SUPPLY CHAIN COMPLEXITY: AN INVESTIGATION INTO THE RAPID DECLINE OF THE UK's TEXTILE AND CLOTHING MANUFACTURING INDUSTRY

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ABSTRACT

Opportunities in globalisation has brought with it serious challenges for businesses in all sectors. Although there have been many success stories, but there has also been some serious challenges in traditional industries. The problems currently facing the UK's textile and clothing manufacturing industry, particularly its SMEs are a pointer to the degree of adverse utilisation of globalisation opportunities. This paper examines UK apparel industry supply chain structure, examples of successful strategy development through case studies and presents results from their application. It concludes that to fully seize the opportunities presented in globalisation, companies are required to build distinctive capabilities based on a mix of talent (skills) and technology. Thus, companies can only expect to move up the value-chain by innovatively creating a combination of capabilities which require them to deal with and manage business ambiguities- operations which are not governed by rule books and other explicit guides - more effectively.

Keywords: Supply Chain Complexity, UK Textiles, Manufacturing strategies

INTRODUCTION

Globalisation can provide new markets and opportunities for businesses. Whilst there are many success stories, increased competition as a result has provided a serious challenge to traditional companies and even whole industries within the UK in particular. For example the ship building has all but disappeared and the automotive industry is no longer British owned. The problems currently facing the UK's manufacturing industry, particularly the small to medium sized enterprises (SMEs) involved in textile and clothing (sometimes referred to as apparel industry) manufacturing are a pointer to the degree of adverse utilisation of globalisation opportunities (Cooper et al. 2005). To survive, businesses need to overcome their supply complexity, embrace change and implement different strategies to achieve strategic success and remain competitive (Fawcett et al. 1997).

Evidence suggests that immediately prior to the total removal of trade quotas in January 2005, the remaining textile and clothing manufacturing industry in the UK and elsewhere had resorted to employing business strategies and organisational models of out-sourcing their manufacturing to low cost manufacturing countries (Baker, 1996; Cooper et al . 2005; BATC Report, 2002). Although this move largely provided substantial cost benefits, they can be short-term and unsustainable. As a result the industry has continued to spiral in its decline from being the 9th largest employer in the UK at the end 2000 to its current position of 16th (DTI report, 2004). Successful competitive strategies result from instilling a mindset of pervasive innovation – entrepreneurial thinking, flexibility, organic growth, competencies and increased capabilities – at all levels of organisation and industry (Berkeley et al. 1999). Understanding the determinants of superior business performance is a subject of regular debate and of central interest to both researchers and practitioners. In many business and operations management literature, this dialogue is generally framed in terms of the standardisation / adaptation dichotomy.

The quest to better manage business processes within the product and/or service supply chains is by no means a new phenomenon. Business process flexibility versus superior performance in the supply

chain is an ongoing battle waged by organisations in the global arena, more-so within SMEs, and the only winner is the organisation that is better able to effect its strategies for change. The adoption of appropriate strategies allows organisations to start weaving together people, applications, technologies, and data to support individual and unique processes, helping organisations and businesses within the supply chain to meet its challenges and opportunities in a global, multi-channel environment. This ensures that key business value can be derived from supply chain operations and provides frameworks and standards for building the future of those supply chains. Cooper et al. 2005 argues that, to sustain successful strategies that allow organisations and industry to be competitive, requires complete overhaul of culture, management structures, performance measures, and processes in this age of rapid economic change. However, the additional challenges for most SMEs in harnessing these factors are in their 'smallness', the liquidity of their resources and constraints of management capabilities. There need to better utilisation of limited resources more effectively, to build distinctive capabilities based on the mix of talent (skills) and technology required to deal with and manage business operations which are not governed by rule books and other explicit guides so as to move up the competitive value-chain.

Results from a three years research project into the industry conducted by the authors suggest that, whilst companies (forward-thinking SMEs) have attempted to boost their labour productivity mainly by outsourcing production, they have failed to match this with the development of operations management and organisational models involving intangible assets that can help them produce competitive performances and exploit tangible assets. The intangible assets can provide more innovative and higher value solutions, which are more enduring and difficult to copy by the competition. This research acknowledges that certain characteristics prevalent in the textile and clothing supply chain have contributed to its adverse utilisation of globalisation, resulting in its rapid decline, examples are as given below.

APPAREL SUPPLY CHAIN STRUCTURE

An insight into textile and clothing supply chains (see figure 1 below) provides a context for understanding the economic organisation of the UK industry as a complex interconnected organisation. In the 70s, almost all sectors of the textile and clothing supply chain - textile and clothing manufacturing, yarn, fibre, fabric and clothing design, and retailing were located entirely in the UK. Textile manufacturing was generally characterised by capital intensity and high automation with about 70% of employment being in large companies in the UK. Although, there were also large companies in some parts of the clothing industry where mass production was particularly important, such as, the hosiery and knitted underwear, men's suit and coats, dress shirts, and jeans, the manufacture of commodity knitwear products was sometimes vertically integrated with textiles. However, such large organisations accounted for less than 20% of clothing jobs. In this period small and medium size companies increased and continued to grow in importance (Cooper et al., 2005; Berkeley, 1999 and Bolton Report, 1971). Almost half of all clothing employment is in organisations with fewer than 100 employees, typically SMEs. The authors reported in earlier research in 2005 that 99.76 per cent of the manufacturing in the textile and clothing sector was done by SMEs. The total turnover from the manufacture of textiles and textile products in the UK fell by 16.0 per cent between 1999 and 2001, in particular the total turnover for the 'manufacture of other wearing apparel and accessories' fell by 24.6% in the same period. The government statistic office reported that the share of turnover for the top 20 companies in the textiles and textile product manufacture fell marginally from 11.1% in 1999 to 10.3% in 2001. It is not disputed that the number of SME Manufacturing businesses fell by 14.7% in major textile and clothing manufacturing regions in the UK North. The sector in this region also experienced a fall in turnover from £1.08 billion in 2000 to £717 million in 2001. The Gross Value Added (GVA) at basic prices continues to fall from the 1997 peak, by 8.7% (North West Development Agency-NWDA- Report, 2002). Research reports from elsewhere in the developed world on the state of the industry appears to show a similar trend; for example, the USA reported shrinkage of manufacturing businesses from 58% in 1980 to 27 in 2001 (Doeringer et al., 2004; USITC, 2004).

KEY SUPPLY CHAIN PROCESSES

The principle stages of manufacturing and associated processes within the textile and clothing stages (see figure 1), are;

(i) production of yarn (represented as inward arrow labelled ‘supplier’ to the fabric manufacture element
   a. spinning of yarn
   b. dyeing of some yarn
(ii) production of fabric
   a. weaving or knitting of yarn
   b. dyeing of some yarn
   c. printing
   d. finishing
(iii) productions of sewing thread and other trim used in making-up products
   a. spinning and twisting
   b. dyeing
   c. finishing (lubricating final winding and packaging)
(iv) manufacturing of apparel products (including garments and household textiles)
   a. design
   b. dyeing of some garment or apparel products
   c. printing of some products
   d. making-up of garments and household textiles

Fibre and yarn production

At the top of the textile and clothing supply chain, is fibre manufacturing. Although not represented in figure 1, fibres are usually classified into two groups: natural fibre and man-made, (synthetic) materials. Natural fibres include plant fibres such as cotton, linen, jute and cellulosic fibres and animal fibres such as wool that are produced by agricultural organisations. Synthetic fibres include nylon, polyester and acrylic. Synthetic fibre production usually requires significant capital and knowledge – human capital capabilities; thus operations in synthetic fibre manufacturing are sophisticated and complex.

Fabric production

This segment of the supply chain transforms yarn into fabric by weaving, knitting or a non-woven process. In a weaving process, yarns are interlaced lengthwise and widthwise at right angles. Yarn may be woven by a simple procedure to produce generic goods and then dyed for a specific fabric. Alternatively, dyed yarns may be woven. In knitting, yarn is inter-looped by latched and spring needles.

Clothing (apparel) production

There are more manufacturing companies involved with this part of the supply chain, than in any of the others. The reason being, that it is relatively cheaper to set-up a manufacturing business for products in this segment. An Apparel manufacturing process typically starts with the craft design (drawings) of the garment to be made. Patterns are made from the designs which are then used to cut the fabric. The cut fabric is then assembled into garments. This element is the most labour intensive and fragmented segment of the textile and clothing supply chain. Capital and knowledge requirements are not significant, making it attractive for new business entries. Businesses in the women's and girl's categories tend to be smaller, while those in the less fashion sensitive men's and boy's clothing, knit-wear and underwear categories can utilise economies of scale and tend to be larger in size. Apparel companies usually specialise in narrow product categories and rarely produce garments for both genders.

Generally, the industry is characterised by short product life cycles, volatile and unpredictable demand, high product variety, and long and inflexible supply processes. Coupled with this, the internal activities of individual companies within the supply chain vary greatly depending on product specialty (see figure 2). For example, manufacturers can contract all or part of the production process to smaller intermediary companies - *contractors* in figure 1. Contractors are engaged in managing the manufacturing of garments and are not responsible for sourcing raw material or the design and marketing of these garments. The distinction between manufacturers and contractors is sometimes blurred, as manufacturers may contract out their work or perform contract work for other manufacturers, and contractors sometimes may start their own.

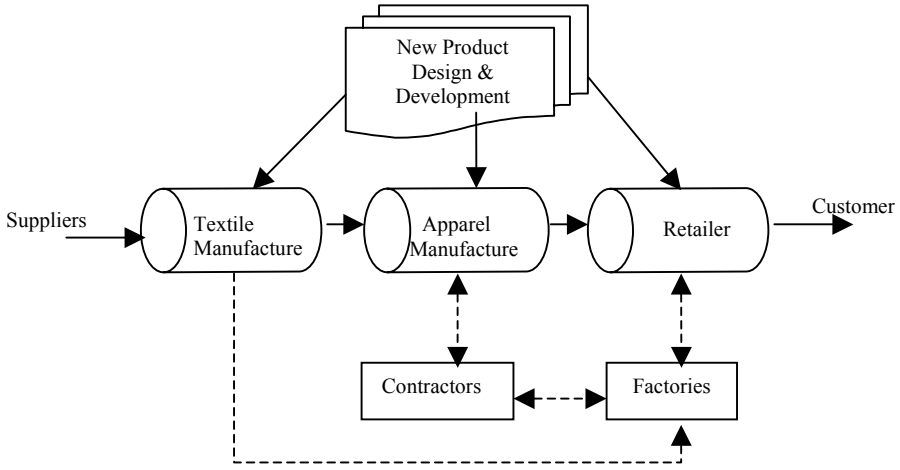

Figure 1: Apparel manufacturing supply chain

private labels. Thus, the functions of these contractors can vary from making product samples to buying and cutting fabric and/or trims, managing contract for clothing assembly, and sometimes design clothing, or even carry out quality inspections in factories on finished products before shipment to retailers (Teper, 1937). Also, custom-made product manufacturers can select create design collections that are manufactured in small quantities and typically sold in their own showrooms or through independent fashion boutiques. They may also develop and design less expensive collections that are assembled by contractors for other retail outlets. As products move down the value-chain (refer to figure 2) designs become more commercialised and products are priced lower to serve larger markets. Mass production techniques become more common and products are sold through a wider range of retail outlets.

Apart from the limited automation of the manufacturing processes of basic commodity products and routine sewing tasks (such as buttonholes, belt-loops etc) technological change has been concentrated in pre-production activities and pattern making. The high cost of many of these new technologies limited their adoption to larger textile and clothing manufacturers (Murray, 1995; Rothstein, 1989). Despite the potential and availability of enormous amount of data enabled by information technologies, the industry has been neglected in terms of utilising such data in strategic decision making for operations and supply chain management (Cooper et al, 2005). Also, retailers in the UK industry have traditionally had arms-length buying relationships with their suppliers. Cooper et al., 2005, argues that such practices, has contributed to long lead-times and the lack of right first time quality goods that have affected UK domestic manufacturing in recent times.

Retail

The final segment is the retailers; this makes apparel and other textile products available to consumers, through different retail channels (Brown and Rice, 1998; Hammond and Kelly 1991). For example, specialty stores, such as Laura Ashley, Adams, Gap, Next, and The Arcadia Group offer a limited range of apparel products and related accessories specialising in a particular market segment. Discount outlets and mass merchandisers and Supermarkets such as Wal-Mart – George label of ASDA, CHEROKEE, Florence + Fred labels of Tesco offer a variety of hard and soft goods in addition to apparel using an ‘everyday low prices’ strategy. Department stores, such as Debenhams, and M&S offer a large number of national brands in both hard and soft goods categories. Apparel chains, such as New Look and Primark, offer a wider range of products to their market segments. Off-price stores, such as TK Maxx, specialise in buying excess stock of designer-label and branded apparel from manufacturers and other retailers, offering considerably lower prices but often with incomplete assortments of goods. Other apparel sales are through mail order companies, e-tailers, factory outlets and other retail channels (BATC, 2002).

MANUFACTURING SUPPLY CHAIN OPERATIONS

The manufacturing supply chain typically begins with the product;

Design and Production of Samples

Design is either completed in-house or commissioned to smaller design companies. The first stages involve analysing the consumer group of potential high street retailers. This might entail sampling their current products. Thus, the design process is influenced by existing samples (prototypes) of garments or by the works of other designers presented in collections in exhibitions and/or other sources including trade shows (Bohdanowicz and Clamp 1994). Another source of design inspiration, is the feedback gained from the sales of similar products, although this is largely carried by 'word of mouth', it requires some degree of collaboration and trust between the retailers and the manufacturer. The second stage of the design process involves sample production. At this stage, samples of the different sizes of products are manufactured and fitted, before any final decisions are reached. These two processes, before the final decision-making stages can take between 8 and 19 months (Hammond and Raman 1994). On top of this, there is the possibility of added time as a result of late modification that might be required

Order Collection and Production

Manufacturers often accumulate their orders to gain economy of scale with producing factories. It is common practice for manufacturers to accept orders of non-economic levels for particular designs, for fear of missing out. However, levels of orders are checked periodically to ascertain whether an economically viable quantity has been reached or not. Cumulative orders in each style are assigned to factories usually on the basis of production volumes. There is a limited use of technology which is predominantly in patterns layout for the cutting of fabric (Abernathy et al., 1995). In the sewing operations that follow, garments are usually assembled using the progressive bundle system (PBS); a batch production system in which cut material is delivered to individual sawing operators in bundles/batches. As a result of a limited skill set, progress chasing is largely undertaken by supervisors, to both direct and balance sewing activities and check quality. This results in large work-in-process (WIP) inventories and minimal flexibility (Taplin, 1997). Alternative system include; Unit Production Systems (UPS) which reduces the buffer sizes between the operations or modular assembly systems which allow a small group of sewing operators to assemble the entire garment (Abernathy et al., 1995; Blackburn, 1991). See also section on 'clothing (apparel) production'

COMPLEXITY OF MANUFACTURING SUPPLY CHAIN

It is clear that companies' involvement in the operations of apparel manufacturing vary. The industry is organised in the form of manufacturers and contractors; where manufacturers are primarily responsible for the design, cutting and marketing and contractors being responsible for the sewing and assembly or any other functions for which contract agreements are reached. On occasions manufacturers have assumed contractors functions to other manufacturers. Many operations literature suggest that the type of product an organisation manufactures does not only define the manufacturing cycle and the intensity of the design of its operations, but also the manufacturing strategy employed (Fisher, 1997). As such, companies manufacturing basic products - in which demand patterns are more stable, can utilise larger batch sizes, depending on the capacity availability and the capability of the operation. Unfortunately, companies manufacturing fashion products generally tend to be smaller in size and have to live with smaller batches. However, being able to proactively react to late changes by having the capability to carry out late configuration provides the flexibility that these companies need to succeed in the competition (Taplin, 1997). In addition market and product categories factors provide additional dimensions of complexity to the manufacturing supply chain operations. For example:

- Fashion products, with a 10-12 weeks product life which accounts for 35 percent of the market.
- Seasonal" products, with a 20-week product life, accounts for about 45 percent of the market, and
- Basic" products; sale of these throughout the year account for 20 percent of the market.

Men's and children's products usually fall into the basic category, while women's merchandise dominates seasonal and fashion categories (Doeringer et al., 2004). Fashion product category is further split into six classifications (see figure 2); basic commodity fashion products (hosiery items, e.g. underwear, socks), basic fashion products (casual items, e.g. slacks), high fashion products (moderately priced ready-to-wear items), fashion collections (moderate quality, higher priced ready-to-wear fashion products), designer collections (high quality and expensive ready to- wear fashion products) and custom-made products (top quality, premium price products).

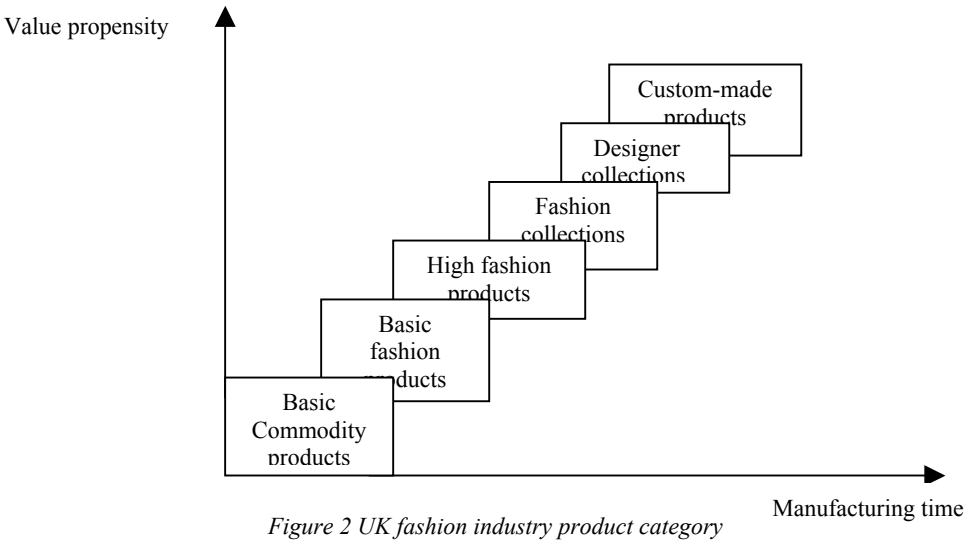

Figure 2 UK fashion industry product category

Another source of complexity within the industry supply chain is the fashion calendar. Typically the traditional fashion production calendar for lower value end products in the supply chain varies, depending on the sales seasons of the different apparel products. Fashion products usually have 4-5 sales seasons in a year, while for seasonal items with more stable, year-round demand there can be at least two seasons (Abernathy et al. 1995; Cooper, 1999). Calendar variation for custom-made or high value products depend on the quality and capacity availability in the manufacturing processes and raw materials. In comparison, the product life cycle for the high value-end products are shorter, particularly for the high fashion, and designer collection goods. This can be as short as one season. It therefore beholds manufacturers to effectively value-map their supply chains to identify factors of fashion content, length of product life cycle, quality, and price and manage the manufacturing processes accordingly. However, the ability to unlock the operational data that would empower owner/managers and business executives to make informed, timely decisions has eluded many companies, particularly those in the SME sector.

High labour cost and low Skills levels

Doeringer et al., 2004, argues that globalisation has put apparel manufacturers in the developed countries at a comparative disadvantage as a result of a relatively high labour costs in these countries. The UK textile and clothing manufacturing is a labour-intensive industry, particularly in the manufacturing phase (Jones, 2001), and on average over 90% of the labour force are unskilled or semi skilled (Berkerley, 1999; LSC report, 2004), which affects efficient productivity. Other challenges concern such areas as investment levels in machinery: the manufacturing technology remains dominated by the industrial version of home sewing machine. It is not surprising that imports from labour abundant countries, with better educated employees and more sophisticated production technologies have risen steadily since the mid-1970s and that apparel import penetration ratios have reached 71% by value and more than 80% by volume (BATC, 2002).

The trend within UK manufacturing companies is that owner/managers usually set up their businesses with a limited, specialised skill-set and in narrower product categories. Predominantly, most owner/managers in this sector have setup their businesses after working as sales representatives in large apparel retail chains (Berkeley, 1999) where they accumulate limited knowledge of the design, manufacture and retailing of apparel products. Like the case studies used in this research, most of these manufacturers operate in the fashion and seasonal apparel product manufacture, specialising in products categories characterised by short product life cycle (typically 10 – 20 weeks). Most of the manufacturing SMEs are ethnic minority owned with about 98% of employees recruited within the family circle. These employees equally have limited or sometimes are even less knowledgeable in business operations and

supply chain management. As such they are typically constrained by the availability of resource –human capital as a result of the low skills levels (Carkhuff et al., 2005; Cooper et al., 2005).

Ability to Anticipate, detect and Respond to Market opportunities

Opportunities are central in the dynamics of the market economy. In business contexts, 'opportunity' can be referred to as the beginning of a successful business. It is more often used in a rather specific sense to mean business opportunity, market opportunity or exchange opportunity. While market opportunity concerns opportunities in the market, business opportunities are those opportunities to do business which seems to be a matter of better selling and buying in the market place. Similarly, exchange opportunities are related to market exchange. Opportunity is thus related to entrepreneurial alertness where one is, at all times, spontaneously looking for unnoticed features of the present or the future environment. In other words, an entrepreneur without knowing what he is looking for, is all the time scanning the horizon and is ready to discover (Kirzner, 1989) valuable strategic contributions. Smith (1967) identified two types of entrepreneurs; 'craftsman' and 'opportunistic'. Earlier research results from investigating the characteristics of SME owner/managers, particularly in the UK textile and clothing manufacturing sector found that they were predominantly craftsmen who are proficient in one area of the business process – that in which they have had practice/exposure over a period of time (Cooper et al., 2005). The craftsman entrepreneur is characterised by narrowness of education and lack of confidence, while 'opportunistic' entrepreneurs are characterised by high social awareness and involvement and confidence to deal with present and future environments within their business operations (Jones 2001).

CASE STUDY: COMPANY A

Company A is an SME in the UK's textile and clothing manufacturing industry. It manufactures ladies fashion products, mens and boys school trousers. Whilst the ladies fashion products are generally sold to four major high street retailers under different labels and limited style variation, the mens and boys trousers are sold to other retail outlets. The organisation has been trading for over 17 years and employs 25 staff including two directors. Turnover last year was £900K, and its best in its 17 years history was £3M about 3 years ago. The company produces about 3500 garments a week, with an additional 1000 garments per week from off-shore sourcing. Like most companies, company A provides European contractor with materials for production and assembly of its products. Final finishes are carried out in the UK. Lead times are typically 4-5 weeks or longer during the fashion peak periods.

The impetus for the case study was that the full manufacturing capacity was to be returned to its UK factory, following an earlier investigation of the company's operating cost. This showed a lack of the anticipated lower cost of manufacturing in low cost countries. Like most manufacturers the initial enthusiasm for off-shore sourcing without taking the full cost and other resource constraints into account 'had hit home' after a number of experiences of longer lead-times, agents fees, insurance costs, and on occasion poor quality- largely due to ineffective communication between them and their overseas factories; items referred to by Jones, (2001) as hidden costs associated with materials sourcing. In articulating the scale of the project, at the project start-up meeting one of the directors in describing the rationale behind the project used words like 'we want to carry out all our production in-house to prevent the headaches of setting up orders externally for no cost savings. Instead we end up with finished goods inventory of over £0.56M, products from overseas which were delivered late (out of season) to us and our customers have had to cancel the orders as a result of a number of problems, including the lateness'. The 'process mapping' of the company's operational activities from goods-in to goods-out revealed a number of problem areas, which was colour coded according to the researcher's perceived degree of contribution to the inefficiencies in coping with business operation pressures. For example:

Text Colour	Hot -Critical (represented critical issues in the operational processes of the company
Text Colour	Warm - Important
Text Colour	Cold - Needs attention

The company, like many in its sector holds high levels of raw material and finished product inventories. The external supply chain structure of the company is comparable to many of its kind in the sector. The manufacturing strategies dominating the operations, was ad hoc, operation decision-makers

had no knowledge of their manufacturing strategies. The manufacturing strategies have been broadly classified under two categories by the authors as; make-to-order and make-to-stock. However, reasons for this combined choice of strategies was not clear, principally they were taken without any resource capacity and availability considerations. As such, the management of materials through the processes had no bearing on the logical flow in the manufacturing facilities layout. Production scheduling was carried out on a FIFO (First In First Out) basis. As orders are received, fabric was cut and sent for production with no prioritisation criteria such as quoted due date, in addition there was limited communication between production and cutting area as to capacity availability, amongst others. As a result there were increase in customer complaints, orders cancellation and loss profits.

Under the former strategy, the companies designs and develops their own products, which they sell to high street fashion retailers with little or no alterations to the original design; targeting different segments of the fashion market. On the odd occasions, specific retailers have configured design styles to fit their brand image in targeting their own markets (e.g. younger consumers or consumers looking for distinctive fashion). In this case the manufacturer is expected to produce samples of the final design of the potential product, before the final buying decision is made by the retailer. Thus, products can easily move up or down the value chain (see figure 2). Under the latter strategy, the company acts as an intermediary - the local contractor between another manufacturer and mail order companies for women's dresses. In this situation company A is not responsible for the design of these dresses, but manages the manufacturing operations on behalf of the manufacturer by using other contractors to produce the orders to the require specification of the product for both volumes and quality. In this role the company liaises with the main manufacturer and the customers.

Processing Mapping

In structuring the case study process mapping exercise the organisation was broken down into the following areas;

- Goods-In
- Raw material storage
- Cutting
- Cut material storage area
- Make-up garments
- Trouser press area
- Trim / Inspect
- Labelling and Packing
- Finished Goods Storage
- Goods-Out/Despatch

The above areas were further broken down and investigated using the following 10 criteria:

- Facilities
- Capacity
- Span of process
- Process
- Human resource
- Safety
- Quality
- Control Policy
- Maintenance
- Other Issues

Results

Table 3: Example of problem areas are highlighted and prioritised using the colour scheme

	Goods in	Cutting area	Cut materials storage
Facilities	Outside space for deliveries but not dedicated for goods in only	*2 cutting tables – one auto but untidy under one table*	Cages are use for materials storage which is not ideal as this all goes up to cramp the production area
Capacity	*Space utilisation*	Spare capacity and owner / Director can be extra staff in this area if necessary	
Process	*Tacit and as and when required*	Linear and very tacit, minimal documents seen or used, only cutting book	
Safety	Cramped area with high stacking of rolls of material	*No gauntlets seen as the cutting / profiling was carried out*	Storage area is the shop floor which ends up cramped, this could be hazardous
Quality		Not an issue	*Poor identification of the cut material, could be better*
Control Policy		Only the cutting book seen as far as documentation is concerned	No documentation seen other than cutting book, order book
Maintenance		*Reactive maintenance policy – as and when required*	

DISCUSSION

Over 98% of employees had no formal training or related education in any aspect of team work, operations and/or business management. Company A's operations are managed solely through tacit knowledge and experience of garments make-up and quality control. As such it was impossible to achieve any consistence, visibility and traceability in the operational processes. There were also no formal planning/scheduling of the production process and activities, the effects of this was evident in the high level of inventories (raw materials, WIP and finished products) in the shop floor. Materials were cut well in advance of the make-up process; this increased the risk of damage and contamination of cut materials(see table 3). Initial findings from the investigation suggested that with limited investment a simple material pull (based on the philosophies of JIT-kanban) system as part of a make-to-order strategy was required. This provided control in the flow of material through the manufacturing process and increased capacity utilisation by 65%.

CONCLUSION

The high complexity of the supply chain and even higher degree of uncertainty and product variety makes the strategic decisions of which operations to manage within the manufacturing processes difficult, particularly for SMEs in this industry. At best it is envisaged that the management of such operations is difficult under these complex conditions with one's own manufacturing facilities (factories). This problem is compounded when contractors and other intermediaries are used in part of the manufacturing process. Research shows that unravelling such operational decisions requires critical examination, risk analysis and mapping of operations 'value stream(s)' and competitive advantage propensity (Brown and Rice 1998). Cooper et al., (2005) suggests that such critical risks examination, distinguishes between responsiveness and cost efficiency, and require a higher human capital to be able to realistically arrive at positions of strategic competitiveness.

The results from the case showed a number of the operational characteristics present in majority of the manufacturing SMEs (Storey, 1994), particularly those SMEs in textile and clothing manufacturing. Typically our industry launch themselves into projects driven by perceived 'lower manufacturing costs' but often fail to take into account 'total cost' and the risks inherent in; longer supply chains and distant sources of supply, different cultures, the need to develop and master one's own operational competences. This in the view of the researchers might have been responsible for large numbers of business failures in

the UK industry (Lumpkin et al., 1985; Lim et al., 2001). Company A has reacted to this challenges in a positive way. It recognised the importance of local skills and knowledge network collaboration in producing fashion items in short lead times by drawing together distinctive combination of capabilities to utilise both tacit and explicit knowledge in developing, planning and operationalising business processes. Particularly those still in traditional manufacturing in today's competitive economies with limited resources to identify areas of value adding to focus management efforts in their domestic operations which can also be configured to manage off-sourcing operations in the future. As such the investigation suggests that company A should not lose sight of the fact that off-shore sourcing can provide a legitimate strategy for competition in certain products, particularly commodity and seasonal products, such as its mens and boy's school trousers respectively. Thus, the success of their production management is dependent on the application and transfer of knowledge and skills – resource capabilities that are culture proof.

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