From the 1960s up to the turn of this century, Japan was the world's largest shipbuilding nation, at one point producing about half of all new ship tonnage in the world. However, Japan’s dominance has subsided in recent years as its global market share of CGT (compensated gross tonnage) has fallen to 20 percent, with China now the leading global shipbuilder. Ahead of Japan in second place is South Korea, whose shipping industry has been buoyed by government financial support in recent years due to the impact of the 2008 economic crisis on demand for new vessels.

Recently Japan, backed by the EU, took a case against South Korea to the World Trade Organization, claiming that the government subsidies are unfairly reshaping the global shipbuilding market, which could prolong the current oversupply of vessels that is damaging to the sector.

But Japan is not just depending on the WTO ruling in its effort to win back market share from South Korea. It has also devised comprehensive plans to revive its shipbuilding industry and has targeted a 30 percent market share of completed ships by 2025, by leveraging the nation’s technological prowess to build environmentally friendly vessels adopting the latest technologies.

In 2020 worldwide maritime regulations on sulfur oxide emissions are set to significantly increase the demand for environmentally friendly ships. And Japanese companies that are strong in environmentally friendly technology, such as Mitsui Engineering & Shipbuilding, Mitsubishi Heavy Industries and Tsuneishi Holdings Corporation, are preparing to take on Chinese and South Korean rivals by positioning themselves to meet this new demand.

"Our target here at Tsuneishi Shipbuilding is to reduce Co2 emissions by 40 percent by 2020 in comparison to 1990. We are currently at about 30 percent," says Takao Kawamoto, president of Tsuneishi, a company which builds bulk carriers, container carriers and tankers and celebrated its 100th anniversary in 2017. Also leading the charge are companies like Musasino Co. Ltd., which develops marine equipment, systems and sensors that have supported safe and reliable cargo handling operations in the global shipping industry for more than 60 years.

"Most ships use heavy fuel oil, a dirty fuel high in sulfur. The challenge is how to reduce emissions if we’re still using that fuel. Success will come from our ability to build ships that can meet the regulations coming upon us," says company president Naoki Sugiyama. "Thanks to our craftsmanship and superior technology, we can create products that tackle environmental issues."

Aside from greener ships, Japanese companies are also pioneering the use of fourth industrial revolution technologies such as robotics and IoT, and aim to launch self-navigating vessels by 2025.

"We are currently partnering with different universities in order to start using robots in our shipbuilding operations. We also are collaborating with Kyushu University in order to develop laser-arc hybrid welding," says Tsuneishi’s Mr. Kawamoto.

Meanwhile, Musasino is also supporting their shipbuilding client’s digital transformation with its ‘Smart Network’ platform, which it has developed based on its signal processing technology.

“Our entire firm runs on digitalized systems and we’re able to provide our clients with technologically advanced products," says Mr. Sugiyama. "Our Smart Network enables data to be sent directly to onshore offices via satellite. As part of that network, we recently released our MDE (Multi Digital Interface Equipment), which is a versatile product that can also bring in data from third party equipment. We’re looking to lead the industry’s digitalization with MDE and Smart Network, and integrate ships and their onshore offices."

"Thanks to our superior technology, we can create products that tackle environmental issues”
Naoki Sugiyama, President, Musasino Co. Ltd.
Japan’s global reputation for its manufacturing prowess, underpinned by the dedication to monozukuri (craftsmanship), is often associated with the big players like Toyota, Sony and Panasonic.

But the true strength of Japanese manufacturing lies in the multitudes of SMEs that provide high-quality parts and components to these larger companies to build their final products.

While most of these SMEs are not as well known as Japan’s giants, they form the backbone of the service sector and are a crucial part of the manufacturing and export supply chain. In 2016, the Economic Census for Business Activity estimated that SMEs and LMEs (large medium-sized enterprises) accounted for nearly 97 percent of all Japanese enterprises. Japan’s SMEs employ 70 percent of the total workforce and are responsible for 50 percent of total manufacturing output.

Japanese brands have had to deal with emerging competition in recent years from China and South Korea, who have tried to replicate monozukuri to varying degrees of success. But what differentiates Japan’s manufacturing industry from its regional competitors is the support of its strong and stable SMEs, many of which have a longstanding history in innovation and technology that cannot be matched by their counterparts in China and South Korea.

“Japanese monozukuri is the knowledge and craftsmanship that have been cultivated throughout the years. I also believe that Japan’s manufacturing strength resides in the stability of its SMEs,” says Kanzo Shimizu, President of Nichiei Kakoh, a company which manufactures state-of-the-art adhesive paper and film for customers in the printing, electronics and automotive industries.

“From abrupt changes in management to lack of capital, SMEs in other Asian countries aren’t stable. In Japan, SMEs are extremely stable and their production ability is maintained constantly throughout the years.”

Another competitive edge of Japanese SMEs is their incredible ability to adapt to change, be it technological or market-oriented, which is particularly important in the era of globalization and the emergence of fourth industrial revolution technologies.

Japan’s shrinking domestic market has forced the nation’s SMEs to expand their operations overseas in recent years, both by following bigger Japanese companies to new markets and by finding new customers in those markets.

“Inevitably, alongside other companies, we feel that we have to move to overseas markets. International markets represent 10 percent of our sales. In the years to come, we definitely have to increase this percentage,” says Mr. Shimizu.

“Consequently, we are following the big names that localized their businesses outside Japan. Those companies require a certain level of trust towards their suppliers, and as we have already acquired that trust, our expansion strategy is to follow our customers.”

“We are especially targeting foreign markets that require functionality. Since our field is B2B, we understand that we need to put something so the customer realizes that our products are unique to Nichiei Kakoh. The most appealing point that we want to translate to potential customers is that our products aren’t simply ‘Made in Japan’; they are ‘Made by Nichiei Kakoh’.”

Yagi Industries, meanwhile, is also pushing for global expansion. For years, Yagi has supplied high performance bearings and clutch rotor bearings for car giants like Toyota, and is particularly targeting the growing U.S. automotive market in its overseas strategy.

“Right now, our main target is North America, as there are 270 million cars running. This represents a huge market of 14 million new plus 40 million used cars. Also SUV and truck numbers are expected to continue growing until 2023,” says president, Norihiro Yagi, who also highlights Yagi’s competitive advantages over other companies in the industry.

“One of our key competitive advantages is that we have been able to vertically expand, meaning we are able to manage every process of our production line in house. This allows for cost reduction in areas such as inventory stock fees and transportation expenses, which in turn results in more appropriate pricing for our customers and more flexibility,” he says.

“We are very proud of having access to technologies that most of our competitors do not. Some of them include fully enclosed die forging, coreless forging, composite forging and automatic forging just to name a few.”

One of the major changes in manufacturing right now is the growing adoption of fourth industrial revolution technologies, such as the Internet of Things (IoT), Big Data and advanced robotics. And it is an area in which Japanese SMEs are forging ahead.

“For this year, we will introduce IoT on-site as we plan to improve the productivity and reduce defects by arranging computers at the worksite that can form unified processing of accumulated production data,” says Mr. Yagi.

“Small, agile and technologically adept, Japan’s SMEs have been the backbone of monozukuri for decades and are now following the Japanese big players abroad in the quest to bring their high-quality products to new markets.

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<th><strong>The backbone of monozukuri</strong></th>
<th><strong>70%</strong></th>
<th><strong>50%</strong></th>
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<td>SMEs represent 70% of Japan’s total employment</td>
<td>SMEs represent 50% of Japan’s added-value manufacturing output</td>
<td>SMEs have overseas offices</td>
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**Kanzo Shimizu, President, Nichiei Kakoh Co., Ltd.**

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“Small, agile and technologically adept, Japan’s SMEs have been the backbone of monozukuri for decades and are now following the Japanese big players abroad in the quest to bring their high-quality products to new markets.
From cell phones and laptop computers to wireless speakers and electric toothbrushes, lithium-ion batteries power the devices we use every day. First introduced to the market by Sony in 1991, these rechargeable batteries also have many industrial uses and power the charge-up electronic vehicles (EVs) that are set to become ever-more prevalent on our roads each year.

Fueled by increasing demand for smart devices, EVs, and the growing need for automation and battery-operated industrial equipment, the lithium ion battery market is projected to grow at an average yearly rate of 16 percent, from $374 billion in 2018 to $922 billion by 2024.

Aside from the task of meeting this growing demand, ensuring the high performance, safety and environmental friendliness of these batteries is also a big challenge for electronics and automobile manufacturers, many of whom depend on the superior battery testing equipment developed by TOYO System.

Automotive companies, for example, have used TOYO’s testing machines to develop the battery technology behind many well-known hybrid vehicles. Worldwide PC and electric communication device manufacturers also depend on TOYO’s equipment to manufacture laptop and phone batteries, while many universities and research institutions also employ TOYO’s machines in battery development and innovation. This small-yet-agile company’s diverse list of clients reads like a who’s who of the electronics and automobile industries.

“As an SME, we only focus on producing one particular product: secondary battery testing systems. Throughout the years, we have accumulated expertise in the production of secondary battery testing equipment and today, we’re proud to cover all types of different batteries,” says president and CEO, Hideki Shoji, who was named Ernst & Young’s Entrepreneur of the Year in 2009.

“To reach such a diverse clientele, we have had to integrate our battery testing systems to meet various testing equipment requirements for the different needs of each company. We cover different industries all over the world and we’re proud to say that we’re a one-stop company.”

In light of the growing demand for lithium-ion batteries in the United States, TOYO established its American subsidiary TOYO System USA in Ohio in 2013. Through which it offers a series of TOSCAT and TOSMAC testing equipment to its U.S. customers. Moving forward into the era of Big Data, Toyo aims to continue to expand its presence and tradition of excellence in the U.S., Europe and beyond by leveraging on its massive capacity for data collection to offer more services to its customers.

“As our employees conduct testing on a daily basis, they gather an incredible amount of data. We must systematically collect that data and analyze it to further understand our market,” explains Mr. Shoji. “Investing in data-management is a crucial factor for our company’s development. From this data, we will be able to create more services, ultimately allowing us to diversify from an integrated manufacturer, to a unique company that is an integrated manufacturer and service provider.”

In a natural disaster-prone country like Japan, civil engineers are constantly trying to develop new ways to make buildings and structures more resistant to earthquakes, tsunamis and heavy flooding. And the pace of civil engineering development in disaster prevention has only accelerated following the Great Earthquake of 2011 and subsequent Tsunami, which exposed many structural weaknesses that civil engineers have and continue to address.

Established in 1952, Asahi Inovex manufactures fabricated structural metal and steel, as well as heating/cooling panels for residential buildings. Its outstanding metalworking technology has been used in offices, hospitals, hotels, public facilities and sports facilities throughout Japan, helping buildings to stand against major earthquakes.

The company’s cutting-edge technology is the result of its long-standing commitment to ceaseless innovation—hence the “Inovex” part of its name. One of its most renowned and widely used innovations is the ‘Auto Gate’, an automatic gate that aims to prevent tsunamis and rivers from flooding.

“The ‘AutoGate’ is designed to open-and-close by reacting to water levels on the inner and outer side of the gate. Consequently, it does not require man-power to operate,” explains company president Mikihiro Hoshino. “The product has existed in the market since 1998, long before the Tohoku earthquake in 2011. But due to the national disaster, the demand increased and we introduced it to more areas.”

Over the 20 years of the product’s existence, Auto Gate, which was awarded the The Prime Minister’s Prize in the Fifth Monozukuri Nippon Grand Award in 2013, has been installed at around 2,000 sites in Japan, and that number continues to grow. The plan is to have 30,000 Auto Gates installed across Japan over the next century, while the company also aims to expand the product to Southeast Asia, where it is already in use in Thailand. Also on Asahi’s radar is Europe, where torrential flooding continues to become a greater problem because of climate change.

“Two things are under consideration in our R&D activities right now. Firstly, we are trying to increase the capacity of the ‘Auto Gates’ themselves to serve as tsunami preventers, as our current gates have only been preventing river overflows,” adds Mr. Hoshino. “Secondly, we are making a new type of gate purposely to serve different applications. The idea is to take the automatic opening-and-closing function and apply it to civil purposes, such as in living quarters or sewage systems. Therefore, we are expanding into areas the company hasn’t touched yet.”

Whether it’s in civil engineering, the steel division, ‘Auto Gates’, or its environmentally friendly heating panels, the company sees many avenues for growth in the future.

“The next target for the company is to diversify our segments and expand in different divisions,” concludes Mr. Hoshino. “With our capable and trusting workforce, future possibilities are endless.”
Brains behind the beauty: how Japanese SMEs drive cosmetics innovation

There is much more to Japan’s booming cosmetics sector than a handful of recognizable corporate giants, with a multitude of smaller firms specializing in manufacturing components that make up the innovative final products.

“SMEs in the cosmetic field occupy a similar role to their peers in the automotive sector,” explains Yoshihiko Ando, President and CEO of Ichimaru Pharcos, a leader in the SMEs drive cosmetics innovation.

Eternal youth has, since the dawn of time, been the ultimate fantasy of human kind. Our obsession with youthfulness, and by association, beauty, has transformed the global cosmetic and personal care market into an industrial giant expected to generate more than $600 billion by 2020.

As a nation reputed for its perfect skin, young looks and healthy diet – not to mention a long-established tradition in the use of cosmetics (Geisha) – Japan has all the fundamental criteria to lap into the world’s booming wellness demand. According to Euromonitor International, Japan’s annual beauty and personal care market is today about $50 billion in size, second only to the United States.

While well-known brands such as Shiseido and Kanebo have made quality and attention to detail core components of their portfolio, and as a result, helped Japanese cosmetics products gain a globally sought-after reputation, like so many other Japanese industries, there is much more to its cosmetics sector than a handful of recognizable corporate giants.

“SMEs in the cosmetic field occupy a similar role to their peers in the automotive sector,” explains Yoshihiko Ando, President and CEO of Ichimaru Pharcos, a leader in the research and development of natural active ingredients for the cosmetic industry. “While end consumers are aware of the brands making the final vehicle, such as BMW, Honda or Ford, these companies are but the assemblers. When you look at the parts and pieces necessary to produce a modern car, you will find a multitude of smaller firms specialized in manufacturing precise components. We are exactly the same.”

Indeed, while the general public will most likely recognize the names L’Oréal and Shiseido, similarly to car makers, these large firms are only famous for releasing and branding final products. At lesser-known companies such as Ichimaru Pharcos, on the other hand, much work goes in behind the scenes to develop the active ingredients that compose these end products. It is within these smaller businesses, says Mr. Ando, that the innovation for which Japanese products are coveted originates.

“Since flagship organizations are extremely large, they do not have the flexibility to invest a large sum of capital and human resources on developing niche technologies. While their ability to research innovative products is well-known, these large companies decide to outsource niche-market research to specialized firms,” says Mr. Ando. “Consequently, they commission a part of their research to OEMs and R&D-focused companies, such as Ichimaru Pharcos, to develop functional substances. As a result, the objective of SMEs is to create innovative solutions that can cater for the desires and needs of larger firms.”

In recent years, international consumers have manifested their interest for natural and organic products in particular, an area in which Ichimaru Pharcos specializes. However, while the company president argues that utilizing natural components in beauty products has become “a necessity,” such trends must continue to be supported by “accurate science”.

“Comparable to the fashion industry, which changes from season to season, the cosmetic world is constantly evolving. At Ichimaru Pharcos, we put great effort in remaining on top of the latest market trends,” says Mr. Ando. “That being said, the cosmetic world isn’t all about glamor. For products to work effectively, they must be backed by functional technologies and scientific evidence. The scientific part of the cosmetic industry is where Ichimaru Pharcos shines.”

“Such focus on innovative measures, backed up by proven science, goes a long way to explaining why in the USA, and internationally, the mania for Japanese cosmetics products has exploded in recent years. For instance, from 2012 to 2015 exports of cosmetics from Japan to America more than doubled, passing from an estimated 7 to almost 15 billion JPY, and making America Japan’s favorite non-Asian destination for cosmetics.

Ichimaru Pharcos’ own natural cosmetics innovations include the award-winning Juvecol Proteoglycan, a patented salmon cartilage extract developed for MayPro, the leading global cosmetics supplier. Juvecol, which won the prestigious NEXTY Award for Best New Ingredient of 2017, induces the generation of collagen, supports the production of hyaluronic found in soft connective tissues, and enhances the proliferation of keratinocytes essential to protecting the skin from damage and stress.

Explaining his company’s success, Mr. Ando says: “At Ichimaru Pharcos, we were one of the first to import the natural cosmetics trend to Japan. As a matter of fact, we became the first Japanese cosmetic product manufacturer to use natural ingredients only. Throughout our history, we have accumulated a long track record of technological breakthroughs. The goal of Ichimaru Pharcos is to continue exploring the countless possibilities that natural products have to offer.”