LEADING INNOVATION AND CHANGE THROUGH HUMAN–ROBOT INTERACTION ECOSYSTEMS: A MULTIDISCIPLINARY PERSPECTIVE FROM CO-LIVING ENVIRONMENTS

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Abstract - The integration of artificial intelligence and service robotics into everyday environments is reshaping how organisations design, implement, and manage innovation. In co-living ecosystems, where residential, educational, and social functions converge, human–robot interaction (HRI) is emerging as a key enabler of transformation. This paper examines how HRI systems can be leveraged not only as technological solutions but as strategic tools for innovation, leadership, and change management. Using Aspire House in Hong Kong as an illustrative case, the study positions co-living environments as multidisciplinary platforms where technology, human behaviour, and organisational practices intersect and evolve.

Despite growing interest in robotics and smart living, a clear research gap remains in understanding how HRI can be managed as a socio-technical innovation within complex, shared environments. Existing studies largely focus on technical performance or user interface design, with limited attention to the leadership and organisational processes required to support adoption, behavioural change, and sustained engagement. Moreover, there is insufficient integration of multidisciplinary perspectives—such as management, social interaction, and community dynamics—into HRI research. This gap is particularly significant in co-living contexts, where innovation must be collectively negotiated and embedded within daily practices.

Generation Z represents a critical driver of innovation in this setting. As digitally native users, they exhibit strong expectations for personalised, seamless, and socially interactive technologies, which challenge conventional approaches to system design and implementation. Their preferences require leaders and organisations to adopt more adaptive and participatory innovation strategies, where users are actively involved in shaping technological experiences. In this sense, HRI becomes not only a tool for service delivery but also a medium through which leadership facilitates engagement, builds trust, and guides behavioural change.

This study has two objectives:
1. To examine how HRI supports innovation adoption and user engagement in co-living environments.
2. To develop a model for managing change and leadership in HRI-enabled ecosystems.

A qualitative and exploratory approach is adopted, drawing on the Aspire House case and existing literature. Through thematic analysis, the study identifies key dimensions influencing innovation, including user expectations, system adaptability, and community interaction. These dimensions are synthesised into a conceptual framework that links HRI design with leadership practices and change management processes.

The findings highlight that effective innovation in HRI requires leadership approaches that go beyond technical implementation to actively shape user experience and social integration. In the Aspire House context, HRI systems can perform diverse roles, ranging from operational functions such as automated services to interactive roles such as learning support and social facilitation. These roles illustrate how robotics can contribute to both efficiency and community building. However, their success depends on how leaders manage user expectations, encourage participation, and align technological solutions with evolving social needs.

A key insight is that innovation in co-living environments must be managed at both individual and collective levels. Unlike traditional settings, co-living spaces require systems that can support shared experiences, group interaction, and diverse user preferences. This reinforces the need for multidisciplinary approaches that integrate perspectives from management, design, and social sciences. Leadership plays a central role in orchestrating this integration, ensuring that innovation is not only adopted but also sustained through continuous adaptation and feedback.

Theoretical contribution: This study extends existing HRI research by integrating innovation management and leadership perspectives into the design of robotic ecosystems. It proposes a multidisciplinary framework that situates HRI within broader socio-technical systems, highlighting the role of leadership in bridging technological capability and human behaviour.

Practical contribution: The study provides actionable insights for educators, designers, and innovation leaders on how to implement HRI systems in shared environments. It emphasises the importance of participatory design, trust-building, and adaptive management strategies to support successful adoption and long-term engagement.

To sum up, HRI-enabled co-living environments represent a new frontier for innovation and organisational transformation. Achieving this potential requires not only advanced technologies but also effective leadership and multidisciplinary collaboration. By aligning technological innovation with user needs, social dynamics, and management practices, organisations can create adaptive ecosystems that support meaningful and sustainable change.

Keywords - Human–Robot Interaction (HRI), Innovation Management, Change Leadership, Multidisciplinary Collaboration, Co-living Ecosystems