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SPECIAL REPORT

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SURVEILLANCE AND HARASSMENT—

DEEP INSIDE IN AMERICA

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Japan's hidden champions reign supreme

While Japan has faced increasingly larger competition from the likes of China, South Korea and Southeast Asia in recent decades, many Japanese manufacturers have maintained large global market shares in B2B and niche fields characterized by high-mix, low-volume production. Working behind the scenes by supplying high-quality parts, materials and machinery, these niche companies are the so-called 'hidden champions' of Japanese manufacturing. They have and will continue to excel thanks to a strict adherence to the tenets of *monozukuri*, the Japanese manufacturing philosophy that centers around craftsmanship, excellence and the constant pursuit of innovation.

From automotives and electronics, to industrial equipment, chemicals and material science, these hidden champions will continue to play an important role in the Industry 4.0 era as Japan looks to place itself at the forefront of industrial development in the 21st century.

Kobelco Compressors Corporation is one such hidden champion whose compressors play a vital role functioning "as the heart of a manufacturing plant", says president Horoki Iwamoto. It is due to this extremely important role that high quality and high reliability are in turn of the utmost importance, and why Japan still excels in such fields. "We've been working for over seven years in China so we understand Chinese quality and we can tell that the manufacturing quality there is improving each year. However, regardless of their price advantage, they still can't compare to Japanese levels of quality. We pay meticulous attention to the standards and policies being implemented in various manufacturing facilities, and we have a very solid level of development standards that we constantly update and improve."

When it comes to competing with regional competitors, Japan must continue to focus on high-end, value-added technology, says Yasuhiro Takeuchi, President of Hitachi Industrial Equipment Systems, which also manufactures compressors and other important industrial equipment. "Japan must avoid mass production-style manufacturing and focus instead on value-added products. At Hitachi Industrial Equipment Systems, we focus on the development of advanced engineering and value-added products. Our solutions play a critical role in our customers' businesses. For example, our G series screw compressors are oil free and equipped with noise control devices. Only a few companies in the world are able to develop such products, and Hitachi is one of them. Our ability to develop such innovative and complex products is the reason why we play a major role in the global industry."

Yu Nakata, President of KEYENCE, which manufactures factory automation equipment such as sensors, machine vision systems and measuring instruments, also stresses the importance of added value. "We have continued to create truly useful products by directly addressing the problems of our customers and the challenges they face at their production sites. This process has led to the result that about 70% of our new products are world or industry firsts. We strongly believe that the meaning of our existence is to create added value, and we would like to produce products that have unprecedented value in the world. That's how we are trying to support our clients."

Giving his take on *monozukuri*, Fumiyuki Kanai, president of semiconductor manufacturing equipment maker KOKUSAI ELECTRIC CORPORATION, highlights the importance of *'Tai-wa'* and technology as the foundation of the company's philosophy. "*'Tai-wa'* is a Japanese word meaning 'dialogue'. We use *Tai-wa* to hear the voices of the clients and partner companies, and really understand their needs as fundamental to our business," he explains.

"Another important point for us is 'Technology'. Technology is obviously necessary in order to realize the needs of customers at a high level. In conventional fields there are regional competitors coming up, which inevitably intensifies competition. We are not a company that wants to compete in that red ocean. Our strategy is to compete in a field where we can leverage our unique technological capabilities. We cater to an incredibly cutting-edge and high-end market. In order to do that, of course, we always pursue advanced technology and innovate by fusing our technologies, refined across multiple fields."

Indeed, it is in the field of semiconductor manufacturing equipment that Japan's high-end technology continues to be indispensable, while other regional competitors have taken the lead when it comes to the production of the semiconductors themselves.

"Back in the 1980s Japan became number one in terms of market share [of semiconductors]. But regional players came like Taiwan, and most recently South Korea and China, and the market share has shifted over to them now," says Minoru Shichino, President of Elionix Inc., a manufacturer of electron beam lithography systems for cutting-edge R&D and nanofabrication. "On the other hand, Japan is doing really well in creating manufacturing equipment for semiconductors. Electrical components is also another field that we are really good at, with companies such as TDK leading the way. While it is true that semiconductors themselves have shifted away, the support in production is coming from Japanese firms, so I can say that Japan still holds a strong advantage in this field."

Within the industry, Hightec Systems Corporation has carved out a niche for itself as a supplier of refurbished semiconductor and flat panel display (FPD) manufacturing equipment. CEO Moriaki Abe explains that the demand for older refurbished equipment has and will continue to remain high even as semiconductors become more advanced. "Producing the latest semiconductors doesn't require the most advanced equipment, and can be produced by equipment that is 20 years old, or perhaps even older. As such, 650 fabrication plants around the world need to fine-tune or calibrate their equipment. In the used equipment market, therefore, the maintenance and prolonging of the equipment's life is key, so that really makes up the focus of our business," he explains.

"In the past, the main focus and application of semiconductors were for PCs, but now we see that it has shifted to mobile devices. The next frontier for semiconductors will be electric vehicles and drones. Once Japanese companies take that seriously I think that they will once again reign supreme in the markets of semiconductors."

Given the strength and size of the Japanese automotive industry, many of the nation's hidden champions are engaged in the manufacture and supply of parts to car and motorcycle makers, both in Japan and across the globe. The shift to CASE (connected, autonomous, shared, electric) vehicles presents both a challenge and opportunity for these companies, with the majority forced to reorient and diversify their business in light of the fact that the conventional internal combustion engine will eventually disappear.

Having cemented its reputation as a leading provider of clutches, FCC is expanding its core technologies to lead new developments in advanced material science, including ceramic paper technology and its collaboration with Carbon Fly on its high-performance multi-walled carbon nanotube (MWCNT).

"It is said that clutches will gradually disappear. So we have two main activities to combat this trend," says president Yoshitaka Saito. "The first activity is mobility. Even in this CASE era, we still want to go ahead and serve the mobility world. We're trying to develop new products. How we're doing so is through our core technologies. First of all, we have the aluminum die casting technology, which would be necessary for the lightweight trend and also for heat management.

"The second activity we're doing is related to our core technology that we initially used for paper but found that it can also be used for fields other than mobility. We are in development to utilize our paper technology for environment purification and energy solution applications. Our core technologies are being implemented for non-mobility sectors, as well as fuel cell products."

AIDA is a leading developer of press metalforming solutions, with the automotive industry serving as one of its main clients. While president Kimikazu Aida acknowledges that the changes are having a major impact on the business, the increasing demand for drive motors and batteries for EVs presents opportunities for the company's renowned MSP and UL presses.

"The demand for MSP is increasing rapidly because it is used for producing EV drive motors," he says. "MSP stands for Multi Suspension Press. Motor cores for EVs are made by laminating about 300 silicon steel sheets with a thickness of 0.25 mm. Punching of the 0.25 mm thin plate, dowel forming, laminating and caulking are performed simultaneously at high speed. So you can imagine extremely high accuracy is required for the press machine," explains president Kimikazu Aida. "When it comes to the MSP, we change the structure of the machine depending on its purpose. In order to achieve the highest accuracy, we have made various changes and improvements. This machine has the

Yu Nakata, President and Representative Director, **KEYENCE Corporation**

Shinichi Taniguchi, President, Representative Director and COO, **Mabuchi Motor Co., Ltd.**

Masayoshi Fujimoto, President, Representative Director and CEO, **Sojitz Corporation**

Yasuhiro Takeuchi, President and Director, **Hitachi Industrial Equipment Systems Co., Ltd.**

best reputation in the world. Some of our European customers have said that the MSP is the best."

Mabuchi Motor, the world's largest manufacturer by volume of small electric motors, also sees opportunities being presented by the CASE era. "In terms of EVs, in order to increase the battery efficiency and manage its temperature, we have this new technology called thermal management, where we install a motor into thermal management systems to control the temperature. When you look at the car as a whole, there is a need to cool down the battery, but we can also utilize the heat that is generated by the battery to warm up the car, for example," explains president Shinichi Taniguchi.

He adds: "We are not going to produce any large-scale motor that will replace traditional internal combustion engines (ICE), however, when talking about mirrors, door locks, and power window lifters I think our motors will remain in the EV society. With increasing expectancy for EVs to run more efficiently and be able to drive further distances, everything needs to become more compact and lightweight. I think this is where our existing technology can come into play."

Fine Sinter is a pioneer in powder metallurgy whose main client has historically been Toyota. President Yoichi Inoue is also optimistic about the future as the company looks to diversify its business. "Some in the industry have been joking that the only thing left for us to make will be the wheel axles, but I think that diversification not only for the automotive industry, but also hydraulic equipment, agricultural equipment, and industrial products, has meant that we are not putting all of our eggs in one basket. Beyond automotive, there are so many possible industries and opportunities for our manufacturing techniques. The only way to survive these harsh times is to diversify," he explains, adding that there is great potential for the company's reactor core technology when it comes to next-generation batteries.

"The reactor core is for the inverter, and right now we are looking into new applications in battery charging. Battery charging, not just in automobiles, needs to have good features. People need shorter and faster charging times, and that itself is presenting a bright future for our type of inverter reactor core."

Japan's chemical industry is also representative of the nation's industrial evolution, with Japanese companies leading the way in value-added, functional materials while the mass production of base chemicals has shifted to other countries. "The applications of functional materials include batteries, semiconductors, cellulose nanofibers and films. These products were developed to meet the demand of end-users and to provide added value to existing products," says Matsuru Kushida, President and Representative Director of N.E. CHEMCAT CORPORATION, a manufacturer of precious metal catalysts for a wide range of industries that is focused on developing materials for the new energy value chain in line with carbon neutrality goals.

"Japanese companies have grown by catering to ever-changing client needs. The functional material sector also grew because of the uniqueness of the Japanese market, which requires a short production cycle and high innovation. These are the driving forces that inspired Japanese companies to evolve. Private and public Japanese companies and research centers such as AIST have conducted research on functional materials to provide additional value, and this led to Japan receiving a Nobel Prize in the chemical sector. Japanese companies will continue to provide added value and not focus on mass production to stay competitive with countries such as China, Korea, Taiwan and other ASEAN countries."

Katsumi Ishizaka, President and CEO of Fuji Silysia Chemical (FSC), shares a similar perspective on Japan's chemical industry. "Japanese firms are focusing on high value-added products and functional materials. They are trying to cultivate superb technology, and it is the same with us when it comes to the specialized field of chemical R&D," he explains.

FSC's products are used in a range of industries, including pharmaceuticals, foods, cosmetics, paints and plastics. "Our products are always evolving as we try to keep up with customer requirements. For example, with paints and plastics, they are making new technological innovations and our products are always needed for them, especially with paint, which is used everywhere," adds Mr. Ishizaka. "With plastic, for example, think about plastic films. Many kinds of plastic film are needed for solar panels and smartphones, and our silica is always needed, so we need to keep up with client innovations through partnerships."

Having previously formed part of the Bridgestone Group, Archem Inc. recently became an independent company and focuses on urethane materials to develop products across three areas: seat pads, chemical products and office automation. Satoru Kusano, Global CEO and Representative Director, is confident that focusing solely on the urethane business will give Archem an advantage as it looks to expand in the global market.

"In order to establish Archem as the No.1 in the urethane industry, to build a foundation to be recognized by stakeholders around the world, and to be recognized as a first-class company, we are focused on building a growth strategy for Archem as a whole and to developing human resources who can meticulously assemble and execute PR strategies. We are looking to raise the talent that will bring about change, thoroughly promote DX, and build a strong, globally diversified team. A single company focused only on the urethane business also increases the potential for new use cases and new business ideas to come to fruition quickly."

Japan's pyramid-shaped industrial structure has been key to its success in manufacturing, with SMEs, known as *chusho kigyos*, providing the materials, parts and technologies to larger companies higher up the value chain, while the nation's famous trading houses (or *sogo shosha*) have also played an important role.

"Typically SMEs, which can produce parts at lower costs than large enterprises, manufacture components and deliver them to large enterprises, which then assemble the parts," says Toshihiko Kawai, President of Hanshin Metallics Corporation. "This also helps large companies concentrate on marketing, design, assembly, and quality assurance. Since large companies are often publicly listed, they tend to be slow in making decisions to invest in new equipment. There are cases where smaller companies can get business opportunities by making quick decisions about investing in new equipment. Our company's role is to purchase materials from steelmakers and deliver finished products to our customers, including those SMEs in the fastest and most cost-effective way possible."

Masayoshi Fujimoto, President and CEO of trading firm Sojitz Corporation, meanwhile, explains the important role of *sogo shosha* in Japan's manufacturing history. "We were able to make a significant contribution to Japan's enlightenment and industrialization through the establishment of a wide range of manufacturing businesses, and these trading firms then helped to sell Japanese products abroad."

With 75-plus bases internationally through more than 300 interconnected companies, Sojitz is currently focusing on renewable energy development projects while it looks to expand its global reach. "My vision is for Sojitz to become a true global *sogo shosha* that pursues business initiatives based on unique regional needs," adds Mr. Fujimoto. "In Japan, there are many companies which have been in existence for 100 to 150 years, continuing from the Meiji era to the present. My hope is that Sojitz will continue to evolve in different forms, while continuing its legacy as a *sogo shosha*."