

NEC Group and Public Safety

From combating epidemics and providing effective social security to protecting the public from acts of terrorism, solutions to diverse safety and security issues that impact the quality of life have been increasingly sought by countries around the world in recent years.

NEC Group is providing governments on a national and local level with an expanding variety of public safety services and solutions that are needed to ensure the safety and security of people's lives.

This issue will introduce the reader to NEC public safety and security technology and solutions with a focus on Biometric Identification, Video Surveillance, Access Control and Airport Safety Management.

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1 Introduction

Recently growing attention is focused on protection against pandemics; countermeasures for earthquakes, heavy rains and other natural disasters; and enhanced solutions for various life quality issues ranging from social security to environmental pollution. In addition, countries are urgently seeking ways to secure public safety and security against terrorist actions, bombings and other tragic attacks against society that seem to headline the news almost everyday.

This feature puts the spotlight on the growing menu of NEC Group services and solutions provided to the national and local governments of countries around the world with the aim of preserving public safety, which is essential for the safe and secure lives of people everywhere.

2 NEC's Public Safety Business Strategy

2.1 Providing Solutions Tailored to Customer Scale and Requirements

For customers ranging from nations to local governments,

NEC Group has provided each with various types of public safety solutions according to their specific needs and scale. **Fig. 1** shows the scope and approach of NEC Group's public safety business.

NEC builds systems that incorporate state-of-the-art identification and sensor technologies, information technologies/network (IT/NW) technologies and information security for clients of any scale from national governments to corporations in the private sector.

Specifically NEC provides video surveillance, facility/equipment surveillance and other solutions that can respond to a broad range of operational needs from immigration inspection which is essential to securing national borders to national ID systems.

2.2 System Evolution and Integration

NEC Group has developed numerous systems for video surveillance, human behavior visualization and "hands free" access control and delivered them to a variety of organizations. Today the performance of security systems is increasing due to incorporation of more advanced cameras and other sensors; moreover, NEC is combining individual security systems and providing highly sophisticated integrated systems.

For example, the capability to keep track of the location/presence of personnel by integrating video surveillance and access

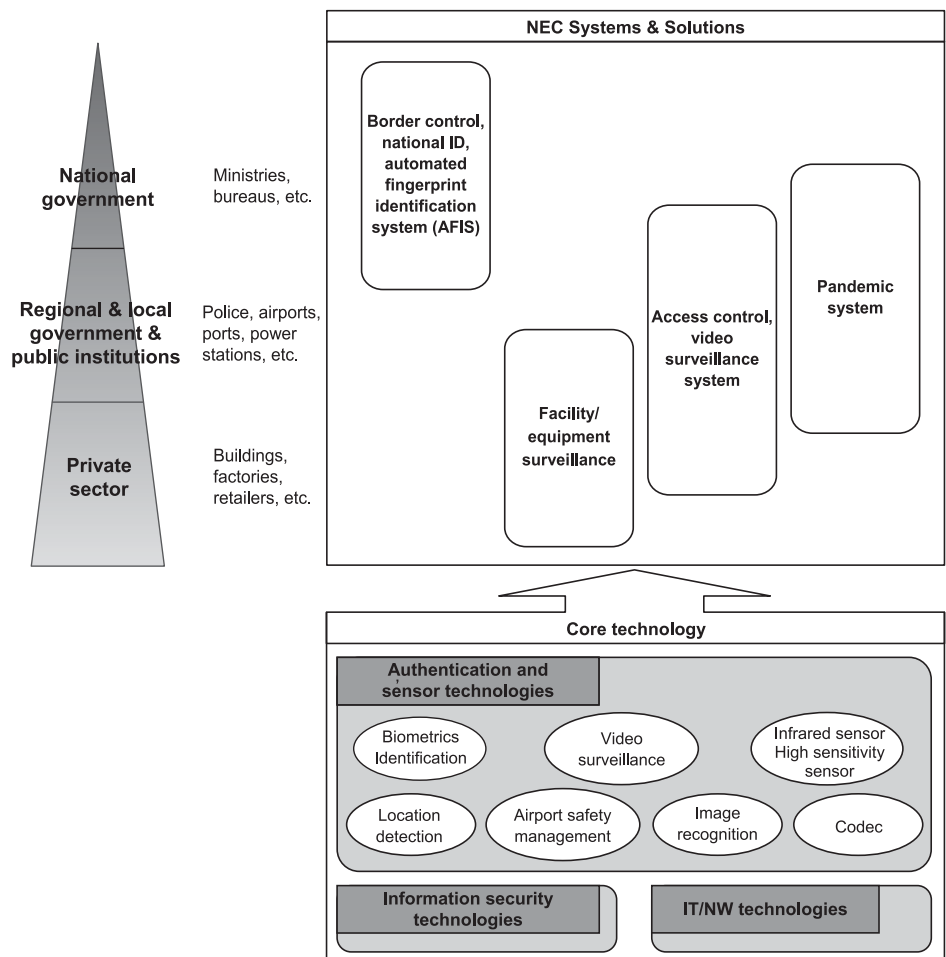
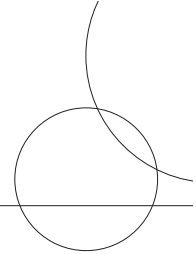


Fig. 1 NEC Group public safety business scope and approach.

control systems can realize a system that automatically turns on and off equipment and facilities, contributing to a more energy-efficient environment.

2.3 Global Deployment

Thirty years ago, the Automated Fingerprint Identification System (AFIS) pioneered by NEC Group and supplied to North American law enforcement authorities made a sensational debut, assisting in the identification and arrest of criminals before the statute of limitations allowed many to escape punishment. Since then NEC Group has provided biometric identification systems including AFIS to over 480 customers in more than 30 countries including the US and Canada. The systems have been deployed in many public sector organizations where it is used for a broad range of personal identity recognition and identification-related applications including searching

criminal databases, national ID authorization, issuance of passports and driver's licenses, and pension/social security payment authorization.

NEC Group possesses highly sophisticated technologies that power not only advanced AFIS but also access control systems that prevent unauthorized access to premises and video surveillance systems to detect suspicious behavior, and is currently providing products and solutions that incorporate these technologies through our global network of overseas subsidiaries and other business centers.

3 NEC Group Component Technologies and Solutions

This section of the special issue will introduce 4 categories of

NEC public safety solutions and component technologies: Biometric Identification, Video Surveillance, Access Control Systems, and Airport Safety Management.

3.1 Biometric Authentication

One of the key technologies supporting NEC's public safety business is biometrics. NEC was the first company in the world to realize the practical application of automated search technologies for the identification of fingerprints left at the scene of a crime. Today our AFIS solutions continue to demonstrate the superiority of our technologies, recording top scores in accuracy in benchmark tests conducted by the National Institute of Standards and Technology (NIST) of the USA. These technologies provide an application platform for systems in a wide range of fields from criminal investigation to national ID and passport systems.

The accuracy of our facial identification systems also ranked number one in the world according to benchmark tests performed by NIST from January to May 2010. Unlike other biometric technologies that require some form of contact or interaction, facial recognition offers the unique merit of using a camera to collect information about the subject from a distance. Recognizing that this advantage can be used in a variety of applications and open new markets, NEC is reinforcing its efforts in the research and development of facial recognition as a system platform technology and aggressively turning this potential into business opportunities.

With an eye on the future, NEC is also making significant advances in the development of new technologies. In this special issue, the reader will be introduced to the superior authentication accuracy of our multi-modal finger identification technology that can detect and scan not only fingerprints but also vein patterns below the skin surface, and a compact portable device that can perform high-speed analysis of DNA - a process that previously required large-scale equipment and could not be conducted outside of the laboratory.

3.2 Video Surveillance

In step with the widespread deployment of network cameras, surveillance camera systems are evolving into IT systems. By combining the conventional collection and storage of surveillance camera video with image analysis technology, video surveillance is finding broader application as a vital tool to support law enforcement and security.

In the course of constructing diverse social infrastructure systems, NEC has tackled the development of a variety of image processing technologies. In the field of video surveillance system as well, we have been working on the development and commercial application of component technologies related to

human behavior analysis and automatic vehicle number plate recognition with the aim of reducing the burden on security personnel who routinely monitor and examine multiple video images. NEC is meeting the challenge of technical issues inherent to surveillance video such as responding to the changes in the environment that come with each passing minute of the day, detection of the shape characteristics of monitored vehicles or people, and stable tracking of target subjects. At the same time, systems that can perform real-time analysis of the images captured by the surveillance camera are nearing practical application.

This special issue will describe surveillance-related component technologies that target detection of suspicious human behavior and vehicle surveillance with a special focus on the future practical application of related metadata analysis technologies.

3.3 Access Control Systems

Systems to manage the entry and exit of people to and from buildings and access-restricted areas is a critical element of public safety.

The usage of uncooled infrared sensors enables the supply of very compact thermograph cameras at a relatively low cost. As far as we know, the innovative use of this camera in airports and other border control points as a measure to prevent pandemics such as SARS or new strains of influenza is unprecedented.

There are also vehicle entrance/exit management systems that use vehicle-mounted ETC devices and "hands free" inventory control systems for management of entry and exit of items using IC tags.

In this special issue, readers will be introduced to various applications of access control technology such as pandemic countermeasure systems, "hands free" entrance/exit management systems linked to environmental management, and vehicle entrance/exit management systems. In addition, a perimeter fence sensor for detection of intruders will also be introduced.

3.4 Airport Safety Management

Having an accurate grasp of the terrain and buildings in the area surrounding an airport is vital to aviation safety. International Civil Aviation Organization (ICAO) has required the civil aviation authorities in countries around the world to make major airport periphery terrain, building and obstacle data available electronically. Using Fixed Assets Change Judgment (FACJ) technology and its core tool RealScape to obtain terrain and building height data based on unique pixel-by-pixel stereo processing and analysis of aerial photographs, NEC has developed a methodology to efficiently extract airport periphery obstacle data.

4 Future Prospects

As described in this article, NEC Group has been contributing to the maintenance and reinforcement of the safety and security of the public by providing diverse solutions of various scales to the public and private sector in countries around world, responding to increasing concern about public safety both domestically and abroad.

While endeavoring to further refine and innovate the advanced technologies behind our physical security, AFIS and other solutions, NEC Group is drawing on its long and rich ex-

perience to expand its public safety business not only in Japan but also EMEA, Greater China, APAC, North America and Central/South America (see **Fig. 2**).

We hope that this special issue has provided an overview of NEC Group's approach to meeting the challenges of public safety, introduced our proprietary component technologies and the solutions that we provide to our customers, and given you a glimpse of the public safety innovations that will come from the research laboratories of NEC in the coming years.

Through our public safety solutions business, NEC Group will contribute to the realization of a society where people around the world can live their lives in safety and security.

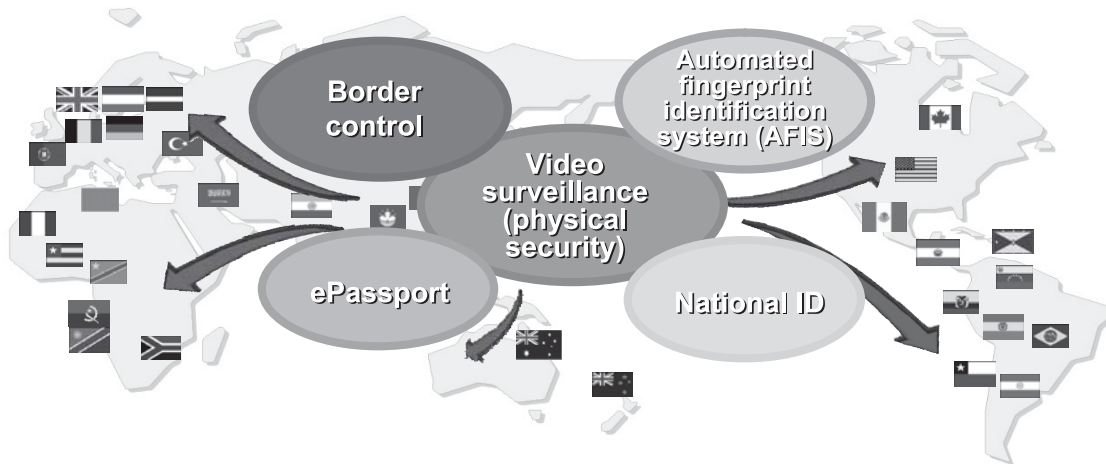


Fig. 2 Global deployment of NEC's public safety business.