

CHAPTER 4

THE CASE COMPANY: FABRINET CO., LTD.



4.1 Company Background (Fabrinet Co, Ltd.)

Bangkok-based Fabrinet Co., Ltd. headed by Tom Mitchell, former president and chief operating officer of disk-drive manufacturer Seagate Technologies. Tom Mitchell spotted a gap in the outsourcing market in optical components and decided to fill it. The logic goes that the manufacture of disk drive subassemblies (Seagate's forte) demands skills similar to those required in the optical components industry, and has to meet similar tolerances. If anything, the tolerances for making disk drives are tighter, according to Fabrinet.

In January 2000, Fabrinet took over a 200,000-sq-ft facility from Seagate, the very facility Mitchell helped build when he was with the company in the 1980s. Along with the facility came 1,600 employees and almost 100 are engineers—all with a strong background in the disk-drive industry. The folks at Fabrinet also negotiated a contract with Seagate to produce the non-core subassemblies found in Seagate's desktop disk drives.

The contract with Seagate to manufacture disk drive subassemblies has kept the startup afloat while it has been transferring production of components over from new customers, a process that can take up to nine months. That contract has accounted for about 75 to 80 percent of the revenues so far.

In the 18 months since it was founded, the startup has recorded revenues of more than \$190 million.

Though Seagate has since contracted a second source, Fabrinet remains the main supplier of the subassembly. It has no plans to manufacture the part for other mass storage companies, however, opting instead to focus on the manufacture of optical components.

The field of Electronic Manufacturing Services (EMS) has been a viable market for some time, but Optical Manufacturing Services (OMS) is very new that Fabrinet is among the first players in the space.

The company has introduced a new operating model for contract manufacturing, in which it acts as an extension to its customers' own process engineering and manufacturing efforts. The company is going to the major players in the optical space and transplanting their manufacturing lines intact over to Thailand facility. The company model is to keep the client's technology strictly confidential and getting involved in the design for manufacturability at low cost and high quality and reliability with the customer at the earlier stage.

4.1.1 Mission

The mission is to be the leading engineering and manufacturing services company by providing our customers with the highest quality precision electromechanical and opto-mechanical manufacturing, process engineering, and supply chain management across a range of industries.

4.1.2 Business Focus

The company focuses on Total Customer Satisfaction by provide customers world-class quality, reliability and services.

4.1.3 Market Segments

Market segments for Fabrinet are Telecommunications, Data communications, Automotive, Medical, Mass Storage, Industrial/Commercial, and Imaging.

Telecommunications

- Passive optical components and modules
- Active optical components and modules
- Optical amplifiers

Data Communications

- CATV transmitters
- TO cans & OSA
- Transceivers

Automotive (TS16949 Certified)

- Sensors and actuators
- Mechanical assemblies
- Electronic assemblies

Medical

- Sensors, lasers and transducers
- Small form factor mechanicals
- Diagnostics and monitoring devices

Mass Storage

- Complex mechanical and electronic assemblies
- Service and refurbishment

Industrial/Commercial

- Semiconductor equipment assemblies
- Motor assemblies

Imaging

- Digital/optical projection television
- CMOS imaging sensors
- Cell phone camera assemblies

4.1.4 SWOT Analysis

Strengths:

1. Management team has strong relationship with customers.
2. The company has an excellent process engineering team.
3. All employees have strong background in the disk-drive industry that can be applied their skills to optics industry.
4. The company implements turnkey materials management.

Weakness:

1. Engineering team has less experience in term of optical design.

Opportunities:

1. Low labor cost.
2. First player in the manufacturing services market for optical components.

Threats:

1. Buyer volume has trend to decrease due to economic impacts.
2. Cost of products has trend to increase due to economic impacts as higher cost of raw materials and higher cost of transportation.

4.2 Market Overview of Electronic Manufacturing Services (EMS) in Thailand

Eric (2004) has studied the electronic manufacturing services market in Thailand and found that Thailand could well be the rising star for electronic manufacturing services (EMS) outside of China. The country boasts large facilities maintained by multinational EMS providers plus numerous indigenous EMS companies. The big draw is an educated stable workforce, low wages, and access to the Asian global supply chain.

Thailand is a constitutional monarchy. The monarch, King Bhumibol Adulyadej, Rama IX, is the longest reigning monarch in the world and an engineer by training. Thailand

has a business friendly government, with stable rules for conducting business. The Thai government has set up several industrial parks located around Bangkok and in Northern Thailand, and direct foreign ownership is permitted with only very minimal (less than 1%) Thai ownership required.

The Thai government is also more transparent than is China with policies impacting the public. The SARS outbreak that impacted Asia a few years ago exemplifies this. In Thailand the government provided weekly updates on the spread of the disease and efforts to contain it. The government also tracked down the people who had visited infected areas and restricted them for two weeks so as to minimize their ability to spread the disease. In contrast, most people judged China's initial handling of this crisis as secretive and ineffective.

Thailand boasts a very stable and content workforce of roughly 34 million people. The vast majority of Thai citizens (~95%) are Buddhist and are hard working, diligent, loyal people. The result is that there is little labor or political unrest in Thailand, unlike neighboring Malaysia with its mainly Muslim population. The Thai people are not very entrepreneurial in nature, so there are not many Thai start-ups.

The general infrastructure within Thailand in terms of communications, energy, and transportation is quite good. In fact there are over four thousand Japanese subsidiaries within Thailand that have helped grow the local supply base. The local supply base is well developed and it is easy to get materials in and out of the country.

Labor rates in Thailand are actually very comparable with China. Workers in the Bangkok area are on par with workers in Shanghai and Shenzhen, while workers in Northern Thailand are on par with workers in inner China.

There are two manufacturing industries that have done well in Thailand over the last 20 years: automotive and disk drives. Thailand is the largest automobile making country in Southeast Asia, and it exports mainly to other Asian countries as well as Australia. Automotive companies that are currently manufacturing in Thailand include Toyota, Mercedes, Nissan, Isuzu, Honda, and BMW. The disk drive industry accounts for approximately ten percent of all Thai exports. As the disk drive industry was developed in Thailand by companies such as Seagate, the requisite support industries such as metal machining, PCB, and mechanicals also developed.

4.3 Current status of Fabrinet in EMS market

According to Eric Miscoll, Fabrinet is a tier two EMS provider that performs precision manufacturing of optical and opto-mechanical devices. Fabrinet did not possess any optoelectronic know-how when they first began, but they did have the manufacturing skill sets. Their first customer was E-TEK Dynamics, whose COO, Sanjay Subhedar, saw that Fabrinet had the requisite skill sets for his manufacturing. Fabrinet also manufactured non-core sub-assemblies for Seagate, which accounted for about 30% of initial capacity.

Although Fabrinet prefers turnkey manufacture to consignment work, this is not a critical issue for the company. Fabrinet describes itself as agnostic when it comes to materials issues since they are not a materials driven organization. Their typical customer is not looking to get inventory off its books, but rather they are looking for relevant manufacturing technologies. Fabrinet's value is not necessarily realized in a high-volume manufacturing environment, and therefore does not really compete with the other large EMS companies in this regard. According to Mark Schwartz, Fabrinet's CFO, "The revenue opportunities in our niche are generally realized in smaller chunks than what Top-Tier EMS may be traditionally be looking for."

The main competition that Fabrinet faces is with the OEM's internal manufacturing. Some of their business does compete with other EMS companies such as Celestica, Pemstar and Benchmark, but the majority of the complex opto-mechanical devices they manufacture do not currently compete with other EMS providers.

Fabrinet's focus on the opto-mechanical space is proving to be a good strategy. From 1998 to 2000 the optoelectronic industry growth was primarily in long haul telecommunications. The current growth is in the metro and access markets, with optical transceivers, primarily for the data-communications market, with signals that cover much smaller distances. The growth in this market is being driven by enterprises and business parks that are upgrading their communications infrastructure. New growth sectors for optical devices now include automotive (e.g., airbag sensors), industrial (e.g., oil and gas sensors), and imaging, with front and rear optical projection systems that compete with plasma (e.g., DLP (digital light processor) chips from Texas Instruments, and LCOS (liquid crystal on silicon)).

Due to the success of its business model, Fabrinet is currently expanding its footprint within Thailand. It just acquired a new facility and is building a new 200K square foot building that will be completed in 2005. Fabrinet does not subscribe to an “if you build it they will come” mentality. They will expand only as required by their business forecasts.

As the secular trend towards outsourcing continues, Thailand will attract increasing attention as a low cost manufacturing option. Its low cost labor, stable and experienced work force, and developed infrastructure make it a real option to manufacturing in China. Fabrinet is a great example of the world-class level manufacturing that this emerging geographic region has to offer.

4.4 New Product Introduction (NPI) Process in the case company

In the case company, Fabrinet, new product introduction process will refer to the process which consist of 5 phases;

Phase 1: Product, Plan and Define

1. Product Definition
 - Customer input/ manufacturing process design inputs
 - Input review
2. Manufacturing feasibility study
3. NPI Kick-Off Meeting and Project Plan Establishment

The customer inputs and manufacturing process design inputs will be obtained and reviewed by the team. The manufacturing feasibility shall be investigated, confirmed and documented in the contract review process. The review of

manufacturing process design input may be done either when or after doing the feasibility study.

The customer inputs, which are parts of product design output, should include:

1. Design FMEA, reliability results
 2. Product special characteristics (SC) and specifications
 3. Product error-proofing
 4. Product definition including drawings and mathematically based data
 5. Product design review result
 6. Diagnostic guidelines
 7. Customer requirements
- The manufacturing process design inputs will include:
 1. Target for productivity, process capability and cost
 2. Experience from previous development
 - The manufacturing feasibility study should include
 1. Risk analysis
 2. Process cost review
 3. Capacity review
 4. Technical process/product review
 5. Material availability review
 6. Terms and conditions review
 - NPI Kick-Off Meeting and Project Plan Establishment

The project leader will call the team for NPI Kick-off meeting after the manufacturing feasibility study is conducted and customer preliminary approval is obtained. The meeting is to define the activities of NPI process, including time lines of each activity.

Phase 2: Manufacturing Process Design and Development

The key goal of this stage is to develop the design features and characteristics into a near final form. Here some of the tasks involved include:

1. Specification and drawings
2. Manufacturing process flow chart
3. Manufacturing process layout
4. Manufacturing process FMEA
5. Control plan
6. Work instruction
7. Process approval acceptance criteria
8. Data for quality, reliability, maintainability and measurability
9. Result of error-proofing, as appropriate
10. Method of rapid detection and feedback of manufacturing process non-conformities

Phase 3: Process design/ development review

Design and development review will be performed to evaluate the outputs of design and development to meet requirements, and to identify the problems and propose necessary actions. The review will also include the review of target for productivity, process capability and cost.

Measurements for monitoring purpose will be defined, analyzed and reported with summary as an input to management review. The measurements include quality risks, cost, lead-times, critical paths and others as appropriate.

Phase 4: Process design/development verification

Verification will be performed to ensure that the process design and development outputs have met the input requirements. The verification can be considered as a final review stage. If any item is found

incomplete/non-comply, the team must provide action and plan to make that item comply with customer input.

Phase 5: Process design/development validation

The qualification build of product will be performed to validate the process designed, or developed, in order to ensure that the resulting product is capable of meeting the requirements for the specified application or intended use, where known. The team will consider the validation results and finally obtain the approval of manufacturing process from customers. If the actual results of the build do not meet specified target, the action plan must be provided.

Phase 6: NPI to mass production

After the customer agrees to run mass production, the documents of manufacturing design/ development output as appropriate will be registered to the document control.

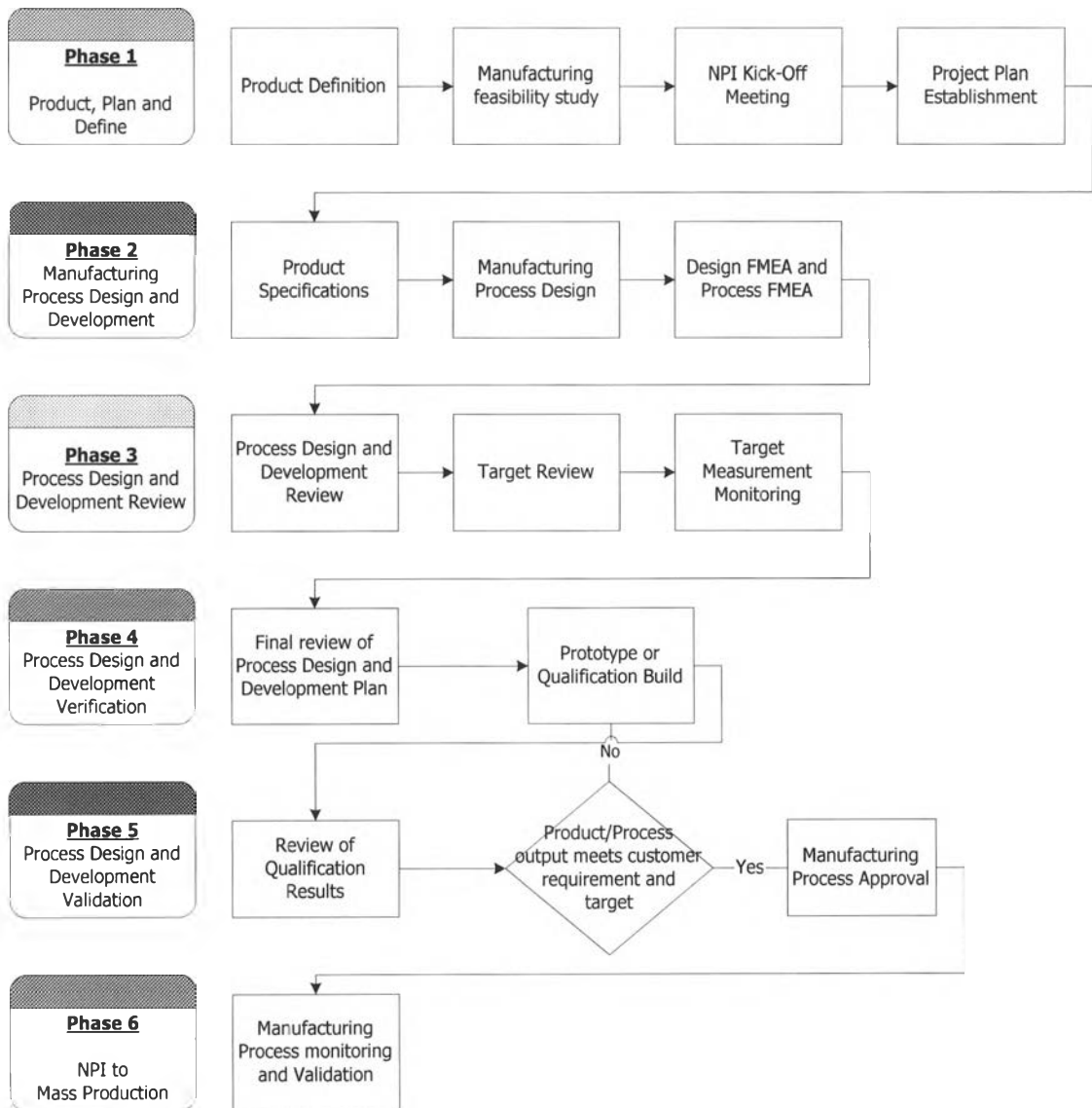


Figure 4.1: New product introduction process of the case company