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THE GLOBAL TEXTILE AND GARMENTS INDUSTRY: THE ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTs) IN EXPLOITING THE VALUE CHAIN

Information and Communication Technology (ICT) has an important role to play as developing countries adjust to the new era. These opportunities will derive from the ability of ICTs to open up parts of the supply chain (other than basic manufacturing and processing) to developing countries. This report presents case studies of companies that have successfully used ICTs to move, for example, into higher-value activities such as design and logistics, or to access niche markets.

AN *infoDev* PUBLICATION PREPARED BY

Enlightenment Economics

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Executive Summary

The global textile and garment sector has been in a state of flux since 1 January 2005, when almost four decades of restrictions on trade formally came to an end with the demise of the Multi-Fibre Arrangement (MFA) quota system. Many developing countries now face increasing competition and downward pressure on prices as the global garment industry consolidates around a relatively small number of winners.

Information and Communication Technology (ICT) has an important role to play as developing countries adjust to the new era. First, ICT, as a general purpose technology, can improve business practices and increase the efficiency and competitiveness of developing country firms. Secondly, ICT is the main driver that shifts value along the value chain, enabling new business models, disaggregating production chains, and creating new opportunities for developing countries in the global supply chain.

These opportunities will derive from the ability of ICTs to open up parts of the supply chain (other than basic manufacturing and processing) to developing countries. This report presents case studies of companies that have successfully used ICTs to move, for example, into higher-value activities such as design and logistics, or to access niche markets. The case studies demonstrate the variety of strategies available to developing country producers. Whereas Chinese manufacturers have focused on serving major retailers through large-scale production and speed-to-market through an emphasis on logistics, other examples show companies elsewhere adopting a strategy of moving into fashion design and specialized fabrics or raw materials, or alternatively identifying niche markets that do not demand large-scale production. ICTs have been crucial in each case, although the type of technology needed varies from case to case.

Yet technology alone will not provide the answers for struggling garment makers in developing countries. A suitable business environment,

adequate infrastructure, and indeed a fundamental comparative advantage are also required. If an ICT-enhanced textile and garments sector is to be an effective component of a developing country's poverty-alleviation strategy, then the following broad questions must first be addressed by both policymakers and private investors considering their post-MFA strategies:

- What is the right position to seek in a sector increasingly dominated by a very large scale exporter, China, and what role might ICT have in such a strategy?
- What aspects of the wider enabling environment must be in place before investment in ICT for development makes sense?
- What are all the factors, including ICT investment, which cause value to migrate along the global supply chain?
- To what extent are the opportunities offered by ICT in the textile industry limited (or promoted) by natural and historical factors in specific countries?

This sectoral report seeks to use the textile and garments industry to demonstrate the type of analysis needed for a realistic strategy for ICT-enabled growth in any sector. Core tasks include understanding the sector's existing global value chain; assessing a country's potential competitiveness as value shifts along the chain; and highlighting any obstacles to growth in the country's domestic economic structure. This list includes tasks for the private sector and for policy makers. Particular aspects of the broader enabling environment will be important for competitiveness at each stage of the textile and garments value chain, including:

- Infrastructure—roads, ports, and airports, as well as telecoms and other ICT investments.
- Policy and regulation, such as cost of access to telecoms and the internet, competition policy, banking regulations, customs clearance rules.

- Relevant business management skills, including the ability to restructure business models and reengineer firms.
- Other skills, sufficiently widely available that employers can hire the workers who will be needed to implement ICT-based strategies.
- Information flows that determine patterns of trade and market access, including historical and personal links as well as officially mediated trade contacts.

Greatest attention here is given to the parts of the value chain that can be sustainably located in low-income countries. The textile and garments sector is highly globalized, but its structure has for decades primarily been determined by restrictions on trade rather than by free market forces. If the textiles and garments sector is to play an enduring role in poverty-alleviation in any developing country, then that country must carve out a place along this value chain which it can defend against the unpredictable vagaries of the quotas, tariffs and subsidies imposed by developed countries.

This study demonstrates how the process of using ICT to help a developing country firm establish a position in the textiles and garments value chain often falls into one of two approaches. This is because ICT creates two types of new opportunities for firms in developing countries. First, it can mean that for the first time a developing country firm can offer an integrated “total package” garment solution for increasingly demanding (mostly large-scale) global retailers.

The second type of opportunity is to use ICT to occupy parts of the newly disaggregated value chain that the firm has not occupied before, such as custom design or custom production. These niche successes may be the most relevant for smaller developing country firms. They are readily accessible by small producers thanks to ICTs, and are furthermore higher value-added activities than basic manufacture.

This study attempts to develop these ideas through an analysis of the textiles and garments sector, reinforced by specific company case studies.

- Section 1 provides a brief overview, including the quota and tariff regime and an introduction to the main trends affecting the supply chain.

- Section 2 takes a more in-depth look at the value chain and how it has evolved in recent years.
- Section 3 explains what types of ICT are used in the industry, and what barriers exist to uptake.
- Section 4 takes a detailed look at the reasons for China’s dominance in the sector, and considers which low-income countries look most vulnerable in the post-quota era.
- Section 5 uses Mauritius as a detailed case study to demonstrate how a country whose exports may be under threat from Chinese competition might analyze its position in the industry.
- Section 6 draws together the lessons learned about the role of ICT in maintaining and enhancing a competitive textiles and garments sector, using other examples from Cambodia, Thailand and Uganda.
- Section 7 provides conclusions.

The key conclusions are:

ICTs can help companies in some developing countries compete more effectively in the global garment and textiles sector.

This may either be in specific niches or through developing specific advantages that avoid head-to-head competition with China on its key advantages of scale and vertical integration in the area of logistics. While countries such as Mauritius and Bangladesh are unlikely to be able to match Chinese garments producers in terms of speed-to-market for very large-scale orders, they can nevertheless use ICT to specialize in other aspects such as innovative fabrics or design.

Thinking in terms of the whole supply chain is key.

Some developing country firms are successfully pursuing strategies of vertical integration back from garments into textiles and cotton. Other alternatives, however, include (upstream) design, fabric and yarn R&D, and (downstream) developing niche markets.

ICTs offer the scope for the creation of virtual supply chains linking producers within countries or regions.

Scale and effective internal logistics are important competitive advantages in supplying the major garment markets of the EU, US and Japan, and explain the dominance of China. While few companies elsewhere can hope to compete head-to-

head on this front with Chinese producers, capturing the efficiencies of a virtual supply chain could allow smaller producers in particular to compete more effectively in other ways.

The ICT requirements will vary from case to case.

Producers will need to assess which parts of the supply chain can offer them competitive advantages and benchmark their ICT requirements against what is currently available. It will be important for firms to consider their ICT investment needs in the light of a clear strategy as to their position in global supply chains. However, the ICT needs can be substantial and smaller firms in particular may be hindered by the difficulty of financing the investments. Access to information is also important.

Much of the transition to the post-MFA world will depend on the strategic choices of private sector firms.

However, governments have a vital role in providing an adequate infrastructure and policy environment, and may also be important in coordinating access to finance and information for smaller producers.

However, countries which were almost entirely dependent on the quota regime, and which lack basic comparative advantage and infrastructure, are unlikely to find the salvation of their garment industry in ICT investment.

Note: Throughout this study “textiles” is used to mean yarn and/or fabric, while “clothing”, “garments” and “apparel” are taken to be synonymous. “China” refers to mainland China unless otherwise indicated.



1.1 Global Trade in Textiles and Garments

The global textiles and garments industry forms an important component of world trade flows, particularly for some developing and least developed countries where clothing accounts for a large proportion of total exports. In 2004, world exports of textiles were valued at \$195bn and of clothing at \$258bn, representing 2.2% and 2.9% respectively of total world merchandise trade (WTO, 2005). Developing countries produce half the world's textile exports and nearly three-quarters of the world's clothing exports (UNCTAD, 2005).

Trade patterns in textiles and garments are similar although textiles tends to be a capital-intensive business, while garment-making is labor-intensive and usually relies on a low-cost workforce. For textiles, the European Union is the biggest exporter (if including intra-EU trade), followed by China. However, India, Turkey, Pakistan, Indonesia, Thailand and Mexico all rank among the top 15 textile exporters, according to WTO trade statistics. Overall, Asia accounted for 45.1% of world textiles exports in 2004. The EU and the US are the biggest importers of textiles, followed by China, which needs fabric for its large garments industry.

For clothing, the EU is again the biggest exporter (including intra-EU exports), followed by China with a 24% share of world garments exports. Although all other countries lag far behind, Turkey, Mexico, India, Indonesia, Bangladesh, Thailand, Vietnam, Tunisia and Pakistan all feature among the top 15 clothing exporters. Overall, Asia accounted for 46.8% of world clothing exports in 2004. The major importers of clothing are the EU and the US, with Japan trailing in third place.

A distinctive feature of the clothing industry is the number of countries highly dependent on garment

exports, even though the absolute value of those exports is not high in global terms. In 2004 clothing provided more than 40% of total merchandise exports for Cambodia, El Salvador, Bangladesh, Sri Lanka, Mauritius and Lesotho. Such reliance on the garments industry for both jobs and export revenues makes these countries, and their populations, very vulnerable to adverse shifts in trading patterns. (See Sections 2, 4 and 5.)

1.2 Quotas, Tariffs and the End of the Multi-Fibre Arrangement

On 1 January, 2005, the quota restraints of the Multi-Fibre Arrangement (MFA) expired, finally bringing to an end four decades of restrictions on trade in textiles and garments among World Trade Organization (WTO) members. Trade in these products is now governed by normal WTO rules.

The main impact of the quota system had been to place limits on exports from a number of low-cost countries into the United States and Europe, whose domestic industries could not compete against the low-cost overseas products. The quotas placed significant restrictions on high-volume producing countries such as India, Pakistan and Bangladesh, but in recent years the main target of the system had been mainland China. By the 1990s, economic reform and development in China had created a burgeoning export-driven clothing industry that was grabbing global market share very rapidly. In countries where quotas against China were abandoned early, such as Australia and Japan, China has in recent years accounted for 70%–80% of clothing imports.

In practice, the MFA and ATC had only limited success in protecting manufacturers in the US and

EU, which continued to decline. Instead, the restrictions stimulated unintended growth in garment manufacturing in a number of low-cost quota-free countries in Africa and Asia. At the same time, the quota system kept garment prices higher than they would otherwise have been, to the detriment of European and American consumers.

The result has been a highly distorted trading pattern which in the run-up to the lifting of quotas had already begun to unravel, creating winners and losers. The losers are the countries which had benefited from the artificial advantages created by the quota system. Ahead of quota removal, they began to see garment factory closures and job losses as production capacity shifted to China and other producers, including India, that were about to become free of quotas. Many of the countries worst hit were those which were most dependent on garment production for export revenues.

The value of Chinese clothing exports to the US had jumped 56% in the first nine months of 2005, and 44% to the EU in the first eight months of 2005. Tough trade negotiations began, and the protracted uncertainty caused considerable disruption to the industry. The final result was agreements with China by mid-2005 on new lower-level voluntary quotas that would restrict Chinese export growth into the US and EU until the end of 2008 and 2007 respectively. Vulnerable developing country producers have thus been given some extra time during which to adjust to a completely quota free environment, although many will still suffer from China's increasing market share of exports to the US and EU, and the gains which India and Bangladesh can make now that their exports are unrestricted.

The saving grace for some low-income countries will be the complex system of tariffs and preferential trade agreements that remains firmly in place. Similarly, The African Growth and Opportunity Act (AGOA) offers duty- and quota-free entry into the US until 2015 for certain textile and apparel products from designated sub-Saharan African countries, subject to strict rules about raw materials origin. Tariffs on textiles and clothing are generally higher than for other manufactured goods, so this preferential market access offers many developing countries a very useful platform from which to devise a strategy for their textiles and garments industry. In total, there are more than 100 regional

trade agreements that can affect the relative competitiveness of countries in various industries.

1.3 Jobs and Poverty Reduction

Measuring employment in the textiles and garments sectors is difficult because of the large number of small enterprises and numerous home-workers. More than 40 million workers are estimated to be employed directly in the global textile and garment manufacturing industry, of whom around 19 million are in China. The textiles and garments sectors account for a very high proportion of total manufacturing jobs in a number of countries where poverty-alleviation is a central issue. These include Cambodia (80.1% of total manufacturing jobs), Mauritius (72.8%), Sri Lanka (49.2%), Bangladesh (35%), Pakistan (42.9%), Madagascar (45%), Turkey (34.3%), Morocco (27.3%), Guatemala (27.1%), Romania (25.3%), India (21.9%) and China (18.9%) The fast growth of textiles and garments manufacturing in Asia and other developing countries has had a dramatic effect on employment in the industry in developed countries. The World Bank and IMF have estimated that barriers to textile and clothing trade have cost 35 jobs in developing countries for every job saved in rich nations (de Jonquieres, 2004). The removal and reduction of quotas since 1 January 2005 therefore offers the scope for job creation in poorer countries which will no longer be restricted by quotas. Balanced against this, however, are the serious job losses in those low-income countries whose garments industries only emerged as an unintended consequence of the quota system and which are now suffering factory closures.

1.4 Trends in the Value Chain

The value chain in the textile and garments industry stretches from raw material production through yarn spinning, fabric weaving, dyeing and finishing, garment sewing, trimming, to labeling, packaging and delivery. The various elements in this supply chain are geographically dispersed, and involve a number of different partners. During the past decade a number of key trends have emerged which

have re-shaped the way the industry is organized. Any business hoping to compete in the world market needs to assess the impact of these trends on its plans:

- **Geographical shifts.** As already mentioned, the shift of garment manufacturing from developed to low-cost countries has been pronounced over the past decade, with China leading the way in winning market share. China, Turkey, Romania, Vietnam and Tunisia all recorded double digit annual clothing export growth for 2000–2004 (WTO, 2005). In 2004, US imports of clothing from China rose by more than one-third to \$16.2bn, exceeding imports by the EU and Japan for the first time. Africa's exports of clothing rose by 10% to \$9.5bn in 2004, but many African countries' clothing industries have since proved vulnerable to quota removal.
- **Transnational Corporations (TNCs).** The emergence of large international retailers has come to dominate the global textiles and garments industry, influencing the geographical locations of parts of the value chain and putting further downward pressure on prices because of their immense bargaining power. These US-, EU- and Japanese-based corporations need to source large volumes of products, and in the post-quota environment have shifted towards sourcing in larger amounts from fewer countries. The multinational companies have had a big influence on shaping the industry, and in many developing countries the foreign affiliates of transnational companies account for a large share of total production and exports (UNCTAD, 2005).
- **"Lean retailing".** The smart retailer wants to concentrate on selling garments while transferring as much as possible of the rest of the supply chain activities onto its suppliers—hence the image of the "lean retailer". In the jargon of the industry, this calls upon the supplier to offer a "full package" service. Upstream, this can mean taking responsibility for sourcing fabric and trim. Downstream, it means organizing the logistics and transportation, and delivering the items to the retailer's warehouse or even stores in a "ready-for-sale" packaged state. Retailers are increasingly cutting out agents and doing business direct with manufacturers, who are expected to provide a very much wider range of support services and facilities than ever before.

Taken to the limit, a supplier may take responsibility for monitoring the retailer's stocks and placing replenishment orders. In developing countries, particularly those that do not have the supporting industries, the shift towards a full package service can represent a considerable challenge. Instead of being responsible for only one part of the value chain, a supplier needs to be able to co-ordinate and run several stages along that chain. This demands a high level of integration, and the necessary management systems and information technologies to make it possible but it also offers an opportunity to move into higher margin activities, improve profits, and establish niche services.

- **Speed-to-market.** It is instructive to turn the value chain on its head and view the whole process from the retailers' point of view. Gone are the days when a season's products were ordered up to 10 months in advance, delivered in bulk to large warehouses, and large stocks of unsold items offloaded in end-of-season sales. Retailers now use electronic point-of-sale barcode technology to collect and process huge quantities of data about what their customers are buying and which lines are selling well. Garment retailers such as Zara and Hennes & Moritz have set new standards for fast turnover in styles and fashion trends, and products have ever-shorter life-spans. This puts considerable demands on the garment manufacturers who must be able to respond to a series of small, irregular orders. Logistics chains need to be able to support a turnaround from a retailer's order to the delivery of finished product to the correct stores sometimes in just a few days. The manufacturer needs to have efficient supply arrangements with the textile producers, who in turn need to make sure that they can access the appropriate raw materials. In a business where speed-to-market is paramount, the supply chain must be highly integrated in terms of information and efficiency, while often being geographically highly disintegrated.

1.5 Use of ICT

It is the flow of information that binds together the textile and garments supply chain, and ICT is the means to achieve efficient information sharing. Appropriate technology can enable a supplier to

improve business practices, increase efficiency and competitiveness, and to meet the ever-shorter lead-times required. Within a company, ICT can provide a detailed tracking mechanism so that the progress of an order through the production line is accessible in real-time. Bottlenecks can be solved, and efficiencies much improved, for instance, through the use of an Enterprise Resource Planning (ERP) system, which integrates order processing, materials sourcing, manufacturing, account handling, and logistics. Customers can then be given reliable progress reports on order schedules, and productivity greatly enhanced.

Communications between a supplier and a customer can similarly be transformed by electronic communication, either through a dedicated Electronic Data Interchange (EDI) or on a more flexible web-based system. Documents such as Purchase Orders are easily set up online, thereby reducing costs and avoiding mistakes. Replenishment orders, price checks, availability inquiries and stock checks can all be handled through EDI or an equivalent internet data exchange system. When fully connected, this allows buyers can help themselves to information, so that they do not have to wait for a supplier in another time zone to respond. Orders can be placed at any time, on any day of the week.

The introduction of ICT can enable a firm to offer an integrated “full package” service, but it also provides new opportunities to capture emerging niches in a disaggregated value chain. For instance, the wide range of ICT applications already in use within the textiles and garments industry encompasses everything from advanced Computer Aided Design (CAD) and virtual prototyping packages, to the online handling of routine customs and export bureaucracy.

It is possible to connect every stage of the whole value chain electronically, and for large commodity suppliers this can bring big advantages. But developing country suppliers often face a number of hurdles in selecting and implementing a useful ICT system. Many other factors need to be assessed in order to

produce a successful ICT strategy. A slow, unreliable internet connection at a factory in Africa, for instance, may mean it takes hours to download a detailed electronic specification—yielding frustration rather than any savings (see Section 3).

1.6 Consumer Pressure

Ethical standards and workplace conditions at supplier factories have become more important following consumer protests about “sweat shops” and child labor in the textiles and garments industry. Prompted in some cases by negative publicity, many companies now subscribe to Corporate Social Responsibility programs and Codes of Conduct which cover their suppliers and subcontractors. Independent audits are carried out to ensure compliance on a range of health, safety and environmental issues. Some developing country suppliers resent the extra costs that this involves, but large US and EU buyers are increasingly refusing to place orders without such systems in place, and there is some acceptance of a connection between improved conditions and productivity. International Labour Office (ILO) involvement, such as in the Better Factories Cambodia scheme, has helped to give certain nations a “no-sweat shop” image that has proven a competitive advantage and attracted business. Several big name clothing retailers have now become more pro-active and open over workforce conditions. Eco-labeling is becoming more popular with consumers in the US and EU, and presents a new challenge to developing country manufacturers. However, these voluntary schemes too can be used effectively as marketing tools. At the moment, eco-labels tend to target niche markets, but it is possible that as public awareness increases they will present a new barrier—or opportunity—for manufacturers selling into developed country markets.¹

¹ Knappe, 2004a.

The Global Textile and Garments Value Chain

2.1 From Fibres to Frocks

The textiles and garments value chain falls into distinct segments: the production of raw materials (natural and man-made fibres); the manufacture of yarn and fabric; the making of clothing, and the retailing of the finished items. It is the labor-intensive garment manufacturing stage—usually of greatest relevance to poverty alleviation in developing countries—that is the focus of this study. Other end-uses of fibres and textiles, including household furnishings and various industrial products, are not considered here in detail.

In the past, industrialization in garment and textile manufacture has been an important development route for a large number of economies, despite the distortions arising from the trade regime, as barriers to entry such as capital requirements and technical know-how were relatively low. The developmental role of the industry was all the more important as small and medium enterprises could readily succeed, and as the industry has always employed a high proportion of women.

However, the entire value chain has been altered during the past decade by the emergence of very large “lean retailers” such as Wal-Mart in the United States and Pinault-Printemps-Redoute in Europe. These global buyers, in implementing advanced ICT in their own retailing, stock management and ordering operations, have driven a geographic relocation of value all the way back through the supply chain. Four decades ago, the industrialized countries dominated global exports in textiles and clothing; these days, developing countries produce half of the world’s textile exports and nearly three-quarters of world clothing exports (UNCTAD, 2005). While the share of developing countries in the textile and garment trade has been rising, the increase has been more pronounced in the more labor-intensive and lower-value added segment of garment manufacture. Many of the

high-value activities have not migrated. According to one study, the EU textile and clothing industry has retained high value added segments (for example, new materials, technical textiles, high-end fashion, and sportswear) where design and research & development are important competitive factors. This kind of innovation uses human capital (in design and marketing) more intensively than information technology (e-businessWatch, 2005). Macroeconomic statistics for some developed countries offer a rough and ready confirmation: for example, according to the Bureau of Economic Analysis figures for the United States, in the 10 years to 2004, the output of the apparel industry (in dollars) declined by 44% whereas the corresponding decline in value added was only 11% (data last accessed 14 March 2006). Figures are unfortunately not available for global output and value added or GDP in textiles and apparel by country or country group. However, there can be little doubt from case study analysis that the dominant pattern so far has been the relocation of lower value output.

The textiles and garments value chain has become highly globalized and buyer-driven with customer demands shaping the industry. The major retailers seek competitive advantage in their own markets through huge marketing efforts, strong brands and responsiveness to the changes in consumer tastes which they themselves help to generate, all forming significant barriers to entry.

In recent years, the distinctions between different types of buyers have become quite blurred. There are broadly three main categories of apparel buyers, although these also overlap so exact distinctions cannot be made²:

- i. **Retailers** (such as Gap, Hennes & Moritz, etc) that sell own-label clothes in their own stores

² Rangaswami, Oct 2005.

- and usually, but not always, sub-contract the manufacturing;
- ii. **Marketers** (such as Nike and Liz Claiborne), that specialize in design and marketing functions and contract all the actual production to others, and also do not have their own retail outlets apart from a small number of flagship stores; and
 - iii. **Branded manufacturers and marketers** (such as the Sara Lee Corp,) who manufacture apparel in their own factories as well as sourcing from unrelated factories, and whose products are sold mainly by third party retailers.

In the first group, big retailers selling own-label garments are increasingly in control of their supply chains, performing the same function as marketers and manufacturers in terms of product design and development, followed by production which is contracted out to overseas suppliers. This trend is sometimes referred to as “vertical retailing”.³

Meeting a buyer’s priorities is crucial for any developing country garment manufacturer seeking new business. These requirements will depend on the specific product in question, but will include

quality, price, reliability, “speed-to-market” and the ability of the supplier to extend its capabilities beyond the actual making of the garments (the so-called “full-package” service). The demands of the modern retailer mean that any garment production line increasingly needs to be well-integrated into the value chain as a whole. See Figures 1 and 2.

There are distinctions between different parts of the overall manufacturing chain, but also within any one segment of that chain and its associated value chain. The production of yarn and fabric tends to be capital-intensive and reliant on technological innovations such as new man-made fibres and improved machinery, while clothing production, in contrast, remains a very labor-intensive process. But there is a big difference between manufacturing low-cost commodity items (such as cotton T-shirts and underwear) in a highly-automated factory, and producing small volumes of expensive hand-finished tailored jackets. Any developing country needs to decide which type of product it can best produce and what parts of the associated value chain it can service. As always in this industry, that decision has

3 Gereffi et al, 2003.

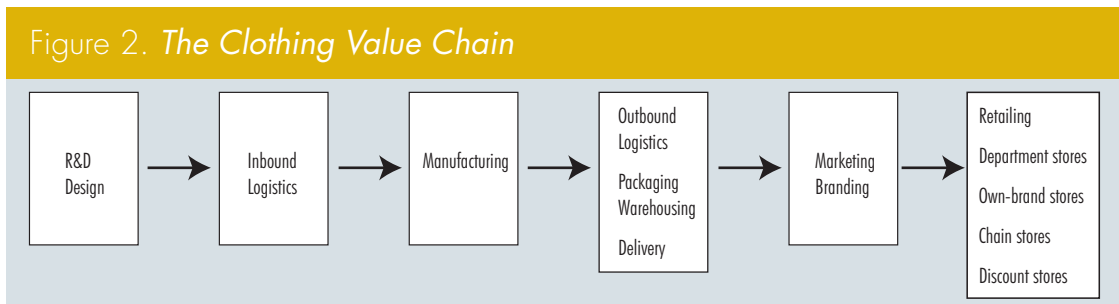
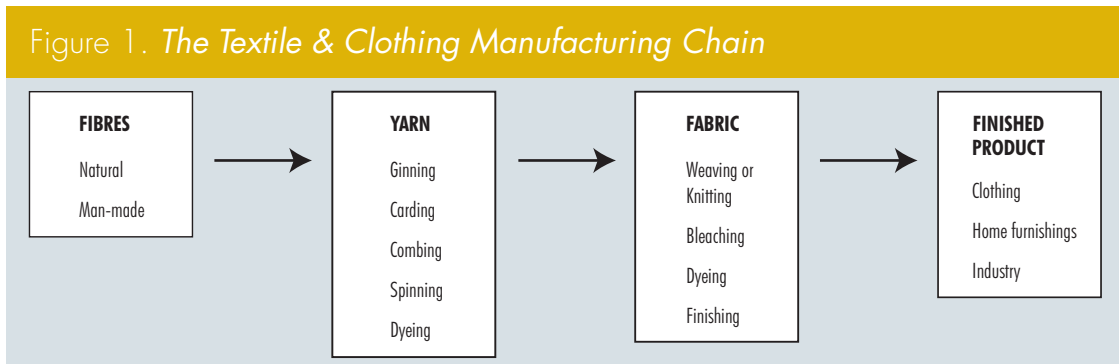


TABLE 1.

	Developed Countries	Developing Countries
Self-sufficient in fibres	Net exporter of fibres; position in fabric is indeterminate (case by case); net importer of clothing. E.g. Australia, France, New Zealand, US.	Competitive in fibres (which might be retained for domestic use); position in fabric indeterminate; net exporter of clothing. E.g. China, Pakistan, South Africa.
Net importer of fibres	Do not produce fibres for export; position in fabric is indeterminate; net importer of clothing. E.g. Japan, South Korea	Do not produce fibres for export; position in fabric indeterminate; net exporter of clothing. E.g. India, Indonesia

to be made with reference to the quota and tariffs systems currently in place.

Four considerations govern a country's position in the textile and garments value chain.⁴ This provides a useful schematic grid that distinguishes these country categories, and which illustrates the parts of the value chain that can be targeted by different nations.

- The division in the natural fibre sector is between agricultural and non-agricultural economies, rather than developing and developed countries.
- Fabric production is capital-intensive and susceptible to technological advances and lies at the cusp of competition between developed and developing countries.
- Clothing production is labor-intensive, thus giving a great advantage to developing countries in most product lines other than high-fashion and specialty products.
- Retailers in OECD countries, especially those that develop their own design capacities and ties to offshore manufacturing centers, are coming to dominate a greater length of the value chain.

In practice, the distortions created by decades of MFA quotas and complex tariff regimes are then imposed on these natural categories and become highly influential in determining which actual countries secure a position in the supply chain. Quota and tariff barriers have thus extended the lives of some uncompetitive garments manufacturers in developed countries (in the US and EU), curbed the growth of garment exports from large volume low-

cost producers (e.g. China and India), and promoted textile and garment manufacturing in countries where quotas and tariffs offered opportunities (e.g. Mauritius and Lesotho). The precise impact of the MFA quotas has been very complex. Given this trade landscape, capturing value successfully in any part of this chain has depended on a combination of gaining a competitive advantage through the use of ICT, exploiting economies of scale, and/or identifying an unoccupied niche.

2.2 Geographical Shifts

2.2.1 Textiles

Textile production is more capital intensive and skill intensive than clothes manufacturing, and therefore tends to be less mobile and need longer lead times to establish itself. Developing countries account for a smaller share of world textile exports than of apparel production, and small, least-developed countries rarely export textiles at all, instead retaining any production for domestic use. Among lower income countries, only China, India, Turkey and Pakistan achieved textile exports above \$5bn in 2004. The EU and US are the big textile importers, followed by China, which needs fabric imports for its huge garments manufacturing industry. The graphs show the leading textiles exporters and importers. (In each case, in order to focus on trade patterns between regions, clothing trade *within* the EU is not included.)

⁴ OECD 2005a.

The textile business includes spinning, weaving or knitting, and dyeing, printing or other finishing processes. These functions are often integrated in the same factory. The fibres are commonly cotton and polyester, but also include rayon, wool, jute, flax and silk. The capital intensity of the industry results in relatively large minimum orders, so there is limited scope to adjust production swiftly to consumer tastes. The textile sector is thus ⁵ Textile production and clothing manufacture is not normally integrated within one company.

2.2.2 Clothing

Clothing manufacture is labor-intensive and can be found in almost all developing countries, particularly least-developed countries. Since the 1950s, the industry has seen several migrations, all involving Asia and at each stage involving a shift to a country where labor costs were initially lower.⁶ As one writer put it, dominance “has historically been a fleeting moment, a brief stop in the race to the bottom in this intensely competitive industry”.⁷ In the 1950s and early 1960s, the move was from North America and Western Europe to Japan, as western textile and clothing production was largely displaced by Japanese imports. The second shift was from Japan to Hong Kong, Taiwan and South Korea, which together dominated global clothing exports in the 1970s and early 1980s. By the late 1980s and the 1990s there was a third migration, away from Hong Kong, Taiwan and South Korea to other lower-cost, developing countries. This included a big shift of production to mainland China, where economic reform and opening up had prompted a surge in export-oriented industrial growth. A number of South-east Asian countries including Indonesia, Thailand, Malaysia and the Philippines, as well as Sri Lanka, also benefited from the migration. And in the 1990s, other new suppliers emerged in South Asia and Latin America.

The impact of these dramatic geographic shifts on importing countries was severe. In 1992 about 49% of all retail apparel sold in the US was made domestically; by 1999 that proportion had fallen to 12%.

The reasons for the migrations were various. In Hong Kong, Taiwan and South Korea, the industry was forced to adjust to rising wages, labor shortages, and higher land values, as well as external factors such as stronger currencies and, as always, tariffs and quotas.

By the end of the eighties, manufacturers in these countries needed to find lower-cost production bases and ways around quota restrictions. In one analysis, “In this division of labor, skill-intensive activities, which provided relatively high gross margins, such as product design, sample making, quality control, packing, warehousing, transport, quota transactions and local financing in the apparel industry, stayed in East Asia and labor-intensive activities were relocated.”⁸ Thus countries in Africa, such as Mauritius and Lesotho, enjoyed a surge in inward investment for garment manufacturing, but usually only took over the lower-margin parts of the supply chain.

China is overwhelmingly the biggest clothing exporter, but extra-EU exports are still sizeable. Meanwhile, the US, EU and Japan account for the majority of clothing imports.

While lower wage costs were often the initial reason for shifting location, other factors have also played a significant part. The goal of shorter lead-times could be achieved by situating production nearer the final markets. Mexico, the Caribbean Basin (Dominican Republic, Guatemala, Honduras, etc) and Central America are particularly attractive because of their proximity to the US. Most of this production has traditionally been basic assembly work—called “outward processing” or “production sharing”—the sewing together of cut pieces and trim provided by US companies. The complex rules of origin in the preferential trade agreements have often limited the opportunities for these countries to widen their role in the supply chain or move into higher margin activities. Turkey, North Africa (Tunisia and Morocco) and various former Eastern European countries (Romania, Poland and Hungary) offer quicker access to the EU markets. Each supplying country has its own profile. For example, Turkey is a “full-package” supplier with vertically integrated textile and apparel companies and strong links with Germany. Tunisia and Morocco are “outward-processing” sites that mainly assemble apparel for firms in France and Italy. And Eastern Europe and the former Soviet Union countries do both outward processing and full-package servicing.

5 Nordas, 2004.

6 Gereffi et al, 2003.

7 Rivoli, 2005.

8 Gereffi et al, 2003.

It is East Asia as a regional supplier, however, which remains the powerhouse of the apparel manufacturing business. Manufacturing companies, or buying agents, may be headquartered in Hong Kong or Taiwan, for example, but will have outsourced most production across the region. As well as initiating the mainland Chinese apparel boom, this shift has created work for some of the poorest communities in Asia including in India, Indonesia, Bangladesh, Vietnam and Pakistan. This can create some very well-traveled items of clothing, as illustrated by one analysis of the production process of a cotton men's shirt produced for a US retailer by a large transnational manufacturer based in Hong Kong:⁹

- **Cotton:** Pakistan. Good-quality source, manufacturer trusts fabric mill with selection.
- **Yarn:** Malaysia. Regional vertical integration with fabric mill.
- **Fabric:** Malaysia. Choice of dyeing techniques and good relationship with main producer.
- **Interlining:** (collar and cuffs): Malaysia and Japan. Interlining is a higher-value, capital intensive product.
- **Buttons:** China. The buyers specified the supplier for this component only—the manufacturer arranged everything else.
- **Garment:** China. Company-owned factory puts the shirt together.

With this type of disaggregated supply chain, co-ordination and communication becomes vital for controlling the network of companies involved in the production of just one product line. ICT technologies have brought considerable benefits in this regard.

The position of Sub-Saharan African country suppliers is almost entirely a consequence of the various quota and preferential tariff regimes such as AGOA for the US market and Cotonou for the EU. However, this meant that many least-developed countries only produced the low-cost commodity items for which China and other Asian manufacturers suffered quota restrictions, and did not expand into higher-margin products and services. This has made them particularly vulnerable in the post-quota environment, as commodity item production can now be shifted back to large volume Asian producers.

The rise of China, combined with the impact of quota and tariff systems, is shown by an analysis of

the supplier country shares of clothing imports into the three big markets in 2004: the US, EU and Japan. At the point when MFA quotas finally expired, China already provided 19% of America's clothing imports, with other East Asian and South Asian countries accounting for a further 36%. The geographically proximate suppliers in Mexico, Honduras, Guatemala and El Salvador together accounted for 18%. For the EU, China's hold on clothing is even more pronounced, with 24.4% of imports (excluding intra-EU trade). But the relatively nearby sources in Turkey, Romania, Tunisia and Morocco managed a respectable 32%. Meanwhile, Japan gives a glimpse of China's potential when unfettered by trade barriers (and assisted by geographical location). Japan abandoned quotas against Chinese clothing many years ago, and 81% of its clothing imports now come from China.

2.2.3 Patterns of Foreign Direct Investment (FDI)

Another way to look at the geographical spread of the value chain is through the allocation of foreign direct investment (FDI). From 2002 to 2004, a total of 275 FDI projects related to the manufacturing of textiles and clothing were recorded (UNCTAD, 2005). While 45% of the project investors were from the EU, some 35% originated in an Asia-Pacific country. Among Asian investors, the leaders were Japan (31 projects), Taiwan (15), Turkey (13), South Korea (11), Malaysia (7) and China (6). The newly industrialized and industrializing East Asian economies are thus not only shifting garment production to lower-cost neighboring countries, but also investing directly in those countries. A consequence of the shifts driven by developed country TNC retailers has been the emergence of some non-EU or US TNCs in garment manufacture. In countries such as Lesotho, Madagascar, and Mauritius, foreign-owned companies have historically accounted for a large share of exports, with Hong Kong and Taiwan the dominant investors. Much of that shift was to mainland China. As in many industries, FDI has poured into China, and in textiles and clothing this has been particularly marked ahead of quota removal. UNCTAD quotes Chinese government statistics which said the number of foreign-invested textiles and clothing enterprises increased in 2003 by 5,856 to nearly 20,000 in total.

⁹ Knappe, 2005a.

2.2.4 The Future

Most industry observers agree that there will be a period of consolidation in the post-MFA era which results in buyers reducing the number of countries from which they purchase. China followed by India are viewed to be the two main winners, but the need in some product lines for short lead-times will help to maintain the industries in countries situated close to the US and EU markets. Diversification will also be promoted by the desire of large buyers not to be over-dependent on a single source country.

There is less agreement about which countries secure a place in the second tier with India. One study expects Indonesia, Vietnam, Mexico and Turkey to look the strongest among low-cost producers.¹⁰ South Korea and Taiwan are expected to maintain niche roles as suppliers of higher-value items. On the other side of the world, the Caribbean Basin suppliers are expected to expand their production-sharing assembly sales into the US market, but face competition from Mexico on price and speed-to-market. Sub-Saharan Africa faces the greatest challenges because of low volumes, the lack of adequate domestic textile production, and its adverse geographical location for access to the major developed markets. In many cases, the limitations of the wider business environment (transportation links, telecommunications infrastructure, access to capital and workforce skills) all exacerbate the problems caused by the end of quota benefits.

The influence of big transnational retailers and manufacturers appears certain to increase, along with the expected physical shifts in the industry. Developing country suppliers will increasingly need to forge links with the large buyers, and offer the sort of services which are required. The relatively low entry barriers into garment production encourages new entrants each year, and new competitive pressures for existing suppliers.

2.3 Adding Value

Profits and value-added tend to be highest in the parts of the global supply chain where entry is hardest. The high-margin work includes research, design and product development, marketing and

financial services. The retailers, designers and marketers are able to act as strategic brokers in linking overseas factories and traders with product niches in their main consumer markets.

Traditionally, the part of the value chain which has been situated in low-cost countries has been the low-margin, labor-intensive work and until recently it has been extremely unusual for the high value-added work to migrate along with the stitching.

Given the very different types of garments that are produced, it is not possible to generalize about the value chain. But as a starting point the figures in the box illustrate how the cost of a basic commodity product is broken down.¹¹ Strikingly, the cut-make-trim (CMT) cost accounts for just \$2 of the final \$30.65 retail price of a men's cotton shirt. Even the total cost of the completed garment, at \$6.80 accounts for just 22% of the retail price.

Even with low labor costs, the profit margins on the actual manufacture of the garment tend to be very thin. The retail price mark-up looks the most generous part of the equation, until one remembers that this is what usually pays for all the design and development of a product. There is thus a potential mutually beneficial shift that can occur, if more of that design and development work can be moved to the low-cost supplying company and country. The retailer can reduce costs, and the supplier can expand into higher margin services. ICT can play a part in making this shift possible. That, more up-market, part of the industry employs higher-paid workers and has smaller production runs. The emphasis on design and capturing fashion tastes also means that a higher proportion of costs are incurred in developed countries, and may be less likely to shift towards the manufacturer. When garment production in this market segment is outsourced abroad, it is likely to be of higher value, and demand a more skilled workforce.

The different qualities of product often result in very different patterns of manufacturing. Basic garments increasingly tend to be mass produced by vertically integrated companies, with most manufacturing provided by low-cost suppliers. For a

¹⁰ Gereffi et al, 2003.

¹¹ Birnbaum, 2005.

BOX 1. Cost Breakdown of a Men's Woven Cotton Shirt Sold in the US Market

	\$
Fabric	3.00
CMT (cut-make-trim)	2.00
Quota category 340	1.80
FOB price (for completed garment)	6.80
Duty (19.8%)	1.34
Freight	0.30
Clearance and inland transport	0.14
LDP (landed-duty-paid)	8.58
Private label importer price mark-up	3.68
Wholesale price	12.26
Retail price mark-up	18.39
Retail price	30.65

Source: David Birnbaum. 2005. Source-it, Global material sourcing for the clothing industry. Hypothetical case study based on standard US costing. Retail mark-up includes R&D, design, marketing, head office costs, other costs.

developing country supplier to add value and increase profit margins on a basic garment usually means moving away from only offering assembly or cut-make-trim services, and into other parts of the value chain. Alternatively, a supplier can instead decide to focus on higher-margin fashion items, which often means identifying a suitable niche of the market.

One study of how value originates during garment manufacture illustrates the differences between two low-cost countries, one of which has a vertically integrated textiles and garments industry and

another which does not.¹² The figures are shown in the table (with the health warning that some income, e.g. of the self-employed, appears as capital). Overall, however, the data shows the large element of unskilled labor, and the big difference between a country such as India with a domestic textile base, and a supplier like Vietnam which needs to import a lot of the content. Vietnam is thus at a disadvantage in terms of its value-added share.

Although not in the table, the study cites Bangladesh as a country which has managed to achieve greater vertical integration through promoting a domestic textile industry. In 1991, the import value of textiles was about 60% of the export value of Bangladesh-made clothing, but this had fallen to 40% by 2001.

In the post-quota era, many vulnerable developing country suppliers need to move away from commodity products and into higher value products. However, one of the unintended consequences of the quota system has already been to encourage China to move into higher value-added activities. Quotas are volume-based, so it is more profitable to use a quota for a higher-margin upmarket version of a product rather than a low-value version. The limitations on export quantities have also encouraged China to start offering higher-margin ancillary services such as design, sourcing and logistics. As we will see in the next section, buyers do want their suppliers to offer more than a narrow garment manufacturing service. The challenge for many developing country suppliers is to be able to match what their main competitor, China, is already doing.

¹² Nordås, 2004.

BOX 2. Examples of the Cost Structure of the Clothing Industry, 2001 (per cent of gross output)

	Unskilled Labour	Skilled labor	Capital	Total value added	Intermediate inputs	Of which imported
India	21.1	2.9	7.8	31.8	68.2	1.8
Vietnam	9.0	1.2	3.8	14.0	86.0	40.4

Source: Nordås, 2004.

2.4 The Buyers' Requirements

2.4.1 Volume

Retailers are getting bigger, and large retailers want large volumes of products. By the mid-1990s the five largest retailers—Wal-Mart, Sears, Kmart, Dayton Hudson and JC Penney—accounted for 68 per cent of all apparel sales in the US.¹³ These large retailers are likely to consider only very large producers able to handle the sort of volumes needed. Under the quota system, these large volumes had to be sourced from a number of different countries. The expectation now is that the biggest buyers will streamline the number of countries from which they source. Large factories in the selected countries will be the main beneficiaries. Liz Clairborne, the US fashion marketer, provides an example of current thinking. Ahead of quota removal, the company envisaged halving both the number of countries from which it sourced its clothes and the number of factories it used around the world in three to four years. In the process, China's share of company direct overseas sourcing would rise significantly from 15 per cent in 2004 to perhaps half eventually.¹⁴

2.4.2 "Lean Retailing"

The example (in Section 2.3) of the cost structure of a men's cotton shirt demonstrated that a retailer hoping to reduce costs is unlikely to find enough savings in the cut-make-trim part (CMT) of garment production, and conversely that suppliers wanting to increase profit margins need to look outside the confines of CMT. These two aims are on the face of it highly complementary. "Lean retailers" seek to outsource many, if not all, aspects of their business between the design of items and the sale of the finished product in the stores. If cost savings on CMT are so limited, then efficiencies clearly need to come from elsewhere in the value chain. A fully-integrated supply chain should offer those efficiencies. Thus a garment manufacturer may increasingly be expected to assume responsibility for intermediate stages such as sourcing the fabric and trim, packaging and labeling for sale, and organizing the logistics of inventory and delivery.

The full package service can be thought of as the continuation of a trend that has been underway among developing country suppliers for almost 20

years. This full package service clearly shifts a great deal more responsibility onto the supplier, but does offer the potential for seizing higher value segments of the value chain. Management know-how and technology, specifically ICT, come to the fore when offering a full package solution. The buyer wants to track the process of each order very precisely, which means i) that the supplier must already have tracking systems in place and ii) the information about individual orders must be easily accessed by the retailer. All this demands close cooperation between the manufacturer and the retailer—and compatible data-sharing and electronic information exchange systems. Wal-Mart was an early mover in this regard, insisting that suppliers implement information technologies for exchange of sales data, adopt standards for product labelling and deploy specific methods of material handling. Wal-Mart's aim was to cut inventory levels and reduce the lead-time for replenishment orders.¹⁵

2.4.3 Speed-to-Market

Suppliers must now provide these new services in record quick time. Until relatively recently, retailers' buyers would order a whole season's supply of the selected garments up to 10 months before they would go on sale. From the garment manufacturer's point of view, that system meant price and quality were the main ways to compete; logistics and speed of response were less important. This has changed. Customers expect much greater variety of choice, and a faster turnover of individual styles. Retailers need to offer a large number of products, each with a shorter lifespan. Orders are for shorter production runs, and involve point of sale ICT equipment providing real-time information about best-selling items. The retailer's inventory levels are kept very low, which helps to cut their costs. Four key factors are involved in a supplier achieving sufficient speed and reliability to meet these demands: i) proximity to the retailer's market, ii) adequacy of the transportation infrastructure, iii) efficient customs administration, and iv) adequacy of the telecommunications and IT infrastructure. However the ability to organize the supply chain quickly and efficiently can be easily thwarted by factors completely outside a company's control.

¹³ Gereffi et al, 2003.

¹⁴ McGregor et al, 20 July 2004.

¹⁵ Nordás, 2004.

2.5 Barriers to Progress

Problems endemic in the external business environment will make offering a full package service and short lead-times extremely difficult for developing countries. A recent Carnegie Endowment study listed some typical external barriers:¹⁶

- **Domestic government policies.** For example, suppliers need quick access to specialty fabrics, yarns, and trims used in the production of most apparel today. Yet many countries without adequate domestic supplies impose high tariffs on imported fabrics and trims.
- **Lack of human capital.** Developing country producers often lack managers with the necessary skills needed to provide full package services. These skills include translating apparel designs into production patterns, and supply chain management know-how. Tertiary education in textile and clothing skills is often unavailable. The management skills required also include tacit knowledge not readily acquired without experience in a business already implementing the higher value-added services.
- **Telecommunications and IT impediments.** Full package production and fast replenishment demands adequate ICT systems to connect the buyer and supplier. This requires a modern and reliable telecommunications infrastructure, and back-up from IT professionals.
- **Transportation infrastructure.** Good roads, railways, ports and airports are needed to facilitate swift order deliveries, especially from countries distant from their buyers' markets.
- **Customs Administration.** Bad customs administration can disrupt the best-planned delivery schedule. Inefficient bureaucracy and corruption are usually the main culprits.

Market access restrictions also form an impediment, although sometimes there is scope for

country governments to adjust policies accordingly. Rules of origin are often the most complex aspects of preferential tariff regimes. For example, some Bangladeshi producers find it difficult to qualify for preferential rates, which require that Bangladeshi value content exceed all other regional content. The domestic textile industry is too small to support the larger garment-manufacturing sector, but if fabric is imported from India, then its cost will very often exceed the cut-sew-trim costs within Bangladesh, thus voiding any claim for tariff reductions. The supplier is helpless, because if it raised the on-site garment assembly costs to solve the tariff problem, then the product would lose its cost-competitiveness.

Suppliers in Bangladesh have to contend with several of the listed barriers.¹⁷ Telecommunications services can be poor, and energy supplies unreliable. Wages are among the lowest in the world, but so is productivity. The lead-times for products can be 120–150 days, compared with just 12 days in India. But Indian suppliers face their own challenges. The costs of international transportation to the US are much higher than for China, and the transportation time is twice as long on average. Poor roads within India cause too much time to be lost in reaching the ports. The supply chains within India can be extremely complicated because an estimated 80% of the clothing industry is composed of small, family-run businesses which lack modern equipment.

Addressing such issues is a complex business, involving both the public and private sectors. Technology is never the only answer, but it is one of the answers. The next section turns to the specific role of ICT in the global textile and garments value chain.

¹⁶ Rangaswami, 2005.
¹⁷ UNCTAD, 2005.



The Role of ICT in the Textile and Garments Value Chain

The use of ICT is no longer an optional extra for developing country manufacturers wanting to compete effectively in a global textiles and garments market where speed-to-market and price are key determinants. The shift to “just in time” operations is possible with the appropriate uses of ICT across the length of the value chain. At the same time, as margins are driven lower by global competition, ICT can help secure necessary cost savings in the sourcing and manufacturing process. The new-style lean supply chain requires a very high level of co-ordination among manufacturers at the different stages. This, in turn, depends on accurate and timely information flows, from raw material sourcing and the manufacturing process, through to delivery to the end customer. A large amount of information needs to be collected, processed, transmitted and used in a value-enhancing way.

Still, ICT is not an end in itself. It is important for a supplier in a developing country to appreciate that

investment in ICT will not alone solve a business problem; the purchase of a new software system does not immediately win new customers or retain old ones. The key is to establish the desired business outcomes, and only then to ask what role ICT has in achieving these goals.

One instructive survey of garment buyers’ future sourcing plans asked respondents to rate the importance of various factory-specific factors, including “Technological Level”. The result can be seen in the table below. It demonstrates that use of technology was of “critical” or “major” importance for 60% of buyers, but that technology was just one of several performance criteria which a factory must satisfy. Just as relevant, therefore, as the explicit question about technological level is the more subtle role of ICT in improving performance in the other highly-rated factors, such as price and product quality. (The survey was conducted in the context of work on corporate social responsibility, which may

TABLE 2. Importance of Factory-Specific Factors in the Decision to Source From or Invest in a Country—a Survey of Buyers.

%	Critical	Major	Moderate	Minor	None
Price, Production Costs	40.0	53.3	6.7	0	0
Health & Safety Practices	20.0	60.0	20.0	0	0
Product Quality	53.3	46.7	0	0	0
Production Capacity	0	93.3	6.7	0	0
Workforce Skills & Productivity	6.7	80.0	13.3	0	0
Technological Level	13.3	46.7	40.0	0	0
Product Development & Range of Services	6.6	46.7	46.7	0	0
Storage Facilities & Transportation Infrastructure	13.3	40.0	40.0	6.7	0
Delivery Lead Times & Rapid Re-orders	13.3	60.0	26.7	0	0

Source: FIAS 2004)

have encouraged the very strong response regarding health and safety practices.)¹⁸

3.1 Information Flows and ICT

A key question is the type of interactions for which ICT can be useful in the business processes applied in the textile and garments industry. Some specific ICT technologies can be used to secure the required outcomes. Some of the hardware and software applications are difficult to understand without a demonstration, and one of the first hurdles faced by a developing country supplier is the challenge of simply obtaining objective advice about what technologies might be appropriate.

There are three key areas of communication between retailers and manufacturers for which ICT is important:¹⁹

- **Exchange of information** including any data that influences the action and performance of other parts of the supply chain. This includes sales data, inventory management, production schedules and shipment details.
- **Synchronized planning** so that all parties agree what is to be done with the information that is exchanged. This will create strategies for product introduction, forecasting and replenishment.
- **Workflow coordination** which exploits synergies between the different supply chain participants.

A schematic diagram can best illustrate, in a very simplified manner, some of the information flows important for a developing country supplier that could be enhanced by ICT. Electronic applications can be used to improve performance at each stage in the supply chain, and can also be used in the management of all activities across the supply chain. In either case, implementation is likely to improve communication between several different players. It is therefore useful to consider the various phases in which ICT might be introduced into a garment-making company. Intentia, a Swedish company specializing in lean supply chain technology, defines three stages:²⁰

- First, there is need for coordination and monitoring within the various stages of the

garment company production line so that bottle-necks are removed and managers know immediately the status of any orders. This is usually achieved through an Enterprise Resource Planning (ERP) system (see Section 3.2). Once a system is up and running for the production line itself, the technology can be expanded further along the supply chain, for example by linking warehousing and transportation processes to the ERP backbone. This increases visibility of delivery, cost and other execution activities for the entire customer and supplier order process within the supplying company. Other relevant ICT at this stage would include computer aided design (CAD), while related technologies could cover pattern making, cutting, and packaging/labeling.

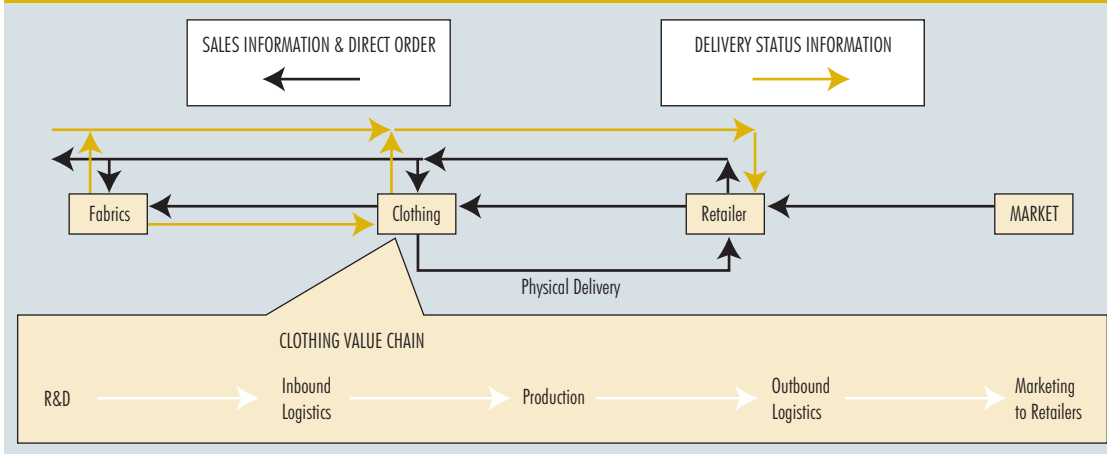
- The next step would be the integration and synchronization of inbound and outbound order management activities with trading partners. Purchase orders, for instance, are best handled electronically. For this step, companies must be willing to share important information with immediate trading partners. Normally this information is restricted to tactical functions and is focused on short-term cost savings, operational efficiencies and customer service. Inbound logistics would include the transportation and customs clearance for fabrics and yarn. Outbound logistics would cover customs clearance, tariff and quota handling, shipping and transportation for the finished products.
- Finally, internet-enabled systems can be used to synchronize the network of supplier relationships into a single, scalable “virtual” enterprise with a fully integrated system between manufacturer and retailer. Demand, manufacturing, logistics and storage data will be visible to all trading partners in the supply chain. The resulting network organization is capable of improved flexibility and responsiveness, and enables optimization of each component of the value network. The retailer or buyer will have full access to delivery status information, so that all orders can be tracked. The supplier will similarly receive information about inventory levels for the relevant products, and data on

¹⁸ FIAS, 2004.

¹⁹ International Trade Centre, 2005.

²⁰ Adapted from McKee and Ross, 2005, with material from Knappe, 2004b.

Figure 3. ICTlinked Information Flows in the Textile and Garments Value Chain



Source: Adapted from a slide by Matthias Knappe of the International Trade Centre UNCTAD/WTO. The Changing Global T&C Market and the role of “e” Applications to Increase Competitiveness. Sao Paulo, November 2004.

actual sales of the products. Replenishment orders may start to be automated, or mainly in the hands of the supplier, and stock levels will be kept very lean. Systems can be designed according to whether the product is a non-seasonal basic garment or a fast-changing fashion item.

In parallel with these customer-supplier links, there will be extended use of ICT by the supplier. The creation of a simple website brings new B2B (business to business) and B2C (business to consumer) marketing opportunities for firms in far-flung locations, while internet access brings much-needed information about the fast-changing fashion market. Overall, ICT can facilitate the provision by the supplier of a much broader range of services to the buyer, including aspects of product development, design and online sourcing of fabric and trim. Thus ICT can help suppliers to take over wider value chain responsibilities as part of moving towards a full package solution.

3.2 Specific Technologies

A number of specific types of information and communication technologies are used in the textiles

and garments sector, many of which were created for other industries and then adapted for the needs of the apparel value chain. An ICT system is usually configured for the particular needs of the user, but any technology must obviously be compatible with the systems used by both customer and supplier. A few of the most common types of system and typical scenarios are briefly described here, together with some recent advances which are likely to become more common in coming years.

3.2.1 Electronic Resource Planning (ERP)

ERP is a system for managing and integrating a number of different business activities within a company, including order processing, materials sourcing, manufacturing, account handling, and logistics. It can be introduced in modules. ERP may start off as an internal company resource, but information and data from the system can subsequently be made available to the other players in the supply chain, particularly the buyer.

A functioning ERP system should provide access to a range of information and tracking data including:

- purchase orders from customers;
- purchase orders issued to fabric and trim suppliers;

- fabric inventory control;
- garment production line processes from cutting to finishing;
- status of particular work orders;
- work station usage/performance (for lines and individual workers);
- dispatch details;
- supplier inventories;
- customs documentation; and
- quota applications (if relevant).

Such real-time information means that suppliers can see how their part of the supply chain is performing. Customers can be given reliable progress reports, and productivity can be improved after identifying bottlenecks. Staff time formerly spent collecting data can be redeployed. Although employees often resent the system's ability to monitor individual worker output, the new data also means that conscientious employees can be identified and rewarded with bonuses.

3.2.2 Electronic Data Interchange (EDI) and internet-based data transmission systems

Supply chain management systems need communication networks connecting a supplier with the customer. EDI has traditionally been the most commonly used technology, but web-based systems are gradually taking over. EDI is a system which transmits documents electronically in a standard format and syntax. Electronic transmission largely removes the possibility of the supplier introducing order-entry errors, thereby reducing costs and avoiding mistakes. Orders can be placed at any time, on any day of the week.

During the course of a transaction for garments, an EDI system can handle:

- availability inquiries;
- the Purchase Order from the retailer (or agent) to the garment supplier and/or fabric supplier;
- an Advanced Ship Notice from the fabric supplier;
- an Advanced Ship Notice from the garment manufacturer;
- a report on the status of orders;
- order amendments;
- generation of packing lists;
- generation and printing of barcode labels;

- automatic generation of an invoice;
- replenishment orders;
- provision of an audit trail covering the history of the contract.

Recent web-based alternatives and XML (eXtensible Markup Language) protocol systems offer the same functionality as EDI but without the need for a dedicated system for a single customer, and are more attractive and cheaper for small- and medium-sized suppliers in developing countries. Web-based alternatives are making progress, although many major clothing retailers continue to use their legacy EDI systems. Wal-Mart is the most prominent retailer to have moved to internet data exchange, and is rolling out the move through its supply base.

3.2.3 Integrated Systems

In an integrated supply chain, all partners will ideally have real-time access to information from each stage of production. This is possible using a web-based transaction/project management system. One typical example is the ecTrack software application sold by Integrated Solutions Technology (IST), a technology business started in 1998 by the Luen Thai apparel company. The timeline can include all stages from pre-production to delivery. The supply chain partners collaborate to modify this plan until it satisfies all their requirements. An integrated supply chain enables such information to be available to both the retailer and the supplier, so that orders can be swiftly adjusted.

At the retailer's end, point of sale information is closely related to inventory management. A fully integrated system will include real-time, online inventory monitoring which is vital if stock levels are to be kept low. The overall level of coordination and collaboration in an ICT-enabled world depends on a clear definition of responsibilities and tasks. Once this is achieved a high level of tracking and service is available, with information updated and shared in real-time.

3.2.4 Logistics "e"-Information

The transportation and warehousing of goods needs to be integrated with the rest of the supply chain if bottlenecks and delayed deliveries are to be avoided, but standalone software packages are also available. Manifests and customs documentation can now be

handled online in some countries, which can speed up the bureaucracy considerably. The logistics information highway is a two-way street. The retailer and the supplier need to be able to track stock and shipments, but the firm's logistics managers also need to know about upcoming order flows. A web-based system can provide this access to all the supply chain players.

3.2.5 Design and Virtual Prototyping

ICT also has an important and growing role in the early design stages of a product's evolution. Sophisticated computer aided design (CAD) software packages cover all stages of the process from initial drawings and 3D simulations of garments, following on to pattern generation and production of data outputs suitable for a computer-aided manufacturing (CAM) process.

Virtual prototyping offers what its name suggests: a digital prototype rather than a physical prototype is used to simulate designs and fabrics, evaluate comfort, and provide animations to demonstrate the garment. The applications can assess the behavior of the garment's fabric in different postures (sitting or running, for instance). This offers the opportunity to speed up product development and would greatly cut costs. Prospective designs can be shared quickly between a large number of people using internet transmission. These applications are too expensive at the moment for a typical developing country supplier, but in the future may become more relevant for companies producing garment samples for buyers.

3.2.6 Online Portals

The internet offers easy and cheap access to information for developing country manufacturers, who previously could be very isolated from global industry trends. Apart from keeping in touch with patterns of demand, web access can also provide information on developments in the relevant ICT technologies.

3.2.7 E-Commerce

There are intrinsic limitations to B2B e-commerce sourcing in the textile and garments sector because of buyers usually need to handle samples and touch fabrics before making their decisions. Even for those companies which do not want to take the risk, the internet provides access to details about the products on offer and their suppliers.

As a seller, setting up a website to showcase a company's products is straightforward. Thus a developing country garment maker can use its own website to advertise its own products, while using the web to search the sites of companies from which it can source yarn, fabric, and trim. Once relationships are established between a buyer and its preferred suppliers, an internet-based system can be used for the negotiation of contract terms.

3.2.8 Vendor Managed Inventory (VMI)

A "lean retailer" wants to do as little as possible apart from selling clothes. One way to achieve this is for the garment manufacturer to take responsibility for checking and replenishing the retailer's stock levels—the so-called Vendor Managed Inventory (VMI). A high level of collaboration and trust is

BOX 3. *The Worth Global Style Network*

One of the main challenges for developing country suppliers is keeping track of global trends on the catwalk and in the fast-moving fashion industry. The Worth Global Style Network (www.wgsn.com) was launched in 1998 as an online source of information about clothing and textile trends around the world. Clients pay an annual fee for access to a range of information including reports about trade shows, market overviews, the latest trends, sector-specific intelligence and even photographs of thousands of shop windows. The information is delivered quickly, often within hours of an event.

Access to the site only needs an internet connection, and so is readily available to developing country manufacturers. By keeping up-to-speed with market developments, a supplier is better placed to know what buyers will want. Information on yarn and textiles is also provided.

Before the advent of ICT information systems, developing country suppliers were often at a disadvantage because they were unable to access timely information about developments in the textiles and garments industry. The internet has now brought such information to all suppliers. In October 2005, WGSN was bought for £140m (\$245m) by Emap, the publishing company, which hopes to double the size of the business.

BOX 4. Reverse Auctions

One ICT tool useful to garment retailers to shorten the apparel buying cycle and reduce purchase prices is the web-based “reverse auction”. Pinault-Printemps-Redoute (PPR), the French luxury goods company, uses an auction platform developed by Agentrics, (formerly GNX and VVWRE) to streamline its apparel buying process. The online auction process enables simultaneous negotiations with a number of potential suppliers, improves the consistency of information from these companies, and cuts out a lot of the paperwork and travel traditionally involved in sourcing garments.

Auction coordinators within PPR first identify the products and services to be negotiated online. Requests for Bid and specification sheets for an apparel product are sent to a number of pre-selected suppliers, who must then provide a sample of the item to PPR by a specified date. At the designated time for the auction, all the invited suppliers log into a secure internet site and place their opening bids. The participants then reduce their bids incrementally, if they want to undercut a competitor’s lower price. The duration of the auction is fixed before the start, but the auction can be extended if someone places a lower bid just before the planned deadline.

PPR uses reverse auctions to source seasonal basics, such as T-shirts and jeans, and also for more expensive garments such as jersey dresses and suits. On average, purchase prices across all Agentrics’s customers have fallen by around 10% as a result of using online auctions, and the apparel buying cycle time has reduced from weeks to days. From the suppliers’ point of view, the process makes the purchasing process more transparent for all the companies taking part, for example by enabling them to witness rival bids. The suppliers also benefit from very clear specification sheets and an open communication channel with the buyer.

All that a supplier in a developing country needs to participate in a reverse auction is a computer with a reliable internet connection. Usually the main challenge is not the technology, but the willingness to be involved in this new method for winning contracts. But participation in auctions may increasingly become a necessary feature of winning business.

necessary for such an arrangement, and it is only usually relevant for long-term business relationships.

VMI needs a very high degree of systems integration. The supplier receives information about sales and customer-country inventory levels through an EDI or web-based ICT link. Under VMI, enormous trust is put in the overseas suppliers, both in terms of giving them access to market-sensitive information and control over inventory levels. This makes inventory management both easier and more important: any supplier who allows a customer to run out of a popular item, or whose aggressive reordering leaves a lot of unsold stock, will lose both business relationships and income.

3.2.9 Radio Frequency Identification (RFID)

The RFID label—or “smart tag”—emits a radio signal that can be picked up by a short range receiver. In the first instance RFID is being used to label pallets and cartons, but as prices drop the smart tags could be attached or incorporated into single garments. The technology opens up the possibility of tracking items at the piece level, which should lead to greater efficiencies in the supply chain and even more precise inventory control. RFID technology will start to matter for any developing country supplier that is providing labeling and packaging.

The data provided by RFID will be available in real-time and therefore offers a means to the most precise type of monitoring of the supply chain—at least from the point when the smart tag is fitted. This will bring great benefits to retailers, which in turn will expect their suppliers to accommodate the new technology. However, managing the large amount of data which RFID makes possible will be a new challenge.

3.2.10 Mass Customization

The swift collection and transmission of data has created the potential for garments to be manufactured for an individual customer at an affordable price—the so-called “lot size of one” or “mass customization”. The process depends on the possibility of being able to track an individual item through the supply chain, something that has become possible with ICT. Implementation usually involves these steps:

- A customer visits the store, where a body scan machine provides the necessary measurements. Alternatively, this can be done manually in store, or provided direct by the customer from self-measurement, and input to a website.
- The measurements and other details of the order (color, number of units etc) are transmitted by internet to the supplier factory.

- Made to Measure software generates the pattern.
- The fabric is cut and the garment manufactured.
- The finished item can be shipped direct to the customer or to a specific store.

A turnaround time of less than a month is usually possible. Only suppliers with the appropriate technology will be able to support a retailer offering this option as it demands a swift information flow from the shop floor to the production line and then back again.

3.3 Barriers to Entry

Many developing country garment producers were simply unaware of how key information technologies were changing the patterns of trade in textiles and garments. Recent research shows low online exchange of documents and only limited digitization and integration of commercial activities among developing country producers. Somewhat more common was “e”-collaboration in product development.²¹

There can be several obstacles that hinder the uptake of ICT in low-cost supplier countries, including:

- lack of knowledge about available technologies;
- low awareness of the expectations of buyers in the US and EU;
- inability to access capital to fund the necessary investment;
- shortcomings in the wider business environment;
- low levels of existing IT equipment or incompatible systems;
- cultural barriers to information sharing; and
- Lack of awareness of upcoming technologies.

Making the transition from a low-tech operation to a business that can be integrated into an ICT-enabled value chain is daunting without adequate support. Most businesses choose to implement any electronic processes in an incremental fashion. The first step, which the majority of suppliers have already made, is simply an e-mail account and internet access. A reliable internet connection and a password is all that is needed to gain access to a customer’s internal network where orders can be

managed electronically. Introducing ERP to improve efficiencies on the production line can also be done in small, modular steps over an extended period of time. And once this is achieved, the new information and data can be shared with customers, and greater integration of the value chain achieved.

For a virtuous circle to be attained, workforce involvement is of key importance. Problems can arise from opposition to changes in working practices and unfamiliar systems. Resistance is best countered by clear explanation that the new technologies offer the potential to improve business systems (thus safeguarding jobs by retaining customers). The level of apparent surveillance that ICT systems provide can often appear more of a threat than a benefit to employees at all levels of the company.

The implementation of technology needs to be part of overall management goals, which include devising business strategy, nurturing customer relationships and overseeing production and product development. An appropriate management structure thus needs to be introduced which will integrate the way the company is organized with the new ICT technology. The traditional approaches to business must adjust. Considerable cultural and organizational changes are necessary within companies (whether in a developed and developing country) that have previously seen themselves as isolated entities, rather than as part of an integrated virtual extended business.

Some supply chains are considerably more complex than others, and a highly-mechanized manufacturer of commodity garments will find it more attractive and simpler to implement some of the ICT systems described earlier than a low-tech producer of more specialized products. In later sections, we look at several companies that have embraced new forms of ICT. But this first case study looks at a successful firm (which did not want to be identified) whose supply chain demonstrates the considerable challenges when implementing ICT with developing country suppliers.

²¹ Knappe, 2004b.

Case Study: Company X

Company X is a European retailer of women's and children's garments, including craft-oriented product designs demanding a high level of hand-work during manufacture.²² The company's sales have almost doubled since 2000, which has meant a correspondingly fast expansion of the supplier base. About 60% of the firm's garments are now sourced in China, a further 30% in India, and the remainder from Turkey and Europe including some former Eastern bloc countries. The company's main office is in London, with sourcing units in Delhi and Shanghai.

The company's Indian operations provide a useful illustration of how the use of ICT can be restricted by the realities of a complex supply chain in a developing country. A complex garment may take several weeks to manufacture, often relying on a range of time-consuming beading and embroidery skills. Unlike a commodity garment manufacturer with an automated factory production line, this firm's fragmented supply chain includes thousands of village home-workers. In this context, ICT plays an important role for the Indian suppliers, but the key technologies are mobile phones, digital cameras and e-mail, rather than cutting-edge software applications.

A selection of styles is made each month in London for delivery six months hence. In India, the sourcing office will then liaise with the head offices of the Indian manufacturers to agree on designs, obtain samples, and set timetables for each stage of getting a product to market. An Indian supplier may have its head office in Delhi, but will commission production from around the country. This part of the manufacturing supply chain is therefore far from transparent.

The Delhi sourcing office is on the internet and communicates with the Indian suppliers via e-mail, telephone and fax. The supplier head offices usually rely on mobile phones to contact their regional staff when they are out on the road, as mobile coverage is generally good. The handworkers are often in villages that do not have electricity, let alone fixed line telephones, and the suppliers must physically travel around the villages to deliver piece-work and pick up finished items.

The dilemma for the company is that a factory with more structured supply base would mean losing the individuality and hand-embellishments of the garments. Furthermore, relationships with suppliers in India in some cases date back more than 20 years. One technology that has proved very useful in India is the digital camera. If a supplier has a problem, or a question, then photographs can be taken of the various garment options and e-mailed around all the relevant offices for a decision. This saves time at a key stage of the production process, and avoids the risk of losing samples sent by courier.

In the London office, a Product Development Management (PDM) system is linked to a small number of suppliers. Although at a very early stage, one Indian supplier is now also setting up a factory which will introduce some basic ERP technology and Company X would be keen to see other factories start installing basic tracking systems. As with all garment retailers, the priorities are product quality and speed-to-market.

The company has the following checklist for the attributes it looks for in a potential supplier:

- Design innovation. Most of the design work takes place in the UK, but some existing suppliers now produce their own samples which are couriered to London for inspection. The company would welcome more design input as a potential source of competitive advantage.
- Ability to translate design sketches into actual garments.
- Procedures and management systems. This is becoming more important given the growth in sales volumes, and the need to track orders more systematically.
- Innovative thinking with regard to applications, such as computerized cutting systems and pattern management.
- The potential to grow capacity as Company X expands.

In the post-quota environment, there are no plans to transfer garment production away from India to China, although the mainland has won a large share of new business as the retailer has expanded. The two countries offer different strengths: China is

²² The company asked to remain unidentified as a condition of providing information it considered commercially sensitive.

strong on rapid response and is skilful at producing exact copies of samples, while Indian suppliers offer specific craft skills and are often more innovative and flexible. The Indian suppliers may lack ICT but they are offering particular niche skills which have so far protected their business.

3.4 How Does ICT Affect the Value Chain?

The decision by a garment maker to invest in ICT can be made for both negative and positive reasons. In the former case, a supplier may have been told by a customer that compatible ICT systems are now necessary even for existing business to be retained. Or a developing country manufacturer may start to find it impossible to win new business without being able to offer the level of service which is enabled by the use of technology. In these cases, ICT can be a prerequisite for retaining competitiveness in the global marketplace.

But what about the more positive reasons for investing in ICT? As already indicated, some of the benefits of technology include:

- improved supply chain management;
- reduced supply chain costs;
- shorter lead times;
- efficient information exchange;
- creation of “virtual networks”; and
- ability to handle smaller batches.

The next step is for a developing country company to assess what opportunities can be created for moving into higher-margin, more profitable areas of the value chain by utilizing appropriate ICT.

ICT is a key tool in enabling a small- or medium-sized supplier to offer a “fuller package” service, even if it cannot do everything. Sourcing fabric is more practical with e-enabled systems, both in terms of

identifying suppliers and also implementing orders (the garment manufacturer assumes the role of buyer in this transaction). Most developing country garment manufacturers do not have their own textile operations, but a “virtual” link can be established with a fabric manufacturer, securing a measure of vertical integration, even if actual material samples will always be necessary. Standardized items for trim, such as zips and buttons, are readily purchased using B2B systems. At the other end of the factory production line, logistics and shipments are best handled and monitored using ICT. If the buyer wants the supplier to manage inventory control as well, then this too is achievable with ICT. Thus even a modest-sized garment manufacturer can be in a position to offer a full package service thanks to electronic commerce tools.

In the post-quota environment, companies wanting to compete against their competitors in China, India and Bangladesh will need to offer a premium level of service, which relieves the retailer of many traditional activities. The ability to exchange quite complex information over the internet opens up the possibility of suppliers in developing countries starting to collaborate in the early stages of the value chain, including product design and development. Again, the ability to take part in such work makes a supplier attractive and means higher-margin work. And in this part of the value chain developing country suppliers may be able to offer fresh, creative ideas. Efficient US border entry will also depend on an increased use of electronic information systems.

In conclusion, product and process innovation are now the key to survival in the textiles and garments industry. ICT is an important piece in the very complex puzzle which makes a developing country manufacturer globally competitive. Two contrasting manufacturing bases—China and Mauritius—are considered in the following sections in order to start understanding the wider picture of success or failure in the textiles and garments industry.



The Rise of China

4.1 A Global Leader

China joined the World Trade Organization in 2001, thereby becoming a signatory to the Agreement on Textiles and Clothing (ATC) and the phase-out of MFA quotas. Since then, Chinese-made clothes have rolled out in expanding volumes from increasingly sophisticated mainland factories, mainly destined for the US, European Union and Japanese markets. Between 2000 and 2004, China's clothing exports jumped more than 70% to \$61.9bn.

Unlike some of its potential competitors, China is also a big producer of raw materials and has a thriving domestic textile industry. This offers the scope for both vertical integration within the country, and rapid export growth across the textiles and garments value chain. Despite the increased domestic demand from its own clothing industry, China's textile exports still managed to double between 2000 and 2004. Textile imports have shown a more modest rise over the same period, but

remain very sizeable as China's garments factories still need to bring in yarn and fabric from other countries to meet their sourcing requirements. It is estimated that about half of China's exported clothing is made from imported textiles.²³

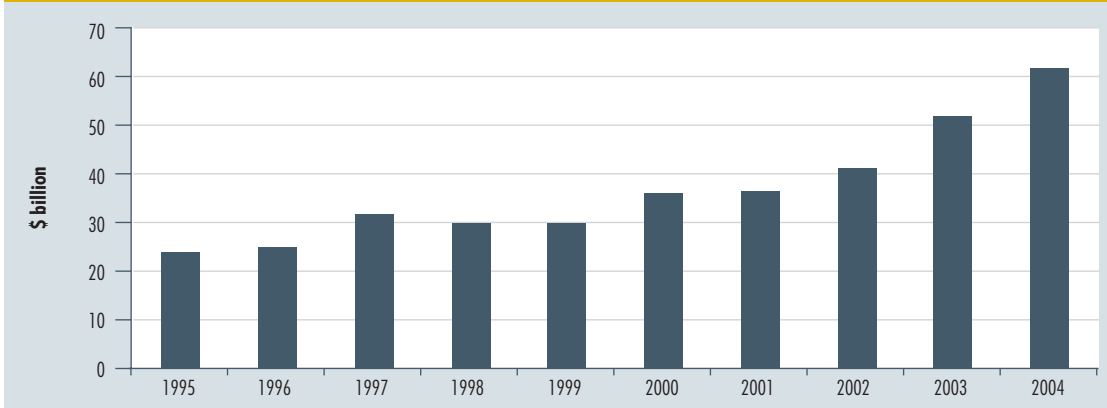
All this textile and garments activity has pushed up China's demand for raw materials, often exhausting the country's own domestic supply. China is, for instance, the world's biggest cotton producer, but its consumption now exceeds what its own cotton fields can produce. China is also a big importer of wool and of textile machinery and parts.

4.1.1 Poverty Alleviation

It is China's success at capturing the global garments market that has become the dominant feature of the whole value chain. Often this is presented simply as a threat to clothing businesses in both developed and developing countries, with the latter warning of

²³ ILO, 2005.

Figure 4. China: Clothing exports (\$bn)



Source: WTO International Trade Statistics 2005, and WTO Background Statistical Information with Respect to Trade in Textiles and Clothing, September 2004.

the poverty implications for their unemployed garments workers. Yet **the expansion of an export-oriented textile and clothing sector has played a big part in the strides towards poverty alleviation within China itself.**

In the years before economic reform, mainland China's textile-related industries were dominated by large, inefficient and over-manned state enterprises, and the structural adjustments demanded by reform resulted in an estimated 1.4 million textile and garment workers (mostly middle-aged women) losing their jobs. Without the surge in exports, the number of people made redundant would have been far greater. Today, the textile and garments industry employs 19 million workers (22% of the total employed in manufacturing industry), and another 80 million are indirectly dependent on the sector.²⁴

4.1.2 China's Attractions

When China first began its economic reforms under Deng Xiaoping in 1979, garment manufacturing was an obvious place to start the industrial modernization process. Garment factories were low-tech, did not need high quality workmanship, did not require huge amounts of capital to set up, and employed lots of people, even though the work did not pay very well. Restructuring hence started in the textile and garments industry earlier than in many other sectors, thereby initiating a process which would create globally competitive Chinese companies. It is estimated that only 13% of China's textile and garment sector is now state-owned. Of the remaining 87% in private ownership, 15% is foreign-owned and 15% is held by businesses in Hong Kong, Macau and Taiwan.²⁵ From early on, China's garments industry had the benefit of the attention of businessmen from Hong Kong, traditionally a major garment exporting center, who were the first to recognize the potential benefits of shifting production to lower-cost mainland factories.

Two decades later, what are the reasons for China's remarkable success at winning overseas customers for garment manufacture? It is far too simplistic just to point to China's plentiful supply of relatively cheap labor. **Chinese wages are relatively low, but they are not the lowest.** Nowadays China's workers are more expensive in terms of hourly pay than their counterparts in many competing Asian countries such as Vietnam, Bangladesh, Cambodia,

India and Indonesia. The Youngor company (see China Case Study A) competes successfully in the global garments business and says it pays its workers between \$150 and \$300 a month, much more than competitors in several neighboring countries. There is also no independent trade union representation to lobby for higher wages and improved labor rights.

Overall, the cost of a garment's production including labor costs is important, but it is not the decisive factor in competitive success. The average cut-make-trim cost of a men's woven cotton shirt is actually one-third higher in China than in Bangladesh, for instance, and the FOB price (price for completed garment) is 58% higher. **Where Chinese companies score highest is by offering a combination of a low-cost and disciplined workforce, vertical integration with textiles and other suppliers, a full-package service, and state-of-the-art machinery including ICT.** Fabric and trim can be sourced from within China, saving time and cost, and meaning that a garment manufacturer can control more of the supply chain. Chinese companies are increasingly able to offer everything from design input, through sourcing and manufacturing, to packaging, customs and shipping services. The result is speed-to-market for high volume orders, efficiency, and reliable quality. All of which means China can justify higher prices than its low-cost developing country competitors. The scale of the country's textile and garment industry enables mainland China to compete on any product and at all quality levels in the market.

The most successful factories in China today work with production line technology and ICT that is often on a par with the machines and software in use at developed country manufacturers (see Case Studies). The large flow of foreign direct investment into China over the past decade, including into the textiles and garments industry, has set benchmarks for domestic companies to follow in terms of the use of up-to-date machinery, and has given Chinese managers relevant expertise. **Chinese managers have been quick to embrace ICT, and in some cases are as innovative in their chosen business models for their own domestic market as any of their foreign customers are in their home mar-**

²⁴ ILO, 2005.

²⁵ *ibid.*

BOX 5. *The China Syndrome:*

- A productive, low-cost workforce
- Vertical integration
- A full-package service
- Speed-to-market
- Up-to-date technology including ICT
- High volume production
- Reliable high quality

kets. But technology is only one element of the total business package offered to the foreign buyer.

For several years, China has been much more than a supplier of low-margin, low-price commodity garments. The restrictions of the quota system have in practice encouraged Chinese manufacturers to move up-market in terms of producing higher-margin, more expensive items. **Quotas have thus, perhaps perversely, pushed Chinese companies into precisely the part of the supply chain which US and European manufacturers had hoped to defend as their own. Made in China cheap T-shirts are increasingly giving way to Made in China design-label outfits.** Improvements in the Chinese textile and garments industry have also been driven by domestic demand, both in terms of scale and the increasingly sophisticated fashion tastes of the country's 1.3 billion people. Data from China's National Bureau of Statistics shows that expenditure on clothing grew 41% in real terms between 1999 and 2003. China's global reputation is as an unstoppable clothing exporter, but around 80% of its vast clothing production is sold domestically.

4.1.3 Exports to the US

An analysis of mainland China's clothing exports to the US demonstrates the breadth of the product range that by 2004 meant China accounted for 19% of the US's total clothing imports. The impact of the end of MFA quotas has therefore been felt right across the market for textiles and garments. Surges in Chinese imports can be seen in product categories both large and small in value terms. The impact of the end of MFA quotas has therefore been felt right across the market for textiles and garments. Data from the Foreign Trade Division of the US Census

Bureau demonstrates the large increase in Chinese exports to the US market in the first nine months of 2005, (before new temporary restrictions were agreed in November).

4.1.4 Government Support

China's textile and garments manufacturers also benefit from a number of wider policies adopted by the Chinese government help assist all export-driven sectors:

- The yuan's de facto peg to the US dollar, maintained at a level that critics allege significantly undervalues China's currency, makes exports far cheaper to the rest of the world than might be the case if the currency was allowed to float.
- China additionally gives all exporters big tax breaks, so in effect a state subsidy.
- Companies which have needed capital for investment have also for several years benefited from easily-obtainable credit from the state-controlled banks, although excessive fixed asset investment has tightened the supply of loans in some over-heated sectors of the economy in recent years.
- In practice (although legislation says otherwise), standards of intellectual property rights, environmental controls and labor protection are often less rigorous than in competing countries, with a consequent (and possibly short-term) cost advantage.

As Chinese garment manufacturers have expanded, the government has encouraged them to move downstream into retail, and upstream into fabric manufacturing, all of which has promoted the ability to offer overseas customers the desired full package service.

At the same time, sourcing textiles and garments from China also has its challenges. Shortages and a lack of capacity for producing some finished fabrics means that large quantities of fabric still must be imported for use in the clothing industry. Developing country suppliers therefore need to understand what their Chinese rivals are offering buyers if they are going to try to compete. That package provides a range of attractions, including ICT. But just as elsewhere in the world, there are big differences between the large-scale commodity producers in China, and the smaller lower-tech businesses.

TABLE 3. US Imports of Textiles, Textile Products and Apparel from China

Naics Code & Description	Jan-Sept 2005 (\$1000's)	% Change
Total, All Textiles and Apparel	20,352,589	50.4%
313111 Yarns	11,515	13.5%
313113 Threads	6,948	110.8%
313210 Broadwoven Fabrics	424,337	28.5%
313221 Narrow Fabrics	81,626	27.7%
313230 Nonwoven Fabrics	25,938	191.1%
313249 Knit Fabrics and Lace	98,881	106.7%
313312 Textile and Fabric Finishing Mill Products	1,431	190.5%
313320 Coated Fabrics	76,981	71.9%
314110 Carpets and Rugs	227,605	4.4%
314121 Curtains and Draperies	490,623	28.7%
314129 Other Household Textile Products	2,101,466	43.4%
314911 Textile Sacks and Bags	57,464	64.8%
314912 Canvas and Related Products	283,484	6.5%
314991 Ropes, Cordage, and Twine	83,448	36.5%
314992 Tire Cords and Tire Fabrics	20,193	329.2%
314999 All Other Miscellaneous Textile Products	973,224	20.0%
31511X Hosiery and Socks	166,839	-3.6%
315221 Men's and Boys' Underwear and Nightwear	184,458	218.4%
315222 Men's and Boys' Suits, Coats, and Overcoats	216,180	197.2%
315223 Men's and Boys' Shirts (Except Work Shirt)	851,049	73.6%
315224 Men's and Boys' Trousers, Slacks, and Jeans	587,868	68.0%
315228 Men's and Boys' Other Outerwear	1,074,084	140.2%
315231 Women's and Girls' Lingerie, Loungewear, and Nightwear	1,082,932	57.3%
315232 Women's and Girls' Blouses and Shirts	2,111,384	61.2%
315233 Women's and Girls' Dresses	521,343	27.3%
315234 Women's and Girls' Suits, Coats, Tailored Jackets, and Skirts	1,643,648	129.2%
315239 Women's and Girls' Other Outerwear	3,313,320	87.1%
315291 Infants' Apparel	926,845	14.8%
315292 Fur and Leather Apparel	693,646	-8.7%
315991 Hats and Cap	504,415	17.8%
315992 Gloves & Mittens	362,407	13.4%
315993 Men S & Boys Neckwear	91,129	43.7%
315999 Other Apparel Accessories	1,055,875	15.3%

Source: US Census Bureau, Foreign Trade Division

Suppliers in other low-cost countries need to decide where in this spectrum they want to compete.

China Case Study A: The Youngor Group

Youngor is China's largest integrated textile company, with world-scale fabric manufacturing, garment making and retailing capabilities. It is based in Ningbo city, near Shanghai, in China's eastern Zhejiang province, and was established in 1979 by a small group of politically astute entrepreneurs.

The company began life as a garment manufacturer and grew through acquisitions, until in 1995 it began establishing its own retail network. Three years later, in 1998, Youngor listed on the Shanghai Stock Exchange, where it quickly became a star performer. It used the new capital it raised to expand its retail operations and currently Youngor has more than 100 branches, 400 exclusive shops and 2,000 retail outlets in China. In 2002 Youngor also began to implement an upstream project to manufacture fabric, and today it is a vertically integrated company with 25,000 employees, making 10 million shirts, 2 million suits and 20 million pieces of miscellaneous garments, mostly sportswear, annually.

The company's manufacturing operations have a reputation for quality, and can charge foreign clients a premium over what they pay other local suppliers. It is an OEM (original equipment manufacturer) for overseas brands such as Nike, Gap, Marks & Spencer, Next, Ralph Lauren, and Pierre Cardin, who sell the garments under their own brand names. In 2004, the group had total revenues of \$1.6bn and net profits of \$76m.

ICT and Production

Xiao Lihua is Youngor's Chief Technology Officer (CTO), based in Beijing where the company's 80-person IT center is headquartered. As a large company with very high volume production, it can achieve the maximum benefits from what ICT can offer. Xiao says Youngor "just could not function without ICT today", and that "continuing investments in technology were essential" for the company to maintain its competitiveness. "Today, the main issue in the textiles game is the ability to execute

quick turn-around," said Xiao. "Next is quality [of goods and client services], then cost-control and then quality of management." Youngor's entire supply chain and ICT infrastructure, which required an annual budget of \$15m last year, has been built to achieve these advantages.

In both its textile and garment production units, Youngor uses Enterprise Resource Planning (ERP) applications that manage processing of orders, purchasing patterns and volumes, production planning and shipping

The textile unit uses a custom-built application, while the garments unit runs an ERP application called Movex, developed by the Swedish company Intenia. "Since we link both systems we can coordinate the production of textiles with the making of garments. This allows us to reduce its inventories, lag times and production costs," Xiao said. ERP applications "also reduce order processing time, which used to be one week, to just 10 minutes."

Today, all Youngor's overseas OEM order production is done on a made-to-order (MTO) basis and uses just-in-time (JIT) production processes, which means the company carries little or no stock for its overseas customers. The efficiencies that these ERP applications bring to the production process means that Youngor can now "turn around a 100,000 piece order for T-shirts from Nike in a week to 10 days," whereas it previously took three to five months, says Xiao. "This quick turn-around cycle pleases foreign clients who can now release 2-3 different lines" during each season instead of just one, Xiao said. This is extremely valuable given how fast tastes change these days, he added.

All production for Youngor's retail sales in the Chinese market is done on a made-to-stock (MTS) basis, and demand forecasting is achieved by linking production to the point-of-sale applications that run in all Youngor's retail locations. That way, the system predicts in, for example, January what the demand for an item will be in March. Production can then commence in advance to allow for the time needed to get the garments into the store for March.

One often overlooked advantage of automated order processing is that it also reduces the stress and frayed relations caused by human errors during manual order processing, Xiao said. All in all, "it's because of

these advantages that OEM clients pick us,” he said. “They pay us RMB 15 (\$1.95) to make a shirt instead of RMB 10 (\$1.20) others charge because they know we can deliver. The small companies that use manual processes are losing out every day to us. They just cannot react as fast as us.” Though Xiao said he had “not yet calculated the return on investment” for his ICT investments, “it is certainly a lot, a lot, a lot.”

To further ease the minds of foreign customers, Xiao said he could also give them the ability to track their orders through Youngor’s production and shipping systems, though he said none of them have requested this facility so far. “They already trust us,” he said. “We have a track record.”

While focused on improving performance, Xiao said it was also important to cut IT costs, and to do this he said Youngor had embraced some innovative ideas. The textile ERP application sits on local servers and is managed in-house, but the company has “contracted with a US-based Application Service Provider (ASP) for access to Movex,” Xiao said. This has kept Youngor’s overheads low “as it removed the need for the company to hire expensive ERP experts.”

In addition to the ERP tools, various departments in both the textile and garments factory also use different Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM) tools. Using these tools allows designers to create new fabrics in as little as a day, when it previously took months, Xiao said. These CAD tools are also useful in working with small companies, which was as

important as working with big clients, Xiao said, because some “small companies will be big tomorrow.” The garment factory has still retained some traditional skills, like how to reverse-engineer a T-shirt. “Some small companies just give us a T-shirt and say ‘we want this but with this and this changed,’” Xiao said. “So we use CAD to analyze the t-shirt and make more just like it.”

Lastly, Youngor’s managers in the factories also use personal PCs, equipped with e-mail, and they also have access to corporate-level financial and human resource ERP packages.

Distribution and Retail ICT Tools

Every one of Youngor’s 2000-odd distribution and retail centers runs a point-of-sale (POS) application on a company network. Every time a customer buys a product—for example, a shirt—the POS software records the brand, model, size, color and so on. Then, at the end of the day, it creates a report of all the sales made and this report is used by the company to do the following:

- *Replenish stocks.* By keeping track of exactly what items are being taken off retail shelves and establishing a pattern of store sales, the distribution centers know exactly how to restock every store. “For example, store A might sell lots of pants on the weekend, while store B might sell lots of shirts on weekdays,” Xiao said. “The POS application will allow each store to be replenished with the products it needs in time for its peak sales period.”

BOX 6. *Made to Measure*

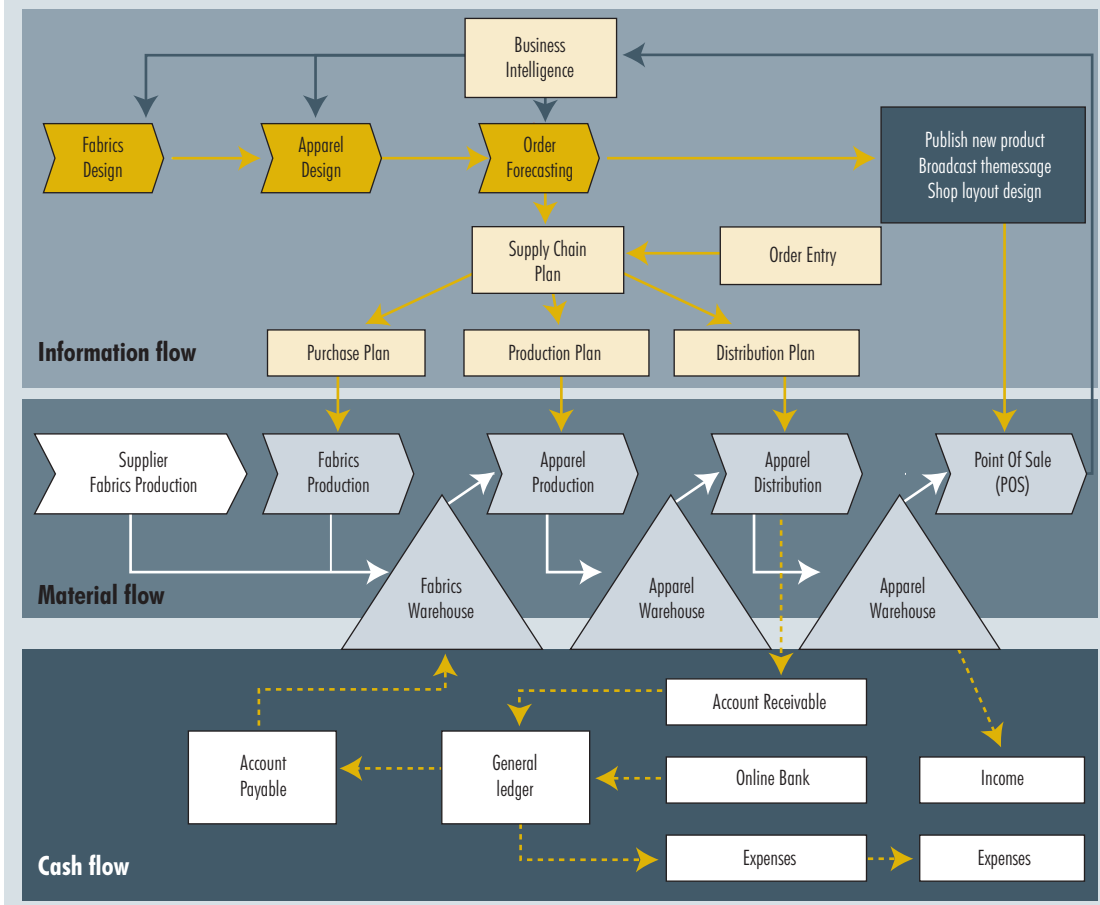
One ICT-based innovation Youngor is rolling out in its stores is what the company calls “mass customization”. This system is integrated with Youngor’s production IT infrastructure, and works like this:

- Every major Youngor store has a computer that scans and takes computerized measurements of a client’s body.
- These measurements are then forwarded to the factory, which in turn orders from the textile factory the material required to make the one-off item of clothing.
- Once it receives the material a machine custom-tailors it to “fit” the computer scans.
- The finished product is dispatched to the store or the customer’s home.

The system is based on a Japanese application called COSTAR. Not only does Youngor charge a 20% premium for this service, while only spending 10% more in costs, the novelty of the idea is attracting lots of people into the stores. Xiao Lihua said the company expected to grow its mass customization business by 25% a year, and this revenue stream would be impossible without the technology.

None of Youngor’s overseas customers have yet asked the company to provide this service, but a similar level of customization could be offered internationally. “So someone could order a suit in London that we make in Ningbo,” said Xiao.

Figure 5. Youngor's Integrated Purchase-Production-Distribution-Retail Information System



Source: Youngor

- ABC analysis.** By tracking what styles, colors, sizes etc. are selling the company can more accurately estimate “which products are ‘hits’, which are not, what (current) consumer tastes are, and what to produce” going forward. For example, while reading a previous week’s report for Beijing city, Xiao could see that though Youngor had 280 shirts out on the shelves, just 12 styles were accounting for 53 percent of all sales, while 163 accounted for only 20 percent of all sales. Hence, Xiao intended to use this information to increase production of those 12, and other similar shirts, while cutting the production of the 163 unpopular designs. Significantly, the POS system is so

well integrated into the ERP applications at the factories, Xiao could even identify which design teams were responsible for the successful and unsuccessful designs and pass this information on the company’s management.

Corporate ICT tools

At the corporate level Youngor maintains the following ICT tools:

- A website, which it sees as a bare necessity for any company.
- An email system, also seen by Youngor as indispensable.

- A financial ERP system developed by a local company called UFSOFT, which helps the company keep control of its cash flow and in compliance with local laws.
- A human resources ERP system that allows the company to track, evaluate and manage its 25,000-strong staff. The system manages their payroll, evaluations, employee records, leave schedules, etc.

Perhaps most importantly Xiao uses a Business Intelligence (BI) application that “acts as the umbrella application for all the different IT tools he has in the company.” He chose a tool called PowerPlay by a US-based company, Cognos, and its essential function is to integrate all the tools and capabilities in the company and help administer and manage them. “Without this we would be dead, in more chaos than if we had no IT,” Xiao said. A schematic diagram of how Youngor’s information flows interact with the production and financial structure of the business is shown below.

The Wider Business Environment

The biggest challenge currently facing Chinese textile companies is constant change. “There are so many quick changes today. It makes it tough to plan, and it keeps costs high as we usually get lots of unsold stock [for the domestic market],” says Xiao. The solution is using ICT to speed processes and using services such as mass customization to keep clients happy, he said. Competition is also rising rapidly, both within and outside China. “In 1995 we didn’t have any IT but it was OK; there was no need for things like demand forecasting because whatever we made, we sold,” he said. “Today, almost every manufacturer has overcapacity and can make products of good quality so we have to fight for buyers.” In his view, the biggest threat is from countries such as India, and the speed at which they are developing the skills and scale to compete with China.

China Case Study B: Hanbo Textile Company

Hanbo is a mid-sized garment and textile manufacturer based in Hangzhou city in China’s eastern Zhejiang province. The company specializes in producing woven ladies garments, such as suits,

casual wear, pants, skirts and dresses in wool, linen, cashmere, and synthetics.

Some 75% of Hanbo’s revenues come from manufacturing for foreign brand name clients, such as Gap, Jones New York, Liz Claiborne, Ann Taylor, Nine West, and Next. But the company also brands and sells its garments in the local market through a network of 100 stores in China’s largest cities. Hanbo has developed two of its own brands, Hailives and Hempel, and has also entered into a joint venture with the US firm John Paul Richard Inc. to manufacture and market its designs in China.

Gao Zhiwei, Hanbo’s general manager, said the key reason for the company’s success has been “our ability to provide better service and quality.” The company secures a lot of repeat business, which helps keep costs down. For example, Hanbo has an efficient booking system and plans orders almost a year in advance with big clients who buy more than 1 million units a season.

In order to meet demands from overseas customers for fast turn-around times, Hanbo has decided to pursue a program of backward integration, which it feels will give it greater control over its production lead times, manufacturing schedules and quality. As a first step, the company has set up its own dyeing plant where it can color and pattern grey fabric, in collaboration with a Spanish company, Textile Santanderina. “That’s the trend in the industry,” said Gao. “Competition is very tough so you have to do something different and create a differentiated product.” To fund this expansion, as well as other improvements in its manufacturing and marketing, Hanbo plans to list on the Shanghai Stock Exchange by the end of 2006.

Currently, Hanbo’s 3000-employee operation can produce up to 10 million garments a year and 40 million yards of dyed cloth. But the company is not operating at full capacity. Its 2004 revenues were \$86m. Hanbo did not give an exact figure for its net profit, but said its operating margins were 10%–15% on manufacturing for overseas customers and 25%–30% on local sales.

Gao said that Hanbo is competitive because “China is now an open market. We can import any technology and equipment we want.” He added, “And of course we have cheap labor; that is a key reason.” He

said his employees earned an average of between \$120 and \$150 a month.

ICT Infrastructure

Investments in IT will also constitute a large part of Hanbo's expenditures in the future, said Gao. "We started making lots of investments in 1997 because, though we are a smaller company, we felt that as we grew we must get more and more IT to manage the business part as well as the technical part of our company. It was a good decision and now we have many advantages over others."

Since 1997 the company has spent more than \$20m on building its IT infrastructure. Gao said it had increased efficiency by at least 30%.

Currently, Hanbo has a 100-strong in-house IT team whose budget for the current year is \$1.25m. The focus will be to complete the rollout of a new ERP solution made by Fastreact Enterprise, a UK company, which Hanbo purchased and began implementing last year. "We couldn't work without Fastreact now because it controls our entire supply chain," Gao said. "This allows us to see the entire manufacturing system, for both overseas customers and China, right from production to delivery." Significantly, Gao said the \$110,000 this system cost had already been paid for by cost savings, which may grow in future.

Hanbo plans to invest even more in ERP by buying additional modules of the Fastreact system, with the aim of computerizing and by the end of 2005 Hanbo had computerize its entire order processing, purchasing, production planning, distribution and marketing operations.

The company also has its own website and e-mail system, which are seen as necessities. At the corporate level, almost all its managers have their own PCs and different departments use various human resources packages, financial tools, and reporting software.

At the retail level, all Hanbo stores run a custom-built Point of Sale (POS) application. These systems "can now connect information between the fabric unit and the garment factory and our shops and we can get all the information we need all the time. So our demand estimation is better, which makes stock management and so the production process go much more smoothly," said Gao.

Within Hanbo's factories, its textile engineers and designers also use advanced CAD/CAM systems. Previously the company cut the patterns for its clothing out on paper. It now uses a computerized pattern-making system that helps to make new patterns and designs. "Previously, it took 4–5 days to make a good pattern, now we can do it less than 1 day," said Gao. The design desk also uses a color-reading system from Germany's Hanover University called ColorExpert. The company also owns a computerized system to analyze garments and find the best way to tailor them, developed by General Sewing Data, a Preston-based UK company.

"The advantage of these systems", said Gao, "is that we can always produce the perfect cut and color, which is very important for women's clothes. We have to give clients exactly, and I mean *exactly* what they want. They must see us as extensions of their own business."

4.2 Temporary Suspension of Quota Removal

Faced with surging Chinese imports after the demise of the Multi-Fibre Arrangement quotas on 1 January 2005, the US initially invoked safeguard quotas on 19 categories of textiles and apparel including knitted fabrics, cotton and man-made fibre dressing gowns and bathrobes, and cotton and man-made fibre bras. Buyers were therefore forced to continue to source products outside China. The EU similarly launched investigations into the market impact of burgeoning imports from China.

The textile and garments industry in 2005 was dominated by months of uncertainty as trade negotiating teams from Washington and Europe wrangled with China over broader export restraints. Amid protests from Beijing, this culminated in separate agreements to re-impose quotas on China for certain categories of products.

While the revived quotas were bad news for retailers and consumers in the US and EU, the new restrictions have provided much-needed breathing space for developing countries as they continue to search out ways to maintain a competitive textile and

BOX 7. EU – China Agreement

The European Union launched investigations into nine categories of imports from China at the end of April 2005, including T-shirts where import volumes had increased by 187% in the first four months of the year.

- In June, import quotas were reintroduced by the EU on 10 categories of products from China, under the safeguard rules.
- The new restrictions came into force on 12 July 2005 and set limits for the rest of 2005, 2006 and 2007.
- The quotas allowed a maximum increase in import volume of between 8% and 12.5% per year.
- As soon as the new limits were announced, a rush of imports from China meant that the quota ceilings were swiftly reached.
- This left more than 77 million garments—including jumpers, T-shirts, blouses and bras—stranded in port because their import would breach the new limits.
- In September, the EU and China finally agreed that half the blocked goods would be waved through, and the other half would count against China's 2006 quota limits and unused categories.

clothing sector. The respite is only temporary, but the most vulnerable companies in other countries can now benefit from the opportunity to improve their manufacturing operations, and to seek out niche markets which potentially offer a longer-term future.

The new quotas on China are also particularly helpful for other WTO-member countries, such as India, as their textile and garments have been quota-free since the beginning of 2005, allowing them to increase exports. The challenge for developing country manufacturers will be to make the most of the opportunity offered by re-imposition of quotas on China.

The rebirth of restrictions on China's exports will encourage companies to negotiate ways through the quota system, some of which will benefit other developing countries:

- China will continue to shift towards the manufacture of better quality and higher price items in the categories that are covered by quotas, in order to maximize profit margins. This means that other developing countries can increase market share in mass-market products such as basic T-shirts.
- Opportunities will be exploited by Chinese firms in product categories that are not restricted.
- Chinese companies will themselves look at whether to manufacture overseas in order to avoid the trade barriers and benefit from lower wages. Nie Zhenhong, a senior manager at Nanjing Textile Import and Export Company said her company had set up processing plants in Mongolia and Vietnam to avoid quota restric-

tions.²⁶ China's foreign investment in textiles and clothing in other countries had reached \$500m by mid-2005, supported by government policies offering preferential loans and simplified administrative procedures.²⁷ Official textile trade delegations in 2005 visited Tunisia, Morocco and Bangladesh to assess areas for cooperation. Such moves offer business opportunities for a number of other countries.

- Orders placed with manufacturers in Hong Kong (which is not restricted by quotas) often lead to a large part of the production being outsourced to mainland China under the Outward Processing Arrangement (OPA). The garments remain outside the quota system so long as their "major transformation" occurs in Hong Kong. Production costs for these well-traveled clothes can be 35% higher than an equivalent wholly mainland-manufactured item, but the final price can still be competitive with goods from Thailand or Indonesia, for example.

4.3 Winners and Losers

Two factors combine to make a garment-manufacturing country vulnerable to China's inexorable rise and the effect of reduced quotas.

First, the impact of the global system of quotas has meant garment manufacturing has expanded in some countries simply because of the distortions

²⁶ Chinadaily.com, 2005.

²⁷ ILO, 2005.

BOX 8. US – China Agreement

After months of negotiations, the US and China finally reached agreement in November 2005 regarding new quotas on Chinese textile and garments imports.

- The three-year pact allows for escalating annual import growth rates for 34 individual categories of Chinese-made fabrics and apparel, including knit shirts, cotton pants and underwear.
- The 34 categories account for about 46% of Chinese textile and clothing exports to the US.
- Growth rates on most clothing products are limited to 10% in 2006, 12.5% in 2007 and 15% to 16% in 2008.
- The pact ends on 31 December 2008.
- The 34 categories include the 19 that were covered by safeguard quotas. The three-year agreement means that China will be able to export 3.2% more in these 19 categories than if the safeguards had been extended until the end of 2008.
- Safeguard quotas can still apply on items not covered by the deal.

Bo Xilai, China's Commerce Minister, said that while the agreement was "still a far cry from our original expectations" of free trade in textiles and apparel, the stability it brought "a win-win result."

caused by these restraints, and without any underlying economic or commercial logic. Some of these countries may have had to import all their fabric, or may be geographically remote from the major clothing retailers. But the scope for quota avoidance and tariff-free access to Western markets has created a thriving textiles and garments sector in some cases.

Second, clothing has traditionally been a very labor-intensive, low-tech industry relying on large numbers of low-paid, mostly female workers. This made the business an ideal candidate for outsourcing to low-income, developing countries that do not have many other manufacturing industries.

The result is that clothing exports account for a very large proportion of total merchandise exports in a number of countries. In 2004, for example, clothing provided more than 40% of total merchandise export revenues in Cambodia, El Salvador, Bangladesh, Sri Lanka, Mauritius and Lesotho. These look among the most vulnerable countries as the world adjusts to the end of MFA and a quota-free (or quota-reduced) China. Several are already feeling the impact of more intense competition, with a significant decline between 2000 and 2004 in the proportion of exports provided by garments as suppliers and manufacturers prepared for quota removal.

The impact on employment in the most affected countries has been severe. In October 2005, trade union representatives from 10 African countries estimated that 250,000 clothing workers had lost their jobs in recent years. The countries worst affected were Ghana, South Africa, Nigeria and

Swaziland, but also suffering were Mauritius, Zambia, Madagascar, Namibia, Kenya, Malawi and Tanzania.²⁸ In Nigeria, since 1999 two-thirds of textile enterprises have disappeared and 100,000 jobs have been lost.²⁹

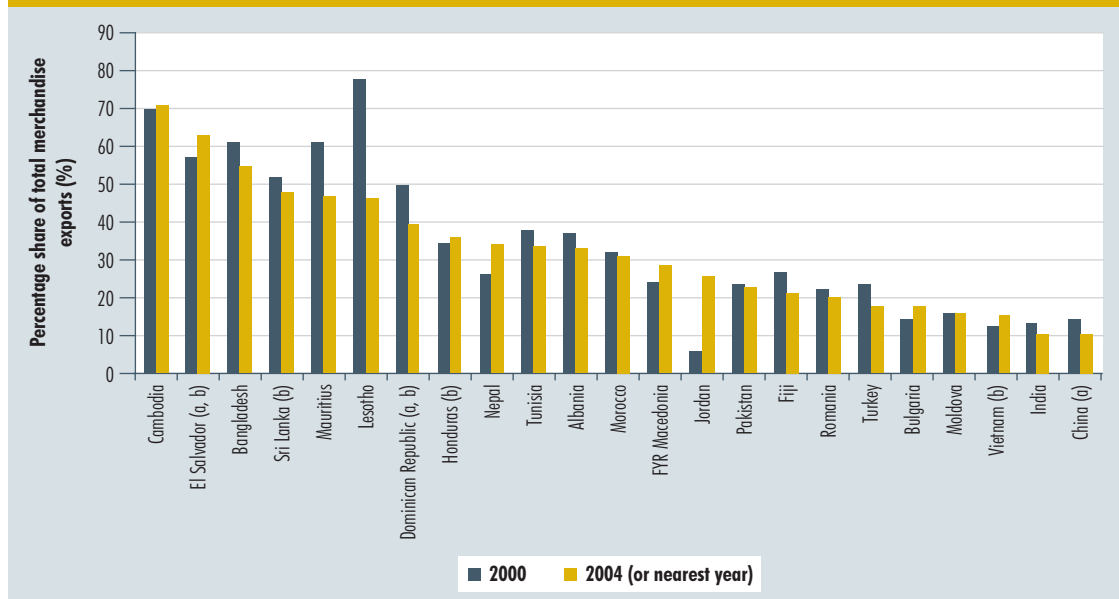
Looking at US International Trade Commission data for clothing imports into the US for the first nine months of 2005, the main losers of market share included a number of smaller clothing producers in Africa (South Africa, Ghana, Namibia, Mauritius, Lesotho and Malawi). On the other hand, some of the most pessimistic forecasts for Asia have been confounded. India, Bangladesh, Indonesia, Cambodia and Sri Lanka were all expected to suffer but have actually showed significant increases in exports to the US.

The indications are that buyers are narrowing the number of countries from which they source, but that these large Asia suppliers are well-placed to win business in the queue right behind China, now that they too are no longer subject to quotas. The big losers in Asia were some of the smaller countries (Mongolia, Nepal and Laos) and the former garment leaders (South Korea, Hong Kong and Taiwan). Figures for mainland China's clothing exports to the EU show a 44% jump by value for the first eight months of 2005. Imports to the EU from the African, Caribbean and Pacific countries that have duty-free entry under the Cotonou agreement fell by 24% in value.

²⁸ Africa News, 2005.

²⁹ ILO, 2005.

Figure 6. Clothing Exports as a Percentage Share of Economy's Total Merchandise Exports



(a) includes significant exports from processing zones; (b) includes WTO Secretariat estimates
 Source: WTO International Trade Statistics

The divergence between countries showing resilience and their less fortunate competitors suggests some obvious trends. Geographically, Asia is doing much better than Africa for maintaining clothing exports to the US, with the low-cost, high-volume producers within Asia faring best. Countries with little tradition in textiles and garments, or where the

industry had developed mainly in response to quota and tariff regimes, are often faring badly. Survival for companies in a country like Mauritius will depend on meeting buyers' demands for short lead-times, quality, price and value added services—and the use of whatever technology makes this possible.

TABLE 4. *Winners and Losers in the Post-MFA Era*
Origin (Africa and Asia) and Value of US Clothing Imports
Jan - Sept 2005 (and % change on the same period in 2004)

	\$m	% Change		\$m	% Change
Tanzania	2.6	69.9%	Malaysia	899.1	-0.50%
Mozambique	2.1	62.1%	Vietnam	2,053.0	-0.90%
China	15,759.0	56.1%	Swaziland	126.7	-1.50%
Uganda	4.0	40.3%	Madagascar	206.7	-5.80%
India	2,405.3	31.8%	Malawi	17.9	-10.80%
Bangladesh	1,770.3	20.0%	Lesotho	295.9	-11.20%
Botswana	18.7	19.7%	Hong Kong	2,390.6	-16.10%
Indonesia	2,240.0	18.0%	Brunei	132.3	-17.30%
Cambodia	1,253.5	17.3%	Laos	1.4	-20.10%
Sri Lanka	1,284.3	11.0%	Mauritius	134.6	-21.00%
Pakistan	981.1	8.6%	Namibia	39.6	-21.50%
Kenya	205.8	3.3%	Macao	805.9	-24.40%
Thailand	1,653.6	3.1%	Taiwan	895.4	-27.40%
Philippines	1,373.5	0.2%	Singapore	119.8	-29.50%
			Ghana	4.2	-30.70%
			South Korea	951.2	-35.70%
			Nepal	49.6	-38.30%
			Mongolia	99.0	-41.10%
			South Africa	56.4	-48.60%
			Japan	91.2	-57.40%

Source: US International Trade Commission

BOX 9. *Lesotho: Badly Hit*

In 2000, Lesotho's garment industry accounted for 77% of the country's total merchandise exports. It is dominated by Taiwanese investors, with most of the products (mainly jeans and T-shirts) destined for the US market under the tariff-free arrangements of the Africa Growth and Opportunity Act (AGOA). Lesotho is covered by the AGOA "third-country provision" which permits lesser-developed countries to source the yarn and fabric for garments from other countries.

More recently, however, the sector has been badly hit by increased competition, and in 2004 garments only accounted for 46% of total merchandise exports. At the end of 2004, six of the 50 garment businesses closed down, because they could no longer match competition from other low-cost countries whose quotas were being removed, including China and India. The situation was exacerbated by the weakening of the US dollar against Lesotho's currency, which is pegged to the South African rand. In the first nine months of 2005, clothing exports to the US fell 11% to \$296m.

The impact on the workforce has been severe. In February 2003, 43,000 employees (90% female) were operating in the garments sector (OECD, 2005b). The factory closures at the end of 2004 made 6,650 workers redundant, while another 10,000 employees in other companies were put onto short-term working (ILO, 2005).

In response to the closures, the industry is trying to improve the quality of the workmanship. The government is also promoting higher labor standards, in the hope of attracting US retailers thanks to improved policies on workforce conditions.

BOX 10. *Bangladesh: Fighting Back*

Textiles and garments together account for three-quarters of Bangladesh's exports and provide jobs for 2 million workers, mostly women. The demise of MFA was expected by many to cause big problems for Bangladesh's garments factories, but the reality has proved far less bleak.

Bangladesh's exports are no longer themselves constrained by quotas, and have been able to withstand the increased competition from China. US and EU buyers have indeed been reducing their numbers of supplier countries, but Bangladesh has maintained its position as an alternative source for retailers that do not want to be wholly reliant on China. In the first nine months of 2005, Bangladesh's clothing exports to the US actually rose 20% to \$1.77bn, according to US International Trade Commission figures, confounding the gloomy predictions. Interestingly, FDI is still extremely limited in Bangladesh, where 95% of the country's garment factories outside export processing zones are still locally owned.

The Bangladesh garments industry is at a disadvantage compared with China, however, because much of the fabric needed for production has to be imported, limiting the potential for vertical integration. In the run-up to January 2005, the Bangladesh government launched a Post-MFA Action Plan which included quality and capacity enhancement goals.

Mauritius – A Garment Industry Under Threat

At independence in 1968, sugar accounted for 95% of Mauritian export earnings, due to preferential European trade agreements. But the sugar sector was perceived to be vulnerable. So in 1970 the government began to develop a number of Export Processing Zones, financed in part by the proceeds of the sugar industry. The new strategy was to diversify the economy into tourism and manufacturing, and in particular, garment-making. Mauritius offered several attractions as an investment destination: incentives for firms locating in the EPZs, preferential trade agreements with OECD countries, cheap labor, and a population speaking French and English.

5.1 The Clothing Boom

The garment industry expanded in the Seventies, thanks to capital from sugar exports and investment by Hong Kong-based companies (UNCTAD, 2005) keen to benefit from the trade agreements and to diversify geographically ahead of the handover to China in 1997. Chinese companies chose to come to Mauritius, says Eshane Biidassy, advisor at the Textile and Apparel Development Centre, largely because the island already had an ethnic-Chinese population. “People in Hong Kong already had connections in Mauritius. It was easy for them to set up here. The Mauritian people began to emulate the Chinese and with capital from the white French population, the industry took off.” The complex global trade rules for quotas and tariffs on textiles and garments provided the motive for much of the further expansion.

By the late 1970s, rising labor costs and the appreciation of the exchange rate had curtailed the initial boom. But structural adjustment programs and further government incentives in the 1980s facilitated a second expansion of the industry.³⁰ Garment manufacturers and retailers moved produc-

tion to Mauritius to circumvent the quota restrictions and high tariffs that governed clothes exports from other low-cost countries. In the 1990s, despite international competition and steadily increasing domestic labor costs, the island’s real GDP per capita grew on average 5% a year, largely because of the continuing growth of the textile and garments sector. At the industry’s peak in 1999, textiles and garments accounted for 11% of GDP. In 2000, the industry employed 80,000 people or 15% of the available labor force, in 286 companies with exports valued at over \$800m.³¹ That year, clothing accounted for 61% of the island’s merchandising export revenues, according to World Trade Organization figures.

5.2 The Impact of Trade Agreements

The major exports from Mauritius are at the mercy of trade agreements. The island’s already declining sugar industry is facing a 39% cut in the price of sugar over the next four years. The survival of the sugar industry is doubtful. Likewise, the garment industry has historically been given a lifeline by duty-free trade agreements and the quotas imposed on other countries, mainly China. In particular, Mauritius benefits from two preferential trade agreements: the Cotonou agreement, which allows duty-free exports to the EU (a 12% advantage) and runs until 2020. Thanks to determined lobbying of US Congress by the Mauritian government in 2004, Mauritian companies could produce garments from imported yarn and still benefit from AGOA. Since September 2005, garments in Mauritius must be manufactured using yarn produced in Mauritius or Africa in order to qualify under AGOA, (unless a yarn is in ‘short supply’). As the majority of yarn

³⁰ Andersson et al, 2005.

³¹ MEPZA, 2005; Mauritius CSO, 2004.

BOX 11. *Tariff Benefits*

Textile Industries makes 500,000 men's shirts a month in Mauritius and sells them at around \$10 each. The company is part of the large Hong Kong-based Esquel Group which manufactures in China, Malaysia and Vietnam as well as Mauritius.

There is one reason why Textile Industries exists in Mauritius: duty-free access to the US market. "AGOA is a lifeline for us," according to the Assistant General Manager Hemraj Ramnial. Esquel grows the cotton, spins and weaves it in China, and ships the fabric to Mauritius in huge rolls. The shirts are made from a particularly high value yarn that is not produced in large quantities in the US and Africa, so the yarn qualifies under the AGOA 'short supply' provision. The shirts have duty-free access to the US market. On cotton knit shirts, this represents a 20% advantage.

Textile Industries employs 3,000 people. "Our group has a factory in Malaysia, which of course produces cheaper than we do. But then, they don't have AGOA," says Ramnial? "We'll be here for at least for 10 years—until the end of AGOA in 2015."

used is imported from China and India, this is a major barrier to the US market.

By far the greatest threat to the Mauritian textile and garments industry, however, arises from the final demise of the Multi-Fibre Arrangement. It is highly unlikely that Mauritius would ever have established a large textile and garments sector, were it not for the earlier restrictions on China's exports. **The new quota-free (or quota-reduced) world is thus putting enormous pressure on Mauritian companies to find new ways to compete with Asian suppliers.**

5.3 The Beginning of the End?

The textile and garment industry in Mauritius first came under pressure from increased competition from the Far East during the 1990s. The outlook worsened when China joined the WTO in 2001, thereby qualifying for quota removal on 1 January 2005. The Hong Kong companies were the first to leave Mauritius. Most moved their operations to China, in anticipation of the end of quotas. Only one of the original Hong Kong based clothing manufacturers is now left. Mauritius has also faced increased competition from other low-cost manufacturing countries such as Bangladesh and India.

The impact has been abrupt. Foreign direct investment in the EPZs collapsed from around \$24m for the period 1995–9, to just \$5m from 2000–4.³² Clothing exports have remained reasonably steady in

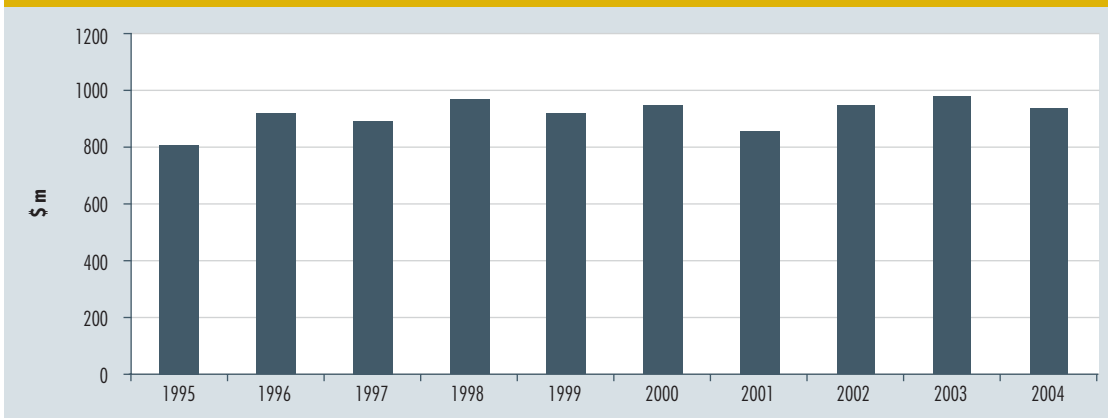
US dollar terms, but in 2004 accounted for 47% of total merchandise exports, compared with 61% in 2000, according to WTO figures.

"The problem," says Lance Wickman, Chief Operating Officer of Enterprise Mauritius, the government body that manages the EPZs, "is that the whole textile industry here is based on the preferential textile agreements. That doesn't lead to a healthy competitive textile market. Management has been mediocre, and there's a lack of strategy. In the last five years almost all the foreign owned companies have pulled out. Mauritian companies have closed too, especially the smaller ones. We expect only the big companies using technology, adding value and with good customer relations to survive."

Mauritius is thus at a critical juncture for determining whether its textile and garments industry has a future. Marcel Wing, an analyst at the Ministry of Industry says: "Now that Chinese quotas are continuing, buyers want to diversify. Some of them are coming back, gradually, to Mauritius." But these temporary quota restrictions have a life-span of only three to four years. The government and the industry are both well aware that time is limited if Mauritius is to identify ways for its garments companies to survive. Part of that process will be to judge what role ICT can play in giving Mauritius a competitive edge.

32 MEPZA, 2005.

Figure 7. Mauritius: Value of Clothing Exports (\$m)



Source: WTO International Trade Statistics 2005, and WTO Background Statistical Information with Respect to Trade in Textile and Clothing, September 2004.

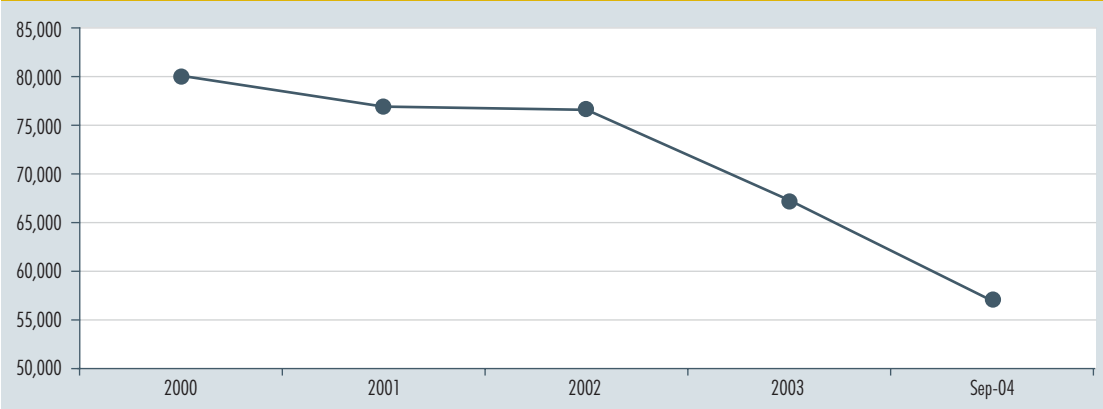
5.4 Poverty Alleviation

The growth in the textiles and garments industry over the years has contributed to a corresponding improvement in the standard of living in Mauritius. Since the industry is a big employer, any further decline will have serious implications for large numbers of people on the island. GDP growth averaged 5.9% a year between 1973 and 1999 and per capita incomes trebled. Gross national income

per capita was \$4,640 in 2004 (World Bank, August 2005), and in terms of purchasing power, Mauritius is ranked highest in Africa (\$12,695) by the IMF (IMF, 2004). Mauritius is classified as an Upper Middle Income economy.

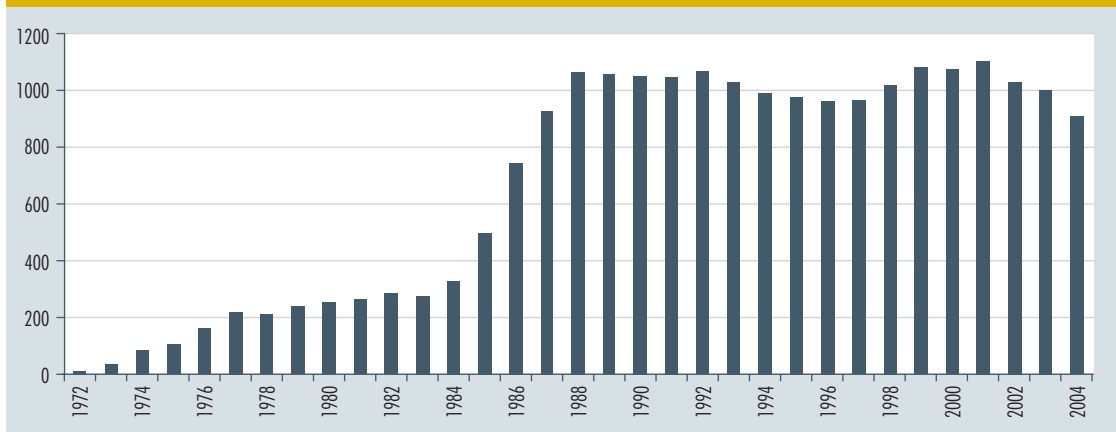
With more than 20 textile and garments companies closing in the last five years, and many remaining companies downsizing operations, employment in textiles had fallen by 29% to 57,000 by September

Figure 8. Mauritius: Employment in Textiles and Garments, 2000–2004



Source: Mauritius Export Processing Zone Association Annual Report & Directory 2004/5

Figure 9. Mauritius: Employment in Export Processing Zones, 1972–2004



Source: Central Statistics Office, Government of Mauritius, Survey of Employment & Earnings

2004, with 10,000 jobs lost in that year alone. In his August 2005 budget, the Finance Minister, Ramakrishna Sithanen forecast an 8% decline in output in the EPZs for 2005. Exports of textiles and garments made up 73% of EPZ exports in 2000, but this had fallen to 66% in 2004.³³

5.5 Government Policies & the Business Environment

The wider business environment has been a factor in Mauritius' success in establishing a textiles and garments industry, and will be important in determining whether the sector can successfully respond to its new challenges.

Physical Infrastructure

Mauritius is a small island (about 30km by 50km), which has been an advantage in terms of building infrastructure. It has a good road network; three-quarters of households have a fixed telephone; and mobile cellular coverage is near universal. The seaport meets the standards of the International Ship and Port Facility Security Code. ICT investment here has helped exporters cut lead-times. One key development is the Freeport sector of the seaport, which offers integrated logistics facilities such as warehousing,

customs control and shipment services. These are controlled through an Electronic Data Interchange (EDI) system to speed up the customs process and minimize bureaucracy.

Geography is clearly a disadvantage, however. Sailings to Europe take about four weeks, and about six weeks to the US. Shorter lead times are crucial in the textile industry, particularly in the fashion and value-added ranges, and this has hindered growth particularly in the US market. In 2004, a surge in demand for shipping in China led to increased freight rates and fewer vessels docking in Mauritius. Import freight costs rose by 100%. To reduce lead times, air-freight is being used more and more by the textile and garments industry.

Economic Policy

In the 1990s Mauritius was one of the most liberal trade and investment regimes in Africa, although protection was still higher than in South East Asia. The government has signed double taxation agreements with 26 countries. The government has lifted all restrictions on current account and capital account transactions of the balance of payments; there are no restrictions on the repatriation abroad of profits, dividends and capital gains. Offshore companies are subject to corporate tax at

³³ MEPZA, 2005.

a rate not exceeding 3% (as from July 1, 2002) after taking into account foreign tax credits. International companies are tax exempt. Machinery, equipment, materials and other goods imported into the Freeport are free of customs duty, excise duty and value added tax. The government has continued to offer incentives to the private sector, and to invest in business development, to stimulate growth.

Labor

Despite having an unemployment rate of 10%, Mauritius suffers from a labor shortage in the EPZs. “The wages are poor and the hours are long in the EPZs. It’s better to work in a hotel,” says Marcel Wing, at the Ministry of Industry. Business leaders complain that local workers lack skills and are unproductive, and for this reason they import labor. “We import labor from China, Sri Lanka and Bangladesh. That labor can be up to 40% more productive,” says Louis Lai, Director of Compagnie Mauritienne de Textile (CMT), a Mauritian-owned textile and clothing manufacturer [see Case Study C]. Other companies like Star Knitwear [see Case Study B] also import labor from India, despite the extra costs of having to provide dormitories and pay for flights. . One other important advantage of imported labor is the commitment to a three-year contract. To minimize the impact on local jobs, the government now requires 75% of workers in a factory to be Mauritian.

Governance

The World Audit organization ranks Mauritius as the third highest out of 149 developing nation in

terms of democracy (World Audit). The United Nations Development Program ranks Mauritius 65th out of 177 countries in its 2005 Human Development Report. The report places Mauritius towards the top of the Medium Human Development group, but also indicates that it is lagging in one area: education.

5.6 ICT: Investment, Policy and Impact

Government investment and policy has encouraged ICT infrastructure investment in all sectors for the last 15 years.

- **Telephony**
By 2004, 28% of Mauritians had landlines, and 41% had mobiles according to the International Telecommunication Union (ITU) with a total of 353,000 landlines and more than 510,000 mobile subscribers. These compare favorably with the averages for Africa, Asia and the Americas. The government subsidizes Mauritius Telecom, enabling low cost local calls, and a monthly line rental of \$2.50.
- **Media**
Television is more popular than radio, with transmissions in French, English and Hindi watched in 93% of Mauritian homes, according to the ITU. The published press operates freely producing six daily newspapers, two of which also publish on the internet.

BOX 12. Institutional Support

Economic policy and reform is coordinated with the private sector through a range of institutions:

- Joint Economic Council – developed as a forum for dialogue between the private sector, industry bodies, and government. It coordinates the industry associations, and informs policy on cross cutting issues such as the budget, wage negotiations, and international trade negotiations.
- The Development Bank of Mauritius has provided long-term financing and investments in infrastructure in the garment industry.
- Enterprise Mauritius – a government body that co-ordinates and promotes the activities of the EPZ and provides consulting services, and works with the Textile Apparel Development Centre to expand the use of technology in the industry.
- Mauritius Export Processing Zone authority (MEPZA) – industry association of the EPZ that liaises between companies and government. It works with the Textile Emergency Support Team (TEST), a joint private/public sector initiative to assisting enterprises to re-structure.
- Investment Climate Improvement Committee – created in 2005 to focus on four main areas: governance and bureaucracy, infrastructure, skills, and finance.

■ Internet Bandwidth

In 1993, Mauritius Telecom invested \$96m in the development of the South Africa-Far East (SAFE) fibre optic submarine cable. Mauritius now has enough international bandwidth to support over 6 million simultaneous telephone calls. However ever-increasing demand for bandwidth means even this will soon need to be upgraded. Despite having the infrastructure, the take-up of internet technology by the general public has been comparatively slow. In 2004 28% of Mauritians had computers, and 15% were using the internet.³⁴

■ Business Use

In contrast, the use of ICT in the business community is substantial. An OECD survey in 2001 showed 75% of businesses were using the internet, more even than in the UK at that point. Some 21% of businesses had a website, and 4% were receiving orders over the internet. Mauritius ranked higher in the OECD survey than developed countries such as Spain, Italy and Greece.

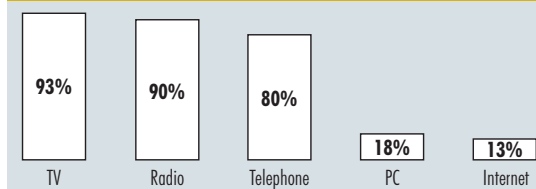
■ Market Liberalization

So far, competition has been limited in the ICT sector. Mauritius Telecom has a monopoly over fixed line services, and there is a duopoly for mobile and internet services. The National Telecommunication Programme of 2004 outlines plans to transform the market structure towards a more competitive, liberal, regulated market.

5.7 The Education Challenge

Despite having excellent standards in comparison with many African countries, compared to countries with similar per capita gross national income, Mauritius lags behind in education. “Mauritius has the lowest tertiary enrolment level of peer countries and the second lowest level of educational attainment,” stated a 2004 report by the International Telecommunication Union. ICT still has a limited role in the classroom. The average primary school has just two computers, while the average secondary school has 15. Universities do now offer a Local Area Network (LAN) with free internet access for students. The government is aware of these issues and is currently reforming the education system and

Figure 10. Household ICTs (%), 2002



Source: ITU, 2004

increasing the role of ICT. Education is a major issue for the textile industry. Louis Lai, Director of the biggest textile firm, Compagnie Mauritienne De Textile (CMT), states bluntly: “If there’s one thing the government can do, it’s improve the quality of education. We need people with skills.”

5.8 ICT and a Survival Strategy for the Textile and Garments Industry

The garment manufacturers of Mauritius, and officials at the Ministry of Industry, are well aware of the new demands that are being put on clothing companies by customers in the US and Europe. Any company in Mauritius hoping to survive against competition from Asia in the new post-quota world needs a strategy which embraces four key goals:

- Provide total package solutions to garment retailers, from sourcing fabric and trim to packaging and shipping.
- Improve speed-to-market and cut lead-times for fashion items.
- Increase vertical integration by expanding into other parts of the textile and garment supply chain including yarn spinning and fabric production.
- Move into higher margin products and services.

“The way to deal with these changes is to move from a defensive strategy to an offensive strategy. That

³⁴ Mauritius CSO, 2004; ITU 2004.

means looking at material sourcing, at e-trade, at logistics. It means trying to predict what the buyers want. Don't talk to me about labor costs: it's about staying ahead of the market. Our industry is now a service industry," explains Danielle Wong, director of the EPZs industry association, MEPZA. "The companies that survive will be the ones using technology."

Over the past 10 years, ICT in the global textile industry has come to mean specific systems to manage production and merchandising. But it is only recently that the government body managing the EPZs, Enterprise Mauritius, focused on promoting ICT in the textile and garments industry. Its Chief Operating Officer, Lance Wickman, explains: "The government has invested a lot of money in ICT, but they are only just starting to use ICT to develop existing industries."

The need to offer a total package service and to reduce lead-times has already led to increased use of ICT by Mauritius garment companies. The textile value chain used to be managed by buyers. "In the past the buyer would do everything. They would organize supplies, tell us what to make, with what materials, and how to make it. We want to reverse this, and say, 'This is what we can do for you'." says Wong. Eshane Biidassy, at the government's Textile and Apparel Development Centre (TADC), concurs: "The aim of companies now is to make things 'store ready'. We'll warehouse clothes for retailers; we pack them up; and we even put the

price tag on." Producing a total package means adding more stages to the production line. "This is where the technology comes in," says Biidassy.

Producing a total package means adding more stages to the production line. Larger Mauritian companies are already using Enterprise Resource Planning (ERP) systems to control all aspects of the production process from fabric, to complete garment, incorporating stock control, inventory and merchandising as well as the assembly process. Guillaume Desmarais of Uniconsults, a local IT consultancy, recognizes that installing systems like ERP is a big undertaking for most Mauritian companies: "It costs about \$400,000 minimum, and it takes about two years before one can see the benefits."

The impact of e-commerce has also put pressure on Mauritian manufacturers to invest in the necessary ICT equipment for electronic communication with customers. In some cases this has meant installation of an Electronic Data Interchange (EDI) system which controls the process of raising purchase orders, making alterations to purchase orders, and issuing invoices and shipping notices. These systems are custom-made for each specific customer, so smaller companies (like many in Mauritius) often prefer instead to access their customers' extranet systems over the internet. Flexible internet-based data exchange systems are taking over from EDI, and are more cost-effective for supplier companies.

BOX 13. *Tropic Knits and ERP*

Tropic Knits is a division of CIEL Group. It ships 13 million garments a year at an average price of \$3. Serge Uranie, the IT manager, installed ERP in three divisions of CRP including Tropic Knits in 2000 at a cost of \$700,000.

ERP, he says, "has streamlined operations through the group, by linking the supply chain, managing orders, optimizing resources, and making sure goods ship on time." It allows managers to work on daily results on every line running through these processes; before ERP, they were working on monthly results that took three days to produce. The system assists stock control and manages an inventory worth \$3m.

Production has been integrated between different divisions, and now the company could not be managed without ERP. "Our dyeing plant manages 150 batches per day, and each one goes through 5 or 6 processes. It's just not humanly possible to manage that without this technology," says Mr Uranie.

A cost benefit analysis for a system like ERP is not easy to produce. Mr Uranie asks: "What if we didn't have the system? What would be the cost on the production floor, and what would be the cost in terms of lost opportunities? We can tell a retailer tomorrow how much an order will cost, and when we can deliver. How much is that worth?"

"Having good ICT," he says, "is like having a good manager. After a while, you don't realize it's there."

BOX 14. *Spinning a Yarn*

Tianli Spinning has taken advantage of the incentives on offer to set up a spinning mill which will satisfy part of Mauritius's annual demand for 50,000 tons of cotton yarn. At a time when the majority of Chinese-owned garment companies were moving back home, Tianli realized that there was a captive market for cotton yarn for the foreseeable future, thanks to AGOA.

The investment in setting up a spinning mill is substantial; in Tianli's case it was \$30m. It is a capital-intensive industry, employing only 500 people in Mauritius. Tianli's General Manager, Chen Qiliang, says: "Up until 3 months ago, we were making only 2,000 tons a year; we've just expanded, and are now making 10,000 tons."

The raw material for the yarn comes from all over Africa: Zambia, Zimbabwe, even Mali and Chad. The product compares well with yarns produced abroad, and as a result, Tianli is finding that many of its customers are also using its yarn for garments which are destined for all markets, and not only for the US.

Tianli's business strategy is much the same as that of the garment makers in terms of wanting to move into value-added yarns. They are currently investigating the potential of products made from viscose, bamboo and soybean. Other possibilities in the future include expanding along the value-chain into knitting and dyeing.

In December 2004, Pascal Lamy, then EU Trade Commissioner, together with Enterprise Mauritius, launched a "secure e-marketplace". The online trading system was funded by a Euro 1 million (\$1.3m) grant from the EU. It was designed to allow trading and improve cooperation between the companies in the EPZ, and was intended to allow Mauritian companies to connect to similar trading platforms in Europe. However, this investment has yet to pay off. In practice, few companies are using the e-marketplace. Current plans are to shift its focus to provide the companies with an online storefront to showcase products to potential buyers.

5.9 Vertical Integration

It is not easy for a relatively small island in the Indian Ocean to offer a vertically-integrated textile and garment industry. But government strategy has increasingly been to encourage companies to import raw cotton (and other raw materials) and to move into the higher-value yarn spinning and fabric knitting parts of the supply chain.

One incentive was the introduction of a 60% tax credit on equity investment in spinning, weaving and dyeing companies. The government has also removed duty on imports of raw materials and machinery for spinning mills. In the last five years two spinning mills have been set up in Mauritius, and there are plans to open a third. The tax credit has now been extended to other parts of the textile industry.

Eshane Biidassy, at the government's Textile and Apparel Development Centre (TADC), says: "The main problem is that if you don't have a proper supply chain, you're out of the market. We've realized that we neglect both pre-production and post-production. We're operating at only 20% of the value chain, and we want to take over the other 80%." An integrated supply chain is not the only benefit to Mauritius of producing its own yarn. It also meets the AGOA challenge of needing locally- or African-produced yarn to qualify for the tariff benefits.

5.10 Adding Value

Mauritian companies have tried to reduce the impact of higher labor costs on their competitiveness by moving into added value products, where margins are greater, and labor is a smaller percentage of the total price. The island also promotes recognition of its compliance with International Labor Organisation (ILO) workforce standards, part of its image as a high-value supplier rather than a "sweatshop".

Mauritius sees its future as competing with the fashion-led European and Turkish manufacturers, rather than the high-volume low-cost producers of Asia. Central to that strategy is to produce higher-margin, more expensive items, as described by David White, an adviser to Mauritian-owned manufacturer CMT: "We will be beaten in the bottom-range clothing market. That's why we have

gone into the medium-range market, competing with Southern Europe and North Africa. In that range there is some price elasticity.”

The government is encouraging companies to make this shift. “The time has come to move into value-added products, design and fashion. We want to link up with design houses, get market intelligence on current cuts, materials, colors and start a design bureau here.” says Biiidassy of the TADC.

Companies like CMT and Star Knitwear, (see Case Studies) already input into the design process. These companies’ designers use computer-aided design (CAD) and join specialist internet sites like wgs.com to follow highlights from the latest catwalk shows and get intelligence on next autumn’s colors. Their design teams create styles, make up samples and send them to buyers. “We can’t compete with Bangladesh on price, says Ahmed Parkar of Star Knitwear. “But the first priority of buyers will never be price. Enterprise Mauritius is also looking at niche marketing and own-branding as possible survival strategies for the beleaguered industry.

Case Study A: Tara Knitwear

Tara Knitwear is a Chinese owned company employing 1,300 people making cotton T-shirts, polo shirts, and woolen and cashmere sweaters for European companies. Before 1997, many Hong Kong-owned clothing companies moved to Mauritius to take advantage of the Cotonou agreement (which allows duty free access to the EU market) and to avoid quotas on Chinese-originated goods. But Tara Knitwear is now the only Chinese-owned clothing company left in Mauritius.

Increased Competition

Tara’s Managing Director, Joseph Lee, says some customers have remained loyal because of his quality and reliability. “Our competition isn’t China or the Far East; it’s Turkey and Greece. They make high quality, reliable goods on a short lead-time; and so do we. Our customers don’t trust the Far Eastern companies; their quality is not as good as ours.”

But Lee knows that the future will be challenging. European retailers are finding that quality is improving in Asia without eroding the price

advantage. Tara Knitwear makes T-shirts for \$2.75; this is roughly 25 cents cheaper than Turkish companies, but 25 cents more expensive than Bangladeshi firms. The impact has been painful, and the past two years have seen a steep decline in the number of T-shirts and cotton knit tops sold by the company to Hennes & Moritz. “This year they’ve only taken 250,000. They get the rest from Bangladesh,” says Lee. “Our company is suffering,” he says, “we are surviving but we cannot expand.”

Investment & ICT

Tara uses little ICT, which Lee blames on lack of capital. There are about 30 computers for basic tasks: sending email, managing the inventory, running the automated production line, and for accounting. An EDI system manages shipping and customs licensing.

One of his US customers has suggested he invest in a second EDI system to replace paperwork and data entry between Tara and this customer, and to streamline their accounting practices. But this will cost \$8,000, and will only work with this one customer. Mr Lee says he will buy it if he has to, but is hoping the customer will pay part of the cost.

Tara has also been looking at installing an Enterprise Resource Planning (ERP) system, which would reduce administration by automating the creation of purchase orders, amendments and invoices. More importantly it would produce real-time information on each stage of production from yarn right through to the finished garment. ERP would, Lee admits, “save work on the inventory, reduce staff needs, and would mean less mistakes.” He estimates that it would cost about \$100,000 to install, and that he could recover the cost in 2 years, but says he just does not have access to the necessary capital.

Tara Knitwear does not have a website, and has some resistance to internet-based business. According to Lee, “buyers know us by reputation.” He has established long-term relationships with customers, and believes new buyers will come looking for him because of his reputation. He has concerns about setting up a website: “Maybe 100 people will start asking for samples. Making samples costs a lot of money and takes a lot of resources, which I don’t have. And probably none of them will be serious.” Similarly, Lee has not used the internet to find suppliers of yarn and fabric. His existing

suppliers have been working with him for over 10 years, and he believes he can depend on them. Lee says he would not put his trust in a website, and he would not expect his customers to either.

The Future

Over the last couple of years, Tara's investment has focused on knitting and dyeing machines in a strategy to occupy more of the clothing value chain. Lee also opened a garment factory in Madagascar in 1997, where labor is cheaper. However, political instability there in 2002 forced him to stop production, and the company suffered serious losses.

AGOA should be providing a window of opportunity for a company like Tara. But in order to get the saving of up to 20% (depending on category of garment) on duty for the US market, AGOA requires that the garments produced be made from African or Mauritian yarn. Currently, there is only one spinning mill in Mauritius supplying the open market (the other supplies only its own company), and Lee complains that other suppliers have sold him sub-standard products. Last year, he was unable to complete his orders to the US, because he could not find a suitable source of the African yarn now necessary to qualify under AGOA.

Cashmere sweaters are Tara's most profitable business. The raw material is expensive; even the cheapest spun yarn from South Korea costs around \$40 per sweater, while Scottish-spun yarn costs up to \$75. "Handling cashmere," Mr Lee says, "is like handling diamonds or gold. You have to take a lot of care, a lot of investment, security and technical know-how." Cashmere is one area of the garment industry that has been less affected by technology, so Tara's lack of capital is less of a disadvantage. Computerized knitting machines tend to waste the high-cost yarn, so it is more cost-effective to knit cashmere garments on manually operated machines, says Lee.

The Ministry of Industry organized a trade mission to Italy in October 2005 during which Lee was hoping to meet a high-value customer seeking cashmere from a supplier offering quality and reliability. "They'll find that in Mauritius," he says, "not Bangladesh." The meeting proved a useful introduction to Italian buyers, but did not lead to any immediate contracts for Tara Knitwear.

Ultimately, Lee is a realist: "We didn't think we could survive for 3 years [after 2001], but we have. We need capital, and we don't have any long-term plans. We might be around in 10 years time, but probably not. If I did invest now, it probably would be in China."

Case Study B: Star Knitwear

Star Knitwear's business is T-shirts, polo shirts and blouses, shipping about 1 million garments a month to the UK and France, mostly to fashion retailers such as Top Shop and River Island. For the year ending September 2004, Star registered profits of \$2m on a turnover of \$28m. The company employs 1,300 people. Star's manager, Ahmed Parkar, describes Star Knitwear as a "Mauritian-owned family business," just as his father pops his head around the door and suggests going for lunch. Star projects an image of a modern, fashion-oriented company. The reception looks like the foyer of a chic hotel, with abstract oil paintings and *objets d'art*, all tastefully co-ordinated.

When Mr Parkar talks about his business, he sounds more like a retailer than a factory owner. His company designs many of the garments it manufactures. "We make things for the younger age group, mostly young women, aged 16 to 30. We have to reinvent ourselves every year. Product lines don't run for three years like they used to. You have to know your market and your buyers. You have to understand them; you have to dress like them; you have to speak their language."

Star has an office in London that keeps in touch with buyers daily. "We have a small customer base and so we put a lot of time into developing those relationships." Dirk Robens, Parkar's brother-in-law and Star's Marketing Manager, visits his buyers in Europe regularly. The buyers come out to Mauritius twice a year to see the new collections. "We work very closely with our buyers," says Parkar. "We send them designs and samples. They send us ideas, we send them ideas. Every two weeks we'll send them about 10 samples to look at."

Star's fashion-led customers want a reliable high-quality supplier able to fulfill orders quickly. The "four-week lead time" is something Parkar repeats

like a mantra. Achieving this relies on the use of a lot of technology.

Tailor-Made ICT

In 2001, Star's in-house team of software engineers bought and developed a tailor-made ERP system costing \$35,000. Managers can view the progress of goods and the manufacture of garments along the production line throughout the company using the ERP system. "We can show you production figures for each stage, from knitting to shipping hourly," says Parkar. Sometimes customers ask for this data, which it would be impossible to provide without ERP. The system monitors every aspect of the business: the inventory, accounting, production, shipping, quality control, and merchandising.

From a management point of view, the ERP system has not only helped to reduce work-in-progress times, but improved planning. The automatically updated Excel spreadsheets show bookings for operations three months ahead. A color-coded display indicates spare capacity and shows where more capacity is required. The system, as Parkar says, allows Star to "spot problems when they come up, even before they come up. It makes us accountable." The end result is faster production, and more reliable output.

Star also uses retailers' extranets that enable the buyers to place orders and, importantly in a fast-moving business, adjust them when necessary. This is linked to the ERP system to produce purchase orders and invoices. In 1999, they invested in the EDI system provided by government to streamline customs, warehousing and shipping operations from the Freeport. Perhaps surprisingly, the company does not have a website.

In future, Star might invest in a warehouse delivery system. This would enable the company to keep track of customers' sales and stock, and to initiate orders accordingly. However, at the moment Parkar remains cautious. "Fashion brands like Top Shop change their mind so often, you'd be supplying them with a line and suddenly they'd decide to drop it."

Supply Chain

Part of Star's strategy for the post-quota era is to offer and promote a more integrated supply chain. By October 2005, the new Tianli spinning mill in

Mauritius was supplying 50% of Star's yarn. Three months earlier, it did not supply any yarn to Star at all. The cost, says Parkar is the same as the yarn he buys from Pakistan.

Star now wants to convince Tianli to move into value-added yarns and man-made fabrics like polyester and viscose. The more yarn it can supply, the better for the overseas buyers, and Mauritius can start to become a "one-stop shop" for garments.

Star's sister company does the knitting. Star invested in a dyeing plant a few years ago that now employs 300 people. A computer aided design system enables staff to design the fabrics on screen, and then send the instructions straight to the knitting machine.

Adding Value

Value is added by expanding the services on offer to customers. What is known at Star Knitwear as "the Kate Moss shirt" is the pride of the company. It is the biggest-selling unit, and the longest-running line; the company has been making the same shirt for 7 years, and the colours change every season. After Kate Moss was photographed wearing one, they were making 40,000–50,000 units a week. What is remarkable about the Kate Moss shirt is that it was not designed by Top Shop, the retailer that sells the garment. It was created in Mauritius by Mr Robens, Star's Marketing Manager.

Design is an aspect of the business that Star is keen to develop further, and a way to move into higher margin business. The company's designers sit at their desks with briefs from buyers, and "mood boards" made up of pictures from magazines. The latest images from fashion shows, and suggestions for next season's looks and colours, are provided by the internet-based fashion information business, WGSN.com. Star's own-design collections are on show for buyers to view in Star's boardroom.

Each new offering and each additional stage of production means added value. Star does not produce many 'classic' garments, and most items are made from striped or printed fabrics, often finished with embroidery or beading. The fabric can be washed with enzymes to make it softer or look aged. "We can make money at each stage," says Parkar.

“knitting, dyeing, printing, embroidery, finishing and washing.” Innovation is also crucial. Star was one of the first companies to start looking into making garments from Lyocel, a new fabric made from wood pulp cellulose, and it is already selling it to Top Shop. The company is currently testing a new fabric made from bamboo.

In the past five years, Star has opened a new dye-house and expanded this part of the production chain. The workforce—1,700 in 2000—stands now at over 2,300. Over that time, Parkar says productivity and value-addition have both increased by 25%. Computers and ERP have enabled Star to manage this expansion. Investment in technology is part of Star’s core strategy. “If I don’t invest every year, I’m falling behind,” says Mr Parkar.

Enabling Environment

Star has found ways around some of the geographical disadvantages of manufacturing in Mauritius. The “four-week lead time” relies on flying goods to Europe, at the cost of about 25p an item. Air freight is twice as expensive as shipping to Europe, but Parkar says it is becoming more popular because of the need for shorter lead times, and because only two big vessels a month now ship to Europe.

Obtaining capital can be a challenge. Loans from the government development bank are charged at 6%-7% interest, but Star still borrows privately at 8%-9%, because it says government loans take too long.

Operating costs can also be expensive, with companies complaining of high utility charges. “Water charges are expensive, and the government puts the burden on business rather than consumers,” said Mr Parkar.

The Future

Star is trying hard to define itself for the post-quota environment. “We can’t compete [on price] with Bangladesh,” says Parker, “But the first priority for any retailer will never be price.” Efficiency, reliability, quality and customer relations are Star’s priorities. “We have advantages over China because of our relationships with suppliers, because we’re a family business, because we can answer questions from buyers in 24 hours, and because we can have garments in the shop in four weeks time,” Parkar concludes.

Case Study C: Compagnie Mauritienne de Textile (CMT)

Mauritian-owned CMT is the biggest vertically-integrated clothing and textile manufacturer on the island measured by both sales revenue and number of garments, making 40 million garments a year at an average cost of \$4. The majority are T-shirts, polo shirts and sweatshirts for the European market, manufactured for retail brands such as Top Shop, Next and La Redoute.

Growth

Over the past five years, CMT’s workforce has jumped from 3,000 to 7,000. During that time, the company’s turnover has increased by 25% each year from \$50m in 2000 to \$127m in 2005. Louis Lai, CMT’s Chinese-Mauritian director and one of the owners, says the company had to grow to survive: “If we didn’t grow, we would be out of the market. If you want to work with big companies, you have to be big.”

CMT has grown in two different ways. Firstly, it increased production, building a new garment plant employing 2,500 people. Then it decided to expand into other parts of the textile and garments value chain. Its biggest investment was \$36m in a cotton spinning plant that now produces 8 tonnes of yarn a year. “It’s not very profitable,” says Mr Lai, “but it’s part of a strategy to get control of the supply chain.” CMT wanted to reduce its dependency on imported yarn. “You have to keep 3 months of stock in the warehouse if you’re importing yarn from India. Now we can reduce our stock levels, and control quality ourselves.” These days 60% of CMT’s garments are made from CMT yarn, although they still import the raw cotton from India.

Growth, explains Lai, needs to take place across the value chain in a vertically-integrated company. “You can’t grow just one part of the production; you have to grow everything together, or else you run into supply problems.” As well as the spinning plant, CMT has increased capacity in knitting and dyeing, and invested in new washing and embroidery units.

Use of ICT

CMT’S rapid growth would not have been possible without technology. In 1995, it was one of the first companies in Mauritius to invest in an ERP system.

This streamlines operations through the company, linking the supply chain, the managing of orders and the production process so that goods ship on time. The system provides information and progress reports on each stage of an order, all the way through the factory. The actual orders from buyers are managed through the extranets of the retailers. “Everything is done on the web these days,” says Lai.

When the company wanted to expand, it invested in new systems to facilitate management. The increased volume of production, the number of batches and the different stages of production all mean that the company could no longer be managed without an ERP system. Technology is seen as an integral part of the business, and as an asset which needs constant renewal. “Investment in technology is a continuous process; you have to tune machines, invest in maintenance and the upgrade of equipment regularly. And you have to invest in the people skills to go with the equipment. That too is a constant process, training people how to use equipment and investing in people skills.”

Full Package Offering

The artificial waterfall outside CMT’s entrance promotes its self-image as a modern, forward-looking company. Visitors watch a video on a wide flat-screen TV that focuses on the company’s technology, modern machinery, quality control and its high standards. “‘Good enough’ isn’t good enough,” says the narrator. Printed in gold on the red banners hanging down the glass wall of the atrium is the slogan: “Shaping Up for the Next Millennium”.

CMT’s close relationships with customers depend on the company’s ability to demonstrate its understanding of the market and high-street trends.

CMT’s office in France keeps in regular contact with buyers. “Our strategy is to keep and develop and increase the good relations we have with our existing buyers, rather than look around for other business,” says Lai. He concedes that companies in Bangladesh are cheaper than CMT, but insists that “they don’t know the market like we do”.

CMT’s strategy is to offer retailers an increasingly full package service. Back in Mauritius, CMT’s design team (surrounded by swatches and magazine cut-outs) develops new ideas to suggest to retailers. The company also has a team of 50 people making

up samples. This gives it the capacity to send out around 300 garments a day as samples for buyers. “We’ll design styles and feels, and then the retailers tweak them to suit their needs,” says Lai. The designs include prints, embroidery, lace, and washes to demonstrate the full range of what the company can do. These aspects of garment production are all completed in-house.

Markets: Europe or US?

With its own yarn spinning mill, CMT could now benefit from AGOA and access the US market. However, Lai says he is not interested in the American market because the lead time to the US is too long. Like other fashion suppliers on the island, logistics make it difficult for CMT to access the US market. Shipping times to Europe can take as little as three weeks, but it takes five weeks to reach the US, and sailings are less frequent. Air freight is also twice as expensive to the US as it is to Europe.

CMT must reduce lead times to meet customers’ expectations. Air freight is becoming increasingly important. In 2000, CMT shipped 5% of its output by air. Given the increasing emphasis now in Europe on speed-to-market, that figure jumped to 20% in 2005.

Like Star, CMT’s strategy is to capture the European fashion-led added-value market. As a result, they have not only doubled their production in the last five years, but their average garment now costs almost 20% more than it did in 2000.

5.11 The Way ahead for Mauritius

ICT performs two distinct roles in the textile and garments industry in Mauritius. As a management tool, ICT clearly streamlines production through the factory, minimizing labor costs, cutting lead times and enabling precise control of the inventory. It enables managers to plan months ahead, to identify bottlenecks and spare production capacity ahead of time, and to reorganize production accordingly. But ICT also has more intangible benefits. It improves communication flows between the factories, their suppliers and their clients. By producing hourly production figures, ICT enables suppliers to answer queries from buyers immedi-

ately. ICT has enabled Mauritian suppliers to work together more closely with their customers.

The strategy currently being adopted by the more successful Mauritian suppliers is the emphasis on added value. The more stages of in-house production involved in making a garment (such as printing, embroidery, enzyme-washing) in addition to the basic cut-make-trim stage, the more value added is captured. ICT helps to manage the complex chain of processes. Increasingly companies are also gathering information through the internet from fashion portals and using ICT as a design tool. The latest fashions can now be conceived, designed, and produced in factories all over the world.

The most successful Mauritian companies pride themselves on knowing their market. Far Eastern and Chinese companies can produce high-volume goods more cheaply, and have better geographical access to the US market, but Mauritius has closer cultural ties with Europe, and wants to capitalize on this to capture a share of the high-end market. Price will only be a small part of this.

The government of Mauritius has also played a role in building the industry by creating an “enabling environment”. Mauritius benefits from its small size and dense population. Mauritius has excellent roads, and a high-tech port. Institutional support to industry has aimed at restructuring companies in crisis and increasing co-operation between private business and government. Investments in ICT infrastructure have provided enough telecommunications bandwidth to allow for growth in use of the technology. The large number of landlines allows easy household access to the internet, and the government is in the process of liberalizing telecommunications markets to increase competition and bring down prices.

However, skills in ICT at all levels are lacking, and skill levels amongst the population generally are low. Education levels correlate with levels of ICT use and skills. When benchmarked against other middle-income countries, education is the chief aspect of

development where Mauritius falls behind. ICT use by business is patchy. Many companies do not have websites, and government could clearly provide a role here in both providing a service to encourage and aid this, and to develop a network of companies that would provide a shop-window for international retailers.

Mauritius would also benefit from investments in research and development. Companies need to seek out ways to exploit niche markets of low-volume goods. If Mauritius can brand itself as a center of high-quality production with good conditions, labor and environmental controls, this will help it exploit these opportunities.

Currently, it would appear that the larger garment companies—those that use ICT, produce higher value goods, and know their market thoroughly—are the most likely to survive. However, even these firms need help from the umbrella offered by the preferential tariff agreements, because labor costs make production costs higher than in Asia.

Now, in a bid to reduce labor costs, Mauritian companies are investing in neighboring Madagascar. Although around 30,000 jobs have been lost in Mauritius in the last five years, Mauritian-owned firms now employ 32,000 people in Madagascar. As more and more production has moved out to Madagascar, the government in Mauritius has been trying to identify a new industry which could replace much of the textiles and garments sector. The focus of its investment in ICT at present is to develop Mauritius as a ‘Cyber Island’, making technology the ‘fifth pillar’ of the economy (after sugar, the EPZs, financial services and tourism). In a symbol of the transformation of the economy, the government chopped down a sugar cane plantation to develop ‘Cyber City’ in the middle of the island. Built with a loan of \$30m from the Indian government, the development is expected to employ 20,000 people on completion in 2007. The bulk of employment will be in call centers, data entry, software and web development, telemarketing, image capture, and information processing.

Strategies for Staying Competitive

6.1 Defining the Issues

How can a country position itself in a sector which has become increasingly dominated by China? In broad terms, **three categories of garment-producing nations need to be considered:**

- **Volume producers** with a tradition of textile and/or garment manufacturing, where exporters are now free of MFA quota restraints (e.g. India, Pakistan and Bangladesh). The removal of quotas for these countries has brought considerable potential for expansion, given the right enabling environment. Any moves towards further vertical integration are likely to enhance the country's prospects.
- **Countries where the garment industry grew primarily as a consequence of preferential tariff systems** and quota restraints on other countries (e.g. Mauritius, Lesotho and other African countries). These producers appear to be the most vulnerable during this period of adjustment, and may have to expand their product ranges or seek out market niches.
- **Garment producing nations that are geographically situated near either the US or the EU markets** (e.g. Central and South American countries, the Caribbean basin, Eastern Europe and Turkey etc.). These countries will face greater competition from Asia but can exploit their logistical advantage by offering skilled and flexible companies that can meet "just-in-time" order schedules.

Companies situated in these different types of countries will have varying options when devising a strategy for remaining competitive in the post-quota environment. In each case, some level of ICT will certainly have a role, but that role will vary significantly between a producer of basic commodity garments and a more specialized niche manufacturer. Most importantly—and the theme of this

study—the opportunities to exploit ICT in the textile and garments industry will always be limited (or promoted) by natural and historical factors in given countries, and by the robustness (or weaknesses) of the wider domestic business environment.

What, then, are the general aspects of the business environment that are considered most important? Buyers responding to survey about the relative importance of various business factors when deciding to source from or invest in a country provided some answers. The results are shown in the table, and have been ranked in the order according to the proportion of "critical" plus "major" responses.³⁵ Developing countries facing pressure from the end of MFA quotas can at least take heart that many of the most important factors are matters over which a national government has considerable control. So there is much that can be done to help satisfy the requirements of the buyers.

Labor standards top the list, suggesting that education and skill-enhancing policies are of key importance. The main shortcoming mentioned by companies operating in Mauritius, for example, was the inadequate educational levels on the island. Inevitably, preferential tariffs and free trade agreements also score highly, given the lack of a free market for textile and garments trade during the past four decades. But even in this area, a government can seek to exploit any subtle opportunities produced by the vagaries of the tariff and quota regimes, and must certainly bear in mind any end-dates for such systems (although lobbying by regional groups on the international stage may sometimes yield more tariff concessions). Of the other high-ranking factors in the survey, political and economic stability is largely in the hands of a government, as are governance issues such as corruption, law enforcement, effective inspectorates, and efficient customs processes.

³⁵ FIAS, 2004.

TABLE 5. Importance of Country-Specific Factors in the Decision to Source From or Invest in a Country—A Survey of Buyers

%	Critical	Major	Moderate	Minor	None
Level of labor standards and practices	46.6	46.6	6.7	0	0
Preferential tariffs or free trade agreement	33.3	60.0	6.7	0	0
Political and economic stability	26.6	66.6	6.7	0	0
Access to international materials and/or supplies e.g. yarn, fabric, trim (imported or domestic)	26.6	60.0	13.4	0	0
Corruption, law enforcement and effective inspectorates	6.7	66.7	26.6	0	0
Speed-to-market	13.3	60.1	13.3	13.3	0
Customs delay	20.0	46.7	26.6	6.7	0
Risk mitigation (diversification)	6.7	60.0	26.6	6.7	0
Protecting the rights of workers to organize unions	13.3	46.7	40.0	0	0
Bureaucratic red tape	20.0	40.0	33.3	6.7	0
Level of environmental standards and practices	13.3	40.0	46.7	0	0
Investment promotion and incentives	7.7	15.4	38.4	30.8	7.7

One of the most interesting aspects of the study is the importance put on the ease of creating a vertically integrated operation, either through local supplies or imports of yarn, fabric and trim. This confirms the view that **a full package service is what buyers are increasingly demanding.** Fortunately, this is one area where there is considerable scope for a developing country to improve its performance, and where ICT can play an important role in sourcing materials efficiently as part of offering the full package service. Separately, **the ranking given to speed-to-market demonstrates how for the majority of buyers this is crucial, but that there are some less seasonal and less fashion-oriented products for which it is only of “minor” importance. A developing country situated geographically far from the main export markets, and with long transport times, would be well-advised to identify such products and buyers.**

Any country needs to position itself realistically in the value chain. Issues and trends for policy makers to bear in mind include:

- **Fewer suppliers.** Buyers are reducing the number of countries from which they source, especially for high-volume, basic commodity items. The biggest retailers now source in such

large volumes that only big suppliers have the necessary capacity to fulfill some orders. Thus the trend towards fewer, bigger suppliers will continue. Low-volume producers of commodity items are likely to be vulnerable to a further shift in production towards China or other Asian countries. At the country level, the big producers like India and Bangladesh have the potential to become the alternative source to China for low-cost items as buyers will still want some geographical diversity. This high-volume production will demand highly automated factories and the widespread use of ICT. All that said, there will still be a place for niche or high-end manufacturers offering specialized products and skills not widely available.

- **Speed-to-market.** The general trend towards “lean retailing” and a much quicker turnover of fashion lines contributes towards a requirement for shorter lead-times. That is very difficult for companies without modern technology, situated in developing countries with poor infrastructure and at a large distance from the customer’s home markets. However, there are still some products that are not seasonal and are ordered on long lead-times, without the need for quick replenishment, and which offer opportunities to immature industries in developing countries. ICT

is usually crucial to achieve short lead-times, but a lower level of technology may be adequate for less time-sensitive production.

- **Full package service.** The requirement for suppliers to offer a wider range of services is seen across the board, regardless of whether the lead-times are long or short. The level of integration sought from suppliers means that smaller companies need to create “virtual” integrated supply chains, with much greater co-operation with between textile, garment and trim businesses. ICT is often very important for the smooth running of such a network. Larger companies will themselves be finding ways to extend back up the value chain, by taking on more of the fabric processing. Downstream activities, such as logistics and inventory control, are all aided by ICT.

These trends are clearly inter-related. For instance, speed-to-market can best be achieved in a vertically integrated company that offers a full package service. Such a business is likely to be larger, and will therefore be able to offer volume production as well as more specialized skills.

The temporary quotas re-imposed on China have provided a much-needed breathing space for developing country manufacturers to redefine themselves against this landscape so that their textile and garment businesses have a chance of survival in the longer term. There are a number of ways in which a small least developed country (LDC) that is vulnerable to the end of quotas can seek to improve the position of its textile and garment businesses:³⁶

- **Improve product diversification.** An LDC that has focused on producing commodity garments for which China’s exports were constrained is immediately vulnerable to losing business as the final quotas are removed. As mentioned above, 77% of all clothing exports from Africa under AGOA in 2004 were knit shirts and simple trousers—which China will be increasingly free to manufacture without restraint. Product diversification into higher-value items and niche products is something which should therefore be considered.
- **Maximize any tariff or quota advantages that do exist.** For example, cotton is relatively less protected than man-made fibre apparel. The US, for example, imposes an average 20% duty on

imports of cotton-knit shirts, but 32% duty on shirts of man-made fibre. To make the most of their duty-free access, firms should therefore develop clothing exports of man-made fibre and improve their sourcing of man-made fabrics.

- **Diversify markets.** This should include looking for opportunities to sell into fast-growing developing markets, so long as tariff barriers are not too high.
- **Promote cooperation among firms, industry associations, governments, banks, port handlers and customs agencies to develop a coherent strategy for the sector.** This could include cross-border cooperation. The World Bank estimates the average customs clearance time for sea cargo is more than 10 days in Africa and South Asia, nine days in Latin America and the Caribbean and only two days in developed countries. China has achieved big savings on customs clearance time, thus cutting time-to-market.
- **Improve sourcing skills to create integrated industry and supply chains.** For small countries this can be done on a regional level, to create a “virtually” integrated supply chain (see below). Larger countries can promote new areas for domestic integration. For instance, Pakistan’s Textile Vision 2005 aims to increase output of apparel made of synthetic material by encouraging the production of polyesters and other man-made fibres.³⁷
- **Enhance design capabilities** and exploit any market for local, craft-enhanced “ethnic” textiles or clothing.
- **Seek (particularly on the part of low-cost countries) long-term partnerships with investors** that are based on factors other than quotas or temporary preferential tariffs. This might include collaboration over training and technology transfer, or even an equity stake in a textile mill or garment factory.
- **Make appropriate ICT investments** to meet buyers’ technology requirements for electronically-managed supply chains and information flows.

6.1.1 “Virtual” Vertical Integration

As the survey results above showed, a supplier’s access to yarn, fabric, and trim is considered highly relevant

³⁶ Knappe, 2005a.
³⁷ UNCTAD, 2005.

by a buyer looking for a full-package service. But this can present a huge challenge to a supplier in a small developing country without an indigenous textile industry. Technology can have a useful role to play in such cases by helping to create “virtual” integrated business networks. Small LDC suppliers can group together within and across countries to develop economies of scale and to offer a vertically integrated service to buyers. African countries, for instance, mostly do not have adequate domestic textiles industries to process local raw cotton into fabric for the export-oriented garments sector. One expert argues: “Filling the ‘fabric gap’ in the chain could help them reduce costs and boost their competitiveness. Cotton growers, ginners, fabric manufacturers and clothing manufacturers in different parts of the continent should consider collaborating in a regional value chain, from cotton to clothing, to offer competitive products to major markets.”

The output from one textile factory is usually large enough to need several different garment-making customers. By establishing a customer base in a number of neighboring countries, it may prove possible to create the necessary market to justify investment in a textile mill and to tempt in foreign investment. One study found that the greater the quality of a country’s infrastructure, the larger the

share of total exports driven by vertical specialization. Alternatively, the cooperation can be between regions rather than just countries so that, for instance, raw cotton from Africa can be exported to Asia for processing into fabric, and that fabric then brought back to Africa for garment-making.

6.1.2 Niche Positioning

Vulnerable suppliers need to carve out a lasting niche in the value chain. There are various ways in which this strategy might be approached. One is to focus on a specific type of high-end product, such as cashmere sweaters (as at Tara Knitwear in Mauritius, see Section 5) or a range of items which demand specific craft skills (see the case study in Section 3). Another way to seek out a niche reputation is by meeting the increasing demands from developed country consumers for labor-friendly and eco-friendly products. Retailers fear adverse publicity and boycotts that result from consumer lobby groups discovering poor labor conditions in their suppliers’ factories. Independent auditing for compliance of such standards can raise a developing country’s status in the eyes of buyers, as Cambodia found. A country open to independent monitoring of this type can clearly differentiate itself from China, where independent trade unions or workers’ associations are not permitted.

BOX 15. Cambodia and ILO Monitoring

Better Factories Cambodia is probably the most high-profile example of a direct link between a workforce improvement project and improved export performance. This has created a market niche for Cambodia based on respect for labour standards.

In 2001, the US awarded garment export trading privileges to Cambodia in return for improvements in factory working conditions. As part of the deal, the International Labour Organization (ILO) created a team of independent monitors who make unannounced visits to the garment factories with a checklist of more than 500 items, including freedom of association, wages, working hours, sanitary facilities, machine safety and noise control. The ILO then provides assistance in redressing any problems and improving factory productivity. Garment manufacture has subsequently grown to employ around 260,000 workers, mostly female, and accounts for more than 70% of the country’s total merchandise exports (WTO 2004 figures). Both the quantity and the total value of garment exports to the US have increased since the project started. Buyers say that good working conditions are one of the reasons for sourcing from Cambodia, which is now rated more highly in this regard than Bangladesh, Thailand, Vietnam and China.

Under this transparent system, the ILO provides independent information on the factories which is available to buyers from overseas. The project is implementing a web-based information system which will provide reports on monitoring, training and improvements in Khmer, English and Chinese.

The ILO monitoring scheme appears to have offered Cambodia some protection against the loss of business forecast ahead of MFA quota removal. So far, both employment levels and exports to the US have been maintained. Indeed, in the first nine months of 2005, garment exports to the US were up a healthy 17.3% in dollar terms, according to US Department of Commerce figures. This is even more remarkable because the bonus quotas awarded by the US in 2001 have now also come to an end. If there has been a shift in business patterns, this has happened within Cambodia with buyers tending to consolidate their purchases by sourcing from fewer, larger factories.

Source: International Labour Organization (2005)

6.2 A Realistic View of ICT

ICT is so broad-ranging in what it offers that there are few buyer requirements (as typified by the survey of buyers, above) that would not benefit from some ICT input. As outlined in Section 3, these technologies offer big advantages for speed-to-market, vertical integration and for improving efficiencies in a host of ancillary services, such as fast customs clearance. Overall, some of the necessary investment will need to come from national governments (e.g. electronic data interchange at ports and customs houses), and some from individual businesses. That said, any developing country manufacturer must judge the appropriate level of investment and type of technology that makes sense, given its position in the value chain. For the Case Study company in Section 3, the camera-enabled mobile phone was a critical component of ICT. Investment in ICT needs to be targeted specifically at improving efficiency, productivity, and quality as part of a wider strategy for survival and growth. Enhancing work productivity through technological upgrading and skills training is often, for instance, a key step towards a goal of diversifying production into higher-value-added garments, such as fashion-orientated women's wear.

As in any business decision, there is a balance between the potential benefits and the costs. If a buyer insists on automated order entry and tracking systems, then this will be the necessary (but not sufficient) condition for winning any order. Luckily, hardware costs for such systems have reduced dramatically in recent years, because the packages can run on PCs and low-cost servers rather than needing mainframe or Unix computers. A garment company making a late entry into this type of ICT technology will therefore be able to do so at a much lower cost. Even so, a company may in practice find that the introduction of quite low-level ICT is all that is needed in the first instance, and a greater investment may be both unnecessary and unwise. If a supplier only needs to be able to log into its customers' internal networks, then reliable internet access will be adequate. Web access will also enable a good knowledge of the retailer's home market and the fashion trends shaping the industry. Business relationships across different countries and time zones are improved by e-mail and secure website

interactions, improving efficiency and saving costs. Tracking and transparency of progress along the supply chain is almost impossible to achieve without ICT. The example of Youngor, in Section 4 demonstrated how some large Chinese suppliers can already match any developed country business in terms of successful implementation of an ICT-enabled full package service.

Staff is often the most important factor in the introduction of ICT. Not only does staff need to be sufficiently skilled, as discussed above, it will also either welcome the new technology or hinder its effective use. Cultural and organizational adjustments are often needed if a business is going to win the levels of collaboration necessary for an integrated supply chain. There are many issues about trust which create barriers to collaboration, which can mean that the technology is not fully exploited. Much greater openness is needed than in previous ways of doing business, and training programs need to be devised, particularly for managers. To quote from one of the main studies of ICT-implementation in the textiles and garments industry: "The companies that appear to have been most successful in e-business, wherever their location and whatever their size or range of operations, started with 'e-preparation' in advance of e-implementation."³⁸

As specified in Section 3.2, there can be a number of obstacles that hinder the uptake of ICT in low-cost supplier countries, all of which need to be addressed before a decision is made:

- Lack of knowledge about available technologies.
- Low awareness of the expectations of buyers in the US and EU.
- Inability to access capital to fund the necessary investment.
- Shortcomings in the wider business environment e.g. unreliable power supply.
- Low levels of existing IT equipment or incompatible systems.
- Cultural barriers to information sharing.
- Low awareness of up-coming technologies.

³⁸ ITC, 2005.

6.3 The Enabling Environment

No amount of ICT investment will solve a company's business problems if transportation links to the port are very poor, electricity is unreliable, or employees lack the skills to make use of the new applications. All such factors are part of the wider business enabling environment that must be in place before adoption of ICT systems makes business sense. These considerations span a variety of issues ranging from basic infrastructure provision, to import/export restrictions, educational levels, and cost of capital to fund investment.

A supplier will be well aware that greater efficiencies within the company's factories will be dissipated further along the value chain if the supporting networks are not in place. The most basic needs include a reliable power supply and telecommunications links, including adequate bandwidth for the planned ICT. As was seen in Section 5, for instance, the location of Mauritius means lengthy transport times to the EU and US, so companies that want to offer short lead-times to their buyers can be forced to switch to air cargo to upgrade their service. The extra costs of such decisions need to be factored into any business plan. If the quickest port clearance and transportation time to the US is two months, for instance, then the company is unlikely to be attractive to buyers as a supplier of high-fashion items which rely on rapid replenishment re-orders.

The local or national government can be encouraged to address the problems. Public investment in dry ports, the creation of Export Processing Zones, provision of incentives (grants, loans, tax relief) and removal of tariff barriers to fabric imports, or export duties are all matters of government policy. Similarly, national investment (or development projects) in the roads and telecommunications infrastructure is something that will demonstrate a country's readiness to play a part in a globalized value chain. In India, for instance, man-made fibres have been subject to special taxes, licensing requirements and import duties because of the domestic cotton industry, but this has restricted potential growth in synthetic garment manufacture.

In many cases, the opportunities offered by ICT in the textile and garment industry will be limited (or

promoted) by all kinds of natural and historical factors in the particular country. The strength of Hong Kong and Taiwan in the global textiles and garments industry, and the need during the MFA quota days to find alternative production bases, has traditionally meant that links through the Chinese diasporas have often led to inward investment for the industry in various developing countries. New diasporas may prove important in future for investment and market access.

The importance of the wider business environment is well illustrated by look at the policies adopted by three very different countries—Bangladesh, Lesotho and Colombia—which broadly match the three country type categories outlined at the beginning of section 6.1.

Bangladesh

- Bangladesh is beset by natural disasters, poor infrastructure, political instability, and corruption, but it has nevertheless made considerable effort to improve its attractions as a garments supplier to foreign buyers. In 2004, textiles and clothes accounted for three-quarters of exports. In the post-MFA environment, Bangladesh's position has held up rather better than expected, with the country emerging as one of the likely high-volume "second-tier" production bases after China. In the first nine months of 2005, clothing exports to the US actually rose 20%. It has gained from some quota removals, but is also facing increased long-term competition from mainland Chinese companies. Bangladesh offers very low wage costs, but its competitiveness is held back by the absence of vertical integration and the slow lead-times. It benefits from some of the preferential tariff deals offered to the lowest-income countries, but in some cases (e.g. the EU's Everything But Arms tariff pact) suppliers cannot qualify for the benefits because their reliance on imported fabric breaks the rules of origin.
- Over the past 20 years the government has acted to reduce import tariffs, float the exchange rate (in May 2003), improve labor conditions and address corruption—although much remains to be done in many areas. The World Trade Organization in 2000 said that reforms were still slow in the "tax revenue base, customs administration, banking, restructuring/privatization of state-owned enterprises (SOEs), and matters of governance".

- One of Bangladesh's main weaknesses when compared to India and China is its lack of vertical integration due to its low production of raw materials and limited fabric manufacturing. The government is well aware that the garment-making industry cannot expand without better access to yarn and fabric—both cotton and synthetic. So barriers to imports have been reduced sharply, with a reduction on the tariff on cotton yarn from 50% in 1984 to 7.5% in 1995 (OECD, 2005a). Overall, import taxes more than halved between 1992 and 1998 on most yarn, textile and garments products. Fabric is mainly imported from East Asian countries, including China. The government has also taken several measures to encourage private investment in the textile industry, both to increase capacity and improve quality, but progress has been slower than originally hoped. Investment in plant and modern technology is needed to boost yarn and fabric production.
- Bureaucratic delays still undermine attempts to shorten lead-times. Customs clearance, port congestion and corruption are all cited by businesses as presenting enormous hurdles. Overall, the lead time for a project is around 12 days in India, but 120–150 days in Bangladesh. The investment climate is very open, with no limits on foreign ownership of companies, but inward investment has been very limited outside the Export Processing Zones.
- Labor is cheap, but of low quality so that productivity is generally poor. There is some appreciation now that business in global markets cannot be won on price alone, and efforts are being made to improve skill levels. Labor stoppages have been a source of disruption for garment makers, further lengthening lead-times for delivery.
- The checklist for reform covers familiar ground: a strategy for vertical integration; expansion into higher value-added products; training and skill-enhancement of the workforce; the introduction of more modern fabric manufacturing systems; improved governance; and more efficient bureaucracy.

Lesotho

- Lesotho faces considerable hurdles in maintaining a vibrant garments industry, and is one of the countries most vulnerable to the end of MFA quotas. In 2004, clothes accounted for 46% of

its total merchandise exports, down from 77% in 2000. Exports have been adversely affected recently both by the ending of MFA quotas and the appreciation against the US dollar by the Lesotho currency, which is pegged to the South African rand.

- The government did take some measures to improve the investment environment when quota and tariff regimes made garment manufacturing an obvious sector for industrialization and export promotion. Various incentives are therefore offered to foreign investors in the industry and there are no restrictions on the level of foreign ownership. Administrative barriers remain because of excessive regulations and weak administrative capacities, but facilities for trade rate reasonably well for Africa.³⁹
- The challenge for Lesotho is that most of the foreign investment has come from Taiwanese businesses, which have started to relocate back to Asia. In addition, almost all the products manufactured in Lesotho are low-margin commodity basics such as jeans and T-shirts, which were previously most restricted in China by MFA quotas. Lesotho has done little to position itself in other, niche products which might offer exports that could more easily be defended. There has been an absence of local entrepreneurial enterprise to take over from departing foreign investors.
- A further challenge is the need to plan ahead for the removal of the relaxed country-of-origin rules for the poorest countries, which are only available under AGOA until 2007. At the moment, all the inputs for garment manufacturing are imported. The government is promoting greater investment in fabric, spinning and knitting facilities to create a more vertically integrated supply chain, but more will be needed.
- In its analysis of Lesotho, the multi-donor Integrated Framework for Trade-Related Technical Assistance program concluded that the garment industry in Lesotho urgently needed better physical infrastructure, stronger backward linkages, and enhanced local human capital. It identified some key barriers to further foreign investment in textiles: insufficient or erratic supplies of water to all major industrial estates; lack of available factory shells and serviced

³⁹ OECD, 2005a.

industrial sites; inadequate conditions and handling facilities at the Maseru railhead; the need for customs clearance facilities at the border with South Africa.⁴⁰

- Time has almost run out to start implementing measures ahead of the 2007 AGOA rules of origin changes. Investment in ICT may have a role both in tackling some general trade-related issues and in helping the garments industry to seek new products and customers. But it will only yield results if it is seen as one of many measures required in a very challenging situation.

Colombia

- Colombia is considerably more developed than Bangladesh or Lesotho and has the benefit of geographical proximity to the US market, with ports on both the Pacific Ocean and the Caribbean. It is also much further forward in moving from basic garment assembly to a full-package service, and can offer design and distribution services as well as the actual clothing manufacture. Various government measures have helped this process to occur. The strategy has been to position the industry to be able to offer higher-value products and shorter lead-times, thus catering for the “just-in-time” demands of the “lean retailers” of North America. All this creates an industry which is relatively well positioned to define a niche in the post-quota world.
- Wages are significantly higher than in Asia, but the workforce skills are higher and quality control is more dependable than in some lower-cost countries. The importance of a skilled workforce has been well recognized, with the government and the private sector both putting an emphasis on training. This investment has included management education, so that the people running the Colombian-owned companies could cope with the evolution from basic garment assembly to offering a full package service.
- The shift from a protectionist to an open economy led to a number of reforms including the floating of the currency in 1999. More than half the cotton and almost all the synthetic materials needed for garment manufacture is imported into Colombia, and there is tariff-free entry for materials used in finished products for export under the Plan Vallejo. As protectionist

barriers were abandoned, local companies started to put more emphasis on exporting products rather than simply satisfying home demand. A number of free trade agreements have been negotiated with other countries, which have been exploited as local businesses became more competitive on the global market.

- Overall, while there are still aspects of the industry to be improved, the Colombian example demonstrates how a country can identify a viable long-term position in the textile and garments value chain, and then take the necessary measures to ensure that the wider business environment encourages businesses to secure an enduring role. Although still at an early stage, clothing’s share of Colombia’s total merchandise exports has increased from 4.0% in 2000 to 5.4% in 2004, according to WTO data.

6.4 Adding Value

Countries have traditionally added value to their textile and garments industries by moving steadily from garment assembly towards offering a full package service, and then sometimes developing their local brands. As seen in Section 2, the proportion of a garment’s value represented by the cut-make-trim stage of a commodity garment is minimal, and if developing countries want to improve profit margins then they need to move beyond this part of the value chain. This can mean either offering higher-value services, or moving into more expensive products, or a combination of both. This was the route taken by companies in Japan, Hong Kong and South Korea in both garments and other sectors in the past as they evolved from being simply low-cost suppliers. Those transitions took place at a time when low labor costs and quality control were still the major factors in winning business. Buyers nowadays take price and quality for granted, and demand a great deal more. This makes the transition more challenging but also creates new ways for some companies to win business.

In a post-quota environment, countries need to expand their strengths to move into higher value

⁴⁰ IFRTA, 2003.

activities. In Sri Lanka, for example, technological upgrading and skills enhancement is being funded by a garment tax. The Commercial Minister has called for universities to introduce of design and product development professional courses. In Thailand, too, there is a new emphasis on design (see box).

Technology puts greater demands on suppliers, but equally it enables value to migrate geographically along the supply chain in a way that was not previously feasible. Only a few years ago it would have been thought fanciful that a garment-manufacturer based in Asia could be in control of organizing the fabric and trim orders, let alone managing the inventory of a big US retailer (see Section 3). The drive for speed-to-market and full package service, combined with ICT, has made all of this a reality.

Ways can be found to add value in the most unpromising environments. If a company finds its activities undermined by the weaknesses of the general business environment, it can still seek out niche products with which it can both compete against global rivals, and secure higher profit margins. The final case study illustrates how strategic thinking can identify market opportunities for survival in a post-quota world, and how ICT will play a part in that medium-term strategy.

Case Study: Phenix Logistics, Uganda

In the 1990s, under its program of economic structural adjustment, the Ugandan government privatized and sold off a range of non-performing assets. One of these was an old textile factory, which was bought for \$500,000 in 1999 by a consortium led by a Japanese businessman, Yuichi Kashiwada. The same Kashiwada had earlier run the factory successfully, producing clothes for the local Ugandan market until 1984. Political instability, a declining economy and the collapse of the regional cotton industry forced him to return to Japan.

“I came back to produce for the export market,” explains Kashiwada. After a \$1.5m investment the new company, Phenix Logistics now employs 300 people to produce 570,000 T-shirts and cotton knit shirts a year. But, it is struggling. “Even with AGOA,” says Kashiwada, “I can’t compete with companies in China, Bangladesh and Vietnam. What they can produce for \$1 with the cost of quotas, still costs us \$2 to make and sell to America.” As a result Phenix’s clothes are sold on the open market within Uganda, and even then it is hard. Kashiwada is selling \$200,000 of stock a month locally, but at 10% below cost. It is the only way to compete with cheaper Chinese imports. “We’re operating at one-third of capacity, but I have

BOX 16. *Thailand’s Strategy*

The Bangkok Fashion Week is now a twice-yearly event aimed at promoting Thailand’s desire to emerge as a regional hub for the fashion industry – and a wish to become the “Italy of Asia”. The event is organized by the Department of Export Promotion, with the support of the private sector, and is a showcase for the country’s fabric and garments industry, and in particular the new emphasis on promoting local design skills and young Thai fashion labels.

Thailand is usually thought of as a specialist in silk and as a production base for global brands such as Calvin Klein and Tommy Hilfiger. But the country now aims to carve out a reputation for its own design houses, which include such newcomers as Tube, Soda and Greyhound, as well as the country’s most established brand, Jim Thompson Thai Silk. Individual designers such as Thakoon Pannichgul and Chamnan Phakdeesuk have a reputation on the international stage.

Cotton garments are receiving more attention, including the small output of the non-profit development organization, Mae Fah Luang Foundation, which uses hand-woven fabric from northern Thailand village weavers as part of a poverty-alleviation project backed by the Thai royal family. Like Jim Thompson, Mae Fah Luang is a vertically integrated operation, from growing the fibre to wrapping the end product.

Moving up the value chain and going international remains a challenge for Thailand, however. In a down to earth assessment of progress to date for the Textile and Garment Development of Efficiency and Technology (T-DET) organisation, Gil Aimbez, of the New York fashion consultancy Fezbez, said the key problems were lack of good designs, an inadequate fashion database and bad trend analysis. Product quality was also deemed to be a problem. “Designers should create costumes that can be worn all over the world,” he said (Jaiimsin, 2005).

to keep up production to keep the skills in my labor force,” says Kashiwada.

A Disabling Environment?

Chinese competition is not the only problem Phenix faces. Electricity, water and fuel costs are all high. Power cuts are common, and when power comes back, the electricity board charges the factory for the surges in demand which, of course, would not occur without the power cuts in the first place.

Uganda is landlocked, and this results in a natural taxation in the form of transportation costs. Kashiwada says it costs \$1,350 to transport a 20-foot container to the Kenyan port Mombasa by road. After four days in customs, a day at the Kenyan border and 500 kilometers on poor roads, the journey takes a minimum of 10 days. On arrival, the shipment may then have to wait two weeks before the next sailing to Europe. Air freight at \$5 a kilo is not a realistic alternative. Interest rates, in what is an immature financial market, are also high. Kashiwada has managed to secure loans at 18% to cover his operating costs, below the standard 25% rate.

The Ugandan government has done little to attract investment, and does not offer many of the incentives that its competitors do, such as tax holidays, duty-free imports and reduced taxes. Instead, incentives and subsidies are given to companies on a firm-by-firm basis, opening the government to allegations of corruption. A 2001 report notes: “Uganda must bear in mind that it competes with all countries of the world to attract FDI resources. Many other countries offer attractive incentives to induce firms to locate inside their borders. Uganda has not pursued these as aggressively as others.” (Nathan-MSI Group, 2001)

“The incentive is nil,” says Kashiwada. “We have 200 items we import to maintain production. We’re paying 18% VAT on all our production inputs: imported fabrics, sewing thread, buttons, dye stuffs. Other countries are given incentives, tax relief. There is no incentive in this country.” He recalls being promised five years tax exemption back in 1999, “But it was an empty promise,” he says.

The company has suffered from lack of investment. It uses old refurbished machines, the production line is entirely manual, and even layering and cutting is

done completely by hand. A team of six people layer cloth before cutting at Phenix, while in other companies this would be done faster and more accurately by a machine.

Organic Opportunities

Despite these problems, Kashiwada is optimistic. His strategy remains the same now as it was in 1999. “I never wanted to export for AGOA. My strategy was for vertical integration and production of organic cotton for small European markets.”

Uganda has some of the best cotton in the world. Phenix has opened a spinning mill producing cotton of quality USTER 5%—which means its cotton is in the top 5% globally. More importantly, much of that cotton has been certified as organic. It already exports to added-value garment manufacturers in countries like Mauritius, and plans to tap into the premium prices for organic cotton (see table). “Our only merit is our cotton,” explains Kashiwada. “There’s very good cotton here. Only Turkey, India, Egypt and Australia are producing organic cotton now, and there’s a big premium on organic cotton.”

Kashiwada has a three-stage plan, beginning with a \$2.1m upgrade of the spinning plant from its current capacity of 7 tonnes a month to 54 tonnes. The plant will produce organic cotton yarn that can fetch \$4 a kilo, a big premium on the standard price of \$2.70. The next stage is to produce organic fabrics, and finally organic garments. The plan includes investment in cutting machines, and a \$90,000 ERP system. For Phenix, expansion is contingent on ICT investment. ICT enables savings on production, and bigger production.

TABLE 5. Premium prices for organic products

Price per kilo (\$)	Non-organic	Organic	Price premium
Cotton	1.20	1.50	25%
Yarn	2.75	4.00	45%
Fabric	3.75	5.20	39%
T-shirts(x 4)	16.00	32.00	50%

Source: Based on figures supplied by Phenix Logistics, Uganda

The plan is dependent on a pending \$5.5m loan from a Japanese-funded development program. The loan was given on the condition of a guarantee from the Ugandan government, ostensibly as protection against political instability. However, the local press has argued that the government's guarantee of a private loan amounts to favoritism, and parliament initially delayed approval of the loan. Nevertheless, Kashiwada expects to begin the upgrade on the spinning plant with the approval of the loan in early 2006. And he says he already has three European buyers for his added-value organic cotton yarn.

6.5 A Checklist for ICT success

The many factors involved in improving competitiveness in the textiles and garments industry mean that a multitude of questions need to be asked by any country or country thinking of investing in ICT. No list can be exhaustive, but an attempt below has been made to draw together some of the issues that have been raised here, addressing the need for, or the merits of, investment in ICT in the textile and garments industry. It should be noted that many of these concern private sector actions: to the extent that ICT can directly improve firms' competitiveness, the initiative and implementation will often come from business. At the same time, government policy will be important in co-ordination, infrastructure, and shaping the general business environment.

- Businesses decisions must always consider the likely **medium-term impact of the ending of MFA quotas**.
- The **basic features of the host country** should be considered against the broad categories in Section 6.1 in an initial attempt to define a viable position in the value chain.
- Firms should **identify the appropriate product types** for the post-quota world in terms of realistic lead-times, production volumes and quality level.
- Firms should carry out an **independent assessment** of the quality of existing output and whether quality could be improved by investment in ICT to ensure retention of existing business.
- **Existing business relationships** with Asian countries should be investigated for their future potential.
- Governments and companies must take a realistic view of the **infrastructure shortcomings** (including transport) adversely affecting the development of the textile and garments sector.
- A similar assessment should be undertaken of **government policies** and bureaucracies.
- A review may be necessary of the **calibre of available business management** skills, including the ability to restructure business models and reengineer firms.
- **Developing country suppliers** need to explore what their existing customers will want them to provide in the post-quota environment.
- Companies should analyze how they can **improve their speed-to-market** for time-sensitive deliveries.
- Similarly, they should investigate how they could use ICT to move towards a **“full-package” service**, and what other parts of the supply chain could be managed.
- Firms should assess what **new niche business** could be won as a result by using ICT to move it further upwards along the value chain.
- Management should continually update itself about the **role of different ICT applications** in the industry.
- Firms should talk to existing customers about their demands for ICT use and compatibility.
- Any upgrade of ICT should include a **thorough review to identify the necessary changes to management structures**.
- A decision should be taken about **whether to outsource the ICT** implementation or develop (or buy in) the in-house skills.
- Similarly, a **choice will have to be made between off-the-shelf software products, or a custom-designed system**. The former is usually preferable and cheaper for a small or medium-sized business.
- **Staff should be included in planning an ICT investment** to encourage them to be receptive and willing to change working practices. Management needs to be aware of workforce sensitivities.
- **Staff training** needs to be planned carefully and implemented fully.
- **Make full use of all the information provided by the new ICT system** when implementing a new business plan.



Conclusion

This study has outlined the type of research and analysis that a developing country should undertake when drawing up a realistic strategy for ICT-enabled growth in any particular sector. A value-chain approach was adopted as a way of examining some of the recent and future trends in the textiles and garments industry. This highlighted the type of challenges developing country suppliers are facing. In conclusion:

- **There are opportunities in textiles and garments for developing countries other than China over the next 10 years, but only for those that define viable positions in the value chain.** Producers outside China face a strategic challenge. A few will be able to compete in high-volume commodity products; others will have to find particular niches; and those situated geographically closer to the US and EU will be able to exploit a logistics advantage. Speed-to-market and a full package service are the two main current requirements facing suppliers.
- **ICT will gain in importance in textiles and garments over the next 10 years,** as it will in most industries. Technology is usually affordable at some entry level and it is increasingly a requirement from certain types of buyers, for certain types of products. ICT can help meet the demand for shorter lead-times, and will enable smaller firms to play a role in integrated supply chains. But its impact will not be uniform: in some situations, ICT will be indispensable; in others it will provide a competitive edge. The actual technologies that are appropriate and most desirable will be determined on a case by case basis, depending on what services and products the supplier is supplying. ICT will continue to mean different things to different companies in the value chain.
- **Introduction of ICT is itself a challenging business step, and needs to be a well-re-**

searched part of a much broader business plan. One ICT system provider said the “willingness to change” and the “ability to handle transparency” were the two most important attributes for a company to implement ICT systems successfully.⁴¹

- **No amount of ICT investment by a company will be able to overcome serious shortcomings in the wider business environment.** Investment in technology should always be addressed in the context of that enabling environment. On the other hand, a national government can often use ICT to help improve some aspects of the business and trade landscape.

The trends in the global textiles and garments industry mean that it will be harder for businesses in many countries to prosper or even survive. Garment exports might cease to be a major sector in some developing countries, especially in Africa, because the companies involved simply cannot meet buyer requirements. Such countries will have to diversify into other export-oriented sectors. **Investment in ICT is unlikely to be the sole decisive factor governing the future of the garments industry in any country. But well-informed decisions about ICT can improve the chances of competitive success.**

The types of ICT required will vary from case to case depending on which advantages each country is seeking to reinforce. Garment producers in developing countries should seek to identify the stages of the supply chain in which they can realistically specialize, depending on factors specific to their country such as closeness to major markets, scope for vertical linkages, existing infrastructure and the policy environment.

⁴¹ ITC, 2005.



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