

# A Study on Matters of Consideration in Building Cloud Environment through Analyses of Advanced Cases

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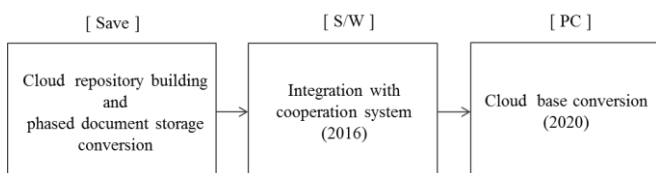
## Abstract

In the government as well as private corporations, it is Cloud that appears as a topic of conversation as infrastructure of corporations. The Republic of Korean government is implementing realization of Cloud base business system as one of plans for realization in the government 3.0 development plan and in compliance to this, Cloud project is now under implementation. In addition, in private sector, for information protection and for possible efficient processing of business anytime anywhere, Cloud Environment building is now under progress. In this study, we put meaning of a study and has implemented by examining Cloud building cases of the government and private sector, by finding out problems and by suggesting various implications of Cloud infrastructure building. Therefore, in this study, we have conducted the study based on cases of three advanced countries and cases of three leading domestic corporations and have suggested implications based on this.

**Keywords:** Cloud System, Security, Case Study

## Introduction

The Republic of Korean government is implementing tasks in stages for realization of the future type Cloud government. It first task is to transfer data stored in individual PCs to the Cloud repository and to convert open type document standards that are possible for unlimited sharing. Second, until 2016, the government has a plan to implement cooperation system and integration operation such as Web Office, etc and finally, until 2020, the government has a plan to implement with the goal to complete Cloud based cooperation and sharing infrastructure. Through this, the government is implementing the tasks in stages with the ultimate goal to end the era of individual PCs of government servants and convert into Cloud Environment [1].



**Fig.1. Future type Cloud realization stage of the government**

Purpose and meaning of this study are to suggest implications in this aspect through introduction of advanced cases and private sector and examinations of service models so that we learn and make references to lessons of advanced cases.

## Case study

In this study, we review first Cloud introduction cases of England, USA and EU as advanced cases and next, we review three representative building cases (K Co., S Co. And L Co.) of private sector.

## Advanced cases of Cloud building of each country

As the first of Cloud building cases, in case of England, it has built G-Cloud. G-Cloud is a Cloud computing service built for overall government dimension as a part of datacenter innovation strategy in public sector of England. The purpose was to save IT related cost by providing departments of the government with IT services and new use methods of IT assets for application. Therefore, purchasing departments of the government institutions could purchase not only IaaS, PaaS, SaaS in 'Cloud Store' but also 'SCS' which is specialized management service. And they also could receive services through private companies with certification of the government. In addition, as it became possible to share and recycle same project and similar project, they could react to issues of cost-saving of public institutions. That is, in case of England, it can be abbreviated that it was effective in an aspect of cost-saving.

Second, it is a case of USA. 'Cloud First' strategy of the USA was implemented with the purpose of playing a leading role of spreading Cloud as the US government and public institutions had first introduced Cloud. And for achieving successful goal, direct activity and supplementary support activity were also carried out. As an representative sample, Cloud was first introduced in public sector Cloud infrastructure building and in civilian claims service field. General Affairs Department has conducted as much investment as to operate Apps.gov, which is an on-line Apps Store for the government institutions so that they could buy Cloud IT services. And together with related companies and stakeholders, NIST has supplied reference architecture that can respond to technical development and innovation flexibly without depending on specific solution and products. By installing joint examination system, it was implemented focusing on achieving reduction

of time and cost required for examination in each government institution as well as business efficiency.

Finally, it is a case of EU. EU Council and member countries have aimed for policy application for all target objects of suppliers, customers and Cloud industry field such as security, standards and IPR, etc with the goal of building European style Cloud model that is different from other regions. Among them, digital Agenda is one of growth strategies that EU implements until 2020 for development of smart (Smart), sustainable and comprehensive economy. And EU is implementing with the goal of bring about effects to each member country such as employment promotion, innovation, educational development, social harmony, environment protection and energy saving, etc. In addition, with the goal of optimized infrastructure services, EU has developed IaaS software 'OPTIMIS' for supporting small and medium companies can build, operate and monitor Cloud applications efficiently.

Until now, we have reviewed cases of England, USA and EU as advanced cases. Looking through these cases, it was found out that Cloud building was implemented with main focuses of three aspects of cost-saving, business efficiency and growth strategy.

#### Cloud Introduction Cases in Private Corporations

Cloud introduction cases of private corporations were started for achieving effects of cost-saving, information protection and business efficiency improvement just like [Fig. 2].

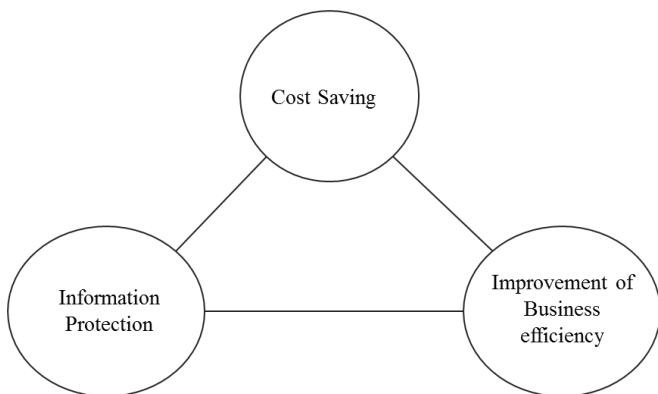


Fig.2. Cloud Introduction Effect of Private Corporations

In case of K Co., smart work system strategy for communication was established and it is under implementation with the goal of realizing values of communication through various services such as centralization of documents and overall company UC, etc together with account management in mid-and-long term.

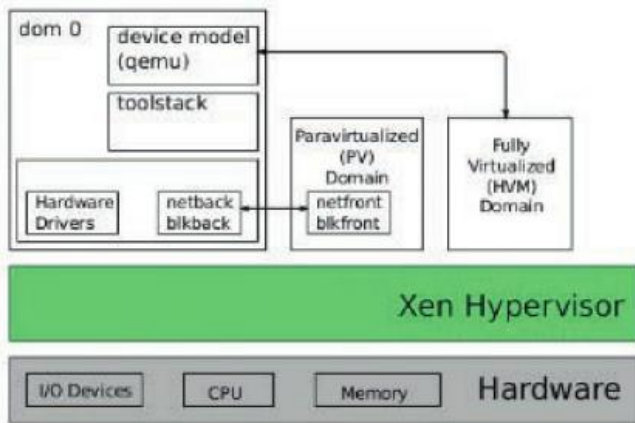
Therefore, together with implementation of smart work environment building for productivity improvement, GCC strategy for global communication, cooperation and sharing and establishment and building of mid-and-long term strategy for smart work IT innovation are under implementation. Among them, global account management system has finished building and at present, as a part of five year plan, overall company document centralization system building is under

progress. In addition, overall company Unified Communication System building is under progress as a three year plan. That is, it can be said to be a stage attempting changes of aspects of infrastructure and software for utilizing Cloud.

In case of L CO., the Company has shown most progressive path within Korea. In 2009, with the target of SI affiliate among the group affiliates, Cloud system building model project was implemented and services were provided to research centers of electronics affiliate and gradually Cloud system building was implemented for business efficiency and prevention of security issues within the Group. In case of L CO., by building document centralization system for protection of integration information sharing and intellectual property of all the Group, its value is increasing gradually as a key foundation of accumulation of the organization's intellectual property, protection and knowledge sharing. It was possible to accumulate and manage document knowledge properties of all Groups systematically and innovative improvement of internal security system became possible as it was possible to prevent outflow of document originally. In addition, by utilizing a single repository and a single classification system by all Group Companies, all employees could share information according to given authority. Like this, document centralization has worked as a momentum to reinforce security while inducing business efficiency playing as a role of hub system of knowledge and document between the organization and members and various business systems not as a tool for document accumulation.

Finally, in case of S CO., through introduction of Cloud, business agility was increased and value chain was innovated and through optimization of IT resources, the goal was set to increase operation efficiency before implementation. From platform aspect, through building PaaS based on IaaS, it was aimed to have high level Cloud operation system and through server virtualization, standardization and optimization of degree of agglomeration, upgraded standardization of system performance and version was established. In this process, aged unit business system and possible area of Big Data within supply chain were converted first and infrastructure status improvement and Cloud platform operation efficiency increase were gradually implemented in parallel. However, for systems that can cause business stop was decided for implementation of public conversion in maximum conservative position.

Next is service model of Google. Google is providing repository for 425 million Gmail users. Google is providing Cloud service by using this kind of computing infrastructure and Cloud base solutions [2].



**Fig.3. System composition map of Google**

Google had entered into search market which was already saturated and had become No.1 Company by taking over Yahoo which has prevailed the market at that time. Search technology requires large capacity IT resources. However, Google was started from deteriorated environment using resources of college research centers. In addition, Google has secured technology possible to provide stable services under deteriorated hardware environment such as using cheap LINUX server and is composed of factors like [Fig. 3].

Until now, we have reviewed Cloud implementation from policy aspect of the governments of advanced countries as well as cases and service models of private corporations. It is the reality that majority has features of initial stage equipped with technical infrastructure until now.

In case of the Republic of Korean government, through G-Cloud building, ceaseless administration service of 24 hours, 365 days is provided through efficient operation of over 18,000 units of information resources of 47 central administration institutions located at the government integration computing center. In addition, by utilizing 'Fed RAMP' certification examination items which are Cloud security certification programs of General Service Agency (GSA) in public sectors, verification of security is being implemented and while inducing improvement methods, the government is supporting business SW development for Cloud conversion [4].

Like this, the future feature of Cloud will dismantle egoistic barriers of departments for business and information and will evolve into dimension to achieve business efficiency based on cooperation and sharing [1].

#### **Matters to consider when building Cloud and Implication**

Like this there are lots of researches on building and utilizing this expanding Cloud environment are under progress [3, 4, 5, 6]. However, as theoretical and technical approaches are majority. Therefore, in this study, we review additionally consideration matters required to know definitely from Cloud building courses from working-level aspect and its implications.

In building Cloud environment, what is especially important is a security aspect. In here, there exist technical consideration matters and policy consideration matters.

First, as technical consideration matters, a network security that can safely remit/receive data by using encryption communication protocol and can respond to malicious codes spread through networks and security of client device using Cloud are required. In addition, when new data come in, a system security for verifying safe data or not and user certification to approach to Cloud must be set and managed correctly. And approach control that prevents approach account not to access more than authority is a representative technical consideration matter required [5].

Next, as policy consideration matters, it is necessary to have advance consideration about jurisdiction between country or institution of data location and Korea according to transfer of the data and this is a matter requiring consideration when using Public Cloud service which provides global Cloud services such as Google and Microsoft, etc. In addition, as preparation and reinforcement of Cloud use policy is necessary and it is necessary for financial / individual information to control not to use Cloud environment for dangerous data and no allowance of transfer to overseas transfer according to loss of data control authority. And it is necessary to prepare policy of accident countermeasure such as BCP and DRP for securing continuity of business and various accidents.

As seen in previous advanced cases and Cloud building cases of domestic representative corporations, Cloud building is now in a stage to provide PaaS, SaaS and IaaS and is an initial or preparation stage for full-fledged services. In particular, in case of media and services using Internet, as security factor appears as an important factor for users in accepting technology and service, it is necessary to definitely consider and reinforce this security factor in the aspect of services.

#### **Conclusion**

In this study, we have reviewed direction of advanced cases of Cloud building of England, USA and EU and also have analyzed contents of Cloud building of representative private corporations through case study. For realization of true Cloud services, sharing and cooperation function must be reinforced and sharing economy of dispersed IT resources must be realized. In these courses, factor technology such as security which become the base must be sufficiently considered and reflected and then it can play its function faithfully in the future as infrastructure or platform for analyses such as IoT and big data, etc. In addition, this Cloud infrastructure will ultimately change working method of public institutions and private corporations and can work as solid foundation for implementing efficient businesses.

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