

INTEGRATING AROUND THE CONSUMER:

A path forward for the
global apparel manufacturing
supply chain

BY JON GEORGE AND PETER TING

NOVEMBER 2018



PREFACE

This is the first in a series of annual research papers that will apply the Theories of Disruptive Innovation to explore a variety of issues facing the global retail supply chain. This paper begins this process by using the **Theory of Interdependence and Modularity** to analyze the drivers of current challenges facing the supply chain. Future papers will examine more prescriptive measures that retailers and others within the value network can use to survive and hopefully thrive in the current environment. In particular, the next paper will focus on understanding what retailers can do to create experiences powerful enough to inextricably link a customer's needs to their retail brand.



The Theory of Interdependence and Modularity predicts how companies can avoid the ominous threat of commoditization and capture attractive value going forward.

INTRODUCTION

The apparel industry is in a high state of fluctuation. Everywhere we look, news stories decry the upheaval in the market, citing the retail apocalypse,¹ notable bankruptcies,² shoppers suffering from financial turmoil and uncertainty, and millennials seeking experiences over products.³ It seems that there is little optimism about the industry today, and no one has a clear vision for the future.

The apparel industry goes beyond brands, retailers, and online e-tailers. There is a vast, complex, always-changing value network of producers, facilitators, and managers across the globe, who together form the global apparel manufacturing supply chain. Amidst the sea of challenges, participants in the value network must discover how they can capture attractive profits for the future. There's certainly not a lack of innovation. In nearly every stage of the global apparel manufacturing supply chain, technologies such as artificial intelligence, 3D printing, augmented reality, and Internet of Things are dramatically impacting the way customers, factories, designers, and retailers respond to global retail demand. Yet none of these innovations have given anyone a decisive competitive edge.
















Given the massive stakes at risk, managers are in need of a framework that will allow them to make accurate predictions about the future, so that they may, in turn, make the best decisions for their companies. In other words, managers must turn to theory. Data can help inform predictions, but data alone is insufficient. Sound theories provide a framework to translate data into actionable decision-making.

The Theories of Disruptive Innovation, conceived by Harvard Business School Professor Clayton Christensen, are powerful tools toward this end. Within this toolkit is the Theory of Interdependence and Modularity, which illustrates not only why the global apparel manufacturing supply chain is experiencing its current challenges, but also predicts how companies can avoid the ominous threat of commoditization and capture attractive value going forward.

THE GLOBAL APPAREL MANUFACTURING SUPPLY CHAIN: A PRIMER

The global apparel manufacturing supply chain is a network of companies and individual participants collaborating across well-established processes including: research, design, product development, production, logistics, and retail experience. Under each process, there are more sub-processes that supply chain participants may need to perform. For instance, research can include trend, fabric, trim, and manufacturer research, to name a few. (See Figure 1 for examples of companies operating in each process step).

Figure 1. Global apparel manufacturing supply chain processes

	Research 	Design 	Development 	Production 	Logistics 	Retail 
ZARA						
COSTCO						
TOMMY HILFIER						
betabrand						
amazon						



Depending on the complexity of a garment and the sophistication of the supply chain, it may or may not need to go through all of these processes during its lifecycle. Different retailers in the supply chain have different business models and sometimes have overlapping processes. On one extreme, vertically-integrated retailers like Inditex (e.g. Zara) and Ermenegildo Zegna control their supply chains end-to-end for their strategic collections, owning all of the processes “from sheep to shop.”¹⁴ On the other end, department stores like Macy’s and Kohl’s own the retail and consumer experience, but they rely on third party designers, producers, and fulfilment providers for non-private label products. Then there are speciality retailers like PVH (e.g. Calvin Klein and Tommy Hilfiger) that own design, marketing, and some retail operations. They have strong control over product development but may outsource production to sourcing agents like Li & Fung. Finally, emerging and powerful e-commerce giants like Amazon own the customer “retail” experience as well as warehousing and distribution. In rare cases, Amazon may have products drop-shipped to consumers directly, owning just the e-commerce platform.

Each of these different business models is still valid, but which will produce the most attractive profits in today’s shifting apparel landscape? What are the most attractive parts of the apparel value chain to own? More importantly, how should stakeholders think about which processes are best to own and which are best to outsource?

THE THEORY OF INTERDEPENDENCE AND MODULARITY: A PRIMER

The Theory of Interdependence and Modularity is a critical framework that managers can use to answer the following questions: What is the right scope for our business? What activities should we do internally and which should we outsource to a supplier or partner? Will success be best built around a proprietary, integrated approach or should a company focus on a narrow aspect of the value chain? What causes the evolution of an industry from closed, proprietary architectures to open, modular ones?⁵

A widely used but erroneous framework that has guided the supply chain's business model evolution (and those of other industries) is based on the notion of core competence. If a process fits a company's core competence, it's done internally, and if another company can perform the process better or for lower cost, it's outsourced. The problem with this approach is that what may not be a value-added activity today, may be crucial tomorrow and vice versa. Additionally, core competencies can actually become core rigidities, limiting a company's ability to adapt to a changing landscape. So, "core competence" is not the most reliable framework for managers in deciding which activities their companies should perform in order to maintain attractive profits over time.

In contrast, the Theory of Interdependence and Modularity is based on the fact that products, services, and even entire industries have architectures that dictate which components or steps are required to make something work and how they should fit together. Products and services have multiple constituent components, and they go through several value-added processes before reaching consumers. The place where any two components fit together is called an interface. Interfaces exist not just within products but also between stages in the value-added chain.⁶ For example, there is an interface between manufacturing and distribution, and another between distribution and retailing.

An architecture is interdependent if one process component cannot be completed independently of another. This happens if the way one component is designed and made depends on the way other components are designed and made. When there are unpredictable interdependencies

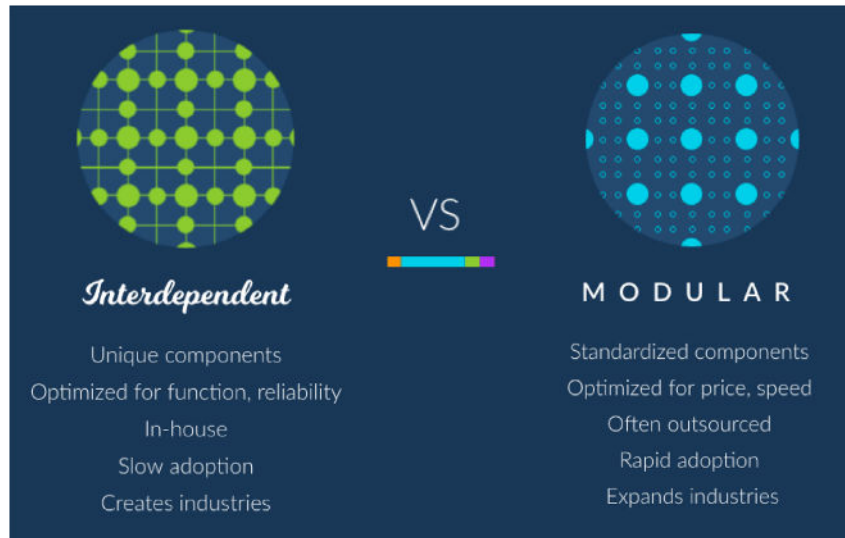
across an interface, the same organization needs to perform both steps in that value chain in order to adequately do either step.

Businesses commonly adopt an interdependent architecture during early phases of an industry when products and services aren't quite good enough for consumers. An interdependent architecture optimizes on performance, and businesses need to integrate multiple components and value-added processes to be competitive. For example, early computer manufacturers like IBM designed and produced nearly all the required components—including microprocessors, drives, memory, operating systems, etc.—to deliver computers with enough performance to satisfy customer expectations.

In contrast, in a modular architecture, components and processes fit and work together in well understood and highly defined ways. This happens when there is no unpredictability across interfaces. In this architecture, each step of the value-added process is specifiable, verifiable, and predictable. Therefore, it doesn't matter who makes a given component or performs a service in a certain part of the value chain. Today's personal computer industry is highly modular. Nearly any component from any manufacturer can fit into any motherboard due to industry-wide standards that specify exactly how interfaces pass data from one component to another (SCSI, USB, etc.).

A modular architecture optimizes on flexibility, but this comes at the cost of performance. Modular architectures must be highly specified. As a result, engineers have less latitude in designing a product for bleeding edge performance. Thus, modular architectures tend to be prevalent in

Figure 2. Interdependent and modular architectures



products or industries that have matured to a point where some aspects of performance can be sacrificed in favor of choice and customization.

The primary difference between the two architectures and the main implication to businesses is the basis of competition, or the way in which companies must optimize their offerings in order to compete effectively. Initially, when there is a performance gap—when functionality and reliability are not yet good enough for consumers—companies win by taking the interdependent architecture and controlling every critical component of their offerings. However, as products and services improve over time, the basis of competition changes. Performance gaps that once necessitated integration become performance surpluses, and consumers at some point stop paying a premium for ever more functionality. When this overshooting happens, what becomes “not good enough” is that consumers cannot get exactly what they want, when they need it, as conveniently as possible. As a result, the industry migrates to a modular architecture to meet customer demand along new dimensions: speed to market, convenience, and customization.

Modularization brings a variety of benefits to customers in the form of increased choice and customization. But for companies participating in a

modular industry, the experience may not be so rosy. This is because as an industry modularizes, it also commoditizes.

As discussed earlier, modularization happens when the performance of a system overshoots customer requirements. Once this happens, customers are no longer willing to pay higher prices for improved performance. At this stage of an industry, product differentiation becomes incredibly difficult because customers don’t value the performance of the product itself but rather the ability to customize the product which includes the ability to pay as little as possible for only the amount of performance they require. And when product differentiation is impossible, the product is by definition a commodity.

This process of commoditization can once again be easily seen in the personal computer industry. As the PC became modular, customers saw that they could get acceptable performance regardless of whether they bought from Compaq, HP, or any other vendor. PC makers quickly realized that the only way to compete was by offering the most customizability at the lowest cost. Margins in the PC industry tumbled to subsistence levels and companies like Dell brutally pushed this margin compression back through their supply chain wherever possible. Certain critical components within the PC like the microprocessor and the operating system remained insulated from this commoditization, but they were the exception rather than the rule.

To escape commoditization, the Theory of Interdependence and Modularity offers a clear prescription: businesses must identify where performance within individual process components could improve—the bottlenecks that limit how well the overall system can perform— and then adopt a more interdependent and proprietary architecture across that interface to optimize it for performance.

A system is like a group of runners who are all required to stay together and cross the finish line at the same time. The overall speed at which the group can travel is defined by the slowest runner in the group, and the only way to improve the group’s performance is to increase the speed of the slowest member.

Similarly, in a product or value chain, attractive profits can almost always be earned by improving the performance of the steps that are lagging. And the way to improve the performance of that step is to once again create an optimized, interdependent architecture around that step.

IMPLICATIONS FOR THE GLOBAL APPAREL MANUFACTURING SUPPLY CHAIN

Using the lens of Interdependence and Modularity, it's clear that the global apparel manufacturing supply chain has become highly modular, with well-defined interfaces between each step in the value chain. While this has brought a host of benefits, the industry is subsequently experiencing the commoditization that inevitably accompanies a modular architecture.

Modularity in today's global apparel manufacturing supply chain is evident from the sheer number of factories, distribution centers, warehouses, brands, and retailers that can work together seamlessly to bring garments to consumers. The industry has modularized to the point where any garment can be produced in any factory, be shipped on any container, arrive at any distribution center, and be sold at any retailer. The interfaces between each of these steps is so well defined that it doesn't matter which company performs a given step. Each one is plug compatible with any player in the next step of the process.

Further evidence of modularization in the supply chain can be seen in what customers value from the supply chain: flexibility and an ever-changing display of new fashion at their fingertips. Incumbent players like factories and trading companies in the apparel supply chain are all too familiar with this shift in customer expectations; retailers are now demanding smaller order quantities and a larger number of styles, and the overall supply chain push for speed signal the industry's march towards flexibility. Clearly, today's basis of competition is speed to market, convenience, and customization, all of which suggest a modular architecture is prevalent in the value chain.

The apparel manufacturing industry is also experiencing commoditization, intense competitive pressure, and margin erosion—all hallmarks of a modular architecture. Retailers, brands, factories, and trading companies can all feel that their best efforts to innovate or improve go unrewarded by customers. Retailer margins are under constant threat from e-commerce providers and similar to Dell Computer, retailers are pushing that margin compression backward through the supply chain. With the supply chain more modular

than it's ever been, retailers are able to work directly with factories, cutting out the trading companies they previously relied on to navigate the supply chain for them. The entire industry is caught up in a race to the bottom, a common refrain in commoditized industries.

Customer Centricity

Escaping commoditization rests on finding steps in a value chain where performance is still lacking and then integrating around the interface between them to optimize their output. There are many interfaces in the supply chain where performance is not good enough. However, our research suggests that one of the most critical interfaces where performance is lacking, and where a tightly integrated approach can help, is the one between design and consumers.

The present global apparel manufacturing supply chain is product-centric rather than customer-centric. Apparel production and fulfillment processes are robust, standardized, and modular in nature and can deliver common, mass-produced, and quality products to all tiers of the market. The model worked well prior to the e-commerce era when the global apparel manufacturing supply chain was more opaque with greater information asymmetry. During that time, consumers accepted the limited selections from massive global fashion companies that dictated fashion trends and product availability. However, in the internet-age where information is transparent and shelf space is virtual, consumers expect more than just quality and sameness in design. Today's modular supply chain is optimized to be as flexible as possible in fulfilling

the needs of big brands and retailers, but is not optimized for catering to individual consumers. But change is already on the horizon. A small but growing number of apparel makers are finding success by bringing the supply chain closer to consumers.

Business models that link consumers and their experience closely to product conceptualization and design are thriving. Contrary to the old, product-centric way of working where retailers and designers push their ideas and options to consumers, in these customer-centric business models consumers pull products and services they want from the supply chain. In other words, consumers indicate their preferences first, and then the supply chain does its best to produce against those preferences.

It works like this: the interface that is being optimized through integrated, proprietary architectures is between design and consumer demand. Companies that are able to integrate design processes around consumer trends, data, and feedback gain an important competitive advantage by optimizing design around what consumers want rather than pushing designs onto the consumer.

Business models that link consumers and their experience closely to product conceptualization and design are thriving.

A good example of a company optimizing the interface between design and the consumer is the Spain-based brand Zara. In an industry where the majority of players are struggling, Zara's parent company Inditex enjoyed 9% growth in 2017.⁷ Using the combination of technology, process, and people, Zara built a customer co-creation culture and delivered fascinating success stories of winning on consumer-driven design. For instance, in 2015, a woman walked into a Zara store in Tokyo and could not find a pink scarf in stock. Elsewhere in the world, other shoppers had similar experiences around the same time, as scarves were not in season. However, through efficient company-wide feedback channels and a customer-centric design and production model, more than 2,000 Zara stores globally started selling pink scarves merely seven days later, and 500,000 pink scarves were sold out in three days.⁸ Zara's supply chain, while highly integrated, still follows the same functional areas as the rest of global apparel manufacturing supply chain. Where Zara truly excels is in its ability to bring consumers closer to its design and fulfilment, and it is benefiting greatly from this integrated architecture.

Another example of a company integrating to improve the interface between design and consumers is the San Francisco clothing start-up Betabrand.⁹ The internet clothing retailer does not own production, logistics, or fulfilment functions, where the existing supply chain is sufficient for its needs. Instead it uses a crowdsource model similar to Kickstarter to improve the interface between design and the consumer. Both in-house and external clothing ideas are put in campaigns on Betabrand's website where consumers can comment and pre-order at a discount. However, only designs that pass a production threshold will be made, while the rest will be scrapped. By bringing conceptualization and design really close to consumers through an interdependent "click, buy, then make" model, Betabrand ensures that only what is wanted is made. It also doesn't have to go through the design guesswork and excess inventory markdowns like traditional apparel retailers. In Betabrand's case, its integrated, customer-centric model allows it to earn attractive margins by optimizing the performance of stages in the supply chain where performance is still not good enough.

RECOMMENDATIONS FOR BUSINESSES IN THE GLOBAL APPAREL MANUFACTURING SUPPLY CHAIN

Zara and Betabrand are just two examples of forward-thinking companies that have positioned themselves to guard against commoditization and capture future profits. Any business, regardless of its function in the global apparel manufacturing supply chain, can similarly follow their lead and reclaim a competitive edge. In order to do so, businesses must restructure their business models to integrate around a performance shortfall—customer centricity—and become highly efficient in exceeding customer demands.

For most businesses in today's global apparel manufacturing supply chain, being customer centric implies a major shift in mindset. All decisions in the customer-centric world need to begin with consumer inputs. Products should no longer be pushed to prospective customers. Instead, customer needs should be engineered into product and service offerings.

Of course, being customer centric has different implications to businesses with different models. For a vertically integrated brand like Inditex, it could mean that the business needs to have efficient feedback loops and production capabilities to timely convert consumers' needs into products they can buy. For a retailer that already owns significant consumer insights like Kohl's, being customer centric means that it needs to create proprietary interfaces with supply chain partners so that information can be shared in timely ways. It also needs partners that have the flexibility and willingness to produce on demand. Finally, for a brand owner that controls design and retail operations like Tommy Hilfiger, being customer centric could mean that the brand needs to understand post-sale consumption and have those insights reflected in design.

Companies in the global apparel manufacturing supply chain have a unique opportunity to push back against the forces of commoditization by

delivering to consumers exactly what they want. But to do this, they must put the consumer at the center of what they do, investing in the processes and systems necessary to link consumer demand all the way back to design. And as the pace of change in the industry continues unabated, companies will need to remain nimble, integrating across any activities necessary to meet customer expectations.

Companies have a unique opportunity
to push back against the forces of
commoditization by delivering to
consumers exactly what they want.

NOTES

1. Taylor, K. (2018, July 03). These haunting photos of the retail apocalypse reveal a new normal in America. Retrieved August 17, 2018, from <https://www.businessinsider.com/the-american-retail-apocalypse-in-photos-2017-3>
2. Thomas, L. (2017, September 23). Here are the retailers that have filed for bankruptcy protection in 2017. Retrieved August 17, 2018, from <https://www.cnbc.com/2017/09/23/here-are-the-retailers-that-filed-for-bankruptcy-protection-in-2017.html>
3. Germano, S. (2016, January 08). Millennial Shoppers Don't Fit the Norm. Retrieved August 17, 2018, from <https://www.wsj.com/articles/millennial-shoppers-dont-fit-the-norm-1452213218>
4. Sanderson, R. (2017, November 19). Italian luxury group Zegna tailors its cloth to suit millennials. Retrieved August 28, 2018, from <https://www.ft.com/content/fc090e84-c9ff-11e7-ab18-7a9fb7d6163e>
5. Adapted from Christensen, C.M. & Raynor, M.E. (2013). The Innovator's Solution: Creating and sustaining successful growth (pp. 125). Boston, MA: Harvard Business Review Press.
6. Christensen, C. M., & Raynor, M. E. (2013). The innovator's solution: Creating and sustaining successful growth (pp. 125-148). Boston, MA: Harvard Business Review Press.
7. Inditex. (2018, March 14). Inditex's net sales rise 9% to €25.34 billion in fiscal 2017. Retrieved September 5, 2018, from <https://www.inditex.com/article?articleId=552792>
8. Roll, M. (2018, August 11). The Secret of Zara's Success: A Culture of Customer Co-creation. Retrieved September 5, 2018, from <https://martinroll.com/resources/articles/strategy/the-secret-of-zaras-success-a-culture-of-customer-co-creation/>
9. Lowensohn, J. (2014, February 20). Sink or sew: How Betabrand turns crazy ideas into real clothing. Retrieved September 6, 2018, from <https://www.theverge.com/2014/2/20/5430460/move-fast-and-sew-things-how-betabrand-turns-crazy-ideas-into-real-stuff>

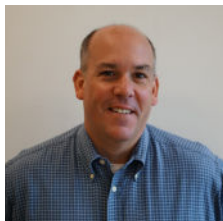
About the Christensen Institute

The Clayton Christensen Institute for Disruptive Innovation is a nonprofit, nonpartisan think tank dedicated to improving the world through Disruptive Innovation. Founded on the theories of Harvard professor Clayton M. Christensen, the Institute offers a unique framework for understanding many of society's most pressing problems. Its mission is ambitious but clear: work to shape and elevate the conversation surrounding these issues through rigorous research and public outreach.

About Li & Fung Limited

Li & Fung is the world's leading supply chain solutions partner. It specializes in responsibly managing supply chains of high-volume, time-sensitive goods for leading brands and retailers worldwide, in more than 230 locations across over 40 markets.

About the authors



Jon is a visiting research fellow at the Christensen Institute from Li & Fung, a Hong Kong-based trading and supply chain management company. Jon's primary research focuses on the global supply chain of the future in order to identify how organizations should develop to serve the existing and emerging needs of stakeholders.



Peter is a visiting research fellow at the Christensen Institute from Li & Fung, a Hong Kong-based trading and supply chain management company. Peter's primary research at the Institute focuses on advancing the global research agenda on the future of the apparel supply chain, where Disruptive Innovation is having a profound impact on incumbent companies.

