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Unifying the Role of IT in Hyperturbulence and Competitive Advantage Via a Multilevel Perspective of IS Strategy

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Abstract

While information technology (IT) serves as a new source of sustainable competitive advantage for firms, it also induces hyperturbulent environments (or hyperturbulence) that erode that sustainable competitive advantage. In this paper, we posit that these contradictions might be due to cross-level nonlinear causality between firm-level IT-based strategic actions and collective-level IT-induced hyperturbulence. We develop a multilevel perspective of IS strategy for theorizing this causality, and unifying novel with established research. Complex adaptive systems theory is employed as the overarching framework for its strength in formalizing cross-level nonlinear causal paths. Using literature-based theorization and agent-based modeling, we establish two bottom-up nonlinear causal paths by which IT drives hyperturbulence: IT can act as an external force (i.e., component IT innovation) to locally instigate firm strategic actions that aggregate to temporary hyperturbulence or as an internal force (i.e., architectural IT innovation) to drive pervasive firm strategic interactions that aggregate to persistent hyperturbulence. Each causal path produces varied amounts of reducible and irreducible uncertainties and thereby renders a top-down nonlinear effect that reshapes the opportunity for IT to contribute to competitive advantage. This multilevel theorization paves the way for new, IS-specific theory regarding IT's unique role in inducing nonlinear dynamics and in affording new business strategies in today's competitive environments.

Keywords: IS strategy, IT innovation, hyperturbulence, generativity, uncertainty, complex adaptive systems, agent-based modeling, role of information, big data