

“This is essential reading for anyone seeking to compete—
and succeed—in the flat world.”

—**John Hagel**, Chairman of Deloitte Center of Innovation

COMPETING IN A FLAT WORLD

*Building Enterprises for
a Borderless World*



VICTOR K. FUNG
WILLIAM K. FUNG
YORAM (JERRY) WIND

Praise for *Competing in a Flat World*

“Li & Fung has been a pioneer in building and leading organizations designed for the borderless world. This book reflects the wisdom that companies will need to succeed on the next global stage.”

—**Kenichi Ohmae**, author of *The Borderless World* and *The Next Global Stage*

“The world may be flat but what does that mean for a corporation—new or established—in operational terms? This book is full of insight into just that question. It should be assigned reading to stir the imagination of corporate leaders who want to get ahead before they find themselves behind. It’s flat-out provocative and flat-out good.”

—**Greg Farrington**, Executive Director, California Academy of Sciences

“*Competing in a Flat World* integrates genuinely innovative thinking on network-based structures with sound, established concepts in areas such as business planning and accountability. By outlining the principles of network orchestration, the authors provide a roadmap for successful change in an increasingly global environment.”

—**Lennart S. Lindegren**, Retired Vice Chairman, Strategy,
PricewaterhouseCoopers, LLP

“We are led by unstoppable economic forces to connect our resources to form smart networks, either wired or unwired. The authors bring forward the notion of ‘network orchestration,’ an almost one-size-fits-all strategy for organizations to survive and excel in an ever-flattening world.”

—**John Chen**, Sybase Chairman, CEO and President

“Properly orchestrated global networks are fundamental to the long-term success of companies and their shareholders. Since this is a journey that may be longer than the tenure of many CEOs, it is vital that boards and other top leaders recognize the importance of network orchestration. This book offers a roadmap for navigating this new ‘flat world.’”

—**Dolf DiBiasio**, Retired Senior Director of McKinsey & Company and retired
Executive Vice President of Strategy and Investments at AOL/Time Warner

“For decades Li & Fung has been one of the most innovative companies in reshaping itself to meet the opportunities of global business. Its model for network orchestration has been one of Asia’s best kept secrets. Now the secret is out.”

—**Tan Sri (Dr) Francis Yeoh**, Group Managing Director, YTL Corporation

“To find your way in a flat world with no clear landmarks or well-worn paths, a roadmap is essential. This book provides such a map for business leaders and is an invaluable tool in today’s competitive landscape.”

—**Pat Harker**, President, University of Delaware

“In our own global business, we have learned to use partnerships to improve performance, reduce costs, and build strong, innovative businesses. But global networks are complex, and they require a different approach to management. This book offers deep wisdom about orchestrating these networks and proven strategies for success.”

—**Paul Fribourg**, Chairman and CEO, Conti Group Companies

“Competing in a Flat World provides an extraordinary glimpse into a new kind of organizational architecture, one built around the notion of orchestrating resources you don’t control and doing so in a way that builds both trust and agility. This architecture may well turn out to be the dominant model of the firm for the 21st century. This book is a must read for anyone who wants to compete in a flat world. Every chapter details new and powerful ideas.”

—**John Seely Brown**, Former Chief Scientist of Xerox Corp and coauthor of
The Only Sustainable Edge

“The flat world that has resulted from the unbundling and globalization of value chains is driving a fundamental shift from company-centric to network-centric strategies and business models. This book provides an inspiring view of what Li & Fung has done to design a net-centric business model that is both profitable and resilient. For executives and scholars wondering where we are headed, this book provides a vision of the key elements of successful net-centric strategies and the innovations they are likely to engender. Altogether, a splendid accomplishment!”

—**Paul R. Kleindorfer**, Anheuser-Busch Professor of Management Science
(Emeritus), The Wharton School of the University of Pennsylvania,
Distinguished Research Professor, INSEAD

“There has been a substantial change in the world’s commercial geography. This book shows how to compete in a market that is adding two billion consumers and new global capabilities. The authors provide ideas drawn from the experiences of companies that have understood these changes and transformed them in new business strategies. This book is a must for managers and business students who want to know what is going on and how to cope with this new scenario for the world’s economy.”

—**M.V. Pratini de Moraes**, Former Brazilian Minister of Agriculture,
Mines and Energy and Industry and Trade

“This book should make all companies rethink their way of doing business.”

—**Stewart Resnick**, Chairman and President, Roll International Corporation

“This is essential reading for anyone seeking to compete—and succeed—in the flat world. The authors skillfully weave theory and practice to provide a compelling perspective on a critical new management imperative—network orchestration. Ignore this book at your peril.”

—**John Hagel**, Chairman of Deloitte Center of Innovation

“A masterpiece of business detail for today’s global economy.”

—**Jon M. Huntsman**, Chairman and Founder, Huntsman Corporation and author
of *Winners Never Cheat*

“We are all now facing the business challenge of Friedman’s ‘flat world.’ The authors have produced a compellingly practical handbook on the operational and strategic approaches to not only survive but indeed prosper in this strange world. They challenge many traditional notions of control and what constitutes a business, and they offer some wonderful insights based upon their own highly successful journey across this ‘Flatland.’”

—**Colin Crook**, President, Penberen Center and former CTO, Citicorp

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To our father, Fung Hon Chu,
who taught us loyalty and the value
of relationships.

Victor and William Fung

To Dina, John, and Lee,
who taught me the importance of
orchestrating empowered partners.

Jerry Wind

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Preface

Competing Flat Out

As Thomas Friedman points out in *The World Is Flat*, a convergence of technology, globalization, and other forces has transformed the way we work. India, China, and other countries are an increasingly significant part of the global supply chain for manufacturing and services.¹ Geography, while not irrelevant, is no longer the obstacle it once was, and companies can stretch their manufacturing, customer service, and other business processes around the globe. This dispersion of the supply chain creates tremendous opportunities to change the way we do business in this world, and how we design and run our companies—if we are prepared to rise to this challenge.

Li & Fung has been working in this flat world since the early 1980s, long before it had a name, and now produces more than two billion pieces of apparel, toys and other consumer items every year. Li & Fung now accounts for more than US\$8 billion in garments and consumer goods for some of the best brands in the world. By the time of its one-hundredth anniversary in 2006, Li & Fung had become the world's largest sourcing company, growing at a compound annual rate of 23 percent for the last 14 years.

Yet Li & Fung does not own a single factory. It is a flat business for a flat world. The company started as a trading broker in Guangzhou (Canton) in 1906 during the Qing Dynasty and transformed itself into a Hong Kong-based exporter and then into a multinational corporation. Finally, the company reinvented itself for the flat world in a new role, as a “network orchestrator.”² It is now the orchestrator of a network of more than 8,300 suppliers served by more than 70 sourcing offices in more than 40 countries and territories. The company indirectly provides employment for more than two million people in its network of suppliers, but only less than half a

percent of these are on Li & Fung's payroll.³ With this lean structure, each of the company's own employees generates about US\$1 million in sales, earning a return on equity of more than 38 percent per year. As a family firm at the intersection of the East and West, the company is both deeply traditional and thoroughly modern. Recognizing its creative thinking and use of technology, *Wired* magazine placed Li & Fung among young upstarts such as Google, Apple, and Amazon on its 2005 "Wired 40" list.

Over the years, Li & Fung's innovations have attracted attention, from business school case studies to magazine articles and books.⁴ Now we are pleased to share more detailed insights from the transformations at the company and examine how they can help other enterprises to compete in a flat world. Victor and William Fung pioneered these transformations in the trading company founded by their grandfather, Mr. Fung Pak-liu. Wharton professor Jerry Wind has worked with them since 1998 on the company's triannual strategic review process and also offers broader perspectives from research and practice.

The flat world has ripped the lid off the corporation. It has broken through traditional national and organizational borders. It challenges the way we look at and run everything from enterprises to nations. Companies in manufacturing will find these innovations and shifts in thinking directly relevant. But the impact is not limited to manufacturing or to companies with offshore activities. The principles of network orchestration are relevant to any organization and industry (including services) that wants to take advantage of the opportunities presented by the forces flattening our world. The principles of network orchestration, discussed in this book, have applications in many areas, from managing strategic alliances (which have a poor track record of success) to services, to open innovation, to comarketing.⁵

As you read this, freighters and cargo planes are churning across the planet. High-speed information networks are whisking voice and information, and billions of dollars, instantaneously around the world. Looking down from the Li & Fung conference room on the thirty-fourth floor of Alexandra House, where we worked on the book, we could see the freighters steaming in and out of Hong Kong harbor. It

is a hive of activity, and the pace of commerce just keeps increasing and evolving in new ways. Every day the view changes. It has been a tremendous adventure and education to have such a ringside seat on the emergence of this flat world and to be an active participant in its development.

These freighters are connecting points of the globe that have never been connected, in new and changing configurations. The ships and planes streaming across the world are rewiring the neural networks of commerce. How does your own thinking need to change to keep pace? Have you understood the implications of the flat world for your own business?

The flat world is here. Organizations that can embrace it and understand how it works will find that it offers many new opportunities. Those that cannot adapt quickly enough to these new realities will fall behind or be bought out by those that have learned how to compete in a flat world. The opportunities are as broad as the world. How do you need to remake your organization, management, and mindset to seize these opportunities?

Victor K. Fung

William K. Fung

Yoram (Jerry) Wind

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Compete Network Against Network

Companies used to see competition as firm against firm. But a networked world is like a team sport—the final score depends not on one player, but on the strength of the entire team. The best network will win. How do you design a network that provides a platform for rapid growth?

With the start of spring, the minds of all red-blooded males north of the Mason-Dixon Line in North America turn toward the barbecue. With the thawing of the snows, rolling out the barbecue is a ritual act of welcoming the summer. It is the modern equivalent of dancing around the maypole. Tossing steaks or burgers on the barbecue means the coming of summer. When the snow thaws, it triggers the barbecue reflex in the brain.

For manufacturers and retailers who sell these grills, spring is not such a happy time. This purchase pattern means that, at the beginning of May, all the customers for grills converge on retail stores at roughly the same moment. They all want their grills and want them now. Before this point, consumers are buying snow shovels. Then,

like throwing a switch, they are buying grills. The result is that a product with almost no demand for much of the year is suddenly flying off the shelves. In a period of a few months, all the barbecues that will be sold are sold. For the factories in China that make these grills, this means nine months of not producing a single grill, followed by three months of working around the clock. This means finding enough workers, luring them back from the countryside, and then laying them off when the work stops. It means overtime pay, problems obtaining supplies, and shipping nightmares. It means sourcing gas nozzles from Italy and rolled steel from different parts of the world in sufficient quantities early enough to meet demand.

For retailers, it means nail-biting moments waiting for the shipments to arrive or paying extra for air shipping to make sure they do. The last thing the retailer wants is for a barbecue-obsessed customer to walk in the door and walk out empty-handed. It could mean more than losing a sale. It could mean losing a customer to a competitor.

The solution to this dilemma is actually quite simple. The factories can smooth out production of grills over a longer period of time and warehouse the grills. This avoids overtime and ensures a steady supply for the retailers. Your garden-variety barbecue is not like a luxury automobile or fashion dress. It does not change radically in design from year to year, so it can be designed and produced in advance without going out of style. But the complication is that this smoothing of production is not a solution that the factories can arrive at on their own. If they invest in warehousing, they have to bear the added cost and could be stuck with the product if they misread demand. The factories also have to carry the expense of the production and warehousing until they sell the grills to the retailers. With a stockpile of products in the warehouse, they could be susceptible to pricing pressure from retailers, who would then have the upper hand. So suppliers, on their own, cannot come up with a good solution to this challenge.

Neither can retailers, who want to keep their costs down and do not want to invest too much in the manufacturers' businesses. These investments could leave them vulnerable and put them at a disadvantage in negotiating with the suppliers. Left alone, both retailer and manufacturer will try to optimize their own businesses, with the result that the overall system is suboptimal. This is a problem that cannot be solved one piece at a time. It can be solved only by looking

across the entire chain—including the retailer and manufacturer—and optimizing the entire network.

Working with a major North American retailer that sources \$75 million worth of barbecues per year, Li & Fung essentially stretched out the production cycle. As the network orchestrator, it offered the factories 120-day credit terms on behalf of the retailers and arranged for warehousing the grills. Instead of starting production in October, the factory could start in the beginning of August, adding two months to the production cycle. This meant less overtime for the factory. Most of the shipping can be done by sea, reducing expenses and avoiding rush charges. The retailer received the barbecue grills at a little lower cost, even with the storage charges. The factory had fewer disruptions and lower costs. Both sides benefited because the overall supply chain was greatly improved.

Neither the suppliers nor the retailers can solve the problem of the spike in demand for barbecue grills without looking at the broader orchestration of the network.

The New Competition

Competition is no longer company against company, but rather *supply chain against supply chain*. Partners in the chain are all members of the same team trying to optimize value. If the other chain kills your chain, all of you are out of business. The more the members of the supply chain *cooperate* with one another, the better they can *compete* with rivals. This is a different view of partnership and a broader view of the firm itself.

This changes the way members of the supply chain interact with one another. In the old supply chains (or other “value chains” that deliver products or services), suppliers tried to extract the best prices from buyers. Buyers sought concessions

Competition is no longer company against company, but rather supply chain against supply chain. This is a different view of partnership and a broader view of the firm itself.

from suppliers. Each player optimized one piece of the chain. This leads to classic “bullwhip” effects, where lags in orders and lack of coordination lead to excess inventories or stockouts. The retailer without the right product on its shelves is at a disadvantage to rivals that have a better supply chain. Wild fluctuations in demand play havoc with factory production schedules.

In a European football (soccer) game, if individual players are always vying for control of the ball and scoring a goal, the entire team will lose against a more cooperative competitor. The individual skill of the players is important, but just as important is their ability to work together. A cooperative team of mediocre players will almost always outperform an uncooperative team of prima donnas. Studies of basketball, for example, find that the most successful teams are not those with one outstanding star player. Instead, the best teams are those that work smoothly together. This is the same with supply chains. A set of solid partners in a well-designed and well-coordinated network can outperform a star in one part of the chain with a weak team.

A study of rowers found a similar result. A crew team with the four strongest rowers was pitted against another team with less powerful competitors but better coordination. The coordinated team won the race. This is why these crew teams recognize the importance of carrying the extra weight of a coxswain to keep everyone in time. The coxswain, typically a very lightweight person, does not pull an oar or contribute to the forward motion of the craft, except for keeping all the other rowers

In a crew race, the coxswain does not row. The coxswain orchestrates.

in time. What does the coxswain do to justify bringing along this extra baggage when every pound counts? The coxswain does not row. The coxswain orchestrates.

Adversarial supply chains emerged because of a desire of each player in the chain to maximize its own efficiency and extract as much profit for itself as possible. An adversarial relationship can rarely produce the best results because the overall efficiency of the chain is usually sacrificed to optimize the returns for one powerful player. But much more than efficiency is involved in making a modern supply chain successful, and this is where the adversarial relationship can really be a detriment. Adversarial relationships dampen the creativity of suppliers, reduce flexibility, and suboptimize the entire chain in

many ways. As flexibility becomes more important, the toll of this lack of coordination is growing.

Collaboration, on the other hand, can improve the overall supply chain. For example, consider rapid replenishment. All the Indian manufacturers of towels for a U.S. retailer are linked with the retailer. Using overseas collaborative replenishment, the retailer can cut inventories because it can track and count the inventories that are at the dock, on the water, and even in the factories in India. The manufacturers can keep some inventory of goods and yarns, and can, to some degree, speed up or slow down work in progress. Retailers never want to run out of towels, but now the inventory needed to deal with surges in demand can be across the entire chain rather than in the retailer's own warehouse. The retailer typically sends an EDI transmission to the manufacturer every Sunday night (electronically transmitting sales data); the manufacturer responds by Monday; and the needed shipments are on the way by Wednesday. This is a 72-hour cycle of replenishment. It truly has become a collaborative enterprise, with the entire chain working together to maximize results.

Improving the Network

A European retailer often complained that the orders of garments from a factory in Sri Lanka suffered from long delays. The Sri Lankan factory was excellent; the trouble was the fault of a supplier in Korea that provided the fabric. Although the Sri Lankan factory was among the largest in the country, its in-house sourcing department was small and had no staff or operations overseas. The raw materials were inspected when they arrived from Korea, but if the quality was poor and the fabric had to be rejected or exchanged, production and shipment were delayed. By the time this was recognized in Sri Lanka, the materials had taken a long and expensive boat ride. This added costs and delays, slowing delivery and increasing risks of stockouts or mark-downs for the retailer.

The solution was for Li & Fung, acting as the network orchestrator, to inspect the fabric in Korea on behalf of the Sri Lankan supplier. This saved time and money. Except for its fabric inspection, the

Sri Lankan supplier had a very good factory. But what happened outside its factory walls turned out to be more important than what was going on in the factory. By improving the overall supply chain, the Sri Lankan factory had fewer rejected products and lower costs. The retailer had fewer delays. Looking more broadly at the entire supply chain and network led to tremendous overall improvements in the supply chain.

Many companies have begun to recognize the importance of a superior supply chain in competing against rivals. Companies such as Dell, Wal-Mart, and Toyota have designed supply chains that have set them apart from rivals and allowed them to deliver superior value to customers. Although some of these supply chains are based on flexible networks, they are often built around relationships with a fixed set of suppliers. The next challenge is to think beyond competing supply chain against supply chain, to think about competing network against network.

Competing network against network means that the companies with access to the best networks not only can outperform competitors today, but also have the capacity to flexibly outperform them tomorrow. They can create superior supply chains now and also design new supply chains drawn from their networks. This gives companies many more options in responding to customer needs. The best networks give birth to the best supply chains.

This is like the bench strength of an athletic team. While only a few players are on the field at a given time, many more are on the

A view of network against network means that the companies with access to the best networks not only can outperform competitors today, but also have the capacity to flexibly outperform them tomorrow. This is like the bench strength of an athletic team.

bench. Some players with certain skills can be switched out at different points in the game or if another player is injured or fatigued. In U.S. football, “special teams” are brought to the field for specific situations such as kicking a field goal or closing the last yard to the goal line. Similarly, supply chains can be drawn from a bench of good players and can be rearranged based on the capacity of the suppliers and the demands

of customers. Although not all the players are on the field, the team's ability to deal with whatever situation arises depends on the strength of the entire bench.

Competing network against network is much trickier than simply competing supply chain against supply chain. When partners in a single chain are shown the overall picture, they can see how everyone can benefit through cooperation. Being part of a network has its benefits, but these might be a little less clear, especially as individual members of the network are brought in for a specific project. Network orchestrators need to be able to make an argument for partners to be part of a specific supply chain, which typically is based on a measurable financial return, and also make a case for partners to be part of the network. Network participation is based on both tangible and intangible benefits, such as learning, trust, access to global clients, and long-term business development. Part of the role of the network orchestrator is to educate the entire supply chain about the benefits of working together as a team. (Of course, this is complicated by the fact that members can be part of more than one network, which sometimes compete.)

The Wisdom of Networks

As author James Surowiecki points out in his book *The Wisdom of Crowds*, a group can sometimes be smarter than its individual members.¹⁹ This wisdom is seen in the success of Google's search engine, based on the searches of other users. As another example, although experts were correct only 65 percent of the time in answering questions from the game show *Who Wants to Be a Millionaire?* the "less expert" TV studio audience guessed right 91 percent of the time. Surowiecki points out that, "under the right circumstances, groups are remarkably intelligent, and are often smarter than the smartest people in them."²⁰

Networks can also work "smarter" than the individuals or firms that are a part of them. With the right structures for gathering and sharing the wisdom of the network, they can be "smarter" than any individual member. This means that a strong network is more than the collection of a set of strong players: It also depends on how the

Networks can work “smarter” than the individuals or firms that are a part of them. Orchestration is what makes smart networks smart.

members of the network are organized and how they interact.

“Flat world” technologies have the potential to draw groups of people or firms together for a common goal, whether it is connecting with friends or tapping into global innovation networks to find the next hit

product. Groups of people working together in systems that are well orchestrated can develop projects that are beyond the scope of their individual capacities. Howard Rheingold’s *Smart Mobs: The Next Social Revolution* explores how wireless technologies are linking people together in temporary networks or “ad-hocracies.”²¹ In *Wikinomics: How Mass Collaboration Changes Everything*, Don Tapscott and Anthony Williams examine how companies are using networks to work together to solve problems and create value.²² Recognition of the power of the network is increasing.

Online communities are demonstrating some of the possibilities for tapping into the wisdom of the network. Computer software makers increasingly rely upon a network of users (particularly if they have a dedicated user base) to respond to customer questions, reducing the need for customer support, and to test software, reducing the need for internal testing. Companies are using internal betting markets to make sales forecasts and public auctions to underwrite insurance policies.

Building on the Wikipedia model, the “We Are Smarter Than Me” project was launched in 2006 to test whether a book could be written (and ultimately published) by tapping into the collective wisdom of the community. The project, sponsored by Pearson, Prentice Hall, The Wharton School’s SEI Center for Advanced Studies in Management, and MIT’s Center for Collective Intelligence and Shared Insights, invited more than a million participants to write and edit the online book. It is testing the limits of community collaboration to produce an intellectual and commercial product.

Another group is even designing an open-source automobile. Markus Merz, a former BMW employee, started the Open-Source Car project (or OScar), which has brought together more than a

thousand participants to create a four-door electric vehicle.²³ The community exchanges ideas in forums moderated by volunteers, and the best ideas are incorporated into the car design. The project has yet to produce a prototype (let alone engage in crash tests and other trials), but it does show that open-source models are beginning to migrate from software and knowledge to the creation of physical products.

But crowds are not always smart. Remember Surowiecki says that they are smart “under the right circumstances.” Under the wrong conditions, crowds can often have less wisdom than individuals. Many examples point to how “groupthink” has led crowds of people over the edge like a pack of lemmings. The group tends to reinforce the current mental model, and this filters out great ideas and the perspective of outliers. So it is not enough to just bring together a great group of smart minds; there need to be the right circumstances. One of the right circumstances is having someone looking across the network, organizing it, creating frameworks and platforms, and drawing together the right people. This is the network orchestrator.

Smarter networks do not just happen. They require guidance, intelligence, a design, and an invisible or visible hand drawing together all the diverse contributions. In other words, they require orchestration. Otherwise, crowds can rapidly devolve into chaos and stupidity. Orchestration is what makes smart networks smart.

Beyond the Cheapest Needle: The Logic of the Network

A fixed supply chain or service value chain is built to deliver a specific product or service. The supply chain manager must access the specific capabilities needed for that goal. A broader network, on the other hand, must be designed to offer the broader capabilities that are useful now and might be useful in the future. What are these capabilities? What is the logic of network design?

Whereas quotas or cost savings were once the primary drivers in the decision to shift manufacturing abroad—and still play a major role in such decisions—companies are increasingly recognizing other factors as

well. The lowest-cost location might not always win. In outsourcing services, cost is also not always the primary reason to look abroad. A Bureau of National Affairs survey of human resources outsourcing in 2004 found that the top two reasons for outsourcing were gaining access to

Although quotas or cost savings were once the primary drivers in the decision to shift manufacturing abroad, companies are increasingly recognizing other factors, such as accessing best-in-world capabilities, increasing resilience, boosting speed, capitalizing on collaboration, navigating global trade restrictions, and establishing standards.

greater expertise and improving service quality. Only 28 percent of respondents cited cost-cutting as a primary driver.²⁴ Beyond price, the logic of global networks might be based on accessing best-in-world capabilities, increasing resilience, boosting speed, capitalizing on collaboration, navigating global trade restrictions, and establishing standards. In designing the best networks, we need to look at each of these benefits of the network, as explored in more detail on the following pages.

Feed Me More Mommy! Accessing Best-in-Class Capabilities

Networks need to be designed to offer access to diverse capabilities. The Baby Talk doll can tell us a lot about the potential of dispersed manufacturing, despite her fairly limited vocabulary. When the Baby Talk doll was introduced in the 1980s, it represented a revolution in toy making (see Figure 3-1). This blonde haired, blue-eyed marvel was described as an “animated talk-a-tronic” toy. It required a new word to describe how it was different from the old pull-string talking dolls. When a child finished giving the doll a bottle, the baby would respond by saying “Mmmmm, that was good.” Pull out the bottle too soon, and the baby would demand “Feed me more, Mommy!” Pick up the doll, and it would say, “I love to be picked up.” It was almost human. Although these words were not as profound as Neil Armstrong’s “one small step for man, one giant leap for mankind,” they represented a profound breakthrough in drawing together diverse capabilities through dispersed manufacturing.



FIGURE 3-1 Baby Talk doll

Dispersed manufacturing allows for the development of products such as Baby Talk that are fundamentally different. It does this by bringing together the best components from different parts of the world. The Baby Talk doll used the best computer chips from Taiwan, the best vinyl body assembled in mainland China, and the best fabrics from Korea. Borderless manufacturing brought all these together—the best components from the best sources—into a single doll.

The network needs to seek out best-in-the-world capabilities, wherever they are in the world. In making porcelain dinnerware, for example, the best decals for the decoration come from Japan, and because they are relatively inexpensive and easy to ship, they can be sent to China, where the best and cheapest porcelain work is done. The result is outstanding quality for the decals as well as the dinner set, at a reasonable price. This is better than what could have been done in either Japan or China alone.

In some cases, certain parts of the world are centers for specific capabilities. For example, certain types of casual cotton shirts are best made in India, but finer white cotton dress shirts might come from China or Korea. Certain types and styles of fancy embroidering or

beadwork are centered in certain cities or regions, and it makes sense to go to these regions for this work. As John Hagel and John Seely Brown point out in *The Only Sustainable Edge*, the real power of outsourcing is in accessing capabilities. Companies can use outsourcing to accelerate capability building by accessing the best capabilities in the world.²⁵

9/11 and SARS: Building Resilience

Networks also have to be designed to increase flexibility and resilience. Shocks are a fact of life in the modern world. These shocks can come from regulatory changes but also from economic, political, and natural catastrophes. The impact of these disruptions was graphically demonstrated by the 9/11 terrorist attacks in the United States and the SARS outbreak in Asia.

Following the terrorist attacks on New York and Washington, D.C., on September 11, 2001, many retailers thought the American consumer economy would come to a crashing halt. When one panicked retailer called Hong Kong to cancel a line of high-fashion parachute pants, Li & Fung proposed changing the order to one for basic, all-season pants and reserving the zippers for other products. In the end, consumers kept buying and the retailer renewed its order for parachute pants. Li & Fung was also able to quickly shift production from high-risk countries to low-risk ones, reallocating hundreds of millions of dollars' worth of merchandise in just a week's time.

With the outbreak of severe acute respiratory syndrome (SARS) in Hong Kong in March 2003, the World Health Organization issued a warning in early April against travel to Hong Kong and South China. Some of Li & Fung's overseas customers canceled their trips to the Chinese mainland for the subsequent two months, which is a busy procurement season. In response to customers' requests, the company allocated manufacturing orders among several mainland factories, in case any of them had to be shut down because of SARS. In view of possible loss of business, Li & Fung arranged to conduct videoconferences with customers and moved half of its top management team to the U.S. and European offices. The company lost only about 5 percent of orders in this period that devastated other compa-

nies in the region. Like the Internet, this network of suppliers is a resilient system that is built to survive catastrophe.

This process of midcourse corrections happens on a smaller scale all the time. As exchange rates fluctuate, demand changes, or regulations shift, the network orchestrator can change the supply chain in response. An orchestrator, such as Li & Fung, can broker multiple deals on all levels simultaneously, sending raw materials to manufacturers, linking factories with each other, managing logistics and distribution networks, and building knowledge networks around customers to support product design and development. The company can easily divert orders from countries or regions beset by economic or political crises to others that are more stable because it has a network that is broad and diverse.

Some resilient systems are designed to have redundancy, such as backup telephone networks or information systems, but a dispersed network has many more degrees of freedom. Instead of merely backing up a given capability, the system can be dynamically reconfigured to move various processes to different locations around the world. Instead of one or two backup facilities, thousands of factories can be brought together into new supply chains.

Two Million Christmas Trees: Boosting Speed

Networks also have to be designed to increase speed. Even in a flat world, Christmas comes only once a year. The gifts and wrapping paper that are so highly valued on December 24 are marked down by 50 percent or more on December 26. So when Coca-Cola in Mexico needed a rush order to manufacture a unique Coca-Cola Christmas tree as a premium, the deadline was not negotiable.

The tree was a small wonder, a green polystyrene tree about a foot high, with a toy train running around its base, flashing colored LED lights in its branches and decorations emblazoned with Coca-Cola bottles, Santas, and polar bears. A small white light in the interior rotated as the tree played Christmas music. The light shone through the ornaments to project dancing stars, Coke bottles, and other images on the walls. Practically speaking, however, all these features made it an extremely complicated product to produce. It required pulling together many capabilities from diverse suppliers.

Molded out of plastic, the tree demanded 40 to 50 tools and hundreds of molds. And Coca-Cola needed two million of these trees before the holiday season.

This project might typically take a year or more to complete. It was finished in four and a half months. To compress the manufacturing time, Li & Fung used three factories simultaneously to manufacture the trees. The factories chosen to fulfill this order were located near one another, to facilitate sharing component parts. The IC chips came from Taiwan, where the best-in-class chip-making companies are located. When the chips ran short, the company sent an employee down by airplane to bring back more; it could not afford a lull in the action. The cost of the \$200 airline ticket to retrieve the tiny chips was small in comparison to the cost of shutting down the line or paying to air-freight the final product.

While running production in parallel, Li & Fung closely monitored each of the factories to ensure that products from all factories looked the same. It took only ten weeks to finish all steps, from design to product delivery. By October, 700 containers of Christmas trees were shipped to Coca-Cola. The promotion was a huge success. Now every year that promotion and other work from Coca-Cola has come to Li & Fung—but the sourcing of the projects is usually from a different set of suppliers each time.

Dispersed manufacturing can reduce cycle time. Historically, it took 12 to 15 months to develop a line of clothing and deliver it to retailers. So for the line expected in spring 2008, work would begin in the summer of 2006. Now production can be compressed to as little as 45 days, although typically six or seven months are involved in designing and sampling to refine the concept and show it to retailers. Reorders can be done in as little as 15 days.

A broad network allows for parallel processing that accelerates the change. Another strategy for increasing speed is to design a network that allows for initial production to be carried out in the most cost-effective market and for reorders to be made in another country close to the end market. For example, for the U.S. retail market, initial production could be in China to lower cost, but if the product sells well, reorders for quick delivery can be made in Central America, shaving weeks off the trip to market. The Chinese fabric can be

shipped there waiting to be cut. When the reorder comes in, it can quickly be finished and shipped north to catch the season, albeit at a higher cost. But this would be sales that would otherwise be lost.

Networks have to be broad enough and have enough capacity to allow the production to be completed quickly through parallel paths, when needed. Networks also have to be matched to the needs of customers. Some do not need such a quick response time, so the network must include slower, lower-cost suppliers that can produce good-quality products more slowly and cheaply. But companies that require quick response—to meet the demands of rapid fashion changes, for example—can achieve faster turnaround by moving production to different locations.

Improving Forecasts: Increasing Responsiveness

Orchestrating the entire supply chain also allows companies to delay ordering and sourcing decisions, which can improve forecasting and reduce costs of markdowns or stockouts at retail. In a world of short product cycles, forecasting demand is a challenge. Even if forecasts are accurate when they are made, in a flat world where consumers' tastes are changing rapidly, the forecast could be wrong by the time the product arrives. Faster production and delivery can allow for delayed forecasting and delayed ordering decisions, so the big bets can be made as late in the process as possible. For products that do not have rapid fashion changes—basic polo shirts or sheets and towels, for example—it is possible for the retailer to hold a good buffer in reserve to meet any fluctuations, but this also increases warehousing costs. So even here, the capacity to manufacture and deliver products as quickly as possible is still very important.

Flexible commitments can lock up the capacity of a supplier without specifying the final design and color until the last moment. The trust between Li & Fung and its supplier network means that it can reserve undyed yarn from the yarn supplier. This locks up capacity at the mills for the weaving and dyeing, with the promise that they will get an order of a specified size, but no details. Five weeks before delivery, Li & Fung lets the supplier know which colors to use and when additional fabric and trim will be delivered. The factory then

has three weeks to deliver the final garments. This orchestration gives suppliers predictability, while providing buyers with rapid and accurate response.

Under the old import model, this would not have been possible. Thousands of miles away, the manufacturer was a black box. Customers would send orders to factories with specifications in advance. They needed the complete order to ensure that the factory could produce it in time. By orchestrating the entire chain, Li & Fung opened the black box, making it possible to wait until the last minute to make decisions. If purple is no longer selling, the orchestrator can dye the wool another color. If a certain weave has become popular, it can shift its processes. When the fabric is on the cutting table and long sleeves are no longer selling, it can ask the factory to cut them short. By opening the black box, Li & Fung creates the opportunity to adapt *even after the initial buyer order*.

Floral Buttons: Discovering New Resources

The orchestrator always needs to be on the lookout for new capabilities that answer questions that customers have not even asked. For example, the lead designer of a new garment in New York might specify a line of clothing with a floral pattern, but a designer close to the factory in India might know of a new button that has been produced with a floral pattern that the designers in New York have not seen. This fits perfectly with the new design. The on-site designer might also suggest a modification that will make the product easier, cheaper, or faster to produce. Communications links around the world create opportunities to share knowledge and engage remote partners in collaborating on new designs. The network needs to have enough diversity to bring these new insights to the table and to share them with partners wherever they are in the world.

Maintaining Continuity of Supply for South Africa: Navigating Shifting Global Trade Regulations

Markets can change overnight. For example, on a Friday in early September 2006, the South African government announced that it would be imposing strict quotas on Chinese imports in two weeks. Li &

Fung had orders already in production for South African retailers that would be affected by these changes. Managers began to look at contingency plans to move production to factories in different countries and even to move the last stage of existing orders to different end countries to satisfy non-China country-of-origin rules. The network needs to be broad enough, global enough, and flexible enough to meet such shifts in national or global trade.

The lumps and bumps of the flat world make orchestration all the more important. In addition to managing networks, designing and empowering supply chains, and deriving value from the broader network, the orchestrator can adjust supply chains and networks to the current terrain of the world.

RFID: Creating Standards

Radio Frequency Identification (RFID) tags contain an integrated circuit that is so small that it can be hidden under a sticker as small as a postage stamp, for product identification, or under the skin of a patient, for medical identification. Powered by the radio waves of the reader, the RFID tag sends back data to the reader wirelessly. This replaces clumsier bar codes for product identification, making it possible to more easily monitor the movement of a box full of products or even individual products throughout the supply chain. The tags are also used in passports, transit passes, libraries, and animal identification. The lowest-cost tags, such as the EPC RFID chosen as the standard by the U.S. Department of Defense, Wal-Mart, and other major retailers, sell for a few cents each.

The network can play a powerful role in establishing standards for such new technology, as demonstrated by the rise of the GSM standard in European wireless, now accounting for more than 80 percent of mobile systems worldwide, in contrast to the mix of standards that emerged in the United States. A powerful player in a supply network such as Wal-Mart can be instrumental in establishing such standards. Wal-Mart required its top 100 suppliers to use RFID tags for all shipments starting in January 2005, to improve supply chain management.

Clear standards often benefit all the players in a network, as the Win-Tel standard (Microsoft Windows operating system and Intel chips) in personal computing demonstrated. The standard helped the partners in the network compete against rivals such as Apple, which, by holding its proprietary computer technology tightly, limited its growth in personal computing. Standards, which are particularly important in technology-based businesses, can help organize a network and often allow one network to compete more effectively against another. The victory of Matsushita's VHS technology in video over Sony's Betamax, which was considered technologically superior, was largely attributed to the ability of Matsushita to draw together a network of content providers, equipment manufacturers, and other companies to adopt the standard. The network orchestrator can play an important role in establishing and implementing standards that benefit the entire network.

Clustering in a Flat World

Although the flat world has made clustering less important, many clusters remain. In a flat world, the challenge is to balance the benefits of being part of a single cluster with the benefits of being part of multiple sets of clusters. Some regions of the world still have specialized skills—many of them, in fact. Not all the films in the world are made in Hollywood. Clusters of expertise exist in Bollywood in India,

Although the flat world has made clustering less important, many clusters remain or can even become stronger. In a flat world, the challenge is to balance the benefits of being part of a single cluster with the benefits of being part of multiple clusters.

Hong Kong, and other regions. And even Hollywood filmmakers turn to different parts of the world to lower costs and access expertise in animation, martial arts, or other skills. Silicon Valley is still a substantial center for emerging technologies, but there are many other centers now around the globe in places such as Boston, Bangalore, and Tel Aviv. The best porcelain in the world comes from China, the

best leather comes from Korea, and the highest-quality and cheapest-cost sewing comes from Vietnam and Bangladesh.

Some of these skills take time to develop, as does the creation of a critical mass of supporting resources (from universities to venture capital). This means that despite continued decline in logistics and communications costs, there may be compelling reasons for clusters to continue to exist. In addition, clusters and colocation are more important when a lot of human interaction is needed for innovation and creativity, such as for R&D. Network orchestrators need to be aware of these clusters and tap into them.

These new clusters can be across countries and within countries. Within the Yangtze River Delta region of China, the city of Taizhou is known for auto parts, handicrafts and arts, and rubber products; Shanghai is home to clusters of companies in areas such as refined steel, petroleum, and chemicals. In designing networks, orchestrators need to recognize these clusters and identify suppliers in regions that offer capabilities needed by the network.

Because products are physical, geography is still important, but not as important as it used to be. About 40 percent of Li & Fung's orders are sourced from China, so its location in Hong Kong and knowledge of local language, culture, and policy is beneficial. But the flexibility of geography can be seen in the company's sourcing from 40 different countries. Geography is not irrelevant, as it is with digital goods, but it is becoming less important. The additional costs of moving the stages of production to different countries need to be weighed against many other factors, including quality, cost, time, regulations, and the location of the customer. Rapid reduction in costs of logistics, coordination, and communication mean that it is more important to find the *best* location for each stage in the process instead of the *closest*.

Li & Fung's networks are designed to produce physical goods. When networks are engaged in creating digital rather than physical outputs, virtual clusters emerge. User groups and online communities come together to collaborate. Linux developers and the Wikipedia community can be anywhere in the world, but they are drawn together by common interests and a shared project. Even in these networks, certain nodes emerge as more important than others, with more connections within the network or to other networks.

These nodes emerge as the new hubs of a set of clusters that are not limited by geography.

In a flat world, the challenge is to balance the benefits of being part of a single cluster with the benefits of being part of multiple clusters. Companies might be part of geographic clusters that are linked to global clusters around common interests or expertise, as well as clusters based on delivering a specific type of product or service. A single company might thus be involved in several different clusters at the same time.

A Robust Network

A robust network is the soil from which customer solutions spring. Creating a robust network requires anticipating the capabilities that might be needed in the future and assessing what might need to be done and where. This demands that orchestrators have their ears to the ground to anticipate how the world is changing. Greater “periph-

A robust network is the soil from which customer solutions spring.

eral vision” is needed to sense weak signals and respond to them.²⁶ The network itself can offer outposts for sensing changes in the world and responding to them.

Listening to the feedback of the network is therefore crucial to success. Orchestrators also need to monitor the environment to anticipate changes. The orchestrator needs to augment or reshape the network to respond to these changes. In a flat world, the strength of a business is not based on the assets and capabilities that it owns; these can sometimes be a weakness if they are made obsolete by changes in the environment. Most important are the assets and capabilities that the business is connected to. The richer and deeper this network of connections is, the better the orchestrator will be able to draw forth the right solution when a customer demand arises.

Trust and Relationships

What binds the network together? Information technology, of course, is essential. Complex and fluid networks and organizations require advanced information technology and management science tools for configuring the network, valuing options, identifying profit opportunities, and managing risk. Technology and advanced modeling have made these tools more powerful. Information technology is at the center of the flattening of the world. It keeps all the members of the orchestra on the same page at the same time. It allows them to move forward in concert, regardless of where they are in the world. Although information technology has transformed business organizations, the heart of any network and enterprise consists of human judgment, trust, human relationships, and business processes.

In building dispersed supply chains, many things can and do go wrong. This is where trust and relationships are essential. A few phone calls can resolve situations that could be tied up in debate and litigation for months or years. Although the network is dispersed and the supply chain is temporary, thick connections of both personal relationships and technology are the glue that binds this loose network and makes it work. The network orchestrator builds and nurtures these relationships.

Although information technology is at the center of flattening the world, the heart of any network and enterprise consists of human judgment, trust, human relationships, and business processes.

These relationships help to work out the inevitable smaller bumps along the way. For example, a new buyer for a customer had been in discussions about a new sheet-and-towel program but had neglected to mention the advertisement date and in-store date. In early September, the buyer said it needed the product in stores by the end of November. A Li & Fung executive picked up the phone to call suppliers to see what they could do. Then he called the CEO of the retailer, apologized for the miscommunication, and found out exactly how much product was needed in stores on November 30. The first shipment was by air, with the cost split between Li & Fung and the retailer. The rest could come later by water, to reduce costs. These

types of bumps in the road come up every day; personal connections help to resolve them.

The need for trust in networks may explain the persistence of the physical interactions in an online world. Even one of the most popular political blogging sites had its first face-to-face meeting in Las Vegas in 2006, which brought out politicians to press the flesh of these once-disembodied bloggers. This is somewhat surprising if you consider that blogs are designed for some level of anonymity and placeless interaction. The technology does not require physical interaction; the humans in the system do. At some point, even a purely electronic community leads to a desire for physical interaction. This is a powerful commentary on the limits of the technology.

One might imagine that, in a flat, digitally connected world, machines would resolve problems and overall design of optimal networks and supply chains. But smoothing these bumps and dealing with the complexity of modern networks depends more than ever on old-fashioned trust and personal relationships.

A Machete and a PDA

In building and managing networks, orchestrators need to work in a flat world and an unflat world at the same time. The image of the traditional trader is a khaki-clad adventurer with a machete in hand slicing his way through the jungles to find the best suppliers and products. The modern Li & Fung trader is more likely to carry a cell phone and a PDA (symbols of the flat world—borderless and always connected) as well as a machete. This trader must cut through the underbrush to locate the next most cost-competitive factory, while at the same time bridging the IT gap by downloading point-of-sale information on the smart phone from retailers in sophisticated developed markets. The Li & Fung trader might be sending text messages to a buyer in New York even while wielding the machete on the ground.

The jungles have not gone away with the flat world. The mountains are still just as high. The day-to-day challenges of turning raw materials into finished goods have not been diminished—just transformed. The yarn still needs to be woven into a certain pattern. The

stitches still need to be even and tight, the buttons secure, and the color fast. This is the reality of competing in a flat world. Success requires both the machete and the PDA—and the presence to know which one to lift up to your ear when the phone rings.

Are You Ready for the Flat World?

- How do your supply chains compete against those of others? Which supply chains in your industry are winning? Losing? Why?
- Where are the opportunities to move to more cooperative relationships?
- How broad is your network from which your supply chain is drawn?
- What are the capabilities of your network? What capabilities will you need in the future?
- How can your networks be strengthened?
- How are you building trust and relationships, as well as technological connections?
- Given the need to compete network against network, what do you need to do next?

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