Humans and machines in the emergence of service ecosystems: Addressing false dichotomy by embracing paradox

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Purpose – To theorize the roles and interactions of humans and nonhumans (machines) in the emergence of service ecosystems (Barile et al., 2019; Storbacka et al., 2016; Vargo et al., 2021; Yadav & Pavlou, 2020). To this end, we: (1) identify and address conceptual confusions (e.g., humans vs. nonhumans as false dichotomy; machines as actors vs. resources) by integrating service research discussion on emergence with insights from computer/information/management sciences (Rahwan et al., 2019; Raisch & Krakowski, 2021); and (2) model and simulate the humans/nonhumans-involving emergence with the agent-based modeling (ABM) (Rand & Rust, 2011; Rand et al., 2018).

Design/Methodology/approach – Taking the conceptual-only paper steps (Vargo & Koskela-Huotari, 2020), we aim at achieving theoretical contribution of "envisioning (revising)" and "relating (integrating)" (MacInnis, 2011). We employ ABM for simulation-based illustrations.

Findings – The recent effort to conceptualize emergence (Taillard et al., 2016; Vargo et al., 2021), in the context of rapid technological advancement (Bryoffsson & McAfee 2014; Ng & Wakenshaw, 2017), calls service researchers for theorizing the roles of not just humans but also machines in service ecosystems, and it invites conceptual confusions: For instance, Storbacka et al (2016) describes machines/technologies as actors, whereas Akaka & Vargo (2013) regards technologies as operant resources.

Employing the automation-augmentation paradox, we address the false dichotomy of "humans vs. nonhumans": Instead of taking automation (machines taking over a human task) vs. augmentation (machines helping humans to perform a task) as tension, Raisch & Krakowski (2021) proposes a paradox view of the two interdependently reinforcing each other across time and space. This helps us to integrate machines as both actors (when replacing humans through automation) and resources (when helping humans through augmentation).

In simulating human-human, human-machine, and machine-machine interactions in the emergence, we incorporate ideas like "nesting" and "reinforced learning" into ABM (Manson, 2005; Rounsevell et al., 2012) and compare it with alternatives (e.g., generative adversarial nets) (Goodfellow et al., 2014).

Research limitations/implications – As a conceptual-only paper with simulation-based illustration, it lacks empirical support.

Practical implications – We intend to help focal actors (Storbacka et al., 2016) or those designing and managing a service ecosystem to effectively manage nonhuman elements of emergence.

Originality/value – Humans are no longer sole agents in our society, yet most service research to date assumes human agency. The paper helps advance theoretical development by addressing this gap in the service literature.

Key words (max 5)
emergence, service ecosystems, actors, resources, human-machine interactions

Paper type – Conceptual paper