

Toward Integrated Roadmapping: Networked Foresight for Innovation Systems

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Abstract

With the emergence of complex cyber-physical systems, roadmapping is increasingly being used to support the systematic planning and networked foresight of diverse functional activities and issues of technological innovation at inter-organisational levels. However, these multiple, interrelated roadmaps are often disconnected from each other, leading to potential problems such as inefficient use of resources and missed opportunities to participate in future innovations. In order to address these challenges, this paper presents the conceptualisation and design of an integrated roadmapping approach, which allows more systematic and coherent consideration of diverse functional perspectives in broad innovation systems. It is developed by explicitly taking the innovation systems perspective as the theoretical underpinning, so reflecting the systemic, contextual, and evolutionary understanding of innovation that is dominant in the academic field of innovation studies. It also incorporates insights from preliminary case studies of existing roadmapping exercises, closing the gap between theory and practice. Iterating between a high-level overarching roadmap at the innovation system level and a family of sub-roadmaps focusing on various functions of innovation, the integrated roadmapping approach supports their systematic integration and alignment, thus allowing coherent and coordinated strategies in complex innovation systems. Further in-depth case studies of multiple roadmapping exercises are also conducted to develop a process model of integrated roadmapping, addressing practical challenges associated with its organisation and management. The research thus contributes to the theory and practice of roadmapping, which is becoming increasingly important for strategic management of technology and innovation, particularly in complex technological systems such as Industry 4.0.

Keywords: *roadmap, foresight, innovation, smart systems, industry 4.0*

Biography

Jae-Yun Ho is a Research Associate at the Centre for Science, Technology and Innovation Policy (CSTI), University of Cambridge, UK. She obtained a PhD in Engineering (Management & Manufacturing) and an MPhil in Technology Policy, both from University of Cambridge. She also completed BS and MS in Mechanical Engineering at POSTECH, Korea. Her main research interests are in the area of innovation policy and management, with particular focus on technology foresight and roadmapping.