

The Study on the Business Development Prospects Analysis Using Big Data

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Abstract

The huge amount of data are being generated by rapid development of internet and social networks with the wide spread of smart devices. Many data has started to be produced more and more and become complex as the IoT, M2M is active. A lot of research has been progressed in business and government in order to create new business model using this. The application value of these big data is expanding in various fields. The demand of technique and professional manpower as a source of future competitive advantage is expected to jump. In case of Korea it has been estimated that there is a shortage of professional manpower and technology gap with the advanced counties. Therefore, we analyzed the characteristics and paradigm of the Big data business in this paper. We also analyzed applied technology for development model of Big data business through it. In particular, we divided the development model for Big data business step-by-step and analyzed consideration about this systematically. The companies and public institutions based on the analyzed result in this paper will provide advantages to production of big data systems.

Keywords: *Big Data, Business Prospects, Data Utilizing, Data Analysis, Data Mining*

1. Introduction

The rapid development of the computing environment has brought great changes to the IT environment of the companies. Introduced IT system as a means for solving the various problems of the companies caused increasing dramatically the data within the companies. The companies were obtained various achievements of productivity improvement and process betterment but occurring data by system construction was out of interest in the meantime. The competitiveness of company is improved and creation potential of new business model is been on the rise through large data analysis as per wide information generation by the spread of smart devices, the rapid growth of social networks, and IoT(Internet of Things) [1-2]. In particular, big data technology enables to analyze large and complex data that companies have. And competitive advantage can be gained by deriving strategic value through these analysis techniques and applying these to the business.

Big data as a platform and foundation resources for new business and ecosystem has advantages that can be utilized in order to create new value of business optimization and the creation of new business through the big data analysis being beyond the technical possibilities that are emerged [3]. Due to this reason, introduction of big data is pursued actively in order to utilize big data strategically with global leading companies as the center. There are a lot of difficulties by introducing hastily without considering the strategic value and performance through big data. It is very important to identify clearly the strategic value by big data and analyze systematic environment for the introduction of successful big data. But companies are struggling because they consider only a partial achievements and technological parts that can be obtained through the big data.

Therefore, the research on analysis technology of big data should be backed by policy support and the competitiveness of companies as well as country through this can be ensured.

In this paper, we analyze the characteristics of the business using big data in order to secure the competitive of the companies by successful induction of the big data and create new business model. The future big data business based on the analyzed characteristics is proposed.

This paper is organized as follows. In Chapter 2, we describe the basic characteristics of big data and research on the business. The characteristics of big data business are explained in Chapter 3. Chapter 4 is presented the development of big data business model. Finally, Chapter 5 concludes.

2. Related Works

2.1. The Technology of Big Data

The big data can be divided into a collection of data for data analysis, pre-processing and storage, and analysis processing and operating steps. And it can be classified into data size and storage technology, data connection and combination technology, and improvement of data processing speed according to the technical characteristics of big data [4]. First, the data size and storage technology are expected to be created based on cloud. Increase of cloud data will expand the link between the clouds and evolve into multiple cloud technology. Second, data link and metadata technology is needed for connection and combination of data of infra technology because big data has a variety of shapes. Finally, big data requires a rapid process of data. Therefore, it is required data collection and pre-processing of data from multiple sources, and information storage and analysis processing. Figure 1 shows the create structure of big data service.

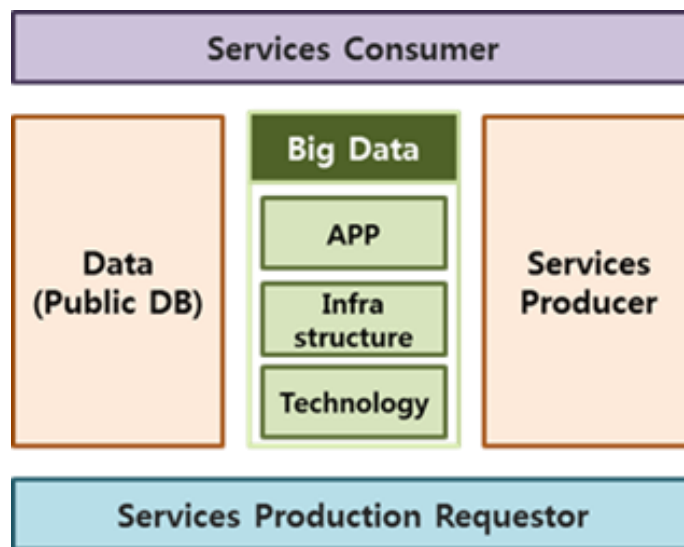


Figure 1. The Components for Big Data Services

2.2. Analysis Technology of Big Data

In order to analyze data on a grand-scale like big data, infra differentiated with existing technology should be made. Infra technology for analysis of big data current worldwide can be divided into three types [5]. First, Hadoop is software framework supporting open source distributed processing technology. And it is solution used the most widely to structured data and unstructured data analysis. The company adapted the Hadoop among

companies introduced big data is increasing because companies enable to analyze entire data not sample data any more. Second, R is a programming language and also software environment for statistical computation and graphics. Implementation and improvement from basic statistics technique to modeling and data mining technique through R language is available. And it can be virtualized to various forms and is also easy to connect with other programming languages. Currently, it is used for statistical analysis of large amounts of data and data mining in companies that analysis of big data is required such as Google, Facebook, Amazon, *etc.* Third, there is a NoSQL as a non-related database. NoSQL is not fixed table schema, does not support the join operation between tables, and is that horizontal extension is easy. In addition, it has advantages that combination process between the databases is simple and horizontal and vertical division is easy. But it has the advantage that does not guarantee the consistency and validity of the data [6].

Analysis technology of big data based on these infra described above can be classified as shown in Table 1.

Table 1. Features of Big Data Analysis Techniques

Analysis technology	characteristic
Text Mining	Analyze natural language and grasp the hidden information Extraction and processing of useful information in large unstructured text data are possible
Opinion Mining	Technology utilizing to certain service, market scale prediction, and consumer reaction Accumulation on representation of experts and word resource needs in order to improve accuracy
Social Network Analysis	Being based on graph theory Utilization for finding main user on the social network using the connection structure and strength
Cluster Analysis	Using to grasp the similar characteristic by integrating data with similar property Purpose to reflect to products and services by classifying community and grasping the characteristic of community

3. Feature Analysis of Big Data Business

3.1. Big Data Business

Big data business is collectively called companies using big data and environment related with this. Big data business can be classified into three types of service producer which produces and makes service, user using service provided to market, and service consumer by utilizing data and requester of information production as a role requesting production of service information [7-8]. Thus, big data business proposes organic relationship of producer and the layer consuming this through requirement of requestor. And it refers to environment providing various services which producer utilizes data in case of the big data. Figure 2 shows the outline of big data business.

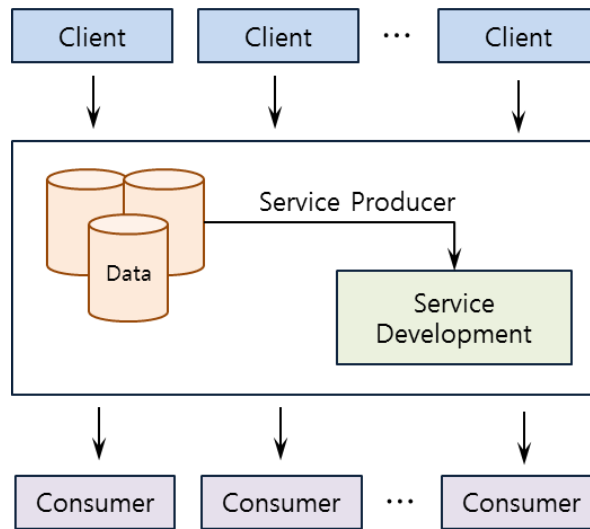


Figure 2. Big Data Business Flow

3.2. Paradigm Analysis of Big Data Business

Real time connection between users and wide spread of smart devices have evolved into smart era due to the rapid development of computing technology. Hyper-connection network aiming smart society is evolving existing individual industry technology to smart environment through convergence between industries and hierarchical cooperation based on information and communication technology [9]. These smart environment have occurred data explosion. And existing data processing and analysis techniques was reached to the limit. Utilizing big data becomes the key for the smart era. Increasing of occurring data by diffusion of smart device and M2M is expected to be accelerated. The big data era that confusion and potentiality exists by explosive increasing of data expects to advent. Therefore, utilization level of big data is expected to have a significant impact on the competitiveness of nation and company. Collection, processing and analysis of big data are being highlighted to financial assets and measure of competitiveness as economic capability. The point is to provide securely and constantly optimum service which is proper for the situation of the user anytime, anywhere. <Table 2> shows the characteristics of the IT technology trend change.

Table 2. The Transformation of IT Technology Trend

Division	PC	Internet	Mobile	Smart
Change of paradigm	Computerized digital	Online information	Social mobilization	Intelligent, Personalization Things
It issues	PC, PC communication, DB	High-speed internet Web server	Mobile internet Smartphone	Big data, The next generation PC, Network objects
Key sector(service)	PC, OS	Portal search engine, web 2.0	Smartphone app service, social media	Future outlook, Situational awareness, personalized
IT vision	PC for one	e-Korea	PC in hand, Communication	IT Everywhere

3.3. The Consideration of Big Data Business

The introduction of big data around the company and public institution is increasing day by day according to increasing importance of big data. However, there are factors that should be considered in large part for the introduction of big data. In particular, after introduction of big data, it can be divided into opportunity respond, market forecasting, discovery of hidden opportunities, risk management, and data production and utilization according to utilizable object [10]. Opportunity respond means corresponding to opportunity after external data combines with internal data and analyzes. This depends on whether the use of external data or not. Market forecasting is utilized to forecast market situation based on data of web site statistics and social media analysis. This utilization result shows a much better prediction result than the result of the survey. It is a very difficult and important work to predict hidden needs and predict the behavior change in the big data business. Therefore, it becomes a very important factor to realize the behavior pattern of the consumer based on the information of various forms by utilizing big data. Risk management means to remove in advance the potential risk approached to company by decreasing dissatisfaction that consumer can have on production of service, and realizing in advance risk elements of companies and removing. Data production and utilization is to utilize to a variety of activity of company such as production and business of data occurring in the process that company sells production or service.

4. Development Model of Big Data Business

4.1. The State of Big Data Business

It is not easy to utilize user information in the company due to a variety of conditions of big data business. Analysis of big data up to now has much uncertain information and takes a lot of time for detailed analysis to extract the valuable data. It is necessary to dispute problem on the limit of realistic utilities in data mining and approach balancing in multiple perspectives.

It is need to recognize the strategic value on utilization of big data and establish necessary laws. And it is need to speed up in R&D that can form legal framework that company can generate value from the data and create value in various fields. It also should make an effort to strengthen infra.

Internet data ownership is also a consideration. The ownership of data is uncertain because created data by the company has the ownership in the company and data occurring from SNS such as Facebook and Twitter is that user creates the data personally. Increasing of cloud storage service storing personal information by internet is for data mining eventually. Storing subject of information is owner but ownership become unclear because data is processed. The ownership of big data currently is the situation that owner of information is individual but license and custody for this information is provided potentially in the company. And the virtuous circle structure of data accumulation is required but systematic accumulation of data and data analysis by obsession with short-run performance is lack.

4.2 Development Stages of Big Data Business

The development of big data business is classified into three stages. The first stage is to utilize big data. It is internal data-oriented utilizing to profit of company after analyzing using only internal data of company or public institution. The technique collecting data that needs from several servers is important in this stage. In particular, the integrity should be checked when data is collected and big data system collects large amount of data in a short time. Therefore, data collection technique should provide flexibility for the data of different size and keep the maximum delay time. The second stage is converging

technology-oriented. New value is created by analyzing this after public data, and data created in the external and internal company are converged. Standardized accumulation system for scattered data integration needs in this stage. This integration of data is necessary in order to compete with large ICT companies that are based on global service and are sucking information like a black hole. It needs recognition switch that big data makes convenient and safe life more than invasion of privacy by utilizing big data of public information. The third stage is a service-oriented providing environment that solution provider personalized service and individual can make a direct service by engrafting idea to published data of various form created in various location such as companies and public institutions.

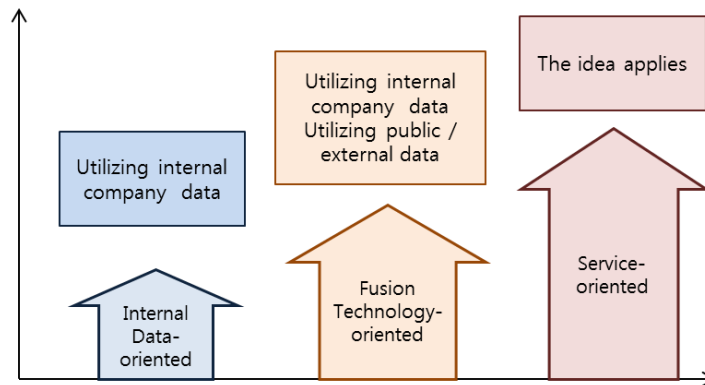


Figure 3. Big Data Business Development Stages

4.3 Application Technology for Big Data Business

Gradual application technology for development of big data business is expected by analyzing the characteristics of big data, and the characteristics and paradigm of big data to apply this.

1) Infra construction supporting big data business

Construction of systematic Eco system is required to construct information accumulation base. Eco system in the big data is required development of systematic technology such as collection, analysis, processing, and utilization of data. However, company that does not own data in the initial market is difficult to participate in the project. Intelligent service market based on big data is yet the initial step technically and industrially. Therefore, the role of data holder is very important to create big data service currently. Also, big data has different opportunities and obstructive factor by industry and companies must construct infra for this.

2) Construction of data transaction framework

The problem for right and information security of data should be resolved to create value by maximizing the sharing and utilization of big data. The problem of data power is highlighted because of the expansion of cloud service advocating efficiency improvement through ownership and right of information. For solving this problem, data transaction framework should be set in order to create new value added by utilizing this and ensuring safe flow of personal data. Business model providing new service can be implemented by this framework construction.

3) Acceleration of analysis processing technology

The importance of data analysis technology and the need of a large stream processing technology are increasing according to the large change in the collection and utilization method of data. In addition, the study of big data processing technology should be considered conjunction with distributed data cloud for large distributed processing, storage of big data, and interworking. For this, new computing technology and hybrid artificial intelligence technology analyzing data of different types at the same time need.

Also, virtualization technology that can understand easily source data by processing and analysis needs. This enable to collect data having high accurate if the popular usage of big data is increased and data is detected and shared easily through this.

5. Conclusion

Development of the network technology and dissemination of computing device gives a big change in the computing environment and companies. In particular, the amount of data created through the internet and SNS is increasing rapidly. Many companies are working to find new business model utilizing this by extract high-value data after it predicts future using accurate and scientific method by analyzing the behavior and habits of many people using these big data. But, the collection and analysis technology of these big data is a level of initial phase. The companies are very difficult situation to create new value without thorough and systematic planning. In this paper, we proposed development model for big data business in order to lead to creation of new service in data, service, and infra and pull activation of big data market. For this, we analyzed the characteristics of big data and proposed development model by each steps for development model of big data business in this paper. Utilization method when companies and public institutions introduce big data system in the future was presented by providing the information to be considered in each development model.

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