data structure in the sense of the Gioia method, linking first-order concepts, second-order themes, and aggregate dimensions. Three constitutive mechanisms of hypermodern agility emerge convergently.

The first, cognitive reconfiguration, refers to the ability of teams to revisit their representations of the situation and their decision heuristics on the basis of weak signals. For example, in a digital SME, the use of *feature flags* allowed interface variants to be tested in production and the weekly backlog adjusted in response to usage signals. In an NGO, the rapid reinterpretation of local epidemiological indicators led to the rescheduling of mobile clinics in under forty-eight hours.

The second mechanism, coordination-structure plasticity, denotes the capacity to temporarily reconfigure roles, rituals, and organizational boundaries. A ginger-processing company, for instance, reassigned packaging operators to dryer monitoring during seasonal peaks and introduced a fifteen-minute stand-up ritual every two hours; an urban transport network created daily “adaptation windows” during which bus scheduling was recalculated on the basis of real-time occupancy data.

The third mechanism, ecosystem reflexivity, captures the ability to orchestrate cross-learning loops among partners, users, and communities. A university–industry consortium, for example, co-developed open dashboards with user associations to monitor water quality in a sanitation project and to derive micro-level regulatory adjustments.

These mechanisms combine with three recurrent enabling resources:

- Loosely coupled digital platforms that reduce the cost of process recombination;
- Adaptive rules, i.e., simple decision principles specifying when to deviate from routines;
- Inter-organizational relational capital, supported by collaboration membranes such as framework agreements, shared data, and interface engineering.

Abductive iteration between data and theory allowed the formulation of theoretical propositions guiding the quantitative phase:

- First, the greater the level of cognitive reconfiguration, the stronger the development of hypermodern agility measured as a second-order construct.
- Second, coordination plasticity amplifies the effect of agility on strategic performance when environmental variability is high.
- Third, ecosystem reflexivity mediates the conversion of agility into organizational sustainability through shared learning and the reduction of inter-actor frictions.

The credibility of these results was reinforced through category saturation, researcher triangulation, and member checking with key informants, who confirmed the plausibility of the proposed causal chains.

5.2. Quantitative Results (PLS-SEM)

The measurement model meets established quality criteria. Standardized outer loadings are above 0.70. One indicator of the “adaptive rules” dimension was removed due to insufficient loading, which improved internal consistency. Cronbach’s alpha values range from 0.82 to 0.91, composite reliabilities from 0.86 to 0.93, and AVE values from 0.54 to 0.71, demonstrating convergent validity. Discriminant validity is established (HTMT < 0.85; confidence intervals excluding 1), and no problematic multicollinearity is detected (VIF < 3.3). The overall fit of

the structural model is satisfactory (SRMR = 0.058), and predictive relevance is confirmed for the endogenous constructs ($Q^2 > 0$).

Table 5. Summary of reliability and validity indicators.

Indicators	Observed values	Interpretation
Standardized External Loads	≥ 0.70 (mean 0.75)	Convergent validity confirmed
Cronbach's Alpha	0,82 – 0,91	Good internal consistency
Composite reliability	0,86 – 0,93	Reliability of the constructs
AVE (Average Variance Extracted)	0,54 – 0,71	Satisfactory variance extraction
HTMT (Discriminant Validity)	< 0.85	Established discriminant validity
VIF (collinearity)	< 3.3	Lack of multicollinearity
SRMR (fit global)	0,058	Satisfactory model adequacy
Q^2 (Predictive Relevance)	> 0	Demonstrated predictive relevance

Structural relationship tests, obtained by *bootstrapping* (5,000 resamples, $N = 311$), support the proposals from the field. The three latent antecedents significantly contribute to second-order Hypermodern Agility (HA): cognitive reconfiguration \rightarrow HA ($\beta = 0.34$, $t = 7.21$, $p < 0.001$), coordination plasticity \rightarrow HA ($\beta = 0.28$, $t = 5.18$, $p < 0.001$), ecosystem reflexivity \rightarrow HA ($\beta = 0.31$, $t = 6.43$, $p < 0.001$). The explanatory power for HA is substantial ($R^2 = 0.62$). HA then exerts a marked positive effect on strategic performance (SP) – time to market, perceived quality, operational efficiency – ($\beta = 0.42$, $t = 8.05$, $p < 0.001$; $R^2_{PS} = 0.49$) and on organizational sustainability (OD) – continuity of service, material sobriety, robustness of partnerships — ($\beta = 0.35$, $t = 6.72$, $p < 0.001$; $R^2_{DO} = 0.45$). The indirect effects are significant: cognitive reconfiguration \rightarrow PS via HA ($\beta_{ind} = 0.14$, 95% CI [0.08, 0.21]), plasticity \rightarrow PS via HA ($\beta_{ind} = 0.12$, 95% CI [0.06, 0.19]), reflexivity \rightarrow OD via HA ($\beta_{ind} = 0.11$, 95% CI [0.05, 0.18]). Environmental uncertainty positively moderates the effect of HA on performance ($\beta_{mod} = 0.12$, $t = 2.32$, $p = 0.02$), suggesting that the benefits of hypermodern agility grow with contextual turbulence. The control variables (size, sector) do not substantially modify the coefficients; however, belonging to the "digital firms" sector reinforces the cognitive reconfiguration link \rightarrow HA during the multi-group analysis (difference of $\beta = +0.09$, $p < 0.05$), which corroborates the qualitative indices of shorter learning cycles.

Table 6. Detailed results of structural relations.

Tested relationships	B	t	p	R ²
Cognitive Reconfiguration \rightarrow Hypermodern Agility (HA)	0.34	7.21	<0.001	0.62 (AH)
Coordination plasticity \rightarrow AH	0.28	5.18	<0.001	
Ecosystem reflexivity \rightarrow HA	0.31	6.43	<0.001	
AH \rightarrow Strategic Performance (SP)	0.42	8.05	<0.001	0.49 (PS)
AH \rightarrow Organizational Sustainability (OD)	0.35	6.72	<0.001	0.45 (OD)

Complementary analyses confirm the robustness of these results. The Importance–Performance Map Analysis (IPMA) reveals a high importance of Hypermodern Agility (HA) for both performance and sustainability, while the lowest-performing dimension remains ecosystem reflexivity—a priority area for improvement in order to convert agility into enduring value. Checks for common method bias indicate no major risk (single-factor variance $< 50\%$; rooted VIF < 3.3). Finally, PLS-Predict forecasting tests show prediction errors lower than those of a linear benchmark for the main performance indicators, thereby confirming the model's practical relevance. Taken together, the convergence of the two empirical strands validates the view that hypermodern agility is a composite construct grounded simultaneously in renewed cognitive routines, flexible coordination architectures, and ecosystemic learning loops. It enhances both strategic performance and organizational sustainability, particularly in environments marked by uncertainty. These findings thus provide a robust empirical foundation for a theory of hypermodern agility, specifying its generative mechanisms and conditions of effectiveness, while also identifying concrete levers of action for organizations operating within highly volatile ecosystems.

6. Development of the Theory

6.1. Formalization of the Hypermodern Agility Theory

The empirical results obtained and the abductive iterations between data and literature make it possible to formalize the theory of hypermodern agility as an explanatory framework for organizational adaptation in a context of radical uncertainty and, therefore, in turbulent times.

Hypermodern agility, a captivating concept, which is defined as the systemic capacity of an organization to simultaneously reconfigure its cognitive traditions (paradigms), coordination structures, and ecosystem relationships in response to environments characterized by technological acceleration, interconnected complexity, and market volatility.

Unlike so-called "classic" agility, which focuses on the speed of execution or the flexibility of processes, hypermodern agility is based, as illustrated in Figure 5, on a double dynamic: internal organizational plasticity (cognitive reconfiguration and modular structures) and external ecosystem reflexivity (collective learning, adaptive governance, emerging technologies). This theoretical model highlights the idea that organizational performance and sustainability depend less on the speed of reaction alone than on the ability to continuously recompose decision-making frameworks and inter-organizational links, in a logic of co-evolution with the environment.

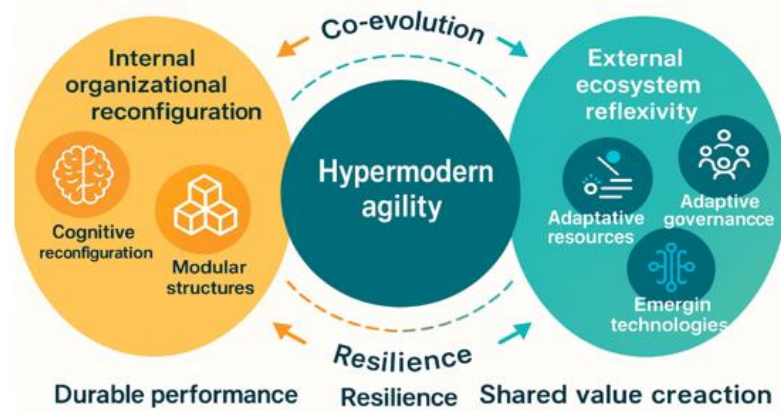


Figure 5. Double dynamique de l'agilité hypermoderne.

“Hypermodern agility” responds to a managerial constraint that has become structural: instability is no longer a temporary anomaly but the ordinary operating regime of markets, technologies, and regulatory frameworks. Classical approaches to agility—focused on execution speed or process flexibility—remain effective for absorbing tactical fluctuations. They fail, however, to address the combined challenges of radical uncertainty, ecosystem interdependence, and nested temporal horizons. The proposed theory—linking internal organizational plasticity with external ecosystem reflexivity—fills this gap by connecting cognitive reconfiguration in decision-making, modular structural design, and collective learning with partners. For executives, the value is twofold. Internally, cognitive reconfiguration equips decision-making under weak signals through short sensemaking loops, controlled experimentation, and explicit exception rules.

Structural plasticity—modular teams, decoupled product and data architectures, and option-based portfolios—reduces recombination costs and accelerates strategic pivots without destabilizing the operational core. Externally, ecosystem reflexivity institutionalizes co-evolution mechanisms with customers, suppliers, regulators, and communities: data sharing, adaptive governance, and learning clauses embedded in contracts. This dual dynamic transforms uncertainty into a capacity for strategic iteration rather than a source of value erosion. Managerial relevance is evidenced by measurable, actionable effects. Sustainable performance improves when the firm couples velocity indicators (time-to-learn, cycle time) with robustness metrics (recovery rate, supplier diversity) and links these metrics to governance commitments (traceability, algorithmic ethics). Sectoral examples confirm the approach: remote software updates in the automotive industry, reconfiguration of healthcare networks through telemedicine, and supply-chain security achieved via “friend-shoring” and digital twins. In short, hypermodern agility does not prize speed for its own sake; it makes rapid experimentation, resilience, and shared value creation complementary, providing managers with an operational framework to decide quickly, learn accurately, and endure over time.

6.2. Concept of Fractal Temporality

One of the original contributions of this theory lies in the introduction of the concept of fractal temporality. Inspired by work on complexity (Prigogine & Stengers, 2003) and recent reflections on organizational rhythms (Reinecke & Ansari, 2015), this notion refers to the ability of organizations to articulate short-, medium- and long-term horizons in an interlocking manner. Hypermodern agility implies the simultaneous management of several time scales:

1. The short term, marked by rapid decision-making cycles and iterative experimentation, ensures immediate responsiveness to weak signals.
2. The medium term, which focuses on consolidating learning and temporarily stabilizing innovations, makes it possible to integrate adjustments into reproducible processes.
3. Finally, the long-term maintains a strategic orientation towards economic, social, and environmental sustainability.

Fractal temporality suggests that these horizons do not add up in a linear fashion, but reflect and fit into each other, with each short-term decision bearing the seeds of repercussions on medium- and long-term trajectories. This approach makes it possible to go beyond the traditional opposition between exploitation and exploration (March, 1991), by showing that true agility consists in maintaining a co-presence of temporalities, where daily micro-adjustments feed into long-term strategic choices while being themselves reoriented by sustainable ends.

6.3. Implications for the Agile Literature

This theoretical formalization enriches and reconfigures the existing literature on organizational agility. On the one hand, it extends the work on *business agility* (Denning, 2018) by demonstrating that agility cannot be reduced to a set of methodological practices (Scrum, Lean) or to a simple speed of execution. Hypermodern agility introduces a cognitive and ecosystem dimension that places co-creation, adaptive governance, and collective intelligence at the heart of the adaptation process. On the other hand, it complements research on strategic agility (Doz & Kosonen, 2010) by proposing a model capable of reconciling immediate flexibility and long-term vision, thanks to the concept of fractal temporality. Finally, it offers a conceptual response to the limitations of resilience-centric approaches: where resilience mainly aims to return to equilibrium after a shock, hypermodern agility postulates creative instability, in which the organization thrives by exploiting uncertainty as a resource for innovation.

6.4. Contributions to Organizational Theory

Beyond the field of agility, this theory opens up new perspectives for the theory of organizations. It invites us to rethink the organization no longer as an entity seeking to minimize entropy, but as a living system capable of

generating its own complexity to better interact with turbulent environments. By integrating collective intelligence and emerging technologies, hypermodern agility is in line with recent proposals on "augmented learning" organizations (Garud et al., 2021) and on the logic of *dynamic capabilities* (Teece, 2018), while providing them with a temporal and fractal dimension. It suggests that sustainable performance is based on the adaptive co-evolution between structures, technologies, and actors, and not on the accumulation of resources alone. This conceptualization thus contributes to a more detailed understanding of the mechanisms by which organizations transform uncertainty into competitive advantage and societal value.

In short, the theory of hypermodern agility proposes an integrative paradigm where adaptation is not a one-off reaction, but a continuous practice of cognitive, organizational and ecosystem recomposition, articulated to multiple and interlocking temporalities.

7. Discussion and Implications

7.1. Theoretical Contributions: Moving Beyond Traditional Agility Models

The empirical results and the formalization of the concept of hypermodern agility invite us to reconsider the classical theoretical frameworks of organizational agility. Where traditional agility remains focused on speed of execution, procedural flexibility, and optimization of development cycles (Highsmith, 2002; Denning, 2018), hypermodern agility introduces cognitive and ecosystem thickness. It is not limited to the ability to react to turbulence but aims at the proactive co-evolution of organizations with environments marked by hypercomplexity and technological acceleration. In this sense, it extends the work on *dynamic capabilities* (Teece, 2018) and strategic agility (Doz & Kosonen, 2010) while going beyond them, by integrating a logic of fractal temporality that simultaneously articulates the short, medium, and long term. This perspective enriches organizational theory by placing reflexivity and collective intelligence at the heart of adaptation, and by showing that stability is no longer an objective, but a transitory effect of continuous learning.

7.2. Managerial Implications: Algorithmic Governance, Strategic Management, and Organizational Learning

On the managerial level, the theory of hypermodern agility offers benchmarks for rethinking the governance of organizations in the digital age.

- **Algorithmic governance:** The results show that the integration of artificial intelligence and predictive analytics tools requires transparent and ethical regulatory mechanisms (Dignum, 2020). Managers must develop protocols that ensure the explainability of algorithms, data protection, and human oversight of automated decisions.
- **Strategic management:** Hypermodern agility calls for a dynamic strategy, capable of continuously adjusting priorities and resource allocations according to signals from the ecosystem. This requires real-time monitoring and *feedback* systems, but also an internal culture that values rapid experimentation and iterative correction rather than fixed planning.
- **Organizational learning:** Iteration between decision-making levels and the involvement of external stakeholders reinforce collective learning. Leaders must create spaces for dialogue, co-creation, and knowledge transfer in order to transform uncertainty into a resource for innovation. This ability to learn becomes a source of resilience and a key factor in sustainable performance.

7.3. Societal Implications: Sustainability and Inclusion in Emerging Ecosystems

Beyond organizations, hypermodern agility has major societal implications. The study highlights that ecosystem capable of absorbing and redistributing innovation – territories, business networks, communities of practice – can transform uncertainty into collective opportunity.

- **Sustainability:** the articulation between adaptive governance and emerging technologies promotes the emergence of economic models that are resource-efficient and resilient to climate shocks. Permanent reconfiguration mechanisms make it possible to integrate environmental constraints into the design of products and services, thus meeting the imperatives of energy transition and carbon neutrality.
- **Inclusion:** By valuing collective intelligence and open access to data, hypermodern agility creates the conditions for the participation of traditionally marginalized groups. Collaborative platforms, open educational resources and distributed decision-making processes pave the way for a contribution economy, in which the diversity of knowledge becomes a source of competitiveness and cognitive justice.

7.4. Towards Systemic Transformation

In short, hypermodern agility is not just a managerial methodology or a one-off adaptation. It represents a new governance paradigm that links organizational performance with social and environmental responsibility imperatives. Organizations that manage to combine algorithmic governance, adaptive strategic steering, and collective learning are not content to survive uncertainty; they actively participate in building more inclusive and sustainable societies. This perspective paves the way for future research on the institutional, cultural, and technological conditions that facilitate or hinder the appropriation of hypermodern agility in different geopolitical contexts.

8. Limitations and Future Research Directions

Although this study offers an original conceptualization of hypermodern agility, it is not without limitations—each of which suggests promising avenues for further inquiry. The first limitation concerns sectoral and geographical generalization. The empirical investigation focused on innovative SMEs, digital enterprises, and non-governmental organizations operating primarily in African and francophone contexts. While the diversity of sectors and countries provides a rich empirical foundation, it does not support claims of universal validity. Economic ecosystems differ across institutional regulations, levels of digitalization, and organizational cultures. Comparative studies in other regions—Latin America, Asia, or Europe—as well as in capital-intensive industries

such as aerospace or pharmaceuticals would allow for testing the robustness of the model and identifying potential contextual variations in the mechanisms of cognitive reconfiguration, organizational plasticity, and ecosystem reflexivity.

A second limitation lies in the absence of longitudinal and experimental designs. The abductive research strategy enabled the integration of qualitative exploration and quantitative validation, but it captures adaptive dynamics at a single point in time.

Yet hypermodern agility unfolds through cycles of learning, technological disruption, and ecosystem recomposition that cannot be fully apprehended through a cross-sectional approach.

Longitudinal studies following the same organizations over several years would make it possible to measure the evolution of adaptive capacities and to verify the stability of the observed relationships—particularly the mediating effect of agility on strategic performance and organizational sustainability. Similarly, experimental settings, such as controlled simulations or open-innovation pilot projects, would provide opportunities to test causally the impact of cognitive reconfiguration or algorithmic governance on resilience indicators.

Finally, this research invites interdisciplinary dialogue to deepen understanding of hypermodern agility. Concepts such as *fractal temporality* or *augmented collective intelligence* extend beyond the traditional boundaries of management and would benefit from engagement with other disciplines. Organizational sociology could illuminate the dynamics of power, legitimacy, and institutional change that underpin the plasticity of coordination structures. Data science could contribute advanced methods to analyze real-time information flows, detect weak signals, and model interactions within complex ecosystems. Political science, in turn, could examine the implications of algorithmic governance for public regulation and digital sovereignty.

By acknowledging these limitations, the present study does not aim to close the debate but to open a research agenda on how organizations transform uncertainty into a resource for innovation and sustainability.

Hypermodern agility, as outlined here, is less an endpoint than a scientific project in progress—one that calls for comparative, longitudinal, and interdisciplinary investigations to refine its mechanisms and extend its theoretical and practical reach.

9. Conclusion

This research proposes an integrated conceptualization of hypermodern agility as an explanatory framework for organizational adaptation in environments marked by uncertainty, technological acceleration, and systemic complexity. By adopting an abductive design that combines a systematic literature review, multi-sector qualitative investigations, and quantitative validation through PLS-SEM, the study identifies three constitutive mechanisms, cognitive reconfiguration of decision routines, plasticity of coordination structures, and reflexivity within innovation ecosystems—which, when combined, grant organizations an unprecedented capacity for continuous recomposition.

The introduction of fractal temporality, highlighting the interweaving of short-, medium-, and long-term horizons, enriches the agility literature by moving beyond the simple opposition between immediate flexibility and strategic vision, thereby opening new perspectives for organizational theory.

Practically, these findings provide managers with guidance for designing transparent algorithmic governance systems, adaptive strategic steering mechanisms, and collective learning arrangements that foster inclusion and sustainability. They demonstrate that performance stems not merely from execution speed, but from the ability to continuously interlink structures, technologies, and actor communities within a logic of co-evolution.

Beyond these contributions, hypermodern agility remains an emergent field requiring repeated and diversified empirical tests to consolidate its theoretical reach and to assess the transferability of the identified mechanisms across sectors and geopolitical contexts. Longitudinal studies, controlled experiments, and international comparative analyses would help evaluate the stability of the observed relationships and refine understanding of moderating effects related to environmental turbulence, digital maturity, or institutional configuration. This openness also calls for interdisciplinary enrichment: organizational sociology can shed light on power dynamics and legitimacy processes underpinning the plasticity of coordination structures; data science offers advanced methods for real-time analysis of information flows and detection of weak signals; and political philosophy can contribute to debates on digital sovereignty and algorithmic ethics.

In sum, this study does not claim to close the discussion on hypermodern agility; rather, it represents a first theoretical and empirical formalization, inviting scholars and practitioners to extend the investigation. The challenge is to develop an organizational science capable of capturing the complexity of contemporary ecosystems, where adaptive capacity is no longer limited to surviving change, but consists in transforming uncertainty into an opportunity for value creation, cognitive justice, and collective resilience.

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