A Study of Original Equipment Manufacturing in China: Current and Future Trends

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This study examines issues faced by Chinese original equipment manufacturing firms (OEMs) and explores OEM future development. Qualitative data, consisting of responses from 32 managers in 16 OEMs, were content analyzed. Results reveal various threats to OEM development and numerous opportunities that have yet to be fully explored by OEMs, as well as OEMs strengths and strategic and managerial challenges. Further, this study interprets the future OEM trends, particularly the shift from an OEM business model to the original design manufacturer (ODM) and original brand manufacturer (OBM) models, as well as, the development of long-term relationships with their clients.

INTRODUCTION

Manufacturing outsourcing, aiming at reducing production cost and efficiently using worldwide labor and resources (Bhagwati, Panagariya, & Srinivasan, 2004), has become a widespread and prominent business practice for over three decades (Berggren & Bengtsson, 2004; Wadhwa & Ravindran, 2007). For example, Chrysler outsourced 100 percent of its manufacturing on half of its minicompact and subcompact cars (Gilley & Rasheed, 2000). Typically, an outsourcing company (an outsourcing client) keeps its core business components (i.e., research and development (R&D), ownership of its intellectual properties, and distribution of its final products), while contracting all or part of its non-core productions to outside businesses (outsourcing providers; Insinga & Werle, 2000; Kakabadse & Kakabadse, 2000). The client-provider economic transactions are governed by business contracts so that providers are paid for producing goods in accordance with clients' particular specifications (Grossman & Helpman, 2005).

As one of the most important off-shore locations for U.S. manufacturing outsourcing, China has dominated the world's outsourcing manufacturing sector due, in part, to low labor costs (Hexter & Woetzel, 2007) and large-scale manufacturing capacity (Wendin, 2005). The Chinese outsourcing manufacturing industry is mainly made up of three business models. The first business model is original equipment manufacturers (OEMs), which produce a variety of goods from semi-commodities to finished products including automobile parts, furniture, toys, and clothing. Original design manufactures (ODMs) are more than 'factories-for-hire' (i.e., OEMs); they design products for and/or co-design products with their clients, products such as printed circuit boards and finished electronics-based products. It is predicted that China's ODMs will continue expanding in capacity and number, while competing with OEMs for business contracts by producing value-added products at competitive prices (Merritt, 2005).

The third business model is original brand manufacturers (OBMs) which design, manufacture, and market their products under their own brand names.

The lines of these three business models, however, are blurring. Some ODMs also have OBMs functioning, shifting from being simple outsourcing providers to also becoming emerging competitors of outsourcing clients. Moreover, when opportunities present themselves, OEMs may move beyond just manufacturing products for their clients by adopting ODM/OBM characteristics, thus moving up the supply chain from efficiency to innovation (Horng & Chen, 2008). Although some studies have suggested OEMs shift to ODMs/OBMs (e.g., Chu, Chang, & Cheng, 2006; Horng & Chen, 2008), the driving force for such a transformation, the time required for achieving the industry transformation, and the scope at which it will occur, remain unclear. Thus, one purpose of our study was to explore OEM managers' views of the OEM business model transformation.

At the same time, environmental factors, such as labor market, the legal system, technology development, global and domestic competition, and market liberalization, continue to evolve in China (Minevic & Richter, 2005). To OEMs, one of the biggest environmental changes is that China became a member of the World Trade Organization (WTO) in 2001. Thus, China has agreed to open and liberalize its regime in order to better integrate in the world economy and offer a more predictable environment for trade and foreign investment in accordance with WTO rules (World Trade Organization, 2001). For instance, "China has repealed, revised, or enacted more than one thousand laws, regulations, and other measures" (The United States Trade Representative, 2007, p. 3) in compliance with the WTO agreement, such that price controls will not be used for purposes of affording protection to domestic businesses against international competitors (World Trade Organization, 2001). These political opening, market liberalization, and private entrepreneurship may contribute to the growth in the OEM industry and China's economy at large (cf. Fligstein & Zhang, 2011; Huang, 2010).

Since these environmental changes may result in new business practices and shifts in its business models, issues affecting China's OEM industry and challenges faced by OEMs need to be re-examined. In an effort to reduce the dearth in research examining the provider's position within the outsourcing relationship, this study targets the OEMs in China. Therefore, a second purpose of our study was to explore the industry's current situation to outsourcing providers, elucidate strengths and managerial challenges faced by OEMs, and provide insight into opportunities, threats, and future trends. We believe that our study have implications to both providers and clients such that the reveal of current OEM business practices and industrial trending development will provide insight into business model change, efficiency, innovation, and supply chain survivability.

METHOD

A qualitative methodology was chosen due to the exploratory nature of this study. We reasoned that querying OEM managers by allowing them to express their insights to open-ended questions would provide rich information not possible with a quantitative methodology. We sought to collect managers' perspectives regarding current outsourcing conditions (i.e., external opportunities and threats, internal strengths and managerial challenges) while providing insight into future trends. The overarching research questions were: *What are the external opportunities and threats and internal strengths and weaknesses currently being faced by Chinese OEMs? And how are the OEMs reacting and evolving?*

Procedure and Participants

Data were collected via anonymous web survey. The survey contained nine open-ended questions for capturing rich information at three levels of analysis (the OEM industry as a whole, OEM organizations, and OEM individual managers). Survey questions were written in both English and Chinese; back-translation (Brislin, 1980) was used to translate the questions from English to Chinese. The survey questions were:

1. In the OEM industry in China, how has the external environment changed since China entered the WTO in December 2001?

2. What opportunities exist in the OEM industry in China?
3. What are the threats in the OEM industry in China?
4. What are the strengths of your company?
5. What are the major managerial challenges that your company faces?
6. What recent companywide changes are you aware of?
7. What recent changes have you witnessed in your job?
8. What are the major challenges faced by you due to the changes in your job?
9. Please list any other comments and insights about the OEM industry in China, your company, and your job.

Respondents had the option of choosing to answer the survey in either English or Chinese. They were also asked to complete demographic information such as company's name, job position, years of work experience in current company, and total years of experience in the OEM industry.

Contact was made with 16 OEM firms, all of which were willing to participate in the study. These 16 OEMs produced a wide range of manufactured products for major U.S.-based firms as clients. The OEMs were located in, ranging from north to south along China's coastline, eleven cities across three provinces (Guangdong, Fujian, and Jiangsu) and two municipalities (Beijing and Shanghai). The primary author sent out a solicitation email to these 16 OEMs and asked the firms to post the email in their public poster areas. To reduce response bias and produce a rich data that included a variety of perceptions common within OEM firms in China, we invited managers at all levels (i.e., top-, middle-, lower-level) to participate in the survey.

In total, usable data were obtained from 32 OEM managers, ranging from 1 to 4 managers per OEM firm. In terms of OEM product types, the 32 responses were distributed as follows: clothing (25%), textile machines (16%), construction equipment (16%), handcrafted products (13%), electronics (9%), sportswear (9%), hardware and tools (6%), and furniture (6%). Of the 32 responses, 9 responded in English and 23 in Chinese. The 23 Chinese responses were first translated from Chinese to English by the primary author, and then translation was independently verified by a researcher whose native language is Chinese. Among the 32 OEM managers, 7 (22%) were top management, 12 (38%) were middle management, and 13 (41%) were lower management. Respondents' work experience ranged from 8 months to 10.5 years within their current firms, and 1.6 years to 20.1 years overall within the industry.

ANALYSIS AND RESULTS

To analyze qualitative data, content analysis (Krippendorff, 2004) was conducted by three researchers. First, textual raw data were unitized on the basis of categorical distinctions by two researchers. Second, using the constant comparison method, these two researchers independently examined data units and inductively classified them into meaningful themes at the respective levels of analysis (i.e., OEM industry-, OEM organization-, and OEM individual-level). Discrepancies in the derived themes by the two researchers were identified, discussed, and reconciled to ensure 100% agreement. Third, after the themes were finalized, definitions for all the themes were developed by the two researchers. Fourth, based on the definitions of the themes, three researchers independently unitized the textual raw data, coded data units, and classified the data units into defined first- and second-order themes at the three levels of analysis. Last, we computed the inter-coder reliability, with an overall kappa coefficient of .94 (Cohen, 1960; Futrell, 1995). The Kappa coefficients for the first-order themes at three levels were .89 at the industry level, .95 at the organizational level, and .96 at the individual level. The Kappa coefficients for the second-order themes at three levels were .78 at the industry level, .86 at the organizational level, and .92 at the individual level. The first-order themes and random examples of responses of the second-order themes are outlined in Tables 1, 2, and 3.

TABLE 1
INDUSTRY LEVEL FIRST-ORDER AND SECOND-ORDER THEMES AND SAMPLES OF RESPONSES

Major Themes	N	Samples of Responses
Industry Environment and Transformation	76	
Potential for Foreign Investors into the OEM Industry in China	9	Free trade fosters foreign investment into China. The industry is attracting more clients from all over the world. More multinationals build their manufacturing facilities in China.
Governmental Advantages	17	China's healthy open market environment. The customs duties on imported materials and parts are lower. The government is more open and helpful.
Business Opportunities	28	China's OEM industry has more business opportunities. Their (the OEM industry) revenue and profit are increasing. The (OEM) exports hit record high.
Employment Opportunities	4	Individuals working in the OEM industry have more employment opportunities and higher income. The industry has created more employment opportunities in China.
Low Costs	2	China has low labor cost advantage. Low production cost, and low labor cost destinations such as China.
Maturity of the Industry	3	The OEM industry is close to its maturity stage.
Shift to ODM/OBM	13	China's OEM industry… has started to transform into an industry that develops its own brand products. Every OEM firm in the industry wishes/plans to have its own brand products in the future.
Challenges to Industry Development	57	
Competition for Business	26	The competition in the OEM industry is intensifying. (The industry is) facing competition from some foreign competitors.
Profit Margin	10	Although the total output value in the industry has been increasing, the profit margin is constantly dropping.
Cost	4	Labor and material costs are rising.
Exchange Rate	7	This (increasing exchange rate) is a big problem to OEM firms. Higher foreign currency exchange risk.
Client Quality Expectations	4	Clients are asking for higher quality standard products. The OEM firms in the industry must improve their product quality.
Competition for R&D Professionals/ Engineers	6	Lack of talented employees (such as R&D engineers) to develop and manage brand products. Needs more engineers in the industry.

Industry Capabilities/Competencies	9	
Technology/R&D Advancement	6	The OEM industry is learning advanced techniques and technology. R&D is still underdeveloped in the industry.
Production Capabilities	3	The industry can produce almost everything. The industry has very large production capacity.

Note: 1. First-order themes are numbered, and second-order themes appear in italic font.
2. N represents the numbers of units that fall in first- and second-order themes.
3. The samples of responses are randomly selected from responses of top-, middle-, and lower-level managers.
OEM = original equipment manufacturer. ODM = original design manufacturer.
OBM = original brand manufacturer.

TABLE 2
ORGANIZATIONAL LEVEL FIRST-ORDER AND SECOND-ORDER THEMES AND SAMPLES OF RESPONSES

Major Themes	N	Samples of Responses
Strategic Planning	99	
Strategic Thinking/Top Management	19	Low cost strategy is no longer a good strategy (in my company). The top management needs to have a long-term strategy to expand our business globally. My company is located at a geographic advantage point, close to sea port and airport (concerning transportation of products), and accessible to adequate labor forces.
Business Expansions	25	Our company is expanding, from small to big. My company has more business contracts.
Increase in Branding and Marketing / Shifting to ODM/OBM	34	Our company is building a foundation to develop our own brand products. We (the company) are preparing to transform into an ODM company.
Organizational restructuring	10	The company should have a well-designed organizational structure. We restructured the organization in coping with the changing environment. For example, VP-Marketing used to be in charge of the Import/Export department. Now, we have created a new position -VP, International who is in charge of all import/export businesses.
Building Relationships with Clients	11	We have long-term clients in partnership with our company; the clients and our company share risk and profit; we have built trustful relationship between our company and our clients. As a new CEO, I focus on building sharing-risk-sharing-benefit long-term partnerships with our clients.
Efficacy and Development	82	
Development of Reputation	3	Good reputation (is my company's strength.)

		(My company) builds its own reputation.
Organizational Learning– Technology/R&D Innovation	23	My company is increasing technological component in product. To my company, it is a constant learning process. We have learned advanced production techniques and technology.
Organizational Efficacy – Production /Product Quality	56	We guarantee our clients for high quality manufactured products. (My company has) strong mass production capability. My company maintains adequate production capacity.
Organizing	110	
HRM - Planning	6	HR management (is the challenge my company faces.) (My company is) improving our HR policy and practice.
HRM – Recruitment and Selection – Inadequacy of the Labor Force	23	It's harder to hire talents who can speak fluent English and also know the business environment. Lack of talented employees, especially those R&D engineers (which is the challenge the company faces.)
HRM - Recruitment and Selection – Other Comments	19	Our company has attracted talented employees. My company needs to hire more technology talents and experienced managers (which needs to be improved).
HRM – Orientation and Training	20	The company lacks training programs for the employees. We should hire a professional training firm to provide companywide management training programs.
HRM – Performance Management / Promotion Fairness	2	The company cannot promote an employee because he/she has relationship with company's management. The company should not promote an employee because he/she has Guanxi (relationship) with or a relative of the top management.
HRM – Compensation and Benefits	6	The company needs to give engineers more incentives (salary plus stock shares/bonus). (My company needs to) increase employees' salaries.
HRM – Career Prospects and Development – Turnover	18	High employee turnover is always a big problem (in my company). Turnover is high in my company.
HRM – Career Prospects and Development – Retention	14	To retain talented employees is my job focus (as a CEO). We are competing with multinationals and large SOEs for engineers. How to retain engineers is a big challenge to my company.
Communication	2	Managers need to improve their communication skills. The company needs to improve communications between branches - headquarters and among branches.
Controlling	67	
Operations Management - Scheduling	12	Clients are very demanding on product delivery schedules.

		Sometimes, we have to work 3-shift to keep up the production.
Operations Management- Production	8	The physical environment of the assembly line is not good enough. Operations management (needs to be improved.)
Operations Management - Client Quality Expectations	3	Our clients now are product-quality oriented rather than previously low-cost oriented. We had one client who rejected our products due to product quality issues.
Quality Control /Management Systems	14	Our company has established a quality management system that meets the international standard. Stable product quality.
Financial Controls – Revenue/Profit/Cost	23	In order to keep our clients, sometimes we have to do business that breaks even or even lose money. This downward spiral is not a good sign for any business.
Financial Resources	7	The biggest challenge is we need more financial resources to ensure successful transformation (into an ODM firm). We have retained financial resources.

Note: 1. First-order themes are numbered, and second-order themes appear in italic font.
2. N represents the numbers of units that fall in first- and second-order themes.
3. The samples of responses are randomly selected from responses of top-, middle-, and lower-level managers.
OEM = original equipment manufacturer. ODM = original design manufacturer.
OBM = original brand manufacturer. HRM = human resource management.

TABLE 3
INDIVIDUAL LEVEL FIRST-ORDER AND SECOND-ORDER THEMES AND SAMPLES OF RESPONSES

Major Themes	N	Samples of Responses
Job Characteristics	31	
Job Function Changes/Role Changes	6	I was promoted to Director from a front-line worker. I am transferred to the Import/Export department.
Job Demands	15	I often need to work long hours. I am asked to travel on more business trips.
Job Stress	10	I feel increasing job stress. It is stressful to work over 60 hours a week.
Self-Motivation	18	
Self- Learning	18	I will continuously learn new knowledge to improve myself in coping with the development of my company. I need to improve my English language proficiency so I can communicate with foreign clients directly. I also need to improve my computer skills since I often need to rely on electronic devices at work.

Note: 1. First-order themes are numbered, and second-order themes appear in italic font.
2. N represents the numbers of units that fall in first- and second-order themes.
3. The statements are randomly selected from responses of top-, middle-, and lower-level managers.

A SWOT (strengths, weaknesses, opportunities, and threats) framework was applied as an analysis tool in order to uncover various strengths and managerial challenges encountered by OEMs across all management levels, as well as current opportunities and threats within the industry. We classified the content analyzed data into major issues in each SWOT category and computed additive percentages at the industry level as well as at the organizational and individual levels. These findings are summarized in Tables 4 and 5.

TABLE 4
OPPORTUNITIES AND THREATS

Opportunity	Percentage
Business Growth/Opportunity	30
Government Advantage	12
OEM Shifting to ODM/OBM	9
Industry Capability/Competency	6
Threat	**Percentage**
Strong Competition	21
Rising Cost/Decreasing Profit Margin	10
High Currency Exchange Risk	5
Lack of R&D Engineers	4

Note: 1. The percentages are additive.
2. The major issues in opportunity and threat categories are derived on the basis of frequency of the responses in the second-order themes at the industry level.
OEM = original equipment manufacturer. ODM = original design manufacturer.
OBM = original brand manufacturer.

TABLE 5
STRENGTHS AND WEAKNESSES

Strength	Percentage
Business Prospects	15
Organization Capability/Competency	14
Organizational Learning	6
Self-Learning	4
Quality Management	4
Weakness	**Percentage**
Human Resource Management Issues	25
Strategic Planning and Resources	14
Job Characteristics Related Issues	7
Operations Management Issues	7

Note: 1. The percentages are additive.
2. The major issues in strength and weakness categories were derived on the basis of frequency of the responses in the second-order themes at the organizational and individual levels.

Current: Opportunities and Threats

Findings suggest China's OEM industry is likely to continue growing primarily due to ever-burgeoning business opportunities (30%) and an optimal governmental environment (12%). Other factors, such as prospects of OEM transformation (9%) and strong industrial competency and capability (6%), also contribute to the OEM growth. Nevertheless, two serious threats are strong competition in the industry (21%) and rising cost/decreasing profit margin (10%). In addition, appreciating value of Chinese

currency (5%) and R&D engineer shortage (4%) represent great concerns to all levels of management within the OEM industry.

Our results indicate that perceived opportunities (57%) outweigh perceived threats (40%). Across all managerial levels, surveyed managers displayed confidence in their industry's competencies in producing "all kinds of high quality products" to capture business opportunities. On the other hand, they voiced concerns of "intensified competition" from OEMs counterparts in "China" as well as "overseas" such as "India" and "Vietnam." In addition, they pointed out the rising cost in "labor", "raw materials", and "utility" may hinder the industry "future growth" and diminish its "competitive advantage."

An interesting finding is that all surveyed top level managers expressed a strong desire for industrial transformation–shifting from their current OEM manufacturing-only function toward the development of, and, ultimately the marketing of, their own brand products–transforming the firms into competitors within the ODM and OBM segments. As previously stated, no clear distinctions exist separating the OEM and ODM models. In fact, some OEMs, once they develop the core competencies and activities of ODMs, approach a hybrid model in which they offer both OEM and ODM services (Carbone, 2004). Due to the fact that OEM/ODM firms do not own their own brands, the business volume and profit margin of OEM/ODM firms are inevitably affected by the profitability and market performance of their clients and by OBMs (Yu & Hsu, 2002). Thus, there is more incentive for OEMs to become OBMs.

Current: Strengths and Managerial Challenges

Major strengths of OEMs include optimism concerning future business prospects in their OEM firms (15%), as well as high competencies and wide-ranging capabilities in manufacturing a variety of products (14%). In addition, our respondents expressed a strong focus on organizational learning (6%), the value of self-learning at an individual level (4%), and the implementation of quality management control and systems (4%).

Our results suggest that perceived managerial challenges (53%) exceed reported strengths (43%). The greatest managerial challenges faced by OEMs are almost invariably human resource (HR) related (25%), including such issues as: the "inadequacy" of the labor force; a "lack of formalized training"; and high "employee turnover." Based on the large quantity of qualitative units related to these issues, it seems that OEM managers were well-aware of these HR-related issues and were on the forefront of their minds such that their concerns concentrated on recruitment and selection, training, and retention areas. They stressed that these areas were in need of "revision" and "improvement" in terms of "HR policies and practices." As survey responses stated, to sustain current operations and fuel future growth, OEMs "must deal with" these HR-related issues, recognizing that knowledge workers are corporate assets crucial to their R&D and branding functions in light of their desire to progress to ODM/OBM models.

The second grouping of prevalent managerial challenges is strategy-related issues (14%) which, in line with the industry transformation, mainly concern difficulties in organizational transformation. Specific areas include "strategic planning," "branding and marketing," "organizational restructuring," and "financial resources" issues. Respondents reported that their top management needs to work on a better strategic architecture to assure their firm's short-term success, and should focus on increasing R&D capabilities to build future, long-term success through. In addition, responses suggested that, at the individual level, high job demands, coupled with job function changes and resulting role changes and perhaps role ambiguity, provide for greater job-related stress (7%). Last, production scheduling, clients increasing demands for quality and delivery deadline, and work environment represent concerns in the operations management area (7%).

DISCUSSION

Three future trends can be drawn from our data. First, OEMs are not satisfied with a strict contractual relationship with their clients; instead, they desire to establish long-term, strategic relationships with key clients. Second, as strong competition and rising costs continue to affect OEMs, some OEMs will look for ways to exit the OEM sector by transitioning into the ODM and/or OBM sectors. Third, OEMs continue

to promote strong organizational leaning culture. Within this discussion, we interpret our findings regarding these three trends to provide further insights into business model change, efficiency, innovation, and supply chain survivability.

Concerning the first trend, the conventional view in the outsourcing literature is that short-term contracts tend to be used in manufacturing outsourcing (i.e. non-core component parts), and that clients and providers form a strict contractual relationship at the operational or transactional level (Greaver, 1999). However, our study indicates that OEMs are struggling (i.e., concerns of production scheduling, high job stress among employees) in meeting their clients' increasing demands for low price and strict delivery deadlines (cf. Jiang, Baker, & Frazier 2009). Our data suggest that OEMs have a strong desire to establish and building long-term, strategic relationship with key clients. This is in line with outsourcing as defined by Grossman and Helpman (2005), who, in fact, emphasized a mutual bilateral relationship between a client and a provider. Such mutual bilateral relationships foster trust and commitment between a client and a provider in the supply chain which, in turn, reduce transaction costs such as verification, inspections, and certification of the provider (Kwon & Suh, 2004). The reduction of transaction costs associated with outsourcing contracts will create a win-win situation for both supply chain partners in their respective cost structures and contract management. Further, if client and provider sustain their supply chain partnership/relationship in long run, further vertical integration may be a solution to gain competitive advantages (Cacciatori & Jocobides, 2005). In this regard, our study of providers coincides with Kakabadse and Kakabadse's (2005) study of clients. Their study identified the critical future outsourcing trend to be effectively managing client-provider relationships. They emphasized that establishing meaningful relationships (i.e. Keiretsu-type relationships), governed by performance-based contracts, with a number of key trusted providers, will become an ever-increasing competitive imperative for outsourcing clients because they can apply great cost discipline and improve product quality simultaneously. Conceivably, clients must strategically analyze how their current outsourcing practices will have an impact on building relationship with their key providers, and how, if any, ODMs/OBMs transformed from the OEM industry will reshape the domestic market and global market as well.

With regard to the second trend, based on our data, at the industry level, OEMs recognize the massive demand from the Chinese domestic market, and are therefore transforming themselves in order to tap into the huge market opportunity. Our data highlight some specific strategy and tactics that OEMs are pursuing, including: (a) focusing on organizational learning on gaining business and marketing knowledge of the products they manufacture, (b) increasing their investment in R&D, and (c) aiming at developing and marketing their own brands in the domestic market. This may be the first step in the OEM-ODM-OBM transitioning. It is foreseeable that, after newly transitioned OBMs successfully launch their own products in the domestic market, some of them may aggressively pursue initiatives focused on entering the global market by means of strategic alliances with foreign companies, organic expansion, and/or acquisition of foreign brands and companies (via forward vertical integration) (Child & Rodrigues, 2005). According to China's Ministry of Commerce (2011), in 2010, Chinese firms invested in 3,125 overseas companies in 129 countries and regions, and total foreign direct investment in non-financial sector rose 36 percent to 59 billion in comparison to that in 2009. This clearly indicates that a growing number of Chinese companies are seeking business opportunities overseas. As the manufacturing powerhouse in the world, we can speculate that China's OEM industry's enormous economies of scale and competency can be leveraged toward achieving further growth in both its domestic market and international markets as well.

Conversely, also driving the trend for changing business models is that OEMs are facing fierce competition both domestically and internationally. Production low-tech competency and over capacity, coupled with intensive competition, are driving gross margins to an unprecedented low level (cf. Wendin, 2005). Consequently, OEMs are under constant pressure to add value, fueling their march toward the OEM-ODM-OBM transformation. As summarized in the *Outline of the Eleventh Five-Year Plan* (2006-2010), the Chinese government is "promoting development by optimizing industrial structure" and "improving the capacity of independent innovation," indicating a countrywide industrial change pattern of development toward growth driven by technology and innovations (National Development and Reform

Commission, 2006, Chapter 1). Our data indicate that some respondents did urge that the Chinese government should include the OEM industry transformation as part of the China's industrial restructuring plan and provide necessary support, such as financial resources and tax incentives, to the successful transformation. In addition, at the organizational level, managers recognized certain obstacles in such a transformation, including an underdevelopment of technology, a lack of R&D capability, and insufficient financial capital and human resources.

Concerning the third trend, many comments in our data regarding organizational learning and self-learning are encouraging for the industry and its transformation. Our data reveal that OEMs are eager to learn business knowledge and internalize new technology. Knowledge and technology are essential resources for OEMs to gain competitive advantage in competing with other domestic and international OEMs, as well as reduce dependent relationships with their clients (Pfeffer & Salancik, 1978; Ulrich & Barney, 1984). Through their learning processes, OEMs exploit what has already learned and explore new knowledge (Crossan, Maurer, & White, 2011) which, in turn, prepare them to capture market opportunities such as business contracts and/or develop their own brands. At the individual level, the data indicates that employees are self motivated to learn work-related knowledge and improve their language proficiency. Given the content of the individual responses, the reason behind the employees self-learning motivation is most likely due to the fast-changing environment, the challenging nature of their jobs, and employees' language proficiency levels. It was once reported that the language barrier is one of the most serious obstacles preventing Chinese firms from entering the outsourcing market (Qu & Brocklehurst, 2003). As OEMs work more frequently with foreign clients, employees feel a strong need to improve their English language proficiency as well as their work-related skills and knowledge. These activities are recognized as leading to desirable outcomes such as getting promotions in their firm or being more marketable within the industry job market. Additionally, collective self-learning at the individual level also serves to informally fuel organizational learning.

Before discussing implications, we note our results reveal that reported managerial challenges exceed reported strengths, despite the respondents reporting that the industry as a whole is continuously growing. One explanation could be that, when the data were content analyzed, no comparative weight was assigned to data units. Instead, major issues in the strength and managerial challenge categories were derived based solely on the frequency of the responses mentioned by the respondents at the organizational- and individual-level, and there were far more managerial challenge-related units than strength-related units. It may be that one data unit within the strength category may weight more than that in the managerial challenge category. Another explanation may lay in the fact that 78% of the respondents were middle- and lower-level managers who manage day-to-day operations involving work challenges and in some cases, if not many, job frustrations. One should consider that the 16 OEMs within this study are located at the China's manufacturing outsourcing frontier, where OEM firms are highly concentrated, and where most potential clients make their first stop in looking for outsourcing providers. The strong competition, constant changing environment, fast work pace, and high job stress contribute to their responses in managerial challenges. It is not surprising that the major managerial challenges pertain to job and/or HR related issues, accounting for 32% of the total responses at the organizational and individual levels.

Implications for Outsourcing Providers and Clients

The study findings are of significance to OEMs. Our study identifies current opportunities and threats in the OEM industry and uncovered the types of strengths and weaknesses facing OEM firms. Our results suggest that, in order to capitalize OEMs' unique assets and capability such as competency and organizational learning ability as well as capture the market opportunities, mangers need to have a better understanding of the pervasiveness of the managerial challenges, especially in the HR area. The increasing competition, both domestically and internationally, requires that OEMs address their HR-related issues quickly. This would likely entail adopting well-established HR policies and procedures that not only address the specific issues identified by this study but also cover the entire HR spectrum from self-managed work teams to incentive pay programs.

The duality of the OEM strategy, shifting to the ODM/OBM models and developing stronger, long-term ties with foreign clients, seems contradictory on the surface in terms of moving in different strategic directions. In fact, they both make sense according to the resource dependence perspective (Pfeffer & Salancik, 1978). When outsourcing activities are not critical and can be performed by many providers, they may be outsourced at market value rather than through established, long-term contracts. This is the case with most surveyed OEMs in this study, who are usually dependent on foreign clients for business. Such a power-dependent business relationship seems to be a primary reason that OEMs desire to turn into ODMs/OBMs, especially given that foreign clients now place increasing demands on the OEMs in terms of delivery deadline and price. Furthermore, OEMs can reduce risk in such a fast-changing environment by establishing long-term relationships with their clients–exploiting and exploring opportunities and resources and knowledge of the partners, which will give them the greater share of economic return over time.

Our findings are of value to both current outsourcing clients and those firms that have plans to outsource their business operations to China. The study provides insight into OEMs as outsourcing providers, in particular, how the external environment is affecting them, and what are driving them to pursue OEM-ODM-OBM transformation. Clients, in order to reduce environment uncertainty and sustain competitive advantage in the market, may need to evaluate business relationships with their providers and assess the impact of the industry transformation on their business.

According to strategic network theory (Gulati, Nohria, & Zaheer, 2000), the need for alliances is low when market-based exchange is less costly and more substitutes are available. As such, clients are not at great risk for lock-in or lock-out effect, in terms of opportunities for strategic relationships. Therefore, they have not tied themselves specifically to OEMs long-term. Instead, many foreign firms maintain their alertness and responsiveness through plenty of weak strategic network ties with OEMs, high centrality, wide geographical scope, and organizational quickness to respond (Zaheer & Zaheer, 1997). Conversely, many clients find that establishing long-term relationships with key OEMs is less risky than working with numerous OEMs on a contract-by-contract basis, since using fewer OEMs allows for the establishment of knowledge-based trust–knowing what their OEM partners are doing. It can also lead to greater coordination because of less need for monitoring OEM activities (Gulati et al., 2000). At the same time, clients may need to take precautions in protecting their intellectual properties which have a strong impact on their survivability in the supply chains. The consequence can be of collapsing pricing structures and shortening the profit cycles of products, diminishing the return of investment from R&D and product development (PriceWaterhouseCooper, 2005).

Limitations and Future Research

This study has several limitations. First, the study findings cannot be generalized beyond the Chinese OEM industry. In addition, although our sample contained 16 OEMs manufacturing different types of products from different geographic locations, cautions should be taken when generalizing our findings to the entire OEM industry.

Future research should be conducted utilizing a broader sample of OEMs, including firms that manufacture other types of products and are located in other geographic regions. Moreover, quantitative studies would be beneficial in further corroborating the findings of this study, as well as in uncovering other strategic and managerial issues. Future research may also examine client-provider relations in the contractual relationship, long-term partnership, and vertical integrated association. Additional research should examine HR-related policies and practices in the Chinese OEM industry, thus presenting a clearer picture on where HR-related issues lie as well as providing guidance of sound policy and practices.

In conclusion, our study reports Chinese OEM managers' views of the industry's environmental and organizational dynamics such as the market evolution, business model changes, and managerial challenges. Although facing various threats and numerous strategic and managerial challenges, OEMs are optimistic in its competency and capacity to capitalize market opportunities. Our study further provides insight into the future trends of the China OEM industry as well as implications to both outsourcing providers and clients.

REFERENCES

Berggren, C., & Bengtsson, L. (2004). Rethinking outsourcing in manufacturing: A tale of two telecom firms. *European Management Journal, 22,* 211-223.

Bhagwati, J., Panagariya, A., & Srinivasan, T. N. (2004). The muddles over outsourcing. *Journal of Economic Perspectives*, *18,* 93-114.

Brislin, R. W. (1980). Translation and content analysis of oral and written material. In H. C. Triandis & J. W. Berry (Eds.), *Handbook of cross-cultural psychology*, (Vol. 2, pp. 349–444). Boston, MA: Allyn & Bacon.

Cacciatori, E. & Jocobides, M. G. (2005). The dynamic limits of specialization: Vertical integration reconsidered. *Organization Studies*, *26,* 1851-1883.

Carbone, J. (2004). Targeting design. *Purchasing, 133,* 30-36.

Child, J., & Rodrigues, S. B. (2005). The internationalization of Chinese firms: A case for theoretical extension. *Management and Organization Review, 1,* 381–410.

China's Ministry of Commerce, (2011). *Statistics of China's Non-financial Foreign Direct Investment in 2010.* Beijing, China.

Chu, C., Chang, C., & Cheng, H. (2006). Empirical studies on inter-organizational collaborative product development. *Journal of Computing and Information Science in Engineering, 6,* 179-187.

Cohen, J. (1960). A coefficient of agreement for nominal scales. *Educational and Psychological Measurement, 20,* 37- 46.

Crossan, M. M., Maurer, C. C., & White, R. E. (2011). Reflecting on the 2009 AMR decade award: Do we have a theory of organizational learning? *Academy of Management Review, 36,* 446-460.

Fligstein, N., & Zhang, J. (2011). A new agenda for research on the trajectory of Chinese capitalism. *Management and Organization Review, 7,* 39-62.

Futrell, D. (1995). When quality is a matter of taste, use reliability indexes. *Quality Progress, 28,* 81-86.

Gilley, M. K., & Rasheed, A. (2000). Making more by doing less: An analysis of outsourcing and its effects on firm performance. *Journal of Management, 26,* 763-790.

Greaver, M. F. (1999). *Strategic outsourcing: A structured approach to outsourcing decisions and initiatives.* New York: NY: American Management Association.

Grossman, G. M., & Helpman, E. (2005). Outsourcing in a global economy. *The Review of Economic Studies*, *72,* 135-159.

Gulati, R., Nohria, N., & Zaheer, A. (2000). Strategic networks. *Strategic Management Journal, 21,* 203 – 215.

Hexter, J., & Woetzel, J. R. (2007). Bringing best practice to China. *The McKinsey Quarterly*, *4,* 1-6.

Horng, C., & Chen, W. (2008). From contract manufacturing to own brand management: The role of learning and cultural heritage identity. *Management and Organization Review, 7,* 39-62.

Huang, Y. (2010). Debating China's economic growth: The Beijing consensus or the Washington consensus. *Academy of Management Perspectives, 24*, 31-47.

Insinga, R. C., & Werle, M. J. (2000). Linking outsourcing to business strategy. *Academy of Management Executive, 14,* 58-70.

Jiang, B., Baker, R. C., & Frazier, G. V. (2009). An analysis of job dissatisfaction and turnover to reduce global supply chain risk: Evidence from China. *Journal of Operations Management, 27,* 169-184.

Kakabadse, A., & Kakabadse, N. (2000). Critical review–Outsourcing: A paradigm shift. *Journal of Management Development, 19,* 970-728.

Kakabadse, A., & Kakabadse, N. (2005). Outsourcing: Current and future trends. *Thunderbird International Business Review, 47,* 183-204.

Krippendorff, K. (2004). *Content analysis: An introduction to its methodology* (2nd ed.). Thousand Oaks, CA: Sage.

Kwon, I. G., & Suh, T. (2004). Factors affecting the level of trust and commitment in supply chain relationships. *Journal of Supply Chain Management, 40,* 4-14.

Merritt, R. (2005). Private-label quest marginalizes OEMs. *Electronic Engineering Times*, *1367,* 1, 14, & 62.

Minevic, M., & Richter, F. J. (2005). *Global outsourcing report 2005.* Going Global Ventures Inc., New York: Horasis, Geneva.

National Development and Reform Commission of China. (2006). *The outline of the eleventh five-year plan (2006 – 2010)*. Beijing: China.

Pfeffer, J., & Salancik, G. R. (1978). *The external control of organizations*. Harper and Row: New York.

PriceWaterhouseCooper. (2005). *Redefining intellectual property value: The case of China.* New York: PriceWaterhouseCooper.

Qu, Z., & Brocklehurst, M. (2003). What will it take for China to become a competitive force in offshore outsourcing? An analysis of the role of transaction costs in supplier selection. *Journal of Information Technology, 18,* 53-67.

The United States Trade Representative. (2007). *2006 report to congress on China's WTO compliance.* Washington DC.

Ulrich, D., & Barney, J. B. (1984). Perspectives in organizations: Resource dependence, efficiency, and population. *Academy of Management Review, 9,* 471.

Wadhwa, V., & Ravindran, A. R. (2007). Vendor selection in outsourcing. *Computer & Operations Research, 34,* 3725-3737.

Wendin, C. (2005). The unstopped growth of electronics manufacturing. *European Business Forum, 20,* 61-63.

World Trade Organization, (2001). WTO successfully concludes negotiations on China's entry. *WTO Press,* 243. http://www.wto.org/english/news_e/pres01_e/pr243_e.htm. Retrieved on July 5, 2011.

Yu, C. H., & Hsu, Y. J. (2002). The dynamic relations between the World's leading computer companies and their corresponding OEM/ODM firms. *Review of Quantitative Finance and Accounting, 19,* 315-333.

Zaheer, A., & Zaheer, S. (1997). Catching the wave: Alertness, responsiveness, and market influence in global electronic networks. *Management Science*, *43,* 1493-1509.

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