Case Report

Participatory Public Service Design by Gov.3.0 Design Group

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Abstract: Citizen satisfaction levels with public service have become a key indicator in evaluating a nation's policy capability; as such, it has become important to realize citizen-centered public service that enhances the satisfaction of citizens. Governments need to adopt new and creative methods to respond to changes and redefine the conditions of their policy processes. This study reviews the effectiveness of utilizing open innovation by design thinking for policy processes, and aims to detail the conditions for a policy process geared towards citizen-centered public service. The study reviews open innovation as a means of overcoming the insular tendencies of organizations, and also reviews the advantages of design thinking in identifying the diversified needs of citizens and coordinating their interests. Based on those, we conducted a case study and applied open innovation by design thinking for policy processes. The results revealed that key conditions include cooperation among designers, the diversification of communication channels between internal and external organizations, the joining of citizen experiences, repeated verification of citizen needs, and visualization of the whole progression. Such conditions are principal factors that contribute to citizen orientation and participation, and are expected to play a conducive role in the realization of citizen-centered public service in the future.

Keywords: participatory policy; citizen-centered; citizen participation; citizen orientation

1. Introduction

Trust in government is an important goal in order for governments to implement policy measures effectively and realize good governance. Recently, some surveys have shown that trust in government has been declining worldwide, including in the United States and Europe [1]. The decline seems to be a general trend, and can be regarded as a government failure. Each country is exploring new and creative methods of administrative innovation [2]. South Korea is no exception. South Korea has been categorized in the distrusted country group, where public trust in government has been ranked low compared with the level of trust in government expressed by citizens of other countries [3,4]. According to a study by the Organization for Economic Co-operation and Development (OECD, 2015), the citizens' level of trust in the South Korean government fell to 34%, which is in the mid–low range ranking of 26 out of the total 41 member countries [5].

Although the South Korean government has made a great deal of progress on government effectiveness through reforms, South Korea faces the ongoing challenge of improving transparency [6]. Transparency and participation have been cited as key objectives for building trust in government by many research studies. Kim (2016) explained the relationship between participation, transparency and trust. The author asserts that participation contributes democracy, efficiency, and transparency, and with these, the cooperative method will be constructed and the level of public trust in government will

consequently be increased [3]. The reason for the low ratings in the level of trust in the government and citizens' satisfaction with public service may be found in the "insular" characteristics of government organizations. In a 2013 OECD study on transparency in policy decision-making, the South Korean government took the 133rd position out of the 144 countries surveyed. Such results might stem from the closed nature of national government organizations. Government design policies and provide public services from a supplier organization standpoint with a target to enhance their operational efficiency and ease of achieving objectives [7]. Such a supplier-centric public service should not but be passive in discovering and accommodating the innate needs and problems intricate to the lives of citizens, as it would deprive the citizens of the opportunity to validate whether the policies serve the public good. Consequently, citizens become unable to receive satisfaction from the public services derived from such policies, and grow to mistrust their government. Such a cause and effect phenomenon could be summarized by stating that a delivery gap has occurred between the government and its citizens. As citizen-centered public service proactively seeks out and accommodates the problems and needs of citizens, its process, objectives, and achievements are all based on satisfying the citizens, and thus reducing the delivery gap [8]. To secure transparency in policy decision-making and overcome the delivery gap, change is needed within government organizations. The type of organization is an especially important factor. According to Rosenstone and Hansen (1993), the participation of various citizens or groups has a close relationship with trust in government, administrative responsiveness, and political efficiency [9]. Osmani (2007) stated that participatory governance has gained enormous popularity in recent times, both in academic discourse and actual practice [10]. Guutafson & Hertthing (2017) studied citizens' motives for participation in such new governance arrangements [11]. Ansell and Gash (2007) stated that over the last two decades, a new strategy of governing called "collaborative governance" has developed, and they developed a contingency approach to collaboration that can highlight conditions for collaborative governance [12]. Blakeley (2010) outlined a useful way of understanding the developing relationship between governance and citizen participation [13]. Cornwall and Coelho (2006) mentioned that public institutions need to be responding to the calls voiced by participants for greater public involvement in making the decisions that matter, and holding governments to account for following through on their commitments. They also explored some of the meanings and practices associated with participation of citizens, both in theory and in practice [14].

Over the past few decades, a new form of policy process has emerged to replace adversarial and managerial modes of policy making and implementation. Policy process based on citizens' participation, as it has come to be known, brings public and private stakeholders together in collective forums with public agencies to engage in consensus-oriented decision-making [2].

This study focused on the importance of "citizens' participation" to secure transparency in policy decision-making and overcome the delivery gap. The study aims to detail the conditions for a policy process that is geared towards citizen-centered public service. Such conditions are principal factors contributing to citizen orientation and participation, and are expected to play a conducive role in the realization of citizen-centered public service in the future.

As with the general problems in our society, one must consider that the problems with public service are also complicated. Complication in public service originates from the disparate needs of the citizens. As the scale of public service expands, so continually does the complication of interests [15]. Therefore, to understand the varied interests of citizens and obtain accord and balance through adjustment, a new process or methodology for problem-solving is necessary. Changes in government activity requires not only organizational changes, but also a new process that supports such changes.

Research question

This study was conducted based on the following questions.

- First, what are the principles that must be considered for public service?
- Second, what is the significance of utilizing open innovation in policy process?

-　　　Third, what are the advantages of using design thinking in policy process?
-　　　Fourth, what is the efficacy of utilizing open innovation by design thinking on policy processes?

2. Literature Review

2.1. The Principles of Public Service

The conceptual definition of public service is wide-ranging and fluctuates with the epochal and social paradigms [16]. This study confirmed the principles that public service should consider—such as concepts, fundamental qualities, and innate characteristics—through a literature review. The purpose of this was to establish the principles that should guide policy process to achieve citizen-centered public service.

As the concept of public service is wide-ranging, and as the viewpoints, needs, and objectives of public service have changed with the times [16], a variety of definitions exist. Public service is the process through which the government distributes benefits in order to solve human problems and form a more ideal environment [17]. Roth (1987) stated that it is the fundamental justification of a government's existence to differentiate public resources from private resources, and use them to provide its citizens with public benefits and satisfy their needs. Kim (2002) stated that public service refers to the comprehensive set of activities by the government to supply resources and services to society, aiming to satisfy public desires. Public services are the tangible and intangible products that a government supplies to its citizens [18]. The fundamental value intrinsic to such diverse definitions could be found in the etymology of the word "public" as explained by Horace Frederickson, who created and promoted the new public administration. He asserted that there are two etymological sources to the word. First is the Greek word pubes, which means maturity. Here, the term maturity refers to the ability to understand the interests of others and to understand the relationship between an individual and others, as well as the ability to identify such relationships. The other is another Greek word koinon, from which the English word "common" derives. The word koinon comes from komm-ois, which means "care with" in Greek. Both "common" and "care with" are rooted in the importance of relationships. The meaning of the word "public" combines the meanings of "common" and "care with" in addition to the concept of "maturity," thus implying not only how one works with others, but also how one is "looking out for others" [19]. Relation orientation may be construed as an activation of interactions that occur within shared relations that include numerous participants, and mature solicitude may be construed as the understanding, consideration, and balancing of the impacts and losses that such interactions create. Based on the above interpretation, it may be summarized that "relation orientation" and "mature solicitude" must be principles of public service. Public services in the past have had two types of problems. The first came from the government practice of setting policy goals that were easy to attain. A simple fulfillment of efficiency and productivity, as well as reaching fixed quantity targets that were easily achievable, were set as policy objectives. The other was the top–down delivery system [20]. When a small number of experts plan and provide policies for the sake of the government's operation management efficiency, the citizens are relegated to the role of unilateral receivers [8]. A supplier-centered public service, which emphasizes the interests of the government as the supplier, has faced a period of change since the 1980s due to problems in goal setting and delivery systems [21]. Citizens have grown smarter with higher levels of education and information access, and individually they harbor a variety of needs, and expect public service to provide refined care. Furthermore, citizens have recognized their dissatisfaction with public services was being caused by siloed policy processes that excluded citizens, and subsequently raised objections against the delivery gaps caused by such processes [8]. Due to such changes, the demand on public services based on citizens' basic and potential needs is expanding [16]. It has become necessary to convert to a citizen-centered public service, which emphasizes the demands, needs, and satisfaction from the standpoint of the citizens. Governments must newly establish the conditions of policy processes that identify the needs of citizens by considering their individual traits (inclusive of the

demographical, social, economic, cultural, and educational backgrounds) and aim to reflect the same in policy decisions [22].

2.2. The Significance and Methods of Utilizing Open Innovation

The private sector has continued to achieve innovation through "openness" in order to surmount limits to growth and adapt to changing paradigms. By focusing on the effectiveness of collaboration and open innovation, in which service users are directly engaged with the innovation of services [23], the study considered the use of open innovation as a means to overcome the insular characteristics of government organizations. Through the literature review, the study investigated the significance and methods of utilizing open innovation for citizens' participation (or interactions between government and citizens) in policy processes.

Innovation is normally applied to the product, service, and system level. Scott (2011) defines innovation as something different that has impact [24]. It contains not only tangible, but also intangible things, and change can be incremental, radical, or transformational. To manage these complicated and diverse circumstances, it should be handled in a better way. Greg (2017) suggests using an innovation matrix, which is divided four sections: basic research, sustaining innovation, disruptive innovation, and breakthrough innovation [25].

Although government organizations have continually attempted to transform themselves, such efforts relied mostly on internal resources, and thus were limited in their vision, as well as in their ability to overcome the introverted and closed nature of those organizations [26]. After being first discussed by Michael Porter at a national strategic level, open innovation has constantly stood at the center of discussion on innovation strategy for public societies or government organizations such as public bureaus [27]. Henry Chesbrough (2011) defined open innovation as "a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology". In such regard, the study intended to contemplate open innovation as a method of innovation to overcome the insular nature of government organizations.

Open innovation has been carried out extensively in a variety of fields for more than a decade based on the outside-in and the inside-out types, but in most instances, they were deemed limited in form, whereby outside knowledge or ideas were imported in a one-off manner, or internal resources were exported outside to boost their utility. These cases were characterized by their foundation on insularity, where resources such as knowledge and ideas moved only in one direction [28]. Therefore, if government organizations desired to utilize open innovation as a strategy to surmount insularity, they could consider using the coupled type. That is because coupled-type open innovation enables the bilateral importing and exporting of knowledge, information, and ideas from both internal and external organizations, and draws out innovative results from a mutual union through collaboration. In particular, for the government to attempt interactive communication with the citizens or collaboration, it is necessary for it to utilize the innovation platform mechanism shown in Table 1. In general, such platforms are founded on internet communication technology (ICT), but in this context, they differ in that they signify a ground upon which internal and external organizations exchange knowledge, information, and ideas smoothly, and attempt bi-directional mutual interactions.

Table 1. Case Study Outline.

Title	Education	Overcoming Mismatch Between Characterization High School Curriculum and Occupations
Policy Target	Adolescents	Goryeong High School students majoring in culinary art
Period of Operation	Eight weeks	08.01.2016~09.23.2016

This study focused on three major functions of innovation platforms. The first function is that they support innovation based on communication between internal and external organizations. The second function is that they support innovation by circulating knowledge and ideas generated from the experience of external human resources. The third factor is that they place importance on evaluating the process of innovation and support the effective generation of innovation [27].

Governments could apply such functions as follows. First, governments could ease their internal silos and attempt to generate communication between internal and external organizations. Second, they could introduce knowledge and ideas stemming from the experiences of citizens and experts that reside in organizations outside of the government. Third, they could sustain policy innovation through the sincere evaluation of the policy innovation process rather than through evaluating efficiency or productivity.

Open innovation is garnering attention as an innovation strategy that counters policy issues, changes, risks, and challenges [29]. For policy innovation, constant interaction between suppliers, citizens, and stakeholders is heavily emphasized, as well as the process of attempted consensus and adjustment [30]. This stems from the view that government organizations can realize services that are aligned with public values by interacting with the knowledge sources from outside [31]. In such interactions, the government's role is redefined as one that supports the citizens in active self-expression or in the fulfilment of common interests [32], whereas the citizens' role is redefined as the joint producer of policies [33]. Such a re-definition of roles is accompanied by massive changes in government organizations, the character of which may be summarized as breaking out from vertically integrated organization structures or citizen orientation [34].

By utilizing open innovation in policy processes, governments would reinforce their interactions with citizens and redefine the relationship, while simultaneously deriving drastic organizational changes. Such changes trigger horizontal agreements and regulations between governments and citizens, as well as contribute to an enhanced citizen orientation. Policy processes with a high citizen orientation also have a high value towards the public benefit, provide highly satisfactory services, and enhance the outcome of public services [35]. As such, the use of open innovation in policy processes is significant.

2.3. The Advantages of Using Design Thinking in Policy Processes

Design thinking is effective in producing innovative solutions to policy challenges such as a loss of trust in policies and the expansion of ambiguity in policy management activities [36]. Noting that design thinking is effective in problem-solving based on extrapolating the users' potential needs [37], the study considered the utilization of design thinking as a means to surmount the complexities of public service. Through the literature review, the study aimed to validate the strengths that manifest when the general attitude that design thinking is a practical mode of solving obstacles by combining logic and creativity is applied to policy processes [38].

Although developed countries and numerous public organizations recognize that they must reflect citizens' opinions or expert knowledge in policies by opening up, they continue to show an unenthusiastic tendency towards organizational innovation [33]. This is due to the ambiguity surrounding the means of responding to the complexities of citizen issues and demands. There is complication because the specific phenomena, issues, problems, needs, and interests do not exist in isolation, but rather are interrelated in a complicated manner. As it is in general with our social structures and problems, issues and problems in the public realm are characterized by complication. Complication in public service originates from the variety or complex relations between the needs and interests of citizens. More specifically, complication emerges in the process of discovering citizens' needs for public service and integrating such needs into publicly beneficial values. As design thinking is effective in solving problems of complication in user needs [37], it is receiving attention as a crucial tool for resolving problems in society or in a public realm [39]. Public organizations such as Britain's Design Council, Finland's SITRA (The Finnish Innovation Fund, Helsinki, Finland), and Australia's

TACSI (The Australia Centre for Social Innovation, Adelaide, Australia) are utilizing design thinking as a tool for policy improvement or social innovation due to its effectiveness.

Design thinking refers to thinking like a designer, by which a designer is seen to attain creative solutions when they utilize intuitive thinking and analytic thinking in balance [40]. Since the analytical thinking methodology is limited in its ability to solve problems due to its reliance on only known facts and information, a balance with intuitive thinking is needed to overcome this limitation. Charles Sanders Peirce (1865) summarized the design thinking process that is geared to reaching optimal solutions for users, as shown in Figure 1.
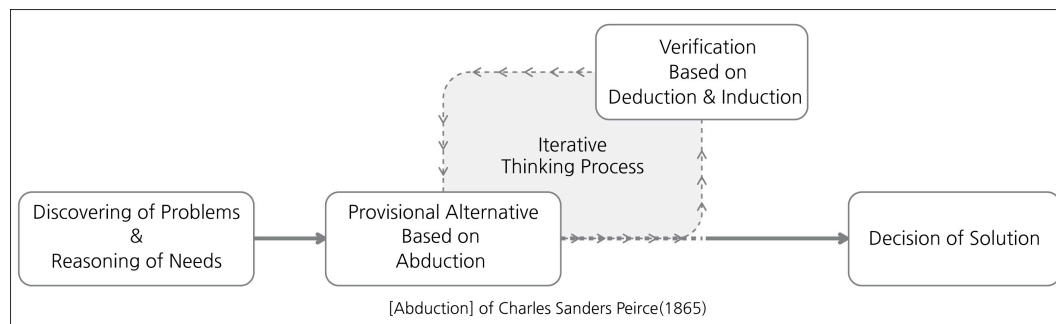
Figure 1. Abduction process by Charles Sanders Peirce.

First, a user's problematic issues are discovered, and the corresponding needs are deduced by reasoning. Then, a provisional alternative is established, which is verified against any faults in fulfilling the diverse needs and interests of the user through the iterative process of induction and deduction, in order to derive the final solution. This process is called abduction [41].

Challenges that arise in policy processes are categorized into three types, and the strengths of the design thinking process are validated in its ability to address those challenges.

Firstly, the objective of citizen-centered public service is to enhance citizen levels of satisfaction. Here, satisfaction refers to fulfilling citizens' feelings, needs, and preferences when they experience service [42]. This requires access to citizens' inner demands and needs, but analytical thinking methods based on surveys, questionnaires, and statistics do not provide sufficient data for a thorough identification of the factors that comprise citizens' problems, needs, and satisfaction.

By joining the citizen experiences, design thinking is a powerful method of discovering information about citizen needs. Design thinking is differentiated from analytical thinking in that it gives rise to insights based on an understanding and empathy for users' emotions and relationships [43]. Design thinking begins with empathy through joining the users' experience worlds. One can observe the service environment in detail, understand, and empathize with the emotional states, and subsequently approach the internal needs by participating in the users' experience worlds [44]. Such processes extract insights for problem-solving. Insight is what enables one to sensitively recognize the factors that satisfy others through emotion, sensibility, and intuition, and it plays a key role in revealing information that cannot be found using analytical thinking and extrapolating service solutions that satisfy users. By providing opportunities for the policy supplier to join citizens' experience worlds, design thinking contributes by accessing citizens' inner demands and needs, and deriving solutions based on these demands and needs.

Secondly, solutions based on needs that have been identified through joining the service experience of a small number of citizens cannot be deemed to originate from a universal, valid source, and may be subject to controversy.

Design thinking is strong in verifying citizens' needs.

Design thinking undergoes a logical verification process to confirm whether a solution that is satisfying the needs of a small number of citizens can be broadened universally to a more

comprehensive concept, and to see if such a broadened solution does not fail in satisfying the needs of a small number of users [45]. An optimal solution with minimized faults is derived by iterative verification through induction and deduction (Sanders Peirce, 1865). These traits of the design thinking process provide the advantage of endowing logic to solutions derived from the needs of a few citizens so that they become universal.

Thirdly, citizens' needs for public service are unavoidably diverse, as they are based on individual interests. Therefore, such diverse interests must be adjusted in order for public service to materialize.

Design thinking is strong in regulating complex interests, as it is based on co-creation and a multidisciplinary approach, and results in proposing comprehensive solutions.

Design thinking leads to creative problem solving through co-creation by suppliers, users, designers, and external experts. Suppliers, users, designers, and experts collaborate with one another to identify commonalities in the needs, problems, resources, and opportunities that are scattered and exist individually, and create integrative solutions by attempting combinations at new levels. Co-creation encompasses citizens' diverse needs, and extracts integrative solutions through the processes of adjusting the interrelationship between interests, thus contributing to the materialization of public service.

3. Materials and Methods

This study deems that governments can realize citizen-centered public service when they establish a means of overcoming their organizations' insular characteristics, and create processes that address the complications of public service.

From this perspective, the study focused on the use of open innovation by design thinking. As in Figure 2, this study aims to explore the advantages revealed when using open innovation by design thinking, and to utilize the same in detailing the conditions of policy process to achieve citizen-centered public service.
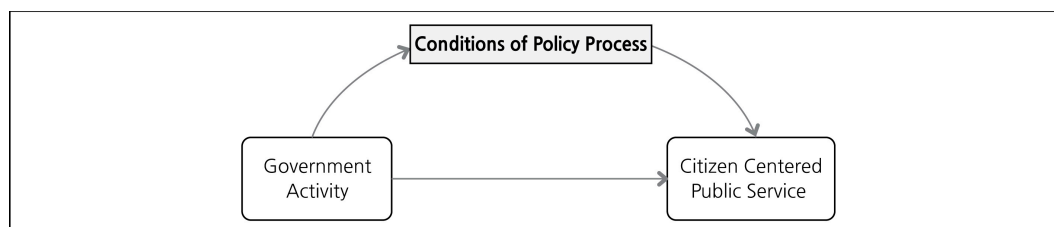

Figure 2. Research design.

The research framework, as shown in Figure 3, has been extracted through the literature review. The study applied open innovation by design thinking to the case of the Gov 3.0 Design Group, which is a type of citizen-participatory public service design platform [16]. Open innovation by design thinking proposes guidelines in two aspects: one is a guide for organization, and the other is a guide for processes. These two guides are founded upon the principles of relation orientation and mature solicitude, and correspond to the aforementioned public service principles. Through the case study, the study detailed the conditions for policy processes to realize citizen-centered public service.

Gov 3.0 Design Group; Citizen participatory public service design platform.

The study used a case study from 2016 involving the Gov 3.0 Design Group, which is a type of citizen-participatory public service design platform. The Gov 3.0 Design Group was planned and proposed in 2014 by the Ministry of Public Administration and Home Affairs jointly with the Ministry of Trade, Industry and Energy, and the Korea Institute of Design Promotion. It is a policy working group in which public servants act as policy suppliers for the overall policy processes, from agenda establishment to policy decision-making, implementation, and evaluation. As service users, citizens and designers also participate in developing and improving public services. Tasks are divided into

central government tasks and local government tasks. Public servants, citizens, designers, and other relevant experts work in a single group for about two months to identify agenda items by using processes and methodologies rooted in design thinking, or to come up with measures to improve current policies. In 2014, 19 central government tasks and 12 local government tasks were carried out as pilots, and the numbers have been growing over the past two years, with 39 central government tasks and 204 local government tasks in 2015, and 44 central government tasks and 338 local government tasks in 2016. The group won the Gold Prize for Service Design from the 2015 IF Design Awards. This award demonstrated the Gov 3.0 Design Group's world-class excellence as a model for policy development through citizen participation. The Gov 3.0 Design Group is aligned with the purposes of this study, as it is an open innovation-based organization in which design thinking processes are used in the operation of a working group for policy development.
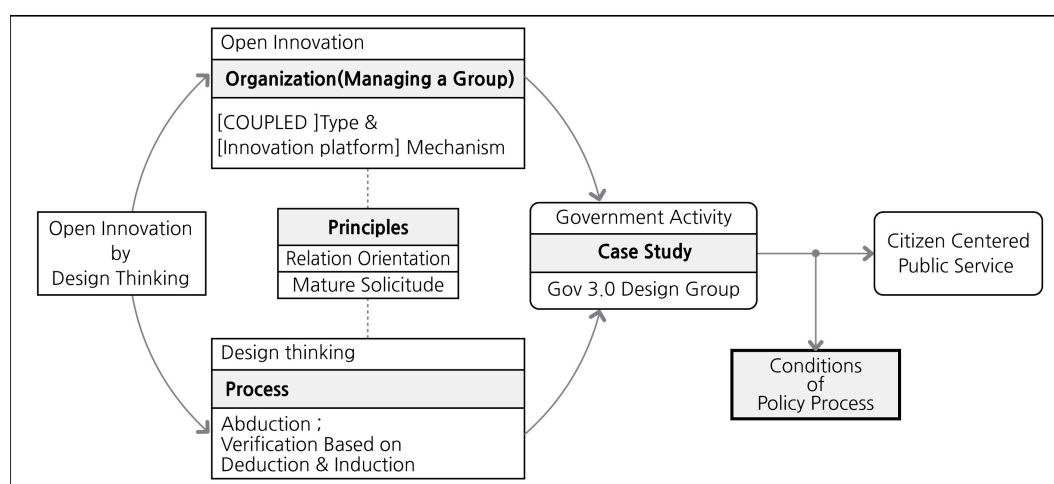
Figure 3. Research framework.

4. Results

4.1. Outline

The outline of the case study is shown in Table 1. This study used a case study involving Goryeong High School, which was one of the local government tasks for the Gov 3.0 Design Group in 2016. The case study dealt with students at Goryeong High School majoring in culinary art as policy targets in its attempt to identify the causes for the delivery gap that emerged when supporting their education, and to propose a solution accordingly. Goryeong High School is a "characterization high school", which is a type of high school designated by law in 1998, whose purpose is to address such issues as the increasing rigidity in the South Korean labor market caused by a stronger preference for college graduates, as well as the drastically falling application rates for specialty high schools. Goryeong High School is a specialty high school that was designated as a characterization high school in 2009. Although it offers majors in culinary art and interior design, students graduating from this school often fail to enter the professional labor market and turn to office jobs or manufacturing jobs, or pursue college education instead. A working group was managed to seek ways to overcome this mismatch between the characterization high school curriculum and the subsequent occupations of its students.

4.1.1. Organization

The working group's organization was based on an innovation mechanism that is called coupled-type open innovation. This type was chosen to avoid the introvert or centralized approach of open innovation in order to respect external knowledge and ideas, and discover new logic and value [46]. The working group consisted of a designer, public servants, citizens, and experts from

related fields, as shown in Figure 4. This organization has three characteristics. First, the designer becomes a key member. The designer not only facilitates active communication among the members, but he or she also offers the process and methodology of design thinking, which is a strong approach to solving complicated policy issues. As such an expertise plays a huge role in enhancing the quality of public service, the designer plays a core role within the working group. Second, citizens, who are the actual users of public service, also participate in the working group. This provides the citizens with an opportunity to contemplate policy issues by themselves, and to express their needs while at the same time understanding the restrictive environment of the suppliers. Third, experts from relevant fields take part in the working group. In this case, educational and culinary experts joined the working group to offer an objective analysis and technical information regarding the phenomenon in question.
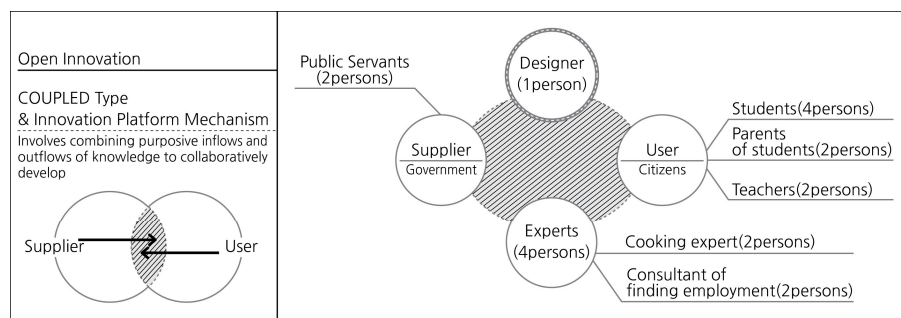
Figure 4. Organization of the working group.

4.1.2. Process

The working group utilized the design thinking process. This is also the reason why the designer took a key role in this working group.

In principle, the working group followed the "abduction" model of Charles Sanders Peirce, as shown in Figure 5. However, for the purpose of easily managing the working group, the working group sought ways to utilize the "dynamics of divergence and convergence" framework [41], which can be seen as a simpler and more systematic version of the iterative thinking process of "abduction".
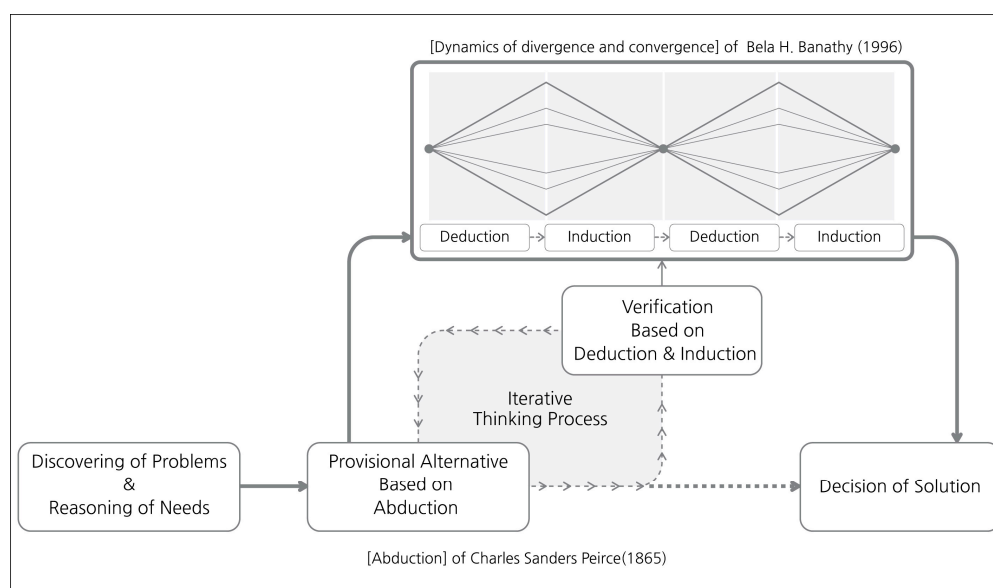

Figure 5. Bela Banathy's dynamics of divergence and convergence.

The final process of the case study was determined as shown in Figure 6. It was comprised of ① through ⑦, in which Charles Sander Peirce's "abduction" was combined with Bela Banathy's "dynamics of divergence and convergence".
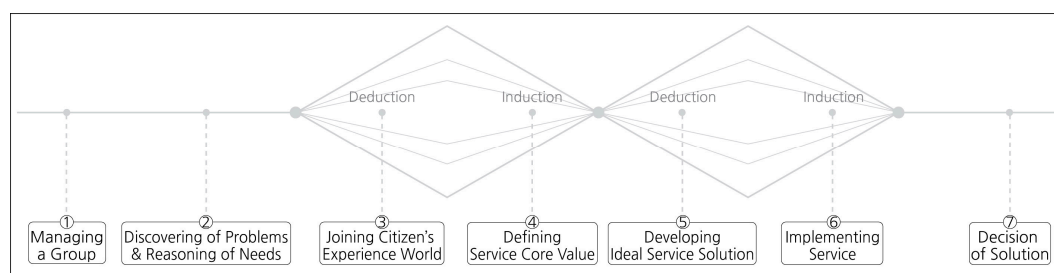

Figure 6. The process of the case study.

4.1.3. Activities, Methods

The activities were largely divided into field research, group meetings, and workshops, as shown in Table 2.

Table 2. Division of Activities.

Field research	A series of activities required for observations and interviews
Group meeting	Small group meetings among internal and external members for consultation or adjustment
Workshop	Collaborative activity in which internal and external members participated in consensus-building, adjustment, and thinking based on collaboration

Methods were selected and used according to the designer's strategy and planning (Ice-breaking, Focus group Interview, Creative workshop, Affinity diagram, In-depth interview, Observation, Contextual interview, Persona, Customer journey map, Mind map, Concept sheet, Service flow, Idea matrix, Storyboard, Service prototype).

4.2. Results of Case Study

The results for each process from ① to ⑦ are summarized as follows:

[① Managing a Group]: The activities, methods, and outputs of "Managing a Group" are shown in Table 3. Two group meetings were held to help members understand the purpose of managing the working group and their respective roles within it.

Table 3. Activities, Methods, and Outputs of "Managing a Group".

Activities			Methods	Outputs
Field research	Group meeting	Workshop	Ice-breaking	- Working group formation
-	Twice	-		- Purpose and procedure of managing the working group - Division of roles among members

The first group meeting was held in order for public servants, the designer, and experts to share information and discuss the project's direction and management. Then, the second group meeting for all of the participants, including citizens, was held to share a specific project schedule and discuss how to divide roles.

[② Discovering of Problems and Reasoning of Needs]: The activities, methods, and outputs of "Discovering of Problems and Reasoning of Needs" are shown in Table 4. Two field research sessions (focus group interviews), one group meeting, and one workshop were held to discover overall issues and to deduce needs.

Four parents of students were interviewed twice to verify factors of frustration and hope for their children's education. The parents were frustrated due to a lack of opportunity to see their children's capabilities, and they hoped that their children would get positive evaluations from others.

One workshop was carried out for four working group members as well as 30 students majoring in culinary art to examine the existing educational environment and the participants' overall perception. The extensive information extracted from this workshop was summarized into four keywords (lack of motivation for learning, repetitive learning, insufficient practical exercise, and loss of self-confidence) through an affinity diagram.

Table 4. Activities, Methods, and Outputs of "Discovering of Problems & Reasoning of Needs".

Activities			Methods	Outputs
Field research	Group meeting	Workshop	- Focus group interview - Creative workshop - Affinity diagram	- Overview of current learning environment - Students' awareness (keywords) - Factors of frustration and hopes by parents of students
Twice	Once	Once		

Following the field research and workshop, the designer, public servants, and teachers had a group meeting to understand and analyze the issues and needs at hand.

[③ Joining Citizens' Experience Worlds]: The activities, methods, and outputs of "Joining Citizens' Experience Worlds" are shown in Table 5. Thirteen field research sessions and two group meetings were held to identify various needs for education and understand the educational environment in context.

Table 5. Activities, Methods, and Outputs of "Joining Citizens' Experience Worlds".

Activities			Methods	Outputs
Field research	Group meeting	Workshop	- Observation - In-depth interview - Contextual interview	- Touch point and insights of service - Structuralization of complex needs
13 times	Twice	-		

Students were interviewed four times to learn about the factors of their frustration in terms of education. It was found that theory-centric, repetitive learning; the absence of a role model; and negative evaluations from others worked as frustrating factors, making students lose passion for their major.

Teachers who were actual providers of education were interviewed twice to learn about their educational goals and the difficulties of educational guidance. The teachers responded that their educational goal was to help students acquire a number of certificates based on the belief that such certificates would guarantee the students' employment after graduation. The teachers also pointed out that the failure of students and parents of students to see that the acquisition of certificates would ensure the students' future is an obstacle to education.

Graduates were interviewed twice to learn about their regrets regarding high school education and areas for improvement from the perspective of working-level staff. They regretted that the school education failed to equip students with expertise in specific fields, and argued that school education should provide students with direct and indirect experiences for actual work.

Job consulting experts were interviewed twice to confirm the essential elements to consider for education at a characterization high school. They emphasized that social and service manners must be acquired through education, because quick and flexible adaptation to actual work is crucial. They also said that a high separation rate after employment is due to a lack of expertise, and that the possession of experience and skills in a specific field can help lower the separation rate.

Students were observed three times during the theoretical instruction and practical experience to examine their subconscious behavior. The students' focus was significantly weak during theoretical instruction, and the level was beyond the teachers' control. On the contrary, the students showed a relatively higher concentration during practical exercises. In particular, students who were often called by teachers or given specific missions showed much higher concentration levels during class. They even expressed a willingness to sell products that they had made successfully.

Two group meetings were held with the designer, public servants, and students to compile data from the interviews and observations into a formal reference. Also, the materials needed to carry out [④ Defining Service Core value] were produced.

[④ Defining Service Core value]: The activities, methods, and outputs of "Defining Service Core Values" are shown in Table 6. One group meeting and one workshop were held to define core values that a service needs to deliver to citizens.

All of the members of the working group participated in an in-depth workshop to share details of ① to ③, while compiling and analyzing various needs for service. Participants defined and prioritized core values that need to be embedded in service through eight hour-long sessions that examined consensus-building and adjustment.

Table 6. Activities, Methods, and Outputs of "Defining Service Core Values".

Activities			Methods	Outputs
Field research	Group meeting	Workshop	- Persona - Customer journey map - Relation map - Creative workshop	- User type, service category - Core values of service - Prioritization of core values
-	-	Once		

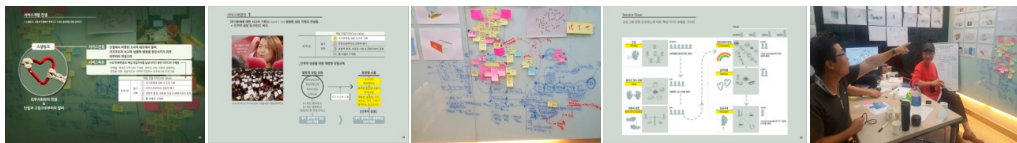The service core values are shown in Table 7.

Table 7. Service Core Values.

			Core Value
1	Students	Stronger motivation	Opportunity to think about one's own problems
			Positive evaluations from others
			Opportunity for contact with external environment and social experience
			Detailing of role model
2	Parents of students	Improved perception	Opportunity to verify children's capability
			Opportunity to improve perception about their children's employment
3	Teachers	Public image	Stronger school standing in the community
			Inflow of new students from outside the region
4	Public servants	Securing community resources	Characterization of the region in connection with education
			Securing talented individuals from the community

[⑤ Developing Ideal Service Solution]: The activities, methods, and outputs of "Developing Ideal Service Solution" are shown in Table 8. Two workshop sessions were carried out to identify a service solution embedded with core values, as defined in ④.

All of the members of the working group participated in a workshop that was formatted so that the participants felt free to suggest ideas without criticism. Most of the ideas were suggested as conceptual forms, and thus it was necessary to convert the ideas into specific service forms.

Table 8. Activities, Methods, and Outputs for Developing an Ideal Service Solution.

Activities			Methods	Outputs
Field research	Group meeting	workshop	- Concept sheet - Service flow - Idea matrix	- Service idea - Service solution
-	-	Twice		

Therefore, only the designer and experts, excluding citizens, got together once again for an intensive workshop to turn the ideas into specific service forms. To that end, the participants used an idea matrix, as shown in Table 9, to check if the service solution was consistent with the core values defined previously, and then proposed the final service solution.

Table 9. Idea Matrix.

		Core Value			
		Stronger Motivation among Students	Improved Perception among Parents	School's Public Image	Securing Community Resources by County Office
Ideas	**Hardware**	- Social space	- Space for open class/learning	-	-
	Software	- Competition program	- Open education program - Counselling program	- Differentiation of programs	- Preemption of specialized programs
	Networking	- Connection with graduates - Connection with external experts	- Connection with Goryeong High School	- Connection with outside experts - Connection with Goryeong Country Office	- Connection with other agencies

Service solution: The service goal was determined as a "breakaway from [the] isolated education environment (physical and non-physical), and a "snap link program" was proposed as a solution, as shown in Table 10.

[⑥ Implementing Service]: The activities, methods, and outputs of "Implementing Service" are shown in Table 11. The service solution was put together as a story, and a service prototype was implemented.

The story was built around the students as the policy target to allow them to partly experience the developed service as they moved along the story's journey. Every student in the culinary art department had 60 h of theoretical learning and practical exercises, as well as two field training sessions. During this period, two interviews along with observations were conducted, and the students' reviews on the experience were collected.

Table 10. Service Solution.

Service Solution		
Concept	Core Value	Ideas
Snap link program	**Stronger motivation among students**	- Build a space for field-oriented service education - Practical education and specialization education in connection with outside experts - Support for interactive career counseling and mentoring for seniors - Opportunity for positive competition (a system of competition and compensation)
	Improved perception among parents	- Increased (media) opportunity to expose student capability - Increased direct participation by students in community festival, school events, and county events - Counselling program for parents
	School's public image	- Student internship opportunities by utilizing outside experts - Development and expansion of educational programs in connection with Education Office and Goryeong County Office
	Securing community resources by county office	- Development and right registration of new recipes using representative local produce (e.g., strawberries and watermelons) - Establishment of business startup support for graduates in connection with the Small and Medium Business Administration, and building success cases of entrepreneurship

Table 11. Activities, Methods, and Outputs of "Implementing Service".

Activities			Methods	Outputs
Field research	Group meeting	workshop	- Storyboard - Service prototype - Contextual interview	- Service story - Service implementation
Twice	-	Twice		
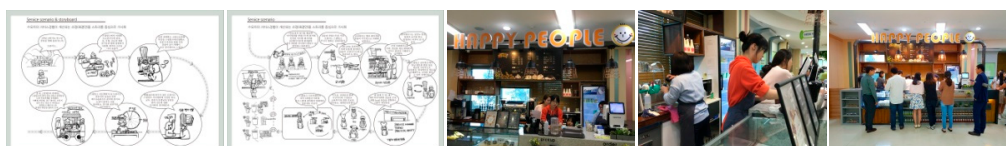
Through this, the study could verify whether the service solution, when materialized, could offer a better experience based on the policy target's actual experience. The students demanded longer hours for practical exercise, and more opportunities for outside field education. At the same time, they expressed a sense of anxiety over increased contact with outsiders, as well as over competition. It served as an opportunity to identify factors that may cause new problems or increase dissatisfaction when the service solution is implemented for a large number of students. Also, factors that may get in the way of materializing the service were examined beforehand by verifying whether the needs were satisfied, with public servants looking at the issue from the position of the Goryeong County Office, and teachers from the position of Goryeong High School.

[⑦ Decision of Solution]: The activities, methods, and outputs of the "Solution Decision" are shown in Table 12. The designer, public servants, and teachers had a group meeting to decide on the final solution. The result was prepared as a business plan for a public service.

Table 12. Activities, Methods, and Outputs of the "Solution Decision".

Activities			Methods	Outputs
Field research	Group meeting	Workshop	- Business model canvas	- Draft business plan
-	Once	-		

Public servants prepared a business plan (draft) that centered on citizen needs, and could attempt decision-making within the supplier organization based on the draft.

5. Discussion

5.1. The Effect of Diversified Media on Enhancing Citizen Participation

Open innovation is used in policy processes because it can enhance innovation outcomes when there is a higher level of collaboration between internal and external organizations. Opportunities for interactions are crucial because when the supplier and users interact without boundaries, their respective information and needs generate a valid flow and can enhance the outcomes. For this reason, offering efficient medias (or channels) for gaining specific knowledge can be defined as one of the characteristics of open innovation [47]. In the case study, the working group selectively used both non-face-to-face media for communication, such as email and SNS, and face-to-face media for communication such as group meetings and workshops, depending on the needs.

Non-face-to-face communication media was effective in allowing participants to share information or opinions without the boundaries of time and space, and in conveying ideas and information that would make the participants feel uneasy to deliver face-to-face. Meanwhile, face-to-face media was effective in revealing internal needs, as it could be used to convey emotions that are hard to express with words or writing through facial expressions and nuances in speech and gestures. In addition, free discussion opportunities were given to the group to facilitate consensus-building and adjustments among the group members. The frequency of media utilization is shown in Table 13.

Table 13. Frequency of Media Utilization.

Non-Face-to-Face Media		Face-to-Face Media		
E-mail	SNS	Field research	Group meeting	Workshop
51 times	37	17 times	6 times	6 times

The diversification of media contributed to raising the frequency of contact among the members, and the higher frequency of contact is not irrelevant to the frequency or willingness of participation. It was also confirmed that the prior approval and delegation of full authority in terms of the disclosure of internal information or of suggestions had a great influence on the level of participation among public servants and teachers.

5.2. The Effect of Designer Facilitation on Enhancing Citizen Participation

The designer's involvement as a facilitator had an effect on enhancing citizen participation. Here, effect is about the relationship and roles between citizens and suppliers. The designer explained to the citizens and public servants the meanings and objectives of each process, while also suggesting methods and roles for creative collaboration. In addition, the designer continuously emphasized that the goal of

the working group management is to realize citizen-centered public service. Such facilitation of the designer led to a particularly visible change in [④ Defining Service Core Values], as shown in Figure 7. Citizens and public servants at this stage attempted their first and strongest consultation to prioritize needs and adjust their interests. It is believed that through this attempt, the two parties reached "goal congruence". Up until this stage, citizens as recipients of policy argued for their rights to benefit, while public servants as suppliers and policy managers emphasized restraints and the limitations of management. However, after experiencing a bond through "goal congruence", both citizens and suppliers worked as voluntary participants of public service and policy assistants, respectively.
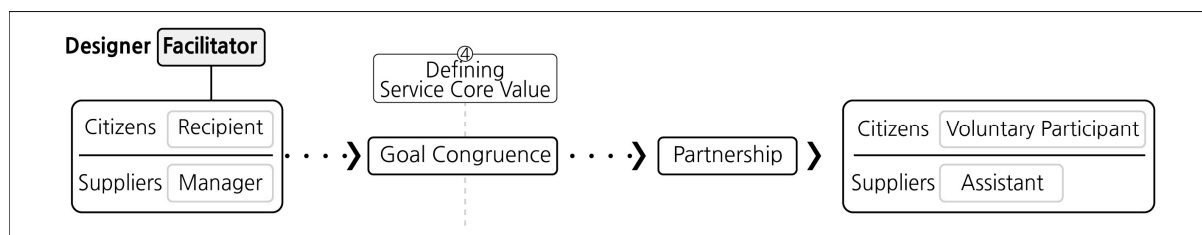

Figure 7. Changes in member relationship.

This is also a result of the designer inducing close collaborations between internal and external members in [③ Joining Citizens' Experience Worlds]. An awareness of relationships and roles based on "partnerships" between members contributes to the enhancement of citizen participation in public service by strengthening citizens' willingness to participate, not only in the process of policy development, but also in the process of policy realization.

5.3. The Effect of Joining Citizens' Experience Worlds on Overcoming the Delivery Gap

Joining citizens' experience worlds had an effect on reducing the delivery gap of public service. Effect here means enhanced accuracy in identifying citizens' problems and needs. Joining citizens' experience worlds was carried out through several observations (three times) and interviews (10 times), and as a result, the problems and needs defined were significantly different from before.

This is directly related to providing a satisfactory solution to citizens. The delivery gap can be bridged when problems and needs are accurately identified through joining citizens' experience worlds.

5.4. The Effect that the Iterative Verification of Citizens' Needs has on Enhancing Citizen Orientation

Iterative verification provided by design thinking has an effect on enhancing citizen orientation. Effect here means that the solution based on specific citizens' needs and insights does not run counter to the universal value.

A solution that fulfills the needs of specific citizens participating in the working group must also satisfy the needs of the larger public. Verification was employed to that end as shown in Figure 8. More specifically, verification was performed by mainly checking (A) Appropriateness: Is the service solution aligned with the service core values? (B) Realizable possibility: Is the service solution realizable? and (C) Universality: Does the service solution reach the needs of both a small number of people and the public?. This process offers an opportunity for citizens to intensify their needs on their own and observe them from the perspective of satisfying universal needs. This process itself and solutions deriving from it both can be considered to have a high level of citizen orientation.
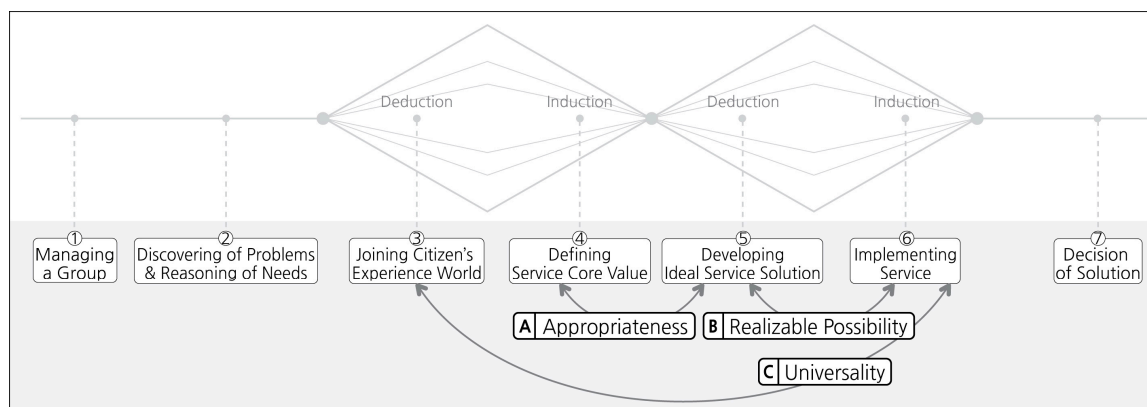
Figure 8. Iteration of verification.

5.5. Visualization of Process

It is important to create visualized materials for consensus-building, adjustment, and verification that often occur between internal and external organizations. Visualized materials are used to supplement text-dependent data that are hard to explain or understand. In particular, this effort is highly significant, because it allows supplier organizations to understand the process of structuralizing citizens' needs through visual materials, thereby helping them make final decisions from the perspective of the citizens.

6. Limitation

The case study introduced here is one of the qualitative research attempts that consolidates information and analyzes meanings based on highly dense observations and interviews involving a small number of specific people. This was done in order to approach aspects that cannot be discovered by surveys involving a universal majority or by research that depends only on statistical analysis. The study focused on the contextual analysis of findings from intensive observations and interviews carried out by 15 members of a working group for about eight weeks. As such, the study is limited, as it is difficult to consider whether the study's findings and conclusions drawn by using the aforementioned method have representability from the perspective of qualitative research. From this study, the conditions of a policy process that is needed when a government activity is intended to realize citizen-centered public service were identified. Seen from another aspect, this can be regarded as a process of finding mediating variables, and as such, quantitative future research is needed to validate whether the application of the conditions of the policy process discovered in this study to government activities contributes to the realization of citizen-centered public service. This is a crucial step towards materializing and generalizing the findings of this study, which is needed to overcome the aforementioned limitations of the research.

7. Conclusions

The study extracted the strengths of open innovation by design thinking used in policy processes through a case study, and then identified five conditions of policy processes for citizen-centered public service, as shown in Figure 9. Applying the derived conditions to policy processes is expected to contribute to reducing the delivery gap of the aforementioned policies and achieving citizen centered public services.

In general, it is important to emphasize the need for participatory policy development and government innovation. However, few studies or experiments have suggested a new approach for realize it. Study that focus on the limitations of government innovation argue that they mostly lie in the closure and low trust of government, and suggest new and creative ways (method) of overcoming these

limitations by combining open innovation and design thinking. In addition, this study specifically describes the process by which the proposed method is implemented through case studies. The content of this study, in which theory and practice coexist, will contribute to the promotion and improvement of similar studies in the future. Furthermore, it will contribute to realizing government innovation based on its participation.
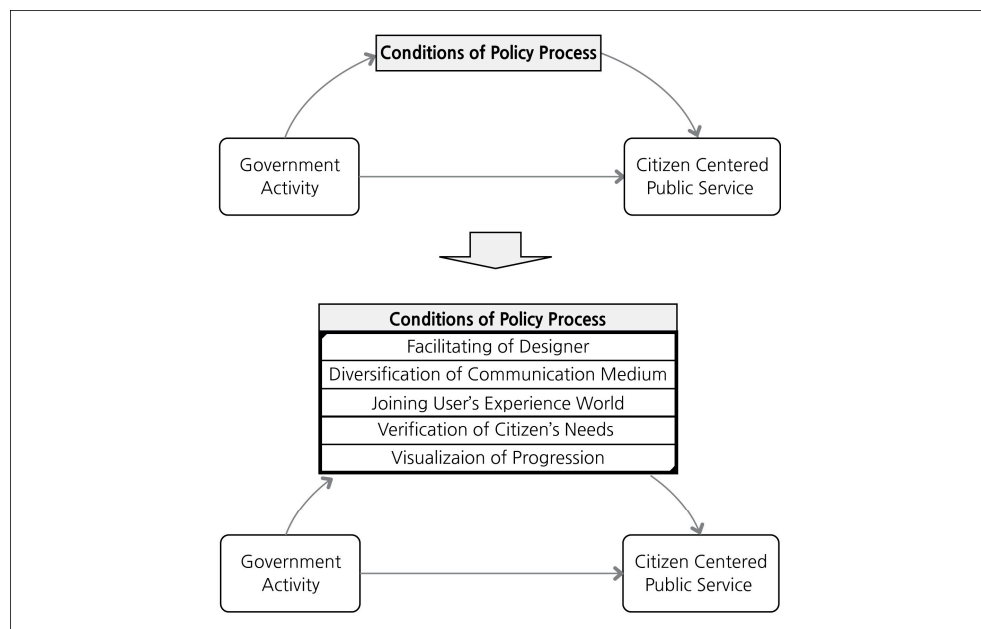

Figure 9. Research design and summary of results.

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