

From Singapore to the World SIIX Corporation, a pioneer in the evolution of EMS

Electronics manufacturing services (EMS) are well known for providing outsourced manufacturing of electronic devices. EMS have been growing in importance in recent years with the rise of fabless manufacturers that only plan and design products and do not have production facilities. One trailblazer in the EMS field is the SIIX Corporation (hereafter SIIX).

Even before the term EMS had been coined, SIIX was offering one-stop manufacturing services, from procurement of electronic components to manufacturing and assembly. SIIX's EMS business, based in Singapore and Batam, Indonesia, is expanding globally from its involvement with the production of all kinds of electronic devices from the development stage. This case study looks at how SIIX has set up its development, sales, and marketing headquarters in Singapore and its manufacturing base in Batam, leveraging capabilities in both countries as part of their overseas expansion.

An EMS business pioneer that got its start in Singapore

SIIX's EMS business dates back more than 60 years. The company was originally formed in 1957 as the trading division of Sakata Shokai (now Sakata Inx) and began exporting Japanese electronic components to the Philippines. SIIX launched a business procuring electronic components and distributing parts on behalf of the many Japanese, European, and American manufacturers that were setting up production bases in Singapore starting in 1979 and continuing into the 1980s. SIIX opened a representative office in Singapore in 1972, and in 1974, it established a local subsidiary focusing on sales and distribution, leading to a full-scale procurement business for electronic components. Initially, the main focus was to procure electronic components for Japanese companies operating in Singapore, but later on, the company launched an electronic-component picking service that was customized for each customer product. This "kitting" business, which provided just-in-time deliveries in sync with production schedules, proved to be a huge success and the company saw significant expansion. In the late 1980s, a major consumer electronics manufacturer approached SIIX about assisting it in offshoring its production facilities, starting with PCB assembly. SIIX and the company formed a joint venture, leading SIIX to begin PCB assembly, which was the origin of today's EMS. A few years later, SIIX moved into an industrial park on Batam Island, a joint project between Singapore and Indonesia, and in 1994 established its own factory.

Today, SIIX ships all kinds of finished electronic devices, from information devices, industrial equipment, educational devices, and in-vehicle equipment to communications, IoT, and robotics products, all over the world. The company's global expansion is centered on its bases in Singapore and Batam. Batam Island is located about 20 kilometers south of Singapore, just a 40-minute ferry ride away. The Singapore base is responsible for design, development, parts procurement, and sales as well as regional management, while Batam is the site of the company's production plant.

Singapore, a hub for just-in-time operations

Singapore functions as a major hub in SIIX's EMS business for parts procurement. Because SIIX manufactures such a wide range of products, it is imperative to procure in an efficient manner just the right volume of electronic components and parts used in each product. From this perspective, Singapore is a good place for procurement, as many parts manufacturers have moved their headquarters and distributors into the city. A large factor behind Singapore's role as a hub for parts procurement is the existence of a parts procurement infrastructure that encompasses neighboring countries. Singapore is surrounded by major production sites for both electrical and mechanical components, which minimizes transportation. Malaysia, for example, is a major producer of electronic components and can supply them quickly.

This rapid supply system is also enabled by Singapore's port facilities. Singapore has well-established shipping routes and shipping services, and parts can be procured by air in a day thanks to electronic customs clearance. Procured parts can reach the Batam factory in as little as 40 minutes and can be inside the factory ready for production on the same day. The advantage of this production system is not only the reduction of inventory risk, but also the fact that if a defect occurs, replacements can be supplied immediately, allowing the company to start improving the next lot right away. This eliminates production downtime and enables higher quality and more efficient manufacturing.

The Batam factory's relationship with Singapore is also beneficial in terms of container transportation. Parts procured in Singapore are conveyed to the Batam plant in containers. Since the volume of parts brought in and the volume of finished products shipped out are almost the same, cost advantages can be obtained. SIIX handles parts procurement from Singapore, which has allowed the company to establish a just-in-time production system that uses just the necessary amount of parts just when needed, by minimizing its own inventory and its operations with each parts manufacturer.

Manufacturing systems, from IoT to robotics, developed in Singapore

In this age of increasing globalization, the rapid development of emerging economies has led to diversified needs for products and accelerated the speed of change. In tandem with this, the needs for EMS are no longer limited to the conventional framework of procurement, manufacturing, and assembly, as more manufacturers press EMS providers to get involved from the product development stage. To address these new needs, SIIX has been broadening the scope of its EMS business while also rolling out two new services — DFM and JDM — in Singapore.

DFM stands for Design for Manufacturability and is a service in which SIIX gets involved from the design stage. A DFM project begins with product planning, and includes circuit design, production method development, process design, prototyping, and other pre-production product development processes. SIIX procures parts as needed for the project and sees the project through to the finished products.

JDM, which stands for Joint Design and Manufacturing, is a service for collaborative design and manufacturing. This service utilizes SIIX's global network to work with development partners to perform everything from planning and development to design and manufacturing. SIIX has about 15 JDM development partners, mainly in Singapore. For example, SIIX has partnered with an optical device developer to develop miniature camera units and in another case, it is working with a battery-pack design and development partner on the development of battery packs for industrial and medical applications. This network of development partners has enabled SIIX to fully integrate the development of products that rely on digital technologies such as communications and IoT.

Such advanced development and design are underpinned by engineers in Singapore, who are not only experts in design and manufacturing but also have built systems to ensure high quality manufacturing, including inspections and quality control of parts manufactured at the Batam plant. Through joint design and development between its Singaporean engineers and its development partners, SIIX is able to integrate design with prototyping, procurement, production, and quality control for all kinds of electronic devices, including next-generation technologies such as IoT, AI, and robotics. Hence, manufacturers can bring products to market quickly and inexpensively without the need to send technical personnel to production sites.

With today's fast-changing trends and needs, it is very difficult for a company to develop products relying only on its own resources. By leveraging Singapore as a base for their operations, SIIX has achieved manufacturing systems that address the demands of today.

Development and product commercialization support for startups

SIIX also engages in joint development and product commercialization support with startups in Singapore. Singapore, which ranks first in Asia in terms of digital competitiveness, is a major hub where more than 4,000 startups are active. Within this startup ecosystem, SIIX provides development support by utilizing its strengths in design, prototyping, parts procurement, production, as well as in having a worldwide sales network. The company supports startups from the National University of Singapore (NUS), Nanyang Technological University (NTU), and the Agency for Science, Technology and Research (A*STAR).

One product created through collaboration with a development partner is the TraceTogether Token, a COVID-19 contact-tracing device. TraceTogether Token was jointly developed by SIIX Singapore and iWOW Technology, a wireless technology-focused IoT service provider and partner of SIIX. SIIX is also working with a Singapore-based partner to develop a system that automates meter reading for Singapore's National Water Agency (PUB). In ways like these, SIIX is working to nurture startups and expand new innovative products with its strengths in procurement, manufacturing, and global sales, which come from its EMS business, and collaborations with development partners in Singapore.

Global expansion of diversified products with a smart factory

SIIX plans to respond to the increasing complexity and diversity in manufacturing by automating and digitalizing the Batam factory. Globalization is expected to drive further product diversification and greater product variations in the future. By evolving Batam into a smart factory, it will be possible to establish a high-quality and efficient production system without expanding the number of per-product workers. The engineers to support the new smart factory already exist in Singapore and Batam, and SIIX plans to utilize them to trigger global business expansion.