Research Trend and Futuristic Guideline of Platform-Based Business in Korea[†]

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〈요 약〉

Platform is considered as an alternative strategy to the traditional linear pipeline based business. Moreover, in the 4th industrial revolution period, efficiency driven pipeline business model needs to be changed to platform business. We have such success stories about platform as Apple, Google, Amazon, Uber, and so on. However, for those smaller corporations, it is not easy to find out the transformation strategy. The essence of platform business is to leverage network effect in management. Thus platform based management can be rephrased as network management across the business functions. Research on platform business is popular and related to diverse facets. But few scholars cover what the research trend of the domain is. The main purpose of this paper is to identify the research trend on platform business in Korea. To do that we first propose the analytical model for platform architecture whose components are consumers, suppliers, artifacts, and IT platform system. We conjecture that mapping of the research work on platform to the components of the model will make us understand the hidden domain of platform research. We propose three hypotheses regarding the characteristics of research and one proposition for the transitional path from pipeline to platform business model. The mapping is based on the research articles filtered from the Korea Citation Index, using keyword search. Research papers are searched through the keywords provided by authors using the word of "platform". The filtered articles are summarized in terms of the attributes such as major component of platform considered, platform type, main purpose of the research, and research method. Using the filtered data, we test the hypotheses in exploratory ways. The contribution of our research is as follows: First, based on the findings, scholars can find the areas of research on the domain: areas where research has been matured and territory where future research is actively sought. Second, the proposition provided can give business practitioners the guideline for changing their strategy from pipeline to platform oriented. This research needs to be considered as exploratory not inferential since subjective judgments are involved in data collection, classification, and interpretation of research articles.

Key Words: Platform, Pipeline, Network Effect, Linear Business Model, Coordination, Innovation

Ⅰ. Introduction

It is not difficult to recall that the manufacturing giants such as GE and GM dominated the business world until the new millenium. However, the new type of businesses such as Facebook, Google, Amazon, eBay, and Apple demonstrates the new way of doing business, making the traditional linear pipeline based businesses lagging far behind. Businesses are usually recognized as an brokerage entity between the suppliers to the entity and the customers of the entity. In this situation, the competitiveness of a business is determined by the level of streamlining its upstream, internal, and downstream supply chain process effectively and efficiently. Since the requirements of its customers tend to change and individualized, the brokerage work is susceptible to change even though we have advancement in IT to make the alignment easier. The approach is based on the linear pipeline strategy, which is suitable under stable business environment.

The Internet brought aggregate possible for many online mall operate to serve many customers.

Since 2006, platform appeared in the literature as a new strategy of doing business (Eisenmann et al. 2006). A two-sided market entails two user groups such as consumers and suppliers in a business and a IT based platform which facilitates the interaction of the groups. Google search engine as an IT platform for both web searchers and advertisers is a good example.

Apple's huge success based on AppStore introduced platform strategy in the front of management agenda. One of the prominent researchers on platform area, Van Alstyne et al.(2016) even declared that "Learn the new rules of strategy for a platform world, or begin planning your exit."

Even though there are many arguments for platform introduction into a business, it is not easy to find which part of process of our business need to be transformed from pipeline to platform. We have witnessed Business Process Reengineering (BPR) in the late 1980 and early 1990, which involves meticulous IT introduction to make the process faster, cheaper, more accurately, especially sharing databases and communication technologies. At that time, the main issue of BPR was to find which business process we need to and how to reengineer the process in effective and efficient way using information technologies.

As the analogy of BPR with IT, we can interpret platform business with Internet based technologies which we call IT platform system: platform implementation deals not with individual linear activities, but with a community or ecosystem where suppliers and consumers gather together to achieve their own objectives. Note that there is many to many relationship to solve their own problems. The complexity of the relationship is exponentially growing as the number of participants or problem solvers to seek the solution increases. We can contrast the problem solving architecture of platform and BPR environment: P2P vs centralized.

The warning by Van Alstyne et al.(2016) and the reviewing of historical case of BPR motivated the author to investigate the platform business research in Korea.

The main purpose of this paper is as follows: Even though there exist many academic papers on platform, no previous research was done to analyze the structure of research on this issue in Korea. By doing this, we can see the general trend of research done so far, figure out the areas where the research are matured and where more research needs to be done.

Beside academic purpose, we provide a proposition for business practitioners to give a guideline for transforming a traditional, linear based pipeline to platform based business model.

The structure of this paper is as follows: In section II, we provide a related literature review on the comparison between pipeline and platform business models, two-sided markets, and network effects. In Section III, we propose the research hypotheses and a proposition. In Section IV we provide research method to test the hypotheses along with data which is derived from the bibliography analysis from the Korea Citation Index (KCI). Over there we provide a set of summarized data from the filtered research articles. In Section V the results of the analyses and the application of the findings and evolutionary paths to platform business implementation are provided. In Section VI, we conclude with limitations and conclusions.

II. Literature

In this section we provide a related literature review on the comparison between pipeline and platform business models, two-sided markets, and network effects.

1. From process based to platform based business

We are accustomed to the general process based model. The main assumption of the model is that if we control a process to be effective and efficient as much as we can, then the competitiveness of a firm will follow. The strategy is to design optimal design of business activities internally.

We can easily understand platform by the analogy of the platform at the railroad stations. Over there entities such as passengers, different types of trains, infrastructure of railroad system, governing rules, and strategies to manage the station. Thus the platform is the interfacing place where the consumers (passengers), suppliers (trains) meet together and the consumers enhance their value by using the transportation services. In this situation, the platform provides the facilities for the information, orderly service, safety, security, and fun.

Note that there are two types of networks involved in the platform: network of consumers and network of suppliers. In the similar way, we can define a general type of platform where two sided markets are

interacting.

The main difference between pipeline vs platform approaches is to provide a direct interface between non-homogeneous entities so that they interact in P2P way. The main theme of platform is interaction via information between producers and suppliers, and the network effect induced by virtuous cycle.

The crucial asset in the pipeline business is distinctive and inimitable resources compared to competitors. However, in the platform business, community is the main asset. The community possess distinctive capability since the members of the community contribute there resources to the community (Van Alstyne et al., 2016).

The comparison between the traditional process based and platform based business is summarized in <Table 1>.

<Table 1> Comparison of pipeline vs platform based business

Category	Pipeline based	Platform based
Strategic business activities	controlling resources in a linear series of activities	coordinating the members of networks
Core assets	scarce and difficult to copy assets	network asset of producers and consumers
Source of value creation	process optimization	facilitating interactions between consumers and suppliers
Value focus	focus on the life time value of customers	focus on the total value of participants of platform ecosystem

Source: Contents are extracted from Van Alstyne et al.(2016).

2. Two-sided market

We can categorize markets into two: One-sided vs Two-sided or Multi-sided markets. One-sided market is a place where a single group of users participate in a market. However where more than one user group with different business purposes participate in a market through technical brokerage platform system, it is called two-sided or multi-sided market, depending on the number of user groups. (Jun et al., 2016)

Two sided market is the archetype of platform based business. According to Eisenmann et al.(2006) and Van Alstyne et al.(2016), there are four components in two-sided market. First there is owner(s) who implement and operate the platform. The owner designs the IT platform system and devises strategies for the overall platform business. Second, producers provide their offerings in terms of artifacts, solutions, or services to their customers via platform. Third, customers satisfy their consumption needs again through platform. Since IT has the capability to capture, analyze, and share data
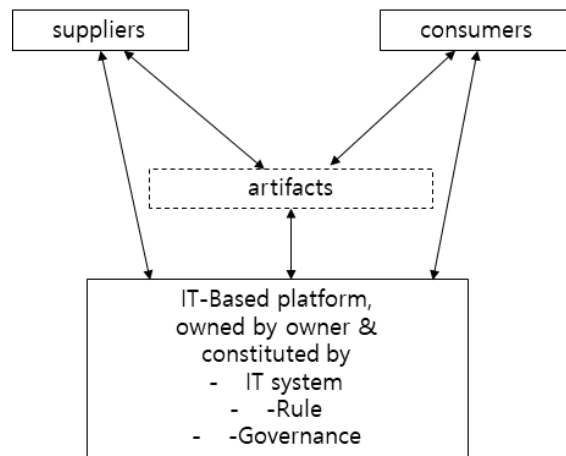
among the participants in efficient way, IT based platform is the key to the success of platform business. Also it provides the logical market place where both producers and consumers interface each other and satisfy their information requirements, and exchanges transactions.

Kim et al.(2013) classified the two-sided market into the three types. The first type is "market maker". Open market is the representative example where M sellers and N buyers meet for the transactions. Second type is "audience maker" where the platform connects advertisers and audiences. Examples are online newspapers and Google. Third type is "demand coordinator" where cross network effects are rapidly created as in AppStore.

The main issues of this research is to fill the gap from the single market to two sided market platform. This makes the research on this area difficult since it involves two sides of user groups such as consumers and producers who are interfacing indirectly through IT platform system. Thus, we need to take into account the systematic view of multiple components.

The architecture of a platform of two sided market can be described as in <Figure 1>.

<Figure 1> Architecture and components of platform business

According to Eisenmann et al.(2006), in a two sided market the benefit of two sided market is to make the pricing structure flexible, easy extension to new business territory, and capturing market share quickly.

A cautionary remark is that a two sided market is a necessary condition for a platform establishment. That is, a platform can support a single sided market too. However, as we will see, the platform effect will be bigger under a two-sided market situation (see for example, Jung et al.(2015), where the authors examine the one side network of "corporations").
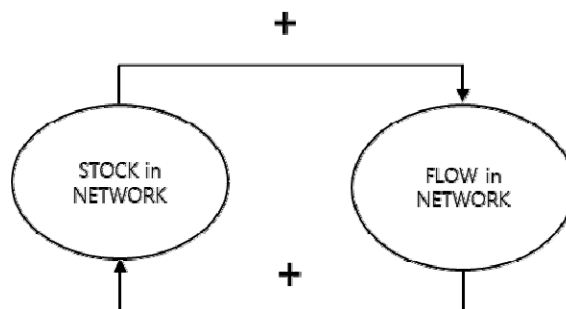
3. Network effects

When we have a network of users, there exists a network externality which refers to the benefit coming from the increase of the size of the group. That is, the benefit from the increase in the network size is bigger than the cost associated. This effect comes from the effect of scale. Cross network externality is the necessary condition for two sided network to be established. (Kim et al., 2013)

For the best utilization of platform, we need to strengthen feedback loop in the positive way. In wiki, it is defined as "feedback occurs when outputs of a system are routed back as inputs as part of a chain of cause-and-effect that forms a circuit or loop". The system then can be said to feed back into itself. The notion of cause-and-effect has to be handled carefully when applied to feedback systems. The main cause of the importance of feedback loop is the network effect. Network effect refers to the value of a service or a product increases as the number of users of the service or product increases. This contrast the traditional economic phenomena of decreasing marginal return.

The capability from the network resources can be derived from two sources such as stock and flow resources. For example at kickstarter.com, a crowdfunding platform, the stock resources are accumulated in the project database. According to kickstarter.com, it contains more than a half million projects which are the combination of ideas, plans, drawings, prototypes. It is a repository of knowledge provided by producers and interaction between the supporters and producers. The stock resources can be enhanced by the filtering mechanisms provided by the platform. Through the mechanism, donators can understand the projects better. By promoting the communication among the supporters and between supporters and producers, the richness of the network can be strengthened. <Figure 2> implies that the more stock in network induces the more flow resources and the active flow in turn tends to bring in better projects in the platform.

<Figure 2> Network Resource Reinforcing Model (modified from Namn et al., 2011)

Another example of cross network effect can be explained as follows: Think about Airbnb. There are two networks: suppliers and consumers. If the size of consumer group increases, there is a greater chance that a supplier can be selected. In the similar way, when more suppliers bring in their apartments to Airbnd, there is a higher likelihood that consumers can find their taste of lodgings. There exist a virtuous cycle, forming a positive feedback loop.

Ⅲ. Exploratory research hypotheses and a proposition

In this section we provide a set of exploratory hypotheses and a proposition regarding the state of platform related research in Korea.

For the research of this domain, the author will focus on one or more components from the platform architecture. The components include two user groups of suppliers and consumers, owners and IT platform system. Among these, we have a rich set of established theories in marketing and MIS on consumer behavior, satisfaction to a system or service. Thus, we believe that the extension and the application of the theories to platform business area is rather natural. This conjecture leads to the following hypothesis.

Hypothesis 1: The proportion of research on "consumer" will be high, compared

with other components of platform system.

In the sequel to Hypothesis 1, since we have a plenty of related verified research models regarding consumer behavior in other fields of research, those empirical research models can be easily modified to platform business area, leading to the following hypothesis.

Hypothesis 2: Research method on "consumer" will rely on empirical study, compared to other methods such as normative or case studies.

In the similar context, when research is done on the "whole system" where all or majority of the components are taken into account, then the number of variables and interactions among the variables are increasing. Consequently the complexity becomes higher so that a general theoretical model cannot be applied for the analysis. Thus we have the following hypothesis.

Hypothesis 3: Case study or normative study will be applied more for the "whole system" related research.

As indicated by Van Alstyne et al.(2016), pipeline based businesses tend to maximize the lifetime value of individual customers who are at the end of the linear process. When the pipeline based businesses transform themselves into platform based business, they will utilize the existing network of consumers and extend

the network to other network of users such as suppliers, seeking the cross network externality.

The path to the platform business taken by pipeline business will be evolutionary, not a radical big bang approach.

Proposition: An organization needs to take an evolutionary path to platform for the better performance

IV. Research method

In this section we discuss the research method to verify the hypotheses and a proposition in Section III.

1. Data

We need a set of data for testing our hypotheses and to prescribe the proposition set forth in the previous section. For the data set, we used peer reviewed academic articles registered in the KCI (Korean Citation Index). The search on the database of KCI (www. kci.go.kr) was done in January, 2020. To obtain the articles dealing with platform, we used keyword filtering method.

The sample for this study was filtered out by the following procedure. Using the word, both in Korean and English "platform", we filtered all the articles by searching the author provided keywords of the articles. Note that in most of the academic journals, a set of keywords in both Korean and English is required to describe the contents of the articles. However, we did not search on the abstract since we found the resulting articles are too general to interpret them as platform related research.

All the articles were filtered if there exist word "platform" in keyword. To minimize omissions, both Korean and English keyword search were performed simultaneously. It is noted that the keyword platform can be a part of a phrase given by the authors such as from "platform business", "platform service", or "IT platform". Then by the search of the single keyword of "platform", a superset of articles can be included for our analysis.

Based on the filtering from all the disciplines in the domain of Social Science, we obtained 823 articles. To see the trend of research on platform we compiled the number of articles by the publication year in <Table 2>. From 2015 to present, the number of articles is an increasing order, culminating in 2019. It indicates that platform is a hot research subject in Social Science domain.

We found that the search on Social Science generates a huge set of articles and most of the articles are not relevant. <Table 3> shows the distribution of the articles on platform, based on journal discipline. The number of articles in Management area is followed by Law and Trade. Since we are interested in the application of platform in general business environment, not in specific areas such as Law, Trade or Education, we focus on Management area.

<Table 2 > Distribution of articles by publication year

Year	Number of articles
2020	7
2019	173
2018	131
2017	102
2016	80
2015	48
2014	53
2013	60
2012	35
2011	30
2010	24
2009 - 2002	80
Total	823

<Table 3 > Distribution of articles by discipline of journal

Discipline	Number of articles
Management	165
Economics	20
Tourism	18
Education	28
Trade	93
Law	127
Mass Communications	80
Social Science	53
Others	239
Total	823

2. Content analysis of Management Area Articles

Based on the components of platform business discussed in Section II, we categorize and look into details of the articles in Management area. For the categorization, we use the 165 article from "Management" in <Table 2>. Note that "Others" include 15 disciplines other than 8 areas in <Table 2>, meaning that platform is a popular term in diverse research areas. The components are consumers, suppliers, IT platform system, owners who design governance and rules of platform business. Superficially, most of the articles encompass and deal with all the components. Among the components, we figure out the main prominent component. However,

when the author judges that all the components are evenly discussed in an article, then "whole system" is assigned to that article.

For the classification, we identified 1) the type of platform of research so that what kind of platform types are discussed in the Management area, 2) the main purpose of the research, and 3) research method used such as empirical study, case study, or normative study.

To classify the articles, the author first read the abstract to figure out the major component of a platform among consumer, supplier, owner, technical platform system, or strategy. If the abstract does not provide a clear clue for the classification, the author further read the whole article.

However, if the article just mentioning platform to introduce the current trend of business like "4th industry revolution" or "big data", or the article does not deal with IT platform system, we did not include it for further examination. The resulting set includes 56 articles.

The summary data from <Table 4>, <Table 5>, and <Table 6> provide a picture of research trend on platform based business in Korea. Thus these data in themselves can give researchers and practitioners insights for possible research area or for adoption or extension to platform business in their research or organizations.

In <Table 4> we provide the synopsis of articles dealing with the research whose emphasis is on "consumers". As is indicated in the column "Main purpose of the research", this group of research deals with the ways of

enhancing the attractiveness of a platform for the consumers. That is, this group is to increase the direct network externality, according to Einsemann et al.(2006). Of course, the consumer group can be either individuals or organizational levels.

As an analog of consumers, of course, we have a group of suppliers. In C2C and open market, supplier side group is well developed. However, in other platforms, the group is not dealt with much. Also research on the supply group is not active.

The inactive research on supplier group might be due to the traditional emphasis on customer value. However, in the platform, the value from the interactivity and coordination between the two group is the key (Van Alstyne et al., 2016). For example, the asymmetric nature of information requirements for the groups of consumers and suppliers is discussed in Shin et al. (2017) and Cho & Park et al.(2018), which signals further research on the supplier group.

From <Table 4> we see diverse platforms are considered, ranging from C2C, SNS platform, mobile platform, YouTube channels, knowledge sharing, to collaborative platforms. For the knowledge sharing and collaboration, the unit of analysis of consumers is corporate or organization. It is easily noted that empirical study is the major research method employed.

In the similar way, we provide a content summary of the articles emphasizing on "whole system", dealing with not an individual, but more than one components in <Table 5>. Differentiation among the components is not
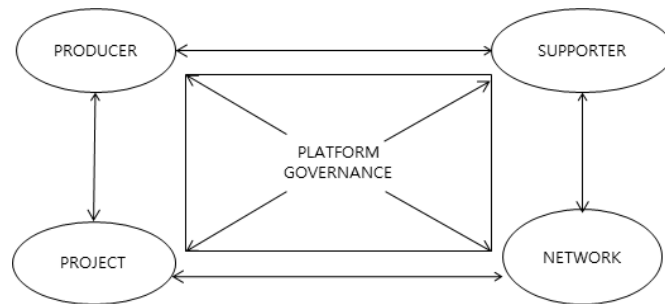
straightforward, but the author assigned an article into "whole system" when the article touches multiple components in a balanced way.

In this way, a set of 27 articles are filtered out.

As in "consumer" side in <Table 4>, we have a diverse types of platforms in <Table 5>. But many articles deal with the prescriptive suggestion for introducing platform in an organization or case study for the platform already implemented. Individual platform tailored to an individual organization is not easy to provide a unified way of implementation.

Since the whole system refers to the set of components and the interaction among them as in <Figure 3>, which shows the example of crowdfunding platform site. The complexity of the analysis is much higher than that in consumers only. As we can see in the column of "Main purpose of the research" in <Table 5>, platform governance and strategy play an important role for the successful platform implementation.

<Figure 3: Interrelationship of components>

The scale of the main themes of the articles is organizational, rather than individual level. For example, the subjects mentioned are airport, tourism platform, valuation of a platform, counselling and collaboration platform, role of platform for solving asymmetry between consumers and suppliers and so on

On the other hand, if an article highlights products or intangible artifacts in specific, we provide the summary in <Table 6>.

In a platform a product is the main object: suppliers provide it and consumers use it. Since the advent of AppStore, which deals with diverse products or artifacts and is the model for achieving cross network effects, new platform business application is applied to the shared economy model such as Uber and Airbnb. In an organizational level, managers, who want to introduce platform in their organization need a creative and critical view of their business. The products can be either tangible or intangible, such as AppCessory (Cho & Park, 2015), information, knowledge, consulting expertise, applications, open source program development, etc.

<Table 4> Content summary of articles emphasizing on "consumers"

Platform type considered	Main purpose of the research	Research method	Source
Dog care platform	Determinants of service quality	empirical studies	Back (2018)
C2C	Determination of factors for participation in C2C: comparison of consumers and suppliers under information asymmetry	empirical studies	Shin et al. (2017)
SNS platforms	Factors affecting the level of SNS platform service	empirical studies	Bae et al. (2016)
General platform	Antecedents to behavioral intention to participate in platform business	empirical studies	Lee (2018)
Idea commercialization platform	Antecedents of platform usage	empirical studies	Lee, J et al. (2018)
Ticket selling platform for performance and art	Consumer motivation to use platform	empirical studies	Park et al. (2017)
Travel and aviation platform	Factors affecting convenience of shopping	empirical studies	Lee et al. (2014)
1 person media on YouTube platform	Determinants of continuous use of one person YouTube service	empirical studies	Lee et al (2019)
Kakao supplementary service platform	Characteristics of supplementary service adoption	empirical studies	Kim et al. (2015)
mobile phone platform	Factors affecting adoption of smart devices	empirical studies	Lee et al. (2012)
mobile phone platform	Antecedents of switching intention	empirical studies	Oh (2014)
tourism/hospitality platform	Strategy for enhancing customer satisfaction/loyalty	empirical studies	Kim (2017)
real estate platform (O2O)	Factors affecting trust on platform	empirical studies	Choi, M, et al (2019)
WeChat, Chines platform	Platform characteristics affecting marketing public relations	empirical studies	Yang, Y. et al. (2019)
Social manufacturing platform for SME	Factors to participate in social manufacturing platform	empirical studies	Kil, et al. (2015)
knowledge based platform	Ways to build capability by utilizing knowledge ecosystem	normative studies	Jung et al (2015)
Knowledge sharing platform	Identification of networks for knowledge sharing among NPOs	empirical studies	Jin et al (2017)
WeChat social network service	Trust on platform: contents, source, and platform	empirical studies	Qu et al (2017)
mobile phone platform	Determinants of application selection	empirical studies	Pyo et al (2014)
payment platform: KakaoPay	User resistance to the use of payment platform	empirical studies	Kim et al. (2017)
Open market	Relationship of trust on platform to continuous usage	empirical studies	Kim et al. (2019)
collaborative platform for collective Intelligence	Determinants of quality and usefulness of collective intelligence	empirical studies	Joo et al (2012)
Total	22 articles		

<Table 5> Content summary of articles emphasizing on "whole system"

Platform type considered	Main purpose of the research	Research method	Source
Airport	Competitiveness of whole airport platform system for CPTN(Contents, Platform, Terminal, and Network)	case studies	Kim et al. (2014)
Online community as startup platform	Proposition of platform valuation model	empirical studies	Kim et al. (2014)
Healthcare platform	Comparative analysis of healthcare platforms Google vs Apple	case studies	Cho et al. (2018)
Smart phone platforms	Comparative analysis of competition strategy between Samsung vs Apple	case studies	Kang et al. (2013)
Crowdfunding platform	Success factors for equity based crowdfunding platform	normative studies	Dong et al. (2016)
Startup mentoring platform	Proposition of organization and strategy for mentoring platform	case studies	Yang et al. (2016)
Social venture platform	Success factors for social venture platform	case studies	Park et al. (2017)
Open source software development platform	Comparative analysis of impact of open platform on system development process: Github vs Sourceforge	case studies	Hahn et al. (2013)
crowdfunding for business mission	Implementation strategy of crowdfunding for business mission	normative studies	Sung (2017)
platform strategy for co-creation entrepreneurship	Proposition of strategy of co-creation entrepreneurship platform	normative studies	Kim & Hong et al. (2014)
mobile platform	Success factors for competition	case studies	Jang et al. (2013)
Art education platform	Proposition of education platform implementation	normative studies	Suh et al. (2019)
Global IT platform	Literature review on two sided market and proposition of competitive strategy	normative studies	Kim & Choi, Lee (2015)
General platform	Factors leading to winner takes all platform	empirical studies	Jun et al. (2016)
mental health counseling platform	Proposition of counseling platform introduction	case studies	Rha (2019)
social platform: kakaotalk	Evolution strategy of one-side market into two-sided market of Kakaotalk	case studies	Kim J & Kim M (2013)
mobile service platform	Factors for success of two-sided market	empirical studies	Kim, Yoon & Kim (2014)
IT service platform	Service requirement of SMEs	normative study	Han et al (2015)
medical tourism platform	Feasibility study for medical cloud tourism platform	normative study	Kim W. et al (2019)

tourism platform	Tourism platform as combination of data and service provision	normative study	Chang et al (2017)
Platform for collaboration	Collaboration for innovation and performance	normative study	Lee & Oh et al. (2013)
general two sided market platform	Competitive factors for two sided market platform	normative studies	Suh et al (2013)
Information brokerage for solar photovoltaic platform	Developing online platform for solving information asymmetry between suppliers and consumers	case study	Cho & Choi et al. (2018)
General two-sided market platform	Factors for platform competitiveness	case study	Jung & Chung (2019)
IoT platform	Proposition of new business model for IoT information service platform	normative study	Kim (2016)
InsureTech platform	Identification of InsureTech services	empirical studies	Kim & Kim (2019)
Crowdfunding platform	Suggestion for implementation of crowdfunding platform for social economy	normative studies	Roh (2013)
Total	**27 articles**		

<Table 6> Content summary of articles emphasizing on "products"

Emphasizing component	Platform type considered	Main purpose of the research	Research method	Remark	Source
Artifact (appcessory)	Smart peripheral accessories platform	Proposition of appcessory introduction and business model	case studies	Extension of product in a platform	Cho & Park (2015)
IT platform system	General platform	On the optimal level of authing service at a platform	normative studies	IT Security on platform system	Yoo et al. (2018)
Artifact (funding project)	crowdfunding platform	Success factors on crowdfunding projects	empirical studies	Producers offer artifacts	Choi et al. (2017)
Artifact (knowledge product)	knowledge platform	Factors affecting the utilization of knowledge platform	empirical studies	Product is embedded in IT platform	Kim & Ha et al (2009)
Artifact(Open Public Data)	public open data platform business	Proposition of public open data platform introduction	case studies	VR enriched data provision	Han (2019)
Artifact (lifelog healthcase data)	lifelog-based healthcasre platform	Provision of reference data model for the platform	normative study based on literature and interviews	characteristics of data offerings	Lee & Ko (2018)
Artifact (online fashion content)	online fashion platform	Identification of contents to be provided in fashion platform system	case studies/empiric al studies	content presentation on IT platform system	Ko et al. (2013)
Total	**7 articles**				

Ⅴ. Results

In this section we discuss the testing of the hypotheses and how to augment the proposition given in Section Ⅲ.

1. Hypotheses testing

Regarding Hypothesis 1: We have 56 articles. Of these 22 articles (in <Table 4>) deal with the single subject of consumers. Since "whole system" in <Table 6> encompasses all the components and if the table is decomposed into further a single component, the ratio of "consumers" will dominate other components.

Majority of the articles deal with the identification of factors leading to customer satisfaction to a platform. Since customer satisfaction research has been done extensively using TAM and UTAUT, we believe the accessibility to this domain is relatively high.

Regarding Hypothesis 2: In general there are three research methods such as empirical study, case study or literature review, and normative or prescriptive study. The 21 articles in <Table 4> employed empirical studies. Based on the heritage of customer related research, rigorous research model can be established and causality is tested. But it is noted that the scope of the analysis is limited to individual level in general.

Regarding Hypothesis 3: Compared to the emphasis on empirical study for "consumers", research on "whole system" is extensive in terms of research scope and complex due to the interaction among the components. Further platform implementation is business specific, meaning that individual company needs to adopt its own business specificity and technical implementation strategies.

In <Table 5> out of 27 articles, there are 11 case studies and 12 normative studies, and 4 empirical studies for the analysis of "whole system". The data supports the hypothesis.

2. Proposition

Kim et al.(2013) proposed evolution strategy of one-side market into two-sided market of mobile service, Kakaotalk. Based on the critical role of network effect, they proposed a growth model of three stages and mapped the instruments for facilitating the cross network externality. In the growth model, Kim et al.(2013) did not separate two groups of users. Instead they treated them equally. However, since there exists asymmetry requirements between consumers and producers (see Cho et al.(2018) in Section Ⅳ), we need to divide the two network effects.

We propose the competitiveness of platform business is determined by the three independent variables such as direct network effects from consumers and suppliers, and cross network effect.

> Competitiveness of a platform business = F (consumer network effect, supplier network effect, cross network effect)

The above functional relationship can be represented by <Figure 4>. It shows the degree of competitiveness in terms of network effects and how the target level can be reached.
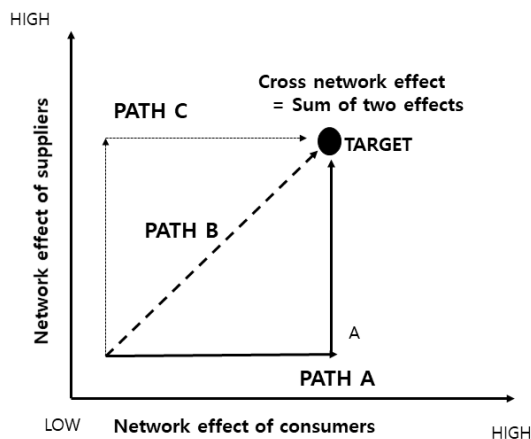
<Figure 4> shows that there are three paths or strategies starting from the origin (starting point) to the target state of platform: Path A, B, and C.

Path A is to enlarge the consumer network effect and then promote the suppliers network, independently. For example, online eyeglass retailer Warby Parker induced its customers to post their photos with eyeglasses online and ask their friends to recommend which eyeglasses they like (Van Alstyne et al., 2016). In this way the retailer leveraged consumer network effect for its marketing functions. The internal marketing function is replaced by the external consumers. That is, the outside network becomes internalized without any cost, but bring in more satisfaction and cost saving. In the Warby parker case, there are two user groups: customers and friends. The two groups interact the online photos posting, modeling and recommending through the IT platform system.

On the other hand Path C is the analog of Path A. However, in general the supplier network does not exist at the beginning. Thus, Path C is not an normal path to the target level.

Path B is the most sophisticated since it is based on the continuous evolution linking the two groups of users. Thus this path requires business managers to come up with creative strategy. We believe that the argument of platform proponents like Van Alstyne et al.(2016) that the adoption of platform into an organization is not the issue, but the continuous management of platform is the key capability of an organization.

<Figure 4> Evolutionary paths to platform target

VI. Limitations and conclusions

The main purpose of this paper is to identify the research trend on platform based business in Korea. The main contribution of this work can be summarized into three: A set of exploratory hypotheses regarding general phenomena of platform research based on the past research, and a proposition which suggests the guideline for the future research and practical implementation in an organization. We also provided a list of summarized attributes on platform research.

It is also found that majority of the articles deal with the issues focusing on the individual component like consumer group. This finding warns that platform is a complex system, so that we need research from the "whole system" perspective.

Like the arguments between BRP vs TQM (Total Quality Management), we believe that the evolutionary approach to platform strategy is more effective than a radical big bang approach. That is, managers need to recognize platform as an area of management like process management in the traditional business environment.

However as we noted, this study is exploratory: Data is not extensively collected and the categorization scheme is not rigorous since it depends on mostly author's subjective judgment. However, it gives insights to the researchers and practitioners about the general trend of research on platform domain.

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요 약

플랫폼 기반 비즈니스에 대한 국내 연구동향 및 미래를 위한 가이드라인†

남수현*

　플랫폼은 기존 전통적인 선형적 파이프라인 기반 비즈니스 모델에 대응하는 대안으로 떠오르고 있다. 특히 최근의 4차 산업혁명시대에 효율성 주도의 파이프라인 기반은 조정 주도의 플랫폼 기반으로 변환되어야 한다는 것이 일반적인 인식이다. 플랫폼 성공사례는 애플, 구글, 아마존, 우버 등에서 쉽게 찾을 수 있다. 그러나 규모가 크지 않은 기업에서는 플랫폼 비즈니스로의 전환 전략을 찾기가 쉽지 않다. 플랫폼 비즈니스의 핵심은 네트워크 효과를 경영활동에 도입하여 활용하는 것이다. 따라서 플랫폼 비즈니스는 경영활동 기능에서 네트워크 효과 관리를 어떻게 할 것인가와 유사하다. 플랫폼 관련 연구는 최근 활발하고 다양하다. 그러나 이 분야의 연구 동향에 대한 연구는 많지 않다. 본 연구의 주요 목적은 최근 국내에서 수행된 플랫폼 관련 연구를 통하여 연구동향을 이해하는 것이다. 이를 위해서 우리는 연구가설과 명제를 제시하였다. 데이터는 연구논문으로 한국학술지인용색인 시스템에서 "플랫폼" 혹은 "platform"을 키워드 속성으로부터 얻었다. 수집된 논문집합은 "경영학" 분야로 국한하여 구성하였다. 선택된 논문들을 대상으로 연구된 플랫폼 요소, 플랫폼 유형, 주요 연구 내용 등에 대해 56개의 논문에 대해 분석을 하였다. 56개의 데이터를 이용하여 탐색적인 연구가설을 검증하였고, 명제를 제안하였다. 본 연구의 시사점은 연구자들에게 연구 영역 중, 많은 연구가 수행되어 온 성숙 영역과 아직 더 많은 연구가 필요한 분야를 제시하였다. 또한 실무자들에게는 파이프라인 비즈니스로부터 플랫폼 기반 비즈니스로 변화를 추구하는 가이드라인을 제시한 것이다. 가이드라인의 핵심은 극대화하기 위해서는 IT플랫폼 시스템을 기반으로 소비자와 공급자 네트워크를 점진적으로 조정하고 관리하여야 한다는 것이다. 본 연구는 데이터 수집과 수집된 데이터의 구분 및 주요 연구내용 등 주관적인 판단 요소가 많아 추론적이 아닌 탐색적 연구로 간주되어야 할 것이다.

　핵심키워드: 플랫폼, 파이프라인, 네트워크 효과, 선형 비즈니스 모델, 조정, 혁신