

MISQ Archivist

Connecting the Parts with the Whole: Toward an Information Ecology Theory of Digital Innovation Ecosystems

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Abstract

The remarkable connectivity and embeddedness of digital technologies enable innovations undertaken by a broad set of actors, often beyond organizational and industry boundaries, whose relationships mimic those of interdependent species in a natural ecosystem. These digital innovation ecosystems, if successful, can spawn countless innovations of substantial social and economic value, but are complex and prone to often surprising failure. Aiming to understand ecosystems as a new organizational form for digital innovations, we develop a theory that addresses an underexplored but important question: In a digital innovation ecosystem, how are the efforts of autonomous parties integrated into a coherent whole and what role do digital technologies play in this integration? By synthesizing ecological and information perspectives, we identify several key functions that digital technologies serve in providing the information needed to support the interactions and tasks for innovation in ecosystems of varying scales. This information ecology theory contributes to digital innovation research new insights on managing part–whole relations, the role of digital technologies in innovation, and multilevel interactions in and across digital innovation ecosystems. The theory can also inspire the development of next-generation information systems for ecosystems as a new organizational form.

Keywords: Digital innovation, ecosystem, information, ecology, theory, holon