Dynamics of Government Innovation and Decentralization in Korea
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EFFICIENT GOVERNMENT

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Partnership with the World Bank. Many countries have displayed their interest in Korea’s current efforts to eliminate corruption in the public sector and have moved forward to benchmark various other government initiatives designed to foster innovation and decentralization. This series of books has been published for the purpose of introducing the distinguished cases of Korean government innovation and decentralization to the international community.

When the current innovation and decentralization initiatives undertaken by the Participatory Government are successfully completed, for the first time in her history, Korea will become a nation that exports advanced institutions and systems. Additional cases of success in innovation and decentralization will subsequently be published, and in this respect, this book can be regarded as a historical record of these monumental efforts.

Efforts in government innovation and decentralization in Korea will continue to drive the transformation of a government that exists to serve its people and corporations. Furthermore, as model practices of government innovation and decentralization, I hope that these cases contribute to other nations’ efforts in government innovation and decentralization.

In terms of the size of the national economy, Korea is ranked 11th in the world and is a nation of great competitiveness in various industries including semiconductor, mobile phones, electronics, steel, and shipbuilding. However, competitiveness alone does not put a country into the ranks of advanced countries, nor does it ensure respect or recognition from the global community. For the happiness and fruitfulness of its citizens, competitiveness alone is an insufficient condition; rather the country must possess a culture, ethics, institutions and systems of the highest quality which are well balanced with the pace of the economy.

Government innovation and decentralization, two of the most important administrative tasks of the Participatory Government, aim to elevate the level of the public system of Korea one step further by creating a government that exists to serve its citizens and corporations, thereby creating a first-class nation that other countries will emulate. In this respect, Korea must transform itself from a nation that exports ‘hardware’ goods including semiconductors, mobile sets, electronic goods, steel and ships, into a nation that exports ‘software’ goods and services, such as our culture and cases of innovation. Already, Korean E-government has been ranked 5th in the world by the United Nations and a digital budget accounting system is being developed in joint partnership with the World Bank. Many countries have displayed their interest in Korea’s current efforts to eliminate corruption in the public sector and have moved forward to benchmark various other government initiatives designed to foster innovation and decentralization. This series of books has been published for the purpose of introducing the distinguished cases of Korean government innovation and decentralization to the international community.

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different aspects of government innovation. In terms of suitability for international promotion, the criteria were the degree of change, the result of innovation, and the originality of innovation. For example, although a specific initiative had produced a significant degree of change and favorable outcomes, if the case study had simply benchmarked the practices of another country and did not possess original elements unique to innovation in Korea, it was excluded. For an appropriate distribution of different aspects of government innovation, subjects such as the goals of government innovation, organizational restructuring, reengineering of work processes, and the introduction of new systems were analyzed in terms of their respective productivity, customer satisfaction, and transparency.

Guidelines for writing were drafted so that each case study would contain sufficient information that would be of interest to government innovation specialists in both advanced and developing countries. Specifically, every completed work should contain the impetus for the drive for innovation, description of the innovation, structure of the innovation, the process of the innovation and the challenges that were overcome, the result of the innovation, the main factors of success, and the lessons learned in order to facilitate other nation’s efforts in benchmarking specific cases.

To alleviate the workload that would inevitably occur at the end of the year, the selection process was carried out in two steps. As a first step, the cases currently in progress by the Presidential Committee on Government Innovation and Decentralization and those promoted by each ministry through their own published works were reviewed. Out of about a 100 cases, 13 cases were selected for study and publication. As a second step in the process, the CoPOWERING asked different ministries to submit their cases and consulted with the Ministry of Government Affairs and Home Affairs on their list of best practices of different ministries. Out of 180 cases, 17 were selected.

CoPOWERING (Committee for Promotion Of World Exchange and Replication of Innovation in Government of Korea) was inaugurated in July of 2005 with a mandate to select and promote successful cases of government innovation in Korea. By the end of 2005, the CoPOWERING planned to select 30 successful government innovation initiatives and publish their respective case studies. In addition, in 2006 these cases would be promoted through joint studies with internationally prominent scholars, presentations of these cases in international conferences, dissemination of information regarding Korea’s efforts in government innovation through the internet, and by establishing partnership networks with scholars and civil servants of advanced and developing countries.

In order to select and produce these successful case studies in government innovation, several criteria for selection and a guideline for writing were prepared. Eventually, 30 government initiatives were selected and 30 scholars were asked to study individual initiatives and write case studies about each one. In addition, each individual case study was subjected to a process of editing and revision prior to final draft approval.

The selection criteria for publication were based on the suitability of each case study for international promotion and an appropriate distribution among
1. The Need for Government Innovation

The reasons for why governments innovation can be classified into 3 broad reasons. The first reason is to improve the public’s level of satisfaction and the quality of life. The sudden changes in the administrative environment have created new problems in policy-making and have placed new demands on the administration - a situation that was not predicted to occur. Accordingly, in order to deal with public problems in a more effective and efficient manner, and to improve public satisfaction, government innovation has become a vital element in the improvement of the value proposition of the government. In the times to come, public goods and services will no longer be exclusively provided by the government, but rather various constituents will have to compete to provide or work together to provide these services. As income levels rise, the public’s willingness to pay for high quality, high satisfaction services is also rising.

If the quality of public goods and services fall short of those provided by the private sector, the public will overlook the goods and services provided by the government and will attempt to satisfy their needs in the private market. Therefore, the government must not solely consider the logic and value of “the government” but must reestablish all organizations and functions according to

For the sake of quality control, scholars who were most expert in the specific practices of each case were selected to study the innovation and draft case studies. Subsequently, members of the Promotions Team provided suggestions for improvement and revisions were carried out.

The resulting 30 successful case studies of government innovation are a product of this process. These case studies have been translated into English to facilitate the international promotion of Korea’s work on government innovation. However, a Korean version has also been published because these case studies would also be of great benefit for specialists and civil servants in Korea.

The 26 case studies collected in this series represent the initiatives that have had the most significant impact on the advancement of government productivity.
the logic and values held by “the public”. In effect, every aspect of organizational structure, culture, and work processes must be redesigned to maximize the value rendered to the consumer.

The second reason is to strengthen the competitiveness of a nation. It is a common perception that the promotion of national competitiveness via government innovation is the most important task of a government- a perception held not only by the Korean government but also by many other governments in the international community. In the era of globalization, where nations compete in each and every capacity, not only is the international competitiveness of the private sector deemed important, but also the securing of international competitiveness in the public sector is being perceived to be equally crucial to national development. Accordingly, in this era of globalization, where competition between nations are intensifying on a daily basis, a government that is incapable of providing high quality administrative services will gradually lose its basis for existence. In this sense, it can be stated that the Korean government has not yet secured a strong national competitiveness.

In the international competitiveness evaluation report presented in 2005 by the International Institute for Management Development (IMD), Korea was ranked 29th among the 60 countries evaluated - a position 6 places higher than the previous year. However, given the relative importance of the economy and the political structure of Korea, the level of national competitiveness and the efficiency of government administration is still insufficient. This significance of this ranking is better understood when compared to those of other nations such as Hong Kong (ranked 2nd), Singapore (3rd), Taiwan (11th) and Japan (21st). Through the tasks of government innovation, including the establishment of an infrastructure well matched with the era of globalization, the digitalization of knowledge and information, and innovation by improvements in work procedures, thought processes and customs, the government must elevate its competitiveness and elevate the competitiveness of the nation.

The third reason is the need to bring forth continuous and active changes. For the government to survive, it must engage in changes and innovation more than any other organization, and further, the government must realize that innovation is the prerequisite for its survival, not a matter of choice. The survival of the government is dependent on how it meets the challenges of existing in an ever-changing environment and how effectively it can cope with new policies and new demands in administration. Moreover, boundless competition, such as the competition over the provision of public services between nations, the spread of the digital era, and the decentralization and autonomy of administrative authority are all being demanded. Due to this diversification, sophistication and rapidity of policy environment, the degree of difficulty to meet the requirements of administration is increasing. In order to cope with these changes it is imperative that an organization conducive to learning be established.

Changes such as informatization and globalization have inevitably demanded changes in the methods of providing government services, have expanded the public’s direct participation, and the have increased the trend towards the fragmentation of the unit of service provision. In addition, as cultural exchanges and joint responsibilities by civil and local self-governing bodies expand, the provision of government services have become more complicated.
2. The Vision and Goals of Government Innovation

According to these needs, the Participatory Government has continually pursued innovations in government. The Participatory Government operates its national administration based on fundamentals that focus on ‘principle & confidence’, ‘fairness & transparency’, ‘open communication & mutual concession’, and ‘decentralization & autonomy’ in addition to the goals of promoting a nation that fosters democracy with the people, a society of balanced development, and an era of peace and prosperity in Northeast Asia. As these administrative fundamentals and goals are realized, Korea can begin to be recognized as a nation that has the world’s highest level of competitiveness in the 21st century. In order to do so, the Participatory government aims to be a competent government by inviting every member of the society to engage in equal participation, thereby making all aspects of the government transparent to the public and efficiently operating the national administration.

For a nation to gain such competitiveness, innovation in government is the most essential requisite and through systematic and constant government innovation, it is possible to build a foundation upon which the nation’s competitiveness can be fostered. To establish such a foundation, the Participatory Government, with the vision of being a “transparent and competent government,” is driving forward a type of government innovation that is systematic and constant, and to realize this vision, the participatory government has instituted the following 5 objectives:

Vision of Government Innovation : Transparent and Competent Government
- Efficient Government
- Serving Government
- Transparent Government
- Decentralized Government
- People-centered Government

By pursuing these 5 objectives in a well-balanced manner, and is appropriate to the circumstances, the Participatory government will be recognized as a government that is highly competitive. The following is a more detailed explanation of the specific tasks that are being undertaken to achieve this goal.

(1) Efficient Government

The Government operates with the funds made available by the collection of tax from the people, and therefore, a government cannot exist without the effort of the people. In effect, all governments must value the effort of the people, and accordingly, must perform administrative activities in the most efficient manner. As the most basic virtue of a government to provide the most efficient administration, it must be able to provide the best service at minimum cost. More than ever before, the Participatory Government is actively pursuing improvements in government efficiency - not only by raising the efficiency by a certain degree, but also by setting an objective of bringing about epochal changes in efficiency.

Just as new and innovative inventions in science and medicine bring forth dramatic improvements in our lives, to bring forth epochal improvements in government efficiency - not only by raising the efficiency by a certain degree, but also by setting an objective of bringing about epochal changes in efficiency.

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Government is pursuing the following innovation tasks:

a) The establishment of efficiency improving systems through tasks such as the establishment of an evaluation infrastructure, establishment of a coordinated performance management system, and improvements in work conduct through BPR.
b) The promotion of conditions in which those civil servants with sufficient capabilities work in a more effective manner through tasks such as the activation of an interchange of personnel between civil, government, and academic institutions, the expansion of open recruitment of interns and specialists, the introduction of career path management system, the introduction of a high-rank civil official system, and improvements in system of classification of civil servants.

c) The provision of a foundation in which highly satisfying services are efficiently supplied to the local residents through tasks such as the customized establishment of innovative systems for each locality, innovations in training of local civil officials, improvements in personnel systems of local civil officials, the introduction of special local administrative districts, and the strengthening of the grievance mediation function.

d) The establishment and operation of an efficient financial system through performance-oriented tasks of reform include the establishment of a results-centered financial system, reform of the structure of financial expenditures, and innovation in the management of public enterprises.

e) The elimination of redundant governmental functions and the establishment of an efficient handling of operations are designed to occur through the coordinated development and operation of hardware, software and services, the concentration of capacity of information-oriented manpower, and the protection of information and privacy.

(2) Serving Government

The basis of a government’s existence and the purpose of administrative activities is to serve its people. It is the main responsibility of the government to secure a ‘publicness’ that provides benefits to each and every member. In other words, the cardinal point of a serving administration is how well publicness is actualized by the administration. The original meaning of “pubes”, the etymological word of the word public is “caring for others”, “consideration for others” and therefore, inherently contains altruistic implications. Of course, in the case of the government, “others” signify the “people”, and in effect, it is the basic duty of the government to honor and respect the public, act according to the desires of the public, and provide services that the public really wants. However, until now, the government has unilaterally ruled over the public and has neglected to uncover and provide services that the public wanted. Services were provided as the government saw fit and were provided with only the convenience of the government considered. The Participatory government is devoted to the notion that the basis of a government’s existence is the people and is striving to be a serving government that provides the most suitable high quality services to the people.

Administrative services are basically “universal” services and each and every member of the public, regardless of region and financial or social stature, must be provided with high quality services. Moreover, no one is to be overlooked in the provision of these services.

The Participatory Government strives to promote a serving administration that is of the highest quality where no one is overlooked. Through the opening of the government, the movement towards an electronic government, and the deepening of competition between public and private sectors, the times when the government ruled over the public, was indifferent to the desires of the people, and unilaterally provided services to the people, are over. The
government must be capable of providing services that are comparable to those provided by the private sector in each and every aspect. The Participatory Government strives to create a service administration that respects the public and one in which every member of the public can receive the best administrative services. To create a service administration, the Participatory government is pursuing the following tasks of innovation:

a) The development and provision of diversified services that the public wants are provided through endeavors such as the pursuit and strengthening of service standards, improvements of services to the underprivileged, and improvements in the supply capacity of services in first line institutions.

b) The activation of civil society through the strengthening of the system of volunteer services

c) The reasonable reorganization of the tax system for improvements in the balance of taxation and a comfortable and sensitive environment to assist tax payments.

d) The provision of digital support systems, through which the government serves its people, relies on initiatives such as the systemization of integrated public welfare systems of insurance, health and social welfare, and the establishment of a public information system.

(3) Transparent Government

A government that does not have the confidence of its people cannot achieve anything and the public will not be willing to accept this government’s pursuit of even the most beneficial policy. Past governments have suffered from a lack of confidence due to its obstructive and corrupt nature, and because of this, policies have been distorted and endless inefficiency have characterized the process of policy execution that ultimately led to the decline of government and national competitiveness.

Most recently, trust and transparency have been emphasized as the core elements in improving the competitiveness of a nation. All aspects of government must be made open to the people and all policy decisions, as well as their execution, must be transparent. Only those governments that do not neglect the trust of the people, devote themselves to their duties, and prove themselves to be trustworthy, transparent, and ethically sound will be able to lead their nation to competitiveness in the 21st century. Above all, the Participatory Government aims to create a transparent and open government where all information is shared with the public, and in doing so, is pursuing the following tasks:

a) Expansion of the openness of administrative information and improvements in accessibility by enhancing administrative openness through real-name policies, an obligation to record major plans, and the securing of civil office ethics through improvements in the code of ethics of civil servants.

b) The securing of transparency in personnel management through the establishment of a transparent and fair selection system, a balanced promotion system without discrimination, the establishment, and utilization of diversified evaluation systems.

c) The prevention of authoritarian exercise of administrative power by local governments by activating a self-regulating system through the strengthening of the system of council activities, the strengthening of the accountability of local governments, and the strengthening of the soundness and transparency of financial operation of local governments.

d) The provision of transparent financial operations by opening financial information to the public and the establishment of a financial accounting infrastructure.

e) Garnering increased public confidence and preventing the possibility of generating ambiguous affairs at root sources by guaranteeing
transparency through electronic systemization of government operations.

(4) Decentralized government

The transfer of the central authority to localities, by dispersing authority concentrated at the central government and drastically expanding the functions and roles of localities, is being pursued to realize a decentralized and autonomous administration that is appropriate to the fostering of local governments. With a sound assignment of complex and specialized government functions to the central and local governments, a more efficient execution system of administrative functions will be established and will play an important role in strengthening national overall competitiveness. The transfer of central authority to localities raises issues in both the democratization of politics and the administrative, technical, and functional aspects of efficient operation of the administration. Such transfer of central authority to localities should not be conducted uniformly. Specifically, if the main logic of the localities is that they have a better understanding of the needs of the residents of a given region and are able to seize opportunities to provide more suitable services to its people, the transfer of authority to localities must take into consideration the distinct characteristics of each region, and thereby, utilize diverse approaches to decentralization.

Together with the decentralization of central the government to local governments, administrative decentralization within the central government itself is also needed. By creating a decentralized administrative structure, including an expansion of autonomy over human resource management, autonomy and full accountability will be maximized and separate organizations and individuals will become the main constituents of innovation, thereby improving government’s capacity to provide public services. Accordingly, the establishment of a decentralized administration has been achieved in various fields as follows:

a) Constructing a decentralized administration through designing a decentralized organizational structure by dispersing authorities once concentrated on one organization and by creating a horizontal administrative culture.

b) Autonomous decentralization of personnel management through by expanding the delegation of the right to implement personnel management, the right of autonomous hiring practices for each ministry, and the abolition and relief of cumbersome international regulations.

c) The transfer of central administrative authority to local governments through the introduction of municipal police systems, the improvements in local autonomy in education, the transfer of control over special administrative institutions, the promotion of Cheju Special Administrative District, the strengthening of the exemptions for metropolitan cities, improvements in the system of administrative division, the establishment of a system of balanced city planning, and the expansion of autonomous legislation and autonomous organization.

d) The expansion and relief of the imbalance of financial power in local governments by strengthening of autonomy in local finance, the promotion of financial decentralization, and improvements in improvements in local financial systems.

e) The elimination of the disparity of information generated and shared among the central body and information generated and distributed to the local regions by the provision of a method through which authority can be realized in an equal e-Government environment.

(5) People-centered Government

As sovereignty rests with the people, the basis for the existence of a government rests not upon the government itself, but upon the people, and for this very reason, in the operation of administrative policy, the people can only be the most central constituent. Through the previous authoritarian operation
of the government, the people were not the main constituent of the national administration. Rather the people were ruled by the government or were perceived as being only subjects to be managed. Because of this, there has always existed a great disparity between the services that the people wanted and what was actually provided. In the current age, such methods do not pave the way for efficiency in the national administration, nor do they elevate national competitiveness. As is apparent in numerous developed nations, and many other nations in the OECD, a national administration where people participate as the main constituents in governance-oriented operations has become the universal standard. In other words, the function of a desirable national administration cannot be created according to prior authoritarian ways, but is only possible when the various main constituents outside the realm of the government, including the people, corporations, and civic groups are actually included in the national administration.

The Participatory Government does not pursue an authoritarian national administration, but instead emphasizes a governance-oriented national administration where all members of the nation can actively participate. In order to achieve this goal, various tasks are being carried out. The following are the major directions in which participatory government is being brought forth.

a) Actual and aggressive expansion of civil participation in administration through the activation of the policy community.
b) The acceleration of civil service and civil personnel participation through the expansion of open recruitment of civil service positions, the expansion of employment of members of minority groups, and the establishment of harmonious labor relations.
c) The strengthening of democratic values through direct public participation through the introduction of the referendum, legal suits, and the recall.
d) The provision of a foundation upon which the people can substantially participate in financial decision making systems through the dissemination of financial information to the public and the introduction of the legal suit.
e) The establishment of a foundation upon which the people can conveniently and effectively participate in the administrative process through the introduction and expansion of administrative informatization, e-voting, and online civil participation systems.
The Korea Customs Service's Smuggling Alert System Development
- Korea Customs Service
The Korea Customs Service’s Smuggling Alert System Development

Youngkee Shim (Director, Bearingpoint Corp.)

Case Overview

The development of the Smuggling Alert System (SAS), spearheaded by the Korea Customs Service (KCS), is a specific case in which the KCS demonstrated its potential to have one of the world’s finest customs systems through innovations in the field of investigation and surveillance in customs administration. The SAS, which even experts had previously thought almost ‘impossible to devise,’ was successfully developed through the strong will and great efforts of the KCS’s investigation agents to create a system that would be the first of its kind in the world. The self-motivation, individual achievement, and hands-on experience gained through this development case have enhanced the innovative drive of the KCS as it pursues its goal of becoming the world’s best customs service.

For this very reason, it was imperative that new developments in the field of investigation and surveillance be achieved in tandem with innovations in the field of logistics and customs clearance.

I. Background of the Development of the Smuggling Alert System (SAS)

In general, the work of Customs Service can be broadly divided into two functions with two goals. One is to assist freight and passengers through Customs as quickly and smoothly as possible, with the aim of facilitating smooth transactions in international trade through fast, accurate clearance. The other is to protect the national economy, social security, and domestic environment by blocking the entry of smuggled goods, drugs, terror-related items, counterfeits, and pollutants, with the objective of eliminating all dangerous factors that may be by-products of international trade. In all respects, it is difficult to attain an appropriate balance among these various customs service duties.

As a matter of fact, in the past, when protective trade practices were widespread and trade barriers between countries were high, international trade and the movement of people were much lower priorities than they are today. In those days, the KCS, as a front guard of the national border, focused mainly on the maintenance of national security and the counteraction of contraband smuggling (items such as drugs and firearms). Through this process, the KCS contributed by securing revenue through collecting customs duties. With the advent of globalization, however, the world economy was liberalized and tariff rates were constantly decreasing while overall trade volumes and the number of overseas travelers increased rapidly. As a result, the KCS began assigning the utmost importance to clearance service speed, something that began to be considered a significant element to achieving stronger international competitiveness through the provision of convenient logistics and travel services.

In response to these international environment changes, the KCS established the vision of becoming the world’s best customs service, with the objective of raising the quality of customs service to the level of any advanced trading country. Subsequently, sixty tasks to develop the world’s best customs service were set, and the efforts to realize this grand vision continued from 2002 to 2004. Following these efforts, cargo clearance time was reduced from 9.6 days to 5.5 days, and passenger inspection time dropped from 40 to 25 minutes. The measures implemented to improve export competitiveness and clearance service earned the KCS the Best Agency award in the 2004 Government Innovations Assessment (Appendix 1. Achievement of the World’s Best Customs Initiative). While these fast clearance services did increase national competitiveness, smuggling crimes and overseas property

...
runaways became easier, and the KCS faced the challenge of dealing with international criminals taking advantage of these new customs circumstances. As the clearance sector was being innovated through changes in customs administration, the investigation sector also required innovation in response to the changes in the customs environment.

Previously, when all import and export inspections were carried out by customs, it was possible for some smuggling activity to be contained, to some extent, by customs investigation officers; they simply followed up on offenses, whether disclosed on the spot or reported by informers. During this time, thorough and fair investigation was a priority. But today, given the situation of an inspection rate of freight and people at less than 5% and of passive post-control methods, a more active investigation involving collecting smuggling information, sorting smuggling-susceptible items, and managing surveillance on suspicious persons is needed in order to effectively crack down on the growing number of criminal activities. Public opinion also showed that there was strong demand for more active control than had existed in the past.

Tim Rod, the chairman of Tobacco Manufacturer’s Association in England reported:

“According to Her Majesty Revenue and Customs in England, financial loss caused by smuggled tobacco products has reached almost £2.5 billion. The total consumption of tobacco products in England seems to be decreasing after increases in the price, but the consumption of duty-free tobacco products from EU countries and smuggled tobacco is rapidly increasing every year.” It is believed that Korea will be facing the same challenges as more and more smuggled Chinese tobacco is pouring into the market, in response to raises in the price of tobacco without the appropriate measures.” (Sept. 9th, 2004, The Chosun Ilbo)

“My business is being adversely affected by smuggled goods in the market. All smuggling acts must be stopped at their source, and I don’t think the customs service is doing the job properly.” (Mar. 17th, 2005, in a civil petition)

It was only natural for the investigation administration to change in response to changes in smuggling trends in the global environment. It was no longer possible to catch smugglers who were getting smarter, more globalized and more technical, using methods that were getting outdated everyday. In reality, the actual results of customs offense control had been at a standstill since 2001(See Figure 1- Records of Smuggling Control during the Last 4 Years).

The KCS, however, was well aware of the situation, and had been straining every muscle to make investigation and surveillance administration more efficient and advanced from 2002. It set up an “Integrated Surveillance System” that incorporates an integrated surveillance information system combining surveillance information with high-performance CCTV’s (closed-circuit televisions); established a graded surveillance system based on risk management; and began cracking down on smuggling with a container inspection machine. The KCS also began operating a Special Investigation Team on Organized Smuggling and Illicit Foreign Currency Transaction, and created the “Honorary Customs Official System” that had volunteers participate in offering information and promoting prevention of smuggling and surveillance activities. A “Voluntary Cyber Surveillance System” aimed at inspecting illegal goods being smuggled through electronic commerce and information of distribution of these goods was also one of the actions taken to improve investigation and surveillance administration. Yet all these measures were insufficient to cope with the growing amount of smuggling activity that was becoming more organized and sophisticated, and larger-scaled. As it was not possible to continue providing infinite support through manpower and resources to detect illegal trade practices, it was crucial to eliminate sources of such activity in advance. During this period, one particular case arose which
forced the KCS to devise substantial means of tackling these illegal activities. A group of smugglers had attempted to smuggle contraband articles into the country: $1 billion worth of smuggled goods was seized, including fake Viagra, Chinese deer antlers, and hot peppers disguised as a construction material and tiles. The KCS realized the time had come to take some serious measures to root out smuggling before the act was committed, instead of dealing with illegal activities only after the event, a practice the media said characterized KCS’s smuggling control at the time.

After this particular incident, the KCS redirected its smuggling control administration from post-control to proactive surveillance. Such an approach had long been proposed, but at this point there was practical acknowledgement that a more aggressive system was essential for maximum effectiveness in customs administration. The Early Warning System implemented by the Ministry of Finance and Economy had been suggested as a good example of such a system. The problem, then, was that no one could conceive of how such a system could be capable of monitoring smuggling activities in advance.

**Figure 1** Reports of Smuggling Control During the Last 4 Years
(Unit: number of cases)

![Graph showing reports of smuggling control during the last 4 years](image)

II. Developmental process of the Smuggling Alert System

The KCS had the commitment and determination necessary to develop the Early Smuggling Warning System. The Early Smuggling Warning System was the principal project that appeared unfailingly in both the annual strategy and management plans of the KCS Commissioner and the Investigation and Surveillance Bureau, which oversees smuggling control.

“With smuggling tactics getting more sophisticated, such as destroying evidence, using special phones, [and] operating camouflaged companies, we will actively counteract these criminals by utilizing high-tech investigation techniques.” (Hyung-won Yu, Supervisor of the Investigation Division in Investigation & Surveillance Bureau at the time, “Direction of Investigation & Surveillance Administration in 2003”)

“We will establish foreign transaction order through scientific and systematic investigation control. For a scientific investigation control system, we will invent a smuggling warning system which analyzes high-risk factors such as real-time tracing on main smuggling items, crime records.” (Yong-duk Kim, the Commissioner of the KCS at the time, “Management Direction of 2004”)

“We will thoroughly control acts of smuggling and prevent these acts in advance by setting up a smuggling warning system that will predict the probability of smuggling.” (Jong-In Lee, then the Director of Investigation & Surveillance Bureau, “Direction of Investigation & Surveillance Administration in 2004”)

“We will construct a smuggling alert system targeting high-risk items and launch and operate a Smuggling Intelligence Division, to reinforce the
collection and analysis of information... We will turn to a planned investigation system through national and overall information analysis.” (Jae-hong Park, Director of Investigation & Surveillance Bureau at the time, “Direction of Investigation & Surveillance Administration in 2005”)

However, customs officials on the front lines continue to bring up the issue that collecting and analyzing information and controlling smuggling are tasks that can only be done in the field, not in an office, and that the head office was wasting its time. Their argument was that even with the best investigation and early warning system supported by information analysis, these tools would be meaningless if not properly operated in the field. In the face of these doubts, it was difficult to positively direct development of this system and the head of the office became increasingly skeptical about the success of constructing such a system. Yun-Sik Kim, an officer of the Human Resources Innovation Planning Group of the KCS, described the atmosphere of that time as follows:

“Most people in the KCS generally acknowledged the need for creating an Early Smuggling Warning System. But many were doubtful whether it was possible to develop such a system. They also questioned our capability to make it possible, and there were negative views that we wouldn’t be able to make good use of the system even if such a system was developed. It was true that many officials thought they would sit back and see for the time being, until the Investigation & Surveillance Bureau announced the launch of the development of the system.”

Despite overflowing skepticism about the system, it was the unwavering determination and commitment to innovation displayed by the two highest executives (Commissioner Yong-duk Kim1) and Deputy Commissioner Yoon-kap Sung2), that drove the development process into full force. In late November 2004, the two executives declared that construction of the system take priority over all other affairs of the Investigation & Surveillance Bureau, and they ordered the initiation of the development process toward building the system initially named “The Smuggling Warning System.”

After setting up a plan to make radical improvements in investigations work, the Investigation and Surveillance Bureau selected the best personnel from a pool of more than 600 KSC investigation officials: four highly capable individuals with the most experience in investigation and demonstrated excellence in understanding the system and analyzing information, formed the group (hereafter identified as the development team3) that conceived the smuggling warning system development in January 2005. With the full backing of the Commissioner, the development team, headed by Jong-ho Kim and three other members in charge of gathering data and case analysis as well as model development, set to work with an advisory committee comprised of experts ranging from university professors and researchers to government employees from other departments and government agencies related to customs affairs.

Jong-ho Kim, the team leader, worked as facilitator, arranging the project schedule and fine-tuning external relations while checking on details of proceedings. Supporting the team, the Director of the Investigation & Surveillance Bureau and the Supervisor of Investigation Division provided an adequate budget, including traveling allowances for business trips, contacted other government offices for assistance, and recommended experts when needed. It was the Commissioner who had the responsibility of setting goals and giving direction to the team. The Commissioner arranged and participated in the system development discussion meetings in which expert groups and the development team took part.

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1) The present Vice Minister of Construction & Transportation. Formerly served as the Commissioner of KCS. His term of office was from March 3rd, 2003 to May 26th, 2005.

2) The present Commissioner of KCS. Formerly served as the Deputy Commissioner from April 29th, 2003 to June 1st, 2005. He took office as Commissioner on June 2nd, 2005 and is presently holding the office.

3) The development team members were as follows. Team leader Jong-ho Kim, Il-bo Park, Nam-sup Kim, and Jae-chul Kim.
III. The Development of the Smuggling Alert System: Obstacles and Solutions

The first obstacle for the highly motivated team was the discovery that there were no domestic or international examples against which to benchmark the system. They confronted this problem as soon as they set to work. The team searched for information on the Internet, perusing academic reports of similar systems at home and abroad, but they soon learned that these sources could never amount to the kind of smuggling warning system reference the KCS desired. After examining about 10 cases from foreign customs services including those of the United States, Japan, and Hong Kong, it became clear not one country had a system that monitored or analyzed the trends of smuggling. The systems that did draw the attention of the team were the Early Warning System (EWS) of the Korea Center for International Finance (KCIF), which was developed as a response to the economic crisis in 1999, and five other government departments’ early warning systems stemming from the EWS of KCIF. But since these early warning systems were based on academic rationales with the assumption of rational economic behavior as a macroeconomic indicator, it was difficult to apply the same kind of rationale to criminal acts such as smuggling.

The system development period was projected to run for three months – one month for benchmarking similar systems of developed countries, one month for analyzing items and measuring smuggling risk indices, and the last month for developing the smuggling warning system. The team was highly positive and enthusiastic about its success from the very beginning.

Kim described the atmosphere at this time as follows:

“We were excited to be given the challenge of a new project, a project that was of high interest to and under the intense scrutiny of the chief executives; it was with the enormous pride of being selected as the best professionals capable of undertaking such a tremendous task that we began the project. We didn’t think it would be so hard to develop the system with this kind of atmosphere and enthusiasm. We thought three months would be enough.”
order to use price increase rate as an indicator of the SAS, the statistical relationship between this rate and smuggling had to be proved; but because there is no way to determine the actual number of smuggling acts, it was impossible to analyze any data. One expert of an advisory committee articulated this impossibility:

“There was a case in the United States which statistically analyzed the educative power of prison in aiding decisions to parole prisoners in a scientific way. This endeavor cost billions of dollars and required three years of time, but the predictive accuracy rate of second offense was only 52 percent. Therefore, it is almost impossible to forecast criminal acts.”

The team explored every aspect of related institutions, foreign customs services, academic reports/theses, and online resources, but they were unable to find any case in which a warning system had been applied to the field of crime. They began to worry about how they could overcome the lack of exemplary precedent and, after numerous meetings to find a solution, their frustration and doubts began to grow bigger and bigger. Kim describes those times as follows.

“We had series of brainstorming sessions without any benchmark cases, but we weren’t producing any good ideas that could break through the situation. Sometimes we complained to ourselves that there was no way in the world we could create such a system; even experts were telling us it just was not possible. Time was passing, slipping away.”

Although the team constantly received discouraging responses from their contacts with experts, they never stopped working to realize the idea that the system could actually be developed. However, during one of those many, tedious brainstorming sessions, a breakthrough came out of nowhere, a breakthrough that could be called a paradigm shift. During a discussion, one person suggested that they change the direction of the system from an early warning pattern to an instant warning pattern. The basis for this suggestion was the realization that they had neglected the primary goal of constructing the system in their pursuit of actual system development. The principal purpose of developing the system was to better interdict smuggling, and given this aim, an early warning system that would foresee the next six months was not particularly necessary. They recognized that analysis of present smuggling risk alone would improve smuggling control; and even if an early warning was impossible, a system which sent off an alarm as soon as smuggling took place would be enough to increase the efficacy of the process of smuggling control, thus removing the stigma of the KCS’s being a late-responder to this particular problem. Armed with this strategy, the team was able to move on to the next task, which was to delineate a strategy to make the transfer from an early-warning pattern to an instant-warning pattern. Various experts had to be called upon for the execution of this task.

With the advice of professionals at the KCIF and the KIET on the new idea, the team tackled the formation of SAS. Experts recommended studying the Stock Watch System of the Korea Exchange, which uses a model that detects manipulations on stock items by selecting unusual types of transactions on the basis of stock volume and price.
The Korea Customs Service’s Smuggling Alert System Development

volume; global price trends; trade volume between Korea and exporting countries; domestic price trends; and previous smuggling cases. Based on this model, the master plan for the SAS’s development was established.

However, the team faced another challenge when it began analyzing statistical relationships. The effects that each indicator had on the smuggling of certain items needed to be proven statistically meaningful in order to make a smuggling risk gauge model. The team constructed the indicator analysis per each item with help from the Korea Customs and Trade Institute’s chief researcher – with whom the team had made a consulting contract – by visiting the KCIF and the KIET many times, and studying statistics independently. After collecting four years’ worth of data for each indicator, they checked the data’s validity by analyzing the relationships between the volume of smuggling activities for each item and the data for each indicator. For indicators that had not been computerized, the team was required to gather the data themselves, and they made countless business trips to obtain valuable resources from other institutions, associations, and companies. This repeated statistical analysis took a great deal of time and energy.

However, it was crucial to make elaborate analyses of indicators in order to successfully construct and operate a system that could search through smuggling acts at the right time. As such, indicator analysis could not be delayed. The team had to find periodic indicators that regularly quantified data with the passing of time so as to predict the timing of smuggling. Only such indicators could grasp the trend of smuggling risk by monitoring through and over the flow of time.

The problem, though, was that such indicators were not common for any item. The biggest challenge posed while collecting indicators was the inability to find sources of indicators in this age of overflowing information. The team leader Jong-ho Kim describes the circumstances of the time as follows:

<table>
<thead>
<tr>
<th>Types</th>
<th>Early Warning System</th>
<th>Monitoring System</th>
</tr>
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<tbody>
<tr>
<td>Merits</td>
<td>- Response through prediction - Generalized index</td>
<td>- High reliability as an alarm - Checks on multiple items</td>
</tr>
<tr>
<td>Demeats</td>
<td>- Low reliability as an alarm - Need for complement with monitoring (constant checking of indicator required)</td>
<td>- Response after the situation has already occurred - Prediction not possible - Need to develop a system for each item</td>
</tr>
</tbody>
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The EWS has the advantage of responding through prediction, but reliability of such prediction as an alarm is low.

On the other hand, a monitoring system can check on various items and offer high reliability as an alarm. Its weak points are that it is unable to predict, and it responds to the situation only after its occurrence.

After examining the advantages and disadvantages of each system, the team planned to make a model that measured smuggling risks by analyzing
The Korea Customs Service's Smuggling Alert System Development

The reason the team had made it a priority to personally meet the people in charge was the conclusion that those individuals were ready to help and would get updates often, which would make them the best sources for information on indicators. The team also wanted to maintain good relationships with those sources and use them as key contact people when time came for the team to gather information necessary to smuggling control in the future. Most of them showed positive response to the plan to develop a high-tech system that would minimize the inflow of smuggled items, and agreed to cooperate closely with the team. Some even offered very useful information beyond what was asked regarding smuggling control, thereby providing an unexpected benefit effect to the team.

On the other hand, some organizations, like the Merchants' Association and Wholesalers, doubted the intentions of the KCS and responded in a negative way. They viewed the team with suspicion and refused to disclose any information. The team made constant visits to persuade them to cooperate, and managed to collect information by targeting individuals more open to their ideas.

Fortunately, since the import and export clearance data of the KCS are completely computerized, and the level of Korea's information environment is the best in the world, work on these indicator analysis tasks gradually began progressing. After going through these work processes, smuggling risk measurement models were made for each item.

“We fluttered with renewed hope while analyzing an indicator that was difficult to find, and feared that if it turned out that the indicator’s correlation with smuggling was insignificant, we would be greatly disappointed. But when we found an apparent correlation, we shouted with joy. We continued performing this important task, while our feelings fluctuated between hope and fear at each statistical analysis.”

In order to find sources of information that could collect these indicators, the team members went to relevant institutions, such as the Korea Agricultural Trade Information (KATI), Korea Pharmaceutical Traders Association, duty-free shops in the city, and the National Agricultural Cooperative Federation, and personally met with those in charge. From these contacts, the team attempted to obtain various indicator sources such as internal and external prices; sales figures; actual output; and overseas trade results of main items.

| <Table 1> Correlation Analysis for the Core Indicators of Gold Bullion |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                | case            | price_in        | price_out       | price_diff      | imp_kg          | exp_kg          |
| case           | 1.00000        | -0.19532        | -0.25206        | 0.34574         | 0.27195         | -0.09721        | 0.32992         |
| price_in       | -0.19532       | 1.00000         | 0.98604         | -0.06504        | -0.34267        | 0.38698         | -0.61853        |
| price_out      | -0.25206       | 0.98604         | 1.00000         | -0.23028        | -0.33188        | 0.42765         | -0.64554        |
| price_diff     | 0.34574        | -0.06504        | -0.23028        | 1.00000         | -0.01383        | -0.33810        | 0.25269         |
| imp_kg         | 0.27195        | -0.34267        | -0.33188        | -0.01383        | 1.00000         | 0.33202         | 0.67157         |
| exp_kg         | -0.09721       | 0.38068         | 0.42765         | -0.33810        | 0.33202         | 1.00000         | -0.47593        |
| imp_exp        | 0.32992        | -0.61853        | -0.64534        | 0.67157         | -0.47593        | 1.00000         |

Gold bullion was one of the highest risk smuggling items selected. Since the difference between the prices of gold Bullion at home and abroad is greatest, the level of supply and demand was identified as smuggling indicators. Through statistical analysis, the smuggling risk measurement model was developed.

\[ Y' = 0.0034827 X_1 + 0.000002276 X_2 \]

\[ Y : \text{Measured Smuggling Risk} \quad b_1, b_2: \text{Constant} \]

\[ X_1 : \text{Domestic Price} \quad e: \text{Error} \]

\[ X_2 : \text{Import Volume - Export Volume} \]
When indicator collection and analysis for the development of a system were almost complete, the team began to systematize the smuggling risk models made for each item. However, there was another obstacle awaiting them: the absence of a qualified person to develop the model. Many IT (information technology) experts were contacted, but no one was able to develop the program without a complete understanding of smuggling, which is very specific professional knowledge.

Without a basic understanding of the project, experts would not be able to contribute to the system’s programming, and the team did not have enough time to instruct them about the process through which the system had been planned and constructed.

The team sought new staff within the KCS who could develop the program, and found the right person (Dong-soo Nam of Incheon Customs), who soon joined the team. Nam had much experience in the field of investigation, and with his understanding of smuggling, he started computerizing the system in cooperation with the original team members and correcting errors that were discovered along the way.

As the one-month long development process of the system reached its final stage, the team held an advisory committee meeting to ask for advice on May 27th, 2005. Experts participating in the meeting were surprised that the system had been built solely by the efforts of the KCS officials, without the help of an outsourcing company, and marveled at the team’s creation of a system that could predict and measure such criminal acts as smuggling. The following is an opinion from one of the experts:

“I thought it was impossible to predict and measure a criminal act such as smuggling. But I realized that the people at the KCS stepped up to the challenge, an attempt that no one had ever made, and developed the first such system in the world. I now understand why this organization and its people were selected as the best performing government agency in the Korean Government Best Practice Competition last year (2004).”

Meanwhile, the advisory committee advised the team on ways to examine and utilize the system. Various ideas for upgrading the smuggling warning system, as well as cautions that needed to be taken when the system was in actual work settings, were brought forth, thus providing direction to being implementation.

On May 31st, 2005, in the presence of executive members of the KCS and the Commissioner, the team gave a demonstration of the system. The executives showed great deal of expectation, and anticipated that the construction of a system that measures smuggling risk by statistical analysis and uses the analysis to make smuggling control scientific could advance the smuggling control administration one big step further.

### IV. The Structure and the Contents of the Smuggling Alert System

Every item traded between countries has an independent trade pattern. The analysis for each item must be done in separate patterns, since each item’s production area, price, season, delivery pattern, and consumption pattern is different. Patterns for smuggling also vary from item to item. For instance,
bullion smuggling is susceptible to economic trends and domestic/international price differentials, while agricultural products are affected by seasonal factors apart from standard price differences. The items to which a quota system applies are likely to have disguised place of origin marks. Therefore, smuggling must be monitored through different strategies from all different angles, and for this reason the development of a customized warning system for each item is required. The team therefore selected 14 main smuggling items – such as rice and tobacco, as well as main high-risk items of the past four years (See Appendix 2: Arrest Records of Smuggling Interdiction of Main Items in the Last 4 Years) – whose impact on the national economy is relatively significant. (In the case of rice, smuggling risk would increase with the opening of markets; of tobacco products, with projected price increases.) The ability to monitor these 14 main high-risk items would enable management of more than 60 percent of direct smuggling.

Although the actual volume of rice and tobacco being smuggled is not high, it was included among the main high-risk items because the opening of rice markets and an increase of tobacco prices were soon to be put into effect. These items are likely to emerge as new high-risk items in the near future.

Subsequently, the team began to seek indicators which affect smuggling per item, and they settled upon more than 20 indicators such as price; the amounts of imports; global business trends; smuggling information; and supplies by brainstorming and collecting opinions from investigation experts (See Appendix 3: Smuggling Risk Measurement Indicators).

The SAS is composed of diverse components including input per item, risk measurement, and basic data analysis, among others, where a user can input estimated figures in trend analysis in case basic data collection falls behind.

Also, in order to utilize the system for each field of the KCS such as customs clearance, auditing, and investigation, the team created a council composed of heads of each division of the KCS and discussed with them the ways to maximize the effectiveness of control utilizing new methods, such as arranging import and export inspection rates per item, planned audits, and planned investigations.

Smuggling risk was categorized by five levels, beginning with “low” and continuing to “cautious”, “elevated”, “high”, and “critical”, and the team decided on the measures to be taken at each stage and the divisions that would be responsible for taking those measures after consultation with the council. (See Appendix 4: Smuggling Risk Level and Response Measures)
V. Achievements by the Application of the Smuggling Alert System

When the system development phase was nearing its final stage, the team conducted a monthly smuggling risk measurement in May 2005, and found that deer antlers, gold bullion, and tobacco products posed a ‘high’-level smuggling risk, the 4th highest level. In accordance with this evaluation, the team released a smuggling warning on June 10th, 2005. After the warning, everyone at the KCS performed his duties in perfect order and organized special countermeasures teams at the four main customs houses in Seoul, Busan, Inchon, and Incheon Airport; thus began smuggling control.

*The blue graph represents the amount of gold bullion smuggled, and the red one shows gold bullion smuggling risk. The smuggling risk of gold bullion was at “high” level as of May 2005.

The effects of the system were far superior to what the team expected. The results of the special control amounted to $57 billion for 90 cases, which was 8.4 times greater than what was expected by the planned control from June to July 2004, and 17 times the number of arrest incidents in the first half of 2005.

In light of Customs’ past tendency to take primarily post-incident measures, and the media and public’s criticisms of that practice, these results marked a considerable change. Smuggling control used the SAS to predict the timing of the smuggling and took action at the right time by detecting changes in the smuggling environment, such as a sudden decrease in the amount of imports and the sudden increase in price differences between home and abroad.

*Figure 9* Records of Special Investigation by the Smuggling Alert System

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<th>Unit: 100 Million Won</th>
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<td>60</td>
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</table>

The development of the SAS brought much media attention to KCS. The media reported about the system in more than 20 cases on outlets ranging from TV programs and newspapers to Internet news. The following article is one of those news reports.

“...It was a long-cherished desire for the KCS to predict the trend of smuggling activities. They constructed a model that measures the smuggling risk of 14 items with the great efforts and commitment by many experienced and skillful..."
KCS at the end of July 2005, close to the date when free trade in the rice market was to commence, to request information about rice smuggling control, and was surprised that the SAS was already in full operation. Pfizer, a global pharmaceuticals company, paid a thank-you visit to the KCS on August 23rd of the same year, and also sent a letter of gratitude to the SAS for its efforts in interdicting smuggling. Finally, the SAS was creating a sensation, marking the beginning of an epoch in the history of smuggling control.

The virtues of the SAS, highly acclaimed by the media and customers, can be analyzed as follows.

First, efficiency in smuggling control, particularly prompt action enabled by thorough analysis of the smuggling environment, was acknowledged by the special control last June. The KCS was able to minimize resource waste by fully utilizing limited human resources and budgets on specific items at specific times.

Second, the SAS presented an entirely new case – a case in which statistical methods are applied to the field of investigation, a field that had been traditionally dependent on smuggling information and intelligence. This system advanced smuggling control and made it scientific.

Third, this system has helped prevent smuggling through advance response. According to criminal economics, crime activity such as smuggling is affected by the frequency of control and intensity of punishment; thus, the SAS is expected to boost its smuggling prevention effects in the future by its selective and intensive control. The achievements of the SAS are significant because they have shown that even crimes like smuggling can be controlled through strategic decision-making, statistical analysis, and scientific examination of the present situation. In addition, the practical value of statistical analysis is boundless as it can be used for human resource distribution, inspection rates per item arrangement, and special investigation team organization, among others.
If such scientific analysis is applied to tax fraud and other fields of crime, it will be useful for efficient resource distribution and strategic initiative development according to risk levels.

VI. Success Factors

The KCS’s development of the SAS was a dramatically successful case because of the chief executive’s strong will to achieve innovation, the support and encouragement received by the KCS members through the process of development, and the strategy employed by experienced and knowledgeable team members who were passionate and committed despite obstacles.

The reasons the KCS succeeded in overcoming difficulties can be attributed to the following three factors.

First, there was a lack of indicators to adequately understand smuggling. In this matter, Korea’s IT infrastructure, the world’s highest, was a great help. Team members also visited more than 40 relevant organizations and succeeded in gathering the necessary information for each item through constant persuasion for information and cooperation. In addition, the team successfully set up points of contact with relevant institutions and organizations, and thus constructed a domestic information network, which was another result of the SAS development.

Second, the correlation between smuggling indicators and actual smuggling was discovered to be insignificant. If an indicator the team had examined turned out to be irrelevant to smuggling, they had to continue searching for the right one. In addition, they had to study statistics during the system development period; at that point, they did not have much knowledge of statistics for correlation analysis. With the expert help of statisticians, however, they managed to handle that difficult work of evaluating processes and gained the requisite knowledge and expertise necessary to add items and examine statistics.

Third, the SAS is based on a computerized smuggling risk model. The team first intended to consult with an outsourcing company about this task, but the professionals who were hired to advise eventually gave up on this challenge due to the enormous workload and lack of knowledge of smuggling. Though this temporarily placed the project of system development in danger of being delayed indefinitely, one official at the KCS who was familiar with investigation work and was very capable in computer programming was sought and eventually selected to join the team. He had previously developed a program that dealt with foreign exchange and cargo investigation, and he had applied such a system in actual practice. He joined the team so that the development process could continue.

In consideration of these success factors, this case highlights the following points. First, there must be strong will and support from the executives of an organization to achieve innovation. The key factor to success in smuggling control is the number of arrests being made on the spot, so it is not easy to use investigation officers in charge of important tasks on the front lines for certain projects. Since the beginning of the Participatory Government, the former Commissioners’ strong will to innovate created a atmosphere conducive to innovation in the KCS, which boosted voluntary innovation activity in employees. In line with this innovation-conducive culture, the present Commissioner organized the development team and provided them with an environment where they could concentrate solely on the project; by granting exclusive office space and exempting them from routine work, and by offering ideas for the development direction through many discussions and early-morning meetings, the team was strengthened and encouraged. In the end, such support and freedom allowed the smooth and successful construction of the SAS.

Second, the innovations of the past lay the groundwork for innovations of
the future. The complete computerization of customs clearance through the continuous application of information technology (IT), the six-month IT training given in order to foster officers to specialize in IT, and Korea’s internet infrastructure were the foundations upon which the SAS could be built.

Third, there should be a close partnership between the public and private sectors. There are many cases in which the private sector may have superior capacity to perform better and have important sources for information and skills compared to the public sector, and the administrative goals of the public sector are achieved far more easily when the citizens participate in achieving these goals. Recently, in the public sector, policies which induced active participation by the private sector, such as the C-TPAT (Customs-Trade Partnership Anti-Terrorism) program of United States, are displaying their great effectiveness. C-TPAT is a program which draws voluntary reports from ship owners, transporters, and warehousemen who are related to trade, and help the government and private sector work together on anti-terrorism tasks. In the national security field, increasing efforts are being made to draw participation from the private sector in such areas as operating the Anti-Smuggling Informant Reward System or the Anti-Smuggling Report System.

Considering such trends, it was possible for the SAS development to be achieved successfully because the team made a conscious effort to invite private sector participation by visiting producers, consumers, and sellers directly, gathering information like sales volume and demands, and finally utilizing that information.

Fourth, the SAS demonstrated that it is possible to use statistical analysis methods in the field of criminal investigation. Until now, investigative work such as smuggling control mainly depended on portions of reports collected from informants rather than on statistical analysis. However, from now on, a strategic Decision Supporting System (DSS) using statistical methods will be needed for employing strategic resources in accordance with the trend of smuggling crime and deciding the time and the intensity of the control; in this sense, the SAS, accomplished by the KCS, is the first of such attempts.

VII. After the Development of the SAS: Evaluation and Future Plans

On September 29th, 2005 the SAS was awarded the first prize in the Government Innovation Competition in which 46 agencies submitted a total of 140 cases. The contest was held by the Ministry of Government Administration and Home Affairs, and the award given by the President of Korea. The SAS received high scores from the judges because the KCS officials had successfully developed a system that defied even the expectations of the experts, and its results were viable and specific.

This SAS case was introduced to various government agencies, including the Blue House (Presidential Office of Republic of Korea), and it suggested that government officials’ work could be scientific and systematic. Some divisions in the KCS, those that had formerly had a negative attitude toward the unfamiliar concept of smuggling risk, started to use the monthly results of smuggling risk measurement and apply them to their work plans.

In addition, other government agencies such as the Korean Coast Guard and the Korean Intellectual Property Office made inquiries about the SAS, and the system was introduced as a main smuggling control measure during the Assembly’s inspection of the KCS in 2005, receiving many interpolations with curiosity and much encouragement from the legislators of the National Assembly.
Smuggling evolves continuously since it is a crime committed by humans. Specifically, the act of smuggling terror-related and other prohibited items, such as drugs and small arms, guarantees much profit, and many international smuggling organizations are involved in smuggling activities with constant practice. If the present smuggling indicators of the SAS are not managed properly or continuously improved, the indicators will soon become completely useless. Therefore, the KCS has made it a priority to check and revise the SAS every six months by considering recently emerging high-risk items in smuggling trends. For example, if the rice market opens, smuggling methods will be more likely to diversify, and such tactics as smuggling in concealment, in mixed shipping, and in separate shipping are used, those trends must be addressed in further developments of the system. Drugs only make up an negligible part of the current trends in smuggling, but they have the potential to become a main smuggling item as the gross national income continues to grow. Because of this, drug smuggling also needs to be researched and studied ceaselessly.

In addition, the KCS will continue to strive to evolve the SAS into an early warning system by accumulating data, studying analysis methods, and evaluating utilization results. The KCS has installed a separate information organization (Smuggling Intelligence Division) in the Investigation and Surveillance Bureau to focus on managing smuggling-related information and to operate the SAS. This Division will function as the control center of the KCS’s information system and will build an information network at home and abroad to analyze collected data.

If this case can successfully be applied to other fields of criminal investigation and tax fraud investigation, which have traits similar to smuggling control, it will greatly improve Korea’s administrative function and move it one step closer to better control over preemptive risk management, scientific distribution of human and financial resources, and the construction of regular surveillance systems for risk sectors.
<Appendix.1> Achievements of the World’s Best Customs Initiative

**Background**
- To become the “World’s Best Customs Service” through innovation and capacity building, thereby contributing to the realization of the national vision of making Korea the logistics hub in Northeast Asia

**Vision**
- “Realization of the "World’s Best Customs Service" to contribute in the making of the nation as an economic hub in Northeast Asia

**Strategies**
- Innovating clearance procedures to become the “World’s Best Customs Service”
  - Logistics innovation Team (47)
  - Port Surveillance Modernization Team (10)
- Modernizing the information system
  - Business Process Improvement Team (16)
  - (90 tasks total)
- Adopting penalties to make the customs declaration system efficient
- Adopting flexible penalty system

**Tasks**
- Constructed "Single Window" Internet-based Civil System
- Constructed internet import & export declaration service
- Rs. 15,000, 22.69% decrease in customs processing time
- Reduced passenger clearance time from 40 minutes to 25
- Introduced Real Time Cargo Management System
- Set up comprehensive surveillance information system: 4 ports
- Designed Custom Service for Green Lane

**Proceedings**
- The 1st Steering Committee (03.5)
- Establishing the committee and reviewing the innovation direction of the KCS
- The 2nd Steering Committee (03.7)
- Setting and announcing the vision and 60 tasks for innovation
- The 3rd Steering Committee (03.12)
- Examinig the results of the 60 tasks and adding six more tasks
- The 4th Steering Committee (04.4)
- Adding 14 more tasks
- The 5th Steering Committee (04.11)
- Adding 10 more tasks
- The 6th Steering Committee (05.7)
- Suggesting CMP/Customs Modernization Project(2010) as a future direction of the KCS

**Achievements**
- Reduced cargo clearance time from 5.6 hours to 4.5
- Introduced Real Time Cargo Management System
- Reduced passenger clearance time from 40 minutes to 25

**Information Section**
- Constructed internet import & export declaration portal
- Constructed internet-based civil appeal system
- Constructed “Single Window” between clearance condition confirmation and reduction of the number of tasks

**International Cooperation**
- Initiated APEC SCCP activities
- Developed "Korea Intuitive" Action Plan
- Establishing and operating KCS FTA strategy supporting team

**Audit Section**
- Introduced monthly payment system
- Introduced client self-assessment system
- Introduced customs system that allows changes in customs declaration by clients without penalty

**Investigation & Surveillance Sector**
- APIS passenger advance information obtaining rate: 26% to 98%
- Set up comprehensive surveillance information system: 4 ports
- Constructed Smuggling Trend Management System
- Result-oriented Human Resources Management

**Service Oriented**
- Regular Reviews & Feedback
  - Slim
  - Specialization

<Appendix.2> Arrest Records of Smuggling Interdiction of Main Items in the Last 4 Years

<table>
<thead>
<tr>
<th>Types</th>
<th>Items</th>
<th>Number of Arrests</th>
<th>Amount of Arrests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Items of</td>
<td>Gold Bullion</td>
<td>101</td>
<td>1,753</td>
</tr>
<tr>
<td>Direct Smuggling</td>
<td>Antler</td>
<td>152</td>
<td>717</td>
</tr>
<tr>
<td></td>
<td>Red Pepper</td>
<td>291</td>
<td>512</td>
</tr>
<tr>
<td></td>
<td>Viagra</td>
<td>1,308</td>
<td>202</td>
</tr>
<tr>
<td></td>
<td>Ginseng</td>
<td>296</td>
<td>112</td>
</tr>
<tr>
<td></td>
<td>Diamond</td>
<td>45</td>
<td>83</td>
</tr>
<tr>
<td>High-risk Smuggling</td>
<td>Tobacco</td>
<td>194</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Rice</td>
<td>71</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Soybean</td>
<td>29</td>
<td>206</td>
</tr>
<tr>
<td>Main Items of</td>
<td>Ginkgo</td>
<td>37</td>
<td>204</td>
</tr>
<tr>
<td>Tax Evasion</td>
<td>Alaska Pollack</td>
<td>13</td>
<td>183</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>2,537</td>
<td>4,000</td>
</tr>
</tbody>
</table>

<Appendix.3> Smuggling Risk Measurement Indicators

**Classification**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Measuring Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>Increase rate</td>
</tr>
<tr>
<td></td>
<td>Increase rate</td>
</tr>
<tr>
<td></td>
<td>Increase Rate</td>
</tr>
<tr>
<td>Import</td>
<td>Comparison between monthly average import volume and the average import volume of the recent five years</td>
</tr>
<tr>
<td>Domestic demand</td>
<td>Insufficient supply= Demands — Production volume± Import volume</td>
</tr>
<tr>
<td>Domestic production amount</td>
<td>Decrease rate</td>
</tr>
<tr>
<td>Overseas production amount</td>
<td>Increase rate</td>
</tr>
<tr>
<td>Major exporter</td>
<td>Changes of major exporters</td>
</tr>
<tr>
<td>Business number of importing companies</td>
<td>Increase rate</td>
</tr>
<tr>
<td>Data from Professional journals and associations</td>
<td></td>
</tr>
<tr>
<td>Overseas market</td>
<td>Data collected online and overseas media</td>
</tr>
<tr>
<td>Statute/Regime Export subsidies/drawback system</td>
<td>Export supporting program, Tariff changes</td>
</tr>
<tr>
<td>Domestic regulations/concession amount</td>
<td>Import restriction Measures/Possibility of concession amount increase</td>
</tr>
</tbody>
</table>
### Classification Indicator Measuring Method

<table>
<thead>
<tr>
<th>Classification</th>
<th>Indicator</th>
<th>Measuring Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smuggling Trends</td>
<td>concession amount</td>
<td>concession amount increase</td>
</tr>
<tr>
<td></td>
<td>Ex-convict trends</td>
<td>Ex-convicts’ overseas travel trends</td>
</tr>
<tr>
<td></td>
<td>Number of tips and intelligence</td>
<td>Smuggling reports</td>
</tr>
<tr>
<td></td>
<td>Number of arrest</td>
<td>Results, methods, and route of smuggling</td>
</tr>
<tr>
<td></td>
<td>“Shuttle Trader” goods detention results</td>
<td>Changes of main items smuggled in by “Shuttle Trader”</td>
</tr>
<tr>
<td></td>
<td>Inspection detection rate</td>
<td>Import, post-audit cargo selectivity detection rate</td>
</tr>
<tr>
<td>Other Variables</td>
<td>Sales of Duty-free Shops</td>
<td>Ratio of sales of designated items to the number of passengers</td>
</tr>
<tr>
<td></td>
<td>Loading permission record of supplies for vessels</td>
<td>Loading permission rate of supplies for vessels</td>
</tr>
<tr>
<td></td>
<td>Drawback record</td>
<td>Change in drawback amount for each item</td>
</tr>
<tr>
<td></td>
<td>Trend of the industry</td>
<td>Industry association trends</td>
</tr>
<tr>
<td></td>
<td>Foreign Currency</td>
<td>Fluctuation Rate</td>
</tr>
</tbody>
</table>

### <Appendix.4> Smuggling Risk Level and Response Measures

<table>
<thead>
<tr>
<th>Range</th>
<th>Risk Level</th>
<th>Measurement</th>
<th>Offices in Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 50</td>
<td>Low</td>
<td></td>
<td>- Smuggling Intelligence Division</td>
</tr>
<tr>
<td>-60</td>
<td>Cautious</td>
<td>- Unusual trend analysis</td>
<td>- Smuggling Intelligence Division</td>
</tr>
<tr>
<td>~70</td>
<td>Elevated</td>
<td>- Trend data transmission to the front lines</td>
<td>- Smuggling Intelligence Division</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Raising cargo selectivity inspection Rate</td>
<td>- Customs Valuation &amp; Classification Institute</td>
</tr>
<tr>
<td>-80</td>
<td>High</td>
<td>- Selecting cargos for inspection</td>
<td>- Trade &amp; Logistics Division</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Targeting Advanced Investigation</td>
<td>- Comprehensive Audit Division</td>
</tr>
<tr>
<td>-90</td>
<td>Critical</td>
<td>- Additional information analysis</td>
<td>- Investigation Division</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Launching special investigation</td>
<td>- Narcotics Investigation Division</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Comprehensive Audit Division</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Passenger &amp; Simplified Clearance Division</td>
</tr>
</tbody>
</table>

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Efficient Government

The Implementation of the Ubiquitous Patent Administration System
- The Korean Intellectual Property Office
The Implementation of the Ubiquitous Patent Administration System

Jeongjin Woo (Professor, Dong-A College)

Case Overview

This case illustrates the Korea Intellectual Property Office’s (KIPO) innovation of its intellectual property administration to achieve quality productivity and customer satisfaction. This has been done through the introduction of the 6 Sigma System, which enables the paperless computerized operation of the whole process of intellectual property administration from application, evaluation to the publication of an official report. This system has remarkably improved the speed and accuracy of the administration, cut down the processing fee, thereby gaining a recognition as an outstanding case of innovation from the World Intellectual Property Organization (WIPO).

I. Background for the construction of the ubiquitous patent administration system

While 20th century society can be characterized as an industrial society, where capital and labor were important parts of economic activities, the 21st century can be seen as a knowledge-based information society, in which accumulation of knowledge and information and their effective applications are playing key roles in social and economic activities. In order for individuals, enterprises, and the government to perform their economic activities appropriately in the knowledge-based information society, it is imperative that relevant environments and related capabilities to acquire and utilize useful information anywhere and anytime be available to everyone. Most countries in the world have recognized that a rapid and timely transition to a knowledge-based information society is one of the most crucial factors in surviving and thriving in the fierce global competition of the 21st century. In fact, most countries are currently rushing to establish information networks.

Under this context, the Korea Intellectual Property Office (KIPO) set up a master plan for the computerization of the patent administration in the latter part of 1995 in accordance with “The first plan (1992-1998) for the administration’s computerization of industrial property.” The KIPO has successfully completed a large-scale development project from 1996 to 1998 and opened ‘KIPOnet’ in January 1999.

Through the establishment of ‘KIPOnet,’ applicants have access to the system from their homes and an Internet search service has also been provided. Inside the KIPO, the paperless, computerized operation system has laid a foundation for remarkable progress in intellectual property administration.

In 1991, the number of applications for industrial property was 120,000 cases and it more than doubled to 270,000 in 1996. There was a waiting period of three years before starting an actual examination of the application documents. It also cost 10 billion won (10 million dollars) to publish intellectual property information in books. These published papers and books required tremendous room for storage and the need for more space continued. This situation has demanded that fundamental measures be taken to bring innovations to a patent administration that had mainly operated through documents. In addition, the KIPO main office moved from Seoul to Daejeon in August of 1998. Typically 70% of intellectual property applications come from Seoul, and an urgent need was emerging for establishing an environment for application and subsequent operations processing without restrictions of time and space.

In this context, the KIPO implemented u-KIPO in which the utilization of the patent network was optimized and a base to realize the vision of the KIPO - “Creating a country with intellectual property in the 21st century” - was
established. By providing a foundation of efficient administration services where the whole processes of patent application, examination, registration, and decision are computerized through the network, 415 billion won (415 million dollars) could be saved in the areas related to applications and relevant administration. KIPOnet has become a center for ubiquitous administration services that provide any information without restrictions of time and space.

1. The increase of the social and economic impacts of intellectual property in a knowledge-based information society

According to a joint survey by the KIPO and KDI, an increase of intellectual capital by 1%, as measured by an increase in patent applications, enhanced the economic development rate by 0.11%, as measured by an increase in the per capita GNP. An increase in the intellectual capital based on intellectual property including patents usually shows a deferred influence on the increase in productivity and national income, usually a 3-5 year interval. As of the end of 2001, it is estimated that an additional 1,000 patent applications would bring about an increase of 446 billion won (446 million dollars) in national income in the next five years. Therefore, consistent patent applications for intellectual property and the efficient performance in patent administration exert a direct impact on the development of the national economy and play a very crucial role in the accruing of developmental potential.

An investigation by the FKI (Federation of Korean Industries) showed that 9% of patented technology would reach the final declining stage of the technological cycle when the patent is actually registered by the KIPO because the overall cycles in technology have shortened drastically. One of the most frequent complaints from the industry regarding intellectual property administration is that the waiting period before an actual examination is too long (75.2%). On the basis of this survey, if one year in the waiting period is curtailed, 1.4 trillion won (1.4 billion dollars) can be saved accordingly. There is a high demand for efficiency in intellectual property administration including a reduction of the waiting period.

Since its inception in 1977, the KIPO has contributed both to the enhancement of national competitiveness by establishing a foundation for advanced patent administration and also to the promotion of the development of industrial technology through the protection of intellectual property rights. When the KIPO began its operations, the number of industrial property applications was 25,675 and by the end of 2004, the number of cases rose to 327,943. This number indicates that Korea has become the world’s fourth largest in terms of application volume. In comparison to other nations, Korea is the fifth in rank following the USA, Japan, Taiwan, and Germany. In the WIPO (World Intellectual Property Organization), the number of international patent applications from Korea was the 7th highest, which indicates that Korean intellectual property rights have reached a world-class level.

2. Intensification of global competition over intellectual property

In the case of digital TV and DVD players, Korea’s main developmental engines for the next generation, 11.1% and 15.0% of the total product prices were paid as royalties to the patent holders of the main technology. Moreover, a recent tendency has been that the patent holders have begun to organize a patent pool. Unless companies with patented technology use technologies from the pool, access to the market is impossible. In this situation, the patents are acting as entry barriers to the major markets.

Fierce competition between nations has caused a drastic increase in the number of applications of industrial property rights. In 1960, the number of
The Implementation of the Ubiquitous Patent Administration System

have created and pursued policies on intellectual property issues.

3. The innovation initiatives of the participatory government

The participatory government, in its efforts to realize its ambition of creating a nation with a per capita income of US$20,000, has delineated five strategic plans. They are technological innovation, the repositioning of Korea as the center of North East Asia, balanced national development, corporation restructuring, and improvements in labor relations. Technological innovation is the core of these plans. The KIPO has abandoned its investment-centered development policies. Instead, the KIPO has proposed ‘A Wealthy Country with Intellectual Property’ as a new vision for development so that the widespread fever for invention can be channeled into consistent value creation with the help of national innovation systems.

‘A Wealthy Country with Intellectual Property’ means a society in which high productivity and value creation in industries and economies are possible through the active creation, protection, and application of intellectual properties in patented technology, brands, and designs all throughout society. In a concerted effort to make all of these possible, intellectual properties and other essential national assets should be accumulated in a consistent manner. These assets should be managed systematically and effectively. Furthermore, new systems of creating, applying, and thoroughly protecting intellectual property should be put in place.

II. Basic Principles of the ubiquitous patent system and its contents

The basic principles of the ubiquitous systems of the KIPO can be
The Implementation of the Ubiquitous Patent Administration System

and 298 group meetings were held in 2005 alone. Through the Knowledge Management Systems at the KIPO, every employee can participate in on-line discussions at the “knowledge Q & A section” on any subject in their specialized areas. The systems have also enhanced the convenience and efficiency of knowledge application by enabling browsing and retrieval of all internally signed and processed documents. With the experience and capability in knowledge management, the KIPO was attempting to disclose internal, specialized information with the cooperation of private Internet portal sites such as Naver.

With the development of a knowledge-based management, there has been an increase in the number of examinations per person by 46% compared to the year 2002, and a decrease of 40% in the examination error rate. It can be inferred from the data that there has been improvement in patent examination capabilities. With the cooperation of private portal sites, there has been an increase in the number of people who take advantage of patented information, which contributes to the reinforcement of the national knowledge foundation.

The KIPO is planning to further expand cooperation with other portal sites and research institutions for the mutual exchange of information.

(2) Performance-based evaluation system

The KIPO became the first central governmental organization that adopted a performance-based evaluation contract with its employees on the basis of the Balanced Score Board (BSB) system. According to the discussion conducted in the Innovation Junior Board in September of 2004, 38 tasks for improvement were selected after a thorough evaluation of the whole organization. 40% of these tasks needed improvement, and 15 cases were about the systematic evaluation of performance. This internal demand for change prompted the adoption of performance-based evaluation system.

The main contents and characteristics of the system can be categorized into

1. Basic principles of innovation

(1) Knowledge-based management

Knowledge-based management refers to an operational method in which the creation, sharing, and applications of knowledge are optimized in order to improve the problem-solving capability and competitive edge of the organization. The KIPO, in charge of global-level information and intellectual property processing, has the duty to disseminate the importance of knowledge creation and its applications. There have been several cases of discussion about applying knowledge-based management principles to the KIPO. In 1999, ‘The comprehensive measures on the innovation of patent administration’ was accepted and “the use of knowledge-based management” was included as a core strategy in these measures. The proclamation ceremony for knowledge-based management was held in December of 2000 and the ‘Korea Knowledge Management Society’, which had been an unofficial organization, became an official member organization under KIPO. In September of 2005, an innovation initiative was accepted as a way to reinforce national knowledge capabilities on the basis of accumulated internal knowledge.

Subsequently, the KIPO has begun to support many research groups consisting of experts from Korea and other countries including the Nanotechnology Research Group and Ubiquitous Patent Research Group. As of July 2005, 59 research groups were actively engaged in research activities.
two parts. First, a communication channel for an effective evaluation of performance was established by developing strategic schemes and organizational visions for each department, with strategic charts and key performance indicators (KPI) based on the overall organizational visions and strategic orientations. Secondly, organizational performances and developmental potentials have been promoted by formulating and managing the critical success factors (CSF) and the key performance indicators (KPI) from five perspectives. These perspectives regard the people in charge, performance completion, policy performance, finance, and innovation/studying.

Performance evaluation management could also be optimized with the help of KIPOnet. By combining performance information obtained from KIPOnet and the performance evaluation system, strategy execution could be monitored in real time and cumulative evaluation information could be provided through the database.

The KIPO has established an integrative performance evaluation system for departments and individuals, which includes capability evaluations, multifaceted evaluations, and innovation mileage on the basis of information obtained from performance evaluations. This evaluation system was selected as the best form of evaluation system construction and management in government organizations. 24 organizations in the local governments and civilian institutions have decided to integrate this system into their extant evaluation systems.

One of the most important measures in practicing performance-based management is the 6-sigma technique. 6-sigma is an organizational management innovation activity designed to obtain quality levels of 6-sigma by statistically gauging and analyzing any defects during management processes and eliminating their causes. 6-sigma is structured to diagnose and solve any problems internally by providing differentiated and systematic education in accordance with the levels of assignments. The KIPO decided that the 6-sigma management system was the most suitable operational innovation measure for the KIPO by taking into account the organizational characteristics of the KIPO, which has excellent manpower and highly sophisticated expertise. The system was initiated in May of 2005.

During this innovation, 6-sigma verified the processes of scientifically and systematically finding problems and solutions while providing objective assessments and feedback. One of the approved advantages of the 6-sigma system is the flexibility in its system processing with a close connection with the innovation methods attempted in the past. The system has recorded many instances of success in various governmental and civilian organizations. However, 6-sigma is not the innovation mainly pursued by the heads of organizations or innovations teams. It trains innovation agents in the lower levels of the organizations and is regarded as a suitable innovation method for the initial settlement stage of the innovation. The KIPO conducted specialist training for 36 members of the core task employees (Black Belt), employees in charge of tasks (Champion), and working level employees (Green Belt) for six months beginning in April of 2005. Implementation of these six tasks was completed by September of 2005. It is expected that the implementation of 6-sigma will directly enhance operational efficiency, including a reduction in the rate of error in examinations and decisions (from 2.79% to 0.14%) and a curtailment in the examination periods (from 12.8 months to 6 months). The KIPO is planning to conduct 6-sigma training and task operation performances for 100 employees by the end of 2005 and for all employees by the first half of 2007.

(3) Customer-centered management

In 2004, as part of corrective measures against the decline in the customer satisfaction response rate, which had dropped by 0.6% from the previous year, a customer-centered management by the KIPO began in 2005. The specific management measures included continuous service to customers, even after the entire examination and decision process was over, examination
The Implementation of the Ubiquitous Patent Administration System

[Image: The Internet-based intellectual property processing environment]

Ubiquitous IT is the key to the innovation of the patent administration. Following are actual cases of innovations in u-KIPO.

(1) 24 hours a day, 7 days a week support of electronic service to the public (Anytime)

Since 1999, for the first time in the world, the KIPO has supported electronic patent applications via the Internet during office hours. After the designated office hours, applications were not possible and applicants (particularly individual applicants and small sized companies) have demanded an extension of the service hours on the Internet.

2. Main contents of the ubiquitous patent system.

The purpose of the u-patent system is to provide an efficient foundation to conduct ultimate innovation in intellectual property administration by providing unlimited patent information for applications anywhere, anytime. The KIPO has completed restructuring the intellectual property processing system into an Internet-based on-line system in which every electronic document is processed and prepared for patent application, examination, registration, and publication.

service at customers’ sites, and the development of manuals for how to respond to the customers. With these institutional changes, emphasis was placed on how to interact with customers for maximum satisfaction through the VOC (voice of customer) service. The positive effects of these efforts were reflected in a satisfaction survey conducted in June of 2005. Total customer satisfaction scored 66.7 points, which was a 7% increase from the previous year. Specifically, satisfaction in the area of examinations and decisions showed an increase of 19.6%. The KIPO is pursuing the world’s fastest examination and decision performance system while maintaining a high level of quality. In order to realize this goal, the KIPO is depending on outsourcing for the special employment of examination and decision staff. Together with these efforts, the KIPO aims to shorten all examination and decision processes to 10 months by 2006 by creating efficient reviewing and evaluation environments through the reinforcement of information infrastructures, and the improvement in operation processes and on-time knowledge searching systems.

The KIPO will keep building customer satisfaction by setting up the improvement processes in order to increase customer participation by including real-time monitoring and evaluation on performance on patent examinations and decisions. Major decisions of examiners are to be duly recorded and ready for disclosure anytime in an effort to improve service quality.

Dynamics of Government Innovation and Decentralization in Korea
Several countries signed the PLT (Patent Law Treaty) in 2000 with the aim of the global unification of patent procedures. In preparation for Korea to join this treaty, there arose a need to actively operate an electronically based public service system 24 hours a day.

To keep abreast of these changes, improvements in computerized systems in the KIPO have been pursued in order to extend working hours to nights and holidays with the aim of establishing nonstop/real-time service. The service time was extended from 8:00 PM to midnight and it is expected that service will be provided 24 hours a day eventually.

The types of services that should be included in 24 hours-a-day service will be almost every electronic service such as applications, notice of reception and notice of domestic and international patent applications, requests and issuance of the original registration and other certificates, and perusals of patent review status.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Night Service (1st period)</th>
<th>Holiday service (2nd period)</th>
<th>24 hour service (3rd period)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Hours</td>
<td>Week days: 08-24 (8 hours) Saturdays: 08-24 (6 hours) Holidays: No service (24 hours)</td>
<td>Week days: 06-24 (6 hours) Saturdays: 06-24 (6 hours) Holidays: No service (12 hours)</td>
<td>Week days : 00-24 (6 hours) Saturdays : 00-24 (6 hours) Holidays : 09-21 (12 hours)</td>
</tr>
</tbody>
</table>

In accordance with chapter 5 of the treaty, restrictions on nationalities and countries of origin shall be removed when submitting documents for patent application.

In accordance with chapter 7 of the treaty, foreigners may conduct the processing of paying application fees and patent registration without going through domestic representatives.

Hours in parenthesis indicate the time for system maintenance

(2) The introduction of an online home telecommuting system

There has been a rapid increase in the number of patent applications for the past three years. While the rate of increase of applications remained at 2-3% in 2001 and 2002, it reached 16.5% in the first half of 2005. There has been a continued hike in the number of new employees in the KIPO in an effort to shorten the waiting periods within 10 months. In 1995, there were 659 employees in the KIPO and by 2005, the number doubled and the total number of employees working for the KIPO was 1,489. It is expected that by 2008, 400 more people will be employed by KIPO.

This drastic increase in the number of employees has caused a problem of office space necessitating a budgetary increase to buy enough office space to accommodate the new employees. Some departments with the same function had to be separated into different locations which resulted in the degeneration of productivity and efficiency with additional rental costs. In 1998, the KIPO moved to Daejeon, 150km (90 miles) south of Seoul. Unfortunately, due to the move, there were 138 long distance commuters. It was understood that these commuters were experiencing psychical and psychological difficulties. The KIPO had to actively intervene to alleviate their hardships. Moreover, many
The Implementation of the Ubiquitous Patent Administration System

(I) Examiners connect to computer systems via fingerprint authentication by fingerprinting sensors.

(II) When using GVPN in the Ministry of Government Administration and Home Affairs, the examiners access the GVPN by entering an ID and password obtained through registration.

(III) Through administrative electronic signing and secondary fingerprint authentication, reviewers can access KIPOnet. Examination and decision can be performed by the electronic approval system, examining operation system, and searching system for previous patents. As of September 2005, a total of 76 examiners have been telecommuting. Days of working at home can be chosen from one to four days a week, with the four days a week program being the most popular. The age range for the employees choosing telecommuting is from the 30’s to 40’s. Employees in the 30’s comprise 56% of the home workers. 86% of the telecommuters are male workers.
There is no discrimination in benefits between telecommuters and workers at the KIPO. Benefit requests are conducted through my-PPSS (Personnel Policy Support System in Central Human Resources Committee) to Managers and General Managers.

In an effort to guarantee the same working conditions for home workers with workers at the office, the same computer and office supplies are provided. In addition, home workers are also supplied high-speed Internet connections and pre-paid phone cards.

Together with telecommuting, office space is shared to save costs. When home workers come to the office, two or three employees share the same space. As of September 2005, every section in the patent examination department adopted an office space sharing system and the problems of the lack of office space have been resolved.

(3) Online International Patent Applications (Anywhere)

The computerization of the intellectual property administration including application, examination, registration, and decision was completed in 2002. However, the international patent administration, based on the PCT (Patent Cooperation Treaty), was conducted with paper documents. As PCT international patent administration entails document exchange with other related institutions, computerization can be implemented with the enactment of technical standards regarding electronic patent applications and electronic document exchange.

After the year 2000, as the number of PCT applications were on a steep rise, the WIPO (World Intellectual Property Office) began to recognize a need for the introduction of an electronic application system. The WIPO announced a technical standard for the PCT electronic applications and began to pursue the development of PCT-SAFE (electronic application software) with the aim of distributing it to signatory countries in 2004.

In keeping with these changes, in February of 2005, for the first time among the patent offices in the world, the KIPO opened an online PCT system in which the previous paper document-based patent processing was transformed into an electronic processing-based system. The Online PCT patent application service to the public was initiated. Examination and decision services were connected to the networks and documents regarding WIPO and PCT began to be exchanged through the Internet by converting them into an electronic document format. The KIPO and the EPO (European Patent Office) had provided electronic application service for PCT patent, but the online document exchange was unprecedented.

The online PCT system can be explained in three parts.

1) Electronic support for the international patent application

In January of 2004, the KIPO imported PCT-SAFE, an international patent filing software. The KIPO requested WIPO to add an online filing function through the KIPO homepage and a Korean specification filling function in the PCT-SAFE Editor. The Korean specifications editor was also modified so that international patent filing specifications could also be edited.

2) Paperless operational environment support for international investigations and international preliminary examinations

Support was provided so that PCT operations in the office in charge, administration operations in international investigation agencies, and international preliminary examinations could be performed through electronic
documents. The paperless operation environments could be constructed where the electronic PCT documents could be processed through the Internet in order to minimize the possibility of document loss and damage that might occur through the inter-office transfer of documents.

3) Online document exchanges with WIPO international operations office

As the PCT documents were controlled electronically, a foundation was laid for online exchanges with WIPO. Beginning in September 2004, an online exchange of priority right certificates began. The exchange service was expanded to an international filing application, a translation on international public services, and a report on international investigations.

(4) E-mail and Mobile Service (Any Device)

It is possible that a big loss might occur to applicants if the filing itself is rejected or regarded as having been abandoned against the will of the applicants in cases when appropriate measures, such as submitting additional documents or paying relevant fees, are not done. Since its inception from 1999 to 2000, the electronic filing system dictated that applicants had to log onto the KIPO homepage and check with the proceedings of their filing or get special directions from the KIPO. However, it is the nature of patent operations that requests or special instructions from the KIPO to the applicants occur sporadically throughout the processes. The applicants do not know when those special cases happen unless they have access to the system all the time, which is not a desirable way of providing service to the public.

Moreover, the applicant should be able to browse the database to see if similar technology exists in order to improve the chance of success after the applicants have specified the ideas for the patent. Of course, for the
companies, the searching of the previous patents is essential to avoid redundant investment and to increase the opportunities for developing better technology. To browse public information and registered information on the KIPO homepage, the applicants should be able to access patent information search sites and browse the previous technology by combining key words or operator search methods. This searching sometimes poses difficulties for applicants in obtaining information on time.

To ease these difficulties, the KIPO has developed an online Push service in which the most recent information is provided through e-mail and SMS (Short Message Service or text messages), which has served the public.

1) Processing status notice service

Patent processing status and other information are released to the applicants via e-mail and text messages on mobile phones. The following is a list of information supplied to the applicants via e-mail or mobile phone.

2) Public information notice service through the Internet

If the applicants register their subjects of interest and e-mail address, newly released public information is compiled daily or weekly and sent to the e-mail addresses. This way the applicants can browse the newest information on patented technology. Many people and organizations including patent applicants, inventors, researchers in firms, and laboratories can take advantage of these notices.

5) Access to intellectual property information

Intellectual property administration information is open to the public so that the applicants can browse information on their own applications and registrations through ‘My registration’ and ‘My decision’ sites. There has been a restriction in the scope of the public information where only rudimentary information on the history of documents, while administrative information on international filing and registration, petitions, and procedures on technical evaluation are not released. Publicized information can be accessed by browsing through the KIPO homepage. Automated management of filing and controlling information by companies, universities, and patent law firms is difficult.

In terms of intellectual property administration information exchanges and utilization, patent offices in three countries (US, Japan, and European Union) have decided to launch a “mutual acceptance of examination results” in the case of joint filings. As a preliminary step, they agreed on the establishment of related systems to take advantage of the results of patent examinations. As a follow-up measure, the US Patent and Trademark Office started PAIR (Patent Application Information Retrieval) in 2000 and the European Union initiated QFI
Dynamics of Government  Innovation and Decentralization in Korea

(Online Public File Inspection). Both systems provide patent examination information in English. In Japan, by utilizing AIPN (Advanced Industrial Property Network) and the English-Japanese automatic translation system, the patent examination information system became available in English from May 2003. As illustrated, the patent offices in advanced countries established the relevant systems and released patent examination information to other counties in English. This was part of their global strategy to actively protect their patent technology by publicizing their patented technologies to other countries. The KIPO started the development of a related system from January 2005 so that intellectual property information, including cumulative patent examination information, would be open to other countries. This system will start operation from the end of 2005.

1) Support of My-Patentnet

The KIPO is now constructing My-Patentnet and it will provide additional information on international filings, registrations, petitions, and technical evaluations in addition to the administrative information regarding filings, examinations, and evaluation processes with the objective of becoming a supplier of total intellectual property information.

Moreover, adding to the history-oriented administrative information of the past, the new system will publicize information regarding electronic documents, public documents, and information on due dates of document submissions and fee payments. This means that the public can access almost the same level of information as the patent examiners and evaluators in the KIPO.

Personal information release is managed through HTML web page browsing while information releases to corporations, laboratories, universities, and patent law firms are scheduled to be managed through a SOA (Service Oriented Architecture) based web service.
2) International service of patented information

International service of patented information provides information in English. As the information is stored in Korean, it needs to be translated, but manual translation is almost impossible. An alternative is an automatic, computerized translation system. The KIPO signed a contract with the ETRI that has been investing millions of dollars in multi-language translation technology since the late 1990s, developing a high level of relevant technology. After the signing, the development of a Korean-English translation system started on April 12, 2004.

The patented international information release system consists of a Korean-English translation engine and a specialized dictionary of science and technology nomenclature. In December of 2004, the translation engine and the dictionary were completed and a dictionary on other special terms will be prepared in 2005. The Korean-English translation program will be subsequently upgraded and the patented information English service will be available from the end of 2005.

III. Coping with internal tensions by capitalizing on the innovation implementation system

The KIPO has been striving to construct a u-patent system for the last ten years beginning in 1995. Especially after the launch of the participatory government, there has been a systematic effort for the development and implementation of innovation tasks including regular meetings for discussion, education, and surveys on employee satisfaction. These endeavors in organizational management have played a motivating force in making the u-patent system operational and have made a substantial contribution to the KIPO.

1. Organization of an innovation team and continuous activities

The main innovation driving organization of the KIPO is the Office of Policy Promotion Management, consisting of an Innovative Human Resource Planning Team, Financial Planning Team, Administrative Legal Team, and an Evaluation Team. The key functions of the Office of Policy Promotion Management are to enhance internal innovation capabilities, to develop and manage human resources, and to construct more suitable organizations and secure relevant human resources. The other functions include the planning and allocation of budgets for the operations of each organization and the conducting of operations on intellectual property lawsuits and evaluations. The need for implementing u-KIPO strategies surfaced with demands for the environments of public services and operations without the constraints on time and space as the KIPO moved its headquarters from Seoul to Daejeon in 1998. With the launch of the Participatory Government in Korea, there was a reshuffling of government organizations and the Office of Policy Promotion Management took the initiative in innovation and the construction of the u-patent system started with full force. Moreover, an innovation team was formed and played a leading role in developing and implementing the innovation tasks appropriate for the nature of the KIPO. The activities of the innovation team can be classified into two separate periods. The first period was from January to August 2004. The second period was from September of 2004 until now. In the second period the synergetic effects began to be created in a balanced combination of knowledge-based management, performance-based employee evaluation, and customer-oriented management, together with innovation philosophies, innovation tasks, and the u-patent system.
The Implementation of the Ubiquitous Patent Administration System

organization, evaluation, public service improvement, and education - a new innovation team under the human resource management office in charge of HR and organizations.

In the KIPO, the innovation has had some progress. However, HR management did not fulfill its full potential due to its difficulties in the performance evaluation, as the seniority-based evaluation system has been kept intact. At the same time, there was a need for a change in management as the continued pursuit of innovation caused resistance to internal changes. A basic plan for change was set up in January 2004 and directions for future changes and specific plans were proposed through a SWOT analysis. At the same time, the action plans needed for the initial stage of the management change started to boost innovation-oriented minds. The action plans included staff workshops and the relocation of working schemes. Based on the experience gained during the implementation of TQM, tasks needing innovations were researched by the innovation team. 171 innovation tasks from various departments and sections were identified in 2004.

(2) 2nd Innovation period (September 2004 - 2005): Leaders changed and new initiatives, such as the 6-sigma technique, introduced.

The new director of the KIPO started a new performance-based BCS HR system in response to concerns voiced by the junior innovation board regarding the seniority-based HR evaluation system. The junior board conducted an organizational investigation and summarized 38 sets of problems in association with the management of the KIPO. Out of these 38 sets, 15 sets were connected with the performance evaluation system. Consequently a performance-based evaluation system in connection with the visions and missions of the KIPO was established. For the first time as a central administrative organization, a contractual employment system based on performance in association with the BSC was implemented. In July 2005,

(1) 1st Innovation period (January 2004 - August 2004): Constant innovation task exploration and implementation system establishment through the formulation of an innovation team.

At first the whole KIPO level organizational reshuffling was initiated so that the tasks including innovation planning, government performance evaluation, public service improvement, and operational attitude changes were handled by a team consisting of four members from different levels of the organizational hierarchy (1 from the fourth level, 2 from the fifth level, and 1 from the sixth level). The workload was too high for the team at first. Consequently, there was a new regulation on innovation team operations (December 31, 2004) stipulating that a designated innovation team should handle affairs of the innovations, human resource management (HR),
an integrated individual evaluation system including a performance assessment, capability assessment, and a 360-degree assessment based on the KPI was constructed. The system actually began to be used for the employment evaluation for the first period of 2005.

In an effort to enhance patent examination quality in the areas of consistency and accuracy (as in many cases, patent decisions rely heavily on the sole discretion of an examiner), a discussion on the introduction of ISO9001 began in November 2004. A decision was made to implement the 6-sigma system for each level of the KIPO in April 2005 for the innovation of patent administration processes to cover applications, examinations, and registrations. The 6-sigma technique has had many instances of success in other areas of specialties in process improvement and employee capability development. For the successful launching of 6-sigma, the director of the KIPO and heads of departments learned of the successful adaptations of other organizations (POSCO on July 27, 2005 and Samsung Petrochemical on July 28, 2005). Through this leadership and participation, appropriate tactics for success have been established. This 6-sigma movement was selected as an exemplary case of government innovation by the Presidential Committee on Government Innovation and Decentralization for overseas PR purposes.

In July 2005, the Knowledge Management System (KMS) was revised to improve convenience of knowledge application so that every approved document could be browsed by keyword, and every employee could participate in discussions on specific points in the section of “Knowledge Q & A” on the Internet. The KMS and three research institutes including ETRI (Electronics and Telecommunications Research Institute) and the KMS from the KIPO were linked and cooperation agreements with 11 institutions, including the Korea Research Institute of Chemical Technology, were signed. This cooperation purported to expand the sharing of knowledge from outside sources. Cooperative relationships with private portal sites, including Naver, were established on July 20, 2005 to publicize specific expert information. As a result of these connection efforts, the patent information application rate increased by 70% and the knowledge base of the people has been broadened accordingly.

2. How to cope with conflicts involving the upgrading of Patentnet

The upgrading of Patentnet required the release of intellectual property information and support of the online international patent application system. However, employees who are not keen to changes have voiced their opposition. To overcome this, with directions from the KIPO director, the innovation team established a management change master plan to answer the questions of what should be changed, why it should be changed, and how momentum from the changes could be obtained. Since September of 2004, a seminar has been held every week to win over the employees.

(1) Conflicts over the release of intellectual property administrative information

1) My-Patentnet service support

In order to satisfy the needs of the administrative information of private sectors in the process of constructing My-Patentnet, cooperative bodies between patent project offices of private companies, patent law firms, and patent operations management system developers have been formed. Through consultation with these organizations, useful information which people actually need could be provided. The list of services includes browsing the status of multiple applications and patent rights information, a processing period for operations, and the browsing of applications that are not examined.
2) International patented information release support

In order to alleviate possible problems associated with the development of the international information release system in which patent information is translated into English, the following measures have been taken. First, in order to establish relevant levels of translation ratio for complicated documents about patents, translation patterns which cover 150,000 words have been developed making distinctions between names of inventions, detailed explanations of the inventions, and the range of patent applications. At the same time, a patent nomenclature dictionary with 3.6 million terms was written by covering the total contents of the domestic patent materials. Unlike Japanese, the Korean language sometimes has complex sentences that are difficult to translate. Special functions were added to convert these complex sentences into simple sentences to improve the quality of translation. Surveys on the satisfaction of translation were conducted with patent examiners from the Japanese and European Patent Offices as they would be the main users of the translation service once the automatic translation service is provided. With this survey, a communication channel for suggestions for improvement has also been offered.

(2) Conflicts over online international patent application support

Since the electronic application system was implemented in 1999, the KIPO has handled every patent document electronically on the Internet. However, a systematic foundation to manage the electronic documents was not ready. When sending a Priority Certificate, with regard to a PCT international application to WIPO, electronic documents had to be printed first, then, sent to WIPO. The WIPO digitized the documents after they were received.

In an effort to improve this efficiency operation, the KIPO has proposed that Priority Certificate documents be exchanged via Internet since 2001. Additionally, knowledge and experience regarding electronic document exchanges were proposed to the WIPO. In October 2004, the KIPO became the first patent office that exchanged the documents with the WIPO.

3. Conflicts over the development of the u-patent system and coping strategies

With regard to the construction of the u-patent system, there was opposition from old patent examiners who were not used to using electronic telecommunication equipment. To address this issue, the director of the KIPO established a Changing Leadership Development Education for the managers. This educational training included strategic thinking for vision setting, communication skills, lessons on how to make a good workplace, and lessons on how to reinforce achievement evaluations. Lower levels of staff have also received training to share the ways of expediting innovation and rectify any defects encountered during the process of innovation. In addition, training on “Self-Leadership Development” was conducted to understand personality factors and hence to enhance communications skills. Through several surveys, it became clear that employees avoided telecommuting because of a fear of any disadvantage in their performance evaluation. In an effort to eradicate this possible fear, HR management systems have been totally revised and employee satisfaction has increased significantly.

(1) Conflicts over the construction of the electronic public service system for 24-hour, 7 days a week service.

1) Overcoming the dogmatic notion that “network integration is not possible.”

Until the end of 2004, the networks inside the KIPO consisted of three separate networks including patent application Internet networks, internal
administration networks, and the governmental administrative networks. The reason for maintaining a disparate combination of networks is that all patent documents had to remain confidential for 18 months after the application date. In order to provide public service 24 hours a day, the three separate networks had to be integrated. However, there was a concern over possible security accidents associated with the network merger and this worry delayed any decisions regarding the network integration.

Several successful cases of the network incorporation were presented to skeptical employees in order to eliminate any concerns regarding network security with the additional use of security technologies including Enterprise Security Management (ESM), dual firewalls, and Intrusion Detection System (IDS).

2) System establishment for telecommuting initiation

In accordance with the law on E-government administration, telecommuting is possible. However, the literal interpretation of chapter 217 of the Patent Law stipulates that any document under examination shall not be removed to outside making telecommuting impossible. Another chapter (216) in the same law specifies that unless confidential, any document can be duplicated and browsed as long as there is a request from customers. The regulation has been interpreted to mean that working on documents at home is possible unless the document is confidential. This issue was checked with the Ministry of Legislation and the Ministry approved the interpretation, removing any legal stumbling block for the telecommuting. Also, a revision of the law is under way to examine undisclosed documents.

2) Systematic approach to 24-hour service support

In the case of 24-hour electronic public service, there might be confusion regarding the exact time of document submission (e.g., if a document is submitted exactly at midnight, is it regarded as a submission for the next day?). Reviews of relevant regulations and exact cases from other countries were employed to solve this possible dilemma. Relevant regulations and laws were revised so that, in the case of an electronic patent application system breakdown, the due date for document submissions is automatically postponed one day to prevent any inconvenience to the customers. Revisions of patent law have been conducted so that, if the due date for the document submission falls on Saturday, the due date is postponed until the next working day as has been done in other advanced countries.

(2) Disagreement over online telecommuting

1) Elimination of opposition to telecommuting in public services

There were several adverse reactions against the introduction of the telecommuting system. Several reasons given for the reservations against this system included, “It is impossible for public officials to work at home;” “The system will be gone with a change of the director;” and “The office sharing program is a part of a scheme for layoffs.” A survey of every employee in the KIPO showed that 82% of the participants supported telecommuting and the system gained some ground for full-fledged implementation. However, in order to minimize any possible opposition during the implementation processes, this topic has been intensively discussed at an executive meeting. The junior board also tried to spread the positive effects of this system through the KIPO.

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3) Eliminating concerns of telecommuters regarding disadvantageous performance evaluations.

When screening volunteers for a demonstrative session on telecommuting, there were only 20 volunteers even though 158 people had previously expressed their intentions to participate in telecommuting in the survey. Telecommuting was in danger of being scrapped even before it was initiated. It was expected that female examiners would be enthusiastic about this
IV. The spread of Economic and Social Impacts of innovation

The following are the impacts of innovations through the use of ubiquitous IT technology.

1. Examination process facilitation and accuracy improvement through the release of intellectual property administrative information

It is expected that the release of My-Patentnet will create innovation in patent management in private sectors that had previously experienced difficulties in the application and management of property information because intellectual property administrative information was not released. In particularly, as the administrative information would be provided through web-services on the basis of SOA, private companies, research institutes, universities, and patent law firms would automatically and systematically control patent management. It is also believed that the new web-service technology applied to My-Patentnet service can be expanded and utilized in other operational processes where information is shared and used between organizations.

Patent examination results in the KIPO will be provided to other countries and results from patent offices from foreign countries will be exchanged and utilized. These activities will eventually enhance the accuracy and speed of the examination operation process. As Korean patented technology is supplied overseas, protection of Korean patents will be reinforced.
2. Cost reduction with online international patent application support

The PCT application system developed by the KIPO was highly recognized by the WIPO. The KIPO and WIPO decided to jointly develop the system further and supply it to patent offices in areas around the world that may not have this necessary capacity. It is because the system developed by the KIPO had adapted technical standards of the WIPO that it is highly compatible with other systems in the world. At the same time, WIPO considered the PCT system management in Korea successful.

On the economic side of the PCT, domestic patent applicants using the PCT paid lower application fees, saving 285,000 won (US$280) per application. From 2004 to the first half of 2005, 3,518 cases of patent applications were made through the PCT system and the total savings by domestic applicants reached 1 billion won (US$1 million). The PCT system initiated in 2005 made it possible to apply for a patent application without visiting the KIPO, resulting in an additional cost savings of 27 million won (US$270,000). With the use of the online electronic document exchange system with the WIPO, postage costs were not necessary. With the revision of the regulations on application fees, each applicant was exempt from postage costs (10,000 won). As of June 2005, 1,166 applications were exempt from paying postage cost.

Additionally, with the use of the PCT system, a prompt application for international patents became possible, which enabled applicants to gain an advantageous footing for a patent by obtaining an application date before other applicants. By using a verification function in the PCT, errors during document preparation were minimized, thus unnecessary steps of correction were saved. Applicants can also enjoy the benefits of online fee payment and online notice reception in the case of PCT patent applications.

3. Convenience enhancement of customers through the implementation of 24-hour, 7 days a week service

Patent related operations are now handled 24-hours a day without any break as opposed to the previous practice of delaying the process until the next working day. It is expected that the convenience to customers will be enhanced accordingly. At the same time, with the operation of new systems, including the Disaster Recovery Center and Supplementary Control Center, continuity and stability of the patent administration were secured. On-time exchange of electronic documents with foreign countries became possible without any restrictions on time and space. A service foundation for patent administrative information systems was established to prepare for the PLT signing and to enhance the international competitiveness of the Korean patent administrative service.
4. Improvement in the quality of life of employees by introducing online telecommuting

The KIPO evaluates every examiner’s performance to check if employees meet annual and monthly objectives. After reviewing examination records from March to July, it was found that the telecommuters fulfilled the objectives by a minimum of 11% to maximum of 23%. When compared with commuting employees, the telecommuters processed 10% more operations. This was considered evidence that telecommuting was better than commuting in terms of work efficiency. According to a survey, the satisfaction rate of telecommuters who answered ‘satisfied’ or ‘very satisfied’ reached 75%. If ‘moderately satisfied’ is included, the satisfaction rate of telecommuters was 93%. There was an increase in employees who wanted to telecommute and the number has continued to grow. In March 2005, 54 employees applied for telecommuting; in June, 60 employees; and in September of the same year, 76 employees applied for telecommuting.

Due to telecommuting, 60 million won (US$60,000) was saved in office renting costs along with an additional savings of 40 million won (US$40,000) from stationery purchases. Additionally, there were savings on commuting expenses (based on 1,400 won per day and 4 days a week) and housing expenses (based on the interest incurred on the renting cost in Daejeon). This amount reached 400 million won (US$400,000). If the number of telecommuters increases to 200, the total savings would be 2 billion won (US$ 2 million).

It was also found that telecommuting has the effect of attracting excellent personnel to the KIPO. The location of the KIPO in Daejeon might be thought to inhibit attracting prospective employees of high caliber. However, among the 126 new employees in the first half of 2005, 46 were former employees of large conglomerates like Samsung and LG, 13 were former university professors, and 20 were from research institutes. 70% of these new employees responded in a survey that the telecommuting system in the KIPO greatly influenced their applying for the KIPO and 60 of them wanted to participate in telecommuting.

5. Dissemination of patent knowledge in Korea through e-mail and mobile services

Public service processing notices through online channels were improved from a unilateral service supply mode to a bilateral service system. As of August 2005, there have been 49,892 members of this service and there have been 259,571 cases of services being provided (email: 214,928 SMS: 44,643). In terms of the Internet PR and notice services, in which the latest patented technology is provided to customers based on subjects of interest, 2,604 people have joined this service as of August 2005 and there have been 820,125 cases of actual information exchanges. This is one of the main mailing services of the KIPO that supplies patented technology to civilians.

V. Success factors and lessons from the innovation

1. Strong leadership from the head of the KIPO

The decisiveness, initiative, and drive of the director of the KIPO have played a key role in the successful implementation of the ubiquitous KIPO. The Director of the KIPO considered telecommuting an important innovative task that could change ways of working and stabilize the culture of performance-based management. He redesigned the systems so that there would be no
disadvantage in terms of HR evaluation and financial management. The director reiterated this point clearly in meetings with the telecommuters and job stability and security were accordingly established.

In the case of the online PCT system construction, the original schedule was shortened by one year so that applicants in Korea could receive benefits of the registration fee exemption from 2004. When establishing the international patent information release system, decisions on system establishment was delayed due to concerns about the correct translation rate of automatic Korean-English translators. He signed a cooperative agreement with ETRI and a synergetic context for further operations was established.

2. Foundation of performance-oriented organizational cultures

The key to the success of telecommuting depends on how the rational performance management system is controlled. Together with the initiation of the telecommuting system, the BSC management system was introduced. In this system, performance records of each department, section, and individual were quantified and evaluated based on this data. The evaluation results were reflected in promotion and performance payments and this system contributed to the fostering of organizational cultures based on performance.

3. Accumulated internal experience and continuous upbringing of experts inside the organization

In order to develop the information system successfully, two things are needed: the expertise of system developers and cooperation between system users and system developers. In the KIPO, the number of computer related administrative officials is larger than that of any other Ministry. System users in operation departments can participate in the system development projects and the system developers can work at the administrative positions. Therefore, the inconsistency or incompatibility between operational processes and information systems is rare. In addition, when pursuing information system development projects, relevant teams consisting of experts from different fields are formed. All development projects receive all-out support with flexible and elastic organizations.

4. Actively reflecting customers’ needs

The KIPO is researching customers’ needs and opinions and then applying them to the information system development. Prior to starting the development of the information systems, information strategies are established after conducting an overall needs survey. One employee in each section is designated as an information management coordinator and they participate in the development processes. Opinions from private sectors are actively gathered through a channel called Patentnet, consisting of civilians for continuous opinion collection and surveys.

VI. Innovation driving strategies for the future

Korea is exerting its best effort to successfully plunge into u-Korea where the quality of life will be improved, productivity of industries enhanced, and public service innovated by constructing ubiquitous environments.

To keep abreast with this trend, the KIPO has exerted great efforts to establish an ideal model for electronic government services by constructing 24-hour electronic public service support, telecommuting, online processing of
intellectual property administration, real-time notice of information through e-mail and mobile services, and global networks that link nations. These efforts have created substantial results and other organizations in Korea and other countries are trying to learn and import core factors of success from these projects.

The online international patent application system developed by the KIPO was named PCT-ROAD (PCT Receiving Office Administration). LG CNS also participated in the PCT system development project. They converted the system into English for five months from October 2004 through February 2005. The English version of the system was provided to Israel, the Philippines, and Egypt. For other countries, the program and the manual may be downloaded from the KIPO homepage. Following the success of PCT-ROAD, Spain and France have requested the development of Spanish and French versions with relevant royalties to be paid to the KIPO.

Many organizations inside and outside Korea are attempting to adopt the idea of telecommuting employed in the KIPO. The Patent Office of Japan and seven Korean ministries including the Ministry of Finance and Economy, have accepted the idea of telecommuting. The provincial offices of Kyungsangnam-do and the Ministry of Finance and Economy have started telecommuting and it is viewed as indicative of the social changes in the working mode. The Ministry of Information and Telecommunication has formed a u-Work forum for the construction of a national infrastructure for telecommuting and it is studying the case of the KIPO as a national model.

However, the level of u-KIPO so far has concentrated on automation of the patent administration operations including electronic public service, patent examinations, and decisions. The future strategy should focus on operational processing for the benefit of customers and supplying high-quality patent information to the private sector. At the same time, long-term and practical plans to promote patent information exchange between organizations in and outside of Korea should be established, along with a system for the spread and utilization of strategic patent information to match the driving force of national development.

Concurrently, on September 20, 2005, the KIPO announced the “patent administration innovation directions and tasks” in which the strategic focus will be placed on performance-based management, knowledge-based management, customer-satisfaction management, and 6-sigma management. With a foundation of the focus on these four directions, the KIPO has been engaged in all-out efforts to convert to responsible managing institutes on the basis of autonomy and responsibility. The strategic approaches and important techniques utilized during the innovation processes will be a model of success that should be mirrored by domestic organizations and foreign nations when pursuing innovations.
Compilation of the Budget in the Top-Down System
- Ministry of Planning and Budget
Compilation of the Budget in the Top-Down System

Yunhi Won (Professor, University of Seoul)

Case Overview

The Ministry of Planning and Budget has made an innovation during the past 3 years to promote work efficiencies and customer satisfaction. This has been done by switching the budget allocation from bottom-up system to top-down system. In the new system, the MPB, the budget authority, presents budget ceilings for sectors and departments. Consequently, each department autonomously compiles the budget for their projects within the sectoral ceiling. This system aims to increase the efficiency and transparency of budget distribution.

I. Background

Traditionally, the government compiled the budget in a yearly based “bottom-up” system. The bottom-up system required that each administration office request a budget for projects which the Ministry of Planning and Budget (MPB) then screened for suitability to decide the total amount of expenditures as well as expenditure amounts in individual sectors.

The traditional system proved to be advantageous in several ways. First, because the budget authority did not commit itself to any future expenditures, flexible budget adjustments could be made when annual revenues were unstable. Also, in the bottom-up budget compilation system, specific restraints made by the budget authority could improve the fiscal efficiency in situations where pre and post-project evaluations were not properly made. Moreover, the bottom-up system could settle conflicts with ease. Main issues and political conflicts were partly solved during the long process of budget deliberation.

Nevertheless, the bottom-up system had various limitations. First, because ministries and agencies, the MPB, and the National Assembly, all had shortsighted viewpoints, it was very difficult to distribute resources according to mid and long-term strategic planning.

Under the bottom-up process, the MPB authoritatively and microscopically controlled the budget compilation process, which fostered an information asymmetry with the ministries. As a result, the ministries submitted “unrealistic requests” to which the budget authority responded by making “drastic cuts”. Unnecessary conflicts between the MPB and the ministries led to inefficient management and increased expenditures. Also, since the MPB did not have specific and professional knowledge of projects for which the ministries submitted for budget, necessary projects often suffered cuts while less important projects survived.

Second, the main focus of budget management was input control rather than output/outcomes and performance management. Due to the fact that the MPB was not equipped with a feedback system for expenditure results, it was difficult to achieve efficient financial management.

As a result, the bottom-up system, which relied on the authoritative and microscopic control of the MPB, impeded strategic distribution of resources and provoked inefficiency due to information asymmetry between the budget authority (MPB) and the ministries. As the financial circumstances became more complex and as the ministries became more professional, the MPB faced limits in controlling all the projects within the budget. Accordingly, it became necessary to adopt a “top-down” system, according to which the budget authority presented budget ceilings for government offices to allocate funds for different projects on their own standards and judgment.

Another crucial backdrop for introducing a top-down system was the increased national debt accumulated during the economic crisis. Namely, the
government recognized the urgent need to restore financial health by controlling the national debt which had increased in the process of recovery from the economic crisis. The government now assessed the economic situation and conditions in order to establish goals for the aggregate expenditure ceiling, national debt, and budget deficit through the National Fiscal Management Plan (NFMP). The sectoral expenditures ceiling was settled and operated within the framework of the NFMP.

Under these circumstances, the new Participatory Government included the top-down system in the finance and taxation road map and actively promoted the system.

II. Main Contents of the New Budgeting Process

1. General Perspectives: The Four Fiscal Reforms

Since 2004, the Korean government has been in the process of reforming the fiscal management system into a system that is “autonomous and decentralized, performance or output-based rather than input-based, and based on medium-term macroeconomic financial management that includes all the revenue and expenditure information of budget and funds.” Fiscal reform can be specified into four major tasks which are closely interrelated. The tasks are to design a mid-term based fiscal management system, introduce a top-down system, construct a performance management system, and construct a digital budget and accounting system. In order to address the objectives and content of the top-down system, we need to illustrate the general features of these four fiscal reforms.

The general features of the current fiscal reform is summarized in Table 1 above. Compared to the traditional fiscal management process, the current system maximizes distribution efficiency. Also it makes it possible to utilize the budget effectively by managing the national finance system broadly based on the mechanism of autonomy and accountability.

The NFMP complements the yearly based fiscal management process and aims for both medium and long term goals. This plan acts as a blueprint for national fiscal management. For example, it presents the basic objectives and directions of public finance, total revenue, total expenditure, fiscal deficit levels,
and resource distribution and investment plan for each ministry for the following five years. Although the plan is designed for five year periods, it is connected and supplemented every year in order to reflect changes in economic and social situations.

The performance management system for fiscal projects predetermines goals that should be accomplished through the project. The system also develops quantified outcome indicators in order to estimate the attainment levels of project goals and to evaluate performance. Because the introduction of the top-down system increases ministerial autonomy, it becomes crucial for each ministry to intensify their performance management.

The digital budget and accounting information system electronically manages data concerning the fiscal activities of the central government, local governments, public enterprise, and other public sectors. This system encompasses all the components of fiscal management, including revenue collection, budget compilation, execution, and settlement of accounts and assessment, etc. This system is a prerequisite infrastructure for successful reforms.

2. Content of the Top-down System

In the top-down system, the MPB (the budget authority), presents budget ceilings for sectors and ministries on the basis of the NFMP. Consequently, each ministry autonomously compiles a budget for their projects within the sectoral ceiling. This system aims to increase the efficiency of national resource distribution by promoting collaboration and division of responsibilities between the MPB, which strategically distributes resources based on national vision and priorities based on the NFMP, and the ministries, which are in charge of distributing resources for projects on the basis of their policy goals.

The top-down system has two major features which are resource allocation by MPB and the autonomous budget compilation of the ministries.

1) Resource Allocation by the MPB

Resource allocation, which distributes fiscal resources for sectors and ministries, is accomplished through the process of establishing the five-year NFMP. Compared to the traditional medium-term plan, which only presents an abstract investment plan, the NFMP of the Participatory Government presents aggregate amount objectives such as fiscal balance and national debt and also suggests a specific allocation plan. The NFMP is utilized as a basic framework for establishing a yearly based budget and fund management plan.

The total expenditure ceiling in public sectors is set up for the unified budget that includes the general account, special accounts, and funds. The total ceiling is distributed into individual sectors such as social welfare, health, education, environment, and national defense.

The sectoral expenditure ceiling is further distributed into sub-sectors that are generally the medium classification of the NFMP. For example, in the social welfare and health sector, social welfare and health are separately classified. The social welfare sub-sector is further classified into nine areas such as security of national basic livelihood, assistance for low-income households, senior citizens and teenagers, etc. The sectoral expenditure plan also presents the classification of the expenditure into a budget and off-budget fund.

The process of budget allocation of the fiscal year 2006 is elaborated through the establishment of NFMP 2005~2009. NFMP 2005~2009 revises and supplements NFMP 2004~2008, established in 2004 by reflecting social and economic changes. The establishment process is divided into 1) Preparation and Request 2) Establishment of Tentative Plan 3) Revision and Supplementation 4) Settlement Stage.
1) Preparation and Request Stage

The NFMP of 2005–2009 was initiated in the beginning of December 2004. The MPB delivered each ministry the NFMP establishment guideline 2005–2009 which assists the preparation of the medium-term fiscal management plan for sectors and also includes fiscal conditions, policy objectives, contents/method/standard/form of the NFMP, and timetables. Simultaneously, working-level talks and joint workshops were held for all ministries in order to provide education in establishing the medium-term plan as well as to collect diverse opinions.

Each ministry followed the guidelines to establish its own medium-term management plan by the end of January 2005, which was then submitted to the MPB. These plans of the ministries were used as basic data for forming NFMP tentative plan 2005–2009.

2) Establishment of Tentative Plan Stage

Fourteen sectoral working parties, composed of a general party and thirteen sectoral parties, were organized in the beginning of January 2005 and a tentative plan was formed by April. Each sectoral working party consisted of government officials, researchers, academic circles, and civil specialists. The general party examined the macroeconomic prospects, fiscal prospects, priorities of resource allocation, and the establishment of the aggregate numbers. The sectoral working parties analyzed the performance of public projects and set prospective policy and project goals. The box below enumerates the fourteen sectoral working parties.

While preparing the NFMP tentative plan for 2005–2009, open forums regarding individual sectors were held thirteen times which were broadcasted live on KBS and K-TV for the first time ever. The MPB and KDI hosted a forum to gather opinions from various backgrounds. Parties participating in the forum were specialists from the government ministries, academic circles, the press, private enterprises, private research institutes, and private organizations. Cyber forums were also held through the internet which focused on promoting the participation of the general public in the major national policies.

A ‘resource allocation conference’, attended by the president who served as the chairperson, the prime minister and all the cabinet members, was held for two days starting from April 30th to May 1st in order to confirm the tentative plan for 2005–2009 and to discuss principal issues such as total numbers of the fiscal revenue and expenditure, fiscal balance, goals and principles of resource allocation. The conference was a historic event in the sense that it was the first time ever for ministers to convene to discuss medium-term resource allocation goals and basic principles from an overall governmental perspective.

Major policy issues were also discussed in the resource allocation conference. Some of the major issues discussed were: social welfare, which prepares for the low birth rate and the aging population, efficiency in university investment, and investment priorities within the SOC. Moreover, the twelve principles of resource allocation, including the private capital utilization and balanced development, etc., were determined. On the basis of the priority ranks of resource allocation discussed in the conference, a tentative NFMP plan was settled and utilized as a foundation for establishing the management plan for a 2006 budget and funds.

3) Revisional and Supplemental Stage

After deciding the tentative plan, various views were collected along with the report to the Budget and Accounts Committee of the National Assembly. Step by step, dissenting views were reconciled through persistent discussions and
an examination of critical issues with the relevant authorities during the 2006 budget compilation process. Meanwhile, as the macroeconomic conditions predicted insufficient tax revenues due to a fall in exchange rates and delay in economic recovery, the tentative plan was partly revised and supplemented by consulting the diverse opinions of related specialists through conferences on fiscal prospects and specialist sessions.

In addition, the tentative plan, which was mainly comprised of an itemized budget system, was transformed into a program budget used by many of the OECD nations such as the United States or Australia. The digital budget and accounting promotion committee was in control of converting the itemized budget system into an outcome-oriented program budget system. Accordingly, the budget system was transformed into “field-section-program” from the original “chapter-article-item” scheme. The program budget system will be exercised in the 2006 budget, which will lead to full utilization in the 2007 budget.

4) Settlement Stage
The NFMP for 2005~2009, which has been revised and supplemented, was confirmed after being reported to the cabinet meeting on September 27th and was submitted to the National Assembly with the 2006 budget.

(2) Autonomous budget compilation by ministries

Once the sectoral expenditure ceiling is presented on the basis of the NFMP, each ministry requests a budget, while keeping the policy objectives, project priorities and outcome assessment in mind. The MPB then examines and supplements the submitted budget request in order to provide a draft budget for the ministry.

Individual ministries play an important role in the establishment of the NFMP by drawing up sectoral medium-term plans. Yet, the principal role of the ministry mainly lies in submitting a budget request to the MPB for a specific project within the expenditure ceiling. The following shows the autonomous compilation of each ministry through the case of the Ministry of Information and Communication (MIC).

The MIC had two main strategies for autonomous budget compilation. First, the MIC opened its expenditure ceiling and compilation process to all related offices and bureaus in order to earn confidence. Secondly, it connected its budget allocation with the CEO mission and the IT839 strategy which were the core strategic plans of the MIC.

Details of the autonomous budget preparation process of the MIC, according to the two basic strategies, are summarized in the following.

1) Intensification of the Pre-deliberative Function
The deliberative function was intensified by confirming the resource distribution goals on the basis of prioritized ranking for the corresponding projects. This process was operated by the budget council, which consists of MIC bureau chiefs and IT specialists (such as PM), and the budget advisory committee, which is comprised of task-based IT specialists brought in from the outside.

2) Building Confidence by Collecting Public Opinions
In the budget compilation process, questionnaires were distributed to the interested parties (MIC staff, affiliated organizations, general public) to collect opinions regarding the investment plan and resource distribution standards of the MIC. Also, the MIC guaranteed transparency and reliability by disclosing their budget compilation process through various forms of fiscal reform forums and meetings.

3) Efficient Resource Allocation Linked to Medium-term Fiscal Planning
The MIC appointed external professional organizations for examining the
appropriateness of resource allocation according to the development of the IT industry and the expansion of the IT service market in order to earn confidence and efficiency in the NFMP. Moreover, the MIC formed a special team for medium-term fiscal plan through participation of headquarters staff, affiliated organizations, IT specialists and academic circles.

4) Strategies for the Top-down System

The annual expenditures went through a restructuring (10% decrease of the project) in connection with project evaluation and major policy goals such as those set in the new year report to the President. Within the boundaries of the expenditure ceiling, a draft budget was compiled through a selection and concentration process, based on the prioritized ranks for sections, projects, and departments.

Specifically, a feedback system was devised for the budget which reflected the comments given by external organizations such as the citizens group and the National Assembly. In addition, more than 10% restructuring was initiated on the basis of a yearly project assessment to promote efficient fiscal management through consistent restructuring. Autonomous assessment was also performed through the establishment of outcome goals in accordance with policy goals for each mission and department.

5) Restructuring Expenditures through Performance Assessment

A "Fiscal project performance assessment team" that consisted of four sub-teams was formed in order to effectively promote the restructuring of annual expenditures. It performed the fiscal project outcome assessment and reexamined priority ranking, thereby leded to autonomous restructuring of the projects. Moreover, the budget structure was reorganized to concentrate on major projects in accordance with the policy environments.

6) Strategic Resource Allocation Based on Policy Goals and Priorities

For effective resource allocation, new IT growth industries identified on the IT 830 strategy were intensively funded with 177 unit projects grouped into five missions and projects areas.

7) Restructuring Annual Expenditure for Strategic Resource Allocation

Major fiscal projects went through restructuring based on autonomous performance assessment and the standard for the combination and abolishment of similar projects. The number of projects that went through restructuring was 33 (18.6% of the total number of fiscal project) projects out of a total of 177 projects, 16 out of which were completed in an early stage and the other 17 were either combined or abolished. Financial resources (114.1 billion won), which were raised during the restructuring, were used to support the core projects such as the IT839 strategy. An autonomous budget compilation council and an advisory committee were also actively engaged in order to promote reliability and efficiency during the restructuring process.

8) Reforming Affiliated Organizations that Actually Compile Budget and Perform Projects

The MIC presents common guidelines for the fiscal management of the affiliated organizations and standardizes the structure of budget items. The MIC also actively adopted the budget proposal compiled autonomously by affiliated organizations that compiled MIC budgets for major projects.

9) Overcoming Obstacles

Several project staffs had insular attitudes, due to a lack of preparation and recognition of the top-down system. In order to minimize such attitudes, financial forums and reform education were promoted that emphasized the necessity of a new budget compilation system and restructuring. However, customary budgeting processes such as excessive requests and
unreasonable cuts still prevailed. Therefore, the type of restructuring and project sizes were determined (such as early termination, combination or abolition) on the basis of individual consultations with the project manager and autonomous assessment results of 32 major projects.

III. Conversion Procedure and Strategy

The top-down system of budget compilation is gradually reaching a stable phase. At first, basic reform of the original system was met with serious resistance as the traditional system had been in use for decades. Not only were related parties skeptical of the new system but there were also systematic problems due to insufficient preparation stemming from a lack of time to prepare for execution. Nevertheless, countless conferences and public hearings were held in order to gather ideas and to promote public relations. The promotion system also underwent reorganization which ultimately brought success in overcoming these difficulties. The following illustrates promotional procedures and successful strategies in introducing the top-down system in 2003.

1. Conversion Procedures

(1) Model Execution in 2003

The top-down system is one of the four fiscal reform tasks that was actively promoted after it was presented as ‘pre-distribution system’ in the ‘Finance & Taxation Reform Road Map’ of the Presidential Committee on Government Innovation and Decentralization in July 2003. The Participatory Government recognized the necessity of reforming the fiscal management system in order to sustain fiscal health and manage the national deficit that had increased dramatically during the economic crisis.

In August, a resource allocation improvement team was established in the MPB and the introduction of the new system was promoted by organizing a joint promotion team with external professional organizations such as the KDI. After having carefully investigated cases in foreign countries, they devised a system that was appropriate for Korea. In 2004, the new budget compilation system was tried out in four organizations: the Fair Trade Commission, the National Tax Service, the Korea Customs Service, and the Supply Administration. Those with their own revenue source and/or with relatively simple organizations were selected.

Because the NFMP was in its preparatory stages in 2003 and the pilot organizations had a high proportion of existing expenditures, their expenditure ceilings were determined on the basis of necessary funding levels for on-going and new projects, and on the basis of the trends of previous expenditure levels. Although some of the four pilot organizations requested excessive budgets for particular expense items, all adhered to the expenditure ceiling. These executed models prepared a foundation for fully introducing the system in the 2005 budget compilation.

(2) Full-Scale Execution in 2004

In 2004, the top-down system was applied in 48 organizations out of 53 offices of the central government, excluding the five independent organizations: the National Assembly, the Supreme Court, the Constitutional Court, the National Election Commission, and the Board of Audit and Inspection. From 2005, the top-down system was fully applied in all organizations. The sectoral expenditure ceiling, which was based on the NFMP 2004-2008, was determined provisionally and reported at the end of
April following the presidential impeachment in March 2004. In June, a follow-up conference of cabinet members was held.

According to the budget request submitted by the government organizations, 37 out of 48 organizations adhered to the expenditure ceiling. Even the remaining 11 organizations did not deviate extensively from the expenditure ceiling or they reflected inevitable expenditure demands. The MPB fully respected the requests submitted by the departments and also distributed the appropriate resource amounts to national projects with higher priority rankings. Moreover, the MPB examined the appropriateness of new projects which required large-scale resources, redundant investments by multiple organizations, and on-going projects. A final draft budget was devised through the consultation and supplementation of ministries.

2. Emerging Problems and Countermeasures of the Two-Year Execution Procedure

In 2003 and 2004, various problems appeared in the execution procedures. Therefore, a promotional system was needed to establish the system and to minimize certain problems that were already anticipated due to the drastic transformation of the traditional fiscal management system. The following section illustrates several problems that occurred within two years of the execution process and the corresponding countermeasures.

(1) Problems and Trial & Error

1) Skepticism within the MPB Organization and the Problems in the Promotional System

The MPB was skeptical of the new budget compilation system. First, it was concerned that each department might misuse its immense authority to compile a budget for the purposes of self-interest as opposed to national interests. In fact, various systems, such as the medium-term fiscal management plan, the top-down system, and performance management were all only in their initial stages of operation even in other advanced countries. Therefore, many were afraid that it might not work well in Korea.

Secondly, there was strong resistance to decreasing the authority of the MPB. According to them, medium-term NFMP or performance management system could be more successful with the MPB’s supervision over the budgeting process of individual projects.

Moreover, preparatory procedures were insufficient and conditions were immature. For the top-down process to succeed, medium-term NFMP had to be firmly established and performance management systems needed to work. Yet, these systems were not fully prepared at that time and the adoption of a top-down system seemed premature.

Another difficulty was the lack of collaboration among the departments within the MPB. The budget office and the fund bureau were in charge of yearly based budget and fund organization, whereas the fiscal planning department was in charge of the medium-term NFMP. These systems required intense cooperation among the departments since they were related to one another. However, collaboration among them were not close enough and most of the staff were cynical about “having to create a new project” since they already had an excessive work load.

2) Issues Raised by Departments

The majority of the departments were skeptical of the new system. First, they perceived that a separate NFMP seemed unnecessary because individual investment plans were already in process for sectoral resource distribution vis-à-vis the NFMP. In addition, most of the sectors or departments were devising medium long-term investment plans which required more than the available resources. Various adjustments had to be made so that the individual
investment plans could merge into the whole framework of the NFMP.

Also, within the distribution limits of aggregate amounts, departments were not sure of how much autonomous power they would be given. Most understood that the autonomous system and the collection of departmental opinions to be superficial and that ultimately the MPB would establish the NFMP and compile the budget at their own discretion, ignoring autonomous decisions.

Excessive workloads were another factor of resistance. Departments already had far too many duties in compiling the annual budget. The idea of devising a medium-term fiscal plan and a performance report was not welcomed.

Finally, many ministries complained about the duplication of work due to insufficient preparation. Since specific agenda and adjustment standards were not predetermined, each ministry experienced difficulties in performing their duties in an organized manner. Moreover, departments were dissatisfied with the fact that their medium-term plans had to be discussed with the fiscal planning office, the yearly budget with the budget office, and with the fund bureau.

(2) Strategy for Successfully Establishing the System

2) Reorganization of the MPB to Provide One-Stop Service for Departments

The MPB restructured its organization into a matrix organization to provide one-stop service to ministries, make adjustments, and promote ease of integration. First, the MPB formed a new vision and mission of “creating a better future”, as the national “Strategic planning headquarters”. Discarding the usual authoritative attitude, the MPB acknowledged the necessity for reform in the fiscal management system by having workshops and conferences at staff levels as the financial conditions they faced changed.

Based on this recognition, the MPB eliminated the duplication of work and reorganized its structure to provide one-stop service for major ministries by the end of May 2005. Fiscal management TF, which integrated the three departments (fiscal planning office, budget office, and the fund bureau), has been in operation since the beginning of 2005 as shown in <Figure 1>. Namely, the yearly based budget, funds, and medium-term NFMP which were managed separately by the fiscal planning office, budget office, and fund bureau became integrated into the one office that would act simultaneously. Three fiscal planning departments were in charge of integrating and performing all the tasks related to the department, ultimately enabling one-stop service. In addition, human resources needed for budget compilation dramatically decreased from 154 to 73 staff members through this reform. The 'Performance Management headquarters' was also founded to reinforce performance management such as autonomous financial project assessment.

<Figure 1> Integration of Department Functions

Moreover, the fiscal strategy team, the fiscal management team, and the
performance management team collaborated in order to integrate functional tasks, such as the NFMP (Plan), budget and fund compilation (Do), and performance management.

This matrix organization enabled one-stop service for ministries and fostered harmonious adjustment and integration. Efficiency and professionalism were greatly increased. The details are diagramed in <Figure 2>.

Meanwhile, human resources and the function of the MPB were redadjusted through organizational reform according to the policy objectives. As <Figure 3> presents, the budgeting function for individual projects decreased whereas the macroeconomic policy settlement, medium-term planning and strategic resource distribution, and performance management function were reinforced.

2) Reducing the Workload and Strengthening Functions of Ministries

Responsibilities were divided between the MPB and ministries to minimize the workload; as a result, resistance from the ministries was radically reduced and voluntary cooperation emerged. The budget deliberation system was reformed into one that had the ministries compile the draft budget, which was then consulted and supplemented by the MPB. Moreover, the data style for budget deliberation and reports to the National Assembly were standardized to reduce the workload. Active communication was also achieved through “the budget deliberation by visit” on the working and ministerial level, in accordance with departmental collaboration in the budgeting process.

Simultaneously, necessary assistance was provided to reinforce autonomous adjustment functions of the ministries. The MPB budget department (department level) was elevated to the fiscal planning bureau (director level). The functions of integration and adjustment were enhanced. Moreover, the know-how of the MPB was shared with the public through fiscal reform forums, thus solidifying the budget advisory committee of each ministry (supervised by the head of the policy PR management).
3) Close Collaboration between the MPB and the Ministries

Expected standards for new models of fiscal authority and the ministries on issues of national resource distribution were shared by having continuous conferences and debates. Pre-education for operating the new system was provided. The procedures were continuously examined by holding academic conferences and working-level presentations for fiscal reform with all the ministries as partners. It was recognized that autonomous organization was neither a self-interested act of the ministries nor a dictatorship of the MPB over the budgeting process.

Each ministry played a more active role in the various procedures, such as devising the NFMP. The year before devising the plan, the ‘NFMP framework guidelines’ were reported and a medium-term project plan for each ministry was submitted. A tentative plan for the NFMP ‘05-’09 was devised through this process. An open forum for 13 sectors also was broadcast live on TV. From 4.30~5.1, 2005, a cabinet resource allocation conference was held under the supervision of the President. Also, a follow-up consultation with the government ruling party was attended by the minister for major departments, the chairperson of ministerial policy mediation, and the manager of the standing committee. Through the twelve principles of resource allocation, the parties, which agreed on the basic principles of resource allocation but disagreed with individual department adjustment policy, gradually consented.

4) Efforts to Achieve Procedural and Content Legitimacy

In order to achieve legitimacy in the fiscal reform, aggressive PR activities were conducted. As mentioned above, a cabinet resource allocation conference was held for extensive discussion. Premeditated and elaborate PR strategies were devised and implemented such as the press organization session, mass media advertisement on live TV and the internet, internet homepage (MPB, relevant ministries, KDI), policy PR (PCRM). Consultation channels with the specialists were also diversified by having working party operations, fiscal forums (Korea Institute of Public Finance), an international seminar with World Bank?KDI, financial specialist sessions, and a budget advisory conference, in order to collect opinion of civil groups and external specialists. In addition, open forums, mass media advertisements, and internet forum participation opened the transparent process of the fiscal reform procedure to the public.

There were also efforts made to gain political support from local governments and the National Assembly. For example, a local debate was held as well as government ruling party consultations and political presentations, where the chairperson of ministerial policy adjustment and the manager of a standing committee were present.

4. Joint Budget Compilation in 2006 with the NFMP

Budget Compilation in 2006 increased the scope of participation and consultation because many authorities including competent departments and the local governments became more interested in it. That is because immense effort was put into stabilizing the system by rectifying errors of 2004. Extra effort was also put into establishing a common ground for a medium-term resource distribution strategy in the compilation of the 2006 budget. The NFMP establishment guidelines were distributed to all the departments at the end of December 2004 in order to effectively prepare for the 2005-2009 NFMP. Public interest was further provoked through various open forums and live TV shows on NFMP establishment procedures. A two-day State Minister Resource Distribution Conference also provided an opportunity to establish a common ground for medium-term resource distribution principles and for enlightening the public. Afterwards, the sectoral expenditure ceiling was determined.

The connection between the NFMP and the yearly based budget and fund management plan was strengthened. Namely, the state ministers discussed utilizing the NFMP to decide expenditure ceilings for the yearly based budget
and fund management plan. This framework became the basis of the top-down system.

The autonomous role of departments in budget compilation was also intensified. An independent budget inspection council was activated in most departments in order to reinforce the autonomous adjustment role. The budget department (head level) was also elevated to the status of fiscal planning department (chief director level), concentrated on the twelve major departments. Accordingly, the status and function of the department was greatly enhanced.

Moreover, the Autonomous financial project assessment system was introduced in the year 2005. According to the common autonomous assessment guidelines devised by the MPB, each department systematically evaluated their projects and reflected their assessments in their autonomous budget compilation. One third of the financial projects were assessed by each respective department. In the year 2005, 555 projects were evaluated by 40 departments. Through these autonomous assessments, each department improved performance management and provided a foundation for the top-down system.

### IV. Outcome of the Reform

#### 1. Analysis of the Budget Compilation Outcome

After passing the budget compilation stage in 2005, the top-down system is in its second year of execution in 2006. As a result, the system seems to have conformed considerably to the current budget system.

By the end of June 2005, the overestimated rate of demand in 56 central government offices was greatly reduced in comparison to the past few years according to the draft budget and fund management plan submitted to the MPB. The draft budget and the MPB were reflected in a government bill. Therefore, the government bill did not differ greatly from the draft budget that was submitted to the National Assembly.

Table 2 shows an increased rate in budget and fund demands since 2003 and also displays the changes to the final budget overestimation rate. We can see that the rate of overestimation of demand has sharply decreased since 2005, when the top-down system was introduced. The overestimation rate of budget demand which was 28.6% in 2003 and 24.9% in 2004, decreased remarkably to 5.0% in 2005 and 4.4% in 2006. The decrease shows that each department considers the scope of aggregate amounts when compiling draft budget demands rather than requesting excessive amounts in anticipation of cuts.

Meanwhile, the actual budget increase rate from the year 2003 was 5.1%, 1.7%, 4.8% respectively, which shows the traditional excessive budget demands made by departments. However, since 2005, when top-down system was introduced, this trend disappeared and budget demands were at realistic levels.

<Table 2> Trends in Increased Budget and Fund Demands

<table>
<thead>
<tr>
<th></th>
<th>'03</th>
<th>'04</th>
<th>'05</th>
<th>'06</th>
</tr>
</thead>
<tbody>
<tr>
<td>O Budget (General &amp; Special Accounts)</td>
<td>28.6</td>
<td>24.9</td>
<td>5.0</td>
<td>4.4</td>
</tr>
<tr>
<td>(final budget increase rate)</td>
<td>(5.1)</td>
<td>(1.7)</td>
<td>(4.8)</td>
<td></td>
</tr>
<tr>
<td>General Account</td>
<td>25.8</td>
<td>30.8</td>
<td>11.7</td>
<td>8.7</td>
</tr>
<tr>
<td>(final budget increase rate)</td>
<td>(5.3)</td>
<td>(6.2)</td>
<td>(7.2)</td>
<td></td>
</tr>
<tr>
<td>Special Account</td>
<td>33.1</td>
<td>15.6</td>
<td>Δ6.7</td>
<td>Δ5.2</td>
</tr>
<tr>
<td>(final budget increase rate)</td>
<td>(4.8)</td>
<td>(Δ5.2)</td>
<td>(Δ10.6)</td>
<td></td>
</tr>
<tr>
<td>O Fund1</td>
<td>28.9</td>
<td>21.6</td>
<td>12.0</td>
<td>11.2</td>
</tr>
</tbody>
</table>

1) Excluding the five account funds such as the public fund management and nine financial funds, such as the trust guarantee fund.
<Table 3> shows the 2005 budget, 2006 budget demand amounts, budget reflection amounts, and the difference per major sectors. Compared with the 2005 budget, the overestimation rate of budget demand amounts in 2006 showed large variations. The unification diplomacy sector showed a 42.7% increase in demand amount whereas the transportation and traffic sector showed a 5.7% decrease. Yet these sectoral demand amounts basically reflect resource distribution amounts established by the NFMP. Thus the increased rates were agreed upon in part at the state minister resource distribution conference.

Additionally, in order to observe how well autonomous compilation and aggregate amount distributions were conducted by departments, a comparative study had to be conducted to determine how close the demand amounts were reflected in the final draft budget. As in <Table 3>, the biggest gap between the demand amounts and the reflected amounts was 5%, and only 0.1% in agriculture and marine products. Thus, it seems that the top-down system came quite close to its original goals.

<Table 3> ‘06 Increase Rate in Budget Demand Rate and Budget Reflection

<table>
<thead>
<tr>
<th>Sector</th>
<th>‘05 Budget (A)</th>
<th>‘06 Demand (B)</th>
<th>(B-A)/A*100</th>
<th>‘06 Reflected Budget (C)</th>
<th>(B-C)/C*100</th>
</tr>
</thead>
<tbody>
<tr>
<td>General public administration</td>
<td>376,899</td>
<td>395,739</td>
<td>5.0</td>
<td>390,915</td>
<td>1.2</td>
</tr>
<tr>
<td>Public order and Safety</td>
<td>93,901</td>
<td>100,875</td>
<td>7.4</td>
<td>102,405</td>
<td>1.5</td>
</tr>
<tr>
<td>Unification diplomacy</td>
<td>20,078</td>
<td>28,657</td>
<td>42.7</td>
<td>27,305</td>
<td>5.0</td>
</tr>
<tr>
<td>National defense</td>
<td>205,301</td>
<td>231,069</td>
<td>12.6</td>
<td>226,843</td>
<td>1.9</td>
</tr>
<tr>
<td>Education</td>
<td>276,497</td>
<td>300,537</td>
<td>8.7</td>
<td>290,636</td>
<td>3.4</td>
</tr>
<tr>
<td>Culture and Tourism</td>
<td>26,396</td>
<td>30,038</td>
<td>13.8</td>
<td>28,978</td>
<td>3.7</td>
</tr>
<tr>
<td>Environmental Protection</td>
<td>36,043</td>
<td>37,761</td>
<td>4.8</td>
<td>38,411</td>
<td>1.7</td>
</tr>
<tr>
<td>Social welfare</td>
<td>443,099</td>
<td>496,521</td>
<td>11.8</td>
<td>491,281</td>
<td>0.9</td>
</tr>
<tr>
<td>Health</td>
<td>50,291</td>
<td>56,203</td>
<td>11.8</td>
<td>55,256</td>
<td>1.7</td>
</tr>
<tr>
<td>Social welfare</td>
<td>443,099</td>
<td>496,521</td>
<td>11.8</td>
<td>491,281</td>
<td>0.9</td>
</tr>
<tr>
<td>Health</td>
<td>50,291</td>
<td>56,203</td>
<td>11.8</td>
<td>55,256</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Agricultural marine products 141,337 143,961 1.9 144,114 0.1
Industry, medium and small enterprise 118,591 121,452 2.4 123,919 2.0
Transportation and traffic 155,321 146,479 Δ5.7 151,974 3.6
Regional Development 27,244 26,582 Δ2.4 25,826 3.7
R&D 77,996 92,971 19.2 89,729 3.6

<Table 4> and <Table 5> show the 2005 budget, 2006 demand amounts and 2006 reflected demand amounts in the General Public Administration sector, and the Culture and Tourism sector for individual projects. As <Table 4> shows, in the general public administration sector, the 2006 demand amounts show a significant difference from that of 2005, while the difference between the demand amounts was quite moderate, excluding one project. So, it is possible that the autonomous compilation principles of the departments were kept within the boundaries of aggregate amounts.

On the other hand, in the Culture and Tourism sector in <Table 5>, there was a relatively big difference between the demand amounts and the actual reflected amounts. For example, in the case of Gyeongju historical cultural city formation, the demand amount by the department was three billion won, whereas the budget compilation amount by MPB was only a third of that amount at one billion won.
On the whole, the top-down system is in its second year of execution and seems partially successful for its early stage. However, the budget demand amounts and the final reflected budget amounts still differ considerably for several projects. This is probably due to details such as the outcome assessment results of individual projects that were not considered in the traditional budget compilation process, which are currently reflected in the budget deliberation process.

2. Outcome of System Operation

The four fiscal reforms, including the top-down system, have transformed the basic paradigm of fiscal management. Although it is said to be an “abstract numerical expression of government policy,” fiscal reform has given “life” to the budgeting process by adding "logic" and "principle" to the national resource distribution process. The success of the reform can be summarized as follows.

Efficiency of resource distribution was improved by distributing limited resources according to prioritized ranking. The resource distribution conference attended by state ministers and the President as the

### Table 4: Demand Amount Made by Departments Compared to the Budget Reflection Amount, for Individual Projects (General Public Administration)

<table>
<thead>
<tr>
<th>Specific Projects</th>
<th>'05 Budget (A)</th>
<th>'06 Demand (B)</th>
<th>'06 Budget (C)</th>
<th>(B-A)/A*100</th>
<th>(B-C)/C*100</th>
<th>Competent Authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>e-government project assistance</td>
<td>2,202</td>
<td>3,057</td>
<td>3,057</td>
<td>38.8</td>
<td>0.0</td>
<td>MOGAHA</td>
</tr>
<tr>
<td>Informalization of regional administration</td>
<td>112</td>
<td>280</td>
<td>280</td>
<td>150.0</td>
<td>0.0</td>
<td>MOGAHA</td>
</tr>
<tr>
<td>National document management reform</td>
<td>15</td>
<td>49</td>
<td>49</td>
<td>226.7</td>
<td>0.0</td>
<td>MOGAHA</td>
</tr>
<tr>
<td>Naming roads and numbering buildings business</td>
<td>30</td>
<td>62</td>
<td>62</td>
<td>106.7</td>
<td>0.0</td>
<td>MOGAHA</td>
</tr>
<tr>
<td>Economic free zone foundation facility support</td>
<td>1,150</td>
<td>2,370</td>
<td>2,307</td>
<td>106.1</td>
<td>2.7</td>
<td>MOFE</td>
</tr>
<tr>
<td>Residence trust guarantee funds donation</td>
<td>1,300</td>
<td>1,000</td>
<td>1,000</td>
<td>-23.1</td>
<td>0.0</td>
<td>MOFE</td>
</tr>
<tr>
<td>Total investigation of retail sale and wholesale, and service industries</td>
<td>3</td>
<td>244</td>
<td>244</td>
<td>803.3</td>
<td>0.0</td>
<td>NSO</td>
</tr>
<tr>
<td>Standard local fiscal information system expansion</td>
<td>-</td>
<td>41</td>
<td>41</td>
<td>-</td>
<td>0.0</td>
<td>MOGAHA</td>
</tr>
<tr>
<td>ASEAN+3 Fiscal collaboration promotional system reinforcement</td>
<td>-</td>
<td>13</td>
<td>14</td>
<td>-</td>
<td>-7.1</td>
<td>MOFE</td>
</tr>
<tr>
<td>Public union president election management</td>
<td>-</td>
<td>38</td>
<td>28</td>
<td>-</td>
<td>36.7</td>
<td>NEC</td>
</tr>
</tbody>
</table>

### Table 5: Demand Amount Made by Departments Compared to the Reflected Budget Amounts, for Individual Projects (Culture?Tourism)

<table>
<thead>
<tr>
<th>Specific Projects</th>
<th>'05 Budget (A)</th>
<th>'06 Demand (B)</th>
<th>'06 Budget (C)</th>
<th>(B-A)/A*100</th>
<th>(B-C)/C*100</th>
<th>Competent Authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copyright protection and use activation</td>
<td>39</td>
<td>80</td>
<td>64</td>
<td>105.1</td>
<td>25.0</td>
<td>MCT</td>
</tr>
<tr>
<td>Asian cultural industry exchange and collaboration</td>
<td>30</td>
<td>50</td>
<td>25</td>
<td>66.7</td>
<td>100.0</td>
<td>MCT</td>
</tr>
<tr>
<td>Professional athlete education</td>
<td>261</td>
<td>393</td>
<td>312</td>
<td>50.6</td>
<td>26.0</td>
<td>MCT</td>
</tr>
<tr>
<td>National Asian cultural hall establishment</td>
<td>934</td>
<td>2,041</td>
<td>1,927</td>
<td>118.5</td>
<td>5.9</td>
<td>MCT</td>
</tr>
<tr>
<td>Cultural assets general hospital establishment and operation</td>
<td>5</td>
<td>20</td>
<td>20</td>
<td>300.0</td>
<td>0.0</td>
<td>CPA</td>
</tr>
</tbody>
</table>
superintendent was fresh, unusual, and even innovative. Preparatory procedures for the conference gave financial authorities and departments an opportunity to teach and share the general goal and principles of the national administration. Through this procedure, departments also were able to establish a common ground on the principles and strategies of resource distribution, and major policy goals. Moreover, a principal objective of national fiscal management was established, including the distribution amounts for each sector.

Second, the traditional custom of excessive demands and drastic cuts was improved. Strategic resource distribution was also realized through autonomous restructuring of annual revenue. As departments autonomously compiled their budgets within expenditure limits, there was no reason for them to request excessive budgets. Thus, the practice of “excessive demand and drastic cuts” disappeared rather radically. In addition, a budget restructuring process occurred naturally as priority projects received greater amounts than other projects which consequently increased the efficiency of resource distribution. While the overestimation rate of budget demands was approximately 25% before the top-down system, the rate radically reduced to only 5% for 2005, and 7% for 2006.

Third, efficiency and professionalism of fiscal management increased. Due to the division of authority and responsibilities between the financial authority and the departments, the MPB was in control of the aggregate amounts while the responsible department, which was familiar with the details, was in charge of individual projects. As a result, department specialization and administration efficiency were maximized in the budgeting process. More importantly, the secretive negotiating process to obtain more funds almost disappeared and the process became more transparent and fair.

Fourth, transparency and fairness were promoted by opening the NFMP settlement procedures to forums. For example, active PR such as broadcasting the debate on live TV, particularly achieved transparency and fairness. Medium-term strategies and plans, which used to be conducted exclusively by the financial authority, were opened to the administration, political authority, and the nation equally for the first time in history. Also, democratic procedures were followed by submitting the draft budget, fund management plan, and five-year NFMP to the National Assembly. These democratic procedures included collaboration with governmental ruling party, consultations with departments, numerable National Assembly budget committees, and political party presentations.

Fifth, sectoral expenditures were distributed according to the priorities of national policy as discussed in the state minister resource distribution conference. Thus, projects were operated autonomously within the sectoral expenditure ceilings, promoting a predictable and stable national project. The tentative plans of the NFMP were utilized to determine the expenditure ceilings for the draft budget and fund management plan for the following year. Thereby, effectiveness in the yearly based budget and medium-term plan could be achieved. A "Medium-term deliberation procedure improvement proposal" was further created in order to connect the NFMP with medium-term investment plans from each department.

V. Success Factors and Lessons of the Reform

1. Success Factors

(1) Resolute Division of Authority

The MPB, as the budget authority, actively conducted fiscal reforms and made it possible to abandon the narrow viewpoint that a division of authority
was a renunciation of vested rights. The MBP actively maintained consultation with the ministries by visiting them within the total scope of the organizational hierarchy beginning with the ministers to lower level budget officers.

(2) Participation, Procedural Transparency, and Content Legitimacy

Each ministry participated in the process of establishing expenditure ceilings, establishing the NFMP, and debates on resource allocation to increase a sense of responsibility befitting their authority and independence. Moreover, related specialists stated their views on the improvement of the fiscal management system through working groups, open forums, fiscal specialist sessions, and various other forums.

Procedural transparency was also increased through participation in the open process of budget compilation. The reinforcement of budget compilation, which is outcome-based, helped improve the general efficiency of national resource allocation.

(3) Fundamental and Systematic Approach

An autonomous assessment system was established in order to focus on outcomes rather than inputs. Also, budgetary incentives were given according to the restructuring achievements. Fundamental and systematic measures, including the reorganization of the MPB’s internal structure and the autonomous budget adjustment system of each ministry, were introduced.

2. Follow-up Improvement Measures

Current fiscal reform in Korea, including the top-down system, shares the same context with reforms undertaken in other advanced countries since the 1990s. Considering the experiences of these countries, we know well that our fiscal reform is quite a difficult task. Thus, in order to achieve the original goals, active efforts have to follow.

(1) The Need to Provoke Interest to Attain Fiscal Health

Controlling the rapidly increasing national deficit was one of the focal points of the fiscal reform that introduced a system of establishing aggregate targets of total revenue, total expenditure, fiscal balance and national deficit, and of allocating resources for sectors and ministries under a multi-year budget system.

There are many obstacles that need to be overcome for attaining national fiscal health. First, overly optimistic predictions of the future economic situation could cause excessive estimations of available resources. Second, ministries or organizations tend to accept expected resource allocations under the NFMP as entitlements, causing ministries to oppose any downward revisions. Third, multi-year based predictions are made with real prices rather than current prices. However, during an economic slump or a serious inflationary period, the budget is bound to be readjusted even though the annual revenues do not reach expected amounts.

Such factors would make it difficult to manage the national debt at an appropriate level on the basis of a medium-term perspective NFMP. Hence, it is certain that extra attention and effort are required in order to accomplish efficient fiscal management. This becomes more evident as we rapidly enter into a phase of society with low birth rates and an aging population that places increasingly high demands on social welfare expenditures.

(2) The Need for Political Consent on Total Expenditure Ceilings or Sectoral Resource Allocations

From a medium-term perspective, we need to establish political consensus
on the aggregate targets and give them some level of bidding authority. Sweden, a typical country which operates the medium-term NFMP and the top-down system, submits the total expenditure ceiling to the legislature and goes through a consultation process. Thus, not only the ministries or the executive organization, which compiles the budget, but also the legislature itself is bound by the expenditure target unless it is amended. The multi-year targets for total expenditures in conjunction with initial targets for fiscal balance are maintained regardless of tax revenue fluctuations. In the case of increased expenditure level in some fields, cuts need to be made in other fields to maintain the same total.

(3) Top-down Budget Compilation and Performance Management

The top-down system will promote a rational allocation of national resources and fulfill the fundamental functions of the budgeting process, putting an end to the traditional exhaustive system that led to excessive requests and cuts. Yet, the top-down system cannot accomplish these functions by itself and has to be closely collaborated with a performance management system. Even though the performance management system is outcome-oriented, it should also be reinforced because the system includes some important functions of controlling and mitigating the input as well as of constructing an infrastructure for further effective outcome assessment.
Reduction of Foreign Currency through Competition

Case Overview
The Ministry of Commerce, Industry, and Energy (MOCIE) has introduced an open competition system to increase the productivity and transparency of energy import. The system has been successful in increasing the stability of energy supply and reducing foreign currency needed for import. Such a success has captured a particular attention as a benchmarking case from various media and other parts of the government.

I. Introduction

1. The Rise of an Era of Energy Crisis

(1) Sudden Change in the International Energy Market

Recently, the international petroleum price has been skyrocketing everyday due to the chronic vulnerability of world petroleum supply and demand structure and increasing factors of insecurity such as international terrorism. The high price of petroleum directly affects the world economy. In such an energy crisis, the economic giants, U.S.A, Russia, China and Japan, are competing to acquire stable and affordable energy supplies through the use of political, diplomatic, and economic power.

Especially, the current oil-centered economic structure is turning into a contest for resource supremacy, even as oil has been singled out as a principal cause of environmental pollution. Accordingly, hydrogen and nuclear energy are promoted as possible alternative sources. However, there is also a limit to such alternative resources. Although hydrogen energy is a pollution-free and infinite source of energy, an advanced country has established only a master plan and has not yet been able to produce it in economically feasible quantities. Because nuclear energy could bring fatal damage to the environment in case of disposal of radioactive waste products, supply expansion of nuclear energy as an energy source is under question all over the world. Compared to these types of energy sources, natural gas is a clean energy, and its emission of pollution material is much less than other energy sources like oil and coal. Therefore, natural gas plays an important role in improving environmental pollution.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Index of pollutant emissions by energy source compared with LNG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy source</td>
<td>Pollutant</td>
</tr>
<tr>
<td>CO2</td>
<td>1</td>
</tr>
<tr>
<td>SO2</td>
<td>1</td>
</tr>
<tr>
<td>CO</td>
<td>1</td>
</tr>
<tr>
<td>NOx</td>
<td>1</td>
</tr>
<tr>
<td>Dust</td>
<td>1</td>
</tr>
</tbody>
</table>

Reference: CO2 IPCC, The Intergovernmental Panel on Climate Change, other (EPA, Environmental Protection Agency)

As a source of power, natural gas is divided into PNG (Pipeline Natural Gas) and LNG (Liquefied Natural Gas). PNG is a supply method to transport extracted natural gas from a gas field to an area of consumption through pipelines. It is impossible to transport gas except in areas bordering gas fields. On the other hand, LNG is made through the following process; extract natural gas from a gas field, refine and refrigerate it at 10 degrees below zero, then...
liquefy it. Because LNG is transported by sea under the condition of liquefaction and supplied as gas after vaporization, it can be used in overseas areas. Therefore, alternative resources for Korea are limited to LNG.

More than 40$ of the world's gas deposits are in the Middle East, and another 30% are in Russia. Gas is an imported resource in many countries, including Korea. Of the roughly 2 billion tons of world gas production in 2004, 1.5 billion tons were spent in the producing countries, leaving only 5 million tons for trade. Of those 5 million tons, the amount of PNG was 3.7 million tons (74%) while LNG was about 1.3 million tons (26%).

<Table 2> Ratio of natural gas and oil deposits by region group in 2004

<table>
<thead>
<tr>
<th>Section</th>
<th>North America</th>
<th>Central &amp; South America</th>
<th>Europe &amp; Eurasia</th>
<th>The Middle East</th>
<th>Africa</th>
<th>The Asia-Pacific</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural gas</td>
<td>4.1</td>
<td>3.9</td>
<td>35.7</td>
<td>40.6</td>
<td>7.8</td>
<td>7.9</td>
<td>100</td>
</tr>
<tr>
<td>Oil</td>
<td>5.1</td>
<td>8.5</td>
<td>11.7</td>
<td>61.7</td>
<td>9.5</td>
<td>3.5</td>
<td>100</td>
</tr>
</tbody>
</table>


<Figure 1>

<Figure 2>

(2) Competition with LNG production countries

1) Scale of LNG Imports in Korea

In Korea, 97% of energy consumption is dependent on imports. LNG occupies about 15% of the whole energy consumption. Since 117 thousand tons of LNG were first introduced in 1986, the demand has increased each year in accordance with the growth of Korean economy. By 2004, it was about 22 million tons, 190 times greater than 1986. It cost about 61 million dollars, and Korea became the world’s second largest LNG importer after Japan. From Qatar and Oman of the Middle East, Korea imported 10.34 million tons of LNG, 47% of the whole import amount.

Qatar and Oman are the main LNG supply countries for Korea: Qatar at 5.94 million tons ($16 million), and Oman at 4.44 million tons ($11 million). Such over-reliance on just two countries has been one of the causes in the increase of cost of LNG.

The Ministry of Commerce, Industry, and Energy (MOCIE) compared the high LNG introduction cost of Korea with that of other countries. According to
Reduction of Foreign Currency through Competition

The progress of industrialization. Other major Asian industrial countries, such as Taiwan and Singapore, are also importing significant amounts of natural gas.

Because there was not a maximum price in the existing contracts made under the monopoly system of KOGAS, increases in oil prices were fully reflected in LNG prices. Also, equal import amounts in winter and summer had a weakness in the high oil price situation, because it did not correspond to the Korean demand and supply pattern, which showed great demand in winter and little in summer.

2) Competition with LNG Import Countries

Korea had to negotiate with supply countries for importing gas energy resources while it competed with other import countries. In 2004, the import volume in Asia by far the largest, but that of Europe also expanded significantly. First, Japan accounted for 56 million tons (65%) of 87 million tons of LNG trade in Asia, and Korea was the second largest Asian importer, bringing in 22 million tons (25%). Relatively, Korea had to compete with Japan for LNG imports. Even though the industrial structure of Japan which imports energy resources and exports semiconductor, car, and home appliances was similar to that of Korea, Japan had more connections with various LNG supply countries than Korea, as seen below. Unlike Korea, which was fixated on oil imports, Japan took a close interest in natural gas as well. In Asia, China has also shown increasing demand for raw materials and energy resources with the progress of industrialization.

The main LNG import countries are concentrated in Asia where there are many industrial economies. They do not have energy resource reserves and are far from production sites. Furthermore, as seen below, Europe also imported considerable amounts of natural gas. Especially, a proposal to enhance the EU members’ ability to compete in the electric power and gas markets was presented at the 4th EU annual meeting in January of 2004. This proposal stimulated EU nations to enact a law aimed at the EU guidelines related to competitive introduction and called for continuous enforcement. The main contents of this proposal were as follows. First, EU nations support an independent regulatory organization with sufficient financial and human resources. Second, they offer transparent and fair information and operate a policy of financial incentives in order to manage energy demand. Third, they maintain it in keeping with the goal of establishing a lasting energy policy. Forth, they expand investment in infrastructure and administer an impartial network. If these policy goals are implements, it is clear that the EU will
present even greater competition for Korea in world energy markets.

**<Figure 4>**

![Figure 4](image)

**Table 4** Status of main LNG import country

<table>
<thead>
<tr>
<th>Section</th>
<th>Japan</th>
<th>Korea</th>
<th>U.S.A</th>
<th>Spain</th>
<th>Taiwan</th>
<th>France</th>
<th>Italy</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Import volume</td>
<td>56.2</td>
<td>22.2</td>
<td>13.5</td>
<td>12.8</td>
<td>6.7</td>
<td>5.5</td>
<td>4.3</td>
<td>9.0</td>
<td>130.2</td>
</tr>
<tr>
<td>Ratio</td>
<td>43.1</td>
<td>17.0</td>
<td>10.4</td>
<td>9.8</td>
<td>5.1</td>
<td>4.3</td>
<td>3.3</td>
<td>7.0</td>
<td>100</td>
</tr>
</tbody>
</table>

Standard unit: 1 million tons in 2004

II. Contents of innovation

1. Search for Possibility of Innovative Change

The biggest problem for natural gas introduction in Korea is that the price of natural gas is directly linked to price of oil. Therefore, the introduction price of natural gas goes up along with rising oil prices the current high oil price situation. If Korea does not implement a special countermeasure to deal with this situation, the result will be a serious burden on the national economy and people and will, in the end, bring a decline in national competitiveness.

The Ministry of Commerce, Industry, and Energy began to wonder how it could introduce inexpensive LNG, so it examined the international LNG market situation and the domestic conditions of LNG introduction.

(1) Newly Rising International Market

Korea has had only a limited number of LNG suppliers, such as Qatar, Oman, Malaysia, and Indonesia. However, the recent appearance of many new suppliers, including Russia, Yemen, Iran, and Australia, promises better circumstances than before for LNG importers in the international market.

(2) Appearance of New Competitors in the Domestic Market

Change was also brewing in the domestic market. The affiliates of the Korea Electric Power Corporation (KEPO), which include Korea Southern Power Co., Ltd (KOSPO), Korea East West Power Co., Ltd, Korea Midland Power Co., Ltd, and Korea Western Power Co., Ltd, mounted a challenge to the Korea Gas Corporation in order to survive under the current situation of keen competition. They launched a movement to cut down the cost of generating electric power by directly importing LNG from abroad.

(3) Innovation Motivated by Change

1) Coping with a Time of Energy Crisis through Innovation

In the face of the rapidly changing situation, the MOCIE, which main
responsibility for LNG introduction contracts, was well aware of a need for innovation in the current LNG introduction system in order to raise the nation’s competitiveness. To make the most advantage of the international LNG market where a great number of new suppliers had appeared, Korea needed to secure more suppliers by stimulating negotiations and trade motivation in the domestic LNG introduction line.

2) Carrying out Innovation against Obstacles

One problem was the many people who were dubious about innovation in the LNG introduction system. They worried, “Is it possible to change the introduction system, which has been monopolized by KOGAS for the last 20 years, into a new competitive system?” and “Is it really more advantageous to have multiple competing purchasers rather than a single purchaser?” Despite the doubts of many people, the MOCIE was convinced that the monopoly system of LNG introduction could be reformed by making full strategic use of changes in international and domestic LNG markets. With this confidence, the organization carried out a major innovation to construct a new competitive LNG introduction system.

2. The Target and Direction of Innovation

MOCIE took aim at price-cutting through modification of the LNG introduction system. That is, after building a new introduction system from the existing LNG monopoly and concluding an introduction contract with superior terms, the MOCIE finally targeted “reduction of LNG consumer price” as the find outcome of innovation. The concrete direction for targets of innovation is described below.

(1) Contract by Competition instead of Monopoly

Contracts for LNG imports should be concluded through competition between Korea Gas Corporation (KOGAS) and the four affiliates of Korea Electric Power Corporation, Korea Southern Power Co., Ltd., Korea East West Power Co., Ltd., Korea Midland Power Co., Ltd., and Korea Western Power Co., Ltd., in order to escape from the pre-existing introduction system monopolized by KOGAS.

(2) Maximizing Consumer Welfare through Reduction of Foreign Currency Expenditures

With the application of the competitive system and improvement in LNG introduction price and terms of trade, reduction of foreign currency expenditures would maximize national interests and consumer welfare such as lowering consumer prices.

(3) Securing Energy Resources

Korea should make efforts not only for a short-term price reduction but also for long-term security of energy supplies, so it can adjust the balance of demand and supply, which varies by season.

3. Comparison between Old and New Innovation Contents

With the goal of reducing the LNG price, which was 20% – 30% more expensive than other countries, MOCIE tried to reform the domestic gas market monopoly and to establish a new competitive introduction system. Through this drastic innovation of LNG introduction policy, MOCIE did its best
to minimize the burden on the national economy in times of high oil prices.

MOCIE achieved the original business goal by producing the following results: impartial estimates, selection of preferred sellers with excellent condition, and conclusion of final introduction contract without setbacks. Eight suppliers from six countries, including MLNG Company from Malaysia, bid for new LNG introduction contracts. Among them, Korea signed contracts for introduction of 5 million tons a year with three suppliers from Malaysia, Yemen, and Sakhalin during July and August of 2005.

(2) Diversification of Producing Countries and Variety in Development Projects

As seen in the above table, the existing contracts were divided into long-term, mid-term, and short-term and the main contracts were overly reliant on Malaysia, Indonesia, and Qatar. These 3 main countries accounted for about 70%, or 15.79 million tons of a total 23.07 million tons, in the pre-existing contracts. There was a limitation on favorable terms of purchase through induction of competition under these circumstances of excessive reliance on a few countries.

Yemen and Russia were added to the new contracts concluded in 2005.

<table>
<thead>
<tr>
<th>Section</th>
<th>Original Object</th>
<th>Outcome</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impartiality of estimation</td>
<td>Estimation of the fair and transparent long-term contract (’05.2)</td>
<td>Execution of fair and objective estimation by contract estimating committee consisting of outside figures</td>
<td>Accomplished</td>
</tr>
<tr>
<td>Section of preferred seller</td>
<td>Selection of the introduction contract in competitive conditions (’05.2)</td>
<td>Selection of a low-priced contract of 38% less than the pre-existing LNG introduction contract</td>
<td>Accomplished</td>
</tr>
<tr>
<td>Conclusion of contracts</td>
<td>Final successful conclusion of long-term introduction contracts (’05.7)</td>
<td>Successful conclusion of the introduction contract 3 years ahead of LNG actual introduction</td>
<td>Accomplished</td>
</tr>
</tbody>
</table>

(1) Lowering Introduction Price by 38%

The LNG contract prices concluded in 2005 averaged 38% less than the previous contract. Therefore, a total reduction of 12.6 billion dollars (13 trillion won) in foreign currency expenditures will be achieved each year for the next 20 years, beginning in 2008, the time of actual introduction.

From 2008 on, the entire LNG consumer price will go down by a maximum 9.5% compared to the preexisting contract by new introduction of 5 million tons a year. Despite continuance of high oil price, it is certain that LNG consumer price will be reduced.

\[
\text{Reduction rate of consumer price} = \frac{\text{Curtailment rate of introduction price (38.3\%)} \times \left( \frac{\text{Newly introduced 5.5 million tons including option}}{\text{the total amount from the long-term contract of 22.18 million tons in 2008}} \right)}{9.5\%}
\]

MOCIE set a ceiling on gas price increases even in the times of high oil price so that it could take proactive measures again future high oil prices. In other words, MOCIE’s principle was that standard oil price of LNG price would be limited at a maximum of $40 even if oil price went up. LNG price by the preexisting contract was linked to oil prices, so LNG prices went up automatically if oil prices increased. This new contract fixed the upper limit of LNG price.
Reduction of Foreign Currency through Competition

The amounts from these new contract countries exceeded that from Malaysia. Malaysia, a pre-existing contractor, was included in the new contract as a result of terms that it could supply 0.5 million tons more if a purchaser made an additional request. Pursuit of competition was profitable not only for introduction price but for security of supply amount.

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<th>Table 6</th>
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<tr>
<td><strong>Section</strong></td>
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<td>Long-term Contract</td>
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<tr>
<td>Mid-term Contract</td>
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<tr>
<td>Short-term Contract</td>
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<tr>
<td>New long-term Contract</td>
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<tr>
<td>Total</td>
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Those one-on-one consortium enterprises, which participated in tender bids individually, presented terms to producing countries so that new participants appeared other than MLNG. Companies that proposed greater amounts with low prices were selected as suppliers, and MOCIE did not conclude a contract with a producing country and project supplier that would not correspond with MOCIE estimates. This action was to correct the preexisting high prices that the Korean government had been paying. It was valuable not only for Korea by eliminating high prices, but also for the international market because it reduced surplus profits enjoyed by the pre-existing supply countries.

<table>
<thead>
<tr>
<th>Table 7</th>
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<tbody>
<tr>
<td><strong>History of the Drive for innovation</strong></td>
</tr>
<tr>
<td>- September, 2004</td>
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<tr>
<td>- November, 2004</td>
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<tr>
<td>- December, 2004</td>
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<tr>
<td>- January, 2005</td>
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<td>- February, 2005</td>
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<tr>
<td>- August, 2005</td>
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</table>

III. System behind the Drive for Innovation

1. Support System (President’s energy diplomacy)

With the rapid growth of the Chinese economy, competition for energy security has become almost the same as a war. Energy security has become no less intense than the old U.S.—U.S.S.R. arms race, especially now that India has joined in the competition.

Under these circumstances, the China National Offshore Oil Corporation...
(CNOOC) was unable to take over the U.S. energy company, Unocal Corporation, because of opposition from the US Congress. This had very significant implications for MOCIE and Korea where almost all energy is dependent on imports. China concluded a joint contract of both state-owned oil companies with Venezuela for strengthening energy cooperation instead of buying up Unocal Corporation.

Central Asian oil countries in the Caspian Sea area, like Russia and Kazakhstan, began to receive attention. In September of 2004, the major achievement of President Roh’s visits to Russia and Kazakhstan could be considered energy diplomacy for long-term energy resource security. Kazakhstan, called ‘the second the Middle East’, ranks 7th in oil and 15th in LNG reserves, while Russia ranks 1st in LNG reserves and 2nd in coal deposits. The strengthening of energy cooperation with these countries will encourage Korean enterprises to participate in exploitation of natural gas in Sakhalin and Siberia and surrounding regions, and will seriously affect the Korean economy, with its high concentration of energy-consuming industries. Stable security of energy resources is a very important matter because it is directly connected with the nation’s future.

Seeking to cope with various nations’ moves for energy security, MOCIE sought an innovation plan to support the president’s energy diplomacy for securing stable and less expensive energy resources over a long period of time. MOCIE made full use of the policy goal of introduction competition and turned Korea’s weakness as a country excessively dependent on energy imports into “buying power.” The results of turning the LNG introduction system into a competitive system included savings of 12.6 billion dollars (13 trillion won) and securing additional LNG suppliers.

2. Basic Principles of the Drive for Innovation

(1) Basic Principles of Innovation Strategy

1) Conformity of Innovation Target

The innovation of competitive LNG introduction is to contribute to ‘realization of an advanced industrial country’ through lowering the cost of production as a result of reductions in LNG introduction price. In the international circumstance of continued high oil prices, the relative importance of natural gas will increase. The innovation for LNG introduction will be an appropriate countermeasure for any country seeking energy security.

Based on forecasts of long-term natural gas supply and demand, the 7th long-term natural gas supply plan was established and included concrete ideas regarding natural gas introduction policy. LNG prices had been linked to oil prices in the pre-existing contract, thus inhibiting the country’s ability to prepare against high oil prices. Therefore, the maximum price system was introduced to freeze LNG prices on a fixed level with oil prices. Also, the plan called for renegotiation of prices in pre-existing contracts in order to reduce introduction costs.

Korea has had a LNG consumption pattern that of high demand in winter and low demand in summer. Considering such Korean LNG consumption patterns, MOCIE promoted introduction contracts that made it possible to adjust the supply amount seasonally because a flexible contact has economical advantage.

Long-term contracts were preferred for stable LNG introduction, and new contracts with new suppliers, Russia and Australia, were concluded as a means to reduce Korea’s excessive dependence on the Middle East. The
goals were to acquire stable supplies and opportunities for cooperation.

The innovation goals reflected the condition of the international market where a buyer has more advantage with the appearance of many new suppliers, and domestic environment changes like increasing LNG demand. The policy of competitive LNG introduction was established through case research of the oversea gas industry. It can be estimated that a substantial policy plan was successfully devised to implement this reform.

2) Fidelity to Content of Plan
For an alternative plan on competitive introduction of the gas, MOCIE researched foreign instances to make proper policy from June to October 2003. The research revealed that all eleven countries in the study, such as the UK, France, Indonesia, Japan, Australia, and the US, introduced competitive systems in the gas industry.

MOCIE agreed to discuss with the relevant authorities of the Ministry of Construction and Transportation and the Ministry of Foreign Affairs and Trade such issues as supporting the receipt of plant orders from domestic enterprises, oversea expansion of domestic construction companies, and diplomatic cooperation in bidding standards for LNG introduction contracts.

In the process of policy making, the interested parties’ opinions were broadly collected through the operations of a practical affairs subcommittee made up of experts and presentation meetings with related industry and non-governmental organizations. Finally, a main feature of the plan was a delegation from consumer organizations, who stood for the general public and monitored the whole bidding process for introduction contract. This was to allow the participation of the people, who are the end consumers of LNG, in decision-making on LNG introduction policy.

<table>
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<tr>
<th>Table 8: Content of Policy Plan by Ssteps</th>
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<tbody>
<tr>
<td>Establishment of long-term supply plan</td>
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<tr>
<td>Announcement of long-term supply plan</td>
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<tr>
<td>Establishment of the general public’s monitoring plan</td>
</tr>
<tr>
<td>Release of selected subject</td>
</tr>
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(2) Principles of Conducting Innovation

1) Efficiency of Operation Process

<table>
<thead>
<tr>
<th>Table 9: Main Contents of Policy Execution</th>
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<tbody>
<tr>
<td>- 2004. 12</td>
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<td>- 2005. 2</td>
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<td>- 2005. 2–6</td>
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<td>- 2005. 7</td>
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</table>

MOCIE made a final decision by conducting a transparent, proper, and prompt evaluation process on LNG introduction negotiations. All the participating domestic and overseas enterprises and related countries accepted the assessment’s outcome. That was the first principle of innovation, one that prevented any unnecessary dispute after the fact.

Second, MOCIE established an outside evaluation committee composed of an energy specialist, lawyer, accountant, and trusted delegate of a consumer organization who were qualified for objectivity, impartiality, and expertise, and the committee conducted proper bidding.
Third, considering LNG processing period, the MOCIE determined that contracts should be made at least three years in advance of actual introduction time. MOCIE quickly completed the final negotiations with preferable sellers and made contracts without delay.

2) Adequacy of Operation Process

To solve overseas problems, MOCIE made a close analysis of the situation in the international LNG market following the appearance of new suppliers such as Russia, Yemen, Iran, and Australia. MOCIE seized the opportunity in a timely manner and used it to maximize national interest.

Domestically, MOCIE had established and managed the Korea Tripartite Commission with the board of directors and delegates from the labor union of Korea Gas Cooperation (KOGAS) in December 2004 to settle a conflict from the great backlash of the union such as large-scale demonstrations and interference with administrative inspections.

Also, MOCIE prevented the possible damage to the national interest from an excessive competition between KOGAS and four other electric power companies by inducing agreement in fair competition from both sides.

MOCIE also sent letters to clarify the structure of competition in which a Korean buyer and an international LNG supplier should build a partnership by individual negotiation and submit the optimum supply condition to be selected as a final supplier. MOCIE took a persuasive style rather than a unilateral notification to inform the new style of competitive bidding to the overseas LNG suppliers by direct contact.

For those countries that were left out of the final selection in the screening process for a LNG introduction contract, MOCIE sufficiently explained the reasons and requested them to submit better conditions for future contracts.

Finally, MOCIE conducted public relations by mass media about the outcomes such as selection of the final three preferable sellers and settlement of the final purchasing negotiation.

<table>
<thead>
<tr>
<th>Table 10</th>
<th>Outcome of Innovation Public Relations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time</strong></td>
<td><strong>Subject</strong></td>
</tr>
<tr>
<td>February</td>
<td>Selection of preferred sellers of LNG long-term introduction contract</td>
</tr>
<tr>
<td>July</td>
<td>Settlement of final negotiations for purchasing 5 million tons of LNG a year from 2008 on</td>
</tr>
</tbody>
</table>

3. Drive Strategy

MOCIE wisely overcame various obstacles that occurred in the process of pushing for long-term introduction contracts by competitive bidding for the very first time in Korean LNG introduction history. It was remarkable in that MOCIE made an impartial and economic innovation by conducting objective and trusted evaluations. To achieve innovation goals like this, MOCIE established three promotion strategies.

1) Strategy 1: Convert the pre-existing monopoly introduction system to a competitive system

The new LNG long-term introduction contract for about 5 million tons, which would be be put into effect from 2008, would break from the preexisting monopoly system of KOGAS and introduce competition system between KOGAS and four other electric power companies for the first time in LNG introduction history to increase negotiation power of the whole nation and...
induce effective competition.

(2) Strategy 2: Strengthen negotiation ability by utmost utilization of structure of competition in international market

Previously, those natural gas import countries that fully depended on import for their consumption, including Korea, were under the situation where a small number of suppliers had strong influence in the international LNG market. However, there had been a change in the international LNG market, and those new suppliers like Russia, Yemen, Iran, and Australia were desperately looking for LNG consuming sites. MOCIE seized a good opportunity at a suitable time for concluding LNG introduction contracts, and it applied a strategy to make full use of Korea’s negotiation ability.

(3) Strategy 3: Conclude LNG introduction contracts with optimum conditions by objective and impartial assessment

Such a huge scale purchasing process involving hundreds of million dollars usually brings severe diplomatic competition. The most important matter with this kind of enormous purchasing process is maintaining transparency and objectivity of assessment to avoid diplomatic disputes after the fact. Therefore, MOCIE made every possible effort in the establishment of impartial and objective evaluation standards and management of a neutral evaluation committee.

IV. Drive Procedures: Overcoming Obstructions and Conflicts

1. The first round: Backlash of Vested Interests against Appearance of New Challengers

(1) Need to push LNG introduction contracts in preparation for 2008 and after

According to the long-term supply and demand plan of natural gas, Korea was in the situation of needing about 5 million tons of new LNG imports yearly from 2008 on. It was necessary to start pushing forward from the second half of 2004 because of the characteristics of the gas industry that require contracts to be made at least three years in advance.

(2) Appearance of challengers to Korea Gas Cooperation (KOGAS) and building a competitive structure

The Ministry of Commerce, Industry, and Energy (MOCIE) decided upon a policy that would introduce about 5 million tons of LNG yearly from 2008 by a competitive system. In September, 2004, the Korea Southern Power Co., Ltd (KOSPO), Korea East West Power Co., Ltd, Korea Midland Power Co., Ltd, and Korea Western Power Co., Ltd., all companies that consumed large amounts of LNG to produce electricity, submitted, along with KOGAS, business programs for direct LNG introduction from overseas. MOCIE built a competitive structure among these five companies in order to maximize concessions in the import of 5 million tons of LNG.
2. The Second round: Active Use of the Situation in the International LNG Market

(1) Delay of effective competition due to misunderstanding by international LNG suppliers

Following the resolution of those domestic conflicts, misunderstanding appeared among international LNG suppliers. In the past, they had dealt only with KOGAS and they misconceived the new policy as meaning that they would have more clients because of additional participation from other companies in the new contracts. LNG suppliers raised the price and started taking a high-handed attitude. The intention of MOCIE for building a structure of efficient competition was delayed.

(2) Clarification of structure of competition by MOCIE

To deal with this misunderstanding, MOCIE sent a letter in the name of the leader of the Resource Policy Division to the LNG suppliers to clarify the newly introduced structure of competition. MOCIE made it precondition that the five Korean buyers should have individual negotiations with various international LNG suppliers. After a Korean buyer and an international supplier built a partnership, they were to submit the optimum supply condition to MOCIE and go through an evaluation process by the government. After that, the partner-groups who presented the best conditions would be nominated as the final suppliers. MOCIE made this clear in the letter and thereby removed the misunderstanding. As a result of this endeavor by MOCIE, those international suppliers realized that they must offer the best prices and conditions to be selected as final suppliers.

(3) Backlash from the labor union at KOGAS

Under the circumstances described above, KOGAS came out against the new policy with the labor union as the central figure. On September 17, 2004, approximately 870 members of the labor union of KOGAS did a counter demonstration in opposition to direct LNG introduction in front of the government complex in Gwacheon. On October 6, 2004, 100 members of the union conducted demonstration against direct LNG introduction and reformation of the gas industry while the government was conducting inspection of the administration on KOGAS, so the inspection was disrupted.

(4) New Korea Tripartite Commission building support through debates and conferences

To get over these difficulties, MOCIE established Korea Tripartite Commission with a board of directors and delegates from the labor union of KOGAS in December 7, 2004. Up through June of 2005, they held a total of eight meetings and built support for bringing in a competitive system through debates and conferences on all related policies such as direct LNG introduction and reform of the gas industry.

(5) Settling a problem of excessive competition

After settling the problem with the labor union of KOGAS, the MOCIE faced another problem with the boards of directors of KOGAS and the other four companies. By having them sign a written agreement of fair competition principles, MOCIE took action to stop problems from an excessive competition.
3. The Third Round: Diplomatic Actions on LNG Supply

The structure of competition, now clarified and strengthened, stimulated the countries that possessed LNG to start an intense sales competition to supply Korea.

Those countries suggested various options and applied various forms of pressure. Russia stressed the energy cooperation relationship of Northeast Asia that had been strengthened after the Korean President had visited Russia. Iran exercised political influence by threatening to expel Korean construction companies from Iran if Korea didn’t purchase its LNG. Yemen promised additional benefits such as offering interests in gas fields if Korea purchased their LNG, while Indonesia and Malaysia offered LNG purchases with credit terms of 20 years.

4. The Fourth Round: Assurance of Transparency in All Procedures

(1) Principle of evaluation process

MOCIE recognized the reality that the only way to keep international trust and avoid diplomatic trouble after selection of specific suppliers is to make the choice and evaluation fair and clear. Therefore, MOCIE made every possible effort to ensure fairness and objectivity in the evaluation process.

(2) Establishment of evaluation standards and organization of evaluation committee

For impartial evaluation, MOCIE had established the utmost fair and objective standards in advance by acquiring energy-specialized research service from academic and research institutions, which was then submitted to evaluation by an outside committee. This outside evaluation committee was composed of an energy specialist, lawyer, accountant, and trusted delegate of consumer’s organization who were qualified for objectivity, impartiality, and expertise. The committee carried out a thoroughgoing screening process for open and fair contract negotiation.

(3) Results of the evaluation committee’s decision

Following the strictly fair decisions of the committee, MLNG corporation (1.5 million tons a year) of Malaysia, Sakhalin Energy Company (1.5 million tons a year) of Russia, and YLNG cooperation (2 million tons a year) of Yemen were selected as preferred sellers, and MOCIE made final LNG introduction contracts with these three companies in August 2005. It was the very first time in Korea’s LNG introduction history that a competitive system was applied to the purchase contract of 500 million tons LNG per year. The new competitive system achieved excellent results that would save approximately 12.6 billion dollars for 20 years from 2008 on over the pre-existing LNG introduction contract.

V. Achievements of the Drive: the Best Contracts in LNG Introduction History

As previously stated, natural gas is traded as in the forms of PNG and LNG. Generally speaking, it is traded as PNG if distance of transport from a gas field to a consuming site is less than 5,000 km (depending on conditions) and as LNG if it is farther than 5,000 km. Therefore, the gas to Korea is LNG.

The LNG industry is an international investment business with a large scale.
To develop a gas field which can produce 3 million tons of gas per year the cost of investment in equipment runs about 3 to 5 billion dollars. It takes at least three to five years for actual transportation after conclusion of a contract.

This kind of trade is a complicated process done with participation of LNG transportation companies and international financial cooperation in addition to the actual LNG suppliers and consumer countries. Therefore, it is possible to have a long-term contract for 20 to 25 years, and most cases have these long-term contracts. These contracts were very complicated and inflexible because of trade practices such as Take or Pay (TOP)—a condition that requires buyers to take a certain amount of gas per year to pay for the shortfall if they cannot take the preset TOP amount—and Ship or Pay (SOP)—a condition that requires buyers to pay a certain amount of shipping costs (usually 95% of the cost) if annual freight duties fall below a fixed amount.

The MOCIE’s innovation project succeeded in making the inflexible introduction system more efficient. First, making a low-priced contract of 38% less compared to the preexisting contract saved approximately 12.6 billion dollars over 20 years. Second, adjusting the supply pattern cut down 800 million dollars in costs of building additional storage tanks. Third, obtaining interests in gas fields increased the rate of independent exploitation from 4% to 10%. Fourth, sources of introduction became diversified be adding such countries as Russia and Yemen. Fifth, the innovation made it possible to earn 2 billion dollars in related businesses such as the shipbuilding and marine transportation industries.

1. Making Low-priced Contracts of 38% less than Pre-existing Contract

(Saving 12.6 billion dollars per year for 20 years, introduction price freeze of LNG in the case of oil prices rising over 40 dollars per barrel)
prices to a maximum of 40 dollar per barrel oil princes, regardless of oil price increases. By applying the upper and the lower limits of oil price, it was designed to provide flexibility against high oil prices. This is regarded as a great contribution to guard against declining industrial competitive power in times of high oil prices.

2. Matching Supply with Consumption Patterns in Korea

Korea has had an LNG consumption pattern that is high in winter and low in summer. The former LNG suppliers used to insist on provide the same amount all the year round, imposing a heavy economic burden on the people for building additional LNG storage tanks for summer time. The new introduction contracts made it possible to adjust the supply amount with the Korean LNG consumption pattern, so it had the desired effect of saving 8 billion dollars in costs for building additional storage tanks.

3. Raising the Rate of Independent Gas Exploitation:
4% at present, 10% after 2008

Independent exploitation represents the amount of gas field interests acquired when a Korean company participates in oversea LNG exploration and collects gas. As a result of the active application of buying power through the competitive system, Korean companies such as SK, Hyundai, and KOGAS made contracts to acquire 21.5% of Yemeni gas field interests. It allowed Korea to benefit directly from foreign currency gains through exploitation and exportation. The result was an increase in the rate of Korea’s independent gas exploitation from 4% to 10%.

4. Enhancing Stability of Energy supplies by Diversification of Gas Introduction Sources

The new contracts added Russia and Yemen as channels of supply, which used to be limited to a few Middle Eastern and Southeast Asian countries. Securing stability of natural gas supply with diversification of sources is a remarkable gift from the introduction of the competitive system to Korea, which needs low-priced stable LNG supply for its industrial and economic
growth. Especially, supply from Sakhalin area in Russia where is geographically closed to Korea is expected to make it possible to manage more flexible supply and demand program in winter when demand for LNG is usually high.

5. Obtaining Management Rights for LNG transportation

The views of import countries had not been reflected in LNG transportation rights. The usual circumstance had been that an export country ran a separate transportation company or made a contract with another company not from the import country. The current innovation allowed Korean shipbuilding and marine transportation companies to place orders and obtain management right for four tankers. This enabled Korea to have the prospect of earning 2 billion dollars in the shipbuilding and marine transportation industries.

VI. Analysis of Success Elements

Korea has no oil production at all, so energy economy is closely connected to national security in Korea. Therefore, Korea has made constant efforts to increase energy efficiency as it has developed into an industrial country.

The curtailment of foreign currency expenditures through the competitive system of LNG introduction is regarded as a flexible countermeasure that strengthened Korea’s ability to overcome an energy crisis. This achievement was possible for the following reasons. First is the switch to a mentality of searching for alternative energy resources. Second is the introduction of Neo-liberalist open competition to overcome the old monopoly supply system.

Applying an objective assessment system was useful in persuading the interested parties.

1. The Shift in Mentality

From the view of advanced Western capitalist nations, the period of use of solid-fuels was the Industrial Revolution of the 19th century. In Korea, however, the period of use of solid-fuels in Korea was from the 1950s to the 1970s. From the 1980s, an industrial system based on oil resources was established in Korea, so the proportion of oil in primary energy consumption rose to over 50%. Compared to Europe and the US, the rate of dependence on oil is quite high in Korea, and it is still somewhat high compared to Japan.

<table>
<thead>
<tr>
<th>Table 11</th>
<th>Proportion of primary energy consumption classified by nation (unit: %)</th>
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<tbody>
<tr>
<td>Section</td>
<td>Oil</td>
</tr>
<tr>
<td>USA</td>
<td>39.00</td>
</tr>
<tr>
<td>France</td>
<td>35.96</td>
</tr>
<tr>
<td>Netherlands</td>
<td>49.21</td>
</tr>
<tr>
<td>Russia</td>
<td>13.13</td>
</tr>
<tr>
<td>China</td>
<td>24.62</td>
</tr>
<tr>
<td>Japan</td>
<td>47.62</td>
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<tr>
<td>South Korea</td>
<td>51.02</td>
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As previously stated, two-thirds of the world’s total oil deposit are the Middle East, and the supply price has risen continuously due to high demand all over the world. At this moment, it is important to import and save petroleum resources efficiently. At the same time, however, it has also become important to recognize natural gas as a new energy resource and increasing its
proportion of total energy consumption. The technologies of natural gas processing, storage, and transportation are continuously improving. Therefore, the plan of the MOCIE, which predicted higher efficiency of natural gas in the future, has laid a foundation to manufacture new products by natural gas that will also observe the stipulations of the UNFCCC (United Nations Framework Convention on Climate Change).

2. Dismantling Monopoly from the Point of View of the People

Although the monopoly system of LNG introduction had been long taken for granted, MOCIE broke free of the existing framework and applied a competitive system for the very first time in Korea’s LNG introduction history.

Although the monopoly had been seen as untouchable for the last few decades, MOCIE was able to raise objections and make significant inroads. As a result, the organization could present the people with an enormous benefit by saving 12.6 billion dollars in LNG introduction costs. KOGAS, which is a governmental investment organization, could stand to lose, but it has been run by the people’s taxes. Therefore, transferring its vested right is a welcome event from the people’s point of view. Negotiating by a single organization can have advantages, but in the case of LNG the competitive system has more advantages than disadvantages.

There is no doubt that the rise of more supply sources in the international LNG market served as a base of success in negotiations for LNG introduction. However, it was not inevitable that the favorable situation in the international market would be directly beneficial to Korea. It was only by introducing a competitive domestic process that Korea was able to take maximum advantage for the international market situation. As a result, Korea could obtain valuable results with excellent conditions, the best in international LNG introduction history.

3. Building a Proper Evaluation System

Impartiality and objectivity are the primary factors to break down the existing frame of monopoly supply and overcome severe diplomatic competition to achieve such large scale international deals with savings of over 12 billion dollars. Through the transparent and trustworthy assessment of introduction contracts, the entire purchasing process was done successfully without any diplomatic troubles in spite of its tremendous scale. All the participating domestic and oversea enterprises and related countries accepted the assessment’s outcome. If there had been any possibility of showing favoritism a specific party or adopting an improper expedient, Korea would have been subject to criticism from the other petroleum exporting countries and would have encountered serious difficulties.

The reasonable assessment system based on liberal economy system, which is the current world trend, made it possible to break free of domestic monopoly and induce mutual positive results; bringing about cooperation between the private and the government and increasing Korea’s international credibility. Building a proper evaluation system is not limited just to strategy or formation of an evaluation committee. A delegate from consumer organizations monitored the whole evaluation process, a process intended to enable the people to share in the profit and to have greater trust in policy.
4. Harmonious Resolution of Conflict

The labor union of KOGAS showed the great backlash against the introduction of a competitive system. They were afraid that the loss of the KOGAS monopoly would result in a restructuring that would entail mass layoffs. This kind of reaction, with the goal of maintaining official or quasi-official status for the organization, is common in the process of privatization. Privatization efforts are often delayed or even stymied in efforts to privatize the third sector by this kind of reaction.

To settle the conflict with the labor union, MOCIE sought to build support by carrying out tripartite discussions under the principles of allowing for sufficient dialogue and consultation. To deal with those international LNG supplies that misunderstood Korean intentions, the government actively clarified the newly introduced structure of competition. MOCIE also prevented excessive competition among KOGAS and four other electric power companies and continued to manage the structure of efficient competition until the conclusion of negotiations. The result was the maximization of profit for the nation.

5. Lessons from this Success

The Korean government became more interested in natural gas energy during the process of implementing the new system and negotiating the contracts. The 2005 contract was a case of the application of competition theory for import, and the important lesson was that the government should concentrate its effort to establish its position in the gas market by active participation in the development and exploitation of gas fields. The world gas exploitation market is currently dominated by three major enterprises: Royal Dutch Shell Group, Exxon Mobil Corporation, and BP. They began to pay attention to the natural gas market from the time when North Sea old fields began to decline, so now they dominate the market. Now is the time for Korean companies stop admiring their achievement and to realize that Korean firms, too, should be able to participate in this market.

We are now focusing on solving domestic competition. Application of competition shouldn’t be only limited to just one policy, which is LNG introduction. Restriction of competition by government intervention is still exists in many fields of the whole economy and society in Korea. In these fields, of course, there are interest groups that try to keep vested interests and their profit in monopoly. To overcome these strong interest groups, we need a spirit that welcomes challenge and is committed to achieving decisive innovations. ‘Competition’ is not just about innovation, but should entail an awareness of crisis, a knowledge that we will fall behind over unless we accept the need for competition and innovation.
The Comprehensive Knowledge Management System Of The Fair Trade Commission

- Fair Trade Commission
The Comprehensive Knowledge Management System Of The Fair Trade Commission

Kwanbo Kim (Professor, Catholic University of Korea)

Case Overview

The goal of the Knowledge Management System (KMS) developed by the Fair Trade Commission is to enhance customer satisfaction and the enhancement of business quality. In order to achieve this goal, the Commission established an on-line system, which enables customers to handle their businesses through the Internet. In addition, the Commission also established a portal business-supporting system and knowledge milage system. As a result, this innovation has brought in the simplification of business processing and the curtailing of labor and expenditure.

I. Purport of Innovation: Background of C-KMS Construction

Alvin Toffler indicated that the third wave to be developed in the 21st century would be an intellectual community. He emphasized that knowledge would function as the source of competency. The Comprehensive Knowledge Management System (hereafter C-KMS) developed by the Fair Trade Commission (hereafter FTC) is a task execution system based on the Knowledge Management System (hereafter KMS), which has greatly enhanced task productivity and customer satisfaction through the systematic linkage with other tasks (i.e., case rulings and monitoring task processes) of the FTC. The KMS represents the internet-based information management system designed to enhance an organization’s competitiveness through new value-creation gained by sharing the various knowledge competencies of all employees. This is achieved by systematically categorizing, registering, and evaluating both the knowledge produced within the organization and the individual knowledge acquired by each employee.

In the 1990s, Information Technology (IT) rising from the emergence of informatization has significantly influenced the way people work. In the past, data batch processing using mainframe computers was an important task in information systems. Following the development of telecommunications and client/server techniques, however, IT is changing the task process beyond simple data processing over the entire organizational management. In developed countries, knowledge management is expanding as a new management technique along with the advancement of Informatization. In Korea, however, only a portion of large enterprises have constructed and are currently utilizing KMS, while the government lacked recognition of knowledge management itself before 1999.

The background of the FTC’s establishment of the C-KMS can be approached from the following three perspectives: First, there was a high demand for the necessity of records information on legal case precedents and concern over the loss of valid knowledge information. As a quasi-judiciary agency, the FTC has needed to keep records of legal precedents necessary for systematically utilizing and managing similar cases and market analysis data in order to maintain consistency in agency rulings and enhance the level of adjudication. However, there has been a loss of valid knowledge information and a decline in business efficiency due to the absence of a knowledge accumulation system. High value-added information and personal know-how collected and produced during the task process were disappearing, resulting in delays in task process speed as well as inefficient task performance. Second, there has been increased civil dissatisfaction with the FTC’s public service delivery due to the absence of clear guidelines and the low information accessibility of complaint-related legal knowledge. In the case of civil appeals or data submissions by citizens and enterprises, informers and complaint filers had to visit the agency in person several times during the
The Comprehensive Knowledge Management System Of The Fair Trade Commission

II. Goals and Contents of C-KMS Innovation

1. Goals of C-KMS Innovation

The goals of C-KMS construction are the actualization of customer satisfaction and improvement of business quality. To achieve this goal, three tasks must be executed: the enhancement of citizens’ convenience, efficient task processing, and systematic management of knowledge. The enhancement of citizens’ convenience, first of all, is required for shortening case processing periods, one-stop/non-stop public service of complaints, and public relations of FTC. Second, efficient task processing and management should be conducted by both preventing overlapping task processing and simplifying procedures through the organic integration of various processes. Finally, the systematic management of knowledge should be institutionalized for sharing information on external matters through information accumulation and utilization of a knowledge map, which could lead to the actualization of customer satisfaction and enhancement of the organization’s competitiveness.
2. Major Contents of C-KMS

(1) Knowledge Management System (KMS)

1) Knowledge Hub: Accumulation and management of knowledge using the ‘Knowledge Map’

Knowledge information from various policy reports and data on policy produced during the task implementation process, such as case processing, is automatically saved while related external information is collected and accumulated by utilizing personal-created knowledge and the Web Robot (automatic program that collects necessary data). Knowledge is systematically sorted, accumulated, and utilized into 12 categories (i.e., case processing, policy, law, lawsuits). The Knowledge Map is designed in a format similar to Yahoo’s portal site, providing users with convenient access.

2) Knowledge Management Task Process

The knowledge management task process of the FTC’s KMS includes knowledge acquisition, knowledge creation, knowledge retrieval, knowledge refinement, knowledge storage, and knowledge utilization.

a. Knowledge Acquisition: Network Construction for External Knowledge

A distinct and concrete network for the inflow of external knowledge is set up. For example, the network includes data collection by overseas FTC residents, on-line information collection by 100 monitoring members of FTC policy, and construction and operation of an overseas competition policy system. Also, diverse external expert pools, such as attorneys, are utilized as sources of knowledge acquisition. In particular, interaction with other agencies, benchmarking of foreign case studies, and symposia with invited experts are used to actively pursue the inflow of external knowledge.
b. Knowledge Creation: Linkage with Suggestion System, CoP Activity
Management Online and Offline

The FTC provides an Innovation Plaza within its own KMS to create new knowledge so that all employees could propose new knowledge and ideas. As a CoP (Communication of Practice) activity, such knowledge and data are registered in the Innovation Plaza and the important activities are recorded by the internet broadcasting so that absent employees can hear new developments at their convenience.

c. Knowledge Accumulation: Systematic Accumulation of Task Related Data, Know-how, and Manuals

Data and know-how are systematically accumulated in the KMS to the extent that no additional cabinet will be needed. Along with the task related manuals, for example, the case and civil complaints processing system, policy quality control system, case business processing helper, and FTC knowledge map are systemically formed, accumulated, and managed through the online system.

d. Knowledge Refinement: Knowledge Refinement Criteria, Knowledge Grade Scheme, Knowledge Master

Knowledge refinement is clearly conducted by knowledge refinement criteria, that is, such steps as knowledge registration, approval, certification, and evaluation. All knowledge is evaluated into AF grades by knowledge user and knowledge guide. Also, a designated knowledge master periodically evaluates knowledge, selecting that which is considered to be excellent.

e. Knowledge Storage, Distribution, and Utilization: Task Oriented Knowledge Guidance, Knowledge Access Differentiation, System Convenience

A knowledge map is designed according to business processing purposes and the differential criteria of knowledge access are concretely classified according to knowledge type. Also in the process of task performance, most necessary information and knowledge is provided through the KMS which is designed based on such user-friendly perspectives as Single Sign On and search function of diverse dimensions. Also, Q&A corner, SOS Help Corner, and Innovation Issue Identification and Cyber Discussion Room Corner are implemented.

3) Institutions for Knowledge Management Vitalization: Knowledge Search and Establishment of Knowledge Sharing Culture

a. Knowledge Mileage Policy

The ‘Knowledge Mileage Policy’ is introduced and operated to promote the voluntary participation of employees by providing opportunities to share knowledge and information. This policy operates evaluation and compensation systems based on the degree of knowledge supply and utilization, which leads employees to continuously make contributions to knowledge management. The FTC has been enforcing this policy since October 2000 and operational problems have been decreasing every year. In 2005, the knowledge mileage policy has been established as a means of knowledge management vitalization of the FTC by setting forth the ‘Guidelines for Operations and Management of the Knowledge Management System’. By granting innovation mileage for registration and use of knowledge, awards such as ‘Knowledge Champion of the Month or Year,’ ‘Best Knowledge Department,’ and ‘Knowledge Guide of the Year,’ are determined, providing additional points in personnel performance evaluation along with appropriate awards. These points and awards induce employees to voluntarily participate in the knowledge management activity of the FTC.

b. Designating and Operating a Departmental Knowledge Guide

A knowledge guide has been appointed for each department since 2001.
The Comprehensive Knowledge Management System of The Fair Trade Commission has become paper-free. Circulation of electronic data and active electronic approvals has diminished the waiting times and shortened the large amount of time consumed in the delivery of documents. Moreover, by regularly announcing the registration of knowledge with the granting of mileage as well as posting the content of knowledge on the portal website, knowledge registration competition is induced among the employees, ultimately leading to a more active ‘Information Wall-less’ environment.

f. The Publication of e-FTC: Electronic Informatization Newsletter
By publishing bi-weekly newsletters (e-FTC) and distributing it to employees through e-mail, employees’ understanding and use of knowledge management is increased. The e-FTC news update covers the need of knowledge management, domestic and world-wide cases of knowledge sharing, the very latest IT trends, and issues regarding informatization of the FTC.

(2) Comprehensive Knowledge Management System (C-KMS): Major Task Systems Linked to the KMS

The C-KMS is a one-stop overall administrative task portal system through which the KMS is organically linked to the following eight sub-systems: work progress review, investigation processing, case and litigation management, policy quality management, customer information, cyber synthesis consultation room, enterprise information, and electronic approval and documents. Moreover, all systems can be accessed through the portal site through a ‘Single Sign-On’ system. While in the past each system was individually logged on, the current C-KMS, through its Single Sign-On portal system, allows all systems to be utilized in the portal screen through one integration certificate.

c. The Knowledge Information Search Competition
Every May, the ‘Knowledge Information Search Competition’ is held to improve employees’ knowledge search abilities, at which time 10 winners receive awards. Employees search for designated information within the knowledge management portal system, which is intended to enhance the knowledge sharing culture.

d. The Knowledge Contest
The Knowledge Contest initiated in 2005 requires that every employee provide one piece of knowledge during a specific period. All information is assessed by evaluation members and the employees selected as providers of outstanding knowledge are given awards. This contest held every October is intended to produce advanced high-quality knowledge such as personal experiences or know-how (policy development, case research technique, policy reformulation).

e. 3-Less Campaign: ‘Information Wall-less’, ‘Paper-less’, and ‘Loose time-less’ Activities
The FTC continuously developed Paper-less, Loose time-less, and Information Wall-less activities to strengthen knowledge management. This activity was aimed to reduce unnecessary tasks and improve the overall work environment. By converting various documents and data into electronic data (paper-less), executives’ weekly or monthly meeting presentations have become paper-free.
1) Work Progress Review System: Customized Information Provision by Job Position

The work progress review system supports the decision-making and policy judgment by providing customized information to the Chairman, headquarter directors, and team directors. Sharing information on various tasks that are on-going, coming to a close, or are in delay throughout the organization, enables managers to enhance the task implementation competency and efficiency of all employees.

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4) Policy Quality Management System
The policy quality management system improves continuously the quality of 37 major policies of the FTC by examining the policy processes through real-time two-way communication between executives and managers.

5) The Internet Broadcasting System and Cyber Training Institute
Employee meetings, education, and CoP/study group presentations are broadcasted live through the Internet to both the headquarters and branch offices, strengthening the bonds among employees and facilitating the sharing of information. The Online Cyber Training Institute is operated so that all employees can obtain professional knowledge related to their duties independent of space and time restraints. Educational contents in 14 different areas such as curbing economic concentration and reviewing mergers & acquisitions were developed in order to strengthen employees' professionalism.

6) The Cyber Synthesis Consultation Room
The Cyber Synthesis Consultation Room provides the utmost consideration for the convenience and benefits of the civil petitions. Civil petition registration is available over the Internet without a visit to the FTC's office. When one needs consultation in person, appointments can be arranged through the Internet. After such public service is carried out, the customer-satisfaction survey is conducted and its results are used as feedback data.

7) Innovation Management System
The innovation management system seeks to pursue the attainment of innovation goals. This entails the continuous evaluation of and compensation for innovation activities in order to maintain and manage the goals. By opening
innovation accounts, the innovation mileage system evaluates and manages innovation activities at various levels ranging from individual to department. The system covers “my innovation accounts” and innovation account rankings.

By creating bulletin boards for each county’s innovation activities, innovation supporters (junior board, transition leader team, and study groups (CoP), the progress of innovation activity is frequently monitored and information is mutually shared. Innovation issues are explored in cyber space and creative and innovative ideas are brought up for debate among employees in the cyber discussion room.

8) Enterprise Information System

The Enterprise Information System accumulates and provides enterprise-related data that are needed for various tasks such as business (enterprise) group management, credit evaluation information, fair trade case processing, and policy formulation. The system releases to the public internally important knowledge information such as fair trade deliberation and rulings, law and regulations data, outsourcing research reports, and policy documents.

In the aftermath of globalization and open-economy, the FTC has noticed that there were frequent cases of domestic firms paying overseas fines to foreign competition agencies in relation to international cartels. Up to March 2001, there have been 33 domestic firms that have been penalized more than $10 million (103 billion won) in fines. Under these circumstances, the need to enhance domestic firms’ rights and benefits has been proposed and foreign competition policy-related information has been delivered to overseas expansion enterprises since May of 2003.

9) Additional Management Support Systems

Finally, various additional management systems were constructed to enhance business or management efficiency. They include the policy assignment management system requested by the National Assembly, the Q&A system of the National Assembly, and a multifaceted (multi-dimensional) evaluation system.

(3) Operation Case Presentation of Task Processing Linked to Knowledge Management

Task processing linked to knowledge management is conducted through the following procedures: Registration of civil appeal → Initiation of case → Deliberation Processing → Ruling by the FTC → Execution Management.

<Figure 8> Organic Task Processing Linked to Knowledge Management
When the processing of a case is terminated, a message is sent out to the customer’s mobile phone. Customers can easily verify the result by logging into the homepage of the FTC, where they can also provide an evaluation of their customer-satisfaction level.

<Figure 9> Notice of Final Decisions by the FTC

(4) Future KMS Development Directions

Current evaluation and performance management system for knowledge activities provide appropriate incentive mechanisms to establish a knowledge sharing culture by promoting knowledge registration and utilization through employees’ voluntary participation. However, generation and management of core knowledge as well as systematic linkage to performance management of knowledge-activities through qualitative evaluation have not been efficiently carried out. Thus, a qualitative leap of knowledge management is necessary by improving the weak points of the existing KMS. Rather than quantitative evaluations like the number of knowledge registrations, qualitative evaluations for generating and sharing more valuable core knowledge should be pursued. By increasing the reuse rate of such knowledge, the innovation competency and competitiveness of the organization (FTC) should be strengthened.
In particular, newness of knowledge should be maintained by eliminating knowledge that is repeated or that has lost significance. Finally, the linkage scheme between the Balanced Score Card (BSC) as a performance management tool and knowledge management activity should be constructed to communicate the perception among employees that such activity is an important task within the organization. The FTC is currently reviewing a plan that stipulates a KMS infrastructure reflecting these improvement suggestions through revision of the “Guidelines for Knowledge Management System Operation & Management.”

III. Construction Process of KMS & Overcoming Barriers

1. Promotion System

To execute harmoniously the project of customer-oriented C-KMS construction, the FTC has been making an effort to realize successfully its goal by forming the internal promotion group.

(1) Promotion Group for KMS Construction: Before July 1999

The promotion system was relatively weak until July 1999. As shown in Figure 11, the promotion group was operated by the internal staff of the Information Management Office and its functions were limited mainly to the selection of informatization target businesses, the writing of project plans and RFP, and the selection of contractors for KMS construction.

(2) Formation of Promotion Group for C-KMS Construction: After July 1999

In July 1999, a current promotion group was formed for C-KMS development. After establishing the Secretary General as the director of the group, an independent T/F team was formed with 26 people including the appropriate officers of each department and multiple discussion sessions, such as the knowledge management workshop, and social gatherings were held for the purpose of forming an common internal sense of purpose. The promotion group has been composed of a team director (planning and management officer), coordination committee members (director generals, general service director, computerization deputy director, LG-EDS PM), promotion unit (administrative & judicial officer/unit director, bureau and division - designated 14 deputy director and officers, 5 staffs of information management office, and one officer for overall undertaking of administrative affairs) (see Figure 12).
The major activities of knowledge management organization are establishment of planning and strategy of knowledge management, formulation and implementation of knowledge management guidelines, and management and support of CoP activities (expansion of participatory culture for knowledge activities through the knowledge leader operation). In addition, along with the knowledge information search competition and the knowledge contest for expansion of participatory culture in knowledge activities, its functions include guidance, maintenance, registration approval, evaluation, quality control of knowledge, and experts' Q&A.

The current knowledge management team is composed of Chief Knowledge Officer (Planning and Management Officer) as the knowledge management team director, Knowledge Master as a knowledge manager (one staff in Information Management Office), and 24 Knowledge Experts (knowledge guides) as a business innovation consultation group (see Figure 13).

The duties of the Chief Knowledge Officer are as follows: establishment of basic planning for KMS management, operation and maintenance of registered knowledge, expansion of knowledge sharing culture as well as employee training, evaluation of knowledge, and establishment of compensation methods. The Knowledge Master’s duties are the operation and maintenance of overall KMS matters, authentication of registered knowledge, operation and maintenance of the knowledge mileage policy, and activation promotion of the knowledge sharing culture. The Knowledge Guide’s functions include the encouragement of knowledge registration and sharing of published data by bureaus, quality evaluation and authentication of personal knowledge registration, evaluation of idea and cases by events, departmental informatization task maintenance, and cooperation and support for information system construction and supplement-related tasks. Finally, the knowledge-based business innovation consultation committee (2005) is composed of 3 external experts and conducts consultations for the operation, activation, and information system construction of the FTC’s efficient knowledge management.
After this setback, the FTC’s Mr. K, an innovator who showed interest in knowledge, was sure that the KMS was a must for organizational competitiveness and began to agonize over how to promote the system construction business. At that time, most executives and regular employees showed little interest. K thought that for the successful promotion of the system, it was vital to encourage staff interest first, and initiated a report to induce executive interests. Mr. K reported detailed concrete cases about the necessity of knowledge sharing to the internal meeting of FTC. The cases were the problems of solution on how the FTC should cope with remedies on subcontracting case related to reconciliation and the possibility of unadjusted amounts’ position as a liquidated bond, which were main issues in competition policy at that time. The two cases had been reported and examined in the past. However, after the person in charge was changed and the same issues reappeared again over time, new replacements were redundantly examining these cases from the beginning once again. Mr. K then found and transferred the previously attained data knowledge to the new replacements, and it became apparent that the old data was very useful to newcomers in the process of reporting those cases. As a result, executives recognized the necessity of knowledge sharing, and issued orders to inquire into methods for data sharing.

Mr. K’s presentation to the executives provided the impetus. At last, the FTC decided to invent an internal data sharing system on its own and use it temporarily, while re-promoting the C-KMS construction project. Due to a lack of understanding of knowledge management and a concern that the term, “knowledge management system” might sound too extravagant, at first, the system was named the “internal data sharing system” and the basic contents of knowledge management, such as the necessity of data sharing and the recycling of knowledge, were transmitted to the employees. The internal data sharing system let various data, examined and reported by each department, to be presented in the electronic publication room, while recycling those
presented data by saving them in a database and categorizing them into various subdivisions, such as strategy information, corporation information, overseas information, etc.

The internal data sharing system, launched in June 1998, began to encounter complaints and suggestions for improvement from employees in the latter half of the year. The fact that the employees demanded improvements meant that they recognized the necessity of data sharing. It was a great success at that time, and provided strong hopes for promotion of the C-KMS (comprehensive knowledge management system) construction project. The first improvement suggestion was due to the double work-load needed to register data; the system required employees to report data on documents and register the same contents in another file. The next requests were to improve the difficulties of data search and the inconvenient user methods of the system.

(2) KMS Project Planning Establishment, Construction, and Opening Phase for Desire of Innovation and the Fruits of Perseverance

In March 1999, based on the experiences attained from the internal data sharing system and the plan of the ‘Fair Trade C-KMS’ construction established in 1998, the FTC established a project plan for the “construction of the ‘Fair Trade C-KMS’ for customer satisfaction” and applied for selection as a project for informatization at the Ministry of Information and Communication. Finally, the FTC project proposal was accepted.

For successful promotion of the project plan, the FTC needed the understanding and support of the people who would use the system in operational processing. This was because people tended to resist the adaptation of new institutions and processes that would change established traditional practices. To cope with this situation, the FTC appointed a Secretary General as the promotion director and inaugurated a system development team formed with 26 people including each department’s deputy director. Then the FTC executed two knowledge management workshops, and set up a knowledge management master plan that included a search for knowledge of management targets, business process designs, etc. Also, the FTC completed the system development during the time period between Aug 1998 and March 2000, while deriving and reflecting additional requests and improvements by holding two demonstration meetings targeted towards both executives and employees. After going through a test run in five main departments from May 2000 and an expanded test run of all departments for a month, the system was formally opened on July 10, 2000.

(3) The Expansion and Settlement Phase for Knowledge Management

Thereafter, through constant system improvement, it was expanded and reorganized into the portal system of knowledge management in 2003. Systemization of the needed knowledge and rational evaluation system was set up due to systematic classifications and accumulations of knowledge on cases, laws and regulations, policies, and main industry information as well as the establishment of an evaluation of knowledge and compensation systems. Moreover, a knowledge utilization scheme was established by encouraging employees to actively and voluntarily use accumulated knowledge gained through case presentations on knowledge utilization.

In particular, the FTC was selected as an outstanding government agency for knowledge management in 2004, and has been in the process of promoting an advanced project of the same system since 2005 in accordance with internal and external requests. The chairman of the FTC reported to the president of the Republic of Korea on the KMS case on August 19th, 2005 and the FTC was selected as the best government agency in knowledge management in 2005.
3. Resistance and Barriers and the Strategies for Overcoming Them

(1) Overcoming the Misunderstanding of the Knowledge Management System as a Suffocation Management System

At the beginning of system operations, there were intense complaints from the employees due to the instability of system, inexperienced users’ skills, and changes in operational process methods, etc. At the time, the chairman listened to employees’ bottlenecks over dinners with each department’s deputy directors. It turned out that the KMS itself was reported as the worst bottleneck. One employee told the chairman that the KMS should be called a suffocation management system.

Some employees emphasized that the operational processes should be changed back to the old traditional ways. Employees’ complaints had been anticipated beforehand as there wasn’t an organizational level knowledge management culture, but the result was worse than expected. The first step in dealing with this crisis was the analysis of employees’ complaints.

One of the characteristics of the FTC’s C-KMS was a recycling of automatically saved results which had come from the comprehensive processing of all administrative tasks (case processing and ruling, electrical approval, task drive review, document management, corporate information, etc) through the system. Therefore, task processing was impossible unless proper procedures were followed as required by the system. As a result, the most common complaints among employees came from the inconvenience of the system and difficulties due to inexperienced users’ lack of skills.

When the results of the analysis were reported to the chairman, a recommendation was made, based on newly devised plans for the proper use of KMS, to reaffirm the agency’s commitment to KMS because, abandoning the system would result in the waste of 1.2 billion won (1.2 million US$) of the budget.

Also, constant education on the skills for system use was conducted along with daily inspections\(^1\) by an employee support team under the collaboration between the development team and the information management office.

In addition, frequently generated cases of errors and obstacles as well as their suggested solutions were posted on the electronic board to be utilized publicly. After the support team was conducted for three months, employees’ complaints about the system decreased and things settled down. The duration of three months to settle down and stabilize the system was at a considerably quick tempo under the circumstances at that time.

(2) Detailed Barriers and Strategies for Overcoming Them

In the beginning of the KMS development, there was an overflow of employee cynicism and disinterest, and some executives expressed their negative opinions about the cost/benefit ratio. The consequences included a slowing of the process of project development. In order to overcome these problems and a detailed beforehand strategy (public relations and induction of interests through executive meetings, employees’ morning meetings, and bulletins, construction of promotion groups, and division of duties among members of the groups).

It was decided that for the success of the system construction, it was urgent to draw employees’ sympathy toward the importance of knowledge management and to form a culture of voluntary participation. To achieve these goals, the trust and support of the chairman was needed along with a continuous operation of multi-dimensional and fresh change-management programs. A strong will for promotion was expressed through executive meetings and the chairman’s speeches at the employees’ morning meetings.

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\(^1\) As a result of monitoring inspections, about 100 cases of errors were hunted down and by looking at the cases. There were 37 errors based on inexperienced use of the system, 23 errors based on lack of proper PC environment establishment and virus infection, etc, and 29 errors based on H/W malfunction due to old PCs.
IV. Innovation Outcomes of C-KMS Construction

After the construction and implementation of C-KMS, the overall performance outcomes were to enhance greatly both the task productivity and the customer satisfaction level. Detailed operational outcomes can be classified into the effects of both KMS itself and C-KMS as follows.

1. Effects of the KMS

(1) Operational Results: Knowledge Registration and Utilization Results

After the implementation of the KMS, the number of personal-created knowledge registrations was 1,414 as of Oct. 2005, a figure that represents an increase of over 1,000% compared to that of 2003. The level of knowledge sharing increased from 92.9 percent to 95.0 percent. Also, the number of...
knowledge utilization cases was 73,642, a dramatic increase of more than 60,000 compared to that of 2003 (see Table 1).

<table>
<thead>
<tr>
<th>Table 1</th>
<th>KMS Operational Outcomes</th>
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<tbody>
<tr>
<td>Year</td>
<td>2003</td>
</tr>
<tr>
<td>Number of Personal-Created Knowledge Registrations</td>
<td>334</td>
</tr>
<tr>
<td>Level of Knowledge Sharing (%)</td>
<td>-</td>
</tr>
<tr>
<td>Number of Knowledge Utilization</td>
<td>9,622</td>
</tr>
</tbody>
</table>

2. Effects of the C-KMS Utilization and Its Linkage to Other Systems

(2) Employee’s Satisfaction Level

Based on the satisfaction-level survey of KMS operation, the employee’s satisfaction level has been increasing annually. Table 2 shows the significant increase of satisfaction level from 75.7% in 2004 to 94.3% in October 2005.

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Employee’s Satisfaction Level by the KMS Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td>2004</td>
</tr>
<tr>
<td>Satisfaction Level</td>
<td>75.7%</td>
</tr>
</tbody>
</table>

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b. Improvement of Task Processing

The efficiency level of the decision making process was maximized through

If civil complaints like unfair trade are reported through the Internet, they are automatically received by the FTC’s civil complaints processing system. At the same time, a reply message is sent to confirm the receipt, while even process steps and ruling or settlement results are notified to the civil complaint filers in real time through e-mail and cellular phone calls. In the end, this online real time processing through the C-KMS has enhanced the satisfaction level of civil complaints (innovation is not just for public officials, but for the general public).
the provision of customized information. By providing customized information to the chairman, executives and headquarter directors, the system enabled the quick and easy understanding of policy tasks as well as orders from the president. Also, sharing of information on various tasks that are on-going enables employees to manage their task progress. For example, when an employee comes to work and logs into the portal site, the portal initial screen informs him what he should do on that day by specifying that “A” case processing is in delay for 5 days or that “B” task needs to be immediately completed (innovation is not to allow indolence).

c. Improvement of Task Productivity

Task processing methods are formed to serve as templates (processing notice formation) so that the level of productivity has improved. Also employees’ morning meetings, education, and forum broadcasting are broadcasted live through the Internet to both the headquarters and branch offices, eliminating time wastage due to spatial distance and employee movement. In particular, the employees of branch offices attend the morning meetings in real-time so that the feeling of belonging towards the organization is intensified and the orders of the FTC Chairman are rapidly delivered.

(2) Quantitative Performance

1) Budget Reduction

In the organizational personnel and budget dimensions, the official trip task-related budgets for examination report and decision signature are being curtailed. In particular, the decision documents of the FTC can be now signed electronically by non-standing commissioners in remote places (branches in Pusan and Seoul), saving time and budget resources. Also the attendance in the executives meeting of four branch office heads through the video conference system has brought about of cost reduction. Customers can also significantly reduce transaction costs (time, money, legal knowledge search, etc.) necessary for their task processing related to the FTC.

2) Time Reduction

The period for civil complaints and case processing has been greatly curtailed. For example, the average processing period for reply of civil complaints has been meaningfully reduced to 2.5 days in 2005 from 10.8 days in 2003, while the average processing period for cases has significantly shortened to 36.6 days in 2005 from 76.8 days in 2003 (see Table 3).

| Table 3 | Average Period Trend for Civil Complaints and Case Processing (Unit: days) |
|---------|------------------------|---------|---------|
|         | 2003       | 2004       | 2005       |
| Average processing period for reply of civil complaints | 10.8       | 3.6       | 2.5       |
| Average processing period for case | 76.8       | 56.1       | 36.6       |

3) Customer’s Satisfaction Level with the C-KMS

Based on the satisfaction-level survey of the C-KMS operation conducted on August 2004, the customers’ satisfaction level reported as “satisfied” of the C-KMS attained 81.0 percent. In particular, the interview results of employees and civil complaints show that the satisfaction-level of FTC’s C-KMS is high as follows:

“In the past, whenever something curious happened, I used to directly visit the FTC and contact the person in charge. However, the current C-KMS enables me to solve such matters under one-stop service without visiting the FTC. Things got more convenient. Particularly, looking at the cellular phone letter service that announces case processing stages, I feel that the government has greatly innovated by showing its stance to really understand civil petitioners’ positions.” <Customer A re civil complaints>
The C-KMS makes a tremendous contribution to efficiency like rapid case processing. However, the most important thing is to search and reutilize various related knowledge of previous similar cases. This is a requisite for the consistency of case processing while employees execute their tasks. “<FTC employee B>"

V. Factors of Successful C-KMS Construction

1. Thorough Preparation in Advance and Leader’s Continuous Concern

In the beginning, the FTC was omitted in the selection process of informatization application project due to the lack of employees’ understanding and preparation in advance. Afterward, however, thorough preparation in advance brought a successful implementation of the KMS. In particular, at the beginning of system operations, there were intense complaints from the employees, as seen in statements that the KMS should be called a suffocation management system due to the instability of system and inexperienced users’ skills. But the powerful leadership of the FTC Chairman overcame this bottleneck.

First of all, recognition has spread that if a goal of the KMS is declared as stated in “knowledge gets bigger and its added value increases as it is shared” and accumulated knowledge is shared, the task processing becomes efficient enough to reduce time and effort. Also, the environment of ‘Systematization of Knowledge’ was created through the in-depth benchmarking of KMSs domestic and international counterparts, as well as internal workshops (clear declaration of goals and persuasion of employees).

Second, from the beginning of the KMS development, the promotion task force team was constituted of working-level officials of each department, while holding two preview sessions for all employees, thereby designing a system that reflected user needs. In particular, the internal promotion task force team consisted of human resources with outstanding competencies and burning passion, as they provided and reflected active voices to the development task force team (use of ‘Q&A’ and ‘free bulletin board’, operation of ‘Help Desk’, thorough monitoring and immediate problem solution).

Third, under the situation where employees’ complaints increased rapidly, the FTC’s Chairman emphasized the necessity of the KMS through an expanded executives meeting, monthly morning meeting, luncheon klatch, etc, while overcoming the difficulties by delivering a strong message that “KMS is the only method for the efficient task processing” (expression of strong will by the Chairman).

2. Active PR and Incentive Offer

Although there was a widely-held perception that the knowledge registration itself was a dual burden and it was useless to inform the public about the steps of case processing, the participation of users was constantly encouraged through public relations and incentive offering.

First, through internal newsletters, workshops, forum, and e-mail advertisements, etc, the utility of knowledge management and the system directions for use were continuously explained. The merits of the accumulation and sharing of knowledge on the case processing steps, as well as automated knowledge registering to decrease task burdens, were actively advertised. For example, the merits include ease analysis of case analysis similar to past
cases and the elimination of confusion of tasks due to changes in managers (active internal public relations).

Second, through the construction of the knowledge mileage system, various incentives were offered to the knowledge donors. For example, by granting additional promotion points to outstanding employees in knowledge mileage and presenting the Chairman’s award, active participation from the employees was encouraged (establishment of incentive system).

Third, through various events, such as the knowledge information hunt competition, knowledge competition, and knowledge champion of the month, active participation from employees was encouraged (various participation events).

The FTC was selected as an outstanding institution for knowledge management due to the construction of C-KMS in 2004, having received a prize of from the Prime Minister. In particular, on August 2005, at the Knowledge Management Forum held by the President of the Republic of Korea, the C-KMS of FTC was announced as an outstanding innovation case. Also, the FTC has been designated as a leading institution of knowledge management since 2005 and 40 government agencies including the Presidential Secretariat have been benchmarking the C-KMS.

Other government agencies should consider the following lessons to benchmark and institutionalize successfully the FTC’s C-KMS.

The FTC is active in data sharing as well as case explanation and education of other departments. For instance, there have been efforts to provide individual case explanation and data to more than 30 government organizations such as the Ministry of Education and Human Resources Development, the Ministry of Justice, the Maritime Affairs and Fisheries Office, the Ministry of Planning and Budget, the Prosecutors’ Office, the National Tax Service, the Korean Intellectual Property Office, and the Ministry of Patriots and Veterans Affairs. Furthermore, the FTC offered classes on knowledge management operation in the knowledge management course of the Central Officials Training Institute.

VI. Lessons for the Successful Promotion of Knowledge Management

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Other government agencies should consider the following lessons to benchmark and institutionalize successfully the FTC’s C-KMS.
1. Improvement of Organizational Culture: The Fundamentals of Knowledge Management (1)

For successful establishment of KMS, the foremost necessity is to improve organizational culture. Even if organizational culture for knowledge management can not be the same for every organization, a common and essential culture exists for every organization in the pursuit of knowledge management.

First, customer oriented culture has to be realized since the information providing for customer satisfaction is essentially in that customers have the right to decide the level of value.

The meaning of true value should be considered from the customers’ point of view. What is the information people demand from the FTC? Also, what are the requests towards the FTC? To answer these questions, a thorough consideration of how and what to do is required.

Second, it is important to speed up the creation and innovation of new knowledge on a broader basis by establishing a culture that respects diversity. The creation and innovation of knowledge come from diversity. The creation and innovation of knowledge would be greatly limited in a society where the majority of knowledge is based on uniform thoughts and activities in group thinking without diversity. To encourage diversity, freedom from controls and directives has to be guaranteed. Only under these circumstances, can new attempts, new experiments, and frank opinions be produced, and from this, diverse and new knowledge can be created.

Third, mutual trust should be institutionalized among all the employees. Knowledge sharing is available only when mutual trust is formed among members of the organization. It is necessary to find ways to effectively utilize other people’s knowledge. Many people tend to under-evaluate others’ knowledge and to be overly attached to their own ideas. Also the greater the importance of knowledge in one’s possession is, the more he or she will not tend to share it. If no one in the organization is willing to share his or her knowledge, knowledge sharing will be difficult. Therefore, a win-win concept of collaborative victory that knowledge sharing is beneficial to each other has to be rooted among employees.

2. Compensation System Construction for the Activation of Knowledge Management

To introduce successfully the KMS, all employees must have an understanding of the necessity of knowledge management. Also a firm faith that only efficient use of knowledge can guarantee survival in a competitive environment should be inculcated among employees. The success or failure of knowledge management is decided by knowledge sharing; thus, proper
incentives and evaluations related to personal knowledge offers have to be realized. To encourage actively knowledge sharing, a fair evaluation system of knowledge offering, including a corresponding system of compensation, should be established.

3. Problems of Supplementation and Improvement for Sustainable Knowledge Management

KMS should be continuously upgraded. That is, the knowledge suitable for increasing new tasks and accommodating customers’ demands should be acquired, refined, saved, distributed, and utilized. This task process should be endlessly diagnosed and thus the sustainable knowledge management activity should be institutionalized. The current case management system is composed of 11 processes, starting from registration to completion, and a more simplified management process is needed. To do this, first of all, it is necessary to systematize both monitoring indicators and management for knowledge management activity. Second, quantitative management of knowledge is needed. Diverse activities should be conducted to increase the amount of knowledge. Third, the qualitative management of knowledge is needed. Diverse activities should be effectively conducted to upgrade the quality of knowledge. Finally, development of the knowledge network for the entire government through the connection of GKMC (government knowledge management center) and KMS of FTC is needed. Thus, a module to link the public information of the FTC with the GKMC as well as an automated knowledge sorting system must be developed.
Introduction of Action Learning in Public Officers Training
- The Civil Service Commission
Introduction of Action Learning in Public Officers Training

Sungho Oh (Professor, Sangmyung University)

Case Overview
The civil service commission has introduced the Action Learning System where public officers in training learn autonomously seeking concrete solutions to pending issues in real circumstances with specialists’ support. Through field-oriented and solution-based learning, trainees find alternative plans to carry out major tasks of each organization and also improve their abilities to function in real situations. This system provided a new model of public officer training, being adopted by other parts of the government.

I. What Is Action Learning, and Why Is It Necessary?

Action learning is a new concept in which trainees, although receiving support from specialists, learn autonomously. Under this new concept, trainees seek concrete solutions to real contemporary issues. Through field-oriented and solution-based learning, trainees must find alternative means in which to execute major projects. In this manner, they improve their abilities to function in real situations.

Changes in administrative environments, represented by globalization, pluralism, and information, make a variety of problems more complicated. Thus, an ability to solve problems in field situation is increasingly required. Accordingly, public officers need to be equipped with these abilities. Therefore, they must strive to lead continual government renovation. To meet this requirement, there also needs to be an effort to improve training systems which will foster these abilities in public officers. Action Learning is a new method of education that has been introduced in order to accommodate such a need.

II. Background to the Introduction of Action Learning

1. Recognition of the Problem: Skepticism over existing methods of training public officers

Training programs for public officers in Korea are largely administered by government level institutions, such as the Central Officials Training Institute (COTI) and Local Government Officials Development Institute (LOGODI). These institutes offer many training courses, which have dramatically contributed to the development of the abilities of public officers.

However, at the same time, prior to Action Learning, there were criticisms that training systems needed to be improved. The following describes the problems presented regarding training methods and their efficiency.

First, concerning the method of training, some argued that too much weight was given to instructor-centered lectures. According to a survey conducted in 2003 (Hong, Gong, & Im, 2003), 69.2% indicated that there existed a need for participatory educational courses; only 5.7% stated that such a need did not exist. Although educational methods — which reinforced participation of trainees through case studies, discussions and presentations — were constantly developed and applied, these methods proved to be insufficient.

Second, some doubted the efficiency of training. According to the survey cited above (Hong, Gong, & Im, 2003), though motivation of trainees for learning was high (4.03/5), the learning outcome was rated lower (3.52/5...
transfer of training was relatively low), as some indicated that the transfer of knowledge from training sessions to real situations was weak. This attitude suggests that at least some trainees doubted the necessity of training, since its applicability to real circumstances was unclear.

2. Inauguration of the New President of COTI

COTI recognized the necessity to solve the problems of training public officials. Full-fledged efforts to change training courses began when Park Myung-Jae took office as the president of COTI, in August 2003. President Park emphasized three main points in his inaugural address. The first point was the need to find ways to support new political ideologies and tasks at the level of training. The second point was to produce the best training methods and goals for trainees. The third point was to recognize that the institute cannot exist without trainees.

President Park established the “Division of Planning”, which includes department heads, full-time professors, and executives. As the central figure, he evaluated the process in a systematic fashion in order to successfully promote COTI’s visions, goals, and strategies. He created forums to accustom, and excite, all members of the staff to the idea of renovations. He also held a “Day of Learning” on working Saturdays. In addition, he provided opportunities for the public officials to see and learn, first-hand, a variety of systems and methods from around the world; he led overseas programs, during which time participants engaged in training and international conferences. Furthermore, he organized and conducted a front-renovation team appropriately named “COTI Sarang-bang”. This team consisted of departments directly involved in training operations.

As stated above, emphasizing the necessity of innovative changes, which would provide systematic education for public officials, President Park actually experienced “Action Learning” at the GE Crotonville Training Center (John F. Welch Center). He participated as a member of the group of Chief Executives from the Presidential Residence, who were visiting advanced training institutes in September 2004. This became the initiative to institute Action Learning in training courses for Senior Public Officials.

3. Emphasis on Field-Oriented Administration from the Office of the Prime Minister

In this process of COTI’s own efforts for innovations, political back-ups were generated. Specialized training for public officials of the Office of the Prime Minister was conducted in the Samsung Human Resources Development Center. This program were positively evaluated and reported to President Roh, who ordered COTI to set up plans to establish an innovative program as excellent as Samsung’s program. Also, after the “Plan for Reinforcing Public Officials’ Ability through Training” was held at the “55th Conference of Governmental Tasks” in October 2004, the President officially charged that a new training program be adopted.

In November 2004, the Prime Minister emphasized the need for a training program, like Action Learning, which stressed problem-solving during a speech given at COTI. He requested that the directors of each bureau should, in person, begin the process of acquiring the facilities which could enable real life learning and the formulation of effective policies. Thus, he required training programs where higher public officials could diagnose real problems and prepare practical ways to solve these problems. In addition, he ordered public officials to practice, occasionally, “field-oriented administration” instead of “desk administration”.

These circumstances operated as the background which accelerated the cultivation of Action Learning for the reinforcement of the abilities of public officials.
III. Contents of Renovation: Introduction of Action Learning

It is not true that renovation in managing education in COTI is limited to Action Learning. However, the following changes focus on Action Learning.

1. Changes to Training Goals

The biggest problem in previous training management at COTI was the emphasis on lecture-centered instruction, which espoused the transmissions of theories and knowledge and, at the same time, required only rote memorization. This training system was fundamentally limited in its ability to offer direct solutions to problems which faced the government. Thus, new training goals were established; public officials were to develop real field policies and the ability to solve problems. Moreover, new emphasis was placed on participation. Thus, practical education dramatically increased, and both the organization and management of curriculum improved.

Specific goals and aims for action learning are as follows. The first goal emphasizes the development of practical problem-solving abilities for officials. In other words, they are to pro-actively and creatively navigate complicated administrative circumstances, and try to find practical solutions to real problems. The second goal is the improvement in the ability to identify and understand the essential facts and causes of a problem. The third goal is to foster communication skills, analytical abilities and a spirit of cooperation through team projects. The fourth goal attempts to cultivate a strategic way of thinking, which synthesizes many different viewpoints and offers long-term solutions. Also, trainees are taught to draw up comprehensive reports and prepare effective presentations.

2. A Change in Perception of the Educational System for Senior Government Officials

A senior executive program, for directors of central bureaus, is being held for 10 months. Providing that the directors do their work, this very important time is expected to bring invaluable results.

Previous courses were considered a hiatus during which time directors took a break from competitive working environments. However, the current government, which is called a “Government of Participation”, emphasized that senior officials should constantly strive to improve their abilities. In order to do so, the current government stresses that public officials must continually learn, and evaluates the work of public officials based on real field results. Accordingly, senior policy courses changed in order to provide education which can strengthen the capabilities of directors. In short, the senior executive programs are no longer passive. Instead, they have become developmental courses for senior officials to solve problems to particular tasks, and senior officials are evaluated based on their presentations.

3. Changes to Training Courses

The most significant change has been to the way of educating. Though there was some trainee participation through group discussions, presentations, and thesis submitting, previous courses were primarily lecture-based.

The biggest difference in Action Learning is that the whole curriculum is organized under the participation and leadership of trainees. Trainees are divided into groups, and each group has a facilitator. While facilitators assist trainees in solving problems, they do not act as lecturers. Also, trainees, not facilitators, play the leading roles. Action Learning is concerned with finding
alternatives, arriving at solutions, presenting results, and evaluating task development, analysis, and solutions. Except for task development, trainees conduct all these elements. Accordingly, Action Learning is a training program that is essentially run entirely by trainees.

The second difference is that Action Learning emphasizes field trips and case studies, which provide first-hand experiences. In executing Action Learning, investigation and analysis are a large component of the total process. This is different from the previous knowledge-based curriculum, where knowledge is only utilized in the classroom. Action Learning is field-oriented, and seeks solutions through discussions with related organizations. Therefore, trainees and directors of central bureaus had to try hard to identify problems and work out improvements in real administrative fields. Also, to get real data from the field, they surveyed 131 institutes and 205 fields. They conducted as many as 40 surveys, though 20 surveys was the team average. Through this process, problems were approached in real circumstances, instead of hypothetical situations.

The third difference is the autonomous team-project. Action Learning is a participatory training method, and the entire curriculum is done completely as a team. Progress in training was planned through autonomous discussions. Each team created weekly plans, and progressed according to its plans. Also, each team, with the help of a facilitator, made rules for active discussions, fair distribution of tasks, the conducting of weekly meetings to share information and the checking progress. Each group had ten reflective meetings to organize results.

**Table 1** Action Learning Weekly Team Activities

<table>
<thead>
<tr>
<th>Week</th>
<th>Team 1 Activities</th>
<th>Team 2 Activities</th>
<th>Team 3 Activities</th>
<th>Team 4 Activities</th>
<th>Team 5 Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Team-building &amp; workshop</td>
<td>Team-building &amp; workshop</td>
<td>Team-building &amp; workshop</td>
<td>Team-building &amp; workshop</td>
<td>Team-building &amp; workshop</td>
</tr>
<tr>
<td>2</td>
<td>search for themes</td>
<td>search for themes &amp; planning</td>
<td>searching for themes &amp; planning of issues</td>
<td>searching for themes</td>
<td>task analysis</td>
</tr>
<tr>
<td>3</td>
<td>Data collection</td>
<td>data collection for establishing new factories and others</td>
<td>investigating current state &amp; plan for field research</td>
<td>checking for collected data</td>
<td>collecting suggestions for private insurance sectors</td>
</tr>
<tr>
<td>4</td>
<td>Investigating current state &amp; data analysis</td>
<td>Benchmarking cases</td>
<td>Investigation &amp; understanding of current state</td>
<td>Investigation of current state and plan for field visits</td>
<td>Investigating issues of current regulations &amp; data collection</td>
</tr>
<tr>
<td>5</td>
<td>Sampling &amp; field investigation</td>
<td>customers opinion survey (complaints, demand for improvement)</td>
<td>Field investigation &amp; FGI</td>
<td>Visiting offices for investigation</td>
<td>Brainstorming &amp; collection of expert opinions</td>
</tr>
<tr>
<td>6</td>
<td>Field investigation &amp; identifying problems</td>
<td>Data analysis (identifying problems)</td>
<td>Goal setting &amp; planning</td>
<td>Identifying data needed during office visit &amp; developing questionnaires</td>
<td>Field investigation</td>
</tr>
<tr>
<td>7</td>
<td>Analysis of problems &amp; data collection follow-up</td>
<td>Revision for solution measures</td>
<td>Draft writing</td>
<td>Field investigation</td>
<td>Office visit for opinion survey</td>
</tr>
<tr>
<td>8</td>
<td>Analysis for alternatives &amp; investigation of model program</td>
<td>Investigation of problems in implementation</td>
<td>Formative check-up &amp; consulting with offices</td>
<td>Draft writing</td>
<td>Analysis of problems &amp; opinion survey from private sectors</td>
</tr>
<tr>
<td>9</td>
<td>Suggestion of model program &amp; consulting with similar institutes</td>
<td>Revision for solution measures</td>
<td>Revision &amp; completion</td>
<td>Follow-up data collection</td>
<td>Intra-team discussion &amp; drafting</td>
</tr>
<tr>
<td>10</td>
<td>Final report and preparation for presentation</td>
<td>Confirming solutions</td>
<td>Preparation for presentation</td>
<td>Consulting to offices &amp; final report</td>
<td>Final report and preparation for presentation</td>
</tr>
</tbody>
</table>

**Table 2** Action Learning Weekly Team Activities

<table>
<thead>
<tr>
<th>Week</th>
<th>Team 6 Activities</th>
<th>Team 7 Activities</th>
<th>Team 8 Activities</th>
<th>Team 9 Activities</th>
<th>Team 10 Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Team-building &amp; workshop</td>
<td>Team-building &amp; workshop</td>
<td>Team-building &amp; workshop</td>
<td>Team-building &amp; workshop</td>
<td>Team-building &amp; workshop</td>
</tr>
<tr>
<td>2</td>
<td>search for themes</td>
<td>search for themes &amp; planning</td>
<td>investigating evaluation system</td>
<td>investigating administrative management system</td>
<td>designing action plan</td>
</tr>
</tbody>
</table>
use them. The sponsors are the premiers and ministers of different bureaus. Thus, feedback and evaluation concerning the practical and proper nature of the presentations can be offered.

At first, this new evaluation system was a big burden on trainees, and thus, there was some resistance. Trainees stressed about presenting, to their seniors, original and real plans for unfamiliar tasks. However, because trainees knew that they would be evaluated based on their presentations, they became motivated to present appropriate political plans, and competition among teams spread. Consequently, enthusiasm and participation in the new educational program increased, and as a result, training efficiency was also raised.

Additionally, since the content that trainees presented could be utilized as either alternative solutions or important reference materials, overall efficacy of training improved.

### IV. Initiative Organizations Introducing Action Learning

Successful implementation of Action Learning was possible because of the number of different public officials and experts who participated in the process of revising training programs. Below are the major organizations that played an important role.

#### 1. COTI Sarang-bang

The leading innovative team (Junior Board), COTI Sarang-bang was established in October 2003; it was comprised of staff members who were directly in charge of training management. COTI Sarang-bang held

### 4. A Change in to the Manner of Training Evaluation

In previous senior executive program, the only requirement was to submit a 70 to 80 page thesis. Theses had to be formatted in a certain manner, and non-standardized theses received a deduction in marks. However, the content of the theses was nothing more than a mere formality; theses did not serve as actual materials for administrative improvements.

Accordingly, trainees did not work hard to present their reflections and opinions. Some trainees even plagiarized from existing theses.

In Action Learning, however, teams are evaluated based on their presentations of political alternatives to sponsors, who are in a position to
conferences, about once a month, in order to outline the major working tasks, and determine practical solutions. Ideas presented from this organization include the “Learning Institute”, “Open Institute”, and “Successful Institute”. They found that these ideas could be realized by promoting a variety of alternatives: the revitalization of meetings for innovative studies, the maximization and utilization of research outcomes, the improvement of a staff’s capacities through their own education, the support of a variety of group activities, the reinforcement of reflections of trainee’s opinions, and the use of manual compositions for workshop operations.

2. HCD (Human Capital Development)

As COTI Sarang-bang obtained results—such as improvements to surveys, modification of teacher evaluation sheets, and creation of manuals for teachers—public officials who supported training management established HCD in September 2004. The purpose of this organization was to look for ways to improve the institute in different manners from COTI Sarang-bang. They were to look for and discuss, on a long-term basis, new trends and techniques in training, and developmental plans. COTI continuously reformed the training content, methods, and systems by emphasizing learning through the participation of all staff members. In this way, it became a worldwide human capital developmental center.

3. T/F Constitution for Development of Innovative Training Courses

COTI’s innovative training methods were officially adopted at the 55th conference for governmental tasks, hosted by President Roh, in October 2004. In order to facilitate the actualization of new training methods, T/F was formed in October 2004. The leader for T/F was Park Myung-Jae, President of COTI. Also playing important roles were the Blue House Innovation Management Office (Currently Innovation Management Secretarial Office), and a number of major governmental offices involved in the innovation of governmental affairs (e.g., The Presidential Committee on Governmental Innovation and Decentralization, the Civil Service Commission, the Administration Innovation Headquarters at the Ministry of Government Administration, and Home Affairs—currently Governmental Innovation Headquarters). Civil experts also participated for several months in developing innovative training programs. In January 2005, COTI’s plan for innovative education was presented at the “Meeting for promoting governmental innovation”.

Several guidelines were created in the operation of T/F. The first guideline was to discern the best proven programs by benchmarking all advanced training programs. The second guideline was to organize a department of development using the top experts. The third guideline was to encourage participation from a variety of institutes and people in order to overcome limitations, which typically face relatively closed organization. Accordingly, many experts, who work in the field, training technicians, and people in each bureau involved with renovation participated in T/F.

4. Utilization of Consulting Corporations

Creating innovative educational programs, like Action Learning, was not a simple task. COTI and the government lacked experienced experts in regards to new training programs. Accordingly, professional private consulting corporations were utilized in developing programs.

To select proper consulting corporations, bids were accepted from firms
who submitted program proposals. In the end, IBS consulting, who had participated in creating other innovative programs for the government, was selected. They were ordered to complete programs for Action Learning within 6 months, and after the first tentative plans were made, advisory councils held a series of meetings. The advisory councils consisted of experts from the government and the academic world. Action Learning was created through a process of thoughtful consideration of potential complications and careful revision.

V. Introductory Process of Action Learning and the Overcoming of Hold-ups

1. Introductory Process

(1) The President of COTI’s Emphasis on Training Revision

The introduction and operation of Action Learning first fell under the larger umbrella of COTI’s revision. In other words, the process was initiated by the pursuit of training revision. As stated in the introductory background section, the recognition for the need for change, on the part of the president of COTI, was the catalyst for this organization’s training revision. Moreover, his constant emphasis on the necessity for change was crucial in driving the faculties’ mind set.

(2) Establishment of Training Values

Training values were established. They were to act as guidelines to maintain COTI’s direction and aims at all times. The new values that COTI was to pursue were summed up in phrases such as, “A Training Institute is a manufacturing factory for high-quality education”. “The President is the CEO of education quality management” and “Staff members are the producers and salespeople of training products”. It was important to realize that “Customers Come First” since education cannot exist without the interest of trainees. Thus, efforts to provide the best program, the best lecturer, and the best training service, with the best facilities, were started.

(3) Constitution of the Group for Planning and the Promotion of Innovation (GPPI), and the Operation of a “Day of Learning”

In 2004, GPPI was formed to promote COTI’s visions, goals, and strategies. This body was monitored by the president, directors, full-time professors, and executives of COTI. GPPI examined and evaluated progress weekly, and stimulated the staff’s interest in training revision by conducting a “Day of Learning” on working Saturdays. On that day, all the staff of COTI presented innovative tasks, and based on this, a road map for COTI’s revision was drawn. Also, on the “Day of Learning”, everyone from the president to minor officers reported on major works on a regular basis. In this manner, new innovative tasks and understanding at COTI could be shared.

Studying abroad was actively utilized as one of the incentives to spur revisions. By training in political spheres, participating in international conferences, and leading trainees, opportunities to see and learn a variety of international training systems were provided. These outcomes were presented and discussed on a “Day of Learning”. Thus, training revisions were expedited in order to improve operations.
Introduction of Action Learning in Public Officers Training

(4) Benchmarking

One of the major methods to invigorate the revision of COTI was to benchmark leading domestic and foreign training institutes. Within the country, officials visited Samsung Human Resources Development Center, LG Academy, CJ Academy, Hyo Sung Human Resources Development Center, which are all firms that are highly evaluated in the field of training. They received a number of recommendations from these institutes. In particular, concerning Action Learning, these officials gained first-hand experience and knowledge during their time spent at Hyo Sung Human Resources Development Center. As a result, they realized that new methods in diagnosis, core leader training programs, and authentic problem-solving learning methods are being practiced privately. The outcomes from visiting the institutes were shared with all staff members on a “Saturday learning day”.

Benchmarking overseas institutes was actively carried out, too. Officials took part in the American Society for Training and Development (ASTD), the best work HRD expert meeting in June 2002 and are annually participating in international conferences and expositions hosted by ASTD. Also, in September 2004, the Chief Secretary of Personnel Department at the Blue House and the president of COTI attended the Federal Executive Institute (FEI) and Jack Welch Center (Crowtonville Training Center) of GE Co. to experience Action Learning.

(5) Securing a Budget

To develop the best training courses, it was essential to secure an adequate budget. The transition from method to actual operation of a new organizational operation was expected to incur more costs than maintaining the curriculum. The president and staff meet people in charge of the budget in order to persuade them of the necessity of developing a new training program that matched the new trends in training.

Budget expansion for COTI was decided at the Strategic Meeting of Government Innovation Initiative and a Cabinet council. The new budget was one billion and nine thousand five hundred million won. This figure represented 32 percent of the major budget for the 2005 fiscal year. With this increased budget, the development of training courses could be pursued more vigorously.

(6) Re-Examination of the Problems of Existing Training Methods, and Discussion on New Plans

Before applying the Action Learning program to the 13th senior executive program, in 2005, surveys and focus group interviews (FGI) were carried out with trainees who completed the 12th training course in 2004. The purpose was to investigate training demands. 79.3 percent responded positively in regards to the degree of satisfaction concerning the aims and content of the training courses. However, in regards to whether the content of training was authentic, 41.3 responded positively, 41.3 responded so-so, and 10.3 responded negatively. These figures reflect that field-oriented education is essential. Also, in regards to the question concerning courses for senior executive program with an aim for more efficient operations, 61.1 percent responded that participatory education, which emphasized the attainment of solutions to real situations, was desirable. In addition, 31 percent responded that autonomous education through a variety of materials and methods was required. Finally, 86.2 percent responded positively to the question concerning the necessity of Action Learning.

(7) Workshop

Prior to completing reinforcement of Action Learning in the beginning of April
2005, a workshop about facilitators and trainees was conducted. This workshop sparked people’s concerns by discussing the purposes and executive methods of Action Learning. In this manner, vague stress over Action Learning was relieved.

(8) Selecting Tasks for Each Team

In Action Learning, it is very important to select tasks and subjects to which to present solutions. Originally, trainee teams were to choose tasks. However, when COTI was about to initiate its program, trainees were not ready to choose tasks. Although trainees were all senior officials, it was not easy for them to choose major tasks, which considered the government on the whole rather than only a scope that was limited to their own individual bureaus.

Therefore, tasks were brought in from the outside. At first, sixty-five tasks in total were presented, in consultation with the Office of the Premier. Then through conferences and discussions with related departments, ten tasks were selected. Each task was drawn from major issues that need to be examined in 2005. Each task was selected through a cooperative process of discussion between relevant offices and experts. The following table shows the tasks selected:

<Table 2>

<table>
<thead>
<tr>
<th>Team</th>
<th>Task for Team</th>
<th>Sponsor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team 1</td>
<td>Checking of current state of similar administrative regulations and improvement</td>
<td>Office for Government Policy Coordination</td>
</tr>
<tr>
<td>Team 2</td>
<td>Methods of improving establishment of mid &amp; small size business and factory building procedures</td>
<td>Office of PM, Ministry of Industrial Resources, etc.</td>
</tr>
<tr>
<td>Team 3</td>
<td>Methods of improving supply chains see products</td>
<td>Ministry of Agriculture &amp; Forestry, Ministry of Maritime Affairs &amp; Fisheries, etc.</td>
</tr>
<tr>
<td>Team 4</td>
<td>Methods of improving mandatory employment policy for the handicapped</td>
<td>Office for Government Policy Coordination, Ministry of Labor, etc.</td>
</tr>
<tr>
<td>Team 5</td>
<td>Methods of encouraging private insurance for natural disasters</td>
<td>Office for Government Policy Coordination, Ministry of Finance &amp; Economy, etc.</td>
</tr>
<tr>
<td>Team 6</td>
<td>Methods of improving regulations for gas safety management</td>
<td>Office of PM, Ministry of Industrial Resources, etc.</td>
</tr>
<tr>
<td>Team 7</td>
<td>Methods of improving regulations for establishing graduate schools</td>
<td>Office of PM, Ministry of Education &amp; Human Resources, etc.</td>
</tr>
<tr>
<td>Team 8</td>
<td>Methods of enhancing effectiveness of integrated national administration evaluation system</td>
<td>Office for Government Policy Coordination</td>
</tr>
<tr>
<td>Team 9</td>
<td>Methods of establishing management system for governmental affairs</td>
<td>Office of Presidential Secretary</td>
</tr>
<tr>
<td>Team 10</td>
<td>Methods of establishing management system for governmental affairs</td>
<td>Office of Presidential Secretary</td>
</tr>
</tbody>
</table>

(9) Constitution of Team

Trainees’ priority on tasks that they should work on was fully reflected in the constituting of teams. In March 2005, senior officials had to choose three priorities on tasks. Ten teams of six members were constituted, and a variety of ministers—such as ministers in economy/non-economy, central ministers/local ministers—mingled. Also, teams were constituted by people who had similar capabilities based on similarities and results of diagnosis of capacity.

(10) Conference

In July 2005, participating directors of the senior executive program held a conference on Action Learning in the building called “Nul Sarom Kwan”. The Prime Minister and other ministers also participated. The conference was divided into Session 1 (Morning session) and Session 2 (Afternoon session). This conference allowed ministers and vice ministers from relevant offices to meet and share their opinions. Overall concluding remarks were given by the
Prime Minister.

The conference was a significant process in maximizing the efficiency of Action Learning training courses. Each team presented results through field trips and surveys for about 4 months, and proposed improvements with the participation of the Premier, ministers and vice-ministers concerned. Trainees could not help but to try to be well-equipped in preparing plans and presentations on policy. While these presentations were a burden, they also acted as a strong motivational tool in raising training efficiency.

Also, the trainees’ political plans were directly presented for reflection and reference as problem solving solutions to the bureaus concerned. This was the exact aim of Action Learning.

2. Hold-ups and Overcoming Hold-ups

In the beginning, Action Learning got 3.8 out of 5.0 in terms of the satisfaction with training courses. Also, after the conference, trainees’ satisfaction was 3.8 overall. One team recorded a 4.3 rating of satisfaction with the training course, and another team recorded a 4.6 rating of the autonomous team project.

However, it is not true that there were no difficulties. Once, trainees’ satisfaction fell to 2.9. Also, a number of obstacles arose. There were many efforts to overcome these obstacles. The following are a description of the major struggles.

(1) Lack of Experts in Operating Action Learning

The skillful role of facilitators, who play the part of promoter, is very important in Action Learning. However, finding an adequate number of suitable experts became an obstacle to operation. It was necessary to utilize experts from the outside.

Facilitators need to know the subjects that trainees are to deal with, and at the same time, they also need to have the ability to lead under the guidelines set forth by Action Learning. In other words, they must control the training process without actually leading the group.

Accordingly, facilitators should have knowledge of both Action Learning and of the public sector. Considering these conditions, ten scholars and experts in consulting firms were selected as facilitators at the recommendation of Hong Gil-Pyo of Cheon-Ahn University (adjunct faculty at COTI). Hong has constantly consulted in the planning process of the Action Learning. With the assistance of nine professors from COTI, a workshop on the conduct of Action Learning for two days was chaired. As they were experts in tasks and education, they understood their roles as facilitators and the nature of the public sector. Thus, they were well-prepared for the role they had to perform.

(2) Anxieties of Trainees Concerning the Ambiguities of Participating in Action Learning

Trainees, having had no experience with Action Learning, worried about the new method. Through FGI, they were anxious over evaluation and competitiveness in the new training courses. Also, even though they understood the utility of working with pending tasks through Action Learning, they had doubts over the effectiveness of the proposals they were to work with for a year.

These worries actually had real repercussions. Trainees strongly resisted reinforced evaluation. In particular, they stressed that their abilities would be under-evaluated if they had to present their outcomes and solutions on unfamiliar issues to the Premier and sponsors.

There was a strategic effort to relieve their stress. First, Park Myung-Jae, the president of COTI, spoke with trainees in person. Conferences with
trainees continued throughout the whole training courses. Mainly, they talked about the necessity of renovations, the changing environment, the role of government, their mission as senior officials and the efficacy of Action Learning. The president persuaded trainees by emphasizing this new system was worthwhile even if no effective solution materialized at this time. Continuous conferences between the president and trainees were efficient, and trainees were motivated to meet the challenge.

Second, the Premier also spoke with trainees. He emphasized the necessity of “Authentic Administration”. Trainees came to understand that this concept had been settled as a permanent fixture, and that Action Learning was an indispensable part of “Authentic Administration”. Furthermore, trainees also came to realize that presentations offered opportunities to impress the Premier. Thus, trainees were motivated to develop good proposals. Moreover, in the 7th week, by having an interim and a reflection meeting, competitiveness and tension among teams started to mount. This heightened trainees’ immersion in their tasks.

President Park Myung-Jae, repeatedly stated that the Premier should take part in the final conference which would conclude Action Learning. However, it was not easy to coordinate the schedules of the Premier, ministers and vice-ministers. President Park Myung-Jae took care of this, and the final conference was scheduled with the close conference with the Assistant Minister for Regulatory Reform at the Office for Government Policy Coordination.

Consequently, systematically utilizing these political factors helped to relieve trainees’ resistance, and motivated them. In the future, COTI is planning workshops and reflection meetings which will provide introductory background and training purposes of Action Learning. This should resolve stress on the part of trainees.

(3) Sponsors’ Interest and Enthusiasm in Action Learning

One of the main factors in deciding success or failure is active interest and participation on the part of sponsors. That is, with a keen interest, sponsors should actively assist so that the plans of trainees can be realized.

However, in the process of Action Learning operation, some policy makers, who are not familiar with field-oriented education, tended to overlook training goals by introducing biased ideas. Sponsors also hesitated to assist owing to fears that they would have extra duties due to the intervention of the people outside their organizations.

These problems and concerns were solved by trainees, whose enthusiasm stimulated relevant departments. Trainees visited fields frequently and collected data to find out desirable solutions. For relevant departments, it was possible for them to gain alternatives perspectives without their active intervention. Also, the fact that these alternatives were supposed to be presented to the Premier acted to pressure sponsor groups into cooperating. They came continuously to assist in an active and positive manner.

Moreover, through their interactions with trainees, a spirit of cooperation was fostered, and some tasks, which had been left unsolved due to conflicts among departments, were settled.

However, the problem of apprehension on the part of sponsor organizations has not been completely eliminated. COTI has a plan to inform sponsors of the purposes, aims, and training goals to increase their concerns with the new training goals.

(4) Problems in the Process of Operation

There were several problems when the curricula of Action Learning were put into practice. The whole atmosphere was somewhat shaken when there were some problems in the different perspectives between the team and facilitators,
content and level of tasks, difficulty in data collection, autonomy of team operation, and conflicts over schedule management.

To solve these problems, the staff at COTI and personnel from the Trusted Civil Institution gathered together several times and shared their opinions. Also, through collaborative discussions with trainees, minor work tasks were lessened in the process, and each team operated the team project autonomously with a great sense of responsibility.

VI. Outcome of Adopting Action Learning

The outcomes of adopting the Action Learning programs can be summarized as follows: First, Action Learning provided new direction for training public officials. It avoided traditional lecture-type, cramming education, and provided a new model for practical education which emphasizes reality and first-hand experience in administration. It also contributed greatly to the realization of high quality policies and of satisfactory customer-oriented administration, as the effectiveness and reliability of government policies were improved. Second, the managers of each office, who are the policy initiators, enhanced administrative services for better customers’ satisfaction and provision of high quality policies, as senior officials’ experience in Action Learning provided them with a sense of the real world. Third, Action Learning enabled the simultaneous pursuit of both training and policy goals. Different from previous learning method in which proposals for learning and policy decisions are separated, action learning resulted in the simultaneous accomplishment of both training and policy goals. This is because the Prime Minister, ministers, and vice ministers participated in the development of the curricula, investigation for solutions to major pending issues and expressed their opinions in deciding certain policies. Fourth, Action Learning show-cased an example of improving policy by boldly adopting innovative methods from the private sector. Action learning was adopted and effectively utilized several years ago as an effective training method in large companies such as Samsung, LG, etc., but was adopted for the first time in training public officials only recently. The adoption of action learning may provide a good example of how innovative methods in private sectors can be utilized in public sectors. Accordingly, Action Learning provides a benchmark case.

VII. Factors for the Successful Introduction of Action Learning

The successful implementation of action learning is due to the concerted efforts by COTI, dedication of trainees, and support from the sponsoring offices. More specific factors for success are as follows:

1. Leadership

The most important factor for the success of action learning was the COTI president’s willingness for training innovation and enthusiasm. The current president, Myung-Jae Park, clearly recognizes the changes occurring in various sectors of administration and the urgent necessity for governmental innovations to cope effectively with such changes. Furthermore, the current president of COTI made official trainers cognizant of the danger in failing to respond to the changing environment by invoking the idea that “as the business with no customers goes down, the training center with no trainees is not worthwhile to exist”. Such a mind-set imbued new spirits in the management of COTI, which could have easily been complacent with the
number of trainees it already had.

The president did not mandate or force changes on those who did not understand the situation or were reluctant about such changes. Instead, he exercised leadership in bringing about voluntary participation. He established favorable environments and persuaded volunteers. In addition, in designing the curriculum, he became a role model; he visited various foreign countries, and made an effort to develop innovative programs by learning, and by including the content of what he learned from these experiences. As a result, the faculties and staffs’ voluntary participation in innovation became a catalyst for solving numerous problems in the process of operating the Action Learning program.

It was largely due to President Park’s continuous dialogues and persuasions that eventually helped the trainees, who were resistant to different teaching styles, to actively participate in the new program. In other words, instead of maintaining superficial relationships with the trainees, the president established more practical and close relationships. He listened to their difficulties, and thought about ways to solve such difficulty with the trainees. His actions were essential to the success of Action Learning.

President Park also made a great effort in securing political and governmental support important for the success of the policies. For example, President Park proposed in a timely fashion a new training policy for officials which reflected the will of the President, who is ultimate decision maker of the country. Also, President Park structured the new program so that it would run in close cooperation with the Office of Prime Minister by securing the support of not only the Prime Minister, but also of both other ministers and vice-ministers.

Such will, effort and judgment on the part of President Myung-Jae Park provided the leadership necessary for the innovation of the curriculum of COTI, and resulted in the success of Action Learning

2. Interest from the President and Prime Minster

Action learning is an education program which directly concerns major government tasks. Therefore, interest from the President is necessary. This is because the program requires government intervention in order to secure cooperation from the different offices. Thus, the President’s official adoption of the innovative education program of COTI was crucial.

Also, from the beginning of the program, the Prime Minister was also interested in the program. He oversaw the conference, and expressed his evaluation of the content of presentations and opinions regarding the direction of policies. Such political support highly motivated trainees, and brought about cooperation from each office. This support was important for Action Learning to be successful.

3. Training Director’s Dedication and Determination for Success

At the beginning, there was some skepticism concerning whether Action Learning could be successful implemented as a training program for officials. However, the staff started to respond to the president’s leadership, which eventually overcame such skepticism and provided the momentum for successful implementation. Despite a number of limitations, the staff’s efforts and determination to succeed played important roles in operating the programs as planned. In addition, the voluntary organization of the “COTI room” and research meeting groups, such as HCD Innovation Research Team, provided the foundation for many valuable ideas concerning innovative education.
4. Trainee’s/Managers’ Active Response and Participation

Action Learning requires the willingness of trainees to actively participate in the program, since it utilizes a problem-solving approach through team activities. As Action Learning proceeded, some people were somewhat skeptical about the program, and resisted. However, once they recognized the need of Action Learning, the trainees, despite their ranks as managers, enthusiastically participated. Furthermore, as the trainees went through such training experiences, they exhibited a strong willingness to utilize the knowledge and skills from various areas. This enhanced the quality of policies when they went back to their offices.

VIII. Implications and Suggestions

Even though Action Learning programs were implemented successfully and the satisfaction for such programs was high, they were not perfect. Also, this success does not mean that such programs will be consistently effective. Accordingly, the followings should be considered to achieve maximum training effect through Action Learning:

1. Development of Experts in Action Learning

One of the perennial problems in investigating the effect of action learning was the lack of experts in Action Learning. Such a lack was manifest in the process of designing action learning programs. There was also lack of facilitators who could lead various processes of Action Learning.

Therefore, there is a great need to secure many experts in the design and operation of Action Learning training programs for the future. There is also a need for the continuous development of facilitators. Related to this issue, COTI is now utilizing adjunct and research faculty, and dispatching faculty systems as well as a full-time faculty system in order to secure experts in education. Accordingly, the number of faculty members—which consisted of three full-time and five adjunct faculty in 2004—has increased to three full-time, seven adjunct, and three research faculty members. Also, four faculty members were dispatched from different government bureaus in 2005.

Nevertheless, there is an urgent need to increase the number of experts in this area. The number of full-time faculty should be larger. These full-time faculty members can then concentrate on their specific work. It is also necessary to expand more room to utilize external human resources, such as adjunct and dispatching faculty. Simultaneously, the level of administrative officials should constantly be enhanced through continuous training and frequent visits to training institutes outside.

Another important point is the development of more facilitators. In order to achieve this, COTI plans to train both three full-time faculty and four faculty members (who are from offices such as the Ministry of Government Administration and Home Affairs). They will first be dispatched to programs among existing administration offices as facilitators. They will learn facilitation skills and other relevant knowledge and skills.

Also necessary is the operation of short programs which are geared to develop those who can compose manuals for Action Learning, which is appropriate to public sectors, or provide courses taught by outside experts to enhance public officials’ facilitation skills needed for Action Learning.
Introduction of Action Learning in Public Officers Training

Contemporary society is characterized as a “knowledge-based society”. What is most needed in a knowledge-based society is humans with great abilities. Moreover, an administration which secures more people with such great abilities is more competitive than another. Accordingly, the government should do its best to secure such people, and there is consequently a need that these people are properly trained. In other words, even though there may be an adequate numbers of able people who are recruited into the government, it is necessary to provide constant training to develop and enhance their abilities. If not, the government may not implement necessary policies at an appropriate time when there is fluctuation in the supply of human resources, which can cause the government to rely on human resources from the outside.

The investment on human resources is a key factor in deciding whether or not today’s organizations can succeed. Accordingly, the government should increase the budget for training programs, which include Action Learning.

2. Increased Understanding and Participation from Government Offices

Cooperation between government offices is crucial in the operation of Action Learning programs. Such cooperation is important not only for data collection, but also for the proactive utilization of alternatives suggested as the results of the program by each office, which is also the key supporter of such research.

In operating the Action Learning program for this report, meaningful cooperation was achieved in the process of collecting data with the help of each office. However, there is no guarantee that such cooperation will continue. In fact, there were some offices which showed passive attitudes toward adopting suggested alternatives or utilizing the data as their reference.

Such problems are difficult to resolve without each office’s increased understanding of the importance of this research. Therefore, these problems should be addressed not only by COTI, but also by other sectors of the government. It may be necessary that some positive incentives that awards offices which supported Action Learning, in terms of adopting the alternative solutions that were presented, is provided.

3. Expansion of Budget, Facilities and Other Material Infrastructure

In 2004, the amount of 1.95 billion won was provided as the training budget for COTI. Given the past allocation of the governmental budget, this was an unprecedented provision for the education of public officials. This budget enabled the expansion of much-needed training facilities and the development of new programs such as Action Learning. As a result, the overall evaluation of such achievements is also positive.

This clearly shows investment in the education of people is of extreme value.
Korea Railroad’s 6 Sigma Movement
- Korea Railroad Corporation
Korea Railroad’s 6 Sigma Movement

Jongrae Kim (Dae-Jin University)

Case Overview

The Korea Railroad Corporation has introduced the 6 Sigma Movement that evaluates quality levels of its business quantitatively by using the statistical measurement called Sigma. This system has created an efficient quality management culture, such as a problem-solving process and fostering specialists, and is being executed throughout all dimensions of Korea Railroad to achieve quality innovation and customer satisfaction. This movement has been generally accepted as a method of minimizing waste of resources and improving profitability.

I. Background to the Introduction of 6 Sigma

6 Sigma is a 21st century innovative enterprise strategy to evaluate all quality levels quantitatively by using the statistical measurement called Sigma, designed to create an efficient quality management culture in such areas as solving problems and fostering specialists, and is executed throughout at all levels of Korea Railroad to achieve quality innovation and customer satisfaction. 6 Sigma refers to the lowest possible inferiority rate of 3.4 out of 1 million, which is the lowest level of errors that can exist in real operations. The 6 Sigma movement is ultimately intended to improve profitability, and 6 Sigma level means the best quality level that we can be achieved with the best efforts. In other words, 6 Sigma is a method of minimizing waste of resources and increasing customer satisfaction at the same time. It is a business process to design and manage general activities and improve in any organization.

To secure competitiveness in the 21st century, which is the age of limitless competition, leading global companies such as Motorola, GE, SONY have utilized 6 Sigma, a tool and strategy for innovation in quality and management, as their motto and have been promoting strategies which maximize general customer satisfaction and profits through innovation in management as well as in quality. Top companies in Korea have also adopted 6 Sigma as an advanced technique in management before and after the financial crisis of 1997 and have been making additional efforts to switch the overall structure in management from ‘high cost-low efficiency’ to ‘low cost-high efficiency’.

In the midst of these efforts, Korea Railroad, a government-run company, swiftly introduced 6 Sigma in the management of the railroad in 2000 based on the customer-centered and innovative activities in management such as CS (Customer Satisfaction) management and TMP (Total Productive Maintenance) activities, and has made long strategic strides in increasing general customer satisfaction and in the creation of profits by making improvements in all work processes through statistical and scientific approaches.

When compared to other types of transportation, the railroad industry has such distinguishing characteristics as fixed schedules, stability, and eco-friendliness as well as a variety of other advantages that stem from the trend toward increasing demand for public transportation and the use of a nationwide exclusive network. However, the railroad industry also has some problems such as lowered competitiveness due to such problems as management operating in the red, rigidity and complexity of the current organization system, and lack of competitive human resources.

Furthermore, the railroad industry has faced a variety of opportunities and threats on account of major environmental changes such as politics, economy, society, environment, and scientific skills, among others. Korea Railroad has had opportunities to expand its business domains and create new demand owing to the possibilities of developing lines linking South and North Korea and transcontinental railroad systems, the development of information...
technology, the opening of the high-speed train KTX (Korea Train Express), and the advent of the five-day work week. At the same time, because of greater competition in the transportation market and growing customer expectations, it introduced the customer-first management system and required reinforcement of efficiency in management through the improvement in work processes.

On the other hand, the constant restructuring at Korea Railroad increased the burden laid on employees and this became a factor lowering the efficiency in work and customer satisfaction. Also, it was suffering from the challenge of maintaining high quality customer service due to insufficient innovation in the customer-oriented work processes.

After the transition to becoming a public corporation, Korea Railroad was obliged to maximize efficiency in work and was also required to meet the necessity of drastically improving a high-cost /low-efficiency process that resulted from the confusion in work due to organizational restructuring. This situation threatened to increase costs and decrease the level of customer service by extending the lead time, eventually lowering customer satisfaction and bringing deterioration in management.

Therefore, Korea railroad began to promote 6 Sigma to realize Power Korail through enterprise innovation. Its expectations through the introduction of 6 Sigma were as follows: first, to provide fast, cheap, and better service in a customer-oriented manner; second, to maximize the results of management by establishing goals of innovation more scientifically and concretely; third, to promote enterprise innovation in optimum work process by actively utilizing knowledge management and information technology; fourth, to drastically reform work which cannot satisfy customers’ requests and that is irrelevant to the creation of value-added services; and fifth, to pave the way for railroad development by enhancing innovation in a successful restructuring.

II. Introductory Direction and Strategy

The introduction of 6 Sigma in Korea Railroad was strategically meaningful at the moment of the structural reform in railroad business. This was significant because it strived for general customer satisfaction and the creation of actual profits by integrating 6 Sigma and the CS movement that was centered in work and the R-TPM, which was centered in the technology departments.

A five-year plan for improvement in railroad management, which had been established and conducted by changing railroad public policy in 1996, was actually limited in improving fundamental railroad management, and this led to the demand for fundamental restructuring of the railroad industry (especially of privatizing the domains of management) in the age of limitless competition. It was in this environment that 6 Sigma, the most advanced innovative technique in management, was introduced with the expectation that a privatized railroad management would create more profits and greatly reduce costs thereafter.

The following Figure 1 shows the direction and strategy of the 6 Sigma movement that Korea railroad introduced under the purpose described above:

Korea Railroad had developed growth-centered innovations under five strategies; improvement in quality of customer service, improvement in customer satisfaction, change of employees’ consciousness, improvement in company environment, and improvement in the image of railroad. Since customer satisfaction and results in management were required, 6 Sigma was introduced to develop brand-new innovations. In other words, previous efforts of innovations, which were person-centered, are now changing into process-centered movements to secure general customer satisfaction and competitiveness in railroad business.
In order to implement 6 Sigma, Korea Railroad found it necessary to have the strong backing of the president, shared recognition on the necessity, identification of proper problems, selection of qualified employees (full-time), educational training (proper tools), motivation, system of compensation, and support from the financial department. These were expected to contribute in securing customer value, sharing knowledge, increasing profits, establishing new railroad culture, and attaining competitiveness by securing high quality, low cost, and speed.

To enhance innovational movements such as customer satisfaction and knowledge-based management in 6 Sigma and realize general customer satisfaction, the 3P innovation strategy was established and is now being executed. The first item of this strategy is ‘Person Innovation’, and this accounts for achievement of reform in consciousness through constant training and self-development.

The second item is ‘Process Innovation’, which is innovation in process through scientific and concrete analysis throughout all fields of planning, resource management, support, etc.

The third item is ‘Product Innovation’, and is to reinforce customer relationships and develop customer-oriented products. These three innovative strategies are carried out as part of 6 Sigma management.

6 Sigma vision of Korea Railroad is to maximize customer satisfaction and business achievement through 6 Sigma over the SMILE campaign that reforms service, management of quality, image, lifestyle, and environment under five values; training of competent persons, priority to customers, consideration of environment, innovation and technology, and cooperation and practice based on strengthening the innovative abilities of executives and voluntary participation of all employees.

Korea Railroad developed a promotion system, aiming to achieve the 6 Sigma quality level and internal COPQ 10% as Figure 2 shows below:

There were four stages in the execution of 6 Sigma. In the introduction stage (2000), an organization for full-time promotion was created within the ‘21st
century strategy planning team’ to work for the stabilization of organization and the 1st and 2nd tasks for improvement, while the Standard Method for Process Improvements for Korea Railroad was developed. In addition, the training of all employees, development of a culture of improvement, the cultivation of BELT, execution of a model project, and the establishment of a strategy to promote 6 Sigma (personnel, education, incentive, etc.) were done during this stage.

In the expansion stage (2001), teams for promoting 6 Sigma in Korea Railroad and the Office of 6 Sigma were organized to build infrastructure, and revitalization of communication within Korea Railroad was fostered through presentations. In this stage, supplementary training for Black Belt, introduction and execution of the system of BELT certification, the expansion of application tool and R & D, RTY management, analysis and improvement of COPQ, and the establishment of managerial regulations were performed.

In the stage of settlement (2002~3), 6 Sigma was spread to all departments and successful examples were shared through the project management system. Also, 6 Sigma management culture was spread to subsidiary and collaborating companies. Furthermore, promotion of training at each department (indirect office work/R & D) headquarters, development of CTQ management system, management of KPI index, intensive improvement of COPQ CHECK, the linkage of 6 Sigma to the quality system, and the development and utilization of PMS were done.

In the stage of maturation (2004), the establishment of a culture of 6 Sigma, the promotion and training of 6 Sigma for collaborating companies, the analysis of problems and improvement plan for application tools, and the linkage to ERP were done.

III. Constitution of Introductory Team

1. Drive Organization

The drive organization (operating system) executed by Korea Railroad is shown in Figure 3 below.

![Drive Organization for 6 Sigma](image)

To efficiently promote 6 Sigma management, the Office of 6 Sigma was organized for the whole operation, and each main office innovation team manages 6 Sigma activities.

The innovation team establishes and develops plans for regional headquarters (each headquarters, team, office, etc.) to promote 6 Sigma,
selects and executes tasks, and appoints and trains specialists for each task.

The office of general operations reports the status of promotion to the
superior office, supports the innovation team with problem-solving techniques,
and promotes educational work. Also, it establishes future plans with the
consulting team and develops methods to promote 6 Sigma for Korea
Railroad.

The improvement team (full-time) selects topics for improvements, solves
the problems, and discusses the problems with the office of general
operations periodically.

The chief of a headquarters (Champion) examines themes for improvement,
engages in regular examination of improvement projects, directs the way to
improve, and supports the improvement team.

The customer-oriented 6 Sigma Examination Committee is composed of the
president of Korea Railroad, a committee chair, and the chiefs of each
headquarter, the committee members.

Roles of the customer-oriented 6 Sigma Examination Committee are: first, to
decide and regulate major policies regarding the promotion of 6 Sigma;
second, to determine certification of improvement experts and the award of
incentives; third, to examine CTQ and tasks throughout all management;
fourth, to manage and examine the progress of promotion and to solve
problems rising in the process; fifth, to create an environment for participation
of all employees.

### Table 1: Roles of Examination Committee Classification

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<th>Classification</th>
<th>Role</th>
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| Committee Chair | - Management of overall operation for certification  
                  - Making final decisions on the committee’s coordination and certification |
| Vice Chair    | - Emergency management in case of the chair’s absence |
| Member        | - Examination and approval of adopting or abolishing operational plans for 6 Sigma  
                  - PJT task approval/performance evaluation or decisions on awarding incentives |
| Executive Secretary | - Develop operational plans necessary for the examinations and perform related tasks possible to achieve after the chair’s approval |

The customer-oriented 6 Sigma Evaluation Committee is composed of the
chief of headquarters for planning, a committee chair, and first section chiefs
of each headquarters, committee members. The role of the Committee is; 1)
to evaluate the extent of task completion, 2) to appropriate effective amounts
of funding for improvement tasks, 3) to examine and evaluate post-
management of improvement tasks, 4) examine and determine training plans
for Black Belt, Green Belt, and others in the organization, and 5) to approve
improvement experts (BB/GB) certificates and grant incentives through the
committee.
For successful achievement of 6 Sigma, it is importance to have persons with professional knowledge and ability and enthusiasm for the project. These people execute 6 Sigma and mainly lead innovative strategies. They are experts who are classified as Champion, Master Black Belt, Black Belt, Green Belt, etc. These experts are trained in a totally different way and improve all the
processes of the company.

The following describes the roles of Champion, Master Black Belt, Black Belt, and Green Belt.

Champions are those executives who carry out 6 Sigma as full-time employees. Champions generally control 6 Sigma activities of the organization, establish plans to introduce and promote 6 Sigma, select 6 Sigma projects, and take the responsibility for the outcomes of 6 Sigma projects. Qualifications of Champions are strong leadership and responsibility, affable social skills, experience in innovative programs, and experience in leading and managing a variety of teams. In Korea Railroad, each chief of headquarters plays a role as a champion and certified the results of execution and selected tasks for improvements.

Master Black Belts, as 6 Sigma full-time experts, distribute 6 Sigma innovative strategies and visions to the organization, develop new methods of 6 Sigma, and apply the developed knowledge and methods to real work environments. They assign members to each team, lecture and collect information, merge 6 Sigma with the culture of the organization, train Black Belts, and help Black Belts to execute their projects. Master Black Belts are certified after a certain training course. They are qualified when employees recognize their high degree of technical abilities and social skills. Master Black Belts in Korea Railroad work full time for 6 Sigma. They train Black Belts and Green Belts, complete projects, and verify authenticity of results. They were selected among people who completed the Master Black Belt training course or carried out more than 4 projects after the evaluation of their training skills.

Black Belts are experts in enhancing profits and sigma levels. Black Belts, as full-time experts for 6 Sigma, understand and improve the main processes that influence profits of organization, learn statistics and problem-solving skills, and train Green Belts under the guide of Master Black Belts. Black Belts need to be highly reliable and confident of 6 Sigma’s possibility, able to challenge previous methods, aware of products, services, and processes of the organization, and must possess high levels of statistical and technical skills and professional knowledge. Their performance is verified through their actual achievements. Training courses for Black Belts are usually 4 courses over 4 months because each training session deals with one of 6 Sigma’s core stages (measurement-analysis-improvement-management). Training consists of lectures and field trips so that field-oriented problems are identified and resolutions are actually applied and achieved. In Korea Railroad, Black Belts, as task project executive leaders, execute projects, lead teams for improvement, and teach tools for team members. They need to complete more than 120 hours of Black Belt training courses and are selected by the Examination Committee from among Green Belts who have accumulated over 200 points in the training program.

Green Belts participate in 6 Sigma on a part-time basis, and are less responsible and less trained. They help the execution of 6 Sigma, perform small projects as assigned, and apply 6 Sigma principles in the field. Green Belts in Korea Railroad execute task project as task members and are selected by Champions of each headquarters from among those who finished more than 40 hours of training with over 100 points.

IV. Introductory Process and Overcoming Difficulties

1. Execution Procedure

6 Sigma tasks were selected and prioritized according to CTQ (Critical To Quality) of customers and other interested persons, such as the government and collaborating companies, by collecting customers’ opinions and
investigating internal capabilities through surveys and environmental analyses.

Significant considerations in choosing tasks are the reduction of defects and cost, enhancement in work efficiency and productivity, improvements in customer satisfaction, increase of profits, improvements in management, and quantitative measurement of task outcomes.

In order to achieve this, a Champion workshop was held to choose reasonable projects, and Champions discussed and decided up projects together to promote 6 Sigma at all levels of the company. In the workshop, tasks for strategic improvement were decided by investigating and analyzing demands of railroad users and seeking core elements of business. Also, through headquarters workshops and meetings, each headquarters’ own tasks were decided.

Once tasks were decided, report sessions for selecting improvement tasks were held for Champions to discuss and reveal their strong commitment to the tasks that had been selected. The sessions were semi-annual (once for the first half/once for the last half) and the execution schedule for projects selected was reported while negotiations among Master Champions of each headquarters were held to eliminate anticipated difficulties. The president, vice-president, Champions, chief officials, the head of the innovation team, Master Black Belts, Black Belts, and Green Belts were required to participate.

Tasks were carried out by five stages called DMAIC. In the Definition stage, after selecting the type of business, the roles and ranges of the project were determined along with the concrete processes. Next, customer’ demands were prioritized by understanding and analyzing their complaints and requests. At the same time, to investigate the process related to the problems, process mapping was done and projects were selected by understanding customer’ requests and defining the process. In this stage, problems and purposes were described, the schedule for the project was decided, and executive plans were reported.

In the Measurement stage, the current level of outcomes stemming from a core process was measured. First, a process of measurement for certain targets was selected and the relevant data were collected. Variables were investigated and examinations for abnormal and random variables were done to measure the power of process involved. This is measuring the process sigma and aims and effects were readjusted according to this measurement.

In the Analysis stage, potential causes were investigated through infra-process mapping, specific charts for variables, scatter diagrams, etc. and such causes were systematically analyzed and tested by quantifying and verifying them through the analysis of process maps (using regression, dispersion analysis, or other highly sophisticated tools of analysis).
In the Improvement stage, plans for improvements were created, selected, and drawn up, and activities were executed. First, proposals were synthesized from a variety of ideas, and the best proposal was selected, pilots were done, and potential problems were investigated.

In the Control stage, activities for improvements were systemized and consistently monitored. In other words, constant process/monitoring plans were established and the process was standardized and documented.

These tasks are managed through PMS (Project Management System), and all employees’ interest in 6 Sigma was raised by the shared presentation about the progress of the tasks especially through a video-conference in which CEOs and executive participated nationwide.

PMS is a system that enables all the progress of the tasks to be checked on-line, and every piece of information is able to be shared by allowing anyone to inspect completed tasks. Also, PMS is being used as a space to provide information and collect the voice of customers by operating 6 Sigma at a bulletin board through the intranet, thus activating communication between the company and its customers.

The background of creating PMS is to build up a foundation for 6 Sigma which efficiently manages projects and shares information, and to develop a unified 6 Sigma execution system in which CEOs, Champions, improvement experts, and execution offices are involved. In other words, PMS provides information for the Board of Directors and Champions to promptly check the status of work process and also provides the infrastructure which can be a guide in solving problems throughout DMAIC. Also the system can create a base for knowledge of 6 Sigma by making management information and Material D/B through the accumulation and sharing of examples of achievements and tasks for improvements.

One a project is completed, the request for approval is to made done by submitting the request form for permission of the project to the Execution Office. The 6 Sigma Examination Committee handles this, and projects are approved for cases that receive at least 80 points. These are graded as A, 70-79 points receive a grade B, and below 69 points become grade C. The projects receiving less than 60 points are reevaluated after revision.

Also, employees’ voluntary participation is encouraged by awarding them incentives for actual achievements, recommendation for special promotion, and financial bonuses through evaluations by each headquarters and presentations after the completion of tasks. In addition, problems were identified and improved through periodical diagnoses of the status management phenomena and COPQ, and many efforts were made to inculcate innovation in management as a railroad management culture by introducing ERP for a completion of systematic innovation and improving process through methods to promote 6 Sigma.
Monitoring is meaningful in examining operations task results, maximizing effects, and at the same time, continuing innovations and creating an improvement-oriented culture. For this, the teams for both standing and ad-hoc examination of evaluation processes are established and the cultivation and retention of experts and outcome of execution of projects were evaluated by each headquarters. Improvement effect is evaluated by yearly amount of money and by whether or not scientific techniques were used. Examiners are Black Belts from the execution office and other headquarters and the targets of the examination are other Black Belts who are in charge of improvements and the chief of the office. The period for examination is 2 years but is conducted semi-annually. Examinations are done in the field and involve achievements for project and the state of management.

The process to select Best Projects in 6 Sigma was prepared for evaluation and monitoring. First, projects are selected in the main headquarters or office, and Best Projects are selected among those projects. These Best Projects are gathered and a presentation is held, and good projects are rewarded through the evaluation by the members of the Examination Committee.

The presentation for Best Practice was also held. This was to form consensus among the employees by announcing performance of improvement and encourage their active participation by examining and publicizing the execution results of best projects. In addition, this is intended to expand and spread the 6 Sigma movement to various fields and enhance the morale of active and enthusiastic participants with appropriate rewards. The presentations were held semi-annually (first and second half of the year, respectively) and the participants included the president, vice-president, champions from each headquarter, chief section leaders, innovation team leaders, BBs, GBs, BBs for project execution, external experts, etc. In the presentations, the improvement results of the projects were announced along with the presentation of the projects and their content which passed the first round of examination. Finally, the champions shared their commitments for management innovation through 6 Sigma.

Training for 6 Sigma is composed of 3 categories: strategy, improvement experts, and organizational culture. First, a strategy course provides seminars for Champions and strategy education for executives and experts. A cyber education course through the intranet and courses on using computers are offered for Green Belts and Black Belts. The certification of Green Belts is confirmed with the approval of Master Champions at the main headquarters, and that of Black Belts is done by the examination of the execution office and the approval of the Examination Committee. In addition, workshops and internal special lectures are done to transform organizational culture and...
innovation of consciousness to bring out consensus and the distribution of an innovative mind set among employees.

The incentives for engaging in 6 Sigma are that, once employees are certified as BBs, they are awarded 4 extra points in their achievement records according to the Korea Railroad Personnel Management Regulations, which helps their promotion. They are also recommended for special promotion based on the recommendation criteria in the Korean Railroad Special Promotion Execution Rules and such achievement is also reflected in awarding individual achievement bonuses. In addition, there are special awards twice a year through the presentation of the examples of best projects while outstanding execution experts and groups are also selected and awarded once a year.

Difficulties and Solutions

Difficulties in promoting 6 Sigma can be summarized as follows:

First, there were employees’ non-cooperative attitudes of refusing to engage in innovation activities. To solve this problem, differences resulting from previous innovations in management were emphasized, and a concrete logical index was developed. Also, exceptional incentives were granted according to achievements and excellent cases were awarded an extra 2 points.

Second, 6 Sigma was too advanced in innovative techniques to apply even to the top private companies, not to mention public institutions. Therefore, Korea Railroad developed its own 6 Sigma program according to its particular circumstances. A standard manual for appropriate process was developed along with a standard index to identify problems. Also, exceptional incentives were granted according to achievements and excellent cases were awarded an extra 2 points.

Third, employees’ lack of professional knowledge of 6 Sigma. To solve the problem, there were efforts at establishing meaningful communication and creating a learning culture of 6 Sigma. Interchanges with private companies such as forming study groups among innovation experts and operating communities were encouraged, and the culture of learning 6 Sigma through a digital management library was developed. The digital management library has books donated by the president and executives and has newly published 450 books about innovation in management and information based on employees’ recommendations. Also, use of the library operation. In particular, a society of 6 Sigma management study is taking charge of education among Black Belts and Green Belts, and conferences and workshops on a regular basis are inspiring employees to learn more. Also, employees’ interest toward 6 Sigma increased through a Day of 6 Sigma and expositions for 6 Sigma, and its achievements are being broadly publicized.

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A 6 Sigma standard manual was developed and a handbook was published to help all employees become more interested in 6 Sigma. Also, special articles were serialized in a periodical ‘cheol-ma 21’ (צלום 21), the progress of 6 Sigma activities was frequently reported and publicized in the railroad newspaper, and small booklets that combined a series of special articles were published and distributed.

For active communication, a 6 Sigma bulletin board using the intranet is being operated, and this is a common space for 6 Sigma for all the employees where all can share their voices. This board allows all employees to publish and discuss their opinions freely and to share materials relevant to 6 Sigma.

In addition, a variety of training programs to spread 6 Sigma are in
IV. Achievements in Execution

1. Performance Evaluation

Improvements in the work process through 6 Sigma largely contributed to improvements of railroad management. As a result, financial gains of 147 billion won were achieved among 307 tasks from 2000 to 2004.

<table>
<thead>
<tr>
<th>Year</th>
<th>Improvement Task (No.)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>29</td>
<td>161</td>
</tr>
<tr>
<td>2003</td>
<td>66</td>
<td>132</td>
</tr>
<tr>
<td>2002</td>
<td>98</td>
<td>350</td>
</tr>
<tr>
<td>2001</td>
<td>90</td>
<td>292</td>
</tr>
<tr>
<td>2000</td>
<td>24</td>
<td>535</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1,470</td>
</tr>
</tbody>
</table>

CTQ shows that 27 cases of increased work efficiency, 12 cases of increased customer satisfaction, 13 cases of increased profits, and 62 cases of cost reduction in Black Belt projects, and 76 of increased work efficiency, 43 of increased customer satisfaction, 14 of increased profits, and 60 of cost reduction in Green Belt project.

The financial effect indicates that in Black Belt projects, 71 cases of improvement effects valued more than 200 million won, 10 cases valued less than 200 million won, 6 cases of 100 million won, and 4 cases valued less than 50 million won, while 23 cases brought out qualitative effects. Also, in Green Belt projects, 33 cases valued 200 million won, 20 valued less than 200 million won, 24 of less than 100 million, and 64 valued less than 50 million won, with 52 that brought out qualitative effects.

Yearly, there were only 24 cases that showed improvements in 2000, the
Korea Railroad’s 6 Sigma Movement surpassed that of domestic airline services (Korea Productivity Center, 2004) and the excellence of railroad services were recognized by the customers.

Additionally, in the theory that regular customers need to be kept according to the recent market economy, regular customers in Korea Railroad increased over 20% annually from 320,000 members in 1996 to 2 million in July 2004 now. In the aspect of safety, the soul of the railroad transportation, railroad accidents, crossing accidents, breakdowns, and troubles in running were reduced up to 50% after 1995.

6 Sigma contributed in enhancing innovative mind and quality of human capital through a variety of training programs. Recognition of customer satisfaction and management toward value in the organization was raised by carrying out different education for executives and employees at the initial stage of 6 Sigma. In addition, it also contributed to enhancing the quality of human capital by recognizing those who can think scientifically and solve problems statistically and by cultivating experts for improvement.

<table>
<thead>
<tr>
<th>Improvement Experts</th>
<th>MBB</th>
<th>BB</th>
<th>GB</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>-</td>
<td>16</td>
<td>16</td>
<td>32</td>
</tr>
<tr>
<td>2001</td>
<td>7</td>
<td>21</td>
<td>34</td>
<td>62</td>
</tr>
<tr>
<td>2002</td>
<td>4</td>
<td>11</td>
<td>73</td>
<td>88</td>
</tr>
<tr>
<td>2003</td>
<td>0</td>
<td>24</td>
<td>50</td>
<td>74</td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
<td>79</td>
<td>163</td>
<td>253</td>
</tr>
</tbody>
</table>

Note: The number is based on the certification of improvement experts per year.

In addition, as a result of customer-oriented, quality management-centered management, the extent of customers’ satisfaction for Korea Railroad
In order to learn about strategic achievements in exemplary innovative movements of this public institution, private companies as well as public institutions are continuing to benchmark Korea Railroad. Samsung Securities, Co. is educating all employees with a video which included examples from Korea Railroad, and officials involved in promoting innovation in Seoul Metropolitan Rapid Transit Corp, Seoul Metro, the Ministry of Information and Communication, and Kyobo Security Co. visited Korea Railroad. Daegu Facilities Management Corporation, Seoul Facilities Management Corporation, VOD Halla, Samsung Network, Cho Heung Bank, LG N-Sys, The Central Officials Training Institute, Samchuly, and Samsung Electronics all made requests for special lectures from Korea Railroad.

Such successful changes and effects by 6 Sigma management of Korea Railroad were also broadcast through media outlets such as EBS, Han-Kyung WOW, K-TV, etc. Moreover, Korea Railroad won the grand prize over the top private companies for 3 years in a row in the 2004 Korea Quality Management Conference, which was held to spread 6 Sigma quality management activities to all businesses in Korea and present a model standard.

### 2. Major Examples of Improvement

Korea Railroad had a significant effect on the improvements of management processes such as cost reduction, COPQ reduction, customer satisfaction, work efficiency, etc. by executing 6 Sigma tasks. Several improvements of Korea Railroad are as follows:

There was cost reduction through the improvement in the examination of bearings for cargo trains and oil tanks, which saved about 0.56 billion won by enhancing quality through optimizing of examinations of linkages between trains, developing standards and methods of examinations, and extending regular check-up time by improving the oil quality in the tanks.

Through the task of ‘Internet sales increase and reservation cost reduction plan by promoting the Internet reservation system’, average monthly sales increased from 9.9 billion won to 12.9 billion won and are expected to reach 15.5 billion won soon. According to a regression analysis which calculates the sales increase by also considering natural increase, the direct increase in sale amounts to about 4.8 billion won. Specifically, there was a cost reduction of 0.25 billion won by expanding the home pager server capacity for members and its content, providing the reservation system through cellular phones and mailing service of reservation information, and 3% extra discount for payment through the Internet.

Also, sales were increased due to the increase in the rate of answering phone calls and a budget of 4 billion 390 million won was reduced annually while customer satisfaction was enhanced by unifying the information hotline of each train station nationwide into a Call-Center and reducing backlogs for calls.

Profits were increased by a decrease in cancellations. Previously, there were losses due to cancellation rates as high as 55%, the high rate of cancellation right before departure, and the inconvenience in purchasing tickets for weekends. However, Korea Railroad reduced the rate of unoccupied seats by applying a differential commission to cancellations and discounts based on
time and finally increased the profit to about 798 million won.

In the field of electricity, by executing ‘the cost reduction for system development and maintenance and repair through the implementation of an integrated automated execution of station work’, the annual average of 1.6 billion won is expected to be saved in the area of costs for system development, of personnel needed for maintenance and repair, and of line use by the year 2006 when the integrated automated execution of station work is to be completed. In addition, there were improvements in the management of station employees, efficient use of station space, production of management strategy materials, and customer services.

In the area of transportation, the improvement in resistance control electronic railways has been made since the latter half of 2001 based on ‘the enhancement of customer services through improvement in the quality of riding on metropolitan electric railcars’. That is, there is a short-term effect of investing the cost for improving the electric railcars but there is a long-term effect of saving more than 400 million won by reducing the cost of purchasing shock observing rubbers for exchange or repair and by reduction of laborer costs for changing them as well as by improving the quality of riding for passengers.

In the area of safe work environment, the program for ‘cost reduction through the implementation of the treatment system for waste oil’ brought about a saving of about 110 million won by establishing the retrieval line of waste oil, about 50 million won by securing waste oil which could be recycled, about 10 million won for workers for unloading and other laborers, about 20 million won for transportation fees or fees for forklifts, and about 30 million won due to eliminating the need to purchase drums.

The surveying of customer satisfaction by professional institutions cost much, and took a long time. It was also difficult to reflect the result in the policies promptly. However, by utilizing customer monitoring in which citizens participate, the results were promptly reflected in management policies and the cost of about 180 million won was reduced annually.

Other qualitative effects are the prevention of soil pollution by oil drops, the prevention of water pollution by spilled oil, internal customers’ satisfaction created by clean work environment, the satisfaction of external customers by the easy take-out system of waste oil by garbage haulers, and increase of profits due to increasing price of waste oil which was collected in good quality.

### V. Factors of Success and Lessons of 6 Sigma

#### 1. Factors of Success

Korea Railroad has been highly evaluated due to successful promotion of 6 Sigma and successful completion of customer satisfaction management, and is becoming a benchmark for private companies as well as public institutions.

Korea Railroad introduced and developed 6 Sigma management from 2000 to maximize general customer satisfaction and performance in management by unifying innovative activities based on 3P strategies. Specifically, by connecting 6 Sigma with CS, TPM, CRM, e-BIZ, etc., they included all innovative activities in 6 Sigma and promoted management innovation strategically. Through this, a total of 259 experts (8 MBBs, 54 BBs, 197 GBs) were cultivated, and the improvement effect of 147 billion won was achieved by executing a total of 307 projects.

In addition, with the opening of KTX (Korea Train Express), Korea Railroad secured competitiveness in train business by improving high cost-low efficiency management process for globalization connecting to TCR and TRS, carefully measured and improved loss scattered in all the organizations, and became a leading model of innovation in the public sector by engaging in a
result-oriented innovation.

Since its introduction of 6 Sigma, Korea Railroad actively discovered tasks for improvements, consistently cultivated experts for improvements, and finally contributed in maximizing general customers’ satisfaction and management performance by raising the experts’ morale.

The success of 6 Sigma in Korea Railroad was largely due to the strong leadership of top executives. Korea Railroad recognized the need for a change of paradigm in management after the 1997 financial crisis and simplified executive systems to build up a reliable management system for profits by abolishing local offices and converting into a department system. At the beginning of the conversion into a department system, Korea Railroad carried out tasks in order to stabilize the organization and improve the process by creating a ‘21st century strategy planning team’ directly controlled by the CEO and intended to solve the current problems in management such as stabilization of organization and restructuring of work process. Also, by having systems that top executives directly supervise and support, the process of task execution and operation was fast and speedy. This was very important for facilitating operations since the CEO is able to check the appropriateness of task execution and receive reports of executive plans by department officials through seminars and meetings for decision makings and report sessions to acquire periodical feedback on task executions. Furthermore, by achieving initial success in big tasks concerning current management issues, Korea Railroad was able to win over those who had resisted and also to wipe out doubts about the possibility of success. In particular, from the beginning of instituting 6 Sigma in 2000, strategists for 6 Sigma were cultivated under the direct command of the president. In 2001, the strategists were stationed in each department to lead innovations, and innovation teams were established. Later, strategic systems for the successful accomplishment of 6 Sigma such as organizing the execution office of 6 Sigma, were developed, and based on this, 6 Sigma was implemented at all levels of Korea Railroad.

In addition to the strategic execution of 6 Sigma through a top-down process, the securing of active human resource pools was also a main factor of success of 6 Sigma. Korea Railroad trained a number of Black Belts and Master Black Belts in stages by executing various kinds of training in its own training center in order to cultivate 6 Sigma experts. Through this, Korea Railroad enhanced its own consulting skills and finally reached the level of solving problems by itself, without outside consulting.

Another factor of success was the systematization of initial strategies and operations. Korea Railroad used both carrot and stick appropriately. As a governmental institution, unlike business in general, Korea Railroad felt limited in financial compensation so that it motivated those who engage in executing tasks successfully by giving exceptional incentives, 2 points based on actual results. It attained considerable effects by making it possible to overcome the limits of hierarchy, and those who were successful in executing tasks were on the potential promotion list and actually promoted based on the incentives received. In addition, the operating system (manual) was established from the beginning and the management system was built for an outward growth. The president’s strong support was also a prerequisite for initial stabilization, but above all, systematic strategies and operating systems such as establishment of operating index and structure of Project Management System (PMS) were largely attributable to successful and consistent establishment of 6 Sigma as part of Korea Railroad’s management process.

2. Lessons of 6 Sigma

What other institutions considering adapting 6 Sigma need to know is that the company president’s strong leadership and active support are significant above all things to succeed in 6 Sigma. One of the most important elements in pursuing new changes and bringing in new techniques is the president’s
strong leadership. Without the president’s enthusiasm, cooperation and participation, no changes can be achieved. 6 Sigma is no exception. Particularly, 6 Sigma is a top-down innovative process in which all the executions and strategies are from the president. That is why 6 Sigma cannot be successful when the president shows only a superficial willingness and perfunctory participation. To achieve 6 Sigma, the president should actively participate in and support activities and take the initiative in cultivating a culture of 6 Sigma. Otherwise, the many achievements that 6 Sigma pursues cannot be accomplished.

Second, Champions should actively participate in 6 Sigma to enhance employee interest and participation. When those who execute 6 Sigma tasks are considered as marginal workers not engaged in the organization’s central business, it is difficult to introduce 6 Sigma management. Accordingly, champions, who are responsible for executing tasks, should check and manage the progress of projects by the execution leader. Furthermore, they need to actively take part in various groups and training to encourage the participation of all employees.

Third, it is necessary to reinforce the execution of tasks and operative power through connection with MBO evaluation. The Champions’ active management and support are essential for the executioners of 6 Sigma tasks; an excellent proposal development and timely operation should be done in order to achieve the goals of projects. Otherwise, the proposals are mere good reports. Also, it is more effective when the number of task execution cases and the result of execution are reflected to strengthen the power of execution.

Fourth, an outstanding core workforce should be in charge of the project in public sectors at the initial stage. For example, regulations, laws, and procedures related to the work in public sectors are very complicated. In addition, to experience initial success and maximize achievements, there should be a focus on strategic execution of tasks in the aspect of innovative management, and this should be considered as the most important task in the office. However, the progress might not go smoothly when novices or inexperienced employees office execute the tasks, meaning that good plans for improvement can not be expected even though such projects are in progress. Fifth, management based on accurate data is necessary. Accurate and objective examination of phenomena prevent rejection from interest groups and make possible accurate diagnosis of problem. Organizations should be streamlined to collect and manage all kinds of data before the initiation of 6 Sigma.

Sixth, systematic education and training for employees are required. Education and training are necessary in any campaign but they are particularly emphasized in the 6 Sigma movement. 6 Sigma requires challenges to conventional ideas, looks into new ways of solving problems, and requires expert knowledge of statistical skills. In addition, by using the Belt system, experts are produced and brilliant results are achieved. 6 Sigma is also a kind of movement to reform employees’ consciousness so that both education and training are indispensable to eliminate employee resistance. Particularly, intensive training in statistics and problem solving methods are necessary in 6 Sigma. In doing so, instead of providing mere education or training such skills and methods, they should focus on how such skills should be applied and adapted to improve the process. Furthermore, 6 Sigma requires education and training that focus on practice rather than theory.

Both education and training for 6 Sigma should be executed for all departments since the goals are hard to achieve when it is limited only to people actually in the field. It should be applied to all sectors of organization such as indirect fields of office work and the fields of customers’ service as well as other places directly concerned.

Seventh, it is important to develop a system in order to develop 6 Sigma as a way to engage in typical management activities and to recognize the need
for 6 Sigma in advance.

6 Sigma is a concept which includes not only a simple quality innovation technique but a philosophy of engaging in work properly. Hence it is possible to link it to public sectors in an efficient manner. Furthermore, since there are a substantial number of road maps and other application tools for public sectors, it is possible not only to revise existing work processes but also to lay out plans for engage in non-existing work processes more effectively.

Unlike other innovative techniques that are dependent on external consultants, innovation in 6 Sigma has progressed mainly by internal workers and innovative subjects based on the innovation teams that can be expanded to the infrastructure of the organization, eventually resulting in voluntary participation of employees who are the core elements in the success of innovation. In addition, once the innovation reaches the level in which self-education and consulting are possible with internal human resources, its strength is bolstered since constant self-progress of innovation and cost reduction related to the process improvement are possible.

<Terminology>

**Belt**
It is a regulatory system for 6 Sigma management to become daily practice and take firm root in the organization and to produce those who possess the certificate of qualification promoted through 6 Sigma. The Belt system is to operate the system in which the participation from all levels of executives and employees is encouraged and such qualified people as Champions, Master Black Belts, Black Belts, Green Belts, and White Belts are produced.

**Control Chart**
The control chart is to represent the statistical results based on time change into graphs and there are management limitation and center lines in order to distinguish the normal from abnormal state in the process.

**COPQ(Cost Of Poor Quality)**
COPQ means the sum total caused by poor quality and includes both visible costs such as the transport of examination and repetition of work and invisible costs such as devaluing of image, loss of opportunity for sales, and re-launching and redesign of projects.

**CRM(Customer Relationship Management)**
CRM is a process of planning, supporting, and evaluating for marketing activities based on customers’ characteristics by analyzing and integrating both internal and external data of the companies related to customers.

**e-Biz**
This is an acronym for Internet Business and means digital-based economic activities instead of traditional analog ones.

**ERP(Enterprise Resource Planning)**
ERP is an integrated information system which plays the role of strengthening ultimately the competitiveness of companies through the efficient management of all human and material resources which are used in organizational activities.

**KPI(Key Performance Indicator)**
KPI stands for key performance indicators.
PMS(Project Management System)

PMS is to manage the procedural elements of registering and executing improvement tasks (projects), the education for improvement experts, and belt systems.

Process Mapping

A Process Map is to the flow chart for specific tasks to efficiently manage the process and the process mapping technique refers to improve inefficiency of process by developing process maps.

RTY(Rolled Throughput Yield)

RTY is a concept to concretize the relationship between overall yield and the yield of each project.

TPM(Total Productive Maintenance) :

TPM aims for the development of an entrepreneurial atmosphere of maximizing the efficiency of production system, the development of a system in the field and actual materials in order to prevent any losses as in the slogan of ‘no accident, no inferior product, no breakdown’ in the all the cycle of production system, the achievement of zero loss with the participation and overlapping small group activities on the part of the president and field workers across such areas as development, sales, and management.

Variation

Variation refers to inevitable difference due to the distribution and individual value of the process. The causes of variation can be divided into random and unusual factors.