

The hidden champions of *Monozukuri*

Working in the background, Japan's small, agile and technology savvy SMEs are the silent heroes that form the backbone of the nation's reputed manufacturing industry.

"There is an undeniable essence of devotion and sacrifice to work that forms the foundations of *Monozukuri*"

Masahiko Suga, President, Magtronics

From cars and electronics, to high-tech engineering components and machines, Japanese manufacturers are renowned for delivering the highest quality, ensuring the longstanding reputation of the 'Made in Japan' brand worldwide.

In recent years, Japan has faced stiff competition from regional competitors that try to replicate the nation's manufacturing standards. And while these competitors may surpass Japan in terms of quantity and price, they often fail to capture the true essence of *Monozukuri*, the Japanese manufacturing philosophy grounded in dedication, skill and the pursuit of innovation.

Monozukuri production has always been focused on the highest manufacturing standards, where painstaking attention to detail in every part of the production process results in products of unrivalled quality and reliability.

Monozukuri (a combination of 'mono' meaning thing and 'zukuri' meaning the act of making) is often equated to 'craftsmanship' in English. However while craftsmanship often puts emphasis on the craftsman, *Monozukuri* is more about reverence for the thing being made, thus deflating attention away from the person doing the making. Stemming from a centuries-old Japanese culture based on a deep respect for both animate and inanimate objects, *Monozukuri* not only focuses on crafting the highest quality products, but also on sustainable man-

ufacturing and working in harmony with the surrounding environment.

Toyota has long been the global face of *Monozukuri*. But the philosophy is also rooted at the core of all Japanese SME manufacturers, who are often hailed as the "hidden champions" of the nation's reputed industrial sector.

"Everything about Japanese *Monozukuri* is highly related to the national character of the Japanese people. There is an undeniable essence of devotion and sacrifice to work that forms the foundations of *Monozukuri*," says Masahiko Suga, president

of Magtronics, which supplies machine tools, control panels for industrial equipment, as well as cables and harnesses to clients in Japan and across the globe.

"Companies come to us with a specific design. By following this design, we elaborate on the final product. Even though we have features of an SME, we stand out due to our capability to deliver on time and the optimal quality that meets our clients' expectations."

Magtronics has taken big steps towards becoming a globally leading engineering company, offering bespoke solutions, from contract manu-

facturing services and hardware/software design to value engineering proposals and construction support.

"We have numerous advantages over our competitors, but I would like to emphasize two. First is the cost merit and second is the business network that we have built through maintaining high levels of efficiency and superior quality."

With a growing international base of satisfied clients, Magtronics is quickly becoming a worldwide ambassador of *Monozukuri* quality with its high value-added products and services.

Crestec's game-changing technology for 5G/6G optical device manufacturing

On the back of unfettered expansion in global internet services and the demand for ever faster bandwidths, the market for optical communication devices grew 14% CAGR between 2015 and 2019. DFB LDs (distributed feedback semiconductor laser diodes) are essential to the manufacture of optical devices. And with the advent of 5G (and later 6G), the market for high-performing DFB-LDs is predicted to grow 30% CAGR through 2025.

Such growth represents big opportunities for Crestec Corporation, which develops Advanced Productive Electron Beam Lithography (ELB) Systems for customers across the world. Crestec's latest EBL model CABL-AP boasts superior operational features that will allow for greater speed and efficiency, higher precision and performance, and lower costs in the manufacturing of the latest DFB-LDs for 5G/6G, cloud services, medical sensing and LiDAR.

"We believe that our EBL can be useful for the production of not only DFB-LDs, but also new multiple high-value-added compound semiconductor devices used in these industries," says Crestec president, Hideyuki Ohyi. "We are excited about the development of new markets that offer us new challenges."

"The introduction of 5G is expected to contribute to the creation of new industries and the resolution of social issues through collaboration among various industries. In particular, we believe that our EBL can contribute to the creation of new cutting-edge semiconductor devices used in smart cities, autonomous driving, telemedicine, AR/VR, etc."

Anticipating rapid growth in the Data Center, IoT, 5G/6G, AI and robotics markets, Crestec is eyeing global growth through the provision of the highest quality machinery for DFB-LD devices and high-performance compound semiconductors.



"Our EBL system can minimize the manufacturing cost of DFB-LD devices and create high-performance products with high-yield rate"

Hideyuki Ohyi, President, Crestec Corporation

CRESTEC
www.crestec8.co.jp



Spreading 'Made-in-Japan' technology across the world

A leading developer of high-performing ring gears for cars, trucks, ships, constructional and agricultural equipment, Benda Kogyo is developing groundbreaking products for the next generation of automobiles.

A well-built car may carry the logo of Toyota or Honda on the bonnet. But on closer inspection, you will find that a high-performing automobile comprises of thousands of parts and components made by smaller, lesser-known companies – all of which must work in perfect unison to ensure the best and safest driving experience.

Carmakers like Toyota, famed worldwide for its dedication to the tenets of *Monozukuri* (Japanese craftsmanship), depend heavily on smaller Japanese manufacturers to supply these parts, which essentially ensure the high quality and performance of their vehicles. As such, these specialized SME manufacturers are themselves proponents of the *Monozukuri* philosophy and the

firm made a name for itself with the development of its proprietary 'Benda Method' – a cold bending process used to manufacture metal rings for which Benda Kogyo held patents in nine countries after its launch in 1975.

This revolutionary metal ring-forming method – which the company has constantly improved over the years – enabled 95% material yield and drastically raised productivity and efficiency, ensuring products of the highest quality with little-to-no material waste.

With such products, Benda Kogyo subsequently rode the wave of motorization that hit Japan, becoming a top company in the manufacture of starter ring gears, as

"Our revolutionary 'Benda Method' led to the establishment of high-quality, high-yield metal ring manufacturing technology that produces an extremely small amount of material loss"

Kazunari Yashiro, President, Benda Kogyo Co., Ltd.

"*Monozukuri* excellence is born in our factories as a result of the technologies utilized in the process. These techniques were introduced by my grandfather, Kazuyoshi Yashiro, who was the founder of Benda Kogyo and the Benda Method," says a proud Kazunari Yashiro, the current third-generation president of Benda Kogyo.

"The cold-bending method is what distinguishes us and makes us unique. We are the only company capable of performing this process on the domestic market. The excellence of *Monozukuri* allows us to exceed the quality standards set in the national and international market."

In line with the growing proliferation of electronic, hydrogen and autonomous vehicles, as well as higher environmental standards for automobiles, there is an ever-increasing demand for higher-performing parts and components.

To meet this demand, Benda Kogyo's R&D Centre in South Korea has worked tirelessly to create next-generation products, such as a new product currently in development that is aimed at a major carmaker's hybrid electric vehicles (HEVs). On the back of its commitment to constant innovation, the company will establish a

second R&D centre in Japan next year.

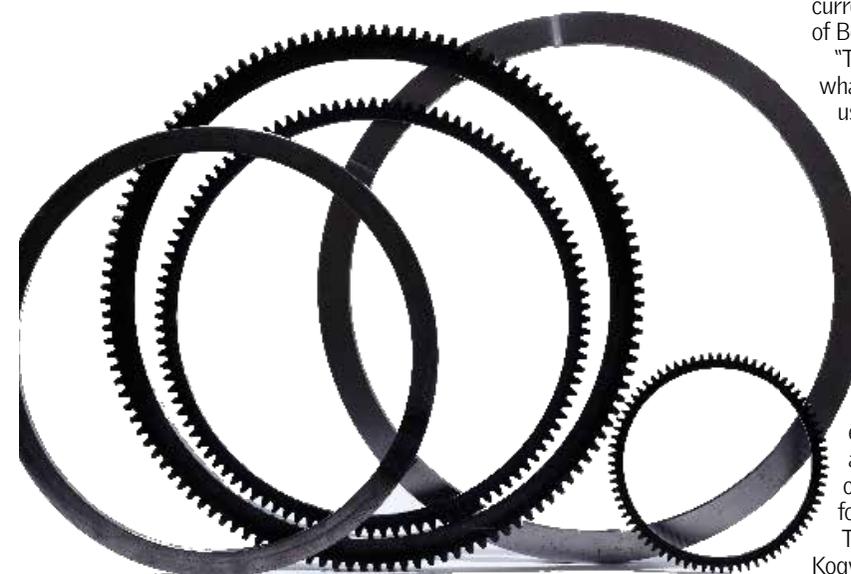
"After 2030, electric automobiles will grow their presence in the market. For that reason, we have adopted this vision to



create more innovative products," adds Mr. Yashiro. "We must adapt quickly and take advantage of market opportunities. Particularly with our new R&D Centre in Japan, we can focus on the new age dawning in the automobile industry."

Another focus for Benda Kogyo over the coming years will be further diversification into new industries while at the same strengthening its presence in overseas markets. The company has identified the construction, agriculture, shipping and robotics industries in its strategy for future growth – sectors in which it currently has a presence but not a significant one.

"We might be small, but we are a very ambitious company and we have a long road of growth ahead of us," concludes Mr. Yashiro. "We are already present in many countries through the establishment of local companies or large suppliers. And we want to continue to strengthen the bonds throughout the group, to strengthen the role of each company, and capture a greater share of global markets. We are aiming to become a global-tier corporation that develops cutting-edge technology."



constant pursuit of innovation – often creating groundbreaking products to meet the demands of one of the world's most technology-intensive industries.

Established in 1964, Benda Kogyo is a small company that has made an enormous impact with its manufacturing technologies, and today aims to spread 'Made-in-Japan' technology across the world. A leading manufacturer of ring gears, inertia rings, drive plates and flywheels essential to the operation of automobiles, this Hiroshima-based

well as for trucks, ships, construction and agricultural equipment. In recognition of its manufacturing prowess, the company won the 'Minister of Economy, Trade and Industry Award' at the 'Manufacturing Japan Awards' in 2009 for making 'perfectly round rings a reality when no one else could'. Today, Benda Kogyo holds 20% of the global market for its number one product, the ring gear.



www.benda.co.jp



Maintenance with the *Monozukuri* touch

With a 99% repair success rate, Kyosai Technos utilizes its advanced technological know-how cultivated over many years of manufacturing experience to offer unrivalled maintenance services for old electronic equipment no longer supported by the original manufacturers.

Japan has long held a deep reverence for machines and the art of manufacturing. As such, *Monozukuri* craftsmanship is not only concerned with the creation of new products of the highest quality, but also the restoration and upgrading of older machines and equipment.

That is certainly the case for Kyosai Technos, which offers repairs and maintenance services for various types of electronic devices, mainly in the fields of medical care, communications and measuring equipment.

As a "Total Multi-Vendor Service" provider, Kyosai Technos boasts a unique busi-

ness model – the Kyosai Life Extension Service (KLES), which is oriented around the repair, redesign and upgrade of older devices no longer supported by the original manufacturers.

Strategically located at the free trade zone at Kansai international airport, the company's 'Global Repair Service' center comprises of the bonded factory, in which the company's skilled technicians repair devices and equipment from all over the world, while also offering clients calibration of measuring instruments.

Since its establishment, Kyosai Technos has repaired more than 30,000 units and proudly maintains a 99% repair success rate; while its 90-day warranty scheme and "preventative maintenance" practices are testament to the company's commitment to client satisfaction.

"When a defective device appears, we have accumulated know-how by thoroughly investigating the cause and thoroughly preventing recurrence," says president, Tsutomu Usui.



"We have transformed our business into a leader in the maintenance service industry with the highest level of technology"

Tsutomu Usui, President, Kyosai Technos, Co., Ltd.

"We believe that our maintenance service has reached a level where it can be highly evaluated all over the world, and which cannot be easily imitated elsewhere. Using the know-how cultivated in the manufacturing industry, we have transformed our business into a leader in the maintenance service industry with the highest level of technology."

Today, IoT technology is enabling Kyosai Technos to offer state-of-the-art diagnostic and maintenance services, as well as to monitor and control the operating status of devices 24 hours a day, 365 days a year.

"We aim to evolve our 'Total Multi-Vendor Service' by incorporating new technologies such as AI, IoT, and robotics," adds Mr. Usui. "Furthermore, we strive to become a major player by making our unique KLES model well known globally."

This year, Japan's Ministry of Economy, Trade and Industry selected Kyosai Technos as one of the nation's '100 Global Niche Top Companies', in recognition of its unique position within the maintenance services industry.

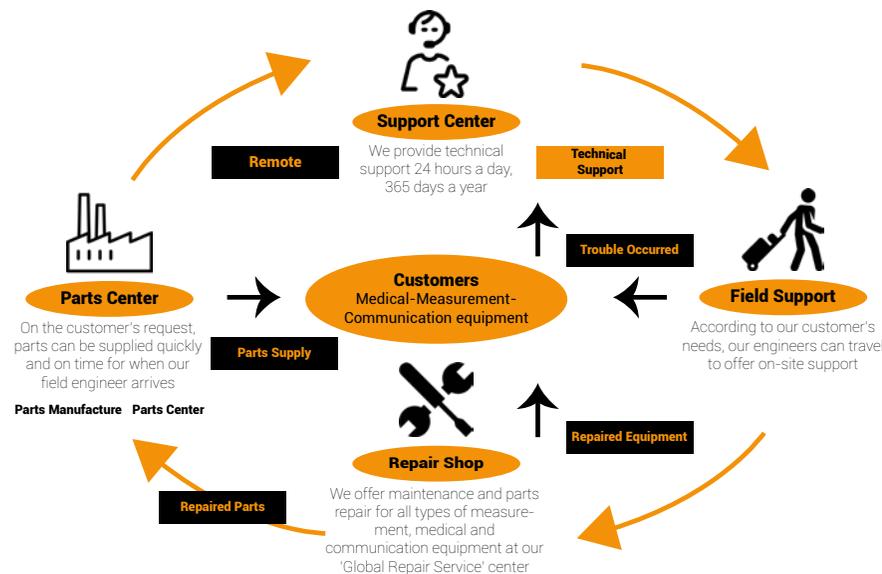


Quick repair with Japan quality "Laundry Service" **G R S** Global Repair Service

Support for all kinds of devices

Kyosai Technos repairs devices from around the world at bonded factories at Kansai International Airport

Total Multi-Vendor Service



We support customers by providing total engineering services with our Call Center, Field Service, Repair Shop and Parts Center

Nabtesco and the technologies setting the Industry 4.0 era in motion



"We are devoting a lot of our energy to enhancing added value through the development of mechatronic and systematized products, under the keywords 'motion control'"

Katsuhiro Teramoto, President & CEO, Nabtesco Corporation

With the emergence of Industry 4.0 technologies such as advanced robotics, automation, Big Data, IoT, and electronic vehicles, a new era of *Monozukuri* manufacturing has begun.

Combining their industrial, technological and innovative prowess, Japanese companies have positioned themselves at the global forefront of Industry 4.0 – building high-performing products, parts and components for these new technologies, while also incorporating them into their *Monozukuri* manufacturing practices.

"Japan's advanced technology cultivated from *Monozukuri* and years of basic research, will work as advantages towards creating products using information technologies like Big Data and IoT," says Katsuhiro Teramoto, president and CEO of Nabtesco Corporation.

"We are currently striving to create 'smart factories' by leveraging data, analyzing it and bringing in digital transformation throughout the production system. Since 2017, after conducting some research on

AI and *Monozukuri*, we saw the rewards of the development within the company."

A reputed leader in motion control, Nabtesco develops cutting-edge products and technologies that will support the Industry 4.0 era over the coming decades, from precision reduction gears for industrial robots, to components and systems for the next-generation of automobiles, trains, aircraft and marine vessels.

Comprising of diverse business domains – such as precision reduction gears, hydraulic equipment, railroad vehicle equipment, aircraft equipment, commercial vehicle equipment, marine vessel equipment, automatic doors and platform doors, packaging machines and welfare equipment – Nabtesco currently holds approximately 100% of the Japanese market for flight control actuation systems; while globally it has secured a share of approximately 60% for precision reduction gears for the joints of medium- and large-sized industrial robots, and an approximate 25% market share for traveling units for hydraulic equipment.

Its transport solutions, such as railroad vehicle equipment, aircraft equipment, commercial vehicle equipment and marine vessel equipment, grow and expand on its OEM sales, while providing continuous and stable services with the MRO (maintenance, repair and overhaul) business. And last but not least, the automatic doors business will experience stable and gradual growth as its value may be reassessed due to a desire for non-contact in the post-COVID-19 era.

With growing trends towards electrification and automation, and increasing demand for industrial robots over the coming years, Mr. Teramoto expects production of precision reduction gears at Nabtesco's existing Japan-based factory to increase from 680,000 to 900,000 units, while the company has also acquired another factory site in Japan to complement its existing Japanese and Chinese factories.

"Industrial robots with our precision reduction gears will contribute to stability in quality, in addition to automation and labor-saving," says Mr. Teramoto, who sees major potential for the company's preci-

sion reduction gears in other areas where electrification is required. "Our greatest advantage would be our co-creation with clients. We understand our clients' demands, and then develop a product that meets those demands," he adds.

Indeed innovation through co-creation will be crucial for Nabtesco moving forward, which is why the company continues to seek partnerships and M&A opportunities that can unlock further development of its existing technological areas of expertise.

"Our R&D center in Kyoto implements CAE analysis, additive manufacturing technology, digital transformation, and intellectual property strategies. Through this center, we connect with companies and universities which provide engineers for deeper and greater discussion. We have developed a win-win relationship with them," adds Mr. Teramoto.

"We are devoting a lot of our energy to enhancing added value through the development of mechatronic and systematized products, under the keywords 'motion control'."



Maximizing value through testing

A reputed and longstanding authority in its field, VALTES helps clients raise product value by offering high-quality software testing solutions for a wide range of sectors.

One of the key tenets of *Monozukuri* – the Japanese manufacturing philosophy of craftsmanship behind the nation's high-quality products and services – is quality control through testing. As such, *Monozukuri* focuses not just on the final product, but also the development of high-quality testing solutions – be they for a car, a semiconductor, a factory machine, or a piece of software.

Software is becoming ever more present in business, industry, and our day-to-day lives. In the new 'smart' era, almost all electronic products we use – from phones, laptops and watches to cars, fridges and even light fittings – are highly dependent on software. And with the emergence of IoT, Big Data, lightning fast 5G/6G internet, more sophisticated factory automation and robotics, demand for high-quality testing solutions will continue to grow.

With an expanding international customer base, VALTES offers *Monozukuri* quality through software testing and consultancy services for both products and processes, enabling clients to provide the best possible products to the end-user.

Offering services such as QA Process Consulting, Software Testing & QA Training, Vulnerability Diagnosis, Other Quality Assurance and enhancement of Software Quality Services, this Osaka-based firm has proven to be the ideal partner for companies in Japan and across the world, with its current business mainly focused on Industry Business Systems, web services, smartphones and IoT.

A reputed and longstanding authority in its field, VALTES – which is one of just eight companies to have been awarded the title of Certified Global Partner by the International Software Testing Qualifications Board (ISTQB) – has written books on the art of testing that even its competitors have relied upon.



"To our clients, we propose and implement efficient and optimal testing with the use of the VALTES method, which has been established based on the latest testing theories and our combined practical experience"

Shinji Tanaka, President, VALTES Co., Ltd.

"We are entering our 17th year of specialization in software testing and we have accumulated rich know-how in this field" says VALTES president, Shinji Tanaka. "Furthermore, we have developed

a greater standard in alignment with the global standards, offering greater quality to our clients. Our major advantage is the fact that the service we provide meets the pre-established quality standards and we also add an innovative service that other companies do not. Thus, our clients acquire even more added value."

In its early years, VALTES worked with major Japanese electronics manufacturers, providing black box testing for their digital TVs, digital cameras, video recorders, VCRs and multifunctional printers. Around the time of the financial crisis and Lehman crash, which coincided with the dawn of the smartphone, the company moved from Embedded Software Testing to Web and App testing and has since become a leader in this field – providing services to companies from different sectors – such as logistics firms, financial institutions, insurance companies and streaming service operators.

More than a decade since the birth of the smartphone, and the ICT industry is once again witnessing a major turning point, this time driven by fourth industrial revolution technologies. And as it looks to respond to the ever-changing needs of clients, VALTES aims to cease the opportunity by offering superior-quality testing solutions and consultancy services for companies looking to make the best use of these new technologies.

"Our highest value is our commitment to quality. We contrib-

ute to the realization of a secure and safe ICT Society. To our clients, we propose and implement efficient and optimal testing with the use of the VALTES method, which has been established based on the latest testing theories and our combined practical experience."

"To our end users, we provide support through the delivery of high-quality products. In today's ICT landscape – which is drastically advancing with technological innovations such as AI, IoT, automated driving, Fintech, and Blockchain – we contribute to the realization of a secure and safe ICT Society through testing – based on our policy focused on the responsibility for the quality of clients' software and proactive involvement in having high-quality objectives."

As VALTES looks to grow its international base through the formation of partnerships or M&As with other leading companies, it will continue on its longstanding mission to help its clients maximize value through testing.

"We are looking to transform the Philippines into the hub of our offshore operations so we are able to support all the work done there from Japan," adds Mr. Tanaka, who sees opportunities in catering to growing Asian markets such as China, Vietnam and the Philippines. "To give you an idea we have only been able to penetrate 2% of this market, so the future of this company is long and bright because we have a long journey ahead of us."

Valtes is raising product value through software testing, allowing everyone to enjoy safer and more convenient products

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