

An Exploratory Study on Fintech Industry in Korea: Crowdfunding Case

Tae-heon Lee¹, and Hee-Woong Kim²

Abstract— Recently in Korea, crowdfunding industry has been receiving a growing attention. Korean government tries to activate crowdfunding industry by increasing venture capital companies and hopes for economic activation as well. However, there are a lot of financial regulations and other related regulations which block their entry and hinder the growth of the market. The related law which could weaken the restrictions is still waiting for a vote. Since there are a lot of stakeholders in crowdfunding industry, it is hard to totally understand the complex and diverse crowdfunding ecosystem and find major factors. This study, which is an exploratory research based on interviews has derived promoting and inhibiting factors of the crowdfunding activation from the government, crowdfunding company, and investors' perspective, and has analyzed a sequence of cause and effect for each factor. For this, the casual loop diagram was developed to deduce key issues, and propose an alternative.

Keywords— Causal Loop Diagram, Crowdfunding, Fintech, System Dynamics

I. INTRODUCTION

RECENTLY, the interest toward crowdfunding is increasing globally. The amount of collected money of crowdfunding companies around the world was \$2.7 billion in 2012, and doubled in the next year as \$5.1 billion. The dramatic changes seem to grow continuously up to \$95 billion by 2025, driven by new digital technology, regulations, consumer behavior and the need to reduce costs [17].

Moreover, in Korea, the amount of collected money for crowdfunding was \$4.5million in 2012, \$18million in 2013 and \$36million in 2014. It is expected to be \$45million in 2015 [10].

Therefore, Korean government tries to help crowdfunding industry by increasing venture capital companies and hopes for economic activation as well. To activate the industry, related law is proposed and it is ready to be approved.

However crowdfunding industry in Korea does not seem to be bright. Industry and academic world think the Korean crowdfunding market is hard to grow due to various regulations such as financial regulation and online regulation. In June 2015, crowdfunding related law is still waiting for a vote in the legislature. Therefore the main purpose of our paper is to analyze Korean fintech industry, especially

crowdfunding issue from the point of government, company and customer's view using interview-based qualitative research, extract major factors and suggest an effective solution using causal analysis of each factor.

The rest of the paper is structured as follow: We look at Conceptual Background in Section 2 about fintech and crowdfunding industry. We describe our research methodology about system dynamics in section 3. Analysis result is described in section 4 and finally Discussion and implication is described in section 5.

II. CONCEPTUAL BACKGROUND

A. Fintech

Fintech is conceptually defined as a new type of financial service based on IT companies' broad types of users, which is combined with IT technology and other financial services like remittance, payment, asset management and so on. Fintech includes all the technical processes from upgrading financial software to programming a new type of financial software which can affect a whole process of finance service. Therefore fintech can improve the performance of financial services and spread the finance service combined with mobile environment [11].

Fintech has an enormous influence on consumer finance and finance market. IT companies can develop simple, easy and various financial services using internet technology. In other words, based on their technology, nonfinancial companies like ICT companies start to enter and make inroads into finance market and this can be a big threat to traditional financial services. Therefore Korean financial companies pay sharp attention to rising fintech industry, and analyze how much it will have an influence on their own business [13].

In Korea, due to regulation on nonfinancial companies doing financial business, their encroaching speed is quite low. However the market is consistently expanding with micro payment and remittance market, which means the income from commission of existing financial companies would continually decrease. On the other hand, the positive impact of fintech is that the volume of whole financial market would increase because of changes in perception of consumers and increase in service usage, which can be done by ICT companies' use of consumers' information [12].

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B. Crowdfunding

Crowdfunding is the practice of raising many small amounts of money (funding) from a large number of people (crowd), typically via the Internet or social media. The special feature of crowdfunding is that fundraising period and time is set and it is cancelled if the collected money does not reach the targeted level. Crowdfunding was firstly started as a form of private loaning service from England called Zopa.com (www.zopa.com) in 2005 and called P2P funding, social funding and so on. The term 'crowdfunding' is generally used after Indiegogo which is the first sponsor platform in US is launched.

According to The World Bank, there are two main categories of crowdfunding: Donation crowdfunding and Investing crowdfunding. As shown in Fig. 1, five business models currently are practiced within two broad categories and crowdfunding platforms typically are organized around one of the five models. The Donation crowdfunding includes donation-based and reward-based crowdfunding. The Investing crowdfunding includes equity-based, lending-based, and royalty-based crowdfunding [17].

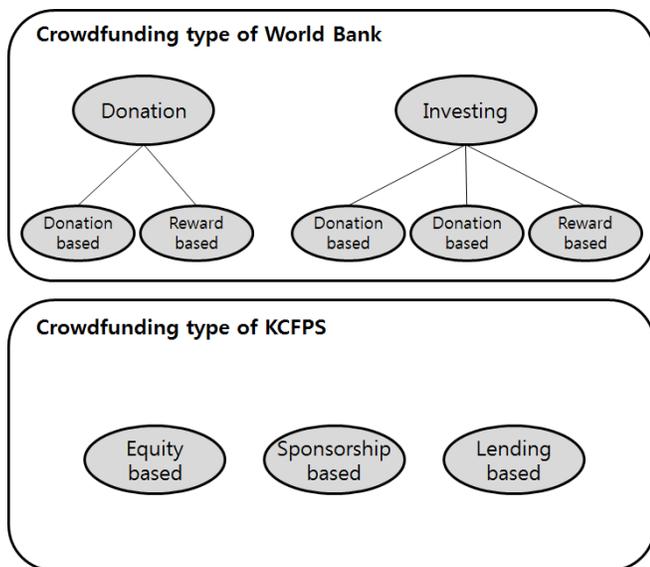


Fig. 1 Crowdfunding Type

However, in Korea, according to Korea Crowdfunding Platforms (KCFPS) which represents Korean crowdfunding companies, there are three types in Korean crowdfunding models which are Equity-based, Sponsorship-based, and Lending-based crowdfunding. Equity-based crowdfunding means people invest in shares or investment contract securities, and funders receive equity instruments of profit sharing arrangements. Income comes from selling investors' ownership shares.

In Sponsorship-based crowdfunding, funders receive non-equity capital like a token gift of appreciation or souvenir rather than the sales of securities for charity causes. Donation may support a creative activity, culture art product, and social benefit activity.

Lending-based crowdfunding means that crowdfunding platform flexibly interacts between lender and borrower. Crowdfunding platform has rights of creditors to the lender and rights of receiving the principal and interest to the borrower [8].

III. RESEARCH METHODOLOGY

A. Qualitative Study

We conducted the exploratory study based on interviews. Because crowdfunding industry includes multiple stakeholders, we learn crowdfunding activation factors through the interviews of each stakeholder.

Data collection for the study is performed in two steps. In the first step, crowdfunding industry related data, including media data, annual reports and literature research were collected as the first data. In the second step, based on the first data, the interviews of government officials, enterprisers of the crowdfunding related company and investors will be used as the second data. The expected number of interviewees is total twenty including four government officials, four enterprisers of crowdfunding companies and start-up companies, and twelve investors. Characteristics of the interviewees are shown in TABLE I.

TABLE I
CHARACTERISTICS OF THE INTERVIEWEES

Category		No. of interviewees (persons)
Government	Government official	1
	Supervisory agent official	1
	Project officer	2
Crowdfunding company	Equity-based	2
	Sponsorship-based	1
	Lending-based	1
Experience of investment	Y	6
	N	6

We have done the first step of data collection, the interviews of government officials of the second step are in progress, and the other interviews will be done shortly.

The interviews of government officials mainly focused on the question as to 'what are the influential factors on activation of crowdfunding industry?' To investigate the influential factors on activation, the interview was aimed at analyzing as to what factors are promoting and hindering crowdfunding industry and how the policy making process of crowdfunding industry in Korea is. The interviews of enterprisers of crowdfunding related company will focus on positive and negative factors of crowdfunding industry activation and difficulties the company actually faces. Finally the interviews of investor will focus on how they understand the crowdfunding industry and improvements based on how they fill it.

B. System Dynamics with Causal Loop Diagram (CLD)

System dynamics (SD) is a methodology and mathematical modelling technique used to describe the behavior of complex

dynamical systems for framing and understanding complex issues and problems [2], [3], [15]. It was originally developed in the 1950s to help directors in firms improve their understanding of complex industrial processes and it is currently being used throughout the public and private sectors for policy analysis and design [9]. Because of feedback loops and flows, using system dynamics is special from other approaches to studying complex systems. Moreover, it is used to look into a complex system wholly and structurally and to see the influence of a variety of relevant factors. In the system dynamics methodology, it is possible to simulate diverse strategies and assume nonlinear changes [18]. For this reason, the methodology is used as a frame of reference for complicated causal relations phenomena [4].

Previous research used CLD (Causal Loop Diagram) for case analysis in different contexts, such as change management in inter-organizational systems for the public [16], a case study of interactions between critical factors [1], and an information

systems project [6]. For the development of CLD in the context of crowdfunding, this study tried to analyze and define the current state of crowdfunding industry in the system dynamics methodology; extract the inhibiting and promoting factors of activation from an interview-based case study; analyze the causal relations of the extracted factors; and make suggestions for crowdfunding industry activation [7], [14].

CLD which is a key to the system dynamics approach is used to schematize the interactions of potential causes and make feedback loops [5]. The diagram is made up of three elements. First, an arrow represents the causal relation of variables. The starting point of an arrow means a cause variable and its end point means an effect variable. Second, a sign represents a direction of the causal relation (+/-), '+' sign means that two factors change in the same direction, and '-' sign means that two factors change in a different direction. Finally, the last element is Time delay which is denoted with '=' [7].

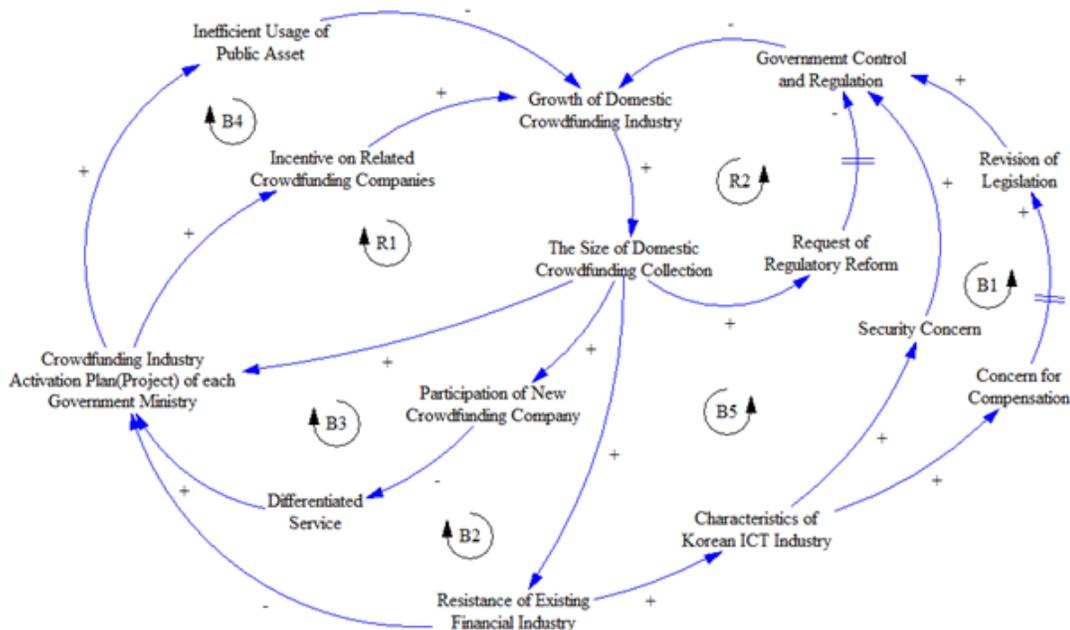


Fig. 2 CLD in Government's Perspective

When causal links create one closed loop, it is called a feedback loop. There are two types of feedback loop which are defined as a reinforcing loop and a balancing loop. In a reinforcing loop, the effect reinforces the variable when a variable changes. In a balancing loop, the effect returns to the variable in an opposite direction when a variable changes. When a feedback loop has the even number of the causal links denoted with '-' or all of which are denoted with '+', the loop is called a reinforcing loop. When a feedback loop has the odd number of the causal links denoted with '-', the loop is called a balancing loop [7]. As a qualitative model, the causal loop diagram is used to analyze the interaction and effect of various phenomena to understand macro view of the whole system.

IV. ANALYSIS RESULTS

A. Analysis Framework of Causal Loop Diagrams

To study precisely on activation of Korean crowdfunding industry, we classify the perspectives in three groups and interview each group: government, company, and investor. Then we analyze the influential factors using a casual loop diagram.

The influential factors of crowdfunding industry are defined as the promoting factors and the inhibiting factors. The promoting factors mean the positive effect generated by each group and the effect that will increase the volume of crowdfunding industry. The inhibiting factors are companies' fear and resistance in the circumstance of crowdfunding introduction and activation, resistance and regulation of

existing financial industry, and obstacles to crowdfunding introduction based on inefficiency in government policy.

The analysis result consists of three big loops including government's perspective, company's perspective and investor's perspective. Based on the result, the main issues are extracted and the final alternative causal loop diagram (CLD) is proposed.

B. Casual Loop Diagram in Government's Perspective

According to government official interviews, majority of officials say Korean crowdfunding industry can grow based on incentives on related crowdfunding companies during crowdfunding industry activating plan(project), however, they add the problem is that their service is not much different from existing financial service [R1, B3]. Moreover, because of different crowdfunding industry activation plan (project)

according to each government ministry, public asset is used inefficiently [B4]. Regarding government regulation, request of regulatory reform could affect the growth of Korean crowdfunding industry, but there still exists security concern when considering resistance of existing financial industry and characteristics of Korean ICT industry. The government also faces Concern for Compensation, which means the subject of compensation is not yet clearly defined and no rules or legislation exists. To dispel the concerns, Revision of Legislation is needed [B1]. Therefore, government cannot just reform the regulatory. Since crowdfunding industry includes various industries like on/offline IT and finance, it is difficult to reform regulations in related areas and progress crowdfunding industry activation plan (project) [R2, B2, B5].

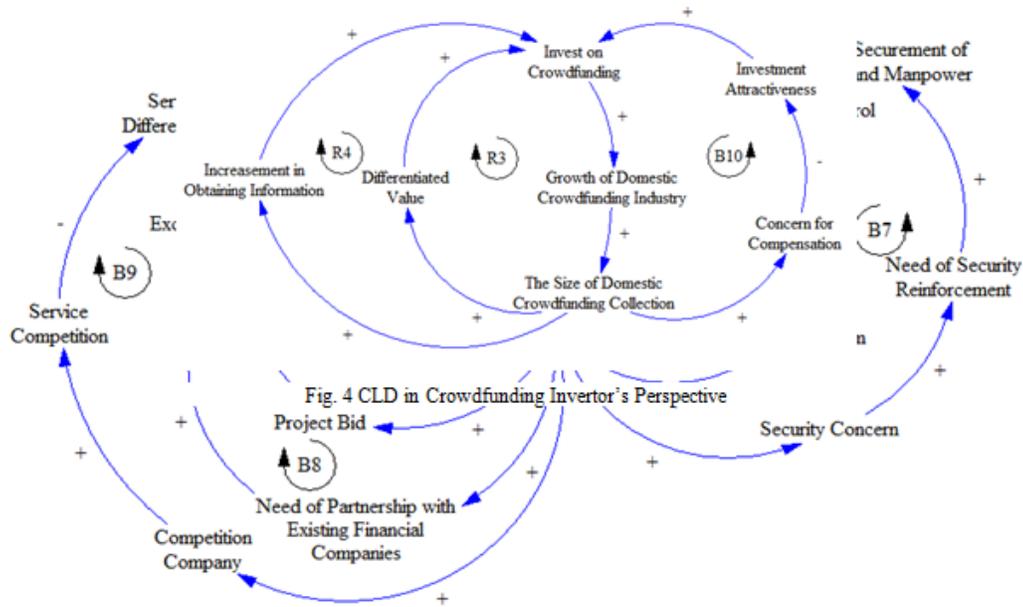


Fig. 3 CLD in Crowdfunding Company's Perspective

As shown in Fig. 2, a causal loop diagram of integrating the promoting loops and inhibiting loops is proposed.

C. Casual Loop Diagram in Crowdfunding Company's Perspective

In regard to crowdfunding, an expert at the related company said "For stable growth of Korean crowdfunding companies, government project bid is needed. So it is important to have a partnership with existing financial companies. However, it is difficult for startup companies to join the bid since the requirements and related criteria are too excessive and complicated." He also added that these kind of situations in Korea results in the growth of domestic crowdfunding industry [B6, B8].

Since security is becoming an important issue among investors, it is recommended to reinforce technical and administrative security approaches. However there is a difficulty in maintaining technology and manpower in a company because most of crowdfunding companies are startup companies and they are hard to maintain high labor cost.

Therefore, many of the interviewees said regulatory reform should be done in order to activate crowdfunding industry. Even though they keep requesting for the regulatory reform, the outcome is still not enough which means government control and regulation is still tough for companies.

Regarding the situation that the number of domestic and foreign competition companies is increasing and it is more difficult to join the fierce service competition, he also mentioned "it is hard to secure new customer since it is hard to secure service differentiation." [B9]

As shown in Fig. 3, a causal loop diagram of integrating the promoting loops and inhibiting loops is proposed.

D. Casual Loop Diagram in Investor's Perspective

Crowdfunding investors are mostly worried about the compensation process of crowdfunding. One interviewee said "there is no safety solution when investment losses happen in lending-based crowdfunding, not even insurance. I do not want to risk losing any money if things come to this stage." [B10]

On the other hand, the interviewee added that there are a lot of people who do not know about crowdfunding in detail. In this case, by providing some information about crowdfunding would lead to an investment [R4]. Moreover the investment

would be expanded when crowdfunding platform has a differentiated and attractive value compared with other platforms [R3].

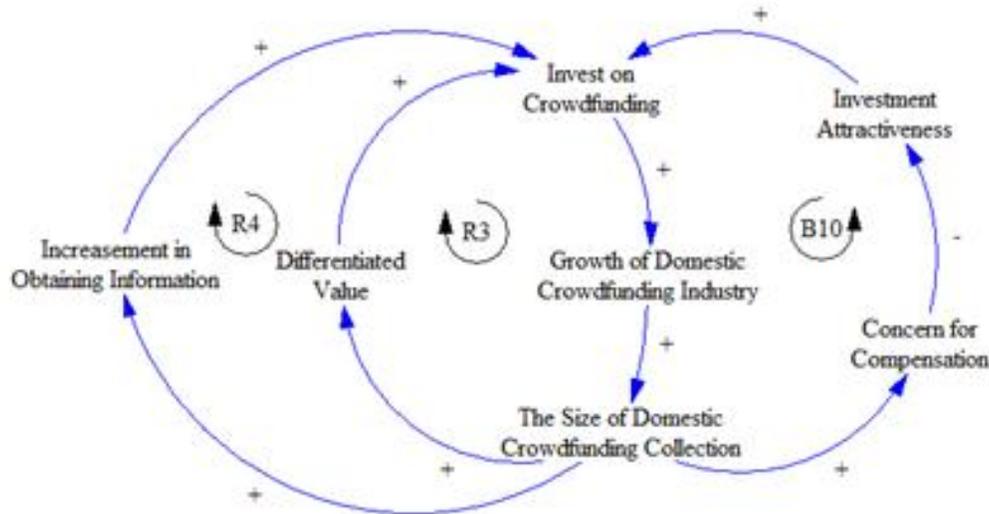


Fig. 4 CLD in Crowdfunding Invertor's Perspective

As shown in Fig. 4, a causal loop diagram of integrating the promoting loops and inhibiting loops is proposed.

E. Summary of Analysis Results

Based on the interviews with experts of stakeholders, a case study was conducted to activate the domestic crowdfunding market. The interview data were examined by a literature review and analysis of the current Korean crowdfunding industry. After that, a causal loop diagram was used to analyze issues and alternatives for the promoting and inhibiting factors

to activate the crowdfunding market.

To sum up, the first issue arising in activating the crowdfunding market is crowdfunding service related law will be established soon. An interviewee in a crowdfunding company said "we expect the situation would be better when crowdfunding law is established". He added the enactment of law and government support would have a positive effect on the safe crowdfunding market and industrial growth of the crowdfunding industry.

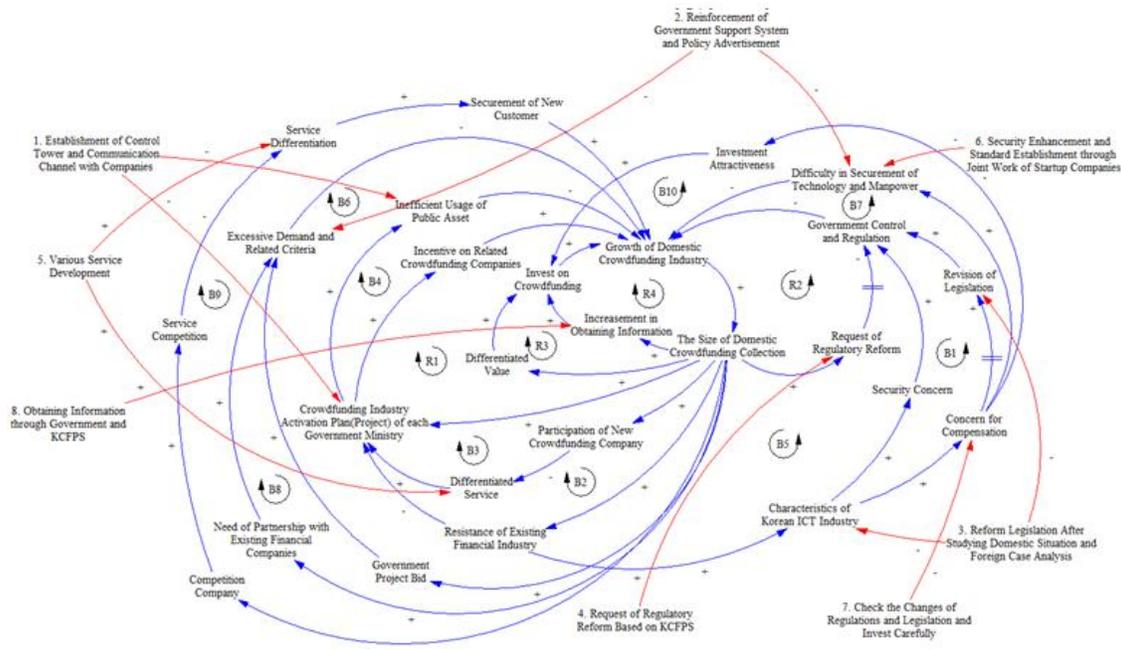


Fig. 5 Overall CLD with Suggestions

However, there still remain issues to be solved for crowdfunding activation. The issues arising in inhibiting the crowdfunding market from the government perspective can be summarized as inefficiency of having different crowdfunding industry activation plan (project) according to each government ministry; having excessive demand for companies; lack of advertisement to companies; concern for compensation due to characteristics of Korean ICT industry. From crowdfunding company perspective, the main issues are lack of crowdfunding related law for a long time; difficulty in having a service differentiation; difficulty in the securement of technology and manpower. Lastly, from an investor perspective, obtaining information and concern for compensation are extracted to be the main issues.

As shown in Fig. 5, a causal loop diagram of integrating all three perspectives of the promoting loops and inhibiting loops extracted is proposed. The alternatives for the issues drawn are marked with red lines.

V. DISCUSSION AND IMPLICATIONS

A. Discussion and Suggestions

In the reinforcing circular structure of the activation of the crowdfunding market from a government perspective, achieving incentive on related crowdfunding companies because of crowdfunding industry activation plan (project) of each government ministry contributes to the increasing growth of domestic crowdfunding industry which increases a use rate of crowdfunding. In the balancing circular structure, strengthening the government control and regulation due to the concern of compensation causes a fall in the growth of the domestic crowdfunding industry.

From a company perspective, the positive circular structure is the growth of domestic crowdfunding industry increases by weakening government control and regulation due to regulatory reform. On the other hand, the negative circular structure is the growth of domestic crowdfunding decreases due to excessive demand and related criteria when increasing government project bid.

From an investor perspective, the positive circular structure

goes like this: rise in differentiated value affects invest on crowdfunding and increased invest positively affects the growth of the domestic crowdfunding industry. However the negative circular structure goes like this: investment attractiveness goes down due to concern for compensation and decreased invest on crowdfunding negatively affects growth of the domestic crowdfunding industry.

Issues and suggestions for activation of crowdfunding by reinforcing the positive circular structure and weakening the negative circular structure are proposed in TABLE II.

Limitations and the Future Research Direction

Although crowdfunding industry has received a great attention in Korea, the domestic crowdfunding market has yet to be activated. Therefore, this exploratory study was conducted. But, it has limitations as follows:

First, although this study collects qualitative data through media data, annual reports, literature research and interview of stakeholders, it needs more data research like quantitative data analysis later on since Korea is in the early stage of crowdfunding industry and does not yet have any single system from the government.

Secondly, this study chose an exploratory study model based on interviews and it had a limited number of samples. In other words, it didn't look into various influential factors which can be appeared in other firms or other industrial areas. Therefore other cases need to be analyzed additionally.

Thirdly, after having interviews with experts, the researcher developed causal loop diagrams without any examinations of interviewees. In other words, this study might reflect the researcher's subjective opinion in interpreting the interviews with experts.

In the future study, it will be necessary to investigate the quantitative effect of crowdfunding industry and analyze various cases. Additionally, it is required to develop the causal loop diagram proposed in this study, to make a more detailed and elaborate model, and perform other empirical studies.

B. Implications for Research and Practice

The study contributes by explaining the critical issues and solutions for the development of domestic crowdfunding industry. Especially, our study tries to cover the macro view of

TABLE II
SUMMARY OF ISSUES AND SUGGESTIONS

Category ^o	Issues ^o	Suggestions ^o
Government ^o	Inefficiency of having different crowdfunding industry activation plan (project) according to each government ministry ^o	Establishment of control tower and communication channel with companies ^o
	Excessive demand for companies and lack of advertisement to companies ^o	Reinforcement of government support system and policy advertisement ^o
	Concern for compensation due to characteristics of Korean ICT industry ^o	Reform legislation after studying domestic situation and foreign case analysis ^o
Crowdfunding company ^o	Lack of crowdfunding related law for a long time ^o	Request of regulatory reform based on KCFPS ^o
	Difficulty in having service differentiation ^o	Various service development ^o
	Difficulty in securement of technology and manpower ^o	Security enhancement and standard establishment through joint work of startup companies ^o
Investor ^o	Concern for compensation ^o	Check the changes of regulations and legislation and invest carefully ^o
	Obtaining information ^o	Obtaining information through government and KCFPS ^o

whole crowdfunding industry and the business in Korea. Since crowdfunding is getting more and more attention these days, the issues and suggestions extracted from various perspectives can be meaningful progress for future research.

Our study thus contributes to the literature by exploring and explaining what issues are critical and how to improve the situation based on the identified issues of the Korean crowdfunding industry. Firstly, we represent causal relationships of various factors and analyze the impact of factors by analyzing real data of Korea. By showing the relationship among the factors with CLD, we transform implicit to explicit knowledge and help facilitates externalization and combination of knowledge.

Secondly, this study adds to the literature by demonstrating how systems thinking approach with CLD can be applied in the context of crowdfunding industry. Especially, our study shows how systems thinking approach with CLD can complement an interpretivist approach in case research. With system thinking approach, we define the relationship between factors whether it is positive (+) or negative (-). We then identify issues and suggest how to improve the situation. By doing so, we provide more pragmatic implications.

From a pragmatic perspective, this study has implications for crowdfunding business. This study looked into the difficulties and obstacles that the government has, service providing companies have in running the service, and customer faces during the service. Therefore, this study is expected to provide new and realistic perspectives of crowdfunding industry that Korean IT industry should understand before commercializing the service.

Therefore, this study is expected to provide new and realistic perspectives of crowdfunding industry that Korean IT industry should understand before commercializing the service.

Furthermore, this study analyzes the causal relationship between the promoting and inhibiting factors which are extracted from an actually leading crowdfunding companies in Korea. Therefore, this study is expected to serve the realistic and effective guidelines for the companies which will perform a crowdfunding business and the government organizations which are able to establish and draw up relevant policies. Ultimately, the results of this study are expected to help activate crowdfunding business in Korea by minimizing the potential negative effects of activating crowdfunding services.

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