



Production Upgrading and Skills Development in the Western Cape
Clothing Sector: are industry requirements being met by institutional
policy implications?

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Abstract

This research paper presents an overview and analysis of skills development in the Western Cape clothing sector in the context of production upgrading. The analysis touches on the broader South African skills development framework and industrial policy towards the clothing sector, notably the shift from mass production towards the adoption of Lean Production and the Quick Response retail model. As clothing firms based in the Western Cape evolved their production strategies and moved up the value-chain and towards Lean Production methods and Quick Response capabilities, skills requirements also evolved. As such, suitable skills development initiatives are required to support this evolution and industry innovation. Skills development institutions such as SETAs are unable to provide the necessary training required by these firms to successfully transition to the new production methods and retail supply model, with skills gaps and shortages occurring both at a technical and managerial level. Due to publicly funded institutions not providing the required associated training, a number of manufacturing firms are privately funding training programmes for their workers in an attempt to resolve this problem, but many cannot afford this intervention. While privately provided skills training may be a short-term transitional solution, it is not sustainable to ensure overall industry development, growth and success as firms undertake the implementation of evolved production methodologies and implement the Quick Response retail model.

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Chapter 1

Introduction and overview

This research paper presents an overview and analysis of firm requirements to improve global competitiveness levels and the associated required skills development, in the Western Cape clothing sector. The paper is positioned in context of the general clothing production strategy shift away from mass production towards the adoption of Lean manufacturing and the Quick Response retail model given the current provision of skills and skills development initiatives. Skills development initiatives are located in the broader South African context, both in relation to the country's Apartheid history and post-1994 economic and policy reforms. Its central focus is assessing whether there are appropriate skills development initiatives in place to support the skills requirements of clothing manufacturers in the Western Cape as they shift towards more domestic and global Quick Response capabilities and Lean production methodologies to improve overall competitiveness. Areas of focus include clothing industry production strategies and the requisite skills requirements, institutional policies concerning skills development initiatives and the resulting disparities between stakeholder needs and institutional provisions and implications.

To present this, Chapter 2 of the paper unpacks the dynamics underlying the fundamentals of the global value chain, requirements for global competitiveness and how it has lead clothing manufacturing firms in the Western Cape to upgrade their production methodologies and strategies, resulting in the adoption of Lean manufacturing principles to ensure Quick Response retail capabilities. It goes on to explain how to ensure the strategy and production upgrades are undertaken successfully, new skills are required. Chapter 3 provides an overview of the South African and Western Cape clothing manufacturing environment and its development, by exploring the travails that the clothing sector has suffered over the past 20 years. Chapter 4 explores the skills gaps and shortages currently found in the Western Cape clothing sector. Their associated levels of employment will be identified along with the training initiatives currently in place to develop these skills and the institutions providing them. Chapter 5 presents feedback from interviews with four clothing manufacturing firms in the Western Cape, which all highlight a divergence in the skills provided and the skills required to successfully upgrade production methodologies and capabilities. It will be shown that private firms have attempted to resolve this skills deficit by privately providing skills training. Chapter 6 concludes with policy recommendations.

Before an analysis of skills development in the face of production upgrading in the Western Cape clothing industry is presented, it is important to understand at a broader level why this industry requires consideration and further development. Textiles and apparel is a major sector for both the industrialised and the lesser developed economies, contributing both to wealth generation and employment (Bruce & Daly, 2004).

Global clothing exports accounted for US\$375 billion in 2011, making clothing one of the most traded manufactured products (Morris & Barnes, 2014). In 2013 clothing exports had the second largest growth rate of 9%, which is more than four-times higher than the average growth rate for world exports (2%), at a value of US\$406 billion (WTO, 2014). At this time, clothing trade as a percentage of total merchandise was 2.6% (WTO, 2015). Developing countries have accounted for a rising share of clothing exports and this constitutes the first manufacturing sector to become dominated by developing countries (Morris & Barnes, 2014). Due to the nature of the clothing sector (low barriers to entry and unrestricted production and trade patterns that can be easily and quickly adjusted to adapt to changing market conditions) it is a highly competitive industry. As such, it is vital for firms in South Africa, and specifically the Western Cape, to enhance their competitiveness and develop production strategies to assist in this regard. This is illustrated by several Western Cape clothing firms (both prominent and smaller operations) undertaking the move towards Lean production methods and improving Quick Response capabilities. However, in order to achieve success with these new production operations and strategies, an appropriately skilled workforce is required.

Industrial development and export diversification of manufacturing activities is a major development objective for developing countries (Morris & Barnes, 2014). The initial point of entry towards export diversification has traditionally been the clothing sector which is generally regarded as the first step onto the path of an export-oriented industrialisation process (Gereffi, 1999). Due to the low barriers to entry (low fixed costs and relatively simple technology) coupled with the labour-intensive nature, the clothing sector has the ability and potential to absorb large numbers of unskilled workers whilst providing upgrading opportunities into higher value-added activities as firms move up the global value-chain. In more advanced economies, such as Turkey, which faces high comparative costs, the clothing sector has sustained large numbers of direct jobs (Morris & Barnes, 2014) and as such provides a vision for South Africa, and specifically the Western Cape to follow a similar direction.

Clothing firms, and especially those in developing countries, are under pressure to improve performance and increase their competitiveness (Humphrey & Schmitz, 2000). As new and low-cost producers enter the global market, competition intensifies as companies' co-ordinate the chains which connect developing country producers with advanced country markets. The growing importance of export-oriented industrialisation has made the integration into the global economy almost synonymous with development for a number of nations (Gereffi, Humphrey, & Kaplinsky, 2001). International trade in goods and services is no longer seen as solely or mainly a multitude of arm's-length market based transactions. An important part of global trade is conducted within multinational enterprises or via systems of governance that link firms together through a variety of sourcing and contracting arrangements (Gereffi, Humphrey, & Kaplinsky, 2001). The lead firms that are involved in constructing these value-chains are predominantly located in developed countries and include multinational manufacturers, large retailers and brand-name firms. They play a significant role in determining what is to be produced, how and by whom (Gereffi, Humphrey, & Kaplinsky, 2001).

When firms face competitive pressures, they either need to perform the same tasks, but more efficiently or they have to change the activities that are undertaken (Humphrey & Schmitz, 2000). The most viable response is to 'upgrade' production – to make products more efficiently while increasing value adding activities by making more sophisticated products and undertaking more sophisticated processes (Humphrey & Schmitz, 2000). The concept of upgrading refers to four different shifts that a firm may undertake:

- Process upgrading: the transformation of inputs into outputs more efficiently as a firm reorganises the production system or introduces superior technology.
- Product upgrading: the decision to move up the value-chain by producing more sophisticated products.
- Functional upgrading: the acquisition of new functions in the value-chain such as design or marketing.
- Chain upgrading: the process of shifting to a more technologically advanced production chain.

The first type of upgrading involves the same tasks done more efficiently, the second and third type of upgrading lead to a repositioning in the global market and as such the global value-chain (Humphrey & Schmitz, 2000). Different products are produced for different customers.

It has been noted that in recent times there has been a coincidental shift in approach to industrial policy for the clothing sector, which is increasingly evaluated from a global value-chain perspective and the manner in which firms, regions and countries are linked in the global economy (Reed, 2012). This has determined the possibilities for firms to become integrated into the global value chain by upgrading their production capabilities as they move away from low value-added production towards high value-added production (Gereffi & Memedovic, 2003). The clothing industry of South Africa has undergone tremendous change over the past 20 years as a consequence of globalisation and trade liberalisation. There are three key aspects of this transformation. Firstly, the dynamic nature of buyer-driven value-chains. This underpins the need for firms in developing countries to transition away from low value-add competitiveness towards upgrading their production, design and marketing by demonstrating World Class Manufacturing capabilities (Barnes, Morris, & Esselaar, 2006). Secondly, the dominance of global buyers. They drive the value chain for clothing and their sourcing strategies and practices strongly influence the spread and pattern of clothing production and global clothing trade and the development of their domestic clothing sectors (Reed, 2012). Thirdly is the dominant presence of China in global clothing networks (Reed, 2012).

The Cape Clothing and Textile Cluster was founded in 2005 in response to the considerable pressure the industry was facing as a result of trade liberalization and increased global competition. The aim of the cluster is to assist clothing and textile firms to bolster their competitiveness. This is achieved by assisting firms with regards to Lean production, Quick Response and value-chain alignment. A focus on Lean manufacture and the Quick Response retail model are the core components of this initiative and assist firms in enhancing competitiveness both domestically and internationally. Many of the large clothing manufacturers based in the Western Cape as well as smaller operations, are members of the Cape Clothing and Textile Cluster and as such have embarked on the journey up the value-chain and towards Lean production methodologies and Quick Response capabilities. Currently, membership stands at 45 firms.

There is a serious need to develop skills in the clothing industry. Currently there appears to be few new skilled people entering the industry to replace those who leave, and very little skills development taking place within firms, whether publicly or privately provided (Barnes, Morris, &

Esselaar, 2006). Without appropriately skilled employees, technical staff and management, the industry will not be able to become internationally competitive (Barnes, Morris, & Esselaar, 2006). Formal tertiary education for clothing and textiles has been very limited in South Africa. Most technikons offer courses in textiles or fashion design, but until January 2001 only the Durban Technikon was providing a course in textiles technology. Since January 2001 the Cape Peninsula University of Technology has also offered a national diploma in textiles technology, and currently offers a Bachelor of Technology in clothing management. Nonetheless, both Technikons are struggling to find sufficient students to make their courses viable (Barnes, Morris, & Esselaar, 2006).

It will be shown that clothing firms based in the Western Cape are evolving and upgrading their production strategies and methodologies while they move up the value-chain, both locally and globally. The implementation of Lean methods and Quick Response capabilities result in skills requirements also having to evolve and suitable skills development initiatives are required to support this evolution and industry innovation. Skills development institutions such as Skills Education Training Authorities (SETAs) are unable to provide the necessary training required by these firms to successfully transition to these new production methods and as such these firms are privately funding training for their workers. While privately provided skills training may be a short-term transitional solution to the issue of skills training, it is not sustainable to ensure overall industry development, growth and success as firms undertake the implementation of new Lean production methodologies and implement the Quick Response retail model to achieve increased competitiveness levels.

Methodology

There are three primary research questions that will be addressed in this thesis.

1. Can Western Cape clothing firms improve levels of competitiveness?
2. What production upgrading capabilities and skills are required to achieve improved competitiveness as firms adopt the Quick Response retail model?
3. Can the production upgrading strategies required by Lean production and Quick Response methodologies be successfully implemented with the current provision of skills?

Clothing firms, and especially those in developing countries, are under immense pressure to improve performance and increase their competitiveness (Humphrey & Schmitz, 2000). As new and low-cost producers enter the global market, competition intensifies as companies' co-ordinate the chains which connect developing country producers with advanced country markets. The growing importance of export-oriented industrialisation has made the integration into the global economy almost synonymous with development for a number of nations (Gereffi, Humphrey, & Kaplinsky, 2001). The clothing industry of South Africa and specifically the Western Cape requires a level of global competitiveness for the industry to develop, grow and flourish. This paper will explore what is required to reach this level of global and domestic competitiveness and whether clothing manufacture firms in the Western Cape possess these fundamental requirements. The adoption and development of Quick Response capabilities and Lean production methodologies is vital for improved global competitiveness levels.

The classic Fordist mass production manufacturing system is no longer in line with market requirements and as such clothing firms in the Western Cape have shifted towards adopting new Lean production methods as they implement the Quick Response retail model and move up the value-chain to become more competitive both locally and abroad. Lean production and agile supply chains should not be viewed in isolation, but rather should be seen as a progression (Naylor, Naim, & Berry, 1999). A firm requires Lean production capabilities in order to achieve an agile supply chain to ensure success of the Quick Response retail model. This is required for manufacturing firms to compete on a global level, given the dominance of both local and global retailers. While clothing producers in the Western Cape take the initial steps towards the implementation of Quick Response capabilities, this paper will look at what production changes are required by Lean methodologies to ensure the successful implementation of Quick Response and improved global competitiveness levels.

These production and strategy shifts necessitate the development of new skills for both management and labour, especially with regards to new demands such as multi-skilling and multi-tasking (Barnes, Bessant, Dunne, & Morris, 2001). It is important to note that the new skills demanded are not solely technical in nature. There is a strong emphasis on the development of 'softer' skills required for increased team-working, increased responsibility and the new focus on the communication and transmission of knowledge, ideas and strategy both within and without the firm (Barnes, Bessant, Dunne, & Morris, 2001). Many of these skills are not publicly provided for and are

critical to achieving global competitiveness, improved domestic value-chain alignment, the adoption of the Quick Response retail model and the overall development and growth of the clothing sector. Clothing manufacturers in the Western Cape have provided private training in this regard, but it is mostly technical in nature and is neither sustainable for industry development and growth nor enhanced competitiveness.

Data for analysis, both qualitative and quantitative, was sourced from a diverse range of government literature, academic research and dialogue with industry consultants, representatives and experts. Interviews with four clothing manufacturing firms in the Western Cape were undertaken. Data for two of the firms was sourced from B&M Analysts on behalf of the Cape Clothing and Textile Cluster. This was done during annual benchmarks. The benchmarks include a collection of data consisting of both financial and performance metrics measured across time as well as a practical assessment at the firm itself, lasting for half a day. Thereafter a benchmark report is compiled, comparing the firm both to itself and competitors over time. Critical areas are then identified for the firm to make meaningful operational adjustments. The benchmark Key Performance Indicator form is attached as Appendix 1.

Firms were randomly selected from the Cape Clothing and Textile Cluster, based on the fact that they had begun the process of production upgrading and were developing Quick Response capabilities. Firm A specialises in feather inners as well as bed linen and has been in business since 1989. The company operates all along the value-chain by producing high-value quality products as well as low-end market items at a lower price. The company produces over 600 metric tonnes of filling and utilises over one million meters of fabric in production operations each year. Firm A employs over 200 workers and the factory is 6 300 square meters. Firm B produces only ladies outerwear and is a family business. They manufacture for several retailers and designers in South Africa and operate on the higher end of the value-chain. They have recently undertaken steps towards production upgrading as they attempt to become a Quick Response retail supplier. Firm C also produces ladies outerwear and operates at the high end of the value-chain. They only supply two retailers, which are both based in South Africa. However, each retailer has operations at a different factory. One factory is in the Western Cape while the other is based in Lesotho. Firm D produces both ladies and menswear garments and manufacturers for a single South African retailer. The firm operates as a Quick Response supplier and operates at various levels on the value-chain.

Questions and discussions at all firms centred around production, workers, skills, capabilities and experiences. The production manager and a member of staff at each firm were interviewed, with each person providing their views on operations and performance. The interviews took place during the annual benchmarks and questions followed from the data and observations. While benchmark questions themselves were planned and structured for the report, often the members of staff would just provide their assessments in an overall view, pinpointing to what they felt were the most serious improvements and concerns.

Measurement

While government has many documents on technical skills training in the clothing industry, there is not much available related to the adoption of Lean production methodologies or the implementation of the Quick Response retail model. Many clothing firms in the Western Cape have moved towards these strategies, as indicated by membership of the Cape Clothing and textile Cluster, but the transition has not always been documented. This has made effective measurement somewhat difficult. When measurements have been undertaken, they are not easily accessible. The firm's know internally the steps that have been taken to reach a level of Lean production and Quick Response capabilities, but it is more often than not formally documented. Neither are the improvements or challenges faced. While there is an abundance of information regarding the new production methodologies, there is a severe lack of actual data.

Company level data is difficult to come by. This is due to companies not measuring effectively or capturing data over time. The Cape Clothing and Textile Cluster is the exception in this regard. As the Cape Clothing and Textile Cluster has collected data over a period of years and continues to do so – they are one of the few institutions that have clothing manufacture data at a firm level. Each individual firm that is a member completes a standardised form relating to financial and operational performance. This is followed-up by a benchmark of the firm. This is done at a financial, operational and competitor level. Consultants physically go to each firm to conduct the assessment and a detailed benchmark report is compiled. This data is some of the most granular data provided in the sector. Some of the firms measure consistently throughout their production cycle, while some only measure for the yearly assessments. Studies undertaken by the Cape Clothing and Textile Cluster offer significant value and demonstrate the effectiveness of Lean manufacture and the Quick Response model when a measurement framework is undertaken properly. All costs and gains are

accounted for and improvements are shown in both financial and non-financial metrics. If a firm is not measuring correctly, they may not see the full benefit.

However, as the data is measured by each individual firm, discrepancies can arise due to different interpretations of some key measurements. This creates some difficulties with cross-company comparisons, but as most companies tend to measure the same across time, at a company analysis level, the measurements tend to be consistent over time.

Firms wanting to implement Lean manufacturing are often faced with various challenges. The overarching challenge is to demonstrate that the implementation of Lean manufacturing is correlated with improvements in operational performance. Overcoming this challenge is critical as the adoption of Lean manufacturing requires significant investment in improving processes and in training and developing capable workers to ensure they have the required skills to support the new processes (Taggart & Keinhofer, 2013). As the investment will have notable financial demands, there is a need to show that the implementation of Lean manufacturing will stimulate operational improvements. Furthermore, once lean manufacturing has been adopted, the organisation needs to show that the Lean manufacturing approach is continuing to provide benefits: a continuous improvement mentality is integral to the lean manufacturing principle (Taggart & Keinhofer, 2013). It is in this context that the emphasis on measurement is highlighted.

Chapter 2

Global Competitiveness, Lean Production and Skills

Globalisation in the productive sphere implies a functional integration between globally dispersed activities. The value-chain perspective of this is an effective means of conceptualising the forms that this integration takes (Gereffi, Humphrey, & Kaplinsky, 2001). The sole focus on production is shifted to the whole range of activities, including design and marketing, and then looks at how these chains are organised and managed. This helps identify those succeeding in the globalisation process, how

and why the gains from globalisation are spread and how to increase the number of successful firms operating in this space (Gereffi, Humphrey, & Kaplinsky, 2001).

“Fashion markets are complex and exposed systems that frequently demonstrate high levels of volatility given their nature. Given the nature of fashion it can be argued that in such conditions managerial effort may be better expended on devising strategies and structures that enable products to be created, manufactured and delivered on the basis of ‘real-time’ demand to mitigate significant demand shifts. This is the context that has produced the emergence of the agile supply chain and the philosophy of the Quick Response model (Lowson, King & Hunter, 1999). The supply chain can be described as a chain linking each element from the customer and supplier from the very first process encountered in the production of a product right through to the final sale to the end customer (Bruce & Daly, 2004). This is achieved by linking manufacturing and services so that the flow of materials, money and information can be effectively managed to meet the business requirement (Agarwal, Shankar, & Tiwari, 2006). “

“Fashion is a broad term which typically encompasses any product or market where there is an element of style which is likely to be short-lived (Christopher, Lowson, & Peck, 2004). Fashion markets can be defined as typically exhibiting the following characteristics”:

- Short life-cycles – the product is often short-lived, designed to capture the mood of the moment and consequently, the period in which it will be saleable is likely to be very short and seasonal, measured in months or even weeks.
- High volatility – demand for these products is rarely stable or linear. It has many influences.
- Low predictability – Accurate forecasts for a given time period are difficult, due to the volatility of demand.

“Current fashion markets are highly competitive and result in the constant need to refresh product ranges. This means that there is an inevitable move by many retailers to extend the number of ‘seasons’. This relates to the frequency with which the entire merchandise within a store is changed. In extreme cases, typified by the successful fashion retailer Zara, there might be twenty seasons in a year” (Christopher, Lowson, & Peck, 2004). The implications of this trend for supply chain management are clearly profound. The combined effect of these pressures clearly provides a challenge to logistics management. Traditional ways of responding to customer demand have been forecast-based, with the resultant risk of over-stocked or understocked situations (Naylor, Naim, &

Berry, 1999). Furthermore, given the forecasted demand, production was generally undertaken with a mass-production approach. Flexibility in product manufacturing was not a requirement.

The emphasis is on adaptability to changes in the business environment and on addressing market and customer needs proactively. Changes in the business environment stem from varying needs of the customers and result in uncertainty in the decision parameters. Flexibility is needed in the supply chain to counter the uncertainty in the decision parameters. A supply chain adapts to the changes if it is flexible and agile in nature (Agarwal, Shankar, & Tiwari, 2006).

“Conventional wisdom holds that the way to cope with uncertainty is to improve the quality of the forecast. Yet, by definition, the volatility of demand and the short life-cycles found in many fashion markets make it highly unlikely that forecasting methods will ever be developed that can consistently and accurately predict sales at the item level. Instead, ways must be found of reducing the reliance that organisations place upon the forecast and instead to focus on actual point-of-sales data and lead-time reduction. Essentially, given shorter lead-times the result is that the forecasting horizon is shorter - hence the risk of error is lower (Christopher, Lawson, & Peck, 2004).”

“More recently there has emerged another trend that has added further complexity and difficulty to the management of fashion logistics. The growing tendency to source product and materials off-shore has led, in many cases, to significantly longer lead-times. While there is usually a substantial cost advantage to be gained through sourcing in low labour cost areas, particularly in the manufacturing industry, the effect on lead-times can be severe” (Christopher, Peck, & Towill, 2006). It is not only distance that causes replenishment lead-times to lengthen in global sourcing. It is also the delays and variability caused by internal processes at both ends of the chain as well as the import/export procedures in between. The end result is longer pipelines with more inventory in them, with the consequent risks of obsolescence that arise (Christopher, Lawson, & Peck, 2004).

Much of the pressure for seeking low cost manufacturing solutions has come from retailers that dominate the value-chain, both locally and abroad (Gereffi, Humphrey, & Kaplinsky, 2001). Governance of the global value-chain is central to understanding its function. Governance can be defined as the non-market co-ordination of economic activity (Gereffi, Humphrey, & Kaplinsky,

2001). Some firms in global value-chains can directly or indirectly influence the organisation of global production, logistics and marketing systems through the governance structures that they create (Gereffi, Humphrey, & Kaplinsky, 2001). The decisions that are made have significant consequences for the access of developing country firms to global markets and the range of activities those firms can undertake. A clear example of value-chain governance is the clothing sector, where the power of buyers is clearly evident (Kaplan & Kaplinsky, 1998).

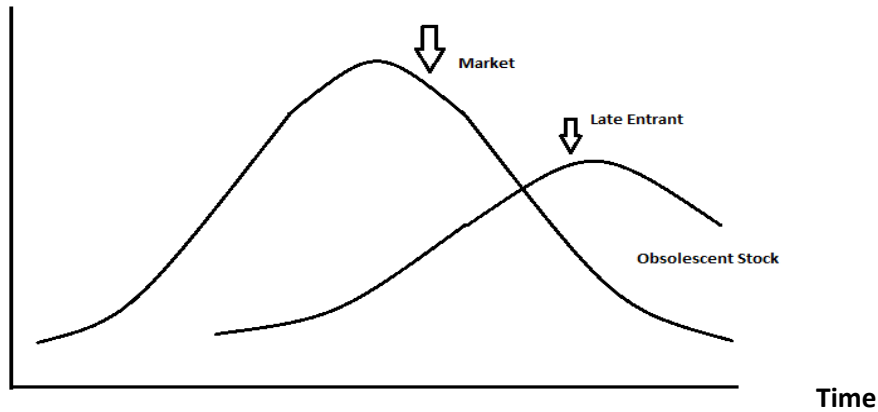
“At the same time there have been moves by many retailers in the clothing business to significantly reduce the number of suppliers with whom they do business. This supply-base rationalisation has been driven by a number of considerations, but in particular by the need to develop more responsive replenishment systems - something that is not possible when sourcing is spread too many suppliers. There are three critical lead-times that must be managed by organisations that seek to compete successfully in fashion markets” (Christopher, Lowson, & Peck, 2004):

- Time-to-Market - how long does it take the business to recognise a market opportunity and to translate this into a product or service and to bring it to the market?
- Time-to-Serve - how long does it take to capture a customer’s order and to deliver the product to the retail customer’s satisfaction?
- Time-to-React - how long does it take to adjust the output of the business in response to volatile demand?

“In these short life-cycle markets, being able to spot trends quickly and to translate them into products in the store in the shortest possible time has become a pre-requisite for success. Companies that are slow to market can suffer in two ways. Firstly, they miss a significant sales opportunity and secondly the supplier is likely to find that when the product finally arrives in the market place, demand is starting to fall away leading to the likelihood of markdowns. Figure 2 illustrates the double jeopardy confronting those organisations that are slow to market as there is less time to capture profits and a greater risk of stock becoming obsolete.”

Figure 2 – Shorter life-cycles make timing critical

Sales



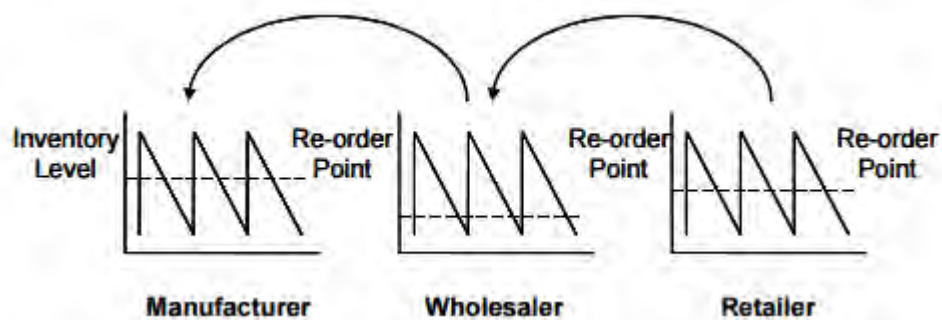
Source: Christopher, Lawson & Peck, 2004

“New thinking in manufacturing strategy which has focused on flexibility and batch size reduction has clearly helped organisations reduce time-to-market. The use of highly automated processes such as computer aided design and computer aided manufacturing have revolutionised the ability to make product changes as the season or the life cycle progresses” (Naylor, Naim, & Berry, 1999). “Traditionally in fashion industries orders from retailers have had to be placed with suppliers many months ahead of the season. Nine months was not unusual as a typical lead-time. Clearly, in such an environment the risk of both obsolescence and stock-outs is high as well as the significant inventory carrying cost that inevitably is incurred somewhere in the supply chain as a result of the lengthy pipeline” (Naylor, Naim, & Berry, 1999). “Furthermore, when manufacture takes place off-shore, considerable time is consumed in preparing documentation, in consolidating full container loads and in-bound customs clearance after lengthy, surface transportation.”

“The underpinning philosophy that has led to this way of doing things is cost minimisation. Primarily the costs that are minimised are the costs of manufacture and secondly the costs of shipping. However, this view of cost is too narrow and is ultimately self-defeating. The real issue is the total supply chain cost, the costs of obsolescence, forced markdowns and inventory carrying costs” (Christopher, Lawson, & Peck, 2004). Once this is taken into consideration, then it can be noted that the old view of costing does not provide a complete assessment. In any market, an organisation would want to be able to meet any customer requirement for the products on offer at the time and place the customer requires them. In order to provide this, a complete assessment of costs must be undertaken (Christopher, 2000). A firm cannot base its competitiveness merely on price and relatively low wages as there will always be others that will find a way to lower prices and wages even more (Tokatli & Kizilgun, 2004).

“Some of the major barriers to this are those highlighted in the previous paragraphs. However, a further problem that organisations face as they seek to become more responsive to demand is that they are typically slow to recognise changes in real demand in the final market place. The challenge to any business in a fashion market is to be able to see real demand (Bruce & Daly, 2004). Real demand is what consumers are buying or requesting hour-by-hour, day-by-day. Because most supply chains are driven by orders (i.e. batched demand) which themselves are driven by forecasts and inventory replenishment, individual parties in the chain will have no real visibility of the final market place. As Figure 3 suggests, inventory hides demand. In other words, the fact that there will usually be multiple, independent decisions on re-ordering policies and inventory levels from the retail shelf back through wholesalers, to suppliers means that up-stream parties in the chain are unable to anticipate the changing needs of the customers other than through a forecast, based as much upon judgment and guess-work as it is upon actual consumer demand (Christopher, Lowson, & Peck, 2004).”

Figure 3 – Inventory hides demand



Source: Christopher, Lowson & peck (2004)

“The fundamental problem that faces many companies - not just those in fashion industries - is that the time it takes to source materials, convert them into products and move them into the market place is invariably longer than the time the customer is prepared to wait (Bruce & Daly, 2004). This difference between what might be referred to as the logistics pipeline and the customers’ order cycle time is termed the ‘lead-time gap’. Conventionally, this gap was filled with a forecast-based inventory - there was no other way of attempting to ensure that there would be product available as

and when customers demanded it. Ensuring that the right product was available was not the priority, but rather that any product should be available. While forecasting was used to try ensure the product was what the customer wanted, it was not always accurate. This would often lead to discounts and additional costs being incurred (Fernie & Sparks, 2004). “

These lengthy supply pipelines often result in revenue losses in the final market. A big concern is forced markdowns - mainly at the retail level. A distinction is made between promotional markdowns, such as special sales, and the marking-down that occurs out of necessity when a season ends and unwanted goods must be moved to make way for new merchandise – forced markdowns (Fernie & Sparks, 2004). It is against this background that the Quick Response retail movement emerged.

Agile supply chain

“The idea of agility in the context of supply chain management focuses around responsiveness. Conventional supply chains have been lengthy with long lead-times and hence, out of necessity, have been forecast-driven. By contrast, agile supply chains are shorter and seek to be demand-driven (Bruce & Daly, 2004). A further distinction is that because conventional supply chains are forecast-driven, that implies that they are inventory-based. Agile supply chains are more likely to be information-based. By their very nature, fashion markets are volatile and difficult to predict, hence the need for agility and flexibility. This means that companies must be able to master both planning for unexpected changes, as well as have business processes in place that allow for changes. Agility means using market knowledge and a strategic network to exploit profitable opportunities in a volatile market place (Naylor, Naim, & Berry, 1999).”

“Being close to the customer has always been a goal of any market-oriented business, but in fashion retailing it is vital. Successful fashion retailers capture trends as they emerge using a variety of means. Point-of-sale data is analysed daily and is used to determine replenishment requirements where the intention is to continue to make the product or iterations thereof available. Beyond point-of-sale data are real consumers and identifying their preferences and changing requirements should be a continuing priority. Zara, the Spanish-based fashion retailer, has teams of fashion ‘scouts’ who seek out new ideas and trends across the markets in which they compete. They also use their own salespeople to identify customers’ likes and dislikes and to feed this information back to

the design team. Using computer aided design and computer aided manufacturing, these ideas can quickly be converted into tangible products and be in the marketplace in a matter of weeks (Christopher, Lawson, & Peck, 2004).” It is primarily a data-driven process.

“The agile supply chain is virtual in the sense that it is connected and integrated through shared information on real demand so that all the players in the chain, from the fabric manufacturers to the garment makers to the retailer, are all working to the same set of numbers. Retailers and their suppliers need to be more closely connected through shared information than was the case in the past (Agarwal, Shankar, & Tiwari, 2006). Until very recently, few retailers in any sector would share point-of-sale data with their suppliers” (Christopher, 2000). Now, however, there is a growing realisation that shared information can enable higher levels of on-the-shelf availability to be achieved with less inventory build-up. Simultaneously, transaction costs can be reduced particularly if the co-operating parties are prepared to move to co-managed inventory.

“Co-managed inventory is a process through which the supplier collaborates with the retailer to manage the flow of product into the customer’s distribution system. The supplier and the customer jointly agree the desired stock levels that need to be maintained in the retailer’s operation. The customer feedback sales data is sent on a regular basis to the supplier who then uses that information to plan replenishments. Typically such arrangements work best where the demand for the product is relatively stable and replenishments within the season are possible” (Christopher, Lawson, & Peck, 2004).

A distinguishing feature of agile companies is their use of flexible arrangements with a wide supply base (Fernie & Sparks, 2004). “Zara has achieved high levels of customer responsiveness by working closely with specialist, often small, manufacturers. The strategy at Zara is that only those operations which enhance cost efficiency through economies of scale are conducted in-house (such as dyeing, cutting, labelling and packaging). All other manufacturing activities, including the labour intensive finishing stages, are completed by networks of more than 300 small subcontractors, each specialising in one particular part of the production process or garment type. These subcontractors work exclusively for Zara’s parent, Inditex. In return, they receive the necessary technological, financial and logistical support required to achieve stringent time and quality targets (Christopher,

Lowson, & Peck, 2004).” The system is flexible enough to cope with sudden changes in demand. This sort of strategic partnership is vital for the development and success of agility in the supply chain.

The changing dynamics of the fashion industry, such as the fading of mass production, increase in number of fashion seasons, and modified structural characteristics in the supply chain have forced retailers to desire low cost and flexibility in design, quality, delivery and speed to market. A key defining characteristic of rapid responsiveness and greater flexibility, in this context, is to maintain closer relationships between suppliers and buyers (Bhardwaj & Fairhurst, 2010).

“Responsive supply chains require a high level of process alignment both within the company and externally with upstream and downstream partners. Process alignment is the ability to create ‘seamless’ or ‘boundary less’ connections, in other words there are no delays caused by hand-offs or buffers between the different stages in the chain and transactions are likely to be paperless (Christopher, Lowson, & Peck, 2004). The underpinning processes will also probably be managed by ‘horizontal’ and cross-functional teams.”

“In an agile network, process alignment is critical and is enabled by the new generation of web-based software that enables different entities to be connected even though their internal systems may be quite different. Now it is possible for organisations that are geographically dispersed and independent of each other in terms of ownership to act as if they were one business (Ferne & Sparks, 2004). In the fashion business there can often be many different entities involved in the process that begins with product design and ends with the physical movement of the product onto the retailer’s shelf. Co-ordinating and integrating the flow of information and material is critical if Quick Response to changing fashion is to be achieved.”

Quick Response

“In all fast moving industries, demand is now more fragmented and the consumer more discerning about quality, value and choice. There is also an increasing fashion influence; no single style or fashion has dominated for any length of time. For many consumer sectors, demand is approaching the chaotic in its insatiable appetite for diverse services and goods. Mass-customisation and individualised products with shorter season lengths; micro-merchandising and markets segmented

at the individual level; large numbers of products chasing a diminishing market share; are all evidence of the inexorable movement toward a market shift and demonstrate the folly of firms expecting to operate as they have in the past (Christopher, 2000). Apparel markets have become more varied and faster-changing in the present retail environment. The development of new, quick fashion appears symptomatic of the transition from a production-driven to a market-driven approach in the fashion apparel industry (Bhardwaj & Fairhurst, 2010).

One of the most fundamental Quick Response philosophies is the ability to compress time in the supply system. If the pipeline is condensed to about one third of its traditional length, not only does the design of goods better reflect more accurate consumer information, it is possible for the retailer to re-assess the demand for products while the season is under way and receive small, frequent reorders from the supplier, provided reorder lead times are short enough. The result is less obsolete stock and fewer markdowns. “

“Quick Response can be defined as: A state of responsiveness and flexibility in which an organisation seeks to provide a highly diverse range of products and services to a consumer in the exact quantity, variety and quality, and at the right time, place and price as dictated by real-time consumer demand (Lowson, King and Hunter, 1999).”

“Quick Response provides the ability to make demand-information driven decisions at the last possible moment in time, ensuring that diversity of offering is maximised and lead-times, expenditure, cost and inventory minimised. Quick Response places an emphasis upon flexibility and product velocity in order to meet the changing requirements of a highly competitive, volatile and dynamic marketplace. To achieve this, Quick Response encompasses an operations strategy, structure, culture and set of operational procedures aimed at integrating enterprises in a mutual network through rapid information transfer and profitable exchange of activity, (Lowson, King and Hunter, 1999). This integration of enterprises forms the basis of strategic partnerships. “

Quick Response has a number of strategic implications for the organisation (Lowson 2002):

- The fundamental principle of Quick Response is the alignment of organisational activity to demand. All activities within an enterprise should be oriented to demand and customer

behaviour. Products and services are produced and delivered in the variety and volume that match demand.

- The alignment of organisational activity to demand requires a strategic understanding of the drivers of demand and its synchronised connection with supply. These linkages between demand and supply are imperative for Quick Response.
- Demand and strategic relationships are required to ensure responsiveness. Quick Response recognises that both consumers and products are dynamic and place unique demands on the organisation. Identical products will have unique product flows depending upon consumer buying behaviour and Quick Response needs. Similarly, product attributes will vary by product type.
- Resource configuration amongst stakeholders must be developed. In a Quick Response environment, this strategic architecture is inter-organisational. Strategy and strategic thinking are at a network level, encompassing many external interconnections.
- Time is a core measurement. Time as a strategic tool is vital to Quick Response operations and its effectiveness depends upon the circumstances of its use, such as process timing and measurement as required by Lean production. Fast and accurate adaptation to market change is perhaps the most important element of the Quick Response strategy.
- Primacy of information is vital. Data and information are the foundation of Quick Response. Timely and accurate flows will enable fast and accurate responses without waste and unnecessary cost.
- Partnerships and alliances ensure effective implementation of Quick Response. A significant development with adopting a Quick Response model is the recognition that performance relies increasingly upon a series of alliances and strategic relationships with other enterprises in the external environment as the most effective way to deal with constantly changing market conditions.

“Apart from the strategic implications, Quick Response also requires a number of operational foundations that have to be integrated and aligned for efficient and effective reaction to real-time demand. The mere possession of the various technologies, processes and activities will be insufficient for an agile response; close linkages are required across the whole supply chain in order to provide a Quick Response capability (Christopher, Lawson, & Peck, 2004).”

As highlighted earlier, consumer demand is becoming more volatile and less predictable. Quick Response is designed for such an environment. The fashion industry is, perhaps, one of the most demanding challenges for logistics management with hundreds of colours, thousands of styles and millions of configurations on the retail shelves at any one time. Furthermore, the average shelf-lives of these merchandise items shorten with each passing year.

In order to realise that much newness, at affordable prices and according to the trends, the textile and apparel industry has to be capable to master and to adapt its business process all along the supply chain. These challenges intensify the fashion industry needs to be agile in terms of technical data and product specifications management, multi-sourcing, informational flow management from suppliers to customers and distant teams management along the supply chain. In addition, the industry is now increasingly facing global competition and rapid technology advances, which bring new challenges and opportunities (Lemiex, Pellerin, Lamouri, & Carbone, 2012).

It is more challenging to ensure operational efficiency when the variety level is increasing. A broader product line can result in higher costs, essentially because of increases in overhead expenses, material costs and labour costs (Mehrjoo & Pasek, 2014).

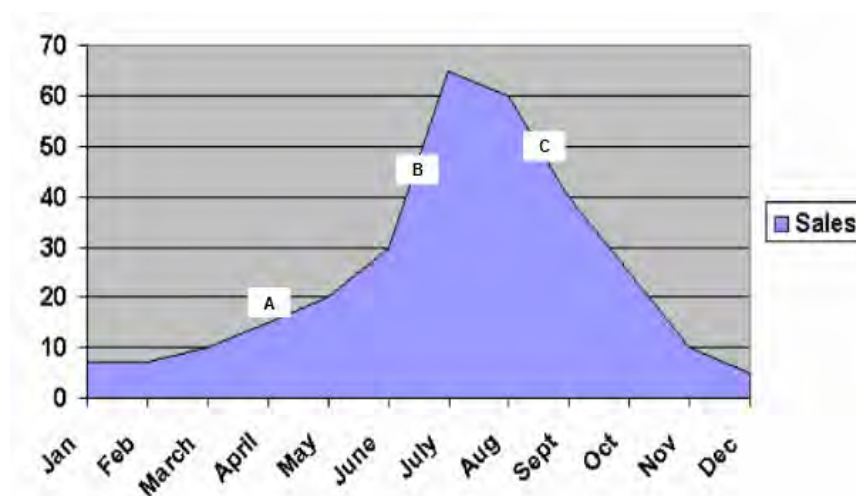
“A key factor in the value of Quick Response is its ability to deal with uncertainty or variance. There are numerous sources of uncertainty in a fashion supply pipeline, starting with demand through to the reliability on the part of suppliers and shippers etc., and Quick Response offers the ability to counter the negative impacts of uncertainty (Tokatli, Wrigley, & Kizilgun, 2008). The type of supply chain needs to fit the characteristics of the product as well as the uncertainty associated with it.”

Retailers no longer carry stock and therefore work with manufacturers who can supply them with new product quickly. There is a shift with fast fashion that actually places pressure on supply chains to increase the number of suppliers used by retailers simply because consumer demand is for a bigger variety of styles that are changing more frequently. Suppliers are under increased pressure to be more flexible and responsive to changing demand (Ciarniene & Vienazindiene, 2014).

Contemporary customers change their product preferences rapidly and are inclined to purchase only what they need or want. In response, the companies need to increase their product variety to improve market share and remain globally competitive (Mehrjoo & Pasek, 2014).

“Many fashion goods sell in distinct seasons and are on the shelf for just one season and almost totally replaced in the following year. Previous purchasing patterns relied on a two-season calendar, but the increased provision of fashionability had retailers add mid-season purchasing to their plans, which has now evolved to purchasing throughout the year (Tokatli, Wrigley, & Kizilgun, 2008). Figure 4 represents sales of a typical product subject to pronounced seasonal fluctuation. The normal practice is to manufacture as much as possible of the finished goods inventory required before the season starts and then deliver half to two-thirds of the necessary products before the beginning of the season (point A) and ship the balance of the inventory at pre-agreed times (e.g., point B), or await re-orders (points B to C). Quick Response takes a different route.”

Figure 4



Source: (Christopher, Lawson, & Peck, 2004)

While manufacturing capacity problems can be an issue, as little as possible is made or shipped before the season. From day one, point-of-sales data is gathered, analysed, and then used to understand demand preferences. From this information manufacturing is then guided by the continuing point-of-sales data. Re-order and re-estimation and replenishment approaches are then used for frequent re-orders (points A to B). This Quick Response approach can be better appreciated

when applied to a particular demand situation such as global or offshore sourcing (Christopher, Lowson, & Peck, 2004).

There are three critical lead times that characterise fashion supply chains: “time-to-market, time-to-serve and time-to-react. All three of these factors emphasise the importance of agility in fashion supply networks. Agility does, however, necessitate radical changes in organisational structures and strategies and a move away from forecast-driven supply. Market sensitivity, virtual integration, networked logistical systems and process alignment all become fundamental prerequisites to achieving the ultimate agility, a Quick Response capability”.

Quick Response offers a new dimension in fashion retailing. For both retailers and manufacturing suppliers it provides a new operational approach, one that is the polar opposite to many firms still operating with structures designed for a mass production era. The adoption of the Quick Response retail model requires a shift in production methodologies. A shift away from mass-production must occur as manufacturers pivot towards Quick Response capabilities and Lean production methodologies. This is a fundamental change.

Lean production and methodologies

The classic Fordist mass production manufacturing system is no longer in line with market requirements, and as such clothing firms in the Western Cape have shifted towards adopting new Lean production methods as they implement the Quick Response retail model. This is demonstrated by the membership of 45 clothing manufacturing firms to the Cape Clothing and Textile Cluster (CCTC, 2016). The cluster facilitates the process of improving competitiveness by providing assistance regarding Lean production and the Quick Response retail model. Lean production and agile supply chains should not be viewed in isolation, but rather should be seen as a progression (Naylor, Naim, & Berry, 1999). A firm requires Lean production capabilities in order to achieve an agile supply chain to ensure success of the Quick Response retail model.

Profits in the Fordist manufacturing organisation were based upon capturing the gains of economies of scale through the mass production of uniform products. The division, standardisation and specialisation of tasks, and as such labour, were considered essential for optimal work-flow and

rapid production. Fordist thinking favoured the view that workers were little more than an extension of the machines they operated (Kaplinsky, 1991). Management style was premised on the idea that workers required close supervision and control. There was a strict hierarchy, with positions clearly defined in terms of task, title and department. Furthermore, in a Fordist organisation workers were thought to have little to offer the company, other than their labour input and therefore communication in such an organisation followed a vertical chain of command, with information flowing from the top of the firm downwards (Kaplinsky, 1991).

The dominance of the Fordist system of manufacturing came under threat in the 1970s with the emergence of Japanese manufacturers. “These manufacturers presented new ideas surrounding competitiveness, pertaining to both their use of technology and automation as well as superior organisation of production arrangements (Kaplinsky, 1991). The Japanese manufacturers developed a new operating environment. The key shift for firms regarding the increasingly competitive operating environment revolved around an amplified emphasis on the concept of upgrading and the different conceptualisation of what value means for a manufacturing firm (Normann & Ramirez, 1993).”

Firms operating in the Fordist era sought to position themselves in the value-chain in such a way as to maximise the value they could add during the production process. However, firms currently operating in the competitive post-Fordist industrial environment have to go beyond value-add in production to find new ways to create value for their customers (Normann & Ramirez, 1993). The creation of value is a complex and co-operative process which requires the input of various stakeholders, both within production firms and extending beyond the firm to include customers, suppliers and even competitors (Normann & Ramirez, 1993). Just as the concept of cost had to incorporate the broader supply chain, the notion of value had to broaden.

The birth of Lean Production was in Japan within Toyota in the 1940s (Melton, 2005). The Toyota Production System was based on the objective to produce in a continuous flow which did not rely on long production runs for efficiency. The fundamental premise was based around the recognition that only a small fraction of the total time and effort to process a product actually added value to the end customer (Melton, 2005). This was in clear contradiction to what was happening in the Western world where mass production was in its prime. Based around materials, resource planning and

complex computerised systems were developing alongside mass production philosophies originally developed by Henry Ford. Essentially, high volume production of standardised products with minimal product changeovers (Melton, 2005).

Lean manufacturing is defined as a systematic approach to identify and eliminate the process wastages through continuous improvement (Kumar & Sampath, 2012). It is a pull-based manufacturing approach. This approach results in an integrated and efficient manufacturing environment. The core focus is the elimination of waste. Understanding and isolating value-added and non-value added activity is essential for manufacturers, from the raw materials until the finished product (Womack & Jones, 2003). Focus is then placed on minimising non-value added activity and processes in the value-chain. This is a continuous improvement.

Lean manufacturing is based on the elimination of waste. According to Womack and Jones (2003) the original seven wastes identified by Toyota are:

- Transport – the movement of products that are not actually required to perform the processing. It is wasteful to transport product between processes.
- Inventory – this includes raw materials, work in progress and finished product.
- Motion – movement of people or equipment that is not required to perform the processing.
- Waiting – when workers or product have to wait on the next production step due, or the occurrence of interruptions, a shift change or a change-over. This can result in longer lead-times.
- Overproduction – the production is done ahead of demand which can result in excessive lead-times, high storage costs and more defects.
- Over-processing – adding more value to a product than a customer actually requires.
- Defects – the effort involved in inspecting for and reworking defects in the product. This can negatively impact the bottom line of a firm.

In Lean philosophy, 'value' is determined by a customer point of view. It is ultimately what the customer is willing to pay for, what creates value for the product which the customer is getting. Lean is about optimising the manufacturing process from the customer's point of view. All processes in Lean are customer centric and focus on elimination of waste.

Manufacturers operating under the process of mass production were able to maintain long production runs using standard designs which ensured that the customer received the lower cost; however customers also received less variety and sometimes less value (as well as the workforce who could find this process tedious). In comparison, the term Lean production comes from the upside of the production method which requires 'half the human effort, half the manufacturing space, half the investment and half the engineering hours to develop a new product in half the time' (Melton, 2005).

Lean production will produce product based orders, and seek to gain economies of speed. The focus of production is to be effective and pull from the customer so as to eliminate waste. This results in small batches which are handled in production cells and workers are encouraged to have a general knowledge of processes (Womack & Jones, 2003). In contrast to this, mass production seeks to make a product and then sell it in the market. The philosophy is based on achieving economies of scale and this is done by improving efficiencies. Production is pushed towards the customer and this results in large batches with production occurring in functional silos. Workers are encouraged to have a specialised knowledge regarding their job on the production line.

Some of the key implications of this production shift are as follows:

- There is a paradigm shift from a financial focus to one that emphasises maximising value for the customer. Measuring performance solely in financial terms in the short-term may hinder value creation in the long term. It is critical that middle management understand these concepts and have the appropriate skills as translating financial objectives into an operational plan usually falls to these employees (Barnes, Bessant, Dunne, & Morris, 2001).
- Knowledge and information (the firm's learning competencies) becomes its crucial asset, surpassing land, labour and capital as the primary resource for economic success (Normann & Ramirez, 1993). It is critical that information is not only accessed, but how to use it is understood. This is linked to a more flat management structure, communication and input from all work levels, with an increase in transparency and broader access to information throughout the firm. This is also vital in the successful implementation of the Quick Response model.

- As the firm becomes a knowledge-based organisation, the next asset of critical importance is the way the firm manages its internal and external relationships (Normann & Ramirez, 1993). Communication channels within the firm are restructured to promote the flow of knowledge in all directions. Externally, production firms need to establish strategic partnerships with other industry stakeholders that are open and collaborative to ensure value creation is maximised. Once again, this is critical for firms adopting Quick Response capabilities as they become Quick Response suppliers to domestic retailers.

These concepts are tightly linked to the production techniques designed to minimise waste and maximise knowledge and value creation within the manufacturing firm. These techniques include just-in-time production, total quality management, team-working and continuous improvement. Techniques such as these provide a broadening of the range and frequency of interactions within the company, and these occur at a much lower level within the manufacturing firm than before (Mallory & Molander, 1989). The table below is a summary of traditional (mass) production versus Lean production.

Table 1

Feature	Traditional Manufacturing	Lean manufacturing
Production Mix	High volume production of identical products Long lead times	Low volume production of many variants Short lead times
Production Practices	Production for inventory (Just-in-Case) Production based on 'push' Large batches High inventory levels (raw, work-in-progress, finished) Assembly line flow - one worker one task Infrequent changeovers	Production on demand (Just-in-Time) Production based on 'pull' One-piece flow Reduced inventory levels Cell production - worker performs multiple tasks Frequent changeovers
Continuous Improvement	Management of quality through inspection and rework Infrequent changes in production practices	Management of quality through prevention Continuous changes to improve efficiency and productivity
Measurement	Report management external Focus on individual labour and machine efficiency	Visual management and shop-floor indicators Focus on process availability and through-put
Supplier	Large volume of direct suppliers	Reduced number of suppliers

Relationships	Frequent supplier changes based on price	Long-term supplier relationships
Management Structure	Many layers of management Strong functional organisations and clear separations between functions Top-down monitoring of performance	Fewer layers of management Strong team-based structure Disciplined team-based measurement systems

Source: (Womack & Jones, Lean Thinking: Banish Waste and Create Wealth in Your Corporation, 2003)

The improvement of firm-level performance is contingent upon two factors. The most important factor is the adoption of principles of continuous improvement within the firm. Levels of international competitiveness cannot be attained by domestic manufacturing firms without a culture of improvement becoming intrinsic to the fabric of the firm (Barnes, Bessant, Dunne, & Morris, 2001). However, this cannot be achieved in isolation. The firm will require considerable support from external institutions in order to meet objectives, as it is unlikely firms will have all the expertise it needs to continually improve itself. Appropriate support from a range of institutions, including private consultants, government institutions and sectoral associations is consequently critically important for the development of individual firms (Barnes, Bessant, Dunne, & Morris, 2001).

Benefits

The benefits of Lean production methodologies extend to both firms and customers. Through the identification of value, the elimination of waste and the generation of a value flow many efficiencies are achieved and gains captured. There are reduced inventories for manufacturers while also providing decreased lead-times for customers. Processes are more robust (as measured by less errors and therefore less rework) and there is improved knowledge management. This makes Lean a very real and physical concept, not merely a philosophy, especially for manufacturing.

Lean production has been expanded and Lean thinking has been applied to all aspects of the supply chain (Melton, 2005). Lean can be applied to all aspects of the supply chain and should be if the maximum benefits within the organization are to be sustainably realized. The two biggest problems with the application of Lean to business processes are the perceived lack of tangible benefits and the view that many business processes are already efficient. Both assumptions can be challenged.

There are many tangible benefits associated with lean business processes. A lean business process will be faster, for example, the speed of response to a request for the business process will be faster, and as most business processes are linked to organizational supply chains, then this can deliver significant financial benefits to a company. The perception that a business process is already efficient is all too often an illusion. Functionally, many business processes may appear very efficient, however the application of Lean Thinking forces one to review the whole supply chain in which the business process sits, and this frequently reveals bottlenecks and pockets of inefficiency (Melton, 2005).

Firms wanting to implement Lean manufacturing are often faced with various challenges. The overarching challenge is to demonstrate that the implementation of Lean manufacturing is correlated with improvements in operational performance. Overcoming this challenge is critical as the adoption of Lean manufacturing requires significant investment in improving processes and in training and developing capable workers to ensure they have the required skills to support the new processes (Taggart & Keinhofer, 2013). As the investment will have notable financial demands, there is a need to show that the implementation of Lean manufacturing will stimulate operational improvements. Furthermore, once Lean manufacturing has been adopted, the organisation needs to show that the Lean manufacturing approach is continuing to provide benefits: a continuous improvement mentality is integral to the Lean manufacturing principle (Taggart & Keinhofer, 2013).

Without the use of structured performance measures, the implementation of Lean manufacturing will not drive changes in operational performance if the structure of the performance measurement framework is not fully understood and integrated into the organisation. "The measurement framework must consist of well-defined enterprise level stakeholder measures (Taggart & Keinhofer, 2013). They must be able to illustrate the relationships between measures across multiple levels and be consistent at all times to ensure robust measurement and allow for comparisons. Fullerton & Wempe (2009) caution that mixed results can be produced with the adoption of Lean manufacturing, specifically if non-financial performance measures are implemented." Non-financial performance measures assist in bridging the gap between Lean manufacturing and the effect on financial performance.

These shifts necessitate the development of new skills for both management and labour, especially with regards to new demands such as multi-skilling and multi-tasking (Barnes, Bessant, Dunne, & Morris, 2001). "It is important to note that the new skills demanded are not solely technical in nature. There is a strong emphasis on the development of 'softer' skills required for increased team-working, increased responsibility and the new focus on the communication and transmission of knowledge, ideas and strategy both within and without the firm (Barnes, Bessant, Dunne, & Morris, 2001). These are all requirements for the shift towards Lean production and Quick Response. Firms are increasingly recognising that competitiveness is a function of both internal and external organisation and as such are initiating supply-chain management programmes to develop the capacity of their suppliers." This is critical to global competitiveness, improved domestic value-chain alignment, the adoption of the Quick Response retail model and the overall development and growth of the clothing sector.

Skills development

South Africa has had two decades of democracy and has undergone much in the way of transformation. However, the pace of change is scarcely enough to keep up with accelerating social and economic challenges (Akoojee, Gewer, & McGrath, 2005). Skills development has been identified as a crucial concern to achieve both social and economic aspirations. Skills are seen as both a constraint on socio-economic delivery and a means of simultaneously achieving international competitiveness and uplifting those in poverty. In co-ordinated market economies, individuals are encouraged to acquire skills to achieve social protection (Allais, 2012). An effective skills development system enables firms to specialise, especially within domestic and international niche markets, which are often higher up on the value-chain.

Firm and industry survival in a highly competitive and fragmented market, such as the Western Cape clothing sector, requires producers to focus on both price and non-price factors, such as quality, innovation, adherence to standards and rapid response to ensure a basis for competitive advantage (Barnes, Bessant, Dunne, & Morris, 2001). In an effort to meet market needs, clothing manufacturing firms are evolving. A range of innovations are being deployed, which include advanced capital equipment and reconfiguration of both their internal organisation and their external relationships (Barnes, Bessant, Dunne, & Morris, 2001). For example, adoption of Lean production methodologies and the Quick Response retail model. This evolution places pressure on traditional organisational

forms within firms as they give way to flatter structures, more devolved decision-making and forms of team-working (Barnes, Bessant, Dunne, & Morris, 2001).

This is coupled with growing recognition of the importance of shop-floor participation, as ideas are formed and problem-solving behaviour is spread over more of the workforce (Barnes, Bessant, Dunne, & Morris, 2001). "Lean production is based on a culture of continuous improvement, and the improvements stem from workers who are familiar with the process and through their efforts can identify ways to capture efficiencies and improve quality, costs, lead times, processes and ultimately value (Conti, Angelis, Cooper, Faragher, & Gill, 2006). The combination of competitive forces and the adoption of new manufacturing technologies and philosophies has increased the pressure on the traditional role of middle-management as manufacturing firms undertaking the restructuring process are finding that the locus of control is shifting from the upper tiers of management to the factory floor, as the knowledge and skills of workers are increasingly appreciated and harnessed for the good of the firm (Barnes, Bessant, Dunne, & Morris, 2001)." The requirement of Lean production methodologies to solve production problems and develop process improvements requires additional use of a workers intelligence, experience and creativity than the usual technical knowledge required for their production task (Conti, Angelis, Cooper, Faragher, & Gill, 2006).

Morris & Reed (2008) demonstrate that whilst manufacturers all operate under the same competitive conditions and challenges pervasive in the South African clothing industry, a firm's potential to become an industry leader, and its relative dominance in the sector, is based on the firm's strategic vision of the future and extent to which World Class Manufacturing principles are adopted. Firms are differentiated by their strategic approaches to address competitiveness barriers based on their response to industry restructuring. In general, firms embracing Lean production and Quick Response principles in their operational performance platforms are addressing competitiveness constraints by internalising the problem and solving it within their own parameters; for instance, skills shortages are being tackled by training and upskilling existing staff or malleable new recruits (Reed, 2012).

Chapter 3

The South African Clothing sector

The clothing and textile sector prior to the mid-1990s was locked into import substituting industrialisation. Firms were protected by targeted import quotas and high product specific tariffs (Morris & Levy, 2011). By 2001, tariffs on textiles were down to 28% and tariffs on clothing down to 40%, both from over 100%. This shift was due to a policy change in South Africa favouring trade liberalisation. Tariffs fell sharply, well below what was required by the then General Agreement on Tariffs and Trade (Edwards, Cassim, & van Seventer, 2009). The lowered cost of imported material favoured clothing manufacturers, but this benefit was far outweighed by the drop in tariffs on imported clothing (final product), which benefitted retailers substantially. Imported clothing tariffs fell from 90% in 1996 to 40% in 2002 (Anstey, 2004).

The United States' Africa Growth and Opportunity Act (AGOA) of 2001 allowed South African clothing manufacturers duty and quota free access to the US market, provided particular rules of origin were met. "Rules of origin are the requirements which set out the working and processing that must be undertaken locally in order for a product to be considered the "economic origin" of the exporting country. This distinction becomes necessary and important where some of the materials used in the production or manufacture of a good are imported from other countries. The purpose of rules of origin is to prevent trade deflection and transshipment, whereby goods made elsewhere are merely routed through a beneficiary country (of trade preferences) with no or insufficient local value-adding activities having taken place (Mattoo, Roy, & Subramanian, 2003)." Given this prospect, a number of US retail buyers began to view South African clothing producers as a base for Sub-Saharan African imports. Concurrently with AGOA was a rapid depreciation of the exchange rate in 2000/2002. It went from a yearly average of R6.94 per \$1 in 2000 to R11.61 in January 2002 (Morris & Barnes, 2014).

The increase in momentum for exports was induced by a rapid depreciation of the exchange rate from 2000 until 2002. This combined by the reduced tariffs on clothing and textiles excited the domestic clothing manufacturers who all seemed to want to jump on the "export bandwagon" (Morris & Levy, 2011). Numerous export orders were signed by local clothing manufacturers with European Union (EU) and United States of America (USA) retailers as they wanted to pursue larger profits than what was available by supplying the domestic market. Many manufacturers did not

have sufficient capacity to supply both the domestic and export market. They did not however expand their capacity, but rather many reneged on their domestic orders (Morris & Levy, 2011). Total nominal clothing exports grew dramatically from R471million in 1995 to R1901million in 2001 and R2 590million in 2002 (Morris & Levy, 2011).

Confronted with cancelled orders, South African retailers had to swiftly find alternative clothing producers. Despite facing an unfavourable exchange rate for imports, domestic retail buyers sourced offshore and found China to be an alternative supplier (Morris & Barnes, 2014). “This transition in clothing supply was facilitated by the coincidental radical simplification and reduction of the clothing tariff structure. The subsequent strengthening of the Rand reversed the entire situation, creating an easier import environment while simultaneously crippling exports. By November 2004, the Rand/US\$ exchange rate had appreciated to R5.73 at its lowest point (Morris & Barnes, 2014).” As retailers were forced to find alternative supplies abroad and as the Rand appreciated, many South African producers found that they had lost both their export markets and their previous domestic markets.

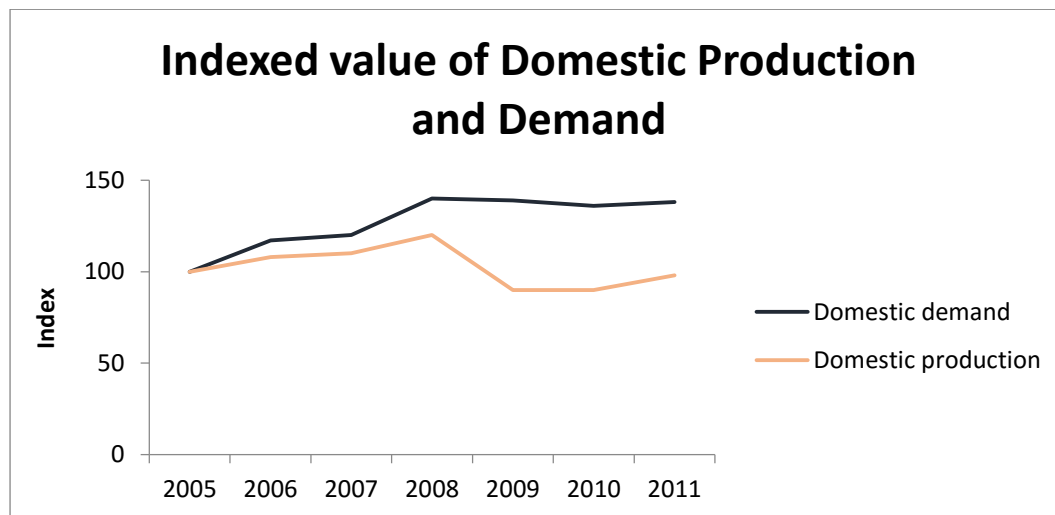
With tables turned, domestic garment manufacturers found themselves in a scenario where capacity to export was radically limited. The drastic shift in the exchange rate meant that all gains in export competitiveness were eroded while the domestic price of imported garments fell sharply (Morris & Barnes, 2014). In a reversal of the environment, clothing manufacturers who had dedicated themselves to exporting their product now reneged on their export orders and by 2006 clothing exports had collapsed to R1 006million, around the same level as 1999 (Morris & Einhorn, 2008).

In the face of an unsuitable exporting environment, local clothing manufacturers sought to return to supplying South African domestic retailers. However, the radical restructuring of the domestic value-chain made this solution no longer viable. The appreciating exchange rate and economic growth coinciding with the indirect impact of global Chinese clothing exports (and competition from falling unit prices), provided retailers with greater buying power in international markets (Morris & Barnes, 2014). The import of clothing grew from \$192million in 2000 to \$755million by 2005 and \$1534million in 2011 (Morris & Barnes, 2014). Significant amount of garments from China (and later from other clothing producing countries) entering South Africa became the status quo, while domestic manufacturing faced a permanently altered value-chain (Morris & Barnes, 2014). The

resulting impact in terms of production, sales and employment on the domestic clothing manufacturing industry was immense. Domestic demand increased significantly, but this was absorbed by retail imports rather than domestically manufacturers products (Morris & Barnes, 2014).

Using 2005 as a base year, the value of clothing imports versus domestic garment production for the local market diverged dramatically. Between 2005 and 2011 the value of domestic production for the local market remained relatively flat, apart from a surge in 2008, whilst the value of clothing imports increased year on year, comprising a greater and greater part of meeting domestic demand (Morris & Barnes, 2014). Domestic production was valued at R14.5b in 2005 and R15.2b in 2011 respectively, whilst the value of imports increased from R4.8b in 2005 to R10.1b in 2011. As a consequence domestic production decreased from 76% of domestic demand in 2005 to 60% in 2011, whilst the share accorded to imports increased from 25% to 40% respectively (Morris & Barnes, 2014). The decline in real terms can be seen in Figure 1. Using 2005 as the base, it shows the indexed value of domestic clothing production versus domestic demand for clothing.

Figure 1



Source: (Morris & Barnes, 2014)

To add salt to the wound, the de facto impact of foreign clothing circulating in the domestic economy was not captured by official import records (Morris & Barnes, 2014). South African borders

were porous while customs officials had insufficient training to monitor false product declarations and organised crime syndicates operated freely (Morris & Barnes, 2014). It is anecdotally recognised that the actual quality and value of imports entering South Africa from illegal operations and sources is much higher than what official records reveal (Morris & Barnes, 2014).

In addition, there was an unintended effect of the Chinese quota plan. The China Restraint Agreement of 2007-2008 was a two-year Chinese quota plan that was implemented. It restricted the importation of a select number of clothing and fabric items (Reed, 2012). The idea behind this move was that manufacturers would use the respite to upgrade their operations and improve competitiveness levels to be able to compete with imported clothing (Reed, 2012). However, what occurred was an acceleration of net import diversion, as retailers simply looked to import from other countries and hence realised China was not the only globally competitive clothing producer (Reed, 2012).

Furthermore, government raised the duty payable on imported clothing from 40% to 45%, but regional country agreements, such as the Southern African Customs Union, were exempt from this. This led to clothing producing countries such as Lesotho and Swaziland having no export restrictions to South Africa (Morris, Staritz, & Barnes, 2011). The Southern African Development Community (SADC) only required double transformation (two processes) for Mauritius and Madagascar to export duty-free into South Africa (Morris & Barnes, 2014). Hence there was rapid growth in imported clothing from these countries, with many South African firms relocating to Lesotho and Swaziland during this period and were responsible for the major export of clothing to South African retailers (Morris, Staritz, & Barnes, 2011). The imports from Madagascar and Mauritius were a direct function of South African buyers and retailers seeking these firms out (Morris & Staritz, 2014)

Due to the restructuring of the domestic clothing manufacture industry, the number of formal clothing manufacturing firms and employees registered with the National Bargaining Council (NBC) steadily declined from 97 960 workers in 2003 to 85 854 in 2005. This decline continued and in 2013 the number of registered employees in the clothing industry had reduced by almost half to 52 656. The decrease in the number of formal sector clothing firms registered with the NBC did not track with the substantial employment decline, but rather dropped by less than a fifth from 1 042 to 865 (Morris & Barnes, 2014). In 2003, clothing and textiles only accounted for 4.2% of total

manufacturing sales, but 13.4% of total manufacturing employment highlighting the labour intensive nature and thus the importance of the sector to the SA economy (Edwards & Morris, 2007).

Table 2: Number of firms and employees in the South African clothing sector

Year	National Total	
	Employers	Employees
2003	1 042	97 960
2004	1 161	97 954
2005	1 149	85 854
2006	1 051	75 929
2007	1 041	72 919
2008	1 048	67 737
2009	1 001	60 253
2010	933	56 699
2011	952	58 647
2012	936	54 737
2013	865	52 656

Source: National Bargaining Council

However, as much as the bargaining council data base provides the only reliable available quantitative data on firm and employment numbers, it also underestimates the actual number of firms operating and employees working in the industry (Morris & Barnes, 2014). There are many small informal economy firms, employing anything between 5 to 50 workers, unregistered, often using unapproved piece work payment systems, which does not necessarily imply actual take home pay is lower, below the statutory wage, hiding beneath the bargaining council and union radar (Godfrey, Clarke, Theron, & Greenburg, 2005). This hidden economy intersects with the formal clothing sector through outsourcing arrangements with design houses, full package firms, and third party intermediaries (Godfrey, Clarke, Theron, & Greenburg, 2005). All the available evidence points to a radical restructuring of the industry, and suggests that small informal Cut-Make-Trim enterprises have proliferated since the early 2000s, while larger CMT operators who are tightly linked to the retail chains are expanding, and the large full package manufacturers are declining (Morris & Barnes, 2014).

These informal enterprises, mostly run by ex-formal sector skilled workers, are hidden in residential areas, mostly competing on price, and operating beneath the radar screen of officials - NBC

compliance officers, union officials, and census takers. They seem to be highly differentiated in scale, scope and performance; with the larger informal enterprises feeding into full package firms and indirectly into the retail chains. However their exact number, levels of differentiation, and workers employed is unknown (Morris & Barnes, 2014).

South African clothing firms appear to be increasingly relocating to areas where they can pay lower wages to counter the price pressures from imports, which has contributed to the decline in employment (Edwards & Morris, 2007). In addition, employers in this area do not have to contribute to sick leave or provident funds, thus further reducing their labour costs. Employment is believed to have not actually reduced, but rather to have moved to these outlying and lower-wage areas according to Flaherty (2002), however, more recent data indicates to the opposite. Natrass & Seekings (2013) argue that employment in the clothing industry has collapsed due to rising wage costs and increasing international competition.

By the latter part of 2005, clothing manufacturers began to fundamentally shift their strategic position to account for the new requirements in the new era of globalisation. This was after a history of import-substituting industrialisation. The first and notable realisation was that accordance with Lean principles and Quick Response capabilities was a necessity and that without upgrading their production capabilities, an enhanced and sustainable competitive model could not be built (Morris & Barnes, 2014).

It is at this nexus of events the existence of two cluster initiatives begin – the Cape and Kwa-Zulu Natal Clothing and Textile Clusters (CCTC and KZN CTC). The clusters launched in response to the considerable pressure the industry was facing as a result of trade liberalization and increased global competition. The clusters have an explicit aim of upgrading the international competitiveness of the domestic clothing and textile manufacturers by improving their operational performance and building their dynamic capabilities (Morris & Barnes, 2014). Due to this core focus, activities were heavily emphasised towards skills acquisition in Lean techniques and as such process and production upgrading (Morris & Reed, 2008). This is demonstrated by the changes in average operational performance data for the two clusters between 2006 and 2012 as presented in Table 3.

Table 3**Operational Performance of CCTC & KZNCTC Combined**

	2006	2012	% Change 2006-2012
Total Inventory (operating days)	37.56	30.58	18.58%
Work-in-Progress (operating days)	6.9	4.98	27.74%
Finished Goods (operating days)	11.76	7.76	34.07%
Customer Return Rate (%)	2.68	1.39	48.04%
Lost production time due to Style Changeovers (%)	8.36	5.85	30.05%

Source: B&M Analyst's database

The average work-in-progress (the build-up of inventory in a system which is found within steps or sub-processes of a production process) inventory levels improved by 28%, while finished goods (products that have been completed by the manufacturing process, but yet to be sold to the customer) inventory reduced by 34%, resulting in both lower financing costs and the ability to move towards a greater level of operating flexibility (Morris & Barnes, 2014). Correspondingly, quality (as indicated by customer return rates) improved by almost 50%. In addition to this the firm's change in capabilities to undertake more rapid changeovers (the process of converting a line or machine from running one product to another), an indicator of operational flexibility, also improved by 30% (Morris & Barnes, 2014). In a market that is simultaneously price and value competitive, these improvements are a vital step towards enhanced competitiveness at both a local and global level.

The next critical realisation by domestic garment manufactures was that their future lay in supplying the domestic market once again. In order to do this, strategic alignment with local retailers, who dominated the domestic value-chain and continue to do so, needed to be achieved to secure greater local sourcing. Domestic clothing manufacturers had nothing to gain and everything to lose by attacking these retailers (Morris & Barnes, 2014). The transition from an import-substitution industrialisation path towards one where meeting globalisation dynamics exhibited itself in three forms (Morris & Barnes, 2014):

- Cluster co-operation - Domestic retailers joined the two clusters, providing moral, financial and practical support to demonstrate co-operation with their local suppliers. Their membership also assisted in raising the general competitiveness level of local clothing manufacture firms.

- Industrial policy co-operation - The creation of a Business Alliance, comprising retailers, clothing manufacturers and textile mills, presented a common strategic position to government and union in various negotiations over several issues affecting the industry.
- Supply chain alignment – By accessing government funding support, both individual retailers and key local suppliers created supply chain clusters to effect domestic value chain alignment and build systematic competitiveness.

The underlying principle of this transition was the main advantage domestic clothing manufacturers had when competing with imports (Morris & Barnes, 2014). The close geographical location of local manufacturers created an opportunity to provide retailers with speed and flexibility of supply which would be reiterated in retailer speed and flexibility to market. This is known as the Quick Response retail model. Based on the successful Turkish model of supply into the European Union, if South Africa clothing producers could reduce lead-times and implement short production cycles, they could establish a significant competitive advantage in the eyes of retail buyers in relation to imported garments (Morris & Barnes, 2014).

However, this shift to Quick Response supply required value chain re-alignment between buyers and producers all along the chain. It also required retailers shifting from simply basing their buying decisions on competitive prices and large orders, which required maintaining large stocks, to moving to a new retailing model based on minimizing inventories and increasing their returns through repeatedly turning over stock within the year. This required shorter lead time and closer geographical proximity from suppliers. This has been increasingly done through building individual retailer supply chains clusters. This involves working with key suppliers that have proven their ability to improve their competitiveness within the two clusters and taking them to a higher level in a new process of upgrading and value chain alignment. Quick Response experiments with such supply chain cluster alignment have demonstrated a significant benefit for retailers shifting to such a model. Several Quick Response pilots have been run between South African retailers and manufacturers over the last few years through the Cape Clothing and Textile Cluster and the results demonstrate the potential positive impact for both retailers and manufacturers of establishing a Quick Response model (Morris & Barnes, 2014).

Two South African retailers ran a total of 159 orders utilising the Quick Response model with a selection of their domestic suppliers in 2013. The retailers were able to capture 14.03% more Rands

relative to a control set of orders placed on long lead times out of the East (Morris & Barnes, 2014). This financial gain was able to be captured because the purchasing of the South African sourced Quick Response product was adjusted on the basis of point of sales data. This data was collected and product was delivered back into stores within 56 days in the right colour, patterns, styles and volumes being demanded by customers. Consequently, the garments were sold at full retail price, providing the retailers with a higher retained margin than secured from their Asian sourced products, which required extensive marking down before being cleared (as such, resulting in lower retained margins) (Morris & Barnes, 2014). Evidence from this domestic pilot is further supported by the documented success of Zara, the world's leading clothing retailer which purchases almost two-thirds of its clothing on a Quick Response basis from higher cost proximate suppliers (Morris & Barnes, 2014). This evidence is indicative of an opportunity for the Western Cape clothing sector.

These pilots by South African retailers and manufacturers illustrate the possibility to grow and maintain a vibrant domestic clothing manufacture industry that provides labour intensive employment. Research carried out by the Cape Clothing and Textile Cluster and Kwa-Zulu Natal Clothing and Textile Cluster suggest that South Africa's clothing industry could sustain 110 697 formal sector jobs by 2022 on the basis of domestic retailers shifting 40% of their total purchases to the Quick Response model over the next decade. Vital to this is the development of manufacturing performance attributes that align with Quick Response retailing requirements (Birtwistle, Fiorito, & Moore, 2006):

- High levels of product flexibility: the ability to shift between knitted and woven products as well as different fabric qualities and a variety of garment styles. This requires product upgrading by domestic manufacturers, which is directly linked to Lean methodologies.
- High levels of production versatility: domestic manufacturers must be able to encompass volume flexibility with short manufacturing throughput times and a range of advanced production skills and associated equipment. This requires production upgrading by domestic manufacturers and once again is directly related to adopting Lean production methods.
- Supply chain management capabilities: the ability to manage both production and product development along with pre-production processes, fabrics, trims and any sub-contracted work. Firms must ensure lead-times and merchandise quality are guaranteed. This requires functional upgrading by domestic producers.

The introduction of the Production Incentive and the Clothing and Textiles Competitiveness Improvement Programme by the Dti in 2010 has supported a large number of established firms in their endeavours to embrace these upgrading challenges (Morris & Barnes, 2014).

The Dti's introduction of the Production Incentive (PI) and the Clothing and Textiles Competitiveness Improvement Programme (CTCIP) in 2010 has supported a large number of established firms in their undertakings to embrace these upgrading challenges. The Production Incentive has, for example, paid out R2.5 billion in upgrading grant support to clothing, footwear and textiles manufacturers over the last four years (DTI, 2014a), while the CTCIP has provided the industry with grants worth R633 million over the same period (DTI, 2014b). This support has helped to initiate the re-capitalisation of the textiles industry that supplies South African clothing manufacturers (Barnes 2012), and has also supported the stabilisation of, and even growth in, employment within certain segments of the industry. For example, manufacturing employment within the TFG Fast Fashion Cluster, a CTCIP supported programme involving seven manufacturers and TFG, a major South African clothing chain, grew from 1,681 in 2011 to 1,893 in 2014, an increase of 212 jobs (12.6%). Similarly, aggregated employment amongst the members of the Cape and KwaZulu-Natal Clothing and Textile Clusters increased consistently from 2009 to 2013 (although at an average growth rate of less than 2%) (Morris & Barnes, 2014).

These achievements have taken place in an environment of substantial production upgrading. Through a mix of successful, although narrow, set of industrial policy interventions, the effective implementation of clustering methodologies, and firm-level recognition of the need for product, production and process upgrading, successes have been achieved. The embracing and implementation of these actions are partly due to a reactive response as international competition intensifies and partly due to a proactive response to emerging demands of domestic retailers as they enter the early stages of developing Quick Response business models (Barnes and Morris, 2014).

Notably, on the other end of the production spectrum, clothing manufacturers that were operating at the bottom to lower-middle end of the market have responded in a different manner (Barnes and Morris, 2014). Some firms relocated operations to Lesotho and Swaziland, allowing them to escape the restrictive labour market conditions and wage systems in South Africa. Wages in the clothing industry are set through the National Bargaining Council and have been since 2003 and differ by

geographical location according to whether the firm is located in a metro or non-metro area (Nattrass & Seekings, 2013). Prior to this, minimum wages in most parts of South Africa were negotiated by employers and unions in regional bargaining councils (Nattrass & Seekings, 2013). Many firms that relocated to cheaper areas and maintained their value-chain linkages to South African retailers subsequently flourished (Morris et al, 2011). Other firms, trapped by the policy refusal to take serious account of locational rural disadvantages and the bargaining council tendency to close the gap between metro and non-metro wages, plainly ignored the bargaining council wages and paid a wage local workers would accept to secure employment. The Chinese firms operating in Newcastle are the most publicly demonstrative example of this (Nattrass & Seekings, 2014).

In addition to this, another group of small firms, pressured by the fact that policy and labour market regimes failed to create sufficient differentiated space for small enterprises, kept beneath the radar and began to operate in the informal economy (Edwards and Morris, 2007). Given this, firms and their workers have effectively demonstrated that a policy environment and response fixed in the old import-substitution model restricts the competitive and employment basis of the South African clothing manufacture industry for this segment of the market (Barnes and Morris, 2014).

It should be meaningfully noted that the legal status of these firms, operating informally, has excluded them from participating in the Dti's Production Incentive or CTCIP support programmes (Barnes and Morris, 2014). These programmes require full National Bargaining Council compliance on the part of each applying firm to be able to participate and as such, effectively restricts the involvement of this category of firm. These enterprises are without the obvious ability to define a competitive advantage based on design capabilities, product versatility, and/or advanced production capabilities defined by speed, flexibility or assured quality. As such, they are forced to shut-down, relocate to neighbouring countries or operate illegally in South Africa's marginal urban or rural geographical areas (Barnes and Morris, 2014). This has fundamentally impacted their ability to create decent employment opportunities in South Africa as they are wedged in the precarious position between demand for Asian prices on the one hand and more advanced Quick Response manufacturing capabilities on the other (Barnes and Morris, 2014).

In summary, the South African clothing sector was built up under isolation with the domestic market driving production and as such, was never able to achieve economies of scale (Barnes, 2005). As the

industry was protected by an import substitution strategy, a policy shift towards trade liberalisation exposed the industry to international competition with its comparatively inefficient industry that was lacking capital, technology and innovation alongside its high labour and management costs in relation to output (Barnes, 2005). The clothing industry faced several difficulties with respect to skills development, lack of finance, poor innovation as well as a shortfall in investment during this time. Reed (2012) shows that in 2004 capital expenditure as a percentage of sales in the Western Cape clothing firms was a low 2.7%, a slight decline from 2.8% in 2003. Trade liberalisation and the restructuring of the industry in the 1990s resulted in large decreases in employment, with augmented productivity growth through cost minimisation and downsizing rather than via production growth itself (Barnes, 2005). These challenges have led to the relocation, closure and restructuring of many firms over the last few years.

The South African clothing and textile industry has undergone difficult restructuring over the past 20 years due to a combination of both domestic and international factors. The negative impact of this transformation has become manifest in the declining contribution of the sector to total manufacturing output, its declining export share and significant contraction in sector employment (Morris & Reed, 2008). Had this process of restructuring and transition been pre-empted and accompanied by a rigorous effort to up-skill remaining workers and promote innovation in the sector, the outcome may have been different. The sector would have been able to pursue a skills-driven competitiveness strategy and an evolution towards higher-cost, high quality items (Morris & Reed, 2008).

Paradoxically, the underinvestment in both human and physical capital in the South African clothing sector has deepened the crisis precipitated by globalisation and currency weakness, leaving the sector incapable of dealing with rising import penetration and foreign retailer presence. Government policy designed to address the effects of liberalisation on the sector have been largely regressive in nature and reinforce the perception of global trade as a threat rather than an opportunity (Morris & Reed, 2008). Evidence from various studies suggest that while a paradigm shift up the value-chain should have been adopted, interventions, such as the China quotas, have pushed domestic firms down in the opposite direction, that is, down the value-chain towards more basic, low-value-added garments (Reed, 2012).

In the new era of globalisation and the subsequent global economy, a country's successful participation in the global value chain for clothing is contingent on its ability to flexibly and reliably respond to customers' needs. This requires local manufacturers to upgrade their design and marketing skills and demonstrate Lean capabilities (Barnes & Esselaar, 2005). Amongst other factors, skilled labour and management has been identified as a critical success factor which provides countries with an advantage and consequently, there is a serious need to develop skills in the clothing and textile industry (Morris, Barnes, & Esselaar, 2007). The global trend has been for less skilled tasks to be moved to low-cost locations whilst higher value-added and higher-skilled tasks remain in developed countries. This is also accompanied by outsourcing to informal economy enterprises. In this context, increasing emphasis is given to the need for developing countries to upgrade their technical and production capabilities so as to compete on quality, design and delivery, rather than simply on price (Roberts & Thoburn, 2002).

The Western Cape Clothing sector

The clothing industry is an important economic sector in the Western Cape. As of 2002 clothing and textile exports were valued at R3.5 billion per annum, employing approximately 200 000 workers. However, the 2008 figure for textile, clothing, leather and footwear employment stood at 168 912 (Statistics South Africa, 2008), indicating a significant decrease in employment in the industry over the six year period. It was estimated that 80% of the Western Cape's clothing output was manufactured by companies based in Cape Town (Mthente, 2008). The Western Cape clothing sector was once comprised of several large-scale manufacturers, but currently it consists of smaller and more agile firms (Mthente, 2008). There is also an informal sector, homeworking, which is perceived to be playing a significant role in the industry, although the size of this sector is difficult to estimate. The homeworking sector does however seem to have links with local retailers. Empirical evidence indicates that homeworking operations are producing for formal retail outlets either directly or indirectly via formal clothing manufacturers or design houses (Godfrey et al, 2005).

The clothing sector in the province produces high value-added products for domestic retail stores as well as for niche export markets in the EU and USA. South African exports to the US were valued at US\$141 million in 2000 and by 2007 was valued at US\$24 million and US\$6 million in 2012 (Morris & Barnes, 2014). This trend was the same for EU exports. In 2000 South African exports to the EU were valued at US\$77 million and this dropped to US\$26 million in 2007 and US\$12 million by 2012 (Morris & Barnes, 2014).

This type of high-value product requires relatively skilled labourers as well as the utilisation of CMT operations (Godfrey, Clarke, Theron, & Greenburg, 2005). These high value-added fashionable products are manufactured in high-productivity firms and are both highly capital- and skill-intensive with wages being higher than in low productivity firms and form a lower component of total costs (Natrass & Seekings, 2012). These products are manufactured for niche markets where there are higher margins due to branding and marketing to a wealthier clientele. Cape Town in the 1990s became the centre of higher-wage production. Clothing enterprises in the Western Cape and more specifically Cape Town tend to be more advanced in the introduction of new production technologies and flexible organisational forms (Rogerson, 2010). This regional difference is explained in part by the fact that many Johannesburg and Durban clothing producers have focused their production towards the lower-middle end of the clothing market compared with higher income segments of clothing manufacture targeted by producers in the Western Cape (Rogerson, 2010). The low end of the market tends to operate in non-metro areas whereas the top-end manufacturers tend to operate in metro areas.

Data from a study on Western Cape clothing manufacturers by Barnes and Johnson (2005) provides an analysis of 17 completed firm-level benchmarks with a focus on several key areas. Insight is provided and highlights there are numerous operational weaknesses that exist in the Western Cape clothing industry, but that a number of competitiveness strengths also remain in place. Critically, though, performance is highly variable, with certain firms performing substantially better than others in respect of certain performance indicators such as quality and lead-times (Barnes & Johnson, 2005).

Given the trends described, the Western Cape clothing manufacturers (including CMT operations), will have to become truly globally competitive, both in domestic and international markets they supply, over the next few years to ensure survival. Competitiveness in this sense will encompass the elements that drive the global and local clothing industry: cost, quality, flexibility, reliability, adaptability and product and process innovation (Barnes & Johnson, 2005).

Chapter 4

Skills policy environment

Skills development was facilitated by at least four important policy documents: the Skills Development Act (1998), the Skills Development Levies Act (1999), the National Skills Development Strategy (2001), and the Human Resources Development Strategy (2001). South Africa's economy had undergone widespread changes to its industrial structure and trade policy by 1994 (Daniels, 2007). "There were significant changes to employment with causality attributable to both trade liberalisation and technological change (Daniels, 2007). Skills biased technological change had been experienced (Bhorat & Hodge, 1999) and the implication of this is that within-sector changes in employment have almost been more important than between-sector industrial structure changes when considering the nature and skills intensity of labour demand in South Africa (Daniels, 2007)."

These two sources of change affect the intensity of labour demand differently. Between-sector changes, such as a decline in primary sector employment experienced simultaneously as an increase in tertiary sector employment, can create structural unemployment. "In this scenario, workers that previously had the prerequisite skills to competently perform their tasks in the agricultural and mining industries (the primary sector), now face a sector with deteriorating terms of trade and so have to seek work in the tertiary (service sector) (Daniels, 2007). " However, they do not possess the requisite skills to enter the tertiary sector, where basic retail skills may be needed in addition to literacy and numeracy, and so are left without the human capital to make the transition to a new occupation. They are consequently structurally unemployed. This kind of change has the potential to create a scarce skills shortage, where both absolute and relative shortages of tertiary sector workers could be experienced (Haskel & Slaughter, 2002).

Within-sector changes result from skills biased technological change. In this case, new technologies or methods of production are introduced by firms in an effort to increase productivity (Haskel & Slaughter, 2002). At an individual firm level this results in the need to train workers, but at an economy-wide level, this could lead to a critical skills shortage. This is highly relevant in the Western Cape clothing industry currently given its general trend towards implementing Lean production methodologies and the Quick Response retail model. While the strategy assists the firm in its development, without the required skills to properly effect the changes needed, the process is not

likely to succeed. This naturally leads to the question of what skills development programmes are currently underway in the Western Cape clothing sector and what skills are they providing.

“The Skills Development White Paper, Bill and finally the Act of 1998 successfully established a single national regulatory framework. This consisted of a National Skills Authority (NSA) and 25 Sectoral Education and Training Authorities (SETAs). The SETA landscape has subsequently undergone restructure, and currently consists of twenty-one SETAs. These effectively link the training programmes at the national level with those at the sectoral level (Kraak, 2004). In addition to this, the Workplace Skills Plans that all firms are required to submit to the SETAs link the firm level to the sectoral level. The importance of this relationship between micro (firm) level data, sectoral aggregation via the Sector Skills Plans, and national aggregation is perhaps one of the most undervalued aspects of the SETAs’ work, for it represents a highly coherent framework for (firm-level) data collection that facilitates both the analysis and implementation of policy (Daniels, 2007).”

Morris, Barnes & Esselaar (2005) argue that work undertaken by the Textiles Industry Development Council in early 2004 suggests that the relevant SETAs lack credibility amongst manufacturing firms and as such, support of the industry. As a result many programmes that are run through the SETAs are not supported and therefore are ineffective. This view has been confirmed by (Robins, Todes, & Velia, 2004), who note that firms are related institutions such as the SETA have shown little evidence of interaction and social cohesion, which has undermined the potential for collective action amongst key industry players. In addition to this, there is a negative perception about the industry and its future and as such is seen as one to be avoided by bright young people or recent graduates. Longer term prospects are required to attract the required people for the industry (Morris, Barnes, & Esselaar, 2005).

“The establishment of this new institutional framework established under the Skills Development Act of 1998 set a path for substantive change to skills development and the method of training workers. However, enterprise training in South Africa was also at historic lows up to this point, and the Skills Development Levies Act (1999) sought to correct this by creating a national levy system applicable to all enterprises based on taxing one per cent of payroll expenditure (Daniels, 2007). Important to note in this regard is the fact that, while Government now levied one per cent of payroll, the King Commission’s recommendations on Corporate Governance in South Africa suggested that

enterprises invest four per cent of payroll expenditure on training (Daniels, 2007). In this context, Government's levy can in fact be considered as crowding out enterprise's own training initiatives. The logic here is that public provision of these services are necessary to correct the market failures associated with historically poor levels of investment by enterprises in personnel training (Daniels, 2007)."

The Department of Labour's National Skills Development Strategy (Department of Labour, 2005) reiterated the importance of learnerships that was part of the SDA. Learnerships were seen as a complement to apprenticeships, and a key method to improve skills development for high, intermediate and low-level skills. The Human Resources Development Strategy (Department of Labour and Department of Education, 2001) sought to further target all three levels of skills development by focusing on linking the general education provision such as schooling and basic education and training, supply-side dimensions of human-resource development which includes the provision of higher education and training, demand-side dimensions which consist of the skills demand from employers in both the private and public sectors and finally national systems of innovation, research and development.

Skills requirements

There are several major challenges faced by the Western Cape clothing sector and the industry as a whole. These challenges stem from globalisation, policy regulations, technological change and production and process upgrading. Knowledge intensity, skill development and total workforce capability are fundamental to meeting the challenges faced by the sector and have an increasingly disproportionate reliance (Rasool, 2005). In traditional manufacturing processes workers were required for their technical skills, but Lean production strategies require workers to possess both technical and managerial skills and to constantly improve their skills and production processes. Business strategies rely on several areas, but success can only be achieved through a highly skilled, motivated and globally competitive workforce. The firm can only evolve as it workers evolve. Lean manufacturing has to have participation at all levels, not just at the top. The workers have to effect the required changes and this can only be done with the appropriate skills.

The term 'skills shortages' is an amorphous concept that encapsulates many specific components, but at the core of the matter is the idea that the demand for certain skills exceeds supply (Daniels,

2007). In the discourse of labour economics, labour supply refers to the individuals who participate in the labour market with given endowments of human capital, whereas labour demand refers to the private and public entities that employ individuals (Daniels, 2007). Intermediating between these is the set of institutional arrangements that help form and shape the nexus between labour demand and supply. This includes educational institutions in civil society and training providers in both the private and public sectors.

The origin of South Africa's skills policy regime is intricately linked to the country's history as an Apartheid state, the legacy this presented in the labour market and the efforts post-1994 to ameliorate the iniquities of 'Bantu' education (Daniels, 2007). "During this period South Africa also underwent significant economic reform. The country had isolationist geo-political and economic policies which were substantively transformed in the era of democracy, forcing firms to become more competitive and export oriented (Daniels, 2007). This tended to have the effect of augmenting capital-intensive technological change and inducing a thorough reorganisation of the forms and methods of production and its resultant skills implications." The growth and development of the clothing manufacturing industry is dependent on many factors, however an important component of which is the increasing efficacy of the skills development regime as the industry evolves and adopts new production methods and philosophies.

Given this context, it is important to define skills shortages and the components thereof. It is noted that there is traditionally a difference in the way that economists think of skills shortages and the manner in which government has come to define it (Daniels, 2007). "For economists, any issue of skills is always approached in context with its relationship to productivity in the firm. However, government has defined skills shortages without taking this relationship into account. Shortages are defined in both absolute and relative terms, but neither of these terms is related to productivity (Daniels, 2007)." This results in disputes between government departments over the precise numbers of occupational skills shortages. Having noted this, in this research paper the latter concept of skills shortages will be predominantly discussed, as the domestic literature is almost exclusively focused (implicitly) on this interpretation of the concept (Daniels, 2007).

Given this definition of skills shortages, it is important to clarify the components of the problem as presented in the government literature. Skills are understood to refer to both qualifications and

experience. Scarce skills, in the parlance of the Department of Labour and the Sectoral Education and Training Authorities (SETAs), is defined to refer to occupations in which there is “a scarcity of qualified and experienced people, currently or anticipated in the future, either (a) because such skilled people are not available, or (b) because they are available but do not meet employment criteria” (Food & Beverage SETA, 2005).

This scarcity can arise due to either an absolute scarcity of these skills or a relative scarcity. “Absolute scarcity refers to suitably skilled individuals that are not available, a lack of sufficient numbers of workers with specific skills or insufficient numbers to satisfy replacement demand (Food & Beverage SETA, 2005). Relative scarcity, on the other hand, refers to a situation where suitably skilled people exist, but do not meet other employment criteria, for example they live in different geographical areas, or do not satisfy Broad Based Black Economic Empowerment criteria” (Food & Beverage SETA, 2005).

Critical skills refer to specific skills within an occupation. In the South African context there are two groups of critical skills: (1) generic skills, including problem solving and learning to learn; language, literacy or numeracy skills; and working in teams for example; (2) particular occupational skills required for performance within that occupation (Food & Beverage SETA, 2005). It is the latter form that accounts for the problems that emerge when a firm experiences technological change or reorganises production methods. The Western Cape clothing sector and its shift towards Lean manufacturing, Value-Chain Alignment and Quick Response capabilities as it upgrades production is an illustration of this. These skill definitions are fundamental to the understanding of skills shortages and must be referred to when diagnosing the nature of skills shortages found in the Western Cape clothing sector. South Africa’s reintegration into the global economy required skills biased changes in methods of production which resulted in too few workers with adequate skills, or a mismatch between skills supply and demand (Daniels, 2007).

It should be noted that emphasis on ‘high skills’ is not sufficient in a developing country such as South Africa. This is one of the central tenets of Andre Kraak’s work (2004, 2005). Emphasising strategies for low skills should be viewed in a positive light, particularly with respect to addressing unemployment and stimulating labour-intensive forms of production, such as clothing manufacture. An exclusive emphasis on the ‘high skills’ strategy ignores the tough conditions and constraints that

developing economies face in their attempts to move up the value chain (Kraak, 2004). Consequently, the concept of “skills shortages” should be thought of as comprising everything from the most advanced qualifications to the most elementary, and “skills development” as something that may be needed for different people at different stages of their life cycle, or over the business cycle, or both.

As such, skills development in the highly labour-intensive garment manufacture sector of the Western Cape must be thoroughly understood and positioned in such a way to meet industry needs to enhance firm competitiveness, improve productivity and ultimately grow the industry.

Reed (2012) found that with regard to skills, problems with recruiting machinists and other production staff has been intensifying due to a skills exodus from the industry. 67% of respondents to the study reported skills shortages and gaps in their production line with fill times ranging from two to twelve weeks. 27% of respondents reported that they were tackling skills shortages by training internally. A key finding was that firms regarded skills to be their *greatest* constraint to growth, not the availability of fabric or the potential to secure orders (Reed, 2012).

Whilst there will always be a place for low-end and intermediate skills in the clothing sector, given the labour-intensive nature of manual work, the proportion of highly skilled workers is likely to grow sharply in comparison to unskilled workers so as to satisfy sophisticated consumer preferences, meet delivery targets and meet price points in the marketplace. Given the production methodology shifts and technological advancements, specialised skills interventions are required to place the sector on the appropriate development trajectory. Mastery of the value chain is assuming greater prominence in all activities of the firm with a view to cut costs and improves quality at every point in the activity chain. Success or failure in firms is now measured by the speed of movement of raw materials from the time it reaches the gate of the firm to the time the finished product lands on the customer’s doorstep, in terms of the Quick Response model and Lean production (Rasool, 2005).

These imperatives require complex managerial skills to enable firms to constantly re-engineer structures and improve processes in response to internal and external market changes. Managers must learn to create and manage seamless interfaces between human resources, technology,

finance, procurement, logistics, operations, marketing and sales and customer service as part of their daily tasks (Haskel & Slaughter, 2002). They also need the skills and network to lock into global supply chains.

Managers and supervisors need to be equipped with skills that rely more on co-ordination and participation than on inspection and control. Likewise, operators need to be trained to accept greater responsibility for individual performance, display sound judgment, work in self-directed teams and offer solutions to problems on the production floor. This is new ground for training in a sector accustomed to Fordist manufacturing practices.

In this new climate, firms need to organise around work, not jobs. The workforce is now required to be multi-skilled with fewer workers doing more work. Workers should rotate around different projects. Managers should be skilled to guide projects, measure performance, encourage innovation, manage talent and communicate effectively. This also presents new skills development challenges and requires a fundamentally different battery of skills for managers and workers alike.

Arguably one of the greatest skills development challenges for the sector lies in the field of management training and development. The rising complexity and speed of business, productivity pressures, innovation and process upgrading, chain management, strategy formulation, logistics, information management and people development are just some of the areas that require specialised training and development interventions for managers to meet the demands of modern business. While there is public provision of training, it is largely directed at technical hard-skills. There is a notable gap in the provision of managerial and other soft-skill training.

This multiplicity of roles is giving rise to more complex organisational architectures in firms and presenting a plethora of new skills development opportunities beyond the traditional offering of learnerships, apprenticeships and technical training, which is also vitally important to improve the competitive capability of firms in the sector (Rasool, 2005).

There are several constraints that appear to limit the chances of addressing the skills development challenges alluded to above. Significant amounts of funding are required to upgrade a national

workforce. The cost to privately fund the required training is unaffordable to most in this sector. There are no educational institutions that are pro-actively providing high quality, accessible and affordable programmes that can contribute to this challenge decisively. If the supply side support is neither affordable nor sufficient, then the sector has no option but to explore new avenues for addressing its needs. But this becomes yet another steep challenge for a sector that already has more than its fair share of challenges.

Firms wanting to remain in the industry have realised the necessity of shifting manufacture away from mass-production and towards a Lean manufacturing approach. However, given the current constraints, especially with regards to lack of skill (both technical and managerial in nature), firms will be unable to effect the required strategy change successfully.

It is important to distinguish between skills gaps and skills shortages. This distinction is important as it provides linkages between two primary issues, namely Lean and skills supply and demand in firms (Morris & Reed, 2008). The reason for this is that the particular ideology driving a firm's production methods will, to a large extent, dictate that particular firm's skills requirements and therefore also its ability to meet its skills needs. This relationship and its relating concepts are explored further in this section.

Skills Gaps

Skills gaps are said to exist when employers recognise that their existing workforce has a lower level of skills than is necessary to meet business objectives (UK Skills Dialogue 2004). Skills gaps therefore refer to a lack of ability of existing workers or aptitude to perform their roles to the optimum level. Skills gaps correspond with critical skills as previously defined. Skills gaps are a key indicator as they can signal a lack of firm efficiency or unsuitable recruitment strategies (Morris & Reed, 2008).

A sectoral skills analysis by Morris & Reed (2008) concludes that for the clothing sector, the main areas of concern appear to be at two almost diametrically opposed ends of the occupational spectrum, namely in management and operative areas. Technical skills gaps were found mainly at production operative level. Each firm surveyed identified a shortage of machinists as their greatest problem, with other production-related occupational positions also becoming increasingly difficult to

fill (Morris & Reed, 2008). With respect to management skills, skills gaps were overwhelmingly identified at mid-management level and related primarily to problem-solving and team-leading (Morris & Reed, 2008).

Skills Shortages

Skills shortages are when there is a lack of adequately skilled and/or qualified individuals in the accessible labour market (UK Skills Dialogue, 2004). Skills shortages correspond with scarce skills as previously defined. These recruitment difficulties can be symptomatic of skills shortages, but may also reflect uncompetitive labour conditions or policies which discourage work (Morris & Reed, 2008). The sectoral analysis by Morris & reed (2008) indicates that skills shortages occur overwhelmingly at the operative and technical occupational levels, although in some cases, firms reported difficulties recruiting professionals, such as engineers.

Key findings

The demand for skills varies across occupations and size of firms, Morris and Reed (2008) determine that skills demand is fundamentally defined by the firm's particular strategic vision for the future. It can be noted that skills gaps are more evident in firms, irrespective of size or market orientation, that have actively undertaken and pursued the transition to Lean manufacturing and the Quick Response retail model and explicitly recruit labour within this new form. In these types of firms, many of which are located in the Western Cape and receive assistance from the Cape Clothing and Textile Cluster as they move up the value-chain, adopting new production strategies, skills shortages are less important. The methodology of Lean production and the Quick Response model completely redefines production activities while supplementing them with new and often greater skills requirements. There is a significant focus on multi-skilled workers as this helps improve production flexibility. This evolution in production explains the creation of new skills gaps. In addition to this phenomenon, skills gaps may also indicate future skills shortages if the current skills gaps are not addressed by firms and skills development institutions. Contrary to this notion, skills gaps are less likely and shortages more likely to be reported by firms that continue with the use of traditional production methods (Morris & Reed, 2008).

According to the FP&M SETA (2015), when these changes are considered, the potential for large scale employment expansion becomes quite limited. Furthermore, many of those workers that are currently employed are facing changes and will need to adapt to ensure a secure future in the sector. The opinion of the FP&M SETA is best conveyed in their own words, “Although the SETA will seek to contribute substantially to the development of new entrants to priority occupations in demand in the sector, there is a strong case for there to be substantial training targeted at existing employees to enable them to adapt to change and to position themselves to be able to contribute to future skills demand in the sector.” (FP&M SETA, 2015).

The FP&M SETA undertook various interviews with both employees and employers and found the reasons listed below as the main reasons that make some positions difficult to fill (FP&M SETA, 2015):

- Low wages in the sector rendering some occupations less attractive to young people
- Technological improvement in the sector requiring a new skills set
- Industry trends creating new pressures for employers in the sector to operate differently
- Lack of immediate skills to replace an ageing and experienced workforce
- Need for multi-skilled people to perform functions that were previously filled by people without
- multiple skills

The paragraphs below will outline some of the interview responses provided by several industry stakeholders. Interviews were held with manufacturing firms of various sizes, all supplying domestic retailers, but not necessarily exclusively. Many of the firms operate near the top of the value-chain or are moving towards that direction. The firms providing high-value clothing products have also adopted or are moving towards adopting Quick Response capabilities. As South African retailers are under pressure from the influx of foreign retailers into the country, many are choosing to implement the Quick Response retail model. However, to successfully implement this model, domestic manufacturers are required to have Quick Response training and capabilities. Given the history of the sector, strategic relationships still need to be developed and technological innovation undertaken to help secure successful implementation of Quick Response. Furthermore, workers in the sector have to be trained on the new Lean production methodologies.

While there were various views regarding skills development in the Western Cape clothing sector, the golden thread that connects them all is the apparent lack of soft-skills and adequate mid-level management at manufacturing firms. Many workers were hired for their technical skill, and once they become a leader with their technical skill, a natural promotion is a leadership or management position, yet they are ill-equipped with regard to skills in this field. Sometimes the technical skills required are not met in order for a firm to move up the value-chain and produce more complex value-added products. Lean manufacturing requires significant shop-floor participation resulting in the requirement of cross-skilling, and team-leaders play a more vital role in production. If they do not possess the required skills, the implementation of Lean manufacturing and the Quick Response model will not be successful or the firm will not be able to achieve the required results.

Chapter 5

Interviews

Interviews were undertaken with four established clothing manufacturing firms in the Western Cape to gauge their experiences and opinions. This was done in conjunction with the annual benchmarking reviews undertaken by the Cape Clothing and Textile Cluster. These benchmarking reviews assess firms on a competitive, financial and operational level. Various members of staff were interviewed at each firm at different levels of employment. Firm A manufactures inners and bed linen for several retailers and has their own retail store, Firm B and C manufactures high-value ladies clothing as independent suppliers to South African retailers and Firm D manufactures both menswear and ladies clothing for a single domestic retailer.

Operating in a niche market and established in 1989 with 30 employees, Firm A has developed and grown substantially as it expanded operations. There is a strong emphasis on support for employees and most of the workers have been at the company for several years. The company expanded significantly in 2010 when it purchased an additional 2100sqm in space, bringing the total floor coverage to 6600sqm. The additional space was to develop production upgrading capabilities by installing new high-quality specialised machinery. The firm believes in building and maintaining strong relationships with suppliers and ensuring levels of global competitiveness. The company is a member of the Cape Clothing and Textile Cluster as has transitioned towards adopting Lean production methodologies in this regard. To assist with the change management and requirements, the company hires external consultants. These consultants help implement Lean production

requirements and facilitate the process with employees. In addition to this the firm allows for an annual benchmarking process that provides an assessment of its financial position, operational performance and competitiveness levels. Interviews were held with the general manager as well as the production manager. Informal conversations were held with several production workers.

As Firm A has embarked on the journey of upgrading production by implementing Lean production methodologies, it has received CTCIP funding from the Department of Trade and Industry. This has enabled the firm to undertake significant capital upgrading and provide consultants to assist with production change to help ensure an effective and successful implementation of Lean production. Workers are trained at a technical level as the firm upgrades its technology and are also trained in Lean production processes by the external consultants. Supplying various retailers with products ranging across a quality spectrum, the firm operates at various levels of the value-chain. Providing products at the top end of the value-chain as well as the low-end allows for increased efficiency and reduced wastage of raw materials. This is achieved by not having to discard raw materials that do not reach certain quality measures. Instead the materials are utilised for the manufacture of products further down the value-chain.

Production operations across a value-chain requires significant flexibility and multi-levelled skills, which has led to the adoption of Lean production methodologies. Training the workers on technical skills in more than one production area as well as effective measurement skills helped the company achieve production improvements. This change in strategy and methodology resulted in the firm reporting less damaged goods, thereby reducing the amount of reworked products as well as increased output. Damaged goods were reduced and increased output achieved by having more advanced technology in use, allowing for more efficiencies to be captured while also up-skilling workers thereby improving their productivity levels. Due to improved measurement across the shop-floor and clear visualisation of the measurements, absenteeism levels decreased, production increased, and rework rates declined. Furthermore, healthy levels of competition between teams was achieved, thereby creating an improved work environment and a culture of continuous improvement.

While improvements had been achieved on a financial and operational level since the shift in production strategies, the firm had independent Lean consultants to assist with the change

management. The firm found itself constrained in effecting Lean production methodologies without the help of consultants (at a significant financial cost) as workers did not possess the requisite skills. Lean production methodologies require active measurement in every process by workers as well as reworks done on the line and not at the end of production. Workers require skills in several areas rather than just one. The firm developed an internal training programme and worked with the Cape Clothing and Textile Cluster to train staff at all levels, but the training funded by the firm was only to maintain a machinist training centre, it did not cover managerial skills. It was acknowledged that the focus on human resources and training had increased and this was a notable change from the past. Firm A emphasized the need to have workers up-skilled across levels as the company upgraded operations and required a broader range of skills.

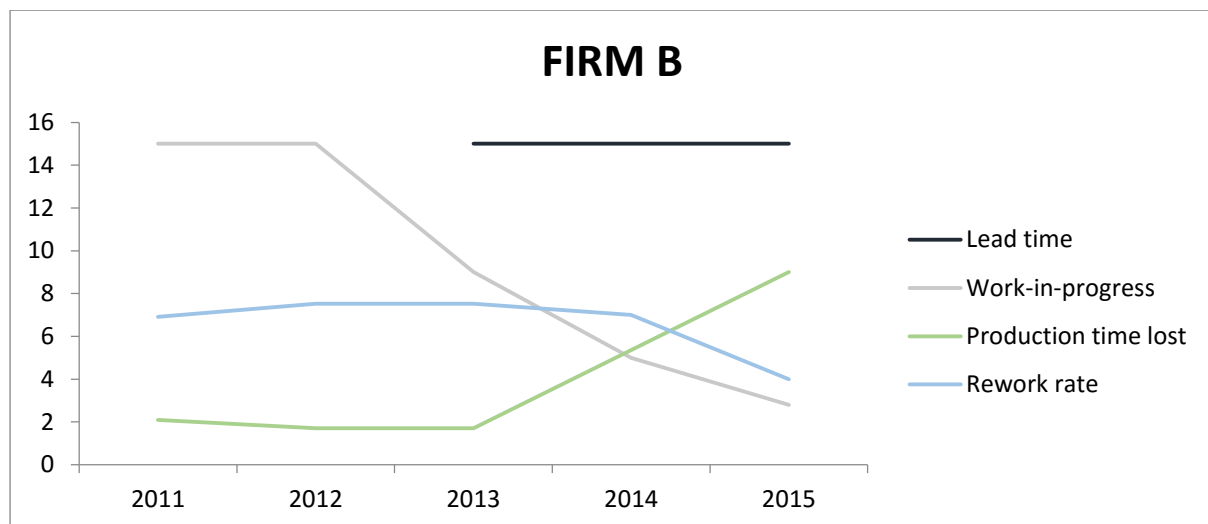
Firm B is a family owned and operated clothing manufacturer specialising in ladies outerwear. It is a member of the Cape Clothing and Textile Cluster and has begun the process of implementing Lean production methodologies as it attempts to become a Quick Response retail supplier in the Western Cape. Unlike Firm A, Firm B is not a beneficiary of the CTCIP funding. This has made the adoption of Lean production methodologies not as rapid and has limited access to improved technology given the financial constraints. Furthermore, without the government funding, the firm cannot afford to hire external consultants to assist with the production methodology change. This has resulted in only selective Lean methodologies being implemented at the current stage. The company is in the process of applying for the Production Incentive funding, however, even with only a basic change effected, the firm has already seen production improvements. By implementing the measurement and visualisation methods of Lean, the company has managed to track performance and note areas on concern and focus.

Firm B began its Lean journey by starting with production measurement at a team-level. Absenteeism, final product, work-in-progress, and reworks were all measured, documented and visualised on the shop-floor. This created a level of competition between teams as well as intra-team competition to improve on their own previous records. Firm B stated that since the measurement began and had been displayed; efficiencies had been gained as reworks rates reduced, along with the build-up in inventory. However, they found difficulties in regard to team-leaders. Often a senior machinist or other technically skilled worker would receive a promotion to lead a team, but did not possess the requisite soft skills to lead. There was a notable lack in managerial skills such as leadership, effective communication, delegating abilities and critical thinking skills in relation to

decision-making and problem-solving on the production floor. This limited their Lean production capabilities and hence hindered the firm's progress towards becoming a Quick Response retail supplier.

Figure 5 below demonstrates the improvements in key metrics for Firm B. Work-in-progress declined notably, alongside the rework rate, a key indicator of quality. Lead time remained consistent, while production time lost due to machine breakdowns increased significantly. This was due to a combination of measuring correctly and manufacturing more complex garments.

Figure 5



Source: B&M Analysts

The firm highlighted that a lack of skills was one of the biggest challenges they face. The lack of required skills affects them on two fronts. They do not possess and cannot find machinists with advanced technical skill to produce complex garments. The production of more complex garments enables the firm to move up the value-chain and without the requisite technical skill – the firm is unable to accept orders with these items. These include items such as lined jackets. In addition, their workers are not multi-skilled and do not possess management skills which are required for effective Lean production. This hinders their progress to becoming a Quick Response retail supplier.

Firm C, similar to Firm B in the market, produces outerwear for women. The firm only supplies to two domestic retailers. However, production for each retailer takes place at different locations. There is a factory in the Western Cape for the one retailer and another factory in Lesotho for the other retailer. Operations in the Western Cape are for products that are on the high end of the value-chain with premium ladies-wear items produced. The interview was held with the production manager for the Western Cape factory.

Firm C began a programme to improve competitiveness levels in July 2011. Realising the theoretical benefits associated with a pull production system, such as Lean production, as opposed to a traditional push method, a pilot programme was initiated. After some planning and training the pull system was formally introduced in May 2012. Initially, the Lean production system did not perform as expected as the production line struggled to reach their production target. However, their work-in-progress inventory declined significantly as there were smaller bundle sizes. This change in production methodologies brought some previously concealed issues to light.

The change from a push system to a pull system highlighted the negative effect of a high rework rate; as lower work-in-progress levels meant that the numbers of reworks were no longer concealed in high inventory levels. This brought significant attention to quality and to build quality checks into the production process. Similar to this was visibility on machine breakdowns. A significant delay in this regard resulted in processes being idle until the machine was fixed as there was no longer a build-up of inventory to keep other operators busy. This highlighted the requirement of effective maintenance management and timeous responses to breakdowns.

Firm C decided then to address the new challenges by introducing new projects. They produced a standard flow diagram that allowed for better pre-production planning relating to machine availability and operator skills requirements. A cleaning schedule was introduced and operators became responsible for ensuring their line remained clean and organised. To ensure improvement on quality, a target rework rate was set and a goal set to reduce the number of reworks. After adopting Lean production methodologies Firm C noted three key improvement areas.

- Throughput time decreased from five hours to three hours. This is measured by tagging a specific garment and measuring the time it spent on the production line.
- The rework rate decreased from 12% to 5%.

- Worker morale improved.

Firm B and C operate in similar niche markets by exclusively manufacturing ladies outwear garments. Both firms indicated a lack of technical skills to produce high-value items such as lined jackets and zipped garments. This lack of skill was found mostly at a technical machine level. There were not enough machinists skilled enough to undertake these more complex tasks. Both firms participated with the Cape Clothing and Textile Cluster and implemented Lean production methodologies to become a Quick Response supplier to domestic retailers. While both firm B and C noted improved operational and financial performance with the new production strategy, they admitted they had not been measuring consistently and uniformly and improvements were not always clear. However, both firms indicated that there was a lack of managerial skills to help ensure effective implementation of the new production methodologies as they became Quick Response suppliers to local retailers and implemented Lean production methodologies to assist in this regard.

Production managers at both firms felt there has been a low-level skills development focus previously and currently it is centred around machinist skills, with a significant lack of managerial skills training across the industry. A dire need of good technical and basic managerial skills was emphasised. Lean production methodologies for Quick Response require active engagement by workers and to constantly improve processes. Without both sets of skills, a move up the value-chain towards higher-value products could not be undertaken with success. The production manager at Firm C felt that training was mostly undertaken to receive an incentive for the firm, rather than upskill workers with the required skills. He believed that the industry in the Western Cape requires the provision of centralised training across skill levels.

Firm D is an established clothing manufacturer for one of the country's largest retailers, and over time found it having to adopt more flexible and efficient production methodologies to compete with other suppliers. Established in 1989 the firm shifted production strategies in 2004 when it felt it was no longer in touch with retailer's needs. An order would be placed in February that was due for August. It was at this juncture that the firm refocused its efforts towards speed, quality, flexibility and reliability. With the renewed focus, Firm D could shorten the time between order and delivery, thereby ensuring product was current and on-trend and that the firm could be a Quick Response retail supplier. In 2012 the firm received a R90 million investment from a domestic retailer towards a

design centre that would reinforce the concept of 'fast-fashion'. After becoming an effective Quick Response supplier to the domestic retail company, Firm D was bought by the retailer's design centre and vertically integrated into the retailer's supply chain. This was done after being a supplier for over 20 years. Prior to being vertically integrated, Firm D supplied about 25% of the retailer's domestically manufactured product. After the integration, a further R45 million was received from the retailer to restructure the factory to help ensure global competitiveness levels as Lean production capabilities were adopted.

The firm has two factories, one based in the Western Cape and another in Caledon. Firm D is advanced in terms of Lean production methodologies given an early adoption of the strategy. As a member of the Cape Clothing and Textile Cluster, the firm received additional benefit and support as they moved up the value-chain to become a Quick Response supplier to retailers. The firm also hired Lean production consultants to provide additional shop-floor assistance. Furthermore, the firm is also a recipient of the Production Incentive funding due to improved competitiveness and thus enabled the factory to reduce assembly line time, increase output and preserve jobs through capital upgrading.

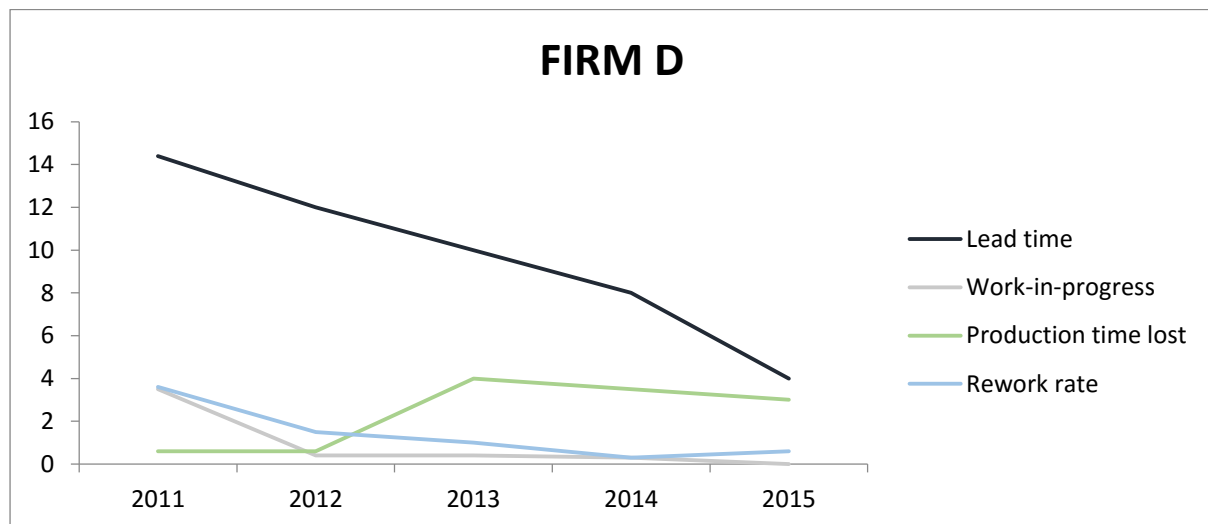
The firm highlighted the necessity of speed to market and flexibility for retailers and they had to provide assistance in this regard. To implement the requirements for this shift, training was needed. The manufacturing firm eventually bought an existing training college nearby and now provides consistent training programmes both for their own workers as well as external worker training. The emphasis remains on technical skills at the moment and private consultants are hired for the management and Lean production methodology training. These consultants work in the factory and not at the training college and come at a significant financial cost. Firm D emphasised the financial and operational improvements that had been gained by the production strategy and methodology shifts it had undertaken over the years and believed it was vital and the key to their success as a manufacturer.

The adoption of Lean production allowed Firm D to capture gains through efficiencies. This was achieved by increased levels of output, a reduction in the rework rate – thereby improving quality and ensuring speed to market with reduced throughput time. The reduction in through-put came from improved maintenance programmes resulting in fewer machine breakdowns and improved

technological capabilities. The capital upgrading that allowed for technological advancement was largely due to the influx of funding and investment. Having embarked on a significant project of skills upgrading at a technical level, workers were able to ensure the firm was able to move up the value chain. The soft skills of workers such as leadership, planning and critical thinking to continuously improve came from training with Lean production consultants.

Figure 6 data comes from B&M Analysts and was recorded at each annual benchmark. Key performance indicators all demonstrate an improvement, except for production time lost due to machine breakdowns. This however is not a true increase – as it only started being measured accurately from 2013.

Figure 6



Source: BMA Analysts

Firm D is proud to note that of the 6 million garments they sold to their retailer in 2014, 41% went from concept to store in under 56 days. And of that 41%, half were in under 28 days. This allows Firm D to compete with other suppliers, both locally and abroad on more than price, but also flexibility and quality.

The companies interviewed all found that they had some of the basic technical skills they required, but no advanced technical skills or lower-middle management skills. Many of the skills found lacking related to leadership ability, effective communication, planning abilities, problem-solving, multi-

tasking, relationship management and critical thinking. As the firms adopted a Quick Response model and shifted towards Lean manufacturing methodologies, they found their workers did not possess the required skills to action these strategies and furthermore, the public training centres did not provide the required skills. In order to fulfil their production strategy plans, several of the firms setup their own private training facilities. Workers were then trained as needed. The lack of this provision in the public sphere resulted in other private firms sending their workers for this same training. While the intervention helps in the short-term, it is not a long-term solution for the firms or industry. The costs involved, the lack of managerial training and the lack of a central location do not make this intervention a sustainable one.

Chapter 6

Conclusion and recommendations

There are several major challenges faced by the Western Cape clothing sector and the industry as a whole. There are pressures from globalisation, emerging technologies, production shifts, regulatory and workforce pressures, managing change and aligning with Lean production standards. These standards are in terms of productivity, price, quality, design and innovation and are required to adopt a Quick Response retail model.

These requirements are pushing firms to adapt to survive in the increasingly competitive local and global landscape. Knowledge intensity, skill development and total workforce capability are fundamental to meeting the challenges faced by the sector. Business strategies rely on several areas, but success can only be achieved through a highly skilled, motivated and globally competitive workforce. The firm can only evolve as it workers evolve. Lean manufacturing has to have participation at all levels, not just at the top. The workers have to effect the required changes and this can only be done with the appropriate skills, both technical and managerial in nature.

This paper has shown that the South African clothing and textile industry has undergone difficult restructuring over the past 20 years due to a combination of both domestic and international factors. The negative impact of this transformation has become manifest in the declining

contribution of the sector to total manufacturing output, its declining export share and significant contraction in sector employment (Morris & Reed, 2008). Paradoxically, the underinvestment in both human and physical capital in the South African clothing sector has deepened the crisis precipitated by globalisation and currency weakness, leaving the sector incapable of dealing with rising import penetration and foreign retailer presence. Government policy designed to address the effects of liberalisation on the sector have been largely regressive in nature and reinforce the perception of global trade as a threat rather than an opportunity (Morris & Reed, 2008).

Due to the low barriers to entry (low fixed costs and relatively simple technology) coupled with the labour-intensive nature, the clothing sector has the ability and potential to absorb large numbers of unskilled workers whilst providing upgrading opportunities into higher value-added activities as firms move up the value-chain. In more advanced economies, such as Turkey, which faces high comparative costs, the clothing sector has sustained large numbers of direct jobs (Morris & Barnes, 2014) and as such provides a vision for South Africa, and specifically the Western Cape to follow a similar direction. As such, it is vital for firms in South Africa, and specifically the Western Cape, to enhance their global competitiveness and develop production strategies to assist in this regard. This is illustrated by several Western Cape clothing firms (both prominent and smaller operations) undertaking the move towards Lean production methods as they adopt Quick Response capabilities, with assistance from the Cape Clothing and Textile Cluster. Interviews with some clothing manufacturers in the Western Cape highlight the benefits of becoming a Quick Response supplier and the associated operational and financial benefits of Lean production. However, in order to achieve success with these new production operation strategies, an appropriately skilled workforce is required.

This paper has provided a review of Quick Response, the agility it provides, its strategic implications and the Lean production building blocks necessary for its implementation. It was demonstrated how a Quick Response operations strategy provides a more viable and attractive sourcing option and benefits all stake-holders along the value-chain including the customer, manufacturer and retailer. The adoption of the Quick Response retail model requires a shift in production methodologies. A shift away from mass-production must occur as manufacturers pivot towards Lean production methodologies. This is a fundamental change. However, it can only succeed with the appropriate Lean production methodologies and therefore the required new range of skills for all workers for its successful implementation.

The introduction of the Production Incentive and the Clothing and Textiles Competitiveness Improvement Programme by the Dti in 2010 has supported a large number of established firms in their endeavours to embrace these upgrading challenges (Morris & Barnes, 2014). However, investment in technology is not the only requirement for success. South Africa's reintegration into the global economy required skills biased changes in methods of production which resulted in too few workers with adequate skills, or a mismatch between skills supply and demand (Daniels, 2007). Whilst there will always be a place for low-end and intermediate skills in the clothing sector, given the labour-intensive nature of manual work, the proportion of highly skilled workers is likely to grow sharply in comparison to unskilled workers so as to satisfy sophisticated consumer preferences, meet delivery targets and meet price points in the marketplace. Given the production methodology shifts and technological advancements, specialised skills interventions are required to place the sector on the appropriate development trajectory.

A sectoral skills analysis by Morris & Reed (2008) conclude that for the clothing sector, the main areas of concern appear to be at two almost diametrically opposed ends of the occupational spectrum, namely in management and operative areas. Technical skills gaps were found mainly at production operative level. Local workers (especially machinists) require more advanced technical skills as production moves up the value-chain. With respect to management skills, skills gaps were overwhelmingly identified at mid-management level and related primarily to problem-solving and team-leading (Morris & Reed, A Sectoral Analysis of Skills Gaps and Shortages in the Clothing and Textile Industry in South Africa, 2008). This was further supported by interviews with industry stakeholders.

Arguably, of the skills challenges mentioned above, the greatest skills development challenges for the sector lies in the field of management training and development. There have been a few technical skill training interventions by private firms, but none at a managerial skill level. The rising complexity and speed of business, productivity pressures, innovation and process upgrading, value-chain management, strategy formulation, logistics, information management and people development are just some of the areas that require specialised training and development interventions for managers to meet the demands of modern business. While there is public

provision of training, it is largely directed at technical hard-skills. There is a notable gap in the provision of managerial and other soft-skill training.

Collective action by manufacturers must be undertaken to lobby for the provision of public skills training in Quick Response strategies and Lean manufacturing production methodologies, both at a technical and managerial skill level. Local manufacturers have to become globally competitive as they operate in a global value-chain and for this to take place, will have to improve Quick Response capabilities. This can only be successfully implemented with Lean production methodologies. If the workers do not possess the required skills for the production upgrade and shift, it cannot be successful. And without being globally competitive, manufacturing firms will not be able to develop, grow or be sustainable.

While several private manufacturing firms have attempted to correct this skills deficit by providing skills training themselves, this is not a feasible solution. Clothing manufacturing firms are in the midst of a significant production overhaul and challenges will arise in various forms, but most notably there will be significant financial demands. The lack of public provision for the required industry skills places additional financial responsibilities onto the firms, which are already in a precarious position given historical under-investment. Furthermore, similarly to public provision of training, there tends to be an emphasis on technical skills provision and not managerial skills development and the training is not available to all firms in the sector. While privately provided skills training and Lean production consultants may be a short-term transitional solution for some firms, it is not sustainable to ensure overall industry growth, development and success as firms undertake the implementation of new Lean production methodologies and implement the Quick Response retail model.

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Appendix 1

Clothing Benchmark Questionnaire

B&M Analysts
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Organisation					
Last saved					
Contact person name					
Contact person position					
Financial year end					
Company					
1. Sales % for primary markets (2017)	Ladies Casual				
	Ladies Formal				
	Mens Casual				
	Mens Formal				
	Underwear				
	Childrens Wear				
	School Wear				
	Work Wear				
	Activewear				
Other					
		2017 YTD	2016 YE	2015 YE	
Operating Profile	2. Average operating days per annum				
	3. Average operating shifts per day				
	4. Average operating hours per shift				
	5. Total operating hours per annum				
	6. Total production volume (Units - Garments)				
Economic					
		2017 Proj	2016 YE	2015 YE	2014 YE
Revenue	7. Manufacturing sales				
	8. Other sales				
	9. Total sales				
		2017 Proj	2016 YE	2015 YE	2014 YE
Financial Information	10. Cost of sales - Materials				
	11. Cost of sales - Direct Labour				
	12. Cost of sales - Manufacturing overhead costs				
	13. Gross profit				
	14. Calculated Gross profit				
	15. Non-manufacturing overhead costs				
	16. Operating profit				
	17. Calculated Operating profit				
	18. Total salary and wage cost				
	19. Value of outsourced work				
	20. Capital expenditure				
21. Return on equity					
		2017 Proj	2016 YE	2015 YE	
Cost Control	22. Raw materials - RM				
	23. Work-in-Progress - WIP				
	24. Manufactured Finished Goods - FG				
	25. Other Finished Goods - FG				
	26. Total Finished Goods - FG				
		2017 Proj	2016 YE		
Utilities	27. Total annual water costs				
	28. a) Total annual cost of energy (electricity)				
	28. b) Total annual cost of energy (gas)				
	28. c) Total annual cost of energy (diesel)				
	28. d) Total annual cost of energy (coal)				
	29. Total covered area of business (m ²)				

Value Chain				
		2017 YTD	2016 YE	
Domestic	30. Breakdown of materials purchasing value			
	31. Breakdown of product sales value			
	32. Lead time from finished goods to Domestic DC/Customer (Days)			
	33. Average supplier lead time (Days)			
		2017 YTD	2016 YE	
International	34. Breakdown of materials purchasing value			
	35. Breakdown of product sales value			
	36. Lead time from finished goods to international DC/Customer (Days)			
	37. Average supplier lead time (Days)			
HR Development				
		2017 YTD	2016 YE	2015 YE
HRD Indicators	38. Labour (excl salaried staff) turnover rate			
	39. Salaried staff (excl labour) turnover rate			
	40. Management turnover rate			
	41. Absenteeism (excl annual leave) rate			
	42. Accident frequency rate			
	43. Overtime rate			
	44. Training as % remuneration bill			
	45. Labour relations downtime			
46. Total full time equivalent employee (incl. contract labour)				
		2017 YTD		
Employee count by category	47. a) Management			
	47. b) Salaried staff (non-management)			
	47. c) Labourers (Direct)			
	47. d) Labourers (Indirect)			
	47. e) Other			
	47. f) Total			
Operational Competitiveness				
		2017 YTD	2016 YE	2015 YE
Inventory Holding	48. Raw materials - RM (Days)			
	49. Work-in-Progress - WIP (Days)			
	50. Manufactured Finished Goods - FG (Days)			
	51. Other Finished Goods - FG (Days)			
	52. Total Finished Goods - FG (Days)			
		2017 YTD	2016 YE	2015 YE
Value Chain Reliability	53. Domestic Supplier OTIF reliability performance			
	54. International Supplier OTIF reliability Performance			
	55. Domestic Customer OTIF reliability performance			
	56. International Customer OTIF reliability performance			
	57. a) Total production time lost to machine breakdowns			
	57. b) Total production time lost to style changeovers			
	57. c) Total production time lost to internal material unavailability			
57. d) Total production time lost to external material unavailability				
		2017 YTD	2016 YE	2015 YE
Quality	58. Fabric failed from international suppliers			
	59. Fabric failed from domestic suppliers			
	60. Internal rework/repair rate			
	61. Percentage of products failed by customer (Customer return rate)			
		2017 YTD	2016 YE	2015 YE
Flexibility	62. Average standard minute value per garment (minutes)			
	63. Average manufacturing throughput time (hours)			
	64. Average order size (units)			
	65. Average bundle size (units)			
New Product Development				
		2017 YTD	2016 YE	2015 YE
NPD Activity	66. Product development spend as a percentage of manufacturing sales			
	67. How many people are in your product development team			
	68. Products developed that result in orders			
	69. Time from request for sample from customer to approval of sealed sample (days)			
	70. Average time from sealed sample to start of production if fabric held by firm (days)			
	71. Average number of design iterations before approval of sealed sample			