

## How do the innovative technologies spread?

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### Abstract

Technological innovation has been influencing the economy and society. It is essential in order to survive intense competition and market saturation. It may be effective to pursue the technological innovation in emerging areas. The emerging areas have various topics, and such topics experience the evolution, such as the co-existence, competition, or extinction. Therefore, understanding the topic dynamics of emerging innovations can contribute to further pursuing the technological development. Particularly, the city can be considered as an important unit of innovation. The occurrence of technological innovation can vary by cities, since technological advances of economic agents can generate innovations in regions. Furthermore, the spillovers of technological innovation among regions have become more important and have spread in the open innovation system.

How can the diffusion of innovative ideas globally occur? What does it imply to the technology management? In this paper, In terms of technology flow, this paper identifies the emerging areas from the entire triadic patents. Then, Latent Dirichlet Allocation (LDA), the topic modeling technique, is applied for extracting the hot topics from the triadic patents and their IPCs on the emerging areas. LDA can methodologically represent that the technology can be affiliated with multiple topics. The structure of spread dynamics is examined with use of the network model of Susceptible-Infectious-Susceptible. The results imply that the policy effort for facilitating the global spillover of innovation is important for pursuing the technological innovation. Also, findings imply that such effort needs to be in proper manner for globally profiting from innovation.

Keywords: Technological innovation, Diffusion, Cities, Triadic Patents