Ever since its establishment in 1917, Nikon has been unlocking new potential for the future to create revolutionary products in response to people’s changing needs. The values of people are projected to grow more diverse in the future. Nonetheless, Nikon will continue to contribute to the better society through the provision of various products and services that utilize its core competence such as opto-electronics technologies and precision technologies.
Progressing to a New Stage

Continue to provide products and services that make people happy

Areas of Long-Term Growth

Digital Manufacturing

Vision Systems / Robotics

Healthcare

2017
Binocular WX 7x50 IF

2017
Digital SLR camera D850

2018
Mirrorless camera Z 7

2018
FPD lithography system FX-103SH
FX-103S

2018
ArF immersion scanner NSR-S63SE

2018
Super resolution microscope N-SIM S

2019
Optical processing machine Lasermeister 100A

2018
CNC video measuring system NEXIV VMZ-H3030

2019
Ultra-widefield retinal imaging device with integrated OCT Monaco

2017
2018
2019
Under its new Medium-Term Management Plan, Nikon has defined three areas of long-term growth as targets of our initiatives for generating new core pillars of profit while pursuing the goal to become a “Leading Company in Precision and Optics.” We will work to realize sustainable improvements in enterprise value over the medium to long term by contributing to industrial development and improved quality of life for people with the opto-electronics and precision measurement and control technologies that represent our strength.

Areas of Long-Term Growth

Digital Manufacturing

Background for Focus on the Area

Digital Manufacturing is an area in which substantial market growth is expected over the medium to long term buoyed by progress in the automation and mass customization trends. In this area, the global machine tool market is currently estimated to have a scale of around ¥4.0 trillion, and average annual growth of about 5% is anticipated in the markets of both developed and emerging countries. The 3D printer market, meanwhile, is projected to enjoy strong annual growth rates of approximately 20%, growing to the scale of ¥550.0 billion by 2026.

Nikon has cultivated precision measurement and control technologies in its semiconductor lithography system and FPD lithography system operations and contactless 3D measurement technologies and expertise in its Industrial Metrology Business. We believe that these assets are highly applicable to the machine tool and 3D printer markets.

Strategies for Achieving Goals in This Area

A major focus for Nikon in the area of Digital Manufacturing will be to develop a Material Processing Business as a new growth engine. In this business, we will utilize and apply 3D printers, laser processing systems, and 3D measurement systems to realize sophisticated processing procedures. For example, Nikon’s core competence can be incorporated into existing machine tools in order to realize novel, rapid, low-cost, and high-precision material processing. In this area, we will look beyond completed products to also contribute to improved productivity in machine tools through the provision of components. We see significant room for the development of our operations through this approach, which should enable Nikon to establish a leading position in this field.

The Company is also eyeing the substantial potential in fields that have thus far been inaccessible by current lithography systems and machine tools. In these fields, Nikon will

Create New Manufacturing Markets and Industries in the Monozukuri Field

“Optics-Based Machine Tools”

- Pioneer new areas inaccessible by current lithography systems and machine tools
- Redefine high-precision, ultra-miniature processing through optical technologies
- Enable high precision by utilizing precision control technologies cultivated in lithography system operations

- Strengthen and expand existing applications
- Supply key components
- Develop technological differentiators

Machine Tools

Lithography Systems

Precision

Small

High

Large

Minimum processing dimension
launch products based on the new concept of “optics-based machine tools.” By applying the opto-electronics and precision control technologies developed in lithography system operations, Nikon will seek to create new manufacturing markets and industries by realizing high-precision, ultra-miniature processing.

**Initiative Examples**

Nikon released the optical processing machine Lasermeister 100A in April 2019. The optical processing machine is Nikon's proprietary metal processing machine that uses lasers to perform various metal processing operations with ease and high precision. This machine has capabilities encompassing everything from the molding and additive manufacturing functions of a 3D printer to marking, welding, and polishing functions.

The optical processing machine Lasermeister 100A is designed to overwrite the previous stereotypes of metal processing machines, namely, that they are large, expensive, and difficult to operate.

Nikon has years of experience in the development, manufacture, and sale of semiconductor lithography systems, which are considered to be among the most precise machines ever developed. The sophisticated opto-electronics and precision control technologies developed in our semiconductor lithography system operations have enabled us to create metal processing machine that is high in quality, compact, and affordable.

**Vision and Value Provided to Society**

Nikon believes it is possible to adapt for use in manufacturing the 3D alignment mechanism, which entails performing precise measurements and positioning and highly detailed processing in an integrated manner without using conventional tools. This innovation can be realized through the opto-electronics and precision measurement, and control technologies developed in the Company.

By adapting this innovation to manufacturing, it will be possible to process ultra-miniature components, difficult-to-cut materials, composite materials, and intricate patterns, substantially reducing the burden of set up, process design, and prototyping for customers. Moreover, this innovation would put the vision of a direct transition from computer-aided design to manufacturing within sight.

Going forward, Nikon will refrain from becoming overly focused on self-sufficiency and adopt a policy of exploring open innovation, collaboration with existing machine tool manufacturers, and a wide range of other external partnership and co-creation options. Always considering the possibility of decisive allocations of management resources, we aspire to revolutionize the Monodzukuri [manufacturing] field.
Vision Systems / Robotics

Background for Focus on the Area

Recently, demand for industrial robots has been growing globally to facilitate automation and labor-saving measures at factories. In addition, the application of robots will no doubt come to permeate public spaces and even our homes, becoming familiar fixtures throughout society as autonomous driving systems, customer service robots, robotic pets, and caregiving robots.

Regardless, the automated control technologies of robots still pale in comparison with humans when it comes to sight, touch, and other senses, meaning that substantial progress is still possible. We also anticipate significant social needs with regard to vision systems, that function as the eyes of equipment, and control technologies, which are vital to realizing more precise handling. Vision Systems / Robotics are therefore an area in which Nikon can truly capitalize on the strengths of its optical, image processing, and precision technologies.

Strategies for Achieving Goals in This Area

To achieve growth in the Vision Systems / Robotics area, Nikon will commercialize modules for industrial robots, which will be created through progress in our existing Encoders Business, and develop image-related robot control solutions. At the same time, Nikon’s optical and precision technologies will be merged with lidar sensor technologies to contribute to the advent of autonomous driving. Our medium- to long-term goal will be to provide new solutions that cater to various applications and issues by raising our equipment sensing technologies to unprecedented levels. Accelerating in-house development and aggressive external collaboration will be the methods through which we accomplish this goal.

Initiative Examples

We have recently been witnessing a rise in the need for automation solutions that use robotics technologies to increase efficiency and uniqueness in the imaging industry. In response to this trend, Nikon acquired all of the shares of Mark Roberts Motion Control Limited, a provider of robotic motion control solutions of imaging equipment, in October 2016. Looking ahead, we will seek to simultaneously fortify this company’s leading position in the film and broadcast sectors while combining its automatic tracking shooting solutions with Nikon’s imaging-related technologies and its broad sales channels to explore new markets.

In addition, in 2019, a manufacturing agreement was concluded with Velodyne Lidar, Inc. (Velodyne), a leading developer and manufacturer of lidar sensors, which are a core technology in autonomous driving. Subsidiary Sendai Nikon Corporation is scheduled to begin mass production of lidar sensors for Velodyne in the second half of the fiscal year ending March 31, 2020.

Vision and Value Provided to Society

Nikon is committed to contributing to the development of industrial infrastructure through the supply of vision systems that provide the functionality of eyes to robots and other types of equipment. We also anticipate that the future will see increased use of AI and IoT technologies. Our role against this background will be to help realize a more comfortable society by supporting the evolution of robots and delivering new solutions to society pertaining to labor shortages and coexistence of humans and robots.
Healthcare

Background for Focus on the Area

Healthcare and medicine are important themes for society and therefore represent markets expected to continue growing over the long term. Over the roughly one century since Nikon released its first microscope, we have dedicated ourselves to the observation of the micro world. In addition, subsidiary Optos Plc offers ultra-widefield retinal imaging devices that have claimed a large share of the global market. There are significant business growth opportunities for the Nikon Group to capture by utilizing its wealth of technologies and expertise to contribute to the medical and bioscience fields.

Initiative Examples

Nikon has been taking part in an ongoing joint research project with CiRA (Center for iPS Cell Research and Application at Kyoto University) on cultivation processes and cell quality during the cultivation of iPS cells. The Company has also developed an iPS cell quality assay system that allows for objective assessment of cells and culture techniques while performing visual evaluations, which are prone to inconsistency, in an integrated manner. We have been supporting researchers in making cell cultures and observing cells since 2007 by supplying BioStation CT, a cell culture observation system that allows for microscopic observation of cells as they are being cultured, and BioStudio, a cell observation system that can be installed in an incubator. Nikon’s iPS cell quality assay system combines such cell observation systems with software that acts in place of the eyes and brains of humans. We have thus been able to provide this system as a solution that realizes consistent cell cultivation with stable levels of quality without relying on the techniques and judgment of humans.

Furthermore, Nikon embarked on a strategic business cooperation in cell-related fields with Berkeley Lights, Inc. (BLI), in 2018. Through this cooperation, we will combine Nikon’s live cell imaging technologies with BLI’s Beacon®, which utilizes this company’s OptoSelect technology, and broaden the range of solutions Nikon can offer in antibody agent, regenerative medicine, and other cell-related fields.

Vision and Value Provided to Society

Nikon looks to grow its Healthcare Business as a core business over the medium to long term and develop it into a core pillar of profit. As we expand this business, we will evolve its Cell Solutions and Ophthalmology Solutions to support early detection and treatment of diseases and contribute to improved quality of life for various people.

Areas of Long-Term Growth

**Healthcare**

Cell Solutions (Regenerative Medicine and Drug Discovery Support)

- **Material cells**
  - **Cell selection**

- **Cell Quality Evaluation**
  - BioStation CT cell culture observation system

- **Regenerative medicine**
  - **Cell processing**

- **Drug discovery**
  - **assay systems**
    - (Analysis, evaluation)

- **Cell therapy**

Ophthalmology Solutions

- **Ophthalmological examination**

- **Support for Retinal Imaging Diagnosis**
  - Ultra-widefield retinal imaging devices

- **Early diagnosis and treatment of diseases**

Contributions to early diagnosis and treatment of ophthalmological diseases as well as diabetes and other internal medical diseases found throughout the body.
Enhancing Monodzukuri (Manufacturing) Foundation

The new Medium-Term Management Plan calls for Nikon to enhance its Monodzukuri foundation with digital manufacturing toward its goal of becoming a “Leading Company in Precision and Optics.” In this section, we will introduce the four reforms geared toward the enhancement of Nikon’s Monodzukuri foundation along with its measures for developing the human resources that will support these reforms.

**Production System Reform**

**Initiatives to Date**

*Monodzukuri Reforms Centered on Cross-Business Unit Organizations*

Utilizing its unrivaled optical technologies, Nikon has provided the world with various products and services. However, we recognize that the Company will need to further heighten its strength in optical technologies and thereby develop a structure that will allow for more efficient creation of value in order to accomplish the goals of the new Medium-Term Management Plan and realize further improvements in enterprise value. As part of its efforts, the Company established the Production Technology Division as a cross-business unit organization. In addition, the optical engineering functions that had previously been dispersed throughout the different business units were consolidated within the Optical Engineering Division, while the similarly dispersed optical component production functions were concentrated within subsidiary Tochigi Nikon Corporation. The resulting technical and technological synergies will be utilized to drive improvements in productivity and quality as we implement Monodzukuri reforms aimed at creating optical products that deliver new value.

**Initiatives Going Forward**

*Promotion of Smart Factories*

Nikon is promoting the realization of smart factories as one facet of its efforts to further heighten production efficiency and quality and to adopt digital manufacturing methodologies. Specifically, we will seek to achieve more ideal manufacturing by front-loading simulations to the design phase in order to minimize costs from quality losses during production. We will also employ AI and IoT technologies to utilize digital data in the optimization of production plans and the quick identification and remediation of defects.

By realizing smart factories, we aim to expedite product launches, boost cost competitiveness, and ultimately provide powerful production-side support to become a “Leading Company in Precision and Optics.”
Nikon has continuously dedicated itself to enhancing monodzukuri technologies to improve productivity. Going forward, the Company will be oriented toward developing digital data utilization, automation, and other innovative manufacturing technologies. These reforms will be advanced through a joint effort between four different divisions, the Optical Engineering Division, the Research & Development Division, the IT Solutions Division, and the Production Technology Division, which will be united under the smart factory concept promoted through production system reforms. Through these efforts, we will establish production processes with even fewer inefficiencies to achieve substantial increases in production efficiency in order to manufacture high-quality products at optimal costs and lead times, even while high-mix, variable-volume production is entrenched as a standard practice.

The Nikon Group views quality, encompassing the safety and environmental friendliness of products and services, as the utmost priority in its operations. This recognition prompted us to establish the Quality Committee in September 2017. This committee spearheads initiatives for reinforcing quality management structures and preventing quality issues. No matter how quickly AI, IoT, or other technologies may evolve, they will not erase the necessity of ensuring high levels of safety and other aspects of quality. Moreover, we see a need to improve quality in terms of not only safety but also responsiveness to customer needs, including those arising from changes in lifestyles and values. The Nikon’s Basic Quality Policy was formulated to encapsulate these beliefs. In addition, the Quality Control Directive has been drawn up to guide the execution of this policy and to ensure consistent “Made by Nikon” product quality worldwide, no matter what production base is used for manufacturing. Going forward, we will continue to reinforce our quality management structures in order to realize further reductions in costs from quality losses and in environmental impacts.

Nikon’s new Medium-Term Management Plan targets an aggregate total of ¥18.0 billion for three-year cost reductions. Procurement reforms will be a crucial element of our efforts for achieving the prescribed cost reductions. To this end, a cost-reduction perspective will be adopted as we swiftly advance measures for formulating and executing procurement strategies, bolster relations with key partners, and improve upon the specialties of procurement staff.

We will, of course, look to reduce direct costs, including those for the materials and components necessary for production. At the same time, we will also go further to implement ground-up revisions of functions and work processes to address expenses, equipment, and other indirect costs.

By ramping up initiatives on these fronts, we will boost cost competitiveness while optimizing cost structures.

Nikon takes steps to maintain and enhance its manufacturing capabilities through effective training designed to help employees acquire the necessary techniques and knowledge for manufacturing. Also for this purpose, we have established the Technical College program. This college program is designed to foster the human resources necessary for supporting digital manufacturing by heightening their ability to adopt overarching perspectives and to perform engineering in a manner that takes manufacturing into account. The Technology Strategy Committee and the Human Resources & Administration Division have been assigned responsibility for implementing programs in this college in order to bolster the Company’s fundamental technological capabilities. Through a joint effort between business units and the Optical Engineering Division, the Research & Development Division, the IT Solutions Division, and the Production Technology Division, we have tailored this program to facilitate systematic, organization-driven learning to endow employees with the engineering, technology, quality, and other knowledge necessary for manufacturing. This program also includes hands-on learning opportunities and will be utilized to foster the human resources who will support Nikon’s manufacturing foundation in the future.