

the dti

THE DEPARTMENT  
OF TRADE AND INDUSTRY  
SOUTH AFRICA



**DEPARTMENT OF TRADE AND INDUSTRY  
POLICY SUPPORT PROGRAMME**

**IMPLICATIONS OF THE INFORMATION REVOLUTION FOR  
ECONOMIC DEVELOPMENT IN SOUTH AFRICA PROJECT  
CODE: A.1.009**

**D14  
FINAL SECTORAL REPORT –CLOTHING SECTOR  
(ICT DIFFUSION AND APPLICATIONS)**

JUNE 2002

**Submitted by**

**PRINCIPAL RESEARCHER - ECKART NAUMANN**

**Research Coordinators and  
ICT Sector Specialists:**

Philip Esselaar (Project Manager)

Tina James

Jonathan Miller

Graham Sibthorp

---

**DEPARTMENT OF TRADE AND INDUSTRY POLICY SUPPORT PROGRAMME  
PROGRAMME MANAGEMENT UNIT  
BANK FORUM (EAST), 1<sup>ST</sup> FLOOR, CNR. FEHRSEN & BRONKHORST STR, NEW MUCLENEUCK  
- PRETORIA  
P O BOX 12139, HATFIELD, 0028  
Tel: +(27-12) 346-8335 - Fax: (27-12) 346-8350 - E-mail: [wolfedra@iafrica.com](mailto:wolfedra@iafrica.com)**

## Copyright

Copyright of the material contained herein is vested with the DTI. The material may be used on the condition that the source is acknowledged.

## Acknowledgements

The study team would like to acknowledge the support of the European Union in providing the funds for this study and the Department of Trade and Industry (DTI) for initiating the project.

In particular, we would like to acknowledge Alan Hirsch, Chief Director, DTI Information Technology Cluster Team Leader, Pearl Thandrayan of the DTI and Wolfe Braude and his team from the Programme Management Unit of the DTI Policy Support Programme, without whose vision and commitment this study would never have been realised.

During the field work the study team interacted with many people across a range of industries. Their input and comments form the basis of this report, and the willingness of so many individuals to devote considerable time to answering the questionnaire is much appreciated.



Miller Esselaar & Associates

[Esselaar@iafrica.com](mailto:Esselaar@iafrica.com)

[Jonmil@icon.co.za](mailto:Jonmil@icon.co.za)

## Table of Contents

Executive Summary.....	ii
<b>1. Overview: Clothing Manufacturing Sector.....</b>	<b>1</b>
<b>2. Methodology.....</b>	<b>2</b>
2.1 <i>Nature of Questionnaire (Sector Specific Components).....</i>	2
2.2 <i>Interviewees: Selection and Role in Sector .....</i>	3
2.3 <i>Interview Process .....</i>	5
<b>3. Results.....</b>	<b>5</b>
3.1 <i>Nature of the Clothing Sector.....</i>	5
3.2 <i>Characteristics of ICT Use.....</i>	7
3.2.1 <i>Basic Technologies.....</i>	8
3.2.2 <i>Applications.....</i>	9
3.2.3 <i>ICT Spending Patterns .....</i>	12
3.2.4 <i>Sources of ICT Information and Training .....</i>	13
3.2.5 <i>ICT Adoption: Drivers and Barriers .....</i>	15
3.2.6 <i>Diffusion of ICT.....</i>	18
3.2.7 <i>Additional ICT-related Characteristics of the Clothing Industry.....</i>	19
<b>4. Analysis and Interpretation.....</b>	<b>22</b>
4.1 <i>Nature of ICT Diffusion: Usage of Basic Technologies.....</i>	22
4.2 <i>Nature of ICT Diffusion: Applications .....</i>	22
4.3 <i>ICT Spending Patterns .....</i>	23
4.4 <i>Sources of ICT Information and Training .....</i>	24
4.5 <i>Drivers and Barriers to ICT Adoption .....</i>	24
4.6 <i>Extent of ICT Diffusion.....</i>	26
4.7 <i>Status within International Context.....</i>	27
4.8 <i>Expected Trends in Applications and Diffusion .....</i>	27
<b>5. Conclusions and Recommendations.....</b>	<b>28</b>
5.1 <i>What can the Sector do to exploit ICT?.....</i>	28
5.2 <i>What can the ICT Industry do for the Clothing Sector?.....</i>	28
5.3 <i>What can the Government do? .....</i>	29

## Executive Summary

### Background and Motivation for Information and Communication Technology (ICT) Diffusion Project

This report represents part of the second Phase of an eight-sector study, commissioned by the Department of Trade and Industry and funded by the European Union, to examine:

- The likely trajectories for the absorption of ICTs in a range of economic sectors; and
- How to adjust the policies and strategies of the government and the domestic private sector to maximise the benefits to South Africa from the insights flowing out of i).

The project builds on existing research work but has at its heart the analysis of a number of 'vertical markets' for ICT, first through a worldwide scan (Phase I) and then through sectoral research in each of the chosen eight sectors.

The sectors selected were drawn from three broad categories – traditional sectors, service sectors, and new economy sectors, as follows:

#### **Traditional**

- Platinum Mining
- Automotive Manufacturing
- Clothing Manufacturing
- Deciduous Fruit Farming

#### **Service**

- Cultural Tourism
- Healthcare Information Flows

#### **New Economy**

- Biotechnology
- Multimedia

The objectives of the research work were to:

- Generate accurate, objective findings regarding patterns for absorption of ICTs in a range of SA economic sectors, in order to guide South African participants in vertical markets for ICT;
- Provide recommendations for impacting public and private sector policies;
- Guide the government in directing some of its existing and future intervention strategies, including research and development programmes and industrial development facilities, whether through the science vote or departmental programmes; and to
- Give government more guidance regarding the commitment of funds for human resource development.

## Project Research Methodology

The overall approach adopted by the lead consultants was to use Sectoral Experts for the interviewing and primary research, with three ICT coordinators (responsible for up to three sectors each) ensuring consistency across the sectors. An International Consultant was employed to provide an external perspective to the research.

The research methodology for Phase I of this project (The International Scan) involved:

- Defining each of the eight industry sectors;
- Identifying the main players in the value chain; and then
- Performing secondary research on each of the sectors to obtain current data about the diffusion of ICTs into those sectors; and
- Identifying leading-edge applications, as far as possible.

Phase II (Diffusion of ICT in South Africa) involved the use of these sector and value chain definitions to identify the major role players and to set up interviews, based on a structured questionnaire, with selected stakeholders across the value chain.

The questionnaire consisted of both a generic section (i.e. used by all sectors) and a sector-specific section (i.e. aimed only at those interviewees within the sector). Most of the questions relied on the *perception* of the interviewee. A rating scale was typically used, but a number of 'open-ended' questions were included to allow interviewees to express opinions in a less structured way.

The questionnaire was subdivided into six generic sections and one sector-specific section:

- Background Information (Name, Address, Organisation Size, etc.)
- ICT Usage (of Technology and Applications)
- ICT Spending Patterns
- Sources of ICT Information and Training
- ICT Adoption: Drivers and Barriers
- Diffusion of ICT into Organisation/Sector
- A sector-specific section dealing with issues of importance to the particular sector.

Between 40 and 55 interviews were conducted per sector; these should not necessarily be construed as being representative of the sector, as the selection of interviewees was often dependent on personal contact from the sector researcher. Also, the responses from those interviewed undoubtedly contained an emotional bias (for example, the desire not to seem technologically backward), which would have influenced the responses. Hopefully, these biases have been minimised through the averaging process.

## Analysis of the Results

The results from the questionnaires were captured on an Excel spreadsheet and a basic analysis performed centrally. This information was then fed back to the individual sector researchers for further analysis and comment. The generic portion of the questionnaire captured up to 117 separate items of information per respondent (either a rating, a comment or basic data), so that a typical sector analysis involved 5000+ items. These responses were subdivided into various categories (e.g. Large, Medium, Small organisations) as applicable and further iterations performed.

Most of the results were shown graphically for ease of comprehension, although only basic statistical analysis was performed due to the nature of the data.

## **Summary Report on the Clothing Sector**

The Clothing Sector in South Africa has emerged from an era of being heavily protected to one of open competition. This has substantially changed the dynamics of the industry, with significantly increased foreign competition in the domestic market.

However, the clothing industry has also been provided with many new opportunities, especially in the export market.

The South African Clothing Industry is located mainly in Kwazulu Natal and the Western Cape, and is also located to some extent in Gauteng. This study gathered primary data from 50 manufacturing enterprises distributed across those three provinces. Interviewees were asked to respond to questions from a generic cross-sectoral component and a shorter sector-specific component.

The Summary findings from the survey questionnaire are as follows:

## **ICT Usage**

### **Basic Technologies**

The South African clothing manufacturing sector is, on the whole, a medium-intensive user of ICTs. It is characterised by significant variations in the adoption of ICTs, ranging from very low use (mainly basic technologies to run office applications and e-mail) to intensive use (completely integrated systems, high end CAD facilities etc.). There is a general realisation, though, that ICTs will play an increasingly important role, even in a relatively labour-intensive sector such as the clothing industry. (Basic technologies refer to the use of Personal Computers (PCs), Servers, CAD/CAM technologies, LANs/WANs, and Internet connections.) The clothing sector is a relatively intensive user of PCs, servers and local area networks (LANs), and has readily taken to the Internet. Owing to the nature of clothing manufacturing, which is labour intensive and makes heavy use of sewing machines and related technology, the use of these technologies is mostly limited to the administrative functions of organisations. The exception, of course, is a technology such as CAD, which is integrated into the manufacturing process.

Although the use of PCs is relatively high, the uptake of basic technologies is far greater among the large companies, rather than the small and medium-sized enterprises. Because the domestic clothing industry is highly competitive and constantly under threat from low-priced imports, financial constraints are frequently a barrier to investment in ICTs.

### **Applications**

This section focused on ICT-related sources of information, and the usage of ICTs for a wide range of applications and processes.

Accounting, stock control and basic payroll functions are the minimum standard among most clothing manufacturers, including small enterprises. CAD is not (yet) the standard across the entire sector, although many companies have readily embraced automated design and are continuously improving its functionality. The significant costs involved in investing in CAD capabilities, including hardware and relatively expensive software

applications (as well as the skills required to properly utilise CAD), are a major problem for most smaller enterprises.

Most frequently used sources of information, from the perspective of ICTs, were CD-ROMs, e-mail and the Internet. These applications are widely used and dispersed within the clothing industry, and the majority of enterprises (both small and large) feel comfortable with using them. E-mail and the Internet were frequently stated as being an extremely useful business and communication tool.

Advanced applications such as teleconferencing and videoconferencing were hardly used at all due to the high cost of these tools (both hardware and bandwidth), although some scope exists for using these tools in future. This relates largely to the fact that the South African clothing sector is a major importer of foreign-produced fabrics and yarns, and can enhance business dealings and supply chain arrangements by using these tools.

Although a small number of large companies have achieved extensive business process integration through ERP applications, the majority of respondents consider these applications too elaborate for their needs, and / or too expensive.

The use of websites in general is disappointing among South African clothing manufacturers, with only a small number of exceptions. This is an area where the sector definitely lags behind other industries, and substantial improvements are possible with a relatively small financial outlay.

The use of B2C and B2B e-commerce, while not uncommon in the clothing manufacturing industry, is utilised mainly by large companies.

B2C e-commerce is utilised to a relatively low degree (across the sector), which probably relates to the existing supply chain configurations whereby clothing manufacturers mostly deal only with the retail sector. Most of the companies that used B2B extensively were very large manufacturers producing either exclusively for one major retailer chain, or for a small number of national retail chains. In many cases, the use of B2B is driven by the retail sector, which sees it as a pre-condition of doing business efficiently.

## **ICT Spending Patterns**

Companies in the clothing manufacturing industry are unanimous in their opinion that the South African clothing industry as a whole spends significantly less on ICTs than is the perceived norm internationally. However, with regard to perceptions relating to the company's expenditure relative to the norm *in South Africa*, SMEs felt that their total expenditure on ICTs lagged behind the sector average, while large companies (as is expected) perceived their expenditure to be fairly significantly *above* the norm.

This outcome indicates that:

- Large companies are committed to increasing ICT-related expenditure, and appear to be moving towards more 'knowledge intensive' manufacturing;
- SMEs, who typically do not have access to the same financial resources as large companies, appear not to be able to invest significantly in ICT-related matters;
- There may (rightly or wrongly) be a perception among many SMEs that they can "get away with" not prioritising ICTs in their organisation; and
- Economic conditions and a weaker exchange rate (which frequently push up the cost of ICTs) reveal that among the smaller manufacturers, demand for ICTs is particularly sensitive to price increases etc.

## **Sources of ICT Information and Training**

Information and training needs are to a large extent fulfilled by the same sources, namely ICT suppliers, in-house training programs, experts within the company and consultants / service providers. Furthermore, the Internet is a medium that is used very frequently to obtain ICT-related information.

An observation that stands out is the fact that ICT vendors (i.e. suppliers of hardware and software) are most frequently used to fulfill the clothing sector's ICT information and training needs. This is not surprising: ICT vendors are likely to be the first "port" of call when companies consider investing in ICTs.

Universities and Technikons were used infrequently as a source of ICT information and training, as few of these institutions offer formal clothing / textile technology training (with an emphasis on ICTs).

Respondents were not aware of any Government ICT-related training schemes, although a few thought that "it might be available under the Sector Education and Training Authority" (SETA) for the clothing and textile industries. Significant scope therefore exists for these institutions to play a more meaningful role in facilitating (or directly providing) the diffusion of ICT-related information and training.

## **ICT Adoption: Drivers and Barriers**

*External economic factors* provided the industry with both drivers and barriers to ICT adoption. Companies across the sector felt that general economic conditions (within the industry) were not conducive to the adoption of ICTs, although larger companies were a little less negative than SMEs.

Some external economic factors were seen as significant drivers, such as: expected increased competition, both in the short and medium term; and the increased presence of global business opportunities. The latter is seen as a driver by large companies, the majority of whom are presently exporters.

*Supply chain factors* are seen as having a positive influence on ICT adoption, facilitating response to customer requirements and improved communications. Customers (meaning the clothing retail sector) are seen as having a driving influence on large manufacturers, frequently steering them to B2B e-commerce arrangements with a view to improving their own efficiencies and supply chain.

*Internal factors:* Among large companies, respondents felt that senior management was a critical driving force in their organisation's adoption of ICT, more so than any of the other internal factors. Small and medium-sized companies did not, on the whole, display this result, and their response was more muted. In a number of cases, senior management was even seen to be a strong barrier to ICT adoption, although this detail is lost in the overall average. The perceived cost of ICTs is seen as a significant barrier, although as stated earlier, demand for ICTs by large companies is clearly less price-elastic than for the small and medium-sized entities.

## **Diffusion of ICT**

Respondents from small and medium-sized companies feel their companies are lagging behind the sector average in terms of the use of ICTs for product / service innovation, market innovation, administrative process management, relationship and resource management. They rate their companies as the "late majority" in terms of adopting

ICTs. The sample of large companies, on average, see themselves as early adopters of ICTs.

### **Status within International Context**

The economic context in which clothing manufacturers operate in South Africa determines the extent of ICT diffusion. The South African clothing sector appears to lag behind its European and US counterparts with regard to the application of ICTs within its organisational and manufacturing functions. The sector has been undergoing significant changes since the large-scale opening (through the downscaling and removal of restrictive trade tariffs and quotas) of the South African market. This has led to increased domestic competition, especially at the lower end of the market (commodity-type output, such as T-shirts etc.). Many domestic companies have been unable to adapt effectively to this influx; some retreating into their "shell", while others adapting and evolving.

The international context is of particular importance to the South African clothing industry, since (export) opportunities abroad play a critical role in ensuring the long-term survival. The overseas market for lower-end clothing made by South African manufacturers is limited, due to South Africa's relatively high local input and labour costs, especially vis-à-vis competing countries such as China.

A market does exist for higher value-added fashion apparel, both locally and overseas. To be competitive in this market requires innovation and movement up along the value chain. The clothing industry globally is largely buyer-driven, and more and more of the value-adding occurs in the (innovative) design, logistics and branding functions. The uptake and use of ICTs will play an important role in achieving greater competitiveness, through organisational management, design, lead times, production efficiency and knowledge facilitation.

### **Expected Trends in Applications and Diffusion**

The adoption of ICTs is likely to increase across the sector, although the trend towards greater knowledge and technology intensity will also claim its victims. Some firms will continue to operate at the lower end of the market, where the focus is predominantly on factors such as price competitiveness and economies of scale.

The concentrated nature of the domestic clothing retail sector, and its market power, will continue to be an important driver of ICT adoption. As a whole, the clothing sector should benefit from the DTI's Integrated Industrial Strategy, and its support for greater knowledge intensive manufacturing and innovation. Recent trade opportunities brought about by the SA/EU Trade Protocol and AGOA, are providing South African manufacturers with vastly improved access to the EU and US markets. These opportunities are likely to be important drivers to ICT diffusion if communication and bandwidth costs, especially relating to the transfer of data (e.g. electronic sending of designs), become more in line with those of South Africa's competitors.

## Conclusions and Recommendations

### What can the Clothing Sector do to better exploit ICT?

**Raising Levels of ICT Awareness:** Many clothing manufacturers are unaware of some of the potential opportunities of ICTs in clothing manufacturing. By raising levels of awareness, manufacturers may view ICT-related expenditure and investment in a different light. An active role can be played by manufacturers themselves (by informing their peers of direct benefits that they have obtained), as well as by industry organisations such as Clofed (Clothing Federation), MACs (Manufacturer Advisory Centres), etc

**Refocus on Higher Value-Added Production:** Clothing manufacturers are increasingly realising that one of the keys to their sector's long-term sustainability in South Africa is to 'move up' the value chain. Such refocusing could become a natural driver to increase the better uptake and exploitation of ICTs in the sector.

**Feedback to Training Institutions of Needs:** By taking a more pro-active role with regard to communicating their ICT-related needs to other stakeholders (esp. training institutions, industry organisations and the Government), clothing manufacturers will be able to obtain sound advice and assistance on how to better exploit ICTs.

### What can the ICT Industry do for the Clothing Sector?

The ICT industry can play an important and pro-active role in facilitating the use of ICTs by the clothing sector. For clothing manufacturers - and by extension ICT providers - to achieve greater ICT-related benefits, they need to form a closer working relationship than is currently the case.

**Raise Levels of Awareness:** The first, and most important step would be for the ICT industry to raise the levels of awareness regarding the potential benefits of ICT to clothing manufacturers.

**Provide Competitively Priced ICTs:** The high costs associated with ICTs, both from an acquisition, maintenance and training perspective, are the greatest barriers to the higher uptake of ICT. Suppliers of ICT products and services should devise innovative ways of tailoring their products to the need of the industry, and the specific company concerned. Attractive leasing arrangements may help reduce the initial burden and cost associated with transforming business and production processes, and reduces some of the risk for clothing manufacturers.

**Develop Training Modules for Clothing Manufacturers:** ICT suppliers could focus more on the development of clothing sector-specific ICT training options, and thereby remove some of the perceived high cost and inaccessibility of entry-level and middle-level ICTs.

### What can the Government do?

**Devise Special ICT Incentives:** The government can play a major role in facilitating greater ICT usage by devising incentive schemes that financially support ICT-related expenditure where it can be demonstrated that such investment will enhance efficiency and international competitiveness. At present there is no direct ICT-related incentive scheme applicable to the clothing industry.

**DEPARTMENT OF TRADE AND INDUSTRY POLICY SUPPORT PROGRAMME  
PROGRAMME MANAGEMENT UNIT**

---

**Increase the Accessibility of Current and Future Incentive Schemes:** Currently, most Government incentive schemes are not readily available, have cumbersome conditions, and so-called "preferential" loans are hardly preferential. As a result, many industry promotion programs have been under-utilised. Government could offer rebates for certain pre-defined ICTs, for example CAD-related expenses.

**Ensure Lower Communications Charges:** By de-regulating the telecom industry, Government can play a leading role in attracting new market entrants and providers of ICT-related services. This is likely to cause rapid reduction in bandwidth charges, which would facilitate efficient interaction by manufacturers with their suppliers and customers, as well as international counterparts, leading to improved supply chain networks, and therefore more competitively priced outputs.

**ICT- Related Accelerated Tax Write-Offs:** In conjunction with the South African Revenue Services, Government could offer additional ICT-related tax write-offs, for example by treating all ICT-related installations as expenses with a full write-off in the year of their being brought into productive use.

**Training Support:** While Government should leave any ICT-related training in the hands of the private sector, it could offer subsidies to both trainers and manufacturing companies to encourage training. It would also be useful to identify nodes of high industry concentration, with a view to supporting and subsidising ICT-related training schemes. Besides the main centres, important "decentralised" nodes of concentration include Newcastle, Ladysmith, Hammarsdale, Mitchells Plain etc.

**The Clothing SETA:** Respondents were wholly unaware whether the responsible clothing (as well as textile and footwear) sector SETA provided or at least facilitated ICT related training for the clothing sector. If it were publicised, SETA could eventually play an important role in diffusing ICT knowledge and training among the clothing sector.

**Support for Tertiary Education:** Very few tertiary institutions provide ICT-related training for the clothing sector. Government could encourage tertiary institutions to provide Textile and Clothing Technology training as part of their curricula and help with equipment for training.

**Organise " Road-Shows " to Enhance Awareness:** A national, annual "road-show" could be a useful means of raising ICT-related awareness among the clothing sector. With ICT suppliers, Government representatives, productivity consultants, ICT trainers etc. involved, it could become a travelling exhibition and consultation forum.

**Wide Publication of Success Stories:** With the consent of the manufacturers concerned, Government can actively promote any news on "ICT success stories" within the clothing sector. These could also be published on the DTI website, amongst others, and serve as an incentive to further raise ICT awareness in the clothing sector.

## 1. Overview: Clothing Manufacturing Sector

While a brief economic analysis of this sector may not seem directly related to the ICT research focus of this report, it is nonetheless useful and important in that it assists the reader to view the sector in its broader context. A sector's economic situation is likely to have an important bearing on the diffusion of ICT within it, since the economic situation of firms directly influences their purchasing and investment decisions, especially in technology related fields.

Overall, the South African clothing industry has emerged from an era of being heavily protected by subsidies, import tariffs and quotas. As protective trade barriers and supply-side support measures were downscaled, the industry has had to deal with increased competition, especially from imported products. To some extent, this has motivated many firms in the industry to become internationally competitive, while others were no longer able to compete and closed down. New market access opportunities have since opened up in the EU and the US, and are currently an important window of opportunity for the industry.

### Definition

The clothing manufacturing industry consists of all activities directly involved in the manufacture of clothing and related articles. The prevalence of various statistical classifications means that the clothing industry is not uniformly defined. Statistics South Africa (formerly CSS) generally uses the SIC classification system, and aggregates SIC codes 313-315 for many of the clothing industry statistics it publishes (termed "wearing apparel division"). In terms of clothing *trade*, the HS system is commonly used internationally, as well as by the Department of Trade and Industry (DTI) and the South African Revenue Services (SARS). Clothing products are contained in HS Chapters 61 and 62. Although SIC codes 314-315 are commonly used in South Africa to define the clothing manufacturing industry ("wearing apparel"), parts of SIC 315 are (strictly speaking) not typical clothing industry activities (manufacturing activities related to fur). These limitations aside, SIC 313-315 statistics serve as a reasonable indicator of clothing manufacture in South Africa.

A much shorter working definition of the clothing industry is:

**"Activities relating to the transformation of knitted or woven fabrics into garments"**

### Sales Output

The clothing manufacturing industry recorded sales amounting to approximately R10,5 billion in 2001, which is a slight decline in real terms from the previous years.

### Locational Dimensions of the South African Clothing Industry

The South African clothing industry is located mainly in three provinces: the Western Cape, Kwazulu Natal and Gauteng. The distribution of clothing companies is fairly even between these three provinces, accounting for over 90% of South Africa's clothing production capacity. There is a noticeable trend in the industry towards de-localisation. In other words, there is significant movement away from the main centres towards outlying areas, largely in search of a competitively priced and more flexible supply of labour.

This observation is true mostly at the lower end of the market, i.e. among producers of commodity type clothing, who are most vulnerable to imported products. A further

trend that has characterised the clothing industry is the large-scale establishment of, and outsourcing to Cut-Make-and-Trim (CMT) clothing manufacturers.

In many of these cases, the original firm continues to specialise in the design and marketing of the garment, while the production side is completed by CMT contractors. This trend is particularly prevalent in the Western Cape and Kwazulu-Natal.

### **Clothing Trade**

According to HS 62+63 trade statistics, which refer to 'knitted' and 'woven' clothing (SARS / DTI), total clothing trade is on the increase. During 2000, total clothing trade (exports + imports) amounted to almost R2.8 billion, while during 1999 total trade was R2.1 billion. The South African industry is a net exporter of clothing, with exports during 2000 amounting to R1.45 billion, and imports to R1.34 billion. The gap between exports and imports (i.e. the trade balance) appears to be on the increase, indicating that South African clothing manufacturers are increasingly penetrating the export market.

South Africa is party to various international and regional trade agreements, some of which are having a direct impact on the domestic clothing sector. These include the Free Trade Agreements (FTA) with the EU, and more recently, the trade arrangement stemming from the US Africa Growth and Opportunity Act (AGOA). The AGOA provides qualifying Sub-Saharan countries, including South Africa, with duty free access to the US market - including articles of clothing. This preferential market access granted to the South African clothing industry is considered by many to be the most important opportunity ever presented to it, notwithstanding the fact that the Agreement has some stringent conditions attached to it. Since the Act's implementation, exports of clothing articles to the US have increased significantly, and are bound to continue to do so if South African manufacturers meet the challenge of high and consistent quality of output and price competitiveness demanded by the export market.

### **Clothing Employment**

The level of formal employment in the clothing industry currently stands at approximately 135.000. While formal employment appears to have remained relatively stable, there is anecdotal evidence that "informal" clothing employment has increased significantly in recent years. Factory downscaling has often led to the establishment of small (and often 'un-registered') enterprises, as mentioned above. It is thus likely that employment in the South African clothing industry has, in fact, increased.

## **2. Methodology**

### **2.1 Nature of Questionnaire (Sector Specific Components)**

Primary data was gathered from 50 manufacturing enterprises through a structured generic questionnaire, consisting in the main of the generic cross-sectoral component and a shorter, sector-specific component. The generic section dealt with aspects relating to ICT usage, ICT spending patterns, sources of information and training, drivers and barriers to ICT adoption, amongst others. The clothing sector specific section expanded on the strict ICT focus of the generic component, by investigating some of the application and usefulness of ICT in the company's production and trade environment.

Specifically, the sector-specific questions dealt with the following issues:

- The use of ICT in building supply chain / trade linkages with *foreign* textile and other input suppliers. This investigates to what extent manufacturers are increasingly using ICT applications such as e-mail, the internet, B2B e-commerce etc. in not only forging, but also maintaining and streamlining trade links with foreign business partners.
- Whether the company exports part of its output. This sheds some light on the orientation of the company towards the increasingly important external market opportunities, and can perhaps also be seen as an indicator of the company's competitiveness. Information was also gathered on the current or intended export markets (by region: US, EU, Far East, SADC, Other).
- Whether recent trade agreements (notably with the EU and the US) have increased the need to use ICTs in penetrating these export markets. In other words, are potential export market opportunities a driver of ICT absorption?
- Whether the application of ICT has directly assisted the company in researching, analysing and following up on export market opportunities.
- Whether the application of ICT has directly assisted companies in making their output more price- and quality competitive in the domestic, regional and international market. In a similar vein, questions were posed as to whether the application of ICT has assisted the company in effecting product changes in terms of a number of production criteria. These include input material efficiency (i.e. lower input wastage), production efficiency (lower percentage of rejects), the output mix (i.e. producing according to market trends) and product design (i.e. using design software etc.).
- Whether, in the opinion of the interviewee, ICT has assisted the company in moving "up the value chain" (i.e. due to greater knowledge, technology, design intensity).
- Whether the company feels that ICT has made it more competitive vis-à-vis its direct competitors and the sector as a whole.
- Whether the company's clients, specifically the retail sector, have exerted significant pressure on the company to increase the application of ICT (for example for B2B purposes).
- Also, companies were asked what, in their view, the most significant impacts of ICT had been on their organisation, and the sector as a whole.

## **2.2 Interviewees: Selection and Role in Sector**

Due to the locational characteristics of the South African clothing sector, clothing companies were chosen in the Western Cape, Kwazulu Natal and Gauteng. Out of the 50 respondents, the largest proportion was made up of Kwazulu Natal based companies, followed by the Western Cape and Gauteng.

Interviewees were chosen based on various factors. A large proportion was contacted based on their details appearing in the South African Clothing Federation (CLOFED) annual clothing industry handbook, and thus their membership of CLOFED. The rest were selected either through their being known to the interviewer, or their details appearing in the local Yellow Pages. While the core focus of the interviewee selection was on the clothing manufacturing industry, a small number of interviewees were also drawn out of the textile manufacturing and clothing retail sector. Most companies were full package clothing manufacturers, although a small number consisted of Cut Make and Trim companies (CMTs) and design houses (which in turn subcontract the production function to CMTs).

**DEPARTMENT OF TRADE AND INDUSTRY POLICY SUPPORT PROGRAMME  
PROGRAMME MANAGEMENT UNIT**

---

In many cases, interviewees were somewhat constrained by time. In other cases, the direct opposite appeared to be the case, with interviewees happily volunteering information, and even taking the interviewer on a tour of the premises. South African clothing manufacturers, as is probably the case worldwide, appear to be fearful of losing their competitive edge, and as a result are often hesitant to provide information that *they* may *perceive* to be of a sensitive nature (which in many cases includes ICT-related information). Of course, there are notable exceptions. In order to be granted the time for an interview with a senior company representative (ICT-related), interviewee firms were assured absolute confidentiality.

## **2.3 Interview Process**

Most interviews were conducted in a personal one-on-one manner, where the interviewer, following prior telephonic approaches, met with the company representative. The interviewer, in the presence of the interviewee, filled in the answers. As such, this process formed the basis of the empirical data-gathering phase. A small number of interviews were conducted via fax and phone. In most of these cases, the interview was conducted over the phone while the interviewee had the questionnaire in front of her, filling in the answers. These were then faxed back to the interviewer.

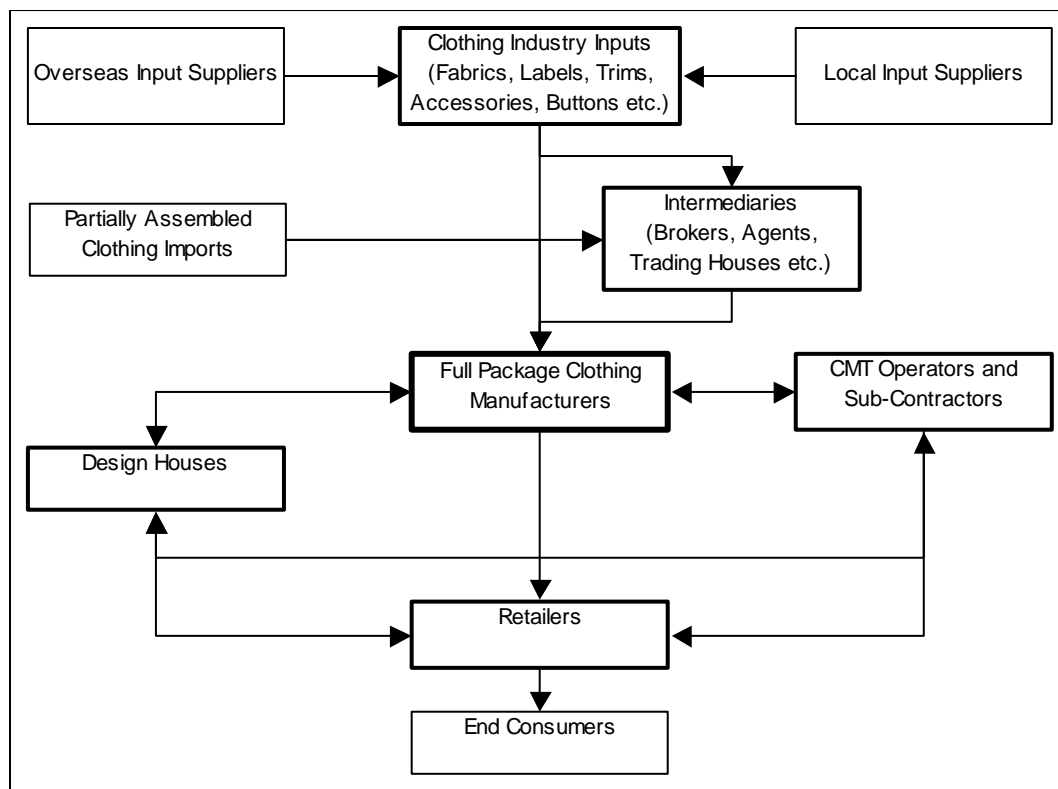
Since the clothing industry is, by its very nature, not an intensive user of ICTs, some ICT-related terminology in the structured survey instrument was at times not clearly understood by some interviewees. This was mostly the case in the smaller companies, especially those that were relatively low users of ICTs and did not have a specialist ICT function in their organisation. A further observation relates to the overstating of answers. Respondents sometimes created the impression that low ICT 'absorption' could be construed by outsiders as being a weakness, and may as a result reflect negatively on the interviewee and the company. The inherently subjective nature of the answers provided was sometimes highlighted, with different respondents adjudging similar situations differently.

## **3. Results**

### **3.1 Nature of the Clothing Sector**

For the purposes of this study, the primary focus was on the clothing manufacturing sector in South Africa. This implies that the core interviewee group were made up of "complete" clothing manufacturers, referred to here as "full package clothing manufacturers". Such clothing manufacturers usually have in-house design capabilities, source fibres and yarns locally or from abroad, and manufacture the complete garment. In some cases, they may also sub-contract part of the production function to outside contractors, mostly consisting of independent Cut-Make-Trim (CMT) operators. A number of CMTs formed part of the interviewee sample.

**DEPARTMENT OF TRADE AND INDUSTRY POLICY SUPPORT PROGRAMME  
PROGRAMME MANAGEMENT UNIT**



**Figure 1: Simplified Overview of the Clothing Industry**

The South African clothing industry is dominated by small and medium sized enterprises, i.e. those employing less than 250 employees. However, the chances of obtaining an "appointment" to conduct the survey generally increase with company size. For the purposes of this research, a greater number of "large" firms were captured than "small / medium"-sized firms. The size distribution of interviewees is shown in the following table.

**Table 1: Size Distribution of Companies Interviewed**

	Micro	Small	Medium	Large
No of Employees	1-9	10-99	100-249	>250
No of Companies Interviewed	1	10	11	28

The focus of this survey is on "full package clothing manufacturers", i.e. those manufacturers that source the fabrics, design and manufacture the garment. However, acknowledging the interlinked nature and organisational characteristics of the clothing manufacturing sector, the sample boundary was slightly extended by including some coverage of the CMT component, and to a lesser extent also capturing responses from "design houses", the clothing retail sector and the textile industry.

**DEPARTMENT OF TRADE AND INDUSTRY POLICY SUPPORT PROGRAMME  
PROGRAMME MANAGEMENT UNIT**

**Table 2: Distribution by Sub-sector**

	Western Cape	Kwazulu-Natal	Gauteng
"Full Package" Clothing Manufacturers	16	13	11
CMTs		4	2
Retail Sector		1	
Design House		1	
Manufacturers of Input Materials (Textiles)		2	

In South Africa, the majority of clothing manufacturers are locally owned and managed, rather than being part of a multi-national group of companies. Recently, there have been a number of foreign (clothing) investments in the country, mostly in Kwazulu Natal. These are predominantly driven by the (US) market opportunities offered under the AGOA. A small number of companies are currently listed on the Johannesburg Stock Exchange (in the Clothing and Textiles Division). These include notable names such as *Seardel, Pals, Ninian and Lester, Goldina, Adonis* etc. Some of these (or their subsidiary companies) were included during the interview process.

While mostly not being part of multi-national companies, there is nonetheless a significant connection between some of the local clothing manufacturers, and their foreign "counterparts". This connection is due to the fact that various international branded products are manufactured locally under licensing agreements. These include household names such as 'Jockey', 'Speedy', 'Bear', 'Christian Dior', 'Polo', 'Carducci', 'YSL' etc.

### 3.2 Characteristics of ICT Use

A substantial part of the survey dealt with basic hardware and communications technologies, and applications thereof. The Likert-type survey, used throughout the survey for the non-qualitative components, graded answers from a score of "0" to "5". "0" referred to "not needed / don't know", "1" implied "no use at all", while the highest score possible, "5", referred to "fully utilised".

The section on "ICT Spending Patterns" applied a similar scale, ranging from "0" to "5", where "0" referred to "much less than the norm" and "5" to "much more than the norm".

"Sources of ICT Information and Training" used a scale of "1" to "3", where "1" referred to "sources least used or not at all", while "3" described "sources most used".

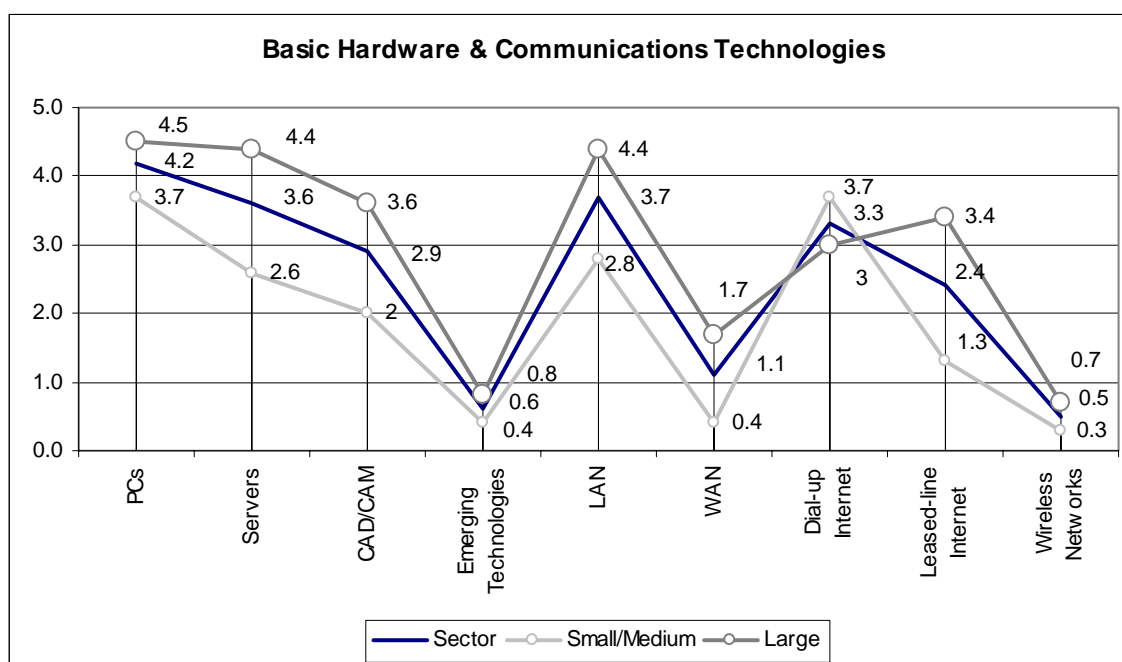
Similarly, "ICT Adoption: Drivers and Barriers" used a scale of "1" to "5", with "1" referring to "strong negative influences / a barrier" and the opposite end of the scale, "5", implying "strong positive influence - a driver".

The "Diffusion of ICT into Your Organisation" section also used a scale of "1" to "5". In this case, "1" refers to the "innovators" and "first few percent to adopt ICT", "2" to the "early majority" and "next 10-15% to adopt ICT" and so forth. "5" referred to the "laggards", in other words, the "last few percent to adopt an ICT innovation".

### 3.2.1 Basic Technologies

The survey instrument initially focused on the use of "basic technologies", including ICT hardware and communications infrastructure.

The use of computers ("PC's") achieved the highest overall score, indicating that this technology is readily used. The average score across all companies was 4.2, which reflects a high uptake of PC's in general. Within the sector, large companies were the most intensive users of PCs. The usage of PCs clearly indicates that this relatively labour intensive sector has embraced computer technology to a significant degree, even if the application thereof (as will be shown later) is in some cases 'merely' limited to straightforward office applications and e-mail. The number of PC's in use ranged from 1 to approximately 2000 in the sample of 50 companies.



**Figure 2. Basic Hardware and Communications Technologies**

A large number of companies - essentially all with more than just a handful of PC's - made use of server technology, with this category achieving a high score of 4.4 among large company respondents. Small and medium-sized companies lagged behind, with significantly lower use of this technology (score 2.6). The trend was similar for **CAD/CAM** technologies, which in most instances were fully embraced only by the larger companies. Those companies that were using CAD technology indicated that they had achieved significant improvements in production efficiency, with lower material wastage and easy scalability of patterns. The variance in this category's results clearly showed that this type of technology is critical in increasing competitiveness and turnaround times, yet economically still unaffordable for many of the smaller companies. The greatest intra-company variances were among the medium-sized enterprises, where some were clearly operating in the high value-added fashion niche markets, while others (especially CMTs, by their very nature) were pre-dominantly in the more commodity-type apparel market.

**Emerging technologies** (including robotics, geo-spatial technologies) were not utilised by any of the respondent companies, with answers being either "not needed" or "no use at all". This outcome was to be expected considering the nature of the industry.

Most companies made use of a **Local Area Network** (LAN), although **Wide Area Networks / Virtual Private Networks** (VPN) were on the whole not required. A high rating was, however, achieved with regard to the use of **dial-up Internet** connectivity, being one of the only cases where small and medium players, on the whole, recorded higher use than large companies. This is, however, due to the fact that large companies had in many cases substituted their dial-up Internet connectivity for **leased line** connectivity. Of all the companies surveyed, only one claimed that it had no use for e-mail.

### **3.2.2 Applications**

Applications cover a very wide range in the ICT survey, including "Information Acquisition and Communications", "Streamlining Business processes" and "Transforming Business Processes".

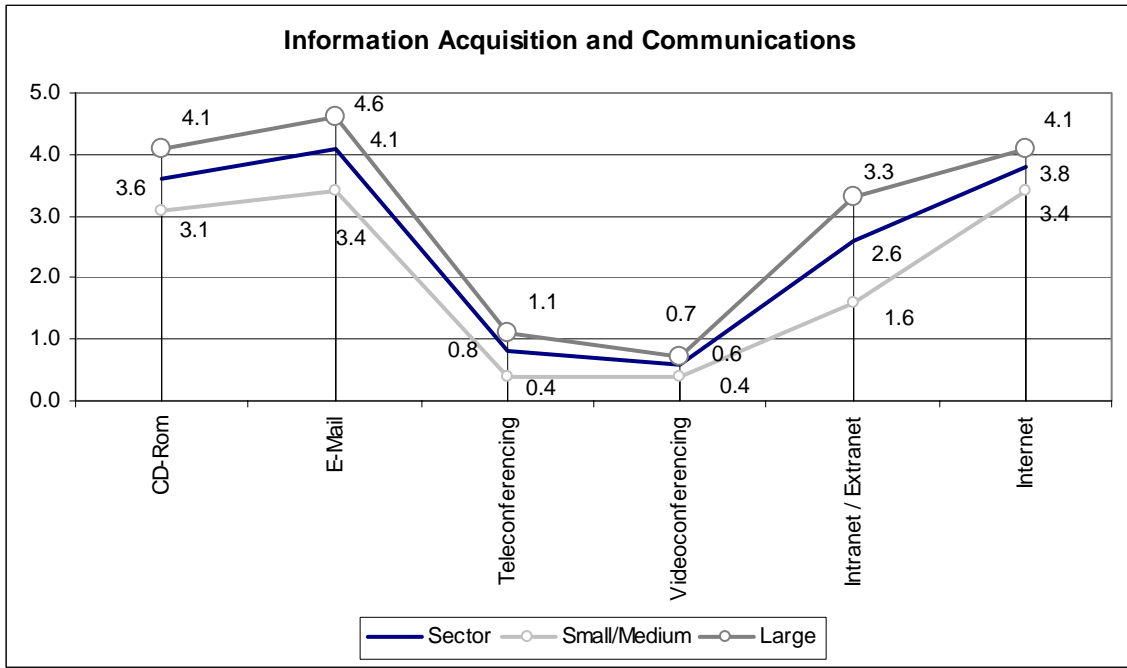
The first of these sections focuses on the applications used to *source* information, and include CD-Rom sources, e-mail, teleconferencing, videoconferencing, intranets/extranets and the Internet.

As can be seen below, **e-mail** is the preferred and dominant ICT-related application used for the acquisition of information. This can probably be explained by its ease of use, and related back to the generally high presence of at least some PC's in clothing manufacturers. E-mail has, in many industries, become the *de-facto* standard for communication purposes, and besides its obvious advantages, appears to be "rubbing off" on the clothing manufacturers. While the industry is, on a whole, certainly not high-tech, there are a number of clothing manufacturers in South Africa that have certainly embraced world-class ICTs, and utilise these to a full extent.

**CD-ROM** is another medium that is readily embraced by the clothing industry as a means of obtaining information. The Internet is widely used by most companies (average 3,8). Small and medium-sized companies generally do not use Intranets/extranets, although there is significant uptake among the large players. Virtually no use is made of **video- and teleconferencing technologies** for communication purposes. This is probably due to the relatively high cost of these technologies and bandwidth, and the fact that very few local clothing manufacturers are part of an international group of companies (in which case a greater need for such technology may exist).

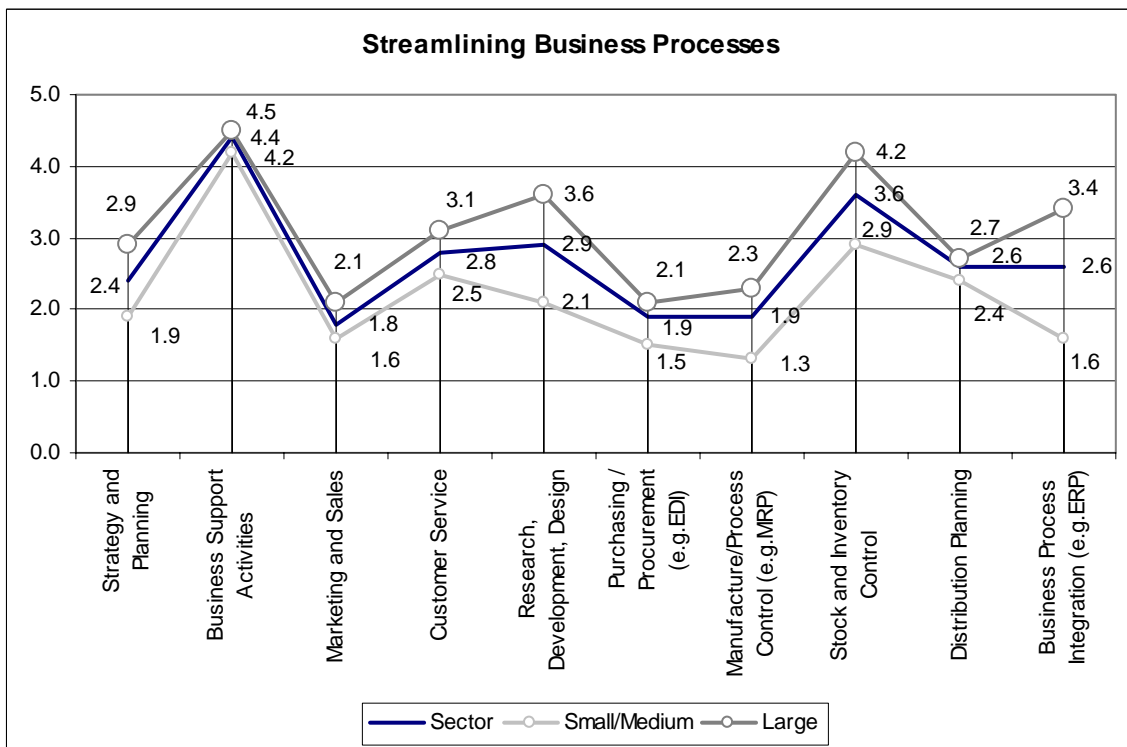
With regard to the streamlining of business processes, ICT usage is fairly developed, although significant variances exist particularly between small-sized enterprises (i.e. less than 100 employees) on the one end, and large enterprises on the other. This is to be expected, especially in a relatively labour-intensive sector such as the clothing industry. Relatively extensive use was made of ICTs especially for **business support activities** such as accounting, personnel management and payroll activities. This was true especially for medium and large enterprises, although even the smaller players utilised ICTs for this purpose relatively extensively. The easy access to and obvious benefits of ICTs for this purpose are drivers of the high uptake in this regard. **Stock and inventory control** also featured as one of the applications that was substantially used by the clothing sector. In one example, one company even linked its entire warehousing system ("goods receiving") via an infrared link to its main system, since the warehouse is across the road from the rest of its premises.

**DEPARTMENT OF TRADE AND INDUSTRY POLICY SUPPORT PROGRAMME  
PROGRAMME MANAGEMENT UNIT**



**Figure 3. Information Acquisition and Communications**

The **marketing and sales** function made little use of ICTs in general, and electronic promotional activities were largely confined to printed media. It is probable that since most manufacturers deal almost exclusively with the retail sector, rather than the public at large, there is relatively little need for such ICT-related application.



**Figure 4. Streamlining Business Processes**

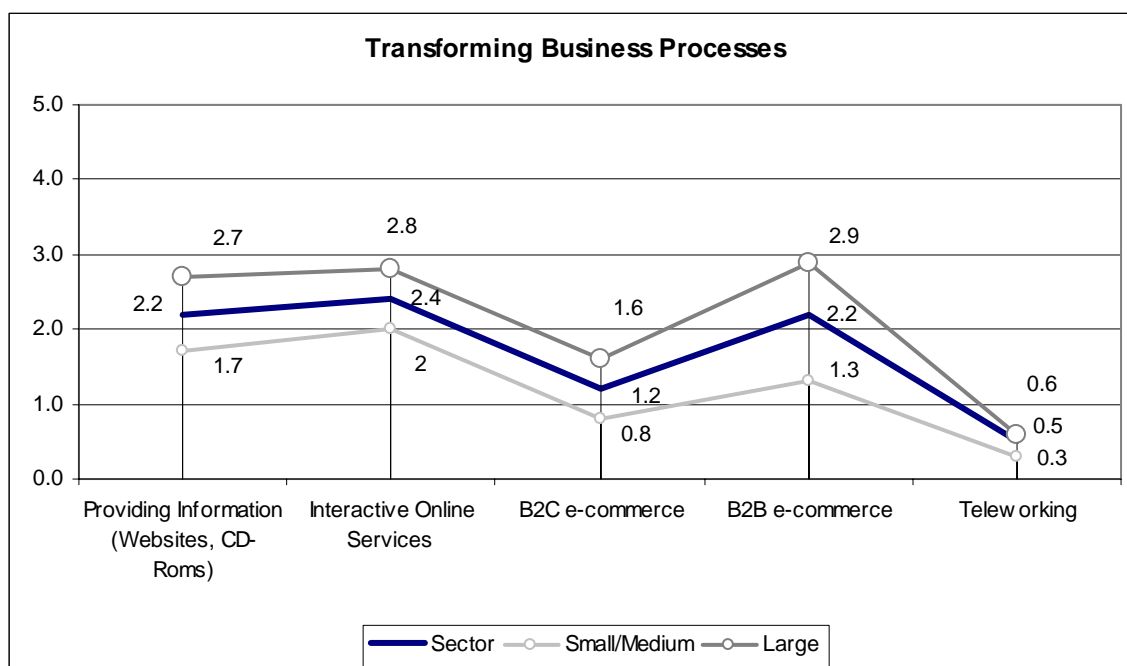
**Business Process / Systems Integration**, such as Enterprise Resource Planning (ERP), showed substantial variance in its use. Out of a sample size of 50 companies, 12 used ERP to a noteworthy extent, although almost all of these fell into the "large company" category. In other words, the uptake of ERP was found to positively correlate with the company's size in terms of employees (and by probable extension, turnover). Although the sector-average score for this category is 2,6, large companies recorded an average of 3,4, while small and medium companies had a score of "only" 1,6.

The last category within the "Applications" section of the survey instrument dealt with the use of ICTs for "**Transforming Business Processes**". In other words, this category measured the extent to which the clothing manufacturing industry applies ICTs in changing the way it does business. This could, for example, be through a greater reliance on the Internet in providing information via websites, or by utilising an ICT platform for business to consumer (B2C) or business-to-business (B2B) electronic commerce.

Once again, significant variance can be seen in the behaviour of small and large firms, and the application and uptake of the abovementioned technologies was mostly restricted to the larger operators.

The **provision of information**, for example via websites or CD ROMs, was utilised by a relatively small number of companies, but not extensively. In most cases, the information provided on websites was rather superficial, and presented a mere initial foray into online media provided by the Internet.

**B2C e-commerce** had little uptake in the sample analysed, being confined to a small number of manufacturers. Due to existing supply channels with the retail sector, manufacturers are unlikely to pursue this option much since it could seriously compromise their relationship with retailers. Of meaning was the fact that **B2B e-commerce** appeared to be largely driven by the retail sector (see Section on clothing-sector specific questions). A number of large companies made use of B2B, and allowed their main retail clients to link into their system. The uptake of B2B among small and medium-sized firms was low. The implementation of such systems, although the responsibility of the manufacturers concerned, often followed pressure from the retailers, which required such facilities to streamline their own systems and supply chains.



**Figure 5. Transforming Business Processes**

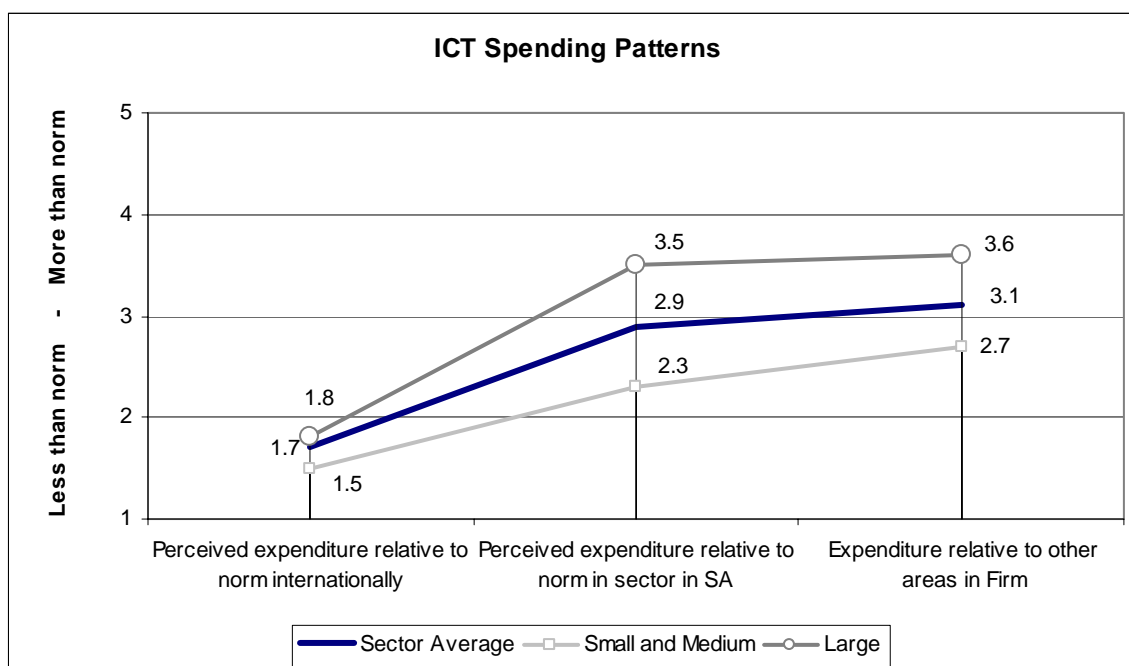
### 3.2.3 ICT Spending Patterns

This section sought to obtain an indication on the clothing industry's spending patterns. Due to the sensitive nature of actual financial values, and the related difficulty of obtaining such information from respondents (who in most cases would not have this information readily available anyway), this section effectively measures perceptions. It asks respondents to provide an indication of:

- The clothing sector's ICT expenditure in South Africa, relative to the norm in this sector globally,
- The respondent organisation's ICT expenditure relative to the (perceived) norm in South Africa, and
- How the respondent organisation's budget for ICT is growing relative to other areas in the respondent's firm.

The results show that, relative to the norm in the clothing sector globally, ICT expenditure in the South African clothing industry has been growing less than the (perceived) norm internationally. This clearly illustrates that there is still a widespread *perception* that ICT-related expenditure is accelerating at a greater rate internationally than it is in South Africa, and that the domestic industry is lagging behind. The results also show that there appears to be little difference in the perceptions of large and small/medium companies, although the latter do hold a slightly less positive view than the large companies.

The second criterion measured the expenditure of the respondent company relative to the perceived norm of the sector in South Africa. Here the responses varied significantly, and significantly different results were achieved by the small/medium sized companies (2.3) versus the large players [3.5]. Small and medium-sized firms appear to be spending significantly *less* than the perceived sector average, while large firms spent more.



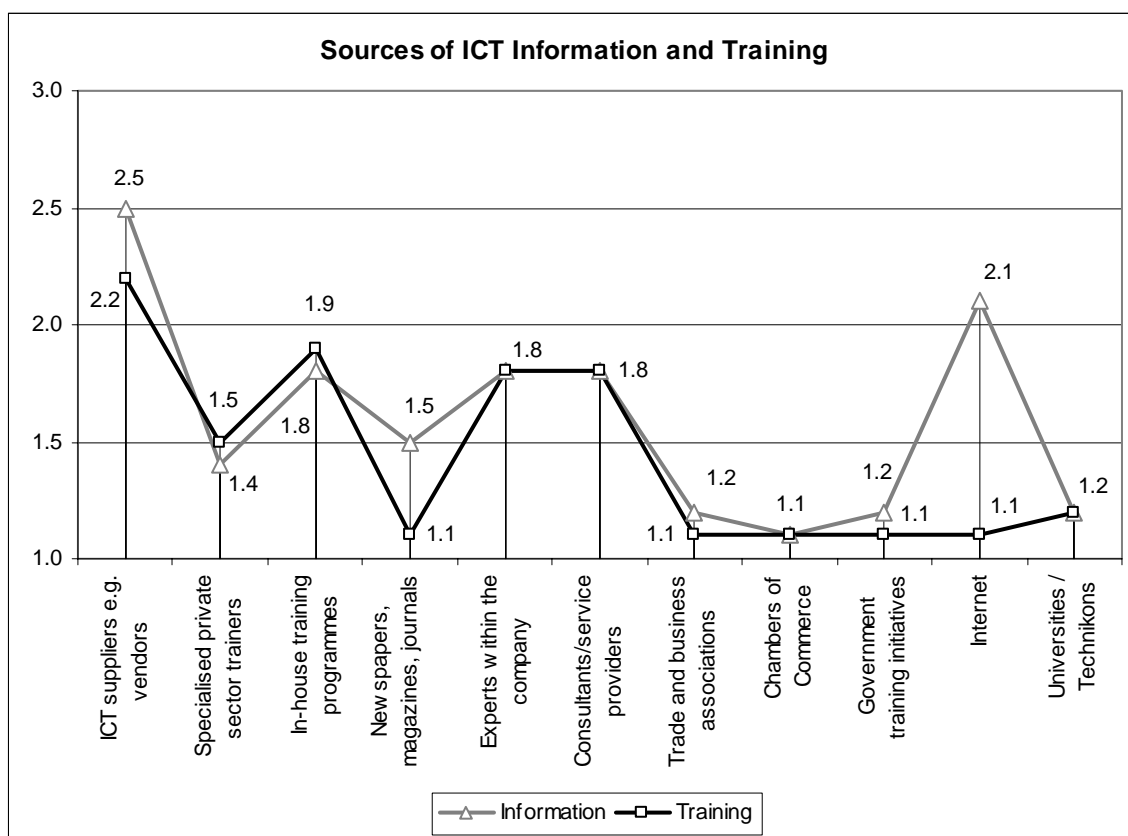
**Figure 6. ICT Spending Patterns**

With regard to how respondents felt that their budget for ICT-related expenditure was growing relative to other areas within their organisation, the general feeling was that the ICT budget was growing marginally faster than budget for other areas [3.1]. Once again, the intra-sectoral variance was fairly significant, with the ICT-budget in large firms growing at a greater rate than that of other areas of the organisation [3.6], while the converse was true for the small/medium-sized enterprises [2,7]. This is probably an indication of the fact that the smaller players in particular appear to be facing challenging trading conditions, and that other more basic needs in the organisation must be fulfilled first. In many cases, the benefits of ICT-related expenditure may not be apparent to the companies concerned.

### 3.2.4 Sources of ICT Information and Training

This section identifies a number of possible sources that companies can utilise in obtaining ICT-related information, and ICT-related training. Respondents were asked to indicate whether they make little or no use of a particular source (1), medium use i.e. "use sometimes" (2), or use a source most as a means to obtaining the necessary ICT-related information and training.

As would be expected, there is a strong positive correlation between the sources used for ICT-related information and training. For example, the sale of ICT hardware and equipment by vendors is in many cases attached to a training contract, especially with the more advanced systems and software.



**Figure 7. Sources of Information and Training**

The sources most often used for **ICT-related information** are ICT suppliers (e.g. vendors of hardware and software) and the Internet. In-house training programs, experts within the company, outside consultants and service providers were sometimes used. Least used were specialist private sector trainers, trade and business organisations, chambers of commerce, government training initiatives and universities / Technikons. *Notable is the fact that industry trade associations, chambers of commerce and government training initiatives ranked so low. This could send a clear signal out to these institutions that significant upward potential may exist in taking up the role of ICT-related information diffusion. A more pro-active role from these institutions, for the benefit of the clothing industry as a whole, may even be called for.*

**ICT-related training** used by clothing manufacturers is most frequently conducted or facilitated by suppliers of ICTs (i.e. the vendors of hardware and software referred to above). As such, the situation is similar to the source most frequented for the provision of ICT-related information. As mentioned previously, this correlation may be explained by the fact that vendors often not only provide tangible products such as hardware and software, but also frequently package a service contract (comprising of training and information / support) with such items. As a result, ICT suppliers become the first "port of call" to many South African clothing manufacturers.

Besides expressing a preference for ICT suppliers, clothing manufacturers make frequent use of in-house training programs, experts within the company and consultants / service providers to fulfil their ICT-related training needs. Specialised private sector trainers were not used that extensively [1,4], although this category showed much intra-sectoral variance between large and small companies. Large enterprises, in particular

those with advanced CAD capabilities and where the uses of ICT applications for systems integration (e.g. ERP) and B2B e-commerce are high, frequently use specialised private sector trainers for their training needs. In some of these cases, it appeared that the ICT suppliers alone were not sufficient for the company's requirements.

Trade and business associations, chambers of commerce and government training initiatives were sourced least for ICT-related training. This closely matches the results of ICT-related information sources, and once again, may call for the greater involvement of these institutions in the provision of ICT training.

### **3.2.5 ICT Adoption: Drivers and Barriers**

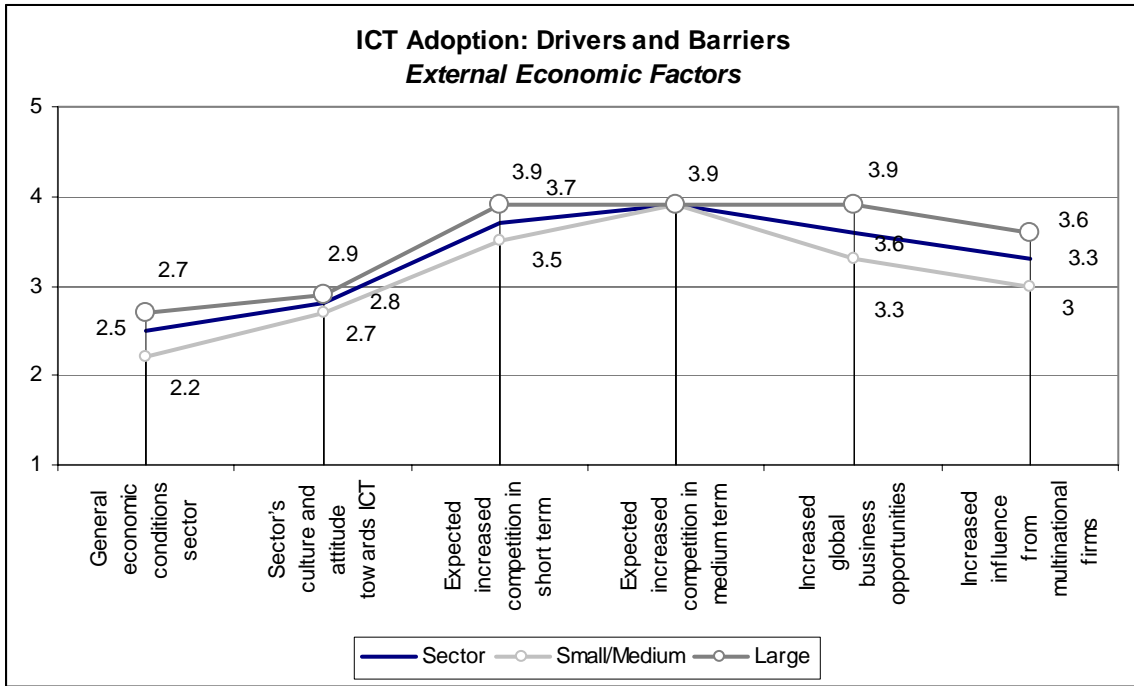
There are many internal and external factors that have a direct or indirect influence on an organisation's decision to invest in ICTs. These factors can range from the external economic environment that a company and sector operates in, upstream supply chain factors, as well as internal factors relating to (management and personnel) attitudes towards ICT, and skill levels within the organisation.

Possible answers in this section ranged from (1) where a factor has a strong negative influence ("barrier") on the adoption of ICT by the organisation, (3) which implied no particular influence, to (5) which implied that a factor had a strong positive influence ("driver").

With regard to the **external economic factors**, it was found that the general economic conditions in the clothing sector were the only factor that, on an aggregate level, was found to be a negative influence on a company's adoption of ICTs. Answers to the sector's culture and attitude towards ICTs ranged in scope, but gave an overall answer of [2,8], implying that on an aggregate level, the sector's culture towards ICT appeared to be a slight negative influence on a company's adoption of ICT.

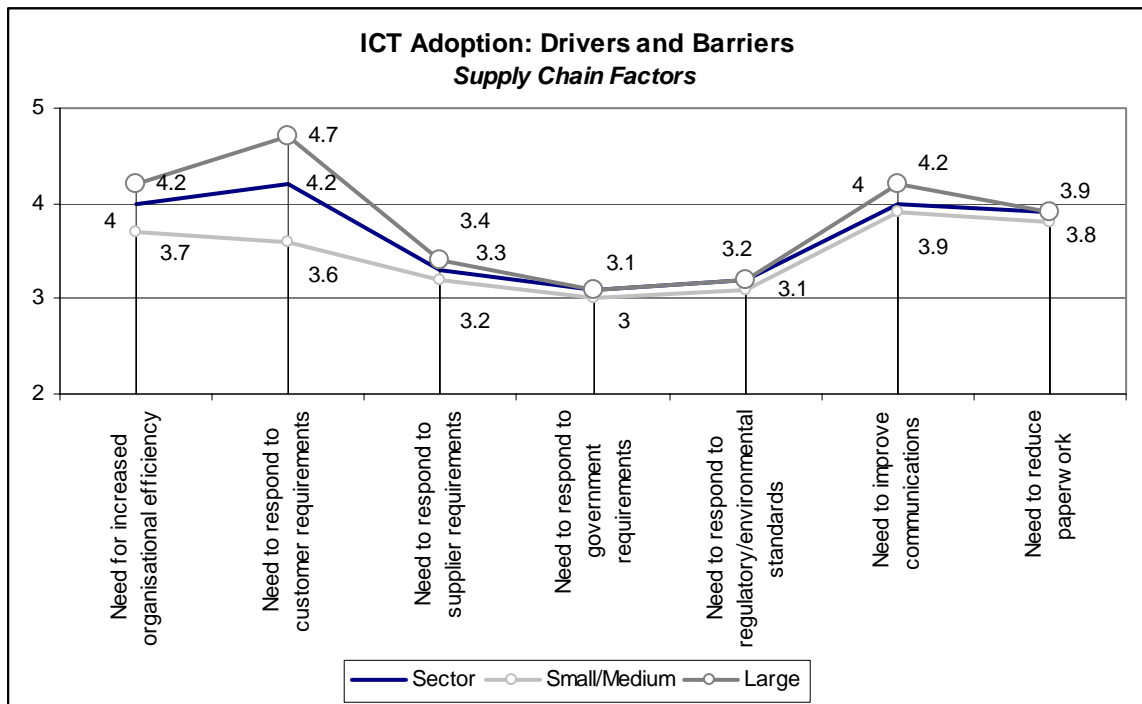
Factors such as the expected increase in competition (especially in the long term), as well as increased global business opportunities, were seen as having a positive influence, with aggregate scores ranging from [3,5] to [3,9]. Once again, large companies identified expected increases in competition as much more of a driver of ICTs than small and medium-sized companies did. This is consistent with general market trends in the clothing industry, as well as increasing global business opportunities provided by a variety of trade agreements, such as with the EU (SA/EU Trade protocol) and the US (through the Africa Growth and Opportunity Act).

**DEPARTMENT OF TRADE AND INDUSTRY POLICY SUPPORT PROGRAMME  
PROGRAMME MANAGEMENT UNIT**



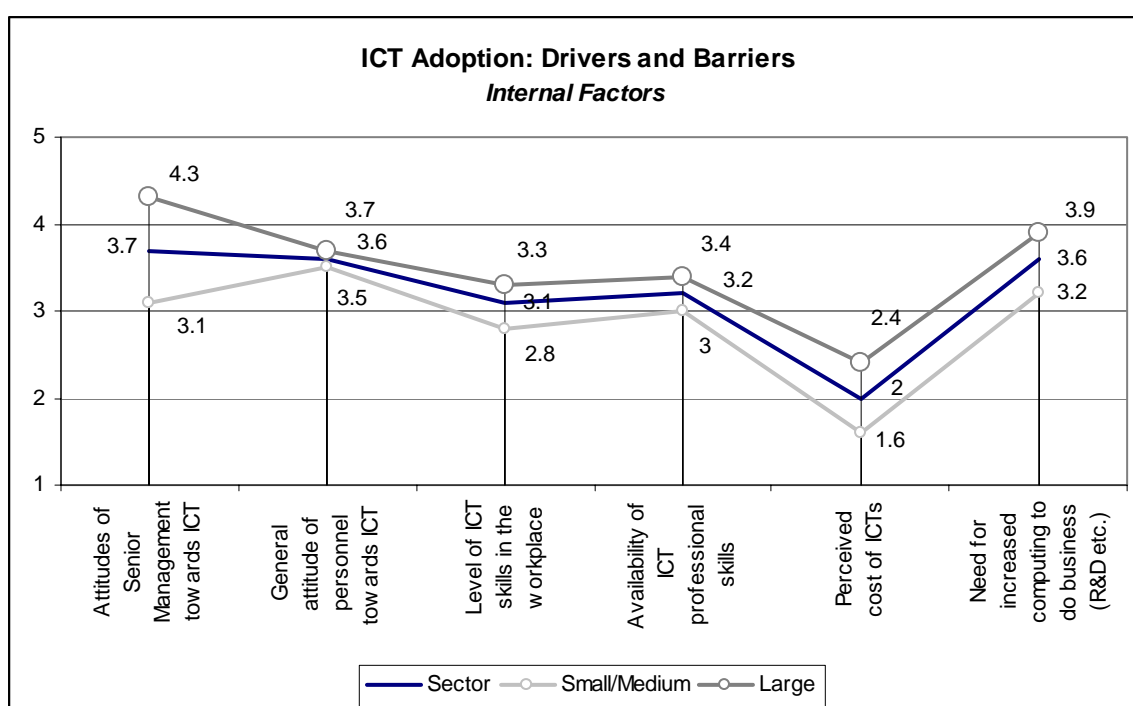
**Figure 8. ICT Adoption: Drivers and Barriers- External Economic Factors**

The results indicate that the clothing industry realises that ICTs may be an important component not only for improving production efficiency and competitiveness, but also that ICTs may in fact be an integral component of doing business globally. Since the sample of companies analysed included both large and small players, significant intra-sectoral variance was once again noted, with the larger companies generally attributing higher scores (i.e. stronger positive influence on the adoption of ICTs) to these external economic factors.



**Figure 9. ICT Adoption Drivers and Barriers – Supply Chain Factors**

The **supply chain factors** (see figure below) were seen as strong drivers of ICT adoption, more so than the *external* economic factors. It is indeed noteworthy that clothing manufacturers attributed the highest score in this section to the "need to respond to customer requirements", which once again highlights the important role that the retail sector plays as a driver for ICT adoption. This observation was particularly true for large manufacturers. Since very few manufacturers sell to end-consumers, "customers" generally refers to clothing retail firms. The need for increased organisational efficiency, improved communications and the reduction of paperwork were also positive influences, a result with relatively little intra-sectoral variance. The need to respond to government requirements and international regulatory and environmental standards were seen as having no particular influence on clothing manufacturers (at least not with regards to the adoption of ICTs).



**Figure 10. ICT Adoption Drivers and Barriers – Internal Factors**

The **internal factors** focus on senior management (i.e. having a direct influence on ICT-related expenditure) and employees in general, the availability of ICT professional skills and the perceived cost of ICTs. The "internal" elements within an organisation have a very large influence on the adoption of ICTs by an organisation, as the final decision on ICT-related investments and expenditure usually lie with senior management. In other words, while the external economic factors are important drivers (and barriers) of ICT adoption in the clothing industry, it is the internal factors that have an important bearing on firm-level responses to such factors. For example, where general economic conditions (an external economic factor) are a barrier to the adoption to ICTs, but management has a forward-looking approach with an intention to vastly improve competitiveness, it may nonetheless readily adopt ICTs. On the other hand, the survey sampled a number of companies where the attitude (and in some cases ignorance) of senior management was clearly a strong negative influence on the adoption of ICTs, notwithstanding the fact that future competition and customer requirements may have indicated the need for the opposite.

Senior managements' attitudes towards ICTs was a strong driver of ICT adoption, although had relatively little influence (on average) among small and medium players. There were some clear examples (mainly among the largest companies) where management attitudes and enthusiasm towards ICTs were clearly a strong positive influence on the organisations' adoption of ICT. The need for increased computing to do business is a further positive influence, although apparently more so for large companies within the sector. This is slightly surprising, since one would have expected small and medium companies needing to play some "catch-up" with regard to the adoption of ICTs in the years ahead.

The general attitude of personnel towards ICT has only a slight positive influence, and can most likely be explained by a certain amount of "fear" regarding ICTs and organisational change. In the clothing sector, which is relatively labour intensive, there is naturally a greater fear among the lower ranked workforce of "computers taking away jobs". Comments were made that the attitudes of administrative personnel towards ICT, however, appeared to be a positive influence. The level of existing ICT skills in the workplace was seen as a slight negative influence by the small and medium-sized enterprises.

A negative influence (barrier) on the adoption of ICT, as expected, is the perceived cost of ICTs. While this result is probably influenced by the nominal cost of ICTs, and may not adequately incorporate the actual or perceived benefits, it nonetheless signals that the clothing sector perceives ICTs as being costly.

### **3.2.6 Diffusion of ICT**

The extent of the diffusion of ICT within an organisation was measured in a series of five broad questions. These related to:

**Product / Service Innovation:** Using ICT in the development of new products/services, or to exploit new market niches. In the clothing sector, this could refer to innovative new designs, higher-fashion garments, new manufacturing techniques etc.

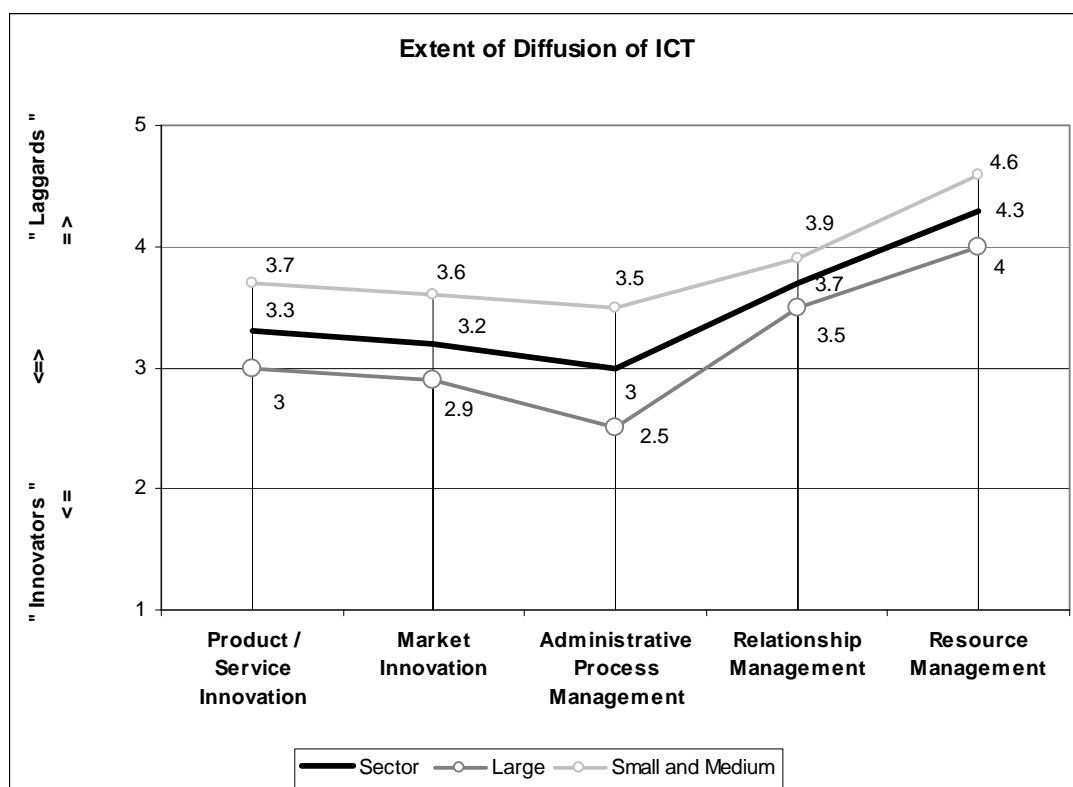
**Market Innovation:** Applying ICT and especially the Internet to create new channels for marketing and distributing products and services. This essentially refers to media such as online (website) offerings, online tracking etc.

**Administrative Process Management:** Utilising the Internet and intranets towards the improvement of communications, especially via e-mail and Web access.

**Relationship Management:** Using Extranets, the Internet and Virtual Private Networks (VPNs) to create closer links with other stakeholders (customers, suppliers, interested parties), especially for EDI-based ordering and invoicing and "just-in-time" production.

**Resource Management:** Using the Internet to provide or obtain expertise at a distance, like remote consultation, distance learning and education.

Respondents were asked to gauge the extent of ICT diffusion in their organisation. The results below thus provide the **firm-level** perspective of ICT diffusion, and are thus (subjective) aggregates of the situation in the clothing sector. It should also be noted that the results essentially provide a measure of how the respondent firms rated themselves relative to the clothing sector as a whole.



**Figure 11. Extent of Diffusion of ICT**

Possible scores ranges from (1) (where a company is among the first few percent to adopt ICT - an "innovator") to (5), which is applied to a company that is among the last few percent in a sector to adopt an ICT innovation - a "laggard").

As can be seen from the figure above, the results are presented on a sector-average basis, in addition to average scores for large companies (>250 employees) and small and medium-sized companies (<250 employees).

This section resulted in fairly high intra-sectoral variance in the way respondents measured the diffusion of ICT in their organisation relative to that in the sector. A strong positive correlation was generally observed between levels of ICT diffusion, and the number of PCs in the organisation. In other words, the larger companies within the sector that had invested substantial resources in ICTs, generally saw themselves as "earlier adopters" of ICTs in their sector, while the smaller companies (especially the "low-technology" respondents) generally viewed themselves as belonging to the "early" to "late majority" or even "last few" to adopt an ICT innovation.

### **3.2.7 Additional ICT-related Characteristics of the Clothing Industry**

This section deals with additional observations with regard to ICTs in the clothing industry. Specifically, respondents were asked about the impact that ICTs have had in their organisation with regard to supply chain linkages, export market penetration, price and quality competitiveness, production efficiencies, as well as to define the most important impacts that ICTs have had on the clothing sector.

Answers were rated on a scale of 0 to 5, with a low score indicating "not needed", "don't know" etc., and a high score (maximum=5) referring to "agree strongly" / "fully utilised".

Respondents were first asked whether the application of ICTs had assisted them with building supply chain / trade linkages with foreign textile (and other input) suppliers. Since a large part of the South African clothing industry's textile requirements are sourced from abroad, ICTs could potentially play an important role in facilitating such linkages. Benefits may include greater information reliability, improved relationship management, easier and cost-effective communications, and other factors. However, while many South African clothing manufacturers are beginning to embrace the export market, it is generally the large companies that are successful exporters. Numerous ICT-unrelated challenges face prospective exporters, such as strict lead times, export insurance costs, market uncertainty etc. On the whole, only few small and medium sized enterprises were able to efficiently utilise ICTs in building supply chain linkages, probably owing to the fact that they frequently source from local agents, rather than direct from overseas suppliers (Score: 2.0). Large companies (many of whom were exporters of some sort) generally responded more positively to this issue (Score 3.3).

Of the small and medium-sized companies (i.e. less than 250 employees), 7 (out of 23) indicated that they exported part of their output. Large companies showed greater export market penetration, with only 2 (out of 27) indicating that they did not export any of their output. Exports mostly went to the EU and the US, with one manufacturer exporting to Australia. With regard to exports, respondents were asked:

**Question:** *"Has the application of ICTs assisted your company in researching, analysing and following up on export market opportunities?"* Score: [3.7]; and

**Question:** *"If your company is a current (or potential) exporter, have recent trade agreements with the EU and the US (AGOA) increased the need to make use of ICTs in order to penetrate these export markets?"* Score: [3.5]

Since these questions related only to exporting companies, and considering the fact that few small/medium companies in the sample were exporters, the results obtained above refer only to the large companies (27). ICTs appear to play an important part, especially in terms of communication and data transmission (for example patterns).

ICTs have also enabled clothing manufacturers in becoming more productive and efficient. Respondents were asked to what extent they felt that the use of ICTs has benefited them in production aspects, rather than communications and organisational issues. Once again, the uptake of ICTs, which has been shown to be significantly more extensive among the larger, economically more powerful players, has had greater positive impacts on these companies, rather than the smaller ones. ICTs used to enhance *input material and production efficiency* relate mostly to the uptake and use of CAD. Results of this category are as follows:

**Question:** *"Has the application of ICT assisted your company in effecting product changes in terms of ...*

***Input material efficiency***" (i.e. lower input material wastage)  
[Large: 3,6; Small: 2,7]

***Production efficiency***" (i.e. lower percentage of rejects)  
[Large: 3,9; Small: 2,6]

The intra-sectoral variance relates to the fact that the general uptake of full-scale CAD technologies is less extensive among small and medium-sized companies.

The study also found that the retail sector plays a critical role in the diffusion of ICTs in the clothing manufacturing sector. In many cases, especially among the larger

companies, ICT diffusion and investment in new technologies is largely driven by large retailers. A small number of large clothing manufacturers were even found to be in exclusive manufacturing arrangements with one of South Africa's largest clothing retail chains. In these cases, the ICT usage is to a large extent dictated by the system requirements of the retailer(s) concerned, whose procurement and stock systems are directly linked to that of the manufacturer. It was also found that the relative strength and market power of retailers was sometimes used as a platform to pressurise clothing manufacturers to "open" their systems beyond the extent originally envisaged. These arrangements have, however, played a significant role in facilitating B2B e-commerce in the clothing sector.

**Question:** *"Have the clients of your company (e.g. clothing retailers) exerted significant pressure on your company to increase the use of ICT? (e.g. requiring you to invest in compatible software / hardware / link in with their systems.)"* [Large: 3,6; Small: 1,7]

The results show markedly different answers for large, and small and medium-sized enterprises. This also indicates that the relationship between large companies and the retail sector is to a significant extent based on ICTs, while the smaller players to a large extent still rely on traditional distribution and communication linkages.

**Question:** *"What, in your view, have been the three most significant impacts of ICTs on your company?"*

Overall, ICTs have had a significant impact on the clothing manufacturing industry in South Africa. The impact has not been uniform across the sector, however, and more in line with the polarised nature of the industry. Challenging economic and trading conditions have had a negative impact on the diffusion of ICTs, with the result that ICT-related expenditure / investments among many of the smaller enterprises have often become less of a priority. From an economic perspective, it can be said that the demand for ICTs is far less elastic among the large companies than it is for the smaller ones.

There was a wide range of answers to this question, although a number of categories were mentioned consistently among most manufacturers. As mentioned above it was clear that the impacts have been different on the smaller and larger players, the latter having embraced ICTs more extensively. Answers provided by small and medium sized enterprises included:

- Improved communications (esp. e-mail)
- More efficient business support systems (accounting, payroll)
- Improved stock control
- Improved access to information (Internet)
- More efficient design using CAD technologies

Answers provided by large enterprises included:

- Improved communications,
- Business support systems (accounting, personnel management, warehouse management),
- CAD technologies, & their link-up with production technology e.g. cutting machines
- Networking within organisation
- Full email and web access
- B2B e-commerce
- Streamlining of business processes and information management

## **4. Analysis and Interpretation**

The results of the ICT survey in the South African clothing sector are contained in Section 3, together with some basic analysis and findings. This section draws together the main observations and interpretations regarding the diffusion of ICTs in the clothing sector, based on the results obtained from the survey. It also looks at some expected trends.

### **4.1 Nature of ICT Diffusion: Usage of Basic Technologies**

Basic technologies in this section essentially refer to the use of Personal Computers (PCs), Servers, CAD/CAM technologies, LANs/WANs, and Internet connections. The clothing sector is a relatively intensive user of PCs, servers and local area networks (LANs), and has readily taken to the Internet. Owing to the nature of clothing manufacturing, which is a relatively labour intensive industry and makes heavy use of sewing machines, the use of the abovementioned technologies is limited mainly to the administrative functions of organisations. The exception, of course, is a technology such as CAD, which is integrated into the manufacturing process.

Although the use of PCs is relatively high across the sector, the uptake of basic technologies is on the whole far greater among the large companies, rather than the small and medium-sized enterprises. The domestic clothing industry is highly competitive and constantly under threat from low-priced imports, resulting in significant financial constraints being a barrier to the uptake of basic technologies. An added constraint is the fact that SMEs have long faced relatively high barriers to accessing finance from lending institutions, with a result that often only the most profitable investments (for example in the upgrading of technologies) are financially feasible and defensible.

The results of this section indicate that SMEs lag behind in the intensity of their ICT usage, especially in the usage of CAD/CAM technologies. Usage patterns of basic technologies in general follow a similar pattern (except for their different intensities), except with regard to Internet access. Dial-up Internet was greater among SMEs, while leased-line Internet access was utilised mostly by large enterprises. It appears that different organisational needs between different-sized companies, as well as the high cost of leased-line Internet technology, account for the wide variance in this result.

It was also found that there exists a wide range of ways in which clothing manufacturers put ICTs to use. The actual usage of ICTs appears to be correlated with the costs of certain applications, and their perceived benefits. As can be seen from the following section, usage intensity and application showed significant variance, with the (mostly) smaller enterprises having different ICT-related priorities to the large enterprises. The use of office applications, as well as administrative tools such as payroll administration and accounting, appear to dominate usage patterns among small companies. Without exception, large companies utilised ICTs for a much greater range of applications.

### **4.2 Nature of ICT Diffusion: Applications**

This section focused on ICT-related sources of information, and the usage of ICTs for a wide range of applications and processes. Most frequently used sources of information, from the perspective of ICTs, were CD-ROMs, e-mail and the Internet. These applications are widely used and dispersed within the clothing industry, and the majority of enterprises (both small and large) feel comfortable with these applications. E-mail and the Internet were frequently stated as being an extremely useful business and communication tool.

Advanced applications such as teleconferencing and videoconferencing were hardly used at all. This relates to the high cost of these tools (both hardware and bandwidth), since significant scope exists for using these tools in future. This is to a large extent due to the fact that the South African clothing sector is a major importer of foreign-produced fabrics and yarns, and is most likely to be able to enhance business dealings and supply chain arrangements by using these tools.

With regard to the streamlining of business processes, the most widely-used applications of ICTs were in the areas of business support activities (accounting, payroll) and inventory control. These were certainly the two areas of business process streamlining where SMEs used ICTs extensively. Large companies, on the whole, also made significant use of ICTs especially in distribution planning, development and design (incl. CAD), and customer service. The high initial costs associated with changing from a manual design process to an automated, computer-aided one, was found to be a major barrier to the economically weaker companies. Once again, the extent of use of business process applications among large enterprises was far more extensive than among the smaller players. In the view of some of the respondents from smaller companies, a number of the abovementioned applications were simply of "little use or relevance", a reaction probably brought about by the perceived ICT and staffing costs that may be incurred when changing to such applications. Although a small number of large companies had achieved extensive business process integration through ERP applications, the majority of respondents considered these applications too elaborate and / or expensive. The IT director of a large clothing manufacturer noted that he had had huge difficulty in "selling" the investment required for ERP to the company's CFO, although its implementation had been a necessity, and ultimately a great success.

The use of websites in general is disappointing among South African clothing manufacturers, with only a small number of exceptions. This is an area where the sector definitely lags behind other industries, and substantial improvements are possible with a relatively small financial outlay. Mindful of the fact that most clothing manufacturers sell only to agents and the retail sector, rather than a wide audience, it is still felt that much could be done to build a proper online corporate identity. Websites could also be utilised to provide product-relevant data, and even downloads of technical aspects relating to products.

The use of B2C and B2B e-commerce, while not uncommon in the clothing manufacturing industry, is utilised mainly by large companies. B2C e-commerce is utilised to a relatively low degree (across the sector), although B2B e-commerce is utilised extensively among some of the respondents. Most of those that used B2B extensively were very large manufacturers producing either exclusively for one major retailer, or to a small number of national retailers chains. In many cases, the use of B2B is almost exclusively driven by the retail sector, which sees it as a pre-condition of doing business efficiently.

### **4.3 ICT Spending Patterns**

Companies in the clothing manufacturing industry were unanimous in their opinion that the South African clothing industry as a whole spends significantly less on ICTs than is the perceived norm internationally. With regard to the company's expenditure relative to the norm *in South Africa*, SMEs felt that their total expenditure on ICTs lagged behind the sector average, while large companies (to be expected) perceived their expenditure to be fairly significantly *above* the norm. Relative to other areas within the organisation, expenditure on ICTs followed a similar pattern to the one observed above. The budget for ICTs was growing relatively slower than other areas within the organisation among SMEs, while large companies indicated relatively faster growth of their ICT-related budget.

This outcome indicates that:

- Large companies are committed to increasing ICT-related expenditure, and appear to be moving towards more 'knowledge intensive' manufacturing;
- SMEs, who typically do not have access to the same financial resources as large companies, appear not to be able to invest significantly in ICT-related matters;
- There may (rightly or wrongly) be a perception among many SMEs that they can "get away with" not prioritising ICTs in their organisation; and
- Economic conditions and a weaker exchange rate (which frequently push up the cost of ICTs) are perhaps revealing that among the smaller manufacturers, demand for ICTs is highly elastic (i.e. sensitive to price increases etc.).

#### **4.4 Sources of ICT Information and Training**

Information and training needs are to a large extent fulfilled by the same sources, namely ICT suppliers, in-house training programs, experts within the company and consultants / service providers. Furthermore, the Internet is a medium that is used very frequently to obtain ICT-related information.

An observation that stands out is the fact that ICT vendors (i.e. suppliers of hardware and software) are most frequently used to fulfil the clothing sector's ICT information and training needs. This is not altogether surprising: it is an increasingly common trend for these services to be bundled together, and ICT vendors are likely to be the first "port" of call when companies consider investing in ICTs. ICT vendors in many cases provide a full package of services to the industry, from ICT consultation, the supply of hardware (or software), and the provision of training in that particular hardware / software application.

Universities and Technikons were used relatively infrequently as a source of ICT information and training, which relates to the fact that only few of these institutions offer formal clothing / textile technology training (with an emphasis on ICTs). In addition, the clothing industry to some extent suffers from an image that is perhaps not conducive to readily attracting ICT skills. In most cases, media headlines over the past years have reported "doom and gloom" for the clothing sector, which has made attracting ICT skills more difficult.

Notably, clothing companies used trade and business associations, chambers of commerce and Government training initiatives very infrequently as their source of ICT information and training. Respondents were not aware of any Government ICT-related training schemes, although a few thought that "it was possibly available under the Sector Education and Training Authority" (SETA) for the clothing and textile industries. Significant scope therefore exists for these institutions to perhaps play a more meaningful role in facilitating (or directly providing) the diffusion of ICT-related information and training.

#### **4.5 Drivers and Barriers to ICT Adoption**

External economic factors provided the industries with both drivers and barriers to ICT adoption. Companies across the sector felt that general economic conditions (within the industry) were not conducive to the adoption of ICTs, although larger companies were a little less negative than SMEs. The sector's culture and attitude towards ICTs was identified as possibly having a slightly negative influence. There were a number of external economic factors that were seen as significant drivers, though. Expected increased competition, both in the short and medium term, was seen as having a positive influence on the adoption of ICTs, as did the increased presence of global business opportunities. The latter are probably as a result of the recent enactment of the SA/EU Trade Protocol, as well as the Africa Growth and Opportunity Act (AGOA), which is

opening doors to the US market. Increased influence from multinational firms was identified (by large companies) as also driving ICT adoption in years ahead.

Supply chain factors are seen as having a positive influence on ICT adoption, with the need to respond to customer requirements and to improve communications as significant drivers. Among the large firms, customers (i.e. in most cases meaning the clothing retail sector) are seen as having a driving influence especially on large manufacturers, frequently steering them to B2B e-commerce arrangements with a view to improving their own efficiencies and supply chain. Less of an influence is the need to respond to government requirements, or to regulatory / environmental standards.

Internal factors also showed similar trends among SMEs and large manufacturers, although a clear difference is recorded in the attitudes of senior management to ICT adoption. Among large companies, respondents feel that senior management is a critical driving force in their organisation's adoption of ICT, more so than any other internal factors. Small and medium-sized companies do not, on the whole, display this result, and their response is more muted. In a number of cases, senior management is seen to be a strong barrier to ICT adoption, although this detail is lost in the overall average. The perceived cost of ICTs is a significant barrier, although as stated earlier, demand for ICTs by large companies is clearly less price-elastic than for the small and medium-sized entities. This is not surprising, since SMEs in a highly competitive and fairly labour-intensive industry such as the clothing sector, are likely to be sensitive to capital outlays for which the *perceived* benefits take place over extended payback periods.

Most medium and large companies have an ICT function within their organisation, ranging from IT Executives, Systems Executives, IT Managers and "permanent" IT consultants. While some belong to the board of directors, most report to the Financial Manager or Chief Financial Officer (CFO). (This is an interesting observation, since it perhaps signifies an inherent barrier to ICT-related investments). The same organisational reporting structure is not necessarily the case with small companies, who seldom have a formally defined IT function in their organisation. More often than not there is some form of shared responsibility amongst the smaller players, and considerable overlap with areas of responsibility. Some take this function very seriously, notwithstanding the fact that many may not be intensive users of ICTs at all. In complete contrast, the manager of a small knitwear company (with approximately 100 employees) remarked "*We're buying 3 new PCs next month (from a current 2), so I suppose you can then call me the IT Manager ...*". This respondent's current ICT exposure was limited to some basic use of office applications.

Most companies are concerned about the security of their data. This is particularly true of companies with leased-line Internet connections, resulting in significant investment in firewalls. Most companies indicate that they do regular backups of company data, ranging from daily backups to weekly and ad-hoc backups. Backups are usually stored in "safe" locations, including offsite and in fireproof safes. However, some merely do ad-hoc CD backups of data and correspondence, and keep these "in a drawer in the office". The impression is created that computer failure is the only "threat" to the company's data.

In-house security is mostly in the form of password protection, especially for employee-related data. In many cases, access to employee records is limited to the HR / payroll personnel, the IT manager (and some IT support) and senior directors when required. In other cases, personnel data is run off separate PCs, especially in smaller companies that do not have fully integrated computer networks.

## **4.6 Extent of ICT Diffusion**

The South African clothing manufacturing sector is, on the whole, a medium-intensive user of ICTs. It is characterised by significant variances in the adoption of ICTs, ranging from very low use (mainly basic technologies to run office applications and e-mail) to intensive use (completely integrated systems, high end CAD facilities etc.). There is a general realisation, though, that ICTs will play an increasingly important role, even in a relatively labour-intensive sector such as the clothing industry.

Basic technologies, including PCs, e-mail and the Internet, are readily adopted by the clothing sector as an efficiency-increasing tool, especially by management. Accounting, stock control and basic payroll functions are the minimum standard among most clothing manufacturers, including small enterprises.

CAD is not (yet) the standard across the entire sector, although many companies have readily embraced automated design and are continuously improving its functionality. The significant costs involved in investing in CAD capabilities, including hardware and relatively expensive software applications (as well as the skills required to properly utilise CAD), are a major problem for most smaller enterprises. Manufacturers face intense competition (both locally and from abroad), and together with the usual constraints faced by SMEs, smaller and less economically strong companies are finding investment in CAD a major burden. A small niche operator producing 'high-end' functional and outerwear has devised an innovative solution, whereby it shares CAD technologies with a neighbouring clothing manufacturer. This has ensured access to design technologies without the excessive price burden, although this particular interviewee remarked, "...we have to fit in with *their* schedule, which is sometimes difficult".

Although the research sample size is too small to extract accurate observations on each clothing manufacturing sub-sector (e.g. fashion apparel, CMTs, design houses, "commodity"-type clothing), significant intra-sectoral variance in the adoption of ICTs was noted between large enterprises, and small-and medium enterprises. This probably relates foremost to the relatively lower costs of ICTs to large organisations, especially with regard to achieving "economies of scale" in terms of technology utilisation.

Respondents from small and medium-sized companies on the whole feel that their company is lagging behind the sector average in terms of the use of ICTs for product / service innovation, market innovation, administrative process management, relationship and resource management. They are almost unanimous in indicating that their companies probably belong to the "late majority" in terms of adopting ICTs. The sample of large companies, on average, sees themselves more as early adopters of ICTs within their sector. This is perhaps not altogether surprising considering the fact that a number of publicly listed companies, or their subsidiaries / group members, form part of the large company sample.

Companies that have readily embraced ICTs are unanimous regarding significant production efficiency improvements using CAD technologies. This is as a result of greater input material efficiencies (i.e. lower input material wastage) and production efficiencies (i.e. lower percentage of rejects), resulting in substantial costs savings. A large manufacturer of ladies outerwear, and supplier to a major retail chain, notes that CAD has helped the company reduce material wastage to a relatively low percentage of total materials used. Every percentage saving in material inputs (data constantly available to the CAD operator) translates into increased profits, especially in light of the company's monthly consumption of "a few million Rand worth of fabrics". CAD also allows companies to decrease production times significantly, since the technology reduces pattern-making times through the automatic scale-ability of designs (into S, M,

L, XL etc sizes). Another Durban-based manufacturer notes that their key-account sales staff still have to travel "down to Cape Town to present printouts and colour schemes of the designs" to representatives of a large retail group. Besides the obvious benefits of personal contact, the company is constrained by slow data transfer speeds and the cost of bandwidth.

#### **4.7 Status within International Context**

The South African clothing sector, on the whole, appears to lag behind its European and US counterparts with regard to the application of ICTs within its organisational and manufacturing functions. The sector has been undergoing significant changes since the large-scale opening (through the downscaling and removal of restrictive trade tariffs and quotas) in the early 1990s of the South African market. This has led to increased domestic competition, especially at the lower end of the market (commodity-type output, such as T-shirts etc.). Many domestic companies have been unable to adapt effectively to this influx; some having retreated into their "shell", while others have adapted and evolved. In many cases, the smaller, financially often less-strong companies have had difficulty remaining competitive, let alone finding the resources to invest in ICTs. It is thus often the economic context in which clothing manufacturers operate that determines the extent of ICT diffusion in South Africa.

The international context is of particular importance to the South African clothing industry, since (export) opportunities abroad play a critical role in ensuring the long-term survival of the sector. The overseas market for lower-end clothing made by South African manufacturers is limited, due to relatively high local input and labour costs, especially vis-à-vis competing countries such as China. However, a market does exist especially for higher value-added fashion apparel, both locally and overseas. To be competitive in this market requires companies to innovate and to 'move up' the value chain. ICT plays an important role in achieving this objective, especially in terms of positive impact it can have on organisational management, design, lead times, production efficiency and knowledge facilitation.

Many of South Africa's clothing manufacturers would certainly like to grasp the opportunities offered by ICTs. In terms of the high costs of ICTs, though, many may not be able to reap the benefits associated with it. Where the transition to a wider adoption of ICTs is accomplished, companies will place themselves in a favourable position to become competitive and design-focused manufacturers, with excellent chances of competing both locally and in international markets.

#### **4.8 Expected Trends in Applications and Diffusion**

The adoption of ICTs is likely to increase across the sector, although the trend towards greater knowledge and technology intensity will also claim its victims. Some segments within the sector will continue to operate at the lower end of the market, where the focus is predominantly on factors such as price competitiveness and economies of scale. Realistically, it is unreasonable to assume that these enterprises will suddenly begin to innovate, adopt ICTs and 'move up' the value chain! However, the benefits of ICTs have been successfully demonstrated by many clothing manufacturers, in particular the larger players, who have achieved thresholds in making ICTs significantly improve their operations. While basic technologies and applications such as PCs, e-mail, the Internet and business support applications are already widely diffused into the sector, it is suggested that they will provide momentum for the further absorption of ICTs.

It is also expected that the concentrated nature of the domestic clothing retail sector, and its market power, will continue to be an important driver of ICT adoption in the clothing *manufacturing* sector. It is also expected that the sector as a whole will benefit from the DTI's Integrated Industrial Strategy, and its support for greater knowledge intensive manufacturing and innovation. Recent trade opportunities brought about by the SA/EU Trade Protocol and AGOA, are providing South African manufacturers with vastly improved access to the EU and US markets. These opportunities are likely to be important drivers to ICT diffusion, a prediction confirmed by many manufacturers. This is assuming that communication and bandwidth costs, especially relating to the transfer of data (e.g. electronic sending of designs), become more in line with those of South Africa's competitors.

## **5. Conclusions and Recommendations**

### **5.1 What can the Sector do to exploit ICT?**

The clothing sector can play an important role to better exploit ICT, and should *not* simply rely on other role-players to take the initiative. There are a number of factors that can have a positive influence on the sector's ability to better exploit ICTs, especially:

**Raising Levels of ICT Awareness:** Many clothing manufacturers are unaware of some of the potential opportunities of ICTs in clothing manufacturing. By raising levels of awareness, manufacturers may view ICT-related expenditure and investment in a different light. An active role can be played by manufacturers themselves (by informing their peers of direct benefits that they have obtained), as well as by industry organisations such as the following: Clofed (Clothing Federation), MACs (Manufacturer Advisory Centres), Clothing Industry Export Council, CMT Employers Association, the CSIR (Textek Division), SAFDA (South African Fashion Designers Association), Texfed (Textile Federation) etc.

**Refocus on Higher Value-Added Production:** Clothing manufacturers are increasingly realising that one of the keys to their sector's long-term sustainability in South Africa is to 'move up' the value chain. Such refocusing could become a natural driver to increase the better uptake and exploitation of ICTs in the sector. Higher value-added production and design are important ingredients for manufacturers wishing to compete in the international market.

**Feedback to Training Institutions of Needs:** By taking a more pro-active role with regard to communicating their ICT-related needs to other stakeholders (esp. training institutions, industry organisations and the Government), clothing manufacturers will be able to obtain sound advice and assistance on how to better exploit ICTs. Training institutions can play an important role in facilitating the uptake of ICTs, for the availability of skills is an important driver for exploiting ICTs.

### **5.2 What can the ICT Industry do for the Clothing Sector?**

As the provider of ICT-related goods and services, the ICT industry can play an important and pro-active role in facilitating the uptake of ICTs by the clothing sector. For clothing manufacturers -and by extension ICT providers - to achieve greater ICT-related benefits, they need to form a closer working relationship than is currently the case. To achieve this, the ICT industry could:

**Raise Levels of Awareness:** The first, and most important step would be for the ICT industry to raise the levels of awareness regarding the potential benefits of ICT to clothing manufacturers. One of the reasons this has not been done is that, especially before AGOA, the ICT industry regarded Clothing as a 'dead' market. Since the ICT industry is very marketing oriented, it will take an opportunity if it sees one. However, the Clothing Industry will need to signal changed circumstances, perhaps through a big drive as proposed above.

**Provide Competitively Priced ICTs:** The high costs associated with ICTs, both from an acquisition, maintenance and training perspective, have been the greatest barriers to the higher uptake of ICT. Suppliers of ICT products and services should devise innovative ways of tailoring their products to the need of the industry, and specific company concerned. Attractive leasing arrangements may help reduce the initial burden and cost associated with transforming business and production processes, and reduce some of the risk for clothing manufacturers. Telecommunications charges, in particular those of leased-line Internet installations, should be revisited to extend their attractiveness to the smaller players too, although this is to a large extent an issue for Government to consider. Lower communications charges (e.g. those associated with bandwidth) could be a vital stepping-stone for more intensive diffusion of ICTs among clothing manufacturers.

**Develop Training Modules for Clothing Manufacturers:** ICT suppliers could focus more on the development of clothing sector-specific ICT training options, and thereby remove some of the perceived high cost and inaccessibility of entry-level and middle-level ICTs. The industry should also play an active role in establishing partnerships at local, provincial and national Government, with the aim of providing a cost-effective service to the clothing industry, and manufacturing in general.

### **5.3 What can the Government do?**

Government plays an important role in helping to guide the manufacturing sector, by providing the necessary policy framework and valuable support measures. Its role (with respect to the manufacturing sector) is thus mainly one of facilitation and guidance, rather than the direct provision of goods and services. It can play a vital role in making ICTs more accessible to all. The following are some options regarding the role that Government can play, many of which were suggestions put forward by clothing manufacturers:

**Devise Special ICT Incentives:** The government can play a major role in facilitating greater ICT usage by devising incentive schemes that financially support ICT-related expenditure where it can be demonstrated that such investment will enhance efficiency and international competitiveness. At present there is no direct ICT-related incentive scheme applicable to the clothing industry.

**Increase the Accessibility of Current and Future Incentive Schemes:** Currently, most Government incentive schemes are not readily available, have cumbersome conditions, and where they relate to loans at "preferential rates", these are hardly preferential at all. As a result, many industry promotion programs have been highly under-utilised. Government could offer rebates for certain pre-defined ICTs, for example CAD-related expenses.

**Ensure Lower Communications Charges:** By de-regulating the telecom industry, Government can play a leading role in attracting new market entrants and providers of ICT-related services. This may result in the reduction in bandwidth charges, which could facilitate more efficient interaction by manufacturers with their suppliers and customers, as well as international counterparts. A result would be improved supply

chain networks, and therefore more competitively priced outputs. However, whatever arrangement is eventually made with regard to Telkom, it should be remembered that Telkom currently owns the "last mile" into the office, and that alternatives for data transmission are still relatively costly. Communication costs can be reduced in a variety of ways, including through the installation of ISDN lines, ADSL etc. This may be something for clothing industry organisations to pick up as a medium-term objective for the industry.

**ICT- Related Accelerated Tax Write-Offs:** In conjunction with the South African Revenue Services, offer additional ICT-related tax write-offs, for example by treating all ICT-related installations as expenses with a full write-off in the year of their being brought into productive use.

**Training Support:** While Government should leave any ICT-related training in the hands of the private sector, it should offer subsidies to both trainers and manufacturing companies to better utilise such training. Any costs incurred by Government is likely to have very positive multiplier effects, so that such costs are quickly recouped through enhanced productivity and knowledge intensive manufacturing. It would also be useful to identify nodes of high industry concentration, with a view to supporting and subsidising ICT-related training schemes. Besides the main centres, important "decentralised" nodes of concentration include Newcastle, Ladysmith, Hammarsdale, Mitchells Plain etc.

**Clothing SETA:** Respondents were wholly unaware whether the responsible clothing (as well as textile and footwear) sector SETA provided or at least facilitated ICT related training for the clothing sector. The SETA could play an important role in diffusing ICT knowledge and training among the clothing sector.

**Support for Tertiary Education:** There are currently very few tertiary institutions that provide ICT-related training for the clothing sector. It is no use hoping that specially-trained IT students will be readily attracted to the clothing sector - rather, Government should support tertiary institutions that provide Textile and Clothing Technology training as part of their curricula with additional support to cover their equipment and training needs. Such support should have a positive effect of attracting scholars into this field, and will have positive downstream consequences for the clothing industry in years to come. In addition, the Government could also devise a special bursary program to encourage individuals to take ICT-specific training and thereby boost the (clothing) manufacturing sector.

**Organise a " Road-Show " to Enhance Awareness:** A national, annual "road-show" could be a useful means of raising ICT-related awareness among the clothing sector. Such a "road-show" could actively engage ICT suppliers, Government representatives, productivity consultants, ICT trainers etc., and take on the form of a travelling exhibition and consultation forum. Public media as well as industry organisations can be utilised to gather maximum support and attendance by a large variety of stakeholders.

**Publication of Success Stories:** With the consent of the manufacturers concerned, Government can actively promote any news on "ICT success stories" from within the clothing sector. These could also be published on the DTI website, amongst others, and serve as an awareness raising incentive to further raise ICT awareness in the clothing sector.