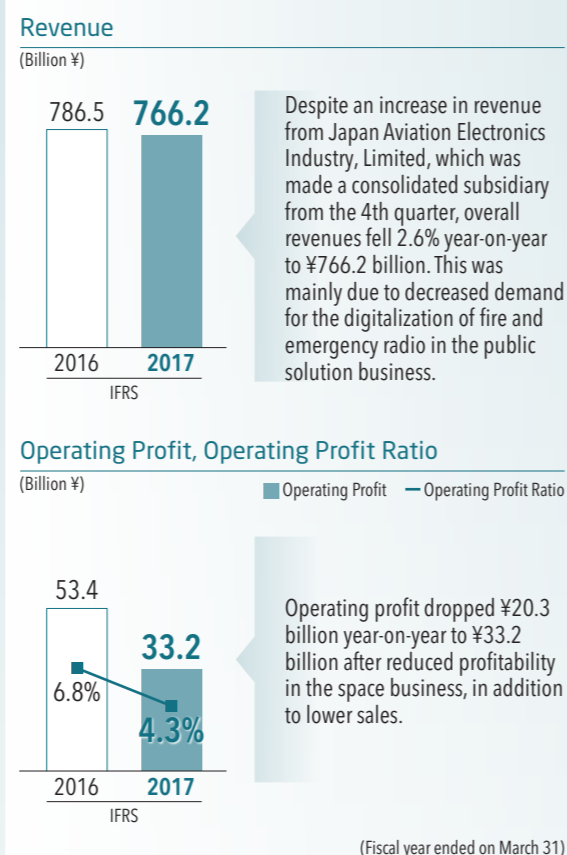# Review of Operations

Public Business

In the Public Business, we provide safe, secure and efficient social solutions for Japanese and foreign governments, governmental agencies, local governments, public institutions and other organizations by combining our distinctive technology assets, including network, sensor and analysis technologies, with a broad expertise in systems integration.

Revenue
(Billion ¥)

786.5   **766.2**

2016   **2017**
IFRS

Despite an increase in revenue from Japan Aviation Electronics Industry, Limited, which was made a consolidated subsidiary from the 4th quarter, overall revenues fell 2.6% year-on-year to ¥766.2 billion. This was mainly due to decreased demand for the digitalization of fire and emergency radio in the public solution business.

Operating Profit, Operating Profit Ratio
(Billion ¥)

■ Operating Profit   ─ Operating Profit Ratio

53.4

6.8%   **33.2**

4.3%

2016   **2017**
IFRS

Operating profit dropped ¥20.3 billion year-on-year to ¥33.2 billion after reduced profitability in the space business, in addition to lower sales.

(Fiscal year ended on March 31)

Strengths

■ Strong track record in delivering products and systems that support social infrastructure – such as systems for domestic and foreign governmental organizations, broadcasting companies, and power companies, as well as cyber- security – gaining high credibility and advanced technologies during this process. High market share in Japan.

■ System integration capabilities developed in the implementation of large-scale mission-critical IT systems for governmental agencies and public institutions.

■ Unique products and solutions born from our strengths in three technology areas: networks, sensors, and data analysis technologies. (Face recognition and fingerprint recognition technologies, Big Data analysis, etc.)

Weaknesses

■ While there is a high proportion of large-scale projects, there are fewer projects with regular income streams, such as in services, leading to exposure to risk from demand volatility.

■ Additional costs result from the complexity of project management for large-scale projects and the issues inherent in system development using cutting-edge technology. These costs have an impact on business results. It is necessary to minimize risks with appropriate project management.

Market Environment (Risks and Opportunities)

Risks

■ Competition is intensifying, increasing the number of projects with difficult requirements in cost and delivery. As a result, constant improvement of quality and cost competitiveness is necessary.

■ Due to the large-scale demand cycle for the implementation of fire and emergency radio and preparation of infrastructure for the "My Number" system, ICT investments by national and local governments are expected to remain relatively low. Moving forward, it will be necessary to develop new markets by uncovering new demand through improvement of our solutions.

Opportunities

■ Looking toward the year 2020, we anticipate active investment for the safe, reliable, and efficient operation of major international events.

■ Cyber attacks pose a threat recognized around the world, gathering attention and increasing demand for reinforcement of systems and monitoring services for cyber security.

■ We expect increased investment toward utilization of ICT across a variety of fields, including application in fields such as health care.

■ As part of efforts toward regional revitalization, local areas across Japan are beginning projects aimed at the creation of smart cities and city development that makes use of public and private data.

IV
Business Activities for Social Value Creation

Public Business Comprised of Two Areas

Public business consists of "Public Solutions," which is responsible for business involving regional sales functions and local governments in Japan, the "Public Infrastructure," which takes charge of business involving government organizations and enterprises supporting national and social infrastructure.

Based on the new organization established in April 2017, the "Public Solutions" considers both the local needs and the required policy seeds. This area works together with regional stakeholders, such as local governments, universities, and businesses, to accelerate the development of new regional businesses, such as smart cities and utilization of the Social Security and Tax Number System ("My Number"), and health care. Based on our many years of achievements gained in supporting government agencies, the "Public Infrastructure" further improves the social infrastructure we provide to support a safe and comfortable lifestyle for everyone.

Public Solutions Business

We provide IT and network systems for local governments and medical institutions, domestically and overseas, and also oversee our local branches across Japan to develop business with close ties to each region.

Executive Vice President   **Chikara Nakamata**

Fiscal 2017 Main Accomplishments

With business this year related to the My Number system remaining steady, mainly through improvements to mission-critical systems and reinforcement of security for local governments, the infrastructure development business has reached a turning point. With efforts such as the launch of sales for "My Number Card Solutions," which support the creation of services and businesses that make use of the My Number card, we are further promoting business as we look towards the expanded use of the My Number system.

In the area of disaster prevention systems, we launched our Landslide Prediction System, which visualizes the risk of landslides by detecting the moisture content of earthen surfaces. In addition, we carried out joint testing of a landslide simulation system based on this technology along with Thailand's National Disaster Warning Center, confirming the efficacy of the system in a forecasting Proof of Concept project conducted in a landslide-prone area in the northern province of Chiang Mai. Demand is growing for advanced disaster prevention systems, especially overseas, and we will continue to focus on expanding our business in the global market.

Cumulative sales related to My Number

¥100 billion

(From the fiscal year ended March 31, 2015 to the fiscal year ended March 31, 2017)

We have focused on infrastructure development for the My Number system for the government agencies and local governments, achieving cumulative sales of about ¥100 billion over the three years since the fiscal year ended March 31, 2015.

Initiatives in the Medium- to Long-Term

Over the past several years, NEC has led the market in infrastructure development for the My Number system, centered mainly on national and local governments. We have been engaged with several systems, starting with the "intermediate server platform" that serves as the foundation of the entire My Number system.

As use of the My Number system increases, we believe there will be an expansion of infrastructure and use of the My Number card, along with promotion of public-private partnerships from expanded use of public and private data. We are working toward the creation of these new markets. In particular, in the area of health care, we expect the realization of effective and efficient health care services through

connection with various types of health and medical information. We anticipate that this will become an area of focus for us in the future.

In the area of regional revitalization, we have begun efforts in a variety of regions toward co-creation of local communities by industry, government, and academia. For a new kind of city development using public and private data, we are working to create new business by providing data linkage and utilization services, as well as an IoT platform that serves as a mechanism to sense, gather, and use a variety of data within a city or town. We are realizing regional coordination through the use of ICT, and thereby contributing to regional revitalization and the resolution of social issues.

Public Infrastructure Business

We provide social infrastructure that allows for everyone to have a safe and comfortable lifestyle, in the form of large-scale mission critical systems and network systems for domestic and foreign governmental agencies, local governments, broadcasting stations, and power companies.

Executive Vice President   **Kazuhiro Takada**

Fiscal 2017 Main Accomplishments

In the area of cyber security, we are contributing to strengthening the security of government institutions through technologies that are unique to NEC, such as through support contracts for the "Cyber Defense Exercise with Recurrence" (CYDER) put on for local governments in 11 regions around Japan by the National Institute of Information and Communications Technology (NICT). Outside of Japan, we have carried out cyber defense exercises in ASEAN countries and approved the acquisition of Brazilian security firm Arcon Informatica S.A., carrying on our efforts to strengthen our global position.

With the year 2020 in mind, we are steadily improving our solutions for realizing safe and secure city development. With improvements to the crowd behavior analysis technology within our state-of-the-art AI technology group, "NEC the WISE," we have developed technology capable of predicting and estimating crowd sizes and flow with high accuracy and in real time using security cameras. Additionally, in conjunction with the G7 Ise-Shima Summit held in May 2016, we conducted a Proof of Concept project, in collaboration with the Tokyo Metropolitan Police Department, of an advanced security system that performs real-time detection of crowd size and automatically detects suspicious objects using security cameras.

Watching over society for **safety** and **peace** of mind

24 hours a day

In addition to the "Cyber Security Factory," our main facility in Japan, we have established security monitoring facilities in Austria and North America, making use of the time difference to build a 24-hour monitoring system.

Initiatives in the Medium- to Long-Term

In order to realize safe and reliable city development in preparation for the year 2020, we expect safety improvements and development of infrastructure such as authentication systems to prevent suspicious persons from entering critical facilities, and surveillance systems to protect the safety of pedestrians. Using NEC's facial recognition technology, which has demonstrated the world's top level of accuracy for both video and still images, and our proprietary AI technology, we will contribute to safe and reliable city development with our immigration control systems and a new means of security services.
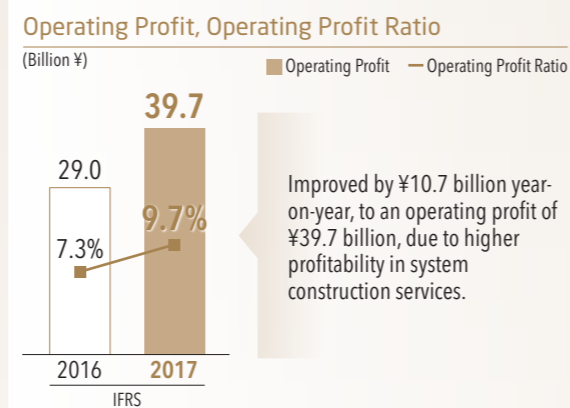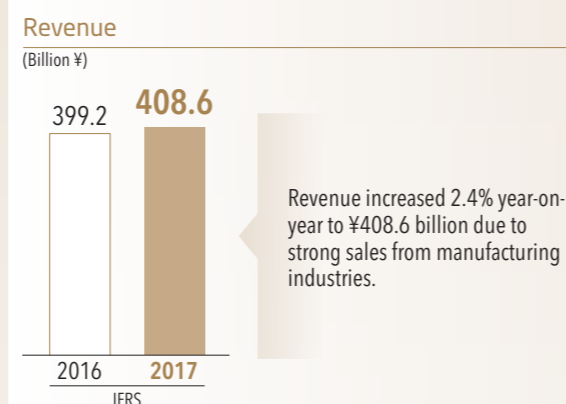
Cyber security is an important area in which we expect market growth over the medium to long term. We will continue to be proactive in expanding our business in this area. Specifically, we are focusing on our steadily expanding security monitoring service and cyber-defense training services for domestic and foreign government agencies. Furthermore, we are working to realize growth through NEC's unique solutions development, which combines product technologies with systems integration capabilities.

IV

Business Activities for Social Value Creation

Enterprise Business

NEC provides IT solutions in manufacturing, retail and services, and finance in the private sector, helping customers to launch new services. We will resolve social issues and create value for customers through value chain innovation utilizing ICT assets such as IoT and AI.

Executive Vice President
Chikara Ishii

Revenue
(Billion ¥)

399.2   **408.6**

2016   **2017**
IFRS

Revenue increased 2.4% year-on-year to ¥408.6 billion due to strong sales from manufacturing industries.

Operating Profit, Operating Profit Ratio
(Billion ¥)

■ Operating Profit   — Operating Profit Ratio

39.7

29.0   **9.7%**

7.3%

2016   **2017**
IFRS

(Fiscal year ended on March 31)

Improved by ¥10.7 billion year-on-year, to an operating profit of ¥39.7 billion, due to higher profitability in system construction services.

Fiscal 2017 Main Accomplishments

We have accelerated development, both in Japan and abroad, of value chain innovation for our total SCM that connects manufacturing, logistics, retail and quality of life. In the IT service business for retailers, we strengthened solutions that provide new value, such as an omni-channel environment, where goods can be purchased, regardless of sales and distribution channels. Furthermore, 7-Eleven, Inc. (the United States-based company of 7-Eleven) selected NEC as a vender to provide point-of-sale (POS) systems and maintenance services for approximately 8,600 stores throughout the US and Canada.

There is also a trend of increased provision of services that make use of advanced ICT, such as IoT and AI. For the manufacturing industry, we launched our "Visual Manufacturing Solution," which realizes next-generation innovation in production using IoT. We also provided a "Warehouse Product Inspection System" for the logistics company of the KADOKAWA Group.

In addition, we are also moving forward with efforts to cooperate with our clients, such as our collaboration with DENSO Corporation, which began in the fiscal year ended March 31, 2017, in the fields of advanced driver assistance, automated driving, and manufacturing. We also established brees corporation, a joint venture with Sumitomo Mitsui Banking Corporation, to commercialize FinTech services that combine financial services with IT.

Operating profit ratio improved to **9.7**%

Since the Enterprise segment was established in the fiscal year ended March 31, 2014, we have continually worked toward improving profitability through efforts such as strengthening upstream processes, like consulting, and thorough control of risks. We have steadily accumulated results each year, and in the fiscal year ended March 31, 2017, the operating profit ratio in this segment reached 9.7%.

Strengths

■ Reliability and achievements cultivated over many years of providing IT services to domestic clients in the manufacturing, retail and service, and financial industries.
■ The knowledge and expertise we have developed in manufacturing innovation at our own plants as a company in the manufacturing industry, as well as SCM transformation for global corporations.

Weaknesses

■ In order to achieve further growth, we will transform to a business model that makes use of knowledge and resources accumulated for each industry and client and consolidates them across the organization.

Market Environment (Risks and Opportunities)

Risks

The market in IT for domestic private firms has many competitors, and competition on price continues to be intense. The question of how to secure profits in this area is an issue. Furthermore, we expect a decrease in existing solutions businesses in the medium term due to rapid adoption of cloud computing in Japan.

Opportunities

A market that utilizes IoT has been created, and we expect the establishment of a new foundation for growth. The expectations for and role of ICT are expanding as a solution, both for global problems, such as food waste and energy consumption, as well as for social issues like changes in the human resources environment due to a shortage of labor.

Initiatives in the Medium- to Long-Term

The three years starting from the fiscal year ended March 31, 2017 have been positioned as a period of solidifying a base for growth in the Enterprise Business. Efforts are under way to transform the SI model, to establish a business foundation geared toward global expansion, and to create new value through IoT. As part of our work to build this system, we are promoting the creation of a business execution system based on horizontal development, encouraging the consolidation of technology assets and resources for each area by strengthening collaboration with other departments.

For areas of business, we are focusing on NEC's strengths: the IT service business for retailers, manufacturing co-creation*, and the creation of new services for financial institutions. We are looking to expand our business with these areas at the core. In the IT service business for retailers, we are adding to the know-how we have accumulated from 40 years of providing IT services to domestic retailers, strengthening new solutions to enable safe, secure and efficient store management for 24 hours a day, 365 days a year as well as to further improve consumers' experience. We are looking ahead to apply these ideas to other industries as we aim for global expansion of our business. In manufacturing co-creation, we are combining cutting-edge technologies, like IoT and AI, together with our own manufacturing innovations and knowledge gathered from reforming SCM for global companies as part of efforts to increase the value provided by NEC and to expand into new areas of business. In addition, with the transfer of business for financial institutions to the Enterprise Business as of April 2017, we are aiming to enhance NEC's lineup of financial settlement and other solutions by reinforcing collaboration with the retail and service industries in the area of FinTech.

* Manufacturing co-creation:
  Collaboration program where NEC offers enhanced solutions based on its own production innovation expertise through facilitating information exchange between customers, executing joint research or conducting Proof of Concept projects, etc.

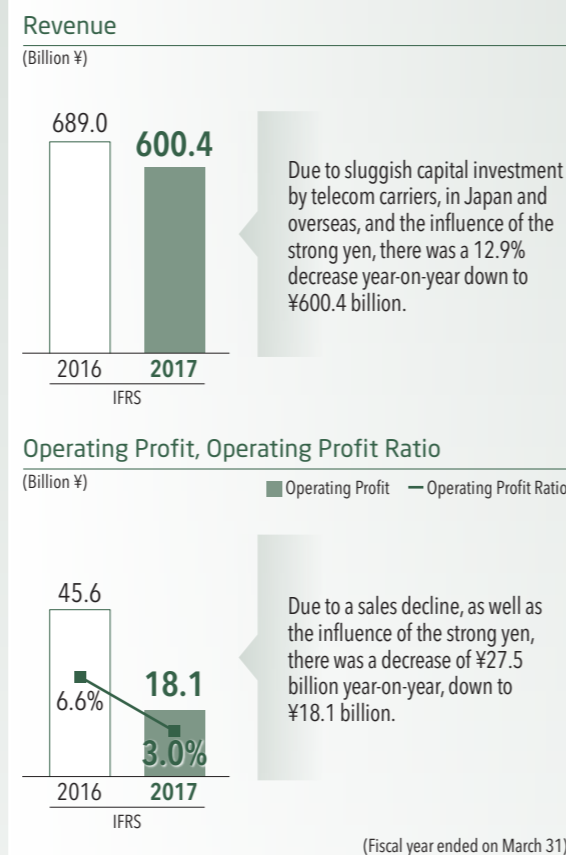IV Business Activities for Social Value Creation

Telecom Carrier Business

We provide network control platform systems and operating services for operations management, along with equipment for network implementation. NEC's wealth of experience in large-scale network implementation and strong technical capabilities help us contribute to the resolution of social issues by providing safe, reliable, and efficient high-value-added networks for the age of IoT through the creation of value with our clients and business partners.

Executive Vice President
Atsuo Kawamura

Revenue
(Billion ¥)

689.0
600.4

2016   **2017**
IFRS

Due to sluggish capital investment by telecom carriers, in Japan and overseas, and the influence of the strong yen, there was a 12.9% decrease year-on-year down to ¥600.4 billion.

Operating Profit, Operating Profit Ratio
(Billion ¥)

■ Operating Profit   — Operating Profit Ratio

45.6
6.6%
18.1
3.0%

2016   **2017**
IFRS

Due to a sales decline, as well as the influence of the strong yen, there was a decrease of ¥27.5 billion year-on-year, down to ¥18.1 billion.

(Fiscal year ended on March 31)

Fiscal 2017 Main Accomplishments

We worked toward expansion of business in the fields of TOMS and SDN/NFV, working along with Netcracker Technology Corporation, a subsidiary of NEC on the systemization of solutions that support rapid adoption SDN/NFV by telecom carriers. In addition, we secured 10 commercial projects for vEPC and vCPE from major global telecom carriers in Europe, the Middle East, and North America.

For the commercialization of 5G, we developed a massive-element Active Antenna System (AAS) that achieves efficient transmission using high frequency bands. In addition, we jointly conducted a Proof of Concept project with NTT DOCOMO for Massive MIMO (Multiple Input Multiple Output), a core technology for realizing high quality 5G transmission with high speed and capacity.

In our existing business areas, we finished construction of the "Asia Pacific Gateway (APG)," a high-capacity optical submarine cable that links 11 countries and territories between Japan and Singapore. We handed the completed cable over to a consortium of 13 companies from Japan, the US, and Asia.

We also developed a solution that links PASOLINK with our lineup of AI Technologies "NEC the Wise" to quickly build and configure optimal networks by analyzing network information with AI, and efficiently operating those networks.

Expanded introduction of TOMS and SDN/NFV; Conducting Proof of Concept projects and developing technology for the commercialization of 5G.

- Increasing our results for the introduction of TOMS and SDN/NFV, our major focus business over the medium-long term.
- Developing core technologies to commercialize 5G and conducting Proof of Concept projects with clients.

Strengths

■ Track record of delivering for telecom carriers: fixed and mobile telecom products; IT system in Japan; and an accumulation of technology know how.

■ Successful delivery to over 250 telecom carriers worldwide in the TOMS area.

■ Industry-leading solutions in SDN/NFV, such as vEPC*1 and vCPE*2, which combine operations and services.

Weaknesses

■ Business model in the international market is dependent mainly on equipment business.

■ Business structure is easily impacted by restrained capital investment in the domestic business.

*1 vEPC: virtualized Evolved Packet Core
*2 vCPE: virtualized Customer Premises Equipment

Market Environment (Risks and Opportunities)

Risks

There is risk of Japanese telecom carriers further curtailing capital investment, and there is the possibility of intensified competition as the market becomes more borderless.

Opportunities

Commercial deployment of SDN/NFV has begun. These technologies contribute to network transformation through outcomes such as faster delivery of services, optimization of network resources, and reduced operating costs for telecom carriers. Also, we expect demand for TOMS to continually increase. Additionally, we anticipate expanded business opportunities through the commercialization of the 5th generation mobile communications system (5G).

Initiatives in the Medium- to Long-Term

Business expansion for TOMS and SDN/NFV is the key for medium- to long-term growth in the telecom carrier business. With a tailwind in the market environment, momentum for deploying TOMS and SDN/NFV is increasing among the global telecom carriers. Within those conditions, NEC is contributing to larger profits and reduced capital investment and operational costs for our customers by creating value through the continuous improvement of solutions that integrate networks with IT, such as AI and linking TOMS with SDN/NFV. These efforts are in addition to our other strengths, such as our ability to propose TOMS solutions, our customer base, and our commercial deployment track record of SDN/NFV.

For 5G, we are accelerating the development of features such as high speed and capacity, low latency, and multiple simultaneous connections, which will be required of networks for new services in the age of IoT, such as transmission of 4K and 8K high-definition video and automated autonomous driving. Sales will steadily improve with the timely introduction of these products and services to the market.
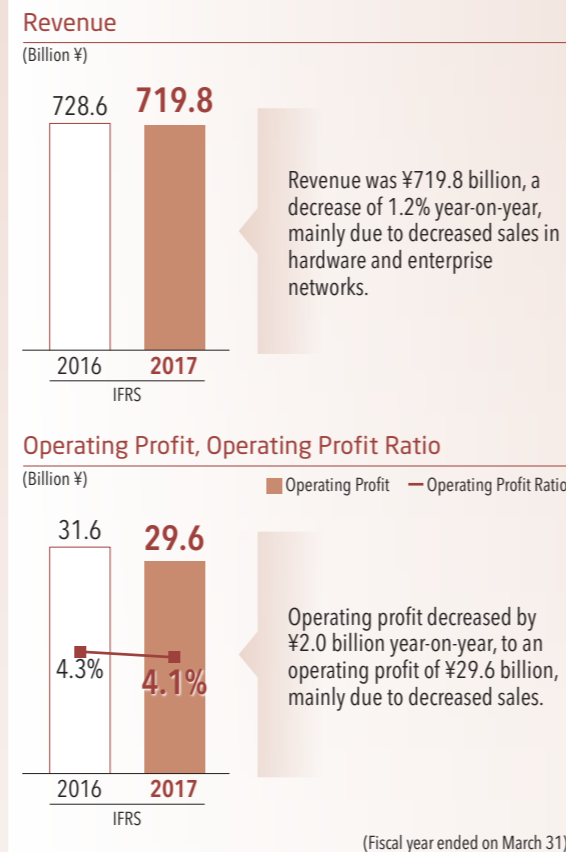
In this business, we contribute to business transformation through co-creation with our customers, actively proposing value to those customers in new areas while working to maintain and expand our existing businesses. We will keep our awareness of the constantly changing market as we continue to work toward providing rich communications that support diversity and the creation of social value.

IV
Business Activities for Social Value Creation

System Platform Business

In the System Platform Business, we provide products for business, ranging from terminals to network and computer equipment, software products and service platforms, as well as integrated platforms based on them. We deliver labor-saving and efficient platforms for customers, while at the same time creating new value such as IoT platforms based on ICT as we contribute to the expansion of solutions for society.

Executive Vice President
Kimihiko Fukuda

Revenue
(Billion ¥)

728.6 **719.8**

2016 **2017**
IFRS

Revenue was ¥719.8 billion, a decrease of 1.2% year-on-year, mainly due to decreased sales in hardware and enterprise networks.

Operating Profit, Operating Profit Ratio
(Billion ¥)

■ Operating Profit — Operating Profit Ratio

31.6 **29.6**

4.3% **4.1%**

2016 **2017**
IFRS

Operating profit decreased by ¥2.0 billion year-on-year, to an operating profit of ¥29.6 billion, mainly due to decreased sales.

(Fiscal year ended on March 31)

Strengths

■ Distinguished group of technologies*[1], including SDN, Big Data, the cloud, and security.
■ Reliability and high quality cultivated under an intensely competitive domestic market; high share in Japan.
■ Comprehensive capabilities with a wide range of assets necessary for building IoT platforms, from the cloud to devices such as networks and sensors.

*1 The world's leading image recognition technology, including face recognition, advanced Big Data analysis technology, technology related to SDN, vector computing technology, etc.

Weaknesses

■ Compared with global mega vendors, the scale of business is smaller due to many areas being specialized for the Japanese market, leading to relatively lower profits.
■ In areas of growth, such as the cloud and SDN, we cannot fully utilize our own resources, and the expansion of our business is still in progress.

Market Environment (Risks and Opportunities)

Risks

We expect a downward trend centered on our existing products and an increasingly competitive environment as progress toward the cloud and open systems continues. Furthermore, in areas such as IoT and AI, more companies will enter the market, including those from other industries.

Opportunities

The markets for SDN and the cloud have grown considerably, and new needs, such as for a hybrid cloud and for vertically integrated infrastructure, are expanding. In addition, as markets launch in the future for IoT and AI, we expect expansion of areas that utilize ICT. On the other hand, development requires a much greater sense of speed than ever before in order to further strengthen our position in the market.

Fiscal 2017 Main Accomplishments

In Fiscal 2017, we have worked toward improving products and services to expand business in areas where we expect market growth, with a focus on SDN and IoT.

In the area of SDN for enterprises, we are putting in effort to expand our list of services to promote the introduction of SDN for customers in all industries with the goal of expanding our SDN business even further. In addition, we are carrying out various policies to expand the use cases for SDN, and to promote its use "on site" in locations other than an office by improving our co-creation activities with those who design and build infrastructure systems at sites such as factories and shops.

In regards to IoT, we began introducing our "Walkthrough Face Recognition System," which is capable of recognizing faces without any need to stop in front of a camera, for use in managing entrances and exits from facilities or event venues. We also launched sales of our "Human Behavior Analysis Services," which support marketing policies for a store by analyzing the behavior of customers using video footage from cameras inside the store. Through these efforts, we are strengthening our product lineup that makes use of our face recognition and image analysis technologies.

In terms of improving our cost competitiveness and as part of our gradual efforts to strengthen our domestic development and production systems, we launched a new company that unifies group-wide development and production of IT and network products. This company was formed by restructuring and integrating a total of five companies and departments, including NEC Platforms, Ltd. and NEC Network Products, Ltd.

Achieved the No. 1 share of the domestic PC server market for the 21st consecutive year.

NEC achieved the No. 1 share of the domestic PC server market for the 21st consecutive year*[2]. As the top vendor in the market, we will continue to listen in earnest to the requests of our customers as we continue to provide high quality products and aim to improve customer satisfaction even further.

*2 CY1996-2016 Japan x86 server (shipment)
Source: IDC Japan, Japan Quarterly Server Tracker CY17Q1
Note: IDC declares a statistical tie in the server market when there is less than one percent difference in the revenues or the unit shipment of two or more vendors.

Initiatives in the Medium- to Long-Term

In order to maximize value in the System Platform Business, it is essential to increase sales in key areas such as cloud platforms, SDN, Big Data, and security. To accomplish this, we must allocate resources to research and development, as well as capital investment, in order to become more focused and efficient. In particular, we will pursue greater profits by pushing for comprehensive improvements to our sales system, such as improving efficacy of our development costs, reducing costs, and increasing added value on our products for all of our existing businesses, which make up a large portion of the present System Platform Business.

Beyond that, we will be certain to link market growth with the expansion of our business by demonstrating our unique strengths in key areas with growing markets, such as SDN, Big Data, the cloud, and security.

In our IoT platform business, we will develop solutions and services that rotate around our competitive technologies, such as video analysis and security, and we will increase the value we provide to our customers. By providing high quality common platforms, including networks, with a sense of speed, we plan to contribute to the expansion of NEC's IoT business and change the trajectory of its growth.

IV
Business Activities for Social Value Creation