

Publication state: Japan
ISSN: 2423-8279

Publisher: J-INSTITUTE
Website: <http://www.j-institute.jp>

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Peer reviewer
E-mail: editor@j-institute.jp

<http://dx.doi.org/10.22471/police.2018.3.1.39>

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A Study on the Status and New Tasks of POLICING Technology R&D in Republic of KOREA

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Abstract

The development and change of advanced technology has brought about changes in almost every sector of the nation and society, and this is the same aspect worldwide. While technological advances have provided convenience in life, crime is also becoming intelligent and emerging in new forms. These changes require new policing needs and the corresponding agility of the police. Despite the worsening environment of law enforcement, such as advanced crime, citizen's demand for policing is increasing. Therefore, active use of technology has become essential for police activities. But we lack budget, infrastructure and attention. The revision of the Police Act provided legal ground for Policing Technology R&D, but systematic research is insufficient. Therefore, the study will assess the status of its and discuss future tasks in Korea.

[Keywords] Policing, Police, Technology, R&D, Crime

1. Introduction

The development and change of advanced technology has brought about changes in almost every sector of the nation and society, and this is the same aspect worldwide. IOE(Internet of Everything), the world's first surgical robot, combat robot, legal robot, and drone(unmanned aircraft) have been introduced, and space elevator will be possible in 2050. While technological advances have brought convenience and abundance of life, crimes are also evolving and changing into new forms, such as cybercrime and intellectual crime. These changes require a new form of policing needs and the proper response of the police.

In May 2012, '2012 European Police Chiefs' Convention' held in The Hague, Netherlands, emphasized the importance of SMART policing. This is an objective analysis of fundamental causes such as crime, focusing police force, and extensive use of scientific technology in police activities, thereby maximizing the effectiveness

of police activities by focusing on existing available resources[1]. Despite the worsening environment of law enforcement, such as advanced crime, the level of public demand for police is increasing. Active technology applications have become essential for the entire police force. However, the police have limited ability to respond. Fortunately, the revision of the Police Act in 2014 provided legal ground for Policing Technology R&D, and various policies are being implemented.

Nevertheless, sufficient infrastructure has not yet been deployed for technological advancement, and there is a lack of focus and investment[2]. The study presents changes in the policing environment brought by advances in science and technology, and introduces the Korean police's Policing Technology R&D status and key relevant cases. And it will suggest policy implications.

2. Theoretical Background

2.1. Definition of policing technology R&D

The word ‘Policing’ is generally defined as “the comfortable control of the country, the maintenance and preservation of the peace and order of the nation's society”(in Naver Language Dictionary). The state agency in charge of security is the police and its activities and duties are defined in the ACT ON THE PERFORMANCE OF DUTIES BY POLICE OFFICERS. Technology, the application of scientific knowledge to the practical aims of human life or, as it is sometimes phrased, to the change and manipulation of the human environment[3]. Policing technology is the wide range of scientific and technological methods, techniques, and equipment used in policing[4].

The Policing Technology can be divided into various forms, while Manning(2003) is divided into mobility technology, training technology, transformative technology, analytic technology, communicative technology, information-processing technology[5]. Wakefield & Fleming also claims the addition of weapons technology[6].

2.2. Current status of science and technology in Korea

Investment in R&D has remained at an annual rate of 11% since 1999, and increased from 1.33 billion to 1.89 trillion from 4.0% to 5.0% of total government spending. The role of national R&D projects changed from simple technology in the 60s and 80s to composite technology in the 2000s. And now its role is diverse, from government-led development to basic research, which is shared by universities and businesses, to applied research[7]. Until now, it had focused on imitation, development and commercialization centered on strengthening competitiveness of manufacturing industries. But increasingly, there are increasing quality of life and social problem solving, scientific technology infrastructure, and needs into a technology-oriented society.

2.3. Why, is it policing technology R&D?

The world we dream of is a world with nature, a world of abundance through new technologies and continuous growth, a world of human life and safety. However, the police must increase the efficiency of law enforcement using advanced technology because of the rapid advances in technology and the criminals using it[8,9]. The change in police tactics abroad is explained by the period. The technology introduced at each time of the year will serve as a major driver of changes in police action strategies and organizational structures[1].

Table 1. Historical change of policing[10].

Division	Political era (1840 to 1930)	Reform era (1930 to 1980)	Community era (1980 to present)
Authorization	Politicians and law	Law and professionalism	Law and professionalism, community support, political
Function	Broad social services	Crime control	Broad provision of services
Organizational design	Decentralized	Centralized, classical	Decentralized, task forces, matrices
Relationship to community	Intimate	Professional, remote	Intimate
Tactics and technology	Foot patrol	Preventive patrol and rapid response to calls	Foot patrol, problem solving, public relations
Outcome	Citizen, political satisfaction	Crime control	Quality of life and citizen satisfaction

There is an increasing sense of anxiety about the risks of crime due to increased crime and widespread damage, diversification, intellection and specialization. As the percentage of traffic, violence and intellectual crime among all crimes increases, the importance of investigation

through scientific technology is increasing to operate limited security resources more efficiently and effectively. The technological progress in police operations is as follows.

Table 2. A process of technological progress for policing[11].

Division	1881~ 1945	1946~ 1959	1960~ 1979	1980~ present
Maincontent	<ul style="list-style-type: none"> • Mobile patrol • Radio com. • Tele-phonecom. 	<ul style="list-style-type: none"> • Traffic violation detentioninstruments 	<ul style="list-style-type: none"> • 911 • Centralized dispatch • Civilian specialists • Research & development organization • Computer age begins 	<ul style="list-style-type: none"> • Telecommunications advance • Mobile data communications • Expert systems • Imaging • Biometrics • GIS

According to the Korea National Statistical Office's 2017 social survey, the number one cause of anxiety in Korean society is the occurrence of crimes. Also, a survey of the nation's crime rates over the past decade showed that 61 percent of all crimes were traffic, violence and intelligence. Crime has been on the rise lately and the rate of arrests is around 70 percent. The number of crimes and the rate of arrests are associated with several social and environmental factors. In order to improve the quality of life and build a safe and healthy society from crime, it is necessary to actively promote crime prevention and security R&D.

South Korea's R&D budget has increased by more than 10 percent annually over the past decade. For effective R&D projects, the government established '2nd basic plan for managing and utilizing R&D performance' in 2010 and announced the National R&D Performance Evaluation every year.

3. The Status and Case of Policing Technology R&D

3.1. The organization and related rules of policing technology R&D

Some of the related organizations in Korea include the National Forensic Service, the Police Science Institute, the Korean National Police Agency, the Korea Crime scene Investigation, the Korean National Police Agency Cyber Bureau. It is difficult to display the expected R&D capabilities, such as budget and manpower distribution, as they are divided into individual institutions, departments and work areas. As such, development and organization of R&D technology at national level have not been systematically implemented. There is also a level of R&D investment that does not match the high public demand for security. In 2015, a new research and development project for public security, science and technology was launched, and the project is worth only 2 billion.

According to Article 3 of the Research and Development Business Processing Rules for Science and Technology, the scope of R&D is defined as follows(in the Korean National Police Agency):

- ① Research and development to enhance technical skills in the prevention, suppression and investigation of crimes,
- ② Research and development to enhance the technical skills in the areas of security, guard and anti-terrorist operations,
- ③ Research and development to enhance technical skills in the field of traffic control and prevention of risks,
- ④ Collecting and analyzing crime information in cyberspace, developing technical skills in the field of cybercrime prevention, investigation and electronic evidence analysis,
- ⑤ Research and development for development of police equipment and application of information and communication technology
- ⑥ Research and development for establishment of research infrastructure, equipment, manpower,
- ⑦ other research and development in which the Director of the National Police Agency is recognized as necessary. However, systematic research and development project is still in the beginning stage.

3.2. The case of policing technology R&D

In the United States, the National Institute of Justice was established in the 1960s to conduct research on the development of technologies and equipment for the safety and criminal courts,

and to conduct research on the causes of crime. In 2010, it allocated 88.7 billion won(26.7 percent of the total budget) and invested 78 percent of the budget, especially in R&D for science technology and capacity building for training, investigation and criminal analysis. In the UK, security-related technology development is centered on the Home Office Scientific Development Branch and National Policing Improvement Agency.

According to the current status of R&D in major policing areas in Korea, the field of forensic science, scientific investigation, and transportation accounts for 75 % of all cases(e.g., identity identification technology, smart system, etc.). On the other hand, only 14 percent of studies are related to crime prevention(National Science & Technology Information Service).

4. A New Tasks

4.1. Establish a systematic and comprehensive implementation system

We recently realized the need for the introduction of a police organization dedicated to R&D and technological development through changes in police activities in developed countries and applications of technology. However, the South Korean government has little experience in implementing the Policing Technology R&D. Only partial studies of issues such as the quality of life have been conducted in some institutions. The effectiveness of ongoing research is also questionable due to the lack of a system, as well.

Therefore, basic plans and implementation plans that reflect mid-to long-term roadmap are needed to develop technology and conduct effective research. This should include the establishment of a dedicated research organization and the development of specialized human resources. It is an organization to support the police. The aim is to provide technologies and systems that can predict and effectively respond to future risks in society. In the long term, it is urgent to establish a research institute, a type of state-initiated research institute[2][12].

4.2. Shared growth and collaboration of the safety services-related industries

Currently, there is a public and private infrastructure(CCTV, etc.) that can be used for policing. However, due to lack of technology and systems, it is only partially utilized. In addition, it is difficult to secure investment efficiency due to the problem of legacy, in which fragmented technology development is pushed forward as required by each department and the connection with existing infrastructure is not considered. Strategic investment execution is needed to maximize investment efficiency. In addition, efforts to implement a safety society through growth of the private sector are necessary. Korea's security industry revenue, combined with information security and physical security, is about 5.5 trillion won in physical security and 1.6 trillion won in information security(KISIA, in 2017). In particular, the security market is expected to continue to grow more than 7 percent per year until 2022 as more single households, aging households, and unmanned shops grow. For the sake of public security, it is urgent to secure a foundation for shared growth with related industries, including high-tech safety and security services.

4.3. SMART Policing

SMART Advertising is a police action strategy that emphasizes the use of strategic management, Analysis & Research, Technology[13]. This is a new strategy given by the lack of resources and intensive police management of scientific technology. With the development of science and technology, it is the Policing Technology R&D that can link it to the police force.

However, support and understanding of the public is essential to the success of the Policing Technology R&D. In the United States, the priority of the Policing Technology demand is police-community relations. If the government develops and utilizes the technology to limit the demands of the police and practical needs, it will likely violate basic rights, including the privacy of the people, and will face the difficulties of public opposition and budget acquisition[9]. It should

not be forgotten that the core of policing is their relationship with citizens. Therefore, intensive research should be done to prevent and respond to life crimes that are closely related to the safety of the people, to violate the people's livelihood, and to expel disorder around life.

5. Conclusions and Discussions

Crime is also becoming intelligent and specialized as technology advances. Developed countries are already stepping up their research and use of technology to counter new forms of advanced crime. Korea also needs a new security strategy for keeping citizens safe and in order from crime through Policing Technology R&D. However, there is very little interest and policy support, and national consensus is still lacking.

Therefore, investments should be made in systematic and planned R&D that includes a security R&D roadmap. First of all, appropriate technologies should be developed for the gradual expansion of investment to meet public demand and national awareness. Such efforts will lead to the expansion of infrastructure in the field of security and effective and organic cooperation among the parties involved. Ultimately, these efforts will help reduce the people's fear of crime, establish effective security policies and prepare criminal measures.

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