

Initiatives on the Themes of Social Value Creation

NEC utilizes its years of experience and unique strengths to focus on seven themes of social value creation in order to solve the challenges faced by customers and society.

These seven themes of social value creation were established based on six megatrends identified by analyzing trends in global economics, society, and technology, and they directly relate to the 17 Sustainable Development Goals (SDGs) adopted by the 193 member states at the UN Sustainable Development Summit.

For example, the “Sustainable Earth” theme of social value creation relates to “Goal 7: Affordable and Clean Energy” and “Goal 13: Climate Action” indicated in the SDGs. The themes of “Safer Cities & Public Services,” “Lifeline Infrastructure,” and “Communication” also relate to “Goal 9: Industry, Innovation and Infrastructure” and “Goal 11: Sustainable Cities and Communities.” Furthermore, the theme of “Industry Eco-System” relates to “Goal 8: Decent Work and Economic Growth,” in addition to Goal 9. Finally, the themes of “Work Style” and “Quality of Life” relate to Goal 8 and “Goal 16: Peace, Justice and Strong Institutions.”

Of these seven themes of social value creation, NEC initiatives for “Safer Cities & Public Service,” “Lifeline Infrastructure,” and “Industry Eco-System” are described here, and these all relate to “Goal 9: Industry, Innovation and Infrastructure” indicated in the SDGs.

Overview of SDGs

The SDGs include a total of 17 goals and 169 targets.

NEC promotes corporate activities that respect ten principles regarding human rights, labour, the environment, and anti-corruption, based on the UN Global Compact signed in 2005.

As a company that provides social value on a global scale, NEC promotes business activities that recognize the 17 goals and 169 targets of the SDGs.





Building and Developing Safe and Secure Urban and Administrative Foundations

In cities where populations are becoming concentrated and globalization is taking place, the risk of safety being threatened with a cyber attack is also increasing. There is also a need to prepare for natural disasters, which occur around the world on a daily basis. By developing early warning systems for crime and disasters, NEC will contribute to the realization of an administrative foundation in which the appeal of regions can be exhibited by making use of the power of the region's people in addition to the fields of industry, government, and academia.

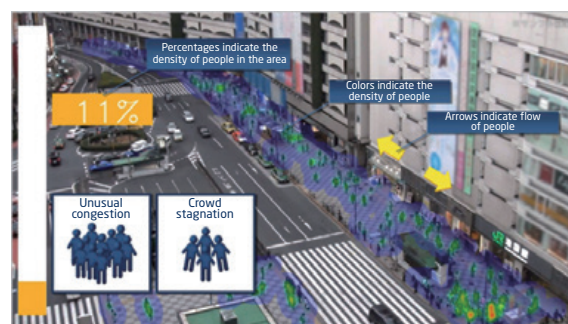
Initiatives in Conjunction with Toshima City, Tokyo The World-first* Total Disaster Prevention System with "Crowd Behavior Analysis Technology"

* Source: NEC

The Great East Japan Earthquake struck the country in March 2011. On the day of the disaster, Toshima city was not able to make swift decisions since there was no way to promptly gather and grasp the information related to the disaster and the situations of the stranded commuters. Thus, Toshima city decided to implement NEC's "comprehensive disaster control system" which provides integrated management for collecting, managing and distributing disaster information.

The city installed 51 disaster prevention cameras in the emergency relief centers near major transport facilities, and on major roads to collect real-time information on damage caused by natural disasters. NEC's indigenous AI "crowd behavior analysis technology" detects overcrowding or stagnation on disaster prevention camera footage. In addition, emergency alerts, accidents, relief center preparation and other information can be compiled centrally on a geographical information system, and then displayed visually using maps.

NEC provides real-time data collection and integrated visual representation of the overall situation to enable Toshima city to make swift decisions, distribute pertinent information, and formulate measures to help stranded commuters, thereby contributing to disaster-resilience.



The crowd behavior analysis technology enables to perform highly precise analyses and issues an alert if predetermined threshold levels are exceeded. Without overlooking, initial response can be delivered timely.

Initiatives in Conjunction with the City of Tigre, Argentina NEC "Face Recognition Technology" Incorporated into the Monitoring System to Detect Suspicious Activities

NEC provides the world's best*¹ face recognition technology, which is adopted in the urban surveillance system in the City of Tigre, Argentina for urban security. The video feeds from network cameras installed in railway



Operation center that integrates the urban surveillance system in the City of Tigre, Argentina. NEC ICT solutions are actively used to improve safety.

and river stations are checked against a massive database of enrolled photos in real time, to allow prosecutors, judicial institutions, and public welfare organizations to search for missing persons.

Unique technologies such as detection of double riding on a motorcycle, a common method of purse-snatching, behavior detection for spotting suspicious behavior and vehicles, license plate recognition to identify suspicious or stolen vehicles, and advanced solutions such as crime area mapping to plot the locations of past crimes on a map for better visualization also contribute to crime reduction across the city.

*¹ Rated No. 1 based on benchmarks by the National Institute of Standards and Technology (NIST).



Building and Developing Safe and High-Efficiency Lifelines

Production and infrastructure are becoming increasingly diverse and complex with the global progress of urbanization. Social infrastructure from now on must flexibly respond to demographic and technical changes, and the growing risks of major disasters. NEC continues to ensure safe and efficient supply of valuable resources by providing infrastructure that operates 24/7, alleviating regional and time disparities with flexible and sophisticated ICT systems.

Advanced SDN/NFV Solutions from NEC to Flexibly Respond to Increasingly Diverse and Complex Social Infrastructure

The progression of the IoT leads to diversifying demands for communication environments, including the need for secure networks and bandwidth guaranteed networks. For telecommunications providers, this means a large investment is required to build the networks that will meet these diverse needs, and delays can easily lead to lost opportunities.

The SDN/NFV solutions of NEC utilize virtualization technologies that enable the overall network system to be dynamically rebuilt, which provides high cost-effectiveness and flexibility.

NEC and Telefónica, one of the world's leading telecom carriers, completed the first phase of a pre-commercial trial for vCPE*2 for residential users in the network of Telefónica's Brazilian affiliate, Telefónica Brasil (Vivo). NEC's vCPE solutions will enable network functions such as IP address allocation, security and others to be shifted away from the residential gateways and towards Telefónica Brasil's own network. This will improve Telefónica Brasil's broadband access network service through better and

stronger operability and safety, as well as network simplification. It also enables various services to be provided to the end user, which leads to increased convenience and customer satisfaction.

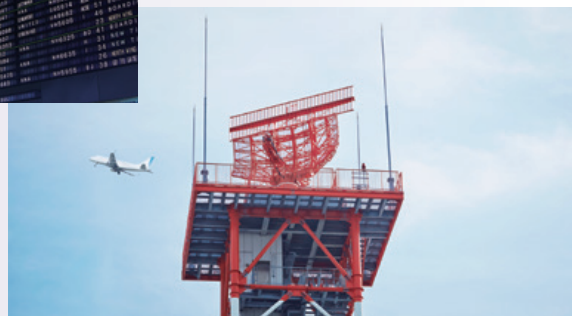


Operation and maintenance of the broadband access network services has improved and the creation of new services for end users on various household terminals is expected.

*2 vCPE: virtualized Customer Premises Equipment

NEC Airport Solutions Provided for More Than 50 Years

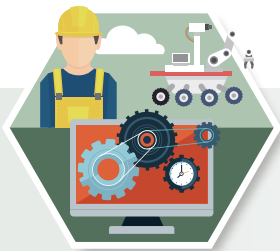
As demand for air transportation increases year after year, it leads to excessively dense and crowded airports and air routes, a highly reliable system that is resilient to failure is essential for ensuring efficient and safe air navigation. The need to prevent unauthorized access and improve service in airports is also increasing.



Flight information display at Narita International Airport (top left)
Airport monitoring radar (bottom right)

Over the past fifty years, NEC has provided airport solutions to more than 50 countries and regions across the world, with a focus on Japan and other parts of Asia. For example, NEC's air traffic control radar uses the latest semiconductor circuit technology and signal processing technology to accurately detect aircraft.

The ICT system that operates the Tom Jobim (Galeão) international airport in Brazil is one such example. This comprehensive system contributes to safe and efficient airport management by providing a security camera system for preventing unauthorized entry, an entry/exit control system, displays for showing flight information, communication tools to enable employees to efficiently contact each other, a wireless Internet environment, and a fire alarm system.



Supporting a World Recreated with New Bonds of Industries and ICT

The IoT connects people, tangible objects, and intangible objects together to enable a highly productive and efficient value chain with the real-time visualization of production and sales processes. User consumption patterns and needs are also diversifying, with the consumption of intangible objects becoming more important than physical products, and users preferring to share things rather than own them. In order to respond to this trend, NEC will realize a next-generation industry eco-system through new digital platforms.

Initiatives in Conjunction with Yamato System Development Co., Ltd. Improving the Efficiency of Manpower and Time for Inspection Work

The logistics outsourcing business handles a large amount of pamphlets and manuals without barcodes and product identification information. In order to maintain high shipping quality, it is necessary to conduct visual and manual product inspection daily, hence Yamato System Development Co., Ltd. (YSD) was seeking solutions to improve efficiency in terms of manpower and time.

NEC took this opportunity to create labor saving mechanisms using its well-proven image recognition technologies and gravimeters, by developing an image and gravimeter inspection system that instantly detects product types and numbers, reducing the burden of inspection work performed by workers. Furthermore, with YSD's know-how in logistics and inspection, as well as their system integration function for warehouse management system, a total management of product master, shipping instruction data, inspection results and the like is now made possible. This inspection support

system, an industry first for logistics, is aimed at optimizing the inspection work at YSD and achieving a 20% reduction in overall costs, realizing highly accurate shipping quality, to support a society that allows its citizens to live comfortably.



Realizing high efficiency and cost reduction by introducing inspection support system to the YSD warehouse located in "Haneda Chronogate," Yamato group's total logistics terminal, and contributing to a comfortable lifeline.

Initiatives in Conjunction with Kagome Co., Ltd. Utilizing ICT for Increased Crop Yields and Agricultural Efficiency

In order to respond to the worldwide challenges of climate change and food security, NEC aims to utilize the IoT to provide value to the various operators in the food and agricultural supply chain that cover everything from agricultural materials to production, processing, and distribution. This will help achieve the production reforms needed to meet the increasing demand for food all over the world and its fair distribution, while contributing to the realization of a safe and secure food environment everywhere.

NEC and Kagome Co., Ltd. agreed to collaborate on

developing cultivation technology that utilizes ICT for processing tomatoes, and since March 2015 the companies have been conducting tests in tomato fields at a Portuguese subsidiary based on the results of virtual field simulations generated in a computer according to data collected by various sensors about the agricultural environment.

These tests enabled NEC and Kagome to analyze the factors that affect crop yields and identify the optimal cultivation method for each field, while also providing accurate predictions of yields and the proper time for harvesting.



Tests conducted in tomato fields in Portugal

