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Managing Electronic Manufacturing Service (EMS) – Terry Gou and the Making of Foxconn

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Abstract

To explain how Foxconn has become the global number one provider of electronic manufacturing service (EMS), this paper incorporates three main driving forces—entrepreneurship, strategic management, and leadership—to study how they contribute towards opportunity discovery, capability accumulation, and firm transformation. By dividing the growth path of Foxconn into four stages, including initiation, expansion, maturity, and diversification, we examine how at each stage these three driving forces help in the making of Foxconn. We conclude that high and fast growth is no guarantee for firm endurance. The limitation of expansion in the EMS industry and impending succession problem pose challenges for the longevity of Foxconn.

Keywords: *strategic management, dynamic capability, entrepreneurship, leadership, mergers and acquisitions, competitive advantage*

INTRODUCTION

The making of Foxconn Group (known as Hon Hai in Taiwan) is associated with the prevalence of electronics manufacturing service (EMS), which is used by firms that design, test, manufacture, distribute, and provide repair services for electronics components and assemblies for global brands of multinational corporations (MNCs) (Lüthje, 2002; Zhai et al., 2007). The progress of information, technology and communication allows MNCs to employ global supply chain to take advantage of each state or region's comparative advantage to add to their global competitiveness (Sturgeon and Kawakami, 2010; Baldwin, 2012). At the same time, global supply chain provides the opportunity for Asian emerging economies to integrate into the world production network by conducting original equipment manufacturing (OEM) (Hobday, 2001), one of the forms of EMS. Many small and medium sized enterprises (SMEs) in Taiwan have succeeded in collaborating with MNCs to improve their productivity and to benefit from fast growth (Krywulak and Kukushkin, 2009).

With a humble start at making plastic TV knobs in 1974, Foxconn transformed itself in the 1990s into producing connectors and entered the personal computer (PC) and notebook (NB) markets by manufacturing key components and assembling them for the world's leading brands, such as Dell, HP, Apple, and Intel. Through vertical integration and a series of mergers and acquisitions (M&A), Foxconn expanded its business to include communication and consumer electronics. The galloping growth of Foxconn manifested in parallel to its total revenues. In 1996, when Foxconn started using

China as a key production base, its total revenues were about US$0.5 billion and hit US$4.4 billion in 2001, and since then Foxconn has become Taiwan's largest private manufacturing corporation. In 2005, when total revenues leapt to US$28 billion, Foxconn overtook Flextronics to be the world's number one EMS corporation. By 2013, Foxconn had more than one million workers on its payroll and total revenues were close to US$132 billion (Foxconn Technology Group, 2014).

It is small wonder that Foxconn has gained a lot of limelight in the media, but there is a dearth of academic studies about the group. The extant studies of the entrepreneurial adventure of Foxconn are few and mostly focused on a few aspects, such as financial operations (Lin, 2003), strategic management (Chen, 2003; Wang, 2007; Folgo, 2008; Lee, 2011), technological upgrading (Chen, 2003; Chu, 2009; Lee, 2011), or the recent issue of suicidal jumps by factory workers in China (SACOM, 2010; Ngai and Chan, 2012). Three reasons stand out for the underrepresentation of case studies on Foxconn. The first is the lack of public information about Foxconn, due mainly to the low profile of Terry Gou, who insists that for the virtue of integrity, an OEM (or EMS) firm should commit to laboring behind the scene. Second, Foxconn has grown at an expeditious speed and changes so quickly that it is not very easy to grapple one issue without risking losing the whole picture at any one point. Third, managing a colossal corporation like Foxconn is a big challenge, and employing a single research approach only offers a partial view and fails to provide a complete perspective to show how it evolved into a huge global enterprise.

To study how Foxconn manages EMS and went through different transformations before transcending to becoming a global enterprise, this paper incorporates three driving forces that parallel the three major research fields dealing with firm value creation: entrepreneurship, strategic management, and leadership (Burns, 1978; Bass, 1985; Hitt et al., 2001; Baumol et al., 2007; Ketchen et al., 2007). By dividing Foxconn's growth path into four stages (initiation, expansion, maturity, and diversification), we analyze how opportunity was discovered, what capabilities were accumulated to secure short-term financial gains and to lay the foundation for long-term growth, and how leadership transforms the firm to a higher growth stage.

The rest of the paper is organized as follows. Section 2 discusses how Foxconn ascended to become the leading EMS corporation by illustrating the development of its unique business model, eCMMS, and how it provides sustained competitive advantages on the pathway of Foxconn's growth. Section 3 introduces three major research fields of driving forces of firm value creation, namely entrepreneurship, strategic management, and leadership and analyzes their interrelation to form the base for interpreting Foxconn's growth and transformation. Section 4 applies a four-stage growth model to examine each growth stage based on three inter-linked driving forces in order to illustrate how Foxconn grew and transformed from a small and medium enterprise to a global number one provider of EMS. Section 5 concludes.

THE ASCENDING ELECTRONICS MANUFACTURING SERVICE (EMS) OF FOXCONN

The growth of EMS firms is closely related to the global supply chain (GSC), which takes advantage of the global division of labor and allows goods and services to be traded in fragmented and internationally dispersed production (UNCTAD, 2013). GSC has become a phenomenon in the industrial production organization, particularly for the electronic manufacturing industry after WWII (Gereffi, 1994; Sturgeon and Kawakani, 2010). The actual activities undertaken by contract manufacturers of EMS firms differ across companies: Original Equipment Manufacturing (OEM) provides only production services, while Original Design Manufacturing (ODM) undertakes production as well design activities. Electronics manufacturing service refers to production services, comprising component purchasing, circuit board assembly, final assembly, and testing. Table 1 presents variant definitions of contract manufacturing with the nuance of differences. Foxconn, as advocated in Foxconn (2014), has turned to a leading EMS and its competitive advantages are mainly ascribed to its own-developed eCMMS business model, which emphasizes itself as a service company rather than

Table 1: Different EMS Business Models

Type	Description
OEM	Original equipment manufacturing: a firm that serves as a contractor for MNCs and stamps MNCs' brand names on the products.
ODM	Original design manufacturing: a firm that designs and builds products using the brand name of its MNC customers; also called contract design manufacturing (CDM).
OBM	Own brand manufacturing: a firm that sells its own brand name and does so through its own distribution channel.
JDSM	Join DeSign Manufacturing.
JDVM	Join DeVelopment Manufacturing.
EMS	Electronics manufacturing service: a firm that offers electronics- related product manufacturing and relevant comprehensive services for OEM or OBM customers.
CEM	Contract electronics manufacturing: one category of EMS firms that concentrates more on production.
eCMMS	e-enabled components, modules, moves and services: a term created by Foxconn to define a vertical-integrated one-stop-shopping business model that covers solutions ranging from molding, tooling, mechanical parts, components, modules, system assembly, design, manufacturing, maintenance, logistics, etc.

Note: Data sources are from Zhai et al. (2007) and Foxconn (2014).

a manufacturing concern, as analyzed by Chang (2008, in Chinese).

eCMMS Business Model

The secret of Foxconn's speedy growth lies in its business model, eCMMS, and its building process illustrates the competitive strategies that Foxconn has created throughout its development (Chang, 2008). It started from C (component), added the first M (module) and another M (move), and then ended with S (service). The beginning letter "e" represents the usage of communication technology (Internet) to enhance the efficiency that CMMS creates (Chang, 2008; Foxconn, 2014). The development of the eCMMS business model took place in a sequential process and is mixed with a series of mergers and acquisitions (M&A) on the pathway to establish its vertical and horizontal integration. Most vertical integration starts with backward directions, but Foxconn chose the path less taken, i.e. forward vertical integration, which integrates toward the downstream and is easy to provoke an anomaly with downstream customers.

Starting up as a plastic component provider specializing in connector and cable production (manufacturing a range of products from peripherals such as serial and power connectors and cables to precision CPU/memory sockets) in the 1970s, Foxconn became the top provider of cables and connectors ("Components") to the global PC industry in the 1980s. Foxconn then continued its strategy of concentrating on labor-intensive production and tapped into PC enclosure production. The "Module" stage was reached when Foxconn combined the enclosures, connectors, cables, and power system it produced to provide subsystems to its OEM customers in the 1990s. After accumulating intensive manufacturing knowledge and achieving global expansion during the labor-intensive production period, Foxconn's outstanding manufacturing capabilities enabled it to further expand along the production chain, particularly acquiring printed circuit board (PCB) production through mergers and acquisitions (M&A) and being able to integrate bare-bone systems (a partially built PC, which contains a case, power supply, and motherboard) and subsystems. Foxconn achieved the "Move" stage through moving along the production chain and finally became a full PC system integrator for world-class OEM customers. "Move" also means the ability to reconfigure organization skills and resources to match the changing environment, such as changing the production lines of PCs into notebooks, mobile devices, and consumer electronics (Chang, 2008).

CMM indicates the evolution of Foxconn's production capability. "e" and "S" are added in the later phase in order to emphasize the group's service capability. By utilizing its intensive knowledge of production methods, Foxconn began by merely

Table 2: Major M&A by Foxconn

Year	Firm	Key Product	Main Purpose
1998	GEM Top Component Inc.	Connector	Taking over the orders of Elite Group.
1998	Shamrock Technology	LCD monitor	Vertical integration.
1999	Pan-International	Connector, system assembly	Vertical integration.
2003	Eimo Oyj	Handset shell	Acquiring the orders from Nokia.
2003	Motorola Chihuahua, Mexico Plant	Handset	Handset eCMMS vertical integration.
2003	Omni Switch Inc.	PC chassis	Acquiring orders from Compaq.
2004	Ambit Microsystem	Internet peripherals	Acquiring orders from Cisco.
2004	Thomson	CD-Rom reader & driver	Acquiring orders from HP, Dell, Sony, and Microsoft.
2005	Chi Mei Communication	RF, Handset JDSM/JDVM	Achieving the world's largest handset manufacturing service provider.
2006	Premier Image Technology Corp.	Digital still camera (DSC)	Mechanical-Electrical-Optical integration enforcement.
2007	Jemitek Electronics	TFT-LCD	Vertical integration
2008	Sanmina-SCI	Optical & RF microwave, Interconnect server	Acquiring the orders from IBM and Dell.
2009	METRO Group	3C distribution	To provide a distribution channel service for IT customers.
2009	TPO Displays	TFT-LCD	Vertical integration.
2009	Chi Mei Optoelectronics	TFT-LCD	Vertical integration - to be the world's biggest display firm.
2012	Sakai Display Product	LCD	Vertical integration - Acquiring TV orders for above 60" panels.
2012	Sharp	LCD	Vertical integration - to penetrate the TV market and China's mobile phone market.

Note: Date sources are from Chang (2008) and Foxconn (2014).

providing suggestions to its customers and then evolved into product designs and developments (such as JDSM and JDVM, as shown in Table 1) where it collaborated with them on the actual details. The advent of Internet has allowed Foxconn to leverage its global network by synchronizing the design houses around the world to fully exploit the 24-hour working day ("e") (Chang, 2008). The unique integration capability of eCMMS, which interlocks an array of activities such as component design and production, bare-bone production, final assembly, and after-sale services, creates a capability that is hard for rivals to match.

Sustained Competitive Advantages – Better Quality, Faster Delivery, and Cheaper Price

The success of Foxconn hinges upon its development of the eCMMS business model. To solidify its vertical integration and later its horizontal diversification, Foxconn conducted many mergers and acquisitions (M&A). In 1996, Foxconn showed its intent to step into the PC business by establishing a PC business department, initiating a series of M&A (see Table 2 for the major M&A activities). Foxconn (2014) claimed that eCMMS is a vertical integrated one-stop shopping business model as it integrates mechanical, electrical, and optical capabilities altogether and covers solutions ranging from molding, tooling, mechanical parts, components, modules, system assembly, design, manufacturing, maintenance, logistics, etc. As Chang (2008) argued, the eCMMS business model creates an unrivalled competitive advantage by providing customers with better quality, faster delivery, and a cheaper price, which manifest chiefly in three factors: competitive pricing strategies, dominance in key components, and effective patent management.

A. Competitive pricing strategies: How does

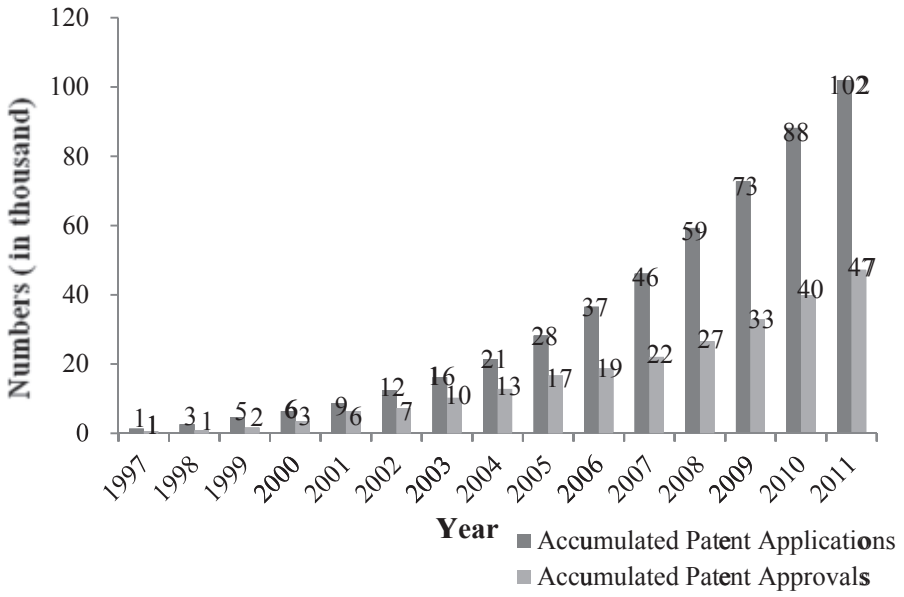

Figure 1: Accumulated Patent Applications and Approvals of Foxconn

Data source: Foxconn Technology Corporation (2012).

Foxconn provide competitive prices? Three elements, if not more, bear noting. First, by arbitraging geographic cost discrepancies, Foxconn has successfully initiated economies of scale and global deployment, which allow it to have prices much lower than its competitors (Ghemawat, 2007). The majority (90%) of Foxconn's manufacturing capacity is located in low-cost countries, particularly in China (Venture Outsource, 2007). Second, Terry Gou deliberately chooses to enter markets late, mounting a rapid frontal assault by undercutting market prices. As Foxconn got bigger, it boded well for waiting until the demand in the market turned big enough before utilizing its large-scale production advantage. Third, an integrated eCMMS business model allows Foxconn to leverage its pricing strategy to outcompete rivals. For instance, with strength in molding skills, the margins on the components it provides for its customers' machines are extremely high, and thus Foxconn can charge low or even negative margins for the final assembly work (Balfour and Culpan, 2010).

B. Dominance in producing key components: The keystone of Foxconn's empire is closely associated with its molding skills in producing components. Take connectors as an example. Like a computer's nerves sending signals around the machine, connectors must be highly precise, and molds are the key to achieving precision in the manufacturing process. Terry Gou, who got his start by making plastic injection molds, purchased equipment from Japan and threw himself into the development of new molds and learned to secure benefits from technologies by filing international patents. In fact, Foxconn now owns more than 8,000 patents just for connectors (Hsu, 2008). When the personal computer industry took off in the early 1990s and drove demand for parts and components, with the high molding skills Terry Gou was able to dominate its commanding-high position in producing PC connectors. The superior dominance in connectors established the core competence for launching Foxconn's EMS enterprise, and provided the foundation that facilitated its vertical integration (Chang, 2008).

C. Effective patent management: The emphasis on patent management stemmed from 1992 when the U.S. PC connector manufacturer AMP filed a lawsuit against Foxconn for patent infringement and asked the U.S. government to cease imports of Foxconn's connectors. After the bitter lesson from AMP, Foxconn has developed a large amount of patents annually and took the number one spot in 2003 as the firm with the most patents in Taiwan

(Chang, 2008). Figure 1 shows Foxconn's accumulated patent applications and approvals since 1997 (Foxconn Technology Group, 2012). Strong patent management not only helps avoid costly errors and reduce the failure of M&As, but also renders firms to realize value from the technological assets they acquired (Wang, 2007). By 2010, Foxconn's legal department grew to 400 employees and held over 20,000 patents around the world. Foxconn has established a system of Intellectual Capital Management and Analysis (ICM&A) to effectively manage the group's intellectual property through monitoring developments and changes in global electronic products, technologies, and patents (Global Views Monthly, 2011).

The eCMMS business model has been touted as the essential reason for the success of Foxconn (Chang, 2008; Hsu, 2008; Foxconn, 2014). The development of the eCMMS business model took place in a sequential process and evolved with the advances of information and communication technology. In parallel to the creation of the eCMMS business model, there are driving forces of firm's value creation. By incorporating three main research fields of firm value creation, namely entrepreneurship, strategic management, and leadership, we establish an analytical framework to explain the growth pathway of Foxconn by using a four-stage growth model. Within each of the four stages—initiation, expansion, maturity, and diversification—we analyze how Foxceonn discovers opportunity, creates competitive advantages, and transforms into a bigger enterprise.

DRIVING FORCES OF FIRM VALUE CREATION: ENTREPRENEURSHIP, STRATEGIC MANAGEMENT, AND LEADERSHIP

In this paper we draw upon three major research fields- entrepreneurship, strategic management, and leadership—that all share a similar purpose in order to study firm value creation, although each one stresses something differently (Kirzner, 1973; Hitt et al., 2001; Ketchen et al., 2007). Entrepreneurship focuses on opportunity discovery and new venture creation (firm formation), strategic management seeks for growing an existing firm by creating a competitive advantage (firm growth), and leadership is about change and therefore emphasizes how to transcend the firm to get bigger or to go global (firm transformation). In short, these three research fields offer three different stages on firm study: firm formation, firm growth, and firm transformation. As the evolution of a firm is a dynamic and complex process, it is not unusual to encounter one research field that integrates the concepts from the other two fields while interpreting the formation, growth, or transformation of the firm. As a result, there are researches of incorporating two of the research fields, such as strategic entrepreneurship (Kuratko and Audretsch, 2009), strategic leadership (Rowe, 2001), and entrepreneurial leadership (Gupta et al., 2004), or synthesizing three research fields (Teece, 2007, 2014; Yan et al., 2014).

Concepts and Linkages of Entrepreneurship, Strategic Management and Leadership

While entrepreneurship, strategic management, and leadership are all essential driving forces for firm performance, each varies on their focus. There has been a surging trend of incorporating and the cross-pollinating different fields of research enrich our understanding of how to improve firm performance.

Entrepreneurship: Entrepreneurship starts from opportunity discovery, or what Kirzner (1973) noted as "alertness to hitherto undiscovered opportunity." Alvarez and Barney (2007) proposed two types of behavior on opportunity: opportunity discovery and opportunity creation. The former involves the possibility of putting resources to better use or discovering new solutions or new needs, or doing things right. For the latter, opportunity creation is connected with true uncertainty, in which entrepreneurs engage in a learning process marked by a gradual investment of resources and attempt to persuade others to change their vague and unformed aspirations into tangible products or services, or new markets, or in selecting the right things to do. In parallel to dividing opportunity into two types, depending upon the types of entrepreneurial opportunity, entrepreneurial behavior can be divided into repetitive (or imitative) entrepreneurship and innovative entrepreneurship (Yu,

2001; Baumol et al., 2007). Apart from the newly created firm, an existing firm also needs entrepreneurial discovery or creation to survive and to grow, as corporate entrepreneurship tends to predicate (Colvin and Miles, 1999; Ireland et al., 2009).

Capability accumulation: The field of strategic management has contributed towards studying how an existing firm grows by creating its competitive advantages (Porter, 1990). A firm's competitive advantages depend on whether it is able to create a bundle of rare, valuable, and non-substitutable resources, as argued by the resource-based view (RBV) (Barney, 1991; Peteraf, 1993). Teece et al. (1997) emphasized that capability is the essence of RBV. Lee and Teece (2013) further stipulated that there are two types of capabilities: ordinary capability and dynamic capability. Ordinary capabilities involve operations, administration, and governance, which are rooted more firmly in routines, like a repeated action sequence, and help a firm to perform basic business functions with efficiency. In contrast, dynamic capabilities are higher-level competences that determine a firm's ability to integrate, build, and reconfigure internal and external resources/competences in order to address and shape changing business environments (Teece et al., 1997). Ordinary capabilities are about doing things right and help generate stable cash flows, while dynamic capabilities are about selecting the right things to do and help determine whether the firm can endure longevity (Lee and Teece, 2013).

Leadership: The study of leadership has a long history, and like that for entrepreneurship, definitions vary depending upon the situation (Yukl, 1989; House and Aditya, 1997). The literature has mostly discussed two disparate types of leadership: transactional leadership and transformational leadership (Burns, 1978; Bass, 1985, 1990; Vera and Crossan, 2004; Jansen et al., 2009). Transactional leaders provide stable, risk-averse leadership in exchange for followers' efforts and performances, and therefore they generate stable profits (Howell and Avolio, 1993). In contrast to transactional leaders who are less willing to go beyond their job responsiveness to try out innovative ideas for the organization's benefit, transformational leaders exhibit charisma, provide inspirational motivation and intellectual stimulation for followers in the organization, and thus create a vision for the future that is meaningful and challenging (Bass, 1990; Avolio, 1999; Mariano et al., 2014).

It is common to find that each of these three research fields link each other to study firm performance. Strategic entrepreneurship, which integrates both entrepreneurship and strategic management —the former emphasizes opportunity-seeking, while the latter stresses the importance of advantage-seeking—merits sustainable growth for a firm (Ireland and Hitt, 1999; Ireland et al., 2003; Kuratko and Audretsch, 2009). Linking strategic management with leadership to emphasize that a firm that only cares about any short-term gain without considering and preparing for long-term challenges will ultimately not survive, Rowe (2001) and Vera and Crossan (2004) stipulated the strategic leadership. This is in line with what Tushman and O'Reilly (1996) and O'Reilly and Tushman (2008) argued that an ambidextrous strategic leader considers both exploitation and exploration, or both the long-term viability and the short-term financial stability of the organization. The other linkage between entrepreneurship and leadership, entrepreneurial leadership, contains characteristics of both entrepreneurship, which stresses opportunity discovery, and leadership, which requires change making. An entrepreneurial leader is one who creates an entrepreneurial vision and has the ability to encourage or motivate others to create value through opportunity as well as advantage seeking while functioning within the paradigm of innovativeness, pro-activeness, and risk-taking (Covin and Slevin, 2002; Gupta et al., 2004; Wang et al., 2012).

Conceptual Framework of Analysis

Two features bear noting from the above discussion on the three key driving forces of firm value creation. First, there is a common thread for these three research fields that distinguishes the organizational goals through both short-term gain and long-term viability. The former is about routine, certainty, and efficiency. Imitative entrepreneurship, ordinary capability, and transactional leadership are related to short-term exploitation of resources in a profit producing way. The latter is about experiment, innovation, and change. Innovative

Table 3: Common Threads of Research among Entrepreneurship, Strategic Management, and Leadership

	Efficiency (do the thing right) Short-term gain	Change (do the right thing) Long-term success
Entrepreneurship	Repetitive entrepreneurship Exploitative entrepreneurship Opportunity discovery	Innovative entrepreneurship Explorative entrepreneurship Opportunity creation
Strategic management	Ordinary capabilities Low-level routine (operation, administration, and governance)	Dynamic capabilities High-level routine (routines to learn new routines)
Leadership	Transactional leadership: (provide stable, risk-averse leadership in exchange for followers' dedication)	Transformational leadership: (provide inspirational motivation and intellectual stimulation for followers)

Note: Summarized by the author.

entrepreneurship, dynamic capability, and transformational leadership are related to long-term exploration of resources to explore for new technologies and markets. Table 3 lists a summary of these three research fields with their respective terminology associated with a short-term or long-term focus. Second, while these three research fields propound that a firm's sustained competitive advantages hinge upon whether both short-term gains and long-term viability are simultaneously considered, it is important to incorporate different research fields to enhance our understanding for how a firm can create its competitive advantages and transcend to a global enterprise.

Based on these two observations, we propose to analyze the growth and transformation path of Foxconn by incorporating entrepreneurship, strategic management, and leadership to study how Foxconn creates sustained competitive advantages. The orientation of the analysis proceeds as follows. The initiation of a new venture can result from imitative entrepreneurship or innovation entrepreneurship. Leadership in the early stage of the new venture creation may be more transactional-oriented, particularly if it starts as imitative entrepreneurship. Once the opportunity has been discovered or created, in order to exploit the profitable opportunity, strategic management is instrumental. Operating with efficiency may be a necessary condition to determine whether a firm will survive, but it is not sufficient to guarantee its long-term success. If the firm can keep growing with sustained competitive advantages, it needs to configure and reconfigure its resources to capture existing and new opportunities. Capability accumulation is important to enable entrepreneurial leaders to have a broader band of radar to detect new opportunities. Since successful firms easily fall prey to path-dependence, or the "success trap," transformational leadership plays an important role to determine whether the firm will rise up to a higher stage. In order to sustain profitable growth, transformational leadership is essential. Notwithstanding this, an entrepreneurial leader with the support of accumulated capabilities will find it easier to recombine and to reconfigure assets and organizational structures as the enterprise grows and as markets and technologies change.

ANALYZING THE GROWTH STAGE OF FOXCONN: OPPORTUNITY DISCOVERY, CAPABILITY ACCUMULATION, AND FIRM TRANSFORMATION

Using the analytical framework of entrepreneurship-strategy-leadership cum ambidexterity developed in section 3, we analyze how Foxconn discovers opportunities, creates competitive advantages, and transcends up to a high growth level by investigating its history through a life-cycle model. Following Hanks et al. (1993), we divide the growth path of Foxconn into four stages: initiation stage (1974-1983), expansion stage (1984-1995), maturity stage (1996-2004), and diversification stage (2005-2013). See Table 4 for the selected critical events of the group's growth path, with its annual total reve-

Table 4: Major Events in the Growth Stage of Foxconn

Stage	Major Events
Initiation Stage (1974 – 1984)	1974 Hon Hai Plastic Material Corporation was founded (producing TV turning knob). 1975 Changed corporate name to Hon-Hai Industrial Corporation. 1978 Established the department of plastic mold fabrication and development. 1980 Produced components of household electronic products and established chemical plating department. 1982 Changed corporate name to Hon Hai Precision Industrial Corporation. 1983 Successfully developed PC connector and entered into the computer industry.
Expansion Stage (1985 – 1995)	1985 Created brand name: Foxconn and U.S.A. branch established. 1988 Total revenue over NT$1 billion; Shenzhen factory established. 1991 IPO in Taiwan Stock Exchange. 1992 AMP sued Foxconn for patent infringement. 1993 Kunsan factory established. 1994 R&D center established in Japan and the U.S.A.; established legal department (dealing with patent issue). 1995 Total revenue over NT$10 billion.
Maturity Stage (1996 – 2004)	1996 Enclosure division established; entered barebone business. 1997 Set up heat transfer product business office; established electro-plating technique development department; established Material Testing Center. 1998 Factory in Scotland was established; Established High-Speed Electrical Test Lab, EMI/RFI Lab, and Heat Transfer Lab. 1999 Entered the whole computer assembly; Ireland and U.S.A. factories established; capital first raised from the international finance market via GDR. 2000 Czech factory established; established optical communication division; invested in Foxconn Optical Technology Inc.; entered into OEM for mobile phones. 2001 Became the largest private manufacturing enterprise in Taiwan; OEM manufacturing for Intel Pentium 4 CPU Stocket478. 2002 Czech factory started production; entered motherboard and distribution (channel) industry; became the largest exporter in greater China.
Diversification Stage (2005 - 2013)	2005 Became world No. 1 EMS firm; overseas subsidiary, Foxconn International Holdings Ltd., was listed in Hong Kong; selected as the largest enterprise in Taiwan by CommonWealth. 2007 Started building factories in Brazil, Vietnam, and India. 2009 Recognized as one of Asia's Fabulous 50 of Asia by *Forbes*. 2011 Ranked 60th among Fortune Global 500 by *Fortune*. 2012 Announced to invest US$494 million in the construction of 5 factories in Brazil. 2013 Ranked first among Taiwan enterprises according to the evaluation of Taiwan Ratings for eight consecutive years.

Data source: Foxconn (2014).

nue illustrated by Figure 2.

Initiation stage (1974-1984)

In 1974, Terry Gou started making channel-changing knobs for black-and-white televisions. With the added value of plastic parts less than US$20,000 (NT$520,000), Terry Gou's initial adventure was nothing innovative, although he was eager to expand his business (Hsu, 2008). While seeking to improve the quality of TV knobs, Terry Gou found that the molding procedure was inefficient and could be enhanced. Discarding the traditional molding process, which was usually conducted through tutor-apprentice impartation, Terry Gou built his own factory with a standard operation procedure for molding in 1978 (Hsu, 2008). This transformation helped his young firm to establish great precision in molding and created high-end manufacturing ability. Two years later, based on the molding skill, Terry Gou seized the opportunity to develop game connectors and then PC connectors (Chang, 2008).

Opportunity discovery: While working as a clerk, sitting in his office to deal with the paperwork

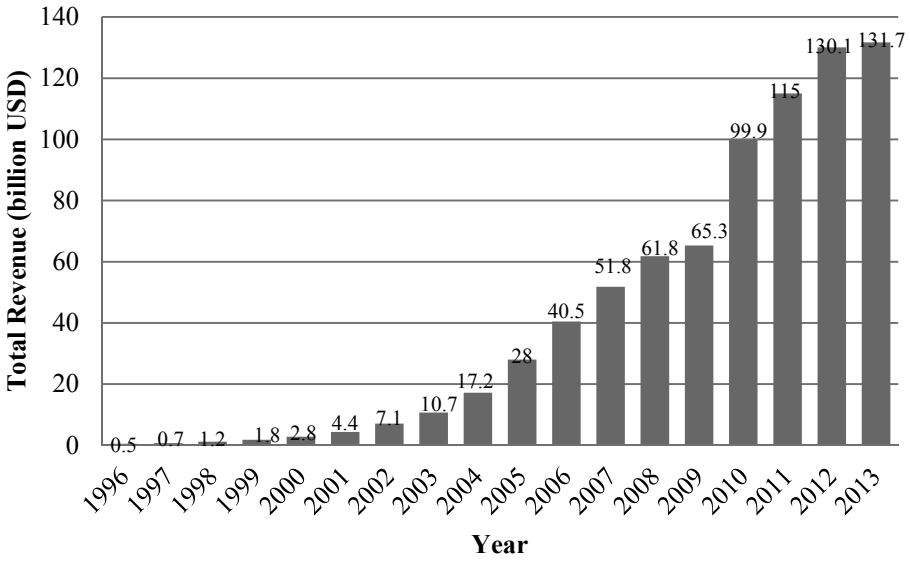

Figure 2: Total Revenues of Foxconn

Data source: Foxconn Technology Corporation (2014).

of an import-export firm, Terry Gou observed that manufacturing is the foundation for industry development. He thus jumped in to get his hands wet by creating his own company. Terry Gou did not find any superb opportunity when he started his own business, yet he tried to find more opportunities inside the business. The improvement of the molding process opened up bigger opportunities for Foxconn. Due to the high precision of its mold manufacturing, Foxconn held a competitive advantage for producing high-quality connectors for IT companies and soon won their trust. The popularity of video games in 1981 and the first PC launched by IBM that same year helped Foxconn earn a great deal of revenue.

Capability accumulation: Apart from accumulating the molding skills by redesigning the production procedure, Terry Gou purchased advanced equipment from Japan to upgrade Foxconn's subcontracting capability and to enable Foxconn to link up with global IT firms. As a result, Foxconn was able to initiate 2,600 pieces of connector production in 1980 for Atari, a provider of video games. With the prevalence of the PC, Foxconn's capability to produce computer connectors helped it enter into the PC business. While profits increased, he doubled up his investments by importing high-tech machines from Japan and the U.S. to improve productivity.

Transformation: Leadership is important for vision creation and firm transformation. Unlike other corporations, which indulged in short-term gains by working with easy-going OEM contractors, Terry Gou sought out long-term growth. With the expansion of PC connectors, Terry Gou figured that working with the elite customers of top global leaders is the best way for Foxconn to learn and accumulate its capabilities to transform to the top level as well. Supplying Atari with connectors that linked the joystick cable to its 2600 video-game console was Terry Gou's first breakthrough in transforming Foxconn. Apart from improving production and uplifting technology, Terry Gou also paid attention to marketing and in the early 1980s stationed himself in the U.S. and visited 32 states within 11 months. In one instance, he booked himself into a motel close to an IBM facility in Raleigh, North Carolina. Being a small potato at that time, Terry Gou was ignored, but with his perseverance and persuasion he finally acquired a PC connector order from IBM (Balfour and Culpan, 2010).

Expansion Stage (1985-1995)

In 1985, the brand Foxconn was launched, and total revenues surpassed NT$1 billion (US$33 million) in 1988. Terry Gou envisioned that in order to ex-

pand Foxconn's production capacity, tapping China's abundant and low-wage labor pool would be necessary and started to set up a production factory in Shenzhen. Going public in Taiwan's stock market in 1991 helped the firm escape from having a shortage of capital, and Foxconn stepped up its investment in China. In 1992, AMP filed a lawsuit for the infringement of intellectual property rights of its connectors, making this the first big crisis that Terry Gou encountered. This incident goaded him to establish a legal department to manage patents. In 10 years, total revenue increased 10 times up to NT$10 billion by 1995. Along with this quick expansion, Foxconn started reshaping its organizational management and business operation system.

Opportunity creation: With rapid growth in producing PC connectors, Foxconn obtained a large market share from global IT firms and began to squeeze incumbents' market shares, provoking enmity. In 1992, the U.S. PC connector manufacturer AMP filed a lawsuit against Foxconn for patent infringement. During the lawsuit, Foxconn started analyzing patents and changed the design in the portion of the connector involved in the lawsuit. The new design (using a plastic locking button to replace the metal one) was released and replaced the original model at a cheaper cost. Foxconn reacquired the market share (Chang, 2008).

Capability accumulation: Upgrading the organizational management of Foxconn to improve efficiency became the main task at this stage. Taking advantage of doing business with global IT firms, Terry Gou learned from the top managers of foreign firms' branches in Taiwan, such as Texas Instruments, Dell, and Phillips, about their business models and operation systems. At the same time, Foxconn started adopting the 5S (Sort, Set in order, Shine, Standardize, and Sustain) management system, which aims to eliminate unnecessary items from the workplace, improve order and tidiness (making sure everything has a home), and maintain a clean workplace, ensuring that a workable system is in place and that improvements are sustained (Gapp et al., 2008). Witnessing the significant effects in improving manufacturing performance, Foxconn also implanted the "Just in Time" (JIT) production model from the automobile industry in Japan (Gunasekaran and Lyu, 1997).

Transformation: As Taiwan's labor market tightened along with rising wages since the 1980s, local manufacturers started moving abroad. Terry Gou presaged the opportunity in China and set up shop in a dusty suburb of Shenzhen across the border from Hong Kong in 1988. With the fast expansion of Foxconn, Terry Gou started paying attention to educate employees in order to upgrade their ability to keep up with the fast growth pace of the firm. Foxconn spent about US$274,000, or about 1.67% of total sales, as a training budget to send employees to be trained abroad in 1987 (Chang, 2008). Terry Gou encouraged employees to practice learning-by-doing and educated employees that the philosophy of success can be simplified with four stages: imitation, research, creation, and innovation (Chang, 2008). Through imitation, learning, and in-house R&D to accumulate its capabilities, Foxconn implanted a continuous learning mechanism to uplift toward a higher growth stage.

Maturity Stage (1996-2004)

In 1996, the Lunghwa factory in Shenzhen started operations. Foxconn employed the methods of the specialization of labor and the diversification of production lines in various factory compounds, mainly in the Pearl River Delta in the south and the Yangzi River Delta in the east, where local governments such as Shenzhen, Shanghai, and Kunsan provided businesses with preferential tax policies, land and industrial infrastructure, and a substantial supply of labor. Foxconn devoured almost all the EMS business from the largest global brands. Total revenue grew from US$0.5 billion in 1996 to US$1.2 billion in 1998, and then jumped to US$17.2 billion in 2004 (see Figure 1). During this stage, Foxconn not only completed its vertical integration of the PC sector by entering the upstream to provide Intel-branded motherboards and the downstream to produce chasses and sub-systems, but also started its horizontal integration by extending its business to communications equipment and consumer electronics. In 2002, Terry Gou was crowned "the King of Outsourcing" (Business Week, 2002).

Opportunity creation: In 1995, in order to obtain chassis orders for the desktop computers of Compaq (later purchased by HP in 2001), Terry

Gou demonstrated another daunting endeavor. By leading the purchasing manager of Compaq to survey the farmland in Lunghwa of Shenzhen, where the campus of Foxconn in southern China would be located, Terry Gou introduced the would-be production program to the manager, although Foxconn at that time only had experience in PC connector production. With Terry Gou's aggressive attitude, Foxconn acquired the PC chassis orders from Compaq (CommonWealth, 2007). At the same time, contracting six Taiwanese firms to produce parts of the order initially, Terry Gou relentlessly imitated, learned, and researched the production lines of the PC chassis of these firms, and then constructed his own production lines in the Lunghwa factory. After half a year, Foxconn started to produce the product to finish the rest of the order in 1996 (CommonWealth, 2007). The success from working with Compaq soon led to business deals with IBM, HP, and Apple.

Capability accumulation: Foxconn launched a series of M&A in order to obtain technologies for completing vertical integration and horizontal diversification (see Table 3). For instance, Foxconn bought Motorola's Chihuahua Mexico plant to initiate vertical integration for handsets in 2003. In order to take over Nokia's handset shell casing orders, Foxconn purchased Eimo Oyj; similarly, in order to acquire orders from Cisco, in 2004 Foxconn purchased Ambit Microsystem, a local-listed Taiwanese firm. Furthermore, with the growing number of employees on the production lines, Foxconn started establishing its factory management in order to maintain strong employee morale and discipline. Foxconn had 9,000 employees in 1996 and by 2004 had increased to 168,000 (Foxconn Technology Group, 2011). With strict work requests, rest control, frequent spiritual education, and demanding work performance requests of employees, Foxconn enabled its manufacturing centers in China to maintain stable production (Ngai and Chan, 2012).

Transformation: Terry Gou, well-known for his execution ability, carries out an authoritative leadership and "militarized administration," practicing militarized training with employees so as to constitute an obedient work culture (Cheng and Wang, 2009). Execution capability is one of the features of transactional leadership, which focuses on doing things right and helps reach efficiency and make stable profits. However, transformational leadership is imperative for a firm to make a change by motivating its followers through an entrepreneur's idealized influence, intellectual stimulation, and individual consideration (Burns, 1978; Bass, 1985). Assimilating different cultures into Foxconn to enhance productivity and creativity during its growth phase was a daunting challenge. In 2000 Foxconn bought a Czech factory "Tesla", where the Czech employees were habitual in a slow life-style pace. To build an archetypical factory model overseas, managers and directors from China, the U.S., and Taiwan gathered together to help train the Czech employees in China's Lunghwa campus. Through intensive interactive communication and intellectual stimulation, the managers and employees of the Tesla factory were amalgamated into the Foxconn Group's culture (Chang, 2008). Gathering, integration, and amalgamation are the three steps that Terry Gou adopts for improving employee adaptation. It is common to see managers change their job divisions in order to abandon their old ways of dealing with their businesses.

Diversification Stage (2005-2013)

In 2005, Foxconn acquired Chi Mei Communication to become the world's largest handset manufacturer. In the same year, Foxconn took the number one EMS spot globally from Flextronics, hitting total revenue of US$28 billion. In 2008, Foxconn grew more than two-fold to US$61.8 billion, and in 2012 total revenues again more than doubled and reached US$130.1 billion. The popularity of iPhone and the alliance with Apple contributed to its major revenues. At the same time, the employees hired by Foxconn increased substantially, first reaching over one million in 2011 (Foxconn Technology Group, 2014). This is also the period when Foxconn encountered suicidal jumps from the Lunghwa campus at Shenzhen in 2010. Since then, Foxconn started to shift its factories further west toward the inland provinces, such as Sichuan and Honen. In 2012, Foxconn established a factory in Zhengzhou, Honen with the world's largest output capacity for iPhones (Wang, 2013).

Opportunity creation: With Apple's launch of

the iPod in 2006, Foxconn's operating revenue breached the threshold of NT$1 trillion (or US$33.5 billion). With explosive sales growth following the subsequent launches of the iPhone and then the iPad, Foxconn's annual operating revenue surpassed US$130 billion in 2012, equal to the total operating revenues of Taiwan's other top ten manufacturers combined (Huang, 2013). In order to feed the large amount of employees and to maintain a persistent growth rate, Foxconn continued its vertical and horizontal integrations through M&A for its EMS businesses of computer, communication, and consumer electronics (3Cs) and also made inroads into different areas for new profitable opportunities, such as contents (movie making is one of them), car electronics, health care, sales channel (Cybermart in China), and clean energy (8Cs) (Global Views Monthly, 2011).

Capability accumulation: To enhance its capability, Foxconn continued its M&A. In 2006, initiating its Mechanical-Electrical-Optical engineering integration by purchasing Premier Image Technology, Foxconn expanded its business scope to digital cameras. Foxconn bought Jemitek to get into the TFT-LCD business in 2007, and merged with Sanmina-SCI in 2008 to acquire interconnect server orders from IBM and Dell (see Table 2). In 2012, Foxconn invested in the Japanese electronics company Sharp Corporation and purchased up to 50% of the LCD displays produced at Sharp's plant in Sakai, Japan. At the stage of diversification, Foxconn employed a multi-targeted strategy of whatever and wherever are profitable. In 2012, Foxconn started to construct five new factories in Brazil.

Transformation: Leading by example is one of the strongest ways to show the dedication of a leader. Terry Gou's working attitude transmits a signal to his subordinates of never slacking off at work. He is a workaholic with great vigor and has worked nearly 16 hours a day for over four decades. Terry Gou has given compelling bonuses out of his own pocket to reward employees for good performance. At every Chinese Lunar New Year party raffle, Terry Gou usually offers a big of prize to cheer up employees. For example, in 2008 the top prize was 300,000 shares of Foxconn, which was worth US$1 million (Balfour and Culpan, 2010). On the other hand, Terry Gou does not spare his sternness for perfection even to his younger brother Tai-Chiang Gou, a division executive at Foxconn and was once scolded in front of a Foxconn customer for his unsatisfactory performance. With a strong personal character and high executive ability, Terry Gou has been in the vanguard, leading Foxconn to venture around the world with an unremitting business expansion.

CONCLUSIONS

The extraordinary growth path of Foxconn provides an interesting research case. By incorporating three main research fields of firm value creation - entrepreneurship, strategic management, and leadership —we analyzed how Foxconn discovered opportunity, accumulated capability, and transformed firm growth in a four-stage growth model. Within each of the four stages—initiation, expansion, maturity, and diversification—we analyze how Foxceonn discovers opportunity, creates competitive advantages, and transforms into a bigger enterprise. Through developing its own business model, eCMMS, Foxconn is able to create an unrivalled and sustained competitive advantage by providing customers with better quality, faster delivery, and cheaper prices. The success of Foxconn doubtlessly revolves around its founder and leader, Terry Gou. With his entrepreneurial ambition and effective leadership, Terry Gou has successfully transformed Foxconn into the world number one EMS corporation.

The prominent success of Foxconn provides at least four useful lessons. First, audacity is important for the firm to grow into a global enterprise. In the instance of the AMP's lawsuit of patent infringement in 1992, confronting the issues and immediately setting up the patent management department, Terry Gou demonstrated his dauntless and ability to turn disadvantages into advantages. Terry Gou's boldness can be witnessed in another occasion when he dared to obtain the PC chassis orders from Compaq in 1995, even though Foxconn at that time only had experiences in PC connector production. The second is incessant learning. Terry Gou has the proclivity to work with the world leading corporations, such as Texas Instruments, Dell, and Phillips, even though they are quite demanding. Terry Gou

is fully aware where the leading technology and management skill are from. Third, in order to grow to a big corporation, it is essential to accumulate capabilities and how to allocate the limited resources to generate short-term financial gains and to plan for long-term viability is imperative. In his early time of producing connectors, although profits are high, Terry Gou kept investing in obtaining new technology and know-how, and remained the same strategy when Foxconn reached up to another growth stage. Fourth, keep growing is essential for the corporation to survive. Well-known for his executive capability, Terry Gou demands for 30% annual growth rate for Foxconn. The commitment, although not easy to reach when the economy is in the downturn, not only keeps Foxconn growing, but also prevents it from being outcompeted.

To conclude, rarely can a firm last forever. Will the Foxconn model be able to endure? At least two immediate challenges lay ahead. First, with the world's leading brands now all its customers, there is narrow room for Foxconn to expand in the EMS business. While Foxconn tried to diversify its business, it inadvertently waded through unfamiliar businesses, such as sales channel, entertainment (movie making), or the recent bidding for two 4G licenses, all of which are not related to its prime business, and in fact many did not go successfully. Take one example. In 2007, Terry Gou invested US$10 million into the movie, "Empire of Silver," without success. Focus is important. The admonition of his once symbiotic friend, the late Steve Jobs, still rings true in that focus is important, and "Focus is about saying, No."[1] Second, a big issue concerns succession planning. Business succession planning has become a hotly-debated topic in Taiwan. The succession issue runs even deeper in Foxconn due to the authoritarian leadership style and Terry Gou's craving for micromanagement (Chen and Wang, 2009). Some sound advice from another close partner of his, Dell's maverick founder, might be useful, "Perhaps the best measure of a founder's success is not how bright the star shines while they are there, but what happens after they are long gone from this earth" (Sonnenfeld, 2011).

NOTES

1) At Apple's developer conference in 1997, Steve Jobs said, "Focus is about saying, No. And the result of that focus is going to be some really great products where the total is much greater than the sum of the parts." One of Jobs' greatest talents was as an editor, selecting what not to include in a product. It was that ability which helped him save Apple from going off in 18 different directions and do a few things better than any other company. See: http://techcrunch.com/2011/10/06/jobs-focus-is-about-saying-no/, visited on December 28, 2014.

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