A STUDY ON BUSINESS ISSUE THROUGH ANALYZING BM PATENTS KEYWORDS

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ABSTRACT. *Business model has been improved and modified based on the development of technology and change in business environment such as market or new regulations. In order for companies to maintain their profitabilities, developing new business model is needed. Meanwhile, patents hold the original information of technology along with commercial value, and the practicality of patents analysis is growing. The BM patent used in this research is about business method and holds a patent content related to system and method. Thus, analyzing BM patents is the measure which helps to figure out the idea and commercial value related to business method. Based on the findings, this research studies about online business issue by analyzing the BM patents applied in Korea.*
Keywords: BM patent, Business model, Revenue model, Text mining, Online

1. **Introduction.** As the environment of the industry became highly enhanced, companies have been modifying and developing business models for continuous business. Recent development of Internet has caused the increase of online-based business models, and the importance of developing new services and business models to enhance competitiveness in online industry is increasing.

Meanwhile, the practical value of patent analysis is increasing as patents possess the source information of technology and commercial value [16,17]. Through patent analysis, trends on technology change, level of technology, and commercial value of technology can be determined [1,6]. Existing research on patent analysis tends to take the form of predicting future technology based on analysis of technology development trends or status. The BM patent used in this research is a patent which protects ideas about new forms of business or service. By analyzing the BM patents, this research discovers the current industry trends.

The paradigm of the industry is changing and the size of the online-based business is growing due to the increase in the marketability of the service industry. One needs to study the online business model based on the Korean business model to stay up-to-date.

This research analyzes core keywords of online business models by analyzing the BM and examining rising issues regarding the business model.

2. **Literature Review.**

2.1. **Business model.** The research of business model has been actively performed since 1990s when the electronic commerce started. Due to the recent development and diffusion of Internet, the emergence of online business models related to various services including electronic commerce and business methods has been increasing. Online business models and data communication technology and computer technology are inseparable from each other. Also, the basic of business model can be considered as economical profit model

TABLE 1. Definition of business model from the revenue model

Researcher	Definition
Timmers (1998) [14]	Internet business model is an architecture for the product, service, and information flows, including a description of the various business actors and their roles, and a description of the potential benefits and the sources of profit for the various business actors.
Mahadevan (2000) [2]	Business model is an adequate mixture of value flow, revenue flow, and distribution flow.
Rayport and Jaworski (2002) [7]	Business model includes 4 factors: the source of profit creation, the distribution channel for customers, the resource supply channel, and financial management.
Rappa (2003) [12]	Business model shows the business method and profit creation method that the company can continue, and clarifies where the company is located in the value chain. The continuous profit creation and value chain is important.
Weill et al. (2005) [15]	The commonly important point in the definition of business models is the method of profit creation. In some cases, value creation is more important than profit creation.

TABLE 2. Definition of BM patent

Researcher	Definition	Main Keywords
Koda (2000) [5]	BM patent is a method of administering, managing, or operating an enterprise or organization, and is a technique used in conducting business.	· Method · Managing business
Wu (2005) [19]	BM patent typically covers some combination of software and business methodology.	· Software · Business methodology
Kim et al. (2008) [4]	BM patent is related to new methods or systems for electronic commerce and explains the business models in real commerce.	· New methods or systems · Business models
Han et al. (2011) [18]	BM patent is the only source of information that can explain the business process or method thoroughly.	· Electronic environments · Business process or method
Kim (2015) [3]	BM patent is about the business data analysis method based on electronic and computer related techniques.	· Data analysis method · Computer techniques

[9]. The definition of business model research based on this kind of profit model aspect is shown in Table 1.

To summarize, business model can be defined as a framework that expresses how to continuously create profit with what kind of product or service [9].

2.2. BM (business model) patents.

Companies have been applying and registering BM patents for protecting their own business models. Table 2 is a definition of BM patent and main keywords through preceding researches.

To summarize the research, BM patent is a new business system or method implemented using computer, Internet, and data communication technology. In other words, it is a

patent that is approved when a new service or system such as marketing method or stock management method in an online business is implemented through data system [11,13].

In Korea, G06Q is used as a patent classification code for BM patent [11]. Thus, this research analyzes G06Q of the IPC patent classification standard proposed by KIPRIS (Korea Intellectual Property Rights Information Service) as a BM patent. The definition of G06Q suggested by KIPRIS is specified in Table 3.

TABLE 3. Classification code of BM patent in Korea (G06Q)

Section	Definition
G06Q	Data processing system or method suited for management, business, finance, business management, supervision, or prediction; system or method suited for other unclassified management, business, finance, business management, supervision, or prediction.

(Source: KIPRIS)

3. Analysis of Business Issues.

3.1. **Research process.** In this research as in Figure 1, there are four steps: **Data Collecting** stage, **Data Filtering** stage, **Keyword Extraction through Text Mining** stage, and using the Keyword **Finding a Business Model** stage. First, collect business model license that corresponds to BM patents through KIPRIS. Patents have been filtered using patent titles. And via text mining, elicit business model issue from extracting keywords of each patent.
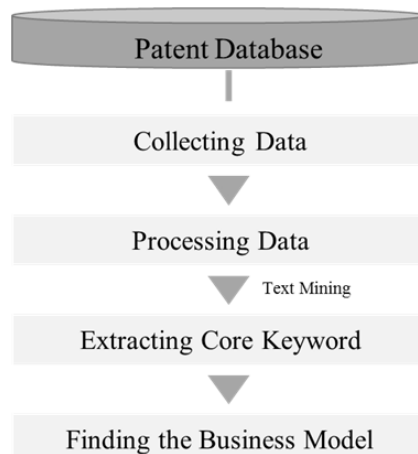

FIGURE 1. Process of BM patents analysis

For in-depth information on each step of this research process, it can be illustrated as Table 4 below.

3.2. **Keyword-based analysis.** The key word-based analysis method is to identify the key information from the content of the patents and this method is to find out the combination of keyword extracted from the patents through text mining. It can be deduced that the frequency of the words in document is the symbol and judged to be useful data [10].

In this study, an examination has been made on the online business model recently in issue through extraction of the keywords from BM patents. Also, use the statistical package R for a keyword-based analysis. Figure 2 shows the process of the core keywords from the refined patents expressed in frequency.

TABLE 4. Explanation of study process

Steps	Explanation
Collecting Data	Use the patents information search service KIPRIS in order to collect BM patents for analyzing the online business model trend. Collect data based on the keyword "Business Model" and G06Q code which is classified as BM patents. 466 collected patents data among 544 collected patents data were registered between 2006 and 2015.
Processing Data	Filter 466 collected patents data to make available data. First, 358 patents were defined as available patents survived from filtration of unrelated patents and noises.
Extracting Core Keyword	Extract a keyword from each of 358 patents' abstract, and lastly refine them through standardization procedure. Perform the standardization procedure to include different words with the same meaning [8].
Finding the Business Model	The core keyword based on word frequency can be extracted by visualizing the analyzed result through text mining. This makes it possible to know the main keywords of Korea's business model trend and the business that is mostly discussed. Also, it seems possible to infer promising business models through this.

FIGURE 2. Analysis process using R

FIGURE 3. Analysis result of BM patents keywords

4. **Research Result.** The result of keyword analysis is shown in Figure 3. Re-extract the main keywords based on the analysis result, such as 'Smart Device', 'Contents', 'Application', and 'Social Network Service'. Recently, business model targeting mobile has been prevailing. This is the emergence of various smart devices starting from smartphones and new services that can support these new devices. It is shown that business models that provide these kinds of services and earn profits through them are emerging.

Furthermore, it can be predicted that the keyword 'Contents' is a most frequently used term in the online business world. To sum it all up, business model that gains profit through the 'Contents Development' is prevalent in online industry. Along with this, Social Network Service (SNS) is also widely spread. This service using network can provide more various services and lead more user participation than normal contents.

5. **Conclusion.** In accordance with rapidly changing industrial environment, a company can have profitability and durability through business model design and modification. Thus, recent business model requires us to keep up with its development process and an insight to predict future prospect. From the research, it could elicit keywords from doing keyword analysis by text mining of the BM patents.

For this, it is considered that upcoming online business model would be able to enrich mobile environment. Besides, now, smart devices are being used with IoT and VR, and considering such environment, it is anticipated that user-based contents development that users can make their own and use will be actively developed as well as business contents development. Therefore, it is expected to have mobile industry developed and to accomplish high level of mobile industry.

Limitations of the research are as follows. Since the research was analysed on the patents registration date basis, there could be 2 or 3 years in time difference. Also, there is a limitation that it only shows us an overview of the rough situation. In order to overcome this limitation, it needs to raise the degree of the research completion by using Delphi technique and accepting opinions of other experts.

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