

Chapter 3

Research Design

ABSTRACT

This chapter explains the research design of this study. The objective is to explore a management approach for facilitating the establishment of cross-sectoral collaboration to promote the regional industry through building/operating the regional system and building/rebuilding the management body. First, since this study aims at theory building, it is considered how to conduct case studies based on the review of the previous studies. Next, the selection of the target case is considered. Here, the criteria for selecting cases are listed, and the cases of three German regions are discussed as fulfilling the criteria. Finally, data collection and analysis are described. In this section, data collection for conducting the case studies is described in detail. Additionally, it is explained that a qualitative comparative analysis method and process tracing for each case study are used to analyze the results of the case studies.

INTRODUCTION

As described in Chapter 1, the promotion of regional industries is premised on the interaction of diverse and many entities. However, the experience of how the interaction is managed for facilitating cross-sectoral collaboration has not been clarified as systematic knowledge. Therefore, there needs to be more empirical research on what kind of management is required to facilitate self-organized collaboration efforts of these entities intentionally and effectively and how to build a regional system and management body to support such efforts.

This study pursues academic and practical value by exploring research questions based on the conceptual model presented. This chapter will detail the methodology used to conduct this study and the research conducted.

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PURPOSE AND APPROACH

Purpose of This Study

This study explores the research theme of “How to implement the management for facilitating the establishment of cross-sectoral collaborations for the purpose of promoting new competitive regional industries through business creation, and with what kind of regional system and competence of the management body to facilitate it?”. Here, the case is assumed wherein the public sector (e.g., local government) promotes industrial fields with high growth potential in the region through cross-sectoral collaboration among diverse entities for business creation. Therefore, the project is envisioned in which a regional structure (regional system) and support organization (management body) are established with the involvement of local industry and academia, and a management body implements management to facilitate cross-sectoral collaborations.

In exploring this research theme, the following research questions posed in Chapter 1 are considered.

R.Q.1: How to build and operate a regional system for facilitating the self-organization process of cross-sectoral collaborations to promote new competitive regional industries?

R.Q.2: How is the management to be implemented for facilitating the self-organization process toward cross-sectoral collaborations?

R.Q.3: How to build and rebuild a management body to display the organizational competence for facilitating the self-organization process toward cross-sectoral collaborations?

The Approach of This Study

As mentioned above, more attempts at comprehensive theory building should be made based on detailed case studies regarding this research theme. Eisenhardt (1989) identifies that theory building through case studies is an appropriate research method to explore a new theme or when current perspectives or evidence are insufficient, indicating that an eclectic approach to theory building, utilizing both an inductive approach based on case studies and a deductive approach based on existing research, contributes to raising the level of internal validity, generality, and theory building. Eisenhardt and Graebner (2007) also note that empirical analysis should be based on relevant previous studies and the importance of presenting a research question

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that clarifies the research gap. Additionally, the success or failure of the research depends on the quality of the research question, which can provide insight into complex social processes (Eisenhardt & Graebner, 2007).

This study focuses on the cases of efforts to promote business creation in the medical technology fields through cross-sectoral collaboration in multiple regions. First, the main questions are how the facilitation of cross-sectoral collaboration is implemented and how the regional system and management body required for support are built. Second, the research subject differs from experimental methods and cannot be controlled by the researcher. Third, the subject of the study is a current case, and primary data can be obtained as current events. Therefore, the research topic is explored through case studies based on the criteria for selecting appropriate research methods, as Yin (2003) indicates.

Glaser and Strauss (1967) propose that a comparative analysis through theoretical sampling is an approach toward theory building. Moreover, Eisenhardt (1989) states that theoretical sampling is not from a statistical perspective but rather the selection of cases that replicate or expand the theory being formed. Similarly, Eisenhardt and Graebner (2007) also state that theoretical sampling is the selection of cases that clarify and expand relationships among concepts and elucidate logic.

Based on these perspectives, this study will examine the validity of the conceptual model derived from related previous studies by considering inductive findings obtained through comparative analysis of multiple selected cases. Based on the findings, it will consider constructing a comprehensive theory for facilitating cross-sectoral collaboration to create new businesses for promoting new regional industries. This methodology has two advantages. First, multiple case studies increase construct validity and internal validity through theoretical sampling in theory building (Glaser & Strauss, 1967). In addition, Yin (2003) confirms that multiple case studies increase external validity and provide a stronger foundation for theory building.

SELECTION OF CASES

In this study, it is considered how to facilitate the self-organization process of cross-sectoral collaboration among companies (including SMEs), universities and other research institutions, and various other organizations for the advancement of business creation toward promoting new industries with the medium- to long-term objective of a leading role in the regional economy. It is also considered how to build and operate the regional system and how to build and rebuild the management body, which supports/manages the facilitation above. This is to build a comprehensive theory and propose practical implications through case studies.

In exploring the research topic, a valid case study subject should meet the following criteria:

- Industrial fields with high growth potential are targeted, and the regional system is built and operated by the public sector with the involvement of local industry and academia to support industrial promotion by facilitating cross-sectoral collaborations.
- A management body is established with the cooperation of the public sector, local industry, and academia to realize the above objectives, working on facilitating cross-sectoral collaboration and providing related services.
- The cross-sectoral collaboration to promote business creation must be considered as an inter-organizational collaboration formed through the voluntary participation of multiple organizations from different fields that are equal and complementary to each other to create value through growth opportunities and new business.

Considering the above criteria, three German regions (North Rhine-Westphalia, Bavaria, and Baden-Württemberg) are selected as case study targets, where the public sector, local industry, and academia are working together to facilitate cross-sectoral collaboration for the promotion of medical technology industries in the regions. As described in Chapter 2, Germany is highly competitive in the medical technology industry. The cluster policies implemented in each region promote advanced efforts to encourage the industry through collaboration among different sectors. Furthermore, the three states mentioned above are the leading regions in terms of the number of companies in the industry. A summary (See also Table 1) and the reason for the selection of each case are provided below.

North Rhine-Westphalia (NRW)

In this case, 16 industrial sectors with high growth potential were designated for support under the cluster policy launched in 2007 by the NRW state government. Efforts to facilitate cross-sectoral collaboration are made to promote the medical technology industry. In 2011, with the support of the state government, the three local medical technology cluster organizations in the state established Innovative Medizin NRW as a cluster organization to promote state-level activities and facilitate collaboration among different sectors. Currently, local cluster organizations are still active.

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This case is about an effort to build a regional system for industrial promotion through cooperation between industry, academia, and government in the state of NRW, where a management body (i.e., cluster organization) was established, and management has been implemented to facilitate a self-organization process toward the cross-sectoral collaboration. Therefore, it is judged to be an appropriate case for exploring the theme of this study.

Bavaria

In this case, under the cluster policy launched in 2006 by the Bavarian state government, cluster organizations in 17 industrial sectors with high growth potential are targeted for support. As one of these, a cluster organization was designated to promote the medical technology field by facilitating cross-sectoral collaboration. Support is provided to facilitate cross-sectoral collaboration for business promotion.

In this case, a regional system for industrial promotion was established with the cooperation of the Bavarian government, local industry, and academia. Further, a management body (i.e., cluster organization) promotes business creation by supporting the facilitation of cross-sectoral collaboration. Therefore, it is an appropriate case for exploring this research theme.

Baden-Württemberg (BW)

In 2006, the state government of BW designated 25 industrial sectors with high growth potential, and several management bodies (i.e., cluster organizations) in each sector were targeted for support. The cluster organizations have been promoting business creation by facilitating cross-sectoral collaboration in each area of BW.

In this case, the regional system was established and operated through information sharing and exchange of opinions between the government, local industry, and academia. In addition, the supported cluster organizations facilitate cross-sectoral collaboration to promote commercialization. Therefore, it is an appropriate case for this research theme.

Table 1. Summary of each case

	NRW	Bavaria	BW
Operating entity of the regional system	NRW State Government	Bavarian state government and an affiliated organization (Bayern Innovativ).	BW State Government and an affiliated organization (Cluster Agency BW).
The management body (cluster organization) to facilitate cross-sectoral collaboration	Innovative Medizin NRW (–2018) (Owned by three local cluster organizations in the state).	Cluster MedizinTechnik (In effect, activities are implemented through cooperation and segregation of activities between the two cluster organizations in the state).	Five state-recognized cluster organizations, such as Mannheim Medical Technology Cluster.
Start of activity of the cluster organization	2011 (The three local cluster organizations have been active since before 2011).	2006 (The two operating cluster organizations have been active since before 2006).	2011 (Mannheim Medical Technology Cluster)
Purpose of activity	Promoting innovation and business creation in medical technology fields.	Promoting innovation and business creation in medical technology fields (and other healthcare fields).	Promoting innovation and business creation in medical technology fields.
Base of operations	Dusseldorf	Nuremberg	Mannheim

Source: Drawn up by the author.

DATA COLLECTION AND ANALYSIS

Data Collection

Data collection for each case study (Chapters 5, 8, 11) began with secondary data available to third parties, including the websites of state governments and cluster organizations, etc., to gain an overview of the case. Then, to collect primary data, questions were developed to gather more details, and semi-structured interviews were conducted with several people involved in the case. The questions were given to the interviewees before conducting the interviews. Internal documents, such as survey reports received during the interviews, are also utilized.

Given COVID-induced considerations, interviews in 2022 were conducted by remote meeting system. Other interviews were conducted face-to-face at the interviewees’ office or in the venue of MEDICA (a trade fair of medical devices in Dusseldorf).

Details of data collection through interviews in each case are as follows.

The Case of NRW

The interviews were conducted with the following parties concerned for collecting the data on the case of NRW.

An official of the Ministry of Economy, Innovation, Digitization and Energy¹ of NRW state government (interview conducted on November 14, 2017), a staff member who played as a managing director as well as a project manager of Innovative Medizin NRW (interview conducted on November 14, 2017, November 14, 2018, and November 20, 2019), a staff member of MedEcon Ruhr (interview conducted on November 14, 2017), and a staff member of the Health Region Cologne/Bonn (interview conducted on November 16, 2017). Innovative Medizin NRW is a statewide cluster organization in the medical technology field. The latter two are the local cluster organizations that deploy in certain state areas (e.g., the Ruhr area) in the same field. Innovative Medizin NRW was established and owned by the three local cluster organizations (two of them are Health Region Cologne/Bonn and MedEcon Ruhr). Since the system was restructured in the medical technology field and a new system (a cluster organization) was launched in January 2019, the case study (described in Chapter 5 of Section 2 and Chapter 8 of Section 3) describes the movement before the period.

Since the system was restructured as above, the case study for Chapter 11 of Section 4 focuses on MedEcon Ruhr, one of the cluster organizations that owned Innovative Medizin NRW. The cluster organization focuses on the Ruhr area for its activities. In addition to the above interview with staff, the following interviews were conducted to update and obtain the data for the case study, especially for Chapter 11 of Section 4. A managing director (interview conducted on November 19, 2019, and June 24, 2022) and a former staff member of MedEcon Ruhr (interview conducted on June 23, 2022).

The Case of Bavaria

The interviews were conducted with the following parties concerned for collecting the data on the case of Bavaria.

An official of the state government (Bavarian Ministry of Economic Affairs Regional Development and Energy)² responsible for cluster policy (interview conducted on November 19, 2018). A CEO and a member of the Executive Board of Bayern Innovativ, an affiliated organization of the state government, which supports cluster organizations' activities (interviews conducted on December 10, 2018). A managing director of Forum MedTech Pharma, a cluster organization in the medical technology field (Interview conducted on December 10, 2018).

Moreover, to update and obtain the data for the case study, especially for Chapter 11 of Section 4, on December 2, 2022, an interview was conducted with a managing director of Forum MedTech Pharma, who was assigned in 2019 as the successor of the managing director interviewed on December 10, 2018.

The Case of BW

The interviews were conducted with the following parties concerned with collecting the data on the case of BW.

A staff member of the Cluster Agency BW that supports the activities of cluster organizations in the state as an affiliated organization of the state government of Baden-Wuerttemberg (interview conducted on January 15, 2019). A staff member of Baden-Wuerttemberg International, also an affiliated organization of the state government, for promoting the internationalization of industries in the state and collaborating with the Cluster Agency BW (interview conducted on January 15, 2019). A managing director of Mannheim Medical Technology Cluster, which belongs to the city government of Mannheim as one of the units and operates as a cluster organization in the field of medical technology (Interview conducted on March 26, 2019; Additional interview was conducted by email on January 28, 2020).

Moreover, to update and obtain the data for the case study, especially for Chapter 11 of Section 4, on July 21, 2022, an interview was conducted with a managing director of Mannheim Medical Technology Cluster, who was assigned in 2021 as the successor of the managing director interviewed on March 26, 2019.

Data Analysis

The methodology for analyzing the case studies for each research question is as follows.

Eisenhardt (1989) indicates that a detailed description of each case is necessary to grasp and gain insight into the unique patterns before generalizing the patterns among multiple cases. Therefore, the initial focus is on the critical concepts in the conceptual model presented based on a review of previous studies on the questions posed above. Then, 5W1H for each case is described in detail.

A method of qualitative comparative analysis with a small number of cases is used to extract similarities and differences for each question between cases, and a preliminary screening of causal relationships is conducted.

Moreover, process tracing is used in each case study to elucidate the details of the causal chain and mechanisms that led to the outcome of each case study (George & Benett, 2004). In process tracing, focusing on human actions (Martin, 1964), a time-ordered sequence of events is analyzed to clarify the event structure (Heise,

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1989), then, the causal network will be clarified by focusing on how each event is causally related. Therefore, this study also focuses on the chronology of events and the cause and effect or logical linkage of each event, confirming causal relationships and organically linking them by examining the “how” and “why” issues over time (Yin, 2003).

Finally, for each research question, the results of the case study will be compared with the conceptual model to examine its validity and to derive theoretical and practical findings.

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ENDNOTES

- ¹ The Ministry’s name is that of when the interview was conducted.
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