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Sociomaterial Practice of Actor-Network in Cooperative Information Systems Development[*]

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Working paper CIRIEC No. 2024/01

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Abstract

This study analyzes how the characteristics of information systems appear in cooperatives and what organizational results they have. Advances in technology reveal that information systems are not just mechanical devices or technologies but are social material beings co-constructed with human actors such as developers and users (Law, 2009; Suchman, 2007). This social material perspective on information systems shows that information systems are continuously reconstructed through social material practices of human and non-human actors (Orlikowski, 2010; Orlikowski & Scott, 2015; Scott & Orlikowski, 2014). This paper defines the information system as an actor-network composed of human and non-human actors. It shows through the case of a cooperative in Korea that the social material practices of the actor-network reconstruct the information system. Through the conversion process of the information system, the cooperative information systems were reconstructed into different forms through different social material practices of its members. It formed a multiple information system actor-network. Furthermore, the members do not establish the cooperative's organizational management principle but mix it with the organizational management principle existing before the conversion, so the members perform different practices. Converting the cooperative information system shows that the information system has multiplicity, dynamic, contingent, and indetermination characteristics. When we consider these information system characteristics in the management field, we increase user participation and the effectiveness of information system introduction by being free from the rigidity of technology.

Keywords: Information System, Cooperative, Actor-Network, Sociomaterial Practice, Korea

JEL Codes: M15

1. Introduction

The governance structure of cooperatives has the characteristic of participation of members, which is distinguished from investor-owned companies. Any member who jointly owns a cooperative shall have one vote regardless of the number of shares invested and may vote on major decisions related to the operation of the cooperative, such as the election of the board of directors, business plans, and budget decisions. The participation of cooperative members, symbolized by one vote per person, stems from the ownership structure of the cooperative and is institutionalized in the most basic form. However, Laidlaw (1980) emphasized that democracy can be implemented when cooperatives guarantee members' participation in practical activities beyond the system of one vote per person. Cooperatives are introducing various systems in which members can participate in activities daily and implementing education and training for members. In the case of workers' cooperatives, where ownership and labor coincide with increasing the productivity of cooperatives, member participation practices can form a member participation structure and system and establish a governance structure (Abell, 2014; Bonin et al., 1993; Erdal, 2011; Kim & Jang, 2015).

This study examines how member practices that appear in introducing the information system of workers' cooperatives establish a governance structure. The technological determinism view of information systems as fixed and stable technologies believe that information systems have a one-sided effect on organizations (Boell & Cecez-Kecmanovic, 2015; Doherty et al., 2011; Markus & Robey, 1988). However, the actor-network theory, which sees the information system as a human and non-human network, believes that the technical aspects of the information system and the human role are mixed and expressed within the organization (Callon, 1986; Law, 2009). Therefore, no purely human or technical problems exist, and heterogeneous problems involving humans and technology are created (Hong, 2010). The practice that appears in the process of introducing an information system as a heterogeneous network between humans and non-humans is a sociomaterial practice created by the compositional entanglement between humans (social) and non-humans (material) (Orlikowski, 2007). As an alternative perspective to existing theories related to information systems, sociomaterial practices of actor-network can provide new insights regarding the establishment of cooperative governance by member practices.

The Garam Cooperative (a pseudonym), the subject to study in this paper, was in a conflict situation in introducing a new information system. We faced

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the differentiation of the governance structure of the Garam Cooperative as we approached it from the perspective of sociomaterial practices to analyze the conflict situation of the Garam Cooperative. Rather than analyzing the reasons for the differentiation of the Garam Cooperative governance structure, this study shows the differentiation of governance structure through members' practices in introducing the information system. The practices shown by the Garam Cooperative members, which have established a worker participation system for over a decade after switching from a corporation to a worker cooperative, reveal that the democratic organizational management principle is not working for Garam Cooperative.

This study examines the differentiation of governance structure revealed in the process of developing the information system of the Garam Cooperative as a research question on how to establish a governance structure for members of the Workers' Cooperative. To this end, we review the governance structure of cooperatives, cooperatives and information systems, the evolution of information system theory, and sociomaterial practices of information system actor-network. In addition, we examine the governance, information system development process, member practices, and governance differentiation of the Garam Cooperative.

2. Theoretical Review

2.1. Cooperative Governance

The ultimate purpose of governance is to make good decisions about the company's vision to effectively fulfill its purpose (Kim, 2000; Novkovic & Miner, 2015). In other words, it is necessary to establish a governance structure that can effectively control the pursuit of private interests of controlling shareholders and prevent the company's management losses due to arbitrary decision-making by controlling shareholders (Jun, 2007; Lee & Son, 2009).

In this sense, cooperatives have a governance structure that can make good decisions by ensuring the participation of all members in decision-making, as symbolized by the system of one vote per person. However, it is difficult to say that the member's right to vote alone will sufficiently guarantee their participation in decision-making at the annual general meeting of members. Because they have to wait one year until the next general meeting to voice their members again, and during that period, decision-making authority is

inevitably concentrated on the board. Notably, in the case of workers' cooperatives, where members' ownership and labor coincide to lead to the economic interests of cooperatives, it is essential to establish a system to ensure members' daily participation in decision-making (Abell, 2014; Bonin et al., 1993; Erdal, 2011).

In addition to the general meeting structure and the board of directors, the workers' cooperative operates various methods for members' participation in decision-making. It includes the operation of various committees in which members participate, including selecting, rewarding, and punishing members and policy proposals (Novkovic & Miner, 2015; Kim & Jang, 2015). Turnbull (2012) proposes network or polycentric governance to allow cooperative members to participate in daily decision-making. Network governance is dividing a large organization into manageable units and reorganizing decision-making into a network of independent control centers. Several essential elements are required to design network governance (Novkovic & Miner, 2015). First, it is the principle of complementarity that small independent units guarantee autonomy in decision-making, and the organization's upper unit does not decide on behalf of small units but determines what small units cannot decide. In addition, multiple control systems in which centers that bind several small units are linked and mutually evaluated, and expert participation is needed to help the cooperative make effective decisions.

The institutionalization of member participation, such as network governance, is essential in that the less hierarchical the management method of the cooperative is, the more active the members' participation in decision-making can be (Wuisman & Mannan, 2016). However, since the members determine the governance structure, the participation practices of the members should be combined with the institutionalized decision-making system. Suppose members who need to become more familiar with decision-making participation continue to participate passively. In that case, decision-making will continue to be concentrated on a small number, making it difficult for members to participate, resulting in a centralized governance structure (Kim & Jang, 2015). Therefore, education and training should be provided so that members can understand the democratic operating principles of cooperatives and participate in the decision-making system. Such education and training can be the basis for member participation practices.

In a worker cooperative where ownership and labor coincide, workers' participation in decision-making occurs throughout the cooperative's operation,

including capital raising, marketing strategies, and business expansion, including decisions related to their working conditions and salaries. When the opinions submitted by the members are reflected in actual management, the participation practices of the members can be further activated (Kim & Jang, 2015). Workers can have explicit opinions on working conditions, salaries, etc., but can only make decisions on areas related to the overall operation of cooperatives due to a lack of expertise (Kim, 2016). Developing members' expertise through daily information sharing on the management of cooperatives, the current status of the industry to which the cooperative belongs, and the strategy of the cooperative can support the members' participation in decision-making.

When setting up a cooperative, it is essential to have a governance structure beyond a basic one-to-one voting system. This means creating an organizational structure that allows members to participate in management daily and ensuring that their practices align with this structure. By doing so, the cooperative can operate democratically.

2.2. Cooperative Information Systems

With the development of information system technology, cooperatives also use various information system-related technologies. It may vary depending on the business and size of the cooperative. However, various systems such as Social Networking Service (SNS), accounting management, member administration, and transaction relationship management for member activities can be used. Dealing with materialities such as these information systems in cooperative research is essential. Organizational activities involve materialities such as offices, desks, telephones, and water and sewage systems, as well as information systems (Orlikowski, 2007), and organizational materialities are resources that enable people to work in new ways and do things that they could not before (Leonardi & Barley, 2008).

In a time when there were no mobile phones and SNS functions, information delivery to members had to be made by phone or mail. However, in recent years, all individuals have mobile phones and can use SNS functions, making it easier for cooperatives to deliver information to members using text services or SNS functions. SNS functions can have positive functions, such as delivering the necessary information and encouraging members to participate in cooperative activities. However, when a conflict occurs in a cooperative, the content of

the conflict of the cooperative can quickly spread through SNS, and one-sided posts can amplify the conflict. It is why the materiality of the information system should be dealt with when studying cooperative organizations.

The emergence of new types of cooperatives also accompanies the information system. Platform cooperatives were created in response to the deterioration of workers' quality of life by platforms mediating delivery services and household services. Korean domestic workers' cooperatives have provided domestic services to consumers around certain regions but have joined forces to introduce digital platforms to cope with market changes caused by technological changes. This is in response to changes in the domestic service market that platform companies are encroaching on and to ensure workers' labor rights. Investor-owned platform companies have been worsening the working conditions of domestic workers, rating workers, and undermining labor rights. Domestic workers' cooperatives have enrolled devices into the platform system to counteract this undermining of labor rights (Kim et al., 2022). Domestic workers' cooperatives, which provided services mainly in the region, have regularly conducted member education, training, and small gatherings. However, since the introduction of digital platforms, the process of organizing members has inevitably changed. Unlike how existing members joined and worked as members of local cooperatives, workers entering through digital platforms often perceive cooperatives as the same as the market's domestic service platform. Domestic workers' cooperatives previously conducted education and training for new members. However, after introducing the digital platform, they had to implement education for new members more delicately and meticulously.

As such, the cooperative's information system is always accompanied by organizational activities as a resource that changes how cooperatives work and allows them to do things they could not do. However, it is still difficult to find research on the information system of cooperatives. It is because cooperative research has focused on demonstrating that it is reasonable, sustainable, and performance compared to corporations. At a time when the information system is rapidly developing, and cooperatives are also using the information system as a company, studying the information system of cooperatives can bring new insights into cooperative research.

2.3. Evolution of Information System Theory

Information system theory takes different positions depending on the perspective of technology and human role. The oldest theory of information systems is technology determinism. The technology determinism view is that technology develops according to the internal logic in the technology itself without being influenced by society and that technology affects or changes society and organization (Hong, 2013; Russell & Williams, 2002). For example, if an ERP (Enterprise Resource Planning) system has improved productivity in one company, it can also achieve results in other organizations. In other words, it assumes that technologies are generally exogenous, homogeneous, predictable, stable, and performed as intended over time and place (Fleck et al., 1990: Orlikowski, 2007). Therefore, the technological determinism perspective treats information system technology as an independent variable and, importantly, treats dependent variables affected by information system technology (Orlikowski & Iacono, 2001; Orlikowski, 2007). These research practices have contributed by identifying various variables and factors that increase organizational performance and lead to organizational change (Boell & Cecez-Kecmanovic, 2015; Remus & Wiener, 2010). However, these discussions focus on properly introducing the artifact of the information system or regard the information system as a static process and need to consider the dynamics of the socio-political context and the potential interrelationship between variables (Doherty et al., 2011).

Unlike technology determinism, the perspective of treating technology with people at the center focuses on how people understand the technology and interact with it in various situations (Orlikowski, 2007). One of them is organizational determinism, in which organizations introduce technology to organizations to meet their needs for change (Markus & Robey, 1988); that is, managers decide to introduce information systems according to the organization's information processing needs, resulting in organizational changes. Organizational determinism has been supported by management and organizational theorists who view information technology as a tool for solving organizational problems. However, most studies have been criticized for needing help evaluating information technology designers' intentions (Markus & Robey, 1988).

The Social Construction Of Technology (SCOT) perspective explains how social factors shape technology and sees related social groups (RSGs) as interpreting the same technology artifacts with different interests and perspectives (Hong, 2010; Bartis & Mitev, 2008). Unlike technological and

organizational determinism, the SCOT perspective views information systems dynamically and contextually. However, it has limitations in reducing the role of technology and considering technology as a passive object (Cecez-Kecmanovic et al., 2014; Orlikowski, 2007). It means that since related social groups evaluate technology through interpretation and meaning based on their standards and grounds, the role of technology itself needs to be underestimated or passive ahead of subjective and political interpretation.

While technological determinism, organizational determinism, and SCOT perspective recognize technology and people as mutually independent beings, a perspective that recognizes technology and people as interacting has emerged. It is a socio-technical system, explaining that changes in technology and organizational change appear intertwined into a complex network of mutual causal relationships (Trist, 1981). Trist and colleagues changed the organizational system to respond to technological changes in British coal mine research in the 1950s. However, in the labor field, workers responded by creating informal teams and changing jobs. In other words, workers took various ways to organize their work according to technology. Through this, Trist (I981) and colleagues proposed that the organization's social and technology system should be viewed as socio-technical, not separate. The socio-technical system goes beyond the limitations of technological determinism and human-centered perspectives in that technology and human factors have equal weight for the joint optimization of social and technology systems (Mumford, 2006). However, field studies have shown that social systems are more influenced by technological systems and are modified accordingly (Leonardi, 2012). It also dealt with only part of the technology and social system, such as separating management and field workers, despite various actors that make up the technical and social aspects of the organization (Kaghan & Bowker, 2001). Despite these criticisms, the social technology system supplemented the limitations of technology determinism and human-centered perspectives and raised awareness of the interactive relationship between technology and society (Boell & Cecez-Kecmanovic, 2015).

Suppose the socio-technical system explains the interaction between technology and society. In that case, the actor-network theory (Latour, 1990) and the sociomaterial practice perspective (Orlikowski, 2007) assume that technology and social (materials and humans) constitute jointly. It assumes that technology and society do not exist separately but consist of an actor-network (Callon, 1986) and are constitutively entangled (Orlikowski, 2007). Technology and society are not composed of the interactions of individuals with already defined properties but result from the relationships that constitute each other (Law, 2009). Forms and attributes are acquired only through relationships with other things in

the network (Orlikowski, 2010). Because technology and social co-organize each other in this way, there are no purely technical or purely social problems, creating heterogeneous problems of technological and social character (Hong, 2010). These assumptions cover the context, dynamics, multiplicity, and uncertainty of technology, as well as studies that have previously privileged technology or humans and deal with technology stability, homogeneity, predictability, exogenous or stakeholder political interpretation (Feldman & Orlikowski, 2011; Orlikowski, 2007).

2.4. Sociomaterial Practices of Information System Actor-Network

Actor-Network Theory (ANT) assumes that social actors are formed as heterogeneous networks of human and non-human actors (Law, 1992). In a paper on electric vehicle development in France in the 1970s, Callon (1986) presented non-human beings as an actor in electric vehicle development, including automakers, battery development companies, urban transportation system operating companies, research centers, scientists, consumers, social movements, government ministries, storage cells, fuel cells, electrodes, catalysts, electrolytes. It is because these non-human actors act and react like humans, and if any of them are missing, the electric vehicle development network will be dismantled, and the development of electric vehicles will not be possible. Therefore, no electric vehicle development network actor can be hierarchical or distinguished according to characteristics. Consumers interested in the environment and fuel cells are equally important and can act.

ANT's human and non-human actors are co-constructed (Hong, 2010). Computers are jointly composed of networks of computer developers, producers, various parts, computer repairers, and computer users, and human and non-human technologies and materials are composed of actors without hierarchy, such as researchers composed of networks such as humans and computers, the Internet, keyboards, and printing technologies. They are not composed of interactions of objects with already defined properties but are relational results that constitute each other (Law, 2009). Forms and attributes are acquired only through relationships with other things in the network (Orlikowski, 2010).

These actor networks are not fixed and are repeatedly enacted and re-enacted through continuous intra-action (Barad, 2003). The internal act of establishing an actor-network as such a relational being can be called sociomaterial practice

(Orlikowski, 2007). Law (2009) referred to this as the effect that is continuously generated on the web of the relationship of the actor-network and the practice of transporting the web.

Sociomaterial practice refers to the continuous reconstruction of the attributes and boundaries of the actor-network through practices within a relational existence rather than interactions in which separate objects or actors with intrinsic boundaries or attributes. Therefore, sociomaterial practice is the intra-action of relational existence and is called agential cuts (Barad, 2003). Their practices become internal actions because social and material actors are constitutively entangled to form a relational existence. Intra-action of relational beings performed by practices can be created and recognized as objects with specific boundaries and attributes when determining the specific properties of an object. However, the enacted boundaries and attributes are not fixed but are repeatedly enacted through continuous stabilization and instability.

The actor-network theory and the sociomaterial practice perspective are similar in assuming that humans and non-humans or social and material exist in a relationship. We want to examine the sociomaterial practices of the actor-network, believing that the actor-network can better reveal the patterns of human and non-human relational existence and that the sociomaterial practice perspective can richly explain the practices inside the relational existence. In other words, the sociomaterial practice of the actor-network is that humans and non-humans, social and material, form a heterogeneous actor-network, exist in a relationship, and humans and non-humans, social and material continue to be re-enacted through practice.

Let us look at the sociomaterial practices of the information system actor-network as an example of our daily smartphones. Suppose a mother in her 50s and a daughter in her 20s bought the same smartphone simultaneously. A mother in their 50s increases the size of letters on their smartphone with presbyopia and changes the background screen to a family photo. It will install a reunion app, a walking exercise app, and an SNS app that middle-aged people widely use. A daughter in her 20s installs apps that can use various streaming services and SNS apps preferred by young people. Install apps and game apps that can take pictures well and change your background screen to selfies taken with friends. Now, are the two smartphones the same smartphone? The two smartphones have the same technology and hardware but differ. The two social beings, mothers in their 50s and daughters in their 20s, have newly established smartphones to suit their convenience and taste. The two smartphones of

the same model met a mother in her 50s and a daughter in her 20s, and each was established as a new smartphone. Hundreds of thousands of smartphones of the same model manufactured in the factory have become hundreds of thousands of different smartphones through their relationships with each user. Also, the walking app on the mother's smartphone in her 50s will make her walk more, and the game app for her 20s will reduce her study time. As such, the actions of those who routinely own smartphones reconstruct their daily lives. In other words, smartphones and users jointly organize and redefine each other.

The everyday and repetitive nature of sociomaterial practices of actor-network shapes the social world (Feldman & Orlikowski, 2011). The contextualized repetitive behavior of users of an organization's information system can establish different ways of using the same system within the same organization. In a study by Quattrone and Hopper (2006), the ERP system newly introduced by a multinational company established multiple ERP systems as it was used according to users' understanding at each branch office without transparent new business processes. In other words, a single ERP system exists within the organization, but users use it differently, and different ERPs work. It may be referred to as a multi-actor network (Law, 2009). It can be said that the multi actor-network reconstructs the information system in that it is a reality established through different practices, not different interpretations of the information system (Law, 2009).

The sociomaterial practices of the actor-network explain that the information system actor-network is contextual, dynamic, multiple, and uncertain. It is because it is established and reestablished through continuous stabilization and instability through social and material internal actions within a network of heterogeneous information systems between humans and non-humans. These properties of the information system described through the sociomaterial practice of the actor-network reveal the characteristics of the modern information system, such as the reconstruction of smartphones and the reconstruction of ERP.

3.   The Case of Garam Cooperative

Garam Cooperative is a worker cooperative under a pseudonym. For the Garam Cooperative case study, three sources of data, including documents, physical artifacts, and interviews, were used to secure consistency, validity, and reliability in the direction of the inquiry (Yin, 2009).

We observed 'the information system conversion plan' and 'the construction evaluation report' as documents and the operation status of the information system of the Garam Cooperative as physical artifacts. The interview was conducted with ten members of the Garam Cooperative between August and October 2020. The status of members is two management, one board member, seven employees, seven members, and three non-members. The Garam Cooperative's membership system will not meet the conditions for membership until three years after joining the company. Two non-members are in their second year of employment and have yet to qualify to join the member. Garam Logistics is a subsidiary of the Garam Cooperative, and the Garam Cooperative's logistics center was established as a subsidiary after the conversion of the information system. Garam Cooperative is often a member and works for a subsidiary, and Garam Logistics also has employees who are members of the Garam Cooperative and work at Garam Logistics. Details of the interviewees are shown in Table 1.

Table 1 - Interviews with Garam Cooperative Members

	Member Status	Position	Working Period
Member 1	Member	Management	18 years
Member 2	Member	The board of directors	21 years
Member 3	Member/Executive	Employee	12 years
Member 4	Member	Employee	9 years
Member 5	Member	Employee	6 years
Member 6	Non-member	Employee	2 years
Member 7	Member	Employee (Garam Logistics)*	8 years
Member 8	Member	Employee (Garam Logistics)	12 years
Member 9	Non-member	Employee	4 years
Member 10	Non-member	Management (Garam Logistics)	2 years

* Garam Logistics has been separated into subsidiaries since the conversion of the Garam Cooperative Information System, but the members continue to work and use the Garam Cooperative Information System.

This paper identifies the actor-network in the Garam Cooperative's information system transition process and analyzes sociomaterial practice within the actor-network to describe governance differentiation. To this end, we track the development process from the beginning of a project in which actors such as people, technology, and documents form a network to develop new information systems. The information system development project began three years before the research began, and when the research began, the information system was in operation. Therefore, the research is conducted through interviews with past projects, current situations, project-related documents, and artifacts in use.

Different actor network maps depending on the time zone are presented to explain the Garam Cooperative's information system transformation and analyze the actor-network's composition, dynamics, and trajectory (Cecez-Kecmanovic et al., 2014; Sarker et al., 2006). It is because these maps help mark the registrations and associations of actors and in tracking and discussing the reconstructions expressed. In addition, this is because sociomaterial practices that occur inside the actor-network can describe the revealed governance differentiation phenomenon by reconstructing the properties and boundaries of the actor-network.

3.1 Governance

Garam Cooperative operates a restaurant franchise business and is a co-operative that has been converted from a corporation to a worker cooperative. The start-up generation of a corporation before the cooperative has operated the company with a people-centered value as a corporate ideology since the establishment of the company. The direction of these start-up generations led to the conversion of cooperatives with employees as owners of companies. When the Framework Act on Cooperatives was enacted in 2012, the management who held the company's shares transferred the shares to all employees, and about 70 employees who had worked for more than three years gathered to hold a general meeting to decide to convert them into workers' cooperatives.

The Garam Cooperative elected a new board of directors and formed various committees and member councils to formalize members' management participation and communication channels. The Garam Cooperative's members' council is an organization where members can participate in management daily,

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collects the opinions of the members, and delivers the opinions of the members to the board of directors and the general meeting. Garam Cooperative is a management-related committee in which members participate and operates a special policy-making committee, a future strategy-making committee, and a personnel system committee. In the early days of the transition, for example, the Personnel System Committee, consisting of 12 members, discussed the reform of the wage system and the method of distributing members and proposed it to the General Assembly. The wage system discussed at the time tried to minimize the wage gap within the cooperative by designing the gap between the minimum and maximum wage to be less than four times. In addition, for the sustainable growth of cooperatives and appropriate compensation for members, a method of determining the dividend rate of members was proposed after determining 30% of legal reserves, business reserves, and special reserves for member welfare. The committee's proposal was passed at the general meeting.

The governance of the Garam Cooperative consists of the traditional structure of the General Assembly and the Board of Directors. However, it is supplemented by the Member Council and the Member Participation Committee to expand the members' participation in decision-making. Garam Cooperative is a large scale labor cooperative in Korea with about 120 members and 30 non-members. In addition, most of the 700 worker cooperatives in Korea are small, and unlike start-up cooperatives, they are characterized by cooperatives converted from stock companies. As of October 2020, the Garam Cooperative consists of five organizations, including the Garam Cooperative, Garam Logistics, and production plants, and about 120 members are distributed to each organization.

3.2 Information System Development Process

The company's growth was behind the Garam Cooperative's decision to develop a new information system. As the company grows, the number of franchises increases and sales increase, and there is an overload problem that the existing information system needs help to handle. In addition, a franchise management program was needed to systematize customer management and differentiate itself from competitors in the rapidly changing restaurant franchise market. As subsidiaries by function and purpose were established due to the company's growth, the need for an integrated information system connecting each organizational unit was also raised.

"We decided to change the system because we thought it would be good to make decisions intuitively, but we wanted to have a basis for it. The idea is that an integrated information system is needed to connect organizational units within the group because the company is oriented toward the group. Regarding personnel, we hoped that the job value would be set to serve as a basic standard for job movement between units, and we thought a system was needed to reflect this." (Member 2)

"We were using the D program, and the D program came out according to the accounting, so store owners ordered it and pulled it from the center to check it, but there was an opinion that we should change it because there are times when I have a disability during the peak season. If there is a problem like that, I will call and check my order by hand ... That happened twice after joining the company." (Member 7)

The Garam Cooperative's information system conversion plan was established around the Task Force (TF) team for building a computer system. For about three months from October 2016, the TF team prepared measures to analyze the current work, derive improvement tasks, define new processes, and establish a new information system. These contents were written in the Informational Strategic Plan (ISP) Final Result Report (hereafter strategic plan).

The strategic plan proposed improving, organizing, and computerizing the company's business process by introducing a new information system. In other words, information system transformation is promoted to prepare a consistent and efficient process of sales-purchase-production-delivery, integrating individual and distributed information, and introducing a system suitable for the expanding business system.

To this end, the strategic plan proposed is to establish ERP, FMS (Franchise Management System), groupware, merchant force, and logistics management system as an integrated system and link them to external financial management systems and partner portals. The strategic plan proposed that the ERP be carried out in a way that customizes products developed by existing companies, external companies newly produce FMS, and groupware is carried out using existing companies' programs. Figure 1 shows the method of establishing and linking each system, focusing on the primary business process of the Garam Cooperative.

The strategic plan was submitted to the general meeting of members after approval by the management meeting and the board of directors of the Garam Cooperative and was approved at the general meeting of members in February 2017.

After the General Assembly approved the strategic plan, the Computer Team (TF) began concrete implementation to apply for the work in January 2018. However, the controversy continued for five months due to differences between management and computer teams over selecting external companies in charge of technology. The debate was about which company to link and integrate the programs to be built, and the computer team insisted that ERP companies should work on integration. The management insisted that FMS builders should be in charge. While the computer team focused on standardizing work and determined that the expertise of ERP companies was appropriate for program integration, management considered the scalability of FMS programs important within the franchise industry and judged them as program integrators. The conclusion was determined by the management that the FMS builder would perform the entire program integration work.

Finally, the company was decided, and the program construction work began in August 2017. Since March 2017, the computer team has organized the current work process, organized processes that need to be improved or standardized by reflecting employees' opinions, and delivered them to developers so they can be reflected in the program.

However, in organizing the work process, the computer team felt difficulty because the definition of the work was unclear, and the field was not systematic. For example, the same task was handled differently depending on the person performing it. It is likely due to practices such as manual management of prospective customer data. There needed to be more discussion or time to standardize work in the program development process. In addition, employees of each department should have considered defining and standardizing their work as their job. This situation caused difficulties in documenting and communicating requirements to developers. As a result, whenever a problem occurred, it was often dealt with as a temporary measure.

> *"Our organization chart changes once a year, and the person in charge changes as the organization changes, so the way we work changes, so the first person in charge asked for A, but later another person asked for it differently ..." (Member 5)*

"There were many holes in trying to create the system when the field was not organized, and there were many issues in the process of building it, so there were many things that we did after filling it up every time after time. There was an aspect that the company could not accurately deliver the construction direction in the documentation. It was inferior. The problem of systematization in the field, the lack of expertise of computerized personnel, and the lack of time."
(Member 3)

"Communication with the teams and field members that promoted (the computer system) was not smooth. The promotion unit asked Aziz Toby to cooperate with each unit to submit a proposal, but the working units did not feel the need strongly and seemed to think it was not their job." (Member 2)

Figure 1 - Garam Cooperative Information System Establishment Plan
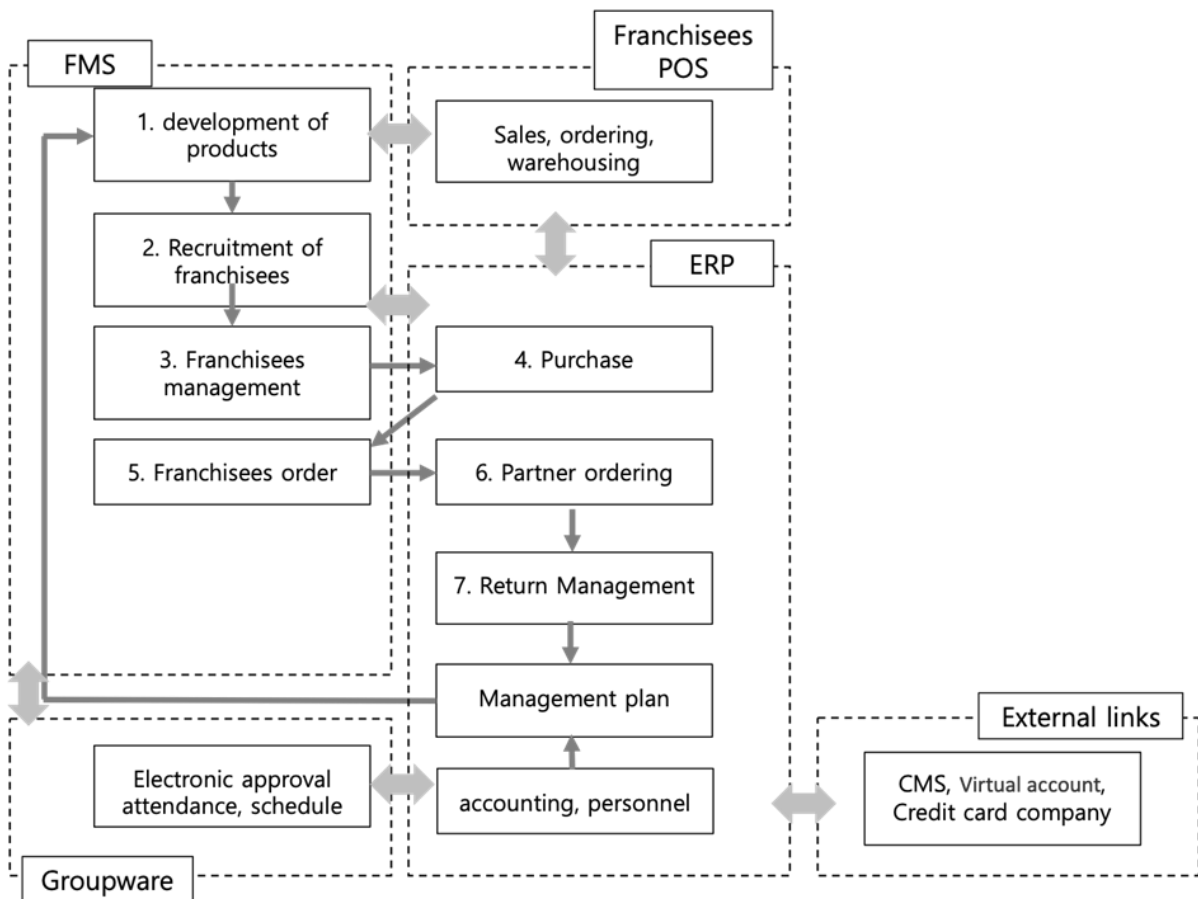
Source: Reconstruction by referring to internal data of Garam Cooperative.

There was also a question of the role of management in the system construction process. The computer team wanted management to participate in the system construction process. In the early days of system construction, management held meetings with the computer team to understand the progress of conversion work. However, it failed to focus on system construction due to problems such as the replacement of representatives and tax audits on the franchise industry. The computer team believes this situation has led to management's lack of understanding of the system.

> *"There should have been participation from the management, but the management has never met. I did not do it once; I did it in the beginning. The management should be aware of how the process changes so that the system could be established later and managed to change it when the working group used it, but there was little participation." (Member 3)*

During the program development period, the development workforce of the development company has changed several times. In the case of FMS, as companies were sold and developers changed during the development period, development did not proceed stably, and the development period increased, causing the entire system development period to be delayed.

> *"In the case of FMS and groupware, development personnel have changed a lot. So FMS is not fully developed." (Member 5)*

> *"Convenience had to be improved, but progress was difficult. This is because there was a complexity, such as the sale of the company during the development process." (Member 1)*

ERP, FMS, and groupware integrated systems were developed in April 2018. Since then, past data have been transferred, the system uses training and pilot operation period, and a new system has been introduced into work in earnest since January 2019.

3.3   Sociomateriality of Members' Practice

Members of Garam Cooperative were embarrassed about the new system, which was developed more than a year after deciding to switch to the information system. It is because the method of use was very different from the existing system. Employees opened the system thinking the operating principle

would be similar even if the computer system were changed. However, the new system had some errors initially and needed to be more accessible and more straightforward. For example, existing ERP programs were simple to delete even if a user entered them incorrectly. However, new ERP programs were not easy to delete, and even if they were deleted, records remained and were affected, so they often appeared as errors in the calculation data. However, it took a lot of work to determine the cause because users needed a sufficient understanding of the program. The computer team also had to solve the problem through the developer so that the problem could have been faster.

> *"Since the franchise FMS is intertwined with ERP logistics, a certain amount of money deposited by store owners should be shown when placing orders at the store, but there were problems such as an error in the number of logistics that appeared to be negative or vice versa. It was not fixed immediately in a day, but it took time to solve. In the beginning, there were such problems, and in our department, the inconvenience of store owners is conveyed as it is..."* (Member 9)

> *"Some old programs have become familiar, some are convenient to use, and some are easy to delete when they are wrong. The new ERP does not work and does not delete it. If you cancel it, there will be a record. Because it is completely different."* (Member 7)

> *"When there are some mistakes in use, the results are not derived, and the cause is difficult to find, so the staff was difficult."* (Member 1)

Problems such as the difficulty of using the new information system and the complexity of solving it have led to conflicts with the computer team and the staff using the system. As for the difficulty of using it, employees raised problems with the computer team, thinking it was a problem with the program, and the computer team accepted that users put all problems to the computer team without proper training or trying. The conflict intensified to the point where a fight broke out between the computer team and the system-using staff. In addition, conflicts were amplified as the evaluations surrounding the system were mainly made in private places rather than officially conducted.

> *"Employees were struggling because of the difficulty of using ... In the case of logistics, if there is an error, the content is large. There was an initial problem with what was ordered from store A to store B. So, there was a fight between the computer and logistics managers. "It is a computer problem, and it is an input problem."* (Member 1)

"Since the introduction, there have been cases where the same inquiry has been made every two weeks, up to six months. Whether the learning effect is poor or if I cannot concentrate, I am a person who does a project, not a person who runs it, so I have to test it and turn it around. The person in charge is in the same situation, but why would I do it if you asked me to test it? You made it, so you should know it the best." (Member 3)

Since the Garam Cooperative introduced the integrated system into its work, it has needed more clarity due to difficulties in using it and conflicts among its members. There was even an opinion to return to the program used before the transition, but after a year or so, members' use of the system also stabilized. However, the methods of stabilization appeared in various ways. It was stabilized in different ways depending on each program, such as ERP, FMS, and groupware, and depending on the user.

Employee 1 group: A modified integrated program

The practices of the Employee 1 group partially modified, partially bypassed, and used ERP, which changed how employees work with algorithms that require accuracy in their work. The sociomaterial practice of the Employee 1 Group and the ERP has registered (some modified) integration programs in the Garam Cooperative Information System Actor Network.

Employee 1 group found errors at the time of program design and development in the process of using the integrated program after introduction. In the case of ERP, it was commercialized and sold as a customer. Errors at the time of development occurred during this customization process and were corrected by the developer at the request of users. In addition, there were demands to return the changed work processes written during ERP design and development. Some of these requests were also accepted, modifying some of the contents of the ERP.

"If a problem occurs, post that there is such a problem in groupware, and the computer team consults with the developer to find a solution." (Member 7)

"There was a demand for the requirements to be changed to what I had done before. I was not used to it initially, but I thought there would be some comfortable parts when I used it, but it was not accepted. Some of the requests have been changed. It is especially ERP." (Member 5)

However, not all of the Employee 1 group's requests for program modification were accepted. The ERP's algorithm differed from the existing D accounting program, so it complained of user inconvenience, but the program itself could not be changed. Several development errors were resolved, and employee group 1 found a compromise between the ERP program principle and ease of use. It is a method of bypassing the parts that cannot be input, adding them to other items, or downloading data with Excel and editing them.

> *"When there are these problems, they may be considered and reflected in Excel or talked to the computer team to be solved by the computer team talking to the ERP developer. Everyone worked it out somehow." (Member 6)*

> *"In accounting, the management accounting does not use the budget, but downloads all the data and edits it in Excel." (Member 4)*

The ERP asked employees for the accuracy of their work. In other words, if the work process inherent in ERP is not followed as it is, it does not work or causes an error. The ERP's demand differed from the previous D program and was opposed to significantly increasing the inconvenience of use. However, it could not be rejected because it was already a computerized task from the D program's time. In addition, since one of the plan's goals to replace the integrated program was to streamline the work process, improved processes were written into the program design. Employee 1 group responded by improving their work accuracy.

> *"Before that, I think ERP was more difficult because there was something that I entered and deleted in program D comfortably… For example, the cost will change if you enter the wrong unit price in ERP, press Cancel, and enter a new unit price. No one knew this. Why is this wrong? The development team came and discovered that the cancellation was due to each other's bites...I learned that I had to cancel all the vouchers going to the merchant because they were out of stock and were caught even if I canceled them, so I became careful about this. The ERP is correct if we follow the principle. ERP is correct if the cost is to be paid by first-in-first-out." (Member 7)*

The system played an essential role in the Employee 1 group's attempt to practice using ERP. The ERP of the integrated program had to be used instead of the already discarded D program because the tasks such as accounting and personnel were already processed by computer. Therefore,

the Employee 1 group attempted to practice in the direction of using ERP. That was the demand for modification of ERP, the indirect use of the unmodified parts, and improved work accuracy. The accuracy of the work required by ERP from employees required the inconvenience of using the program from employees. However, thanks to the already computerized system and the employees' work experience, ERP could remain partially modified without changing the algorithm or discarding the program itself. The social material practices of the Employee 1 group and the ERP have been reorganized with some modifications to the integrated program.

Employee 2 Group: Integrated Program (reduced FMS functionality)

The practice of employee group 2 was aimed at convenience of use. The work of employees who mainly operate and manage franchises were not computerized. It was the development of FMS to systematize the work by computerizing it. However, FMS could have been more convenient for employees who encountered the developed FMS. The affiliated sales and management staff summarized the modifications to the FMS program and asked the developer to modify them. The program modification, conducted directly without the computer team in the middle, was carried out considerably. Unlike personnel and accounting tasks, this was also possible because franchise sales and management tasks were not computerized.

The background of the 2nd group of employees' request for much of the revision of the FMS is that the definition of work was not actively carried out in the field at the time of development. When the computer team requested the job definition and work process to be written on the FMS, the employees did not actively respond because they needed to consider it their work, or different processes for the same work were presented depending on the employee. As a result, the computer team intervened in defining franchise sales and management tasks. The FMS, which was developed based on this, was eventually less likely to be the actual work process of the field.

> *"In the case of FMS, it is inconvenient to turn the system live after April 23rd, so the field asked us to clean up the improvements, and after five months of discussion, the report came out in October, and the system was improved, but it got worse than before. The team corrected it by sticking directly with the company without discussing it with the computer team. Causality, the process has been broken, and we know nothing about what has changed and how. Then he threw it back at us. You guys wrap it up. So currently, FMS is not used*

except for the part that is interfaced with groupware and ERP."
(Member 3)

Much of the FMS program was modified, but the program needed to be more convenient for employees. Previous work practices and annoyance played a role in making employees feel uncomfortable. The work experience of writing merchant management documents in Excel and sharing them within the department using platforms such as Google made it inconvenient to check the merchant management status on FMS. Instead, the Excel file was posted on the groupware department bulletin board and had to be accessed daily for approval and shared with the department members. The security function of FMS also became a factor that made access reluctant. When I visited the merchant and worked after logging into the FMS, the login was released, and it was inconvenient to log in again. As a result, the number of FMS access was gradually reduced, so once every two days, once every three days, and in some cases, even after a week, they never access it.

Sometimes, information that can only be confirmed by accessing the FMS was solved by verbally asking other department employees. These practices reduced much of the FMS function, leaving only functions related to franchise opening contracts and closures. Functions such as sales management, food service product management, commercial district management and counseling management, franchise operation management, marketing, and property management are rarely used. The word 'almost' means that a few employees use it. However, it is not easy to give meaning to because it does not have functions as information and processes internally if not used by everyone.

> *"FMS is rarely used. It was made to be used in the restaurant unit and received many opinions, but they said it was inconvenient to use. It is used only in certain tasks, such as contract work or return process."*
> *(Member 5)*

> *"I did not use a lot of door-to-door inspection management and 100-day inspection logs. The two parts were mostly made in the form of Excel files used in the past in the form of documents within the team, but they were not used because they thought it was faster to communicate within the team than to upload them to FMS. First of all, I access groupware first, so it is easy just to post a document there and check it right away, so that is how it solidified."* (Member 9)

> *"The login will be released if you do not use FMS for more than 30 minutes after connecting. It may be for security reasons, but in the case of Supervisors (SVs), they cannot be accessed periodically during*

phone calls or external activities, so it is inconvenient to reconnect when the login is released, so they only use it occasionally. Do not use anything that feels uncomfortable." (Member 9)

There was a condition that the practice of convenience-oriented employee group 2 was implicit consent of management or a laissez-faire management policy. Management did not implement solid sanctions or compensation systems to allow two groups of employees to use FMS. It was even tolerated to handle the same work process in different ways. When the franchise opens, the Garam Cooperative supports the initial volume of the franchise. An error occurred when the franchise department placed an order with FMS when supporting the initial volume. Factors such as unit price fluctuations intervened when ordering, causing problems because the quantity did not come properly or the product was not delivered. Two departments manage franchises at a regional level, one decided and implemented differently to order with the owner's ID, and the other continued to use FMS. Each of these business processes was conducted in consultation with the merchant management department and the logistics department. However, the management needed to decide on which way to proceed.

> *"(Doesn't the management point out about this?) At the beginning of FMS, they told me to do FMS, but it did not work out, so I told them to upload groupware gradually... The key is to make it simple. The management may not know every detail from 1 to 100, but they know everything is happening." (Member 9)*

The convenience-oriented practice of Employee Group 2 reduced the FMS, a franchise operation management program, to a franchise contract and closure management program. FMS requested the two groups of employees to systematize and share information on franchise management tasks but failed to carry it out and had no choice but to reduce their functions.

Employee 3 Group: Integrated Program (with the third program)

An integrated program (with the addition of a third program) reconstructed as a social material practice of an integrated program with an employee group 3 is described as an integrated program for consistency in developing discussions. However, a third program is just an additional program that is not integrated into an integrated program.

After the integrated program was introduced, logistics center employees used the logistics function included in the ERP. The old D program was an accounting program with some logistics functions. Therefore, the Garam Cooperative logistics work was processed through a computer system. Since then, the ERP of the integrated program was introduced by strengthening the logistics function, and the logistics center also had to use ERP. However, for the three groups of employees, ERP was a program that was large, slow, and not good at causing accidents frequently.

> *"The biggest problem is speed. A function closes at the center and creates an invoice called confirmation, and it takes 30 to 40 minutes to do this. Unnecessary time occurs. In the event of an error, it cannot be processed immediately, and the computer team does not know it well, so it has to be handled by contacting the ERP headquarters, which takes much time and is slow to process. There are errors in the customized part, not the original function of the ERP...Considering our sales and functions, I think it is too early. General distribution centers use light programs. We need a simple program just for logistics."* (Member 10)

> *"The biggest problem with logistics is... There was a server problem a few days ago. The merchant made a deposit, which was not reflected in the computer system. If the franchise fails to place an order by the fixed time, the factory price will be delayed until the problem is solved. Sometimes, it takes time to confirm and cannot be shipped. That problem still occurs today. Nevertheless, there is no clear cause, which is said to be the user's negligence..."* (Member 10)

The three employee groups used ERP for about a year and a half and immediately introduced a new logistics program when the logistics center became independent as Garam Logistics. For the 3rd group of employees, ERP was a program that could have been better at work because it was large and slow. The newly introduced programs are the D accounting and H logistics programs. The 3rd group of employees uses the integrated program for Garam Cooperative-related work, the D program and the H program for other work, and the D program for corporate accounting.

Table 2 - Garam Logistics Program Usage Status

	Tasks related to Garam Cooperative		Other tasks
Sales	ERP (Enterprise Resource Planning)		D Program
Distribution			H Program
Return	FMS (Franchise Management System)		
Accounting	D Program		

*   D Program: Accounting software produced by Company D
** H Program: Logistics software produced by Company H

The practice of the Employee 3 group is a denial of use. Integrated programs are used for tasks related to Garam Cooperatives, but all other tasks show that they are forced to use integrated programs by using other programs. This practice is possible because Garam Logistics is an independent corporation.

The Garam Cooperative Information System was reorganized into different information systems through continuous internal actions of internal actors, that is, social material practices. Structural aspects played a role in the emergence of different social material practices. Employee 1 had no choice but to use ERP because a computer system processed accounting and other tasks. However, Employee 2 could work without using FMS because it was a process of computerizing tasks that were not computerized. In the case of employee 3, it was possible to add a third program under the condition of corporate independence. In other words, structured work conditions constrained employees' practices.

The problem of ease of use of integrated programs played a role in the emergence of different social material practices. The customized ERP has a different operating principle from the existing D accounting program. Employees complained of difficulties in using it, and errors that occur when using the program are still controversial, whether technical or user problems. FMS caused inconvenience when external fieldwork processes were not sufficiently reflected in the design, and technical errors led to confusion in real work.

3.4 Differentiation of governance

In Section 3, we viewed the 'Garam Cooperative Information System' as an actor, that is, an individual, and looked at the development process over time. This section examines the social material practices of the Garam Cooperative Information System as an actor-network and the resulting stability and instability process of the actor-network. Through this, we describe the governance differentiation of Garam Cooperatives.

Figure 2 shows the network of actors in Garam Cooperative's information system in 2017 when Garam Cooperative was preparing to develop a new information system. It is called the old information system actor-network.

Figure 2 - Garam Cooperative Former Information System Actor-Network
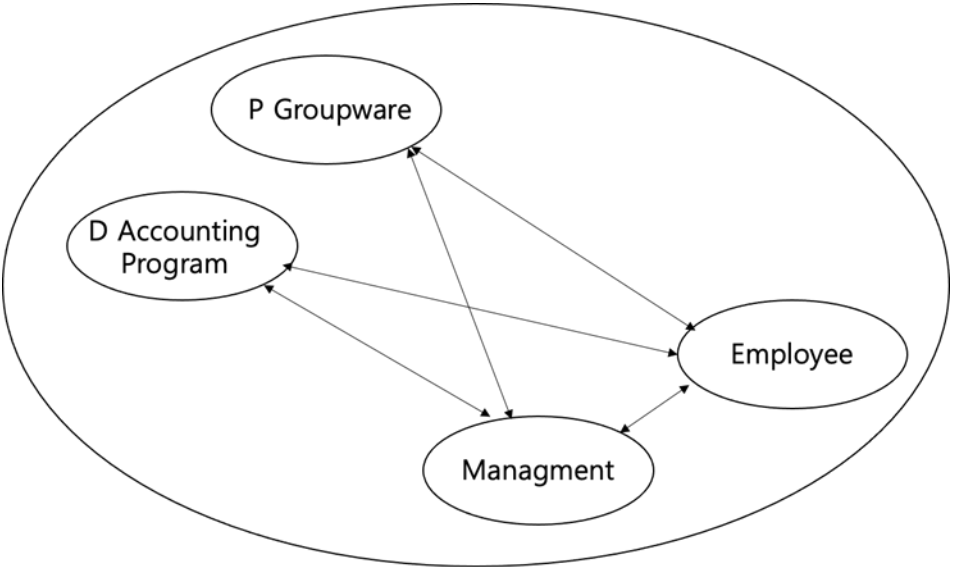
The P Groupware and D accounting programs, non-human actors in the Garam Cooperative's old information system actor-network, are replaced by integrated programs consisting of FMS, ERP, and groupware and converted into information system actor networks such as Figure 3. The newly developed information system actor network had to show that it could process more data accurately in a short time than the old information system actor-network, strengthen the competitiveness of Garam Cooperative's franchise management efficiency, and perform information integration. However, the stabilization state of the new information system actor network was temporary, and in the ensuing conflict, another order was formed through different sociomaterial practices.

**Figure 3 - Garam Cooperative Information System Actor-Network
after registering for the integrated program**
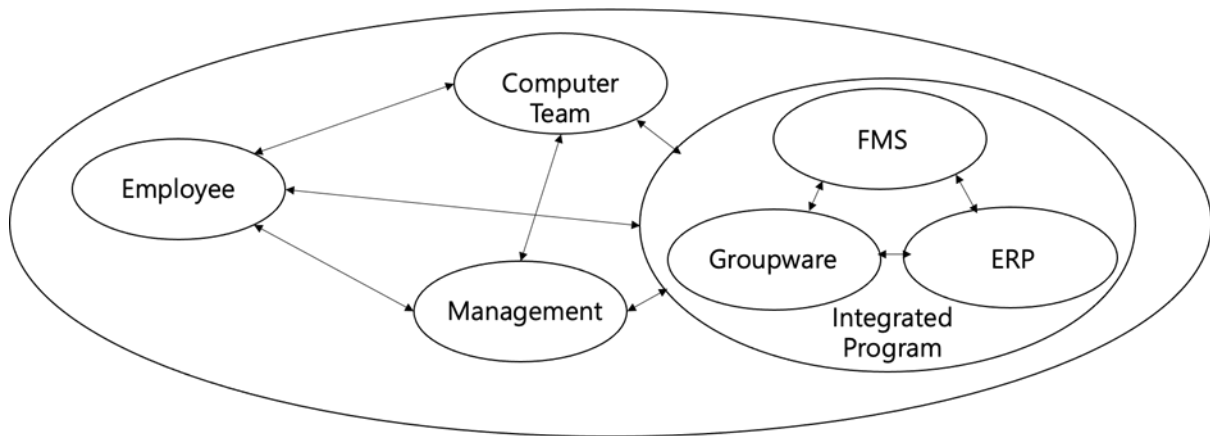
Let us look at each Garam Cooperative Information System Actor Network actor. First, the integrated program has a different algorithm from the old program and has some errors in the development process, an 'unagreed work process.' Program D of the Garam Cooperative Old Information System deletes the input, but the integrated program did not. Once entered, the entire process was affected, and even if it was deleted in one process, it remained in another process, resulting in different results. Some errors made during the development process could be corrected, but the algorithms that the integration program had were unmodifiable characteristics of the program. In addition, employees did not agree with some of the work processes contained in the integration program. In some cases, the practice of performing the same task differently depending on the department or person could not be integrated into one, and the process arbitrarily set by the computer team was entered.

User staff thought the integration program would be similar to the old one. Since they are all computer programs, they thought the principle of use would be similar. So the employees thought they could use it if they had a manual, so they did not faithfully participate in education. In addition, since the computer team was in charge of the development of the integrated program, the computer team was responsible, and the computer team could solve the problem in case of a problem.

Recalling that the development of the new information system was decided at a general meeting of members attended by all employees, including management, the computer team considered that all members were responsible for the development and introduction of the integrated program. However, during

the development process, management and employees did not share such responsibilities, and the computer team recognized that they were responsible alone. Therefore, in the introduction process, management and employees should fulfill their respective responsibilities to settle the integrated program on the network.

Management could not participate in developing integrated programs due to the significant tasks faced in the position of responsibility for cooperative management. Concerning the integrated program development work, they were involved in selecting a company, and the computer team was assigned as the person in charge so that the computer team could perform the development work. In addition, after the integrated program was developed, employees were obliged to use it, and the computer team was obliged to manage it. These integrated programs, employees, computer teams, and management positions could not converge into one. Moreover, the Garam Cooperative Information System actor network was reorganized through each practice into a multi-actor network, as shown in Figure 4.

This multi actor-network shows a particular problem in operating the governance of Garam Cooperatives as a democratic operating principle. Although there were problems with the ease of use of the integrated program, Garam Cooperative employees had a member council to express their opinions on management problems, and they could raise problems through a work-related organizational system. Through this process, we gathered common positions. We made decisions such as giving up the use of integrated programs, deciding to use them together even though it is difficult to use, or improving improvements with more time. However, such a discussion or decision has yet to be made. Eventually, it was left to each member's practice, and within the information system actor-network, three types of social material practices formed multiple information system actor networks. Through this, it can be seen that the governance of Garam Cooperative is differentiated.

We want to examine what led to forming of a multi-actor network that revealed the differentiation of Garam's cooperative governance. After the Garam Cooperative was converted from a corporation to a cooperative, employees became more responsible as cooperative owners. The company that invested in the members' name should grow. Members attended the general meeting of the members. They could decide on the overall business operation, budget execution, and wages of the company and elect a board of directors. In addition, members can attend monthly members' council meetings

to receive regular reports on company management and express their opinions. These contents were delivered to the board of directors and the general meeting. The wages of employees and management were also determined at the general meeting, and the members themselves determined the dividends of members at the general meeting. This formal change revealed the difference between a corporation and a cooperative, making the members feel the change.

Figure 4 - Garam Cooperative Information System Multiple Actor-Network
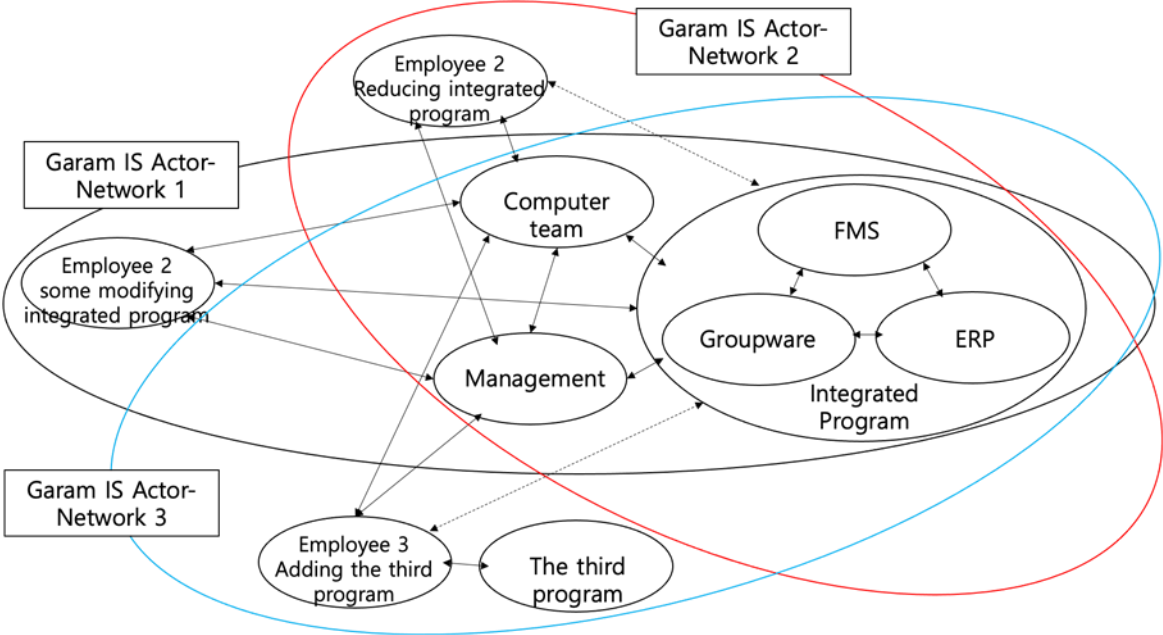
"I do not feel the company has changed dramatically since the transition. It seems right that employees have become more owner-conscious. Trying to participate more can make my voice heard more than other companies, but sometimes it's too much because it's too democratic. It's hard to decide... I changed my mind after changing it to a cooperative in the previous company. The company needs to do better. I don't want the company to fail." (Member 7)

"I felt it was good to know how the company works, to share opinions during the member group meeting, and to express my intention. Now, those parts do not come as much of an advantage. If the company does well, it is accepted well, but when it becomes difficult, it becomes cautious. I do not feel good now. The atmosphere. It's uncomfortable to say why." (Member 5)

The sense of ownership felt by the members of Garam Cooperative after its conversion to a cooperative was not only positive. Members actively expressed

their opinions on the agenda at the general meeting and clashed with opposing opinions. Differences in interests, such as the history of start-ups in two different regions, characteristics of each business sector such as manufacturing, distribution, sales, and management support, and personal relationships and open recruitment due to early start-up employment were also found to be management-related positions. These are problems that can appear in the operation and growth process of many companies, but they were inevitably highlighted in Garam Cooperative. It is because members can speak out through members' councils and general meetings and argue their opinions through voting. The venue for public debate, which will implement the democratic management principles of cooperatives, failed to work as a place to coordinate these differences and seek directions for development.

> *"When there is a major agenda, I have to get approval from the members, so I often hold general meetings, and I think people tend to be sharp, and I think I'm sensitive without being rounded." I have a lot of conflicts with other people, and the atmosphere is not good. The atmosphere is always wrong. It'll be a bright atmosphere for a cooperative. There are conflicts and complaints among people, and it seems that cooperatives have many side effects because it is not easy to cut anyone." (Member 6)*

> *"Autonomy is a problem... It is not bad because we are all different when we gather opinions, but reaching an agreement on that autonomy seems difficult. I'd like it to be brought together, but it takes much time to gather opinions on it, and it's going in different directions...Some people set up businesses before the cooperative in Seoul and Daejeon, so some think it's like a regional conflict." (Member 9)*

> *"I came in knowing it was a worker cooperative, and I expected it at first, but my expectations gradually disappeared as it passed. There seems to be no one in charge. After joining the company, the department changed every two years, and I felt that no one was responsible. If you start something, there should be something that says, "If it's wrong, let's not do this in the future, but there was no such thing. "" (Member 5)*

The Garam Cooperative had an autonomous work performance culture of employees even before transitioning to the cooperative. It is based on the people-centered management philosophy of the founders and the practice of hiring employees centered on human relations in the early stages of the business, and after the transition to a workers' cooperative, the members

who became the owners of Garam also had the legal right to participate in the company's management decision-making and the election of the board of directors. Members of the Garam Cooperative Federation are responsible for management decision-making and labor obligations as part of performing their responsibilities simultaneously. However, the Garam Cooperative operated confusingly to separate responsibility for decision-making and intense labor following the hierarchy and command of daily work as workers. Autonomous work performance was sometimes misunderstood as ignoring work hierarchy and command or distorted as neglecting labor responsibility. In particular, as these appeared in relationships formed around human relationships, conflicts between generations or groups were also made.

> *"Garam has more autonomy than other companies. Regardless of the cooperative transition. With each other. I did not understand at first. There are many cases where I came as an introduction, and I have brothers. That is why we were comfortable with each other before the cooperative transition. I think the biggest advantage is the large amount of autonomy. However, there is a director and a superior, but he treats them comfortably, so even if he treats them recklessly and orders them from above, the staff below often asks why I have to do it. That doesn't mean that work isn't going to work. It's going on because someone else is doing it, but... Some people do it. There is a victim. There is someone comfortable. If you order things, you'll know the person who refuses, the person who listens. I think I'll give instructions to the person who listens. So the work is overloaded with too many people. Even if you look at the team, you can see that he works hard when there are three or four team members, and some people don't think this is it. I think the biggest problem is going out anytime or doing business. I will use it in reverse. There will also be a wall between team members. It's relative, so I'm working hard... Therefore, there is such a thing that distrust builds up." (Member 8)*

> *"Compared to the previous company, it has much autonomy. Aren't you being too careless with your boss? Is this what a cooperative does? It makes me think that. Maybe I'm not familiar with the cooperative. It could be our company's atmosphere. Sometimes it is confusing whether the atmosphere of our company is like this or the cooperative is like this. Our company was like that even when it was a corporation before." (Member 7)*

After converting to a cooperative, Garam Cooperative introduced the above member participation system required by the Framework Act on Cooperatives. It toured and studied foreign best practices, introduced a member council, and

allowed members to participate in various management-related committees. Finance was invested in member education, and efforts were made to reduce the wage gap between management and employees and to establish a fair wage system. All of these attempts were a process to share the values of cooperatives and embody democratic operating principles within the organization. However, such an attempt did not change the culture and practices that Garam had brought about in history before the cooperative. Social material practices that emerged in information system development show this well.

Different social material practices within an organization show no single operating principle to regulate members' practices. Work autonomy based on personal relationships recognized by members acts as a background. Work autonomy based on personal relationships derived from the start-up history and start-up ideology of the Garam Cooperative was mixed with autonomy based on the democratic operating principles of the workers' cooperative. Work autonomy, understood differently by members, appeared as a practice based on individual judgments in converting the information system.

Garam members should have used the cooperative's decision-making system to convert the information system. When integrated programs were introduced, conflicts between members intensified, and the use of integrated programs emerged as an essential issue; members raised and argued in private rather than looking for formal decision-making structures. The General Assembly decided to develop the information system, but the evaluation of the development results was not even presented to the General Assembly. Without democratic operating principles, a formal decision-making system was useless. It shows that members needed to internalize the principle of operating cooperatives that members democratically participate and decide using decision-making systems such as the member council and the general meeting of members as the operating principle of the Garam cooperative.

The business hierarchy in which the business plans determined by the members of the general meeting are executed was shaken by the autonomy of work based on private relations. Work command has yet to be made or accepted as to whether or not to use the integrated program. Under the acquiescence of management, the phenomenon of performing the same business process differently for each department or using the integrated program was found. This example shows management also accepts work autonomy based on private relations as laissez-faire management.

In the end, the decision-making system and principles formalized by the Garam Cooperative after converting to a cooperative were not internalized by the members, and it can be seen that work autonomy and laissez-faire management views were taking root. Converting the information system revealed this organizational management principle of the Garam Cooperative. Each actor's unconverted interests clashed and conflicted while developing and introducing a new integrated program. However, no formal decision-making system was used for members to participate, and work autonomy and free management based on personal relationships allowed practices based on each member's judgment. Furthermore, this served as a factor in multiplexing the Garam Cooperative Information System actor-network.

4. Conclusion

The analysis of the Garam Cooperative Information System development process has shown that the Garam Cooperative Information System has been reorganized in different ways and established as multiple information systems. The Garam Cooperative initially wanted to achieve this by converting the information system to expand and speed data throughput as the company grows, systematic franchise management to secure competitiveness in the restaurant franchise market, and an integrated information system. In other words, it was intended to promote the organization's growth that is being scaled through a single integrated information system. In order to realize this purpose, the Garam Cooperative promoted, with the consent of its members, the conversion of the information system at a general meeting involving all members.

However, although the information system conversion was successful, it was implemented as multiple information systems rather than a single one. It is not purely due to technical problems in integrated programs or organizational problems such as conflicts between members, but rather to social material practices created by the structural entanglement of technology, people, and organizations.

The integrated program algorithms, unagreed work processes among employees, program errors, inconvenience in using programs, institutionalized prior practices, membership autonomy based on personal relationships, free management, and failure of the cooperative decision-making system. The social material practice involving these elements was reorganized into

an information system with some modified integrated programs registered, an integrated program with reduced FMS functions registered, and an integrated program with a third program registered.

The process of converting the Garam Cooperative's information system showed the situation, dynamism, multiplicity, and uncertainty of the information system. Different social material practices appeared depending on the environment, institutions, and users of the Garam Cooperative's business department, and the reorganization of different information systems shows the situation of the information system. In addition, multiple information systems formed by different information system reconstructions show the redundancy of the information system. It can be said to be uncertain that the Garam Cooperative information system is not fixed but has been reorganized and changed so that it can be changed dynamically and continuously.

The information system diversification that appeared in the process of converting the Garam Cooperative Information System revealed that the governance of Garam Cooperative was differentiated. Garam Cooperative is a worker's cooperative, and in principle, the interests of the company and the interests of the members coincide and make management decisions with the participation of the members, so it could be predicted that it would be carried out in unison when the members decided to switch to the information system. However, the Garam Cooperative had different organizational management principles understood by its members as autonomy based on the organizational management principles of the workers' cooperative and private relationships formed from the beginning of its foundation. Converting the Garam Cooperative Information System became a mechanism to confirm the organizational operation principles of the Garam Cooperative. Cooperative decision-making systems such as general meetings of members and council of members did not work due to differences in interests between management, computer teams, and employees. Furthermore, private communication replaced the position, and member autonomy based on personal relationships became a factor in implementing different social material practices while allowing each member to decide whether to use an integrated program.

The Garam Cooperative's organizational management principle, which "mixed the principle of cooperative operation and autonomy based on private relations," became a clue to understanding the subsequent organizational changes of the Garam Cooperative. It was confirmed after this study that the Garam Cooperative's organizational management principle revealed through

this study led to the regression of the cooperative. The study was limited to October 2020, but the organizational changes in the Garam Cooperative, identified in an interview conducted in September 2022 for the possibility of further research, were carried out in a direction that retreated the authority of its members. Garam Cooperative, whose cooperative organization was a business organization, changed its organization in 2021 to a way that is holding company-type cooperative that owns four subsidiaries. Due to the organizational change, the cooperative only held some shares of each stock company and lost its business function. The cooperative was virtually divided into four corporations, and the members were members of the cooperative but worked as employees, limiting their participation in the company's daily management decision-making; that is, their authority as members was reduced. Garam Cooperative maintains the form of a cooperative, but the actual authority of the members has been reduced.

In addition, dozens of members were restructured during the organizational change process, leading to legal disputes. In order to maintain workers' employment in the economic crisis, wages are cut (Hanshin University Graduate School of Social Innovation Management, 2016), or employment is expanded by increasing production facilities; this is also a matter of concern (Whyte & Whyte, 1991).

This study expanded the scope of cooperative research in that it dealt with the materiality of the information system in cooperative organizational research and confirmed the differentiation of governance through it. Over a decade since Garam Cooperative was converted to a cooperative, it has established a democratic decision-making system and expanded management participation. However, it only confirmed that governance had been differentiated by not comprehensively analyzing the reasons for maintaining the pre-transition practices. Suppose the causes of governance differentiation are analyzed through research on the conversion and regression of cooperatives of Garam Cooperatives: in that case, it will be significant for the movement and research of workers' cooperatives.

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