Sanwa and the fiber-optical solutions driving the fourth industrial revolution

Japanese firm Sanwa Denki Kogyo was one of the early pioneers of the web which, today, is supporting the establishment of next-generation fiber optical connections that will drive the fourth industrial revolution across the globe.

Established in Tokyo in 1947, Sanwa Denki Kogyo started out as a manufacturer of quality electric appliance and communication equipment parts and today is a leading supplier of next-generation fiber optical solutions that power the technologies driving 5G, big data, IoT, AI and robotics.

Sanwa's technology has been at the heart of several era-defining moments. The company's manufacturing and engineering strengths were utilized early on in the development of infrastructure for communication networks in Japan during the rebuilding process after World War II. Having cemented a successful reputation as a provider of components for the Ministry of Post and Telecommunications in 1950s, the company continued to expand and improve communication technology, eventually extending their factories and services to communications and IT infrastructure multinational companies.

By the early 1980s, at the dawn of the first internet era, the demand for data transfer technology was growing rapidly, at the same time that Japanese manufacturers were making strides in developing communications hardware components on a global scale. By its part, Sanwa developed the fiber-optic connectors used in those early days of the Internet and remain essential to the functioning of communications equipment to this day.

"In 1983, we created one of our most popular products with our fiber-optic connectors. At the time, the world was entering the Internet era and we can therefore be considered as pioneers of the web," says Sanwa president, Yasuo Ishii.
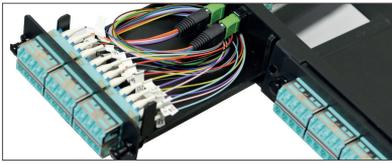
MPO Cassette module for rapid deployment of High-Density Data Center infrastructure.

In tandem with the rapid progress in broadband and mobile technologies, the optical communications industry is evolving at a staggering rate. Having been a pioneer since the birth of the internet, Sanwa will continue to develop products to enhance network performance and discover intelligent solutions for the data-driven fourth industrial revolution era. Drawing on its decades of experience in developing innovative internet technologies, Sanwa is well poised to position itself at the forefront of the data communication market.

"Nowadays, our market is moving to data communications and we have to analyze to what extent we can move into the data market. We have acquired extensive technological experience in the field. There is an important market share for us to acquire by providing solutions to data centers and supporting IoT," explains Mr. Ishii.

From LC connectors to FTTH (fiber-to-the-home) solutions such as optical rosettes and fiber optic wall outlets, Sanwa offers a wide range of high-performing and reliable network connectors and fiber optical equipment, offering up to 10-times the performance and a wider variety of options and tools than comparable products on the market. Its FTTx series, for example, has played an essential role in the provision of higher bandwidth and reliability for global networks as demand for broadband capacity continues to grow.

Key to the competitive edge of Sanwa's products has been the company's adherence to monozukuri, the philosophy of Japanese craftsmanship which encompasses everything it makes. "When Sanwa Denki Kogyo manufacturers our connectors the Japanese spirit of *monozukuri* is present," says the company president. "Whether it is for a tiny connector or a much larger network connectivity solution, this belief of putting your entire soul into the creation is sacred," explains Mr. Ishii.

While Sanwa remains widely unknown by even Japanese end consumers, the company's optical outlets are found in almost every home in Japan with FTTH broadband. Working in conjunction with partner NTT, one of Japan's leading telecommunication multinationals, Sanwa has been a true hidden champion in helping to develop one of the most sophisticated and expansive fiber-optic networks in the world.

Aside from homes, offices, factories and data centers, Sanwa's optical transceivers are also being utilized in Japan's famous high-speed rail network, the Shinkansen. "In the Shinkansen or any other bullet train, various components ensure that the surveillance cameras, Wi-Fi, and radios of the train function properly. Today, commercial trains are composed of various networks that operate behind the scenes and enable railway technology to function. Since it is not a large-scale market, few companies are able to sell railway-tailored components," explains Mr. Ishii, adding that part of Sanwa's growth strategy is focused on niche fields such as this, where "our expertise sets us apart".

With a presence across several countries, Sanwa aims to expand its international presence, with a long-term target to have 50% of its sales coming from overseas, up from 20% today. And the U.S. is one high-potential market where Mr. Ishii sees "endless" opportunities for Sanwa to provide its high-quality optical solutions to a wider customer base. The Tokyo-based firm has had a physical presence in the U.S. since 2000, when it opened its first sales office in Dallas, Texas. Today, Sanwa has embarked on pursuing opportunities in the data industry, as major firms like Amazon, Facebook, Google, and Apple look to aggressively expand their data center network.

"As such, part of our strategy is to sell our components and connectors to these larger data centers. Our connectors have been chosen by some of these companies and are currently utilized in their data centers," adds Mr. Ishii. "We were able to secure these contracts thanks to our solid track record with NTT Japan. Our relationship with NTT

"With the rise of IoT and Big Data, everything will be network-related. The Fourth Industrial Revolution presents a massive opportunity for us"

YASUO ISHII,
President, Sanwa Denki Co., Ltd.

allowed us to strengthen our skill set and to show large carriers that we are a trusted business partner."

Like for many Japanese firms, Sanwa has also focused on enhancing its presence in the fast-growing Southeast Asian market, where opportunities abound as nations like Thailand, Vietnam and Indonesia continue to strengthen and develop modern telecommunications infrastructure for both homes and businesses. In 2013, the company opened its first overseas factory in Thailand and has since expanded its Thai manufacturing plants in response to rapidly growing demand. Moving forward, both the U.S. and Southeast Asia form key focal points as this pioneering firm continues to support the establishment of next-generation fiber optical connections that will drive the fourth industrial revolution across the globe.

Developing superior tech for data centers, the ground zero for IoT and Big Data

Data management centers across Japan, the U.S. and beyond will depend on the high-performing, high-quality fiber optical technology that Sanwa has been supplying to the internet communications industry since the 1980s.

Over the coming years we will enter the age of 'Ubiquitous Sensing', where smart sensors will be attached to all sorts of "things", from buildings, bridges, roads and cars to factory machinery, robots, domestic appliances and even our bodies. These sensors will be connected to computers through the internet, relaying huge amounts of analyzable data.

The Internet of Things (IoT) is here. If harnessed to its full potential, IoT will help businesses to improve productivity, efficiency and sales; it will allow cities to reduce traffic congestion, lower crime and cut energy and water consumption; it will enable farmers to improve yields and reduce waste; and it could help many of us to live healthier and perhaps happier lives.

IoT will be the main technology behind our smart cities, smart society and smart economies of the not-too-distant future. Consultancy firm, McKinsey, forecasts that applications of IoT could have a direct economic impact of between $2.7 trillion and $6.2 trillion per year by 2025. The biggest economic impact will be in healthcare, between $1.1 trillion and $2.5 trillion, while in manufacturing the impact is projected at between $900 billion and $2.3 trillion. McKinsey forecasts that the total operating cost of manufacturing will reach $47 trillion by 2025, and that IoT applica-

Internet of Things
Connected Devices Installed Worlwide
2015-2025

source - Statista
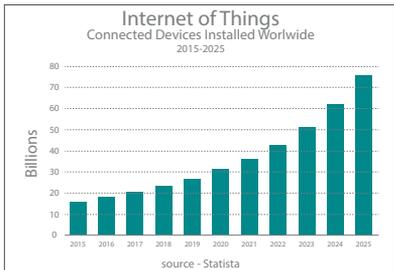
tions could save between 2.5% and 5% on operating costs, including maintenance and input inefficiencies.

There will be two main challenges for businesses and organizations adopting IoT technologies. The first is related to security. Having more devices connected to the internet naturally increases the risk of cyber threats from hackers. Businesses, governments and utility companies will need to put in place extensive cyber security measures to mitigate the risk of attack.

The other big challenge is related to data management. IoT-enabled devices will gather a huge amount of data. It this data is going to have any sort of direct benefit, enterprises will need to have both the human and technology resources in place to analyze it in real time, and then make smart' decisions based on data analysis.

This is where Big Data comes in. Some of the best-positioned companies may be suppliers of big data and analytical software that can help extract meaning from the enormous flows of data that the Internet of Things will produce. The Internet of Things and Big Data are so closely intertwined; and there is no doubt that if used and managed properly the two areas will create new opportunities and solutions that will have a long and lasting impact on society, the environment and the economy.

"In recent years, the communications industry has been living through a series of transformative stages. With the rise of Industry 4.0 technologies such as Big Data , Internet of Things and AI, an ever grow-

ing amount of information needs to be transmitted and shared through connected networks. Today, even changing a single signaling panel in a production line requires a large volume of data management," says Sanwa president, Yasuo Ishii.

The emergence of IoT and Big Data represents major opportunities for Sanwa as a provider of fiber optical components that will be deployed in data management centers across Japan, the U.S. and beyond. These data management centers will be ground zero for IoT and Big Data, and as such, will depend on the high-performing, high-quality technology that Sanwa has been supplying to the internet communications industry since the 1980s.

"Since the beginning of the fiber-optic network decades ago, we have provided optical components, like our optical adapters and connectors, and technical services to data centers all over the world," says Mr. Ishii.

"Beyond these components, we have begun expanding our offerings to include assembled solutions. One of these examples is our patch panels which provide flexible 4 or 6-port sub-assemblies that can easily be inter-changed or removed to significantly reduce the labor and potential errors in installation and servicing of data center cabinets."

Sanwa initially sold these products on the Japanese domestic market only, where it took the opportunity to enhance its products and services before expanding into other markets worldwide. Today, many international

"As we are present in a variety of sectors and countries, we are frequently met with needs to customize our products according to the individual requirements of our customers. Adapting to different requirements while delivering high-quality products has always been our objective"

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clients are seeing the benefits of this Tokyo-based company's technology over that of its competitors.

"A lot of these panels are offered by many manufacturers and utilized in data centers all over the world, but our solution offers the users with significant labor savings and more accurate installation," says Mr. Ishii.

"In amusement parks and event venues for example, surveillance cameras and related devices generate massive amounts of data to manage the system and the attractions. Consequently, they employ an extensive data center network. Predominantly, those panels used in such facility were mostly overseas products, but our solutions are making significant progress in gradually replacing those current systems, helping users save more installation, operation and maintenance costs."

Japan leads
new robotics era

Industrial robots have been used on assembly lines for decades now, but recent technological advances have enabled them to take on more complex work, with more speed and accuracy than human workers. Thanks to advances in artificial intelligence, machine vision, motions sensors and hydraulics, robots are now capable of more intricate and delicate tasks on the factory floor.

As the cost of robotics has declined, sales of industrial robots have grown six-fold in the last decade, reaching $16.5 billion by 2018. The global factory automation market size is expected grow 8.8 percent per year to reach $368 billion in 2025, according to a report by Allied Market Research; while the overall global robotics market is projected to reach $237 billion by 2022, up almost fourfold from an estimated $60 billion in 2018.

"As telecommunications technology improves, automation improves. Before, it was impossible to provide the communication infrastructure for robots to properly function. Today that has changed. Over the long term, I believe that factory automation will help Japan's manufacturing sector," says Sanwa president, Yasuo Ishii.

With five of the world's top 10 producers being Japanese, holding a 30 percent global market share between them, Japan is the undisputed leader in robotics and factory automation. Having installed over 500,000 industrial robots and four million computer numerical control systems, Fanuc is the world's number one producer with one quarter of the global market. Following Fanuc are other Japanese power houses such as Yaskawa Electric, Mitsubishi Electric, Omron Corp., Yokogawa Electric, and Nidec Corp.

Japan's leading position in robotics and factory automation will certainly translate into big opportunities for Sanwa, which has begun the pursuit of expanding its high-grade solutions to clients in the industry.

"A large part of our focus today is centralized on developing active components for Japanese manufacturers active in the machine tool, factory automation and robotic industries," says Mr. Ishii.

"As robots and machines are added to factory lines, the overall cost-per-unit will be reduced, and Japanese manufacturers have the opportunity to make cost competitive, yet, high-quality products. As our firm builds the connectors used for industrial communications infrastructure, we foresee a surge in demand for our products. Every time a factory purchases an automated machine or a robot, they require our products to install it and link it to their network."

Along with Japan, China and Germany, the United States is another leading firm in the field of robotics and factory automation. Consequently, Sanwa can potentially extend its products and services to clients in the U.S. looking for highly reliable and superior-quality fiber optical components to power their robotic and automated equipment.