

## **A Study on the Policy Advice of Integrated CCTV Control Center**

ChoongSik Chung

*KyungSung University, Busan, Korea*  
cschung@ks.ac.kr

### **Abstract**

*In recent years, public area CCTV has also begun to become more popular in the Korea. 2011, Korea's Ministry of Public Administration and Security has recommended that other local governments set up an integrated CCTV control center in each of their districts. The ministry was planning to make it compulsory for local governments to install an integrated CCTV control center by 2015. More than 570,000 public cameras are managed by public agencies and local government offices. Currently, the integrated CCTV control center is playing a very positive role in fighting crimes in the district particularly through its liaison with the district police. The CCTVs were operated by a several different agencies and departments in the district, resulting in considerable redundancy in public service, inefficiency and delays in response to crimes, and other emergency situations. Therefore, Control Center should be operated lawfully and efficiently. CCTV Control Center will be managed by three ways: (1) IT Governance through cooperation with civil areas (2) by regulated with proper laws and (3) managed by proper guideline and personal training.*

**Keywords:** *CCTV, Integrated CCTV Control Center, Privacy, Electronic Surveillance*

### **1. Introduction**

Recently, large safety accidents have occurred frequently in Korea. The collapse of the Gyeongju Mauna Resort Gymnasium in February 2014 and the devastating disasters of the Seowall, which shocked the whole nation in April 2014. However, there have been continuing incidents of disaster safety, such as the MERS issue. Therefore, the Korean government separated the disaster safety function from the existing security administration and established the National Security Agency. However, the systematic system for the response of disaster safety has not yet been established.

In order to respond to the rapid development and diffusion of information technology today, it is not enough to focus on specific areas in order to realize a safe society. Disasters and crimes that threaten the safety of the public can occur at any time, not just in any particular situation or environment. Therefore, in order to realize a safe society, a policy for comprehensive preparation for possible accidents is needed. However, safety related fields are areas where it is difficult to measure clear performance and effects as preventive actions. In addition, most of safety related policies that cover various fields are difficult to implement easily because of excessive policy costs.

Therefore, the policy that is attracting attention from this viewpoint is "the spread and diffusion of closed circuit television (CCTV), and the operation of the integrated control center that manages the management

---

Manuscript received: 3 August, 2017 / Revised: 10 August, 2017 / Accepted: 28 August, 2017

Corresponding Author: cschung@ks.ac.kr

Tel +82-2-557-3661

Kyung Sung University, Busan, Korea

system for this. CCTV in the public sector in Korea has been rapidly spreading since the establishment of five security systems in 2002 in Gangnam-gu, Seoul. As of 2015, CCTV installations in the public sector are showing a rapid increase to about 570,000. The CCTV of the private sector is estimated to be about 4.5 million, although it is not accurate. In addition, with the recent violent assault on children in nursing homes, CCTV has to be installed in nursery schools nationwide by December 18, 2015. Currently, more than 5 million CCTVs are installed in Korea.

CCTV installation in the public sector was initially introduced for the purpose of crime prevention, but recently it has been used in various fields such as regulation of parking regulations, traffic control, prevention of garbage dumping, child protection, disaster prevention and disaster prevention. Therefore, many local governments across the country have integrated and operate a CCTV system that integrates CCTV systems and images, which have been operated by installation agencies and purposes, and enables real-time control in one place.

The Korean government has been carrying out the CCTV integration control project since 2011. The CCTV Integrated Control Center is a project that unifies the CCTV of the public sector in the municipalities of all over the country through the cooperation of supervisory and supervision. The establishment of a similar type of control center has been discussed as a part of the U-City project from the past, but the beginning of such a concrete plan was started in March 2011 by the Ministry of Public Administration and Security This is the time when we announced the smart e-government action plan. At the time, the announcement included the implementation of the world's best mobile e-government, the implementation of a safe and warm society, the activation of smart work to harmonize work and life, the provision of customized nationwide services based on communication, and the implementation of a robust e-government infrastructure. Among them, CCTV integrated control center was promoted as a detailed project of building a safe and warm society, and the goal was to complete the construction in 2015.

Therefore, the CCTV integrated control center in the public sector is still in the early stage of policy, and it is necessary to continuously verify and study the efficient operation direction. After the implementation of the policy, the studies conducted on the integrated control center point to the need for improvement in the management system, system standardization, legal and institutional maintenance, budget, etc[1]. Furthermore, CCTV integrated control center, which is being promoted in the context of the issue of privacy infringement such as portrait rights and the right of self-information determination, is becoming a more social issue, receiving simultaneous attention due to expectation and concern[2].

Especially, recent development of information and communication technology related to the processing of rapidly developing video data such as big data and cloud computing is likely to greatly change the form and composition of the CCTV integrated control center. Therefore, discussions about the development direction of CCTV integrated control center may be difficult to proceed only in the field of humanities and social sciences. The establishment of the integrated control center is based on the developed information and communication technology

Therefore, this study suggests policy directions for effective operation and utilization of the CCTV integrated control center in the public sector, and suggests directions for development in response to technological change. To this end, we intend to derive a practical policy plan through comparison with the detailed operation status of CCTV integrated control center of local government.

## **2. Theoretical background**

### **2.1. CCTV Concept and introduction**

CCTV is a device that captures and records a specific area, usually fixed. Currently, the representative law that defines CCTV specifically is the Personal Information Protection Act. In Article 2 (7) of the Personal Information Protection Act, CCTV is defined as "an image information processing device" means a device that continuously captures images of people or objects installed in a certain space or transmits them through a wired or wireless network. Device."

The introduction of CCTV was first known as military use in the United States in the 1940s, and then it was used in the UK to monitor the public. In London, England, in the 1970s and 1980s, CCTV was installed

throughout the city in response to IRA (Irish Liberation Army) terrorist attacks, making it the city with the highest number of CCTVs per population density in the world. However, after September 11, 2002, the US capital Washington D.C became the city with the most CCTV installations. As such, the interest in personal and public safety has rapidly increased in many countries around the world, and the installation of CCTV is rapidly spreading.

Since the introduction of CCTV in Korea, there has been a constant controversy over privacy violation and personal information protection, but the installation is rapidly increasing. The number of CCTV installations in public institutions has increased from 157,197 in 2008 to 565,723 in 2013 and has increased by about 20% each year since 2010. According to the classification by installation purpose, the CCTV for facility management and fire prevention is the largest portion of the total number of CCTVs by the year 2013 as 278,002, and CCTV for crime prevention is the next most.

Due to the rapid increase in CCTV and public interest in safety, the Ministry of Public Administration and Security (2011) promoted the installation of CCTV integrated control center. Prior to 2011, CCTV integrated control center was installed centering on Seoul and Gyeonggi Province members. The government plans to build a national video information integration control center for the integrated image information resources management. It will establish 230 city, county, and district integrated control centers by 2015, taking into consideration the utilization rate and the number of each country, 28,579 CCTV units were added. Specifically, from January 2011, the government invested 40.8 billion won in government and local expenses in 34 cities, counties, and districts including Seoul, Choong-gu and Nowon-gu to establish a CCTV integrated control center[3].

Specifically, the reasons for the establishment of the CCTV integrated control center are as follows: Before the establishment of the CCTV integrated control center, the CCTVs operated by each city, county, and county are installed according to the characteristics of each task and usage. There are many points that it is inefficient because CCTV video information can't be shared. Through the establishment of CCTV integrated control center, CCTV is used for the purpose of CCTV installation such as crime prevention, traffic control, parking control and child protection in the daytime and in the middle of the day. In case of night or crime, To switch to crime prevention and to respond quickly to various incidents and accidents.

For this purpose, the CCTV Integrated Control Center can monitor various kinds of crimes and illegal activities in advance by monitoring in real time using 24-hour real-time monitoring by professional control personnel, and improve the crime detection rate by organically sharing information and cooperation system between police and other related organizations And to play an important role in protecting the safety of citizens. In addition, CCTV managed by several divisions was integrated in one place, which reduced the number of manpower, and reduced the maintenance cost by jointly using equipment, so that the efficiency of CCTV operation was greatly improved.

## **2.2. Theoretical discussion on CCTV integrated control center**

The construction and operation of CCTV and integrated control center have been discussed from the point of view of technological operation such as prevention of crime and the prevention of the illegal dumping of waste and administrative service support. However, in order to operate the CCTV integrated control center efficiently, it is necessary to discuss more in depth.

### **2.2.1. Effectiveness of CCTV installation**

The installation of CCTV has long been discussed in terms of crime prevention effectiveness, and contributes greatly to the prevention of crime and further the arrest of criminals. In recent years, CCTV has become a mandatory requirement for middle schools and high schools as well as kindergartens, and the scope of its use has been rapidly expanding from crime prevention to school safety. In addition, it is necessary to conduct an empirical analysis on the effectiveness of CCTV installation in each field, because it is widely used as an overall area of administrative duties from prevention of littering to disaster prevention and disaster prevention.

### **2.2.2. Efficiency aspects of CCTV integrated control center**

Until now, local governments have installed and operated CCTV by department, and the institutions that installed CCTV according to their purpose were different, making it difficult to operate efficiently. For example, CCTVs installed by local governments and CCTVs installed by police stations can't be interconnected, making it impossible to share necessary information. Therefore, the installation of the integrated control center can reduce the manpower and cost, and further improve the efficiency of information sharing. Therefore, there is also a need for an empirical analysis of the efficiency of such an integrated control center.

### **2.2.3. The governance aspect of CCTV integrated control center**

The CCTV integrated control center, which was promoted by the government, was a small-scale integration of sub-units belonging to the metropolitan city, the police agency, and the National Emergency Management Agency. In other words, current CCTV Integrated Control Center does not include system integration control center hardware, integrated control solution, infrastructure, space structure and operating organization that should be provided for efficient operation and management of national visual information resources. Especially, in the reality that CCTV equipment is becoming more intelligent, the organic integration and management of the operating organization becomes more important. Therefore, the issue of establishing governance that can integrate the systems that have been separated and operated independently into local autonomous bodies, police offices, and firefighting headquarters is becoming important.

## **2.3. Precedent research**

The previous researches related to CCTV integrated control center can be broadly divided into CCTV integrated control center researches and CCTV researches.

### **2.3.1. Study on integrated control center**

Although there are not many studies conducted on the CCTV integrated control center, some studies have been conducted on case studies and improvement plans after the policy implementation in 2011. First, in relation to CCTV integrated control center, Kwang Chang-hwan and Suh Chang-gak tried to identify the problems and preconditions that occurred during the integration process between the agencies through the case of CCTV integrated control center in Busan. And a linkage problem, administrative and technical integration alternative to the broadband network needed for successful implementation of the Integrated Control Center [4].

Kim, Ji-sun examined the efficient operation of the integrated control center, which is the basis of the integrated control system operation that can utilize CCTV as a multipurpose. As a result, in order to operate the integrated control center efficiently, Second, standardization of integrated control system of CCTV. Third, efforts to improve the qualities of monitor personnel and establishment of management responsible department. Fourth, improvement of legal system and provision of information protection measures. Fifth, continuous management. It is necessary to secure a budget.

### **2.3.2. CCTV related research**

The research on CCTV has been continuing since 2002, when it was first introduced to Korean public institutions. These prior studies can be divided into three aspects, except for the area of technology development. First, the studies related to legal infringement of personal information infringement by using CCTV. Second, the studies related to the verification of the effect of CCTV installation. Third, the problems related to the operation of CCTV for crime prevention and the alternatives are suggested.

#### **2.3.2.1. Study of legal aspect**

First, the legal and institutional improvement plan for effective operation of CCTV is the main subject of CCTV related research. Kim Minho analyzes the current status and issues of CCTV laws, systems, and issues in Korea, and suggests ways to build a comprehensive CCTV management system that can eliminate the public's concerns about the efficient use of CCTV and the protection of personal privacy, and suggested measures for the maintenance of the related legal system [5]. This research is now exploring the concrete

solutions to the dysfunctions that can be caused by CCTV, which is widely used today for various purposes such as crime prevention, facility security and workplace surveillance in the private and public sectors. Specifically, it pointed out the non-systematic part of the protection system for personal image information in the statute and insisted that the regulation based on the concept of the new personal image information should be executed for the uniformity of regulation of image information.

#### **2.3.2.2. Study on installation effect**

The validation study on the effect of CCTV installation has been continuously studied in order to verify the effectiveness of CCTV installation and to establish an efficient installation plan. Kwak, Dae-kyung, Lee, Seung-chul conducted a study to identify the influence of CCTV on perceptions and fears of local environment [6]. Noh Ho Rae studied the effective use of CCTV for crime prevention. This study examines the theoretical background of the CCTV application and examines the evaluation of the effects of the 22 CCTVs in foreign countries. And I reviewed the situation and problems in Korea and searched for effective ways to use it [7]. Park Cheol-hyeon and Choi Soo-hyung used the similar experimental design with two experimental groups (Nonhyeon 1 and Gangnam-gu area) and one control group (other districts outside Gangnam-gu) The results of this study are as follows. First, the effects of crime prevention and crime transfer were analyzed [8].

#### **2.3.3. Management and Operation Research**

Studies on management and operation have focused on recognizing the necessity of CCTV installation, minimizing adverse effects and ensuring efficiency. Kwak, Yun-gil, and Imtae-hee analyzed case studies of CCTV using the foreign and Korean cases of CCTV and investigated the dysfunctions of CCTV such as infringement of basic rights and deterioration of crime prevention effect This study aims to increase the effectiveness of CCTV and to utilize it effectively [9].

Jang Il-sik and Yang Moon-seung (2014) studied the use of CCTV for police crime prevention and improvement in Gunsan area, Jeonbuk Province. This study analyzed the actual cases of CCTV and CCTV in Gunsan Police Station in Jeonbuk to examine the problems of the effectiveness, technical and operational aspects of the arrest, and suggested ways to improve them [10].

### **3. Analysis framework**

The Korean government has been working on local governments across the country to integrate and manage CCTV systems and images in the public sector, such as crime prevention, schools, illegal parking cars, waste disposal, disaster and disaster prevention, And the establishment of the integrated control center. This study analyzes the operation status of CCTV integrated control center and tries to derive direction of development. To this end, we categorized the problems derived from the previous studies into two major categories: governance factors, legal and institutional factors, and management and operation factors.

These factors as well as the important aspects to be considered are the changes in the technology environment. The changes in technology related to the CCTV integrated control center are greatly influenced by the new information technology paradigm based on Big Data and cloud computing as well as the CCTV has evolved into the intelligent CCTV through its own technological evolution.

The government policy related to the CCTV Integrated Control Center is covered by 230 local governments across the country, but this study limited the analysis to 16 cities and counties of Busan City Basic Autonomous Communities. The reason for this is that, in order to derive a practical improvement plan through the issues discussed in various previous studies, it has been determined that it is more efficient to limit the policy to a region that is consistent with the consistency. The results of this study are expected to lead to a more in - depth discussion through comparative analysis with other regions in the future. Therefore, the object of this study is the integrated control centers of the Busan municipal autonomous entities that gathered CCTV for various purposes.

For this study, we selected one of the 13 Busan Integrated Control Centers that were currently operated

and selected four centers in Jeongjung - gu, Sajang - gu, Namgu and Haeundae - gu, and interviewed them. Visits to the Busan Integrated Control Center were held in April and May 2015. In order to facilitate cooperation between citizens and related organizations, the government should refer to these discussions and discussions of previous researches in order to improve the governance in order to cooperate with citizens, minimize the adverse effects of CCTV introduction, Management, and management. In addition, we tried to propose a unified governance system considering the change of technology environment following the introduction of intelligent CCTV which is rapidly developing.

## **4. Status and Problems of Integrated Control Center**

### **4.1. Governance aspects**

As a result of investigation of the Busan Metropolitan City Integrated Control Centers, the main related organizations were local government, education support agency, and police station. Unusual is that military units also have business agreements with integrated control centers in each municipality. This is a special situation because Busan Metropolitan City is adjacent to the sea. The integrated control centers of the municipalities adjacent to the sea have concluded business agreements with military units at the time of opening, but the military units did not play a special role in the operation of the actual integrated control center.

The main roles of the related organizations can be grasped at two levels. The first part is about the composition of the integrated control center. In order to effectively cope with various problems occurring in the administrative area of the municipality, the integrated control center needs to secure as much CCTV as possible. Therefore, before the establishment of the integrated control center, the public agencies such as the local government, the police station, and the education support agency provide CCTV images to the integrated control center. Second, it is related to the management and operation of the integrated control center. The municipal government is in charge of the management and operation of the integrated control center, and the police department plays a role of facilitating rapid response such as liaison with the police station in case of a problem through dispatch police. The Education and Support Office provides budget support for the CCTV control staff of the DOE.

And there is no agreement on business between local governments. In the jurisdiction of the integrated control center, it is understood that the situation where the crime occurs and the situation that can be controlled when the problem is confirmed can be performed smoothly by the dispatch police officer. However, when there is no business agreement between the local governments, if the crime situation extends to the related area of other localities, the dispatch police of the integrated control center report the crime situation to the police station, . Therefore, in order to cope more smoothly in the future, a cooperation system between the local autonomous bodies is necessary for the task of the integrated control center and the image information.

### **4.2. Legal and institutional aspects**

In 2009, CCTV was operated by a public agency based on the Guidelines on the establishment and operation of CCTV of public institutions. However, this guideline is abolished and CCTV is operated by each public institution based on the Personal Information Protection Act. In addition, each ministry has guidelines on the protection of personal information and uses it as a basis for CCTV installation and system operation. Although private CCTV is basically based on the Personal Information Protection Act, details are provided on the basis of CCTV Personal Video Information Protection Guidelines, the rules of the Korea Internet Promotion Agency. However, these laws and guidelines are insufficient to cope with the rapid increase of CCTV, and a comprehensive management rule along with the organization management part will be needed in the future.

The establishment of the Integrated Control Center will be carried out through designing according to the guidelines established by the (former) Ministry of Public Administration and Security, and by establishing internal guidelines in accordance with the relevant provisions of the Personal Information Protection Act. The management of the CCTV controlled by the integrated control center is managed and operated in

accordance with the regulations of the national video information processing equipment.

The Integrated Control Center installed in the local governments of Busan is based on the related laws and regulations, and establishes and operates the integrated control center for each of the 13 municipalities in which the Integrated Control Center was established. The regulations on the construction and operation of the integrated control center for each municipality are divided into 30 sections, and the rest of the municipalities are composed of 24-25 sections. There are differences in the number of provisions, but there are no significant differences in the details.

The regulation on the establishment and operation of the integrated control center can be roughly classified into the articles related to the image information resource and the related matters related to the operation of the integrated control center. The articles related to image information resources provide detailed information on the collection, use and provision of image information, installation standards, and integration and linkage of image information processing devices. The articles related to the operation of the integrated control center are divided into a dedicated department, It provides information protection.

### **4.3. Management and Operational Aspects**

In the public sector, CCTV management and operation must be strictly controlled in order to monitor whether personal images acquired through use, installation, or use in compliance with the provisions of the law are being used solely for the legitimate purpose prescribed by law. Therefore, in order to prevent misuse, it is necessary to minimize the violation of human rights of people who are photographed by pursuing the principle of strict restraint. Specifically, it is necessary to take strict responsibility for the abuse of CCTV, such as unauthorized access to video recording information, and the provision of third parties other than the purpose, through administrative sanctions or criminal punishment. On the other hand, CCTV operators should limit their operations to those who have received qualification and education so that they do not infringe on their personal rights and privacy. Even though CCTV is installed in each public institution, there is a lack of awareness about CCTV. Therefore, long-term management education should be conducted for designated CCTV management personnel.

Currently, the operation of the CCTV Integrated Control Center in Busan is managed by various departments depending on the CCTV usage in each borough. In other words, they are operated separately from the related departments of crime prevention, facility management, environment, illegal parking, disaster, safety and forests belonging to each local government, and the dispatched personnel of the education and police agencies are participating in the operation. From the standpoint of the installer, it is difficult to secure continuity and expertise because it is dispatched and operated by various organizations.

These local government personnel are responsible for the administrative tasks of the Integrated Control Center, while CCTV monitors are hired by contracting companies. Therefore, institutional measures should be prepared to improve the qualities of these monitors. At present, the monitoring staff of the integrated control center do not only receive professional training, but also monitor the monitor literally without knowing how to operate the system. Therefore, it is necessary to discuss the specialization and regularization of the monitoring staff.

Security problems related to CCTV are largely divided into security of CCTV and security of video management. CCTV has a weak security structure because it did not consider connection with the Internet at the time of original development. Currently, the integrated control center of each municipality has evolved from the existing analog CCTV system to a network-based integrated control system, which integrates crime prevention, investigation and disaster safety.

Therefore, the network-based CCTV integrated control center is vulnerable to external hacking and has a high risk of image information leakage, so information security management against the risk of leakage of personal information should be performed. In addition, it is required to build an internal control system to prevent leakage and misuse of CCTV image privacy information.

### **4.4. Intelligent CCTV appearance due to changes in technology environment**

Recently, the technology related to CCTV control is rapidly developing with interest in safety. Along with the development of digital video technology, the technology of watching CCTV video over the Internet has

been popularized, and it is combined with intelligent technology that automatically detects and identifies specific objects such as people and objects, And it is developing as an intelligent CCTV [11].

These intelligent CCTVs can operate with a small number of people and have the advantage of being able to continuously observe objects or behaviors that need to be identified, as opposed to the identification of crime situations depending on the degree of concentration of the monitoring personnel.

In recent years, there have also been cases in which such intelligent CCTVs are introduced and operated. Intelligent CCTV is now being deployed by local police agencies, and the CCTV integrated control center is also attempting to monitor it using intelligent CCTV. This is a trend that crime has been prevented or solved by the help of intelligent CCTV even though it was not directly detected by human eyes.

## **5. Policy Suggestions**

Based on the above problems and the results of the interviews with the center staff regarding the operation of the CCTV integrated control center, the improvement measures derived from the above can be summarized as follows.

### **5.1. Governance aspects**

The most important aspect of the governance of the CCTV integrated control center is to make use of CCTV in the private sector in the future. For this purpose, a private CCTV database should be built first. In addition, it is difficult for public officials to manage and supervise the change of related CCTV. Therefore, it is necessary to establish a system such as CCTV registration system and implement a policy that individuals who install CCTV voluntarily provide changes.

Specifically, it is necessary to introduce a CCTV reporting system that notifies CCTV installation location, performance, and purpose when CCTV installation / operator installs CCTV. However, if compulsory reporting obligations are enforced on all CCTVs, there will be a critical opinion that the inconveniences of citizens and excessive administrative convenience will be formed. Therefore, rather than collectively enforcing the notification system at once, it is necessary to carry out enforcement reporting and voluntary declaration concurrently according to the scale of installation and operation of CCTV, and to apply a stage-by- It is necessary to provide an institutional supplementary device. In order to introduce the notification system, legal basis must be provided. Therefore, Article 25 of the Personal Information Protection Act stipulates the obligation to report and the authority to designate a dedicated agency, and the details of the object of notification, notification requirements.

### **5.2. Legal and institutional aspects**

Regarding CCTV integration control, it is necessary to reorganize the legal system related to personal image information. That is, it is necessary to redefine the disciplinary structure that is intertwined with various laws such as the current Personal Information Protection Act, the Enforcement Decree of the Personal Information Protection Act, the standard personal information protection guidelines, the guidelines for the protection of personal image information of public organizations. Of course, these CCTV-related laws have their own meaning. However, there is still no regulation on specific requirements, procedures, supervisory agencies, and individual rights, so it is still necessary to improve the legal system. In particular, the Act on the Protection of Personal Information has been amended by the Act, but the detailed contents related to CCTV Operation and Integrated Control Center are insufficient.

Therefore, the local governments that currently operate the CCTV integrated control center operate them in terms of laws and systems related to video information processing devices. All the integrated control centers of Busan City are operated through CCTV related ordinances. Therefore, a plan should be proposed to establish the purpose and operation direction of the integrated control center separately. However, there are many laws and regulations related to the integrated control center and the image information processing apparatus at the national level, making it difficult to solve at the local government level. Therefore, it is necessary to summarize necessary parts in the upper statute. In this regard, it will be necessary to consider establishing the "CCTV General Law" including the operation of the integrated control center.



### **5.3. Management and Operational Aspects**

In order to utilize an effective CCTV integrated control system, a management system that can read CCTV and make an immediate judgment is essential. Of course, there are technological methods that are developed to respond immediately by using intelligent CCTV, but eventually people must make decisions. Therefore, it is necessary to educate, monitor, and supervise the monitoring personnel. Especially, the information protection obtained from the CCTV is a part that must be constantly strived. Therefore, regulations and cooperation with CCTV control center management and cooperation are required.

Specifically, in the case of the Busan City Integrated Control Centers, the monitoring staff is now in a position to bidding and selecting from the front-line worker if they announce the one-year job announcement from the municipal government as contract workers. This is also the case with other centralized control centers in other municipalities. As a result, the expertise is falling and replaced every year, so that there is a problem that it is replaced by the time of being familiar with the actual work. In addition, there is no separate detailed education program, and only the instructions are learned and placed. Therefore, it is necessary to regularize and professionalize the personnel of the integrated control center. For this purpose, it is necessary to educate the personnel of the integrated control center of each municipality about the role of the monitoring staff and the security awareness of information protection by periodic education and periodic education, And the like.

These contents also apply to police officers dispatched to the integrated control center. Currently, 216 police officers are stationed at 78 integrated control centers nationwide, and 64 police officers are also working at the joint control center and the general control center. They are required to complete the personal information protection process (one week) at the Police Training Center, but there is no special CCTV related course, so it is difficult to expect expertise in CCTV related work. Therefore, it will be important to strengthen the education of these resident police officers and to give a kind of responsibility and authority by creating a licensing system such as "Integrated control system manager".

### **5.4. The need for new governance based on technology development**

The rapid development of CCTV-related information and communication technologies will require new governance beyond existing management systems [12]. In the past, CCTV was installed at low resolution and fixed. However, CCTV, which is being popular recently, can be rotated 360 degrees on the basis of high resolution, and voice recognition and face recognition are possible. It also has a voice guidance function to prevent unauthorized use of garbage or illegal parking. Furthermore, all of the CCTV images have been stored in the form of tape analog storage, but CCTV image storage devices are adopting new technologies capable of digital large capacity and high speed transmission.

Therefore, the establishment and operation of a CCTV integrated control center based on this new digital technology base should be pursued in a different way from the analog approach of the past. In other words, it is no longer an efficient way for all 230 municipalities across the country to establish their own integrated control centers and operate them separately. This is because, if a crime occurs, the criminal does not operate within a single municipality. Therefore, there is a need for an organization at the level of the municipalities that can store, operate and search the images of the integrated control center operated by these basic municipalities.

In addition to the CCTV integrated control center, local autonomous entities have established and operate a regional information integration center from the perspective of promoting local informatization. Therefore, the regional information integration centers of existing municipalities are receiving and managing the image information generated by each integrated control center in cooperation with the integrated control centers of the municipalities under their control, and functions such as backup and link search In this paper, we propose a new integrated image management governance scheme.

## Acknowledgment

This research was supported by Kyung Sung University Research Grants in 2017

## References

- [1] Kim Ji Sun. "Improvement of Operation of Integrated Control Center through Analysis of Research Related to CCTV", *Korean Public Administration Review Bulletin*. Korean Institute of Public Security and Public Administration. Vol. 23, No. 2, pp. 65-96. 2014.
- [2] Jang, Gyo Sik, "A Study on CCTV Surveillance and Protection of Personal Information by Public Institutions", *Land and Public Works Law*. Vol. 66, pp. 279-297. Korean Institute of Land and Construction Law. 2014.
- [3] Ministry of Public Administration and Security. "CCTV Integrated Control Center Promotion Plan", 2011.
- [4] Kwon, Chang Han & Suh Chang Gap. "A case study on the establishment of CCTV integrated control center in Busan," *Digital convergence research*, Vol. 9, No. 3, pp 191-202. Korean Society for Digital Policy. 2011.
- [5] Kim Min Ho. "Legal Research for CCTV Management", *Sungkyunkwan Law*, Vol. 25, No. 2, pp. 219-244. Sungkyunkwan University Law Research Institute. 2013.
- [6] Kwak, Dae-kyung & Lee, Seung-chul. "Impact of Cognition on CCTV and Local Environmental Factors on Crime Fear", *Korean Public Administration Review*, Vol. 39, pp. 12-46. 2010.
- [7] Noh, Ho Rae. "Effective Use of CCTV for Crime Prevention," *Korean Public Administration Bulletin*, Vol. 19, pp. 1-25. Korean Institute of Public Security and Public Administration. 2005.
- [8] Park Cheol-hyeon and Choi Soo-hyung, "Crime Prevention Effectiveness of CCTV for Basic Municipalities: Focused on the Pilot Installation of Nonhyun-dong, Gangnam-gu", *Court Review*, Vol. 30, No. 2, pp. 25-42. Institute of Local Autonomy, Donggeui University, 2013.
- [9] Kwak, Yun-gil, and Imtae-hee. "Effective Use of CCTV for Crime Prevention and Response," *Korean Police Administration Journal*, Vol. 8, No. 2, pp. 119-144. The Korean Association of Policing and Administration. 2011
- [10] Jang Il-sik and Yang Moon-seung. "Performance and Improvement of CCTV Application for Police Crime in Jeonbuk Gunsan Area", *Journal of Police Studies*, Vol. 9, No. 1, pp. 147-175. Wonkwang University Police Research Institute, 2014.
- [11] Information and Communications Industry Promotion Agency. "Intelligent CCTV Trend and Performance Improvement Plan", IT Planning Series. 2013.
- [12] Chung, Choongsik. "Strategies for Promoting Local Information in the Smart Cloud Environment: Focusing on the Establishment of the Regional Information Integration Center", *Journal of the Korean Association for Local Information*. Vol. 15, No. 3, pp. 1-28. Korean Society for Information Technology. 2012.