

論文 / 著書情報
Article / Book Information

題目(和文)	
Title(English)	DYNAMICS OF EXPLORATION AND EXPLOITATION OF TECHNOLOGICAL CONVERGENCE AND COMPETENCE BUILDING IN THE FOOD AND LIFE-SCIENCE SECTOR: FUNCTIONAL FOOD IN JAPAN
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Category(English)	Doctoral Thesis
種別(和文)	論文要旨
Type(English)	Summary

(博士課程)
Doctoral Program

論文要旨

THESIS SUMMARY

専攻 : Department of	Innovation Management 専攻	申請学位 (専攻分野) : Academic Degree Requested	博士 (MOT) Doctor of
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要旨 (英文 800 語程度)

Thesis Summary (approx.800 English Words)

The thesis “Dynamics of Exploration and Exploitation of Technological Convergence and Competence Building in the Food and Life-science sector: Functional Food in Japan” studies the dynamics of technological knowledge convergence in firms from food and life-science industry. It is divided into 8 chapters as follow.

Chapter 1 - Introduction - introduces the background and motivation of this study, namely convergence in functional food and lack of an organizational competence. These issues indicate managerial challenges and thus brings forth the research objectives and research questions.

Chapter 2 - Functional Food (FF) Industry and Japanese FOSHU - gives definitions on FF, discusses FF innovation process, industrial actors, and innovation challenges in the FF development. Also, it explains the situation of FOSHU (特定保健用食品) or functional food in Japan, which is the main focus of this research.

Chapter 3 - Theoretical Background and Analytical Framework - introduces the main theoretical concepts, including the concept of technological knowledge convergence, organizational resources and sectoral system of innovation. Based on these three main concepts, the analytical framework that illustrates the relationship between knowledge flow and competence building in firms is drawn. Finally, three main hypotheses are derived to answer the questions which focus at the different level of analysis. The first level focuses at the characteristics and flow of technological knowledge. The second and the third level focus at sectoral differences and organizational heterogeneity, respectively.

Chapter 4 - Methodology - introduces the data sources, indicators and methodological framework for this study. This study utilizes Japanese patent applications, financial reports, market-related data and also interviews. Different quantitative techniques based on patent analysis and qualitative techniques based on four selected case studies of the leading FOSHU firms together with interviews with the FF experts are used in order to prove each hypothesis. A novel method was developed for detecting different kinds of technological competences that firms strategically built in developing FF innovations.

Chapter 5 - Dynamics and Nature of the Cross-sectoral Technological Knowledge Diffusion - explores the dynamics and characteristics of technological knowledge that diffuse across the sectoral boundaries and create technological knowledge convergence between food and life-science sectors. The results reveal two main characteristics of technological knowledge that trigger convergence towards functional food. Firstly, the direction of diffusion of technological knowledge varies at different phases of knowledge convergence according to a variation in knowledge characteristics and market opportunities. Secondly, cross-sectoral technological knowledge is characterized as more novel and pervasive than the sectoral-specific knowledge.

Chapter 6 - Exploring and Exploiting Dynamics on Technological Knowledge in FF Convergence - investigates the pattern of learning via competence building through collaboration and internalization. Firstly, it investigates the changes in the networks of R&D collaboration among firms in the same sector, different sector and public research and universities. The findings reveal that the type of preferred partnership for an R&D collaboration varies according to different stages of technological convergence and the necessary complementary resources at that period. Secondly, by an internal learning, firms are characterized by both path-breaking and path-dependent learning behavior. They were found to be highly technologically diversified at the emergent to growing period of FF convergence. After they have accumulated adequate amount of capabilities, their scopes of innovative activities are found to be narrower, and persistent with the previously accumulated knowledge.

Chapter 7 - Organizational Difference and Learning: Role of Organizational Core Competence - investigates the role of core competence that influence competence building strategy in the development of FF innovations. By studying the changes in technological competence profiles of FOSHU firms, it was found that the pattern of learning towards FF consists of four types of capabilities, namely, essential,

peripheral, core and cross-sectoral. Even though the types of capabilities that firms build vary by sectoral and organizational heterogeneity, core competence was found to be playing a key role in an early stage of learning in both sectors. Case studies are conducted in four firms to illustrate four types of firms that possess different competences in both technology and market dimensions. Based on their R&D and market activities, the patterns of organizational learning by means of exploration and exploitation can be classified by a degree of orientation towards their own original sector and toward the converging sector.

Chapter 8 - Conclusion and Implication - summarizes all the findings and discusses the implications to academics on the theory of learning and convergence, to policy makers on how to support innovations in the emergent market and to industry people on how to tackle new opportunities that come from another sector based on the complementary convergence framework.

In summary, this thesis has explored the phenomena of technological knowledge convergence and deepen an understanding of the concept of organizational learning and competence building in a unique case of Japanese functional food market. It contributes to the concept of organizational learning and convergence by deepening an understanding of a competence building process and path-breaking learning in firms in F&B and life-science sectors. The findings clarify characteristics of technological knowledge diffusion that affect complementary convergence, which has not been studied in the prior convergence literature. In addition, this research introduces a new framework that explains learning strategies via a process of exploration and exploitation based on a firm's orientation towards the converging sectors. The proposed method was illustrated through case studies and shown to be giving an implication to firms by manifesting the strategy of competence building to benefit from a complementary convergence.

備考：論文要旨は、和文 2000 字と英文 300 語を 1 部ずつ提出するか、もしくは英文 800 語を 1 部提出してください。

Note : Thesis Summary should be submitted in either a copy of 2000 Japanese Characters and 300 Words (English) or 1copy of 800 Words (English).

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