A Data-Driven Approach to Vendor Rationalization and Engagement for Sustainable Supply Chains

by

Jonathan Prout
B.S., Mechanical Engineering, Rensselaer Polytechnic Institute, 2010
M.S., Industrial Engineering, Texas A&M University, 2012

Submitted to the MIT Sloan School of Management and the Institute for Data, Systems, and Society in Partial Fulfillment of the Requirements for the Degrees of

Master of Business Administration
and
Master of Science in Engineering Systems

In conjunction with the Leaders for Global Operations Program
at the
Massachusetts Institute of Technology

June 2016

Signature of Author Signature redacted
MIT Sloan School of Management, Institute for Data, Systems, and Society
May 6, 2016

Certified by Signature redacted
Charles Fine, Thesis Supervisor
Chrysler Leaders for Global Operations Professor of Management

Certified by Signature redacted
David Simchi-Levi, Thesis Supervisor
Professor of Civil and Environmental Engineering and Engineering Systems

Certified by Signature redacted
Steven Spear, Thesis Reader
Senior Lecturer, MIT Sloan School of Management

Accepted by Signature redacted
John N. Tsitsiklis
Clarence J. Lebel Professor of Electrical Engineering
IDSS Graduate Officer

Accepted by Signature redacted
Maura Herson, Director of MIT Sloan MBA Program
MIT Sloan School of Management

This page intentionally left blank

A Data-Driven Approach to Vendor Rationalization and Engagement for Sustainable Supply Chains

by

Jonathan P. Prout

Submitted to the MIT Sloan School of Management and the Institute for Data, Systems, and Society on May 6, 2016 in Partial Fulfillment of the Requirements for the Degrees of Master of Business Administration and Master of Science in Engineering Systems.

Abstract

Demands for shorter lead times and smaller order quantities, a greater emphasis on sustainable sourcing, and better management of supply chain risks are challenges Li & Fung is addressing by reshaping its relationship with its vendor base. The current work seeks to develop a data-driven approach for vendor base rationalization and vendor engagement as part of a larger initiative within the company to move from transactional vendor relationships to ones of greater collaboration and support. The primary contribution of this project is to provide Li & Fung with a rationalization and engagement methodology that leverages vendor performance and capability data collected by Li & Fung, as well as the author's own on-site observations of vendors, to address three main topic areas: vendor evaluation, vendor selection, and vendor engagement.

1. Vendor evaluation addresses the question of how Li & Fung measures the performance of vendors. This is an important aspect of vendor rationalization because the performance parameters used to evaluate the vendors are the behaviors that are promoted. A balanced scorecard taking into account a variety of performance considerations is presented as the tool to evaluate vendor performance.
2. Vendor selection addresses the question of how Li & Fung decides which vendors to continue to do business with and to what extent. These are essential questions to answer because the strength of the supply chain depends on the strength of the links in that chain. Two data streams providing a holistic picture of a vendor's historical performance, production capacity, production capabilities, and engagement level are used to select the right mix of vendors fit for the business's needs.
3. Vendor engagement addresses the question of how to build vendor relationships in a way that provides mutual incentive and benefits in improving performance and profitability over time. Presented as the foundation for this relationship is a vendor engagement package, which includes an objective set of performance data to monitor the vendor over time. It is through this vendor engagement package that Li & Fung exercises its influence to commit vendors to improvement plans aligned with business goals.

The short-term accomplishment of the work was to successfully implement the rationalization methodology on a pilot product category within an operating group to reduce the vendor base from 39 to 19 and to identify three vendors for strategic partnerships. The long-term accomplishment of the work was to provide a robust vendor rationalization and engagement methodology that can be improved upon over time and applied across the remainder of the product categories within the operating group.

Thesis Supervisor: Charles Fine
Title: Chrysler Leaders for Global Operations Professor of Management

Thesis Supervisor: David Simchi-Levi
Title: Professor of Civil and Environmental Engineering and Engineering Systems

Thesis Reader: Steven Spear
Title: Senior Lecturer, MIT Sloan School of Management

This page intentionally left blank.

Acknowledgements

This work and the experience upon which it is based serve as the capstone to what has been a personally and professionally transformative passage through the Leaders for Global Operations program, and it is my great fortune to have had those acknowledged below be an integral part of it. The following few words can, at best, can only hint at the impact they have had on me.

With gratitude and thanks:

to Leonard Lane and the Fung Academy
for partnering with the LGO program and allowing us to share in shaping the future of Li & Fung

to Matthew Xu
for supporting me in your organization, for our always interesting and memorable discussions, and above all, for your friendship

to Pamela Mar
for your mentorship, for your sincerity, and for your commitment to creating a sustainable future – your dedication is inspiring

to Charlie Fine and the LGO community
for being my academic support, for providing perspective when it was most needed, and for sharing this remarkable LGO journey with me

and to my family
with love, always.

Contents

List of Figures

1 Introduction

This introductory section describes the project motivation and challenge being addressed, the project outcomes that address that challenge, and an overview of the document to help the reader understand the progression of the information presented.

1.1 Project Motivation and Challenge Addressed

Li & Fung finds itself today at the crossroads of a rapidly shifting consumer goods sourcing industry, where greater pressure – and in some cases entirely new pressure – is being exerted on its extensive network of over 15,000 vendors. These pressures include reduced order quantities with shorter lead times to satisfy quickly changing consumer preferences, wage inflation pushing factories out of areas that in the past several decades have been the major centers for consumer goods manufacturing, and socio-political and monetary instability in emerging countries. Of particular importance is the pressure to improve compliance and sustainability standards, which is a pressure that Li & Fung in recent years has taken a deep interest in helping its vendors manage. All of these pressures to improve performance in a challenging competitive environment come at a time when many vendors' profit margins are shrinking.

Understanding the fragility of its vendor base and the threat this poses to remaining a leading global supply chain management company, Li & Fung has taken steps to help support its vendors through the establishment of a new organization, Vendor Support Services. It has also sought to partner with external talent and experiment with innovative business ideas in the Fung Academy. One such partnership is with the Massachusetts Institute of Technology Leaders for Global Operations program, the overarching vision of which is to identify opportunities and implement strategies for better supply chain management using data analytics. Being at the center of a massive network, with hundreds of brands on one side and thousands of suppliers on the other, Li & Fung is in possession of a wealth of valuable data that spans the entire supply chain, from raw goods sourcing to point of sale to the end consumer. Thus, there is great interest at Li & Fung to use this data to enhance and change the way it does business.

The current work describes how this data was used in the company's beauty products division to establish and implement a vendor rationalization and engagement methodology as part of a larger strategic vendor management initiative. The purpose of the strategic vendor management initiative

is to transform how vendor relationships are managed. In the past, these vendor relationships have been transactional, which in today's highly-competitive environment with its numerous pressures described previously, is not conducive to putting the division in a position of credibility or influence with the vendor to support them in improving their performance. What is needed are vendor relationships with greater trust, greater collaboration, and greater support to help vendors succeed in a challenging environment, with the driving thought being that a stronger, higher-performing vendor base will allow the division to serve its customers better, thereby securing more business which can then be awarded back to the vendors. Before such a strategy can be carried out though, it is critical to identify which vendors should be a part of this new strategy, how these vendors' performance will be measured, and how the relationship with these vendors will be managed over time. These are the essential elements of the greater strategic vendor management initiative that this work addresses.

1.2 Project Outcomes

The major outcomes of the project are:

- The creation of a balanced scorecard that uses a holistic set of performance metrics to rate the performance of a vendor and benchmark it against other vendors of interest
- The establishment and implementation of a rationalization methodology that sets the capacity and capability requirements of a vendor base, selects the vendors to meet those requirements, and classifies the vendors based on their strategic importance
- The establishment and implementation of a vendor engagement methodology that provides the framework for managing vendor relationships over time in an objective, data-driven manner aligned with business strategy

1.3 Document Overview

Below is an overview of the document and a brief description of the contents of each section:

Section 2: Background and Context at Corporate Level

A history of Li & Fung is given in this section to provide the reader with an appreciation for how adept the company has been over the past century at evolving with changing geopolitical and economic circumstances. This section sets the stage for a brief discussion of the consequences of one of the pivotal events in modern history – the announcement of China's Open Door Policy in

1978 – and how Li & Fung's business model adapted to the globalization of production. With decades of deflationary pressure on consumer goods now coming to an end because of the development of coastal China and the attendant rise in wages, buyers are seeking alternatives farther inland of China and other parts of the world where a sufficiently large pool of low-wage labor can be found to keep manufacturing prices as low as they once were. This development is reshaping Li & Fung's sourcing strategy.

Section 3: Background and Context at Operating Group Level

With the corporate and competitive environment context set, section three goes one step deeper in detail by describing how an industrial accident came about as the result of compliance standards being violated in order to cut costs. This accident served as the impetus for Li & Fung to recognize the vulnerabilities it is exposed to as a result of deficiencies in its vendor base, and that the company is in a unique position to be able to provide support services to its vendors. One of its operating groups – LF Beauty (LFB) – began a strategic vendor management initiative to reshape its vendor relationships and build the organizational structure that can deliver on those support services. Having described the context in which the current work takes place, the document transitions from background information to the author's development and implementation of a vendor rationalization and engagement methodology.

Section 4: Vendor Performance and Capability Assessment

Section four is a self-contained section that begins with a literature review of vendor performance and capability assessment methods, then details the development and implementation of a performance and capability assessment tool, and ends with recommended future work. The approach to develop this tool – the LFB balanced scorecard – was, through a literature review, discussions with LFB employees, and factory visits, to understand what information is important for providing a holistic picture of a vendor's performance and capabilities. Various uses of this tool are discussed. Although this is a self-contained section, as a topic it links sequentially to the next section and is used as the main tool to drive the vendor rationalization effort.

Section 5: Vendor Rationalization

Section five describes the development and implementation of the vendor rationalization methodology. A literature review of vendor rationalization and selection methods provides

information on how this topic has been considered in the past. The pilot vendor base on which the rationalization methodology was implemented was for the Bags product category. In addition to selecting the factories to fulfill the capacity and capability requirements to satisfy customer demand, factories are classified based on their strategic importance to LFB. The section ends with recommended future work to improve the rationalization methodology. As with the previous section, this section is a self-contained section that builds upon the previous and informs the next.

Section 6: Vendor Engagement

Section six describes the development and implementation of the vendor engagement methodology. The tool that is developed to manage vendor relationships over time is the Vendor Engagement Package, which provides, among other pieces of information, detailed performance data, sections that document performance deficiencies and improvement plans, and relevant financial data. Outcomes from implementing the Vendor Engagement Package with one of the vendors is discussed, followed by recommendations for improving the engagement process. The end of this section marks the end of the technical aspects of the work, making it the logical point at which to attempt to validate the work that has been described in sections four, five, and six.

Section 7: Case Study of Selected Vendors

Section seven ties the three preceding sections together by attempting to validate, from a qualitative, observational perspective gained through on-site visits to vendors, the effectiveness of the balanced scorecard in assessing vendor performance and the rationalization methodology in selecting the appropriate vendors. Due to the relatively small sample of observations, this section should be viewed as the beginning of the validation process and an example of how LFB should be relating actual conditions at vendor sites to the performance picture that is conveyed by the balanced scorecard, rather than a completed piece of work from which, at this time, generalizable conclusions can be drawn. The validation process is critical because it grounds the balanced scorecard and rationalization methodology in empirical evidence and allows for improvements to be made to both where discrepancies between actual and assessed performance are observed. Lastly, the first-hand account from the visits brings out in a more impactful way the very real challenges that vendors face, their attitudes toward these challenges, and the untapped potential for improving their operations.

Section 8: Conclusions

Concluding remarks are given about the contribution of this work and the perspective in which it should be viewed, given the context in which it was undertaken and the goals it attempted to fulfill.

2 Background and Context at Corporate Level

2.1 Li & Fung: 109 Years of Trading[1]

Li & Fung Limited is a Hong Kong-based multinational trading company providing services in product design, product development, sourcing, logistics, and distribution. The company was founded in Guangzhou in 1906 by Li To-ming, a traditional Chinese merchant whose family owned a porcelain shop, and Fung Pak-liu, a recent graduate of Hong Kong's Queen's College, who had become fluent in the English language and had gained exposure to British social and business norms. The alliance of Li and Fung combined the practical business experience of To-ming with Pak-liu's understanding of how to manage an import and export business in an environment dominated by British firms. The synergy of the two gave them a competitive advantage that resulted in a thriving business.

From its founding until the mid-1930's, the company quickly expanded beyond its initial business expertise of porcelain and antique wares. It soon began to trade in bamboo wares, jadestones, ivory handicrafts, and China's most well-known export at the time – fireworks. The credibility of Li & Fung as a trading house was recognized in a business almanac as being one of the 28 leading import and export firms in Guangzhou, which was the point of departure for the 'Maritime Silk Road'. It was during this period, too, when Pak-liu, at the behest of the Chinese government, was asked to join the Panama-Pacific International Exposition in the United States, during which he acquainted himself with American society and the country's economy. The relationships he formed with American business men, many of whom were reluctant to trade with China through British firms, were fostered thereafter with annual trips to the United States. It was through these early engagements that the company established strong ties with the United States that continue to the present day.

The mid-1930's witnessed the outbreak of the Second Sino-Japanese War and with it disturbances at the Guangzhou headquarters. Pak-liu relocated Li & Fung's core operations to Hong Kong, which was relatively stable due to its status as a British colony, and sent his son Hon-chu to manage

[1] This section adapted from *A Hundred Years of Li & Fung: Supply Network Orchestrator for Asia and Beyond* by Bang-yan Feng (Feng, 2012).

business there. By 1937, the Japanese invaded the Chinese mainland and had taken control of Guangzhou by the following year. Understanding the danger of the situation, Pak-liu had moved the company headquarters to Hong Kong. Five years later, in February 1942, Japan declared Hong Kong as its occupied territory. The devastation of World War II left Li & Fung's properties in ruins, and in 1945, just months before the unconditional surrender of the Japanese, Pak-liu passed away.

Stability returned to Hong Kong in 1946, but due to uncertainty on the part of Li To-ming of continuing a business relationship with the second-generation of Fung leadership, To-ming sold his shares in the company, passing control over to the Fungs and ending the forty-year business relationship. Because of Hong Kong's open economy and excellent port facilities – as well as the large influx of workers from mainland China that provided low-cost labor – industrialists throughout Asia flocked to the city to establish manufacturing facilities. From the post-war period to the early 1970's, the business of Li & Fung rode the wave of an increasingly industrial Hong Kong to expand the offering of products in which it traded. These products included plastic flowers, toys, electronics, and most importantly, garments, which made up about half of Li & Fung's exports in the 1960's. In fact, Hong Kong had become such a large producer of garments that Britain issued the Lancashire Agreement in 1959 that required Hong Kong to voluntarily restrict its garment exports to Britain. As Hong Kong became more industrialized, Li & Fung sourced a greater and greater portion of its exports in Hong Kong, to the point where the number of suppliers in the city numbered over one thousand.

The early 1970's witnessed a maturing of Hong Kong's financial institutions, as multiple stock exchanges were established to meet the demands of Chinese firms seeking to raise capital. In April 1973, Li & Fung issued an initial public offering to become a public company. It was the brothers Victor and William Fung, both of whom had Western educations and had recently returned home to Hong Kong to assume the role of third generation leadership for the company, who were the driving forces to take the company public. One of the motivations for this was to put the company in a better position to attract more management talent. In order to continue the growth of the business, the Fung brothers recognized that the company needed to modernize its management practices to become more than just a traditional family business.

By the mid-1970's, Li & Fung began to expand its services beyond sourcing and exporting goods by becoming involved in the front end of the production process – marketing and designing – as well as inspecting, packaging, and transporting goods at the back end of the process. The Fung brothers also took another significant step in developing the business by establishing the Li & Fung Retailing Group in 1973, with the idea that the maturing economy in Hong Kong would cause it to lose its export advantage, and it was therefore important to start competing in the retail market. With the opening of China to foreign investment in the early 1980's, the industrial base of Hong Kong began to rapidly move northward into China, making the retail market in Hong Kong all the more important. In 1985, Li & Fung entered into a partnership with two other companies to open its first Cricle K shop, a convenience store selling over 3,000 items, and by 1997 had increased its shareholding of the convenience store chain to become the sole owner. During this time, Li & Fung also entered into a joint partnership with Toys R Us to open stores initially in Hong Kong and Taiwan. In the 1990's the Retailing Group expanded its portfolio of business by acquiring two companies that it eventually sold in the next decade.

From the arrival of Victor and William in the early 1970's until the mid-1990's, the company expanded greatly from its origins as an import and export business to providing services throughout the supply chain and entering the retail market. In 1995 it expanded in another significant way by acquiring the British trading company Inchcape Buying Services, nearly doubling the headcount at Li & Fung. The merger of the two largest trading companies in Hong Kong set Li & Fung up to be a truly global company, since the acquisition gave Li & Fung the access and network to serve Inchcape's European customers. Before the acquisition, 84% of Li & Fung's trading business was with the United States and 14% with Europe, after which it was closer to 60% and 40%, respectively. Additionally, turnover increased by 50% after the first year of the acquisition.

After integrating Inchcape into its operations, Li & Fung sought more acquisition opportunities to continue to grow its capabilities and customer base. In 1999, Li & Fung acquired two business from the British conglomerate Swire Group: Swire & Maclaine Limited and Camberley Enterprises Limited. The significance of the acquisition of Swire & Maclaine was that it was the largest competitor to Li & Fung, and by acquiring both Inchcape and Swire & Maclaine within a five-year period, Li & Fung had become one of the dominant sourcing and supply chain

management firms in the world. The significance of the Camberley acquisition was that Li & Fung was able to learn Camberley's 'virtual manufacturing' expertise as another service to offer its customers. 'Virtual manufacturing' is a model Camberley used to provide design and development services for product samples, in addition to carrying out the sourcing function. This acquisition paved the path for Li & Fung to become a true product supplier rather than just a supplying agent. Finally, in late 2000, Li & Fung acquired another major rival, Colby. Through the acquisition of Swire & Maclaine, Camberly, and Colby, Li & Fung had grown to over 5,000 employees with a global sourcing network to 68 offices in 40 countries, making it one of the largest sourcing and trading companies in the world.

With a firmly established global sourcing network and customer base, Li & Fung changed its acquisition strategy in 2004 to include smaller companies that would enable the company to move into new business areas and expand its product mix, acquire new technologies, and enhance its existing capabilities. The goal was to acquire three to five smaller-sized trading companies each year. Examples of acquisitions under this new strategy include CGroup, which allowed Li & Fung for the first time to enter the beauty and cosmetics business, and Karstadt Quelle, the largest retailer in Germany at the time, which strengthened Li & Fung's presence in Europe. Another aspect of the acquisition strategy was to pursue the 'onshore strategy', which first began in the United Sates. Under the 'onshore strategy', Li & Fung would acquire distributors and retailers in the United States in order gain ownership of their proprietary brands, private labels, and licensing brands, allowing the company to develop business in the United States. This 'onshore strategy' led to the creation of LF USA to manage the business development of the licenses and brands. The 'onshore strategy' was also later used in Europe and Asia to create LF Europe and LF Asia. The majority of these licenses and brands were put under a new business called the Global Brands Group, which was spun off in 2014 as a separate business listed on the Hong Kong Stock Exchange.

Throughout its 109-year history, Li & Fung has continually reinvented itself to meet evolving business, social, and political challenges. In the past twenty years, the company has pioneered an asset-light, network orchestration strategy in which it works with a supplier network of over 15,000 factories in 40 countries across the globe to bring high-volume, time-sensitive consumer goods to the market (see Figure 1). In this network orchestration strategy, the total value created by the supply chain is segmented into value-creating links that are distributed globally to those locations

that can perform the value-creation work most economically. LF's competitive advantage lies in the strength and extensiveness of it's of its supplier network, which it leverages to create a customized supply chain to best meet a customer's delivery, quality, and cost requirements at a given point in time (see Figure 2).

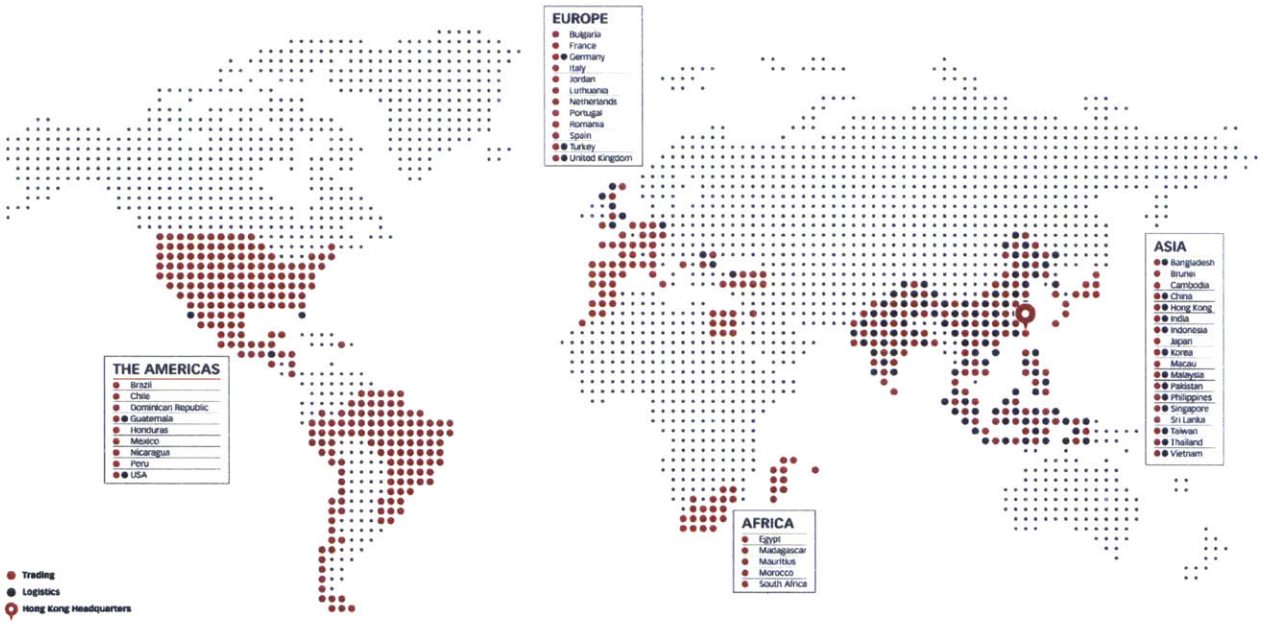


Figure 1: Li & Fung's Global Presence
(Our Global Network – Li & Fung Limited, 2015)

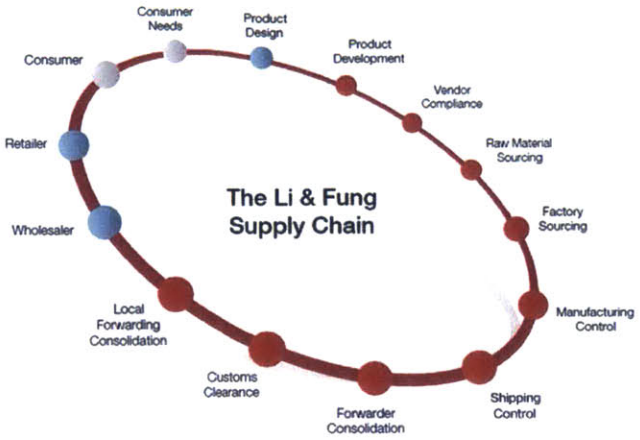


Figure 2: The Li & Fung Supply Chain Management Model
(Fung Trading Services, 2015)

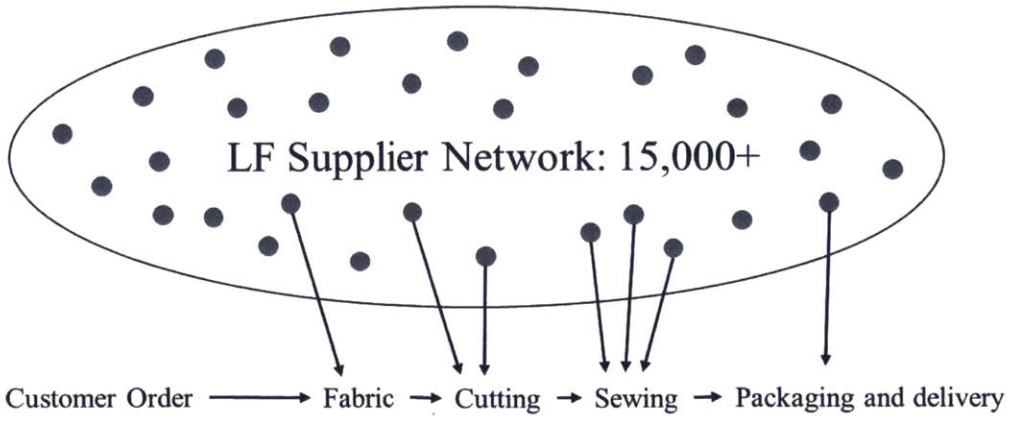


Figure 3: Li & Fung Supplier Network
(Fung, 2008)

To illustrate this concept, suppose BrandX wishes to place an order with Li & Fung to deliver a shipment of backpacks. A representative of BrandX works with an Li & Fung merchandiser to agree on the physical requirements of the backpack (material type, dimensions, quality level, etc.), the number of units to be produced, when they will be shipped, and the price of the order. A merchandiser then solicits quotes from numerous factories and selects which factory will produce which parts of the backpack, which factory will perform the final assembly work, and will arrange the logistics and distribution to deliver the order to the end customer by the agreed upon date.

Figure 3, shows this distributed, decentralized, and asset-light production paradigm where Li & Fung does not own any of the assets used in the production process, but rather acts as a network orchestrator tying the production together.

2.2 The World's Factory: China's Economic Rise from 1979 - Present

An historical event that had a major impact on LF was China's Open Door Policy announced by Deng Xiaoping in 1978, which resulted in four Special Economic Zones being established in 1980 as a means to modernize China by attracting foreign investment. The investment came largely in the form of industrial and manufacturing facilities financed by multinational companies seeking to cut costs by employing, at that time, a virtually inexhaustible supply of low-wage workers. The first decade of the policy produced an average annual rate of trade expansion above 15 percent, and brought China from the thirty-second to the thirteenth largest trade exporter by volume in the world (Wei, 1995).

The full effects of China's Open Door Policy were felt a decade after its inception, as multinational corporations began to figure out how to operate in the new business and cultural environment of China. Figure 4 shows the sharp increase in foreign direct investment into China beginning in 1991, which only leveled off during the correction of the Dot Com Bubble before increasing again. Interestingly, it was during the late 1980's when the term 'globalization' came into the popular lexicon (Feder, 2006), after the publication of the essay The Globalization of Markets by Theodore Levitt in 1983 (Levitt, 1983). He argued that the 'the globalization of markets is at hand. With that, the multinational commercial world nears its end, and so does the multinational corporation.' The global commercial world, and with that the global corporation, had arrived, due primarily to the consequences of the China's opening to the world.

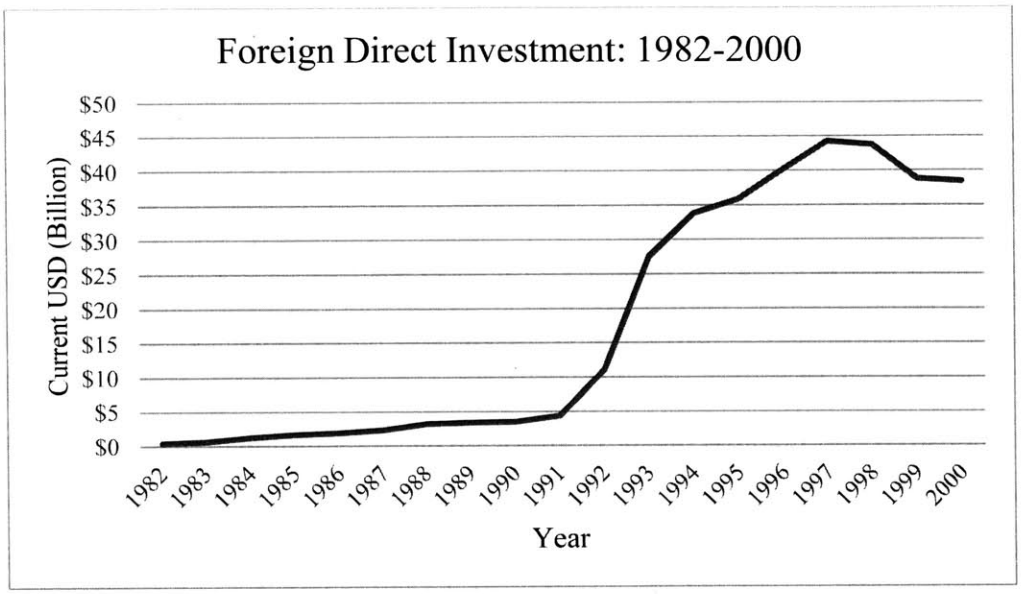


Figure 4: Foreign Direct Investments in China 1982-2000

The first two decades of China's Open Door Policy can be viewed not only as an investment in the manufacturing capacity of China, but also as an investment on the part of corporate leadership in learning how to operate global companies with supply chains spanning different languages, different business and social cultures, and different political and regulatory constraints. China, too, experimented with institutional and social reforms over this period to learn how to accommodate and compete in the nascent globalized world. Thus, the ground work had been laid for the next milestone event in China's economic history – acceptance into the World Trade Organization on December 11, 2001. The significance of the event was reflected upon after a decade of history in the organization by Chinese Premier Wen Jiabo, who said on the tenth anniversary of the accession of China to the WTO: "China's 10th anniversary of its accession to the WTO is a momentous event in China's opening up to the outside world. If we describe the Canton Fair as a window China opened to the world, then the accession to the WTO can be seen as a door China opened to the world. If we describe the Canton Fair as China extending a hand to the world, then its WTO membership is its full embrace of this world" (China in the WTO: Past, Present, and Future, 2011)

From acceptance into the WTO in 2001 to today, the growth of the Chinese economy has been without historical precedent. Figures 5 and 6 show the dramatic growth in the overall Chinese economy and the manufacturing sector in particular. Between 2000 and 2013, the Chinese

economy experienced a growth rate of above eight percent for all but the last two years, and with six of those years with double-digit growth rates. Perhaps most astonishing has been the increase in the value-added manufacturing output since the signing of the WTO. China leaped from the fourth largest manufacturing country to the first in about a decade, and since 2009, has grown the gap between it and the United States by $1 trillion. In the years following the signing of the WTO, China was beginning to popularly be called the 'World's Factory', and with the benefit of hindsight, it can be seen how true that was.

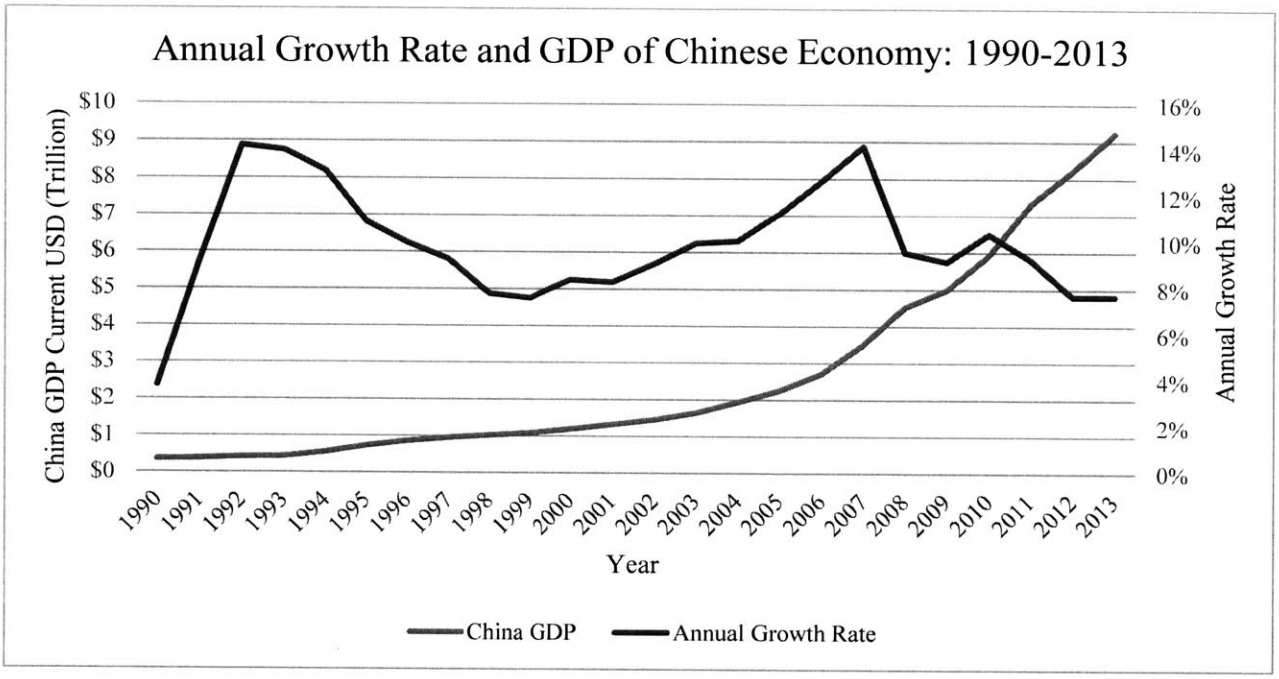


Figure 5: Annual Growth Rate and GDP of Chinese Economy 1990-2013

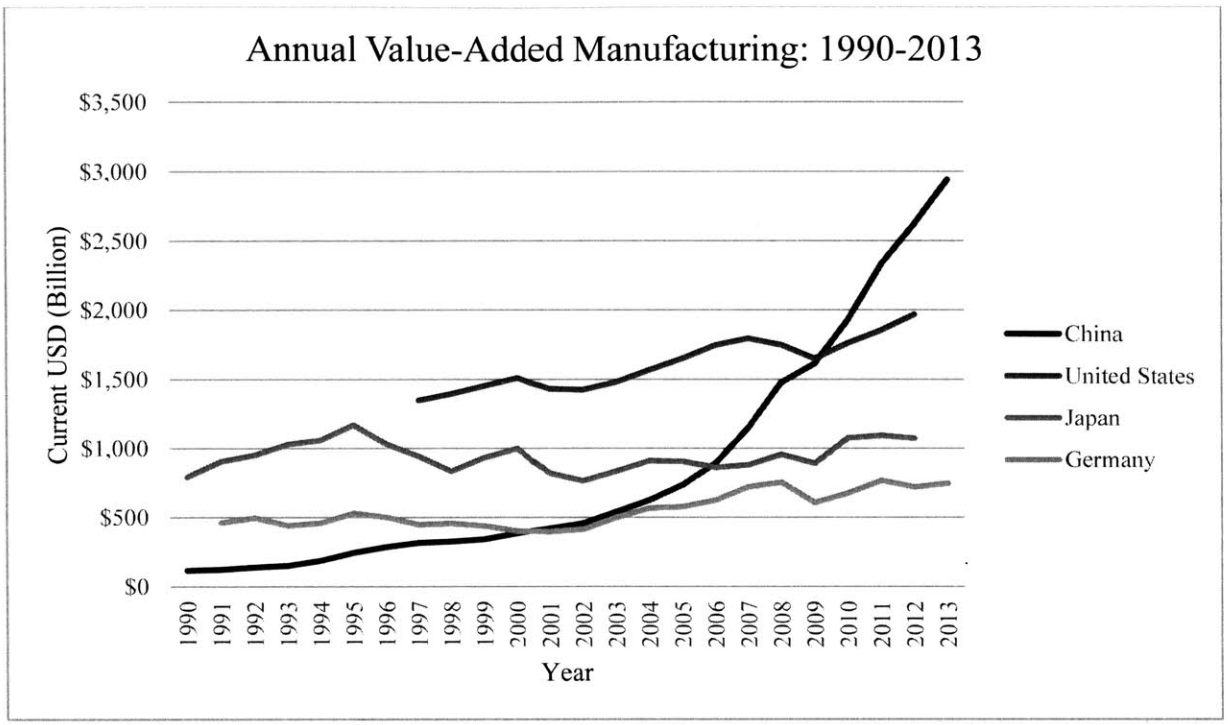


Figure 6: Annual Value-Added Manufacturing

However, the advantage that China enjoyed that attracted so much foreign investment and trade since the beginning of China's Open Door Policy – an abundant supply of low-wage labor – began to wane at the beginning of the new century as the inexorable outcome of the law of supply and demand in the labor market began to be felt. The economically active population of China increased from approximately 740 million to 793 million, a 7.2% increase, between the years of 2000 and 2013 (China Statistical Yearbook, 2014). This modest increase in the economically active population was not able to offset the demand for Chinese workers sufficiently to keep wage levels from rising. A key factor in the economically active population levelling off was fewer younger workers entering the workforce because of the country's one-child policy. From 2000 to about 2005, wage inflation in China, though noticeable, was not yet enough to cause a significant shift in the view of China as being a low-cost producer.

Wage inflation accelerated in following years and became significant enough in the latter half of the decade for China to begin to lose the advantage of being a low-cost consumer goods producing country, as shown in the Figures 8 and 9. Many of the low-value, manually intensive industries like the garment industry that had moved into China during its spectacular economic rise over the preceding thirty years now began to relocate from the coastal and southern area of the country to

surrounding neighboring countries, like Bangladesh, Vietnam, and Indonesia. In the Journal of Economic Perspectives, 'the end of cheap Chinese labor' is declared (Li et al, 2012), bringing with it disruption to world economic and cultural trends generally (Rein, 2012), and a change in sourcing strategies to Li & Fung in particular.

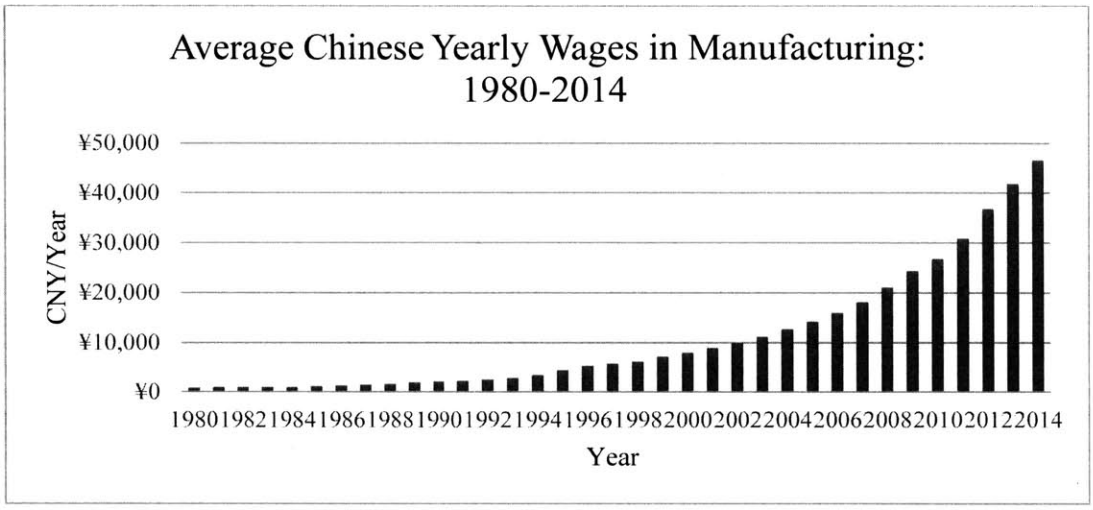


Figure 7: Average Chinese Yearly Wages in Manufacturing 1980-2014
(China Average Yearly Wages in Manufacturing, 2015)

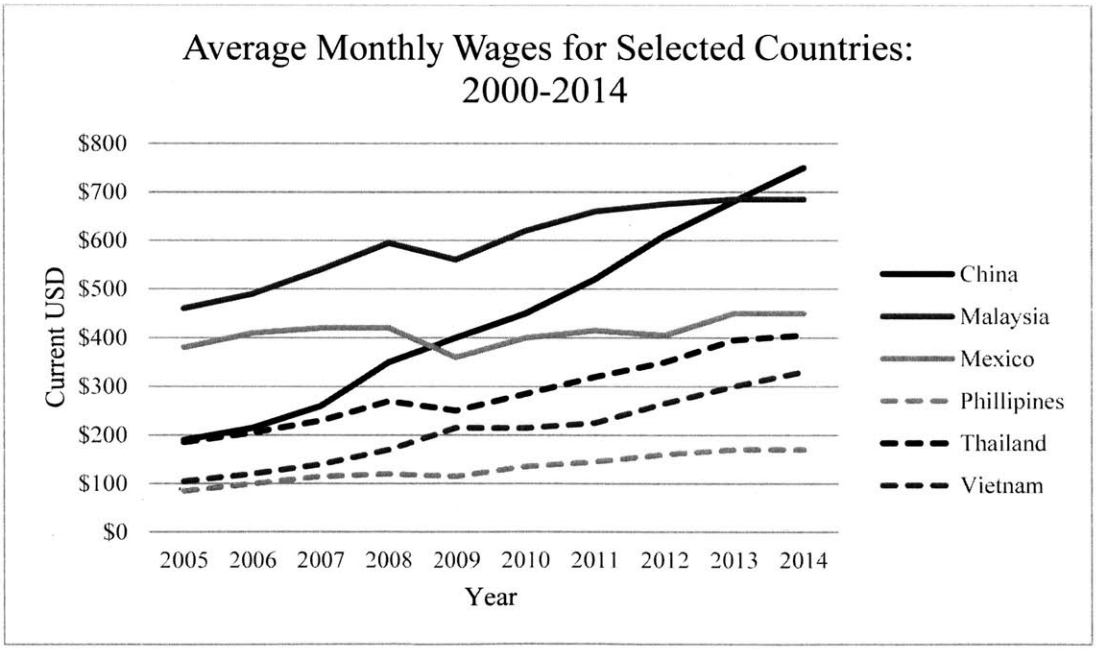


Figure 8: Average Monthly Wages for Selected Countries 2000-2014
(Morrison, 2015)

2.3 Li & Fung's Sourcing Strategy from 1979- Present

Before the inception of China's Open Door Policy, Li & Fung sourced the vast majority of its goods in Hong Kong, which had experienced tremendous growth and industrial development as a major free trade region in Asia after the Second World War. After the creation of Special Economic Zones, the signal was sent that gradually China's nearly one billion people at the time – accounting for approximately twenty percent of the world's population – would become more integrated into the world economy. Businesses, especially those with low-skill, manually-intensive manufacturing operations, saw an opportunity to reduce costs by employing the abundant pool of low-wage workers in China. The manufacturing for the garment industry in particular was one which was well-suited for being shifted to China. Therefore, Hong Kong and the Western world saw this industry and many others relocate to coastal China.

Li & Fung was in an advantageous position at this time, as it could act as an intermediary for western brands that sought to have their goods produced in China but had no experience doing business there. Li & Fung was able to develop an extensive network of suppliers that they could tap into and act as the agent in China for the western brands. From the mid-1980's to the mid-1990's, Li & Fung responded to this global economic shift by managing dispersed manufacturing. As Victor Fung stated, 'Managing dispersed manufacturing was a real breakthrough. It forced us to get smart about not only logistics and transportation, but also dissecting the value chain. Managing dispersed manufacturing, where not everything is done under one roof, takes a real change in mindset...And so we began what has turned into a constant search for new and better sources of supply' (Feng, 2012). It was at this point in the company's history that it began to break the supply chain down into its major value-creating segments and sourcing these where they could be performed most efficiently. Although Li & Fung sourced from a number of countries, the largest supplier was China.

From the mid-1990's onward, Li & Fung could rightly be termed a global supply chain manager, where it provided end-to-end services, starting from product design support all the way to local freight forwarding of the finished goods. But what has been one of the challenges that Li & Fung has been addressing over the past several years is developing a 'beyond China' strategy. For thirty years, China has been exerting a downward inflationary pressure on manufacturing wages and consumer goods, but in the past several years, that trend has been reversing. Through a concerted

government policy of wage inflation, steady industrial development, and the aspiration of younger generations to work in service industries rather than factories, the cost of sourcing goods in China is on the rise. However, there is no ready replacement for China as 'the world's factory'. Although certain manufacturing industries are moving out of China to lower-wage countries, selecting the location of production for consumer goods based primarily where the lowest wages are found is not a viable long-term strategy, especially in light of heightened public and corporate awareness of compliance and sustainability issues. Supply chain compliance and sustainability is an emerging topic within supply chain management that seeks to improve the health, safety, and working conditions of suppliers throughout the supply chain and reduce adverse environmental impacts from raw material sourcing to delivery of the final product. Increasingly, supply chain compliance and sustainability performance, which is typically of greatest concern in developing countries where the lowest wages are found, is becoming more important in customer and supplier relationships. Though, low wage countries often have human rights, labor, and environmental standards meeting international standards, opportunity for improvement remains.

2.4 Tazreen and Rana Plaza: A Call for Sustainable Supply Chains

In 2013, Bangladesh was the world's second largest exporter of garments after China. The country exports $19 billion worth of garments, which make up more than three quarters of Bangladesh's export earnings. It is expected that this industry will grow rapidly over the next decade as the rising labor costs in China reduce its cost-competitiveness in an industry driven largely by labor costs (Alamgir et al, 2013). Bangladesh has been a particularly attractive country for the migration of garment manufacturers from China, due to Bangladesh's large population and low wages.

Before the Tazreen and Rana Plaza incidents, the typical Bangladeshi worker could be characterized as a young woman who migrated from a rural area to the capital city of Dhaka in search of the economic opportunity brought about by the influx of garment factories. These young women were willing to work for what amounted to some of the lowest wages in the world (Karim, 2014), because it was one of the few opportunities they had to make money in a country that had nearly one-third of its population below the poverty line. The garment factories tended to have adverse work conditions, with minimal or no workplace health and safety regulations, programs, and practices. The garment industry in the country dealt with a vicious cycle of lax enforcement

of labor, safety, and social standards, which combined with a focus on low-cost that created an environment rife with risk.

On November 24, 2012, a Tazreen Fashion factory caught fire and killed over 100 workers, making it the deadliest factory fire accident in the Bangladesh's history (Ahmed et al, 2012). Only a few months later, on April 24, 2013, the Rana Plaza building in Dhaka collapsed. This is considered the deadliest garment-factory accident in history, the cause of which is attributed to the building being filled beyond rated capacity. The quick succession of devastating factory accidents in Bangladesh became a watershed moment for not only the garment industry, but for all industries employing low cost labor in developing countries. It became a focal point for concerned consumers and for brands to think more deeply about the working conditions of those producing their goods.

Sustainable supply chains has now became a major theme within Li & Fung. The traditional approach to managing vendors in Li & Fung can generally be described as a transactional one, in which merchandisers choose who to do business with based primarily on lowest-cost provider, given that delivery and quality requirements can be met. The new factory relationship model calls for a more collaborative, long-term, and improvement-oriented approach. Indeed, Fung Group Chairman William Fung stated that, "We will treat our vendors as customers in their own right and be the 'go to' partner for both customers and vendors in the global supply chain," signaling a significant shift both culturally and operationally for Li & Fung.

Fung Group CEO Spencer Fung has stated that "We face rising expectations on all fronts—safety, environment, social, working standards. Rana Plaza has brought many of these issues to the front pages, but they have been developing for some time. And they are on the minds and in the boardrooms of our major customers. We need better strategies to address these: to shift from dealing with things as they come, to an integrated and holistic strategy where we create solutions and build value for our customers in sustainable supply chain management. We need to help our customers be sustainable in every dimension of their businesses" (Melvin et al, 2015).

3 Background and Context at Operating Group Level

3.1 LF Beauty: End-to-End Service Provider in the Beauty Industry

LF Beauty is one of the primary operating groups within Li & Fung. The size of the operating group makes it an ideal test bed for developing a new model of vendor management. It is small enough to allow for quick implementation of new vendor management strategies to identify what ideas have positive potential while limiting the impact of those that do not. It is also large enough so that the learnings from trials can be applied more broadly throughout the company.

LF Beauty is the result of the merger and acquisition of 10 companies in the beauty industry over the past ten years. Each of these businesses had expertise in a portion of the beauty industry, the combination of which gives LF Beauty end-to-end service capabilities, from product design and development to manufacturing, packaging, and distribution. Since each of the businesses composing LF Beauty were until recently organized by the customers they served, with many units operating with different habits, processes, and without the practice of information sharing across the entire group, inefficiencies developed, and the businesses was unable to scale and perform to potential.

3.2 Rapid Transformation: Creating One LF Beauty Culture

Recognizing the need to rethink the way the LF Beauty operated, a change initiative – termed Rapid Transformation – was started in early 2014 that sought to address the organizational issues and uniquely position LF Beauty within the beauty industry to better serve its customers. The vision of this change initiative was to 'deliver value added services in terms of supply chain management, product category expertise, compliance, innovation and design, underpinned by one culture and strategic vendor management to achieve cost-competitiveness'. To realize this vision, the Rapid Transformation focused on four areas:

1. **Vendors** – A way in which to better manage the vendor base was needed to answer the questions:
    - How does LF Beauty identify strategic versus transactional vendors?
    - How does LF Beauty systematically manage vendors?
    - What organizational structure and work processes are needed to build greater leverage with vendors?

2. **Product Categories** – Since LFB was organized by customer groups rather than by product categories, it was difficult for the business to build up its product expertise to deliver higher-quality, higher-value products. The organization needed to analyze and define which product categories it wanted to build its expertise in and answer the following questions:
    - How does LF Beauty define product categories as core and non-core?
    - How does LF Beauty build up product categories that will become strategic?
    - How does LF Beauty develop product expertise in core categories?
3. **Customers** – Only 30% of LF Beauty's customers accounted for 93% of sales. The organization needed to reassess which customers contributed to its profitability and determine which to continue to do business with. A way to more effectively focus attention on customers needed to answer the questions:
    - How does LF Beauty rationalize its customer base?
    - How does LF Beauty identify gaps in the services it provides to top customers?
4. **People, Systems, and Processes** – With the organization structured around customer groups, where merchandisers handle multiple product categories, and with unclear roles and responsibilities affecting collaboration between functional teams, a restructuring of work processes needed to answer:
    - How does LF Beauty allocate the right resources in the right categories to service the right customers?
    - How can collaboration within LF Beauty be improved?
    - How does LF Beauty redefine roles and responsibilities across all functions to create a sense of ownership in all processes and projects?

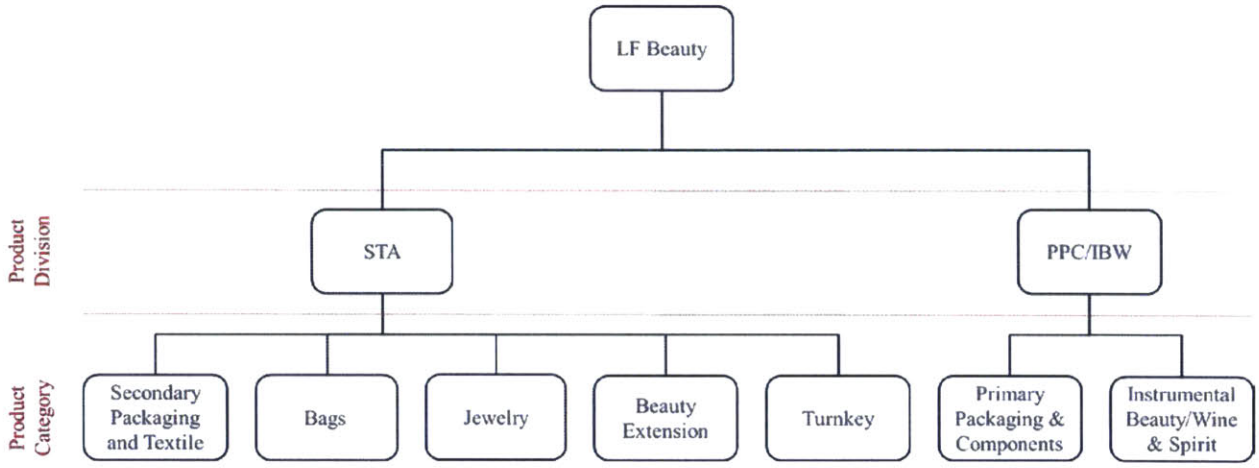


Figure 9: LF Beauty Organizational Structure after the Rapid Transformation

3.3 Vendor Management and Sustainability

The outcome of the Rapid Transformation specifically for the vendor focus area described in Section 3.2 is the subject of the current work. The major outcome from this focus area was identifying the need and providing the senior leadership support for the establishment of a Vendor Management and Sustainability framework, in which LF Beauty invests time and effort in a select number of vendors who partner with LF Beauty to deliver exceptional services, quality, and compliance at a competitive cost. The key components of this framework would include methodologies for:

1. *Vendor rationalization*
    - Identify core vendors from non-core vendors
    - Classify vendors within the base of core vendors based on their strategic importance to LF Beauty
    - Define a process for new vendor acceptance
    - Define a process for exiting a factory from the core base
2. *Risk Monitoring*
    - Identify supply chain risks, with an initial focus on vendor compliance and product quality
    - Provide the tools for understanding the root cause of the risks, so that corrective actions and improvement plans can be implemented.
3. *Vendor engagement*

- Define how LF Beauty engages the vendor for supporting improvement initiatives and how that relationship is managed over time
- Define how involved LF Beauty becomes in vendor operations and the amount of resources it devotes to supporting improvement initiatives
- Identify and cultivate the needed expertise within LF Beauty to be able to support vendor improvement initiatives

4. *Workflow Standardization*
    - Identify who is accountable for performing what functions in this new Vendor Management and Sustainability model, and how these functions are to be performed.

The scope of the current work covers two aspects of the Vendor Management and Sustainability framework. First is the development of a vendor rationalization methodology to identify core vendors from non-core vendors, as well as to select the subset of factories with which to form strategic relationships. Second is the development of a vendor engagement methodology which serves as basis for managing vendor relationships and expectations for performance improvement. Before transitioning to the development and implementation of these methodologies, a brief description of the framework in which the Vendor Management and Sustainability framework was carried out in is provided, followed by a review of literature on the extended enterprise, which grounds LF Beauty's new approach to vendor management in previous work on the topic.

3.3.1 Framework for Change: Rapid Transformation

The 90 Day Transformation framework (see Figure 11) for organizational change was developed by Benham Tabrizi through a decade of research at a variety of major multinational companies across numerous industries, along with a panel of finance, management, and organizational change experts. Based on a sample of fifty-six transformation efforts, the model identifies high-level critical success factors as well as specific principles and tools used by those companies that underwent successful transformative change. A key finding is that successful transformation efforts are all-encompassing, integrative, fast, and have full commitment and buy-in throughout the organization, particularly at top levels, while unsuccessful efforts lack at least one of these factors (Tabrizi 2007). The 90 Days Transformation framework is based on these findings and provides a means for fast-paced, large-scale organizational changes. It is used by LF Beauty in

implementing its change initiatives and is the context in which the current project of establishing a Vendor Management and Sustainability framework is carried out.

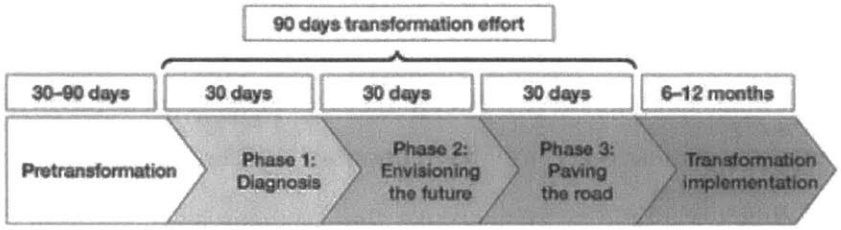


Figure 10: 90 Day Transformation Framework

3.3.2 Extending the Enterprise: Vendor Management and Sustainability

In his book Collaborative Advantage, Jeffrey Dyer identifies what accounted for Toyota's superior performance compared to its competitors throughout the 1980's and 1990's. The conclusion is that Toyota was the first company to generalize its Lean Manufacturing methodology beyond the facility and company level to encompass its supplier network, to create the extended enterprise. Greater collaboration between buyer and supplier creates competitive advantages for the firms involved by enhancing trust and reducing transaction costs, by sharing knowledge of best practices throughout the supplier network, and by faster and more effective responses to production issues through improved communication (Dyer, 2000).

Thomas Stallkamp discusses the shortcomings of the traditional, firm-centric management perspective and argues that a new management perspective – the extended enterprise – is better suited for the realities of the modern business environment in which the barriers of distance, communication, and technical expertise continue to be lowered. As the former president of Chrysler, Stallkamp chronicles the efforts of the corporation to implement its extended enterprise concept and provides a practical case study of the positive business impact of a collaborative approach to working with suppliers. The approach was formalized as the Supplier Cost Reduction Effort, in which Chrysler and its suppliers worked jointly on cost saving measures. Cost savings associated with this effort over an eight-year period were $5.5 billion, giving support to what Stallkamp described as 'one of the largest and most successful industrial collaborations undertaken at its time' (Stallkamp, 2005).

Jones and Womack in Seeing the Whole Value Stream provide a practical guide on how to improve collaboration among firms across the whole value stream to realize significant improvements in

product quality, reduced cycle times, and cost savings. They argue that throughout the decade of the 2000's, instead of analyzing and improving existing value streams to increase value for customers, companies searched globally for the lowest cost suppliers, while at the same time seeking cost reductions from existing suppliers. Because of steady wage inflation throughout that decade and into today, it has become more difficult to achieve cost reductions by finder ever lower-cost suppliers. Many companies today now have complex, disconnected supply chains that have extraordinary opportunity for improvement. Jones and Womack state that multi-function, multi-company collaborative teams 'aligning the energies of many independent collaborative contributors, is the next frontier for Lean Thinkers' (Jones & Womack, 2011).

At the root of the motivation for establishing a Vendor Management and Sustainability framework is the desire by LF Beauty to mitigate against supply chain risks – be they compliance risks, quality risks, or any other risk that may impact customer service – through longer-term, more collaborative relationships with its vendor base. The literature on the extended enterprise describes that there is great opportunity for buyers and vendors to improve on all dimensions of better serving the end customer and achieving cost savings through greater collaboration. This is relevant to the current work because LF Beauty seeks to improve its service and capabilities to its end customers by strengthening its vendor base. The idea is that by committing to long-term strategic vendor relationships and taking a stake in the improvement of these vendors, LF Beauty will have a higher-performing vendor base that better serves the end customer. This in turn will result in an expansion of business for LF Beauty, which allows it to place more orders with its vendors. Thus, a virtuous cycle is created in which vendors improving their performance receive more orders from the growing business volume of LF Beauty.

The preceding sections provide background information necessary to understand the motivation for establishing a Vendor Management and Sustainability framework and the business context in which it is being established. The remainder of the sections focus on the author's original contributions to the establishment of this framework.

4 Vendor Performance and Capability Assessment

Before rationalizing the vendor base, LF Beauty must develop criteria by which it will evaluate the performance of its vendors. This section provides a literature review of vendor evaluation criteria. Based on these evaluation criteria and the behaviors LF Beauty wishes to promote within its vendor base, the LF Beauty balanced scorecard is presented as the tool to evaluate vendor performance. Applications of the scorecard for different users is discussed, followed by recommendations for future work on the scorecard for further improvement.

4.1 Literature Review: Vendor Evaluation Methods

An important initial step in implementing a vendor management strategy is to define the goals the business wishes to achieve in working with its vendors. Once the goals have been determined, an evaluation system to identify and monitor those vendors that best align with those goals needs to be established. An effective evaluation method should promote the behaviors that align the vendors with the business goals; therefore, it is critical that appropriate evaluation criteria are selected.

In his comprehensive review of the purchasing literature in 1966, Dickson identified 23 factors he found to be of most relevance to both academicians and practitioners for vendor evaluation (Dickson, 1966). The top five factors were quality, delivery, performance history, warranties and claims policies, and production facilities and capacity. As an update to this work in 1991, Weber reviewed 74 articles that had been published in the intervening decades, with specific interest in the impact the introduction of the just-in-time manufacturing concept had on vendor evaluation criteria (Weber, 1991). The top five factors from this list are net price (number six in the Dickson study), delivery, quality, production facilities and capacity, and geographical location (number twenty in the Dickson study). The rise in importance of geographical location reflects the increasingly global scale of sourcing operations between the time the two studies were published. Since the Weber study, little has changed in the literature concerning top vendor evaluation criteria.

4.2 Current State of Vendor Performance and Capability Assessment

The following section details the current state of how LF Beauty assesses its vendor's performance and capabilities.

4.2.1 Vendor Performance Assessment

There is a vast amount of data currently collected by LF Beauty on vendor performance. This includes, among other information, delivery data, quality data, compliance data, and business volume data. Besides quality data, which is stored in a separate database, all of this information is collected and stored in Li & Fung's central database. Although some of this information is routinely used to monitor vendor performance, much of it is largely untapped in being used on an on-going basis to make better supply chain management decisions. Highlighted below are three of the most critical gaps in the way in which vendor performance is currently assessed:

1. Lacks holistic view of vendor performance – at the time of the project, there did not exist a report which displays vendor performance across a set of metrics which together give an overall sense of how well the vendor is performing. Most performance metrics of interest are contained in the central database, but one has to extract the raw data for each individually and, with considerable effort, refine that data to convey valuable information. While compliance auditors understand how well a vendor performs on its compliance audit, and a quality engineer understands how well a vendor performed on a Quality Management System audit, there is little cross-functional interaction, and no one within LF Beauty can provide a complete description of a vendor's performance across multiple parameters.
2. Data integrity – because some of the information in the central database is not routinely used, there are some data integrity issues which would have otherwise been discovered and corrected. Additionally, there is a lack of standardization in the way in which data is tracked and used, which is largely the result of the customer group organizational structure before the Rapid Transformation initiative. For example, vendor delivery data was tracked in such a way as to make it unusable to determine the true on-time delivery performance of the vendor. If a delivery date was changed beyond the scheduled ship date, the reason for changing the delivery date was not tracked, so one could not determine whether it was changed due to a vendor problem, or whether this came at the request of LF Beauty or the customer.
3. Vendor cost-competitiveness – understanding the cost-competitiveness of a vendor and gaining more transparency into the vendor's cost structure is of great interest to LF Beauty merchandisers and business leaders. However, at the present time, there is not an effective, objective measure of a vendor's cost-competitiveness over time. Cost-competitiveness is

determined by how a vendor's quotation compares to others it is competing against on any given quotation, but how that vendor typically compares over time and what the vendor's cost structure is, is subjective and based on the experience of merchandisers.

4.2.2 Vendor Capability Assessment

Two aspects of a vendor's capability are assessed: manufacturing capability and testing capability. Manufacturing capability refers to the types and quantity of machinery the vendor has, as well as their product expertise. Testing capability refers to the types of product testing machinery the vendor has. The vendor's capability is assessed through on-site visit to the vendor by product and quality engineers, and through information provided by the vendor. The assessment consists simply of documenting the types and quantity of manufacturing and testing capabilities. Currently, two gaps exist in the way in which a vendor's capability is assessed:

1. Capability information not documented in central database – the vendor capability information is not stored in LF Beauty's central database. The information is stored in a spreadsheet and maintained by the product category leader. Data integrity concerns arise when there is not a standard method of storing the vendor capability information, as there would be if it was stored in the central database. Additionally, it is more difficult to access this information if it is held by individuals rather than being available through the central database. Finally, there is a risk of losing the data if it is stored locally on an individual's computer.
2. No defined responsibility for updating capability assessments – the current capability assessment process does not define who is responsible for updating capability assessments. After the initial assessment is done, updates are done on an ad-hoc basis by LF Beauty personnel (such as quality or product engineers) when they visit the factory to carry out inspections. However, since no one is formally responsible for ensuring that the capability assessments are up-to-date, there is no assurance that the capability assessments held by the product category leader are accurate.

4.3 The LF Beauty Balanced Scorecard

The LF Beauty balanced scorecard is a strategic management tool that addresses the gaps delineated in Sections 4.2.1 and 4.2.2 allows the operating group to objectively measure and monitor the performance of vendors according to four essential performance parameters:

compliance, on-time delivery, quality, and cost-competitiveness (see Appendix A). The performance parameters were selected based on a review of vendor evaluation criteria discussed in the literature, considerations from senior management, as well as what could feasibly be implemented in the short-term with the existing data tracking and data integrity constraints. The weights of the performance parameters were chosen through deliberations by senior management with the intention to reward vendor performance in a way that most accurately aligns with the operating group's vendor management strategy. The performance measures and their weights are displayed in Figure 12.

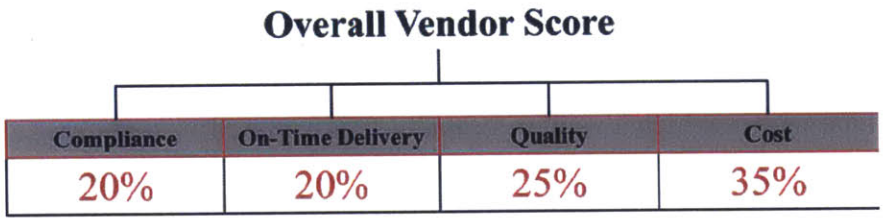


Figure 11: Balanced Scorecard Weighting Summary

4.3.1 Performance Parameter: Compliance

The compliance score accounts for twenty percent of the overall vendor score and is based on a comprehensive audit protocol required for every factory in which Li & Fung places orders. Audits are completed through an on-site inspection by a member of Li & Fung's Vendor Compliance and Sustainability team, or in a small number of instances, by the factory itself through a Self-Assessment Questionnaire. On-site audits are regarded with greater credibility and integrity than a self-assessment audit, which is only used in specific circumstances. The audit protocol covers the following areas:

- Basic Vendor Profile Information – Address, contact information, number of employees, etc.
- General Requirements - Licensing and legal information
- Employment Practices – Voluntary labor and working age assessment, wages, working hours, etc.
- Employee Treatment – Disciplinary practices, harassment/abuse
- Ethical Conduct – Corruption, bribery, fraudulent behavior

- Environmental, Health and Safety (EHS) Practices – Employee health and safety, compliance with environmental standards
- Security – Physical security of factory
- Sustainability (optional) – Energy usage and waste stream tracking

The compliance score awarded to the factory depends on the number and severity of violations identified through the audit. The scores range from 'A' to 'F', each with an associated numerical score ranging from 0 – 100% that is used for the Balanced Scorecard. The 'C' violation category is separated into three scores: C+, C, and C. Because the majority of the LF Beauty vendors (85%) have a 'C' audit score, the gradations of the 'C' score are used as a way to better differentiate the compliance performance. If an adjusted scale is not introduced, a vendor that receives 12 'C' violations is rated the same as a factory with 1 'C' violation, which provides an inaccurate comparison among vendors. If a zero-tolerance violation is identified, such as employment of underage labor, then not only does the vendor not receive a compliance score, but Li & Fung also discontinues business with the vendor for a period of at least six months, after which time the vendor is eligible for another compliance audit. Orders can be placed in the vendor only after passing an audit without any zero-tolerance violations.

4.3.2 Performance Parameter: On-Time Delivery

The on-time delivery score accounts for twenty percent of the overall vendor score and is based on the number of shipments that are delivered on or before the scheduled ship date over the past year. For example, if a factory shipped 49 out of 50 of its deliveries on or before the scheduled ship date over the past year, then the on-time delivery score would be:

$$\text{On-Time Delivery Score} = \frac{\text{number of shipments delivered on time}}{\text{total number of shipments}} = \frac{49}{50} = 98\%$$

4.3.3 Performance Parameter: Quality

The quality score accounts for twenty-five percent of the overall vendor score and is based on two equally weighted measures: the 1st inspection pass rate and the defect rate. The 1st inspection pass rate gives an indication of the stability of the quality performance of a vendor over time, and is calculated by dividing the total number of inspected lots that pass inspection by the total number of lots inspected over the reporting period. Each lot is inspected by a quality engineer from LF Beauty. The number of pieces randomly inspected in a lot is in accordance with ANSI/ASQ Z1.4.

An acceptable quality level (AQL) is agreed upon between an LF Beauty merchandiser and the customer and is used to determine the highest acceptable number and severity of defects. The defect severity types are classified as follows:

- Minor – a defect not likely to reduce the usability of the unit for its intended purpose, can be noticed only after careful examination, and may reduce salability. It is a workmanship deviation from established standards but has little effect on the effective use or operation of the unit.
- Major – a defect which renders the product unusable or results in damaging the product such that the end user of the product would reject it.
- Critical – a defect that is likely to result in a hazardous or unsafe condition for an individual using the product, or a defect that violates mandatory regulations.

As an example, if a lot has a sample size 1,800 and an AQL of 2.0, then up to 140 minor defects, 32 major, and 0 critical defects are allowed. If any of these limits are exceeded, then the lot is rejected.

While the 1st inspection pass rate gives an indication of the stability of the quality performance, the defect rate gives insight into the average level of quality performance. The quality performance of a factory could be stable, but it might be stable just at the threshold of the AQL or even beyond the AQL. The defect rate is also another measure to more finely discriminate the quality performance between two vendors that consistently have high 1st time inspection pass rates. Both pieces of information are included to convey a more complete picture of the vendor's quality performance.

A vendor's quality score is based on equally weighting its 1st time inspection pass rate and its defect rate. If a factory has a 1st time inspection pass rate of 94%, and a defect rate of 4%, then the quality score would be calculated as:

$$\text{Quality Score} = 0.5[\text{1st inspection pass rate} + (1 - \text{defect rate})]$$

$$= 0.5[0.94 + (1 - 0.04)] = 95\%$$

4.3.4 Performance Parameter: Cost

The cost performance parameter accounts for thirty-five percent of the overall vendor score and is based on the net margin associated with the goods produced by the vendor over the reporting period, normalized by the product category. The margin is the difference between the sale price of goods and the purchase price of goods from the factory, divided by the sale price of goods. The net margin is the difference between the margin and the customer charge backs divided by the sale price of goods, where the customer chargebacks represent the value of goods returned to and payable by LF Beauty for quality problems. The net margin takes into account any customer chargebacks due to problems associated with vendor performance. Since the net margin earned by LF Beauty differs from product category to product category, the cost performance of the vendor needs to be compared product category to product category. Therefore, the vendor with the highest net margin in a product category becomes the standard against which other vendors in the product category are compared. The vendor with the highest net margin receives a cost score of 100%, with the rest of the vendors in the product category receiving a score in proportion to their net margin compared to the highest performer.

$$\text{Margin} = \frac{\text{sale price of goods-purchase price of goods from factory}}{\text{sale price of goods}}$$

$$\text{Net Margin} = \text{margin-} \frac{\text{charge backs}}{\text{sale price of goods}}$$

$$\text{Cost Score} = \frac{\text{net margin}}{\text{highest net margin in product category}}$$

Figure 14 provides a summary of the balanced scorecard components, how each is measured, and an example calculation.

COMPONENT	HOW IT IS MEASURED	SCORE	EXAMPLE
Compliance	LF Beauty's factory compliance audit	A = 100% B = 75% C+ = 50% C = 35% C- = 20% D = 0%	If the factory earns a 'B' on its compliance audit, it will earn a Compliance Score of 75%
On-Time Delivery	Number of orders shipped on or before the scheduled ship date	% delivered on-time	If the factory ships 49 of its 50 deliveries during the reporting period on or before the scheduled ship date, it will earn an On-Time Delivery score of (49/50) = 98%
Quality	1st Inspection Pass Rate	pass rate x 0.5	If the factory has a 90% first inspection pass rate, and has a defect rate of 6%, then the Quality Score is (90% x 0.5) + [(1-94%) x 0.5] = 92%
	Defect Rate	(1 - defect rate) x 0.5	
Cost	Net margin normalized by product group	net margin/best net margin in product group	margin = (sale value to customer - factory cost)/(sale value to customer) charge back rate = (charge backs)/(sale value to customer) net margin = margin - charge back rate If the price paid to the factory for an order (factory cost) is $100, and the price LF Beauty sells to the customer (sale value to customer) is $120, then the margin is ($120 - $100)/($120) = 16.67% In the same reporting period, the factory also had a total charge back value of $5, so the charge back rate is ($5)/($120) = 4.17% Net margin is (16.67% - 4.17%) = 12.50% If the best net margin in the product group is 17.00%, then the factory has a Cost Score of (12.50%/17.00%) = 73.53%

Figure 12: Balanced Scorecard Detailed Score Calculation

4.3.5 Threshold Requirements

In addition to measuring performance parameters, the balanced scorecard also has four threshold requirements that vendors must fulfill to receive orders from LF Beauty. The threshold requirements are:

- ISO 9001:2008 Certification – this certification provides assurance that the vendor has general quality management systems knowledge and has implemented at minimum a baseline quality management system. ISO 9001:2008 emphasizes a process approach to quality management with the following characteristics (International Standards Organization, 2008):
    - Understanding and meeting requirements
    - The need to consider processes in terms of added value
    - Obtaining results of process performance and effectiveness
    - Continual improvement of processes based on objective measurement
- Complete In-House Production Capacity – this requirement ensures that vendors are able to produce the goods completely in-house and do not have to rely on subcontractors without prior authorization by LF Beauty. This requirement is targeted at eliminating unauthorized

subcontracting that results in LF Beauty not having visibility throughout the entire supply chain, which exposes the organization to greater compliance risks.

- In-House Lab Testing Capability – this requirement ensures that vendors are able to perform all of the necessary product testing requirements in-house. This gives LF Beauty visibility into where and how products are tested, thereby giving greater assurance of product integrity.
- Use LF Beauty Costing Template for Quotations – This requirement mandates that vendors provide quotations using a specified costing template, giving LF Beauty detailed information about how a vendor arrives at a final price in a quotation. The costing template breaks the cost of goods into five categories: materials, direct labor, authorized sub-contracting, transportation, and manufacturing overhead. Additional costs, such as non-manufacturing overhead, taxes, and net margin are also recorded. Requiring vendors to provide this information allows LF Beauty to determine the cost-competitiveness of its vendors.

4.3.6 Additional Scorecard Information

Besides the four performance parameters and threshold requirements described in Sections 4.3.1-4.3.5, the following information is also contained in the balanced scorecard:

- Vendor Profile Information – provides the following identifying information: Vendor Name, Address, Point of Contact, Contact Information, Country.
- Reporting Period – the user can choose which reporting period to view, allowing for review of historical performance over the periods of interest.
- Business Volume – displays how much business volume has been awarded to the vendor over the period of interest.
- Product Division – classifies the vendor based on the product division for which it manufactures product (see Figure 10).
- Product Category – classifies the vendor based on the product category for which it manufactures product. Multiple product categories make up a product division, so also classifying a factory by product category gives more granularity when comparing factory performance at the product category level.
- Manufacturing Expertise – lists the types of products the factory is able to produce

- Manufacturing Capabilities – lists the types and quantity of important pieces of production equipment
- Certifications – lists third-party certifications awarded to the factory
- Customer-Approved Lists – lists which LF Beauty customers have approved the use of the vendor. Certain customers require that they approve the use of the vendor before LF Beauty can place orders with them.

4.4 Applications of the Balanced Scorecard

Having described the balanced scorecard in the previous section, this section describes a number of applications of the balanced scorecard.

4.4.1 Validation of Audit Tools

One use of the scorecard is to validate audit tools that are intended to provide more detailed information on the operations of a vendor. A way to evaluate the validity of an audit tool is to assess whether or not it has predictive power for the performance measure it is designed to audit. One example to illustrate this is the assessment of LF Beauty Quality Management System (QMS) audit tool that is used by LF Beauty quality inspectors to evaluate the quality management system of a vendor. If the purpose of a quality management system is to create a production system in which the quality of the end product is assured, then an effective QMS audit tool should find relatively few faults with a vendor with a high quality score, and vice versa.

The LF Beauty QMS audit tool is divided into seven sections: General Requirements; Order Processing; Incoming Material; Production; Final & Packaging; Sharp Tool Control; and R&D Sampling. Each of these sections contains questions that are evaluated to arrive at a score for the section, which then contributes to the overall QMS score. The hypothesis then is that the QMS audit score should be positively correlated with the quality score from the balanced score card. Figure 15 shows a plot of the QMS and quality scores for 358 vendors, where the solid black line represents a perfect correlation, and the dashed lines represent a +/- 10% deviation from that.

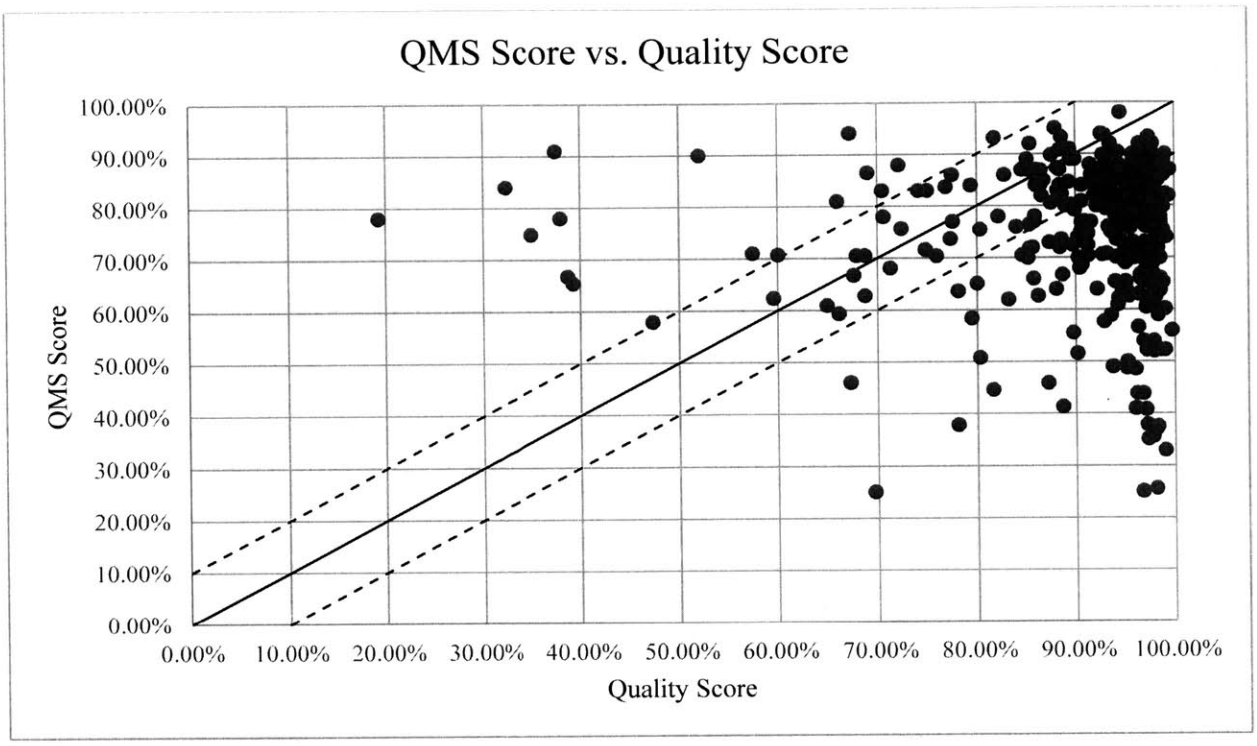


Figure 13: QMS Score vs. Quality Score

What is evident is from the 358 vendor evaluated is that the QMS score has very little predictive value for the quality score. There are three regions that a particular vendor can fall in:

1. *Along the trend line* – this is the assumed correlation, where an increase in the quality score would be accompanied by an increase in the QMS score.
2. *Below the trend line* – if an auditor's evaluation results in a low QMS score, it may suggest that the vendor's quality would also be poor. However, it is plausible to have a low QMS score but have high quality. It could be that the subjectivity of a particular auditor results in a lower QMS score than what most other auditors would rate, or that the vendor is particularly familiar manufacturing the type of product for which LF Beauty places orders. The vendor may generally have poor quality, but with the type of product it produces for LF Beauty, it could perform better than for other customers with perhaps a shorter history or a greater diversity of products. Therefore, there is not necessarily a problem with the audit tool if it results in a low QMS score for a vendor that has actually has a history of producing high quality goods.
3. *Above the trend line* - a problem with the audit protocol is identified when a vendor's scores fall in this region. The purpose of the tool to drive better quality performance is found to

be inadequate when the vendor receives a high QMS score but a low quality score. Either the auditor evaluated the vendor more leniently than other auditors would, or the questions on the audit tool are not appropriately gauging quality performance. When a point falls above the trend line, it should be investigated further to understand why this result was obtained.

The two most likely factors explaining why a point is above the trend line are the inappropriateness of the questions in the audit tool, and the subjectivity on the part of the auditor in evaluating the vendor's performance on those questions. However, given that the quality engineers generally have numerous years of experience evaluating vendors according to the QMS protocol, as well as the fact that subjectivity is limited by being able to answer the questions as Yes, Incomplete, No, and N/A, it can reasonably be inferred that the most likely cause for the QMS protocol not being predictive of quality performance is the content of the questions.

Based on this conclusion, the LF Beauty quality assurance team revised its QMS audit protocol to contain questions that better predict the quality score. At the time of the revision, LF Sourcing, the largest business unit within the company, was also revising its QMS audit protocol. The LF Sourcing protocol was adopted by the LF Beauty quality assurance team to standardize practices with the company at large as well as to benefit from the learnings of LF Sourcing that went into revising the QMS audit protocol.

One innovative addition to the new audit protocol is a section that addresses issues related to recent defect findings. Based on an analysis of recent quality findings specific to each product category, a section contains assessment points customized to focus the auditor's attention on aspects of the quality management system that would have relevance to reducing the occurrence of that type of defect in the future. In addition to revising the audit questions, the evaluation scale was also slightly expanded to accommodate a more granular analysis. With the old scoring system, if a factory fell somewhere between fully-compliant and incomplete, the auditor would have to select one or the other, which could significantly skew the audit results. With the new, more granular scoring system, the indeterminate situations are more accurately portrayed by giving the auditor an intermediate option between fully-compliant and incomplete.

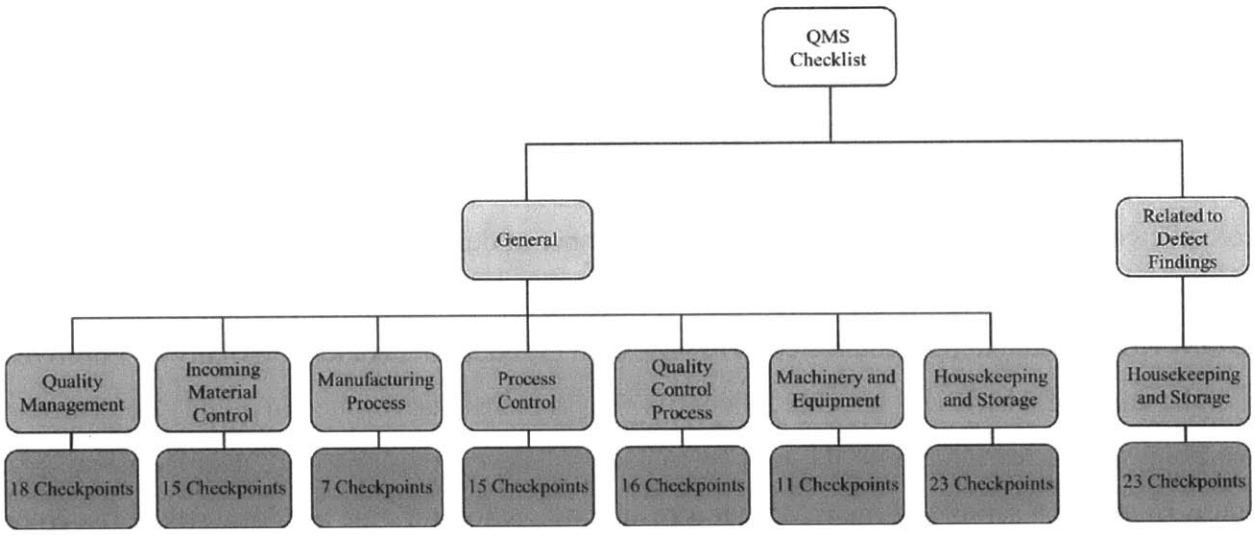


Figure 14: Updated QMS Checklist

The new QMS audit protocol was implemented on a trial basis in 27 vendors representing three product categories, each with a sample of nine vendors, as shown in Figure 17. At this point, it is still unclear whether or not the new audit protocol is a better predictor of the quality score, but the preliminary finding suggests an improvement. Figure 15 shows that out of the 358 vendors analyzed, 16 (or 4.4%) were above the trend line; Figure 17 shows that of the 27 vendors analyzed, 1 (or 3.7%) were above the trend line. More vendors should be sampled before determining that the new audit protocol is in fact a better predictor of quality score.

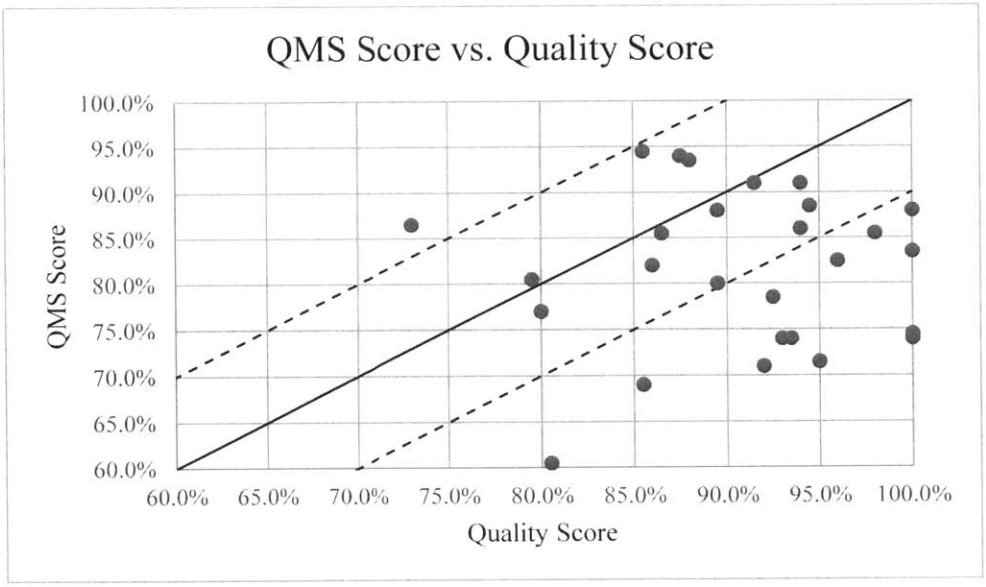


Figure 15: QMS Score vs. Quality Score

The approach of using the quality score from the balanced scorecard as a measure against which the QMS audit protocol is assessed can be extended one level deeper to using the specific defects identified by quality engineers as a measure against which the specific sections of the audit protocol (see Figure 16) are assessed. This gives guidance on which specific sections of the audit protocol need to be improved. For example, if a number of defects were found at a vendor and the root cause of the defects were traced back to issues with incoming material control standards, and the QMS tool rated that particular section highly, then the audit tool could potentially be improved by understanding why it was not able to identify the problems that resulted in quality defects, and incorporate those learnings into the tool by making whatever revisions were deemed necessary. Figure 18 shows a sample of the QMS audit results by section for nine vendors, where the color coding is used to help quality engineers quickly identify where a vendor or group of vendors would be expected to have quality issues.

	Vendor A	Vendor B	Vendor C	Vendor D	Vendor E	Vendor F	Vendor G	Vendor H	Vendor I
Total Compliance Level to Standard	67.5%	72.0%	86.1%	78.0%	80.8%	82.0%	68.5%	85.7%	91.3%
Quality Management Compliance	63.0%	68.5%	88.9%	63.0%	57.4%	88.9%	79.6%	87.0%	90.7%
Incoming Material Control Compliance	77.8%	73.3%	93.3%	88.9%	82.2%	80.0%	68.9%	91.1%	93.3%
Manufacturing Process Compliance	61.9%	57.1%	100.0%	81.0%	66.7%	66.7%	57.1%	77.8%	90.5%
Process Control Compliance	73.3%	80.0%	95.6%	75.6%	84.4%	77.8%	75.6%	97.6%	91.1%
Quality Control Process Compliance	66.7%	84.4%	91.7%	79.2%	81.3%	77.1%	60.4%	89.6%	95.8%
Machinery and Equipment Compliance	63.6%	72.7%	93.9%	93.9%	97.0%	97.0%	81.8%	75.8%	97.0%
Housekeeping and Storage Compliance	72.5%	73.9%	88.4%	85.5%	95.7%	94.2%	72.5%	82.6%	97.0%
Fabric Compliance	66.7%	69.4%	61.9%	81.0%	87.9%	87.9%	64.1%	79.5%	92.3%
Related to Defect Compliance	50.0%	53.3%	60.0%	50.0%	63.3%	43.3%	40.0%	83.3%	63.3%

Figure 16: Detailed QMS Analysis

The approach of validating and improving the QMS audit protocol by comparing its ability to predict the quality score can similarly be applied to any assessment tool whose effectiveness can be measured by its ability to predict a performance parameter score on the balanced scorecard. Having better assessment tools allows LF Beauty to better understand what the drivers of good performance are, so that these behaviors can be shared and incentivized across the network to accelerate vendor improvement. They can also be used as an effective screening tool to assess whether a new vendor should be accepted into the vendor base.

4.4.2 Vendor Benchmarking

Vendor benchmarking is a powerful application of the scorecard that allows comparisons among vendors to be made. A few examples illustrate the customizability of vendor benchmarking reports.

4.4.2.1 Benchmarking for Division Leader

A division leader who is responsible for managing a portfolio of product categories will more likely be interested in understanding the performance of the group of vendors in a particular product category, or the group of vendors serving a particularly important customer, rather than any one vendor in particular. Generally speaking, the higher the position an individual holds in the organization, the more macroscopic view of the vendor base he or she will like to have. For example, if a division leader is receiving complaints from a customer of consistently late deliveries, then a benchmarking report comparing the on-time delivery scores of those group of vendors serving that customer can be generated, and higher performing vendors can be identified to replace some of the lower performers in order to better serve the customer.

4.4.2.2 Benchmarking for Merchandiser

A merchandiser who is responsible for selecting vendors to place orders in will be interested in the performance of a single vendor. Since merchandisers are specialized by product category, they can use the balanced scorecard to identify how a particular vendor compares to the rest of the vendors in the product category. This information can be used to guide the vendor selection process.

4.4.2.3 Benchmarking for Factory Manager

Factory managers are interested in knowing how their performance compares to other vendors they are competing for orders against in LF Beauty's vendor base. Benchmarking reports at the factory level are part of the Vendor Engagement Package (discussed in Section 6) and are used to manage the relationship between LF Beauty and the vendors. Benchmarking information is objective data that both LF Beauty and factory managers can use to agree upon performance expectations and improvements.

4.5 Future Work on the Balanced Scorecard

Due to the business need to rationalize the vendor base within a short time period, the existing balanced scorecard reflects this time constraint by containing only what senior management decided are 'need to have' performance parameters. Recognizing that the existing balanced scorecard is a base platform meant to be improved upon, a number of recommendations for future work can be made.

4.5.1 Cost Score

The performance parameters recommendations are both for improving the measurement method of the existing parameters, and expanding upon the existing set of parameters

In terms of improving measurement methods, the cost parameter should be the first to be revised because it has the least integrity and counts for the greatest portion of the overall score. The current method is deficient in that the calculation is not based solely on the vendor's cost-competitiveness, which is what it is designed to measure. The calculation is based on the difference of the sale price and cost of goods sold, but the vendor has no influence over the sale price. It is possible to have the situation in which the vendor is actually quite cost-competitive, but if the merchandiser negotiates a lower sale price than he or she otherwise could have, then the cost score for the vendor will be lower than it otherwise should have been. On the other hand, a vendor's cost could be uncompetitive, but if the merchandiser negotiates a particularly high sale price, then the vendor's cost-competitiveness according to the existing calculation will be higher than it really is. An additional complication is that scores are normalized by product category in order to make fair cost comparisons, but even within a product category, different types of products have different cost structures, and therefore should not be compared against one another. For example, within the Bags product category, there are six different types of bags – cosmetic, fashion, travel, backpack, wallet, and heat-sealing. The expected margin for fashion bags and travel bags are different, so the cost-competitiveness as it is currently measured cannot accurately reflect the fact that a vendor could be cost-competitive given the low-margin customer it is serving.

To further illustrate the point that the cost-competitiveness is not based only on the performance, Figure 19 shows the cost score for each of the 358 vendors in the LF Beauty vendor base ranked from lowest to highest (black line). The margin of the customers the vendor serves are shown with the various colored/shaped points and are aligned vertically with the vendor that is associated with

producing their goods. By visual inspection, one can see that the low-margin customers are skewed more toward the vendors with low cost scores, and the high-margin customers are skewed more toward the vendors with the high cost scores, indicating that the customer margin – which is not influenced by the vendor – is positively correlated with the vendor's cost score.

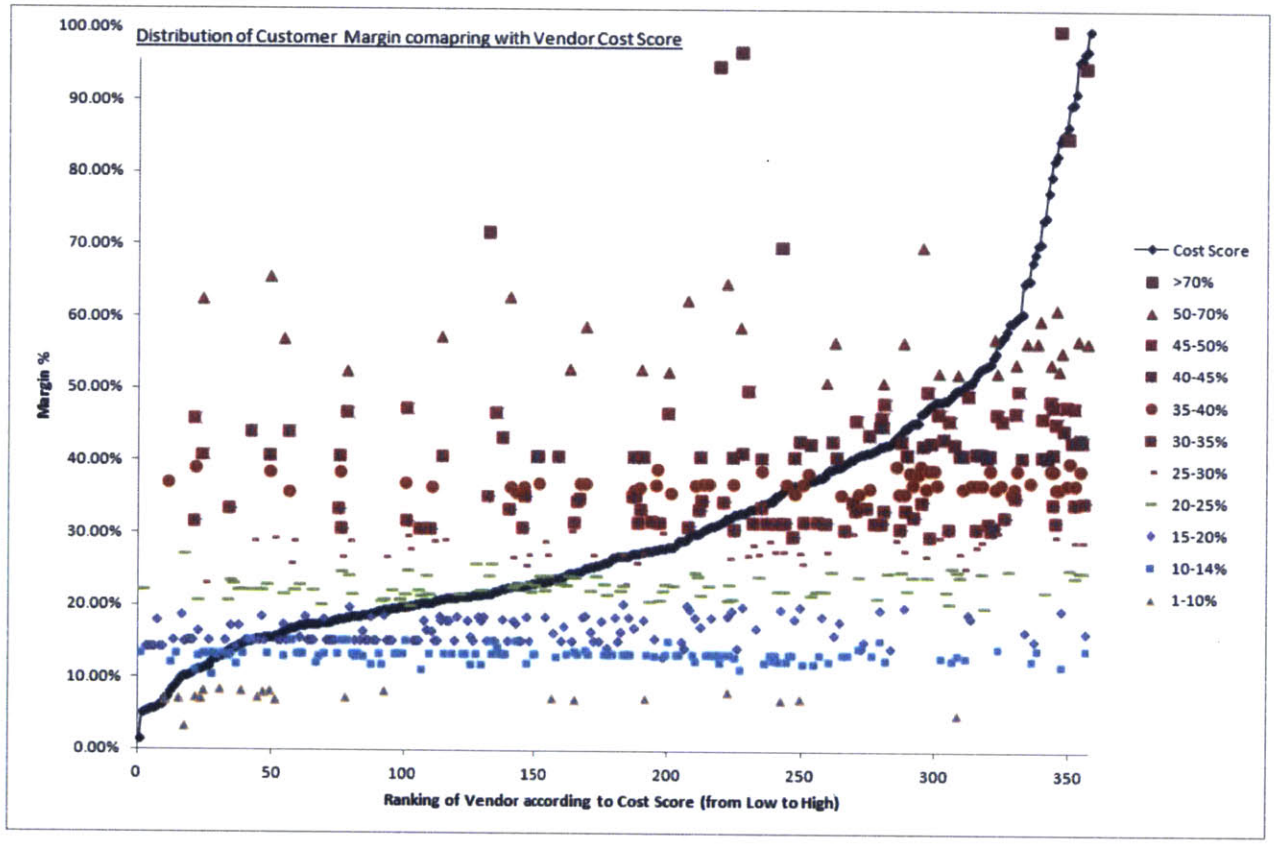


Figure 17: Vendor Cost Score Compared to Customer Margin

A better way to measure the cost performance of vendors in the short-term is to use the 'Net Profit' figure required on the LF Beauty costing template. The 'Net Profit' figure is the profit earned by the vendor on a given order. Since the LF Beauty costing template has been introduced into the quotation process only recently, an historical data set against which to compare profit figures has not yet been established. LF Beauty should begin to record quotation data and develop standards for 'Net Profit' for each product category and for each type of product within the product category. This relatively short term solution addresses the most significant problem with the existing cost calculation – the dependency on the margin of the customer.

The issue with the proposed short-term solution is that 'Net Profit' still does not provide a true picture of the cost-competitiveness of the vendor. A vendor can be very inefficient and incur greater costs in the manufacturing process than its group of peer vendors, but then only markup the sale price of goods to LF Beauty by a small amount. The vendor would then have a low 'Net Profit', but the total cost of the quotation could still be much higher than other vendors. It would therefore be ranked as a highly cost-competitive factory without actually being cost-competitive. Merchandisers would not likely place orders in the vendor if indeed the quotation price was exorbitantly high, even though the 'Net Profit' of the factory was small, so even with this issue, it is still a more desirable way to calculate the cost score because the score depends only on the actions of the vendor.

A longer-term solution that is a greater improvement would be to base the cost calculation on a more detailed analysis of the vendor cost structure. Similar to the approach of the short-term solution, the long-term solution would be to record and maintain a database of all the information on the LF Beauty quotation form, not just the 'Net Profit' figure. The information would include material costs, labor costs, authorized sub-contracting costs, transportation costs, overhead costs, and others. Over time and with a large enough data set, standards can be developed against which quotations can be compared. The cost-competitiveness of a factory in terms of material costs, labor costs, transportation costs, etc., can be determined to come to an overall cost score. At this level of detail, one can have a true picture of a vendor's cost-competitiveness because LF Beauty will have a clear, transparent understanding of how a vendor determines its quotation price, which has historically been difficult to ascertain.

As an aside, having a rich data set of cost standards is valuable information that has value beyond simply calculating a vendor's cost score. Such a database can give LF Beauty a competitive advantage by providing greater awareness of market prices, which allows for better sourcing decisions to be made, as well as putting LF Beauty in a stronger price negotiation position. Having greater price awareness can also help LF Beauty make more accurate revenue forecasts. Lastly, this information can be an added benefit to vendors of being a part of the LF Beauty network, since they would be able to benchmark their cost structure against peer vendors and gain insight into where they either are or are not cost-competitive.

4.5.2 Quality Score

The defect rate calculation for the quality score should also be considered for revision. The current method simply uses the ratio of the number of defects found to the total number of items inspected during the reporting period. While the average defect rate gives general information about the expected level of quality simply in terms of quantity of defects, it does not give information about the severity of defects found. Additionally, different customers have different acceptable quality limits. Generally, the more stringent the quality limits, the costlier and more difficult it is to meet those quality requirements. Therefore, a vendor that serves primarily those customers with higher quality requirements will have a lower defect rate than those serving customers with lower quality requirements. These defect rates are not readily comparable, because each vendor has been producing to a different standard. A way to overcome this difficulty is to calculate the number of defects in relation to the number of defects allowed by the AQL. In this way, vendor defect rates can be compared because they are reflecting how well a vendor performed in relation to the standard against which it was being held. Even though these standards are different, performance to those standards are comparable because the calculations take into account the higher or lower number of defects allowed by those standards.

To illustrate this point more clearly, take the example of Vendor A and Vendor B, both with a defect rate of 3.8% over the reporting period (190 defects out of 5000 inspected items). Figure 20 shows the distribution of the severity of these defects and the vendor performance measured against the AQL standard.

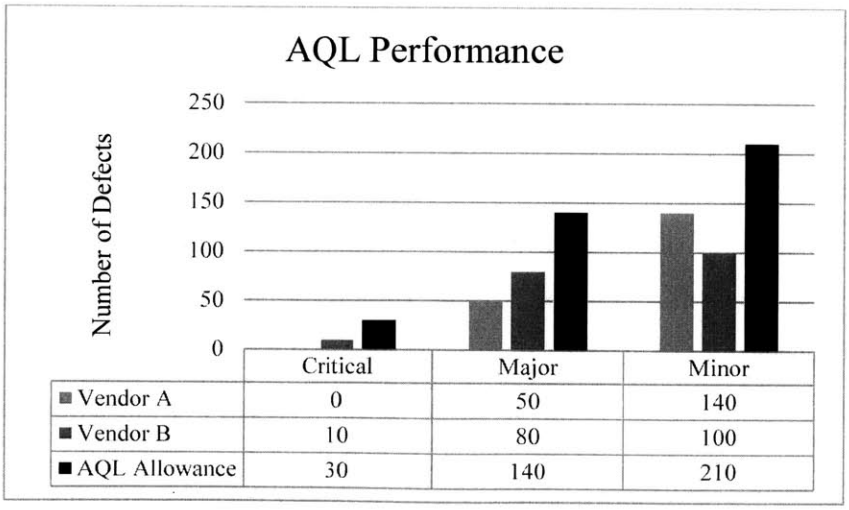


Figure 18: Defect Total Relative to AQL Performance

For the sake of this example, suppose that critical defects are weighted 50%, major defects 30%, and minor defects 20%. The AQL defect rate for Vendor A would then be critical: 0.00%, major: 35.71%, and minor: 66.67%. The contribution of the AQL defect rate to the overall score would be: 0.5(1-0.00)+0.3(1-0.3571)+0.2(1-0.6667) = 75.95%. Similarly, the contribution of the AQL defect rate for Vendor B would be 40.00%. Therefore, even though both factories have the same defect rate as calculated by the raw number of defects, Vendor A actually has better quality when taking the defect allowance and severity of defects into account. This example assumed the same AQL defect allowance, but the same method can be used when the defect allowances are different.

Since LF Beauty quality engineers already record defect severity and AQL allowance information on all the inspections they perform, the data is available to begin using this defect rate calculation method. It is a better way to measure quality performance than is currently being used because it takes into account information on the severity of defects found and the standard against which the vendor is being held. For the sake of simplicity and transparency for those involved, the method of calculating the defect rate by the raw number of defects was used, but as the organization becomes more comfortable using the scorecard, this improved defect calculation method can be implemented at any time.

4.5.3 On-Time Delivery Score

A third area for improvement is the way the on-time delivery score is calculated. Similar to the recommendation for improving the defect rate calculation, where it is proposed that more detailed defect rate information be used to give a more nuanced picture of quality performance, the recommendation for improving the on-time delivery calculation would to use the additional measure of free on-board value shipped on time, where 'free on-board' simply refers to the monetary value of the goods delivered to LF Beauty by the vendor. The free-on board value shipped on time provides information about the value of the shipment. All else being equal, if one were presented with a choice of having the higher-value shipment delivered on time or the lower-value shipment delivered on-time, one would prefer the higher-value shipment because it represents greater worth to the business. Figure 21 shows the historical on-time delivery data for an important vendor in one of the business units. It can be seen that the difference between the on-time delivery performance as measured by the number of shipments delivered on-time and as measured by the freight on-board value delivered on-time amount can vary widely. The original

score from month-to-month is shown by the 'by shipment' line and the new score, which weights the 'by shipment' OTD 60% and the by 'free on-board' 40%, is shown by 'New OTD Score' line. LF Beauty can choose whatever weighting distribution between the two measures it deems most appropriate, but the addition of the free on-board measure is important to give a sense about how well the vendor is delivering on its more valuable orders.

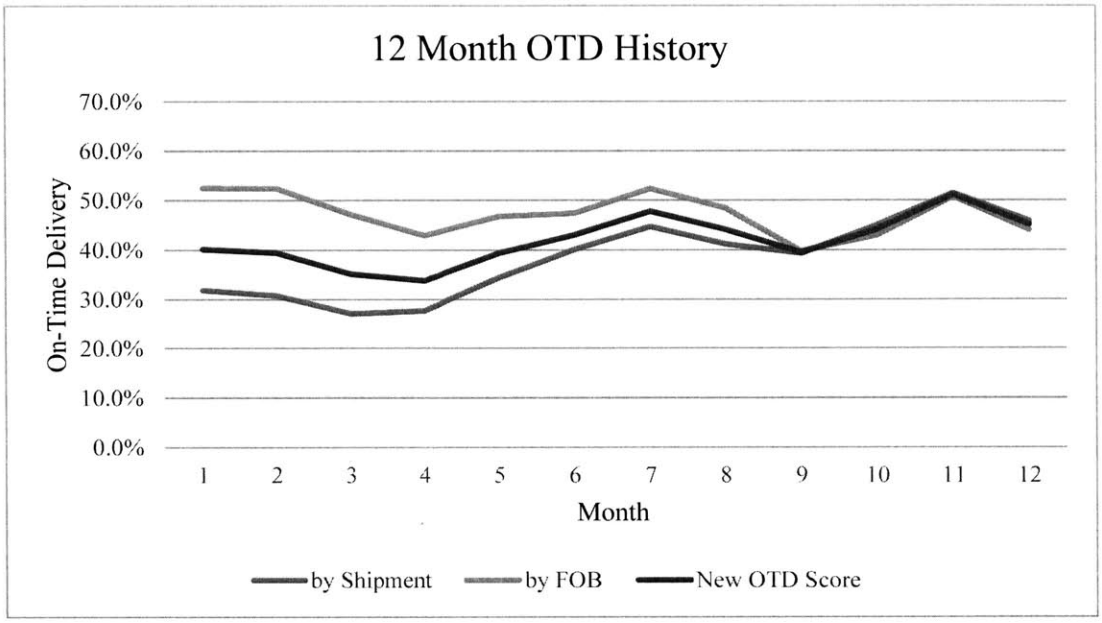


Figure 19: On-Time Delivery Analysis

5 Vendor Rationalization

With the vendor evaluation tool now described, this section turns to the subject of vendor rationalization and how the balanced scorecard is used in the rationalization process.

5.1 Literature Review: Vendor Rationalization Methods

Vendor rationalization, and in particular the selection of those vendors that remain in the vendor base, is recognized in the literature as being one of the most important aspects of supply chain management. Vendor selection has been thoroughly studied over the past forty years because of its criticality in determining the success of a supply chain. Thus, there are a number of methods that have been developed to address the issue of vendor rationalization, and in particular vendor selection.

Although previous work on the topic has divided vendor selection into different numbers of stages, there is a common theme of first identifying the criteria that are used in the selection process, followed by applying the criteria to perform the selection. Some literature extends this one stage further and include a post-selection process, in which methods for maintain the relationship are discussed (Chen, 2007). Within the stage of supplier selection, past approaches have typically been optimization problems requiring a single objective function to be formulated. The problem with this approach, however, is that not all supplier selection criteria can be quantitative, so the objective function does not take all relevant criteria into account (Nukala, 2007). A few approaches have been based on empirical studies. Noteworthy conclusions from an empirical study of a large multinational organization that used on-time delivery, quality, and total cost as the ranking criteria to identify and select high-performing vendors are that reducing the number and improving the quality of vendors results in increased quality, reduced lead time, and a reduction in the number of errors and defects, as well enhanced organizational learning (Cormican, 2007). Most approaches have been based on analytical methods. One of the earliest and most fundamental analytical approaches, later popularly termed 'Berens's weighted rating method', uses a pairwise comparison of each vendor to determine how well each vendor compares to the other. A weighted criteria matrix is then applied to the vendors to develop a score for each vendor, with the highest scoring vendors being selected (Berens, 1972). To address the challenges associated with simple linear weighted average criteria ranking methods, the analytical hierarchy process was proposed, among other applications, to enhance vendor selection (Saaty, 1988). A method for determining

the optimal number of vendors to employ using multi-objective programming and data envelopment analysis was developed by Weber (Weber et al, 2000). Although the analytical hierarchy process developed by Saaty is a widely used multi-criteria decision making approach, it is unable to take into account the uncertainty of a decision maker's perception. In the case of vendor selection criteria, which may be quantified based on the subjective assessment of a decision maker, the inability of being able to account for that uncertainty can be a major shortcoming. To overcome this shortcoming, some recent approaches have used fuzzy analytical hierarchy process, which introduces an efficient tool to handle both quantitative and qualitative factors in the vendor selection process. This approach handles the fuzziness of data involved in deciding the weights of different decision variables used to select suppliers (Chan et al, 2008).

5.2 Vendor Rationalization: Current State

Vendor rationalization is not currently performed in a systematic, process-oriented fashion at LF Beauty. The proliferation of vendors in the LF Beauty vendor base and lack of oversight in reviewing the size and capabilities of the vendor base are part of the motivation for undertaking the Vendor Management and Sustainability initiative. The current way in which the vendor base is rationalized can be described as being ad hoc, as addressing short-term rather than long-term business needs, and as being myopic in that it best serves the needs of small customer groups rather than the needs of the larger operating group. This approach is based primarily on historical business volume allocations and applying the general 80/20 Rule, where vendors at the long end of the tail of the Pareto diagram, which arranges vendors in descending order of business volume, are deactivated from the vendor base.

A major contributor to the lack of oversight in maintaining the right size and mix of capabilities in the vendor base is the recent reorganization of LF Beauty described in Section 3. Because teams were previously organized by customer group, each group would need to have relationships with vendors that could supply the products requested by their customers. This meant that Customer Group A may need vendors that could supply jewelry, bags, and beauty extension items, and Customer Group B may need vendors that could supply jewelry, bags, and turnkey items. With little knowledge sharing between customer groups, the result was that Customer Group A and Customer Group B each had their own set of vendors to supply jewelry and bags. One problem with this was that more compliance audits had to be performed and more quality inspectors were

needed to cover more vendors. Another problem was that to the extent that there was overlap in the vendors used by the customer groups, customer groups would on occasion compete with each other to have their orders completed first at the expense of the other groups. Finally, and most importantly for the Vendor Management and Sustainability initiative, the more vendors in the vendor base meant that there were more compliance risks. Compounding this problem was that with orders being awarded to a greater number of vendors, and LF Beauty therefore being a smaller portion of any given vendor's business, LF Beauty had less leverage in using business volume to commit vendors to performance improvements.

As currently practiced, there are a few processes relevant to vendor rationalization worth mentioning:

1. *Defining the size and capability mix of the vendor base* – the decision of defining the size and capability mix of the vendor base was one that was not made in a systematic or strategic sense. It was, in fact, made in practice by the daily decisions of merchandisers, who are those responsible in LF Beauty for directly placing orders to factories and tracking orders from placement to shipment to the customer. Based on short-term business demands, merchandisers decide whether or not the vendors they have relationships with are able to deliver on their customer orders. If not, then they seek out a new vendor to add to the vendor base.
2. *New vendor acceptance* – once a merchandiser makes a request to add a new vendor to the vendor base, a series of audits and approvals are required. While the audits covered both compliance and quality assessments, managerial approvals did not provide a rigorous, objective check to determine the necessity of adding the new vendor. These approval steps were more or less automatic approvals.
3. *Deactivating vendors* – no one had responsibility for assessing the continued need for vendors and deactivating them when they are no longer needed, except in the extreme cases of a vendor failing to pass compliance audits. This was a symptom of the lack of ownership and oversight for the vendor base from the previous customer group organizational structure before the Rapid Transformation initiative. The problem with maintaining a vendor base larger than that justified by business needs is that it allowed merchandisers more discretion in placing orders with vendors, which as noted above, led to more

compliance and quality inspections spread over more vendors. Furthermore, from a data analysis perspective, it was more difficult to extract and use vendor performance data in a meaningful way to make better vendor management decisions when the vendor database was not being maintained.

In summary, a systematic approach was lacking in the way LFB approached vendor rationalization. Therefore, an original vendor rationalization methodology needed to be created that informed the proper size and mix of capabilities required by business needs, and that guided the selection of vendors.

5.3 Vendor Rationalization Methodology: Development and Implementation

5.3.1 Development

This section describes the development and implementation of the vendor rationalization methodology. First, an overview of the methodology is presented. Each of the steps of the methodology are then described in more detail, followed by the results of implementing this methodology in LFB's Bags product category.

An overview of the vendor rationalization methodology is presented in Figure 22.

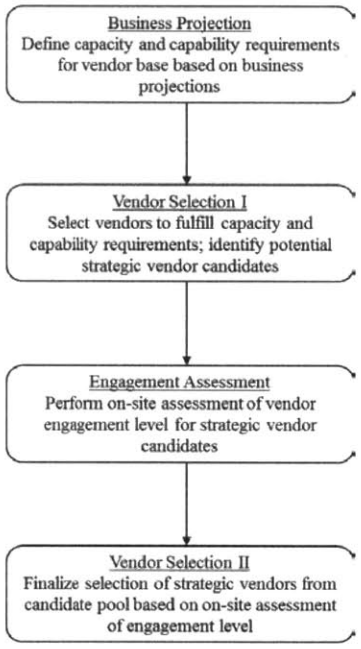


Figure 20: Overview of Vendor Rationalization Methodology

5.3.1.1 Step 1: Business Projections

The first step is to define the capacity and capability requirements for the vendor base. Capacity requirements define the business volume in units of product that the vendor base is able to supply to LF Beauty, and the capability requirements define the mix of products that the vendor base is able to supply. It is important to note that 'vendor base' refers to a collection of active vendors that serve a particular business's needs. Since LF Beauty was arranged by product category after the Rapid Transformation initiative, each product category had its own vendor base. There are very few instances in which a vendor supplying one product category would also serve another. The reason for this is that each product category requires vendors with specific expertise and types of production capabilities. For instance, the vendors serving the Bags product category typically have silk-screening machines to put ink designs on the bags, whereas the vendors serving the Primary Packaging and Components product category have mills and lathes to fabricate metallic components. Vendors typically specialize in one product category, so for the purposes of vendor rationalization, each product category can be viewed as having a unique vendor base. Therefore, the vendor rationalization methodology is applied independently to each product category vendor base. What this means for determining the capacity and capability requirements for the vendor base is that it is done on a product category by product category basis.

Business projections are the source from which the capacity and capability requirements for a product category vendor base are derived. Product category leaders, who are the points of contact for customers who place orders with LF Beauty, are responsible for understanding the quantity and type of work likely to be requested and for developing business projections based on this understanding. Business projections are, of course, flawed in that they attempt to predict an uncertain future, and they are all the more prone to error in the beauty industry where trends change rapidly and the customers themselves have difficulty providing accurate demand forecasts. However, they are better than no prediction at all. Requiring that product category leaders set the bounds of the vendor rationalization process in terms of the capacity and capability requirements puts an expectation on product category leaders to maintain up-to-date business projections.

Another point that needs to be addressed before setting the capacity and capability bounds is the length of time covered by the business projection. Through discussions with the product category leader in which the rationalization process was piloted on, there would be four projections covering

the following periods: Today – next 3 months; Today – next 6 months; Today – Next 9 months; Today – Next 12 months. The reason for having these four projection periods is to give both short-term and long-term visibility into customer demand.

The business projection that sets the capacity and capability bounds is the 12-month projection. There is a balance that must be struck in choosing the length of the projection period that sets the bounds for rationalization. The shorter the business projection, the greater the certainty one has in it. But if one were to rationalize the vendor base on, say, a 3-month projection, the capacity and capability needs of the vendor base would vary dramatically from one projection to the next. This would result in continually adding and removing vendors from the vendor base, which would not be effective in maintaining fruitful relationships with vendors. On the other hand, the longer the business projection, the less certainty one has in it. But if one were to rationalize the vendor base on, say, a 24-month projection, the capacity and capability needs of the vendor base would be more stable, since it would cover more customer demand possibilities. Based on the experience of business leaders within LFB, the 12-month demand projection was chosen as striking the right balance.

5.3.1.2 Step 2: Vendor Selection I

The second step is to initially select the mix of vendors that best fulfill the capacity and capability requirements. Additionally, this mix of vendors must also meet the objectives of the vendor classifications shown in Figure 23.

Figure 21: Vendor Classification Matrix

The objectives of the vendor classifications are as follows:

Strategic – vendors with high capacity for a given product or across a range of products; typically have a successful history of business with LF Beauty; have high aspiration, willingness, and ability to maintain a long-term relationship with LF Beauty. The objective of strategic vendors is to capture a significant portion of LF Beauty's business volume. These are the vendors with which the organization seeks to foster a long-term relationship, where LF Beauty commits business volume to the vendor in exchange for commitments to improve performance and, in some cases, invest in additional capabilities. Typically, the strategic vendor classification has the least number of vendors, but the vendors in this group have the highest business volume per vendor.

Preferred – vendors that balance business risks (i.e. geographic risks, demand variation, vendor-specific risks, etc.); candidates to become strategic vendors; capture business not awarded to strategic factories. One of LF Beauty's competitive advantages is its knowledge of how to optimize a customized supply chain for a specific customer's demand through its extensive network of vendors. With more vendors in the network, the more options LF Beauty has and is therefore better able to optimize a supply chain for a given customer's demand. However, the more extensive the network, the greater the cost in maintaining proper oversight of it, especially in terms of compliance risks. On the other hand, the smaller the network, the less the cost in maintaining oversight, but this comes at the expense of having more options to provide better supply chain solutions to customers. The preferred vendor classification is used to balance these trade-offs.

Qualified – vendors that are product or service specific; fulfill infrequent, low-volume demand. The objective of qualified vendors is to maintain a wide range of production capabilities within the vendor base. Part of the value proposition of LF Beauty to its customers is that it is an end-to-end service provider in the beauty industry. It is therefore necessary to have product expertise within the vendor base that can service most customer demands, even if some of that demand is unsteady and low-volume. Over time and with changing customer demands, what is currently a niche product expertise may develop into something more generally demanded. Therefore, qualified vendors are also used to keep LF Beauty flexible in being able to adapt to changing customer demand. If that demand becomes great enough, LF Beauty can move the vendor into the preferred or perhaps even strategic classification, at which point stronger ties with the vendor will be developed.

Inactive – vendors that are not needed to meet the requirements of the business projections and are removed from the vendor base after the rationalization process.

Figure 24 shows the balanced scorecard performance requirements for each of the vendor classifications. The level of performance required by a vendor increases from qualified to preferred, and from preferred to strategic. The reason for this is that as LF Beauty commits more volume and deepens its relationship with a vendor, better performance is expected from that vendor. The performance requirements were chosen based on both an analysis of the historical performance of the vendor base, as well as what LF Beauty business leaders aspired of the performance of the vendors. The result is a compromise between the realities of the vendor base performance today and the performance that can reasonably be expected with concerted improvement efforts.

Vendor Classification	Balanced Scorecard Perfromance				
	Compliance	OTD	Quality - 1st time pass	Quality - Defect rate	Cost
Strategic	Minimum B	> 98%	> 90%	< 6.5%	Top 1/3 of factories
Preferred	Minimum B	> 95%	> 85%	< 6.5%	Top 1/2 of factories
Qualified	Minimum C+	> 90%	> 85%	< 7.5%	N/A

Figure 22: Vendor Classification Performance Requirements

With the capacity and capability requirements defined by the 12-month business projection, and with the vendor classification requirements defined, the information from the balanced scorecard (see Section 4.3) is used as the vendor selection criteria, as shown in Figure 25.

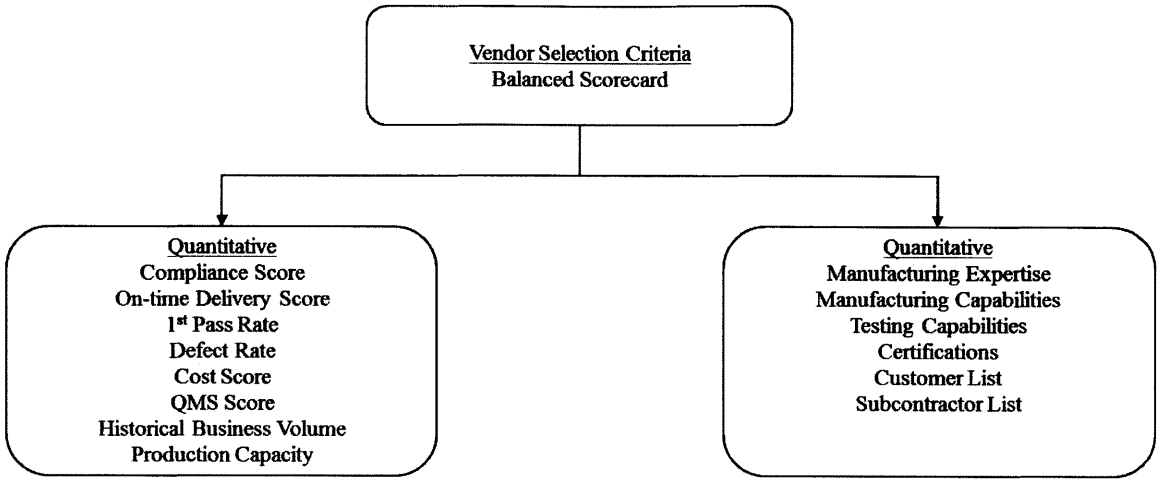


Figure 23: Vendor Selection Criteria

At this point, the initial selection of qualified and preferred vendors is made. In addition, candidates to become strategic vendors are also selected. Since strategic vendors are the most important in the vendor base, greater scrutiny of their ability and willingness to be long-term partners is needed through an engagement assessment.

5.3.1.3 Step 3: Vendor Engagement Assessment

The purpose of the vendor engagement assessment is to better understand the ability and willingness of the vendor to commit to a strategic partnership with LF Beauty. This assessment is conducted by a cross-functional team from LF Beauty representing each of the major functional roles: product category leader, quality engineer, product engineer, compliance auditor, and in some cases senior leadership. Each of these functional roles can assess the vendor from a different perspective, all of which provide a comprehensive picture of the fit of the vendor to be a strategic partner.

While the vendor selection criteria discussed in Section 5.3.1.2 give a picture of the historical performance and capabilities of the vendor, the intention of the vendor engagement assessment is to provide a forward-looking analysis based on on-site visits and discussions with the owner and management team of the vendor. During these visits and discussions, the long-term partnership strategy of setting business volume targets with the vendor in exchange for their commitment to raise their performance level is explained. This can be likened to a hiring process, in which the strategic candidates have already shown their ability to be high-performing vendors for LF Beauty through the information contained in the vendor selection criteria, and the vendor engagement

assessment is the final interview in which more in-depth questioning of the candidate vendors is undertaken to better understand which truly stand out as sharing a common partnership vision with LF Beauty.

5.3.1.4 Step 4: Vendor Selection II

The final step of the rationalization process is to finalize the selection of qualified, preferred, and strategic candidates after the vendor engagement assessments have been completed. Those strategic candidates that are ultimately not selected are added to the initial selection of qualified and preferred vendors, and those candidates that are selected become the strategic vendors. All those vendors that are not included in one of those three classifications is inactive and removed from the vendor base.

5.3.2 Implementation

The vendor rationalization process described in Section 5.3.1 was piloted on the Bags product category, which had an initial vendor base of 40 vendors. This product category was chosen because it is the largest product category in terms of business volume in the product division, and because bags are relatively straightforward to manufacture, which makes the vendor selection process simpler due to fewer vendor capability constraints. Thus, the Bags product category provided the size necessary to prove the effectiveness of the methodology, as well as the simplicity to implement within the time constraints of this project.

The first step in the rationalization methodology is to develop the business projections that define the capacity and capability requirements. Since maintaining business projections at the level of detail recommended by the rationalization methodology was not an expectation before the current work was undertaken, the information that the Bags team would ideally have had was not readily available to be used as part of the implementation. In lieu of using a detailed customer-by-customer projection derived from customer engagements by the product category leader, the Bags team approximated that the next year of business would be similar to the previous year of business, and that the business projection should be assumed to be the same as the previous twelve months. Following this assessment, historical business volume allocation data was extracted, which showed the total amount of volume from each customer and the vendors it was allocated to for production. A spreadsheet presenting this information was created and defined the capacity and capability requirements.

The second step in the rationalization process is to perform the initial selection of vendors into the strategic, preferred, and qualified categories. This was accomplished by gathering a team of decision-makers in the Bags team, which included the product category leader and a representative from each of the organizational functions – finance, quality, compliance, product engineering, and merchandising. Using the historical volume allocation spreadsheet and the balanced scorecard as the foundation for decision-making, the Bags team deliberated over which vendors should be inactivated and how the remaining vendors should be classified. First and foremost, the vendors that were immediately identified to be inactivated were those with a 'D' compliance rating or some other indication of poor compliance performance (for instance, not responding in a timely manner to LFB requests to address audit findings). Second, vendors with significantly below average quality performance were identified for inactivation. Beyond compliance and quality performance, vendors with low historical volume allocation were also candidates for inactivation, though these vendors required a more detailed analysis to determine if other vendors could absorb their production, as well as to understand how well that vendor had performed in the past, which if they did, then there would be a case for keeping the vendor and perhaps allocating more volume to them in the future. Qualified vendors were easily identified as those vendors that remained in the vendor base despite low volume allocation, since they provided a product or service specific capability. An example of this is a vendor that produced hard-shell luggage. Only one vendor in the base had the capability of producing this type of product, so it remained in the vendor base as a qualified vendor, despite it being a low volume vendor. Of the remaining vendors, a four were identified as potential strategic vendors, because of their historically high volume allocation, performance on the balanced scorecard, and positive relationship with the Bags team.

Before selecting the strategic vendors, on-site visits were conducted by a few members of the Bags team, including the product category leader and Vice President of Vendor Compliance & Sustainability at LF Beauty. The objective of the third step in the rationalization process – vendor engagement assessment – was to explain LF Beauty's new approach to vendor management and get an understanding of whether or not the vendor would be a fitting partner for that new approach. An assessment of the vendor's engagement level is important because a strategic partnership requires that both LF Beauty and the vendor share a common vision and understand the commitments that the relationship entails. Understanding how cooperative the vendor will be and

getting a sense of their enthusiasm to enter into a strategic partnership is something not easily quantified, so the on-site visits are necessary to obtain this critical information.

The last step in the rationalization methodology is finalizing the vendor classifications. Based on the vendor engagement assessments, three of the four potential strategic vendors were selected. All other vendors that were not inactivated or selected as qualified became preferred vendors. The outcome of the rationalization process is shown in Figure 26:

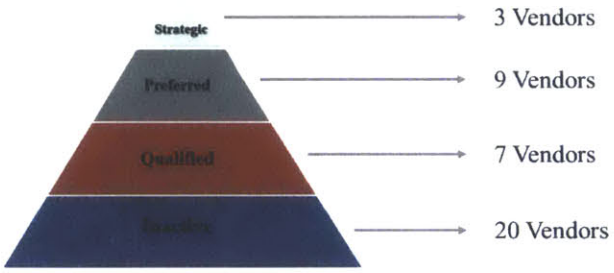


Figure 24: Vendor Rationalization Outcome

5.4 Future Work: Vendor Rationalization Methodology

The implementation of the rationalization methodology suffered from a few shortcomings that can be improved for future implementations. The first is having more detailed business projections that are more closely aligned to the customers' expected demand. In fact, this was a shortcoming understood by leadership in LF Beauty, and during the time the current work was undertaken, greater emphasis was being put on product category leaders to work with customers to develop demand projections over the time horizons discussed in Section 5.3.1.1. Although using the past twelve months of customer business volume allocation by vendor was deemed to be an acceptable forecast in the absence of customer demand projections, the determination of the vendor base capability and capacity requirements are more prone to error than if the actual customer demand information were used to set those requirements.

The second area for improvement is developing clearer guidelines for selecting the optimal number of strategic and preferred vendors. If the goal of rationalizing the vendor base is to select the right vendors to do business, so that longer-term, improvement-oriented relationships can be fostered with the them, then there should be some goal for how much business is typically allocated to strategic and preferred vendors. As the rationalization methodology now stands, there is no

recommendation for how to determine how many of each type of vendor should be selected. For example, should strategic vendors as a class be allocated 50% of the business volume? Or should this be something more or less? This question is unanswered, but it is an important question that should be answered. As discussed earlier, there is a balance between consolidating business into as few vendors as possible and maintaining an extensive network, with each end of the spectrum having its own benefits and drawbacks. How much LF Beauty should consolidate the allocation of its business volume is a strategic business question that needs to be addressed by senior management, and the answer to this question will in large part help answer the question of how much volume should be targeted for allocation to the strategic vendors. Of course, with the diversity of products LF Beauty supplies to its numerous customers and the different product mixes and volumes among the product categories, it may be unrealistic to determine a single right number to target, but there is certainly a range that should be recommended.

The third area for improvement is creating a more quantitatively rigorous way to select the individual vendors to fulfill the capacity and capability requirements. One can imagine eventually writing a linear optimization program to make the selections. For instance, the objective function may be to maximize the average of the overall scores from the balanced scorecard, subject to capacity and capability constraints, no 'D' compliance audit result constraint, no quality score under X% constraint, etc. The business team can state whatever objective function they wish to optimize along with whatever constraints they feel are needed and produce the best set of vendors to fulfill those requirements. What prevents such a selection method from being implemented today are concerns over the integrity of some of the data that goes into the decision-making, as well as the cultural challenge of trusting what may be viewed as a 'black box' method of selecting vendors through a purely mathematical approach. In fact, improving data integrity is a key theme recognized and being actively addressed at LF as a way to make the vast amount of data it collects more useful for data analytics and to hold management accountable to objective key performance indicators. The rationalization method as it was implemented relied heavily upon nuanced discussions with the Bags team to understand some of the limitations in the data, as well as more qualitative information from individuals who had on-the-ground experience with the vendors that provided greater context for the data that was used in the selection process. A large part of developing credibility in the approach of the rationalization process was building trust among the Bags team by making the process transparent and open to their input where the data may not be

conveying a complete picture. Thus, as data is collected and analyzed in a way that ensures greater integrity (recommendations for which were provided to LF Beauty), the selection process can move toward a more mathematically rigorous approach.

6 Vendor Engagement

With the vendor rationalization methodology now described, this section turns to the subject of maintain relationships with those vendors that remain in the vendor base after rationalization.

6.1 Current state of vendor engagement

Vendor engagement refers to the interaction between LF Beauty and a vendor and how the relationship between them is maintained over time. Currently, there exist two significant gaps in the way LF Beauty engages its vendors:

1. Relationships are transactional – orders are placed with vendors on an as-needed basis, with little foresight into LF Beauty's demand projections. LF Beauty typically does not make long-term volume commitments to vendors, and orders are usually awarded to the vendor providing the lowest quotation, given that basic compliance and quality requirements are met. Transactional vendor engagement does not create the incentive structure for vendors to invest in improving their performance to LF Beauty. Thus, LF Beauty generally does not have the trust and leverage with vendors required to have them improve in a competitive environment in which customers continually push for shorter lead times, higher quality, more innovative products, and adherence to stricter corporate social responsibility standards.
2. Relationships are audit-based and reactive – vendors working with LF Beauty today are required to pass quality management system audits and compliance audits. Managing vendor relationships through an audit-alone model often results in a 'pass-the-audit' mentality that does not promote lasting change where vendors seek to continually improve to a higher standard. A recent study (Locke et al, n.d.) based on extensive interviews of nearly three hundred factory owners, managers, union leaders, and government officials in Bangladesh, China, the Dominican Republic, Honduras, and India concluded that while the audit-alone model has delivered on some basic compliance improvements, these improvements have plateaued, and there are many areas where auditing has not achieved any improvements. Such a means of managing a vendor relationship leads to reactively dealing with compliance issues, quality issues, or any number of other issues, and often what is addressed is only the symptom of the problem rather than the root cause.

6.2 Vendor Engagement Methodology: Development and Implementation

6.2.1 Development

A new vendor engagement methodology is developed to address the shortcomings of the transactional, audit-based, reactive nature of the existing one. Foundational to this methodology is monitoring vendor performance objectively using the balanced scorecard, and using this information to drive sustainable, long-term improvements in a partnership with LF Beauty. Because this new vendor engagement methodology requires greater time, commitment, and resources from LF Beauty, one of the critical factors for success is to right-size the vendor base with the appropriate capacity and mix of capabilities fit for the product category. LF Beauty has finite resources which it must purposefully employ in managing its vendor base, so only including those vendors that justify the added attention in managing them should be included. Thus, the vendor rationalization methodology described in Section 5.3.1 is the tool used to select those vendors.

Of great importance is the selection of strategic, preferred, and qualified vendors. The classification of the vendor conveys the importance of the vendor to LF Beauty. The strategic vendors are the smallest in number, but the greatest in importance. These vendors receive the largest portion of business from LF Beauty on a per vendor basis, so performance improvements by these vendors has significant impact on how well LF Beauty serves its customers. This being the case, LF Beauty has an interest in actively supporting performance improvements and capability enhancements. Preferred vendors as a class fill an important role in the vendor base (see Section 5.3.1.2), but any given preferred vendor usually will not have as much impact on LF Beauty as a strategic vendor. Therefore, the strength of the relationship will generally be less than that with strategic vendors, and the level of support provided to these vendors will also be less. Lastly, qualified vendors, which typically provide low-volume, niche capabilities will have even less impact on LFB's business, and the level of engagement with these vendors will reflect this. This outline describing the strength of vendor relationships based on the classification provides general guidance rather than a strict mandate. Particular vendors may justify more or less involvement with LFB, such as a qualified vendor who supplies a strategically important product to a specific set of customers. LFB may need to ensure a higher level of quality with this product

and work with the vendor to ensure that these quality requirements can consistently be met, and support this vendor in implementing whatever is necessary to accomplish this.

The tool that is used to manage vendor engagement is the Vendor Engagement Package (VEP), a pilot version of which is provided in Appendix. The VEP contains the following information:

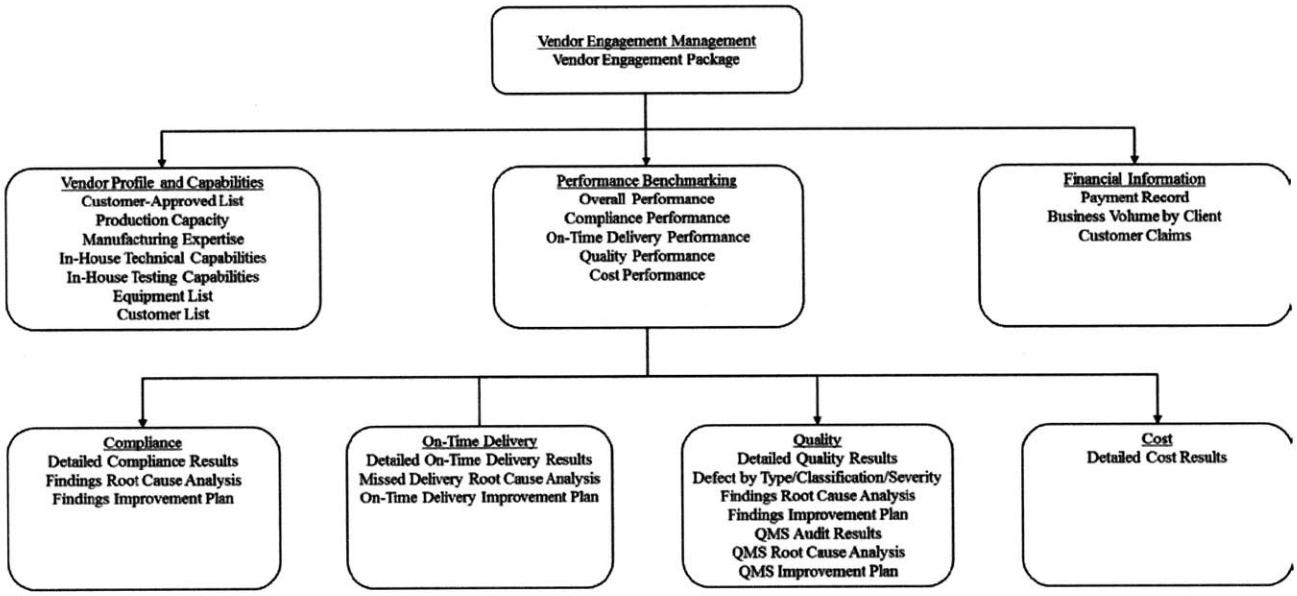


Figure 25: Vendor Engagement Package Overview

Factory profile and capabilities – provides general vendor information (address, contact information, etc.), production capacity, manufacturing capabilities and expertise, and customer-approved list.

Performance benchmarking – shows the vendors performance benchmarked against other vendors in the vendor base. Included is a graphical display of all the vendors and the rank of the vendor within that distribution.

Financial information – details LF Beauty's payment record to the vendor and reasons for delayed payments. Timely payments for goods received is of great importance to vendors and is included as a metric LF Beauty is accountable to perform to. Business volume by client breaks down how business awarded to the vendor is dispersed among LF Beauty customers. Customer claims document the dollar amount refunded to the customer for product issues attributed to the vendor.

Compliance – includes a detailed review of the findings from the past three compliance audits. The reason the past three audits are included is to show the vendor's progress from one audit to

the next, and if when issues are addressed, whether they emerge again. A section for documenting the root cause analysis for the findings is included, as well as a section for an improvement plan, in order to hold the vendor accountable for addressing findings in a systematic fashion.

On-Time Delivery – a detailed review of the vendor's on-time delivery performance over the past year is shown. A section for documenting the root cause analysis for missed shipments is included, as well as a section for an improvement plan to address the causes of the missed shipments.

Quality – a detailed review of the vendor's quality performance, categorized by defect type, classification, and severity is included, as well as the vendor's QMS audit results. Defect root cause analysis and improvement plan sections are included to document quality issues and how they are to be addressed.

Cost – the cost performance of the vendor, based on the competitiveness of its quotations, is documented.

It should be highlighted here that vendor rationalization and engagement is part of the larger Vendor Management and Sustainability initiative (discussed in Section 3.3), which includes the establishment of vendor risk monitoring and vendor improvement and support functions. The VEP ties into the larger Vendor Management and Support initiative by being the tool that unifies the efforts of those functions, LFB business leaders, and the vendor in understanding the mutual expectations, and progress toward those expectations, of LF Beauty and the vendor.

6.2.2 Implementation

The VEP was piloted with a single strategic vendor, both as a demonstration of the new engagement process and to receive feedback from the vendor on the information contained in the package. The VEP was used to facilitate discussion between the Bags product category leader and Vice President of Vendor Compliance & Sustainability at LF Beauty, and the owner and management team from the strategic vendor. The feedback from the LF Beauty team indicated that the VEP helped in conveying the new vendor engagement process and led to a more productive discussion with the vendor. Having all of the performance data on hand and organized aided the LF Beauty team in preparing for the meeting, which resulted in them being better able to manage the discussion during the meeting.

Of great interest to the vendor was the benchmarking information contained in the VEP. The vendor responded enthusiastically to wanting to improve their performance and be one of the highest-rated vendors. The reason this information is so valuable to the vendor is that it provides an objective reference for how well the vendor is competing. It indicates the areas where they are performing well and areas where they are not, as measured by the performance of peer vendors. The vendor therefore has the valuable knowledge of knowing where they should be focusing their improvement efforts.

An additional VEP was created for another strategic vendor, but was not implemented due to time constraints.

6.3 Future Work: Vendor Engagement Package

Future work on the vendor engagement package includes four areas of work:

1. *Automate the creation of VEPs* – at the present time, creating VEPs is manually-intensive and time-consuming. Once VEPs begin to be used beyond a trial basis and more broadly across the vendor base, it will no longer be feasible to create them manually on an as-needed basis. The IT infrastructure needs to be developed to automate the extraction and manipulation of data from the central database to fit the template of the VEP.
2. *Establish vendor support module in the central database* – documenting root cause analyses and improvement plans is not currently being performed. Once the vendor support functions are established as an outcome of the Vendor Management and Sustainability initiative, someone will have responsibility for doing this. It is recommended that a new module be created in the central database to document this information, since it is an integral part of the VEP. Creating a module in the central database will standardize the documentation process and allow the information to be seamlessly imported into the VEP once data extraction and manipulation capabilities discussed in the previous point are added.
3. *Continue to gain feedback from users* – as of this writing, two vendor engagement packages have been created, only one of which has been partially implemented. It is necessary to continue to gain feedback both from LF Beauty users and vendors to ensure that all relevant information that is of interest to all parties is contained in the VEP, and that it is displayed in an easily accessible and readable format.

4. *Define who is responsible for creating and updating the VEPs* – during the course of this research, the author was responsible for creating and updating the two VEPs that were developed for pilot implementation. This is additional work that needs to be assigned to someone within LF Beauty. Since it is the product category leader who leads the vendor engagement process, the logical person who should be responsible for ensuring that the VEPs are updated is the product category leader.

7 Case Study of Selected Vendors

This section is intended to validate from an observational perspective how effective the rationalization process was in selecting the vendors for the various classifications. It is an attempt to give more depth and credibility to the current work, as the theory and tools developed around that theory that drive the evaluation and selection methodologies are tested through real-world cases. The expectation would be that there would be obvious qualitative differences between the vendor classifications that would be noticeable when touring the vendor's facility and speaking with the management team. If expectations are not met, for example if a vendor classified as preferred has one of the most impressive operations, then it would be beneficial to investigate why the selection process failed to classify the vendor as strategic, and make improvements on the methodology. Another reason for including this section is to provide a picture of on-the-ground conditions at vendor sites and appreciate the challenges and opportunities they face, as well as to understand where LF Beauty can provide support in the partnership.

It should be noted that, due to time constraints allowing for only a few on-site visits during the conclusion of the current work, this section contains just a small sample of three vendors, which is not enough to draw generalizable conclusions. However, validating the rationalization and selection process is something that should be done, and this section provides examples of the kind of observations and conclusions that the LF Beauty team should be making.

7.1 Qualified Vendor – 'Factory A'

'Factory A', located in Heshan, opened in 1967 and is under second-generation management, with the son of the original factory owner who now manages the factory having spent a significant portion of his life in Canada. The author was also hosted by a customer liaison who had worked at the factory for about twenty years, and he spoke at length about the difficulties the factory had been having over the past ten years. About fifteen years ago, the factory employed 2,000 workers, compared to the 200 who work there today. The factory has over the preceding decade shifted its focus to lower volume, higher quality luggage brands. The cost of labor has been increasing dramatically, especially over the last decade, which has made it less economical to employ large amounts of labor on high-volume, low quality goods where margins tend to be less. Labor shortage is also an issue because younger workers tend to seek service-orient careers outside of factories. Therefore, the strategy of shifting to lower-volume, but higher-margin goods seems logical.

The basic idea of remaining competitive by focusing on higher quality goods that require fewer workers to make reveals the mentality that competitiveness is exclusively a cost-cutting exercise. Asking the factory owner about what measures he is taking to remain competitive reinforced the impression that competitiveness is seen as being achieved only by cost-cutting. The owner also mentioned that he believed he would have to relocate his factory to a lower wage country like Indonesia if he wanted to remain in business for the long term.

A tour of the factory showed that indeed there is great untapped potential in operating the factory more efficiently to remain competitive. As an example, in the material receiving dock, the customer liaison described how all incoming material is inspected, and that one of the main reasons why they may miss a customer delivery is because incoming raw material is defective. Typically, customers are unwilling to accommodate a later deadline, so the factory usually incurs a penalty for late shipments, either monetarily or in terms of customer goodwill. Asking what type of follow-up action the factory took to ensure that future shipments from the supplier would not be defective revealed that the problem is not addressed systemically, but rather reactively and superficially, which all but ensures that supplier problems will continue to be seen at the levels they are. A second notable observation was in the raw material warehouse, where material was stacked haphazardly on pallets with no apparent order. Much of the material appeared to be gathering dust and dirt and could have been mistaken for left over or scrap material. It does not require a capital investment to store material neatly and cleanly. Many of the defects found by quality inspectors are attributed to dirt or scratch marks. Something as simple as cleaning up and organizing the raw material warehouse would help reduce defects and reduce the amount of time wasted searching for material. Another observation related to quality was noted when walking one of the production lines. The question of what the process was for tracking and identifying the root-cause of defects was asked, and it was responded to with the statement that 'human errors are unavoidable'. It was apparent then that the factory did not systematically track defects and seek improvements to reduce or eliminate the future occurrence of those defects.

There were a number of observations other than the three described above that reveal that there lacks a culture of continuous improvement. Contrary to the pervading thought at the factory that competitiveness means taking superficial cost-cutting measures, the true bedrock of competitiveness is having a culture of continuous improvement. Having pointed out this

deficiency, though, the management team has over the years been very cooperative with LF Beauty, and it was obvious that improving their factory operations was not a matter of willingness, but rather a matter of knowledge and resources.

When the management team was asked what LF Beauty could do to be a better partner to do business with, demand forecasts were described as an area for improvement. LF Beauty places orders on what appears to the factory to be on an ad hoc basis, which makes it particularly difficult to purchase materials economically, since many of the material orders are below the minimum order quantity. The factory then has to purchase more material than is required by LF Beauty's order, and the remainder goes to waste unless used by another customer order. In addition, lack of demand forecasting gives the factory less time to respond to LF Beauty's orders, which in some cases can result in delayed shipments. By providing the factory with more insight into future orders, cost reductions and on-time delivery improvements could be realized through more economical material ordering and better production scheduling. It was noted in Section 5.4 that LF Beauty should develop more detailed customer demand projections; doing so will not only allow LF Beauty to better understand the capacity and capability mix that it needs in its vendor base, but it will also allow LF Beauty to be able to provide demand projections over a longer time horizon to its vendors.

In terms of validating the selection of this particular vendor, it has been appropriately placed as a qualified vendor. It provides a niche product for LF Beauty – hard-shell luggage – that none of the other factories in the base are able to provide. They remain in the factory base not because of performance, but because of unique capabilities. From an observational perspective, the balanced scorecard seems to have accurately captured the performance of the vendor, whose overall score and quality score ranked in the bottom third of bags factories. Additionally, its compliance rating of C was in accordance with observations.

7.2 Strategic Vendor – 'Factory B'

'Factory B', located in Shenzhen, has a 20-year history with one of the beauty businesses that was acquired by Li & Fung a number of years ago that today is a part of what makes up LF Beauty. The factory employed around 2,000 workers a decade ago, but now has just 400, which is similar to the circumstances of 'Factory A'. The shrinking of the factory's employee base is evidenced by the fact that of the three buildings comprising the factory complex, all of which at one point in

time were used for production, two are leased to other business and just one is used for production. As with other many other factories located in southeast China, management is having difficulties attracting younger workers to the factory, because they would rather have 'desk jobs' in services industries. The factory, which specializes in commercial bags of the type that make up the bulk of the Bag's product category orders, is a family run business and is in the process of being handed over to the second generation of management.

One of the challenges the factory faces is that customer quality and testing requirements are becoming more stringent while cost requirements are decreasing, that is customers are expecting lower prices. When asked about how the factory attempts to be more cost-competitive, the answer was that two of the three buildings making up the factory complex are being leased, workers are not being replaced once they leave the factory, and that departments are being consolidated. There was no mention of looking within the four walls of the factory in terms of process improvements to enhance cost-competitiveness. When the factory manager was asked about his familiarity with the concepts of Lean Manufacturing and other continuous improvement methodologies, he said he had not heard of them. The answer to this question is revealing because it indicates that a culture of continuous improvement, whether called 'Lean' or by some other name, does not exist at the factory. A deeply embedded culture of continuous improvement is the surest way for a factory – or any other enterprise for that matter – to be competitive.

While the factory manager looked externally at all the factors putting downward pressure on his selling price, he did not see all the improvement opportunity internally to outpace this pressure while at the same time improving lead time and increasing quality. An example of this improvement potential is that the factory currently does not have a quality management system. There is no systematic tracking of defects and identification of their root cause for corrective action. Another example is the application of automation. One area of the factory taking up a large portion of the production floor was the silk screen area where company logos and brand names are written onto the product. Long tables were laid out to accommodate this work, taking up at least 10,000 square feet of space. Three workers were required to lay the material out on these tables onto the exact location they needed to be in for another worker to come by with the silk screen template and paint the image onto the product. Automated solutions exist for this kind of work that would have a number of benefits, including reducing headcount (which in an

environment of wage inflation is particularly beneficial), reducing the amount of floor space occupied by this process, and reducing the exposure of workers to toxic chemicals, the smell of which was very noticeable. When asked about automation, the factory manager indicated that handbags are too difficult of an item to introduce automation to because of the softness of the fabric. While this may be true for the time being, there still exist opportunities – like the silk screen example – to automate certain processes.

The selection of this factory as a strategic factory is appropriate from the viewpoint of capacity and technological capabilities. The factory is able to produce a high volume of the type of bags that make up the majority of the Bags product category orders. The factory also has unique technological capabilities like a laser cutting machine and silk screening area that allow it to produce a wider variety of bags than peer factories. The long business history that the factory has with LF Beauty – dating back 20 years with one of the companies that now comprise LF Beauty – makes a strong case for their familiarity both with the personnel at LF Beauty as well as the type of products and customers they serve. Additionally, the factory management is open and willing to engage with LF Beauty at a deeper level to improve their factory operations. This willingness is an essential element in any strategic partnership.

7.3 Strategic Vendor – 'Factory C'

'Factory C', also located in Shenzhen, has multiple years of history working with LF Beauty and in many ways has already been a strategic vendor for the Bags product category before it was selected as such through the rationalization process. Even during the vendor engagement assessment, the proficiency and professionalism of the management team was evident by the depth of their discussions with LF Beauty, especially in terms of their vision for remaining competitive in the future. The management team clearly understood the challenges they face and the industry and technological trends that they must adapt to. They discussed innovative automation strategies and developing rapid prototyping capabilities to produce customer samples faster, among other forward-thinking ideas. Unlike some of the other management teams facing a similar tough, competitive environment, the team from 'Factory C' portrayed an attitude of having the knowledge and power to remain successful.

The factory production floor was equally impressive. It was the only factory visit in which it was clear that Lean Manufacturing principles had been systematically deployed. Sewing machines

were placed in sequence of the operation required to make the bag to reduce material movement, work-in-progress at each of the sewing machines was dramatically reduced compared to the piles of partially finished goods seen at work stations in other factories, visual management tools were used to help coordinate production, and the overall cleanliness and tidiness of the factory was exceptional. One particularly notable observation was the way in which goods ready for final inspection, which were produced on the building's second floor, were delivered to the final inspection area, which was on the first floor. Instead of carrying boxes of goods downstairs, an opening in the floor had been cut, which had a chute attached to it that ended in a large padded tote downstairs. Workers simply put the completed bag in the chute, which slid downstairs to the inspectors on the first floor. This example shows the innovative and continuous improvement oriented culture that has made this factory such a clear standout from its peers.

After speaking with the management team and observing the factory in operation, clearly the selection of this vendor as a strategic vendor is a good choice. The factory had even recently opened a second production facility to be able to take on more orders, many of which were expected to come from LF Beauty. Moving forward, this should be the vendor that LF Beauty models its other strategic vendor relationships after. It is also the vendor that LF Beauty should refine its vendor engagement package with, to better understand from the perspective of the vendor where improvements can be made, both in terms of what content is included in the package as well as how that information is conveyed.

7.4 Conclusions from Case Studies

What stood out the most during the vendor visits was just how much the increase in worker wages in coastal China spoken about at some length in Section 2.2 is driving management's perception of their competitiveness, and how much opportunity for enhancing operational efficiency remains unexploited. Speculative but plausible explanations for why this is the case are: 1) the industry in which these vendors compete employs low skill labor for the manufacture of simple, but manually-intensive products. In such an industry, it is difficult to attract talent that has expertise in implementing Lean production systems; in addition, the high worker turnover rate makes it more challenging for a culture of continuous improvement to take hold and be sustained. 2) historically, China's competitive advantage has been its large pool of low wage labor, so vendors have not had to learn how to compete through productivity and efficiency gains. Rather than training workers

to be more productive, it was easier and likely more cost effective simply to hire more workers. Now that the low wage competitive advantage has diminished, hiring more workers is not a solution and many industries in China – certainly the garment and apparel industry – are playing catch up and having to quickly learn modern production management techniques and philosophies that have been practiced in developed countries for decades. An added difficulty for adopting these techniques and philosophies is that they rest on developing workers to be able to see and implement incremental improvements to their daily work. Such a mindset that encourages a certain degree of autonomy and innovative thinking in workers is in many respects at odds with how production is managed in Chinese factories. However, the fact that there is so much opportunity for improving operational efficiency should be viewed as a favorable point, in that the generally negative outlook on remaining competitive that some of the vendors described can be addressed. LF Beauty has a great deal of expertise and knowledge not only within the operating unit but within the company at large that can be leveraged to support those vendors that want to improve and become a stronger performer and stronger partner with LF Beauty.

In regard to validating the ability of the Balanced Scorecard to provide an accurate reflection of the vendor's performance, a longer performance history is needed and more vendor visits must be conducted. With a sample of just three vendors and a performance history only going back one quarter because of a revision in the way on-time delivery data is collected, there is not yet enough information to accurately assess the validity, but with the work done so far, there were no instances in which observations at the vendor were noticeably different than what one would expect based on the Balanced Scorecard. Moving forward, as the Balanced Scorecard becomes a more robust tool and as the data feeding into it becomes more accurate, an exciting possibility would be to use the scorecard to identify correlations between high-performing vendors and the actions they are taking in their factories to achieve those results. LF Beauty could select, say, its top ten highest performing vendors and conduct interviews with the management teams and make on-site observations to try to understand exactly what they are doing differently than other vendors that makes them so successful. Such understanding is highly valuable and serves to strengthen LF Beauty's manufacturing expertise, which it can share with other vendors in the network to spread best practices to improve the network as a whole. Another benefit of the Balanced Scorecard as part of the Vendor Engagement Package is that it gives vendors a clear and transparent understanding of how their performance is being measured and whether or not they are performing

to expectations. It gives them clear feedback on where they should be focusing improvement efforts. It also provides greater assurance about their standing with LF Beauty and how much business they can reasonably expect to be awarded in the future. Uncertainty about future business with LF Beauty was described during the case studies as a pain point for some vendors, since effective resource planning and raw materials purchases require having some insight into future business.

Finally, as a general recommendation, LF Beauty should be systematically collecting and synthesizing observations from on-the-ground conditions at vendors to be discussed periodically as a way to gain a more insightful picture of challenges and opportunities faced by vendors. Even after only a small sample of visits, the author realized how much valuable information can be gained through on-site visits. This is not to imply that some of this information is not today being collected or used to make better decisions, but it is to say that there is not a formal, process-oriented approach to gaining these valuable insights. It could be suggested that on a monthly or quarterly basis, the heads of each of the functional departments (quality engineering, product engineering, compliance, etc.) synthesize relevant information of what their teams are observing at vendor sites, and use this information to identify emerging trends. Such information not only helps LF Beauty make necessary changes in its sourcing strategy, but also makes LF Beauty a better partner to its vendors by being able to share information that helps them compete in a rapidly changing competitive environment.

8 Conclusion

The preceding work has been an attempt to address two high-level goals that are of strategic importance to Li & Fung – transforming vendor relationships into ones of greater support, where, as William Fung stated, "we will treat our vendors as customers," and implementing strategies for better supply chain management using data analytics. Being at the center of a massive network that connects hundreds of brands with thousands of suppliers, Li & Fung is in a unique position to be able to deliver on these goals. Indeed, it is imperative that the company do so, given that the it is only as strong as its vendor base, which is currently facing a difficult competitive environment with ever-increasing performance expectations.

This work was undertaken in the context of Li & Fung being in the initial stages of pursuing these two goals. There is therefore a great deal of organizational learning that took place throughout this work that the author believes will help it better understand, among other things, what processes and information technology resources will be needed to advance the company toward its longer term vision of putting the data it generates as a leading global supply chain management company at the center of its value proposition to customers and vendors; what internal organizational challenges will need to be overcome and what skillsets will need to be employed to achieve this; and what other opportunities exist to innovate that may not yet have been considered. This work, therefore, should be viewed as an experimentation in what is achievable in supporting the two high-level goals with the data as it is today, rather than an ideal solution. While there are still gaps in the rationalization and engagement methodologies presented, these solutions for selecting the right vendors to form longer-term, more collaborative relationships with and a means by which to manage those relationships over time, has moved Li & Fung further down the path of achieving its goals.

9 References

Ahmed, A., & Paul, R. (2012). Bangladesh's Worst-ever Factory Blaze Kills Over 100. Reuters. Retrieved December 22, 2015, from http://www.reuters.com/article/us-bangladesh-fire-idUSBRE8AN0CG20121125

Alamgir, H., Cooper, S. P., & Delclos, G. L. (2013). Garments Fire: History Repeats Itself. American Journal of Industrial Medicine, 56(9), 1113-1115. doi:10.1002/ajim.22196

Berens, J. S. (1972). A Decision Matrix Approach to Supplier Selection. Journal of Retailing, 47(4), 47–53.

Chan, F. T. S., Kumar, N., Tiwari, M. K., Lau, H. C., & Choy, K. L. (2008). Global Supplier Selection: A fuzzy AHP Approach. International Journal of Production Research, 46(14), 3825–3857.

Chen, X., & Li, X. (2007). Multiphase supplier selection model based on supplier development orientation.

China Average Yearly Wages in Manufacturing. (2015). Trading Economics. Retrieved December 22, 2015, from http://www.tradingeconomics.com/china/wages-in-manufacturing

China in the WTO: Past, Present and Future. (2011). Lecture presented at The 10th Anniversary of China's Accession to the WTO. Retrieved December 22, 2015, from https://www.wto.org/english/thewto_e/acc_e/s7lu_e.pdf

China Statistical Yearbook 2014. (2014). National Bureau of Statistics of China. Retrieved December 22, 2015, from http://www.stats.gov.cn/english/Statisticaldata/AnnualData/

Cormican, K., & Cunningham, M. (2007). Supplier performance evaluation: lessons from a large multinational organisation. Journal Of Manufacturing Technology Management, 18(4), 352-366.

Dyer, J. (2000). Collaborative Advantage: Winning Through Extended Enterprise Supplier Networks. New York: Oxford University Press.

Dickson, G. W. (1966). An Analysis Of Vendor Selection Systems And Decisions. Journal of Purchasing, 2(1), 5-17.

Feder, B. (2006). Theodore Levitt, 81, Who Coined the Term 'Globalization', Is Dead. The New York Times. Retrieved December 22, 2015, from http://www.nytimes.com/2006/07/06/business/06levitt.html?_r=1&

Feng, B. (2012). A Hundred Years of Li & Fung: Supply Network Orchestrator for Asia and Beyond (2nd ed.). Singapore: Cengage Learning.

Fung Trading Services (Shanghai) Co., Ltd. (2015). Retrieved December 22, 2015, from http://lifungsh.51job.com/lishien.php

Fung, V., & Fung, W. (2008). Competing in a Flat World: Building Enterprises for a Borderless World. Upper Saddle River, NJ.: Wharton School Publishing.

International Standards Organization. (2008). ISO 9001:2008. Retrieved December 22, 2015 from https://www.iso.org/obp/ui/#iso:std:iso:9001:ed-4:v2:en

Jones, D., & Womack, J. (2011). Seeing the Whole: Mapping the Extended Value Stream (2nd ed.). Cambridge, MA.: Lean Enterprise Institute.

Karim, L. (2014). Analyzing Women's Empowerment: Microfinance and Garment Labor in Bangladesh. Fletcher Forum Of World Affairs, 38(2), 153-166.

Levitt, T. (1983). The Globalization of Markets. Harvard Business Review. Retrieved December 22, 2015 from https://hbr.org/1983/05/the-globalization-of-markets

Li, H., Li, L., Wu, B., & Xiong, Y. (2012). The End of Cheap Chinese Labor. Journal of Economic Perspectives, 26(4), 57-74. doi:10.1257/jep.26.4.57

Locke, R., Amengual, M., & Mangla, A. (n.d). Virtue out of Necessity? Compliance, Commitment, and the Improvement of Labor Conditions in Global Supply Chains. Politics & Society, 37(3), 319-351.

Melvin, S., & Lee, H. (2015). Everything is Connected: A New Era of Sustainability at Li & Fung. Stanford Business Case Study, GS-87, 1-2. Harvard Business Publishing.

Morrison, W. (2015). China's Economic Rise: History, Trends, Challenges, and Implications for the United States (pp. 12). Congressional Research Service. Retrieved December 22, 2015, from https://www.fas.org/sgp/crs/row/RL33534.pdf

Nukala, S., & Gupta, S. M. (2007). A Fuzzy Mathematical Programming Approach for Supplier Selection in a Closed-loop Supply Chain Network. Proceedings of the 2007 POMS-Dallas meeting.

Our Global Network – Li & Fung Limited. (2015). Retrieved December 22, 2015, from http://www.lifung.com/about-us/our-global-network/

Rein, S. (2012). The end of cheap China: Economic and cultural trends that will disrupt the world. Hoboken, New Jersey: John Wiley & Sons.

Saaty, T. L. (1988). Multicriteria Decision-Making: The Analytic Hierarchy Process. Pittsburgh, PA: University of Pittsburgh.

Stallkamp, T. (2005). Score! A Better Way to Do Business: Moving From Conflict to Collaboration (pp. 104, 123). Philadelphia, PA.: Wharton School Publishing.

Tabrizi, B. (2007). Rapid Transformation: A 90-Day Plan for Fast and Effective Change (pp. 13-14). Cambridge, MA.: Harvard Business Press.

Weber, C., Current, J., & Benton, W. (1991). Vendor selection criteria and methods. European Journal of Operational Research, 50(1), 2-18.

Weber, C. A., Current, J., & Desai, A. (2000). Determining the Number of Vendors to Employ. Supply Chain Management: An International Journal, 5(2), 90–98.

Wei, S. (1995). Open Door Policy and China's Rapid Growth: Evidence from City-level Data. National Bureau of Economic Research, 4, 74-74. Retrieved December 22, 2015, from http://www.nber.org/chapters/c8545.pdf

10 Appendix A: Balanced Scorecard

This appendix shows a portion of the balanced scorecard for the reader's reference. The first page documents the quantitative portion with the performance parameters calculated, and the second page documents some of the additional qualitative information.

Vendor name	Overall Score	Overall Rank	Compliance Rating	Expiry date	Compliance Score	OTD	OTD Score	OTD Rank	Defect Rate	1st Pass Rate	Quality Score	Quality Rank	Margin % (Standardized)	Chargback Ratio (Standardized)	Cost Score	Cost Rank
ACE-TEC (HK) CO., LIMITED	43.25%	D	C+	3/31/2015	50.00%	17.54%	17.54%	D	2.12%	93.75%	95.81%	D	16.54%	0.00%	16.54%	D
DONG GUAN ADVANCE TOOLING CO., LTD	59.98%	C	C	7/31/2015	35.00%	40.23%	40.23%	D	6.43%	96.76%	95.16%	D	60.40%	0.00%	60.40%	B
ALLEN & THOMAS COSMETIC ACCESSORIES CO.,LTD	49.78%	D	B	9/30/2015	75.00%	11.11%	11.11%	D	4.86%	100.00%	97.57%	C	23.34%	0.00%	23.34%	C
ANHUI LANLAN TOWEL & SHEET CO.,LTD	60.66%	B	C	3/31/2015	35.00%	100.00%	100.00%	A	8.50%	100.00%	95.75%	D	27.79%	0.00%	27.79%	C
AQUAFEEL COMPANY LIMITED	52.99%	D	C+	3/31/2015	50.00%	33.33%	33.33%	D	6.75%	81.82%	87.53%	D	41.27%	0.00%	41.27%	B
ARTWIN METAL GIFTWARE LTD	64.00%	B	A	5/31/2014	100.00%	0.00%	0.00%	D	12.00%	100.00%	94.00%	D	58.58%	0.00%	58.58%	B
BOOK RICH PACKAGING PRODUCTS (SHENZHEN) CO., LTD	46.73%	D	C+	11/30/2014	50.00%	0.00%	0.00%	D	2.60%	100.00%	98.70%	B	34.45%	0.00%	34.45%	C
ASSOCIATED TRAVELWARE INDUSTRIAL (HE SHAN) CO., LTD	45.40%	D	C	3/31/2015	35.00%	28.57%	28.57%	D	11.16%	94.44%	91.64%	D	27.93%	0.00%	27.93%	C
ASTA PLASTIC TUBES (SHANGHAI) CO., LTD.	57.49%	C	C	8/31/2015	35.00%	86.67%	86.67%	B	9.36%	92.86%	91.75%	D	29.20%	0.00%	29.20%	C
BAI SHI ACCESSORIES FACTORY	44.32%	D	C+	9/30/2014	50.00%	0.00%	0.00%	D	4.50%	100.00%	97.75%	C	28.22%	0.00%	28.22%	C
BEST HOPE HANDBAG CO., LTD	38.87%	D	C+	9/30/2015	50.00%	0.00%	0.00%	D	8.28%	83.33%	87.53%	D	19.96%	0.00%	19.96%	D
BO JING PLASTIC FACTORY	53.10%	D	C	5/31/2015	35.00%	76.92%	76.92%	C	2.01%	100.00%	98.99%	A	17.05%	0.00%	17.05%	D
CASTLE WAY INDUSTRIAL CO., LTD.(CHINA-1)	58.67%	C	C	5/31/2015	35.00%	57.52%	57.52%	D	2.59%	91.51%	94.46%	D	47.29%	0.00%	47.29%	B
JIANGSU CHAOHUA GLASSWORK CO., LTD	54.66%	C	C-	7/31/2015	20.00%	66.67%	66.67%	C	4.53%	100.00%	97.74%	C	36.83%	0.00%	36.83%	C
CHAOZHOU RUIHUA ARTS AND CRAFTS CO., LTD	30.18%	D	C-	7/31/2015	20.00%	0.00%	0.00%	D	6.40%	100.00%	96.80%	C	5.64%	0.00%	5.64%	D
CHANGSHU BAI LING SHI TEXTILES CO., LTD	35.54%	D	C	7/31/2015	35.00%	0.00%	0.00%	D	8.72%	66.67%	78.98%	D	25.14%	0.00%	25.14%	C
CHIN FAI ELECTRONICS COMPANY	69.29%	B	C+	4/30/2015	50.00%	100.00%	100.00%	A	4.44%	100.00%	97.78%	C	42.40%	0.00%	42.40%	B
CHAOZHOU HUADE CERAMICS MANUFACTURE CO., LTD.	38.63%	D	C+	4/30/2015	50.00%	0.00%	0.00%	D	6.82%	66.67%	79.92%	D	24.71%	0.00%	24.71%	C
CHIVA TOYS (SHENZHEN) CO., LTD	65.16%	B	A	3/31/2016	100.00%	25.00%	25.00%	D	6.28%	80.00%	86.86%	D	52.71%	0.00%	52.71%	B
CHEUK LUN METAL MANUFACTORY (SHENZHEN) CO., LTD.	57.73%	C	C-	3/31/2015	20.00%	76.92%	76.92%	C	10.66%	92.86%	91.10%	D	44.48%	0.00%	44.48%	B
CHUNG RHY SPECIALTY PAPER MFG. CO., LTD	53.74%	D	A	10/31/2015	100.00%	11.54%	11.54%	D	0.71%	100.00%	99.65%	A	18.62%	0.00%	18.62%	D
CIXI HONGTAI PLASTIC PRODUCTS CO., LTD	53.55%	D	B	2/28/2015	75.00%	0.00%	0.00%	D	2.39%	100.00%	98.81%	B	39.57%	0.00%	39.57%	B
COROMAT ENTERPRISE CO., LTD.	39.57%	D	C	7/31/2014	35.00%	0.00%	0.00%	D	5.18%	100.00%	97.41%	C	23.48%	0.00%	23.48%	C
LF BEAUTY MANUFACTURING CHINA	57.89%	C	C+	12/31/2014	50.00%	53.79%	53.79%	D	6.24%	100.00%	96.88%	C	36.87%	0.00%	36.87%	C
CREATIVE PRODUCT MANUFACTURING	66.09%	B	A	10/31/2015	100.00%	50.00%	50.00%	D	5.50%	100.00%	97.25%	C	33.64%	0.00%	33.64%	C
CYBERSPACE GROUP LIMITED (CHINA-1)	67.34%	B	A	6/30/2015	100.00%	50.00%	50.00%	D	8.50%	66.67%	79.08%	D	50.21%	0.00%	50.21%	B
DERIK INDUSTRIAL CO. LTD	53.20%	D	C	3/31/2015	35.00%	39.39%	39.39%	D	3.49%	90.76%	93.63%	D	42.62%	0.00%	42.62%	B
DONG GUAN CHANG PING TIMER CHON WING TOYS PRODUCTS I	55.43%	C	A	10/31/2015	100.00%	40.00%	40.00%	D	7.66%	100.00%	96.17%	D	9.69%	0.00%	9.69%	D
DONGGUAN CHONG WEI METALS & PLASTIC PRODUCTS FACTOR	67.06%	B	A	6/30/2015	100.00%	100.00%	100.00%	A	13.40%	100.00%	93.30%	D	10.66%	0.00%	10.66%	D
DONGGUAN HUAYU HANDBAG CO., LTD	34.11%	D	C-	3/31/2015	20.00%	0.00%	0.00%	D	6.98%	100.00%	96.51%	C	17.11%	0.00%	17.11%	D
DONGGUAN HONGQIAO PRINTING CO., LTD	43.84%	D	A	4/30/2015	100.00%	0.00%	0.00%	D	6.90%	50.00%	71.55%	D	16.99%	0.00%	16.99%	D
YIWU DIEFEI COSMETIC CO., LTD	44.33%	D	C-	7/31/2015	20.00%	33.33%	33.33%	D	7.44%	84.21%	88.38%	D	33.05%	0.00%	33.05%	C
DONGGUAN BEILLY ACCESSORIES LIMITED COMPANY	61.04%	B	C+	5/31/2015	50.00%	100.00%	100.00%	A	4.40%	100.00%	97.80%	B	18.84%	0.00%	18.84%	D
DONGGUAN BEAUTY STAR PLASTIC FACTORY LTD.	51.72%	D	C	9/30/2015	35.00%	100.00%	100.00%	A	2.24%	100.00%	98.88%	A	0.00%	0.00%	0.00%	D
DONGGUAN BOYYE INDUSTRIAL CO.,LTD	35.13%	D	C	9/30/2015	35.00%	66.67%	66.67%	C	10.22%	0.00%	44.89%	D	10.21%	0.00%	10.21%	D
DONGGUAN DONGKENG TAI TUNG GIFT BOX FACTORY	52.18%	D	C+	9/30/2014	50.00%	0.00%	0.00%	D	5.26%	100.00%	97.37%	C	50.97%	0.00%	50.97%	B
DONGGUAN HAOXIANG LIGHTING CO LTD	24.50%	D	C	10/31/2014	35.00%	0.00%	0.00%	D	9.44%	0.00%	45.28%	D	17.66%	0.00%	17.66%	D
DONGGUAN JIAN PLASTIC & METAL PRODUCTS LTD.	37.43%	D	C-	8/31/2015	20.00%	17.31%	17.31%	D	4.53%	91.73%	93.60%	D	18.76%	0.00%	18.76%	D
DONGGUAN MEIZHUANG PLASTIC & HARDWARE COMPANY LIMI	47.56%	D	C-	5/31/2015	20.00%	52.17%	52.17%	D	3.04%	91.41%	94.18%	D	27.37%	0.00%	27.37%	C
DONGGUAN CAIXIN COSMETICS CO.,LTD	58.42%	C	C+	4/30/2015	50.00%	35.29%	35.29%	D	5.40%	100.00%	97.30%	C	48.68%	0.00%	48.68%	B
DONGGUAN CITY JINGLI CAN CO LTD	46.59%	D	C+	7/31/2015	50.00%	0.00%	0.00%	D	5.20%	54.55%	74.67%	D	51.21%	0.00%	51.21%	B
DONGGUAN HEYU TRADING COMPANY LIMITED	62.05%	B	C+	9/30/2014	50.00%	100.00%	100.00%	A	4.60%	100.00%	97.70%	C	21.78%	0.00%	21.78%	D
DONGGUAN BAOXIN LUGGAGE CO., LTD	36.92%	D	C+	6/30/2015	50.00%	0.00%	0.00%	D	5.98%	92.31%	93.16%	D	10.37%	0.00%	10.37%	D
DONG GUAN KING NEED PLASTIC PRODUCTS CO.,LTD	44.10%	D	C+	5/31/2015	50.00%	0.00%	0.00%	D	2.88%	100.00%	98.56%	B	27.02%	0.00%	27.02%	C
DONG GUAN PO SING IMITATION JEWELLERY MFG. CO. LTD	40.61%	D	C	7/31/2015	35.00%	0.00%	0.00%	D	14.21%	66.67%	76.23%	D	41.58%	0.00%	41.58%	B
DONG GUAN HU MEN SIXIN METAL WORKS FACTORY	43.53%	D	C+	9/30/2015	50.00%	6.94%	6.94%	D	7.61%	80.00%	86.19%	D	30.26%	0.00%	30.26%	C
DONGGUAN SHANGHE VOION PRINTING CO.,LTD	48.33%	D	C+	7/31/2015	50.00%	40.70%	40.70%	D	5.81%	88.39%	91.29%	D	21.04%	0.00%	21.04%	D
DONGGUAN RIXING HANDBAG CO., LTD	43.85%	D	C+	3/31/2015	50.00%	11.36%	11.36%	D	7.53%	95.83%	94.15%	D	22.98%	0.00%	22.98%	C
DONGGUAN TINSHINE TIN BOX CO., LTD	56.56%	C	A	1/31/2016	100.00%	2.99%	2.99%	D	5.44%	90.86%	92.71%	D	36.53%	0.00%	36.53%	C
DOUBLE BODY CO., LTD.	46.13%	D	C+	1/31/2015	50.00%	26.67%	26.67%	D	8.31%	33.33%	62.51%	D	43.33%	0.00%	43.33%	B
DONGGUAN WEIQUN PACKAGED PRODUCTS CO., LTD.	37.06%	D	C	8/31/2015	35.00%	13.04%	13.04%	D	10.00%	62.50%	76.25%	D	23.96%	0.00%	23.96%	C
DONG WOO ENTERPRISE CO., LTD	57.04%	C	C-	5/31/2015	20.00%	100.00%	100.00%	A	3.85%	0.00%	48.08%	D	60.07%	0.00%	60.07%	B

Vendor Name	Product cat	2014 Final Supplier COGS Amt	2014 Qty	2015 Final Supplier COGS Amt	2015 Qty	QMS %	Client's approved factory	QMS (ISO 9001) Certification s	Complete In-house production capacity	In-house lab testing capability	Using the LFB costing template	Subcontractor that could be legalized	Fashion bags	Small leather goods (wallet,...)	Cosmetic/ simple bag	Specialty function bags	Travel/spo rt bags	Trolley	Hard cell cosmetic case
SHENZHEN JIECHENG HANDBAG MANUFACTURE COMPANY LIMITED	Bags	$11,174,243.22	4,002,699	$9,394,223.55	3,271,685	83.0%	L'Oreal, Oriflame	n/a	6 production lines, output 15万/line total output:90万/month	vibration , handles strength pull test	Y	2	x		x		x		
SHUI HING HANDBAG (SHEN ZHEN) CO., LTD	Bags	$8,223,305.58	5,969,114	$5,559,610.64	4,160,494	83.8%	L'Oreal, Dior, LVMH, Chanel, Burberry, Estee Lauder, Natura, Cath Kidston, Sephora	n/a	6 production lines, 7-10万/line total output:42-60万/month	vibration, salt-spray, colorfastness to crocking, aging, handle strength pull test	Y	0	x	x	x		x		
TENHOPE LEATHER MANUFACTURING	Bags	$5,887,504.86	3,129,420	$2,242,141.12	1,316,374	81.0%	L'Oreal, Boots	n/a	5 production lines, 6万/line total output:30万/month	vibration, handle strength pull test	Y	1	x		x		x		x
JINHUA CITY ERONG BAGS MANUFACTORY CO., LTD	Bags	$2,695,670.16	1,465,860	$1,834,990.51	819,942	79.0%	Estee Lauder Mary Kay, Oriflame	n/a	13 production lines, 6万/line total output:78万/month	vibration, salt-spray, colorfastness to crocking, handle strength pull test	N	0			x		x		
LEADER HANDBAGS FTY LTD.	Bags	$1,687,935.31	793,910	$692,998.62	292,972	78.0%	Chanel , Estee Lauder	n/a	N (outsourced: metal logo parts, silkscreen, embroidery, polybag, carton)	n/a	Y	0			x		x		
DONGGUAN BAOXIN LUGGAGE CO., LTD	Bags	$1,481,647.50	3,312,750	$6,345,367.50	13,297,600	89.8%	Mary Kay,LOVE FURY,KMS,ANNA SUI	ISO 9001:2008	7 Production Lines 40 万/line total output: 280万/Month	salt-spray,handle strength pull test,Fall to the ground,Small object test barrel,Sharp point tester,Sharp edge tester	N(只报总价，不会填明细)	0			x				
YICK FAI HANDBAGS LTD.	Bags	$915,296.38	168,070	$809,468.65	158,362	91.0%	n/a	ISO 9001:2008 SMETA	N (outsourced: metal logo parts, silkscreen, embroidery, polybag, carton)	salt-spray, colorfastness to crocking, heavy metal test	not yet send any enquiry to them	0	x		x		x		
SHUNQI HANDBAGS INDUSTRIES CO.,LTD	Bags	$1,422,902.77	549,599	$936,110.24	242,385	85.0%	n/a	SEDEX	12 Production Lines total output:11-15万/month	salt-spray,vibration,Zipper performance test,conditioning test with humidity	Y(100%)	0	x	x	x		x		
SHUIKEI INDUSTRIAL COMPANY LIMITED (CHINA - 1)	Bags	$2,451,039.58	1,265,134	$538,479.36	30,496	89.2%	Oriflame, Sony, Body shop	SEDEX	6 Production Lines total output:30-60万/month	vibration, salt-spray, colofastness to crocking, XRF, humidity, Running belt, Jerking machine, pull test, zipper , bursting, Abrasion test	Y (fill in 10%)	0	x		x		x	x	x
HUIZHOU REFIAND INDUSTRIAL COMPANY LIMITED	Bags	1,714,532.84	895,364	-	-	77.0%													
ASSOCIATED TRAVELWARE INDUSTRIAL (HE SHAN) CO., LTD	Bags	$556,755.75	27,709	$705,640.00	59,400	80.0%	Costco, Toptoy, LF	n/a	5lines*25workers, 30K bags per month	Luggage/Trolley funtion testing		0						x	x
JOIN RICH (ZHAOQING) ENTERPRISES LTD.	Bags	$440,974.83	443,097	$7,048,934.58	2,512,570	84.0%	GUERLAIN,AVON, L'OREAL KENSINGTON, CARREFOUR, BODYSHOP GUELDENPFENNI, YR ,MASHEER	ISO9001:2008	5 Production Lines 20 万/line total output: 100万/Month(ZHAOQING) (ZHONGXIN and WEIDALI) : 3 Production Lines 15 万/line total output: 45万/Month	vibration, slat-spray, colorfastness to crocking, aging,handle strength pull test	Y （fill in 10%）	2	x		x		x		
DONGGUAN RIXING HANDBAG CO., LTD	Bags	$707,486.30	209,444	$205,933.50	72,474	85.0%						?			x			x	
SHENZHEN JINGFENGSHUN HANDBAG CO., LTD	Bags	$161,402.78	60,336	$114,504.06	589,000	90.0%						0	x		x		x		
GUANGZHOU GAOSIBO HANDBAG CO. LTD.	Bags	$426,963.12	156,073	$858,236.70	203,998	78.0%	L'Oreal, Oriflame, Estee Lauder, Target	n/a	4 Production Lines 6 万/line total output: 24万/Month	handle strength pull test	Y	1	x	x	x		x		

11 Appendix B: Vendor Engagement Package Example

LF BEAUTY.

Vendor Engagement Package - PILOT

(factory name omitted for confidentiality)

Reporting Period: July 2014 – June 2015

[Street Address]
[City, ST ZIP Code]
p. [Telephone]
f. [Fax]
[Email]
[Web address]

Table of Contents

Factory Profile and Capabilities

Customer-Approved Factory

- Burberry
- Cath Kidston
- Chanel
- Dior
- Estee Lauder
- L'Oreal
- LVMH
- Natura
- Sephora

Production Capacity

- 6 Production Lines
- 7 - 10 Workers/line

Manufacturing Expertise

- ☒ Fashion Bags
- ☒ Cosmetic Bags
- ☒ Travel Bags
- ☐ Sport Bags
- ☐ Hardcell Cosmetic Bags
- ☐ Wallets
- ☐ Trolley
- ☒ Backpack
- ☒ Heat-sealing Bag

In-House Technical Capabilities

- ☒ Gluing Section
- ☒ Painting Section
- ☒ Laser Cutting Machine
- ☒ Drying Room

In-House Testing Capabilities

- ☒ Vibration
- ☒ Handles-Strength Pull Test
- ☒ Barcode Scan Test
- ☒ Tape Test
- ☒ Salt-Spray
- ☒ Colorfastness to Crocking
- ☒ High/Low Temperature
- ☒ Metal Detection

Equipment List

- 30 Computer Sewing Machines
- Back-up Power Supply

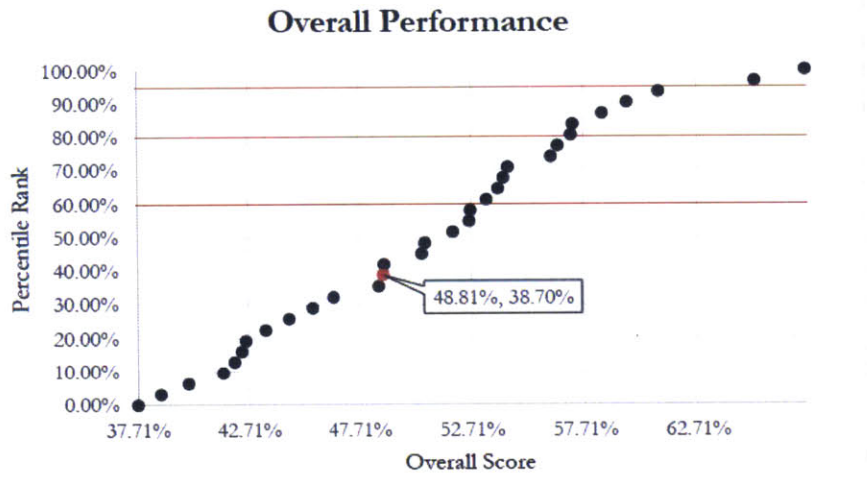
Customer List

- MGNY
- Wu Design

Performance Benchmarking

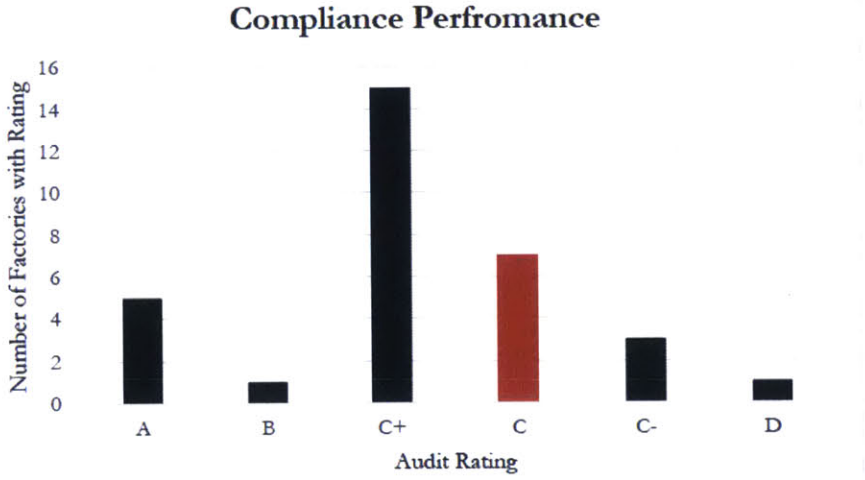
Overall Performance

- Overall Score: 48.81% (D) – ranks better than 38.70% of 32 bags factories



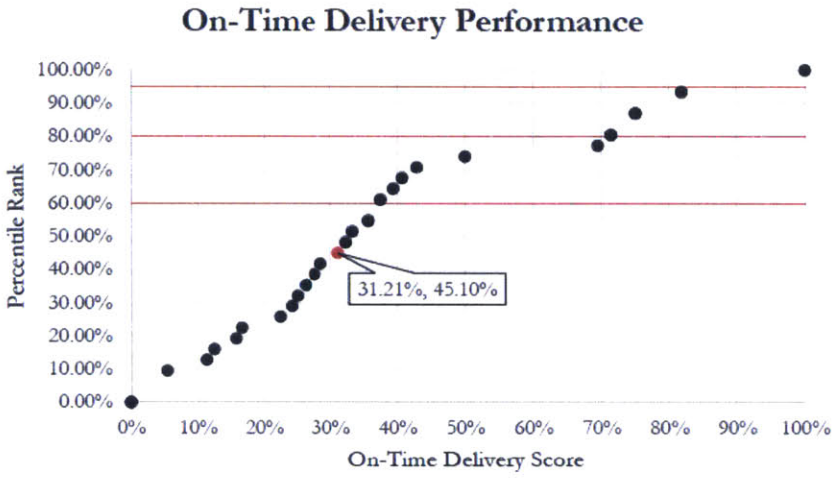
Compliance Performance

- Compliance Score: 35.00% (C)



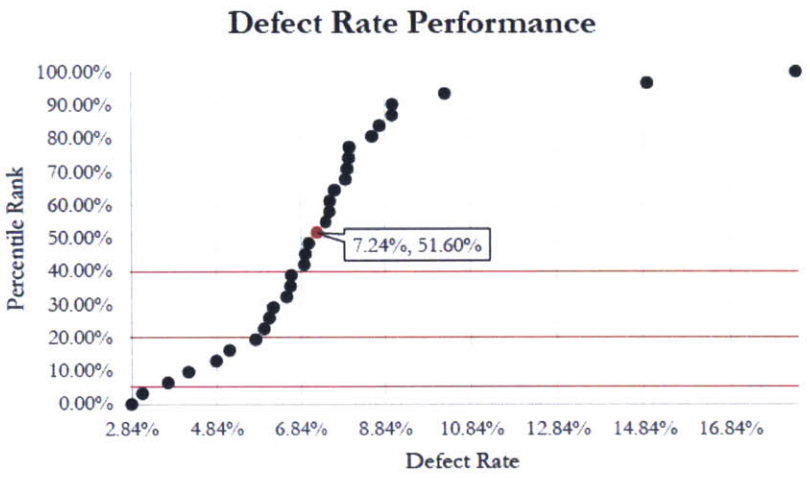
On-Time Delivery Performance

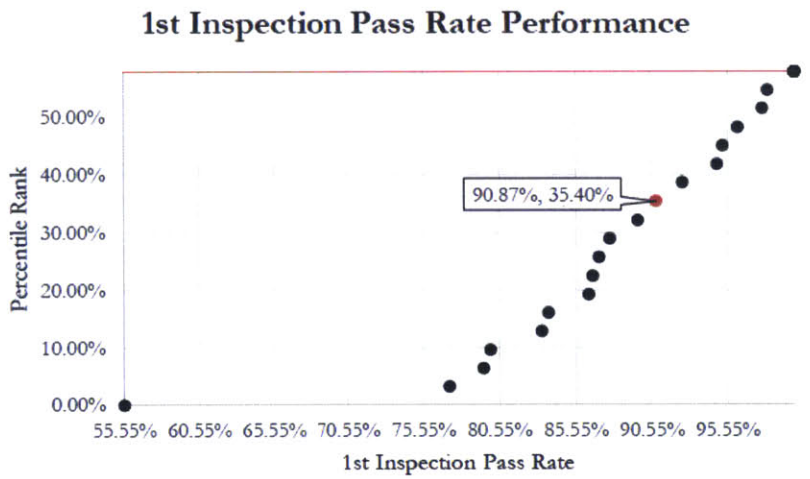
- On-Time Delivery Score: 31.21% (D) – ranks better than 45.10% of 32 bags factories



Quality Performance

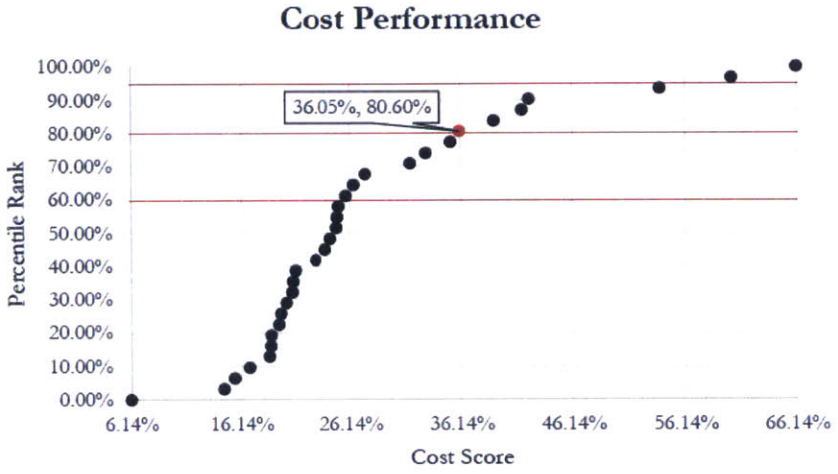
- Quality Score: 91.82% (D) – ranks better than 38.70% of 32 bags factories
- Defect Rate: 7.24% (D) –ranks better than 51.60% of 32 bags factories
- 1st Inspection Pass Rate: 90.87% (D) – ranks better than 35.40% of 32 bags factories


Defect Rate Performance
100.00%
90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
Percentile Rank
7.24%, 51.60%
2.84%
4.84%
6.84%
8.84%
10.84%
12.84%
14.84%
16.84%
Defect Rate


1st Inspection Pass Rate Performance
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
Percentile Rank
90.87%, 35.40%
55.55%
60.55%
65.55%
70.55%
75.55%
80.55%
85.55%
90.55%
95.55%
1st Inspection Pass Rate

Cost Performance

- Cost Score: 36.05% (B) – ranks better than 80.60% of 32 bags factories



Compliance: C

Detailed Compliance Results

	Audit Date	6/8/2015	10/13/2014	8/8/2014
	Zero Tolerance Findings	0	0	0
	Critical Findings	3	4	3
	Major Findings	1	1	3
	Minor Findings	2	4	3
	Result	C	C	C
Zero Tolerance				
Wages, Benefits and Terms of Employment	Paying employees below minimum wage 最低工资不足		x	
	Delay payment for more than one month (the pay cycle in China) in the past 6 months 工资发放周期超过1个月		x	
Critical				
Working Age	No proper health check for juvenile worker 未成年工体检项目不恰当		x	
	Lack of personnel file with current photo 人事档案中没有员工的近照	x		
wages, benefits and terms of employment	Paying employees below the mandatory overtime wage rate 加班费支付不足	x	x	x
	Insufficient annual leave 带薪年休假不足		x	
EHS	Inadequate and/or malfunctioning emergency exits 安全出口使用卷闸门和推拉门；安全出口门朝内打开	x		
	Hazardous waste mixed with non-hazardous waste 危险废弃物与非危险废弃物混放在一起			x
	Insufficient emergency lights 应急灯不足		x	
	No fire alarm 无火灾报警器	x	x	x
	Blocked fire fighting equipments 灭火设备被堵	x		
	Blocked evacuation route 逃生通道被堵塞		x	
	Inadequate maintenance/inspection of electrical equipment and system safety 电器等没有定期检查与维护	x	x	
Major				
working hours	Weekly working hours exceeded 60 hours 没有保证周工时不超过60小时	x	x	x
	No one (1) full day of rest upon six (6) consecutive days of work 连续上班超过7天	x	x	
EHS	PPE for hazardous and high risk work are not provided 未按要求提供或使用个人劳动保护用品	x	x	x
	Insufficient fire drill 不完善的消防演习		x	x
Minor				
wages, benefits and terms of employment	No 100% coverage of social insurance with waiver 没有100%参保但有符合当地社保规定的证明		x	
EHS	Insufficient safety guard for general machines 设备没有保护装置	x	x	x
	Insufficient occupational health check 职业病体检不足	x	x	
	No label of chemical container 化学品无标示	x		x
	No MSDS posted 未张贴MSDS		x	
	Insufficient secondary container 防渗漏装置不足	x	x	
	Insufficient exit sign 安全出口标示不足		x	
	Inadequate handrails at staireases/ladders with four or more steps 超过4级台阶的楼梯没有扶手		x	
	Inadequate procedures for working at height 无高处作业指引	x		
	Hazardous waste inventory not maintained 无垃圾库存清单		x	
	No waste water, waste air, noise test 未进行环境检测(废水废气噪音)		x	x
Comments				
N/A				

Compliance Findings Root Cause Analysis

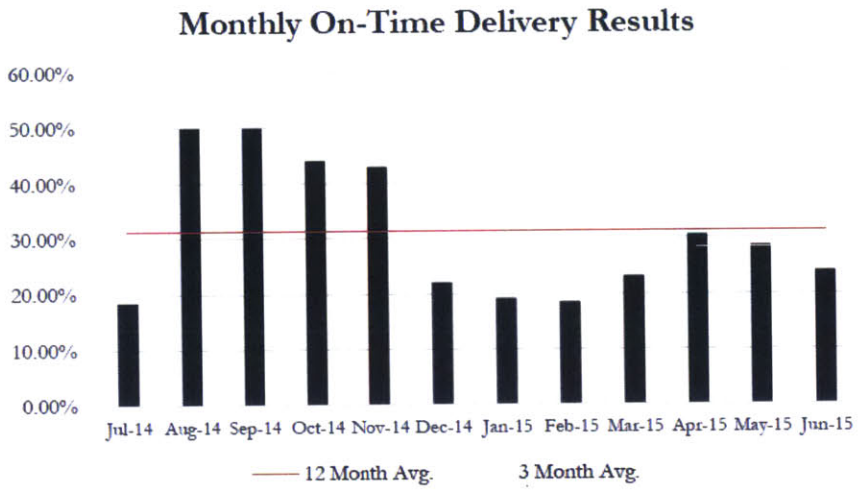
- [Use this section to identify the root cause of the issues]

Compliance Findings Improvement Plan

- [Use this section to detail what actions will be taken to address root causes]

On-Time Delivery: D

Detailed On-Time Delivery Results



	Shipments Delivered On-Time	Scheduled Shipments	Monthly OTD
Jul-14	5	27	18.52%
Aug-14	20	40	50.00%
Sep-14	23	46	50.00%
Oct-14	26	59	44.07%
Nov-14	63	147	42.86%
Dec-14	13	59	22.03%
Jan-15	21	110	19.09%
Feb-15	14	76	18.42%
Mar-15	6	26	23.08%
Apr-15	29	95	30.53%
May-15	28	98	28.57%
Jun-15	12	50	24.00%
Past 12 Months	260	833	31.21%
Past 3 Months	69	243	28.40%

	Scheduled Ship Qty	Scheduled FOB Amount ($)
Jul-14	532,672	$ 661,343.04
Aug-14	447,755	$ 418,870.63
Sep-14	416,510	$ 444,289.94
Oct-14	673,399	$ 642,598.55
Nov-14	663,669	$ 1,995,948.41
Dec-14	412,578	$ 791,977.09
Jan-15	214,217	$ 451,324.03
Feb-15	531,948	$ 642,577.09
Mar-15	302,220	$ 292,150.44
Apr-15	526,553	$ 897,613.20
May-15	924,781	$ 1,505,725.86
Jun-15	560,700	$ 730,781.06
Past 12 Months	6,207,001	$ 9,475,199.33
Past 3 Months	2,012,033	$ 3,134,120.12

Missed Deliveries Root Cause Analysis

- [Use this section to identify the root cause of why shipments were late]

On-Time Delivery Improvement Plan

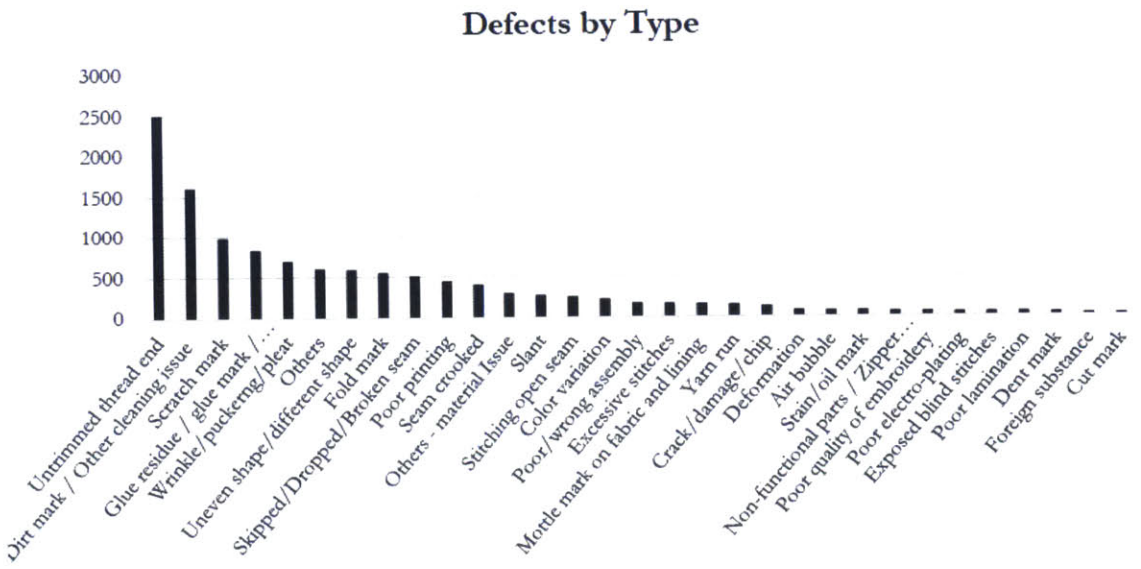
- [Use this section to detail what actions will be taken to address root causes]

Quality: D

Detailed Quality Results

- 1st Pass Inspection Rate: 90.87%
- Defect Rate: 7.24%
- Total Inspections: 615

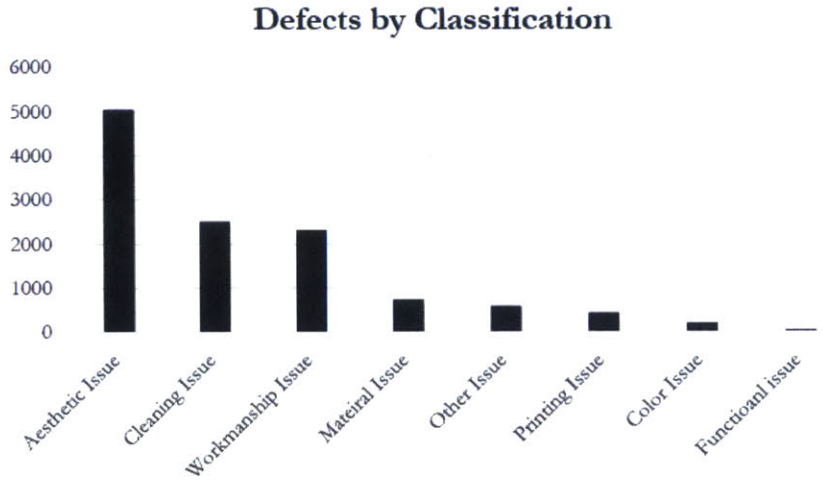
Defects by Type



Defect Type	Count	Defect Type	Count
Untrimmed thread end	2,498	Mottle mark on fabric and lining	150
Dirt mark / Other cleaning issue	1,598	Yarn run	144
Scratch mark	987	Crack/damage/chip	120
Glue residue / glue mark / over glue	830	Deformation	73
Wrinkle/puckerng/pleat	695	Color variation	214
Others	597	Air bubble	62
Uneven shape/different shape	585	Stain/oil mark	61
Fold mark	548	Non-functional parts / Zipper running not smooth	54
Skipped/Dropped/Broken seam	504	Poor quality of embroidery	49
Poor printing	437	Poor electro-plating	42
Seam crooked	394	Exposed blind stitches	42
Others - material Issue	289	Poor lamination	41
Slant	262	Dent mark	31
Stitching open seam	246	Foreign substance	21

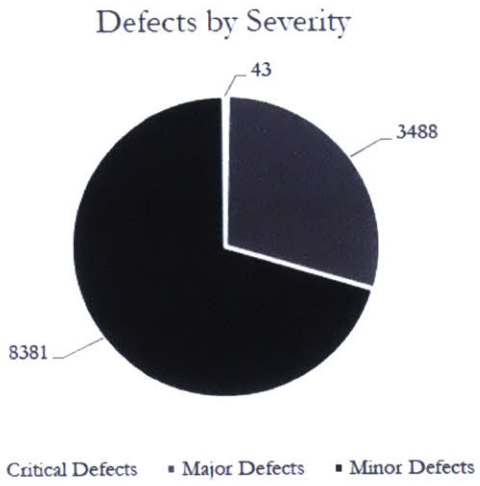
Poor/wrong assembly	163	Cut mark	15
Excessive stitches	160		
		Total	11,912

Defects by Classification



Defect Classification	Count
Aesthetic Issue	5,046
Cleaning Issue	2,510
Workmanship Issue	2,309
Material Issue	745
Other Issue	597
Printing Issue	437
Color Issue	214
Functional Issue	54
Total	11,912

Defects by Severity



Defect Severity	Count
Critical Defects	43
Major Defects	3,488
Minor Defects	8,381
Total	11,912

Quality Findings Root Cause Analysis

- [Use this section to identify the root causes of quality findings]

Quality Improvement Plan

- [Use this section to detail what actions will be taken to address root causes]

Quality Management System Audit Results

		Audit Date	1/23/2015	10/13/2014	8/8/2014
		Critical Findings	1	0	1
		Major Findings	0	0	1
		Minor Findings	4	0	8
		Audit Score	83.80%	N/A	84.00%
Critical					
Incoming Materials	All raw material improperly labeled , stored and traceable 原材料没有适当的标示、存放或跟踪管理		x		x
Major					
Production	Product manufactured identifiable not clear throughout the operation 半成品没有清晰的标识				x
Minor					
General Requirements	No effective pest control process 无虫害管理				x
	Policy was not distributed to all employees and available on site 政策未向员工传达并张贴在工作现场				x
Order processing	No product re-call policy and records 无模拟召回程序和记录		x		x
	No corrective action plan exist in case the supply which can't meet requirement 未对供应商出具整改计划				x
Production	All molds, cut dies, printing plates improperly marked and recorded 模具没有适当的标识、存放和记录		x		x
	First article inspection not conducted prior to daily production start 没有首件样或者没有首件检验记录				x
	Color standards and customer approved range boards were not available for the manufacturing employees 色样和次品限度板未放置在现场供员工参考				x
Final & Packaging	Packed cartons placed on the floor 包装好的成品直接放在地上		x		
Sharp tool control	All sharp tools were not tightened in working area especially packing area 利器未绑定在工作台上		x		x
Comments					
N/A					

QMS Findings Root Cause Analysis

- [Use this section to identify the root causes of the QMS Audit findings]

QMS Improvement Plan

- [Use this section to detail what actions will be taken to address root causes]

Cost: B

Detailed Cost Results

- [Future section providing relevant information from quotations using LFB costing template]

Financial Information

Li & Fung Payment Record and Reason for Delay

Days After Due	Number of Invoices	Amount (HKD)	% of Invoices	Reason for Delay
0-6	105	$ 8,143,000.00	20.2%	Late Invoice Submission
7-13	69	$ 7,815,000.00	19.4%	Late Approval
14-22	42	$ 4,833,000.00	12.0%	Late Approval/Late Invoice Submission
23-30	35	$ 7,363,000.00	18.3%	Late Approval/Late Invoice Submission
31-38	33	$ 2,682,000.00	6.7%	Late Invoice Submission
Over 38	80	$ 9,469,000.00	23.5%	Late Invoice Submission
Total	364	$ 40,305,000.00		

Business Volume by Client – 2014 and 2015 YTD

Customer Group	2014 (USD)	2015 YTD (USD)	Total
A	$ 1,818,233	$ 1,364,402	$ 3,182,635
B	$ 950,743	$ 1,055,566	$ 2,006,309
C	$ 1,806,347	$ 9,813	$ 1,816,160
D	$ 1,248,622	$ 484,184	$ 1,732,806
E	$ 1,033,487	$ 516,632	$ 1,550,119
F	$ 557,825	$ 769,412	$ 1,327,237
G	$ 1,028,665	$ 58,206	$ 1,086,871
H	$ 317,893	$ 305,912	$ 623,805
I	$ 380,363	$ 194,567	$ 574,930
J	--	$ 259,883	$ 259,883
K	$ 216,899	--	$ 216,899
L	$ 142,719	--	$ 142,719
M	$ 24,300	$ 72,930	$ 97,230
N	$ 91,350	--	$ 91,350
O	$ 44,944	$ 45,437	$ 90,381
P	$ 24,615	--	$ 24,615
Q	$ 9,507	--	$ 9,507
R	$ 3,822	--	$ 3,822
S	--	$ 3,000	$ 3,000
T	$ 2,752	--	$ 2,752
Total	$ 9,703,086	$ 5,139,944	$ 14,843,030

Customer Claims – 2015 YTD

Customer	Date	Reason	Amount (USD)
A		Quality Issue	$ 157.44
B		Quality Issue	$ 64.44
C		Quality Issue	$ 458.44
		Total	$ 680.32

Appendix: How to Read the LF Beauty Factory Balanced Scorecard

The Li & Fung Beauty Factory Balanced Scorecard is used to measure the performance of factories within the LF Beauty network on four components: Compliance, On-Time Delivery, Quality, and Cost. The following document details: factory threshold requirements; how the overall factory score is calculated; how each of the four component scores are measured; and how factory rankings are determined. An example scoring and completed scorecard is provided to give further clarity.

Threshold Requirements

A factory must fulfill the following threshold requirements in order to be considered for inclusion in the LF Beauty network:

- ISO 9001 Certification
- Complete in-house production capacity
- In-house lab testing capability
- Use the LF Beauty cost template to provide cost breakdown

Overall Factory Score

The overall factory score is calculated by weighting the four performance components as shown in the figure below:

Component Scores

The four component scores are measured as show in the table below:

COMPONENT	HOW IT IS MEASURED	SCORE	EXAMPLE
Compliance	LF Beauty's factory compliance audit	A = 100% B = 75% C+ = 50% C = 35% C- = 20% D = 0%	If the factory earns a 'B' on its compliance audit, it will earn a Compliance Score of 75%
On-Time Delivery	Number of orders shipped on or before the scheduled ship date	% delivered on-time	If the factory ships 49 of its 50 deliveries during the reporting period on or before the scheduled ship date, it will earn an On-Time Delivery score of (49/50) = 98%
Quality	1st Inspection Pass Rate	pass rate x 0.5	If the factory has a 90% first inspection pass rate, and has a defect rate of 6%, then the Quality Score is (90% x 0.5) + [(1-94%) x 0.5] = 92%
	Defect Rate	(1 - defect rate) x 0.5	
Cost	Net margin normalized by product group	net margin/best net margin in product group	margin = (sale value to customer - factory cost)/(sale value to customer) charge back rate = (charge backs)/(sale value to customer) net margin = margin - charge back rate If the price paid to the factory for an order (factory cost) is $100, and the price LF Beauty sells to the customer (sale value to customer) is $120, then the margin is ($120 - $100)/($120) = 16.67% In the same reporting period, the factory also had a total charge back value of $5, so the charge back rate is ($5)/($120) = 4.17% Net margin is (16.67% - 4.17%) = 12.50% If the best net margin in the product group is 17.00%, then the factory has a Cost Score of (12.50%/17.00%) = 73.53%

Factory Rankings

Factory rankings are determined for each of the four component scores well as for the overall score, giving a total of five factory rankings. Rankings are determined by sorting the factory scores from highest to lowest, and then assigning the rank according to where in the distribution of scores the factory falls. The rank distribution is shown in the table below:

RANK	QUALIFICATION	% AWARDED
A	Top 5%	5%
B	Top 20% - 5%	15%
C	Top 40% - 20%	20%
D	Bottom 60%	60%

Example Scoring for Factory ABC

The following data for Factory ABC are fictitious and for illustrative purposes only:

COMPONENT	DATA
Compliance	Factory ABC received an A on its LFB factory compliance audit
On-Time Delivery	Factory ABC shipped 22 out of 27 shipments before the scheduled ship date during the reporting period
Quality	Factory ABC had a 95% first inspection pass rate and a defect rate of 3% during the reporting period
Cost	Factory ABC had an average margin of 23% and a charge back rate of 6% during the reporting period. The highest net margin among the factories with Factory ABC's prodcut group was 20%

Based on the performance of Factory ABC during the reporting period, its component scores are calculated as follows:

COMPONENT	DATA	SCORE
Compliance	Compliance audit score of A	100%
On-Time Delivery	22/27 = 81.48%	81.48%
Quality	(95% x 0.5) + (97% x 0.5) = 96.00%	96.00%
Cost	(23% - 6%)/20% = 85.00%	85.00%

Based on the component scores of Factory ABC, its overall score is calculated as follows:

COMPONENT	CONTRIBUTION TO OVERALL SCORE	TOTAL
Compliance	100.00% x 20% = 20%	20.00%
On-Time Delivery	81.48% x 20% = 16.30%	16.30%
Quality	96.00% x 25% = 24.00%	24.00%
Cost	85.00% x 35%	29.75%
	OVERALL SCORE	90.05%

Based on the component and scores and overall score of Factory ABC, its rankings are determined as follows:

SCORE CATEGORY	SCORE	RANKS BETTER THAN (PERCENTILE)	RANK
Compliance	100%	99% of factories	A
On-Time Delivery	81.48%	72% of factories	C
Quality	96.00%	88% of factories	B
Cost	85.00%	96% of factories	A
Overall	90.05%	93% of factories	B