THE EVOLUTION OF TAIWANESE ELECTRONIC OEMs
Analysis of Taiwanese electronic contract manufacturers with the Smiling Curve

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Summary

This study discusses the different evolutionary paths of different Taiwanese electronic OEMs. We hypothesize that by using the Smiling Curve we are able to analyze the competitive advantages of different companies and categorize their growth patterns into three different evolutionary routes. With supply chain analysis, we analyze three major Taiwanese OEMs and evaluate their positions on the supply chain. By using case study method, we also discuss the different development strategies these three companies decided to take.

From the results of the case study, we learn that Taiwanese OEMs can develop in three different directions: 1. Product-Oriented B2C, 2. Horizontal Integration B2B and 3. Service-Oriented B2C. Product-Oriented B2C companies focus on product hardware design and targets lower priced markets. Horizontal Integration B2B companies maintain as manufacturers without direct contact with the end consumer market and do not compete with clients with branded products. Service-Oriented B2C firms are highly technological and focus on developing software content for its users. Each evolutionary direction creates value on different sections of the Smiling Curve.

In the conclusion, we will develop managerial implications for the three different evolutionary directions, so that they may be referenced by other Taiwanese electronic OEMs. Finally, the social and development outlook for Taiwan's electronics industry will be provided.

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CHAPTER 1. INTRODUCTION

Section 1.   BACKGROUND AND MOTIVATION

After World War II, Taiwan's core economic activities have evolved from import substitution to exporting. Due to Taiwan's inexpensive labor and high technological expertise, Taiwan has also become a favorite outsourcing site for manufacturing and processing activities in the global commodities chain. Although Taiwan's leading industry is constantly changing, the importance of original equipment manufacturing (OEM) in Taiwan remains unchanged.

Although Taiwan is often regarded as one of the Four Asian Tigers, the country's economic boom is almost nonexistent after the 1990s. High-tech OEMs and original design manufacturers (ODMs) are still attractive industries, but the profit margin in pure manufacture and assembly is being compressed. This phenomenon is referred to as the "OEM dilemma" by Taiwanese scholars and businessmen[1]. The OEM dilemma states that in a mature market, OEMs face high research and development costs and pricing pressure from competitors and clients, making pure profits miniscule. This economic phenomenon has become an increasingly popular discussion topic in Taiwanese industry in these recent years. At the same time, the "smiling curve theory" is proposed. Acer founder Stan Shih developed his famous smiling curve theory in the 1990s, when Acer started to branch into branded products. Shih proposed that in the electronics industry, both ends of the value chain command higher values added to the product than the middle part of the value chain.

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[1] The concept of OEM dilemma is often raised in news articles and academic conferences. One of the most well known OEM discussions was during the "Central Taiwan Technology and Traditional Industries Upgrade Conference" in 2005 held by the Taiwan Think Tank.

Graph 1. Stan Shih Smiling Curve
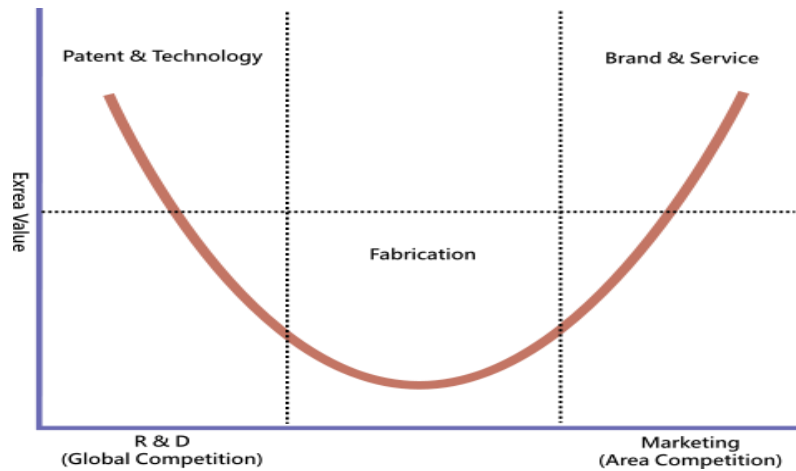
The smiling curve has led many to believe that Taiwanese companies must strive to build their own brands to escape the OEM dilemma. The government has also established a division in the Economic Ministry devoted to assisting domestic companies to build a global brand. However, branding alone might not be sufficient to ensure high margins and long term growth for an electronics company, particularly in the personal computer (PC) and mobile devices industry where key players have multiple roles on the industry value chain. Companies should base its own development on their competitive advantages and roles on the value chain. Through the years, Taiwanese OEMs have developed using three main paths: sales and services development, superior R&D and supplier integration.

The most prominent examples of these three evolutionary routes are respectively Acer, HTC and Foxconn. Acer is one of the first Taiwanese companies to successfully expand globally with its own branded products. Since 1990, Acer developed different strategic business units (SBUs) and regional business units (RBUs). Acer SBUs are in charge of manufacture and assembly while RBUs negotiate with sales channels. Each SBU is semi-independent and cross-invests other business units within the Acer group. Also, parts manufacturing units can sell to Acer affiliates or companies outside Acer. Therefore, each business unit can be very flexible and are very efficient in supporting the manufacturing of Acer products. Eventually, Acer chose to focus heavily on its channel sales activities and achieved as one of the largest PC suppliers in the world.

HTC and Foxconn are two very different companies with different business models and management styles. Both companies originated as OEMs, yet HTC decided to launch its own branded phones while Foxconn continued to operate as manufacturer and assembler. Only nine years into its establishment, HTC launched its first branded product in 2006 and gained wide popularity in Asia and Europe in the next few years as the alternative to Apple smartphones. Foxconn chose to strengthen itself by acquiring several key component manufacturers and became one of the largest OEM companies in the world.

This study will attempt to establish the evolutionary paths of different electronic OEM companies using the Smiling Curve as a framework. Managerial implications for different growth patterns will be drawn out so that the conclusions could be referenced by other Taiwanese OEM companies. Finally, the industrial and social outlook for the Taiwanese economy as a whole will also be discussed.

Chapter Two is the literature review on Taiwan's economic history after World War Two and how government policies led to the development of the island's high tech industry and corporate structure. The Smiling Curve Theory and the supply chain analysis of digital devices will be discussed in detail in Chapter Three. Research methods will be explained in Chapter Four. Chapter Five is the flesh of the study in which we analyze three case companies: Acer, Foxconn and HTC. Finally, the conclusions of the study are drawn out in Chapter Six.

CHAPTER 2. LITERATURE REVIEW

Section 1.   TAIWAN'S ECONOMIC HISTORY (POST WWII ~ 1980S)

Unlike similar economies of East Asia, Taiwan has not developed technology or manufacturing giants as did South Korea or Japan. Instead, Taiwanese economy is highly consisted of small and medium enterprises (SMEs) in manufacturing and export. What differentiates Taiwan from its Asian counterparts could be explained by local economic history.

Taiwan is an island of few resources, under Japanese rule; Taiwan developed a stable social infrastructure with a forte in agriculture. However, without a stable governing force during the long Chinese civil war, Taiwan's economy relied heavily on US economic aid. It was not until the 1960s that the Taiwanese government truly focused on reforming the Taiwan economy.

Due to increasingly shaky Taiwan-US political relations, the Taiwanese government announced several economic policies in an attempt to attract foreign investment and become independent from political aid. In 1960, the 19-Point Economic and Financial Reform and the Investment Incentive Act were announced to benefit foreign investors. The first Kaohsiung Export-Processing Zone was established in 1965 to encourage local production for export. These economic policies successfully supported local economy when US aid was withdrawn in 1965.

Taiwan's economic policies during the 1960s to 1970s attracted much investment from Japanese and US companies. Japan's electrical industry exported heavily to the US market in the 1960s, however environmental costs, labor costs and land prices were increasing domestically. Therefore many Japanese companies sought to invest in developing countries without affecting domestic monetary policies or competition (Ozawa 1979). Taiwan, South Korea and Hong Kong were identified as suitable economies for Japanese corporations to enter. Among these candidates, Taiwan was considered to have the friendliest investment environment.

Taiwan's advantages were good quality labor and low labor cost and the culture was friendly to foreigners and foreign investment. Local factories were small with little technological knowhow and were no threat to Japanese corporations. Duty free export-processing zones, geographic

closeness and historical amiability towards the Japanese were all strengths for Taiwan.

Taiwan became known for producing high quality textiles, electrical parts and chemical products for Japanese companies. Western companies which buy Japanese parts soon found themselves importing heavily from Taiwan. In order to further develop international business, many American and European companies started to invest and establish factories directly in Taiwan. In addition, Taiwan was one of the most open and infrastructurally sound economies in East Asia at the time, and had close ties with Japan. Therefore, Taiwan became a favorite investment spot for Western companies seeking to gain a foothold in the Asian Pacific market.

Due to heavy foreign investment, Taiwan's economy soared during the 1970s and 1980s. Employment rates were high, subcontracting production increased and the economy was greatly stimulated. Most importantly, there were high transference of capital, management skills and technological knowhow from the investor to the investee. Purchasing power parity (PPP) of Taiwan grew from $154 in 1960, to $695 in the 1st oil crisis in 1973 and $2,344 during the 2nd oil crisis in 1980 (Wu 2003).

Economic reliance on exports was 26% in 1970, 48% in 1980 and rose to a record high of 53% in 1987. The largest destination for exports during the 1970s to the 1990s was the US, which took up one-third of Taiwan's global exports. The economic situation also encouraged entrepreneurs in manufacturing and trade. Domestic brands face heavy competition with foreign brands in the local retail market, while the export economy mostly relied on SMEs. Therefore, large multinational corporations did not develop in Taiwan.

Section 2.   DEVELOPMENT OF TAIWANESE HI-TECH INDUSTRY

In consumer electronics Taiwanese firms followed Japan's former strategy by moving into the price-elastic market in the form of small OEMs in the 1980s. At this time, Taiwan had good manufacturing abilities in components and a well-developed labor force. Companies began to differentiate themselves from global competitors by producing more advanced products. In order to enhance competitiveness, Taiwan's information industry gradually upgraded product design and

management in the 1990s. As product costs dropped significantly and the industry ecology changed, companies began to develop more efficient logistic systems and building brand reputation to increase competitiveness. As a result, a global logistics model with cross-strait division of labor formed a complete operation system form many Taiwanese companies. Brand awareness was also brought about with Shih's Smiling Curve.

In the 1980s, the small size of Taiwanese OEMs limited their ability to achieve organizational economy of scale compared to Korean conglomerates. In this situation, international marketing and cross-subsidization of R&D was lacking. Therefore, the role of the government was especially important in building Taiwan's competence in advanced technology. During the late 1970s, the government owned ERSO (Electronic Research and Service Organization) acquired a technology transfer agreement with RCA for IC design. The plan was to develop an integrated information industry with IC design by linking semiconductors, computers, software and telecommunications. ERSO also emphasized the development for custom-tailored ICs, a higher added-value product compared to memory chips. The capacity to design custom-tailored ICs would let Taiwanese companies keep a competitive edge over other electronics-led economies such as Korea, by accelerating the number of new models of any electronic product.

ERSO's success led to the establishment of two of the world's largest IC suppliers: United Microelectronics and Taiwan Semiconductor Manufacturing Corporation. Meanwhile, Taiwan has developed the largest pool of IC design talent in Asia outside of Japan. Many former ERSO researchers and Silicon Valley engineers went on to head Taiwanese electronic firms and design houses and promoted products of good quality, low price and fast delivery. Many of these companies were the predecessors of well-known Taiwanese OEMs.

The first mass produced laptop PCs that ended IBM's monopoly on computers were developed in the late 1980s by Toshiba and NEC, setting the foundation for the development of Taiwan's information hardware industry. Early PC companies both designed the laptop and manufactured key components. They also had close relations with electronic parts suppliers. The laptop market was dominated by Japanese manufacturers until the PC was popularized. This

dominance gradually diminished as technology in mechanical engineering became mature worldwide. In addition, Intel, a key component vendor and platform provider, assisted in lowering development barriers for new manufacturers in order to establish its own platform leadership.

By the 1990s, Taiwan was already well known for its quality manufacturing of electronic products. Many US firms then invested in Taiwanese makers for laptop PC manufacturing, in an effort to compete with Japanese laptop prices. This price competition pushed Japanese companies to also outsource their manufacturing function to Taiwan. By 1999, Taiwan-made notebooks had a market share of 49%, whereas Japan had a market share of 40%. At that point, Taiwan's computer hardware industry developed to the extent that Taiwan ranked first in worldwide market share regarding notebooks, motherboards, monitors and other PC paraphernalia. Although Taiwanese PC companies such as Acer and Asus were already managing their own branded PCs, the high revenue in OEM/ODM made these contracts very attractive. However, the flood of new OEM/ODM contracts decreased the importance of developing branded PCs in Taiwan.

2001 was another stage for Taiwanese electronic OEMs, many Taiwanese companies relocated manufacturing to China after the Taiwanese government lifted the investment ban. With cheaper labor and factory expansion, production capacity for PCs soared. However, investment in R&D shot up and margins for OEM shrunk. Smaller companies either exited the market or were merged into larger corporations. After corporate consolidation, there are now five major Taiwanese PC OEMs: Quanta, Compal, Inventec, Winstron and Asustek. Jointly these companies take up 70% of all PC production. Year 2000 was also the start of the post-PC era of the information industry. Many PC manufacturers began to cover mobile information products. Several companies launched R&D in communication network technology in an attempt to combine various types of information so as to provide multimedia services. As a consequence, digital appliances such as smartphones, online multiplayer game devices and tablet PCs began to appear.

CHAPTER 3. THEORY AND MODEL

Section 1.   SMILING CURVE THEORY

The Smiling Curve by Stan Shih was first drawn in 1992 by Mr. Shih in an effort to convince Acer employees to deemphasize manufacturing and focus on branding and marketing strategies. The Smiling Curve concept was later adopted by other Taiwanese enterprises and often used to characterize the development of companies that originated in manufacturing and transformed into branded companies. The easily understood curve is now also used by business schools and other Chinese entrepreneurs.

Graph 2. 1992 Shih's Original PC Industry Smiling Curve
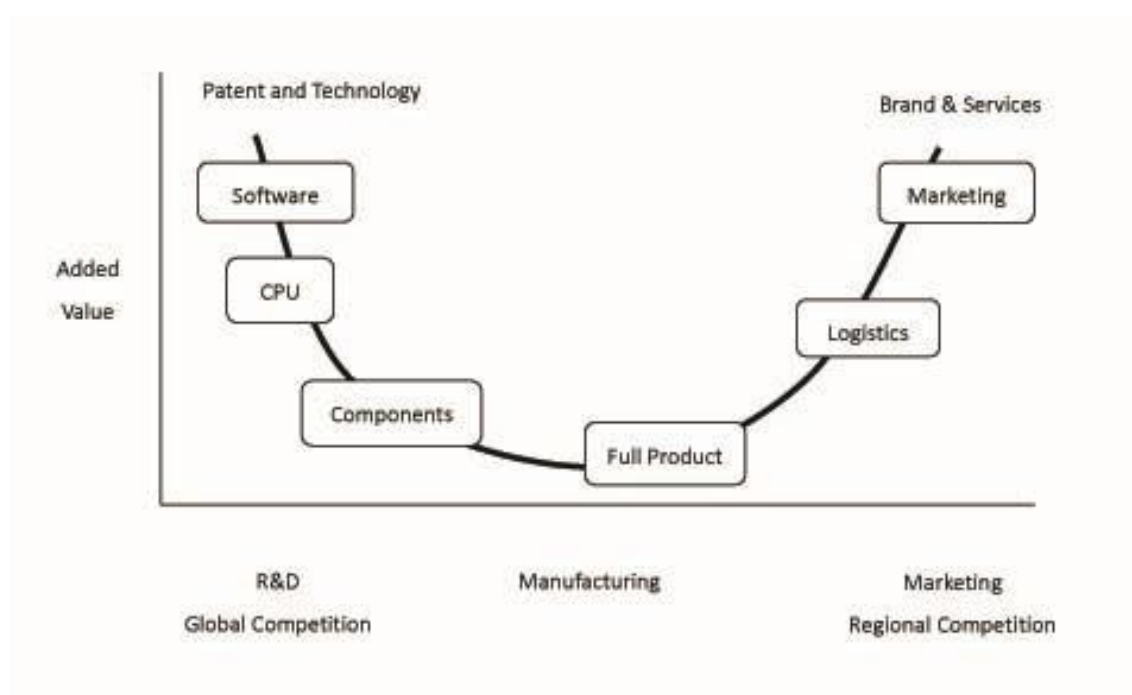
Source: 微笑走出自己的路 (Shih 2012)

The horizontal axis from left to right symbolizes the upper, middle and downstream activities on the industry value chain. On the left is research and development, the middle section is manufacturing and the right is brand marketing. The vertical axis characterizes added value. In terms of market competition, efforts in R&D faces global competition while marketing strategies are more regionalized.

This 1992 curve explained that the higher added value sections in the PC industry are located at the two ends of the Smiling Curve – IP (R&D) and brand and services (Marketing). For Acer's first transformation it was crucial that company employees realize that computer assembly has very low added value in the PC industry. Based on this curve, Acer gave up assembling in Taiwan and started development in higher added value activities. Due to the simplicity of the Smiling Curve Concept, Stan Shih continued to develop his framework over time and modified it so that it could be used in various different industries or by individual corporations.

The Smiling Curve is essentially based on certain concepts of the I-Ching, in which "change" is a main theme. Similarly, the Smiling Curve could be used to analyze internal corporate changes and detect shifts in the external business environment. In addition, there are four key issues in the implementation of the Smiling Curve.

Graph 3. Four Keys of the Smiling Curve
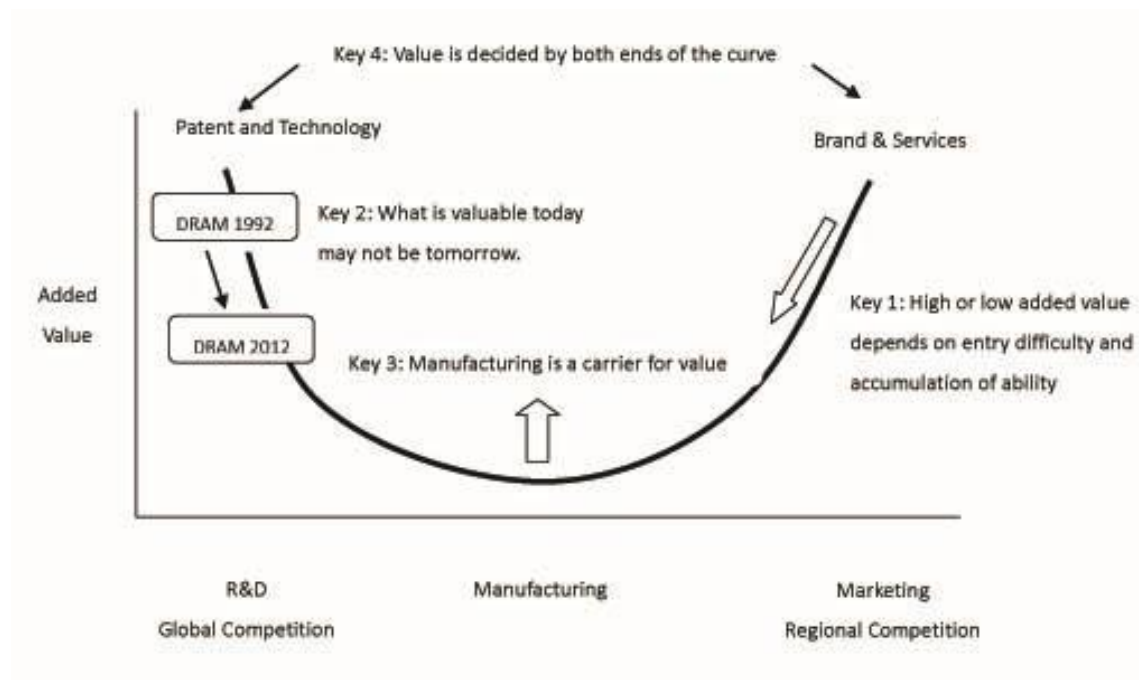
Source: 微笑走出自己的路 (Shih 2012)

1. Emphasis On Added Value

The Smiling Curve describes the added value activities in an industry but does not show quantifiable total production value. In the example of McDonald's, the fast food chain's greatest

financial gains come from the offering of its meals. However, the true value in McDonald's business activities are branding, service management and business model innovation.

Likewise, in the era of the knowledge economy, many industries that did not seem to be able to "smile" could now achieve new heights. The left end of the curve reflects internal research and development or business innovation while the right end of the curve connects the company to its target customers.

Each industry has its unique added value curve. With different requirements and entry barriers, the shape of the smiling curve is different. The higher the entry barrier, the higher the value of the activity. For a corporate entity, once its position on the industry Smiling Curve is identified, it could proceed toward both ends of the Smiling Curve based on its own competitive advantages.

2. Value is Not Absolute

Activities on the industry value chain do not always have the same value. With the maturity of a technology or skill, marginal efficiency decreases, and as the market opens to more competition, added value in an activity diminishes even faster. We can see from IBM's example how the PC industry changed before and after industry standards were implemented. The value of computer assembly dropped significantly in the 1990s.

Graph 4. PC Smiling Curve Before and After Standardization
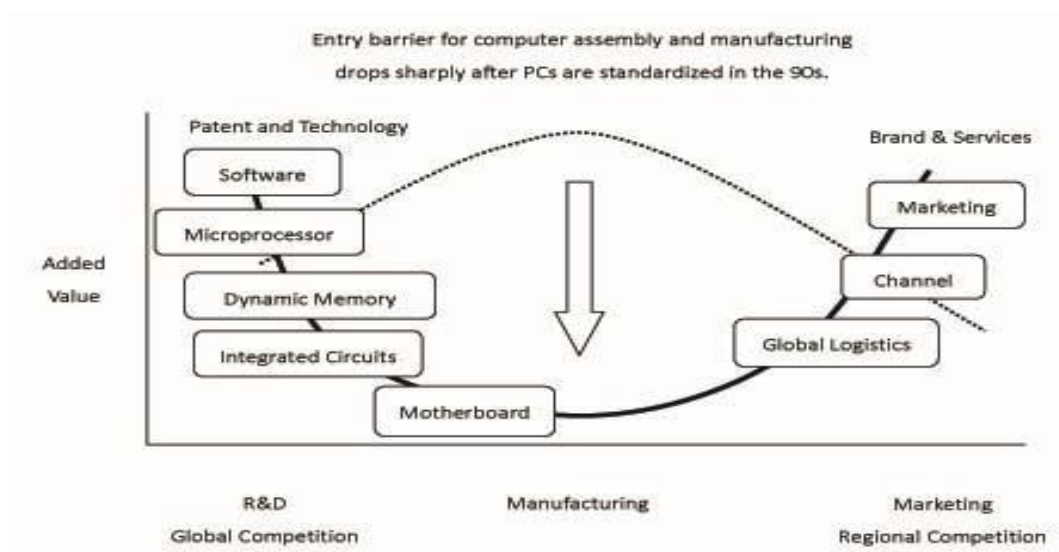
Source: 微笑走出自己的路 (Shih 2012)

Value is comparative. In the early days of computers before chipsets, circuit boards were complicated and require careful design. Computer OEMs were highly valued for their production abilities. As the industry matured, software, CPU and other components were standardized, and the industry focus shifted from hardware system to chipsets. This graph also explains why so many computer OEMs left the market or were merged during the 90s. Therefore, as the Smiling Curve changes, past success factors might not be suitable for the future. However, with enough insight into the industry ecosystem, trends could be observed and harnessed.

3. Manufacturing is Not to be Overlooked

Many misunderstand the value of manufacturing, thinking it is a section that is obsolete in Taiwanese economy. In fact, manufacturing is an important part in the Smiling Curve. Although it has the lowest added value among other activities, considering the global market, manufacturing could have significant total production value. Due to historical reasons, Taiwan's economy was based on manufacturing. Thanks to long time cooperation with global brands, Taiwan's manufacturing industry has high production quality, high management standards and industry cluster effects. With these advantages, high aggregate benefits could be reaped from manufacturing.

4. Value is Decided by Both Ends of the Smiling Curve

According to Shih, manufacturing by itself is of neutral value, the true value of a corporation lies in its development of the left and right ends of the smiling curve. Suppose quality manufacturing is a prerequisite, then a company's efforts in IPR or branding could break the vicious cycle of cut-throat pricing. In Shih's literature, the economic efficiency is highest on the right side of the Smiling Curve. The right side is market oriented and includes activities such as marketing or channel management. The left side of the curve includes technical and technological knowhow. This covers innovative designs and breakthrough technologies. Here, knowledge could be accumulated, licensed out and highly profitable. A company whose Smiling Curve leans to the left is ARM. ARM develops high-tech IP core and licenses out its technology to major IT companies worldwide. Therefore, its left smile is highest.

Section 2.	SUPPLY CHAIN ANALYSIS FOR SMART MOBILE DEVICES

The supply chain for smart mobile devices can generally be divided into six functions: component provision, design, production, branding, distribution and services.

There is a high level of specialization in the smart mobile device industry. In the component provision function, parts are further classified as key and non-key components. Each hardware component requires special technologies to design and manufacture. Different component providers have different impacts on the development of the product.

In the design function, ODMs or in-house design teams investigate user preferences to generate functional specifications for their new product. In this stage, a suitable operating system and available hardware components are selected to fulfill the design's functional requirements. The primary value of designers is system integration and overall design for production.

The production role could be played by OEMs, ODMs or own-brand holders. In production, manufacturers assemble all components and ship to distributors. Own-brand holders would start branding their new product and launch marketing campaigns to promote to potential customers.

In distribution, the products are moved from producers to customers. Some own-brand holders have proprietary channels to directly distribute phones to consumers, such as the physical Apple Stores. However the majority of products are distributed through agents, wholesalers and retailers.

The service function consists of operators, retailers and information service providers. Smart mobile devices depend on the Internet and telecom network to function. Therefore, wireless network and telecom operators are primary service providers. Many network operators also serve as distribution channels, often binding the product with network contracts. Information service providers collect or generate the web content delivered to the mobile device.

3.2.1. Component Providers

There are many different hardware components in a smartphone or tablet. Providers of key and non-key components have different characteristics on the value chain.

- Key Components

Some of the most important components in a smart device are the flash memory, ARM-based microprocessors and cellular basebank processors. Key components such as these have more added value and enjoy higher profit. The availability of these items could strongly affect the development speed, manufacturing cost and launch date of a new product. Therefore key component providers have higher bargaining power than non-key component providers.

However, market share distribution is concentrated on a few mega-brands that still have stronger bargaining power over component providers. To increase profitability, large key component providers would sometimes foster smaller, more regional brands. For example, Taiwan's semiconductor manufacturer MediaTek is known for selling core processors to Chinese "ShanZhai" phones or "white brand" phones. The processors sold to ShanZhais are mostly slower, last generation products. Therefore, there is little conflict of interest between MediaTek and its mega-brand clients. However, ShanZhai products are good imitations of famous brands with similar functions and appeal to the middle-low end market. So ShanZhais are powerful distractions for mega-brands in the Chinese market. Besides supporting smaller brands, key component providers would also approach network operators to develop operator-branded products.

- Non-Key Components

Non-key components consist of passive components, crystals, mechanical components and other low added value parts. Providers for non-key components have low bargaining power towards assemblers. Many non-key players would cooperate with assemblers for steady business contracts. It is also very common to be vertically integrated by large assemblers. Powerful assemblers such as Foxconn are not only capable of integrating non-key component makers, but could also integrate or alliance with key component providers.

3.2.2. Assemblers and Integrators

Assemblers and integrators could be generally classified into two different business models: electronics manufacturing services (EMS) and ODMs.

- EMS Companies

The main functions of EMS companies include component assembly and testing. Such companies focus on improving manufacturing technology in order to provide cost reduction and one-stop shopping services for customers. The majority of customers of pure EMSs are own-brand holders looking to outsource manufacturing jobs for cost down low-3ne products. The global top EMSs include Foxconn International Holdings (FIH)[2], Flextronics, Elcoteq, Jabil, BYD and Quanta. The gross margin for EMSs is 5~8%. Due to low technology entry barrier, there is high market concentration and competition with EMS companies.

The key success factors of EMS assemblers are the abilities to source low cost, high quality components and efficient logistics. Therefore, top EMS companies often integrate non-key component providers and establish strong partnerships with key component manufacturers. Among the top six companies, FIH, Flextronics and BYD have heaviest integration. In the example of FIH the company has more than 10 items in its provision list. FIH manufactures its own casing, cables and other non-key components. Other more important components such as camera modules and LCD panels are sourced from Altustech, InnoLux and other affiliates of the ever-growing Foxconn Group. Intense competition within EMS companies has pushed many players to enhance their value by offering design services. Therefore some companies have moved closer to the ODM role.

- ODM Companies

The main functions of ODM companies are design, assembly and testing. ODMs differ from EMSs with their design capability. Some of Taiwan's top ODMs include Arima, Compal, HTC, Quanta, Inventec and Foxconn. Foxconn's more special business model includes services offered by EMS and ODM companies. Some of these top ODMs also offer pure assembly services while others have developed branded products. The gross margin for ODMs in the smart mobile device sector is around 15%. ODMs enjoy a higher technology barrier compared to EMS companies and the market is more scattered due to specialized design capabilities of each company.

Because of their product design ability, many ODMs would seek cooperation directly with network operators instead of serving own-brand holders. Designing for network operators tend to

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[2] FIH is the Mainland Chinese subsidiary of HonHai Precision and is a global company in handset and wireless communications manufacturing.

bring in higher gross margins. It would also be possible to have the final product carry the logo of the ODM on its body. Such actions usually become a stepping stone for the ODM to become a full-fledged brand company. For HTC, 2002 was a crossover period. In 2002 HTC was designing and manufacturing for HP and Palm. Simultaneously the company was also working with various different telecom operators in Europe and Asia Pacific. The success of its O2-HTC phone boosted the company's confidence in its first steps in branding.

3.2.3. Own Brand Holders

Own-brand holders are companies with branded products in the consumer market. These companies face higher challenge in dealing with market preferences and end-consumer behavior research. Brands must also manage a good public image to attract customers. Gross margin for own-brand holders of smart devices is 30~50%, which is much higher than ODM or EMS companies. Most brand holders focus on the branding and design of their product. However, there are also companies that choose the original brand manufacturing (OBM) model.

- Design and Branding Focus

Companies that focus on design and branding would outsource product manufacturing and assembly to EMS/OEM companies but keep product design in-house. Apple and Sony Ericsson are two such examples. By outsourcing manufacturing and assembly, brand holders can expand production capacity without risking heavy investment on equipment and factories. Outsourcing is also a good way to save cost for middle-low end products. Companies can also focus on product design and marketing campaigns without worrying about production. In Apple's example, the company relies heavily on its branding and powerful design. In turn, Apple does not own any production facilities and entrusts the company's iPhone and tablet line entirely to Foxconn. With Foxconn managing Apple's production, Apple is free to manage its brand image, cultivate its fan base and focus on marketing activities.

- OBM Focus

OBM companies tend to do everything in-house, including branding, designing and manufacturing, i.e. Samsung and LG.. In fact, many mega-brands have their own production

resources. Manufacturing in-house helps the company retain special production know-how and prevents valuable intellectual property rights from being pirated. It is also reasonable to keep manufacturing in-house if the company could quickly and inexpensively source key components. Samsung Group is a Korean conglomerate that plays multiple roles on the mobile device value chain and manufactures several key components. Before 2013, even rival Apple utilized Samsung processor chips in its devices. Therefore it is logical that Samsung would keep its entire production process in-house.

- Five Forces Analysis

The mobile phone production industry had originally favored large companies with expertise in radio technology, software and manufacturing. However, mobile phones have gradually become fashion accessories by the mid-1990s. With the invention of fashionably designed smartphones in the new millennium, product life cycle of handsets has shortened to 6 to 9 months.[3] Therefore the mobile phone industry has become increasingly competitive.

Rivalry Between Brand Holders

The smartphone industry is gradually becoming oligopolistic and rivalry is very intense.[4] The average product life of a smartphone model is 6 to 9 months compared to the 2 year product life of a simple phone. Some of the more notable smartphone manufacturers in the global industry are RIM Blackberry, Samsung, Apple, HTC, Nokia and Sony Ericsson.

The RIM Blackberry targets professional users. One of its most attractive services is that it integrates with the corporate email system. RIM operates on 350 carriers in 135 countries, with North America being its biggest market with 70% of sales.[5]

Samsung's Galaxy phone earnings represent 1/3 of total Samsung Electronics revenue. Samsung is aggressive in advertising and produces well designed phones at attractive prices. The Korean company enjoys high volume growth, however the expense of heavy marketing campaigns has also weakened Samsung's operating profit margins.

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[3] David B. Yoffie, Renee Kim. "HTC Corp. in 2009." P. 4. Harvard Business School. (8 Dec. 2009)
[4] Bernstein Research. "The Emerging Oligopoly in Smartphones - The Handset Handbook for 2011, Part 2: Seismic Shifts in the Competitive Landscape." (2011): 23-27
[5] David B. Yoffie, Renee Kim. "HTC Corp. in 2009." P. 6. Harvard Business School. (8 Dec. 2009)

Apple iPhone has become Apple's most well known product. The company targets sophisticated consumers who want advanced PC-like web experience on their mobile phones. The iPhone takes up around 15% of the smartphone market.[6]

Threat of New Entrants

In the traditional phone market competitors need expertise in radio technology. However entry into the smartphone market does not require companies to have technology know-how. There has been news since the Facebook IPO that the company would launch its own Facebook phone. Facebook's acquisition of Instagram allows the company to gain a foothold in the photography area. In April 2013, HTC launched HTC First with Facebook Home, making it the official Facebook device[7].

Supplier Bargaining

Power Supplier bargaining power is a delicate issue in the smartphone industry. Depending on component, supplier bargaining power varies. The assembly and manufacturing partner of a smartphone brand has low bargaining power. However, the OS code provider and processor chip manufacturers have relatively high power. In the case of Android phones, Google's release of their new code versions varies from brand to brand. It is also an open secret that Apple uses semiconductor chips developed by Samsung.

Buyer Bargaining Power

Generally speaking, buyer bargaining power of end consumers is high, however it also depends on the market where the product is being sold. In markets such as the US and Japan, the telecommunications and wireless internet network is closed and tied to the mobile phone. Therefore, local network operators have higher decision making power in which phones they decide to carry. In Europe where the network is open and untied to the mobile phone, end users have higher brand choice.

Threat of Substitutes

[6] Horace Dediu. "The Global Smartphone Market Landscape." Asymco (17 Nov. 2011)
[7] Facebook launches HTC First Android Phone
http://www.usatoday.com/story/tech/2013/04/04/facebook-apple-htc-android-ios-mark-zuckerberg/2053521/

Although smartphones are now highly popular, 69% of global mobile phone users still use simple mobile phones with basic calling capabilities. In Japan, the Japanese *keitai* is still very fashionable. Also, with the speed of innovation in the communications gadget market, the possibilities are endless.

3.2.4. Platforms and Operating System Players

Smartphone platforms went through heavy competition between 2008 and 2013. Currently the three dominant smartphone platforms are Apple's iOS, Google's Android and Windows Mobile by Microsoft. As internet speed and Wi-Fi access points increase, people rely more and more on their smartphones to multi-task on the go. Avid smartphone users surf the web, listen to music, play on-line games and even shop on their phone. All these activities represent significant business opportunities in mobile services. The smartphone market is a platform market in which content providers build services on top of other companies' platforms. The more services a platform can attract, the more valuable it becomes. Therefore, Apple, Google and Microsoft each focuses very heavily on developing mobile computing.

- Apple iOS

Under Steve Job's leadership, Apple's operations are streamlined and focused on very few core products. This creates a scalable development model for a small company like Apple. All of Apple's products emphasize on design, ease of use and functionality. Instead of diversifying Apple's product line to increase market share, Apple focuses on attracting technology savvy users who could afford higher priced products. Apple's greatest strength is in the App Store and iTunes Store, which is a closed platform that links music content and applications to Apple's devices. Apple's monopoly on software markets has therefore created a high entry barrier for competitors.

Apple has a very strong platform with many high quality applications accessible by Apple devices. The iTunes service also provides a wide selection of entertainment for its users. After the development of the iCloud, users can also store their data in the cloud and access it from any Apple device. However, data stored in an Apple account is not transferable to any device other than an Apple. In short, Apple has very successfully locked-in iOS users to their devices.

- Google Android

Google is most well known for its search algorithm which allows users to acquire very useful results in response to their queries. Among its various products, Gmail and Google Maps are the most popular. Although Google provides most of its internet services for free, the company makes high revenues from advertising. Adwords is an auction-based advertising program, advertisers using Adwords pays Google on a cost-per-click basis. Therefore, Google's sales team focuses heavily on building relationships with large advertisers and leading Internet companies. Since Google's expansion in the mobile device market, its key partners also include OEMs for Chrome OS and Android devices. Google's area of strength is in its internet services which are mostly free. Therefore, Google has a high advantage in inexpensive devices with limited processing power.

Unlike Apple's "closed" system, Google's Android platform is licensed to phone manufacturers for free. So it is possible for consumers to select the Android device manufactured by their preferred brand. However, different carriers or OEMs would customize the Android product, resulting in different user experiences. Although Google's application store Google Play currently offers fewer selections compared to App Store, Android allows users to freely download applications that work on different platforms. On the downside, this freedom also means that some applications operate independently from each other and may give the consumer a sense of inconvenience or lack of order. Control over low-quality apps is also a problem.

- Microsoft Windows

Microsoft is a large computer software company which has dominated the computer operating system marketplace. Although the company has been criticized for its software stability and security in the past years, the Windows reputation has improved with the release of Windows XP and Windows 7. Its main revenue-making operation is in licensing its OS to computing devices. Microsoft also has a powerful web browser Internet Explorer, however the company has a much stronger hold on desktop applications which does not rely on constant Internet connectivity. One of Microsoft's best advantages is their productivity software which is favored by business users.

The Windows mobile platform has also built an ecosystem with Windows Live and Hotmail.

Avid Office users could also share files between devices through Microsoft's cloud storage SkyDrive. However Microsoft's Windows Phone Marketplace has a very limited selection of applications. Moreover, Windows' market share in mobile device sales was less than 10% in 2012[8]. This makes the Windows platform even less likely to attract future content developers.

- Applications and App Stores

Mobile users rely heavily on applications for increase in productivity, entertainment or social networking. The amount of apps a platform carries is an important criteria when choosing a mobile device. Also, advertising revenue on free apps and app sales are monetizing sources for developers and platform providers. This creates a cycle in which platform providers try to attract the greatest number of apps. The wide selection of apps attracts a large number of mobile users. In turn, popularity of the platform attracts software developers. Therefore, without a robust app store, a mobile platform would eventually wither and die.

3.2.5. Distributors

To distribute products to market, makers would rely on direct retail outlets, distribution partners or carriers. Each channel has different characteristics that match the needs of the maker or the market.

- Direct Retail Outlet

Proprietary stores such as the Apple Store can give customers a sense of exclusivity. In these stores, employees are highly trained in educating the customer and perform equipment maintenance if necessary. Visitors could also be more easily persuaded to purchase items and accessories besides the targeted product. However the number of customers reached is limited if there are few stores in the market.

- Distribution Partners

By selling through distribution partners, the maker could share marketing costs and reach a larger population in the market. Such channels are most popular in unlocked network markets, where

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[8] "Gartner Says Worldwide Sales of Mobile Phones Declined 2 Percent in First Quarter of 2012; Previous Year-over-Year Decline Occurred in Second Quarter of 2009" Gartner. May 16, 2012.

users do not need to purchase wireless devices through a carrier. Popular electronic device retailers are important distribution points that could heavily affect sales numbers for phone makers.

- Direct To Carrier

In closed network markets such as USA or Japan, makers most often choose to ship directly to carrier and does not involve a third party distributor. In these markets, carriers are highly involved in the product line and specification requirement of phone makers. The Apple iPhone is one of very few products that were accepted as-is by US carriers. In 2010 Google tried to circumvent the carrier monopoly and sold its Google Nexus handsets online as an unlocked device. However the Nexus met with resistance from the Big Four carriers and were unsuccessful in the US. Furthermore, in order to maintain relationships between US carriers and the Android system, Google soon terminated the Nexus project. Therefore, we can see that network providers play a very important role in the market structure.

3.2.6. Network Operators

Smartphone and tablets rely heavily on fast and steady Internet connection. Therefore Internet operators play an essential role in the smart mobile device value chain. Not all network operators function in the same format worldwide, markets could be classified as open network markets and closed network markets.

In closed network markets, wireless devices are locked-in to one network provider. The United States and Japan are two such markets. In the US, Verizon, AT&T, Sprint and T-Mobile provide Internet service for more than 90% of users. In Japan, NTT DoCoMo, KDDI and SoftBank dominate the market.

Operators in closed network markets provide heavy subsidy for the phones they promote. Hero products enjoy higher subsidies and receive more attention. Such actions are used to lower consumer purchase price. The operators then recoup the subsidy through service plans. Dominant operators know what companies they want to work with and how many product lines they want to bring in. therefore network operators have high bargaining power in these markets and manufacturers have to impress operators to push their products to market.

In unlocked network markets, wireless devices are not restricted to a specific network. Europe and China are two such markets. In open network markets, consumers have the freedom to buy a handset and match it with the Internet provider of their choice. According to studies, consumers in open network markets tend to be more loyal to handset makers. However, subsidies are not provided and the purchase price of the electronic devices could be quite high. Operators compete with each other on calling price packages and services and have low bargaining power toward phone makers. Therefore, it is easier for smaller brands such as HTC to approach each network operator on an individual basis.

3.2.7. Information Service Providers

Information service providers include online entertainment services, e-shopping, etc. on a mobile device the most important source of content is the online application store. According to research, tablet and phone users are spending more time on apps than surfing the Internet[9]. Application development is closely linked to platform compatibility and many developers choose only to publish their work on a single platform. Apps bought on one platform cannot be transferred to another platform; therefore there is a "lock-in" effect for consumers that translates into high switching cost. Therefore the quantity and quality of content offered on each mobile platform is an important decision making factor for consumers.

- iTunes

Apple is one of the first companies to legally sell music over the Internet. iTunes pioneered in selling songs separately from the album, charging as low as 99 cents for one song. This move revolutionized the music industry, in which songs were bundled and sold in albums. Apple was also the first in establishing "apps" and creating the App Store. By January 2013, Apple has a library of more than 800,000 apps in App Store and has currently the largest collection of high quality apps compared to Google and Microsoft. However, Apple is not without fumbles. In 2012, Apple launched the Apple Map on iOS6 along with the iPhone5. However, Apple Map's low accuracy caused much displeasure among Apple users. In turn, many iPhone holders reverted back to

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[9] www.nngroup.com, Mobile Sites VS. Apps: The Coming Strategy Shift

downloading the Google Map[10].

Applications submitted to Apple must first go through approval before they can be published. Developers purchase the Apple SDK (Software Development Kit) Standard Version for $99/yr or the Enterprise Version for $299/yr to submit applications. Developers enjoy 70% of app sales revenue and 30% goes to administration.

- Google Play

Google Play was launched in 2011 and is the runner-up in the great app race. By February 2013 there are more than 800,000 apps active on Google Play. Unlike iOS, Google Android is an open source system that allows users to download non-Android apps. This could result in application performance problems and unsatisfactory customer experience. Therefore low quality apps is a problem. Besides applications, Google also offers music and movies for download. By October 2012, Universal Music Group, EMI, Sony Music and Warner have signed partnerships with Google Play.

Developers can join Android by paying a $25 registration fee. App sales revenue is split 70/30 between the developer and the platform operator.

- Microsoft Phone Store

Microsoft Phone Store was launched in 2010 with the debut of Windows Phone 7. It is the smallest app store of the three with some 135,000 apps by February 2013. The store supports credit card and operator billing and features trial downloads before the actual purchase. Microsoft also features special downloads for 3D games with integrated Xbox features to attract gamers.

Developers for Microsoft pay $99/yr subscription for the Windows SDK to submit to Microsoft Phone Store. Revenues are split 70/30 between developer and Microsoft.

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[10] http://edition.cnn.com/2012/12/13/tech/mobile/review-google-apple-maps Review: Google Maps Put Apple Maps to Shame. Samantha Murphy, Mashable, December 14, 2012

Table 1: Mobile Platform Comparisons for App Developers and Phone Makers

Platforms	App Developers	Licensing to Phone Makers
Google Android	➤ Open Source ➤ $25 USD one-time fee ➤ 30% revenue sharing	Free
Apple iOS	➤ Open API ➤ $99-299 USD annual fee ➤ 30% revenue sharing	Unavailable
Windows Mobile	➤ Open API ➤ $99 USD annual fee ➤ 30% revenue sharing	$8-15 USD licensing fee

Source: This Study

Section 3. SHIFTS AND CHALLENGES IN THE ELECTRONIC INDUSTRY

With the advancement of technology and shifts in the ICT industry, Taiwanese companies are faced with several new challenges. There is increasingly more disintegration on the electronic industry value chain, yet there is heavier competition in each section of the chain. As mobile network devices take over, the value chain itself is also radically different from the traditional PC layout. With hardware and software integration taking prominence, innovation in key components has become extremely important. Also, new marketing strategies and IPR setup need to be considered as crossover products are developed. In addition, Taiwanese brands need to overcome Taiwan's natural deficiencies in the domestic business environment.

1. Vertical Division of Labor & Horizontal Integration

Companies have limited resources; this is particularly true for Taiwanese corporations. It would be most beneficial for companies to select an expertise and outsource the weaker link of its corporate activities. Also, digital devices are becoming increasingly complicated to develop. In order to become more efficient, the digital industry has become very highly specialized in each of its divisions. However, this specialization also means fragmentation in the industry. Therefore eventually only the larger players will be able to compete on a global level. This phenomenon leads to larger companies muscling out smaller competitors or merging with businesses that offer

complementary products. Foxconn Group is a good example of a company horizontally integrating with various component suppliers that supplement the company's main assembly activities. This kind of horizontal acquisition could create economies of scale for the original enterprise.

2.   IT Value Chain Shift

The recent trend in mobile computing products has greatly changed the value chain of electronic products. Software and platforms are now the focus of innovation. In addition, platforms are now the crucial factor for many end-users in choosing the hardware product. Therefore, the value of hardware production is being heavily challenged. On the other hand, as platform providers decide to promote their own products and compete directly with established brands, OEMs are given another opportunity to thrive. One example of platform-OEM cooperation is the Google Nexus 7 tablet, which also carries the ASUS name.

3.   Key Component Innovation

Another force that heavily impacts Taiwanese makers is the innovation ability of key components. Many new IPs and standards are held by Samsung and LG. combined with heavy vertical integration with other Korean electronics firms, Korean brands have an obvious cost and technological advantage over their competitors. In the case of Samsung, the company is the largest global provider and standard bearer for many key components such as memory chips, CPUs and display panels. Even Apple is a consumer of Samsung chipsets. It is also accepted that Samsung could surpass Apple as the greatest innovator in digital devices. However, an interesting move by Apple recently might change the power dynamics between Apple and Samsung. Apple is currently in talks with TSMC on the possibility of substituting Samsung chipsets with Taiwanese made components. Moreover, the Taiwanese government is promoting local electronic firms to purchase domestically produced core components. If talks are successful, the extra incentive could push Taiwan's IC innovation to a higher level.

4.   Marketing Strategy and IP Dominance

Tablet PCs are gradually taking over the market from netbooks and laptops. However, traditional channels and marketing strategies are no longer suitable for tablets. More and more

digital products rely on fast and steady Internet connection. Therefore, deals between makers and network operators are increasingly important. In addition, IPR is now a common tool for makers to prevent or delay the launching of a product from a rival company. Product launch delays or denial into a major market could cause heavy financial losses for the company. Therefore, IP dominance is a critical issue.

5.   Country Barrier

One of Taiwan's greatest disadvantages is a small domestic market. In a small local market saturated with large global brands, it is very difficult for a home grown electronics company to attract attention. Even for companies that have achieved some success, government support is crucial. Many global brands are supported in part through preferential government policies. For example, Lenovo, Huawei and ZTE were backed by the Mainland Chinese government. Samsung and LG are historical conglomerates that signify the pride of Korea. Taiwan is a small country with limited resources. However, with more Taiwanese companies operating in Mainland China, it is possible for Taiwanese firms to make use of China's business environment to establish themselves as brands and breakthrough Taiwan's natural limitations.

With industrial shifts and new challenges, Taiwanese companies need to reevaluate themselves on the value chain and search for future opportunities for advancement. In the following case studies we will see how three of Taiwan's OEMs develop from traditional contract manufacturers to well-known multinational corporations. From these cases we hope to see patterns that other Taiwanese OEMs could follow in order to upgrade its own corporate performance.

CHAPTER 4. METHODS

We choose to approach the research of this paper using case studies. The case study research text by Yin (1994) suggests that case study should be treated as a form of research strategy. Yin defines the case study method as 1. An empirical inquiry that investigates a modern phenomenon within real-life contexts. 2. Used when boundaries between business and social phenomenon are not evident. 3. Multiple sources of evidence are used. In short, case studies can explain phenomenon that are too complex for surveys or quantified data alone.

In Eisenhardt's (1989) text, the writer suggested that four to ten cases works well for case study research. However, Yin (1994) suggests that qualitative research is mostly based on single cases. When the cases chosen are unique and critical, they can be very vivid and illuminating and provide much insight. Dryer and Wilkins (1991) also argue that careful study of a single case can allow researchers to gain theoretical insights. In this study we hypothesize that there are three evolutionary patterns for Taiwanese contract manufacturers. Therefore we have chosen one representative case for each pattern to discuss in detail.

The research focuses on three companies: Acer, Foxconn and HTC. We chose to study Acer because of its position in Taiwan as one of the earliest success stories in branding. Even today it is looked up to as a branding role model for Taiwanese companies. Foxconn is chosen for its insistence on not going into consumer branding while succeeding in becoming the world's most powerful electronic assembler. We also chose to study HTC because of its ability to transform from ODM to one of the largest smartphone brands in the world in only a decade.

The data in this study is mostly obtained from secondary sources such as news reports, business analysis reports and the company prospectus. Lack of interviews means there might be a risk in misinterpreting certain decisions in the companies' growth process. However, Acer, Foxconn and HTC are well known global companies and the media and researchers have published many related papers on the companies so extensive secondary sources of data should be able to provide relevant information needed for this study.

Data analysis for this paper is conducted by process analysis. Pettigrew (1997) states that process analysis should present a chronological sequence of steps that explain how something happens. The case studies presented in this paper consist largely of stories of what happened and the activities and choices that were made over time. Case analysis in this study is conducted as follows. First, the chronology of each firm is described in different growth stages. Next, the business model and of each firm is illustrated. Finally, we will discuss the core competencies and value chain management activities that led to the different evolutionary patterns of each firm.

CHAPTER 5. CASE STUDIES

Section 1.   ACER

5.1.1. Company Timeline

Acer was founded in 1976 as Multitech by Stan Shih and his wife Carolyn Yeh and a group of five partners. The company evolved from a small microprocessor distribution firm to one of the world's largest PC maker. Acer's success is highly regarded by many Taiwanese businesses is often looked up to as a corporate role model. Not only is the company highly respected, its founder Stan Shih is also regarded as one of the pioneers of Taiwan's electronic industry. Shih's experience in technology development and business has also made him consultant to the Taiwan Presidential Office and several international multimedia projects in Asia.

Acer's evolution could be characterized in the following stages:

1. Microprocessor to PC Growth Stage (1976-1989)

2. Multinational Brand Building Stage (1990-1997)

3. Company Spinoff Stage (1998-2003)

4. Channel Sales Stage (2004-2010)

5. Post Lanci Stage (2011-Present)

1. Microprocessor to PC Growth Stage (1976-1989)

Acer was founded as Multitech in 1976 as a technology oriented company focused on industrial design, IT consulting and trading of key electronic components. The company acquired distribution rights of Texas Instruments and Intel to import microprocessor units to install in arcade machines in Taiwan. Other than the trading business, Multitech also established training centers on microprocessor technology. In early 1980s, Multitech began building the modern personal computer.

In 1980, Multitech was able to develop the "Chinese Dragon Computer" which could process Chinese characters. Furthermore, the company developed the world's second 32 bit PC in 1986, even earlier than IBM. (The first 32 bit PC chip was developed by Intel in 1982.) Multitech's technological ability soon attracted many OEM orders from companies worldwide.

By 1988, Multitech decided to venture into the international market with its own branded products. At the time, Taiwanese products were often regarded as inferior. In order to break the "Made in Taiwan" stereotype, Multitech adopted the high pricing strategy abroad and renamed itself Acer Group in 1989.

2. Multinational Brand Building Stage (1990-1997)

Acer's international expansion was successful and its products were noticed in the Japanese and US market. However, PCs quickly became commoditized with low gross margins. Component prices dropped radically and the NTD (New Taiwan Dollar) remained strong. The heavy price war between Compaq, IBM and HP also did not help Acer's sales. The decline in sales and profit led to a restructuring in the early 1990s.

In this restructuring, Shih implemented the "Fast-food Model" (Shih 2004). Shih believes that the problem lies in Acer's inventory management. The nature of the fast moving PC industry is that there is high speed innovation. Acer's products would quickly become outdated with high inventory. Therefore, Acer established a network of autonomous affiliates worldwide. Each affiliate is responsible for locally purchasing non-key components and product assembly, while key components such as the CPU are shipped from Taiwan by air transport. Affiliates are managed by locals who also determine product specifications, pricing strategy and marketing programs based on local preferences. Shih characterized the new strategy as "Global Brand, Local Touch" (Shih 2004).

Acer achieved record high profits of $75 million in 1993. The restructuring also led Acer to be included as the world's top 10 largest PC manufacturers in 1994 and 1995.

3. Company Spinoff Stage (1998-2003)

In late 1990s, there were several integration and acquisitions in the PC and electronics industry. Companies were growing larger and the competition was becoming heavier. Many large companies began outsourcing more operations, supporting the growth of American EMSs and Taiwanese OEMs. However, Acer's OEM service was not as welcomed by global companies due to Acer's branding efforts. Therefore, Acer initiated its "Millennium Transformation" in 2000 by restructuring the company, resulting in two primary units: Acer Branded Operations (ABO) and

Design Manufacturing and Services (DMS).

Acer DMS was incorporated as a separate spinoff named Wistron, which continued Acer's previous OEM operations. At the same time ABO focused on three main areas: product management, services and channel management. Acer was transformed from a technology/hardware company to a customer/service oriented company. Acer's transformation was most successful in Europe.

4. Channel Sales Stage (2004-2010)

In order to implement Acer's new Channel Business Model, Gianfranco Lanci from Acer's European Division, was promoted to CEO in 2004. To increase profit, Acer reduced its labor force and lowered overhead costs. In 2005, Acer had around 7000 employees worldwide compared to more than 70,000 employees at HP and Dell. Under Lanci, Acer became very channel oriented. Although Acer made lower gross margin compared to its competitors, it was willing to offer the distributor higher commission. Therefore, between 2004 and 2010, Acer made rapid sales through its distributors.

In 2007, Acer acquired Gateway in the US and Packard Bell in Europe, making it the world's number three provider for PCs. The company believed that its operations could help it achieve economy of scale and garner higher margin overall. Although this strategy was suitable for PCs in the growth stage, it was challenged when a new product entered the market.

5. Post Lanci Stage (2011-Present)

Lanci departed from Acer in 2011 after a consistent decline in sales in notebook PCs. It was later uncovered that Acer's European distributors had an inventory of 60 days, a significant over-stock in the PC industry. Although Acer could previously achieve quick sales through distributors, the introduction of the tablet challenged the position of netbooks in the PC market. Moreover, consumers have become more willing to pay for innovation. Therefore, Acer's low pricing strategy needed to be revised.

In efforts to stimulate growth, Acer is now planning to invest more in product research, development and marketing. Since 2011 Acer has began to work on ultrabooks and Windows 8 devices. Recent reports show that Acer will be trimming down its product line. Although HIS

predicted the fading out of netbooks by 2015, Acer has found a niche in hybrid tablet-netbook devices running on Windows mobile operating system.

5.1.2. Business Model

Acer has long been a branding role model for Taiwanese companies with its innovative organizational and branding strategies. It has also enjoyed very high PC sales volumes in its Channel Sales Stage. However, this strategy was challenged in 2011 with the disruptive innovation of the tablet. In this section we will discuss Acer's business model before and after the introduction of the tablet.

- New Channel Business Model (2000-2010)

2000 to 2010 was a fast growing stage for PCs and laptops. During this decade, Acer adopted the "New Channel Business Model" in which Acer focused on B2B2C marketing service. The company had not built up its own channel and service system in the US and European markets. Therefore Acer leveraged the channels. By offering a higher commission, the distributor was more willing to carry and market Acer products rather than those of its rivalries. Acer also leveraged ODM vendors' global logistics capabilities to quickly deliver the products to the distributors. Acer's manufacturing partners were Wistron and its regional affiliates which were established under the Fast Food Model. This cooperation model ensured product quality and component availability, shortening time-to-market.

After spinning off its manufacturing branches, Acer became a product management and e-services company. The company decided product specifications and outsourced design and production to its spinoffs. Therefore, more attention and investment could be allocated to marketing campaigns and services. This resulted in high brand recognition for Acer in the mid-low end PC market. Acer was devoted in the management of operations on the right hand side of the smiling curve.

The company's New Channel Model was able to reduce inventory, lower operational costs and shorten the products' time-to-market. Although PC profit margin was low, the various brand acquisitions in 2007 gave Acer economies of scale. During this period, Acer's key success factors

were its organizational network, competitive pricing and channel relations.

- New Focus (2011-Present)

The Apple iPad was introduced to the public in April 2010 as a new class of consumer device. Although Acer was one of the original developers of the "tablet PC"[11], iPad was the first tablet to gain commercial success. As consumers search for lighter, more portable computing devices, powerful tablets cannibalized the netbook and PC market. Although Acer had good relations with distributors, relying solely on channel management and PC sales is no longer a feasible strategy. Due to the change in consumer preference, Acer abandoned its New Channel Business Model.

After suffering heavy losses during the strategy transition era, Acer resurfaced with a new corporate strategy. Instead of focusing on marketing and services, the company will increase investment in R&D and industrial design. In the product development area, Acer is collaborating with mobile platform players in developing ultrabooks and tablets. Acer is also looking to enter the cloud services market.

From Acer's development in the past three years, we can see that Acer's core development strategy has transitioned from pure marketing focus to marketing and design. Despite the setback in 2010, the Acer brand name is still very valuable for the company's future operations. Compared to other Taiwanese electronic manufacturers, Acer is one of few companies that planned for branding since its founding.

Typical Taiwanese companies start as simple manufacturers and slowly integrate in the supply chain. However Acer rapidly developed from component trader to own product maker. Acer's ability to do so demonstrates the company founders' ability to develop and execute formal strategic planning. Such ambitious companies are rare in Asia's family management style business atmosphere.

To truly implement the Smiling Curve concept, Acer spun off its production arm and focused on branding and services. However, this move let Acer fall out of touch with the latest technology trends. Therefore the Channel Model was greatly impacted with the introduction of a new product.

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[11] The original tablet PC was defined as a portable personal computer for field work in business. Early Microsoft tablet PCs released in 2002 failed to gain popularity due to price and usability problems.

Innovations in the IT industry have blurred lines in product definition. Therefore Acer's competitors are no longer other PC makers, but also mobile device manufacturers. The company would need to re-inspect its role in the industry.

In short, Acer's new business strategy could be characterized as follows: 1) Reform the Acer image from low-end PC supplier to sophisticated affordable mobile device designer. 2) Close collaboration with mobile device platform players. 3) Reconnect with the left side of the smiling curve by investing more on R&D and industrial design.

5.1.3. Acer Model Analysis

Acer is one of the world's pioneers in PC production and is perhaps the most revered brand company in Taiwan. After year 2000, Acer broke off with its OEM branch and dedicated itself to the sale of affordable PCs. Although it has encountered some difficulties in recent years, Acer still remains as one of the largest PC makers in the world. The company's core competence and value chain management could be characterized as follows.

- Core Competence

As a pioneer in PC development, Acer's core competencies are computer hardware innovation, sales strategy and a long cultivated brand. Acer's hardware development capabilities brought it high revenues as an OEM. However, in order to avoid conflict of interest with its clients and achieve more flexibility, Acer spun off its OEM branch. As a computer company with no factory, Acer targeted the mid to low end PC market and achieved high sales numbers worldwide. When tablets and smartphones began to eat away at the PC market, Acer could quickly develop its own tablets and market them at a much lower price. Essentially, Acer adopts the "good enough"[12] product strategy and achieves high product turnover rate and market share.

- Value Chain Management

Although Acer no longer owns its OEM branch, it still has very strong alliances with Wistron and its other OEM spin-offs. Therefore, Acer's operations are not limited by upstream component

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[12] The "good enough market" term was coined around 2006, originally used to describe the Chinese market, where reliable products are sold at low enough prices to attract mid level consumers. Now it is used to generally describe mid to low price products with acceptable quality.

suppliers and assemblers. Moreover, Acer's sales strategy allows the company to maintain very good relationships with its suppliers. Although Acer was temporarily set back in 2010 by the mobile internet trend, its new strategy in heavier R&D investment should return the company to its former position. However, unlike HTC, Acer do not plan to venture in developing mobile internet software, but continue to strive in hardware and industrial design.

- Acer's Smiling Curve

Graph 5. Acer Smiling Curve (Hardware – Product Oriented B2C)
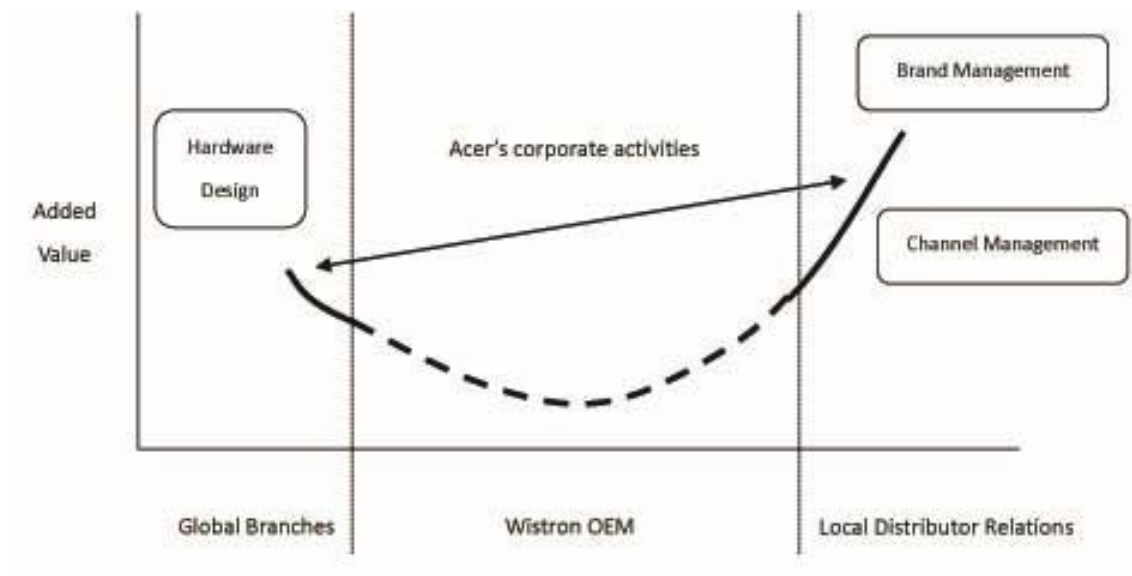
Source: This study

From the graph above, we can see that Acer's smiling curve tilts to the right. In this curve, actual manufacturing is undertaken by Wistron, while Acer focuses on hardware design and brand management. Before the emergence of the tablet, Acer was almost exclusively a sales and services company with limited investment in R&D. as the IT industry evolves, Acer now incorporates more product design to its strategy. However, Acer's brand equity and distributor relations remain the most valuable areas in the company's operations. Acer's strategy to target the good enough market can be inferred here. Acer's reliable and affordable products pushed through distributors could achieve high returns quickly.

Section 2.   FOXCONN

5.2.1.   Company Timeline

Foxconn Group (a.k.a. Hon Hai Precision Corp.) is one of the largest electronic assembly corporations in the world. The company first started as a plastic mold production factory in Taiwan, its business field gradually shifted to barebone computer[13] assembly and system integration. With large orders from Apple, Nintendo and HP, Foxconn expanded to be a global firm with advanced material sourcing abilities.

Foxconn's growth process can be organized into three stages:

1. Discovery & Learning (1974-1990)

2. International Expansion (1991-2001)

3. Technology Innovation (2002-2008)

1.   Discovery & Learning Stage (1974-1990)

1974 to late 1990s was Hon Hai's chapter in domestic plastic molding development. This was a stage of learning for the company when it gradually developed skills and management styles through trial and error. Hon Hai was a late entrant in Taiwan's mold making and production industry. At the time, mold making was a skill passed on from experienced craftsmen to apprentices and production knowledge was not shared, therefore it was difficult to accumulate industry knowledge. In order to improve mold making quality and speed up development process, Hon Hai formulated a standard development procedure for its products that made mold making knowledge transparent. Although this action met with protests from mold makers, Hon Hai soon achieved the ability to produce high quality products with less than half the time than is traditionally required.

After mastering the skills of plastic molding, Hon Hai ventured into producing computer interconnectors in the 1980s for several global firms. In the electronics component production field, it is very easy to unknowingly step on an IP rights minefield. In the 1980s, Hon Hai encountered several IP rights infringement suits from abroad, fortunately the company survived. Now with

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[13] A barebone computer is a partially assembled platform or an unassembled kit of computer parts allowing more customization and lower costs than a retail computer system.

experience in IP rights defense, Hon Hai started to research the IP reports of its competitors and other players on the supply chain. The company eventually organized an ICMA (Intellectual Capital Management Analysis) database and created an IP research department. Now all Foxconn employees receive mandatory education on IP rights.

2.   International Expansion Stage (1991-2001)

The 1990s was a growing period for the company. In order to better interact with foreign clients, Hon Hai created Foxconn as a B2C brand in 1985. Foxconn continued its IP protection efforts and researched the electronic supply chain in detail. Not only did the company collect information on production companies, Foxconn also research technological trends and market info. This is to ensure Foxconn's position and advantage on the electronic products supply chain.

In mid-1990s Foxconn started computer casing production and barebone computer assembly. Although Foxconn is one of many similar competitors, it has an advantage in automated production and mold development. Therefore, Foxconn was able to acquire production orders for iMac that were originally meant for LG.

From 1990 to early 2000s, Foxconn was also active in expanding own manufacturing and research sites in China and acquiring established technology centers in the US and Europe. In 1992, Foxconn purchased a large piece of land in the town of Lunghua in Southeastern China as its production center. The spot was chosen for its proximity to an exporting port and the easy access to eager, inexpensive labor from China's Mid West region. The company also established a research center there with Cisco, studying the future of Internet equipment. Lunghua eventually evolved into a small industrial town whose economy is mainly supported by Foxconn's activities. Foxconn's influence in Southeast China grew to allow it to establish the Foxconn Bonded Factory[14], the first of its kind in China.

3.   Technology Innovation Stage (2002-2008)

Besides global expansion, Foxconn also devotes itself in technology innovations. The goal in

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[14]   Bonded factory: A factory approved by a government where imported materials can be used to produce goods before any import tax has to be paid. The import tax is only charged when the finished goods leave the factory. (Cambridge Dictionary)

this stage is to become a global manufacturer for 3C products. Currently it has developed the CMMS electronic integration business model, which we will discuss in detail in the next section.

Foxconn's innovative efforts could be seen in its high speed molding process. In the field of plastics manufacturing, managing production speed is equivalent to managing lead time. With offices in Los Angeles and Lunghua, Foxconn is able to maintain 24-hour development and production. A mold could be developed in 48 hours from accepting the order to creating the prototype. This procedure is called the FRT (Foxconn Rapid Tooling) System.

Foxconn's IP management is also going strong. By 2008, Foxconn has held 1,780 patents in Taiwan. The nature of these innovations has evolved from mass production technology to innovating upstream materials. Besides in-house research, Foxconn has also started to acquire several technology companies since 2002, based on the wisdom that if a company cannot develop the new technology within 6 months, it is best to acquire it from outside.

5.2.2. Business Model

Foxconn has a very special role on the global value chain. Different from other Taiwanese contract manufacturers, Foxconn developed its own CMMS (Component Module Move Service) Model. In order to compete in the field of manufacturing, Foxconn also factored into the product life cycle of its clients' product and offers different production solutions for different stages. This makes Foxconn's services unique from other competitors.

- Component

As mentioned before in this paper, traditionally only suppliers of key components can enjoy high bargaining power and high profits. However as a non-key component supplier, Foxconn makes up its short comings with superior quality and high production speed. In 2002, Foxconn was selected as one of the three suppliers for the Socket478[15] connector for Intel's Pentium 4 processors. Foxconn was the earliest of the three to pass Intel's quality requirements and took advantage of this lead time to quickly mass produce the Socket478. This move attracted computer manufacturers to

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[15] Socket478 is a CPU socket used to attach the Pentium 4 processor chip to the motherboard. Although seemingly common, its quality and design could directly affect the performance of the CPU.

hurriedly order components from Foxconn in an attempt to occupy the market with Pentium4 products as early as possible.

Besides quality and speed, Foxconn also have strategic alliances with various other component makers. Chimei Innolux, a manufacturer of TFT-LCD panels, is one of Foxconn's larger alliances. Its touch panels and LCD screems are important components to many products assembled by Foxconn. With fast access to high quality low cost components, Foxconn becomes an even more attractive partner for many international brands.

- Module

After Foxconn has gotten hold of the components necessary for production, the company would move into "module". Moduling is the integration of a standardized product. The difference between module and assembly is the system integration required in making modules. Intelligent module making could decrease the amount of parts required, save on costs and improve production efficiency. The barebone computer is a module product constructed before total system assembly.

During moduling, the company needs to consider several factors such as the positioning of different components, usage of materials and production process design. Foxconn's advantages in module are its experience in mass production and assembly, and the flexibility to make engineering changes for the client. While the average module development time needed for US companies is 16 weeks, Foxconn only needs 6 weeks from conception to production.

- Move

The third M (Move) represents Foxconn's ability to quickly complete an order from engineering design to delivery. Due to Foxconn's downward integration of functions from component supplier to design to assembler, Foxconn is able to control almost all aspects of product manufacturing and deliver the product on time. Not only is Foxconn punctual, its ability to predict the product life cycle also allows Foxconn to adjust its production resources and deliver products to clients at the right time. Foxconn's "Move" could be further discussed along with "Service".

- Service

Foxconn's service aspect includes "joint design". As internet and communication devices

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become more popular, Foxconn now owns an important branch that specializes in the production of mobile devices. Mobile devices are not as standardized as the PC and often require the product designer to work closely with the manufacturer on product specifications. Foxconn's worldwide production and design services have a special way of catering to the clients' production needs.
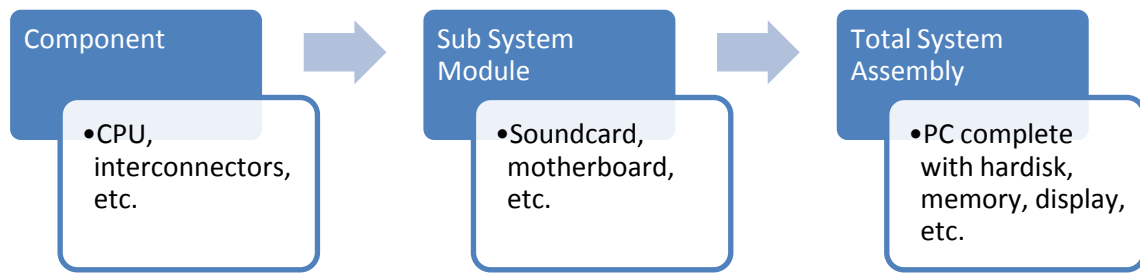
Table 2: Global Production

Joint Design & Development	Fast Mass Production	End of Product Life Cycle
Production centers: Tucheng, Taiwan Renfrew, Scotland Mullinger, Ireland Kansas, USA LA Fullerton, USA	Production centers: Shenzhen, China Kunshan, China Pardubicky Kraj, Czech Rep.	Production centers: Renfrew, Scotland Mullinger, Ireland Kansas, USA LA Fullerton, USA
Quick prototyping	Cost saving	Customization

Source: *Terry Guo's Global Competition Strategy*, Chang 2008

During the early stages of product growth, design and prototyping are done in Taiwan while initial production for early adopters is done in Europe and US manufacturing centers. When the product is ready for global launch, operations are moved to China for cost down purposes. Finally, when the product life cycle comes to a close and demand is low, manufacturing is shifted to European and American centers to provide customized services for smaller orders.

This type of globalized production service is created to achieve a balance between production and sales. This allocation of resources is also cost saving for Foxconn and convenient for the client. Therefore, with production efficiencies placed at the right place at the right time, Foxconn could have the lowest cost structure among other assemblers and hold onto its leading position among the competition.

Graph 6. Foxconn Forward Integration

Component	Sub System Module	Total System Assembly
•CPU, interconnectors, etc.	•Soundcard, motherboard, etc.	•PC complete with hardisk, memory, display, etc.

<div align="right">Source: This Study</div>

From the development of CMMS, we can see that Foxconn's core development strategy is forward integration. The company integrated from component design to module making to final assembly, in order to provide the best services to clients. Foxconn's ability to integrate forward is rare in the manufacturing industry.

Typically, vertical integration is initiated by a company to control subsidiaries that produce inputs used in the production of its products. This move is referred to backward integration. Fox example, a motherboard manufacturer who purchases large quantities of connectors annually would consider acquiring an up-stream connector supplier or start its own supply operations. Due to the lower bargaining power of suppliers, backward integration is usually the case.

By integrating forward, a company would compete with its clients and could face huge losses. In order to successfully do so, the company must possess some unsubstitutable criteria. Foxconn's ability to integrate forward shows that the company's R&D capability and IP rights development is strong enough to support Foxconn's strategic move.

In short, Foxconn's core business strategy could be characterized as follows: 1) Cement the company's position on the value chain with superior R&D on components and strong IPR development. 2) Integrate forward to create economy of scale and provide more value to customers. 3) Provide wholesome services to the clients' activities on the left side of the smiling curve.

5.2.3. Foxconn Model Analysis

Foxconn is one of few Taiwanese OEMs that has embraced its production capabilities and developed into a multi-national corporation. To this day, Foxconn is not eager to promote its own products and establish itself as a B2C company. Instead, it has extensively integrated horizontally

and became one of the world's largest manufacturing companies. Foxconn's core competence and value chain management could be described as below.

- Core Competence

Foxconn has production capabilities of various electronic parts and is competent in precision molding. In the area of production and assembly, Foxconn is ahead of global competition in technology, and has advantage in using low-cost Chinese labor. Therefore, with economic scale, production flexibility, speed and quality, Foxconn is able to acquire large and steady production orders from prominent brand owners. In turn, these brand holders could leverage Foxconn's production capability and enhance their own product competitiveness.

Foxconn has the core capabilities needed for the innovation of the 3C[16] industry. Therefore the company has a unique division of labor on the industry value chain. By horizontally integrating with component suppliers and other assembly companies, Foxconn can provide total solution services to its clients.

- Value Chain Management

In general, Foxconn has never gone through significant transformations in organization or strategy. Instead, Foxconn has steadily developed downstream capabilities and integrated horizontally. Although profit margin for assembly is low, Foxconn enhances its total value by achieving economy of scale. With various production centers worldwide and low-cost manufacturing facilities in China, Foxconn could dominate the production sector in the global IT industry value chain. Moreover, Foxconn's insistence in not branding its own products demonstrates the company's loyalty to its clients. This makes Foxconn an attractive partnership for brand holders.

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[16] The 3C industry refers to the "computer, communications and consumer electronics" industry.

●　　Foxconn's Smiling Curve

Graph 7. Foxconn Smiling Curve (Component – Horizontal Integration B2B)
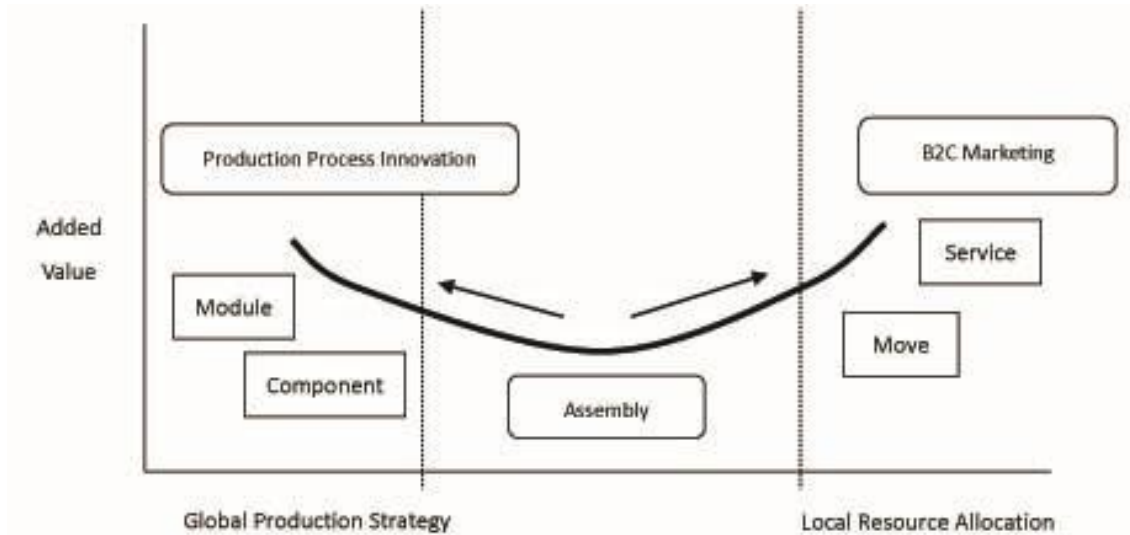
From the graph above, we can see that Foxconn's smiling curve resembles a grin. Foxconn's operations stretch from production process innovation on the left of the curve to B2C marketing on the right side of the curve. Although much of Foxconn's physical labor is dedicated to assembly, the most valuable operations are on both ends of the smiling curve. Reflecting on Foxconn's CMMS model, Component and Module belong to the company's R&D sector, while Move and Service are Foxconn's unique service and marketing abilities. Although Foxconn's operations do not create very high added value, the company makes up on total value with horizontal integration.

Section 3. HTC

5.3.1. Company Timeline

HTC was first established in 1997 by Cher Wang, H.T. Cho and Peter Chou as "High Tech Computer Company". Its original business field was in notebook computer production and personal digital assistant (PDA) development. The company first crossed over from being a domestic manufacturer to a global firm with the alliance with Microsoft. HTC's Windows CE license on its PDA products allowed it to compete with international manufacturers and to further develop the

PDA phone, the mother of smartphones. Through various strategic alliances and technological acquisitions, HTC formally became a branded phone maker in 2006. Its evolution and industry summary could be described in five different stages:

1. PDA development stage (1997-2001)

2. PDA phone stage (2001-2003)

3. Smartphone development stage (2002-2005)

4. Smartphone growth and self branding stage (2005-2006)

5. Smartphone competition stage (2007-present)

Table 3. HTC Growth Stages

Stage	Industry Focus	Mobile OS	Telecom	HTC
One	Notebooks, PDA	Palm, Symbian, Microsft	2G Voice	iPAQ, Leading PDA ODM
Two	PDA, PDA Phone	Microsoft, Palm	2.5G – 2.75G Voice	1st PDA phone
Three	PDA Phone, Smartphone	Microsoft, Symbian, Palm	2.5G – 2.75G Voice	1st smartphone
Four	Smartphone	Microsft, Symbian, Palm	2.75G – 3G Data	Branding, develop touch screen
Five	Smartphone, Tablet, Smart TV	Microsft, Symbian, iOS Android	3G Data – 4G Media	Launch Android phone

Source: This Study

1. PDA Development Stage (1997-2001)

In the late 1990s, the development of PDAs was popular in the industry. Market growth in these light handheld devices was optimistic. Palm was one of the largest players in the market. Eager to have a slice of the pie, Microsoft searched for a suitable manufacturing partner and finally decided on HTC.

In Stage One, Microsoft played an important role in HTC's development in the (ITC) information technology and communication industry. With Window's operating system license, HTC

PDAs could sync and download data through the computer, making HTC an attractive ODM for other brand holders. Through connections in Microsoft, HTC was also introduced to various telecom giants, facilitating HTC's future endeavors in ODM-operator projects. With endorsement from Microsoft, HTC later developed iPAQ, the world's first color screen PDA. This particular product enforced HTC's position as the leading PDA manufacturer. Not only was HTC developing PDAs, the company's vision in a powerful multi-functional communications device lead it to purchase long-term technology licenses with Texas Instruments, Microsoft and Qualcomm.

2. PDA Phone Stage (2001-2003)

Cell phones in early 2000s were dominated by the GSM 2G system. This system emphasizes on voice communication while featuring simple Internet services. Nokia, Siemens and Motorola were some of the largest phone makers in the world. However, although the cell phone was popular, voice communication usage dropped while demand for wireless data downloads increased. The trend call for future integration between telecommunication services with wireless network. In other terms, 'PDA phones' were the future.

In this stage of HTC's growth, telecom operators became important strategic partners. The telecom industry was in the key stage of transforming from 2G to 3G services. With experience in superior PDA production, HTC had technological advantage and R&D capability in the development of an integrated PDA phone. In order to commercialize this product, a strategic alliance between telecom service, software operator and product manufacturer is also essential due to R&D costs and technological difficulties. By 2002, HTC was able to customize products for several large telecom companies: O2, Orange, T-Mobile and Vodafone in the European market. These cooperation projects began HTC's future production model with other network operators.

3. Smartphone Development (2002-2005)

In 2002, HTC developed the world's first smartphone with O2, building a foundation for HTC to emerge as its own brand in the future. Although smartphones was still an unknown market, HTC invested heavily in acquisitions and technological improvement to compete with other larer corporations. The telecom industry was providing 2.5G and 2.75G services at the time. To prepare

for high speed 3G and 3.5G services, HTC acquired several software design companies and core IP holders. In 2004, HTC further purchased photo software and wireless equipment providers.

In this stage, HTC focused on ODM projects with its telecom alliances. HTC's Windows platform product has the advantage of attracting the majority of computer users due to similarities between Microsoft's PC and mobile platforms. This advantage allowed HTC to negotiate for co-branding rights. Therefore, HTC's operator-ODM products could be marketed with two names. In order to pave the way for future branding possibilities, HTC refused production orders from other branded phone makers.

4. Smartphone Growth and Self Branding (2005-2006)

By 2005, global telecom market has reached the 3G era. Mobile high speed internet was offered with 3G services. Mobile video streaming, mobile shopping and GPS became possible. The cell phone could be considered as a mini-computer. Smartphones also brought higher revenues for network operators from value added Internet services. Now, HTC's co-branding client list expanded from European carriers to include US and Japanese operators.

HTC's past co-branded products between 2002 and 2006 were successful, and the consumer market has come to associate the 'HTC' name with good product quality. On this basis, HTC officially announced itself as an independent smartphone brand in 2006.

5. Smartphone Competition (2007-Present)

iPhone's emergence in 2007 was the start of a new challenge for HTC. Industry competition shifted from product quality and technological advancement to OS popularization and content provision. As a counterattack, HTC launched HTC Diamond in 2008 on the Android platform. With Google Android, HTC no longer has to pay high licensing fees to Microsoft. Due to Android's open source nature, HTC could also design to market with OS restrictions. However, as other players enter the smartphone market, HTC is facing more and more challenges.

5.3.2. Business Model

HTC is a fast growing technology company that managed to establish its own brand within 10 years. Moreover, HTC continued its OEM operations even after launching its own branded

products. Another unique strategic move was the company's decision to move towards content provision instead of hardware innovation. HTC's business model can be discussed in three main directions.

- Continue OEM While Branding

HTC's announcement to go into branding caused uproar in 2006. The company originally enjoyed high margins from OEM orders from telecom companies and software providers. Branding would have meant the loss of steady production orders and taking on unknown risks. Not only was there dissent within the company, public speculation of HTC's future was also negative, causing HTC's stock prices to plunge from 1200 NTC to 390 NTD in 2007. However, HTC decided to take advantage of its technological advantage and enter the smartphone market in its growth stage. The strategy proved to be a correct one as HTC became top 5 in smartphone market share in 2010.

The launching of the HTC brand did not cause OEM production orders to decrease as expected. Before 2006, HTC's clients were mostly telecom operators or operating system players. The companies do not have production capabilities and commissioned HTC for customized products. After branding, HTC did not accept production orders for rival handset makers. Therefore, the impact on HTC's OEM department was not traumatic. Instead, constant interaction with downstream players in the smartphone supply chain kept HTC in the loop of the latest technology or regulation changes

- Integration by Acquisition

Like Acer, HTC also started as a small high technology company. However, HTC did not develop its own divisions, but acquired IPs and technologies through acquisition and licensing. The acquired companies were mostly core IP holders, software makers and Internet content providers. HTC's largest difference from its smartphone rivals is its size and youth. We can see the disparity by examining HTC's strongest Android competitor Samsung.

Samsung has a big cost advantage because of its vertical integration in the smartphone supply chain. It controls various key components and has well developed R&D, production and marketing divisions. Moreover, Samsung is financially powerful and is fully supported by the Korean

government. In order to compete with production giants such as Samsung, HTC acquired a different set of capabilities through investments. Also, as costs for electronic components drop, hardware specifications are no longer as important as before. Therefore, HTC decided to focus more on software and services.

- Building a Platform

HTC has slowly been moving towards cloud services. This could be seen in HTC's acquisition of companies such as CatchPlay and KKbox, which are online video and music providers. With HTC Sense, the company wants to create its own user interface and platform, similar to Apple's iTunes and App Store. Currently, HTC is only generating revenues from hardware sales. However once a successful platform is built, HTC could have an on going relationship with its users. This would be similar to Gillette's "razor and blade" model.

From the development of HTC's strategies, we can see that the company is striving in content provision services. Although HTC is a pioneer in many new technologies, it is gradually moving from hardware production to software development and product design.

In short, HTC's core business strategy could be characterized as such: 1. Integrate with information service providers and acquire IP holders through continuous buy-ins. 2. Enhance the user experience by moving gradually towards platform building. 3. Provide wholesome services to end users by creating value on the far right side of the smiling curve.

5.3.3. HTC Model Analysis

Compared to Acer and Foxconn, HTC is a relatively new company. Although HTC started as an OEM company, it soon achieved worldwide recognition as a top smartphone brand holder. Its ability to sustain friendly client relationships allowed HTC to transform itself from contract manufacturer to own-brand holder amicably. The company's core competence and value chain management is detailed below.

- Core Competence

Different from Acer and Foxconn who started as hardware manufacturers, HTC was established as a hardware/software integrator. As a brand holder, HTC's core competence is not in

product innovation as many would assume, but in hardware and software integration. HTC's unique capabilities gave the company higher bargaining power over its telecom and OS provider clients. Alliance between integrator and service provider was mutually beneficial. Therefore, instead of opposing HTC's branding decision, network operators and platform providers co-promoted HTC's products.

- Value Chain Management

Branding is a difficult issue for most OEM companies as such a move would put the manufacturer in direct competition with its clients. In the case of HTC, HTC's OEM clients were not traditional branded product owners. Therefore, HTC could work with its clients after branding and gradually phase out its OEM projects. HTC's former collaboration projects with major network operatiors and platform developers also gave HTC and advantage in managing business relationships.

Unlike Acer's product strategy, HTC now manages a lean, high-end product line. Although HTC had attempted to enter the market with a full product line that caters to all customers, it was no competition for larger, financially robust smartphone makers. Having successfully promoted its own brand, HTC is now investing in and acquiring content provision services and software IPs. The construction of its proprietary user interface, HTC Sense, also points out that the company is striving toward a service oriented business model.

● HTC's Smiling Curve

**Graph 8. HTC Smiling Curve (Hardware/Software Integrator – Service Oriented B2C)**
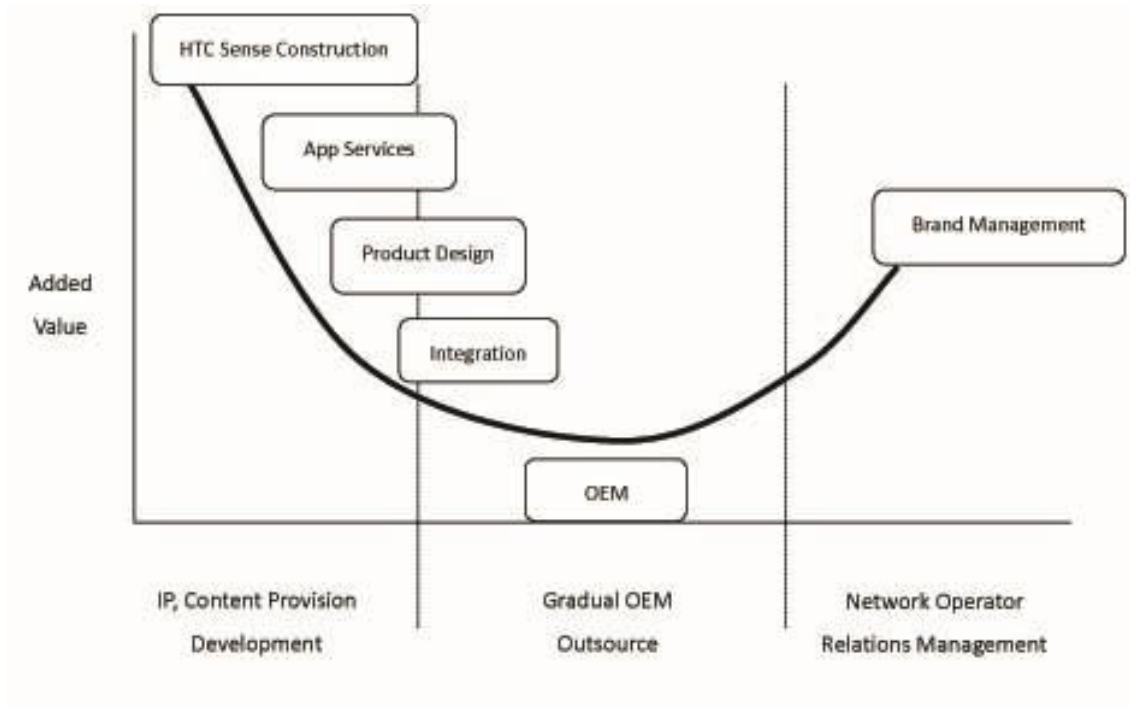
From the graph above, we can see that HTC's smiling curve tilts to the left. For HTC, product manufacturing operations is gradually outsourced to other companies, while HTC focuses on branding and heavy R&D. for mobile Internet products, content and user interface is increasingly important. End users continue to purchase content and access e-services through their mobile device. Therefore, with good content provision and platform services, HTC could continue to generate revenue after the sales of their product. From the graph we see that HTC is attempting to capture value on the high left end of the smiling curve. Although this strategy will not bring immediate revenues for HTC, the company is cultivating its future potential.

CHAPTER 6. CONCLUSIONS

Section 1.   MANAGERIAL IMPLICATIONS

The different sections of the digital device value chain could be characterized on the Industry Smiling Curve as drawn below. Here we see that OS platform and app development rank highest among different industry divisions. Brand management and product design are activities that belong to a branded company and have slightly less added value. Component supply, assembly and distribution have lower added value compared to other divisions.

Graph 9. Digital Devices Industry Smiling Curve
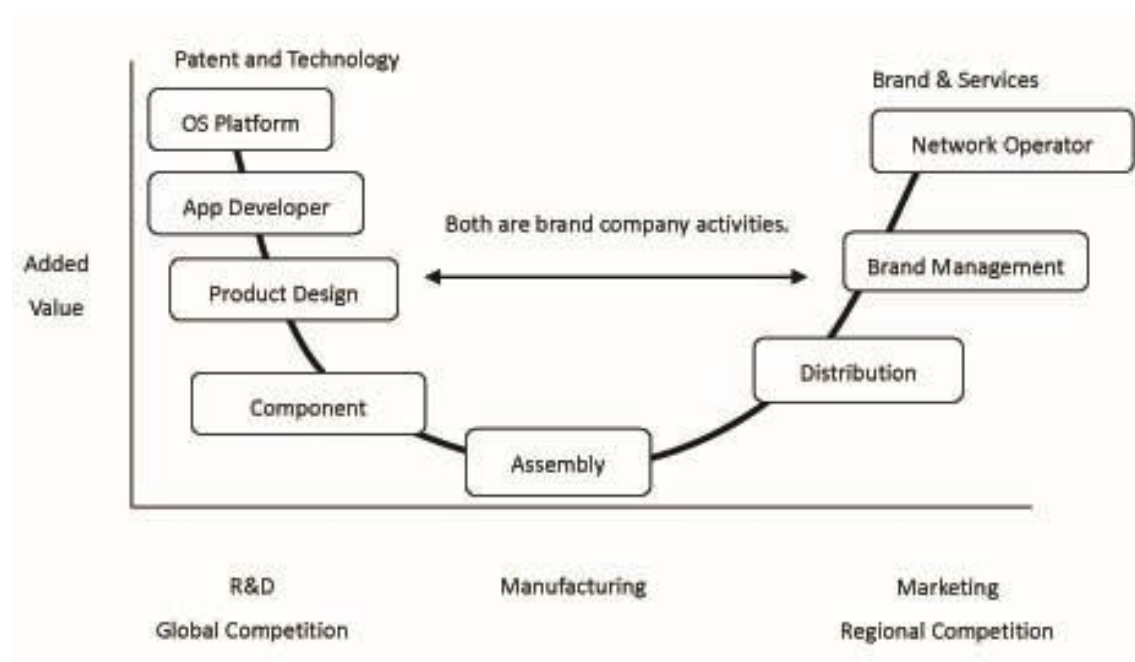
Source: This study

With insights from the case studies in the former chapter, we could also draw the relative positions of Acer, HTC and Foxconn on the Industry Smiling Curve. From this curve, we can draw the conclusion that Taiwanese electronic OEMs can develop in three different directions: 1. Product-Oriented B2C, 2. Horizontal Integration B2B, 3. Service-Oriented B2C. Each evolutionary direction also creates value on different sections of the Smiling Curve.

Graph 10. Acer, HTC and Foxconn's Positions on the Industry Smiling Curve
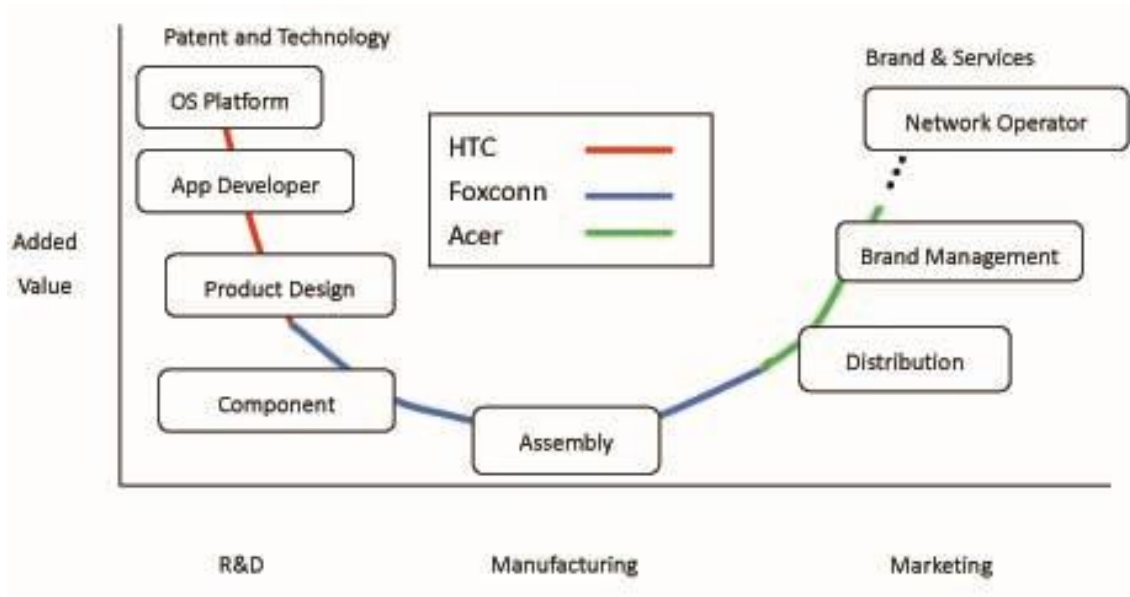
1.   **Product Oriented B2C**

● Characteristics

Product oriented B2Cs could be represented by Acer. Such companies target the good enough market. Large emerging economies often have large market demand for affordable products with acceptable value. By entering emerging economies early, companies have first mover advantage to build up brand reputation and cultivate a strong fan base. Besides emerging economies, there is also market demand for mid-low price electronic products designed for children or light-weight computing activities.

Product excellence in hardware is one of the most important characteristics for product oriented B2Cs. The products are generally very low priced with good product quality. Although product oriented B2Cs tend to have lower profit margin, these companies make up total value with market share.

● Criteria

➢ Low production cost – in order to keep sales price low, product oriented B2Cs need to be able to ensure low production cost. Therefore, such companies need very strong alliances with component suppliers and assemblers.

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> ➤ Good channel relations – mid to low priced products with heavy competition often
> rely on push strategy in channel marketing. With good channel relations,
> distributors are more willing to carry products of one company over another.

> ➤ Brand reputation –Makers of mid to low end devices rely particularly heavily on
> brand reputation and customer services. A well known brand appeals to mass
> market consumers while product reliability and kind services leave a good image
> in consumers' minds.

2.   **Horizontal Integration B2B**

● Characteristics

Horizontal integration B2Bs could be represented by Foxconn. Such companies target businesses and work "behind the scenes" of different brands. OEMs that choose to stay as a B2B company are not in direct competition with clients and are considered to be more loyal partners than OEMs with branding ambitions. However, when the OEM is developed into an extensively integrated company with superior manufacturing quality, the company could attract attention from end consumers. Much like Intel's "Intel Inside" marketing strategy, Foxconn is gradually gaining reputation from its "Foxconn Outside"[17] concept.

Service excellence in customer solutions is an important characteristic for horizontal integration B2Bs. Pure manufacturing and assembly are industry actions with very low added value. However, horizontal integration with smaller competitors and component suppliers allows the company to provide one-stop-shopping service to its clients. Thereby raising the company's value and bargaining power in the eyes of the branded client.

● Criteria

> ➤ Large company size – In lower value activities, it is important that companies
> grow large enough to compete in the market. In horizontal integration, companies
> could eliminate competition and have sufficient control over component supply.

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[17] Foxconn CEO Terry Guo first proposed the "Intel Inside, Foxconn Outside" concept on a shareholder meeting in 2005. During the conference, Guo mentioned that Foxconn would not develop consumer branding, but would strive to build reputation among end consumers as a superior components assembler and manufacturer.

➤ Manufacturing quality – although large company size could attract clients, it is also crucial that the company has high manufacturing quality.

➤ Process innovation – with size and production quality ensured, companies also need to be innovative with its production process and services. It is with unique services and superior production capability that companies could achieve higher corporate value.

3.   **Service Oriented B2C**

● Characteristics

Service oriented B2Cs are represented by HTC. Such companies target the high price market. Geographically speaking, North America, Europe and East Asia are some of its largest markets. High end product companies generally have a leaner product line with high priced, powerful machines. These companies often enjoy a higher profit margin with a smaller target group. In order to differentiate themselves in the electronic market, service oriented B2Cs focus more on software and content provision rather than the physical product.

Software and service excellence is a key characteristic for service oriented B2Cs. Although hardware quality is very important, innovations in software has even higher added value. Due to innovations in mobile internet and changes in consumer behavior, more value could be gained from digital device users. With superior software and content provision services, companies could continue to create revenue even after the selling of the digital device.

● Criteria

➤ Advanced R&D – research and development for service oriented B2Cs include not only technological implementations, but also innovations in consumer trend. By observing customer behavior, such companies could create products that the market did not know it needed.

➤ High quality marketing research – in order to develop better products and services, good marketing research is required. Moreover, high end products have a smaller market demand and therefore need more precise targeting.

> ➢ Strong IP protection – due to the amount of different technologies needed in the development process of a new product, IP protection is crucial. Only when intellectual property rights of a company is protected, can the company can truly create value for itself and the product user.

Table 4. Taiwanese Electronic OEM Development Directions

	Characteristics	Criteria
Product Oriented B2C	*Target good enough market *Product Excellence in hardware *Ex. Acer	*Low production cost *Good channel relations *Brand reputation
Horizontal Integration B2B	*Work behind the scenes *Service excellence in customer solutions *Ex. Foxconn	*Large company size *Good manufacturing quality *Process innovation
Service Oriented B2C	*Target premium market *Software and service excellence *Ex. HTC	*Advanced R&D *Advanced marketing research *Strong IP protection

Source: This study

Section 2. TAIWANESE INDUSTRY AND SOCIAL OUTLOOK

Electronic industry could be described as the backbone of Taiwan's economy. Shifts in the digital industry could bring changes to Taiwan's social and economic situation and vice versa. During the research into Taiwan's electronic OEMs, the following trends could also be discovered.

● Opportunities in Cloud Technology Devices

Digital devices are becoming more powerful, easier to use and cheaper to produce. It would be increasingly difficult to compete in the digital devices market. Fortunately, Taiwan has one of the best developed ICT industries in the world. With a strong foundation in PC development, it would not be hard for Taiwan to enter the cloud technology market through producing integrated cloud

devices. This is not to say that Taiwan's future is in pure manufacturing. The greatest impact of cloud services is the change in our way of life. Through different devices, one could create different experiences. Therefore, the development of cloud devices would include innovations in technology and lifestyles. Current government projects in cloud computing has been centered on data center hardware development. Also, Facebook's recent proposal to Taiwan's cloud computing firms is expected to bring about a new future for cloud computing processors.

- Mainland Chinese Market Advantage

As political and business relations between Taiwan and China improve, more and more Taiwanese businessmen are venturing into the Mainland Chinese market. Many companies that originated in Taiwan, such as HTC, are now claiming to be a "Chinese" company and treating the Mainland as their domestic market. This could bypass Taiwan's natural disadvantage of a small domestic market and allow Taiwanese companies to globalize much faster. It would be possible to conduct market testing and use Mainland China as a springboard to the global market. Taiwan's higher technology maturity could also lead China's digital industry. Such an arrangement would be beneficial to both sides of the Taiwan Strait and seem to be an inevitable industry development.

- Open Innovation

Open innovation points to joint innovation along the whole value chain. Future developments in electronics require heavy cooperation between software and hardware companies and various other technologies. Current industry atmosphere in Taiwan is still rather closed, with companies unwilling to share knowledge with each other. However, as open platforms are popularized, more players in the industry will be encouraged to compete and cooperate with each other. This would bring about lower technology development costs and higher quality innovations.

- Continued Encouragement of SMEs

Many have compared Taiwan's industry situation with that of Korea and suggested that the Taiwanese government support the forming of large enterprises in order to compete with international mega-brands. However the two countries do not seem comparable with each other. Korean industry is composed mainly of chaebols that are heavily supported by the government and

are "too big to fail". Although companies like Samsung and LG are currently enjoying success in the digital device market, the Korean model suffers from organizational inefficiency and resource monopoly, and is not beneficial to innovation in the long run. Healthy competition in the market is needed to invigorate the economy and inspire further innovation.

Taiwan has long been the role model for democracy, independent thinking and cultural diversity in East Asia. Many unique Taiwanese companies have succeeded globally based on these values. It would be most beneficial to the Taiwanese economy to continue encouragement of entrepreneurship as before.

Section 3.   RESEARCH LIMITATIONS

The findings of this study have three limitations. First, the cases used in this paper are limited to PC and handset OEMs. We might be able to apply the findings from this research to other Taiwanese electronic OEMs that specialize in products such as domestic electronics. However, the significance of the study would apply to similar manufacturers of digital devices, which is the current focus of the Taiwanese industry. Secondly, this research is mainly conducted using secondary data. Second hand information could give incorrect results due to incomplete collection of data or author bias. In order to avoid reporter prejudice or false results, information used in this research is cross-checked with various sources. Thirdly, there is rapid and constant change in the industry. For convenience of data collection and analysis, information is gathered as of early 2013. News reports and corporate data after April 2013 is not considered. Due to constant changes in the electronics industry, research is limited to general corporate movements and do not go into specified managerial actions of each firm such as leadership or marketing strategy.

Section 4.   FUTURE RESEARCH

There are two recommended research directions as follows. First, is to frame other industries in Taiwan with the Smiling Curve. Second is the possibility of studying whether other similar East Asian countries to adopt Taiwan's industry model.

Taiwanese OEMs are not limited to the electronic industry. Many traditional non-electronic industries in Taiwan are also facing extinction. Although the problems of traditional industries are different from electronic OEMs, both face low profit margins and substitution by foreign competitors. The logic of the Smiling Curve is already being applied to other Taiwanese industries. Therefore, an analysis of different evolutionary paths of traditional industries should be possible.

As mentioned above, many Taiwanese industries are being substituted by other East Asian competitors. Many emerging East Asian countries share similar characteristics with Taiwan had in the 1980s: low labor costs, attractive foreign investment policies and few resources. It would be interesting to see if Taiwan's successful industry development model could be replicated in other countries.

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