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Business Model Redesign for Embodied AI Service Firms: A System Integration Framework from the Airport Context

Jiaxian Cao

University of Sussex, UK

Abstract

Humanoid service robots are now commercially deployed across service-intensive industries, yet most vendors are stuck selling hardware once and walking away. We examine what changes when these firms stop treating each robot as a standalone product and instead organise the fleet as a connected service system. Drawing on business model innovation, platform economics, digital servitisation, and AI-enabled service systems research, we propose a three-layer framework made up of devices, a cloud platform, and service interfaces. The key mechanism is contextual handoff: information from one encounter informs the next, so separate interactions can accumulate into a shared service memory. In business terms, that shift moves the firm toward a B2B2C model. The API Hub supports a second business-facing channel for complementors, while contextual handoff helps passengers experience the system as one journey rather than a string of disconnected encounters. We use the airport as a theorising context (Flyvbjerg, 2006) because it combines multi-zone movement, time pressure, heterogeneous needs, and a mature digital backbone in a single setting. The paper derives six hypotheses and outlines a 2 × 2 online experiment for later testing. Instead of stopping at the level of individual encounters or isolated devices, the analysis asks under what conditions a robot fleet can function as a viable service platform.

Keywords: B2B2C platform, business model innovation, embodied AI, service robots, system integration