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Chapter 1: Introduction

1.1 Background

High-tech innovations directly influence our lives in the 21st century. IT infrastructure such as personal computers, cell phones and the internet, have become popular in the world, such that people are able to have easier to access information, which has made the world become flat. On the other hand, biotechnology has developed, such that it is possible for humans to have a long life, which has the effect of changing the social configuration. As time goes by, these high-tech innovations have directly affected our lifestyles, stepped up economic growth, and this has exceedingly changed our economic world.

1.1.1 Change of Scale Production

One change is scale production from mass production to customization and personalization. Since the access of information has become easier due to infrastructure democratization, people are able to share with others without the barriers of time and place, which has had an effect upon traditional societies. As evidence, we see the lifestyles of people have changed. There is a variety of lifestyles in the 21st century, and consumers' needs have become various and markets have become complex in the global economy. In the meantime, customers' satisfaction has been highlighted in markets, because it directly influences a firm's abilities to earn monies and advantages in the marketplace. Therefore, customers' satisfaction has become the primary foundation for their survival. Thus, customization and personalization, which meaningfully involve customers in production process have become a new trend to replace mass production in today's economy, as they are able to specifically match customers' needs in order to satisfy customers.

1.1.2 Change of Industrial Configuration

Another change is industrial configuration. A growing economy always changes the interrelations and proportions among the main sectors including agriculture, industry, and services. The ratio of service industries in the gross domestic product (GDP) has

been increasing. For an instance, this ratio in advanced countries, such as Japan and the United States is over 70%. As well, it is increasing in developing countries such as South-east Asian countries. According to a statistic document[1], in 1995, the percentage of GDP that services accounted for was 66% in high-income countries, 52% in middle-income countries, 35% in low-income countries, which is similar to industry's percentage of GDP (38% of GDP). People's incomes continue to rise because of the economic growth, as people demand more services such as education, entertainment and travel, rather than material goods. Hence, the service sector has become the leading sector of the economy instead of the industrial sector.

1.1.3 Change of the Focus of Organizational Resources

The service sector is undeniably knowledge intensive, which shapes organizations' sizes and compositions, and defines the future of organizations. An organization can't raise productivity by itself whereas human talent can, and thus organizational productivity has become more much reliant on knowledge service workers. Statistical data[2] has shown a big shift in the labor force from manufacturing to service in the United States from 1977 to 2007. The number of manufacturing employees has reduced by about 25%. Conversely, the number of service workers has increased by about 168%. *The shift to services in general and to pro-venture workforce in particular had clearly accentuated knowledge as a vital source of energy in 21st century organizations* (Mills & Snyder, 2010, p7). In line with this, organizations have changed the focus of their productivity from labor force to knowledge force. On the other hand, today's firms face a very complicated economic environment, and they must continuously enhance their competitiveness in marketplaces for their sustainability. The main force to deal with complicated marketplaces is knowledge creation whereby firms create new products, strategies and solve business issues in order to gain income. Taking a historical view on the source of wealth in agricultural and industrial eras, the main sources of wealth were from land, labor to capital. However, in late industrial and service-based eras, knowledge is the primary source of wealth, because knowledge creation can leverage the organizational operation and finance, which greatly influences the development of

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[1] Figure 9.1 Structure of world economies, 1995, In Soubbotina & Sheram (2000), Beyond Economic Growth, Meeting the Challenges of Global Development. The World Bank.

[2] U. S. Bureau of Labor Statistics. From Mills & Snyder (2010), Knowledge Service Management, Organizing Around Internal Markets. Springer, p3.

the organization and its value in the market.

1.1.4 Change of Organizational Types

Since knowledge creation has become extremely important to firms, the means of knowledge creation that efficiently gains value for the firm has developed, which in turn has caused organization types to change. In traditional steep organizational hierarchies, most of the top management only marginally understands what really goes on down through the organization to the shop floor. People are controlled by hierarchical orders, and they don't have much chance to interact with others. This structure obstructs knowledge sharing and integration, and thus limits human creativity. Knowledge creation is based on human interaction and human knowledge integration. Therefore, as an organizational type, networks have necessarily appeared in the knowledge-based economic society, to allow knowledge sharing within a wide scope of individuals. Indeed, collaborations among multiple organizations often take place to share resources and gain new knowledge between or among them, promoting firm growing and retaining its long-term competitive advantage. In the meantime, organizational types such as teamwork and projects have increasingly been applied to organizational activities, which effectively use networking to create a win-win situation.

1.2 Motivation

1.2.1 Management Challenges

Fredrick Taylor is the father of scientific management. In his conception, he assumed workers are incapable, and divided mental labor and manual labor to improve work efficiency, thus differentiating between planning work mainly taken by managers and executing work taken by manual workers in the very early industrial management. The core concept of his management theory is control, exemplified in his principles of scientific management as:

1. *"Develop a science for each element of a man's work that replaces the old rule-of-thumb method."*
2. *"Scientifically select and then train, teach, and develop the workman, although in the past he chose his own work and trained himself as best as he could."*

3. *"Heartily cooperate with the men so as to ensure that all of the work is done in accordance with the principles of the science that has been developed."*
4. *"There is almost an equal division of the work and the responsibility between management and workmen. Management takes over all work for which it is better fitted that workman, while in the past almost all of the work and the greater part of the responsibility were placed on the workman."* (Richardson, 2010, p11)

However, a knowledge worker, such as a service worker, is both a mental laborer and also manual laborer. It is difficult to distinguish mental and manual work during a service process. When networking among different people from various backgrounds or multiple organizations became common in knowledge era, the traditional management methodology showed itself to be inadaptable to deal with the complexity of the global economy because it is rooted in hierarchical thinking based on the concept of control. Therefore, it is essential to have a new paradigm of management in the knowledge era. Savage (1990) pointed out some challenges facing management in the executive area. The first challenge is how to maintain accountability in flat, dynamic network organizations. The second challenge is how to support the focusing and coordination of multiple cross-functional task teams. The third challenge is how to build into the very structure of the organization, and the capacity to continuous learning.

1.2.2 Value Co-Creation Projects

In the 21st century, customer satisfaction directly influence organizational incomes and futures, therefore, the marketing focus is changed from goods to human, from the quality improvement to customer satisfaction in markets. There are a lot of open innovations, collaborations, due to value co-creation by multiple enterprises, which are integrated each enterprise`s core technology and know-how, or learned new knowledge from outside of the organization. Since these activities of value co-creation make possibilities to create new products and services to deal with the challenges in markets, or keep controlling competitive predominance of businesses, the concept of value co-creation becomes important in the economic growth, and the activity type of value co-creation has become popular.

In the knowledge era, projects taking the form of value co-creation activities among different people from different backgrounds and multiple organizations are required. Most contemporary projects have a tendency towards unclear goals and unknown solutions in ambiguous situations, and high technology is an integral requirement. Notably, members consist of highly skilled experts from different fields and cultures, and

customers are often involved in project management (PM) processes. In these value co-creation projects, leadership task is shared among participants during the project. Customers in the knowledge era make demands upon the authorized organization. As well, they are idea-providers as co-creators during knowledge creating processes to improve the work efficiency for their purpose. Therefore, the traditional bureaucratic organization type is not suitable to these projects. Neither are traditional teamwork skills such as control and order conducive to such new PM.

Traditionally, a project group is a bureaucratic organizational form, and project practices require a clear goal before beginning the planning of a project. Project management is rooted in scientific management and often focused on planning and control skills. There are several types of PM, which have different focuses according to their respective generation through time (Project management handbook editorial board, 2009*)*. In the first generation, PM is focused on quality, cost and time of delivery for product or system development. In the second generation, PM is focused on management of scope, risk, procurement, integration, knowledge and information based on the development of information system, i.e., the focus is on the PM process. In the third generation, PM treats the whole organization as a set of projects, and pays attention to the optimization of project activity, with the aim of integration and management of multiple projects.

Contemporary organizations must satisfy customers through knowledge creation in order to survive, thus business values must take customers' values into consideration. How to interact with customers is a big question in these value co-creation projects. When customers or multiple parties are engaged in PM, and participants share the task of leadership in a project, how people efficiently work together, and how leaders effectively interact with followers for the success of a project? Facing such situations, Management should be a co-creating process, and thus a value co-creation methodology is required.

1.3 Research Objective and Questions

1.3.1 Research Objective

The main objective in this study is to contribute a new methodology for human value co-creation. Particularly, there are two objectives in this study:

(1) Proposing a new framework for value co-creation
(2) Giving recommendations for leader-follower interaction and participants for value co-creation in the knowledge era

1.3.2 Research Questions

With the research objective, the Major research question is set as the below.

Major research question (MRQ):
How do participants interact with others for value co-creation in value co-creation projects?

Value co-creation is rooted and resulted in human interaction, because human interaction directly influences information flow, which has effects on the efficiency of knowledge creation, resulted in outcomes of human activities. We assume human relation, mindset (e.g. human attitude) and process are important indications and influence elements to human interaction. In a value co-creation project, leadership task is shared among participants, which is different as traditional PM relying on the power of a single leader that leader-follower is a hierarchical relation. Leader-follower interaction is one type of human interaction, which is important to the efficiency of knowledge creation and managerial work in a project. Besides, a positive mood can prime more positive thoughts and behaviors (Eiser 1994). We assume that a positive mindset also is an important element to facilitate human interaction that generates human values. Furthermore, identifying a process pattern is extremely significant for the formulation of a value co-creation framework. Therefore, the guideline of this study is specified in the following subsidiary research questions.

Subsidiary research questions (SRQ):
SRQ1. What is the leader-follower relation in a value co-creation project?
SRQ2. What is the participant`s mindset in a value co-creation project, and why?
SRQ3. What is the process pattern in a value co-creation project?

1.4 Research Originality and Significance

Traditional project management theories developed planning and control skills by

different approaches, conventionally distinguished by two methods: Last Planner[3] and Scrum[4]. The planning and execution in conventional PM are separate, and can`t completely deal with unclear goals, ambiguous solutions and customer involved situations in contemporary project management. In contemporary project practices, value co-creation to benefit all participant parties has become the primary task, and the planning and executive process often take place concurrently. There is however, a gap between the existing PM theories and the contemporary project practices.

Furthermore, a manager's power is highlighted in the conventional PM doctrine, which overlaps with leadership theories. Most leadership insights have expanded on trait, behaviors, situational control, and dynamic aspects (Grint 1997; Yukl 2013). Since contemporary projects involve multiple parties such as customers, the hierarchical order is no longer efficient for such projects, because the leadership task is shared among participants in most value co-creation activities. It is essential to have a new leadership framework for value co-creation by a managerial approach, which can surmount the limitation of leadership theories rooted in the bureaucratic organizational frame.

In the knowledge era, human values in PM are carried out through knowledge creation. Therefore, knowledge management (KM) is the cornerstone of project management. However, KM efforts typically focus on the organizational level. When knowledge creation incentives come from outside of the organization, such as resulting from a value co-creation project among multiple organizations, the lack of a practical method of KM becomes apparent.

All issues shed light on human value co-creation, which improve work efficiency and human satisfaction. Prahalad and Ramaswamy (2004) early on gave an overview of value co-creation activities in contemporary economies. However, there is less research to follow up on the topic of value co-creation. Since the concept of value co-creation has become critical and controversial in both an academic aspect and in practice, Service Science has arisen in the knowledge era, and thereby a trans-disciplinary

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[3] It is defined as a philosophy, rules, procedures, and a set of tools that shifts the focus of control from the workers to the flow of work that links them together and thus proactively managing the production process by Ballard (2000); "Last Planner is a short-term project planning system first used in engineering construction 20 years ago." Mossman (2012).

[4] "Scrum is a pre-defined development lifecycle based on agile principles. Agile methodologies promote a project-management process that encourages frequent inspection and adaption, and a leadership philosophy using teamwork, self-organization and accountability. " "Scrum is a process that teams can adopt quickly to plan and manage their work. Each Scrum step has just enough detail to plan, design, build and test code, while tracking team progress. Its strength is that it is straightforward to use. The risk is that it can be used to focus on building components with less regard for the complete system…Scrum has three primary roles: Product Owner, Scrum Master, and team member." Potter & Sakry (2009)

approach has emerged within Service Science to solve social issues with realism.

We adopted a Service Science approach, including a service-centered view, and a service system thinking with a trans-disciplinary approach in this study, to give a new managerial methodology for human value co-creation using two cases of value co-creation projects, based on understanding issues in traditional PM, leadership theories, KM and value co-creation studies in service science.

1.5 Research Methodology

1.5.1 Case Study Methodology

A qualitative approach is commonly applied in the social sciences for an in-depth understanding of social phenomena, such as human attitude and behavior, which can seek empirical support for research hypotheses. There are several ways to do social science research by a qualitative approach, such as the case study, surveys, experiments, and ethnography. Any research methodology has advantage and disadvantages. To find a suitable way to do research, according to Yin (2009), it depends on the type of research questions, the investigator's control of events, and a research focus on contemporary as opposed to historical phenomena. The case study is typically one of the qualitative research methodologies. Yin suggested that the case study is a better methodology when the research has such conditions as (1) There are "HOW" or "WHY" type questions; (2) The investigator has little control over actual events; (3) The focus of the research is on a contemporary phenomenon within a real-life context.

Accordingly, the research conditions in this study were more suitable to use the case study methodology. The reason is because we aim to find a value co-creation framework through detailed case analyses from two successful project cases, through an inquiry upon a theoretical discipline through contextual phenomena in real project activities. Regarding the research questions (see MRQ and SRQ1/2/3) in this study, we attempt to identify human relation, human mindset, and procedure patterns. Obviously, all research questions pertain to "HOW" or "WHY". In addition, we had detailed data from real projects. The two cases in this study are both customer-involved projects. The first case is a global education project. We had involvement in the real project activities and had first-hand information. We also collected data from the participants of the project. The second case is a successful service business project. We had great support from the key

person in the project who partook in all the business steps in the project. In order to blunt skepticism and criticism, we decided to have a multiple-case study methodology to accomplish this research work. To demonstrate the proposition in this study, firstly we separately conduct two cases, A and B through analyzing and obtaining the result of each embedded case. Secondly, we draw cross-case conclusions based on reports from case A and B. Then, we modify the theory we proposed and develop research implications. Finally, we finish the dissertation. The multiple-case study strategy in this study is shown in the figure 1.1.

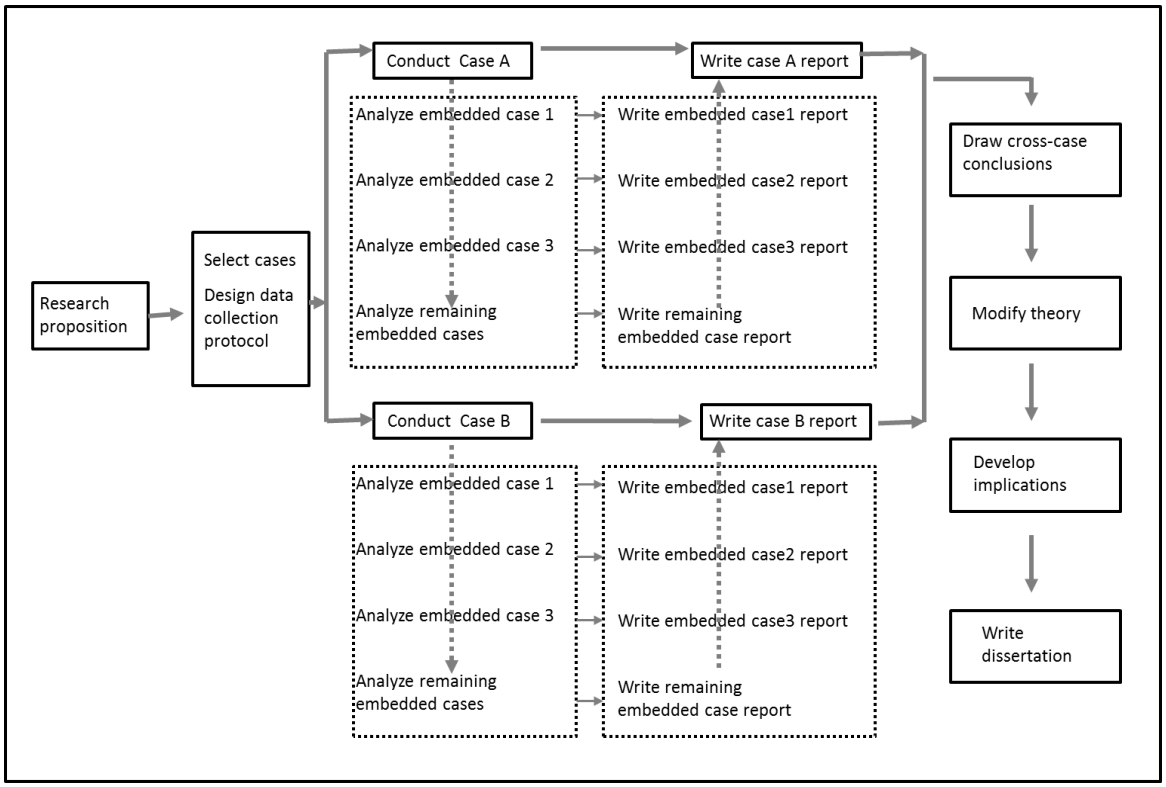

Figure 1.1 Multiple-case study strategy in this study

1.5.2 Data Collection Techniques

We used four types of data collection technique in this study. Interview is one technique of data collection often used to gather in depth information for qualitative research. Mainly there are three types of interview: structured, unstructured and semi-structured interview. To allow interviewees to be free and more easily answer the interview questions, we primarily used unstructured and semi-structured interviews for our research purpose. The advantage of an unstructured interview is that the interviewee can

deeply talk about the facts of a matter or freely give their opinions to a deep degree, which helps to dig out information in depth. An unstructured interview is likely to be a free conversation between the interviewer and the interviewee. Sometimes, in an unstructured interview, we can obtain other sources, such as suggestions for our research and recommendations regarding other persons for interviews from the interviewee. A semi-structured interview is the more preferred type to use when the answers of the interview questions are expected according to the research proposition, but is not as rigorous as the structured interview type. The strength of the semi-structured interview is that it is open to allow the interviewee to freely bring up new ideas but guides the ongoing interview into a deep level, which advantageously collects data towards the research proposition. In this study, we used the unstructured interview type to explore leader-follower relation, participants' mindset in project activities, and the semi-structured interview type for seeking the sequence process pattern.

We not only used interviews as the major technique to gather case study evidences, but also used documentation sources as explicit data collection in this study. There are some advantages in using documents. Firstly, we can find the correct names or spelling of organizations or groups. Secondly, documents give other specific details to corroborate information from other sources. Thirdly, we can make deductions from documents to speculate on the research inquiry (Yin 2009).

Participant-observation is a method of qualitative research in which the researcher understands the contextual meanings of an event or events through participating and observing as a subject in the research. Our observational form was undertaken in the capacity of being a member involved into the global education project activity that was entitled to access substantial study evidence through watching and conversations with other members in the project.

We also employed a storytelling narrative technique through the key person to gather information about the service business project. Traditionally, storytelling is the conveying of events in images and words using embellishment or improvisation, which includes plot, characters and a narrative point of view. Contemporary storytelling technique is widely applied to many fields with a variety of forms, such as personal narrative, and political commentary. We used the narrative technique to comb the contextual business points in a chronological order in the real project case through communicating with the key person.

1.5.3 Data Analysis Strategy

We used a recording unit as a basic unit of analysis. We integrated practical guides of problem-driven analyses and method-driven analyses (Krippendorff 2004) to take a content analysis strategy for this study, as follows below.

(1) Ascertaining stable correlations with research questions:

First, we prepared to be qualified to determine a reliable network of the correlation with research questions in the textual units, which rely on some abilities such as being stable and general in different situations, being certain to determine or be determined, and being able to narrow the set of possible answers to a research question.

(2) Locating and sampling relevant texts:

We first found clues to the relevance of texts through practices such as reading a small sample of texts, and making headlines for texts. Generally, we selected textual units by assuming one-to-one relationships with the phenomena of interest. When the textual units showed multiple relationships overlapped with the phenomena of other interests, we iteratively narrowed the search to discover available texts that might correlate with the research questions. We selected all textual units to find answers for research questions by the relevance sampling technique with a multistage process. During such exploration, we conceptualized available texts while simultaneously reducing the sample of textual units to a manageable size.

(3) Preparing texts in method-specific and context-sensitive ways

We basically conducted the coding task by a text-driven approach and employed the catalog of well-formulated analytical procedures depending on the research conceptualizations.

(4) Adopting standards

As a higher standard for research reliability, we attempted to make analytical efforts on each business step in each project case according to the research questions. Namely, we progressively conducted all analyses of embedded cases in the project. Then we overviewed the whole project activity to validate the hypothesis for this study.

(5) Allocating resources

We accordingly unitized analytical results to write this dissertation.

1.6 Organization of This Study

We organized this dissertation in seven chapters. In the first chapter, we generally give the research background, the research objective and questions, the research originality, and the research methodology in this study. The second chapter lays stress upon the

theoretical issues related to value co-creation through the richness of the literature review in PM, leadership theory, KM, and some studies related to value co-creation. We give a research proposal for human value co-creation framework, mainly based on a service mindset including a service-centered view and service system thinking, in the third chapter. In the fourth chapter that follows the case study design is presented. The research hypotheses are demonstrated through two value co-creation projects in the fifth chapter and the sixth chapter. Finally, we make our conclusions in the chapter seven in order to answer the research questions, give a value co-creation framework, and discuss research implications and suggestions to the future research directions.

Chapter 2: Literature Review

2.1 Introduction

This chapter is to address the problems between the existing theories and the realistic requirements of value co-creation project-activities through the literature review in relevant research fields. New insights of value co-creation have been developed in service science, which is a new emerging discipline. In other hand, commonly, effective project management practice includes PM, leadership and KM. The PM theory provides managerial methodology for projects, which overlaps with Leadership doctrine, because the efficiency of the conventional PM relies on a single leader. Furthermore, KM is important to effective PM practice, because *KM consists of making sure that the teams and individuals have the know-how they need, to make their task easier and to improve their performance,* (Milton 2005, p15) where some values may lie. Therefore, the literature review includes theories related to value co-creation topic in service science, PM, leadership, and KM.

2.1 Value Co-Creation Studies and Service Research

2.1.1 The Term of Value and Value Co-Creation

There are various definitions of value, such as the monetary worth of something, relative worth, utility, or importance (Merriam-Webster Dictionary 2014). *Value for Marx is a social relationship* (Desai 1979, p12)*… but it appears in a "fantastic form" as a relation between things. It is people alone, with their own interests, who engage in this process, using these inanimate objects for sale, and not the other way round* (Marxism 2014). Namely, value is phenomenally determined in a social context and perceived by the beneficiary. For contemporary organizations, values are engaged with customer values, because customers' satisfaction has a direct influence on organizational profitability and their future in marketplaces; therefore organizations must learn from sophisticated customers as well as co-create with customers, so that they might meet customers' needs to satisfy them. Customers' needs can be clarified according to Maslow's hierarchy of

needs into five levels, these being physical survival, safety, belonging, achievement, and self-actualization. Thus it can be seen, *value co-creation is shaped by social forces, is reproduced in social structures, and can be asymmetric for the actors involved* (Edvardsson et al. 2011), which generates a balance between customers' satisfaction and organizational effectiveness to achieve its ultimate goal.

2.1.2 Problems in Value Co-creation Studies

The classical organizational theory and management are focused on internal efficiency in a bureaucratic configuration, without the attention to customers, competitors and suppliers, and organizations are treated as closed systems. A closed system is treated as a definite predictable system, which does not consider the influence from outside (Yokoyama 2001). Contemporary organizations must face many challenges for their survival, such as economic globalization, industrial servitization. Organizations exist to have functions to integrate resources for their goals, to provide goods and services efficiently, to employ high technologies of information and manufacturing, to influence and adjust to their environment, to accommodate challenges of diversity, ethics and motivate employees, to facilitate innovation, and to create value for their stockholders, employees and customers, according to Daft (2004). *Organizations are social entities that are goal-directed, are designed as deliberately structured and coordinated activity systems, and are linked to the external environment* (p11). He assumes a contemporary organization need to be viewed as an open system. All functions of contemporary organizations are knowledge-based, thereby organizations must learn from outside, interact with their environment. Contemporary organizations should be designed as a learning system to interact with its environment and integrate resources of exports and consumers for its survival. Therefore, value co-creating with others, such as customers, suppliers, competitors is an inexorable trend in the complex economic environment for organizations. The concept of value co-creation is necessary to develop for contemporary organizational theory and management.

Originally, the concept of value co-creation is emerged from service research trend, have developed in service science. Theorists and practitioners have converged on service systems in the modern economy. Some scholars categorized service systems to refine them into strategic marketing insights using consumer perceptions and service processes in markets (Lovelook 1983; Bowen 1990; Buzacott 2000) or stressed service systems in service operations, engineering, and design (Wemmerlöv 1990; Roth & Menor 2003; Chase & Apte 2007; Vargo et al. 2008). Alternatively, other scholars focused on new

information technology or methods to improve service efficiency (Jammes & Smit 2005; Rai & Sambaurthy 2006; Demirkan et al. 2008). The concepts of co-product or co-design are appeared during the service research trend (Weidema 2000; Détienne et al. 2005; Kleinsmann & Valkenburg 2008). These studies took a firm-centered view to see service systems in the economy.

It was Prahalad and Ramaswamy (2004) who first indicated that consumers engage in the processes of both defining and creating value, and a customer-centered view to access value creation instead of a firm-centered view for the future of competition. They conceptualized interaction patterns between consumers and the firm based on co-creation experiences in the context of individuals and firms, as shown in the figure 2.4. In their thinking, the market is a forum for conversation and interaction between consumers and firms, and dialog, access, transparency, and understanding of risk-benefits are central to the practice in value creation (Summer 2004).

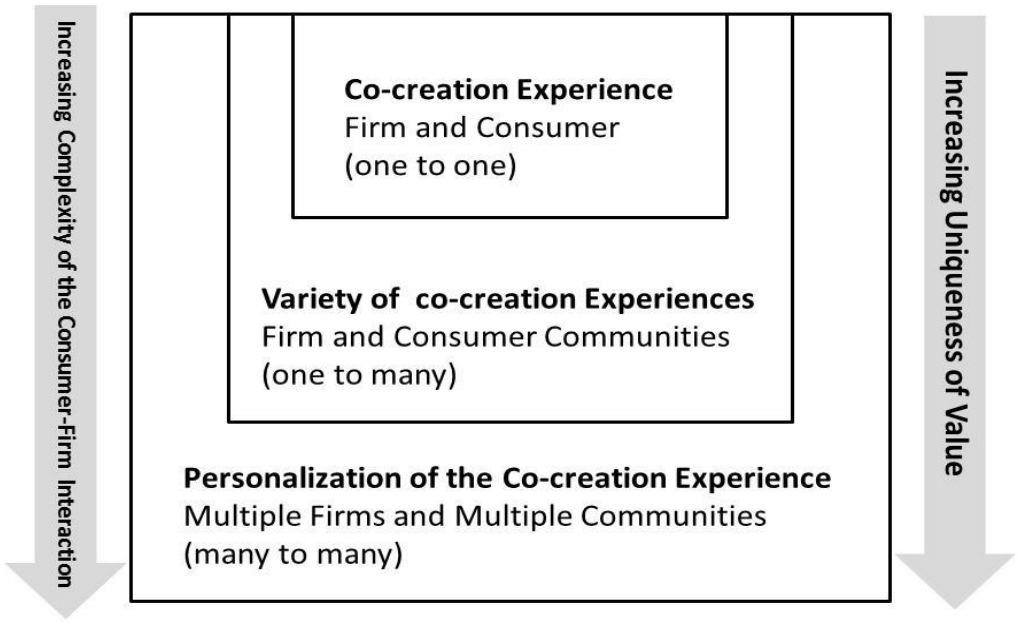

Figure 2.1 The spectrum of co-creation experiences (Prahalad & Ramaswamy 2004)

When value co-creation became the core in service systems in the modern economy, service research have developed into a new discipline, called service science. There are new insights to service science. Vargo and Lusch (2008) think that formal marketing takes a goods-dominant logic to center on goods-exchange. They provided a service-dominant logic where products are viewed as service flows, instead of a goods-dominant logic. Grönroos (2011) considered goods as outputs for production processes and service as interactive processes that lead to an outcome. He thinks service

is a well-supported process for facilitating the interaction between firms and its customers for value co-creation, rather than a service provision for exchange as in Vargo's view. Fisk (2008) discussed value co-creation in marketing using a theater image with performers and audiences. The work by Payne and other scholars (2008) gave a conceptual framework for co-creation of value consisting of three components: supplier value-creating processes, customer value-creating processes, and encounter processes. Recent studies on service have used a system perspective to discuss the orientation for future research (Maglio et al. 2006; Maglio & Spohrer 2008; Maglio et al. 2009; Vargo & Lusch 2011), or attempted to identify service systems modeling and service systems fundamentals (Alter 2008; Böttcher & Fähnrich 2011).

A variety of literature shows value co-creation still is a controversial and unidentified topic in recent studies with academic and practical aspects. Most of the studies give new insights related to value co-creation. However, there is a lack of realistic managerial theory on value co-creation that can facilitate human interaction, which would give satisfaction and work efficiency and effectiveness in ways such as exploiting opportunities, solving problems between individuals and organizations, among individuals or organizations.

2.2 Project Management

2.2.1 The Term of Project

What is a project? Roberts (2007) indicates several characteristics that a project has: *defined deliverability, end date, defined budget, a wide range of resources, a life cycle, and a variety of people involved at different stages of its life* (p6). The project definition by APM[5] identifies two key features: uniqueness and transience[6], and the scope: time, cost, and quality. Most of project definitions have key words such as *team, plan, resources, extend capability, temporary, chaos, unique, create,* and *state transition* (Richardson 2010, p3). Typically, theorists and practitioners gave definitions of project

[5] APM: Association for Project Management

[6] Uniqueness: Projects are distinct from business-as-usual activities, in that they require people to come together temporarily to focus on specific project objectives. As a result, effective teamwork is central to successful projects. Transience: a project has a specific start and end point and is set up to meet specific objectives, to create a specified result, product or service. http://www.apm.org.uk/WhatIsPM 20140221

as being a temporary activity towards a specific objective, as shown in table 2.1.

Table 2.1 Typical project definitions

Definitions	Quotations
Project is a series of work from the beginning to ending, restricted by time, resources, and purpose. Project has specific deliverable, deadline and budget. The quantity of people, resources and money to cast into the project is depended on the budget	Baker & Campbell 2003
A project is a temporary endeavor undertaken to a unique product, or result.	PMI 2004, p5
A project produces a "defined deliverable"; a project has a defined end date; a project has a defined budget; a project uses a wide range of resources; people will be involved in peaks and troughs during the project; a project has a life cycle.	Roberts 2007, p6-7
A project is a sequence of unique, complex, and connected activities that have one goal or purpose and that must be completed by a specific time, within budget, and according to specification.	Wysocki 2012, p6
Project is "a unique, transient endeavour undertaken to achieve planned objectives".	AMP 2014

PMAJ[7] (2007) has given a new direction of a project as value creation for the future in that they have developed the definition of project as *A value creation undertaking with a project mission for the future within a specific period under the limitation conditions, such as resources, the situations* (p46). Manning (2008) provides a broad systemic view to look at projects as *temporary systems are embedded in permanent, yet changing systemic that condition project organizing*.

2.2.2 The Term of Project Management

Generally, PM is a process of the planning, monitoring and control, and focuses on the skills of the project manager who takes responsibility to achieve this work (PMI[8] 2004; APM 2014; MSA[9] 2014). In PMI's definition, *Project management is the application of knowledge, skills, tools and techniques to project activities to meet project requirements. Project management is accomplished through the application and integration of the project management processes of initiating, planning, executing,*

[7] PMAJ: Project Management Association of Japan
[8] PMI: Project Management Institute
[9] MSA: Management Skills Advisor
http://www.managementskillsadvisor.com/what-is-project-management.html 20140221

monitoring and controlling, and closing. The project manager is the person responsible for accomplishing the project objectives (2004, p8). They indicate the managing tasks in a project as consisting of identification of requirements, establishment of objectives, balance among quality, scope, time and cost, and specifications and concerns of stakeholders. PMAJ (2007) also accentuates PM as an ability to apply expertise such as knowledge, skill, tools and techniques to meet project requirements. They define that *Project management is to apply practical expertise to a project for a specific mission, which needs to organize a terminable team, make full use of specialized ability of the project management, and obtain efficient and effective outcome through sequential and fair procedure* (p50). Kerzner (2006) thinks *project management is the art of creating the illusion that any outcome is the result of a series of predetermined, deliberate acts when, in fact* (it) *was dumb luck … project management is designed to make better use of existing resources by getting work to flow horizontally as well as vertically within the company* (p4). Turner (in Atkinson 1999) gives a different explanation to understand the foundation of PM, defining it as *the art and science of converting vision into reality*.

2.2.3 Problems in Project Management

PM is one stream of management doctrine, rooted in principles of scientific management within a historical view. The early project forms were managed by engineers and architects in the early 1900s for conducting construction and engineering. Frederick Taylor is the father of scientific management, who had an influence on Henry Gantt when he first created the Gantt chart to develop planning and control techniques for PM (Richardson 2010). Since Derek Pugh and the Aston Group improved team management skills in the late 1950s (Pugh & Hickson 2007), organizations have popularly applied the project form in many fields, so PM has been rapidly developed and has continuously had its emphasis on the skills of a single manager of a project. Generally, the domains of PM are separately discussed as five main processes, being *Initiating, Planning, Executing, Monitoring and Controlling, and Closing* (Richardson 2010, p22) in PM guidebooks, organized by such as PMI and PMAJ.

Koskela and Howell (2002) recognized three views in the underlying theory of PM, through a richness of literature based on the Guide of the Project Management Body of Knowledge (PMBOK Guide) of PMI, which are the transformation view, the flow view, and the value generation view. In the transformation view, a production is a transformation from inputs to outputs. The whole transformation is hierarchically distributed into subordinate transformation tasks and the separate lowering of the cost of

each task is required. Uncertainty and junction are acceptable in the flow view, which treats time as one attribute of production, and aims for reductions of time and variability in uncertain conditions. The notable feature of the value generation view is customer involvement, which aims towards customers' satisfaction for business purposes. The value generation view highlights dealing with customer requirements. In contrast, the transformation view leaves customers' requirements out of consideration as managers break a whole project work down into several tasks.

Wysocki (2012) systematically discusses three approaches as being traditional, agile, and extreme, according to projects' conditions with regards to goals and solutions in his publication. We distinguish characteristics and applicable models among three approaches according to his taxonomy in the following table.

Table 2.2 Characteristics and applicable models for three PM approaches

Approaches	**Characteristics**	**Applicable Models**
Traditional Project Management (TPM)	Low complexity; Few scop change requests; well-understood Technology infrastructure; Low risk; Experienced and skilled teams; defined plan and goal, and clear solution.	Linear Project management Life Cycle Model (Linear PMLC model)
		Incremental Project Management Life Cycle Model (Incremental PMLC model)
Agile Project Management (APM)	Less clear solution; High risk; Little client involved such as involving the client representative; Small co-located teams.	Iterative Project Management Life Cycle Model (Iterative PMLC model)
		Adaptive Project Management Life Cycle Model (Adaptive PMLC model)
Extreme Project Management (xPM)	Aiming research & development projects; Very high risk; More clients involved such as sponsors; New technology without a known application; A solution out looking for a problem to solve.	Emertxe Project Manageement Life Cycle Model (Extreme PMLC model)

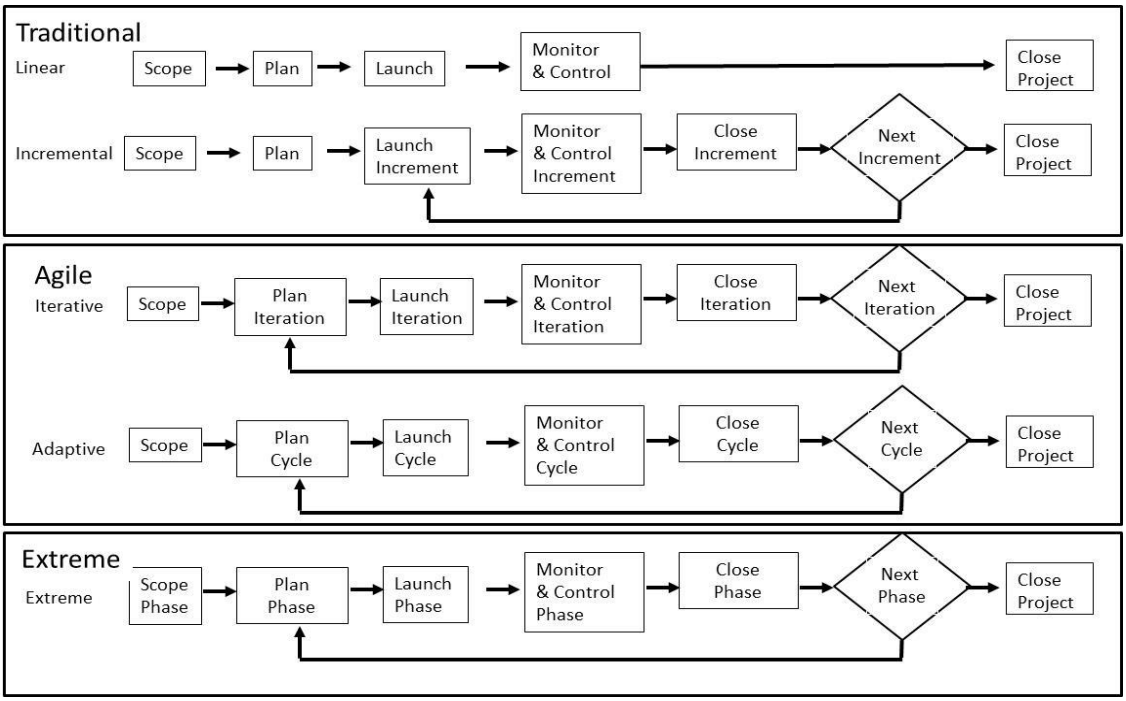

Figure 2.2 Five PMLC models (Wysocki 2012, p55)

In the three approaches of PM, typically, TPM takes a transformation view. In APM and xPM, both of the flow view and value generation view are inhabited in the total PM process. APM tends more towards the flow view, in which uncertainties in a project condition are clarified over time. Obviously, xPM is based on the value generation view towards incorporating customer requirements in business values. Collectively, all of the five applicable models for different PM approaches can be designated as project management life cycle (PMLC) models, and have five process groups, these being Scope, Plan, Launch, Monitor and Control, and Close, as seen in the figure 2.1, based on the Last Planner method. There are several features of the Last Planner method in PM. There firstly is a plan-driven project, which refers to the hierarchical chain of planners. Planning sequentially carries execution out after the last planner at the boundary to execution. Secondly, PM processes are fixed in order as scope, plan, launch, monitor and control, and close phases, and tasks, as units of a project in PM, can be analyzed, such as scope management, cost management, quality management. Thirdly, the focus in execution of a project is control, and always centers on cost, quality and time.

Primarily, conventional doctrine applies two approaches in PM: Last Planner and Scrum (Koskela & Howell Aug. 2002). Scrum appeared in 1990, and particularly used in software projects, seen in the figure 2.2. In contrast with Last Planner, Scrum does

not have Work Breakdown Structure (WBS) such that members in a software project decide and conduct their assignments by self-organization without controllers. However, Scrum still is rooted in conventional PM doctrine based on planning, execution, and control processes. We here recap the outstanding points of Scrum based on the analysis from a perspective of operation management by Koskela and Howell (2002). In the planning stage, the software functionalities demanded from the customer become clear, and the work condition is standardized during the first Sprint Planning Meeting. Then team members state their daily tasks to progress towards a visible target in the short term. In the execution stage, members make dispatching decisions according to their schedules, places, and conduct their assignment in communication with the team. In the control stage, control management consists of three levels: a daily level, a Sprint period level, and an overall level of a software project. The uppermost level watches over the whole project using the Iron Triangle (cost, time, and quality) standard, while the two lower levels proceed to knowledge creation in order to support the uppermost level. In Scrum, the flow and value generation view are apparent.

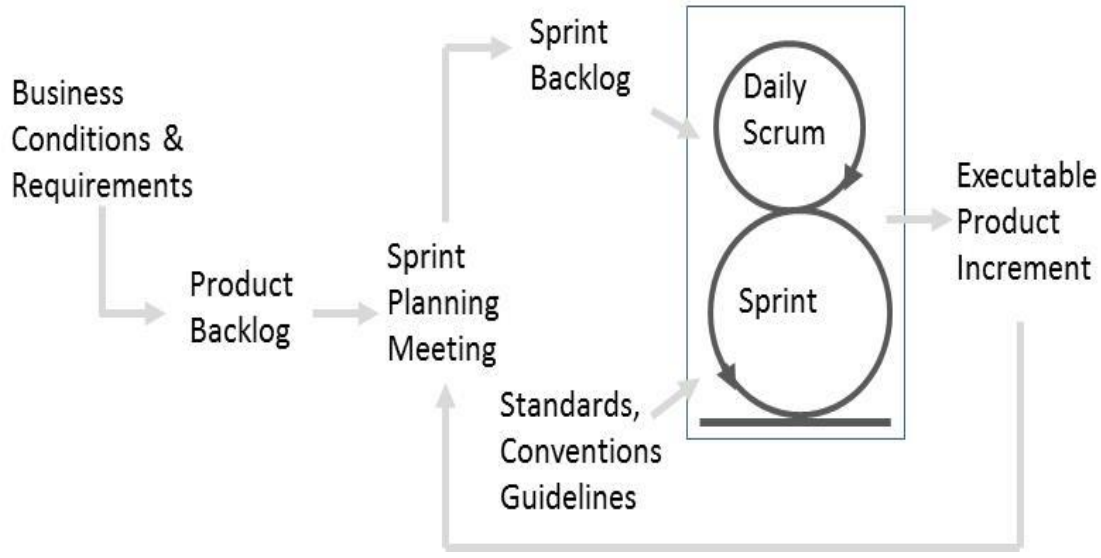

Figure 2.3 Overview on Scrum (Schwaber & Beedle 2002, p158)

In a value co-creation project, indisputably, the situation of PM must directly respond to customers' satisfaction. There is a big gap between the existing scientific theory of PM and practical PM in reality. There are three evident dilemmas in the existing PM theory.

(1) The Iron Triangle versus Value Creation:

The Iron Triangle consisting of time, cost, and quality (Atkinson 1999) is a standard to

evaluate the success of projects within the existing PM doctrine, which focuses on performances as deliverables in a project. When the definition of a project is further developed as a value creation undertaking for the future by PMAJ (2007), the argument between doing something right and doing something valuable has emerged in contemporary organizations. Doing something right can result in an explicit request as in the Iron Triangle standard. However, doing something valuable needs to consider business values in both the long-term and short-term views. Kerzner (2006) recognized that the Iron Triangle is inadequate for defining project success, and adds customers' acceptance, minimum or mutual agreement on scope changes, but omitted culture change, and the main work flow in the organization. He indicated management gaps, functional gaps, and operational gaps in the PMBOK Guide, and introduced a systems approach for PM. However, he took a firm-centric view to rethink PM in organizations without considering customer value creation. Contemporary organizations must face the uncertainty in the economy to ensure customers' satisfaction for their survival. Therefore, the business goals of projects must not only center on organizational values, but must also indispensably provide for customers' values. PM orientation in knowledge era must intensively offer values for the organization that are geared towards the implicit and explicit requirements of customers, not just installing new products and processes (Richardson 2010). Thus, The Iron Triangle standard is not suitable to define the success in a value co-creation project. There is a dilemma between the explicit standard of the Iron Triangle and the implicit requirement of value creation in the success criteria of PM.

(2) Control versus Interaction:

Conventional PM theory is based on the concepts of planning and control (Richardson 2010). Last Planner takes WBS strategy to decompose tasks as units of the PM process. As well, Scrum normalizes the condition of a project in the planning stage despite omitting WBS. Both methods of Last Planner and Scrum attempt to standardize processes in PM so that it is possible to achieve each task rapidly and independently for control. Control is centered on the operation of existing PM theories. The transformation view is completely focused on control by a hierarchical order for a specific outcome from input to output. The flow and value generation views call attention to customers' requirements. Customer involvement in both views tends to reduce the uncertainty so that it is possible to simplify the condition of a project for streamlining each task in its PM process. The strategy of both views is still rooted in the concept of control in PM. All three views are developed within the root of PM: planning and control, which are two separate parts. In a value co-creation project, customers

share their knowledge and provide their ideas, not only their requirements but also contributions for unknown solutions during the PM process. Customers are co-creators (Prahalad & Ramaswamy 2004; Vargo & Lusch 2008; Grönroos 2011) and are directly engaged in the PM process. Therefore, the simultaneity of planning and execution in a value co-creation project is common. The foundation of PM theory, strategically separating execution from planning can't deal with such project situation as a value co-creation project addresses. Moreover, when a project condition is interactive, and customers directly judge the project work, the control method has no efficacy any longer. Indeed, a mutual way is necessary, and the core of PM should be the interaction between the organization and its customers. Management should have the character of a co-creating process with customers, not a planning or organizing process. As Turner (in Atkinson 1999) says, PM is *the art and science of converting vision into reality*.

(3) Hierarchical Power versus the Interactive Project Situation:

Traditional PM theory dominantly focuses on the power of project managers in such aspects as skills, knowledge, and tools for them. In the Last Planner, PM is a hierarchical composition: a project manager, acting as a controller, watches the streamline of tasks in a project, and evaluates the results of the project according to a standard such as time and money. The project manager is the only one to take responsibility for the project that he/she controls. The importance of the power that a project manager should have is understandable when a project situation aims towards a specific product. However, in a value co-creation project, customers directly engage in PM as project team members; even so, the situation sometimes is not formal, but they give and lead the direction of PM in some situations. Therefore, it is impossible for a project manager to control or order customers who are engaged in PM processes by hierarchical power. In the Last Planner, the question is how an organization interacts with its customers in a project situation. There is a dilemma between the hierarchical thinking that focuses on control by a single manager and the interactive situation in a project. Although, in Scrum, team members do share PM work in part, such as when they make dispatching decisions and conduct their tasks without controllers. How do they complete this process? How do they work together for learning and knowledge creation in a way that supports the control in the uppermost level? Scrum still has the same weakness as the Last Planner, because PM in both is rooted in the concept of control. In a value co-creation project, paying attention to customers' requirements is not enough for business values. An organization must interact with its customers for knowledge creation, which subsequently generates business values because customers are co-creators. In summary, in such a project, the leadership task is shared among

participants, not only held by a single leader as the project manager. How do participants interact with each other in a project situation for knowledge creation towards business values? There is a lack of theory to discuss this, and this includes two angles: knowledge creation between an organization and its customers, and leadership and followership in a value co-creation project.

2.3 Leadership Theory

2.3.1 The Term of Leadership and Followership

(1) The Term of Leadership:

The conventional doctrine of PM makes much of the power and ability of the manager in a project, which overlaps with leadership theory. The concept of leadership originated in ancient philosophical thinking many centuries ago, such as the art of war from Sun Tzu on the eastern side, and the philosophy of Plato on the western side (Grint 1997). Despite the disputation in leadership doctrine over several centuries, the concept of leadership isn't clear yet, and the term of leadership still is controversial in its definition. There are many ways to define leadership. Some definitions describe the role of leadership, such as *leadership was bestowed upon a person who was by nature a servant. It was something given, or assumed, that could be taken away* (Greenleaf 2002, p21-22), or emphasize the capacity and behavior of leadership such as *the ability of an individual to influence, motivate, and enable others to contribute toward the effectiveness and success of the organization...* (House et al. 1999, p184). Some scholars think leadership is a process (Tyler 2005; Yukl 2013). Yukl sorts out the division of the conception of leadership in two directions: the role of leadership, including nature, ability and behavior of leadership, and an influencing process that interacts with members or the social system. He integrates both aspects to define that *Leadership is the process of influencing others to understand and agree about what needs to be done and how to do it, and the process of facilitating individual and collective efforts to accomplish shared objectives.* (Yukl 2013, p23) Other scholars give a relational view in their definition of leadership. They describe interpersonal relations on an equal basis in the structure of leadership, such as *Leadership is a relational term. It identifies a relationship in which some people are able to persuade others to adopt new values, attitudes and goals, and to exert effort on behalf of those values, attitudes and goals.* (Hogg 2005, p53)

Leadership is an interaction between two or more members of a group that often involves a structuring or restructuring of the situation and the perceptions and expectations of the members…Leadership occurs when one group member modifies the motivation or competencies of others in the group. Any member of the group can exhibit some amount leadership… (Bass in Gastil 1994) Kevin Cashman thinks that *leadership is not simply something we do. It comes from somewhere inside us. Leadership is a process, an intimate expression of who we are. It's our being in action. At its deepest level, leadership is authentic self-expression that creates value…* (Rikowski 2007, P51)

(2) The Term of Followership:

The role of leaders is the primary focus in conventional leadership theory. Scholars extensively have debated leadership, but rarely discussed followership. Since Kelley emphasized the importance of followership by his book "In Praise of Followers" in 1988, the attention to followers has been increasingly cultivated in recent years. However, the definition of followership hasn't been intensively discussed in contemporary leadership doctrine. There are two tendencies in the definition of followership, as seen in the table 2.3. One view is focused on the role or capacity of followers. Another view is stressed followership as a reciprocal process to leadership.

Table 2.3 Two views of followership definitions

Views	Definitions	Quotations
Role / Capacity	Followership is the act or condition of following a leader. To be a follower is to subordinate one`s self to another.	Frisina 2005
	Followership is the capacity or willingness to follow a leader.	Merriam Webster dictionary
	Followership is a discipline of supporting leaders and helping them to lead well, It is not submission, but the wise and good care of leaders, done out of a sense of gratitude for their willingness to take on the responsibilities of leadership, and a sense of hope and faith in their abilities and potential.	Chaleff 2008, p86
Riciprocal Process	Followership is the reciprocal social process of leadership.	Forsyth 2010
	Followership is a value co-creation process where a follower achieves his/her own purposes throught his/her supportive behaviors for the accomplishment of a leader.	Shimomura & Kosaka 2013

In the opinion provided by Maroosis (2008), *leadership and followership are competencies that work in tandem as a shared discipline of reciprocal response-abilities. Both are learning how to follow that is being called for in a given situation. Leadership*

is a learning process that is not only centered in what needs to be said but also in learning how to say it in ways that others can understand and follow … followership is a reciprocal partnership of ethical response-abilities (p18-24). The reciprocity between leadership and followership is described in Yijing as *(in) leading others, a person must first know what it is to follow and then seek willing agreement rather than coercion or trickery* (p24).

2.3.2 Problems in Leadership theory

Since Max Weber first contributed the principal of authority structures in organizations (Pugh & Hickson 2007), research related to leaders has been one of foci in organization doctrine. Barnard (1997) simplified the statement of the leadership conception as depending on three things: the individual, the conditions, and the followers. Deservedly the leader-centered approach is dominantly developed in leadership research due to the root of authority structures in organizations. There are several theories that have appeared during the development of leadership research. Yukl (2013) provided a broad survey on leadership research regarding the effectiveness of leadership in organizations in thousands of literature references. The following discussion and analysis partly rely on his description.

(1) Leadership styles:

The early leadership theory started from studying individual attributes, the so-called "trait theory of leadership", consisting of perspective, such as motives, personality, and temperament. Research seeking the traits and skills of leaders is useful, but each pattern of traits and skills isn't certain to be effective in different situations. In response to the criticisms of the trait theory, theorists have shed light on leaders' behaviors. Several leadership styles have subsequently been determined to evaluate the effectiveness of leadership by a behavioral taxonomy.

Transactional leadership is a style of leaders who influence followers through rewards and punishments to achieve organizational goals; this is useful for practice with standards, but not innovation through openness. An effective transactional leader is able to reward followers' performance in a timely way (Aarons 2006). Transactional leadership is incompatible with the transformational leadership. The difference between them is that the transformational leaders focus on motivating followers, but transactional leaders are interested in exchanging rewards with followers. Transformational leaders give their insights to followers and motivate followers' interests in the leader's goals through raising consciousness about the value and

significance of outcomes. Bass (in Stone et al. 2004) suggested that transformational leaders transform their followers' values for the organizational goals by earning the respect, trust, and admiration of their followers. Most scholars treat the transformational and the charismatic leadership styles as compatible. Yukl (2013) presents the distinction of the degree of followers' perception in both theories. Charismatic leadership provides an extraordinary image to followers by means of the leader's guidance and inspiration, and probably utilizes more things than transformational leadership, such as information restriction, impression management, and personal risk taking in order to be able to engage and influence followers in extraordinary situations.

Other neo-charismatic leadership styles pay attention to the motivation of followers through the activation of higher-order needs, such as authentic leadership and servant leadership. Luthans and Avolio (2003) defined authentic leadership *as a process that draws from both positive psychological capacities and a highly developed organizational context, which results in both greater self-awareness and self-regulated positive behaviors on the part of leaders and associates, fostering positive self-development.* Authenticity can be treated as the foundational component to transformational leadership. Authentic leaders' actions are based on their personal values and convictions; they do not guarantee accuracy of prediction, but trust followers to be engaged and intelligent enough that they are able to contribute their best knowledge towards attaining the desired future state (Avolio & Gardner 2005). Likewise, servant leadership has the same self-awareness and self-regulation attributes of the leader role as authentic leadership. However, the focus of servant leadership is on others rather than the self of the leader role, and the prime motivation in leadership is to serve and meet others' needs as a servant (Stone et al. 2004). Servant leaders achieve their goals by emphasizing organizational goals, by their capacity for social responsibility, and by the empowerment of followers in treating them as whole individuals having minds and spirits to awaken, engage, and develop, as well as to benefit them (Dierendonck & Patterson 2010). Greenleaf (2002) first discussed servant leadership with a service view, and his concept is rooted in radical humility and common mutuality. Servant leadership takes a long-term focus to consider values within the organization, its employees, and the larger society, and this provides a follower-focused view as opposed to the short-term, personal leader focus found in leadership theory. Democratic leadership also takes the follower's perspective, and pays attention to the interaction between leaders and followers during the decision-making process (Gastil 1994). In this style, leaders share decision-making procedures with followers by practicing social equality.

The foregoing leadership styles are mainly identified from a leader-centered approach. Most behavioral studies have either task-oriented (considering an efficient and reliable way for task accomplishment) or relations-oriented (gaining trust and cooperation from followers to achieve leaders' goals) focus. Little research focuses on change-oriented behavior to understand the environment and a way to implement major changes in strategies, products, or processes. Many insights provide significance to leadership but are limited in finding appropriate component behaviors for specific leadership situations, and do not show a way that effective leaders can adapt their behaviors to deal with situational changes.

(2) Leader-Follower Relationship & Follower-based View:

A lot of leadership research focuses on leaders, but neglects followers. Leader-member exchange (LMX) theory introduces a follower-based perspective into the role-making process between leaders and followers. According to Yukl (2013), the relationship between leaders and followers in LMX is gradually enhanced through interactive behavioral reinforcement through exchange cycles over time, depending on personal compatibility and the ability and dependability of followers. The essence of the exchange relationship is that the leader exerts control over the outcomes followers want, such as tangible rewards, involvement in decision-making procedures, and interesting tasks. The quality of the exchange relationship is a main subject in LMX studies in describing such things such as reciprocal trust, respect, and loyalty. Even though other research (Graen & Uhl-Bien 1995) paid attention to an agreement in the leader-follower relationship, scholars didn't provide a discussion for making a strong leader-follower agreement by their interaction.

Gastil (1994) discussed a democratic relation between leaders and followers. In this approach, the role of leaders is often changed and leadership is widely distributed among people. He described the function of leadership as distributing responsibility, empowerment, and aiding deliberation. According to these functions, democratic followers take such responsibilities as taking responsibility for the group, responsible actions and decisions, keeping autonomy, and cooperating with people who are leading. However, the study only concentrated on the concept and applicable scope of democratic leadership and follower behavioral patterns, not on the leader-follower interactive process.

Meindl and Ehrlich (1987) first formulated the "romance of leadership" phenomenon to discuss the social construction of leadership, which has attracted scholars to trace the leadership relationship between leaders and followers. The result, according to a review of the romance of leadership literature (Bligh, Kohles & Pillai 2011) shows that all

studies that have been conducted in the last 25 years were on three subjects: attributions of leadership, follower-centered approaches, and the social construction of leadership. Some researches explore follower characteristics to understand leadership but don't examine the potential interactions between followership and leadership. Since Kelly (2008, p5) recognized that *leaders neither exist nor act in a vacuum without followers*, this draws attention to a follower-centered approach in recent research. Current studies on followership are focused on the conceptualization of followership, followers' roles, and behaviors in the dynamic leader-follower relationship. Maroosis (2008) took a learning aspect to discuss the relationship between leaders and followers as a partnership in reciprocal following. In his description of followership, the moral practice includes the requirement of discipline and discrimination, engaging in the same thinking as leadership, and needing guidance to develop a response-able attitude to things. The learning process to undertake things initially involves followers simultaneously questioning leadership, giving leadership a sense of traction and tools for discovery, keeping leaders on-purpose by sharing their ignorance with them, and continually training in virtues to avoid devolving into fallowness. Chaleff (2008) posited that followers do not serve leaders; both leaders and followers serve a common goal, each from their own role. He introduced courageous followers' attitudes and behaviors as having five dimensions, these being support, responsibility, challenge, participation, and taking a moral stand. He classified followership styles as implementer, partner, individualist, and resource-based on a matrix of two followership characteristics: the courage to support the leader, also to challenge the leader's behavior. Adair (2008) provided a 4-D followership model to illustrate employees' behavior patterns in their respective organizations and positions, describing these as disciple, doer, disgruntled, and disengaged. In the explanation from Dixon (2008), leadership and followership interact with each other as an orbit in balance around organizational goals and values. The quality of the relationship between leaders and followers is the key for balance, which is effected by commitment to purpose, coexisting equals, power balance, shared values, and trust. These researches have evolved a new angle to look at leadership and followership, but still didn't really explain what the interactive process between leaders and followers is.

(3) Leadership theories against situation changes:

Traits and behavioral leadership reflects different leadership patterns in their identities and behaviors. Contingency theory explains why traits and behaviors differ in different situations for effective leadership. In the summarization provided by Yukl (2013), contingency theory was proposed during the period from the 1970s to 1980s, including

path-goal theory, leadership substitute theory, situational leadership, the LPC (least preferred coworker) contingency model, cognitive resource theory, the multiple-linkage model, and the normative decision model. Path-goal theory describes what influences followers and the performance according to the task-oriented or relation-oriented behaviors of leaders in different situations. Leadership substitute theory indicates aspects of the situation including the characteristics of followers, tasks, and the organization as substitutes in that leaders have suitable behaviors such as task-oriented or relations-oriented. Situational leadership focuses on the short-term behavior of leaders in various situations in that a leader has directive and supportive behaviors according to subordinate maturity, including their abilities and confidence to conduct tasks. The LPC contingency model discusses how a leader's LPC score moderates the effects on group performance depending on a situational favorability including task structure, leader position power, and the quality of leader-member relations. Cognitive resources theory stresses how leaders use their cognitive resources such as experience and intelligence to influence group performance. The multiple-linkage model adopts other theories to describe the joint effect upon the implementation of followers and leaders from situational variables and managerial behavior. The normative decision model is proposed by Vroom and Yetton (in Yukl 2013) and provides five types of decision procedures to present how a leader chooses a specific decision procedure that effectively influences followers and affects performance. Most of contingency theory highlight behavioral meta-categories, but don`t clearly explain how leaders deal with the situation when it continuously changes.

Psychological leadership originated from organizational theory to deal with environmental changes, and, furthermore, it is from traditional social psychology. Scholars observe leadership as *a psychological process and afforded by organizational constraints and opportunities* (Messick & Kramer 2005, p1). The analytical work by Bligh and Meindl (2005) proved that popular books with an ecological perspective on leadership are highly representative of the beliefs, ideas, and perspectives of leadership focusing on the social, cultural, and environmental factors of changes to contextualize the leadership process. Messick (2005) had an idea of leader-follower exchange from a psychological perspective. He believes that the norm of reciprocity is a basic part of human social nature, and that people exchange roles as leaders or followers when the conditions are favorable to them. Leaders and followers provide values for each other; they enjoy a mutually beneficial relationship through the exchange of benefits. He identified some dimensions as benefits, such as vision and security to followers. Tyler (2005) also used a psychological approach to explain process-based factors for

leadership. He thinks effective leadership is judged by followers, to the extent that a leader uses authority through fair procedure. Procedural justice is the key antecedent of attitudes and values, and discretionary behavior. Lewin (in Yukl 2013) is one of the earliest theorists to discuss a psychological process as the force-field model to deal with social change, and this includes three phases: unfreezing, changing and refreezing. Another process theory (in Yukl 2013) provides a reaction pattern for changes imposed on people as having four stages: denial, anger, mourning, and adaptation. There are many ways to judge the outcomes of changes, such as the successful performance of the change, and people's adaption to the change. Yukl (2013) suggested that four things are needed, such as determining what to change, understanding systems dynamics, responsibility for implementing major change, and the pace and sequencing of changes. A change process on leadership is focused on people-oriented action to identify the constitutional causes of changes. However, there is the lack of a process addressing how leadership facilitates the change process to reach the ultimate organizational goal.

Teamwork and cross-cultural leadership are becoming an important focus of organizations for work efficiency and adaption in globalization. Rees (2007) provided a new leadership style with leaders acting as facilitators for activation in project teams or organizations. Behavioral scientists and practitioners contribute their knowledge to team performance in internal organization or external coordination, but they don't explain collective learning and creative problem solving by a group from an interactive aspect. Current cross-cultural leadership studies center on the differences of cultural values, leadership behavioral patterns, and their effects on outcomes, but there is a lack of discussion of leader-follower agreement across cultures. Considering the weakness in leadership research given the variety of approaches, and the narrow focus, Yukl (2013) proposed an integrating conceptual framework to contain each set of variables, including leader traits, leader behavior, leader power, success criteria, situational variables, and mediating variables. He assumed that the mediating variables can discriminate performance at such different levels as individuals, groups, or organizations. This framework gave a new orientation to leadership research, but didn't discuss each variable nor a mediating process to build relationships among different variables.

(4) Problems in Leadership Studies:

Contemporary organizations are facing a competitive and dynamic economic environment. Organizations must take a long-term view to rethink their future, and need to shift their focus to value creation for their survival. Moreover, people in the organization are required to continuously learn and enhance their abilities to deal with

economic uncertainty. Therefore, interaction with external force is increasingly important, as this can improve the efficiency of learning and knowledge creation for value creation. Theorists and practitioners have contributed many significant insights on leadership. However, there are two weaknesses in most leadership studies. One is the narrow focus in most leadership studies due to the limitation in the traditional leadership-followership organizational position paradigms. Many scholars have defined leadership as a role, ability, or influencing process during the development of leadership theory. Studies by a leader-centered approach have emphasized leadership's influence upon followership by power struggles. On the other hand, the follower-centered approach has started to pay attention to the interaction between leaders and followers, focusing on their roles equally. Yet, no matter whether it is the leader-centered approach or the follower-centered approach, the existing leadership studies are limited in their identification of roles and behavioral patterns, in that they do not discuss the dynamic process of leader-follower interaction (leveraging influence between leaders and followers). Another issue is the success criteria. *Influencing follower commitment and optimism for a task are the central aspect of most theories of effective leadership* (Yukl 2013, p330). The success criteria in the existing leadership studies center on the outcome of leadership as being a specific goal, which inherits the legacy of the conservative management perspective in such things as focusing on products, processes or strategies, rather than shifts to value creation with a long-term view for the future of the organization. It causes leadership research narrowly focusing on leadership traits, behavioral patterns, relationships, situations, and decomposition causes at one level. A single perspective is insufficient to deal with a dynamic situation. Instead, a systems thinking and a change process for identifying leader-follower interaction are required, which can help continuous learning and knowledge creation to deal with the complex environment organizations face. Effective leadership in the knowledge era is required to extract ideas and transform knowledge from a wide range of sources into company assets.

2.4 Knowledge Management

2.4.1 The Term of Knowledge and Knowledge Creation

The philosopher Plato famously defined knowledge as "justified true belief". Many

theories discusses the characteristic of knowledge by various aspects, such as a state of mind, an object, a process, a condition of having access to information, or a capability (Cummings 2003). Takakuwa (1995) defined that knowledge is human epistemology, which systemizes data, information and fragmentary knowledge to achieve specific human purposes, and that knowledge configuration is formed as a pyramid, ascending from data at the bottom, then information, scientific knowledge and factual knowledge, knowledge of philosophy, and finally religion and art in the top. Some scholars (Kakabadse et al. 2003) presented the chain of knowledge flow as data, information, realization, action/reflection, wisdom. The term of knowledge is also dichotomized in such ways as tacit versus explicit, and collective versus individual, or classified in management and organization theory as tacit, embodied, encoded, embedded, event, and procedural (Mertins et al. 2003). The most common association with the term knowledge is scientific knowledge and people experiences. From a practical aspect, Mertins, Heisig, and Vorbeck think the criteria of validity and reliability of knowledge is more important. Knowledge in the society includes not only scientific and theoretical knowledge, but also social knowledge, such as institutions, customs, and common interpretations (Zhang & Kosaka 2013). Berger and Luckman (1966) believed that people create knowledge through their interaction in everyday life, and people's beliefs and life experiences affect their perceptions of reality and what is real is justified by the social relativity of the concepts depending on what is socially acceptable.

In the opinion from Takakuwa (1995), knowledge creation is knowledge transfer from the nonexistent state to the existent state with determinately created necessary procedures and methods; knowledge creation also includes the improvement of existing knowledge. He indicated five components of knowledge creation, including knowledge function, input for the content of knowledge transfer, output from the content of knowledge transfer, the content of knowledge transfer (how to do it), and knowledge catalyst. Kim (2001) thinks knowledge creation is a knowledge creating system. He imagined the cycle of knowledge creation as a tree, which is formed having theory as the tree's roots to give nutrient, methods and tools as the branches of the tree to translate theories into new capabilities and practical results, and practical knowledge as the fruit that provides the seeds for more trees. He suggested that knowledge creation needs systems thinking.

2.4.2 The Term of Knowledge Management

Mertins, Heisig and Vorbeck (2003) described that *knowledge management includes all*

methods, instruments and tools that contribute to the promotion of an integrated core knowledge process - with the following four core activities as a minimum, to generate knowledge, to store knowledge, to distribute knowledge and to apply knowledge - in all areas and levels of the organization in order to enhance organizational performance by focusing on the value creating business processes, due to their empirical foundation (p11). They provided a benchmarking survey, that there are two main streams of definitions on KM. One is to define KM as *a part of corporate culture, which supports the active exchange of information, knowledge and experiences between employees and departments*, another is to define KM *as a company-oriented method: the sum of procedures that determine the generation, distribution and application of knowledge to achieve organizational goals* (p3). People and processes are the two keys to KM. KM can combine four components, these being *business processes, information technologies, knowledge repositories, and individual behaviors* (Kakabadse et al. 2003).

2.4.3 Problems in Knowledge Management

(1) Knowledge Management Theory:

Some scholars (Kakabadse et al. 2003) categorized KM into five different disciplines through a rich body of literature, and summarized the features of each model in the table 2.4.

Table 2.4 Knowledge management models (Kakabadse et al. 2003)

	Philosophy-based model	**Cognitive model**	**Network model**	**Community model**	**Quantum model**
Treatment of knowledge	Knowledge is "justified true belief"	Knowledge is objectively defined and codified as concepts and facts	Knowledge is external to the adopter in explicit and implicit forms	Knowledge is constructed socially and based on experience	System of possibilities
Diminant metaphor	Epistemology	Memory	Network	Community	Paradox
Focus	Ways of knowing	Knowledge capture and storage	Knowledge acquisition	Knowledge creation and application	Solving paradox and complex issues
Primary aim	Emancipation	To codify and capture explicit knowledge and information-knowledge exploitation	Competitive advantage	Promote knowledge sharing	Learning systems
Critical lever	Questioning, reflecting and debating	Technology	Boundary spanning	Commitment and trust	Technology
Primary outcomes	New knowledge	Standardization, routinization and recycling of knowledge	Awareness of external development	Application of new knowledge	Creation of multi-reality
Role of IT based tools	Almost irrelevant	Critical integrative mechanism	Complimentary interactive mechanism	Supporting integrative mechanism	Critical-Knowledge centric

Christensen and Bukh (2005) provided two perspectives on KM. The artefact-oriented perspective makes knowledge tangible based on the people-to-document method, known as production rules. The purpose in the artefact-oriented epistemology is the implementation of systems to improve and support the distribution of knowledge; usually the knowledge in a company for its customers' solution is based on which has been used in other situations. Knowledge creation and knowledge sharing in the artefact-oriented epistemology often take place through information processing with a top-down management structure. Another perspective is the process-oriented epistemology mainly influenced by Nonaka (1994), which is perceived as a supplement to the artefact-oriented epistemology using the people-to-people method, and essentially focuses on how knowledge is created through complex processes by the personalization strategy. In the process-oriented epistemology, knowledge is an interpretation of data in a certain context, characterized as a dynamic process developed by interaction between people and technology. Knowledge creation is a continuous process where new knowledge is created from existing knowledge, which affects the actor's view, and depends on the context that is related to the knowledge. The process-oriented view takes a middle-up-down management structure in that middle managers spirally cross the horizontal and vertical knowledge flow to help employees to internalize their useful experiences into the organization.

Broad effective KM efforts in practice engage knowledge transfer, knowledge creation, and information management to support organizational ultimate objectives (Zhang et al. 2013). There is a variety of studies on KM, such as focusing on the conversion of knowledge types and the dynamic relation from the individual level to organizational level (Hedlund 1994; Nonaka & Takeuchi 1995), summarizing the state of knowledge, functions, manners, and components for knowledge creation in organizations (Earl 1997; Wiig 1993; Edvinsson & Sullivan 1996). Some researchers promote information systems in KM as knowledge management systems (KMS) for supporting knowledge transfer, creation, and application in organizations (Alavi & Leidner 2001; Lee & Hong 2002). Most KM studies are focused on distinguishing types, levels, elements, contexts, and IT roles of knowledge by a top-down approach; few studies pay attention to personal knowledge management (PKM) by a bottom-up approach (Wright 2005; Sensky 2002; Zhang 2009). KM efforts typically center on the organizational level, and overlap with organizational learning. Scholars treat an organization as a whole to provide new concepts of organizational learning between an individual and the organization by different aspects (Kim 1993; Buckler 1996; Parboteeah & Jackson 2007). Knowledge-sharing also is important to KM, which lays stress on knowledge exchange

through networks among people, social communities, or organizations, and involves the application of existing knowledge and knowledge generation. Some studies identified primary contexts or behaviors to affect successful knowledge-sharing implementations in organizations (Cummings 2003; Hsu et al. 2007). Collaboration also can be treated as knowledge-sharing activities. Only a few researches related to collaboration discussed how to select good partners or how to manage networks and sustainable firm performance (Mun et al. 2009; Eisingerich & Bell 2008).

(2) The Knowledge Creation Model:

Knowledge creation has become a key to KM to deal with the complex environments of organizations in the knowledge era. The SECI model is a well-known organizational knowledge creation theory, proposed by Nonaka and Takeuchi (1995), which incorporates four modes as socialization, externalization, combination, and internalization for knowledge conversion between tacit and explicit knowledge, as shown in the figure 2.3. The four modes constitute the entire knowledge creating process via a middle-up-down management method through individual experiences for organizational knowledge creation (Nonaka 2005).

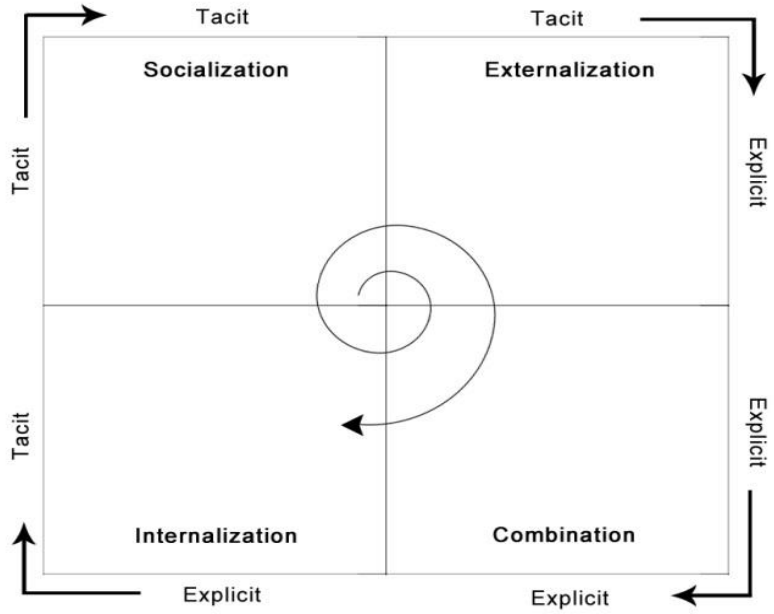

Figure 2.4 The SECI model (Nonaka & Takeuchi 1995)

The core of the SECI model describes how such a spiral through the four modes of knowledge conversion emerges when tacit knowledge and explicit knowledge interact with each other (Takeuchi & Nonaka 2000). Takeuchi and Nonaka assume knowledge is

created by individuals and crystallizes as a part of the knowledge network of the organization, whereby knowledge creation has an ontological dimension. They also think knowledge creation has an epistemological dimension, because human beings acquire knowledge by actively creating and organizing their own experiences. This knowledge-creating theory stresses the interaction between human agents and the environment for evolution in society, which is a context-based process in *Ba*. *Ba* in the knowledge-creating theory is considered as *a context that harbors meaning… a shared time and space for emerging relationship among individuals and groups to create knowledge* (Nonaka et al. 2001, p19). Takeuchi and Nonaka (2000) suggested that the organization in the organizational knowledge-creation process should provide *Ba* for facilitating knowledge creation and accumulation at the individual level; for which is required to have five conditions at the organizational level, including autonomy, intention, redundancy, fluctuation and creative chaos, and requisite variety. The SECI model is one of the earliest theories on KM to advocate the importance of human intelligence in organizations. Nonaka (2005) provided a new insight on KM to look at humanistic creativity through interaction between epistemology and ontology from the individual to organizational level, instead of a positivist rationality considering knowledge as an *exogenous variable or distraction against linear economic rationale* (p390).

(3) Problems in Knowledge Management:

A result of a survey in 2000 (Mertins et al. 2003), showed that increasing customer satisfaction is the most important company goal of KM and most KM is business process oriented. Nowadays organizations face more intense competition and complex marketplaces compared with ten years ago. There is a shift from manufacturing to service during economic development. Accordingly, the criteria of knowledge creation have changed from new product and process to customer value creation, which requires that organizations pay more attention to co-create with customers so that they can learn from sophisticated customers for knowledge creation in order to survive in the complex environment. However, there is a lack of such a co-creating process with customers for customer value creation in the current KM conception. Most KM has only a narrow focus on the effectiveness and efficiency of reconfiguration and adaptation for knowledge creation, transfer, and use in organizations from a firm-centered view, not involving customers as co-creators in KM.

Even though the SECI model is a knowledge creation theory, it can’t entirely adapt to this situation. Because the SECI model is focused on an agential explanation of knowledge creation as the conversion of knowledge types between tacit and explicit, not

customer value creation. The leadership in the SECI model is suggested as being a less hierarchical middle-up-down management. Nevertheless, it can't deal with co-creators during the knowledge creating process who are from outside of the organization, such as customers. The environment conducive to knowledge creation in the SECI model is called *Ba* in which knowledge can be created, but is limited in organizations, so the proposer of the SECI model suggested some conditions at the organizational level to facilitate the development of *Ba*. However, organizations can't control conditions in marketplaces, when KM is required for value creation with customers, there is a lack of a facilitating process so knowledge can be created and converted into values for both organizations and customers.

2.5 Summary

Current PM guide-books independently discuss initiating, planning, executing, monitoring and controlling, and closing processes, which can be classified by three views as the transformation view, the flow view, and the value generation view. Three approaches, these being the traditional, agile, and extreme in accordance with various conditions of goals and solutions, and two methods, these being the Last Planer and Scrum are applied in PM. However, when value creation becomes a focal point in contemporary organizations, and customers become co-creators and directly engaged in PM processes, control and the hierarchical power as a project manager are no longer suitable to PM. In a value co-creation project, the leadership task is shared among participants, not only a single project manager, but also other members from different cultures and fields, including customers. The existing leadership theory is narrowly centered on the role and behavioral patterns of leaders or followers, not on a dynamic process as leader-follower interaction. Value creation in contemporary organizations is based on knowledge creation. Nevertheless, traditional KM focuses on internal human intelligence for the effectiveness and efficiency of knowledge creation, transfer, and use in organizations, rather than involving customers as co-creators in KM in reality. The current theories related to PM, leadership, and KM are not able to provide a useful framework to discuss how participants as leaders and followers interact with each other in a value co-creation project for knowledge creation, which subsequently converts into business values for the organization and its customers. On the other hand, value co-creation studies have been developed, but the topic of value co-creation still is controversial, and there is not a framework of value co-creation to facilitate human

interaction, which would give satisfaction and work efficiency.

The richness of literature provides many insights in different fields, but does not offer a realistic method for human value co-creation activities, such as value co-creation projects. The weaknesses of theories related to PM, leadership and KM, and the tendency of value co-creation studies demonstrate that a new mindset is necessary.

Chapter 3: Value Co-Creation Framework based on A Service Science Approach

3.1 Introduction

A new paradigm of value co-creation requires a new mindset. In this chapter, we mainly present two parts: the conceptual background and the research proposal. In the section addressing the conceptual background, we firstly introduce a service mindset including a service-centered view and service systems thinking; then we explain the human positional exchange characteristic. In the research proposal section, we first off introduce the original concept of value co-creation system and the KIKI model, and then we develop it to build a value co-creation framework, as detailed in the research hypotheses in accordance with each SRQ. This study employs a multi-principle perspective, which is a service science approach, mainly laying emphasis on the service-centered view and the service systems thinking.

3.2 Service Mindset

3.2.1 Service-Centered View

3.2.1.1 Customer-Oriented Thinking

The Bible is one of the earliest records of providing a service concept of serving others to accomplish one's mission. For instance, Jesus washed his disciples' feet and asked them to: *love one another as I have loved you, so you must love one another* (in Bible, John 13:34). The Japanese hospitality hotel service, as a traditional culture, also shows service as considering and satisfying customers first so as to achieve the hotel's mission (Hosoi 2006). These phenomena indicate that service is a serving process where the focus is on others first, and not the one who provides the service, while service is also used to accomplish the mission of the one who gives service. That demonstrates that the essence of service is humility and reciprocity. Drucker (2010) suggested that serving

customers is a firm's primary responsibility because a firm essentially aims for its existence and sustainability first, not its profit. Customer satisfaction directly affects the earning ability and the future of an organization, and value depends on customers in contemporary markets, which reminds us that firms must think of their customers first. A customer-oriented thinking, namely a service-oriented thinking, means to consider and serve others first in order to achieve one's mission.

3.2.1.2 Service Logic

Grönroos (2006, 2011) provides a Service Logic in business for marketing theory, which is a customer-oriented thinking. In his view, service is based on human interaction, and value is generated during human interaction, not created; therefore, a firm and its customers are co-producers of the service and co-creators of value during their interaction. Service Logic emphasizes firm-customer interaction and pays attention to the support of customer value creating processes, as specified in some foundational premises for value co-creation, and briefly summarized into the following five points (Zhang & Kosaka 2013):

1. The essential of business is reciprocal value creation, and service is the mediating factor.
2. A service-centered view is customer-oriented and relational.
3. Fundamentally, the customer is always a value creator, and the firm is a facilitator of value for the customer. The firm can engage with its customers' value-creating processes during direct interactions to offer value propositions. The firm also has an opportunity to influence its customers' value creation directly and actively.
4. All actors in social economy are resource integrators.
5. Value is accumulating throughout the customers' value creating process, which is always uniquely, and both experientially and contextually, perceived and determined by the customer.

3.2.2 Service Systems Thinking

A service system is a system including human beings and knowledge integration within multidisciplinary fields for the purpose of customer satisfaction, and consists of customers, service providers, and their interaction (Kosaka 2010). There are three parts, based on knowledge science and system science, to optimize service systems, and these include customer analysis, co-creation of service value, and optimization of service, as shown below:

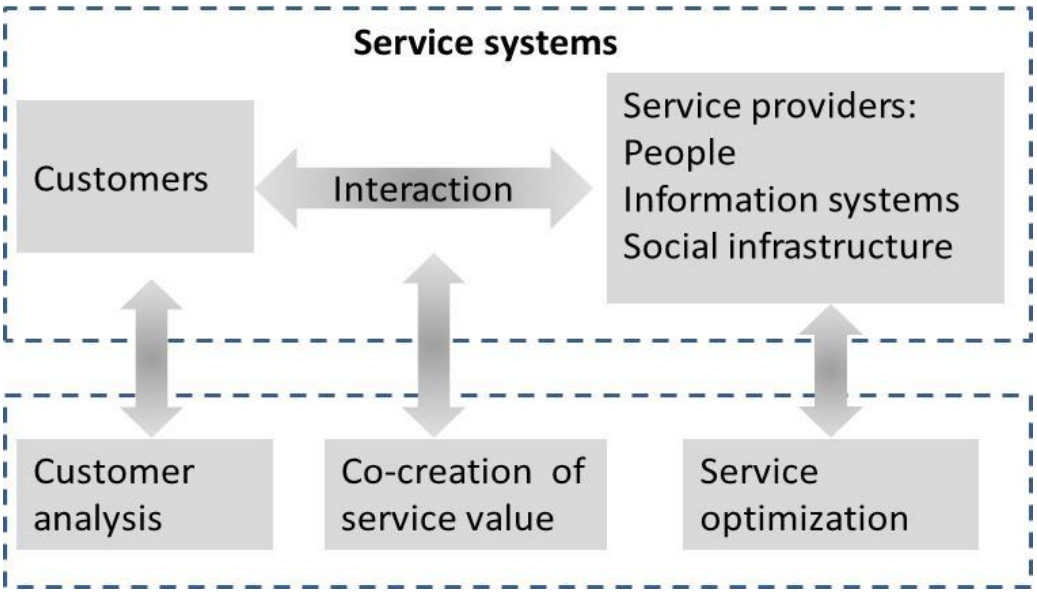

Figure 3.1 Service Systems (modified from Kosaka 2010)

The essence of service is customer value creation, which is associated with customer satisfaction (Kosaka 2010). Nakamura (2007) discerned the service dimensions as fulfillment of desires, goal achievement, and function implementation based on Komeoka's view, which discusses service as supportive activities using knowledge to achieve human or organizational goals. He classified service levels according to Maslow's Hierarchy of Needs as degrees of human satisfaction, as shown in the figure 3.2.

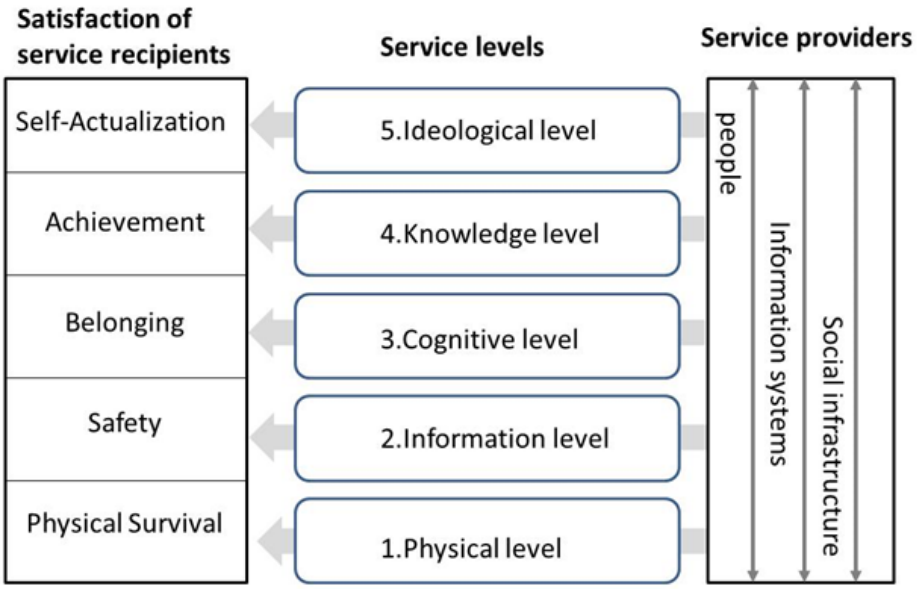

Figure 3.2 Degree of satisfaction and service levels (modified from Nakamura 2007)

A physically identical environment can be psychologically different even for the same man in different conditions (Lewin 1936, p25). Therefore, even though the provided services are identical, the values perceived by customers are variable according to the situations at the different times the customers encounter. Despite the fact that service can't create value by itself, the generated service value will be high when services are provided that aim towards high potential values in the service situation namely the service field such as human characteristics, place, time and cost, in other words, the demand in the service field. Service value has the situation-dependent characteristics, depending on the relationship between the provided service itself and its service field (Kosaka et al. 2014), as seen in the figure 3.3. Therefore, identifying service fields is indispensable to understand what services are adaptive to satisfy customers in various situations for enhancing service values.

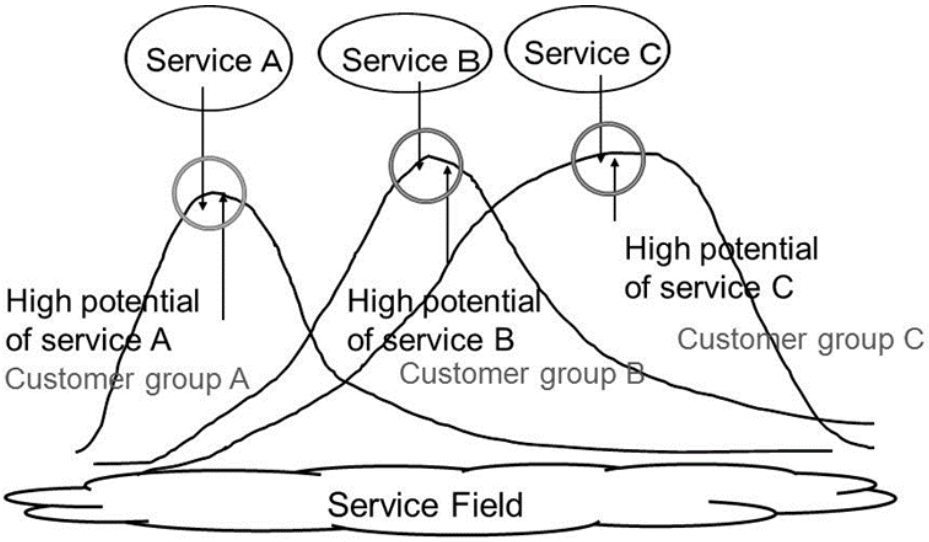

Figure 3.3 Service Field

Kurt Lewin (1936) is the father of social psychology. He attempted to build a framework for the constructive representation and derivation of psychological processes including the characteristics of both the people and the environment based on experimental evidence. In his explanation, the situation comprises of the total of possibilities, and each change in the psychological situation of a person implies that certain events are now possible that were impossible before. The variety of behaviors is understood as belonging to a coherent system of possible events in the situation. While the details of the situation are determined in this sense, the actual possibilities will gradually be limited. The derivation of the totality of possible cases is valid for the

behavior of the person in the situation as well as for the possible changes of the person or the situation itself. In his view, the social environment is a dynamic field with human cognition, which contains adjusting elements in the social situation, predictable particular experiences, and the sequential manifestations of the person's psychological state affecting the situation. He provided the method of successive approximation in force-field analysis, which is to look at factors (forces) that drive or block movement towards goals in social situations. The analysis proceeds stepwise from the general to the particular, and thereby avoids neglecting the individual characteristics in each situation by the method of abstracting classification. The basic principle is to see the situation as a whole. The representation in the first approximation will be made clearer by the second approximation due to the consideration of the situation as a whole. The occasion of an approximation depends on when the particular problem is considered. The optimization of services for increasing service value is based on identification of service fields connecting with the constructive representation for sequentially renewing the service fields and the derivation of psychological processes through human interaction in social environments, which requires a systemic thinking.

3.3 Human Positional Exchange Characteristic

3.3.1 The Characteristic of Co-Creation

There is a human characteristic of positional exchange related to human interaction as co-creation. There are some insights to discuss this characteristic by different approaches. Shimizu (2000) assumed that human has a self-organization system, and explained co-creation in human life from a biological approach. Human has the life property of a doubly-twisted existence, which means having a human localized and ubiquitous presence at one time. There are three characteristics of co-creation of human life in biology. Human life has an exchange characteristic of this interactive position between a leading position and a following position. The life property of doubly-twisted existence has a derivation-match-harmony process of interaction. The result of human interaction is the generation of human consciousness. It is impossible to have human creativity without human consciousness. Human co-creation is based on the co-creation characteristic of human life, which is a fundamental element to all of human co-creation activities. De Michelis (2001) gave a theoretical contribution on the human cooperative

process for knowledge creation. His work proved that knowledge creation is a leading factor to increase the value or cost ration of a cooperative process, due to the capability enhancement of managing complexity. His study observed that there is a positional relation between the actors in a cooperative process. Each participant switches between acting and communicating in a cooperative process over time, depending on the participant's position in the cooperating process with others whom the participant is cooperating with. There is a positional relation between the actors in a cooperative process, and internalization and externalization in collaboration shift between synchronous and asynchronous communication.

3.3.2 New Insight to Leader-Follower Relation

Maroosis (2008) discussed leader-follower relations from a learning perspective and assumed leadership is a learning process, centered in learning what to say and how to say it in order to let others understand and follow. Leaders and followers change their roles depending on what they teach or learn in real situations, this being a dynamic, educational relationship of give and take. The leader-follower relation is one of mutual response-abilities, which is a partnership in reciprocal following. Both leaders and followers have response-abilities for doing right things and creating new situations that clarify real needs in reality. Leaders and followers shift their roles in the ongoing process according to real situations, but the function of leadership and followership doesn't change.

3.4 The KIKI Model and Value Co-creation System

In the early research stage, this author assumed knowledge is primary resource for human value co-creation in knowledge era, and values are generated based on human knowledge creation. The author tried to introduce the famous knowledge creation process, the SECI model into value co-creation studies. However, the knowledge co-creation process and the field concept of the SECI model are limited with a firm-centered perspective and a top-down approach in internal organizations, and thereby it can`t apply to human value co-creation activities in an open social system with customers. The author believes that service is a mediator and facilitator for human activities to carry human values from her work experiences in businesses. Therefore, the definition of service proposed by Kameoka (2007) is applied to this value co-creation

study, which defines service as supportive behaviors for necessary activities to achieve human or organizational objectives. The author has assumed human values lie on human psychology and relationship from the early research stage. Thus, Value is defined as a social relationship, and appears in a social form as a relation between things according to Marx in this study.

We treated a value co-creation system as collaboration, and service was supportive actions in the early assumption for a value co-creation framework. We proposed a value co-creation process for collaboration based on this assumption, which is called the KIKI model (Zhang et al. 2012). Originally, the KIKI model was proposed for business collaboration between two organizations employing a service approach in the author`s previous research. Human value co-creation activities between different organizations are treated as collaboration, and mutual supports between collaborators, such as sharing know-how and offering information, is seen as services that improve the efficiency of knowledge creation to reach the common objective in the collaboration, as shown in the figure 3.4.

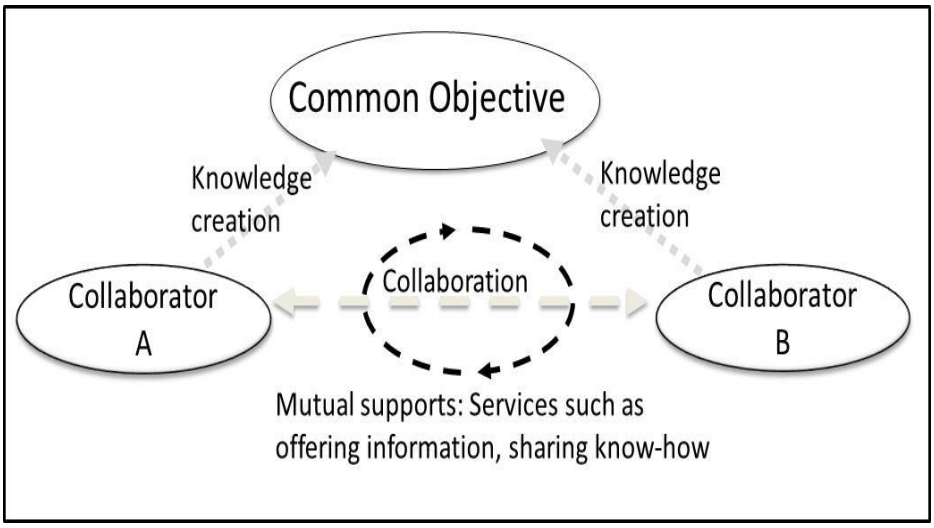

Figure 3.4 Value Co-Creation System as collaboration

The assumptive value co-creation system as collaboration consists of three main elements.

(1) Positional exchange between collaborators:

Collaborators take both roles to give services and take services.

(2)Supportive behaviors as services:

Services in collaboration are supportive behaviors to facilitate the accomplishment of human or organizational objectives that generate customers' value and business value

based on customer satisfaction.

(3) Co-creation process as collaboration

Being a value co-creation process in collaboration, the KIKI model is conceptualized under the concept of service fields. In a service field, service values can be generated through suitable service behaviors, and suitable services will be determined based on identification of the service field in which the services are given. Hence, the process to increase service values in collaboration should proceed by knowing each other, by identifying the service field to recognize suitable services, and by providing them to enhance customer satisfaction. The common objective in collaboration will be achieved by streamlining suitable services over time. With this consideration, the KIKI model comprehends the four sequential steps and a spiral development for value co-creation in collaboration between different organizations as the following.

Step 1. (K1) Knowledge sharing related to collaboration: define the service and its service field; share the objective and the collaboration and its environment.

Step 2. (I1) Identification of the service field: collect and analyze data related to the service and find needs for the service action.

Step 3. (K2) Knowledge creation for a new service idea: create a new service idea.

Step 4. (I2) Implementation of the service idea: realize the service idea in collaboration.

The sequential steps are spirally developed to continuously increase the quality of services and enhance satisfaction among collaborators in order to generate high service values, which is a well-supported process with a customer-oriented thinking.

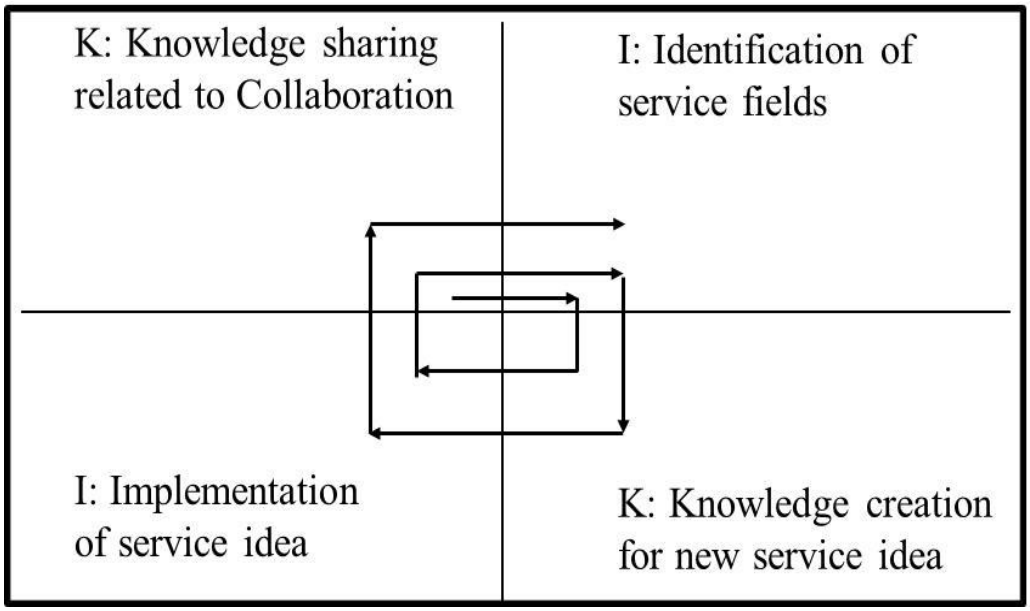

Figure 3.5 The KIKI model for service value creation in collaboration

3.5 Research Hypotheses

The value co-creation system in a value co-creation project also can be seen as collaboration through the interaction among participants. This study aims to propose a value co-creation framework using two cases of value co-creation projects. Three subsidiary research questions are set related to human relation, mindset (e.g. human attitude) and process, which are related to the main three elements in the assumptive value co-creation system.

To conceptualize a new framework for human value co-creation, the research hypotheses leading towards research questions are based on the following concepts.

SRQ1. What is the leader-follower relation in a value co-creation project?

Hypothesis 1: Leaders and followers would be in partnership to support each other to solve problems and create new ideas for the improvement in the project, and not work in a hierarchical relationship by means of order and control.

The work with a biological approach by Shimizu (2000) showed that human naturally has the characteristic of positional exchange during their co-creation with the environment, which makes human interaction possible through selective information processing. Moreover, the work by De Michelis (2001) also proved that there is a phenomenon of positional exchange among participants in human cooperation for knowledge creation. The characteristic and phenomenon of positional exchange in both works by Shimizu and De Michelis, indicate participants in cooperative activities (e.g. value co-creation activities) should work reciprocally, which is a partnership relation.

Comparing with conventional PM centered on the power of a single leader as a project manager that leader-follower relation is hierarchical, however, in a value co-creation project, participants share the task of leadership, since customers or other organizations are engaged during PM processes, the leader-follower relation in a value co-creation project must be different. According to Maroosis (2008), a leader or a follower is a given situation that can be conceptualized as a type of leading or following depending on its efficacy in reality, the leader-follower relation is a relationship of mutual response-abilities, and both are in partnership in a reciprocal followership towards a shared goal. Therefore, leader-follower interaction in a value co-creation project could be assumed as collaboration in that they have positional exchanges to reciprocally take the leader or follower role to work together during its value co-creation process, and collaborators support their partners whom the collaborator is working with, as partnership in a value co-creation system not by order and control.

SRQ2. What is the participant's mindset in a value co-creation project?

Hypothesis 2: Participants would have supportive attitudes and actions towards working together cooperatively for value co-creation in a value co-creation project, because they consider others first in order to get others' support.

The meaning of any social interaction depends on the thoughts of the participants, both in acting and in interpreting each others'actions (Eiser 1994, p130). Human attitude has three-components as affect (e.g. emotions, feelings), cognition and behavior according to the assumption by Hovland and Rosenberg (1960). All of components are regarded and influence with each other, demonstrated by other research work (in Eiser 1994). Eiser pointed that human positive mood can facilitate more positive thoughts and behaviors. Katz`s formulation (in Rokeach 1969) showed human attitude has the instrumental, adjustive or utilitarian function, the ego-defensive function, the value-expressive function, and the knowledge function. Therefore, we assume that a positive human mindset, such as positive attitude and behavior also is one of facilitating elements for value co-creation, which generate cooperative actions of participants that make human interaction smooth to speed up knowledge acquirement and knowledge creation, resulted in human values.

A service-centered view is customer-oriented. According to this view, participants in a value co-creation project consist of customers or people from different organizations and fields, should think of others first in order to earn the supports from others to make their interaction effective to achieve their shared goals. Moreover, according to Service Logic, value co-creation among people is a well-supported process to facilitate human interaction to bring values. Therefore, participants in a value co-creation system in a project should have supportive attitudes and behaviors, which is service mindset.

SRQ3. What is the process pattern in a value co-creation project?

Hypothesis 3: The process pattern of value co-creation has four steps, these being knowledge sharing, identification of needs, knowledge integrating, and implementation to meet needs, with a spiral development to give a constructive representation and a derivation of the psychological process in social environments.

In our assumption, values in a value co-creation system are generated through consequent representations in acting of participants by value co-creation processes, which is the third core element in a value co-creation system. Each representation of participants should be acted as a process pattern. The KIKI model is developed in this study based on the author` previous research. Fundamentally, the third hypothesis is based on a service-centered view and a service system thinking.

According to Berger and Luckman (1966), social knowledge, including people's beliefs and experience, is created through human interaction within human everyday

encounters, and influences human perceptions of reality. Namely, values are human perceptions of reality, converted from knowledge creation. Therefore, value co-creation is rooted in human interaction, which starts by human contact with each other. Petty and Cacioppo (1986) indicate involvement with a topic, has the implications for persuasion and attitude change. If we are involved in a topic, we process information more thoroughly, that we are more likely to be persuaded. According to Itami (2005), the interaction of information influences human decision-making to formulate a common understanding that generates cooperative actions, deepens individual learning through the information accumulation, and stimulates human emotions to generate human sympathies that brings psychological energies. Summarily, organizational information accumulation and organizational cooperative actions are generated through the informative and mental interactions of human in the environment. Therefore, human action as sharing (e.g. involving topics with other) must be important in a value co-creation system, which makes informative and mental interactions among participants. Tao (1999) thinks an organization is an open system. In his opinion, organizational performances are resulted through the interrelation with the environment, and the sustainability in the environment is the top priority in the organizational goals rather than increasing productivity and efficiency. For the interrelation with the environment and the sustainability of the organization, the obtainment of knowledge is a key to understand human actions in organizations, and, the support from the environment is the primary condition for the sustainability of the organization. To get knowledge and supports from the environment, knowledge sharing within individuals through human informative and mental interaction should be the fundamental step for organizational information collection and the obtainment of cooperative actions.

A value co-creation process exists to facilitate the customer value-creating process for customer satisfaction according to a service-centered view. With the definition of a service system and the concept of the service field, service value depends on the provided service and its service field in which customer satisfaction is provided. Customer satisfaction is a result of constructive representation and derivation of psychological processes in social environments. The content of customer satisfaction can be detailed according to Maslow’s hierarchy of needs, and services are accordingly classified into five levels by Nakamura. Therefore, human needs and service levels could be the main factors in a service field for service values. Using the method of successive approximation in force-field analysis by steps, sequentially identifying human needs and service levels, and providing these services over time for customer satisfaction, we can generate service values. With this consideration, following the first

step of knowledge sharing, the second step is to identify human needs in reality that clarify what level of services would meet these needs. To provide a suitable service in reality, ideas about the suitable service are created based on integrating a great deal of knowledge. Then, the ideas should implement into actions. As these four steps, as a cycle, spirally repeat from the general to the particular, the service situation could be sequentially improved, and the degree of human satisfaction and work efficiency would be gradually enhanced, which means values are spirally carried out.

3.6 Summary

This chapter introduces a service mindset, indicates the human interaction characteristic of positional exchange, and provides a proposal for a value co-creation framework. The service mindset consists of a service-centered view including a customer-oriented thinking and a Service Logic, and a service systems thinking based on the concept of service fields and the method of force-field analysis. The human positional exchange characteristic is explained by approaches in biology, cooperation for knowledge creation, and leadership. With the above concepts, a managerial framework based on human interaction is proposed for human value co-creation. Within the research proposal, the KIKI model originally proposed for service value co-creation in collaboration, is introduced and further developed in a value co-creation system. The value co-creation framework is detailed in three hypotheses with its fundamental concepts according to research questions, and will be demonstrated through two case studies of value co-creation projects.

Chapter 4: Case Study Design

4.1 Introduction

We present case study design in this chapter. Firstly the objective of the study design is given according to the research propose of this dissertation. With the study objective, case selection and data collection are considered, and study design is explained in details. The strategy of case analysis is considered in the end of this chapter.

4.2 Case Study Design

4.2.1 Objective

This study aims to identify the characteristics of value co-creation, and find a managerial process pattern of value co-creation using two value co-creation projects.

4.2.2 Case Selection and Data Collection

Three dimensions were considered in the case selection. Firstly, the selected project must have the distinguishing features of a value co-creation project that leadership task is shared among participants involved customers or people from other organizations having different backgrounds and cultures, which are different from the conventional projects discussed in the second chapter. Secondly, we considered a time setting for the project to be selected. Since most value co-creation projects are ongoing, active projects, composed of sequential problem solving or business opportunity integrating activities, we factitiously set a close time to the project we selected, such that we are able to focus on the phenomenal research in the period we set. Thirdly, we considered the effectiveness and efficiency of data collection from real projects. We considered several projects in the beginning during the real case selecting process. Finally, we decided to use a global education project and a service business project. Both were customer-involved business cases, related to our field of interest in this study. We had an advantage in data collection that contributed to the depth of the research. This author

attended the global education project as a member who experienced most activities in the project, thus providing this author first-hand information. This author used the service business case as a collaboration case in her master study. The service business case also was a customer-involved value co-creation project. This author collected new data through previous contacts to deepen the case study in this dissertation.

Mainly, there were three sources of evidence in this study, including interviews, documentation, and observation. We firstly contacted participants in the targeted projects through emails. Then we made a schedule of interviews with each interviewee, and obtained their signature on the document of spontaneous participation agreement (Appendix A).

We aimed to interview all participants in the global education project. Most interviewees were JAIST students who attended a customized English program at UC Davis-Extension in the United States, which was the main activity in the project, instructors who taught English courses in the program, and coordinators at JAIST and UC Davis-Extension. We also interviewed two department directors in both organizations. We used unstructured and semi-structured interviews to let interviewees feel free to give their opinions and answers to a deep degree. Besides the interviews with coordinators, we were able to have the access to documentation. Mainly, we received four types of documents: emails related to their communication context, proposals which provide information about the project objectives and contents, reports of the achievement of the project, and surveys to present the degree of the achievement of the project and students' feedback. We also had information about the organization from their websites. The other method for data collection was by observation. We used participant-observation to collect research data, as mentioned in the first chapter. This author took advantage of being a student in JAIST to have first-hand information of the local organization, and acquired deeper knowledge about the organizational management routine of UC Davis-Extension by an on-the-spot investigation while she visited the United States for the interview work.

In the service business project, primarily, we applied a storytelling narrative technique to collect research information, as mentioned in the first chapter. We interviewed the key person, who was the project manager, several times. We did in-depth interviews to have the manager's insights, and focused on certain activities in the project during our communications with the key person. We also had documentation sources from previous research. As well, we visited some websites relative to the project to have organizational and professional information, because there were some specific energy-saving technologies presented in the project.

4.2.3 Study Design

The main purpose in this study was to identify characteristics and a process pattern of value co-creation in a value co-creation system through value co-creation projects. Our interview design followed the research purpose, and kept some principles in mind. We formulated an interview protocol, which included acknowledgement of interview circumstances to the interviewees and the core of what we were seeking in the interview. We tried to make our interview as comprehensible as possible, so that interviewees would understand our work and be willing to support the interviews. Since we knew all interviewees were busy and voluntarily supported our study, we attempted to keep our interviews as simple and easy to answer as possible in a limited time. We took advantage of our multiple language abilities, and thus created the possibility to allow the interviewees to speak their mother tongue during the interviews. We made efforts to seek our answers according to our research aspects without influencing the interviewees during the open interviews. We tried to make a balance between the comprehensiveness of the interview context and the simplicity of the interview way.

We made an interview guide for each case study according to the research purpose. In case A, a global education project, we designed three sections (Appendix D). The first section was designed to seek information about the project, such as the history of the project, and the background of the interviewee. We added an investigation on student satisfaction through interviews as the second section to affirm the success of this project case, due to the distinctive features on education, because an educational result is an invisible and unmeasurable influence through an individual internalization process, as opposed to a comparable tangible result. In the third section, we focused on finding the characteristics and process pattern of value co-creation in the project with our research perspectives. We made three interview questions according to our research questions and research theoretical hypotheses to query the interviewees during an open interview. In Case B, the service business project, we only focused on information about the profile of the project, and the answers to research questions (Appendix E), because we already knew the project was successful from its sales record.

4.3 Analytic Strategy

We analyzed the data we had by the content analysis, partly using content analysis technique of MAXQDA software. Since the MACQDA software can recognize diverse languages and graphs, we transcribed the interviews into English, Japanese, or Chinese

according the original language the interviewee spoke in the interview. We analyzed the data, including interviews, documentation, and observation according to our subsidiary research questions. We classified the data into four groups as actions, personal opinions, causal relationships, and descriptions. We centered on three categories, these being leader-follower relation, participants' mindset, and the process pattern of value co-creation according to our research conceptualization during content analysis. We coded and grouped the research data according to the three categories given above. The answers related to leader-follower relation were grouped from interviewees` opinions and the context of the project. We attempted to not only identify leader-follower relation in a value co-creation system, but also see whether there are hierarchical influences in value co-creation activities in hierarchical organizations in reality. Answers related to participants' mindset were grouped based on interviewees' opinions and phenomena in the context of the project, such as participants` attitudes and actions. In each embedded case, we firstly looked at each participant` mindset, then, overview the mindset of all participants they had. We coded the process pattern of value co-creation into four steps referring to the concept of the KIKI model, as mentioned in the third cheaper of this study by causal relationship analysis during the context in the project. Firstly, we analyzed the whole project case, so that we could follow the contextual points in chronological order, and to identify how many embedded cases there were in the project. Then, we coded and grouped in the context of each embedded case. Finally, we overviewed the whole project to validate our research hypotheses. In the following two chapters, we will present our findings through two value co-creation projects with this analytic strategy.

Chapter 5: Analysis of Case A: A Global Education Project

5.1 Introduction

We present the research findings of the global education project in this chapter. We introduce its profile in the beginning. Then, the analytical results of each embedded case are detailed in the following paragraphs. To avoid wordiness, we use many figures and tables to show the details of the evidence. We will specifically discuss the findings of the first embedded case, and less specifically explain the findings for the following three embedded cases, then simply summarize the characteristics in descriptions for the other embedded case.

5.2 Profile of Global Education Project

There was an English education project between UC Davis-Extension (UCDE) and Japan Advanced Institute of Science and Technology (JAIST). UCDE is one division of the University of California, Davis, in the United States, and established its operation more than 50 years ago. The goal of UCDE is to create educational opportunities to enhance the capacity for success of every individual and organization as the lifelong learning arm of UC Davis. The division is innovative, service-oriented, and highly responsive to the educational the needs of the local, national, and international individuals and organizations it serves, and provides a variety of courses of adult learning, taught by UC Davis faculty and industry experts. UCDE has had a positive financial balance by nurturing key partnerships, modifying programming and carefully managing expenses. It continuously operates with an entrepreneurial spirit and professional abilities to find business opportunities in today's economy. On the other hand, JAIST is the first postgraduate university in Japan, established in 1990, located in Ishikawa Science Park, near Kanazawa City. JAIST has three graduate schools including Information Science, Materials Science, and Knowledge Science. The mission of JAIST is to foster leaders capable of contributing to the future world through the creation of science and technology. One goal of JAIST is to foster active global human

resources by promoting faculty and student exchanges with leading institutes overseas and by globalizing its education and research. Following that, since 2012, JAIST has sent graduate students to the program"English for Science and Technology"at UC Davis, organized jointly by UCDE and JAIST. The project aims to increase English communication skills for research and daily life, to broaden horizons, and to encourage students to engage in future international academic activities and exchange, through an intensive four-week immersion experience in a native English-speaking environment. JAIST has had three successive years of the program. The project is a continuous educational activity, as well as a constantly integrating business opportunity. In this study, we mainly focused on the period from the beginning of the project to the achievement of the first English program for JAIST students, including the time before the program, during the program execution, and after the program.

The achievement of the project was successful. We gave a survey to students of the first group through interviews for evaluating students' satisfaction on this project. We also did the same survey of students in the second group to see the influence from the first program and their satisfaction with this project. The result from content analysis is shown below.

(1) Attributes of students in the program "English for Science and Technology"

There are 14 students in the first Group and 15 students in the second group. Their backgrounds are shown in the table below.

Table 5.1 Attributes of students in the program of "English for Science and Technology"

Group	Grade				School			Nationality		Sex		Age		
	Master1	Master2	Doctor1	Doctor2	Knowledge Science	Imformation Science	Material Science	Japanese student	Foreign student	Male	Female	20-30	30-40	Up 40
Frist group (14 students)	29%	14%	50%	7%	50%	29%	21%	43%	57%	79%	21%	57%	29%	14%
Second group (15 students)	46%	7%	40%	7%	53%	20%	27%	33%	67%	47%	53%	87%	6%	7%

(2) Analysis results

The analyses of interview contents for the two groups were coded in ten dimensions of students' satisfaction with the program. The statistical answers showed that all students were satisfied with the program in this project. The influence from the program was different in two groups, due to the different backgrounds and previous experiences of students. Most of the students in the two groups were satisfied that they improved English communication abilities and academic skills, understood a multicultural context, and developed international thinking during the program. Many students of the first group

also believed that they became more collaborative and developed divergent thinking through their experiences. Another outstanding influence on the second group was becoming used to speaking English to people, and becoming more positive. Students had apparent changes in their behaviors and attitudes for their research and lives. Actually, most of the students mentioned in their interviews that their TOEIC scores were increased after the program, although the influence related to the TOEIC score didn't code in this survey. From all the individual students' views, the English program was very successful.

5.3 Finding and Results

5.3.1 Relation of Embedded Cases and Shared Goals

We were able to find eleven embedded cases in this study by analyzing all the data we had. We mainly focused on activities related to the first group of students from JAIST, and set the close time of this project at after the program execution so that we could see the influence on the activities following the first program. We will present the finding of each embedded case including four parts in the following discussion in light of the list. Firstly, we will encounter the embedded case we discuss to explain its main events and participants. Then, we will discuss the results of the embedded case in accordance with the order: leader-follower relation, participants' mindset, and the process pattern of value co-creation. The relation of embedded cases in the global education project is shown in the figure 5.1.

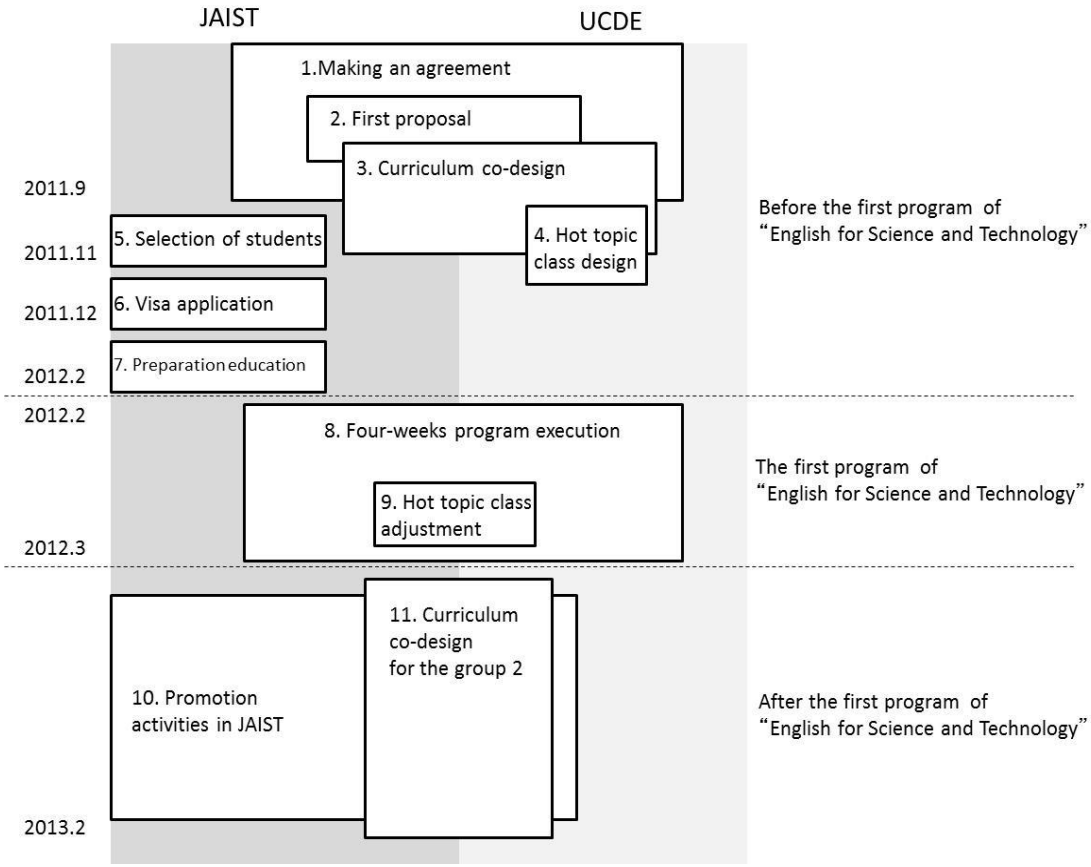

Figure 5.1 Relation of embedded cases in Case A

The goal of the project is to increase English communication skills for JAIST students for research and daily life and broaden their horizons through an intensive four-week English program in UCDE, and thereby, students will have real experiences in native environment, which will encourage them to engage in future international academic activities and exchange. It is achieved through many shared goals in a sequent of events. Each shared goal is listed in the below according to the order in the figure 5.1.

1. To make an agreement between UCDE and JAIST
2. To make a first proposal for the English program
3. To make a curriculum for the English program
4. To make a hot topic course design
5. To have suitable participants for the first students group
6. To ensure all students of the first group have visas to UCDE, that they can attend the English program by its schedule.
7. To train students to unite their mindset, that they have a shared goal which may

carry out a good outcome of the English program

8. To have a successful and meaningful program for JAIST students
9. To adjust hot topic class to meet students` needs
10. To promote the English program and improve the program for the second group
11. To make a new program curriculum based on the experience of the first group for the second group

5.3.2 Findings of Each Embedded Case

Embedded case 1: Making an agreement

In the first embedded case, the main event is making an agreement about the English program, called "English for Science and Technology", between UCDE and JAIST. There are mainly seven participants in this embedded case, as shown in figure 5.2. The arrows show the hierarchical relations in the organizational structure of UCDE and JAIST. Each participant is introduced in the list below. We don`t discuss the same participant in other embedded cases to avoid a verbose description.

Participant (a): The president in JAIST is the top management of JAIST.

Participant (b): The department head is the head of the global communication education department in JAIST, wherein the English education department is situated, which launched the global education project.

Participant (c): The academic coordinator is a professor in the English education department in JAIST, who worked as a head in the department for four years.

Participant (d): The program coordinator (d) is a professor in JAIST, who had a lot of international experience from his life in the USA, and professional knowledge in the English education field. He was a key person in this project and worked as a point person in the early stage of the project.

Participant (e): The point person is the vice-president in a Japanese university wherein there is a research institute, similar to JAIST, from which they sent students to UCDE.

Participant (f): The department director is the top management in UCDE.

Participant (g): The academic coordinator created the model of the English program and promoted it to JAIST after he saw the great outcome of the program from students of a Japanese university. He was a point person in the early stage of the project.

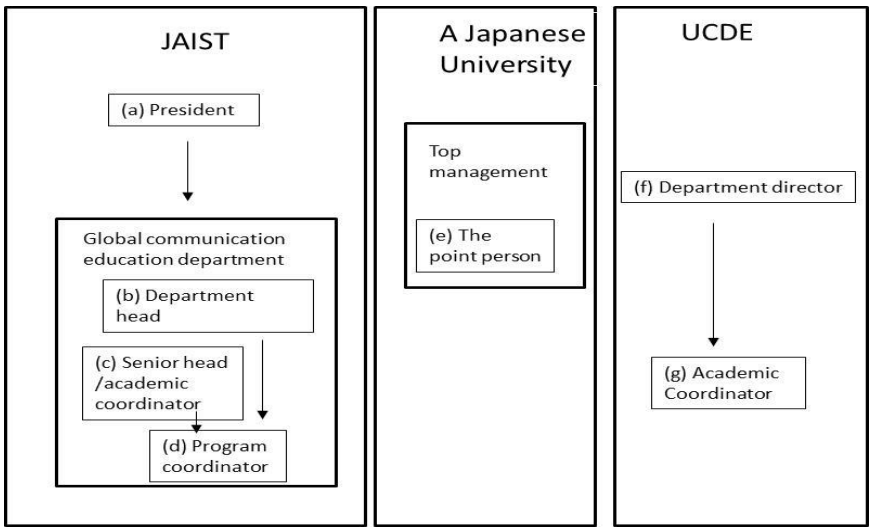

Figure 5.2 Participants in the first embedded case of Case A

1. Leader-follower relation

According to James Maroosis (2008), a leader role consists in a teaching or giving situation, a follower role is in a learning or taking situation. We found that participants often changed their roles as a leader or a follower to share their knowledge, such as information, experiences, and ideas, through the context analysis. The leader-follower relation among participants in this embedded case is shown in the table below.

Even though there was a hierarchical relation between the department director (f) and the academic coordinator (g) in the organizational structure of UCDE, when (g) gave information related to JAIST to (f), he took a leader role, such that (f) was in a learning situation as a follower. In their communication, (f) reciprocally took a leader role in that she gave suggestions to (g). They often changed their roles as a leader or follower to work together in a partnership, as (f) said: *"I try to have a very open relationship with my staff … I try to be as transparent as possible … so that everybody is sort of on the same page."* (Interview with the department director in UCDE) Their relation was described by (g) as *"we work together and help with each other."* (Interview with the academic coordinator in UCDE) They worked together and supported each other in a partnership, not by control and order. The department head (b) learned experiences of English education from the academic coordinator (c) and the program coordinator (d) as a follower role, because he knew: *"I am not an expert in the English education field, but I know they (c and d) have a lot of experiences on English education. I would like rely on them to work out (things for the program)."* (Interview with the department head in JAIST) He worked with his staff as a partnership, not by control and order. Let us look at the relation between the academic coordinator in UCDE (g) and the program coordinator in JAIST (d), both being in different organizations. When

(g) promoted the English program to JAIST, he gave information related to the English program to (d). In his situation, he took a leader role to lead a targeted customer (JAIST) to be interested in the English educational model he designed, and (d) received information in a follower role (Interview with the academic coordinator in UCDE). When (d) had enough information related to the program, he then discussed the specific needs of JAIST to (g); in his situation, he took a leader role to lead (g) to understand JAIST at a deep level, and (g) was then in a learning situation as a follower (Interview with the academic coordinator in UCDE). They worked as a partnership to share information between JAIST and UCDE for their shared goal in this embedded case, which was to start the English program to meet needs of JAIST.

Table 5.2 Leader-follower relation in the first embedded case of Case A

Leader role (teaching/giving situation)	Follower role (learning/taking situation)	Learning content	Code
a	d	Personal views related to globalization	The program coordinator and the president in JAIST had free conversation during a business trip. They shared their global views related JAIST education. (Interview with the program coordinator in JAIST)
d	a		
d	a	Information related to the English program	The program coordinator shared information related to the English program with the president in JAIST, then he became interested in the program. (Interview with the program coordinator in JAIST)
g	d	Information related to the English program	The program coordinator in JAIST met the acadimic coordinator in UCDE and had information related to the English program.(Interview from the program coordinator in JAIST)
g	d	Suggestions related to the English program	The program coordinator in JAIST got suggestions for the program from the academic coordinator in UCDE. (Interview with the program coordinator in JAIST)
e	d	Experiences of the outcome of the English program	The program coordinator in JAIST learned how the outcome of the English program was in the Japanese university which sent students to UCDE from the point person. (Interview with the coordinator)
e	a	Experiences of the outcome of the English program	The point person from the Japanese university discussed the great outcome of the English program they had with the president in JAIST. (Interview with the program coordinator)
d	b	English education experiences	The department head in JAIST thought he is not an expert in the English education field. He learned from the academic coordinator and the program coordinator in JAIST. (Interview with the department head in JAIST)
c	b	English education experiences	The acadimic coordinator in JAIST shared his experience with the progam coordinator and the department head thorugh his work for the proposal. (Interview with the academic coordinator in JAIST)
c	d	English education experiences in JAIST	There were some meetings among the program coordinator, the academic coordinator, and the department head in JAIST, so that they shared English educational experiences for making a proposal for the program. (Interview with the academic coordinator in JAIST)
d	c	Information related to the English program	
g	b	Information related to the English program	The department head in JAIST had infromation about the program from the academic coordinator in UCDE. (Interview with the department head in JAIST)
d	b	Ideas to start the English program	The program coordinator in JAIST repeatedly discussed the idea of the program with the department head in JAIST. (Interview with the department head in JAIST)
g	a	Information related to the English program	The president in JAIST had information about the program from the academic coordinator in UCDE. (Interview with the program coordinator in JAIST)
g	c	Information related to the program and UCDE conditions	The academic coordinator and the academic coordinator shared their knowledge and information and the first version of proposal of the program was made by their cooprative work. (Interview with the department head in JAIST)
c	g	Infromation related to the requirment of JAIST	
g	d	Information related to the English program	The academic coordinator in UCDE shared information about the program with the program coordinator in JAIST when he first made a contact with JAIST. (Interview with the academic coordinator in UCDE)
g	f	Ideas related new English programs	When the academic coordinator in UCDE had the idea of the English program, he discussed with the department director in UCDE first. (Interview with the academic coordinator in UCDE)
d	g	Needs of JAIST	The program coordinator in JAIST gave infromation related to JAIST's needs to the academic coordinator in UCDE. (Interview with the academic coordinator in UCDE)
g	f	Information related to JAIST	The academic coordinator in UCDE shared information related to JAIST and his plan to the department director in UCDE. (Interview with the academic coordinator in UCDE)
f	g	Suggestions and work directions	The department director gave suggestions and checked the work directions of employees (Interview with the academic coordinator in UCDE, and the department director in UCDE)

We also found there were two hierarchical influences from the context analysis, which facilitated value co-creation activities in this embedded case, as seen in table 5.3. One is, the president in JAIST made a decision to start the global education project. The other is the department director in UCDE gave work directions to her employees and her approval for the English program.

Table 5.3 Hierarchical influence in the first embedded case of Case A

Contents of Hierarchical Influence	**Code**
The president in JAIST made a decision to start the global education project.	The president in JAIST used his power as a leader when he decided to start the project, so that there was nobody who was against his decision, even though some professors disagreed with the idea of the project before. (Interview with the program coordinator in JAIST)
The department director in UCDE gave the work direction to her employees and approval for the program.	A leader should have the big picture and make sure to make it happen. (Interview with the department director in UCDE)
	Supervisors check to make sure that the direction is happening or ok. (Interview with the department director in UCDE)
	The idea of the program was approved by the director in UCDE. (Interview with the academic coordinator in UCDE)
	The director is an approver. (Interview with the academic coordinator in UCDE)

2. Participants' mindset

We started to look at each participant in this event. We found that all of them had a supportive mindset, as shown in their attitudes and actions through the following contexts. They cooperatively worked together to make things smooth.

The president in JAIST had a positive attitude, and supported this project, as shown in his proactive actions, such as when he told of his expectation and decision about the program when some professors opposed the idea of the English program. *"Regarding the English program, we did not get support from all professors in the committee specialized in education (in JAIST). Several professors said that they can`t see the necessity of the English program for JAIST… the president as a great leader, said that I hope this program can be the best incentive for improving English (for JAIST) after JAIST starts the program in a responsible way. The president went to the committee meeting in person, and told his final decision about starting the English program to all professors in the committee … there weren't any professors who were against to the decision at that time … I think the president is a key (to solve the problem) in the situation. So that, JAIST decided to start the program."* (Interview with the program coordinator in JAIST)

The department head in JAIST had supportive actions for the program, and a supportive mindset in his position from his opinion, as shown in the context in the interviews. *"After I learned the English program from the presentation presented by Mr.* from UCDE (g), I said: It is a good idea… In the beginning, only Mr.* (d) and I started to run the project. As my responsibility, I met the president and the vice-president (in JAIST) (to persuade them and get their support) in the beginning. I discussed the idea of the English program with the president. Then, I planned visiting UCDE (to have more information related to the program) … A leader must see the whole of the organization, if a work decision is made, then the leader gives support to make the work successful."* (Interview with the department head in JAIST)

The academic coordinator in JAIST had a supportive action to react to the

requirement of the department so he wrote the first proposal of the program, as shown in his interview. *"I wrote down the proposal of the program after some meetings … I think we had a few problems in the beginning … but I think the way which works as cooperation was pretty well from the result."* (Interview with the academic coordinator in JAIST)

The program coordinator in JAIST had a positive attitude. He actively shared his idea of the English program to his colleagues in JAIST, conducted investigations for the program, and presented a proposal of the English program to the committee specializing in education in JAIST for an approval for the project. He made a lot of effort for the project, as we can see from the following context.

"In the very early beginning, only Mr. (d) ran the project, and I didn`t seriously consider it. Since he suggested the idea to me many times, I had been serious to think about launching the project."* (Interview with the department head in JAIST) *"In JAIST's case, we were lucky, because we had support from Prof.*(d). He did a lot of hard work, (more) than we did. He was hard to coordinate with JAIST what it wanted."* (Interview with the academic coordinator in UCDE) *"I brought up the topic related to the program to the president in December, 2009. The president was interested in this program … I visited UCDE three times. In the first time, I did an investigation in UCDE. I attended classes and talked with students who are studying there and the instructor in the class … I realized that we need a customized program to meet JAIST`s need… I discussed with all the English teachers (in JAIST) five times for designing a suitable program for JAIST. …Mr* (b) and I presented a proposal of the program to the committee specialized in education in JAIST for an approval, but some professors disagreed with this idea… I asked the vice-president (e) to share their experience with JAIST … I also suggested to UCDE that they could come to JAIST to do something for promoting the program … After the president made a decision to start the program. We presented the proposal for the program to the committee again."* (Interview with the program coordinator in JAIST)

The point person in a Japanese university gave a supportive attitude and action. He shared good experiences related the program with the president in JAIST with willingness, which convinced the president. *"I asked the vice-president (e) to share their experiences to JAIST… They discussed the necessity of the English program to the president and the vice-president of JAIST with great enthusiasm … the president changed his mind … (because) they said that the program is meaningful because they saw that students had changed a lot (after the program)."* (Interview with the program coordinator in JAIST)

The department director in UCDE had a supportive mindset to her employees, shown in her opinions in the following context. *"Everybody is sort of on the same page… They can make good decisions that don`t always involve me, and I`ll support them in those decisions… I try to make their work possible, that they can do a good job."* (Interview with the department director in UCDE) *"I have a good supervisor. It means she does not micromanage. She gives me freedom to*

make my own decisions as the process goes…. If I have some questions, she knows I would come to her for answers. … In other words, she always supports me, but occasionally she makes critical comments that I have never thought of." (Interview with the academic coordinator in UCDE)

The academic coordinator in UCDE cooperated with the academic coordinator in JAIST well for the first proposal of the program. He had a flexible and positive mindset, as shown in his opinions. *"What I usually do, I try to be aware of what is happening in Japan …We want to satisfy these students who go to UCDE… I have to learn all about the partner of the university, such as their history, what direction they try to go… We always have to be flexible to modify curricula and teaching ways depending on the situation. That is a challenge, but what is important to us is our clients` needs … I get a lot of exciting information from people in Japan. So that, I always think about what is next."* (Interview with the academic coordinator in UCDE)

3. Process pattern of value co-creation

Stage1. Knowledge sharing

We found participants started a lot of sharing activities in the early stage of the event to make an agreement for the English program through the context analysis. They did information sharing, experience sharing, and mind sharing, as seen in table 5.4. When participants took sharing actions, which transferred knowledge into different levels, the potential values were generated to facilitate the following process. For instance, in this embedded case, the president (a) and the program coordinator (d) had mind sharing activities by freely conversing, their personal knowledge was transferred to each other, and they knew each other well: *"The president understood what I said immediately. If we did not have a common view at that time, I don`t think I could get his support later."* (Interview with the program coordinator in JAIST) Some sharing activities helped people so they could find potential issues and new directions. When (d) did an investigation in UCDE, staff in UCDE shared their experience and information related to the program to (d), knowledge was transferred from individuals to organizations between JAIST and UCDE, so that (d) realized *"JAIST needs a customized program, not an existing English program UCDE is running recently."* (Interview with the program coordinator in JAIST) We treat information, experiences and minds as being different types of human knowledge. Therefore, we summarize these sharing activities as "**knowledge sharing**", which transfers knowledge among participants into different levels to generate potential values to promote the subsequent process. The details are shown in table 5.4.

Table 5.4 Knowledge sharing in the first embedded case of Case A

	Knowledge sharing	Knowledge transfer	Potential values	Code
Stage 1	Information sharing related to clients between the top management level and an encounter staff in UCDE.	Individual knowledge to organizational knowledge	UCDE could understand clients and satisfy their needs	There were initial conversations between the department director and the academic coordinator, a lot of back and forth to share information related to clients and their needs. (Interview with the department director in UCDE)
	Information sharing related to the program on the ground between UCDE and JAIST	Organizational knowledge to organizational knowledge through individual knowledge sharing	JAIST and UCDE could understand each other better toward accomplishing their goals.	The program coordinator had detailed information related to the program through his investigation in UCDE; the academic coordinator visited JAIST and gave a presentation of the Englsih program. (Interview with the department head in JAIST, the program coordinator in JAIST, and the academic coordinator in UCDE)
				Other faculties related to the project in JAIST also visited UCDE to have infromation on the ground. (Interview with the program coordinator in JAIST)
	Information sharing related the program through the contact of encounter staffs between UCDE and JAIST	Organizational knowledge to organizational knowledge through individual knowledge sharing	JAIST and UCDE could understand each other better toward accomplishing their goals.	The academic coordinator in UCDE studied JAIST and exchanged infromation with the the program coordinator in JAIST. (Interview with the academic coordinator in UCDE)
	Experiences sharing related to the program among individuals between UCDE and JAIST	Organizational knowledge to organizational knowledge through individual knowledge sharing	The program coordinator in JAIST could evaluate the program on the ground for JAIST.	The program coordinator had detailed information related to the program through his investigation in UCDE; instructors discussed the good outcome of the Englsih program according to their experiences of seeing big changes in students. (Interview with the program coordinator in JAIST).
	Information sharing related to the project between the global communication education department and the committee specialized in education in JAIST.	Group knowledge to organizational knowledge	The English education department in JAIST would have the approval to launch the project.	The idea of the project was discussed between the English education work group and the committee specializing in education in JAIST. (Interview with the department head in JAIST, the program coordinator in JAIST)
	Information sharing related to the program between the top management level and the encounter staff in JAIST	Individual knowledge to organizational knowledge	JAIST could evaluate the program to meet JAIST's needs.	The program coordinator discussed the benefits from the Englsih program after he did an investigation in UCDE, and the top management was interested in this program. (Interview with the program coordinator in JAIST)
	Mind sharing between the top management and the encounter staff in JAIST	Individual knowledge to individual knowledge	The program coordinator could understand the president in JAIST more deeply and thus know his work direction toward the mission of JAIST and get support from the president.	The president and the program coordinator in JAIST shared their global views with each other and had a common view on global education after talking freely during a business trip. (Interview with the program coordinator in JAIST)

Stage2. Identification of needs

Following the early stage, we found a need and an issue that were identified after knowledge sharing activities through the context analysis, as shown in table 5.5. One was a customized program to meet the needs of JAIST. The other was the issue of getting approval in JAIST, because some professors didn`t believe that the program could offer great academic values for students, whereby the kind of knowledge that was necessary was identified. This means that the direction of knowledge seeking became clear. Knowledge to design a suitable program for JAIST and knowledge to dispel doubts in JAIST became necessary in these situations, which facilitated the subsequent process to find ways for making an agreement between UCDE and JAIST. The point at this stage is to identify needs (explicit and tacit); therefore, we name this stage as "**identification of needs"**.

Table 5.5 Identification of needs in the first embedded case of Case A

	Identification of needs	**Knowledge seeking**	**Potential values**	**Code**
Stage 2	JAIST needed a customized program which could meet the needs of JAIST.	Knowledge which specified a program design for JAIST	The program could satisfy needs of JAIST	The program coordinator realized that JAIST needed a customized program to meet the needs of JAIST, not a common program as students from other Japanese universities had taken, after his investigation on the ground in UCDE. (Interview with the program coordinator in JAIST)
	There was an issue regarding approval from the committee in JAIST, because some professors doubted the Englsih program.	Knowledge which dispelled doubts in JAIST to gain approval.	The program could start running for students in JAIST.	The idea of the program was discussed in the committee in JAIST for approval; some professors opposed the idea of the English program due to the big budget and their doubt of the outcome of the program. (Interview with the department head in JAIST)
				Some professors in the comminttee did not think the English program was meaningful for students in JAIST. (Interview with the program department in JAIST)
				Some scientists in JAIST disagreed with the idea of the English program, because of their narrow mind. They focused on doing without interaction with others, without valuing knowledge which is created through sharing, interacting with others. (Interview with the acadimic coordinator in UCDE)

Stage3. Knowledge integrating

We found participants engaged in many activities, who attempted to find ways to meet the needs identified above, as seen in table 5.6. Due to participants` actions, such as cooperation, team work, and making a plan, participants integrated different types of knowledge, which constitutes knowledge creation in that they created ideas to design a customized program to satisfy JAIST, and ways to get approval in JAIST. These knowledge creation activities generated values, so that JAIST could have a suitable program design and approve the program to launch. Therefore, we summarize human actions in this stage as "**knowledge integrating"**.

Table 5.6 Knowledge integrating in the first embedded case of Case A

	Knowledge integrating	**Knowledge creation**	**Potential values**	**Code**
Stage 3	Cooperation between JAIST and UCDE for the first proposal of the English program	Ideas to create the first proposal of the program	JAIST could have a customized program to meet the needs of JAIST.	The academic coordinators in JAIST and UCDE cooperatively made the first proposal of the English curriculum for the program. (Interview with the department head in JAIST)
				UCDE cooperatively worked with JAIST step by step according to its requirement. (Interview with the acadimic coordinator in UCDE)
				UCDE had a flexibility according to needs of JAIST. (Interview from the prgram coordinator in JAIST)
				UCDE possesses flexibility and adaptability to give customized service that could satisfy JAIST. (Interview with the academic coordinator in UCDE)
	Team work in JAIST for designing a suitable English program for JAIST	Ideas for designing a suitable English program for JAIST		The program coordinator worked with all English teachers in the department for ideas to design a suitable English program for JAIST for five sessions. (Interview with the program coordinator in JAIST)
	Experiences sharing related to benefits from the English program at the top management level between JAIST and a Japanese university which had a great achievement from the progam.	A way which takes advantage of a certain record that shows the great outcome of the English program	It would prevail on the top management, dispelling doubts in JAIST	The program coordinator asked the point person in a Japanese university to share their experience of the program, because the university sent students to UCDE and had a great outcome. The point person willingly shared their great experience with the president in JAIST and changed his mind to make a decision to start the English program. (Interview with the program coordinator in JAIST)
	The program coordinator made a future research exchange plan between JAIST and UCDE	A way which draws a picture for the future to give a long term view for the program	It might help to convince others and gain support in JAIST.	A draft of the academic exchange proposal between JAIST and UCDE towards the mission of JAIST (Decument 6)

Stage4. Implementation to meet needs

In the following stage, we found that the outcomes had emerged from efforts made by participants, as shown in table 5.7. The first proposal was made because of cooperative work in JAIST, and between JAIST and UCDE. The way of taking advantage of a certain record of the program was efficient, which directly influenced the president of JAIST, so that he made a decision to start the program, which eliminated the opposed voices in JAIST, whereby the program was approved in JAIST. Then JAIST and UCDE made an agreement. These outcomes were made based on the implementation of ideas towards needs, which met the need of JAIST and solved the problem JAIST had. Hence, JAIST had a global education opportunity for students, and UCDE had a business chance. Therefore, we summarize this stage as "**implementation to meet needs**".

Table 5.7 Implementation to meet needs in the first embedded case of Case A

	Implementation to meet needs	**Knowledge application**	**Potential values**	**Code**
Stage 4	The first proposal of the program which was a customized curriculum, was made by efforts through check-revising actions between JAIST and UCDE	The academic coordinator in JAIST used education experiences to realize needs in JAIST; the academic coordinator in UCDE used education experiences to understand the requirements of JAIST and business sense to support JAIST	The program could start running. JAIST could have a global education opportunity for students, and UCDE could have a business chance in the education field to satisfy JAIST.	The first version proposal of the English program was made and presented in the committee in JAIST. (Interview with the department head in JAIST)
	JAIST made a decision to start the English program.	The point person shared his experience of the great outcome from the program with the top management in JAIST.		The president of JAIST made a decision to start the English program first, because JAIST could evulate the outcome of the program from the first group and then rethink the next step. Thus nobody in the committee opposed the idea. The program was allowed to start. (Interview with the program coordinator in JAIST)
	The English program was approved by the committee in JAIST.	The president had a strong mind and used his leadership power to influence the committee.		The committee made a final decision to approve the English program.(Interview from the department head in JAIST)
	An agreement to start an English program was made between JAIST and UCDE.	JAIST and UCDE obtained common sense through information exchange, so that they understood each other to make an agreement for the program.		JAIST and UCDE made an agreement for the English program. (Interview with the program coordinator in JAIST and the academic coordinator in UCDE)
	A business contract was made between JAIST and UCDE.			A contract between JAIST and UCDE was made. (Interveiw with the department head in JAIST)

Considering the finding from the context analysis above, the process pattern in the first embedded case can be summarized as the following:

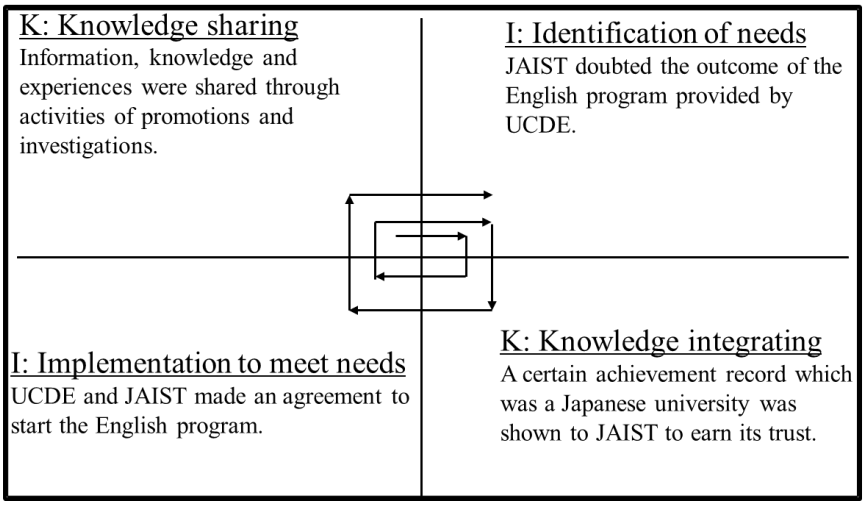

Figure 5.3 Process pattern in the first embedded case in Case A

Embedded case 2: First proposal

The main event in the second embedded case is making the first version of the program proposal, which is an important part of the contract of the English program between JAIST and UCDE. The second embedded case is embedded in the first embedded case. Mainly, four participants are involved in this embedded case, as shown in the figure 5.4.

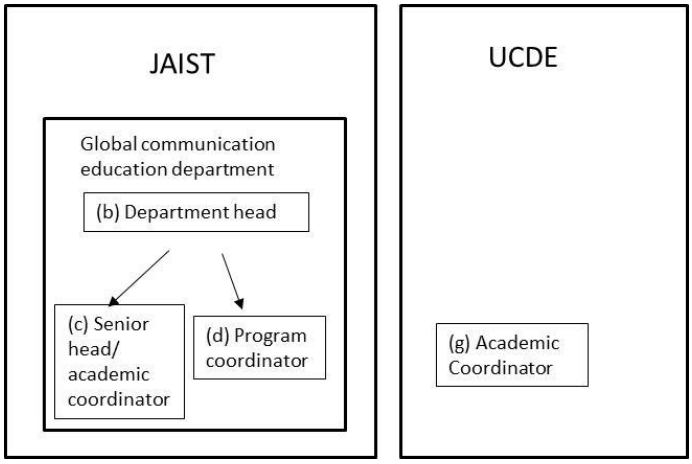

Figure 5.4 Participants in the second embedded case in Case A

1. Leader-follower relation

Because this embedded case was embedded in the first embedded case, the leader-follower relation in this embedded case was involved in the leader-follower relation in the first embedded case. The leader-follower relation in this embedded case is shown in table 5.8, which is extracted from the table 5.2. The explanation for table

5.8 can refer to the findings in the previous embedded case. Again, we don`t discuss in detail to avoid being wordy. There were hierarchical relations in this embedded case, referring to figure 5.4, but we didn`t see that this had any influence during the context analysis.

Table 5.8 Leader-follower relation in the second embedded case in Case A

Leader role (teaching/giving situation)	**Follower role (learning/taking situation)**	**Learning content**	**Code**
c	b	English education experiences	The academic coordinator in JAIST shared his experience with the progam coordinator and the department head through his work for the proposal. (Interview with the academic coordinator in JAIST)
c	d	English education experiences in JAIST	There were some meetings between the program coordinator, the academic coordinator, and the department head in JAIST, so they shared English educational experiences for making a proposal of the program. (Interview with the academic coordinator in JAIST)
d	c	Information related to the English program	
g	c	Information related to the program and UCDE conditions	The academic coordinator and the academic coordinator shared their knowledge and information and the first version of the proposal for the program was made by their cooprative work. (Interview with the department head in JAIST)
c	g	Infromation related to the requirment of JAIST	
d	g	Needs of JAIST	The program coordinator in JAIST gave infromation related to JAIST`s needs to the academic coordinator in UCDE. (Interview with the academic coordinator in UCDE)

2. Participants' mindset

Participants in this embedded case were supportive of each other. All participants cooperatively shared professional knowledge related to English courses and shared their ideas with each other so that the first proposal could be made. The details of evidence can refer to the first embedded case.

3. Process pattern of value co-creation

We found that participants did sharing activities by contacts and communications in the first stage, so that knowledge was transferred from individuals to organizations between UCDE and JAIST. Following that, the requirement of JAIST was identified at a specific level, and the knowledge seeking direction became clear in the second stage. Thus, participants developed a curriculum design through knowledge integrating activities such as check-feedback, and using a draft, so that professional knowledge was created. When this professional knowledge was applied into the real work, it resulted in the outcome of the first version of the program proposal, which met the need identified in the second stage. Therefore, we summarize the process pattern as "**knowledge sharing**", "**identification of needs**", "**knowledge integrating**", and "**implementation to meet needs**" based on the consideration of the results from the context analysis. All activities in each stage in this event had potential values, as shown in table 5.9. Participants` actions and knowledge in this event were related, and meaningful, which facilitated the

subsequent process in this education project.

Table 5.9 Process pattern in the second embedded case of Case A

Stage2.	**Identification of needs**	**Knowledge seeking**	**Potential values**	**Code**
	The program was required to be a connecting English program between the intermediate courses and the advanced courses in the exisiting English education system in JAIST.	Knowledge which related to the English program design for JAIST	JAIST and UCDE could find ways to design a specific program to meet the requirement of JAIST.	We have to think how to position the UC Davis English program into the existing English education system in JAIST, which is systematized from guide level, intermediate level to upper level and how to recombine lecture contents. (Interveiw with the department head in JAIST)
				The UC Davis prograqm need to be a connect English program between the prerequisite intermediate coures and the required advanced courses for post-program activities for studens in JAIST. (Document resourses: 8)
				We had a few problems in the beginning, some things needed to be qualified, some courses needed to be balanced, scrapped or changed. (Interview with the acadimic coodinator in JAIST)
Stage3.	**Knowledge integrating**	**Knowledge creation**	**Potential values**	**Code**
	JAIST and UCDE devoloped a curriculum design through check-feedback based on the existing samples.	Professional knowledge to design a specific currriculum for the program for JAIST	The curriculum design might meet the requirement of English education in JAIST	We made a list of modifications according to our needs, after discussions in JAIST, based on the data of the existing curriculum samples of the program in UCDE. Then, the acadimic coordinator reponded to our requirements. (Intervew with the program coordinator in JAIST)
				We had a lot of correspondence between UCDE and JAIST in the early stage. (Interview with the acadimic coordinator in JAIST)
	A proposal draft was made.	An explicit way to devolop a curriculum design for JAIST		A description of the English program was made. (Document 7)
Stage4.	**Implementation to meet needs**	**Knowledge application**	**Potential values**	**Code**
	The first version of the proposal was made based on cooperation between JAIST and UCDE.	Professional knowledge related to English education was applied into the curriculum design for the proposal of the program from coordinators in both organizations.	One of the necessary preparations for making an agreement between JAIST and UCDE was done.	I wrote a proposal for the program based on a previous proposal modification we made. (Interview with the acadimic coordinator in JAIST)
				The academic coordinator in UCDE responded to our requirements; then we made the first proposal for the program. (Interview with the program coordinator in JAIST)

Embedded case 3: Curriculum co-design

In the third embedded case, the main event is to achieve a certain curriculum design for students from three schools in JAIST. This event is partly embedded into the second embedded case. The curriculum in the first version of program proposal for students of JAIST was continuously developed, after JAIST and UCDE made a contract for the English program. Mainly, there are six participants in this embedded case, as shown in figure 5.6.

Participant (h): The program coordinator in UCDE, who took over the English program for JAIST after JAIST and UCDE made an agreement for the English program.

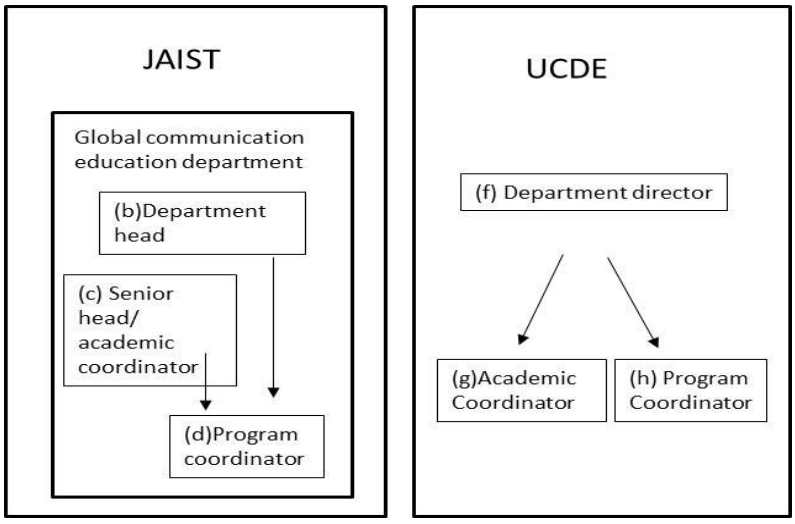

Figure 5.5 Participants in the third embedded case in Case A

1. Leader-follower relation

We found participants often changed their roles between leaders and followers, according to their situations as giving or taking, and worked as a partnership in this event, as shown in table 5.10. Moreover, we didn`t see hierarchical influences from the hierarchical relations in this event according to the context analysis.

Table 5.10 Leader-follower relation in the third embedded case in Case A

Leader role (teaching/giving situation)	**Follower role (learning/taking situation)**	**Learning content**	**Code**
c	b	English education experiences	The academic coordinator in JAIST shared his experience with the program coordinator and the department head thorugh his work for the proposal. (Interview with the academic coordinator in JAIST)
c	d	English education experiences in JAIST	There were some meetings among the program coordinator, the academic coordinator and the department head in JAIST, so that they shared English educational experiences for making a proposal for the program. (Interview with the academic coordinator in JAIST)
d	c	Information related to the English program	
b	d	Suggestions to course design	
d	h	The requirement of JAIST	The program coordinator in JAIST told about what they needed to change with the program coordinator in UCDE through a lot of communications. (Interview with the program coordinator in UCDE)
g	h	Information related to JAIST	UCDE had meetings among the director, coordinators, and instructors to discuss each project running in UCDE. (Interview with the department director in UCDE)
f	h	Suggestions to curriculum design	

2. Participants' mindset

We found the program coordinator in UCDE (h) engaged in a lot of communications with the coordinators in JAIST through emails, Skype meetings, and reports, according

to the context analysis. He had supportive attitudes and actions for this project. He cooperatively worked with others; as he said: *"My attitude is that we need to work together to provide students meaningful, successful education experiences… I think supporting instructors is critical to the success of the program… I was supporting by making sure that the instructors have information they need to most effectively teach classes… I spent a lot of time to have meetings with instructors."* (Interview with the program coordinator in UCDE)

3. Process pattern of value co-creation

We found participants between UCDE and JAIST had communications, discussions as sharing activities in the early stage, such that knowledge was transferred from individuals to organizations, and between organizations. In these, the general need and students` needs were identified, and carried out in the direction of knowledge seeking to find ways to meet the requests of JAIST in the second stage. In the third stage, participants worked together to integrate knowledge for ideas, and ways to meet the needs identified in the previous stage, which were outcomes of knowledge creation. Following that, a final proposal was worked out through real actions, the resulting knowledge of which was applied in the four stage. Therefore, the process pattern can be summarized as "**knowledge sharing**", "**identification of needs**", "**knowledge integrating**", and "**implementation to meet needs**", as detailed in table 5.11.

Table 5.11 Process pattern in the third embedded case of Case A

Stage1.	**Knowledge sharing**	**Knowledge transfer**	**Potential values**	**Code**
	Meetings and discussions for designing a suitble program in JAIST	Individual knowledge to organizational knowledge	The needs of JAIST could be clear in JAIST, and UCDE could understand the requests of JAIST in details.	There are some meetings and discussions for designing a suitable program between the program coordinator and others in the global communication education department in JAIST. (Interview with the program coordinator in JAIST)
	Communication and discussions between coordinators in JAIST and UCDE for the customization of the program.	Organizational knowledge to organizational knowledge through individual knowledge sharing		Coordinators communicated together between UCDE and JAIST; the customization of the program came about through discussions by emails and meetings. (Interview with the program coordinator in UCDE and the program coordinator in JAIST)
	Discussions between coordinators in UCDE	Organizational knowledge through individual knowledge sharing		The program coordinator and the academic coordinator talked about JAIST. (Interview with the program coordinator in UCDE)
Stage2.	**Identification of needs**	**Knowledge seeking**	**Potential values**	**Code**
	The program had the general goal of being meaningful for JAIST	Professional knowledge which designed courses for the general goal and students of JAIST.	JAIST and UCDE could find ways to meet the requests of JAIST for the general goal and students` need	JAIST requested a meaningful education program, which could increase communication skills in both science and technology, and everyday English for students, broaden their horizons, and encourage them to engage with other students in future academic activities. (Interview with the program coordinator in UCDE)
	Courses of the program were requested to meet the needs of students from three different school of JAIST			How to customize each course in the program according to the needs of students needed to be considered in detail, because there would be students from different fields in three schools in JAIST. (Interview with the department head in JAIST)
Stage3.	**Knowledge integrating**	**Knowledge creation**	**Potential values**	**Code**
	Discussions among coordinators and the top management for dealing with the requests of JAIST.	Ideas to deal with the requests of JAIST	UCDE and JAIST could co-design a suitable program for JAIST students.	The program coordinator, the academic coordinator and the director in UCDE discussed how to appropriately develop courses and respond to the request. (Interview with the program coordinator in UCDE)
	The customization of each course was based on the modification of the EST program.	A way of using the EST program as a foundation to customize courses for JAIST		UCDE provided the EST program as a foundation to customize each course in the curriculum for JAIST. (Interview with the program coordinator in UCDE)
	Adjustments of each course between UCDE and JAIST by check-feedback	Ideas to adjust courses' design by check-feedback		We did many adjustments by check-feedback for a long time between UCDE and JAIST. (Interview with the department head in JAIST)
Stage4.	**Implementation to meet needs**	**Knowledge application**	**Potential values**	**Code**
	The final proposal was made after seven versions of the curriculum design	Knowledge between UCDE and JAIST was applied that made a final proposal for JAIST.	The program could be delivered as JAIST expected.	We changed courses in the program according to JAIST's requests, and developed and finalized the proposal after seven versions was made. (Interview with the program coordinator in UCDE)

Embedded case 4: Hot Topics class design

The main event in this embedded case is making a formal and scheduled Hot Topics class design according to the direction in the curriculum of the program for the first group of JAIST graduate students. Participants in this embedded case are shown in figure 5.6.

Participant (i): The Hot Topics designer is a sophisticated instructor in UCDE. She took responsibility to design a Hot Topics course for the first group of JAIST students.

Participant (j): Other instructors are teachers of English courses in UCDE. They share their experiences and suggestions for English course designs and teaching methodologies in their meetings.

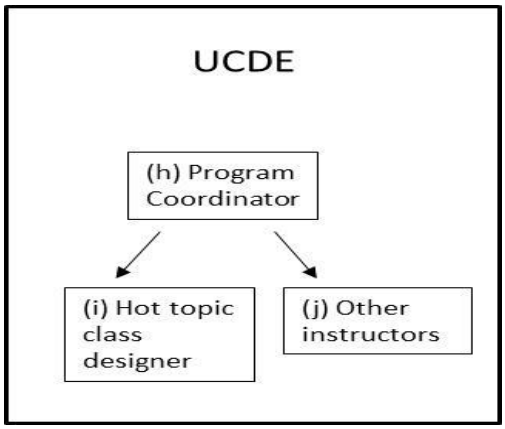

Figure 5.6 Participants in the fourth embedded case in Case A

1. Leader-follower relation

The leader-follower relation among participants in this embedded case is shown in table 5.12. Participants changed their roles as leader or follower according to their real situations in taking or giving information, which implies that they worked together in a partnership. We found there was a hierarchical influence in this event, as seen in the table 5.13. The program coordinator (h) led instructors by giving a whole picture of the program and the relation of each course in the program.

Table 5.12 Leader-follower relation in the fourth embedded case in Case A

Follower role (learning/taking situation)	**Learning content**	Code
i	Direction and suggestions for the Hot Topics class design	The program coordinator in UCDE gave course descriptions, syllabi, and disscussed the kinds of guaranties the instructor would establish for students. He led the instructors to understand the whole picture of the program. (Interview with the program coordinator in UCDE, and the program instructor A)
h	information and ideas related to Hot Topics class design	The program instructor communicated with the program coordinator by emails and meetings, tell issues and what the instructor think about the hot topic course. (Interview from the instructor A)
j	Idea for the Hot Topics course design	There were meetings in UCDE, in which instructors reported their work, shared their experiences, gave their opinions and suggestions to others. (Interview with the program instructor B)
i	Suggestions to the design of the Hot Topics class	

Table 5.13 Hierarchical influence in the fourth embedded case in Case A

Contents of Hierarchical Influence	**Code**
The program coordinator in UCDE gave a direction to the design work for a Hot Topics course.	The coordinator`s functions was as the organizer of this program. He decided what material would be covered. (Interview with the program instructor A)
	The program coordinator was leading the instructors in understanding the whole picture of the program, and how their courses were related to other courses. (Interview with the program coordinator in UCDE)

2. Participants' mindset

Participants in this event had supportive mindsets and cooperative actions. The designer cooperatively worked with the program coordinator of UCDE, according to the requirement of JAIST. In her mind, *"we have to customize it (the program) to our students as customers … We have to focus on customizing to their interests, their levels and their abilities."* (Interview with the program instructor A) Instructors cooperatively work together with their positive attitudes, as the program coordinator saying, *"They are kind, absolutely. They are nice. They are willing to collaborate."* (Interview with the program coordinator in UCDE) The willingness and supportive attitudes were also seen in one instructor`s action and his opinion: *"When (h) ask me what I think, what I can change, I always run with that and change a lot… My purpose is to recreate the successful research`s experience (for students) as I can as possible… The teacher should accept the role as a facilitator, a sparring partner, and the person who can ask the right questions to move students forward."* (Interview with the program instructor B)

3. Process pattern of value co-creation

We found information sharing activities took place in the early stage in this event, that knowledge was transferred into different levels. Then, the course designer identified a need that the suitable topics and the balance of the maturity of students in the design were essential to a Hot Topics class for students of JAIST, which gave her a direction of knowledge-seeking. With this direction, an idea, the way of adjustment using TED.com that could meet the need was created based on discussions among instructors and her own experiences, which integrated different types of knowledge. Thereby, the designer finalized the design for a Hot Topics class in the subsequent process. Thus, we can summarize the process pattern of value co-creation as "**knowledge sharing**", "**identification of needs**", "**knowledge integrating**", and "**implementation to meet needs**".

Table 5.14 Process pattern in the fourth embedded case of Case A

Stage1.	**Knowledge sharing**	**Knowledge transfer**	**Potential values**	**Code**
	Information sharing related to the design for a Hot Topic course for JAIST between the program coordinator and the designer	Organizational knowledge through individual knowledge sharing	The designer could understand the needs of JAIST more deeply	The program coordinator and I discussed the design of a Hot Topic course for JAIST individually. He also shared his ideas with me. (Interview with the program instructor A)
Stage2.	**Identification of needs**	**Knowledge seeking**	**Potential values**	**Code**
	Suitable topics and balancing the level with students maturity were required	Knowledge of suitable themes that could balance different levels of students	The designer could find ways to design a good Hot Topics course for JAIST students.	Graduate students from JAIST were upper-dividion, a little older. Their approach was different than typical EST students. The vocabulary and the communication skills were required by the description of the class in the program agreement. Hot Topics were required to be related to students` research field and majors. I thought about topics and balancing the level with maturity in my preparation. (Interview with the program instructor A)
Stage3.	**Knowledge integrating**	**Knowledge creation**	**Potential values**	**Code**
	Discussions in meetings in UCDE for comments on the course design	Ideas for the Hot Topic course design	The designer could design a suitble Hot Topic course for JAIST students.	We met other teachers to talk about the design for JAIST to hear their suggestions. (Interview with the program instructor (i)) UCDE often has meetings to let instrutors share their views and experiences of teaching. (Interview with the department director in UCDE ; the program instructor A)
	Adjustment to balance the requirement between the course description and students` levels, using TED.com	A method using TED.com		I planned to adjust the requirement from the course description and the students` levels. I used TED.com as a nice reference to meet different language levels. (Interview with the program instructor A)
Stage4.	**Implementation to meet needs**	**Knowledge application**	**Potential values**	**Code**
	The design of the Hot Topic courses was finalized and approved according to the requirment of JAIST	The Hot Topic course was organized around themes based on TED talks	The method using TED would balance the level with maturity for JAIST students.	I organized the Hot Topics course around themes based on TED talks. (Interview with the program instructor A)

Embedded case 5: Selection of students

The main event in this embedded case is the selection of students. JAIST selected fourteen students coming from the three different schools of JAIST, and from different countries, to be the first group for the English program in UCDE. The main three participants are shown in figure 5.7.

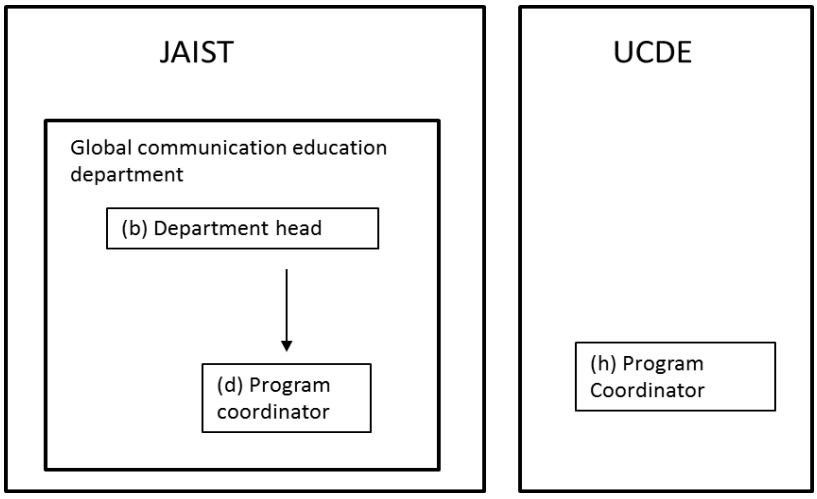

Figure 5.7 Participants in the fifth embedded case in Case A

1. Leader-follower relation

Participants changed their roles as leaders or followers, as shown in table 5.15, which indicates they worked in a partnership. We didn`t find any hierarchical influences from the hierarchical relation in this event.

Table 5.15 Leader-follower relation in the fifth embedded case in Case A

Leader role (teaching/giving situation)	**Follower role (learning/taking situation)**	**Learning content**	**Code**
b	d	Suggestions for the selection of students	The selection of students had a principle after disscusions between the program coordinator and the department head in Jaist, so that JAIST attempted to select students who had a positve attitude and the maturity to be a leader in the future. (Interview with the program coordinator in JAIST)
d	b	Ideas for the selection of students	
h	d	Suggestions for the selection of students based on the condition of UCDE	The program coordinator of UCDE gave information about the limitation of class size and shared their exeerience, that it is better that students` English ability be the same in one class, to JAIST. (Interview with the program coordinator in UCDE)

2. Participants' mindset

We found participants in this embedded case were cooperative from the description of their actions: *"we talked together."* (Interview with the department head of JAIST) *"We had good communication."* (Interview with the program coordinator of UCDE) They worked together to make a suitable selection of students through their information exchange and experience sharing.

3. Process pattern of value co-creation

We found each stage had its characteristic in the value co-creation process as seen in table 5.16; thus, the process pattern of value co-creation in this embedded case was able to be summarized as "**knowledge sharing**", "**identification of needs**", "**knowledge integrating**", and "**implementation to meet needs**" based on the result of the context analysis.

Table 5.16 Process pattern in the fifth embedded case of Case A

Stage1.	**Knowledge sharing**	**Knowledge transfer**	**Potential values**	**Code**
	Information sharing related to the program through briefing sessions among students in JAIST	Organizational knowledge to individual knowledge	Information related to the program was spread so that students of JAIST knew the program.	JAIST held briefing sessions of the progam four times for students. The coordinator and the department head started a discussion about what should be considered for the selection of students. (Interview with the program coordinator in JAIST)
	Discussions of the selection of students between the department head and the program coordinator in JAIST	Organizational knowledge through Individual knowledge sharing	People would know each other's opinions on the selection of students	
	Information sharing related to the limitation and expectations of UCDE between coordinators	Organizational knowledge to organizational knowledge through individual knowledge sharing	UCDE and JAIST could understand each other about their requirements	The program coordinator of UCDE gave information about the limitation of class size and shared their exeerience, that it is better that students` English ability be the same in one class, to JAIST. (Interview with the program coordinator in UCDE)
Stage2.	**Identification of needs**	**Knowledge seeking**	**Potential values**	**Code**
	Suitable candidates and the maximun and minimum number of students in a class were to be considered.	Knowledg of a certain criteria of suitable candidates	JAIST could find ways to have a certain criteria.	JAIST only could send 1-2 classes of students, due to the budget and the limitation of class size. What kinds of students should be considered to send? (Interview with the department head in JAIST)
	Students` English proficiency was considered.			UCDE hoped that students would have similar levels in one class. (Interview with the progam coordinator in UCDE)
Stage3.	**Knowledge integrating**	**Knowledge creation**	**Potential values**	**Code**
	A principle of the selection of students was made after discussions in JAIST	An idea to the selection criteria	JAIST could select suitable participants among students for the first group	The principle for selection of students was made after disscusions between the program coordinator and the department head in JAIST so that JAIST attempted to select students who have a positve attitude and maturity to be leaders in the future. Candidates should have a proficiency level equivalent to TOEIC 600 or 500 levels, the first grade doctoral students from three schools of JAIST were expected. (Interview with the program coordinator in JAIST)
	A profile was made for the selection of students.	An explicit standard		A profile for the selection of students was made between UCDE and JAIST. (Document 1)
Stage4.	**Implementation to meet needs**	**Knowledge application**	**Potential values**	**Code**
	The first group was selected through interviews, and consisted of fourteen students from three schools of JAIST.	Students were selected based on the principle and the explicit standard.	JAIST would have participants for the program.	We had over 40 applicants; then we selected 14 students from 20 candidates after interviews for the first group. (interview with the program coordinator in JAIST)

Embedded case 6: Visa application

This embedded case is focused on the event of the visa application for students of the first group to the United States. Participants in this embedded case are shown in figure 5.8.

Participant (k): The section staff is a project member who worked in the student section and supported all necessary organizational paper work for students.

Participant (l): The first group of students are participants of the first group to attend the program, consisting of fourteen students from three schools of JAIST: knowledge science, information science, and materials science.

Participant (m): The staff member is an administrator of UCDE, who prepared essential documents related to the visa application, issued by UCDE for the first group of students from JAIST.

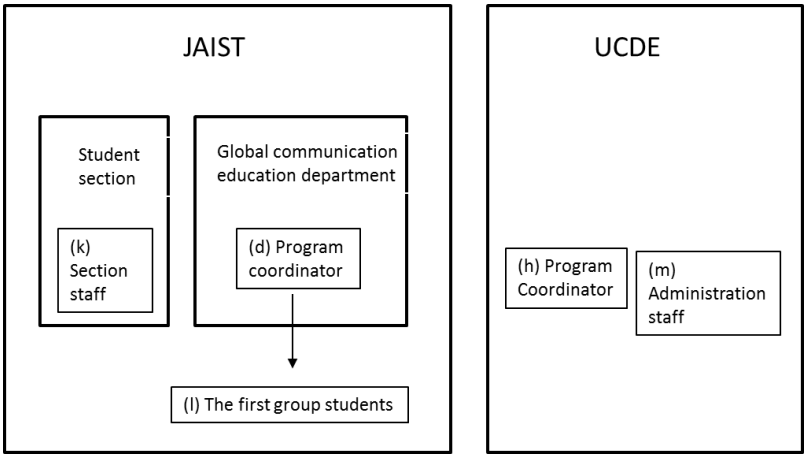

Figure 5.8 Participants in the sixth embedded case in Case A

1. Leader-follower relation

We found participants changed their roles as a leader or a follower in a giving situation or taking situation, as shown in table 5.17, which indicates that they worked in a partnership. We didn`t find a hierarchical influence from the hierarchical relation shown in figure 5.8 in this event.

Table 5.17 Leader-follower relation in the sixth embedded case in Case A

Leader role (teaching/giving situation)	**Follower role (learning/taking situation)**	**Learning content**	**Code**
k	l	Document support for visa application	The progam coordinator and the staff organized the orientations related to visa application twice for the first group of students in JAIST. (Interview with the project member in JAIST)
d	l	Visa application experiences	
h	k	Visa application information for students	Administrators of JAIST visited UCDE and communicated with the program coordinator and the administrators in UCDE, so that they could know things related to the program and the border formalities. (Interview with the project member in JAIST)
m	k	Document support for visa application	

2. Participants' mindset

Participants were supportive and cooperative in this embedded case. Students were cooperative and showed willingness to follow what was required of them in JAIST. One of students said: *"It (the orientation) was useful. I was willing to attend it."* (Interview with a student) Staffs were supportive in both organizations to prepare the necessary documents for students. *"We cooperated well by two way communication. Because the way in Japan is different from in the USA, when I asked them for things such as documents and procedures, the people of UCDE always immediately gave information and responded to our requests."* (Interview with the project member in JAIST) The staff in JAIST had a positive mind, as shown in his

opinion: *"I hoped all things with the program would go smoothly. I wanted to support and satisfy students in my mind at that moment."* (Interview with the project member of JAIST) The program coordinator supported students, to check the paperwork of students' visa applications *"one by one"*. (Interview with a student)

3. Process pattern of value co-creation

We found the process pattern of value co-creation in this embedded case was able to be summarized as "**knowledge sharing**", "**identification of needs**", "**knowledge integrating**", and "**implementation to meet needs**" based on the result of the context analysis, as shown in table 5.18.

Table 5.18 Process pattern in the sixth embedded case of Case A

Stage1.	**Knowledge sharing**	**Knowledge transfer**	**Potential values**	**Code**
	Information sharing by meetings among students and project members in JAIST	Organizational knowledge through Individual knowledge sharing	People related to the program could understand each other in JAIST to find the need in the situation.	1. There was a meeting among the first group of students, the administrator, and the program coordinator in JAIST after the selection of students. The coordinator introduced the program, and students shared their personal information with each other. 2. Administrators of JAIST visited UCDE and communicated with the administrators in UCDE that they could know things related to the program and the border formalities. 3. JAIST had meetings to exchange opinions among coordinators, the department heads, and administrators. (Interview with the project member in JAIST)
	Opinion exchanges by meetings among project members of JAIST			
	Information exchange by communicating between JAIST and UCDE on the ground	Organizational knowledge to organizational knowledge through individual knowledge sharing	JAIST and UCDE could understand each other to find the need in the situation.	
Stage2.	**Identification of needs**	**Knowledge seeking**	**Potential values**	**Code**
	There was the uncertainty regarding students` visas for the first group of students, and they were unfamiliar with the application for a visa to the USA.	Knowledge to reduce the uncertainty for the visa application of students	People related to the program in JAIST could find a way that could make sure that students could get visas.	Many students in the first group were foreign students, from different Asian countries, and most of the students had never been in the USA. JAIST must send students to UCDE as a group, but nobody could make sure that all students were able to get students` visas for the USA. (Interview with the project member in JAIST)
Stage3.	**Knowledge integrating**	**Knowledge creation**	**Potential values**	**Code**
	Orientations related the visa application were held for students	Knowledge related to the visa application	Students could have knowledge about the visa application.	The progam coordinator and the staff organized the orientations related to visa application twice for the first group students. Administrators in JAIST and UCDE cooperativly worked together, so that they prepared the necessary documents for the visa application as fast as possible. (Interview with the project member in JAIST)
	Cooperation of administrators between JAIST and UCDE for necessary documents for students visa application	Knowledge related to the visa application documents	Students could have their complete application procedures to make obtaining visas certain.	
	Supporting by checking the application documents for students one by one	Knowledge to assist students for the visa application		The program coordinator supported students, in that he checked the application documents students made one by one. (participant observation report)
Stage4.	**Implementation to meet needs**	**Knowledge application**	**Potential values**	**Code**
	Students got visas to the USA.	Students had visas through their complete application procedures.	The first group of students could go to UCDE on time by the schedule of the program.	The embassy of the USA separately issued visas to all sutdents, so that the first group could go to attend the program together. (Interview with the project member in JAIST)

Embedded case 7: Preparation education

The seventh embedded case is the event focusing on the preparation education for the first group of students of JAIST. The outcome of this event is shown in changes of students` attitudes and behaviors. The main participants are shown in figure 5.9.

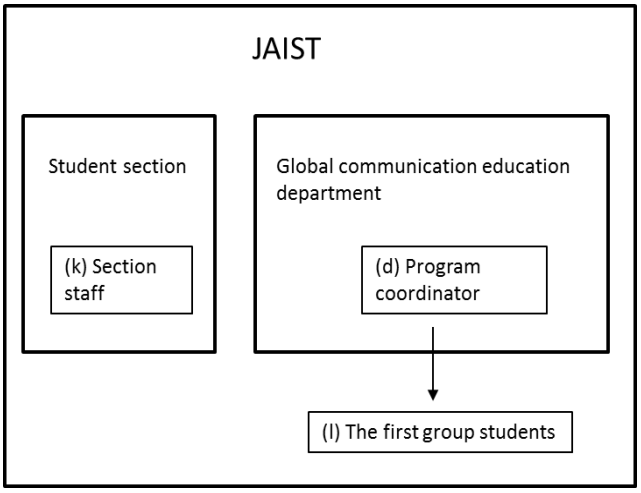

Figure 5.9 Participants in the seventh embedded case in Case A

1. Leader-follower relation

We found participants changed their roles as a leader or follower to work with others as partnership in this event, as shown in table 5.19. We didn`t find any hierarchical influence in this event.

Table 5.19 Leader-follower relation in the seventh embedded case in Case A

Leader role (teaching/giving situation)	**Follower role (learning/taking situation)**	**Learning content**	**Code**
l	d	Life experiences and thinkings	Some students and the program coordinator shared their views and background in their free conversations in JAIST. (Interview with students)
d	l	Personal experiences and views	
k	l	Knowlege of security in the USA for students	The coordinator shared his experiences with students and talked about the purpose of this program and American culture in each training session. The staff member in the students' session in JAIST gave a basic precautions introduction for students. (Interview with students; Participant observation report)
d	l	Experiences related to living in USA and the purpose of the program	

2. Participants' mindset

The staff was very positive and supportive, as shown in his words, *"I hope I can help them (students)."* (Interview with the project member in JAIST) The program coordinator and staff organized training activities for students, which supported the students' life in the USA. We also found students also had very positive attitudes and actions; one student said: *"Even though I was busy, I attended all training sessions on time. I think the training sessions were useful for us".* (Interview with a student) All of the selected students had positive thinking, and cooperatively participated in all the training activities on time. Participants were

positive, supportive, and cooperative in this event.

3. Process pattern of value co-creation

We found the process pattern of value co-creation in this embedded case was able to be summarized as "**knowledge sharing**", "**identification of needs**", "**knowledge integrating**", and "**implementation to meet needs**" based on the result of the context analysis, as shown in table 5.20.

Table 5.20 Process pattern in the seventh embedded case of Case A

Stage1.	**Knowledge sharing**	**Knowledge transfer**	**Potential values**	**Code**
	Conversations to share views and personal information between students and the program coordinator in JAIST	Individual knowledge to group knowledge	The program coordinator and students got to know each other more deeply, so that they could find the need in the situation.	Some students and the program coordinator sharied their views and backgrounds in their free conversations in JAIST. (Interview with students)
	Meeting to share the individual information of students in JAIST			All students, the program coordinator, and other members of the project formally met in a meeting, and shared individual information. (Interview with the project member in JAIST)
Stage2.	**Identification of needs**	**Knowledge seeking**	**Potential values**	**Code**
	Students were required to build unification of their intention and positive mindset.	Knowledge which unifies students as a team.	JAIST could have ways to unify students as a team.	The first group was required to be very successful to dispel prejudices in JAIST, so that the program could continuously run for the second group of students as per the mission of JAIST. (Interview with the program coordinator in JAIST)
				Students came from three schools of JAIST and hadn't had a chance to know each other, and most of them didn`t have an American experience. (Interview with students)
Stage3.	**Knowledge integrating**	**Knowledge creation**	**Potential values**	**Code**
	Six training sessions and a basic precautions session were held for the first group of student in JAIST	Ways which build unification of the intention for the first group of students.	Students could work coopratively and make the program successful.	Six training sessions as the preparation education were organized for the first group before they headed off for the program. A basic precautions introduction for students was given. (Document 8)
				The coordinator shared his experiences with students and talked about the purpose of this program and American culture in each training session. The staff of students secsion in JAIST gave a basic precautions introduction for students. (Interview with students; Participant observation report)
Stage4.	**Implementation to meet needs**	**Knowledge application**	**Potential values**	**Code**
	All students were unified as a team, their mindset changed, became more positive and cooprative.	Students were unified as a team through training sessions	Students could have a good outcome from the program based on their positive mindset and collaborative actions.	Students became familiar with each other as a team, learned some things about American society, culture, and basic precautions in the USA. (Interview with students)
				Students changed a lot, became more collaborative, international, and adaptive, and students supported each other as a team during the program. (Interview with students)

Embedded case 8: Four-week program execution

This embedded case is focusing on the four-week program execution. JAIST students improved their English abilities and views for research and communication through the program, which positively changed their minds and habits, thus having a positive influence on their future. The main participants are shown in figure 5.10.

Participant (n): Class instructors are the staffs of UCDE, who taught English classes for the first group.

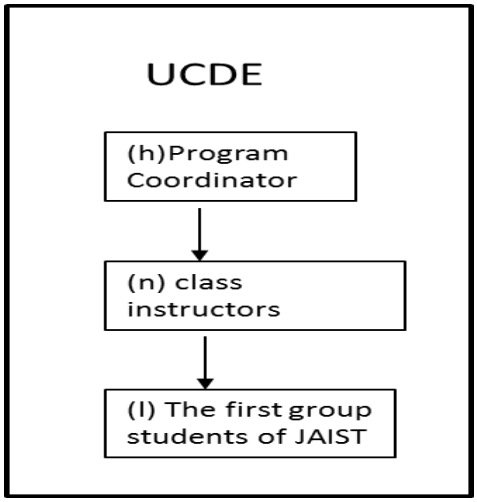

Figure 5.10 Participants in eighth embedded case in Case A

1. Leader-follower relation

We found participants changed their roles according to their situation as being in a taking or giving position, as shown in table 5.21, which indicates that all participants worked together in a partnership. We didn`t find any hierarchical influence in this event.

Table 5.21 Leader-follower relation in the eighth embedded case in Case A

Leader role (teaching/giving situation)	**Follower role (learning/taking situation)**	**Learning content**	**Code**
n	h	Students information	Instructors communicated with the program coordinator in UCDE through emails regularly, that talked about issues they encountered and shared their ideas. (Interview with the program instrucotr A; B)
h	n	Suggestions to improve the program.	
n	l	English courses	There were two-way communications in real class time. Instructors started formal and informal conversations with students and had feedback from students. (Interview with the program instrucotr A)
l	n	Students' feedback on the courses	
l	h	Students' feedback on the program	Students directly gave suggestions for class improvement. The program coordinator directly came into the classroom and listened to students` opinions and suggestions. (Participant observation report)

2. Participants' mindset

The program coordinator of UCDE was supportive, as the program coordinator of JAIST said: *"I think (h) is very supportive. He did a lot of work for students. Once I told him about a student problem with the homestay service, he immediately contacted with the homestay service company, so that I got a reply from the owner in the same day."* (Interview with the program coordinator of JAIST) Class instructors also were very supportive in their attitudes and actions. One student described her instructor*: "The teacher supported us for many things. Once I sent an email*

to her with a question related to homework after the middle of the night. I didn't expect she would rapidly reply me, but I got her email a little while later. I felt deeply moved at that time." (Interview with a student) Students had very positive and collaborative attitudes and actions, as shown in these descriptions: *"We were very collaborative. We supported each other. If someone had problems, other students always gave help, shared useful information, gave suggestions or lent money to the student."* (Interview with a student) *"Students were positive. They were very active in classes, and always directly gave suggestions to me or other instructors for the program."* (Interview with the program coordinator of UCDE) Participants in this case were cooperative and supportive. Students freely gave their feedback related to their classes and shared thoughts with the program coordinator and instructors. People in UCDE were nice and supportive to students; they organized activities, and regularly provided students with opportunities for communication between people related to the program. They also adjusted class design according to individual students' needs.

3. Process pattern of value co-creation

We found the process pattern of value co-creation in this embedded case was able to be summarized as "**knowledge sharing**", "**identification of needs**", "**knowledge integrating**", and "**implementation to meet needs**" based on the result of the context analysis, as shown in table 5.22.

Table 5.22 Process pattern in the eighth embedded case of Case A

Stage1.	**Knowledge sharing**	**Knowledge transfer**	**Potential values**	**Code**
	Communication between instructors and the program coordinator to share ideas and problems they met in UCDE.	Organizational knowledge through individual knowledge sharing	People related to the program could know each other well, so that they could find needs in the situations.	Instructors communicated with the program coordinator in UCDE through emails regularly, they talked about issues they met, and shared their ideas. Instructors started formal and informal conversation with students and had feedback from students. (Interview with the program instructor A)
	Conversations between instructors and students to know each other in UCDE.	Individual knowledge to group knowledge		
	Culture sharing, experience sharing, and information sharing among instructors, coordinators, local people, and students in UCDE through orientation and parties.	Individual knowledge to group knowledge		UCDE organized orientations, a reception, and several parties among students, instructors, coordinators, and home-stay families, so that people shared their culture, experience,s and information related to living in the USA. (Interview with the program coordinator in JAIST)
Stage2.	**Identification of needs**	**Knowledge seeking**	**Potential values**	**Code**
	Problems related to real classes, and home-stay service were required to improve during the program.	Knowledge to solve problems which could improve the program	Ways could be found that the program could be improved to meet the needs of the first group of students in real time.	There were some problems, such as class schedule and home-stay service. Students conplained that the homework was too much, (Interview with the program coordinator)
	Adjustment was required due to the variations of students` abilities			Students` levels were different in the same group; the scheduled original course design could not completely meet the real level of students` abilities and satisfy them. The adjustment was essential according to real learners` situations. (Interview with the program instrutor A)
Stage3.	**Knowledge integrating**	**Knowledge creation**	**Potential values**	**Code**
	Using questionnaire to capture students` needs.	Ideas and methods created by people related to the program that solved problems and improved the program.	The program could be improved and meet real learners of the first group.	UCDE used a questionnaire form to capture individul student` needs. (Interview with the program coordinator in JAIST)
	Class design modifications to meet students` needs			UCDE was flexible to custormize by the client`s requirement and meet students` need in real time. Instructors did many modifications for students. (Interview with the program coordinator in UCDE)
	Ideas sharing to find ways to satisfy students between instrutors and the program coordinator in UCDE			Instructors shared their ideas with the program coordinator, and cooperatively worked together to find ways that satisfied students. (Interview with the program instructor B)
	Students shared their opinions and suggestions to improve the program			There was two-way communication in real time in classes. Students directly gave suggestions for class improvement. The program coordinator directly came into the classroom and listened to students` opinions and suggestions. (Participant observation report)
Stage4.	**Implementation to meet needs**	**Knowledge application**	**Potential values**	**Code**
	All students had great experiences from the program. The program was successful.	The great outcome was carried out from the program based on actions related the improvement of the program.	UCDE could balance the requirement of JAIST between its need and that of the individual learners.	The first group made a great work from the program, and they earned the appreciative criticism from UCDE. (Interview with the program coordinator in JAIST)
				The program was very meaningful to all individual students. they changed a lot, became more positve and collaborative, which benifited future activites in their lives, such as research and job hunting (Interview with students)

Embedded case 9: Hot Topics class adjustment

The main event in this embedded case is to adjust the Hot Topics class according to JAIST students' English levels, which supported learners in real time, and balanced the requirements from the class description with the diversity of students, which is embedded in the eighth embedded case. The main participants are shown in figure 5.11.

Participant (o): Hot Topics instructor is a staff of UCDE, who taught the Hot Topics course for the first group.

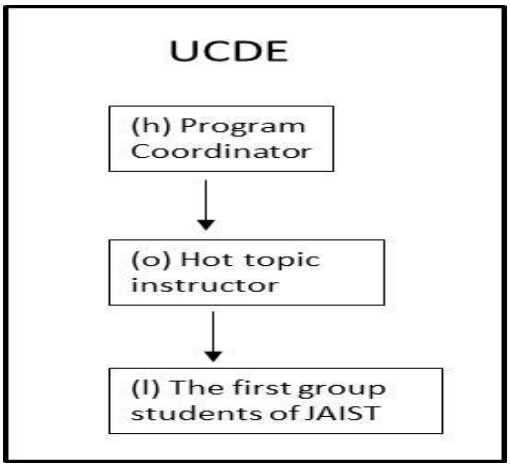

Figure 5.11 Participants in ninth embedded case in Case A

1. Leader-follower relation

We found participants changed their roles as a leader or a follower according to their real situation, as shown in table 5.23, which indicates that participants worked in a partnership. We didn`t find any hierarchical influence in this event.

Table 5.23 Leader-follower relation in the ninth embedded case in Case A

Leader role (teaching/giving situation)	**Follower role (learning/taking situation)**	**Learning content**	**Code**
h	o	Suggestions related to the Hot Topics class	Instructors communicated with the program coordinator in UCDE through emails regularly, that talked about issues they met, and shared their ideas. (Interview with the program instructor A)
o	h	Ideas to adjust the class	
l	o	Students' feedback and their suggestions for the class	Students directly told their problems to the instructor and the program coordinator in UCDE, when they asked their opionions, students also gave their suggestions for the Hot Topics class. (Paricipant observation report)
l	h	Students' feedback and their suggestions for the class	
o	l	Hot Topics course	There was two-ways communication in real classes. Instructors encouraged students to express their opinions, involved every student into discussions, so that students had many opportunities to speak English. (Interview with students)

2. Participants' mindset

The Hot Topics instructor had a supportive mindset to students, in her words, *"I have to modify the materials accordingly… We have to focus on customizing to their interests, their levels and their abilities."* (Interview with the program instructor A) All participants worked together to improve the outcome from the Hot Topics class. Students positively gave feedback and shared their opinions with the coordinator in UCDE. The coordinator supportively agreed to the instructor's idea to adjust the Hot Topics class according to the individual needs of students. The Hot Topics class was the favorite class, shown in the program survey, and all students were very satisfied with the Hot Topics class. (Document

resources: questionnaire)

3. Process pattern of value co-creation

We found the process pattern of value co-creation in this embedded case was able to be summarized as "**knowledge sharing**", "**identification of needs**", "**knowledge integrating**", "**implementation to meet needs**" based on the result of the context analysis, shown in table 5.24.

Table 5.24 Process pattern in the ninth embedded case of Case A

Stage1.	**Knowledge sharing**	**Knowledge transfer**	**Potential values**	**Code**
	Communication between instructors and the program coordinator to share ideas and problems they met in UCDE.	Organizational knowledge through individual knowledge sharing	People related to the program could know each other well, so that they could find needs in the situations.	The instructor shared issues and ideas with the program coordinator by emails. (Interview with the program instructor A)
	Diagnostic through placement tests, partner activities, group activites to know students.	Group knowledge through individual knowledge sharing		Students did placement tests, partner activities, group activities. The instuctor did "get-to-know-you" activites by reading, listening, speaking and writing, so that the instructor did informal diagnostic to know students in the early few days of the program. (Interview with the program instructor A)
Stage2.	**Identification of needs**	**Knowledge seeking**	**Potential values**	**Code**
	The class was required to balance the difference between the course description and the real intrests of learners in real time, and the variations among students.	Knowledge to balance the difference between the course description and the real learners of the first group	Ways could be found to adjust the class design to meet individuals in real time.	Students` interests didn`t exactly match their major, there were variations in age level, research level and language level among students, but we wanted to meet real learners` intrests, abilities individually, because of the customized program. (Interview with the program instructor A)
Stage3.	**Knowledge integrating**	**Knowledge creation**	**Potential values**	**Code**
	Two-way communication between students and the instructor, among students.	Ideas and methods to balance the difference of needs from JAIST and individuals of the first group.	Stduents could be satisfied and have a good outcome from the program.	There was two-way communication in real classes. Instructors encouraged students to express their opinions, involved every student in discussions, so that students had many opportunities to speak English. (Interviews with students)
	Categorizing students` levels and modifying materials and teaching ways based on personalization			The instructor categorized students` language levels according to the results of the Michigan test, did a lot of preparation on expressing opinions to adjust to levels and balance the intelligence by a language perspective, modified materials and teaching ways based on personaliztion depending on students. (Interview with the program instructor A)
Stage4.	**Implementation to meet needs**	**Knowledge application**	**Potential values**	**Code**
	The adjustment was successful that satisfied individul learners of the first group of JAIST.	The adjustment of the hot topic class was made based on modification of meterials and teaching ways according to individual levles in the real time.	The program could carry out a great outcome and be successful.	Students had a great outcome and were satisfied with what the instructor did for them, as shown in their evaluation of the Hot Topic class (Questionnaire)

Embedded case 10: Promotion activities in JAIST

The main event in this embedded case is the improvement and the promotion for the program based on the experience of the first group. The first group of students motivated other students and faculty members by emphasizing the necessity of English learning by sharing their experience of the program, and promoted the program in JAIST. The main participants are shown in figure 5.12.

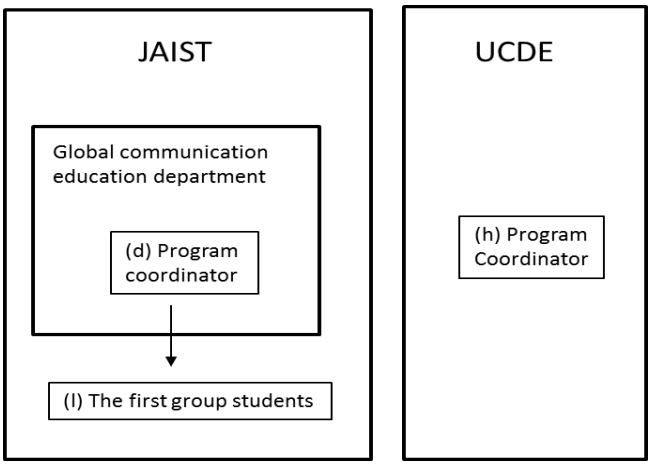

Figure 5.12 Participants in tenth embedded case in Case A

1. Leader-follower relationship

We found participants often changed their roles as a leader and a follower according to their taking situation or giving situation, shown in table 5.25, which indicates participants worked in a partnership. We didn`t find any influence from the hierarchical relation in this embedded case.

Table 5.25 Leader-follower relation in the tenth embedded case in Case A

Leader role (teaching/giving situation)	**Follower role (learning/taking situation)**	**Learning content**	**Code**
h	d	Feedback of the English program from instructors	Coordinators shared information between UCDE and JAIST based on feedback from students and instructors. (Interview with the program coordinator in UCDE)
d	h	Feedback of the English program from the first group students	
i	d	Personal information and experiences	Students and the coordinator communicated well and shared much personal information with each other; they became very close. (Interview with sutdents)
d	i	Personal information and experiences	
i	d	Feedback related to the English program and suggestions	Students positively attended several meetings in which they shared their experience with the coordinator and gave suggestions to improve the program for the next group of JAIST students. (Participant observation report)

2. Participants' mindset

Participants were positive and supportive. Students positively shared their experiences to attract students in JAIST to the program, shown in their actions. *"Students were very positive. All of them attended promotion activities. They willingly gave presentations and shared their experiences to new students. They naturally shared their great experiences from the program with others in their laboratories."* (Participant observation report) Coordinators in both organizations cooperatively worked to improve the program design. They shared information and

gave ideas to each other through their smooth communication. All participants made efforts for the success of the program.

3. Process pattern of value co-creation

We found the process pattern of value co-creation in this embedded case was able to be summarized as "**knowledge sharing**", "**identification of needs**", "**knowledge integrating**", "**implementation to meet needs**" based on the result of the context analysis, shown in table 5.26.

Table 5.26 Process pattern in the tenth embedded case of Case A

Stage1.	**Knowledge sharing**	**Knowledge transfer**	**Potential values**	**Code**
	The department and the program coordinator observed real learning in UCDE, and communicated with students closely.	Organizational knowledge through individual knowledge sharing	The situation after the program would be clear, after information and experiences related to the program were shared among people related to the program.	The department head and the program coordinator of JAIST went to UCDE with the first group, and observed real learning courses of students and assisted their life in the USA in the first ten days. Students and the coordinator communicated well and shared much personal information with each other; they became very close. (Interview with sutdents)
	Student gave their feedback through the evaluation questionnaire.			Every student gave answers to every question in the evaluation questionnaire. (Questionnaire)
	Information sharing between coordinators based on feedback from students and instructors	Organizatonal knowledge to organizational knowledge through individual knowledge sharing		Coordinators shared information between UCDE and JAIST based on feedback from students and instructors. (Interview from the program coordinator in UCDE)
Stage2.	**Identification of needs**	**Knowledge seeking**	**Potential values**	**Code**
	Some problems were required to be solved to improve the program for the next group.	Knowledge to solve problems which the first group had during the program.	People related to the program could find ways to improve the program to meet needs of JAIST.	Some problems related to courses, homework, home-stay service, class schedules, balance of candidates among schools in JAIST were identified and listed in a report based on students` feecback through questionnaires. (Document 4)
	A big pool in JAIST from which could be selected more suitable candidates was requested.	Knowledge to increase suitable candidates in JAIST		There was a difficulty to balance the big diversity of English proficiency among individual studetns. UCDE requested that JAIST could send students at the samilar level, which was requested to have big pool to select suitable candidates for the next program. (Interview from the program coordinator in UCDE)
Stage3.	**Knowledge integrating**	**Knowledge creation**	**Potential values**	**Code**
	Problems were solved by change and the modeification based on the experience of the first group	Ideas and actions to share experiences for the promotion of the program in JAIST	The program would be improved, and promoted in JAIST	Some specific problems were solved based on the experience of the first group, such as some courses were removed, changed. (Interview from the program coordinator in JAIST)
	Meetings to share experiences and opinions between the program coordinator and students of the first group in JAIST			Students positively attended several meetings where they shared their experience with the coordinator and gave suggestions to improve the program for the next group from JAIST. (Participant observation report)
	Experiences sharing through promotion activities by students of the first group in JAIST			Students gave speeches to new students in their orientation session, and presentations in front of other students and faculty members in JAIST, sharing their great experiences from the program, emphasizing the necessity of learning English and encouraging others to participate in the program. (Interview with students)
Stage4.	**Implementation to meet needs**	**Knowledge application**	**Potential values**	**Code**
	The program earned appreciative criticism, and attracted students that increased the number of applicants.	The program showed a great outcome shown in students` changes, the improvement of the program.	The program could attract more students in JAIST, and continuously run for the following group.	Some professors of JAIST had a high opinion of the program, when they saw their students changed a lot in attitudes and behaviors after the program. Many students were interested in this program. The number of applicants increased. (Interview with the program coordinator in JAIST)

Embedded case 11: Curriculum co-design for the group 2

The main event in this embedded case is to co-design a curriculum between JAIST and UCDE for the second group of JAIST students based on feedback from the first group.

This event is partly embedded in the tenth embedded case. The main participants in this embedded case are shown in figure 5.13.

Participant (p): The new program coordinator is a professor in the global communication education department in JAIST, who took over the job position for the program.

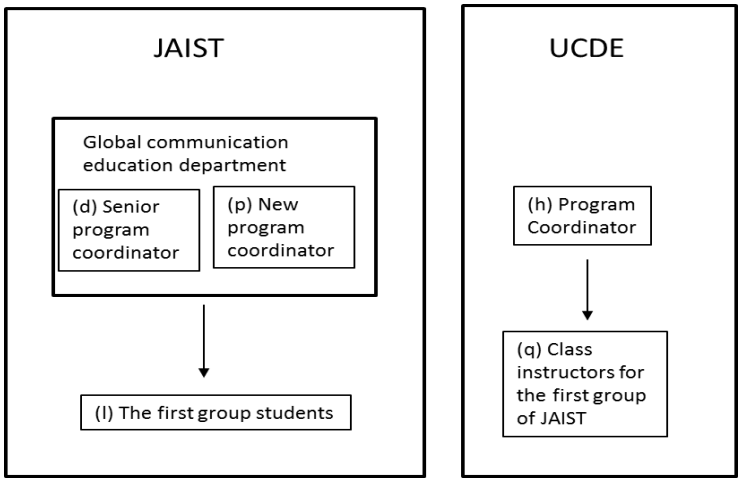

Figure 5.13 Participants in eleventh embedded case in Case A

1. Leader-follower relation

We found participants often changed their roles as a leader or a follower according to their real situations, shown in table 5.27, which indicates they worked in a partnership. We didn`t find any influence from the hierarchical relation.

Table 5.27 Leader-follower relation in the eleventh embedded case in Case A

Leader role (teaching/giving situation)	**Follower role (learning/taking situation)**	**Learning content**	**Code**
d	p	Managing experiences of the English program	The senior program coordinator talked about the program, students, and problems to the new program coordinator in JAIST, after the new program coordinator took over all work for the program. (Interview with the program coordinator 2 in JAIST)
p	h	The requirement of JAIST	The program coordinator of UCDE and the new program coordinator of JAIST had discussions based on the feedback from instructors in UCDE and students of JAIST through emails, Skype meetings. (Interview with the program coordinator in UCDE)
h	p	Conditions of UCDE and	
i	d	Feedback on the program	Students positively attended several meetings where they shared their experience with the coordinator and gave suggestions to improve the program for the next group of JAIST students. (Participant observation report)
q	h	Feedback on the program	Instructors communicated with the program coordinator in UCDE through emails regularly, that talked about issues they met, and shared their ideas. (Interviewfor from the program instrucotr A; B)

2. Participants' mindset

The senior program coordinator (d) in JAIST shared his experience and gave all information related to the first group to the new program coordinator (p). (p) had a positive mindset, shown in his word, *"I learned from (d), such as learning what people in UCDE*

going on, what the program goes, type of students we need to talk with (h) will be the best to be selected into the program, and tried to combine all of these into the selection process, the preparation process." (Interview with the program coordinator 2 in JAIST) (p) worked with (h) cooperatively in the process of co-design. *"We had many discussions… The course description we developed together."* (Interview with the program coordinator of UCDE) Students also were very supportive, shown in their actions: *"Students immediately finished questionnaires, and frankly shared their opinions on the program."* (Participant observation report) *"Some students were procreative. Some students were cooperative."* (Interview with the program coordinator 2 of JAIST) Instructor also positively gave their feedback to improve the program in UCDE. *"They understand that we want to provide students with successful experiences, so, giving feedback is a natural thing… They are willing to collaborate."* (Interview with the program coordinator of UCDE) All participants in this embedded case have positive attitudes and cooperative actions.

3. Process pattern of value co-creation

We found the process pattern of value co-creation in this embedded case was able to be summarized as "**knowledge sharing**", "**identification of needs**", "**knowledge integrating**", "**implementation to meet needs**" based on the result of the context analysis, shown in table 5.28.

Table 5.28 Process pattern in the eleventh embedded case of Case A

Stage1.	**Knowledge sharing**	**Knowledge transfer**	**Potential values**	**Code**
	Information sharing between the senior program coordinator and the new program coordinator in JAIST	Organizational knowledge through individual knowledge sharing	The situation after the program would be clear, after information and experiences related to the program were shared among people related to the program.	The senior program coordinator talked about the program, students, and problems to the new program coordinator in JAIST, after the new program coordinator took over all work for the program. (Interview with the program coordinator 2 in JAIST)
	Discussions between coordinators between UCDE and JAIST	Organizational knowledge to organizational knowledge through individual knowledge sharing		The program coordinator of UCDE and the new program coordinator of JAIST had discussions based on the feedback from instructors in UCDE and students of JAIST through emails, and Skype meetings. (Interview with the program coordinator in UCDE)
Stage2.	**Identification of needs**	**Knowledge seeking**	**Potential values**	**Code**
	Curriculum modifications were required based on experiencs of the first group	Knowledge to modify the curriculum for the program	UCDE and JAIST could co-design a new curriculum for the second group.	Some courses were required to be changed or balanced based on the feedback from the first group of students, such as removing the mathematics course and decreasing the quantity of homework. (Interview with the program coordinator 2 in JAIST)
Stage3.	**Knowledge integrating**	**Knowledge creation**	**Potential values**	**Code**
	Curriculum modifications were made based on several renewed versions through communication of coordinators between UCDE and JAIST	A method using renewing versions to modify the curriculum	A suitable curriculum could be designed for the second group of JAIST students.	The coordinators between UCDE and JAIST renewed several versions of the curriculum of the program by their communication to update new information based on the feedback of the first group. (Interview with the program coordinator in UCDE)
Stage4.	**Implementation to meet needs**	**Knowledge application**	**Potential values**	**Code**
	A definite curriculum of the program was made for the second group.	A new curriculum was made based on the modification of old versions.	The program could be improved, and the new curriculum could satisfy the second group of students.	JAIST and UCDE made a new curriculum of the program for the second group through discussions between coordinators. (Interview with the program coordinator in JAIST)

5.4 Summary

We analyzed the global education project in this chapter. The project proceeded as an educational collaboration mainly between two organizations, the educational service provider, UCDE and its client, JAIST, respectively.

Firstly, we looked at leader roles and follower roles as in situations of teaching and learning in value co-creation activities in this project based on the view of the leader-follower relation provided by Maroosis (2008). We found participants had situations of both teaching and learning in the same embedded case or different embedded cases. Thereby they took both roles as a leader or a follower, and often changed their roles in this project, seen in table 5.29. We also found some participant reciprocally changed the teaching-learning situation with his partner, namely the leader-follower relation between the participant and his partner, seen in the bold- faced part in table 5.29, but not every participant reciprocally changed their leader-follower relation with the same partner in the project. When their situations changed, such as when the requirement of knowledge seeking was shifted, their partners were changed. Therefore, we found that the leader-follower relation wasn`t always symmetric between the participant and his partner he was working with, and participants often changed their partners in this project. The phenomena of partner change and role change in the leader-follower relation indicate that participants worked as being in a partnership, not worked by order and control using leadership powers in this project.

However, we found there were hierarchical influences from the hierarchical relations in two embedded case, seen in table 5.29. The influence in the first embedded case showed that a right organizational decision made by the hierarchical leader facilitated the project to proceed well. The influence in the fourth embedded case showed that a work direction to the employees given by a hierarchical leader also was important, which connected the organizational mission and the project goal. This findings shows hierarchical leaders still have an important role to facilitate the value co-creation process, and to balance organizational requirement and individual flexibility in the project. All of embedded cases in this project had hierarchical relations, but there weren`t influence on the interaction of participants in most of embedded cases, which indicates the hierarchical relation didn`t always influence human interaction in value co-creation activities.

Table 5.29 Leader-follower relation in Case A

Embedded case	Hierarchical relation	Hierarchical influence	Leader role	Follower role	Learning content
1	Have	Have	**a**	**d**	Personal views related to globalization
			d	**a**	
			d	a	Information related to the English program
			g	d	Information related to the English program
			g	d	Suggestions related to the English program
			e	d	Experiences of the outcome of the English program
			e	a	Experiences of the outcome of the English program
			d	b	English education experiences
			c	b	English education experiences
			c	**d**	English education experiences in JAIST
			d	**c**	Information related to the English program
			g	b	Information related to the English program
			d	b	Ideas to start the English program
			g	a	Information related to the English program
			g	**c**	Information related to the program and UCDE conditions
			c	**g**	Infromation related to the requirment of JAIST
			g	d	Information related to the English program
			g	f	Ideas related to new Englsih programs
			d	g	Needs of JAIST
			g	f	Information related to JAIST
			f	g	Suggestions and work directions
2	Have	None	c	b	English education experiences
			c	**d**	English education experiences in JAIST
			d	**c**	Information related to the English program
			g	**c**	Information related to the program and UCDE conditions
			c	**g**	Infromation related to the requirment of JAIST
			d	g	Needs of JAIST
3	Have	None	c	b	English education experiences
			c	**d**	English education experiences in JAIST
			d	**c**	Information related to the English program
			b	d	Suggestions to course design
			d	h	The requirement of JAIST
			g	h	Information related to JAIST
			f	h	Suggestions to curriculum design
4	Have	Have	**h**	**i**	Direction and suggestions to Hot Topics class design
			i	**h**	information and ideas related to Hot Topics class design
			i	**j**	Idea of the Hot Topics course design
			j	**i**	Suggestions to the desing of Hot Topics class
5	Have	None	**b**	**d**	Suggestions to the selection of students
			d	**b**	Ideas of the selection of students
			h	d	Suggestions to the selection of students based on the condition of
6	Have	None	k	l	Document support for visa application
			d	l	Visa application experiences
			h	k	Visa application information for students
			m	k	Document support for visa application
7	Have	None	l	d	Life experiences and thoughts
			d	l	Personal experiences and views
			k	l	Knowlege cincerning the security in the USA for students
			d	l	Experiences related to living in USA and the purpose of the
8	Have	None	**n**	**h**	Students' information
			h	**n**	Sugguestions to improve the program.
			n	**l**	English courses
			l	**n**	Students feedback on courses
			l	h	Students feedback on the program
8	Have	None	**h**	**o**	Suggestions related to the Hot Topics class
			o	**h**	Ideas to adjust the class
			l	o	Students' feedback and their suggestions for the class
			l	h	Students' feedback and their suggestions for the class
			o	l	Hot Topics course
10	Have	None	**h**	**d**	Feedback of the English program from instructors
			d	**h**	Feedback of the English program from the first group students
			i	**d**	Personal information and experiences
			d	**i**	Personal information and experiences
			i	d	Feedback related to the English program and suggestions
11	Have	None	d	p	Managing experiences of the English program
			p	**h**	The requirement of JAIST
			h	**p**	Conditions of UCDE and suggestions
			i	d	Feedback on the program
			q	h	Feedback on the program

Secondly, we clarified participants had positive, cooperative, supportive attitudes and actions in each embedded case, which shows they had a supportive mindset. Summarily, we saw two related characteristics from the context analyses, when we inquired as to the cause of participants` supportive mindset in details. We found participants had supportive attitudes and actions with each other, because they had a shared goal. Otherwise, when participants considered others first for their goals or missions, they had positive attitudes and actions to support others. The details are shown in table 5.30.

Table 5.30 Causes of participants` supportive mindset in Case A

Characteristic	**Code**
1.For a shared goal	To find the best way for the program (Interview with the program cooridinator 2 of JAIST)
1.For a shared goal	To make things right for the program (Interview with the program cooridinator 2 of JAIST)
1.For a shared goal	To meet the needs of JAIST for the goal of the program (Interview with the program coordinator of
1.For a shared goal	For the success of the program (Interview with the program coordinator of UCDE)
2.Considering others	To provide successful experiences for students (Interview with the program coordinator of UCDE)
2.Considering others	To meet the needs of real leaners (Interview with the program insturctor A of UCDE)
2.Considering others	Considering needs of clients first (Interview with the director of UCDE)
1.For a shared goal	For a good result of the job (Interview with the director of UCDE)
1.For a shared goal	For a unit goal (Interview with the academic coordinator of UCDE)
2.Considering others	To meet clients` needs (Interview with the academic coordinator of UCDE)
2.Considering others	To make things better to help students (Interview with the program instructor B of UCDE)
2.Considering others	To meet students` needs (Interview with the academic coordinator of JAIST)
1.For a shared goal	For the success of the program (Interview with the project member of JAIST)
2.Considering others	To satisfy students (Interview with the project member of JAIST)
1.For a shared goal	For the success of the program (Interview with the department head of JAIST)
2.Considering others	To do right things for students (Interview with the department head of JAIST)
1.For a shared goal	Have a common sense for the educational mission (Interview with the program coordinator of JAIST)
1.For a shared goal	For the success of the program(Interview from the program coordinator of JAIST)
2.Considering others	To do the best for students as an educator (Interview with the program coordinator of JAIST)
1.For a shared goal	To return the favor for the program (Interview with a student)
2.Considering others	To repay one`s kindness (Interview with a student)

Thirdly, we analyzed the process pattern of value co-creation in the global education project. We found the value co-creation process in each embedded case was a sequence of four stages, and each stage had its characteristic in all embedded cases. Every embedded case showed that the interaction of participants started many forms of sharing activities in the beginning of the event, such as information exchange, and thinking sharing, which transferred knowledge to different levels among participants. Therefore, the characteristic of the first stage in the value co-creation process can be recognized as “knowledge sharing”. The situation of the event could be clear in the first stage after knowledge transfer through sharing activities. Then, participants could realize what they needed in the situation as connected to the whole project, such as issues, requests or considerations in the situations. Thereby, they were able to know what knowledge they needed to seek. Therefore, we summarize the characteristic of all embedded cases in

this stage as “identification of needs”. When the direction of knowledge seeking was identified, participants engaged in many forms of activities to integrate some types of knowledge that find ways as knowledge creation to meet the needs they ultimately met. Therefore, we call the characteristic in the third stage as “knowledge integrating”. Finally participants applied the knowledge they obtained into real actions to meet the needs in the situations. We name this characteristic of all embedded cases as “implementation to meet needs”. Each stage is denominated according to its characteristic in all embedded cases, thereby the process pattern of the value co-creation process in the global education project can be formed as knowledge sharing; identification of needs; knowledge integrating; implementation to meet needs, seen in figure 5.14. We also found the knowledge flow in the value co-creation process was shifted according to the characteristics of four stages as knowledge transfer, knowledge seeking, knowledge creation and knowledge application, which generated potential values to conduct the event of each embedded case.

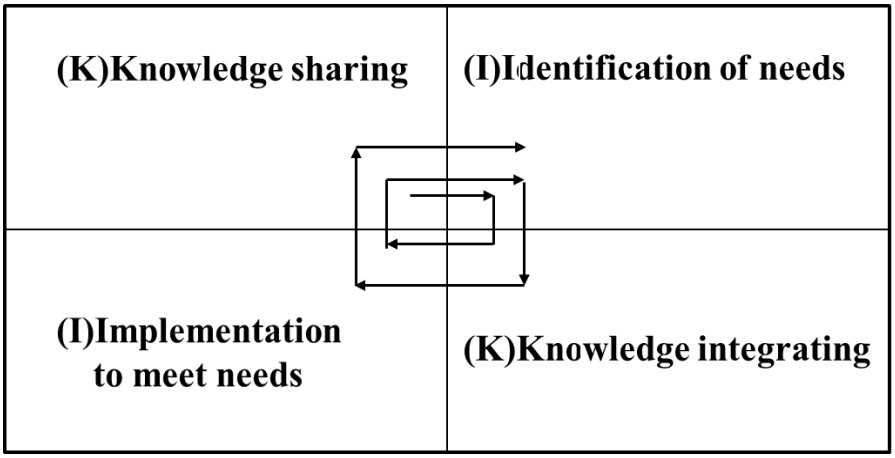

Figure 5.14 Process pattern of the value co-creation process in Case A

All embedded cases were related in the whole project, and all values generated from each event connected to the success of the project. The project succeeded through the value flow of all embedded cases, shown in figure 5.15. We found each embedded case didn`t take place chronologically, its sequence depended on what knowledge needed to be sought in reality within time. The result of each embedded case changed each real situation from the past into a new future to reach the goal of the project.

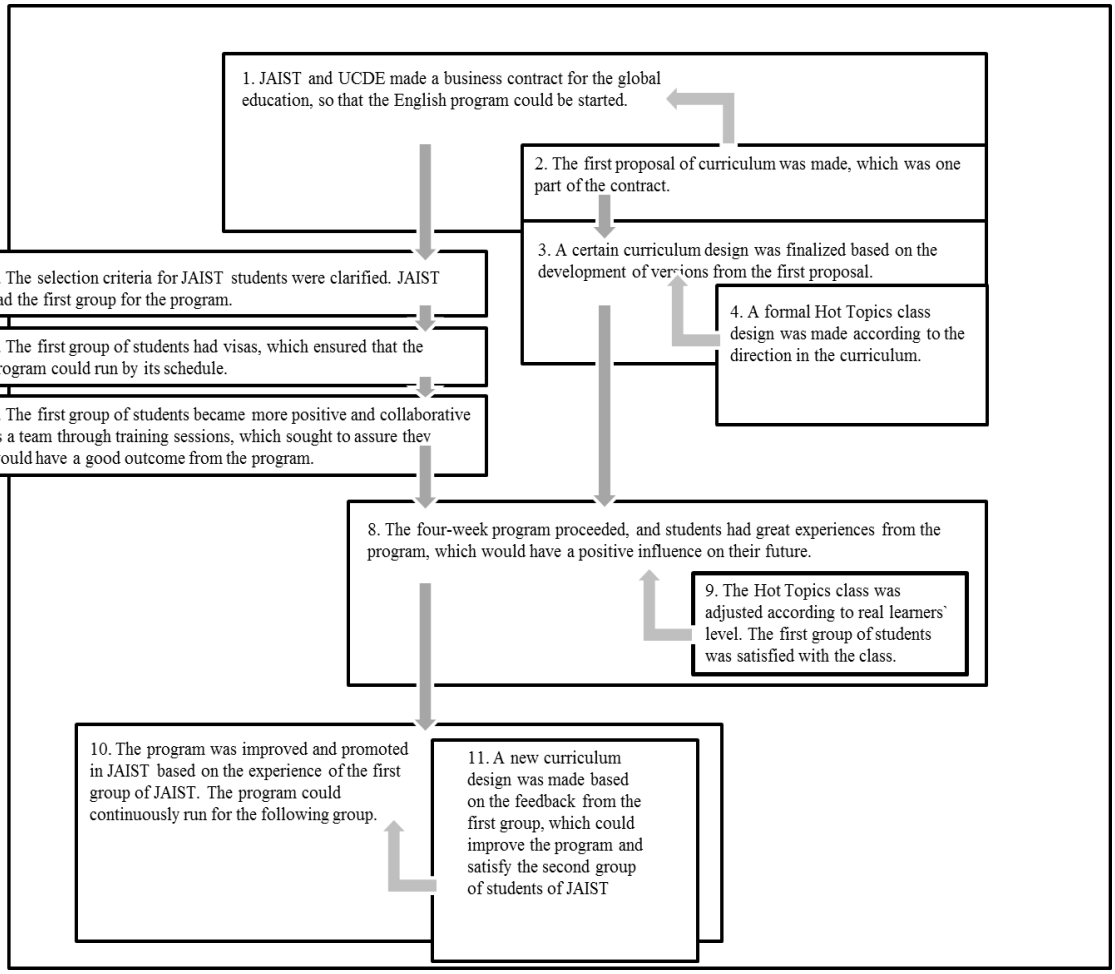

Figure 5.15 Value flow in Case A

Chapter 6: Analysis of Case B: A Service Business Project

6.1 Introduction

This chapter shows the research findings in the service business project. Firstly, its profile is given, then, we describe the analytical results of each embedded case in the following paragraph. We will explicitly explain the findings of the first embedded case, and less explicitly discuss the findings of the second and third embedded case. Then we will simply summarize the characteristics in descriptions for other embedded case. We use many figures and tables to show the details of the evidences to avoid wordiness.

6.2 Profile of Service Business Project

The service business model is called ‘HDRIVE’, which is a new energy saving service system to provide service with inverters and share risk with its user. The principle of energy saving in motors using inverters is shown in the below figure. The horizontal line stands for the rotation rate of the motor, and the vertical line stands for the actual electric power. The turnover rate of the motor can be decreased after introducing inverters. In contrast to the electric utility without inverters curve ‘a’, the electric utility curve ‘b’ should decrease at a geometric rate. The amount of saved energy ‘c’ refers to the difference of the electric utility ‘a’ and ‘b’ depending on the number of rotations of the motor, calculated as ‘c=a-b’. In this service business model, the service provider company introduces inverters into the production line in the user’s side. The user can use the service without any the initial cost, which is invested by a financial company. The reduced energy cost is calculated through data collection from monitoring devices at the use side. And, the user’s profit, the service provider company’s revenue and payment to the financial company can be identified by various operation reports from monitoring data. This business model makes a win-win situation by risk sharing, which helps users who have financial difficulty handling the initial cost of securing their energy saving needs in today’s global environmental protection situation. Thereby it generates more business opportunities for the service provider company. The service

business model is successful in markets, which earned an energy-saving award, the CEATEC AWARD 2011 in Japan. The original business model was created and developed through a TEP-VEC[10] project of Hitachi, in cooperation with people in various fields.

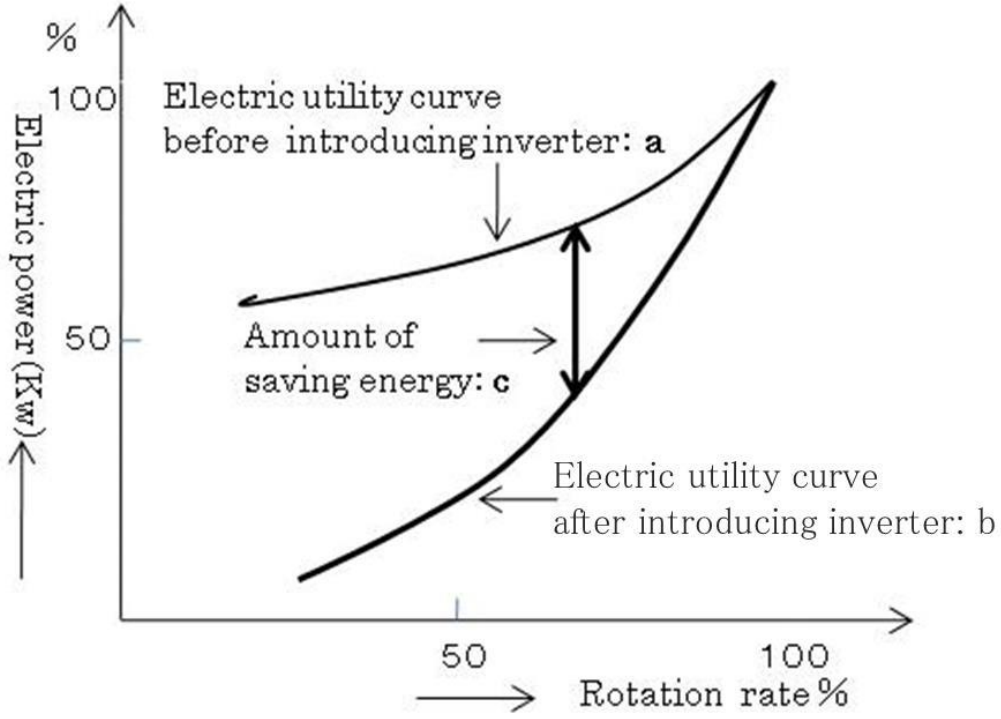

Figure 6.1 Principle of energy saving in motors using inverter (Kosaka & Yabutani 2009)

6.3 Finding and Results

6.3.1 Relation of Embedded Cases and Shared Goals

The whole event in this project was to develop an energy saving service concept into a real business model. We found nine embedded cases by a timeline from certain data mainly from the interview of the key person. We don`t mention code sources in the following tables. Every embedded case mainly had one event. The big event, being the establishment of the energy saving business model, included five embedded cases. The relation of each embedded case is shown in table 6.2. We will explain the analytic

[10] TEP: Task force Project; VEC: Value Engineering for Customers

results of each embedded case as follows. Firstly, we will discuss the main event and participants in the embedded case. Then, we will present findings in the leader-follower relationship, participants' mindset, and the process pattern of value co-creation.

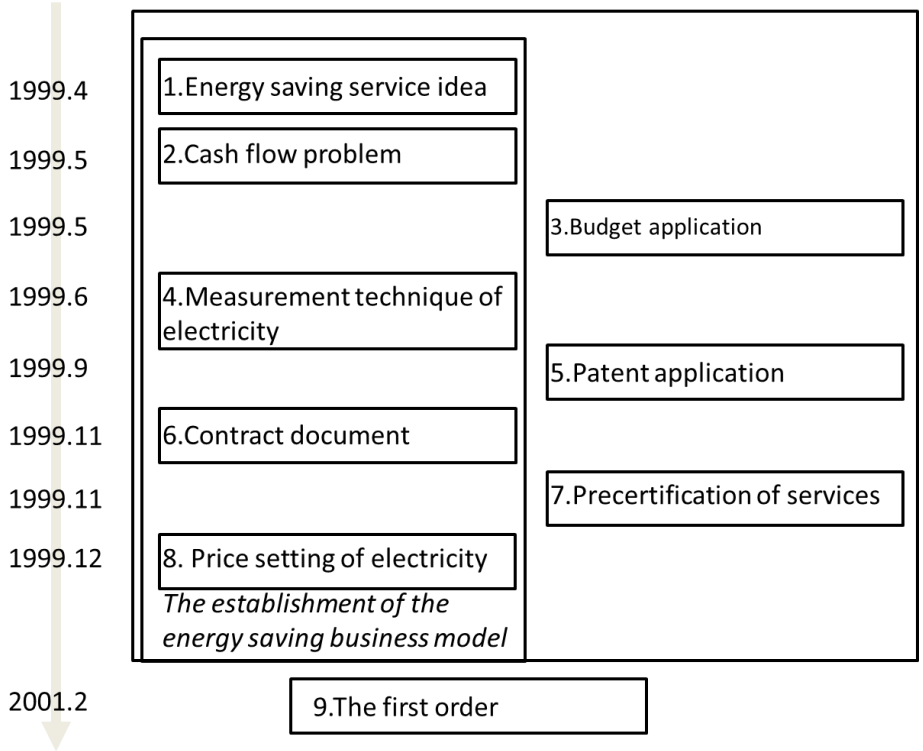

Figure 6.2 Relation of embedded cases in Case B

The goal of the project is to create a new service business model using inverters for energy saving in reality. It is achieved through some shared goals in a sequence of events. Each shared goal is listed in the following according to the order in the figure 6.2.

1. To create an energy saving service concept using inverters
2. To find a solution for the case problem, that someone will invest for inverters for the user.
3. To get a budget and support from the factory for the project
4. To find a solution for measuring electric power
5. To apply a patent for the energy saving service business model
6. To have a formal contract document for the energy saving service business model
7. To have an approval in Hitachi for the energy saving business
8. To find a reasonable way to set power price

9. To make an agreement for the first order

6.3.2 Findings of Each Embedded Case

Embedded case 1: Energy saving service idea

The main event in this embedded case is focused on the original energy saving service idea, which was created from conversations in a workplace, so that the project was launched to develop the idea to become a new service business model. The main participants are shown in figure 6.3. The arrow lines show hierarchical relations in the organizational structure.

Participant (a): The project manager was the VED center head. He was the key person, organized a TEP-VED project to develop the energy saving service idea as a business model.

Participant (b): The engineer of inverter design was a member of the project in Hitachi, who shared technical knowledge about the energy saving of inverters to the VED center head.

Participant (c): Other team members were people in Hitachi, who worked for the project, including a salesman, a quality controller, a designer of inverters, and two designers of motors.

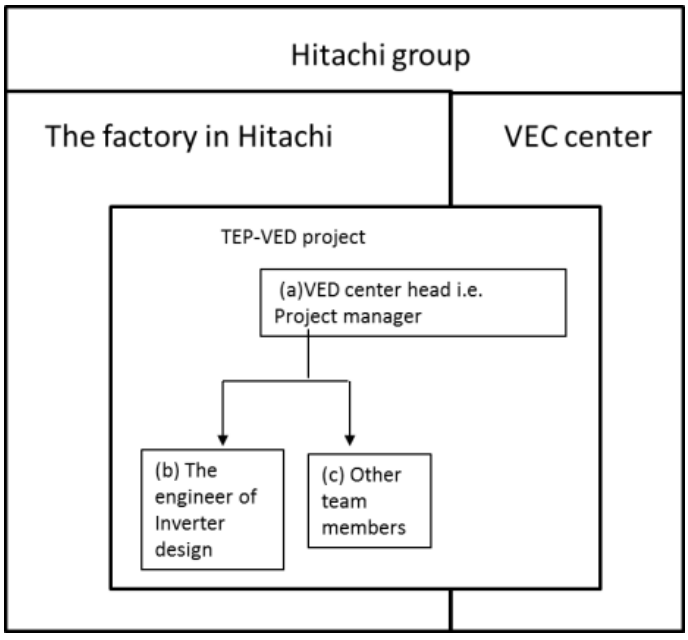

Figure 6.3 Participants in the first embedded case in Case B

1. Leader-follower relation

We found participants in the first embedded case changed their roles as a leader or follower according to their real situations as giving or taking knowledge in their learning process, as shown in table 6.1, which indicates they worked as a partnership, not by order and control. However, we also found there was a hierarchical influence from the hierarchical relation, as shown in table 6.2.

Table 6.1 Leader-follower relation in the first embedded case in Case B

Leader role (teaching/giving situation)	**Follower role (learning/taking situation)**	**Learning content**	**Code**
b	a	Principles of inverters and its application for energy saving	There was a conversation to bring the cost of inverters down between the VEC center head and an engineer of inverter design. The engineer shared knowledge of the principle of inverters and its application in energy saving to the center head.
c	a	Ideas about energy saving	The VEC center head and project members had brainstorming activites in meetings and made a schedule to explicitly see the development of the business concept.
a	c		

Table 6.2 Hierarchical influence in the first embedded case of Case B

Contents of Hierarchical Influence	**Code**
The VEC center head (the project manager) decided starting a TEP-VEC project.	The VEC center head organized a TEP-VED project including inverter designers, motor designers, a salesman, and a quality controller, for the development of the business concept.

2. Participants' mindset

Participants in the case were supportive of each other. The manager supported the engineer of the inverter design so that he could focus on the work he was interested in. The manager also organized fun activities to motivate team members so that members were willing to work together for their mission to develop the service business model for energy saving. The details are seen in the following. All descriptions are from the key person (a) of the project.

He described his opinions and what he did: *"I always have had intellectual curiosity. Technologically I am a layman so I think I must honestly listen to technicians and learn from them…We honestly listen to others, learn from others, and positively proceed with the project… I provided a lot fun activities for my project members. We had a lot of fun with the project, and became friends."* He described the engineer of inverter design: *"He gave a big smile, when he heard he could do things he was interested in. His eyes had a good shine and he was very happy."* He described other project members: *"Members discussed in various ways of words. Everybody gave key words*

fluently… Communication among project members became very smooth in the company, and everyone enjoyably worked for the project like playing. ”

3. Process pattern of value co-creation

Stage1. Knowledge sharing

We found there were four stages in this event. Participants shared their knowledge through a conversation in the beginning of the event. Thereby, knowledge related to energy saving using inverters was transferred from the engineer to the VEC center head, namely knowledge was transferred at an individual level, which generated a potential value in that the image of an energy saving service could emerge in the VEC center`s mind. The detail is shown in table 6.3. The characteristic to share knowledge in this stage can be summarized as “**knowledge sharing**”.

Table 6.3 Knowledge sharing in the first embedded case in Case B

	Knowledge sharing	**Knowledge transfer**	**Potential values**	**Code**
Stage1.	A conversation related to energy saving using inverters between the VDE center head and the engineer of inverter design	Individual knowledge to Individual knowledge	The meta image of energy saving using inverter would appear.	There was a conversation to bring the cost of inverters down between the VEC center head and an engineer of inverter design. The engineer shared knowledge of the principle of inverters and its application in energy saving to the center head.

Stage2. Identification of needs

The idea of an energy saving service was required to become explicit after the situation in the first stage became clear, which in turn clarified what knowledge needed to be sought, so that a way to develop the concept of an energy saving service could be found in the subsequent process, as seen in table 6.4. The characteristic to identify a requirement in the situation in this stage can be summarized as “**identification of needs**”.

Table 6.4 Identification of needs in the first embedded case in Case B

	Identification of needs	**Knowledge seeking**	**Potential values**	**Code**
Stage2.	A new idea of energy saving service using inverters was required in detail.	Knwoledge to develop the concept of energy saving for a new business model	A way to develop the concept of energy saving would be clear.	It would make a new business model if Hitachi changed ways to sell inverters. But the VDE center head and the engineer didn`t have any ideas about a new business model for energy saving using inverters.

Stage3. Knowledge integrating

Since the direction of knowledge seeking became clear, participants took part in some activities such as organizing a project, brainstorming, and making an explicit schedule,

to integrate many types of knowledge to create ideas and methods, which developed the concept of the energy saving service. The detail is seen in table 6.5. The characteristic to integrate knowledge for knowledge creation can be summarized as "**knowledge integrating**".

Table 6.5 Knowledge integrating in the first embedded case in Case B

	Knowledge integrating	**Knowledge creation**	**Potential values**	**Code**
Stage3.	A TEP-VED project was organized.	Ideas and methods were created to process the development of the concept of the business model	The concept of the energy saving service could be processed and developed.	The VEC center head organized a TEP-VED project including inverter designers, motor designers, a salesman, and a quality controller. They had brainstorming activites in meetings and made a schedule to explicitly see the development of the business concept.
	Brainstorming was applied in meetings. Project members had brainstorming activties to develop the concept of the energy saving business.			
	An explicit schedule was made.			

Stage4. Implementation to meet needs

When knowledge related to ideas and methods for the energy saving service was applied in the subsequent process, an explicit concept for the energy saving service was developed in the fourth stage, which was to lend inverters to its users for energy saving. It met the requirement in the second stage and generated potential values so that a business model of energy saving could be created. The detail is shown in table 6.6. The characteristic to implement ideas to meet the requirement in the situation in the fourth stage can be summarized as "**implementation to meet needs**".

Table 6.6 Implementation to meet needs in the first embedded case in Case B

	Implementation to meet needs	**Knowledge application**	**Potential values**	**Code**
Stage4.	The concept of the energy saving service was finalized, which is to lend inverters to its users for energy saving.	Members combined their ideas and worked out a complete concept of the energy saving service.	A new service business model would be created.	Project members in Hitachi created a new model of service business for inverters after they had many meetings to combine their ideas.

Therefore, the process pattern of value co-creation in this embedded case can be summarized as the following:

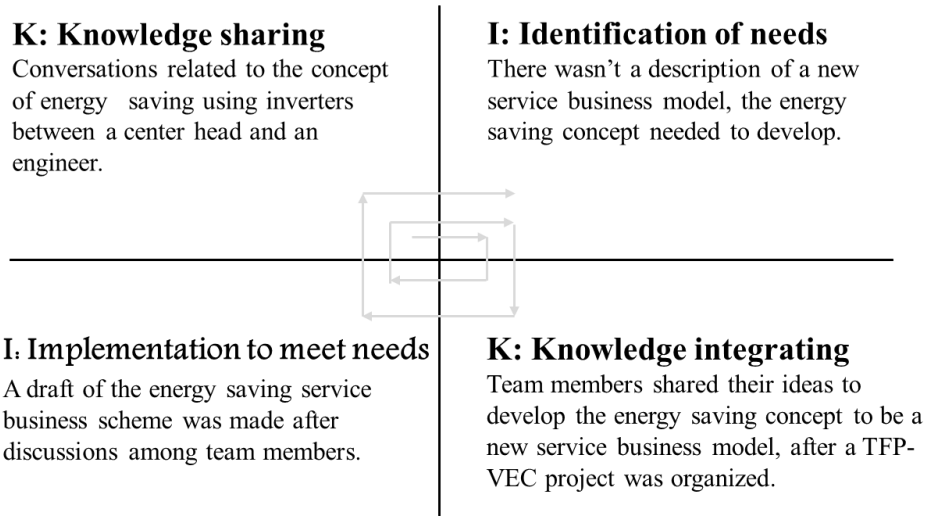

Figure 6.4 Process pattern in the first embedded case in Case B

Embedded case 2: Cash flow problem

The main event in the second embedded case was to find a solution for a cash flow problem in the concept of energy saving service, which was directly related to the first embedded case. The main participants in this embedded case are shown in figure 6.5.

Participant (d): A manager was working in a financial company belonging to Hitachi group. He agreed with the idea of the energy saving service, so that the financial company would invest in the inverters for its user for the energy saving service business.

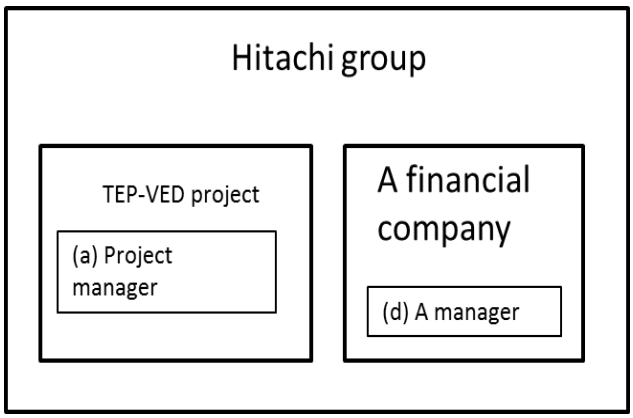

Figure 6.5 Participants in second embedded case in Case B

1. Leader-follower relation

We found participants in this embedded case reciprocally gave knowledge and took knowledge in their learning process. They change their roles as a leader or follower

according to their situations, seen in table 6.7, which indicates they worked as a partnership.

Table 6.7 Leader-follower relation in the second embedded case in Case B

Leader role (teaching/giving situation)	**Follower role (learning/taking situation)**	**Learning content**	**Code**
a	d	The concept of energy saving service business model	The project manager shared information about how to invest money in the service business model, and discussed the investment condition and method in detail with the manager of the financial company. The manager gave information related to some conditions of the financial company.
d	a	Financial rules, ideas related to the energy-saving service business	

2. Participants' mindset

The project manager and the manager in the financial company supported each other with positive attitudes. The project manager shared his idea that offered a new business opportunity to the financial company. The manager agreed with the project manager's idea. They had a shared goal prompting the manager to decide to invest in inverters to support the energy saving service business. The detail is shown in the description from the project manager. *"I discussed the idea of the energy saving service (with a manager in the financial company). He honestly told me he needed two weeks (to discuss with others in the company), because the idea was too new to them. Then, I got a good answer after two weeks when I met him."*

3. Process pattern of value co-creation

We found there were four stages in this event. Participants still had meetings among project members in Hitachi after they created the idea to lend inverters to its users for energy saving, so that they shared their knowledge from individual to group, and the situation became clear during the development of the energy saving business model. Therefore, the question of who would pay for the inverters for its users, i.e. the cash flow problem, emerged, and participants were able to know what knowledge needed to be sought in this situation. A solution could be found in the subsequent process. Participants had activities such as a discussion between the project manager and the manager of the finical company, which integrated their knowledge to create a new idea for the solution. The project manager and the manager made an agreement after their knowledge was applied during their discussion, which was a certain solution for the cash flow problem. Thus, the characteristics of sharing activities in the first stage, identifying a requirement in the situation in the second stage, activities to integrate knowledge in the third stage, and implementing ideas for a solution in the fourth stage,

can be summarized as "**knowledge sharing**", "**identification of needs**", "**knowledge integrating**", and "**implementation to meet needs**". The process pattern in the value co-creation process of the second embedded is shown in table 6.8.

Table 6.8 Process pattern in the second embedded case in Case B

Stage1.	**Knowledge sharing**	**Knowledge transfer**	**Potential values**	**Code**
	Meetings among project members of Hitachi	Individual knowledge to group knowledge	The situation during the development of the energy saving business model could be clear.	Project members of Hitachi created the idea of the energy saving service which is to lend inverters to its users for energy saving. They still discussed and developed the energy saving idea though meetings.
Stage2.	**Identification of needs**	**Knowledge seeking**	**Potential values**	**Code**
	A cash flow problem appreared.	Knowledge to solve the case flow problem	A way to solve the problem could be found.	There was a cash flow problem to the business model concerning who was able to pay for the inverters if the user borrowed inverters without cost.
Stage3.	**Knowledge integrating**	**Knowledge creation**	**Potential values**	**Code**
	An idea of investment for the energy saving service was discussed between the project manager and the managerr of the financial company of Hitachi.	An idea to solve the cash flow problem was created.	The cash flow problem could be solved.	The project manager shared information about how to invest money in the service business model, and discussed the investment condition and method in detail with the manager of the financial company. The manager gave information related to some conditions of the financial company.
Stage4.	**Implementation to meet needs**	**Knowledge application**	**Potential values**	**Code**
	The project manager and the manager of the financial company made an agreement.	The agreement was made based on the investment idea.	The business model could be continuously developed.	The manager of the financial company agreed with the energy saving service idea. An agreement was made that the financial company belonging to Hitachi group would invest the initial cost of the energy-saving service for its user.

Embedded case 3: Budget application

The main event of third embedded case was focused on the application of budget, which helped to run the project and developed the concept of the energy saving service as a business model. The main participants in this embedded case are shown in figure 6.6. Participant (e): The factory director was the director of a manufacturing company belonging to Hitachi group.

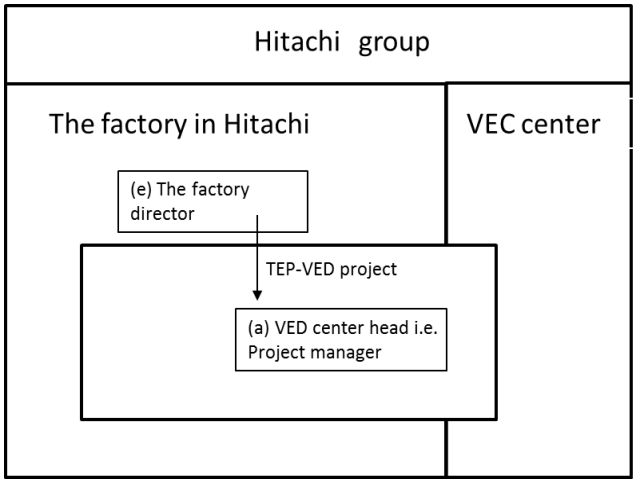

Figure 6.6 Participants in third embedded case in Case B

1. Leader-follower relation

We found the project manager took a leader role by giving knowledge to the factory director who took a follower role in their learning process, as seen in table 6.9. They didn`t worked in a hierarchical relation in the organization structure. This implies they worked as a partnership. However, this embedded case had a hierarchical influence from the factory director, who made the decision to give budget and other support for the project, which facilitated the process to develop the concept of the energy saving service for a business model, as seen in table 6.10.

Table 6.9 Leader-follower relation in the third embedded case in Case B

Leader role (teaching/giving situation)	**Follower role (learning/taking situation)**	**Learning content**	**Code**
a	e	The concept of energy saving service business model	The project manager discussed the service business model with the factory director to get his support. The project manager shared his idea of the application of the service business model to other production lines in the factory with the director.

Table 6.10 Hierarchical influence in the third embedded case of Case B

Contents of Hierarchical Influence	**Code**
The director made a decision to give budget and other support for the energy saving business project.	The project was accepted in the factory without objections, because the director required others to support it. Meanwhile, the project had enough budget, and team members could focus on the project activities.

2. Participants' mindset

The factory director and the project manager were supportive of each other. The project manager considered whether the energy saving service model could apply to other production lines in the factory before he applied for the project budget; that means he considered the director's position first. The director supported the project manager and satisfied his requirement because both had the shared goal that they needed to make the energy saving service business model successful. The details are shown in the following. The project manager described the factory director: *"He said, OK, take a try… He gave a sum for the budget (of the project) as we required… We got support from the factory director… He directly asked other department heads to give support (for the project)."*

3. Process pattern of value co-creation

We found there were four stages in the third embedded case, as seen in table 6.11.

Participants started conversations and discussions to share information, so that knowledge was transferred among individuals. Thus needs, such as a budget or a new performance, became clear in the situation in the subsequent process, so that what knowledge was needed became clear, and this facilitated the following process to find ways to meet needs. Participants integrated knowledge to create new ideas, such as presenting a proposal and making a suitable sum for the budget application, and giving an idea to apply the energy saving service business model into other production lines. When these new ideas were applied into the real situation, the director made a decision to provide a budget and other support for the project so that the project could smoothly proceed. The process pattern can be summarized as "**knowledge sharing**", "**identification of needs**", "**knowledge integrating**", and "**implementation to meet needs**" according to their characteristics of the four stages in the value co-creation process in this embedded case.

Table 6.11 Process pattern in the third embedded case in Case B

Stage1.	**Knowledge sharing**	**Knowledge transfer**	**Potential values**	**Code**
	Conversation between the project manager and others for the feedback related to the factory director	Individual knowledge to indivdual knowledge	The project manager could know the situation related to the business model, the background of the factory director.	The project manager discussed the service business model with the factory director to get his support. He also had feedback related to the factory director through daily conversations with others in Hitachi.
	Discussion between the project manager and the factory director for supports.	Individual knowledge to organizational knowledge		
Stage2.	**Identification of needs**	**Knowledge seeking**	**Potential values**	**Code**
	The project needed budget and the factory needed new performance.	Knowledge to have budget for the project and new performance for the factory	Ways to get budget and give performance for the factory could be found.	There was some resistance to the project in the factory. The project to develop the service business model needed budget and support from the factory director. On the other hand, the factory director was new to the factory, and he hoped that there could be new performance in the factory.
Stage3.	**Knowledge integrating**	**Knowledge creation**	**Potential values**	**Code**
	The project manager presented a proposal and made a suitable sum under the empowerment of the director for the application of budget.	An explicit idea to apply for a budget for the project	The project could have a budget.	The project manager shared his idea of the application of the service business model to other production lines in the factory with the director. The director had empathy with him. Then, the manager presented a proposal to the director, and gave a suitable sum under the maximum that the director was empowered with by the project budget.
	The project manager gave an idea of the application of the service business model to other production lines of the factory	An idea of the application of the service business model		
Stage4.	**Implementation to meet needs**	**Knowledge application**	**Potential values**	**Code**
	The project had a budget and support from the factory.	The director was convinced, because of ideas of the proposal and the new application of the service business model to other production lines	The project could smoothly proceed.	The project was accepted in the factory without objections, because the director required others to support it. Meanwhile, the project had enough budget, and team members could focus on the project activities.

Embedded case 4: Measurement technique of electric power

The main event in the fourth embedded case was to solve the problem of electric power measurement. The main participants are shown in figure 6.7.

Participant (f): An old expert was a senior technician in company 1, who knew the measurement of electric power using the concept of big data.
Participant (g): An engineer was a technician in company 2, who knew the monitoring technique.

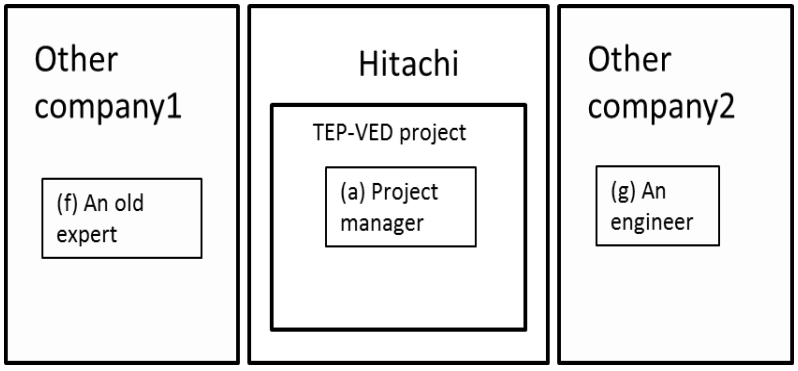

Figure 6.7 Participants in fourth embedded case in Case B

1. Leader-follower relation

We found participants reciprocally changed roles as a leader or follower according to real situations of giving knowledge or taking knowledge in their learning process, as seen in table 6.12. It implies participants worked as a partnership.

Table 6.12 Leader-follower relation in the fourth embedded case in Case B

Leader role (teaching/giving situation)	**Follower role (learning/taking situation)**	**Learning content**	**Code**
a	f	The concept of energy saving service business model	The project manager respectfully talked about the idea of energy-saving using inverters with the old expert under his observation based on his interpersonal communication experiences, because he saw the old expert looked isolated in the company. The old expert became willing to share his experience and teach the project manager about the concept of big data to measure electric power.
f	a	Measurement method of electric power	
g	a	Monitoring technique	The engineer provided a solution for the monitoring technique after their communication related to the energy aving business model.
a	g	The concept of energy saving service business model	

2. Participants' mindset

Participants in this embedded case were supportive to each other. When the project manager learned that the old expert was isolated in the company, he respectfully consulted with him. The old expert had sympathy for the project manager's idea. Then he was willing to tell of the method for electric power measurement. Meanwhile, an engineer in another company was also supportive to sell his monitoring technique, because he was very happy that his knowledge could be applied to the real service business model.

The project manager described himself: *"I immediately contacted him (the old expert) by phone… I did my best to discuss the idea of energy saving with him with great enthusiasm that moved him."* He described the old expert: *"He looked isolated and bored… His facial expression was changed, and leaning forward to listen to the idea of energy saving service… He agreed with the idea of energy saving, and promised me to work for the project for three months without being paid."* He described the engineer: *"He was very happy because his new technology could have a real application (in the energy saving service model). He offered the program with his new technology one week later."*

3. Process pattern of value co-creation

We found there were four stages in the value co-creation process. The process pattern can be summarized as "**knowledge sharing**", "**identification of needs**", "**knowledge integrating**", and "**implementation to meet needs**" according to the characteristics of the sequence of four stages, as seen in table 6.13.

Table 6.13 Process pattern in the fourth embedded case in Case B

Stage1.	**Knowledge sharing**	**Knowledge transfer**	**Potential values**	**Code**
	Meetings among project members of Hitachi	Individual knowledge to group knowledge	The situation related to the development of the energy saving business model could be clear.	Project members of Hitachi still developed the energy saving idea though meetings.
Stage2.	**Identification of needs**	**Knowledge seeking**	**Potential values**	**Code**
	There was a problem related to measurement of electric power	Knowledge to measure electric power	Ways to measure the electric power could be found.	Since nobody among the team members gave answers to the problem of how to measure the electric power in the energy saving service for its user, the manager hoped to find someone who could provide a solution for the problem.
Stage3.	**Knowledge integrating**	**Knowledge creation**	**Potential values**	**Code**
	The project manager had a suitable way to talk with the old expert based on his experiences, and the expert shared his experience related to measurement of electric power.	A solution to measure electric power was created based on intergrating different experiences people have.	A solution to measure electric power was created.	The project manager resepctfully talked about the idea of energy saving using inverters with the old expert under his observation based on his interpersonal communication experiences, because he saw the old expert looked isolated in the company. The old expert became willing to share his experience and teach the project manager about the concept of big data to measure electric power.
	The engineer of another company provided a solution for the monitoring technique after a communication related to the energy saving business model			Team members were anxiously looking for a new monitoring technique, they found the idea when a presentation was given by an engineer of another company, The engineer provided a solution for the monitoring technique after their communication related to the energy-saving business model.
Stage4.	**Implementation to meet needs**	**Knowledge application**	**Potential values**	**Code**
	The way to measure electric power was found.	The problem of measurement of electric power was solved based on the solution of the concept of big data and monitoring technique.	The project could smoothly proceed.	The problem of measurement of electric power for the service user was solved, after the project manager decided to buy the monitoring technique.

Embedded case 5: Patent application

The main event in this embedded case was to apply for a patent for the energy saving service business model including the measurement technique of electric power.

Ultimately, the service business model obtained patent approval, so that the originality and creativity of the energy saving service was approved, and the patent could protect the energy saving service in the market. The main participants are shown in figure 6.8.
Participant (h): The patent practitioner was a professional in patents, and worked in the VEC center.

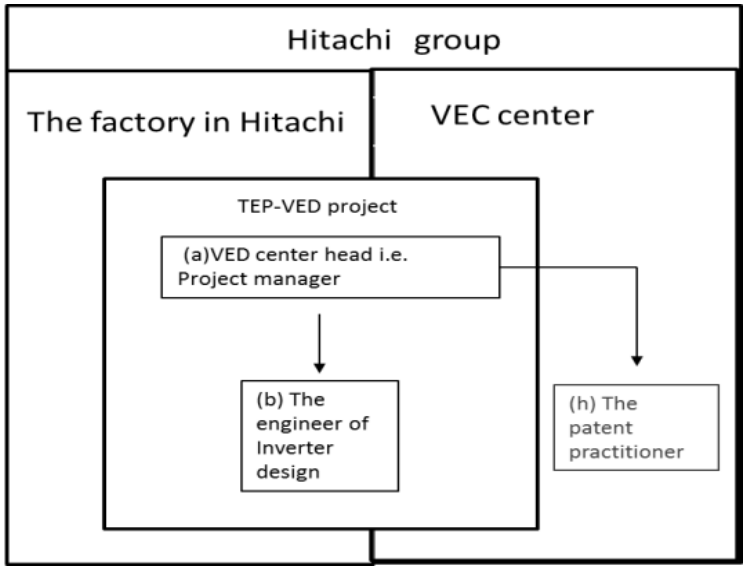

Figure 6.8 Participants in fifth embedded case in Case B

1. Leader-follower relation

We found participants took roles as either a leader or follower according to the real situations of giving knowledge or taking knowledge in their learning process, as seen in table 6.14. Participant (a) reciprocally changed roles of leader or follower with (h), which implies that the participants worked as a partnership. We didn`t see any hierarchical influences in this embedded case.

Table 6.14 Leader-follower relation in the fifth embedded case in Case B

Leader role (teaching/giving situation)	**Follower role (learning/taking situation)**	**Learning content**	**Code**
a	h	The concept of energy saving service business model	The project manager discussed things related to the patent application for the energy saving service business model with a patent practitioner. The patent practitioner shared knowledge about application paperwork with the manager.
h	a	Patent application knowledge	
b	a	Technological graph	The engineer of inverter design supported to finalize the technological graph into the application form.

2. Participants’ mindset

Participants in this embedded case were supportive. When the patent practitioner knew the project manager lacked the knowledge of applying for a patent, he positively helped with the paperwork for the patent application. The engineer cooperatively shared his know-how about technological graph. The project manager shared his dream with others through conversation, such that participants were willing to support him to make the service business model successful for energy saving. The project manager described the patent practitioner and the engineer of inverter design: *"I met a lot of positive people. He (h) also is a very positive person. He said, the patent was like a dream, so I will make your dream come true… The patent could be applied relying on many supports from them (b and h)."*

3. Process pattern of value co-creation

We found there were four stages in the value co-creation process. The process pattern can be summarized as "**knowledge sharing**", "**identification of needs**", "**knowledge integrating**", and "**implementation to meet needs**" according to the characteristics of the sequence of four stages, as seen in table 6.15.

Table 6.15 Process pattern in the fifth embedded case in Case B

Stage1.	**Knowledge sharing**	**Knowledge transfer**	**Potential values**	**Code**
	Free talking between the project manager and some patent practitioners	Individual knowledge to Individual knowledge	The situation related to the patent of the energy saving business model could be clear.	The project manager had free conversation with some patent practitioners, so that he came to know that a patent could be applied for for the business model.
Stage2.	**Identification of needs**	**Knowledge seeking**	**Potential values**	**Code**
	knowledge of patent application was required.	Knowledge to apply for a patent.	Ways to have knowledge related to patent application could be found.	The manager lacked the technical knowledge and patent application knowledge.
Stage3.	**Knowledge integrating**	**Knowledge creation**	**Potential values**	**Code**
	The patent practitioner shared his knowledge to the project manager and made the application paperwork for the energy saving business model.	Knowledge and methods to make the application of patent.	A patent could be applied for for the energy saving business model.	The project manager discussed things related to the patent application for the energy saving service business model with a patent practitioner. The patent practitioner shared knowledge about application paperwork with the manager. The engineer of inverter design supported to finalize the technological graph into the application form.
	The engineer of inverter design shared knowledge of the technological graph into the application.			
Stage4.	**Implementation to meet needs**	**Knowledge application**	**Potential values**	**Code**
	The energy saving business model had a patent.	Knowledge related to patent application and monitoring technique were applied to the patent application process.	The energy saving business model as a new innovation would be protected by the patent and enhance its competency in business.	The patent application was made based on the assistance with the paperwork from the patent practitioner and the engineer of inverter design, and the energy saving business model had a patent.

Embedded case 6: Contract document

The main event in the sixth embedded case was focusing on a formal contract form related to the energy saving service. Participants made a contract for the energy saving service, which was an important document when the energy saving service took place in the market to make a definite agreement with its user. The main participants are shown in figure 6.9.

Participant (i): A head working in the document section, who was familiar with contract making.

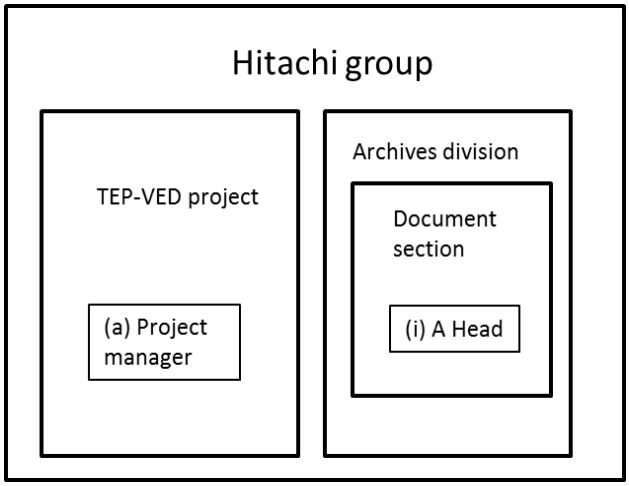

Figure 6.9 Participants in sixth embedded case in Case B

1. Leader-follower relation

We found participants reciprocally changed the roles of leader or follower according to real situations of giving knowledge or taking knowledge in their learning process, as seen in table 6.16. It implies that the participants worked as a partnership.

Table 6.16 Leader-follower relation in the sixth embedded case in Case B

Leader role (teaching/giving situation)	**Follower role (learning/taking situation)**	**Learning content**	**Code**
a	i	The concept of energy saving service business model	The project manager talked with the head in the document section for his help. The head taught the project manager how to make a contract, and he made two A4 size papers for a basic contract sample for the project manager.
i	a	Contract document knowledge	

2. Participants' mindset

Participants in this case were positive and supportive. The project manager happily shared his dream related to the energy saving service business in conversations with the head in the document section. The head positively finished a contract sample for the project manager. The project manager described the head working in the document section: *"When I asked for his help, he said, let me make the basis of the contract… He gave me a contract form on the following day."*

3. Process pattern of value co-creation

We found there were four stages in the value co-creation process. The process pattern can be summarized as "**knowledge sharing**", "**identification of needs**", "**knowledge integrating**", and "**implementation to meet needs**" according to the characteristics of the sequence of four stages, seen in table 6.17.

Table 6.17 Process pattern in the sixth embedded case in Case B

Stage1.	**Knowledge sharing**	**Knowledge transfer**	**Potential values**	**Code**
	Meetings among project members of Hitachi	Individual knowledge to group knowledge	The situation related to making a contract document for the energy saving business model could be clear.	Project members of Hitachi still developed the energy saving idea through meetings. A contract document form was necessary for the energy-saving service business model. However, nobody could make it.
	Talking related to a sample contract for the energy-saving service between the project manager and the head of the document section of Hitachi	Organzational knowledge through individual knowledge sharing		The project manager talked about the energy saving service with the head in the document section and asked for a sample contract document.
Stage2.	**Identification of needs**	**Knowledge seeking**	**Potential values**	**Code**
	It was required to have a contract document for the energy-saving business model.	Knowledge to make a contract sample for the energy saving business model	Ways to make a contract sample could be found.	There wasn`t a sample contract document for the business model, and nobody in the team could make it.
Stage3.	**Knowledge integrating**	**Knowledge creation**	**Potential values**	**Code**
	The head shared his knowledge to the project manager and made a basic contract sample	Ideas to create a two-stage type contract	The project manager could have knowledge to make a contract document.	The project manager talked with the head in the document section for his help. The head taught the project manager how to make a contract, and he made two A4 size papers for a basic contract sample for the project manager.
	The project manager had a idea to make a two-stage type contract document.		The project manager could finalize a contract document.	The project manager had ideas to make a two-stage (introduction stage and operation stage) type contract document and discussed it with other project members.
Stage4.	**Implementation to meet needs**	**Knowledge application**	**Potential values**	**Code**
	A contract document was finalized for the energy saving business model.	The idea of two-stage type contract was applied into the contract document.	The concept of the energy saving business could presented into explicit description which would make possible its introduction into real markets.	The project manager made a two-stage (introduction stage and operation stage) type contract document.

Embedded case 7: Pre-certification of services

The main event in this embedded case was to get approval from the parent company of Hitachi. As a result, the energy saving service was approved by Hitachi, so that the service could be introduced into real markets. The main participants are shown in figure 6.10.

Participant (j): The chief in the operation division worked in the parent company of Hitachi, who had the authority to approve the energy saving service business model.

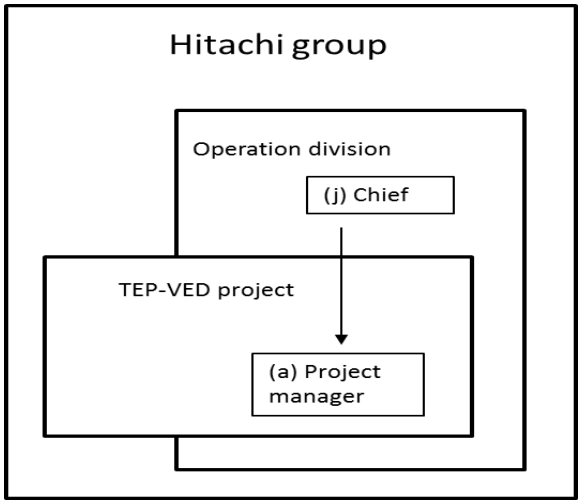

Figure 6.10 Participants in seventh embedded case in Case B

1. Leader-follower relation

We found participants took the roles of leaders or followers according to their real situations of giving knowledge or taking knowlege during their learning process, and didn't depend on the hierarchical relation in the organizational structure, as seen in table 6.16. It implies that the participants worked as a partnership, not by order and control. However, there was a hierarchical influence in the seventh embedded case, as seen in table 6.19, which facilitated the development of the energy saving service business model.

Table 6.18 Leader-follower relation in the seventh embedded case in Case B

Leader role (teaching/giving situation)	**Follower role (learning/taking situation)**	**Learning content**	**Code**
a	j	The concept of energy saving service business model	The manager discussed the energy saving service with the powerful chief in the operation division for a business approval.

Table 6.19 Hierarchical influence in the seventh embedded case of Case B

Contents of Hierarchical Influence	**Code**
The chief made a decision to give an approval for the energy saving business model in Hitachi.	The chief approved the energy saving service business model in Hitachi, so that the model was listed in the production catalog.

2. Participants' mindset

Participants in this embedded case were positive and supportive. The project manager did an advance preparation to visit the chief in the operation division. He gave a constructive message to dispel the chief's misgivings, so that he could do an aggressive marketing campaign for the energy saving service business model. The chief immediately gave a pre-certification to the service business model in Hitachi. The project manager described the chief in the operation division: *"When I started to discuss the idea of energy saving service with him, he immediately called a junior manager to come and they seriously listened to me… He spoke to me with a very positive attitude: 'It is interesting' after my discussion. 'Support it' he told the junior manager… We got support from others by the power of the chief."*

3. Process pattern of value co-creation

We found there were four stages in the value co-creation process. The process pattern can be summarized as "**knowledge sharing**", "**identification of needs**", "**knowledge integrating**", and "**implementation to meet needs**" according to the characteristics of the sequence of four stages, as seen in table 6.20.

Table 6.20 Process pattern in the seventh embedded case in Case B

Stage1.	**Knowledge sharing**	**Knowledge transfer**	**Potential values**	**Code**
	Talking with people in all departments in the parent company of Hitachi to know a business approval is decided by the operation division.	Individual knowledge to individual knowledge in an organization	The situation related to getting approval for the energy-saving business could be clear.	The project manager contacted all dapartments in Hitachi and talked with people, so that he knew the pre-certification procedure in Hitachi. Business approvals in Hitachi are made by the operation division.
Stage2.	**Identification of needs**	**Knowledge seeking**	**Potential values**	**Code**
	It was a question to get approval from the operation division of Hitachi.	Knowledge to find a way for a business approval	A way to get an approval could be found.	The project manager didn`t know how to make the procedure work well, and whom he could talk with.
Stage3.	**Knowledge integrating**	**Knowledge creation**	**Potential values**	**Code**
	The project manager gave a solution for the chief regarding the promotion for the energy saving service business.	A solution related to business promotion was given.	It would make business possible in reality	The manager discussed the energy-saving service with the powerful chief in the operation division for a business approval, but the chief had a doubt concerning who would promote the service model into markets. The project manager proposed that he himself do marketing work for the service business model.
Stage4.	**Implementation to meet needs**	**Knowledge application**	**Potential values**	**Code**
	The energy saving business model had approval and was listed in the production catalog of Hitachi.	An approval was made based on the solution related to business promotion	The energy saving service business could be launched into markets.	The chief pre-authorized the energy-saving service business model in Hitachi, so that the model was listed in the production catalog.

Embedded case 8: Electric power price setting

The main event in the eighth embedded case was to set a reasonable price for electric

power. Participants found a new method of price setting so that the user, who uses the energy saving service, sets the price of electric power; Hitachi, a service company, only charges the consumer for the total amount of electricity after energy saving, which reduces the risk of the service business. The main participants are shown in figure 6.11.
Participant (k): The department head worked in a customer company, which was an energy intensive factory. He had operational experiences in the factory for many years, and was familiar with the price of electric power.

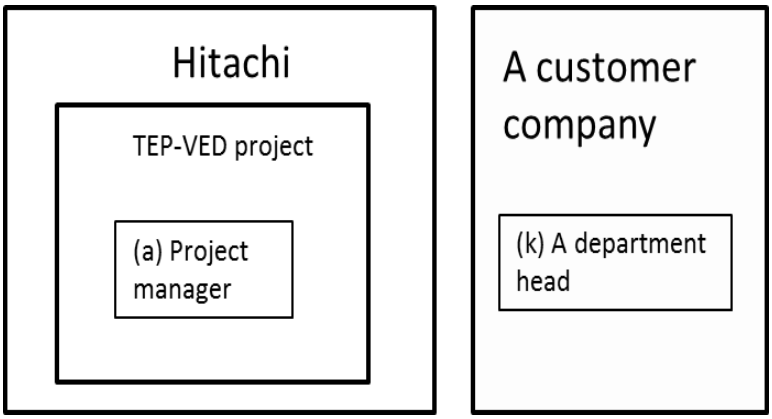

Figure 6.11 Participants in the eighth embedded case in Case B

1. Leader-follower relation

We found participants reciprocally changed their roles as leader or follower according to their real situations of giving knowledge or taking knowledge during their learning process, as seen in table 6.21. It implies that the participants worked as a partnership.

Table 6.21 Leader-follower relation in the eighth embedded case in Case B

Leader role (teaching/giving situation)	**Follower role (learning/taking situation)**	**Learning content**	**Code**
a	k	The concept of energy saving service business model	The project manager had an idea which was to ask customers in the marketplace for a reasonable price of electric power. He started a free conversation about energy saving with a department head in an energy-intensive factory, and shared the idea of the energy saving service. The head had a good mood that he had shared a new method to set a reasonable power price based on his operational experience in the factory for many years. So that the idea of risk-sharing came up in the project manager`s mind.
k	a	Electric power price setting method	

2. Participants' mindset

Participants in this embedded case were supportive of each other. The project manager considered his customers' situation and positively discussed the energy saving service with the department head. Thus, the head had sympathy with the project manager; he

was willing to help the project manager. He positively gave his suggestions to improve the energy saving service model. The project manager described his thinking: *"I think it is important to learn from customers."* He described the department head who worked in a customer company: *"The customer became interested in (the idea of energy saving service) after a free conversation… The head was a positive person… He honestly pointed out the mistake in the proposal of electric power price we gave… He said, we are more familiar with the electric power price. We can make the price of electric power better (It means the customer can share the risk of uncertain price of electric power.)"*

3. Process pattern of value co-creation

We found there were four stages in the value co-creation process. The process pattern can be summarized as "**knowledge sharing**", "**identification of needs**", "**knowledge integrating**", and "**implementation to meet needs**" according to the characteristics of the sequence of four stages, as seen in table 6.22.

Table 6.22 Process pattern in the eighth embedded case in Case B

Stage1.	**Knowledge sharing**	**Knowledge transfer**	**Potential values**	**Code**
	Discussion among people in Hitachi for the power price setting	Individual knowledge to organizational knowledge	The situation related to power price setting for the energy saving business could be clear.	There was a discussion for a method to set the power price among salesman, techical staff and project members in Hitachi.
	Feedback from marketplaces after promotion activties.	Organizational knowledge through individual knowledge sharing from marketplaces		The manager started to promote the energy-saving service into marketplaces and had some feedback from customers.
Stage2.	**Identification of needs**	**Knowledge seeking**	**Potential values**	**Code**
	There was a problem to make a reasonable power price.	Knowledge for the power price setting	A way to solve the power setting problem could be found.	It is a big problem if the measurement for the power price setting wasn`t reasonable to marketplaces.
Stage3.	**Knowledge integrating**	**Knowledge creation**	**Potential values**	**Code**
	Free conversation between the project manager and the head of an energy-intensive factory to share their experieces so that the project manager had a risk-sharing idea.	A new idea of risk-sharing was created that solve the problem of the power price setting	The energy-saving business model could have a certain method to solve the power price setting problem.	The project manager had an idea which is to ask customers in marketplaces for a reasonable price of electric power. He started a free conversation about energy saving with a department head in an energy-intensive factory, and shared the idea of the energy saving service. The head had a good mood that he shared a new method to set a reasonable power price based on his operational experience in the factory for many years. So that the idea of risk-sharing came up in the project manager`s mind.
Stage4.	**Implementation to meet needs**	**Knowledge application**	**Potential values**	**Code**
	The risk-sharing method was applied into the energy saving service business model, instead of price setting.	The idea of risk-sharing was applied in the energy saving business model.	The energy saving business model could have a certain method to make its profit with low risk.	Hitachi used a risk-sharing method that solved the problem of the power price setting after a discussion, which is to set the power price by its energy saving service user itself (the client); Hitachi only charged a service fee according to the total quantity of electric charge after energy saving.

Embedded case 9: The first order

The main event in the ninth embedded case was focusing on a real deal in the market. The content of the agreement contract was improved. New experiences related to the energy saving service business were learned from customers in the market. The main

participants are shown in figure 6.12.

Participant (l): The head worked in the decision-making department, who was the key contact person in a service user company to make a contract for the deal of energy saving service.

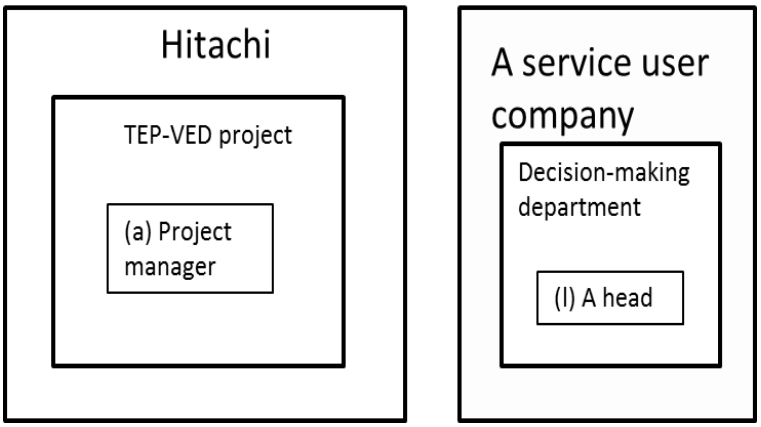

Figure 6.12 Participants in the ninth embedded case in Case B

1. Leader-follower relation

We found participants reciprocally swapped roles as a leader or follower according to their real situations of giving knowledge or taking knowledge during their learning process, as seen in table 6.23. It implies that the participants worked as a partnership.

Table 6.23 Leader-follower relation in the ninth embedded case in Case B

Leader role (teaching/giving situation)	**Follower role (learning/taking situation)**	**Learning content**	**Code**
a	l	The concept of energy saving service business model	The project manager communicated with a head in the decision-making department for an agreement on the energy saving service.
l	a	Legal remedy regarding service interruption due to electric control	The manager scouted about for a solution in different departments of the service user company. The head in the decision-making department provided legal information that the profit insurance of the company would cover all damage due to electricity control.

2. Participants' mindset

Participants in this embedded case were supportive of each other. When a problem related to the legal remedy in the case of service interruption due to electricity control arose in the agreement, the project manager visited the service user company, and scouted about for a solution. The head actively shared information of the law with the

project manager. They supported each other to find a solution to make an agreement so that the energy saving service could be introduced into the service user company. The project manager described the head that worked in the decision-making department: *"We had help from customers to improve the contract. When I was looking for a solution (related to legal remedy regarding service interruption), he got legal information from another department, (that the profit insurance of the company would cover all damage due to electricity control) and immediately told me."*

3. Process pattern of value co-creation

We found there were four stages in the value co-creation process. The process pattern can be summarized as "**knowledge sharing**", "**identification of needs**", "**knowledge integrating**", and "**implementation to meet needs**" according to the characteristics of the sequence of four stages, as seen in table 6.24.

Table 6.24 Process pattern in the ninth embeded case in Case B

Stage1.	**Knowledge sharing**	**Knowledge transfer**	**Potential values**	**Code**
	Communication between the project manager and the head of decision-making department of a service user compnay	Organizational knowledge through individual knowledge sharing	The situation related to the details of business agreement could be clear.	The project manager communicated with a head in the decision-making department for an agreement on the energy saving service.
Stage2.	**Identification of needs**	**Knowledge seeking**	**Potential values**	**Code**
	There was a problm related to a legal remedy for service interruption by electricity control in the contract.	Knowledge to solve the problem related to a legal remedy for service interruption	Ways to solve the problem could be found	There was a lack of details regarding a legal remedy for service interruption due to electricity control in the contract of the energy saving service.
Stage3.	**Knowledge integrating**	**Knowledge creation**	**Potential values**	**Code**
	A solution was found after the head of the decision-making department provided legal information that the insurance company would cover all damage due to electricity control.	A solution was found based on information collection among the project manager, the head of the decision-making department, and other people in the service user company.	The problem could be solved and Hitachi and the user company could make an agreement of energy saving service.	The manager scouted about for a solution in different departments of the service user company. The head in the decision-making department provided legal information that the profit insurance of the company would cover all damage due to electricity control.
Stage4.	**Implementation to meet needs**	**Knowledge application**	**Potential values**	**Code**
	The contract was finalized for the first order.	A certain contract was modified based on the solution related to a legal remedy for service interruption.	The energy saving business model had the first order.	The contract of the energy saving service to the company was revised, and the content of the contract for the service was developed.

6.4 Summary

We analyzed the energy saving service business project in this chapter, which was a business innovation among people who were professionals in different fields and multiple organizations. These people were colleagues, associates, and clients. The

analytic results are detailed in three parts.

Firstly, we identified the leader-follower relations among participants, and they worked as partners, as seen in table 6.25. We found participants took roles as both leader and follower, and they often changed their partners during the whole project. They changed roles and partners depending on the direction of knowledge seeking in real situations. We observed participants reciprocally share their knowledge in most of the embedded cases, so they mutually changed their roles of leader or follower according to their real situations of giving or taking in the learning process, as seen in the bold-faced part in the table below. However, participants didn't symmetrically change their roles as leader or follower in a few of the cases, because they asymmetrically gave information or took information in their learning process. Participants took roles of leader or follower according to their real situations during their learning process, rather than being affected by the organizational hierarchical relation. These phenomena indicate participants worked as a partnership during the value co-creation process of the project, they learned from each other, and did not work by control and order. We also found that a few cases had hierarchical relations, but not any hierarchical relation that had an influence on its value co-creation process. However, three embedded cases did have hierarchical influences. The hierarchical leader didn`t directly order or control his followers, but the hierarchical leadership power had great influence on its organization by making right decisions to facilitate the project for value co-creation. It means the hierarchical leader role still is important for value co-creation activities.

Table 6.25 Leader-follower relation in Case B

Embedded case	Hierarchical relation	Hierarchical influence	Leader role	Follower role	Learning content
1	Have	Have	b	a	Principles of inverters and its application for energy saving
			c	**a**	Ideas about energy saving
			a	**c**	
2	None	None	**a**	**d**	The concept of energy-saving service business model
			d	**a**	Financial rules, ideas related to the energy saving service business
3	Have	Have	a	e	The concept of energy saving service business model
4	None	None	**a**	**f**	The concept of energy saving service business model
			f	**a**	Measurement method of electric power
			g	**a**	Monitoring technique
			a	**g**	The concept of energy saving service business model
5	Have	None	**a**	**h**	The concept of energy saving service business model
			h	**a**	Patent application knowledge
			b	a	Technological graph
6	None	None	**a**	**i**	The concept of energy saving service business model
			i	**a**	Contract document knowledge
7	Have	Have	a	j	The concept of energy saving service business model
8	None	None	**a**	**k**	The concept of energy saving service business model
			k	**a**	Electric power price setting method
9	None	None	**a**	**l**	The concept of energy saving service business model
			l	**a**	Legal remedy regarding service interruption due to electric control

Secondly, we clarified participants' mindset in the service business project. Most of the participants had cooperative, positive, and supportive attitudes and actions, as shown in each embedded case. Roughly, there are two reasons that participants had supportive attitudes and actions in the energy saving service business project, as seen in table 6.26. A few opinions from the research data showed participants gave a supportive attitude or action to their partners, due to a shared goal (or sympathy). However, most opinions pointed to the notion that participants considered others first, thereby giving supportive attitudes and actions to others. As a result, the participant got a good reaction, encountering willingness from the partner the participant was working with.

Table 6.26 Causes of participants` supportive mindset in Case B

Characteristic	**Code**
2.Considering others	Let people do things they are intrested in
2.Considering others	Making things intresting
2.Considering others	Getting people`s interests
2.Considering others	Considering new application of the energy saving service idea for other productions in Hitachi
2.Considering others	Organizing a lot of fun activities for members
2.Considering others	Doing the best with great enthusiasm to make someone moved.
1.For a shared goal	The engineer was very happy because his new technology could have a real application for the energy saving service model.
2.Considering others	Making someon`s dream come true
2.Considering others	Making a basic contract form for people who asked for help
2.Considering others	The project manager positively proposed that he himself do marketing work for the service business model, which eliminated the doubt the chief had.
1.For a shared goal	The nature of business is intresting and profitable, so that people like to cooperate with you.
1.For a shared goal	People had the same interests
2.Considering others	I also gave support to someone`s business.
2.Considering others	Listening to customers, learning from customers

Finally, we found the process pattern of value co-creation in this project, as seen in figure 6.13. The analytical results show all embedded cases had a sequence of four stages in its value co-creation process. There were different characteristics in the four stages. The first stage had a characteristic of sharing. Participants transferred knowledge among individuals, groups, or their organizations through many types of sharing activities, whereby the real situation could become clear. Thus, the characteristic in the first stage is summarized as “knowledge sharing”. The second stage had the characteristic of identifying needs in its real situation, which clarified what knowledge was needed in the real situation, and the direction for knowledge seeking became clear. Therefore, the characteristic in the second stage is called “identification of needs”. Human actions or activities in the third stage had the characteristic of integrating a great deal of knowledge for knowledge creation, which was to find ways to meet needs. Hence, the third stage is named “knowledge integrating”. The fourth stage had the characteristic of implementing new ways to meet needs. Participants implemented new ideas or methods in the real situations to meet needs, which was to apply new knowledge into the reality. Therefore, the characteristic in the fourth stage is given the name “implementation to meet needs”. Therefore, the process pattern of value co-creation in the energy saving service business project is composed of knowledge

sharing; identification of needs; knowledge integrating; and implementation to meet needs. We also found knowledge in the value co-creation process was shifted through knowledge transfer, knowledge seeking, knowledge creation, and knowledge application according to the process pattern of value co-creation.

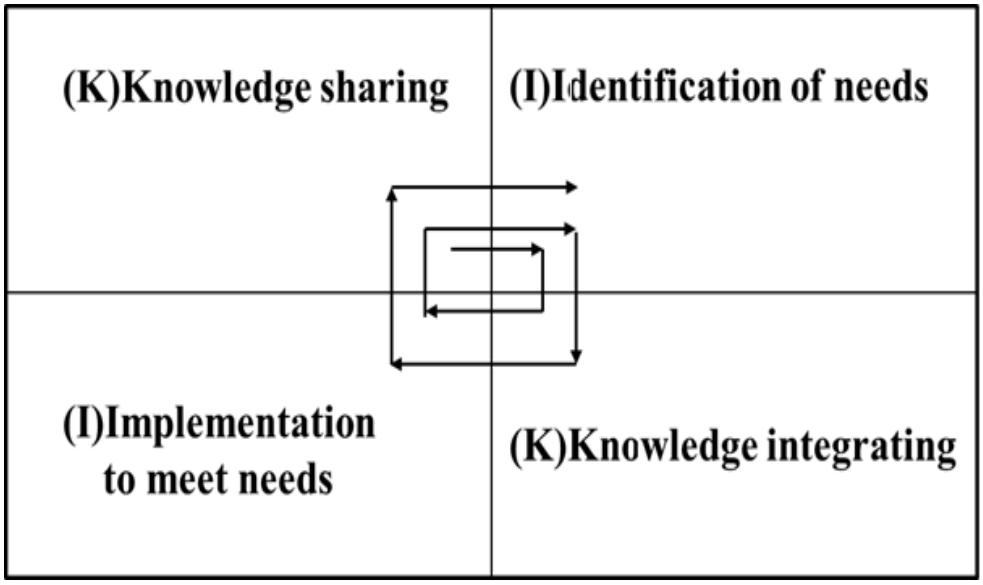

Figure 6.13 Process pattern of value co-creation in Case B

Each embedded case was related to the whole project, and generated values to enable proceeding with the energy saving service business project. The goal of the project was achieved through the value flow of all embedded cases, as can be seen in figure 6.14. Every event in its embedded case in the energy saving service business project happened depending on what knowledge was needed to be discovered in reality in real time, not according to a chronological order or artificial reasons such as human decisions. Every event generated values, which changed the real situation from the past into a new future to aim towards the goal of the project.

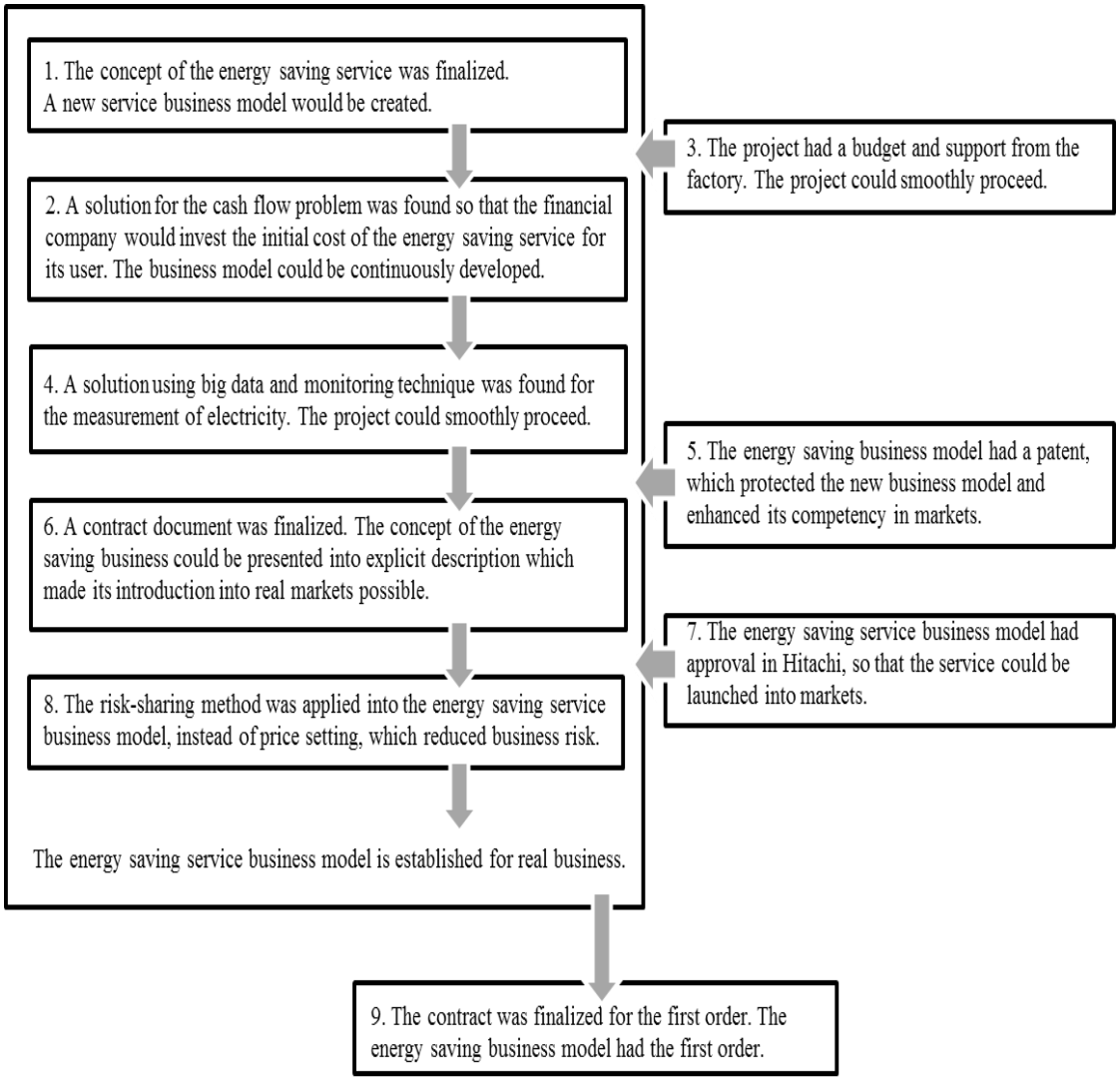

Figure 6.14 Value flow in Case B

Chapter 7: Conclusions

7.1 Introduction

We give an overall conclusion for this study in this chapter. Firstly, we answer research questions and present a value co-creation framework based on the main findings of the two case studies of value co-creation projects in the previous chapters. We then provide the theoretical implication and practical implications. In the end, we discuss research limitations and suggestions for future research.

7.2 Conclusion of two project cases

The findings of the two project cases show that the relation among participants, the supportive mindset of the participants, and the value co-creation process are important in value co-creation projects. Participants take roles as both leaders and followers according to their real situation of taking or giving, and they often change their partners depending on the requirement of knowledge seeking in reality. When a participant learns in a symmetrically reciprocal manner with the partner the participant is working with, the participant reciprocally changes roles as leader or follower with his or her partner; however, it is not in every case that they learn symmetrically in real time. The phenomena of role change and partner change indicate that participants work together as a partnership to facilitate value co-creation activities in value co-creation projects. The leader-follower relation is a dynamic partnership in a value co-creation project that may not manifest itself with symmetrical reciprocity. Nevertheless, the hierarchical leader role still is important to facilitate value co-creation activities by making correct organizational decisions or giving work directions.

The two project cases show that participants had supportive attitudes and actions, which implies that a supportive mindset among participants is also an important factor to facilitate value co-creation activities in value co-creation projects. The two project cases also show there are two reasons for supportive attitudes and actions among participants. One is to have a shared goal among participants, so that they give support to others. Another is to consider others first to support others so that, accordingly, they receive positive reactions and support from others, as emanates from human nature, and

their goals and missions can be shared to others through their positive communication. These two reasons are related. A prior shared goal or a shared goal that arises underway during the collaboration is important to human supportive attitudes and actions, because, commonly, human action must be purposeful. Project case A shows that most of the participants supported others because of a shared goal. On the other hand, project case B shows that most participants supported others because they considered others first for their (those of the others) goals or missions. The global education project (Case A) was more a case of collaboration between two organizations, thus participants had a shared goal as an organizational goal. However, the energy saving service business project was a business innovation in Hitachi. The goal of the project was unlikely to be recognized by participants who came from different organizations outside of Hitachi. The service business project shows that considering others first is a proper strategy to get a willing reaction from others, and then the project goal may be shared with others and so that people might obtain support from others. These phenomena indicate that a supportive mindset, namely a service mindset, facilitates human interaction, which is very important to human value co-creation. Especially customer-oriented thinking is a positive principle to share goals with others and obtain support from others.

The findings of the two project cases show that a value co-creation process is an ongoing process with a sequence of four stages. The process pattern of value co-creation is formed by characteristics of the four stages, consisting of knowledge sharing, identification of needs, knowledge integrating, and implementation to meet needs. Values in each embedded case are generated through a flow as knowledge transfer, knowledge seeking, knowledge creation, and knowledge application. All the values of the whole project are generated based on the accumulation of values of all the embedded cases. Every embedded case is related to the whole project, and directly or indirectly related to the other embedded cases. The result of each embedded case changes its situation in reality, which connects the past to the future in the whole project. What event happens during the whole project depend on what needed to change and what knowledge needed to be sought in the real situation. These phenomena imply that service systems thinking is crucial to human value co-creation.

7.3 Answers to Research Questions

We answer three subsidiary research questions based on the previous summarization of the analytic results of the two project cases. Then, we conclude with a value co-creation

framework to answer the major research question.

SRQ1. What is the leader-follower relation in a value co-creation project?

Hypothesis 1: Leaders and followers would be in a partnership to support each other to solve problems and create new ideas for improvement in the project, rather than working in a hierarchical relationship by means of order and control.

Answer: The analytic results of the two project cases show that participants cooperate in a value co-creation project as a partnership, rather than working by order and control. They support each other by their role exchange of leader and follower, and partner change to give or take knowledge in their learning process, which solve problems or create new ideas to improve the real situation in the value co-creation project. A hierarchical leader works with his follower as a partner in value co-creation activities, not by order and control; however, the hierarchical leader role still has a big influence upon value co-creation activities.

SRQ2. What are the participants' mindset in a value co-creation project, and why?

Hypothesis 2: Participants would have supportive attitudes and actions towards working together cooperatively for value co-creation in a value co-creation project, because they consider others first in order to get others' support.

Answer: The analyses show participants are cooperative and supportive in a value co-creation project. Participants cooperate with each other for a shared goal. When participants consider others first, they naturally give support to others; then they get supportive reactions from others.

SRQ3. What is the process pattern of a value co-creation project?

Hypothesis 3: The process pattern of value co-creation has four steps, these being knowledge sharing, identification of needs, knowledge integrating, and implementation to meet needs, with a spiral development to give a constructive representation and a derivation of a psychological process in social environments.

Answer: The findings of the previous chapters show that the process pattern of value co-creation in a value co-creation project contains four characteristics of a sequence of four stages, these being knowledge sharing, identification of needs, knowledge integrating, and implementation to meet needs, which is named the KIKI model, as seen in figure 7.1. Values are generated through four stages as a spiral development through time. The results through the four stages in an event change the real situation from the past to the future in the whole project, which are a constructive representation and a

derivation of psychological process in social environments.

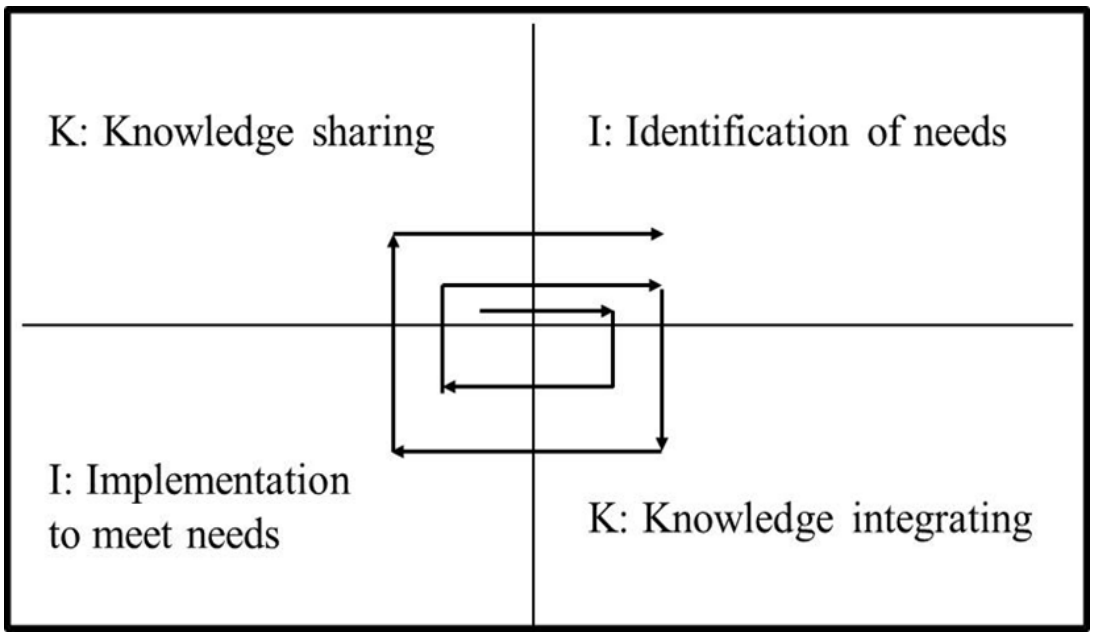

Figure 7.1 KIKI model

MRQ: How do participants interact with others with others for value co-creation in value co-creation projects?

Participants have dynamic leader-follower relation as a partnership. They have a service mindset to think others first to have supportive attitudes and actions from other and reach a shared goal. They work with others through the process pattern as the KIKI model. The value co-creation framework for participants in value co-creation projects is detailed in figure 7.2

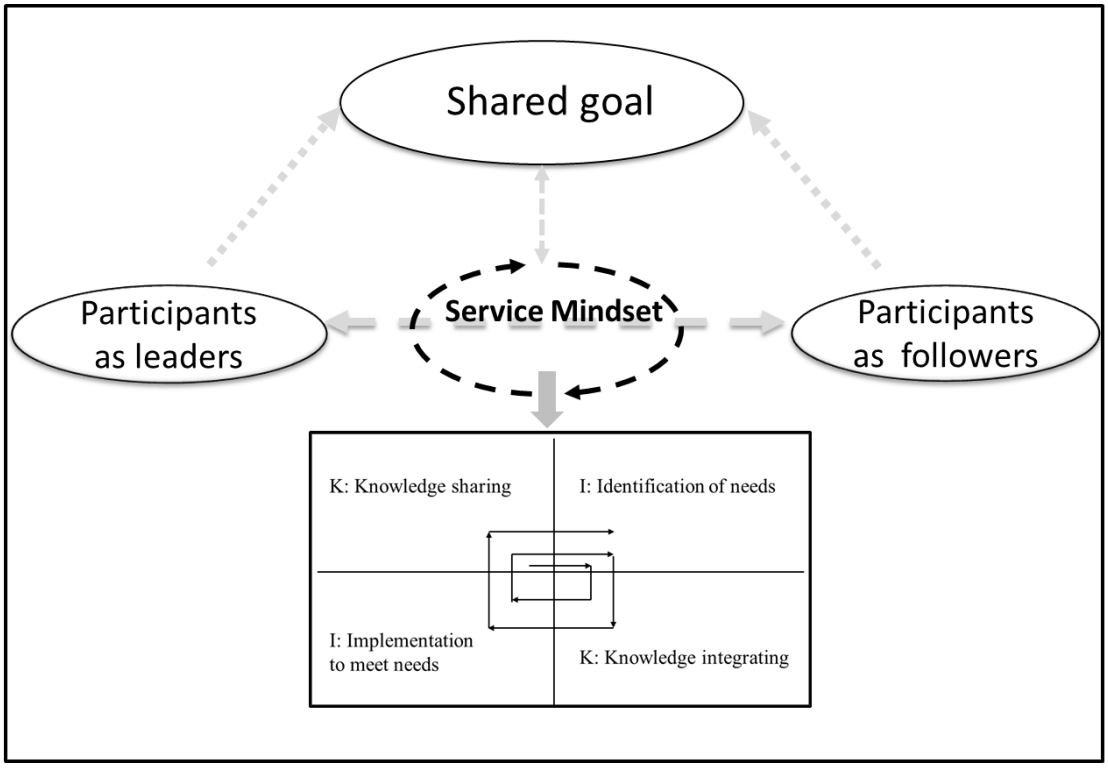

Figure 7.2 Value co-creation framework

A new framework for human value co-creation mainly comprises of three factors.

Factor 1. Dynamic leader-follower relation as a partnership: Participants take roles as both leaders and followers, and the leader-follower relation among participants is a dynamic partnership in a value co-creation framework.

Factor 2. Service mindset: Participants consider others first, so they may have supportive attitudes and actions from others, and reach a shared goal.

Factor 3. Process pattern of a sequence of four stages: The process pattern of value co-creation in a value co-creation framework consists of a sequence of four stages, as in the following.

Stage 1. Knowledge sharing:

Participants take part in sharing-activities to transfer knowledge into different levels among participants, so that the real situation can be clear.

Stage 2. Identification of needs:

Participants identify objective or subjective needs according to the real situation, so that it can be clarified what knowledge is needed.

Stage 3. Knowledge integrating:

Participants integrate a great deal of knowledge to create new knowledge such as new ideas and methods to meet needs.

Stage4. Implementation to meet needs:
Participants apply new knowledge to implement new ideas or methods into real actions that meet needs in reality.

The process pattern of value co-creation spirally carries values out to present a constructive representation towards a shared goal. Values are incrementally accumulated in the whole, so that participants reach the shared goal.

7.4 Theoretical Implication

We provide a new framework of value co-creation in this study, which is a new managerial methodology using a multi-principle approach for human value co-creation activities. This study provides a theoretical contribution to value co-creation study, one core subject of service science. It is significant to facilitate human interaction that enhances customer satisfaction and values in service research. It is also very important to KM. The existing KM theory is limited in knowledge use in organizations, being developed from the traditional organization theory. Most traditional KM studies take a firm-centered perspective and pay more attention to knowledge driven by internal forces. Today's economic changes require organizations to think of how to convert knowledge creation into value creation for organizations, and how to manage knowledge among multiple organizations or between an organization and its customers in marketplaces. This study presents a new paradigm of management for conventional KM in the knowledge era, which breaks down the barrier of organizational hierarchy to facilitate knowledge creation, as well a new method to deal with the external force for knowledge creation. Moreover, this new framework presents a dynamic thinking to leader-follower relations, instead of the hierarchical thinking in current leadership and followership research, and thus the methodology of value co-creation is applicable to the interaction between leaders and followers. It fills the gap in traditional PM centered on control under a conventional scientific management view, and improves work efficiency, such as solving problems and getting work opportunities, to achieve the project goal.

The new value co-creation framework in this study is meaningful to many fields, because it offers a new paradigm of management. Most research related to management and organizations still take a traditional view of scientific management and focus on the control method to improve work efficiency, which is a firm-oriented view. This study primarily provides a service mindset that includes a customer-oriented view and a service systems thinking to develop a theory of value co-creation. The customer-oriented

view applied in the new framework of value co-creation facilitates human interaction, thereby improving human relations, which speeds up human knowledge creation to improve work efficiency. The service systems thinking in the new framework looks at all situations as a whole, which integrates a long-term view and a short-term view to generate values in reality. Therefore, the new theory of value co-creation can overcome obstacles from the organizational hierarchy, and move the organizational focus of human intelligence and creativity from knowledge creation for new products or services to human value co-creation for sustainability in the complicated economic environment in the knowledge era.

7.5 Practical Implication

(1) Implication to Organizational Leaders

This study shows that the leader-follower relation in human value co-creation is dynamic, which gives a new thinking and a managerial methodology to organizational leaders such as managers. Therefore, organizational leaders should dynamically interact with followers in exchanging their roles in teaching-learning situation, which may facilitate human interaction to speed up knowledge creation to carry out organizational benefits or business values.

(2) Implication to Participants for Human Value Co-Creation

This study demonstrates a new mindset for participants for human value co-creation, which provides an efficient way to facilitate human interaction, so that participants consider others first with supportive attitudes and actions for cooperative reactions, so their goals or missions may be shared to others and gain support from others.

(3) Implication to Operational Activities

The new value co-creation framework overcomes the barrier of organizational hierarchy, and facilitates human interaction, which improves work efficiency. Therefore, the framework not only provides a new managerial method for a value co-creation project, but also can be applicable to the operation of traditional projects in organizations, such as knowledge seeking and knowledge creation to improve its efficiency. This framework also can apply to many forms of value co-creation activities in the global economy, such as collaborations and business innovation, which can facilitate human interaction in the operational process to enhance human values and organizational values.

(4) Implication to Customer Relationship Management

The new value co-creation framework gives a suggestion for customer relation management. Human relation is rooted in human interaction. The customer-oriented view in the new framework offers an efficient way to facilitate human interaction. Considering others first with supportive attitudes and actions is a good strategy to build up and enhance human relations with others.

7.6 Research Limitation and Suggestion

We used two ongoing projects for case studies in this research. We focused on the phenomena during a specific period in each ongoing project, due to time limitations. We tried to carefully set an ending time in each project, which allowed us to collect enough data for analysis to find a meaningful result. If we could observe phenomena during a longer period in the two ongoing projects, it would have been better to carry more convictions for this study. Besides, this study is limited to the value co-creation form in businesses.

The global education project stopped after JAIST sent the third group of students to UCDE. When we applied the four stages of the KIKI model to analyze phenomena, and found some steps missed in real situations, we realized that the value co-creation framework could also be applied to unsuccessful projects to find issues. We didn't demonstrate the new framework using unsuccessful case in this study, due to data and time limitation. Therefore, we suggest it could be advantageous to do such a research in the future.

Otherwise, this study is focused on value co-creation activities in value co-creation projects from the individual to the group. Since human interaction is based on individual communication, it is necessary to find out how people share their knowledge through communication at a personal level for future research. This study also emphasizes how humans create knowledge towards human value creation, which is related to well human beings. Therefore, the new framework for value co-creation can apply into many fields for the future.

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Appendices

Appendix A: Spontaneous participation agreement for interviews

Spontaneous Participation Agreement

Thank you for your cooperation and assistance in the interview work. We deeply appreciate your contribution to our research. You hereby acknowledge that:

1. Your participation in the interview for the purposes of research is voluntarily and without compulsion.
2. You are free to respond to questions and requirements of the interview.
3. You permit the use of a recorder to record our conversations during the interview.
4. We are able to use information and data, collected from the interview for research purposes only, and your anonymity will be protected.

Please sign below to indicate your understanding and acceptance of these terms.

Signature: Date:

Interviewer information:
Name: Qi Zhang
School: School of Knowledge Science, JAIST
Contact information: zhangqi@jaist.ac.jp

Appendix B: List of interviewees for Case A

No.	Interviewees	Date	Place	Duration
1	Student1(Group1)	2012.05.24	Jaist	1H
2	Student2(Group1)	2012.06.01	Jaist	1H
3	Student3(Group1)	2012.06.04	Jaist	1H
4	Student4(Group1)	2012.06.08	Jaist	1H
5	Student5(Group1)	2012.06.08	Jaist	1H
6	Student6(Group1)	2012.06.11	Jaist	1H
7	Student7(Group1)	2012.06.14	Jaist	1H
8	Student8(Group1)	2012.06.15	Jaist	1H
9	Student9(Group1)	2012.06.15	Jaist	1H
10	Student10(Group1)	2012.06.18	Jaist	1H
11	Student11(Group1)	2012.06.21	Jaist	1H
12	Student12(Group1)	2012.06.23	Jaist	1H
13	Student13(Group1)	2012.06.26	Jaist	1H
14	Student A(Group2)	2013.01.08	Jaist	30mins
		2013.04.01		30mins
15	Student B(Group2)	2013.01.08	Jaist	30mins
		2013.04.02		30mins
16	Student C(Group2)	2013.01.08	Jaist	30mins
		2013.07.09		30mins
17	Student D(Group2)	2013.01.08	Jaist	30mins
		2013.08.01		30mins
18	Student E(Group2)	2013.01.09	Jaist	30mins
		2013.04.02		30mins
20	Student F(Group2)	2013.01.09	Jaist	30mins
		2013.07.10		30mins
21	Student G(Group2)	2013.01.09	Jaist	30mins
		2013.07.24		30mins
22	Student H(Group2)	2013.01.09	Jaist	30mins
		2013.08.02		30mins
23	Student I(Group2)	2013.01.09	Jaist	30mins
		2013.08.04		30mins
24	Student J(Group2)	2013.01.09	Jaist	30mins
		2013.08.05		30mins

25	Student K(Group2)	2013.01.09	Jaist	30mins
		2013.08.27		30mins
26	Student L(Group2)	2013.01.10	Jaist	30mins
		2013.07.31		30mins
27	Student M(Group2)	2013.01.11	Jaist	30mins
		2013.07.07		30mins
28	Student N(Group2)	2013.01.11	Jaist	30mins
		2013.08.22		30mins
29	Student O(Group2)	2013.01.11	Jaist	30mins
		2013.08.23		30mins
30	Department Head	2014.02.04	Jaist	1H
31	Academic coordinator1	2013.08.29	Jaist	30mins
32	Program coordinator1	2012.04.16	Jaist	1.5H
		2013.05.01		1H
33	Program coordinator2	2013.08.20	Jaist	30mins
34	Project member1	2013.09.02	Jaist	30mins
35	Director	2013.12.04	UCDE	15mins
36	Academic coordinator A	2013.09.09	UCDE	40mins
		2013.10.10		30mins
37	Program coordinator A	2013.09.11	UCDE	1H
		2013.10.23		30mins
38	Program instructor A	2013.09.18	UCDE	30mins
39	Program instructor B	2013.11.12	UCDE	30mins

Appendix C: List of interviewees for Case B

Interviewee	Date	Place	Duration
Project manager	2010.03.23	Jaist(Toyko)	2H
	2011.11.28	Jaist(Ishikawa)	1H
	2014.03.11	Jaist(Ishikawa)	3H

Appendix D: Interview guide of Case A

Conducted by

Qi Zhang
Ph.D. Student
School of Knowledge Science
Japan Advanced Institute of Science and Technology
1-1 Asahidai, Nomi city, Ishikawa 923-1211, Japan

Section 1: Profile of the global education project

1.1What is the project history

1.2 What is your position in this project

Section 2: Students' satisfaction of Group 1&2

2.1 What did you get from the program in UC Davis?

2.2 How was your teamwork during the program?

A background survey of group2 before the program

- ✧ Why did you apply for the program
- ✧ What is your English level now?
- ✧ Do you attend courses designed by GCC?
- ✧ Are you familiar with your members and coordinators with the program?
- ✧ Do you have experiences about living abroad (except Japan?)
- ✧ What do you know about the United States of America?
- ✧ What do you expect for the program and what is your plan?

Section 3: Value co-creation in the project

3.1 What is a leader-follower relation when you work with others in the project? Do you think an organizational position as a leader has an influence in the project?

3.2 What are your attitude and behavior when you work with others in the project, and why?

3.3 How is the co-creation process when you work with others for each achievement during the project?

Appendix E: Interview guide of Case B

Conducted by

Qi Zhang
Ph.D. Student
School of Knowledge Science
Japan Advanced Institute of Science and Technology
1-1 Asahidai, Nomi city, Ishikawa 923-1211, Japan

Section 1: Profile of the business project
1.1What is the project history 1.2 What is your position in this project
Section 2: Value co-creation between in the project
2.1 What is a leader-follower relation when you work with others in the project? Do you think an organizational position as a leader has an influence in the project? 2.2 What are your attitude and behavior when you work with others in the project, and why? 2.3 How is the co-creation process when you work with others for each achievement during the project?

Appendix F: Participant observation report format (Case A)

Participant observation report				
Observer:	Date		Place	
Observation object:				
Observation period:				
Observation content:				

Appendix G: List of document resources

No.	Type	Date	Source	Core issues
1.	E-mails	2012.10.30	UCDE	English program co-design
2.	Document1	2012.10.30	UCDE	Program proposal for Jaist winter 2013
3.	Document2	2012.10.30	UCDE	E421 Overview Orientation
4.	Questionaire	2013.05.07	JAIST	Survey for the UCD program participants
5	Document3	2013.05.07	JAIST	Naist-UC Davis program survey
6	Document4	2013.05.07	JAIST	UC Davis Extension-JAIST English For Science and Technology program report
7	Document5	2013.05.07	JAIST	UC Davis-JAIST academic exchange proposal (Draft)

Appendix H: Abbreviations

Abbreviation	Full Name
APM	Association for project management
APM (approach)	Agile project management approach
GDP	Gross domestic product
JAIST	Japan advanced institute of science and technology
KM	Knowledge management
KMS	Knowledge management systems
LMX	Leader-member exchange
LPC	Least preferred coworker
MRQ	Major research question
MSA	Management skills advisor
PKM	Personal knowledge management
PM	Project management
PMAJ	Project management association of Japan
PMLC	Project management life cycle
PMBOK	Project management body of knowledge
PMI	Project management institute
SRQ	Subsidiary research question
TEP	Task force project
TPM (approach)	Traditional project management approach
TOEIC	Test of English for international communication
WBS	Work breakdown structure
UCDE	UC Davis Extension
VEC	Value engineering for customers
xPM (approach)	Extreme project management approach

Appendix I: Publications related to this dissertation

Journal Papers

Qi Zhang, Michitaka Kosaka, Kunio Shirahada & Takashi Yabutani (2012). A proposal of B to B Collaboration Process Model based on a Concept of Service and its Application to Energy Saving Business. *The Institute of Electrical Engineers of Japan (IEEJ)*, 132 (6), pp.1035-1040

Qi Zhang, Michitaka Kosaka & Yoshiteru Nakamori (2013). Streamlining efficient behaviors for knowledge creation in collaboration. *International Journal of Knowledge and Systems Science (IJKSS)*, 4 (2).

Publication Book

Michita Kosaka, Jing Wang, Weiwei Han & Qi Zhang (2013). A Concept of a Service Field and its Applications to Create Service Value. In Kosaka & Shirahada (Eds.), *Progressive Trends in Knowledge and System-Based Science for Service Innovation, Part of the Advances in Marketing, Customer Relationship Management, and E-Service Series*. Business Science Reference (an imprint of IGI Global), the United State of America, pp.22-43

Michitaka Kosaka, Takashi Yabutani & Qi Zhang (2013). A value co-creation Model for Energy-Saving Service Business Using Inverters. In Kosaka & Shirahada (Eds.), *Progressive Trends in Knowledge and System-Based Science for Service Innovation, Part of the Advances in Marketing, Customer Relationship Management, and E-Service Series*. Business Science Reference (an imprint of IGI Global), the United State of America, pp. 292-306.

International Conference Papers

1. Qi Zhang, Michitaka Kosaka & Takashi Yabutani (2011.6). A model of service value co-creation based on a new concept of service field in service systems, *IEEE International Conference on Service System and Service management (ICSSSM2011*), Tianjin, China, pp.877-882

2. Michitaka Kosaka, Qi Zhang & Minh Chau Doan (2011.9). A model for service innovation process based on a new concept of service field, *Sixth International KMO Conference (KMO2011)*, Tokyo, Japan.

3. Michitaka Kosaka, Qi Zhang, Wooseok Dong & Jing Wang (2012.7), Service value co-creation model considering experience based on service field concept, *IEEE International Conference on Service System and Service management (ICSSSM2012)*, Shanghai, China.

4. Qi Zhang & Michitaka Kosaka (2012.11). A service communication process to streamline efficient service behaviors for knowledge creation in collaboration, 13th *International Symposium of Knowledge and Systems Sciences (KSS2012)*, Nomi, Japan.
5. Qi Zhang & Michitaka Kosaka (2013.7). SECI model and KIKI Model on Knowledge Creation, *The 10th International Conference on Service Systems and Service Management (ICSSSM2013)*, HK, China, S016
6. Qi Zhang & Michitaka Kosaka (2014.6). Application of the KIKI Model for an English Education Project. *The 11th International Conference on Service Systems and Service Management (ICSSSM2014)*, Beijing, China, S263

Japanese Conference Papers

1. Qi Zhang & Michitaka Kosaka (2010.9). A model of Service Value Co-creation by Combining SECI model and Service Theater Model. *IEEJ conference*, Nagaoka, Japan, IS-10-54
2. Qi Zhang & Michitaka Kosaka (2012.5). Application of KIKI model for value co-creation between leadership and followership in project management. *IEEJ conference*, Ishikawa, Japan, IS-12-006
3. Qi Zhang & Michitaka Kosaka (2013.3). Difference between SECI model and KIKI model for knowledge creation. IEEJ conference, Tokyo, Japan, IS-13-008