GLOBAL CLASS JAPANESE SMEs

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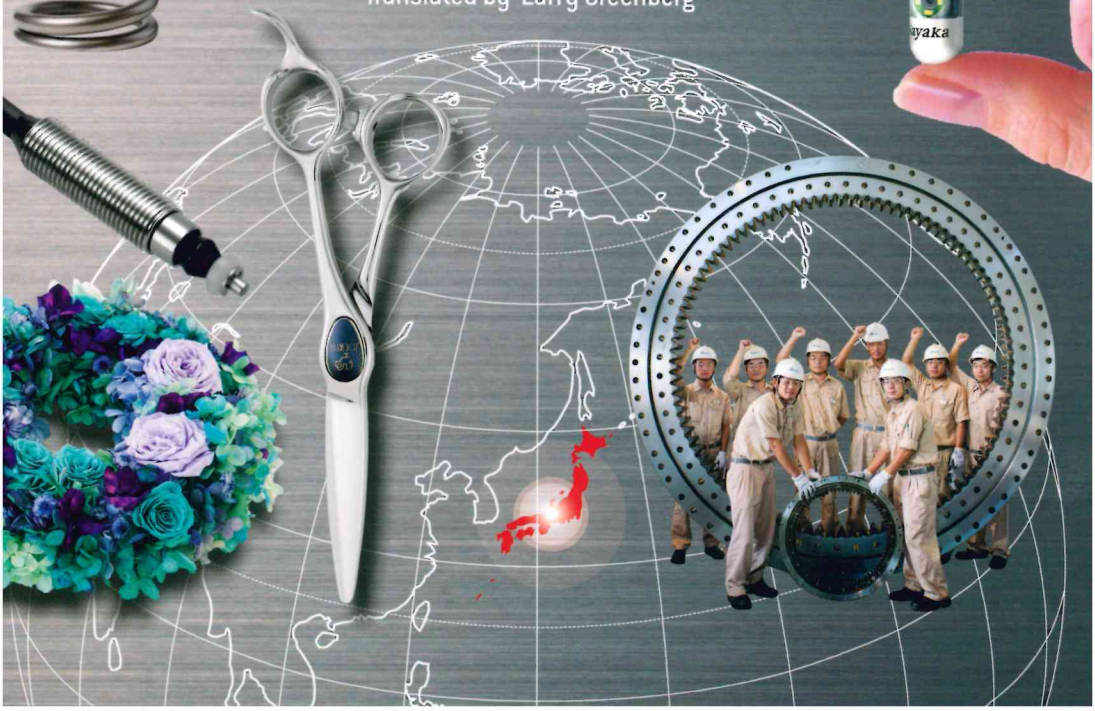

Chapter 4

Controlling Niche Markets Inaccessible to Big Firms

Six Companies – "No Need for an Administrative Department"

The fields where SMEs specialize are niche markets that big companies cannot get into. But the case is often that many of these business categories were not always in existence. In fact, most of them were created by the SMEs themselves. Surviving in a niche market is no picnic for an SME. It requires them to sweat and exert themselves to create that new market. The products invented in the niche markets Japanese SMEs have built up are among the best in the world and in many cases their absence could affect international economic activity.

How does the elevator stop on a dime?

Metrol Co., Ltd., based in Tachikawa, Tokyo, makes mechanical switches for setting precise locations. These switches accurately measure and control positions for the movements of machine tools, semiconductor manufacturing equipment and other machinery. At first glance, it may seem that these components have little impact on our lives, but it is thanks to Metrol's switches that elevators can stop on a dime without even being a millimeter off. The company's switches have been utilized recently for medical instruments used in neurosurgery, helping to save the lives of numerous patients suffering from intractable diseases. Metrol is nearly the only company in the world in this field, with a global market share of 70%. The secret behind Metrol's ability to retain a top share of the global market, despite being an SME with a workforce of just over 100 employees, can be found in how the company has literally

bet its existence on manufacturing and craftsmanship by taking on the challenges of advanced technology and how it has a thoroughly streamlined administration where departments like human resources and accounting do not even exist.

A cutting machine would be the prototypical example of a machine tool. It is equipped with blades for cutting metal. No matter how good the machine tool is, if the blades are not mounted in a precise position, then it cannot perform well. Also, although the blades are made from a special metal that is incredibly hard, after millions or tens of millions of cutting actions, any blade is bound to crack and move out of position. If this goes unnoticed and the machinery continues to operate, it will experience a failure. It used to be that experienced employees with decades in their profession would identify misalignments and chipped blades from the subtle movements and changes in the sounds produced by the machines. Using their experience and intuition, they would make adjustments.

But with positioning switches developed by Metrol, a manufacturer can automatically stop machines when chipped blades will result in defective products. They can even bring machinery to a halt immediately before a misalignment results in a non-conformity. This eliminates the need for experienced employees to constantly check the machines and allows for a production line to be fully automated. And when that line operates 24 hours a day, it yields a productivity gain. Even after executing over 3 million actions, Metrol's switches will initiate a stop when a misalignment of only 0.0005 to 0.0010 mm occurs. They also have a similar sensitivity when detecting chipped blades. Switch prices vary depending on the type, but they can range from a few thousand yen to more than 100,000 yen. There are two types of positioning switches: those that employ mechanical functions like Metrol's and others that use light and magnetic waves.

There was a time when optical and magnetic switches were in heavy use and were mostly manufactured by big electronics makers. These switches would amplify light or magnetism to control machinery, but their undisputed shortcoming was thermal vulnerability. Machine tools emit magnetic waves as well as high levels of heat. Moreover, some machines disperse bits of cut metal or leak oil, which can have an adverse effect on switch performance, reducing accuracy. On the other hand, Metrol's mechanical switches are thermal resistant because they do not use light or magnetic waves and remain quite accurate even under challenging conditions involving oil or flying bits of metal. Furthermore, Metrol's mechanical switches are far more affordable than optical and magnetic switches, as they carry about one-tenth of the price.

During the global financial crisis of 2007-2008, even sales at Metrol fell by more than 50%. Two years later, however, the recovery in exports, where the company makes most of its sales, brought business back up to pre-crisis levels. In the fiscal year beginning April 1, 2014, Metrol achieved even higher sales of 1.5 billion yen, demonstrating the company's strong international competitiveness. This is an example showing that even an SME, if it possesses technology that outdoes anything else in the world, can overcome an unprecedented recession and maintain a stable business.

Fierce resistance to corporate theft by a larger rival

Akira Matsuhashi, the father of current Metrol President Takuji Matsuhashi, founded the company. He was an engineer who graduated after studying at the Department of Precision Engineering, which is part of the University of Tokyo's Faculty of Engineering. He found a job at a big camera maker, where he worked on developing an endoscope and produced a practical design for a first-generation, commercially-available model. This is a time when medicine had not achieved the advances of today. Many people died of stomach cancer, not to mention gastric ulcers as well. Akira thought that being able to look inside the stomach with a camera could save many patients' lives, so he was very motivated as an engineer. However, the company's management exhibited no understanding whatsoever about endoscopes. Instead management resisted development, arguing that if anybody got hurt in an endoscope experiment it would tarnish the company's reputation. Therefore, Akira kept his endoscope research secret as he worked on developing consumer cameras for the next seven years. In the end, his perseverance was rewarded with success. The endoscope he developed was later covered by Japan's health insurance system. Later models employed fiber optics and helped make this company grow into the world's largest maker of endoscopes.

And yet, despite the great things developers did when they were first working on the structural design of an endoscope that would satisfy physicians' desire to take photographs inside the stomach, the company did not reward them, regardless of the central role this technology held within its business. In fact, the company was apparently quite indifferent to their achievements. There was a backlash against this policy and Akira decided to establish Metrol because he wanted to "make a company that rewards the engineers who sweat and work hard to make a contribution to society." The name of the company is a portmanteau of "measure" and "control."

Soon after Akira created his business, a larger company stole a critical technology

developed by Metrol. It was not yet patented and the larger company would not even listen to any objections. Enraged, Akira sent a letter of protest straight to that company's leadership, informed them of the facts and succeeded in negotiating a licensing agreement. Metrol thus overcame a threat to its survival. Today, Metrol vibrantly upholds that defiant spirit of bravely standing up to those who steal its technology.

Own the order—no planned production

Metrol's production method employs the Japanese concept of *ikko nagashi.* This term, which can be translated literally as "one-piece flow," entails an individual person handling the entire process from receiving an order to production, inspection and packaging. It also means no production catering to anticipated demand. President Matsuhashi said, "The greatest saying about our company is that we do not even know what jobs we are going to do three weeks from now." Metrol keeps no inventory whatsoever and takes orders for one item at a time. The thing that does the most to make this production system possible is the company's proprietary order reception and production system. That is because it ensures there is never a surplus or shortage of parts, as the system orders parts in the quantities needed for each individual order as it comes in. According to Matsuhashi, "We always respond in real time and we are not at all considering using planned production in the future."

No matter what kinds of inquiries or orders Metrol receives from users or customers, the company can always provide an estimate and come up with a production plan detailing delivery dates and other information, all within one day. This means that in addition to being able to provide products to Japanese users in a minimum number of days, Metrol can also deliver to most regions of the world within one week.

Decisions via email strictly prohibited

Metrol never holds meetings to share information about the business. Employees instead do this via a closed blogging system for internal use only. Most of the company's important decisions are made when employees meet over coffee in the office. They are not allowed to decide matters over internal email; all decisions are made face-to-face.

There are no separate rooms or partitions between sections of the office. This makes it easy for workers to meet anyone at any time. Department section managers do not have their own rooms. Not even the president has his own office. All employees work in an open office space in a layout that is not determined by one's position.

The president performs his work in the middle of the office so that anybody can talk with him directly when they need to.

The factory operations department is located on the second floor of the plant and it uses the same open office layout. The factory and the office are connected by four flights of stairs. If somebody from the production department needs to meet with a counterpart in the office, they can simply climb one of the staircases. Conversely, if someone from the office needs to go see a person in the production department, they can walk downstairs. But the system is of no use at all if the people in it do not get along. To foster smooth communication between employees, Metrol places importance on both office communication and *nomyunication*, a Japanese portmanteau of *nomu* ("to drink") and "communication." This term refers to building camaraderie over alcoholic beverages. Members of the management team carry credit cards in the company's name which they can use for the company to pay for employee get-togethers over drinks when they are deemed necessary. Interacting at a pub or bar stimulates further communication in the workplace and invigorates the workforce.

Another source of Metrol's strength is the production system the company has established for making high-precision products. There are 7,000 parts required to make Metrol's 700 different products, but most employees go through a standardized training and practice regimen that allows them to devise tools and evenly spread out work so that they do not have to possess advanced proficiency in order to carry out their tasks.

Around 80% of the roughly 60 assembly workers are women working part-time. Most are typical housewives who live in apartments or houses near the factory. Women are a key part of Metrol's success. Their working hours are between 9:30 a.m. and 4:30 p.m. so they can also raise children. The company enrolls them in Employees' Pension Insurance, Unemployment Insurance and other programs in Japan's Social Insurance system. They also receive bonuses three times a year. The part-time female employees are considered "permanent employees with shorter working hours."

All employees get together for parties held three times a year. These events begin at 4 o'clock, before the working day is officially over, but those last 30 minutes are still paid. Generally, all employees are involved in planning the parties. They end at 5:30 p.m. and are arranged so that employees can go pick up their children at daycare and maintain a work-life balance. Part-timers are generally on one-year contracts, but these are usually renewed unless there is a good reason not to, for example if the employee is not suited to the job. Nearly 100% of them get new contracts with higher

wages. "At our company, we have our female part-time employees play an important role, too." Metrol makes maximum use of these women's abilities and offering them a women-friendly workplace goes a long way toward doing so.

Metrol gets over 300 suggestions a year for improving or changing the way it works. That is more than three times the number of employees. Many of these suggestions also come from part-time workers. Making these suggestions is in line with the company's policies, which most of the employees understand. Metrol may be kind to its workers, but they are expected to act "uncompromisingly as a professional organization when it comes to the job." The *ikko nagashi* production system is about more than just making excellent products. It also entails conducting inspections between processes and taking responsibility for defective items resulting during manufacturing. A professional attitude is also an absolute must because Metrol's products must be accurate to one-thousandth of a millimeter.

No need for an administrative department

Metrol has only one person each assigned to administrative areas like human resources, general affairs and accounting. Department managers in charge of sales and production sites carry out employee reviews. Metrol believes these managers can treat personnel more fairly because they are the ones who know their workplace better than anyone else. Front-office employees take charge of general affairs. These workers may play two or three roles each. When somebody has to make a business trip overseas, no approval form is required. Plus, they are given a credit card for their expenses. There is a verbal understanding about the responsibilities involved. The company relies on experts like lawyers, tax accountants and labor and social security attorneys for subjects requiring their specialized knowledge, such as law, accounting and social insurance. That is why one person is sufficient to take care of each of these back-office tasks.

Company founder Akira Matsuhashi was a first-generation developer who built a groundbreaking endoscope at the end of his time working for a major camera maker, but the management that resisted the development and granted him little in the way of public recognition was the beneficiary of his work. Akira was a firm believer in the business philosophy that "at a manufacturer, a bloated back office stifles developer creativity." For a long time he used interviews and other conventional methods for hiring new workers, but many of them could not adapt to the company's free-spirited culture and Akira was acutely aware that this system did not illuminate an applicant's

true capabilities. Now Metrol conducts interviews in the presence of an expert in psychological analysis. This has made the hiring process more expensive, but it has produced a visible result in that the company can now identify workers who will soon perform well after being hired.

Metrol also has operations overseas in China, India and Taiwan, but their purpose is not manufacturing but sales. The locally hired staff in these countries are recruited for management positions and are given decision-making authority. In other words, they are treated just like the Japanese employees. Metrol has websites and posts advertisements in English, Chinese and other languages and now does business in over 60 foreign countries. Most export deals are settled in Japanese yen. Metrol has taken a different path from larger firms and other SMEs to stay in business. Its goal is to be a highly creative company and it harbors no aspirations to be a big enterprise.