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Strategic Risk in Algorithmically Mediated Markets: Understanding Uncertainty, Dependence, and Competitive Volatility in Data-Driven Industries

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Abstract

Algorithmically mediated markets now dominate data-driven industries, where visibility, pricing, ranking, and resource allocation are governed by opaque automated systems rather than direct human negotiation. This theory-development article synthesizes peer-reviewed studies to advance a novel conceptual explanation of strategic risk—the emergent, self-reinforcing exposure arising from the interplay of uncertainty, dependence on algorithmic intermediaries, and competitive volatility. Traditional strategy frameworks fail to capture how platform ecosystems invert firm boundaries, how algorithmic opacity exacerbates information asymmetry, and how automated feedback loops accelerate market instability. We argue that strategic risk is not merely an external shock but a systemic property generated by algorithmic governance itself. Dependence on digital infrastructures locks organizations into structural vulnerabilities, while rapid changes in recommendation and ranking algorithms create unpredictable volatility that propagates across ecosystems. The article develops six theoretical propositions that delineate causal pathways from algorithmic mediation to heightened risk exposure and identifies organizational responses that may either mitigate or inadvertently amplify instability. A conceptual model visualizes these dynamics, highlighting directional flows and reinforcing feedback loops. By reframing strategic risk as endogenous to algorithmically governed markets, the framework offers new avenues for digital business and strategy theory, emphasizing the need for algorithmic resilience capabilities. Practical implications underscore the limits of conventional risk management in platform-dominated environments.

Keywords Digital ecosystems, Algorithmic markets, Strategic risk, Platform dependence, Competitive volatility, Uncertainty

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Introduction

Data-driven industries have undergone a profound transformation in which algorithms function as primary market intermediaries. Platforms such as Amazon, Google, Uber, and emerging decentralized marketplaces no longer simply facilitate transactions; they actively shape competitive conditions through automated decision systems that determine visibility, pricing, resource allocation, and consumer access [1]. Firms operating in these

environments confront a distinctive form of strategic risk that differs markedly from traditional market or technological uncertainties. This risk emerges from the simultaneous presence of deep uncertainty about algorithmic logic, structural dependence on proprietary digital infrastructures, and heightened competitive volatility driven by real-time automated adjustments [2–7].

The scale of this shift is evident in the rapid concentration of market power within platform ecosystems. Developers

and complementors increasingly invert traditional firm boundaries, relying on platform-provided data, ranking mechanisms, and recommendation engines to reach customers [7]. Yet this reliance introduces profound vulnerabilities. A single algorithmic update can instantaneously alter a firm's market position, rendering prior strategies obsolete within hours [8, 9]. Such volatility is compounded by the opacity inherent in machine-learning models, which obscure the causal links between inputs and outputs and prevent firms from anticipating or contesting competitive moves [1, 10–18].

Existing strategy literature, rooted in industrial organization economics or the resource-based view, struggles to explain these dynamics. Classic frameworks assume relatively stable market signals and transparent competitive interactions [19–22]. In algorithmically mediated markets, however, signals are algorithmically curated, information asymmetries are engineered rather than accidental, and competitive actions propagate through network effects at unprecedented speed [15, 16]. Recent studies document how algorithmic pricing can facilitate tacit collusion without explicit coordination [17, 19], how platform governance decisions reshape entire ecosystems, and how sudden deplatforming events expose firms to existential risk [5, 23–26]. These phenomena point to an urgent need for a theory that treats strategic risk as an endogenous outcome of algorithmic mediation rather than an exogenous shock.

This article addresses that gap by developing an integrated theoretical account of strategic risk in algorithmically mediated markets. We focus on three interlocking mechanisms: (1) strategic uncertainty arising from algorithmic opacity and information asymmetry [1, 13, 22], (2) structural dependence on digital intermediaries that creates lock-in and power asymmetries [7, 9, 24], and (3) competitive volatility generated by automated visibility, ranking, and recommendation systems [12, 16, 20]. These mechanisms interact through feedback loops that amplify instability across platform ecosystems [9, 10, 25]. The resulting strategic risk manifests as unpredictable exposure to market repositioning, resource reallocation, and value-capture erosion, often occurring faster than organizations can adapt.

Our contribution is threefold. First, we synthesize fragmented literatures on algorithmic markets, platform dependence, and ecosystem dynamics to reveal previously unconnected pathways of risk emergence [4, 11, 27]. Second, we advance six novel propositions that specify

causal relationships and feedback dynamics, moving beyond descriptive accounts toward explanatory theory [13, 14, 22]. Third, we present a conceptual model that maps the cyclical nature of strategic risk, illustrating how market outcomes feed back into renewed dependence and vulnerability.

The remainder of the article proceeds as follows. The next section synthesizes theoretical foundations from recent peer-reviewed research. We then introduce the core theory-development section, articulate the propositions, and present the conceptual model. By theorizing strategic risk as a systemic feature of algorithmically governed competition, this framework equips digital strategy scholars and practitioners with a language and logic for navigating environments where uncertainty, dependence, and volatility are not anomalies but defining characteristics.

Theoretical Foundations and Literature Synthesis

Scholarship on algorithmically mediated markets has coalesced around several interrelated streams that, when synthesized, reveal the contours of strategic risk. The first stream examines algorithmic decision-making and its implications for market opacity. Studies demonstrate that machine-learning systems used for pricing, ranking, and recommendation introduce fundamental incomputability and contingency into exchange processes [15]. Adversarial competition and collusion become possible precisely because algorithms optimize in opaque, high-dimensional spaces where human oversight is limited [1, 17]. Information asymmetry is no longer a market failure but a designed feature: firms cannot fully observe or reverse-engineer the rules governing visibility and access [18, 19, 28].

A parallel literature on platform ecosystems highlights structural dependence as a core strategic condition. Platforms invert traditional firm boundaries by providing infrastructural resources—data, algorithms, and marketplaces—that complementors cannot replicate independently [7, 11]. This dependence creates both value-creation opportunities and profound lock-in risks. Ecosystem generativity tensions arise when platform owners alter governance rules, suddenly shifting value capture toward the platform core [5, 25]. Empirical cases in healthcare, mobility, and manufacturing illustrate how reliance on platform infrastructures exposes organizations

to the risk of collapse when ecosystems falter [8–10]. Power dynamics within these ecosystems further intensify dependence, as platform owners exercise unilateral control over algorithmic parameters that determine complementor success [24, 26].

Competitive volatility emerges as the third foundational theme. Automated systems generate rapid, unpredictable shifts in market conditions through real-time adjustments to ranking, recommendation, and pricing algorithms [12, 16, 20]. Unlike traditional markets where competitive moves unfold over months or years, algorithmic mediation compresses reaction times to minutes or seconds, producing cascades of repositioning [13, 22]. High-impact, low-probability events—such as sudden deplatforming or algorithmic policy changes—amplify this volatility [23]. Research on innovation ecosystems shows that uncertainty propagates through network ties, turning localized algorithmic tweaks into ecosystem-wide instability [13, 14].

Risk propagation and feedback dynamics constitute a fourth integrative stream. Platform collapses reveal how dependence and volatility interact to create self-reinforcing cycles [9]. Resilience studies of mobility platforms during external shocks underscore the role of ecosystem-level coordination but also highlight limits when algorithmic governance remains centralized [10]. Governance mechanisms, including blockchain experiments, attempt to address openness paradoxes but frequently reproduce new forms of dependence [21]. Ethical and regulatory analyses further illuminate how algorithmic pricing and personalization create consumer backlash and strategic dilemmas for firms [27, 29].

Collectively, this literature documents the mechanisms of strategic risk but stops short of theorizing their systemic interplay. Most studies remain siloed within disciplinary boundaries—economics of collusion, information systems on platform power, or strategy on ecosystem generativity—leaving unexamined the feedback loops through which uncertainty, dependence, and volatility co-evolve [4, 11, 22]. The present theory-development effort bridges these streams by positioning strategic risk as the central construct that emerges precisely from their interaction under algorithmic governance. This synthesis sets the stage for the propositions and conceptual model that follow, which articulate causal pathways and cyclical dynamics previously treated in isolation.

Table 1 clarifies the construct architecture of strategic risk by distinguishing its core dimensions, transmission mechanisms, and organizational manifestations within algorithmically mediated markets.

Table 1. Dimensions of strategic risk in algorithmically mediated markets

Dimension	Core theoretical meaning	Primary mechanism in the manuscript
Market uncertainty	Inability to infer how algorithmic rules shape outcomes	Algorithmic opacity, incomputability, and information asymmetry
Platform dependence	Structural reliance on intermediaries that control market access and key digital infrastructures	Lock-in, asymmetric governance control, data, and API dependence
Competitive volatility	Rapid, non-linear instability in competitive positioning caused by automated adjustments	Real-time ranking, recommendation, and pricing updates; cascade effects
Strategic exposure	Realized vulnerability to losses in positioning, value capture, or resource access	Combined effect of uncertainty, dependence, and volatility
Risk recognition	Organizational awareness	Interpretation of volatile outcomes

	that algorithmic mediation is generating systemic exposure	through monitoring and sensemaking
Strategic adjustment	Deliberate response intended to mitigate or redirect algorithmic exposure	Monitoring, multihoming, repricing, policy adaptation, and influence attempts
Resilience/renewed vulnerability	Divergent but temporary outcomes of adaptation under algorithmic governance	Uneven effectiveness of meta-capabilities and feedback loops

Strategic Risk Emergence in Algorithmically Mediated Markets: The Interplay of Uncertainty, Dependence, and Competitive Volatility under Algorithmic Governance

Building directly on the synthesized foundations, this section develops an original theoretical explanation of how strategic risk emerges and evolves in algorithmically mediated markets. We define strategic risk as the organization-level exposure to unpredictable loss of competitive positioning, value capture, or resource access resulting from the interplay of algorithmic opacity, platform dependence, and automated volatility. The theory posits that these elements do not operate independently but form a dynamic system in which each amplifies the others through feedback loops.

Algorithmic mediation and market uncertainty

Algorithmic systems introduce radical uncertainty by rendering market signals opaque and contingent. Firms

cannot reliably forecast how changes in data inputs or model parameters will alter their visibility or pricing outcomes [1, 15, 18].

Proposition 1
Greater algorithmic opacity in mediated markets increases strategic uncertainty by systematically exacerbating information asymmetry, thereby limiting firms’ ability to anticipate or contest competitive actions [1, 17, 19, 28].

Strategic dependence on digital intermediaries

Dependence arises when organizations embed core activities within proprietary platform infrastructures that they cannot replicate or exit without substantial loss [7, 9, 24]. This structural lock-in transforms platform owners into de facto governors of market access.

Proposition 2
Heightened dependence on algorithmic intermediaries amplifies strategic risk by creating lock-in effects that expose firms to unilateral governance changes and sudden value redistribution [7, 9, 23, 25].

Competitive volatility in data-driven markets

Automated ranking, recommendation, and pricing systems generate continuous, non-linear shifts in competitive conditions. Visibility can evaporate or surge within hours, producing cascades of repositioning across ecosystems [12, 16, 20].

Proposition 3
Automated visibility and recommendation mechanisms generate competitive volatility by compressing reaction times and propagating localized algorithmic adjustments into ecosystem-wide instability [12, 13, 16, 20].

Organizational exposure to algorithmic risk

Firms experience strategic risk as concrete exposure when uncertainty and volatility intersect with dependence. Recognition of this exposure prompts adaptive responses, yet adaptation itself can reinforce the underlying mechanisms [4, 11, 22].

Proposition 4

Organizational exposure to algorithmic risk is mediated by the degree of platform dependence, such that higher dependence intensifies the translation of uncertainty and volatility into realized strategic losses [4, 11, 24].

Feedback amplification and adaptive response

Market outcomes feed back into the system. Successful adaptations may temporarily enhance resilience but often increase dependence on the very algorithmic systems that generated the risk, while unsuccessful ones accelerate volatility [9, 10, 13].

Proposition 5

Feedback loops within algorithmically mediated markets reinforce strategic risk by converting firm-level adaptations into collective amplification of uncertainty and volatility [9, 10, 13, 25].

Proposition 6

Under conditions of high algorithmic governance, firms' attempts to develop meta-capabilities for monitoring and influencing algorithms create path-dependent trajectories that alternate between temporary resilience and renewed vulnerability [11, 22, 26]. Table 2 consolidates the article's six propositions into a unified causal map, showing how antecedent conditions, mechanisms, and system-level implications jointly explain the endogenous emergence of strategic risk.

Table 2. Proposition-to-mechanism map of strategic risk emergence and adaptive reinforcement

Proposition	Causal claim	Antecedent condition(s)
P1	Greater algorithmic opacity increases strategic uncertainty	High black-box decision-making, low observability of ranking/pricing logic

P2	Dependence on algorithmic intermediaries amplifies strategic risk through lock-in	Heavy reliance on platform infrastructures, proprietary data channels, and limited exit options
P3	Automated visibility and recommendation systems generate competitive volatility	Continuous ranking/recommendation updates, compressed algorithmic reaction cycles
P4	Platform dependence mediates the translation of uncertainty and volatility into realized loss	Simultaneous presence of opacity and automated instability under high dependence
P5	Feedback loops convert firm adaptation into collective amplification of risk	Firms respond simultaneously to common algorithmic signals
P6	Meta-capabilities create path-dependent cycles of temporary resilience and renewed vulnerability	High algorithmic governance and repeated exposure to mediated shocks

The model is structured as a cyclical system with four primary nodes, as shown in Figure 1.

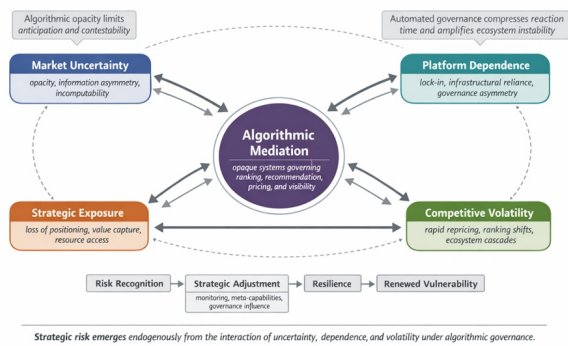


Figure 1. Conceptual model of strategic risk emergence in algorithmically mediated markets

This theory positions strategic risk as an emergent, self-sustaining property of algorithmically governed markets rather than a transient condition. The propositions and model provide testable conceptual relationships that extend beyond prior fragmented accounts, offering a foundation for future empirical and normative work in digital business strategy.

Algorithmic Governance and the Pathways to Strategic Resilience: Organizational Adaptation and Market Stability in Data-Driven Ecosystems

Algorithmic mediation and the limits of traditional risk management

Traditional risk-management frameworks, whether drawn from financial portfolio theory or supply-chain resilience models, presuppose that market signals are observable, competitive moves are interpretable, and adaptation occurs within relatively predictable time horizons [13, 22]. In algorithmically mediated markets, however, these assumptions collapse. Algorithmic opacity transforms risk from a calculable variance into an emergent property that resists quantification: firms cannot assign probabilities to outcomes when the governing rules themselves evolve through continuous machine-learning updates [1, 15, 18]. A pricing algorithm tweak on one platform can instantaneously ripple into recommendation downgrades across interconnected ecosystems, yet the precise causal

chain remains hidden behind proprietary black boxes [17, 19, 28].

This opacity forces organizations to confront a fundamental strategic paradox. Conventional tools such as scenario planning or real-option analysis rely on the ability to model alternative futures; yet when market visibility, consumer access, and even input costs are algorithmically determined, the input parameters for such models are themselves unstable [12, 16]. Proposition 1 gains further explanatory power here: the very mechanisms designed to reduce transaction costs—automated matching and ranking—systematically amplify information asymmetry, rendering ex-ante risk assessment ineffective [1, 17]. Firms that cling to legacy risk dashboards, therefore, experience repeated strategic surprises, as seen conceptually in cases where sudden deplatforming events erase years of ecosystem investment overnight [9, 23].

The literature synthesis underscores that algorithmic mediation does not merely add noise; it reconfigures the epistemology of strategy itself. Where earlier platform studies emphasized value co-creation through generativity [5, 7], the present theory reveals the darker corollary: generativity itself becomes a vector of risk propagation when platform owners unilaterally recalibrate algorithmic parameters [25, 26]. Organizations must therefore shift from static risk registers to dynamic, meta-algorithmic monitoring systems—capabilities that track not only market outcomes but also the latent logic shifts within the mediating code [11, 22]. Without such reorientation, traditional risk management devolves into post-hoc damage control, perpetually one algorithmic update behind the volatility curve [4, 20]. This limitation extends beyond individual firms: entire industries risk systemic fragility when collective dependence on a handful of algorithmic gatekeepers concentrates exposure [8, 24].

Moreover, the ethical dimension compounds these limits. Algorithmic pricing and personalization, while optimizing short-term efficiency, embed moral hazards that traditional frameworks ignore [27, 29]. Consumer backlash against perceived price gouging or biased recommendations can trigger regulatory scrutiny, further destabilizing already volatile positioning [28]. Thus, strategic resilience demands not only technical monitoring but also normative foresight—anticipating how algorithmic decisions intersect with societal expectations. The theory advanced here, therefore, calls for an expanded risk ontology: one that treats algorithmic mediation as an active shaper of uncertainty

rather than a neutral infrastructure [15, 18]. Only by internalizing this reconceptualization can organizations move beyond reactive compliance toward proactive reconfiguration of their algorithmic exposure.

Strategic dependence and the quest for diversified platform engagement

Proposition 2 highlights how dependence on digital intermediaries locks firms into positions of structural vulnerability. Once core operations are embedded within proprietary ecosystems—data pipelines, recommendation engines, cloud infrastructures—exit costs skyrocket, creating a form of algorithmic hold-up [7, 9, 24]. This dependence is not merely technical; it is strategic and cognitive. Managers internalize platform metrics (click-through rates, ranking scores, conversion probabilities) as primary success indicators, gradually subordinating independent strategic judgment to algorithmic feedback [11, 20]. The result is a subtle erosion of organizational autonomy: what begins as efficiency-seeking morphs into existential reliance [25].

Diversification across multiple platforms offers a conceptual antidote, yet the theory reveals its inherent tensions. Multihoming—participating in several ecosystems simultaneously—can theoretically dilute dependence [12, 20], yet it simultaneously multiplies exposure to divergent algorithmic logics. A firm optimizing for Amazon's ranking algorithm may inadvertently degrade its Google Shopping visibility, while Uber-like mobility platforms impose conflicting governance rules [10, 23]. Proposition 4 clarifies this mediation effect: dependence intensity determines how uncertainty and volatility translate into realized losses. Higher dependence compresses the window for corrective action, turning diversification attempts into resource-draining balancing acts [4, 24].

Literature on ecosystem power dynamics further illuminates the governance asymmetry at play [21, 26]. Platform owners retain unilateral rights to alter terms, introduce new fees, or deprecate APIs, while complementors bear the costs of adaptation. Blockchain-based governance experiments, though promising in theory, often reproduce similar dependencies under new technological guises [21]. True resilience, therefore, requires hybrid strategies: selective deepening of core platform relationships paired with deliberate investment in boundary-spanning capabilities—open-source algorithm auditing tools, cross-platform data portability protocols, and even collective

advocacy coalitions among complementors [5, 11]. Such moves, however, risk triggering retaliatory algorithmic adjustments, illustrating the self-reinforcing nature of dependence [9, 25].

At the ecosystem level, strategic dependence also reshapes competitive advantage. Firms that master “platform diplomacy”—negotiating opaque rule changes through data-sharing agreements or beta-testing partnerships—gain temporary buffers [8, 26]. Yet these relational capabilities themselves deepen entanglement, creating path-dependent trajectories in which short-term survival trades off against long-term independence [13, 22]. The theory thus reframes diversification not as a simple portfolio decision but as a dynamic capability for modulating dependence gradients. Organizations must continually recalibrate their embeddedness, treating platform relationships as adjustable parameters rather than fixed infrastructures. Failure to do so perpetuates the lock-in cycle described in Proposition 2, wherein each adaptation layer reinforces the very dependence it seeks to mitigate [7, 23].

Competitive volatility and the development of real-time adaptive capabilities

Automated systems compress competitive time scales from quarters to seconds, generating the volatility formalized in Proposition 3 [12, 16, 20]. Ranking fluctuations, recommendation cascades, and pricing micro-adjustments create non-linear repositioning waves that propagate faster than human decision loops can process [13, 22]. Traditional notions of sustained competitive advantage dissolve when visibility can evaporate overnight due to an opaque model retraining [1, 18]. Firms must therefore cultivate real-time adaptive capabilities: continuous A/B testing infrastructures, sentiment-monitoring layers atop algorithmic outputs, and scenario simulators that model hypothetical ranking shifts [4, 11].

These capabilities, however, are themselves algorithmically entangled. To monitor one platform's recommendation engine, organizations often rely on the platform's own analytics APIs—further deepening dependence [24, 26]. Proposition 5 captures the amplification effect: individual adaptations aggregate into collective volatility. When thousands of complementors simultaneously optimize for the same algorithmic signals, herding behavior emerges,

producing flash crashes in visibility or artificial demand spikes that then trigger corrective algorithmic interventions [9, 10]. The resulting feedback loop turns micro-adjustments into macro-instability.

Real-time adaptation also raises questions about organizational design. Centralized command-and-control structures prove too sluggish; instead, polycentric decision architectures—where frontline teams hold delegated authority to tweak algorithmic inputs—become essential [14, 22]. Yet, decentralization introduces coordination risks: divergent local optimizations may undermine the overall ecosystem's positioning [5, 25]. The theory, therefore, advocates hybrid governance: algorithmic “control towers” that aggregate real-time signals while preserving tactical agility at the edges. Such structures enable firms to surf volatility rather than merely endure it, converting unpredictable shifts into sources of transient advantage [12, 16].

Longer-term, competitive volatility demands investment in anticipatory intelligence—reverse-engineering patterns across historical algorithmic updates, crowdsourcing complementary experiences, and even participating in open algorithmic commons where feasible [21, 28]. These meta-capabilities, as articulated in Proposition 6, create path-dependent trajectories: firms that invest early gain compounding advantages in prediction accuracy, while laggards fall into perpetual catch-up mode [11, 26]. Ultimately, volatility is not an externality to be managed but an intrinsic feature of algorithmic governance that rewards those who internalize its rhythm.

Feedback amplification: designing interventions for ecosystem stability

The cyclical dynamics visualized in Figure 1 reveal how market outcomes reinforce dependence and uncertainty. Successful short-term adaptations—such as rapid repricing or content reformulation—often increase reliance on the very platforms that generated the volatility, while unsuccessful ones accelerate deplatforming risks [9, 10, 25]. Proposition 5, therefore, underscores the need for deliberate feedback interventions. Ecosystem-level coordination mechanisms, ranging from industry consortia to shared algorithmic sandboxes, can dampen amplification [8, 13]. Yet designing such interventions requires overcoming collective-action problems: no single firm benefits from unilateral transparency when competitors free-ride [17, 19].

Interventions must also address the ethical feedback loops identified in recent scholarship [27, 29]. Algorithmic systems that optimize for engagement can inadvertently amplify misinformation or bias, triggering consumer distrust that further destabilizes market signals [28]. Strategic resilience thus incorporates proactive ethical guardrails—transparent model documentation requirements, bias-auditing protocols, and consumer-facing explainability features—that stabilize both market and societal legitimacy [1, 15].

Toward meta-level governance: implications for digital strategy theory

The propositions collectively challenge strategy scholars to move beyond platform generativity or ecosystem orchestration metaphors toward a systemic risk lens. Digital strategy must now theorize organizations as nodes within self-reinforcing algorithmic circuits rather than autonomous actors [7, 11, 22]. Future theory development should explore boundary conditions: do certain industry characteristics (high vs. low data intensity) moderate the intensity of strategic risk? How do regulatory interventions—such as mandated algorithmic audits—alter the feedback loops depicted in Figure 1? These questions extend the present framework, offering fertile ground for cumulative knowledge building.

Practically, the theory equips managers with diagnostic questions: What is our current dependence gradient across platforms? Which algorithmic signals most drive our volatility exposure? Where can meta-capabilities interrupt amplification loops? By embedding these diagnostics into strategy processes, organizations can transition from passive exposure to active modulation of algorithmic risk. In sum, this section demonstrates that strategic resilience is achievable not by escaping algorithmic mediation but by mastering its endogenous dynamics.

Reconceptualizing Competitive Advantage in the Algorithmic Age—From Transient Positioning to Enduring Resilience

The theory of strategic risk developed across this article reframes the central challenge of digital business strategy. No longer can competitive advantage be understood solely

through resource bundles, network effects, or value-capture mechanisms in isolation [7, 11, 25]. Instead, advantage emerges—or evaporates—within a dynamic system where algorithmic opacity, platform dependence, and automated volatility interact to produce self-sustaining exposure. The six propositions articulate precise causal pathways: opacity breeds uncertainty (Proposition 1), dependence converts that uncertainty into lock-in vulnerability (Proposition 2), volatility propagates through automated channels (Proposition 3), dependence mediates exposure intensity (Proposition 4), adaptations amplify systemic instability (Proposition 5), and meta-capabilities generate oscillating resilience-vulnerability cycles (Proposition 6). **Figure 1** crystallizes these relationships into a visual logic of directional flows and reinforcing loops, providing both scholars and practitioners with a shared mental model for diagnosis and intervention.

This reconceptualization carries profound implications for digital strategy theory. First, it bridges siloed literatures—algorithmic collusion, platform power dynamics, ecosystem generativity, and innovation uncertainty—into a unified explanatory framework [1, 5, 17, 22]. Second, it shifts the unit of analysis from the firm or the platform to the algorithmically mediated market system itself, where risk is endogenous rather than exogenous [9, 13, 15]. Third, it highlights the temporal compression of strategy: decisions that once unfolded over years now unfold in days, demanding new theoretical constructs for real-time sensing, meta-algorithmic learning, and ecosystem-level governance [12, 20, 26]. By treating strategic risk as an emergent property rather than a manageable variable, the framework opens avenues for processual and systems-theoretic extensions that better reflect the lived reality of data-driven competition.

For practitioners, the theory supplies actionable heuristics. Executives should audit dependence gradients, invest in cross-platform observability infrastructures, and cultivate polycentric adaptive structures capable of responding faster than algorithmic updates [4, 11, 24]. Boards must elevate algorithmic risk to the same strategic status as financial or reputational risk, requiring regular stress testing of ecosystem exposure and scenario modeling of governance shifts [23, 25]. At the industry level, collective initiatives—shared benchmarking of algorithmic impacts, joint advocacy for transparency standards, and collaborative resilience protocols—offer the only scalable counter to systemic amplification [8, 10, 21]. The ethical imperatives are equally pressing: firms that embed fairness,

explainability, and consumer-centric design into their algorithmic interactions not only reduce backlash risks but also build durable legitimacy that buffers volatility [27–29].

Limitations of the present theory are deliberate and generative. As a purely conceptual, theory-development manuscript, it synthesizes existing evidence without new empirical tests; future research must therefore subject the propositions to longitudinal case studies, comparative ecosystem analyses, and even agent-based simulations that model feedback loops under varying opacity and dependence conditions [13, 14, 22]. Boundary conditions remain underexplored: the framework may apply with varying intensity across regulated versus unregulated sectors, or across nascent versus mature algorithmic markets. Cultural and institutional moderators—such as varying antitrust regimes, data privacy laws, or national innovation systems—likewise warrant further examination. Nevertheless, these limitations do not diminish the framework's immediate utility; they instead invite cumulative refinement.

Looking forward, the algorithmic age demands a new strategic lexicon. Terms such as “algorithmic resilience capability,” “dependence-modulation strategy,” and “volatility-harnessing meta-governance” must enter the canon alongside established concepts such as dynamic capabilities and ecosystem orchestration. Scholars in digital business and strategy are uniquely positioned to lead this linguistic and conceptual evolution, producing knowledge that equips organizations to thrive amid—not despite—uncertainty, dependence, and volatility. Policymakers, too, benefit from the framework: by recognizing strategic risk as systemic rather than firm-specific, regulators can design interventions that target feedback amplification points (transparency mandates, interoperability requirements, algorithmic impact assessments) rather than merely punishing individual infractions [17, 19, 28].

Conclusion

In conclusion, algorithmically mediated markets have inverted the logic of strategy. Competitive advantage is no longer won through superior resources or positioning alone but through the capacity to navigate, modulate, and occasionally reshape the very algorithmic systems that govern visibility, access, and value. The theory advanced here illuminates how uncertainty, dependence, and volatility co-evolve into strategic risk, while simultaneously charting

pathways toward resilience. By internalizing this systemic view, organizations and scholars alike can move from reactive survival to proactive flourishing in the data-driven economy. The figure and propositions offer both a diagnostic lens and a design blueprint. The imperative is clear: only by theorizing—and ultimately mastering—the endogenous dynamics of algorithmic governance can we secure sustainable advantage in markets where the rules themselves are written, revised, and enforced by code. The future of strategy is algorithmic; the choice before us is whether to remain its subjects or become its architects.

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