Towards a proactive approach in supporting sustainable product life cycles in fashion through the development of a new clothing retail cycle

By

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DECLARATION

I, Rochelle du Plessis, declare that the contents of this thesis represent my own unaided work, and that the thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

Signed:  **Date: 09 October 2022**

DEDICATION

I would like to dedicate this to my late mother, Priscilla du Plessis. You taught me how to spell, you taught me how to read and write, you taught me mathematics and you taught me about fashion and fabrics. A smart, motivated individual, a pianist, a sportswoman and a kind-hearted and gentle mother. I would also like to dedicate this thesis to my children and husband. I made it, we made it! Time to celebrate!

For Peter-John Hendricks, Priscilla du Plessis (in heaven), Arden du Plessis, Grayson Hendricks and Harper Hendricks.

ABSTRACT

South African clothing fashion retailers contribute a significant amount of waste through their seasonal processes (retail cycle processes) and fast fashion approaches to maximise profit. Company R, a South African fashion retailer, produces pre-consumer waste and post-consumer plastic and textile waste. The two principal objectives of the study were to determine firstly the quantities of non-recyclable textile and plastic waste that were generated during each phase of the retail cycle (planning, marketing, buying, design, technology, distribution, and operations) and secondly to develop an improved business model for the retail cycle that enabled the quantities of both categories of waste to be minimised and the practices of the company to become more aligned with the priorities of environmental sustainability. The qualitative research design was based on a case study strategy; a single case study in this instance – focusing on one company within the local clothing industry - *Company R*. Qualitative data was obtained from one-on-one and group interviews and analysed through thematic analysis.

The sample assessment and manufacturing stage was found to be very polluting as the factories produce toxic waste, air pollution, textile waste, and plastic waste at this stage. This stage can add up to over 700 samples produced - just for the ladieswear department - in one season. Although single-use plastics have been removed from their stores, store staff are still discarding polybags that thousands of garments are delivered in. Processes in the retail cycle of *Company R* therefore informed a model that is geared towards sustainable practices throughout the cycle, and an improved business model underscoring a more sustainable retail cycle was developed, focusing on waste reduction.

KEYWORDS: retail cycle processes, synthetic fibres, natural fibres, pre-consumer waste, post-consumer waste, sustainability, *sustainable development, sustainable development goals, sustainable development in retail, sustainability*

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CLARIFICATION OF BASIC TERMS AND CONCEPTS

Synthetic: Manmade or not made of natural materials (Corbman, 1983: 5)

Polymer: a substance which has a molecular structure built up chiefly or completely from a large number of similar units bonded together, e.g. many synthetic organic materials used as plastics and resins (Corbman, 1983: 456)

PET: Polyethylene Terephthalate (one scientific term for plastic and plastic). The principal raw material is ethylene obtained from petroleum. The ethylene is oxidised to produce a glycol monomer dihydric alcohol that is combined with another monomer, terephthalic acid in an autoclave at high temperature in a vacuum. With the aid of catalysts, polymerisation occurs. The clear molten polyester forms into a hardened porcelain ribbon formation when extruded through a hole in the vessel after cooling down. The polymer is cut into chips, dried to remove moisture and blended for consistency in order to go into spinning for creating yarns or any other type of plastic product (Corbman, 1983: 375)

Protein Fibres: A fibre made of products such as corn and milk that have been chemically processed and converted into fibres. etc. (Corbman, 1983: 13)

Cellulosic Fibres: A fibre derived either from the cellulose of the cell walls of short cotton fibres (called cotton linters) or pinewood. Pure cellulose is a white substance that is converted into fibre form through chemical treatment (Corbman, 1983: 8)

PCDT: Poly-1, 4-cyclohexylene-dimethylene terephthalate: is one of the most widely used aromatic semi crystalline polyesters, the structure is very rigid, which means the polyester melts at a high temperature (Corbman, 1983: 375)

Staple Fibres: a fibre of any composition of a very short length (Corbman, 1983: 346)

Filament Fibres: a fibre of any composition that is a long continuous fibre (Corbman, 1983: 346)

Pilling: Small balls of fibre that form on the surface of a fabric due to abrasion (Patnaik, 2020: 242)

Tensile strength: the measure of maximum force fabric can hold before it breaks (Patnaik, 2020: 239)

Polybag: clear plastic bag that covers every garment that is manufactured during transportation from the factory, to the distribution centre, to the store and consumer home (Fashion for good, 2019)

Mutilate: A term used in the fashion industry by all retailers, suppliers and customs (SARS, 2014) to indicate that a sample has been cut. Cut samples do not incur any duty and taxes as long as it is in compliance with the policy – samples of no commercial value.

Pre-consumer waste: A material that was discarded before it was ready for consumer use (Taha, 2016)

Post-consumer waste: A material that is discarded after consumer use (Taha, 2016)

Sourcing: is the process of selecting suppliers to provide the goods and services you need to run a business (Walts, 2020)

Conformance: Guarantee compliance with any national or international environmental or workplace safety requirements including, but not limited to, relevant regulations and/or standards (ZDHC Foundation. 2022)

Sustainability: of, relating to, or being a method of harvesting or using a resource so that the resource is not depleted or permanently damaged (“Sustainability,” n.d.) meets the needs of the present without compromising the ability of future generations to meet their own needs (Merritt, 2022)

Cradle-to-grave: the full life cycle assessment from its creation stage “cradle” to the usage phase and disposal phase “grave” (Farrer and Fraser, 2011)

E-commerce: Or electronic commerce, also known as e-business, refers to the transaction of goods and services through electronic communications (Tian and Stewart, 2008)

Circular economy: is a systemic approach to economic development designed to benefit businesses, society, and the environment. In contrast to the 'take-make-waste' linear model, a circular economy is regenerative by design and aims to gradually decouple growth from the consumption of finite resources (“The Circular Economy,” n.d.) (Merritt, 2022)

Sustainable Development Goals: also known as the Global Goals, were adopted by the United Nations in 2015 as a universal call to action to end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity (Tomá˘s Hák, Svatava Janou˘sková and Bed˘rich Moldan, 2015)

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CHAPTER 1: INTRODUCTION

1.1. BACKGROUND

Prominent role players in the fashion and textile industries, such as Zara and Adidas, recognise that threats to the sustainability of their operations are looming large, as a consequence of the damage that manufacturing processes inflict on the environment (Palm, Cornell & Häyhä, 2021). As the COVID-19 pandemic becomes increasingly manageable, the fashion industry will inevitably recover and continue to grow and destructive effects on the environment are expected to proliferate accordingly (Palm *et al*., 2021). The sustainability of industrial operations is invariably threatened when they result in irreparable damage to resources and environments upon which local populations depend to maintain their lifestyles and earn livelihoods.

In 1987, the United Nations Brundtland Commission defined sustainability as **"**meeting the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, 1987:37). Sustainability from the perspective of strategy entails the integration of environmental, social, and economic priorities, to meet what is sometimes referred to as the 'triple bottom line' (Hudson & Rogers, 2011). The triple bottom line framework makes it possible to develop specific criteria for progress in each of the three domains of sustainability that have been identified. Sustainability and green supply chain management are vital for business operations in this day and age. United Nations' new sustainable development agenda for 2030, enforced since 2016 constitutes 17 sustainable development goals (SDGs). The SDGs demonstrate new goals of economic, social and environmental developments, to eradicate poverty, economic growth, environmental protection to name a few. SDGs call for the world to contribute to the goals, this includes governments, companies, civil organisations and the public, to realise a sustainable world (Cai & Choi, 2020). The significance of the ability to measure the extent to which progress in each of these domains is achieved in a business or organisation has been colloquially summed up as "what gets measured gets done" (Eccles, 2011; Kates, Parris, & Leiserowitz, 2005: 13-16; Henriques, 2010). In addition, the triple bottom line framework reveals the

relationships among its three constituent domains of concern (Hudson & Rogers, 2011).

It follows that environmental, social, and economic considerations need to be considered together to ensure a sustainable future (Ciccullo, Caridi, Gosling, Pero, & Purvis, 2018). Although this study is concerned principally with the effects of the retail cycle of the retail clothing industry on the environment, the needs of both society and the economy also need to be afforded due consideration to maintain a viable balance. Accordingly, to ensure the sustainability of the planet and its resources, it is imperative to develop effective strategies to ensure the safeguarding and continued availability of those resources (Niinimäki, 2020).

South African clothing retailers are some of the leading contributors to the production of solid waste as a consequence of their intensive promotion of seasonal fashions, these are new styles that are delivered to stores weekly, that the retailer designs every 6 months. The seasonal fashions emphasise fast fashion products that are not intended to last, to maximise profits. An undesirable consequence of the influence of these factors is the generation of vast amounts of both pre-consumer and post-consumer waste that is discarded, rather than re-used in manufacturing processes (Anguelov, 2015). Pre-consumer waste is waste that is generated by industrial production before manufactured products reach consumers. It is generated during the manufacturing of clothing for the retail market by disposing of waste that occurs in forms such as offcuts, garments that do not meet inspection standards, and product packaging during the manufacturing process (Buyukaslan, Jevsnik, & Kalaoglu, 2015). Conversely, post-consumer waste can be defined as garments or other categories of manufactured products that are disposed of by owners who longer require them (Buyukaslan *et al*., 2015). The negative consequences of the disposal of post-consumer level are exacerbated by a number of different factors. It has been found that only 64% of South Africans have access to waste management systems (Plastics SA, 2018). In addition, in South Africa the collecting of recyclable products from waste disposal operations entail high costs and the often contaminated or adulterated products are expensive to recycle (Duong, 2021).

Among the most significant contributory factors to the problem that the inappropriate disposal of waste represents are the practices of the retail clothing industry and the types of behaviour that rampant consumerism tends to encourage. Consumers of fashion have become accustomed to fast fashion and rapidly outmoded ranges of inexpensive mass-produced clothing (Fletcher, 2013:162). Plastic and synthetic merchandise is purchased in vast quantities from retailers and disposed of in any of a number of different ways when it is no longer needed (Du Bois, De Pelsmacker, Hubo, Moons, Ragaert 2020). As most of the garments that are produced in the fashion industry are made from synthetic materials, they will degrade in the same way that plastic does, which is slowly, over hundreds of years (Carlotto & McCreesh, 2018). Irrespective of how products that are manufactured from plastic and other synthetic materials are disposed of, it is highly likely that they will eventually be incinerated, used as landfill, or find their way into the ocean, all of which are harmful to the environment and the natural habitats of animals, birds, and sea creatures. South Africa is ranked as the 11th-worst offender in the world for polluting the ocean with plastic and the third-worst in Africa, after Egypt and Nigeria (Jambeck, Law, Narayanand, Perrymananthony, 2015). Consequently, it is imperative that the populations of all countries should find effective ways to reduce their consumption of plastic. Retailers need to become aware of the need to recycle and start to develop habits that significantly reduce the creation of waste in an effort to reduce the amount of plastic waste that is generated, both locally and throughout the world (Ryan, Moore, Van Franeker, Moloney, 2020). In addition, as the fashion and textile industry contributes enormously to pollution – it has been reported by Levi Strauss that manufacturing a single pair of jeans has a carbon footprint that is equivalent to that which is produced by driving a car for 80 kilometres – it is equally imperative that the industry should improve the efficiency of its existing systems of production, waste disposal, and recycling (Broega, Jordão & Martins., 2017:2). It is important to reduce the overuse of physical resources, effective strategies for reducing and recycling waste, renewing, rather than depleting resources (Sutton, 2004). Redeveloping manufacturing processes and products to reduce or possibly eliminate the production of plastic and synthetic materials, protecting and restoring natural habitats and environments that are valued by societies are crucial to the survival of the economies of countries that need to be formulated and implemented (Gowdy, 1994). It is equally crucial that these

strategies should be effectively coordinated and implemented on a sufficiently large scale until the environmental problems that are created by waste pollution have been completely eradicated (Palm *et al*., 2021).

1.2 STATEMENT OF THE RESEARCH PROBLEM

Pollution in all its forms is affecting the sustainability (Fletcher, 2013: 15) of the natural habitat, and the clothing retail industry forms part of the cycle of unsustainable and rampant consumerism leading to pollution (Anguelov, 2015: 160). Attention must be focused on the full lifecycle of products to ameliorate our impact on earth's resources and reduce pollution. The sustainability development goals must be operational within the retail cycle, focusing on the 17 goals and 169 targets to action sustainable methods of production (Hák *et al*., 2015). The full lifecycle includes not only the characteristics of the product but also the materials and production methods and the kinds and types of wastes generated in the process. Seen in this light, South African retailers need to be more

proactive in supporting sustainable product life cycles, including optimising waste generation. This includes reducing the need to produce synthetic virgin fibres in fashion apparel through recycling practices (Fletcher, 2013).

1.3. RESEARCH QUESTIONS, AIMS AND OBJECTIVES

1.3.1. MAIN RESEARCH QUESTION

What are the sustainability processes within the retail cycle of this single leading retail company that has its headquarters in Cape Town?

1.3.2. Sub-questions

- How does the retail cycle of this single company negatively affect the sustainability of the local environment as a consequence of plastic and textile waste that is generated?

- How can a more sustainable retail cycle be developed in the local region, on the basis of an investigation of the operations of one leading retail company that has its headquarters in Cape Town, South Africa, with the specific aim of reducing the generation of waste?

1.3.3. Aims of the research study

- To investigate and evaluate the present retail cycle of one retail chain and identify the steps in that cycle that potentially contribute the most waste.
- To identify the types of non-recyclable textile and plastic waste that negatively affect the sustainability of the local environment.
- To develop an improved retail cycle model that will reduce plastic and non-recyclable textile waste and prevent the negative effects that they have on the sustainability of the local environment.

1.3.4. Objectives of the study

- To plot and review the retail retail cycle of the company and identify the steps in the cycle that generate the most waste that takes 20 years or longer to degrade, through an overall assessment of its operations, in respects such as planning, marketing, buying, design, technology, and distribution.
- To identify the types of non-recyclable textile and plastic waste that negatively affect the sustainability of the local environment.
- To develop an improved retail cycle model that demonstrates how the quantities of plastic and non-recyclable textile waste that are generated can be reduced or prevented from reaching landfill sites, to minimise the depletion of local natural resources

1.4. METHODOLOGY

When deciding on the best research method to use, I had to think about the problem and how the research had to be presented. In doing this, I could identify the correct methodology to ethically obtain the data needed to do this research. The research methods chosen should hold the data after it has been attained and facilitated with the extracting of meaning. With the guidance of the research questions, qualitative

research was identified as the best approach to complete an inductive analysis of the problem.

1.5. CHAPTER OUTLINE

The six chapters of which this thesis is comprised are summarised in the sections that follow.

1.5.1 Chapter One: Introduction

The intention of the opening chapter is to introduce the topic of pollution that is caused by the retail clothing industry. The concepts of sustainability, plastic waste, synthetic textile waste, pre-consumer waste, and post-consumer waste in the fashion and textile industries are explained, with a specific emphasis on plastic and synthetic waste. The research questions and aims and objectives of the study are elucidated and the structure of the thesis is summarised in a series of overviews of each of its chapters.

1.5.2. Chapter 2: Literature Review

The second chapter takes the form of a comprehensive review of the relevant available literature that was consulted to trace the trajectory of textiles and plastic in societies that eventually resulted in the pollution crisis that plagues the world today. Although plastics and textiles had been in existence for many decades, the 1950s and 1960s are generally considered to signal the beginning of an era of disposable products. Society has steadily continued to adopt a throw-away mentality to mass-produced products that are purchased (Clarke, 1999). As shopping has become an activity of leisure and luxury in an era of ever-increasing conspicuous consumption (Babin *et al*., 1994), consumers discard and dispose of clothing and plastic products as trends change, thereby creating unmanageable quantities of post-consumer waste (Brooks, 2019).

Sustainability and SDGs can be significantly increased by promoting the use of ethical production processes and making maximal use of organic, recycled, or natural durable materials. Contributing to environmental sustainability requires retailers to re-evaluate their products and business models, in respects such as purchasing decisions, quality, production processes, packaging, and variety (Brocken *et al*., 2014). The triple bottom line, which is also referred to as the pillars of sustainability, captures the essence of sustainability by measuring the effects of the activities and operations of companies or organisations on the world, in relation to their profitability and use of social, human, and environmental capital (Savitz, 2006).

1.5.3. Chapter Three: Research Design and Methodology

As the study took the form of an exploratory case study of a single fast fashion company in the local clothing industry in Cape Town, the researcher elected to make use of qualitative research methods to collect, analyse, and interpret textual or verbal data. The company was studied in a holistic manner and every process and relationship was investigated extensively, to identify the types of non-recyclable textile and plastic waste, along with a smaller amount of paper waste, that exert an adverse influence on the sustainability of the local environment. Data was collected by conducting workshops and semi-structured interviews, with both individual and groups of participants, and also through the administration of follow-up questions. The researcher paid close attention to both responses of the participants and the manner in which they expressed their perceptions, beliefs, and opinions, to make an accurate assessment of the data that they provided. A relatively small sample size was used and the research sample was collected by means of purposive sampling, a non-probability sampling technique that entails using the judgement of researchers or informed insiders to select participants who are best equipped to provide the information that is needed to conduct particular research studies (Henry, 1990).

The analysis of the data was based on the interactive model that was developed by Miles and Huberman (2018).

The data that was collected was saved by means of a filing system that made use of predetermined codes, to enable the researcher to locate, analyse, and interpret it at a later stage. The data was condensed by abstracting and simplifying the information that appeared in the full corpus of recorded field notes from the workshop and interviews, documents and literature, and all other materials that were collected. The conclusions that were drawn during this final stage of the analysis remained provisional, to maintain a requisite degree of scepticism until the findings could be supported by convincing factual evidence (Miles & Huberman, 2018).

1.5.4. Chapter Four: Presentation and Discussion of the Findings

The purpose of the research was to identify the essential characteristics of the retail cycle model of a prominent South African fashion clothing retail business, to determine whether the processes that the cycle entailed had adverse effects on sustainability. This objective necessitated an initial identification of the types of waste whose effects on the environment were most adverse, namely, non-recyclable textile and plastic waste. The findings revealed that the generation of both pre-consumer and post-consumer waste products were detrimental to the sustainability of the environment. After all of the data had been analysed, the objective was to develop an improved, more sustainable retail cycle that could facilitate a significant reduction of pre-consumer plastic and textile waste, in an overall strategy to reduce the large quantities of post-consumer plastic and textile waste that are generated as a consequence of the present retail cycle.

The existing retail cycle model (Figure 4.1, page 61) depicts a detailed step-by-step sequence for each of the operations of the company. Each component of the cycle has a name, which refers to a specific department and the functions that it performs in the retail cycle. The discussion of the findings includes descriptions of the daily routines of the individual participants in their respective roles, the functions that they performed in the retail cycle, and the types of waste that were produced by the departments in which they worked.

1.5.5. Chapter Five: Analysis of the Findings

The final objective of the research was to develop a model for an improved retail cycle that demonstrates viable ways of reducing the waste that is produced by the retail cycle. The findings that the analysis generated revealed that the amount of pollution that resulted from the sample assessment and manufacturing stages was particularly great. Although these manufacturing stages are characterised by severe air pollution and the production of toxic waste, textile waste, and plastic waste, the research was concerned with textile waste only, as the literature revealed that natural resources are depleted by the conventional production of cotton. In addition, once samples eventually reach the retailer for fittings, three samples of each size are made for fitting, apart from the marketing samples that also need to be made. Throughout the retail cycle, the distribution centre operates effectively and products are received and dispatched on time.

The company has played a proactive role at the final trading stage of the retail cycle, by eliminating the use of single-use plastic in its chain of more than 80 stores. By contrast, the company nonetheless continues to dispose of thousands of single-use plastic bags in which the clothing that is sold in its stores is received and large quantities are used in filling the orders of e-commerce customers. Each garment that is purchased online is packaged in a polythene bag before it is packaged in a cardboard box, which, in turn, is packaged in a plastic courier bag. The disposal of this plastic by e-commerce customers results in the generation of large quantities of post-consumer plastic waste, which stand to compromise the sustainability of local environments severely.

There is an urgent need for clothing manufacturers to conduct business with green factories that are expressly designed with the intention of eliminating waste, preventing pollution, and enabling clothing and materials to be recycled. The model that the researcher proposes for an improved retail cycle could help to prevent the textile and plastic waste that are generated as a consequence of the operations of the company from becoming pre-consumer and post-consumer waste, which would inevitably have adverse consequences for the sustainability of local environments. There was a general consensus among the participants that no policies or practices

to promote sustainability had been formulated and implemented by the company to guide the behaviour of employees or suppliers. This finding, in combination with the other research findings and those of the studies that were consulted in the literature review, demonstrates conclusively that there is a definite need for the company to adopt a model for its retail cycle that prioritises the sustainability of local environments.

1.5.6. Chapter Six: Conclusion and Recommendations

The researcher plotted each step of the retail cycle of one local clothing retailer to identify the types of waste that each step generated. To evaluate the present commitment of the company to ensuring the sustainability of local environments, follow-up sustainability questions were distributed to all employees. The findings that the administration of the follow-up questions generated revealed that although the cycle comprised more than 20 stages, the company had not formulated or implemented any practices or policies to ensure sustainability to date.

While some of the participants were knowledgeable concerning the priorities of sustainability, others appeared to be ignorant concerning the connotations of the term and unsure whether the chain was a fast fashion operation or not. The literature confirmed that all of the several types of plastic and textile waste that the retail cycle was found to generate affected the sustainability of local environments. It was also found that the company stocked clothing products that contained high percentages of cotton, which, as it has been pointed out, would contribute to depleting many of the earth's valuable resources if it is not processed in an ethical and responsible manner. In addition, the large quantities of garments that are made from blended fabrics also pose environmental hazards, as they are difficult to recycle.

The findings of this research study could be of great value to the field of the research topic, as many potential improvements could be made to the retail cycle, as the findings confirm. Accordingly, they could play a crucial role in increasing awareness of the urgent need for the retail clothing sector to adopt practices concerning textiles and plastic that ensure sustainability. As it is abundantly evident that many retail clothing operations in South Africa and other countries throughout the world have not

critically evaluated the effects of their retail cycles on local environments and not paid sufficient attention to the enormous threat that textile and plastic waste pose to entire ecosystems, the findings could also make a valuable contribution to promoting awareness among consumers of the urgent need to avoid products that threaten the sustainability of the world in which they live. In the *realpolitik* of business, the demands of consumers constitute the most meaningful incentive for retailers to make purchasing decisions that accord with their perceived needs.

CHAPTER 2: LITERATURE REVIEW

The 1950s and 1960s are often considered to mark the beginning of the era of "disposability". Expendability was a central aspect of 1960s culture, a decade in which rising affluence was accompanied by a corresponding rise in expenditure on luxury commodities. Obsolescence was accepted and celebrated by the young and fashion-conscious, an attitude that could be traced back to the beginning of mass-consumption during the post-Second World War era of consumerism in the United States (Whitely, 1987). Although textiles were initially made from natural fibres, as the demand for fashion increased, scientists developed synthetic fibres, such as virgin polyester and virgin nylon (Corbman, 1983:346). These innovations were accompanied by a proliferation of cheap and disposable plastic products, which encouraged the emergence of a throw-away mentality in societies that were characterised by rampant consumerism (Clarke, 1999). The continued exponential growth of the fashion industry and the ubiquitous use of synthetic fibres have inevitably resulted in relentlessly accreting adverse consequences for the environment. The earth is unable to accommodate the vast amounts of plastic and textile waste that are disposed of in ways that threaten the sustainability of local environments, a predicament to which the fast fashion industry is a leading contributor (Anguelov, 2015).

Although the retail fashion industry continues to produce and consumers continue to consume its products in vast quantities, consumers are beginning to become aware of the effects of pollution from waste on the environment. In response, some retailers have begun to add environmentally conscious messages to the recyclable plastic bags in which purchases are packaged, which urge consumers to recycle, rather than discard the bags (Brooks, 2019). In countries whose populations have become aware of the undesirable effects of plastic and synthetic waste, retailers have begun to revise the priorities of their existing business models, also known as retail cycles, by attuning their retail cycles to giving adequate consideration to the environment and social and economic effects (Harvard Business Review, 2017). Efforts to change retail cycles have been debated for many years. Environmental theories maintain structure of the retail changes in the surrounding economic, demographic, social, cultural and technological conditions of the marketplace. Some authors such as Dreesman (1968) Hensel (1973), Markin and Duncan (1981) have extended this into an ecological

approach, arguing for a natural selection with the economic environment. Fast fashion retail cycle stages do not allow for the reduction of harmful impacts on the environment, as the stages within the cycle are geared towards developing and manufacturing at high speed rates (Fletcher & Rawan, 2022). A study of South Africa shows that only 6% and 11% in 2016/2017 and 2017/2018 financial year ends, have incorporated the SDGs into their business model and strategies as reported (Haywood & Boihang, 2020).

2.1. Brief overview of the beginnings of mass-produced textiles, clothing, and plastics

The beginning of the Industrial Revolution in 1750 and the use of machinery made it possible for the textile industry to maintain pace with the growing populations of industrialised countries and the demands of merchants for ever-increasing quantities of textiles increased accordingly. Inventions such as the Spinning-Jenny, which made it possible to spin eight threads simultaneously, and the later spinning mule, which permitted workers to produce yarn at a greatly increased rate, resulted in textiles being produced in factories, rather than the private residences of weavers. This decisive shift greatly increased the efficiency of manufacturing in crucial respects such as speed and financial gain (Eissa & Koseoglu, 2019).

2.2 The proliferation of the use of plastics in manufacturing

Apart from revolutionary inventions in fabrics and textiles, the Industrial Revolution also witnessed similar breakthroughs in other industries. In 1907, Leo Baekeland, who became known as “the father of plastics”, developed a completely synthetic plastic polymer, which was not made from any natural resources (Mercelis, 2020). It bore the name of Bakelite and was used extensively in the manufacture of a diverse range of products, from radio cabinets to Art Deco jewellery. Plastic has been subsequently used in many different chemical forms and repeatedly been modified by scientists to the present day. Plastics have even been used to replace components that were previously made from other materials in vehicles and aircraft (Mercelis, 2020).

During this period, cotton and other fibres, both animal-derived protein and cellulosic fibres from plants, were used to make clothing. The fruit of the Gossypium genus of plants is known as a boll, an outer casing in which cotton seeds and lint grow. The lengths of the cotton fibres or staples are classified into three categories, namely, short, long, and extra-long staple, each of which is best suited to the manufacture of particular types of textiles (Hahn, 2020). Britain imported more than 50 million pounds of cotton to produce clothing from 1771 to 1780, to meet the dramatically increased demand to supply spindles and spinning machines at mills (Hahn, 2020).

In 1935, Dr Wallace H. Carothers invented the first completely synthetic fibre, nylon. As it has a protein structure, it provided an eminently suitable replacement for the natural fibres, silk, wool, and hair that had previously been consumed in large quantities by the textile industry (Corbman, 1983). Subsequent research into the work of Carothers by other scientists resulted in the development of polyester. The two main varieties of polyester are PET (polyethylene terephthalate) and PCDT (poly-1,4-cyclohexylene-dimethylene terephthalate). PET remains the most commonly used polyester, owing to its strength and versatility (Corbman, 1983). Because the fibre of polyester is highly pliable, it can be extruded and cut into staple fibres or filament fibres, to create polyester fibre that is able to mimic any natural fibre in appearance and replace natural fibres with similar properties. Polyester is both strong and resistant to abrasion if it is manufactured to a sufficiently high standard of quality. Poorly manufactured polyester is likely to be prone to the formation of small balls of fluff on the surface of the fabric known as pilling. Other favourable properties are good tensile strength, resiliency, thermal resistance and satisfactory drapability, low shrinkage and resistance to mould. The introduction of polyester was followed by the development of many other synthetic fibres, such as acrylics, modacrylics, elastane, polypropylene, and even glass fibres (Corbman, 1983).

By 1939, synthetic fibre nylon stockings were an essential item for most women in developed countries (Trossarelli, 2010) and the introduction of Tupperware plastic products marked the beginning of an era in which women began to participate in large numbers in the promotion and marketing of products in a manner that could not have been anticipated in the boardrooms of large manufacturing corporations. By 1951, Earl Tupper, who had begun by marketing his Tupperware products through traditional

distribution channels, realised that the products could be marketed more successfully through the holding of Tupperware parties and took the unprecedented step of withdrawing his products from the shelves of retail stores. Tupperware parties then became a source of income for many women, as the products, which were widely acknowledged to be of superior quality to that of similar products in retail stores, could be sold only through exclusive parties.

As it has been explained, the mass consumption of plastic products has fostered a "disposing instead of reusing" mentality among consumers (Clarke, 1999). Throughout the world, 500 billion to 1 trillion plastic bags are used each year and the plastic bag has emerged as a defining icon of waste and environmental degradation. Reducing the use of plastic bags has become an urgent priority for the governments of many countries. Many local governments are required by law to reduce the quantities of waste, including plastic waste, that enter landfills (Romer, 2010). The dramatically increased use of plastic bags has been accompanied by a doubling in the production of synthetic fibre during the last 20 years (Palacios-Mateo *et al*., 2021), which has resulted in the fast fashion industry having severely detrimental consequences for the sustainability of local environments. The retail cycle attributes waste at different stages, depending on the type of product a retailer produces. The cycle has a long and rich history in retail and serves as a basis for many product line decisions, in particular, packaged goods such as garments in polybags, accessories and footwear (Findlay & Sparks, 2002). High output, driven by low prices and company models with fast turnover of new fashion designs, have called into question the sustainability of the industry (Quantis, 2018) (McKinsey & Company, 2020). Garment production and thereafter, use, results in heavy environmental and social impacts, with apparel accounting for an estimated 5% to 10% of global greenhouse gas emissions (Mair, *et al*., 2016) (WRAP, 2017) ((Niinimaki *et al*). The rate of extraction of raw materials and the stress imposed on the natural world, as well as the impacts caused by the subsequent stages in the retail life cycle, are unsustainable (Roos *et al*., 2017) (Manshoven *et al*., 2019). Consumers have become accustomed to expecting new trends to appear in stores at an ever-accelerating rate. In addition, the longevity of mass-produced apparel has declined. In Germany it has been estimated that mass-produced garments now have a lifetime of only 4.4 years (Palacios-Mateo *et al*., 2021). With fast fashion production rates where it is currently due to clothing retailers waste

producing retail cycles, clothing not lasting and the increase of plastic and virgin polyester products, and retailers not investing in SDGs, the environment is at risk (Vijeyarasa and Liu , 2022) (Gray, S., *et al*. 2022).

2.3. The extensive use of synthetic textiles and plastics in the fast fashion industry retail cycle

Clothing and textiles reflect the materials and technologies that are available to civilisations in different eras. Although clothing fashions traditionally entailed the almost exclusive use of natural fibres, textiles that were made from synthetic fibres such as polyester came to the fore as rates of consumption began to increase dramatically (Claudio, 2007). The use of textiles is deeply ingrained in societies throughout the world and uses range from everyday clothing, protective clothing for firefighters and welders, camping equipment, homeware, cleaning, and even the manufacture of modes of transport such as air balloons. Although the fashion and textile industries make significant contributions to economic growth, they nonetheless pose a severe threat to the sustainability of the environments in which they operate (Gazzola, 2019).

The complete retail cycle of the retail clothing industry has been conceptualised as a “cradle-to-grave” cycle, from the “cradle” stage of creation, to use by consumers, to the stage of eventual disposal, which is characterised as the “grave” (Farrer & Fraser, 2011: 18). By contrast, relatively small but growing numbers of environmentally conscious consumers who wish to contribute to preventing the degradation of the natural environment are increasingly purchasing products that are manufactured in ways that are not environmentally harmful (Chamorro, 2009). Accordingly, discarded clothes are, to a correspondingly increasing extent, being diverted from landfill and incinerators and given a second life through innovative manufacturing and business practices. Retail cycles with wasteful processes show gaps, which can be improved by changing their attitudes and priorities. Insisting on products whose manufacturing processes do no harm and pressuring manufacturers and retailers to adopt environmentally ethical practices, consumers are beginning to campaign for a sustainable future (Russel, 1994).

The manufacturing of plastic products, one of the largest industries in the world, entails the use of polymers, or long-chain molecules (WWF, 2020). Although polymers occur in nature in forms such as silk, hair, proteins, and DNA, in the fashion industry items that are made from a diverse range of different plastic polymers are used. Apart from the extensive use of polyester fabrics that are manufactured from polyethylene terephthalate (PET) fibres, other items include buttons and hangers, which are usually made from polypropylene (PP) or Polystyrene (PS). Packaging materials include poly bags in which garments are packaged, e-commerce mailing bags, and various different filler materials, most of which are made from polyethylene (PE) (Holding, 2019). It has been reported that the production of plastic materials has increased by 4% each year since 2000 (WWF, 2020). Consumers are becoming increasingly aware of the destructive potential of plastics, particularly single-use plastics, through the publication of shocking images that convey the extent of the destruction, contamination, and pollution of marine environments and other wildlife habitats (Holding, 2019). Some South African retailers have reduced plastic production in their retail cycles by removing plastic from stores. Since this is not a government requirement like in other African countries, this is a gap in the South African clothing retail cycle. Other African countries such as Rwanda and Kenya have banned single-use plastic bags and started using recycled paper bags and reusable fabric bags instead. Only some industries such as restaurants are allowed to have plastic bags to store food that needs to stay preserved for long periods (Pretish, 2019). Bangladesh, Taiwan, Thailand, Papua New Guinea, Nepal, Philippines, and multiple states in India have banned plastic bags or have implemented plastic levies (Rayne, 2008).

The complexity of the fashion industry business model is predicated on long supply chains that include the obtaining and extraction of raw materials, the manufacture of textiles and other necessary items, the production and distribution of garments, and the operations of retail stores and online retailers. Although it has been suggested that consumerism has become a defining characteristic of modern societies (Stearns, 1997), the threat that it poses to the sustainability of healthy living conditions is becoming a steadily increasing cause for concern and even alarm in countries throughout the world. Conversely, this awareness is, to a large extent, offset by the myopia that widespread perceptions of shopping as an activity that is engaged in for

the sake of leisure, rather than necessity, encourages (Babin *et al*., 1994). Inevitably, the effects of rampant consumerism result in a direct conflict with the priorities of sustainability.

Throughout the world, fashion brands are starting to adopt sustainable strategies that take environmental, economic, and social priorities adequately into account, which has motivated them to start implementing sustainable product life cycles (Aneja & Pal, 2015). This trend has been prompted by the emergence and steadily increasing influence of the "sustainable fashion" consumer. A sufficiently comprehensive assessment of present business practices with respect to production, consumption, and disposal could provide an appropriate context for determining an optimal means of separating each phase and reveal the complexity of existing business practices in supply chains. To meet the needs of growing numbers of future customers who prioritise ethical practices and sustainability, the fashion industry needs to revise its existing philosophy and existing business models in a manner that permits its operations to remain profitable (Heydari, 2011). Overconsumption of clothing is premised on an outdated mode of consumption that privileges profit above all other considerations and is incompatible with the goals and priorities of ensuring the sustainability of the environment (Hethorn & Ulasewicz, 2008). The shift of emphasis to sustainability is articulated by the three pillars of sustainability, which includes the "people pillar", whose principal priorities are ethical behaviour and social development. By contrast, it has been suggested that the fashion retail industry could cynically endeavour to exploit the public preoccupation with the future of the environment as a social trend that could create opportunities for marketing, without making a sincere commitment to preventing environmental degradation (Farrer & Fraser, 2011).

The production of textiles for apparel by leading Asian countries and their subcontractors in smaller countries such as Cambodia and Vietnam continues to result in a proliferation of cheap clothing ranges, which is accompanied by a driving down of prices as a result of intense competition among suppliers and manufacturing countries (Farrer & Fraser, 2011). Cheaply priced garments have contributed to both the increased consumption of clothing and a tendency to discard garments soon after they are purchased, as a consequence of perceptions of consumers that they are of little value, owing to the poor quality of the fabrics and the construction of the garments,

which prevents them from surviving several washes (Fletcher, 2010). Rapidly changing fashion trends also contribute to the phenomenon. Purchasers will continue to exploit their economic strength as a consequence of the scale on which they consume, thereby providing manufacturers and vendors with opportunities to increase sales on a correspondingly large scale. A direct consequence is the production of ever-increasing quantities of apparel and related products for western markets at significantly lower unit prices than are generally available in those markets, often from less than trustworthy sources. Considerations concerning poor quality and poorly fitting garments continue to be relegated to being of lesser significance to consumers than those concerning style, short-lived fashion trends, and price (Farrer & Fraser, 2011). A growing global consensus is emerging concerning the urgent need to shift from the present linear take-make-dispose retail cycle model to a more circular approach, into which recycling is efficiently integrated (De Kock, 2020).

Continuously rising levels of clothing production inevitably draw heavily on available resources of natural crops such as cotton and linen (Borusiak *et al*., 2020). By contrast, synthetic fabrics, such as virgin polyester and nylon, are easier to produce and do not result in depleted natural resources, as they are synthesised entirely from synthetic monomers. Consequently, synthetic fabrics can be produced in sufficiently large quantities to maintain pace with the demand for fabrics that are needed to supply factories to make clothing, although it needs to be emphasised that synthetic fabrics have many disadvantages (Brooks, 2019).

2.3.1. The most commonly used fibre in the fashion industry

The most common synthetic fibre that is used by clothing manufacturers is virgin polyester. Polyester, a polymer, is very similar to plastic, as its identical molecular structure results in it being virtually indestructible (Suits & Hsuan, 2003). Although images of polluted land and natural environments are widely disseminated, relatively little data concerning extents and distributions of pollution and degradation in South Africa appears to be available at present. The largest data sets that are available concern amounts and composition of plastic waste that are found on South African beaches. A particularly significant finding is a dramatic recent increase in the quantities of disposable diapers that are found on beaches that are located close to informal

settlements (Ryan, 2020). Although there appears to be less information pertaining to the pollution and degradation of land, relevant available literature includes reports of cattle ingesting plastic while grazing (Wiseman, 2020). While data concerning the pollution of land in South Africa tends to be sparse by comparison with marine pollution as a consequence of plastic debris, to a certain extent it is possible to extrapolate from the findings of research that has been conducted in other countries (Jambeck, 2018).

The more consumers buy and dispose of synthetic products, the greater the hazards to the global ecosystem become. Although changing trends result in consumers disposing of clothing and plastic waste from discarded plastic products (Brooks, 2019), the alternatives that are provided by a circular economy enable plastic items to be reused or recycled (Niinimäki, 2017). The damaging effects of synthetic fibres on the global ecosystem are directly linked to the problem of pollution of the ocean by plastic debris. Marine animals have been found dead as a consequence of having ingested plastic bottles, bags, drinking straws, and other small plastic items (Ryan & Fraser, 2020). Close examination by marine protection teams has revealed microscopic textile fibres inside the digestive systems of these creatures (De Falco, 2018). In some cases, the continuous great harm that is being inflicted on ocean life has been proven to be irreversible (Brooks, 2019). Pollution as a consequence of microplastics, or minute particles of plastic debris, in aquatic ecosystems results from sources such as effluent from waste-water treatment plants (WWTPs), sewer overflows, discharges of effluent and industrial waste, and runoffs of agricultural and industrial sludge. In South Africa, urban runoff and pollution by informal settlements are other possible sources, as a consequence of littering and inadequate waste management. Microplastics can enter aquatic systems in two different forms, either as primary microplastics or as secondary microplastics, which form as products of the breaking down of larger plastic items (Barnes *et al*., 2009).

The introduction of microscopic fibres into the ocean can result from the washing of clothing that is made from synthetic fibres or blends of synthetic and natural fibres (Singh & Devi, 2019). During the washing cycle, washing machines flush out waste water (Hartline *et al*., 2016), which, if it is connected to waste water lines, is eventually flushed into the ocean (Mani *et al*., 2015). The size of plastic items influences their

environmental transport once they have been released. Small microplastics, even heavier-than-water polymers such as PET, tend to be retained in the water, while larger particles precipitate more quickly (Khan, 2011). Plastic in the water becomes covered by layers of biofilm. The more biotic material attaches to particles of plastic, the heavier they become and ultimately sink (Ryan & Fraser, 2016). This process affects the movement of plastic particles and debris in fresh water and, potentially, their ability to make their way into marine environments (Nel & Dalu, 2017). The movement of plastic in natural environments can take a number of different forms. Rivers serve as the main conduits for plastics and can affect their ability to migrate to marine environments. As plastics sink, particularly in freshwater beds that have relatively low density, microplastics sink intermittently and are moved further downstream through the action of currents (Verster & Bouwman, 2020), where they are consumed by marine life foraging for food. Ingestion of plastic waste and microplastics by fish and other marine life throughout their lifespans could have a number of possible outcomes. Some might die from starvation or poisoning, while others might die from natural causes or be caught for human consumption, which could have dire implications for the human end of the food chain (Brooks, 2019).

The market share of the fast fashion industry, which can be defined as the rapid production of clothing to keep pace with ever-changing trends, to meet the demands of consumers, has grown substantially in recent years (Brooks, 2019). Fast fashion has become a representative of unsustainable practices, although the rapid turnover of the fashion market is not the only factor that drives unethical practices or contributes to environmental degradation. Instead, fast fashion could be conceptualised as a mode of consumption that encourages increased sales and stimulates economic growth, although it can also have adverse ecological and social consequences. Fletcher (2010) explains in the publication *Fashion Practice* that there are specific questions concerning how speed affects the ability of the fashion industry to act in accordance with ensuring the sustainability of natural environments in respects such as economic systems, business models, and value sets. Choosing practices that promote sustainability requires retailers to evaluate their products in relation to methods of production and present business models, in respects such as purchasing decisions, quality, materials that are used to manufacture products, packaging, and variety (Bocken *et al.*, 2014). Clothing retailers are able to ensure that suppliers

conform to practices that promote sustainability by developing appropriate business models. As it has been pointed out, growing numbers of consumers identify with the values of companies that do not only emphasise low prices, but also quality and sustainability. Business models that prioritise sustainability can contribute to reducing plastic and textile waste (Peters *et al*., 2019) and encourage changes in the behaviour of consumers with respect to social and environmental considerations pertaining to sustainability (Ruiz-Real *et al*., 2018).

Inditex Zara, an international fashion retailer, was named as the company in the fashion industry that demonstrated the most commitment to sustainability by the Dow Jones Sustainability Index in 2018, owing to its stance concerning environmental sustainability. The company has reviewed all phases of its operations, from purchasing decisions to logistics, to reduce the use of resources and employ methods that accord with priorities concerning sustainability, without compromising the quality of products that are offered to consumers (Inditex Zara, 2020). According to Pablo Isla, the chief executive officer (CEO) of Inditex Zara, quality and standards are core values of the company, along with a commitment to a circular economy, recycling, reusing garments, social obligations, and eco-efficiency (Harvard Business Review, 2017). These values correspond to the three circles of sustainability, namely, environment, social, and economy, whose overlapping concerns converge on sustainability. As they strive to minimise waste, business models that prioritise sustainability incorporate both eco-design and strategies to maximise eco-efficiency (Brocken *et al*., 2014).

Pure Waste, a European retailer that creates clothing from waste, reuses all waste, this includes cuttings or off cuts created from production instead of virgin fibres. The retailer has already saved 3,878,439,600 litres of water and 2,375,400 kilograms of CO2e emissions (December 2020). For the year 2020 they have recycled 489,265 kilograms of textile waste and created a new life for clothes. The environmental impact of manufacturing comes from the raw materials, specifically cuttings. By utilising cutting waste, new value as a raw material can be created instead of sending it to incinerators or landfills (Pure Waste, 2020). I find that this is one of the most valuable findings of this study as the retail industry creates post-consumer waste and pre-

consumer waste in textiles and plastic and by reviewing the entire retail cycle, it is evident that the first stages of the retail cycle is one of the biggest causes of the production of textile and plastic waste. Studies show that creating fibres have many different operations that all contribute to waste: fibre production, yarn production, fabric production, pre-treatment, dyeing, printing and finishing treatment (Patti, et al, 2020). The common flow chart of the textile production starting from fibre up to finished fabric is shown below:

Figure 2.1.: General Progressive phases of textile production (adapted from Patti, et.al. 2020)

The yarns and fabric production represent one of the most polluting processes of the industrial world. The environmental impact of the textile process is harmful. In addition, textile waste constitutes an additional issue for environmental sustainability. Raw materials are divided into two main categories: natural fibres, which are derived from vegetables and plants, such as the cotton plant, flax, hemp and ramie to name a few. Animal fibres (protein) such as wool, silk and cashmere to name a few. Then there are man-made fibres, also known as synthetic fibres such as polyester, nylon, elastane and acrylics, these are derived from petroleum-based resources. There are also regenerated fibres, these are viscose, lyocell and modal, and these are made from wood pulp and combined with chemicals to create a fibre. Each of the fibre types require treatment with different chemical agents. For natural fibres typically, many litres of water is used, pesticides, insecticides and fertilisers. The farmers apply these to facilitate growth. With animal fibres parasites may be used, after the hair is removed or shed, chemicals are used to clean the hairs. Synthetic fibres are made from chemicals from the beginning, a solution is extruded through a spinneret (similar to a shower head) which create long fibres called filament fibres, these fibres are cut to various sizes depending on the type of fabric that the mill wants to construct to achieve certain fabric characteristics. The production of synthetic fibres usually generates toxic

by-products (Patti, et al., 2020). Polyester dominates production due to its strength, ease of manufacturing and cost-efficiency, and is projected to increase further as consumers in emerging Asian and African economies begin to adopt Western lifestyles and dress. In an article featured in Nature Reviews Earth & Environment, a study shows the growth in global population and textile production for cotton, polyester, non-cotton cellulosic, polyamide and polypropylene with silk and wool. It shows that the production of textile in 2015 was rising above the population growth, this truly shows that fashion has grown immensely and that there is a need for the industry to slow down.

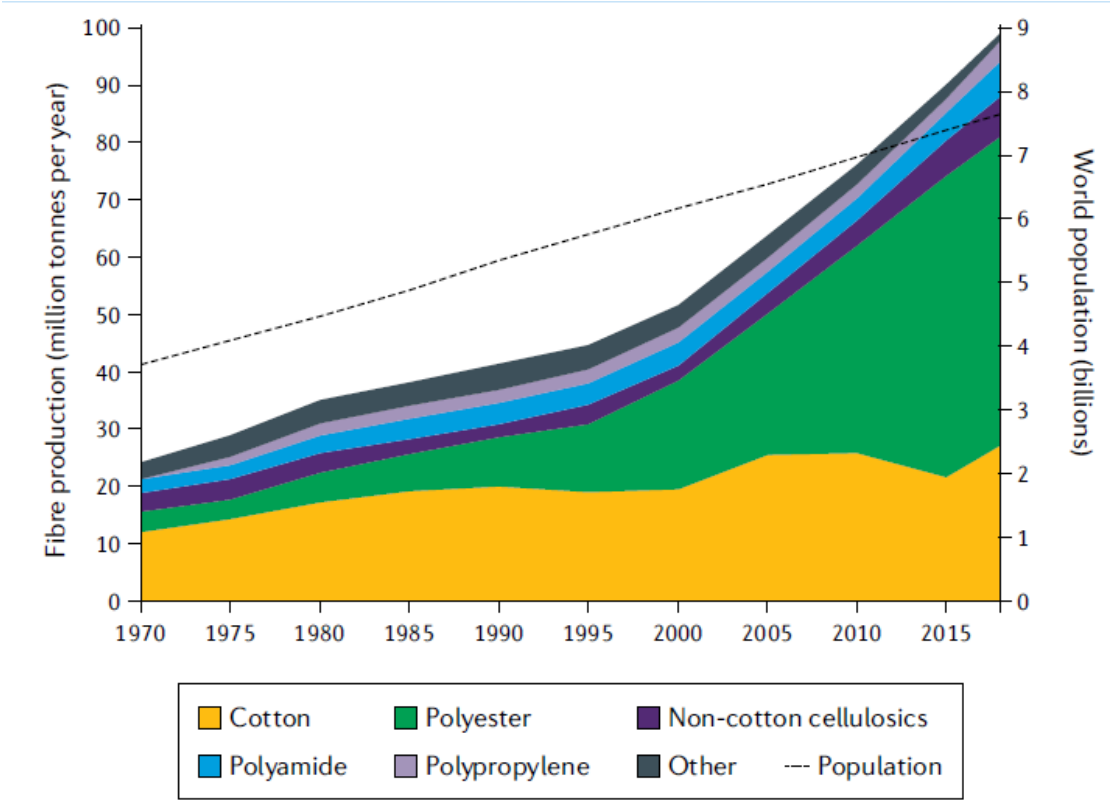

Figure 2.2.: Fabric production growth versus population (Niinimäki, *et al.*, 2020)

Once the yarn is made, the fabric production starts. Textiles are transported to garment manufacturers for assembly (cutting and sewing). Typically, each step of garment production occurs in a different country, which increases the logistic steps between processes. Given that developing countries generally hold the competitive

advantage in manufacturing due to cheap labour costs, textile production has mostly shifted to these nations. Textile exports have grown as countries such as Bangladesh, India, Vietnam, China and Indonesia as fast fashion demands have increased. In addition to textiles, trims (sewing threads, buttons, zippers, linings, labels and lace, for example) are used in garment construction. Typically, in South Africa trims sourcing is largely determined by labour costs, therefore are sourced from countries such as India, China and Bangladesh (Niinimäki, et al., 2020). During the production of fibres and fabric, textile waste develops, this is known as pre-consumer waste.

There are a number of different designs for sustainability models in academic literature. The improvement or implementation of business models that prioritise sustainability can contribute to significantly reduced adverse consequences for the environment and society, or even have beneficial effects, by changing the ways in which business organisations and their networks create, deliver, and capture value to create economic value, or by changing their value concepts. When all relevant considerations pertaining to sustainability are taken adequately into account and successfully integrated in a business model, it should be possible to develop a balanced model to ensure sustainability, whose three pillars are depicted in the diagram in Figure 2.1 (Purvis *et al*., 2018; Brocken *et al*., 2014).

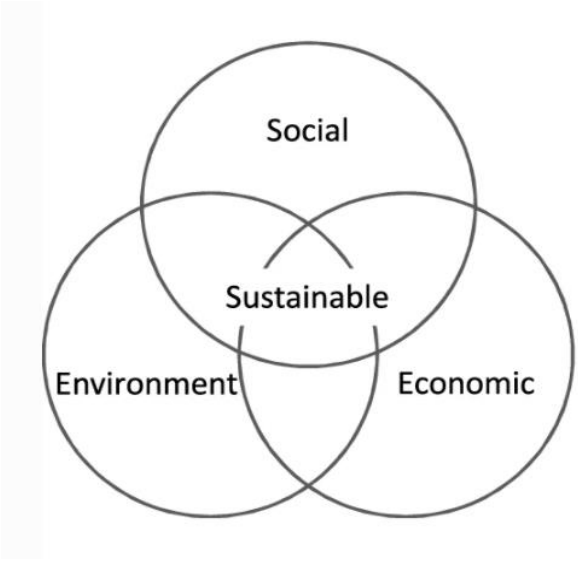

Figure 2.3: The three pillars of sustainability (Source: Purvis, 2018:682)

2.4. SUMMARY

Textiles and plastic have been in existence for many years. Textiles started in natural fibres forms but as the demand for fashion increased and resulted in the development of synthetic fibres, such as virgin polyester and virgin nylon (Corbman, 1983: 346). Simultaneously, plastic was developed and became a household item, to the extent that society changed to having a throw-away mentality (Clarke, 1999). Shopping has become an activity of leisure, shopping is not done for necessity, but rather out of luxury (Babin *et al*, 1994). The more consumers buy and dispose of synthetic products, the more the environment is harmed. Consumers buy clothing and plastic products and as trends change, they continue to dispose, creating post-consumer waste (Brooks, 2019). In a circular economy' approach, plastic items are designed to be reused or recycled (Niinimäki, 2017). The damaging effects these fibres have on the ecosystem is linked to the problem of ocean plastics.

In South Africa, urban run-off and informal settlements are other sources due to littering and inadequate waste management. Micro-plastics enter water systems in two different forms. They can enter the system as primary micro plastics or as secondary micro plastics that form as breakdown products of larger items (Barnes *et al*, 2009). Fast fashion can be defined as the rapid production of clothing, in keeping pace with ever-changing trends, to meet the demands of society has grown substantially in market share (Brooks, 2019). Fast fashion has become a representative of unsustainable practices, although the speed of fashion is not the only factor that determines unethical or environmental damage. Fast fashion instead is a tool that is used to create profitability that has ecological and social effects. According to Fletcher's book *Fashion Practice*, there are questions around how speed affects fashion's ability to be sustainable where economic systems, business models and value sets are concerned (Fletcher, 2010). For retailers to be environmentally sustainable, the products must be relooked, production and business model processes, (e.g.: buying, quality, production, packaging, assortment) (Brocken, *et al*, 2014).

CHAPTER 3: RESEARCH PARADIGM

3.1. Introduction

In this chapter, the methodological choice is presented. The structure is based on the research design framework known as the research onion (Saunders et al., 2019). Research can be defined as “an activity that involves finding out, in a more or less systematic way, things you did not know” (Walliman and Walliman, 2011,). “Methodology is the philosophical framework the research is conducted in or the foundation the research is based on” (Brown, 2006).

3.2. Methodical choice

In this study, a qualitative research methodology was developed. In qualitative research, case studies are often used to conduct exploratory studies of particular events, occurrences, or phenomena, in order to develop a holistic understanding of them by evaluating the lived experiences of participants, through their subjectively expressed perceptions, beliefs, and opinions. Accordingly, qualitative data is collected in the form of words, rather than numbers. Niemann (2005) describes qualitative research as any type of research that produces findings not arrived at by statistical procedures or other means of quantification. Data was collected through interviews. Interviews were chosen as a method for collecting data in this study because they provide much more detailed information than what is available through other data collection methods (Boyce & Neale., 2006).

A research methodology is essentially a detailed plan that is drawn up to guide the conducting of a research study. This chapter is devoted to an in-depth discussion of the research design and the methods that were used to obtain answers to the research questions that were articulated in Chapter 1. It begins with a recapitulation of the research questions and the aims and objectives of the study and proceeds with a comprehensive elucidation of the philosophical assumptions that were inherent in the

research paradigm, the types of research methods that were used to conduct the study, the research strategy that was adopted, and the time horizon of the study. The sampling strategy and the methods that were used to collect and analyse the data are also discussed, before the chapter concludes with an evaluation of the limitations that were inherent in the research design and methodology.

The aims of the study were:

- To investigate and evaluate the present retail cycle of one retail chain and identify the steps in that cycle that potentially contribute the most waste.
- To identify the types of textile and plastic waste that negatively affect the sustainability of the local environment.
- To develop an improved retail cycle model that will reduce plastic and non-recyclable waste and prevent the negative effects that they have on the sustainability of the environment.

The objectives of the study were:

- To plot and review the retail cycle of the company and identify the steps in the cycle that generate the most waste that takes 20 years or more to degrade, through an overall assessment of its operations, in respects such as planning, marketing, buying, design, technology, and distribution.

- To identify the types of non-recyclable textile and plastic waste that negatively affect the sustainability of the local environment.

- To develop an improved retail cycle model that demonstrates how the quantities of plastic and non-recyclable textile waste that are generated can be reduced or prevented from reaching landfill sites, to minimise the depletion of local natural resources.

The following research questions were formulated from the aims and objectives:

- What are the essential characteristics of the clothing and fashion retail cycle of a single leading company that has its headquarters in Cape Town at present?

- Does the retail cycle of this company negatively affect the sustainability of the local environment as a consequence of plastic and textile waste that is generated?

- How can a more sustainable retail cycle be developed in the local region, on the basis of an investigation of the operations of one leading retail company that has its headquarters in Cape Town, South Africa, with the specific aim of reducing the generating of waste?

3.3. THE RESEARCH PARADIGM

A research paradigm, which is sometimes also referred to as the conceptual framework of a research study, is a set of philosophical assumptions that underlie particular approaches to conducting research. It encompasses both epistemology, which expresses assumptions concerning how knowledge is acquired or generated, and ontology, which concerns the assumptions that are inherent in conceptions of the nature of existence or reality. Accordingly, research paradigms reflect the influence of particular philosophical schools of thought on approaches that are adopted to conducting research. The core assumptions of each philosophical orientation play a crucial role in the formulation of relevant research questions, the methods that are used to conduct a study, and the interpretation by researchers of the findings that their studies yield. Apart from epistemological and ontological assumptions, axiological assumptions can also play a significant role in research, as they concern the extent to which the ethical values of individual researchers colour their interpretations of their findings (Saunders *et al*., 2007:102). In addition, epistemological assumptions effectively set the limits of acceptable, valid, and legitimate types of knowledge and determine how it can be communicated to others. Although knowledge can be obtained from many different sources and conveyed in a diverse range of forms, from numerical, textual, or visual data or from facts to opinions and include narratives and

stories, its legitimacy would be determined largely by the research paradigm that has been adopted to conduct a particular study (Martí & Fernández, 2013). The two epistemological poles in research are represented by objectivism and subjectivism, whose central tenets are summarised in Table 3.1.

Table 3.1.: Summary of central tenets of objectivism and subjectivism

Question	**Two sets of continua (two extremes)**	
	Objectivism	**Subjectivism**
How do we know what we know?	In relation to the assumptions of the natural scientist	In relation to the assumptions of the arts and humanities
What is considered acceptable knowledge?	Facts and numbers	Written or spoken expressions of perceptions, beliefs, or opinions and visual accounts
What constitutes data that is of adequate quality?	Observable phenomena	Attributed meanings
What kinds of contributions to knowledge can be made?	Law-like generalisations	Contributions that are specific to individual contexts

(Source: Saunders *et al*., 2019:135)

The research paradigm that guided the conducting of this study was both subjectivist and interpretivist. Qualitative research methods entail the interpretation of verbal data, by contrast with the positivist paradigms that are used to conduct quantitative research, which entails the use of scientific quantitative research methods and the analysis of quantifiable data. An approach that is informed by empirical interpretivism

entails the interpretation of qualitative data that is obtained from conversations, observations, and relevant documents, to develop theories concerning events, occurrences, and phenomena that are of interest, rather than an endeavour to test hypotheses. A central assumption is that as reality is unique to each observer and based on individual perceptions, beliefs, and experiences, human behaviour and non-human phenomena cannot be studied in the same way. When researchers use an interpretivist paradigm, they endeavour to understand the phenomena in which they are interested from the individual viewpoints of the participants of their studies (Saunders *et al*., 2009).

3.4. THE RESEARCH DESIGN

A research design refers to an overall strategy that is chosen to integrate the different components of a research study in a coherent and logical manner, thereby ensuring that the research problem is adequately investigated and research questions are sufficiently comprehensively answered; it constitutes the blueprint for the collection, measurement, and analysis of data (Baskaran *et al*.,2012).

This case study concerned a single company in the local clothing industry, which was initially designated as *Company R.* A case study is defined by Miles and Huberman (1994: 25) as a study of "a phenomenon of some sort occurring in a bounded context", with the case being "in effect, your unit of analysis". This case study entailed performing an in-depth analysis of the different phases of the retail cycle of a fashion retail chain whose headquarters are in Cape Town, to develop a model that enables all phases of the cycle to have the least possible adverse consequences for the sustainability of the local environment.

The extent to which research studies are concerned with testing existing theories or developing new ones plays a crucial role in determining the types of research questions that are formulated to guide them. Types of research study and choices of research methods usually reflect the type of reasoning that is employed, whose polar opposites are deductive and inductive reasoning (Ketokivi & Mantere, 2010). Inductive reasoning is particularly common in interpretations of subjective perceptions, beliefs,

or opinions, which are informed by the specific contexts in which the events, occurrences, or phenomena in which particular researchers are interested take place. Accordingly, inductive reasoning is generally applied to studies of relatively small samples of participants, by comparison with the large research samples that are used in quantitative studies such as surveys. Traditionally, case studies entail the use of a variety of qualitative research methods to collect data and view phenomena from a number of different perspectives (Saunders *et al*., 2019). In this study, qualitative research methods were used to collect textual data whose analysis and interpretation was concerned with verbal narratives, rather than the analysis of quantitative data by means of statistical procedures or other related analytical methods (Chigbu, 2019). Table 3.2 provides a relevant excerpt from a table that summarises the essential characteristics of a number of different types of qualitative research studies.

Table 3.2: Essential characteristics of case studies

Type of study	**Approach to research or enquiries**	**Methods used to collect data**	**Methods used to analyse data**	**Forms taken in scientific writing**	**Epistemological orientations**
Case study	Examination of episodic events, specifically to answer "how" questions	Interviews, observations, contents of documents, and physical inspections	Detailed identification of themes and development of narratives	In-depth study of possible lessons that can be learnt from a case or cases	Social constructionism, feminism, and constructivism (including interpretive and reflexive approaches) in positivist and post-positivist perspectives

(Source: Adapted from Chigbu, 2019:6)

A case study is a particularly effective means of developing a comprehensive understanding of a particular event, occurrence, or phenomenon from the lived experiences of the people who participate in it or are affected by it. Extensive analysis

and description is used to gain a complete understanding of a case or complex bounded system, in a real-life context, to determine cause-and-effect relationships (Wholey *et al*., 1994). Case studies are particularly suitable for research that is concerned with moving between theory and practice (Breslin & Buchanan, 2008).

There are three principal categories of case studies, namely, exploratory, descriptive, and explanatory. Exploratory case studies are conducted to carry out initial investigations of events, occurrences, or phenomena about which relatively little is known. By contrast, descriptive case studies are conducted to identify and describe the specific characteristics of particular units of analysis, in the context of the definition of Miles and Huberman (1994:25) that was cited earlier. As the name suggests, explanatory case studies are conducted to answer "how" and "why" questions in real-life situations. The research report that this case study generates will be highly descriptive and represent an endeavour to discern subtle differences, to provide an appropriately nuanced portrayal of the unit of analysis (Wholey *et al*., 1994).

As this study is a single case study, it concerns a single retail fashion company only, while multiple case studies are conducted to obtain more generalised findings concerning the units of analysis in which researchers are interested. *Company R* was used as the case in this study, because it was representative of many other retailers in the South African clothing industry, in that the business model for its retail cycle is very similar, if not identical, to that of other South African clothing retailers. Its success in its specific market makes it a reliable representative of the industry as a whole.

The approach of the study is holistic, in that the operations of the company were studied in an integrated manner, by investigating every process and relationship within the company, to identify the types of non-recyclable textile and plastic waste that negatively affect sustainability, with the ultimate aim of developing an improved retail cycle. Developing a narrative by listening closely to participants explaining their roles within the organisation and analysing the significance of the verbal data that they provided facilitated the emergence of an understanding of the functional purpose of each department, its role in the retail cycle, and how it was integrated with those of other departments. Carefully noting the tones in which the participants expressed themselves and their verbal and physical mannerisms permitted crucial insights to be

gained into the subjective perceptions that underpinned the beliefs and opinions that they expressed.

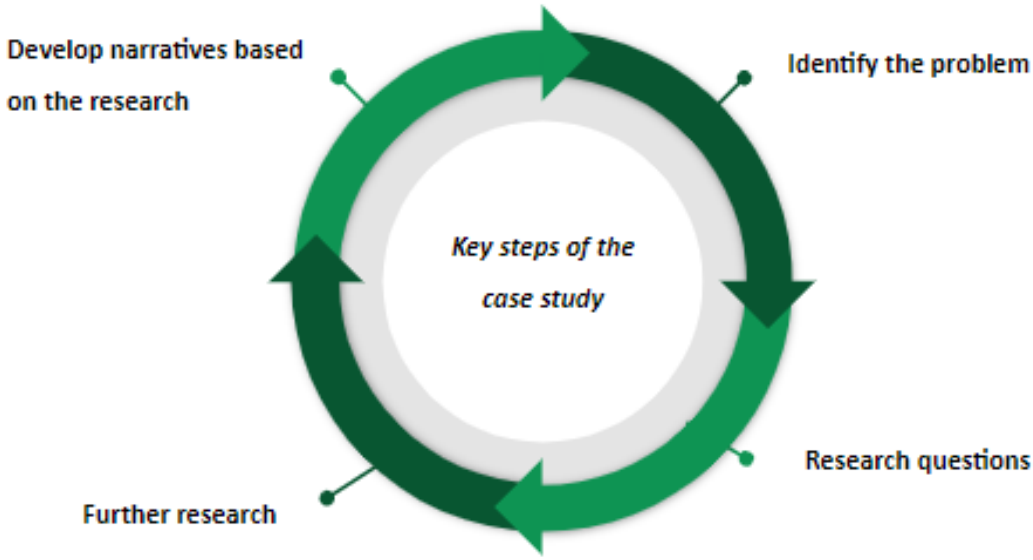

Figure 3.1: Key steps of a case study
(Source: Adapted by the researcher (2020) from Wholey *et al*., 1994:164)

Figure 3.1 provides a diagrammatic depiction of the steps that were followed to conduct the study. The research questions were formulated primarily to obtain descriptions of the operations of the phases of the retail cycle and to explain why they took the forms that they did. Once the data had been collected, the study continued as a descriptive investigation. Qualitative methods were used both to obtain sufficiently detailed data and assess the validity of the information that the participants volunteered (Breslin & Buchanan 2008). The model for an improved retail cycle with respect to the sustainability of the local environment was developed from both the data that was collected and the relevant available literature that had been consulted. The descriptive case study made extensive use of narrative methods.

Narratives provide information that does not pertain only or directly to the events that unfold during the conducting of a study. A narrative entails both a narrator and a listener, the perceptions, beliefs, and opinions of both of whom could affect how a

story is told and how a listener interprets its content. Narratives extend beyond simply reporting the actions of individual participants or how they are affected by the roles that they perform and include expressions of their subjective feelings and their perceptions of how they are perceived by the people with whom they interact (Fisher, 1984). It is crucial to appreciate that the experience that is conveyed by one person to another could result in two different versions of the same narrative, with both being equally true. By contrast with a list of specific criteria for evaluating the validity of statements or a description of the outcome of an experiment, there is no self-evident definition of what is relevant or irrelevant in a particular narrative. The decision concerning what is to be revealed to a listener and what is to be omitted is the sole prerogative of a narrator and can be changed at his or her discretion, in response to the questions of the listener. Accordingly, a narrative engages a listener, invites an interpretation, and enables researchers to obtain an in-depth understanding of the lived experiences of participants, as opposed to relying on purely factual appraisals of them (Greenhalgh & Hurwitz, 1999).

3.4.1. Time horizons

Saunders *et al*. (2009) explain that time horizons define the time frames of research studies. A narrative that follows a longitudinal time sequence has a beginning, a series of unfolding events, and, typically, an ending. While in longitudinal studies data is collected over a lengthy period, cross-sectional studies entail collecting data on a single occasion. Figure 3.2 depicts the research onion that Saunders *et al*. developed to provide a highly detailed sequence of steps to organise the planning of a research study. In accordance with onion analogy, layers are progressively peeled away, from the underlying philosophical assumptions of the research paradigm to the eventual collection, analysis, and interpretation of data. The layers of the onion that have been covered in this chapter are labelled in bold script.

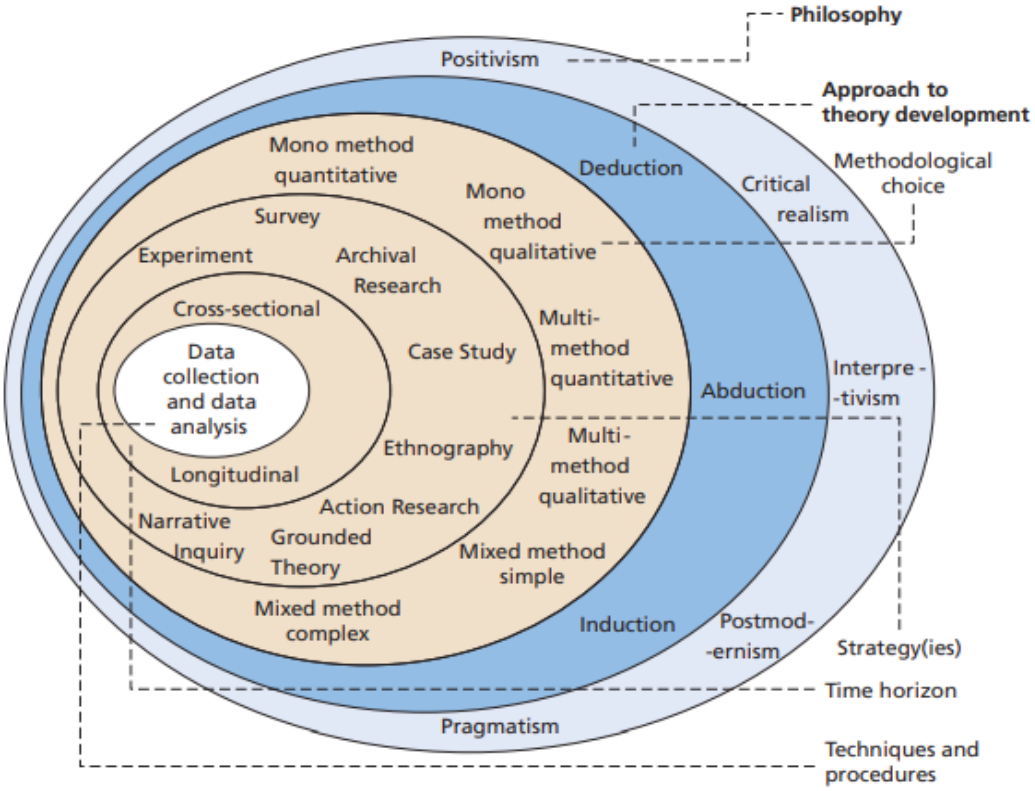

Figure 3.2: The 'research onion'
(Source: Saunders *et al*., 2019)

The research questions and the aims and objectives of the study determined the time horizon. Cross-sectional studies are typically relatively inexpensive to conduct and take considerably less time to conduct than longitudinal ones. As the study was limited by time and the research did not require a long period of time to conduct, a cross-sectional study was most appropriate. Most research studies that are included in the requirements for academic qualifications are cross-sectional, as study courses are usually expected to be completed within specific time periods (Saunders *et al*., 2009).

3.4.2. Population group

The research was conducted within one retail brand. This brand forms part of a larger group within a retail company in South Africa. The focus group was made up of senior retail employees as these employees would have the most experience within the company. The participants in the company were selected based on who I thought

could provide the best information. The decision was made in conjunction with the brand manager and CEO who were interviewed first. The participants were a mix of males and females, who have experience in the retail industry that qualifies them as a senior. A population group by definition is an entire group that a researcher wants to draw conclusions about, a sample is the specific group that data will be collected from. The sample size is always less than the total size of population (Forman and Damschroder, 2007).

The population group contains the below 22 participants:

Management	**Employees**
CEO of brands	Buyer A
Brand Manager	Buyer B
Marketing manager	Buyer C
	Buyer D
	Buyer's Assistant A
	Buyer's Assistant B
	Product technologist A
	Product technologist B
	Designer A
	Designer B
	Planner A
	Planner B
	Merchandise Coordinator
	Digital Coordinator
	Visual Merchandiser
	Area Manager A
	Area Manager B
	Distribution Manager
	Quality Control Manager

3.4.3. Sampling techniques

Sampling techniques are usually divided into two broad categories, namely, probability and non-probability sampling. Non-probability sampling entails selecting research samples deliberately, rather than randomly, while probability sampling theoretically affords each member of a research population an equal probability of being selected for a research sample (Etikan & Bala, 2017). Purposive non-probability sampling was used to select the research sample for this study. The main types of non-probability sampling are:

- Quota sampling, in which representative samples of homogenous groups are selected on the basis of specific sets of characteristics.
- Purposive sampling, which entails selecting cases or participants in accordance with their ability to provide information that is needed for particular research studies.
- Volunteer sampling, which entails participants volunteering to participate in studies. Snowball sampling is a variant in which participants refer researchers to other prospective participants whom they believe would be able to supply the information that they require.
- Haphazard sampling, or selecting participants or cases on the basis of their availability (Henry, 1990).

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- Haphazard sampling, or selecting participants or cases on the basis of their availability (Henry, 1990).

3.4.4. Sampling of participants

The research sample was selected by means of purposive sampling, as the technique permitted participants to be selected on the basis of their ability to provide information that was relevant to the research topic (Etikan & Bala, 2017).

The participants were chosen on the basis of their knowledge and experience in their specific fields. The study commenced with a workshop with the first two participants, the brands manager and brands CEO of *Company R*. As ethical clearance was obtained to cite the name of *Company R*, its identity can be revealed without violating the ethical standards of professional research in the social sciences. During the course of the workshop, all of the stages of the retail cycle were plotted and integrated to create a model. The senior employees in each department that participated in each stage of the cycle were identified, after which interviews were conducted with a research sample of 18 senior members of staff, each from different departments.

Interviews were conducted in phases, by department, as follows:
First phase: The Product Team
Buyers, Buyer's Assistants, Planners, Designers and Product Technologists

Second phase: Product Technologists, Designers, Marketing team

Third phase: Product Technologists, Marketing team, Quality Control Manager, Distribution Manager and Area Managers

3.4.5. Commonly used methods for collecting qualitative data

Research methods for collecting qualitative data include interviews, focus group discussions, direct observations, and surveys.

3.4.6. Data Collection

As the researcher I conducted in-depth interviews with different employees within one retailer that are involved in the retail cycle process. Interviews can be structured, semi-structured, or unstructured. Semi-structured interviews were chosen, as they facilitated making optimal use of the advantages of both structured and unstructured interviews. Although semi-structured interviews entail the use of an interview guide, which contains a list of predetermined questions or subjects for discussion, they nonetheless allow a degree of flexibility that is not possible in structured interviews and enable researchers to probe for additional information. By contrast, unstructured interviews take the form of informal conversations concerning specific topics, in which interviewers ask open-ended questions and allow discussions to develop in an unpredetermined manner (Saunders *et al*., 2015). This interaction with participants was through in-depth interviews to obtain the best quality information in the chosen case study. According to De La Harpe (2008) Interviews are good methods to find out what information participants think, believe and why they react in a certain way. Data was also collected from company documents such as business process documentation, working documents and departmental training manuals. The next section discusses the collected data that will be analysed.

3.4.6.1. Interviews with senior members of the company

I considered that unstructured or semi-structured interviewing methods would be advisable based on this single case study, as they are often used by interviewers who are unfamiliar with particular fields of research or phenomena (Saunders *et al*., 2015). Although I have worked as a professional in the fashion industry for a considerable

number of years, as I was unfamiliar with specific details pertaining to waste in the retail cycle, I chose to conduct semi-structured interviews.

To ensure that the verbal data that the interviews generated was not contaminated by distractions, all participants were interviewed in a private environment, in which only the interviewer and interviewee were present (Saunders *et al.*, 2015). I requested times for the interviews that best suited the participants, to ensure that they were comfortable and that their responses were provided with a clear mind. The purpose of each interview was to sift through the steps in the retail cycle, first to determine which processes in each department produced non-recyclable textile and plastic waste and, secondly, to identify the types of waste that potentially threatened the sustainability of local environments.

Content, thematic, and discourse analysis are some of the techniques that are used to analyse qualitative data. Although all provide the means of obtaining a rich understanding of any given phenomenon, the perspectives that they provide differ (Breakwell *et al*., 2020). Content analysis is used to describe phenomena in a conceptual manner (Elo & Kyngäs, 2008), with data being representational, in forms such as images, expressions, and texts, rather than descriptions of physical events (Krippendorff, 2004).

Discourse analysis concerns the analysis of speech and texts and can be performed on informal conversations, interviews, or written texts, in relation to specific social contexts. Its primary aim is to understandCha how language is used in real-life situations (Bauer & Gaskell, 2007).

Thematic analysis is a descriptive approach to analysis and has been described as “a method for identifying, analysing, and reporting themes (patterns) within the data” (Braun & Clarke, 2006). Thematic and content analysis are similar, in that they are used to perform analyses of the speech of narrators by grouping text into small units of content and submitting it to descriptive treatment (Sparker, 2005). The patterns that emerge allow researchers to analyse text in relation to the research questions that they have formulated to identify the aims and objectives of their research studies.

Thematic analysis of text from interviews entails the identification of common patterns that recur throughout entire interviews or sets of interviews (De Santis & Noel Ugarriza, 2000). In some instances, the analysis generates answers to questions that become apparent only in the course of analysing the data. The purpose of an analysis is to locate portions of text that are relevant to answering specific research questions (Braun & Clarke, 2012).

Thematic analysis was used to analyse the data, as it allows both accessibility and flexibility. It provides a means of conducting research that could otherwise seem vague, mystifying, conceptually abstruse, and excessively complex. It offers a way into qualitative research that makes use of coding and systematic analysis of qualitative data that can be aligned with broader conceptual or theoretical concerns and considerations (Braun and Clarke, 2012).

The data was analysed in accordance with the steps that are prescribed in the interactive model that Miles and Huberman developed (Miles & Huberman, 2018), namely:

- Collect data
- Condense data
- Display data
- Draw and verify conclusions

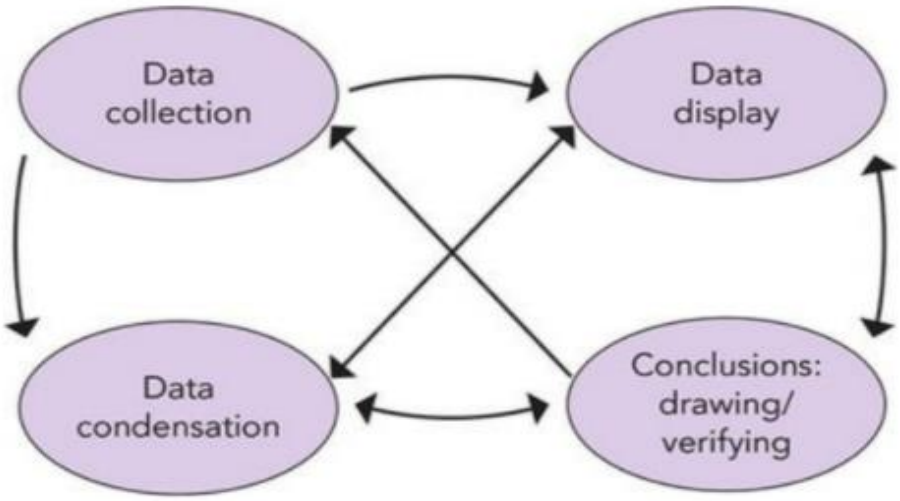


Figure 3.3: Components of an analysis of qualitative data
(Source: Adapted by the researcher from Miles and Huberman, 2018:10)

After each day of the investigation, irrespective of whether it had taken the form of a workshop, an interview or set of interviews, or an investigation of documents obtained in interviews, in accordance with the steps that are recommended by Miles and Huberman (2018), I allocated time as follows:

- One or two days of reading through notes, recording and filing them under appropriate code names, dates, and times, for the purpose of revisiting the data at a later stage and being able to locate it efficiently and effectively.
- From two to three days to creating displays for the purpose of reading and understanding the data visually, to render it easily dissectible to permit the research questions to be answered sufficiently comprehensively (Miles & Huberman, 2018).

The data was saved by using predetermined codes to create a filing system, in order to locate, analyse, and interpret all of the data that had been gathered. It was then split into categories and filed in folders that were labelled with codes that were derived from the departments in question and the stages of the retail cycle in which they participated. The next step entailed condensing the data by abstracting and simplifying the information that had been collected in the recorded field notes from the workshop, interviews, relevant documents, literature, and all other materials that had been collected during the investigation. Condensing the data facilitated sorting the information and discarding irrelevant material to allow the types of waste to be categorised according to the times that it took to degrade and the toxic effect that it could potentially have on the environment.

The data was collated in the form of a display of the assembled condensed information, which allowed me to analyse, reflect, and act upon it in a systematic and methodical manner. The display took the form of graphs, spreadsheets, and mind maps, rather than lengthy notes, which could subconsciously encourage trying to process the information that had been collected too rapidly and result in overlooking elements of the findings that would otherwise have had a significant bearing on the conclusions that could be drawn from them. The final stage of the analysis entailed drawing and verifying conclusions. Although interpretations can be made at the

beginning of an analysis, to facilitate recognising provisional patterns or developing tentative explanations, conclusions need to be drawn only in the final stage, to maintain an appropriate level of scepticism until the findings can be verified against factual evidence that has been gleaned from the literature (Miles & Huberman, 2018).

3.5. LIMITATIONS OF THE RESEARCH METHODOLOGY

3.5.1. Interviews and time

The participant interviews (of 22 participants) were restricted in time and as this one company is a very complex business and large retailer, the employees only had a limited amount of time to be interviewed. Once the data was reviewed, as the researcher I realised that not all research was covered. Participants were willing to complete follow-up questions as part of the research, therefore follow-up questions were sent to each participant including additional participants, in the form of a follow-up questionnaire.

Sample size consistent of 22 participants from *Company R*.

3.6. SUMMARY

This chapter represents an attempt to provide a comprehensive and systematic detailed overview of the development of this research study, from the outermost layer of the research onion, in which its conceptual foundations are discussed, to its core, the collection and analysis of data and the conclusions that were drawn from the findings that the analysis and interpretation of it generated. The purpose of the chapter is twofold. First, it is essential for the study to demonstrate that the researcher is entirely conversant with all aspects of research. Secondly, the contents of the chapter are intended to provide a coherent framework against which anyone who consults the study would be able to evaluate the findings, on the basis of the research paradigm that underpins them and the methods that were used to obtain them. The following chapter is devoted to a presentation of the findings.

CHAPTER 4: PRESENTATION OF THE FINDINGS

4.1. Introduction

All forms of pollution threaten the sustainability of natural environments (Fletcher, 2015). The clothing retail industry is a significant component of the global cycle of unsustainable rapid consumption, which results in high levels of pollution (Anguelov, 2015: 160). As clothing retailers need to accurately assess the complete life cycles of their products to prevent the excessive depletion of the resources of the world and substantially reduce levels of pollution, it was necessary to commence the research with a sufficiently comprehensive assessment of the business model for the present retail cycle of a leading South African fashion retail chain. An in-depth evaluation of the present model enabled me to discern the possible sources of negative consequences for the sustainability of both local and global natural environments.

Identifying the types of waste that the retailer generated, namely, non-recyclable textile and plastic waste, permitted an accurate assessment to be made of the quantities of pre-consumer and post-consumer waste that compromised the sustainability of local environments. It was intended that the business model for an improved retail cycle that would be developed after all of the data had been analysed would significantly increase the sustainability of local environments by reducing the quantities of pre-consumer plastic and textile waste that are generated by the implementation of the present model, as a strategy for reducing the large quantities of post-consumer plastic and textile waste that continue to threaten sustainability.[1]

[1] The analysis of these findings will be presented in the analysis section.

Interviews were conducted with each of the participants, starting with management and then staff within this one retail company. After the interviews were conducted, follow-up questionnaires were sent to obtain additional information that was not obtained in the interview. This was only discovered once the data was being analysed.

The findings of this study show the present stance of the company in relation to sustainability and its intentions to ensure the sustainability of local environments in the future. The follow-up questionnaires administered to members of the management had been developed to obtain an understanding of the perceptions of employees of the policies of the company concerning sustainability. The follow-up questionnaires were intended to generate findings that revealed both the present policies of the company and the extent to which present practices either ensured or threatened the sustainability of local environments. I realised after the interviews that these questionnaires should have been asked during the interview and then follow-up with questions to participants it would pertain to in the retail cycle, based on their role.

4.1.1. *Company R*'s retail cycle model

The model that is depicted provides a detailed step-by-step sequence that includes each phase of the retail cycle of *Company R*. Each component of the cycle has a name, which reflects the functions of a specific department, each of which is responsible for carrying out the operations of a particular phase of the retail cycle. The findings provided a description of the daily routines of individual participants in their respective roles, the operations for which they are responsible, and the types of waste that are produced by their departments. The review of relevant available literature permitted me to make use of the findings of other studies, to determine the types of waste that are generated by the fashion industry and how long each type takes to degrade, which, in turn, revealed the extent to which waste that is generated by the retail fashion industry threatens the sustainability of natural environments.

As the findings of a great deal of research have revealed, many types of plastic and textile waste take hundreds of years to degrade, depending on their structure (Carlotto & McCreesh, 2018). As the final objective of the research was to create an improved retail cycle that enables the quantities of non-recyclable waste that are produced by the retail fashion industry to be significantly reduced, it will be described in detail in the chapter that is devoted to an in-depth discussion of the findings.

Table 4.1. FOLLOW-UP QUESTIONNAIRES TO THE BRAND MANAGER BY MEANS OF GOOGLE FORMS (A response was obtained from one manager on behalf of the company, owing to time constraints imposed by its schedules)

The manager demonstrated a clear understanding of the term “sustainability” and the stance that the company had adopted in relation to it and replied with candour concerning the lack of control that the company had over the policies of suppliers pertaining to sustainability. The manager also explained that the group had begun to implement many practices that contributed to sustainability and expressed the opinion that information pertaining to the practices and the stance of the company should be communicated more effectively to the staff of the chain.

QUESTION	RESPONSE BY THE BRAND MANAGER
What is the management's approach to becoming a fashion business that prioritises practices to ensure the sustainability of the environment?	The Group as a whole and *Company R* are constantly looking at ways to work in a more ethical and sustainable way. It is a key focus for all the retailers within the group and also group services.
What are the rules and regulations of the company	I do not think there is a clear policy on rules and regulations for sustainability.
Elaborate on the sourcing and buying process and the sustainability approach	The current approach is to limit as much waste as possible, currently this is focusing on the sampling process. We are still looking at ways to impact the production processes.
Elaborate on product design and the sustainability approach	We focus on uniquely designed garments, we travel less and we buy less samples because our ranges are designed internally and not copied. We courier less and we are trying to reduce sampling by utilising 3D technology for fits and approvals. These are small efforts that have a minor impact on the environment but a group our size reducing sampling has a much larger impact overall.
Within the business, how are employees informed about sustainability and practicing	Unfortunately this is not something that is done well within our business, it is very much an individual approach and not necessarily a combined effort. I think the focus in the last 18 months has been to survive all the many battles and challenges brought on by COVID and everything else has taken a backseat

environmental responsibility?	
How does management ensure that employees are cooperating, communicating and coordinating the business' current sustainability strategy	No response
What are the current sustainability practices that the group or brand follows internally?	Group-wise I know (name removed) at the larger Group has established many sustainable practices for the group, I do think that information should be shared a bit better.
Elaborate on quality standards and supplier conformance in terms of the approach towards being sustainable	No response
Briefly outline the types of suppliers (do not mention names) and their sustainability approach	We currently do not have as much visibility to our suppliers' processes on sustainability. We audit our factories and ensure they are ethical, but in terms of the environmental impact - there is a lot that still needs to be done. We are aware of many factories offering more sustainably sourced fabrications and wash/dying processes - but we are only in the beginning stages of vetting these processes and testing the outcomes.

	INTERNAL RETAIL BUSINESS
	EXTERNAL SUPPLIERS

Table 4.2. FOLLOW-UP QUESTIONNAIRES TO EMPLOYEES BY MEANS OF GOOGLE FORMS

QUESTION	RESPONSES OF 8 EMPLOYEES							
What is the company doing at present to make its operations contribute to the sustainability of the environment?	I believe the business is open to finding out how we can be more sustainable. There's been a lot of work done to try to move us more and more into this space of sustainability. We've changed our bags in store, we've lessened in person meetings so there's less paperwork and packaging being used up (cause we snack during such big meetings)	More and more fashion brands and businesses are making clothing out of recycled fabric. It just shows that the concern for the environment is there and we are trying to find the best solution. Within our business I'm not sure if sustainability approaches are even discussed.	Using sustainable materials so that we don't harm the environment and ourselves in the long run	From the field side there's very little we can do, but we try our best to recycle the plastics that come out of the boxes when we receive stock and reuse paper as much as possible.	Limit the use of plastic	We are trying our best to recycle and make use of sustainable methods as far as possible	Recycling, I'm not sure.	Switching from plastic bags to paper or woven bags. Recycle paper. More online meetings than printouts needed. Looking into recycled fabrics.
QUESTION	**RESPONSES OF 8 EMPLOYEES**							

What are the rules and regulations within the company pertaining to sustainability at present?	Not sure we have rules and regulations on this	We don't have any that I can think off	we recycle, we try to go more digital as opposed to using paper	Nothing that I know of.	From an operational point of view, we are no longer giving our customers plastic bags, we are now making use of brown paper bags	I am not sure. As an employee we try our best to individually do our parts, but as far as rules and regulations go, I am not aware of any	I'm not sure	No set rules as far as I am aware, but the unspoken rule of behaving in such a manner that is kind to the environment, such as recycling and using electricity wisely
QUESTION	**RESPONSES OF 5 EMPLOYEES**							
Please elaborate on how the sourcing and buying procedures accord with the commitment of the company to sustainability.	I think buying would answer this better	We try to use 100% cotton however it's not always possible to source 100% cotton for the store product	It is important to find reliable suppliers with sustainable methods in place. We need to make sure that we check our suppliers to ensure that they are credible	I'm not sure, we try our best to work sustainably but I am not aware of a specific approach	Not being a fast fashion retailer, I believe we also assist in not creating wasteful buying behaviour. Garments are considered for the customer in this regard. Furthermore, we are working with our suppliers to look into either sustainably sourced fabrics or recycled fabrics and what their capabilities are around dyes. In trying to reduce the amount of parcels sent, we accommodate to only send what is necessary.			

QUESTION	RESPONSES OF 5 EMPLOYEES							
Please elaborate on how the designing of products accords with the commitment of the company to sustainability	I think design would answer this better.	I think the company is moving away from paper and going more digital. The CADs are 3D now and not printed on paper as much as we used to 2 years ago.	All Tech Packs get sent electronically. CAD review meetings are held online, which helps reduce our paper usage. Artwork get printed out to check the scale. Once we are more comfortable in using 3D, this will help with scaling artwork electronically	Everything gets sent electronically, so there is no paper wastage. Range reviews are held in person, but CAD review meetings have been held online since the pandemic so we don't print out the CADS as much as before. We still print out our artworks to check the scale, which is not ideal but needs to happen in order for us to check the print scale on the physical garment. This might improve once we start working on 3D and fit on avatars	Designing products that are not too fashion forward allows for, hopefully, a considered purchase. Designing with all relevant details required by the supplier, it allows fewer garments and packages to be sent to and from suppliers. Considering what trims or tags are required or relevant to ensure we get the message across, but limiting additional things needing to be produced			
QUESTIONS	**RESPONSES OF 8 EMPLOYEES**							
Without mentioning names, please briefly outline the types of suppliers (do not mention names) and their sustainability approach	I think buying would answer this better.	We have one supplier who always delivers samples in brown paper bags which helps eliminate the use of plastic.	I cannot think of one, as I'm not familiar with their processes	N/A	We have one supplier that delivers samples in paper bags	I am not sure.	I don't know our supplier's approach to sustainability approach	Woven suppliers, looking at recycled fabrics. Knit supplier, looking at natural dyes. Denim supplier turned the factory into a green factory. OEKO-TEX certification
QUESTIONS	**RESPONSES OF 4 EMPLOYEES**							

Elaborate on quality standards and supplier conformity to ensure the sustainability of the environment.		I think the quality department would answer this better	I am not sure about this	I'm not sure	Ensuring good quality standards are adhered to, I believe customers will wear their garments for longer and avoid just dumping them. Furthermore, ensuring that suppliers do not take shortcuts that might not be so sustainable when making garments as these shortcuts could be harmful to the environment, but much cheaper to do.			

	INTERNAL RETAIL BUSINESS
	EXTERNAL SUPPLIERS

The results from the follow-up questionnaires show that several of the employees displayed an awareness of the steps that the management of the company was taking to contribute to reducing adverse consequences for the sustainability of the environment, such as reducing the use of paper and increasing the number of digital meetings that are held. Although no measures were being implemented to reduce the use of plastic at the head office of the company at the time of the conducting of the study, a decision to stop providing customers with plastic packaging had been made at the operational level. In addition, although the company was not actively endeavouring to work with suppliers whose practices promoted sustainability, it emerged that the buying department was holding discussions with suppliers of denim and knitwear concerning the use of manufacturing methods that favour sustainability, such as the use of natural dyes, and in the process of soliciting suppliers of denim that is dyed by using green methods. The employees in the research sample were not aware of any specific rules and regulations pertaining to sustainability in the company, although one maintained that there was an unspoken and unwritten rule that required employees to be kind to the environment, in respects such as recycling and the prudent use of electricity.

One of the respondents responded to the request to elaborate on how the sourcing and buying procedures of the company accorded with its stated commitment to sustainability by saying *"Not being a fast fashion retailer, I believe we also assist in not creating wasteful buying behaviour. Garments are considered for the customer in this regard. Furthermore, we are working with our suppliers to look into either sustainably sourced fabrics or recycled fabrics and what their capabilities are around dyes. In trying to reduce the amount of parcels sent, we accommodate to only send what is necessary"* (Buyer D, 2021).

To the request to elaborate on how the designing of products accorded with the stated commitment of the company to sustainability, the same respondent replied *"Designing products that are not too fashion-forward allows for hopefully a considered purchase. Designing with all relevant details required by the supplier, it allows fewer garments and packages to be sent to and from suppliers. Considering what trims or tags are required or relevant to ensure we get the message across, but limiting additional things needing to be produced"* (Buyer D, 2021).

Although it was evident from the responses that the company did not prioritise ensuring that the operational practices of suppliers conformed to generally accepted standards in relation to sustainability, it emerged that the quality department made a definite contribution by ensuring that garments were of sufficiently high quality to enable their life cycles to be significantly extended.

4.1.2. FIRST PHASE OF THE RETAIL CYCLE: THE PRODUCT TEAM

The product team comprises a buyer, an assistant to the buyer, a designer, a planner, and a product technologist. The chain makes use of a circular business model, which is depicted graphically in Figure 4.1. Each spring, summer, autumn, and winter fashion season has a cycle, which runs continuously from beginning to end, before starting again. While the cycle for a season is running for one season, that of another runs simultaneously, although at a different stage.

Figure 4.1: Stages of the retail cycle: The present briefing season is Summer 22, the present production season is Winter 22, and the present trading season is Summer 22 (Source: The researcher, 2021)

The interviews were conducted in groups and each question was answered by each team member. The answers to the questions are merged in this section as answered by each group as this is a complex business, each answer was very long and detailed and therefore, the answers were merged. The interview questions can be found in the annexure.

The first question asked in the interview was: *"Take me through your role, from the beginning of the retail cycle till the "end" of the cycle, what is your role?"*

"The retail cycle 'starts' with a post-seasonal meeting and 'ends' with trading" (Buyer A, 2021). A post-seasonal meeting is held with the entire product team to analyse sales, the performance of individual products, missed opportunities, and the products and performance of competitors.

The trend phase entails continuous design research that is conducted by the design team, which culminates in a workshop, in which the design team presents a trend strategy to the merchandising team. "*This workshop is often held over two days, with a focus on macro trends, colour palettes, key silhouettes, newness in detail, fabric, print techniques and how the trends relate to the brand (unique interpretation)"* (Designer A, 2021). Planner A (2021) explained that the planners played the leading role in strategy, which is also known as strategic intent and is concerned with planning sales for a particular season. Among the topics that are discussed in strategic planning are key categories, volumes per category, pricing strategy, supplier strategy, deliveries, launch dates, and shifts for the incoming new season. Planning entails the integration of strategic intent into systems and presenting it in the form of spreadsheets. After strategic planning has been completed, the buyers receive a range plan from the planner, which provides an overview of how many options in each sub-category they will need to buy per month (Planner B, 2021). The planner also works closely with the distribution centre (DC). As Planner A explained in an interview, *"There are ways to reduce LDPE polybags in the DC. The DC used to pre-pack the boxes and send the stock directly to stores, but then it was stopped. If suppliers can pre-pack and get it right, then we won't have to use any polybags"* (Planner B, 2021).

Figure 4.2: Individual garments packaged in polybags
(Source: Product Technologist A, 2021)

"The buyer then uses the data that has been gathered from post-seasonal meetings and trend meetings to start developing a range" (Planner B, 2021). "*The buyer visits the stores of competitors to compare trends and compiles images and samples of garments to represent the direction of the range. Two other main phases follow the development of the range. In the review of the range, the buyer presents the range to the product team. This procedure provides an opportunity for the team to collaborate and present individual evaluations of the range, review the balance, silhouette, colour, balance of core and fashion newness, identify potential missed opportunities, and ensure that all ideas are representative of the identity of the brand*" (Designer B, 2021). The CAD (computer-aided design) review is also carried out under the aegis of planning the range. "*After the review of the range, the buyer briefs the designer, who draws up the designs by means of CAD, to illustrate the full range in digital format. In the CAD review, the range is balanced with respect to the months during which the designs are launched, the categories into which the garments fall, colour, print, design details, and trims and the placement of trims is checked"* (Designer A, 2021). The range is also evaluated to determine whether it is representative of the identity of the brand and the strategy of the company for the season. Once all styles have been finalised, suppliers can be briefed accordingly (Designer A, 2021).

4.1.3. SECOND PHASE OF THE RETAIL CYCLE: QUALITY ASSURANCE, DESIGN, AND MARKETING DEPARTMENTS

Designer A said that "*once a range has been approved at the CAD review, the designer will start to develop the technical design packs or Tech Packs for each design* (Figures 4.3 - 4.6)*, while the product technologist begins to develop garment specification sheets* (Figure 4.6.) *For each garment, and the buyer works on the brief sheet document* (Figure 4.7.) *for each supplier"* (Designer A, 2021). The full brief consists of an overview of the categories of garments and the total number of units to be purchased, which, in turn, also determines the total number of polybags that will be required. It also provides an estimate of how the order will be broken down in respects such as silhouettes and manufacturing processes, an indication of the required cost and delivery date for each category of garment, an overview of the designs, details pertaining to construction and finishing, artwork, print or colour specifications, detailed measurements of design elements and trims, and measurement specifications for

garments, and specifies the standards of quality that the brand requires (Brand Manager, 2021).

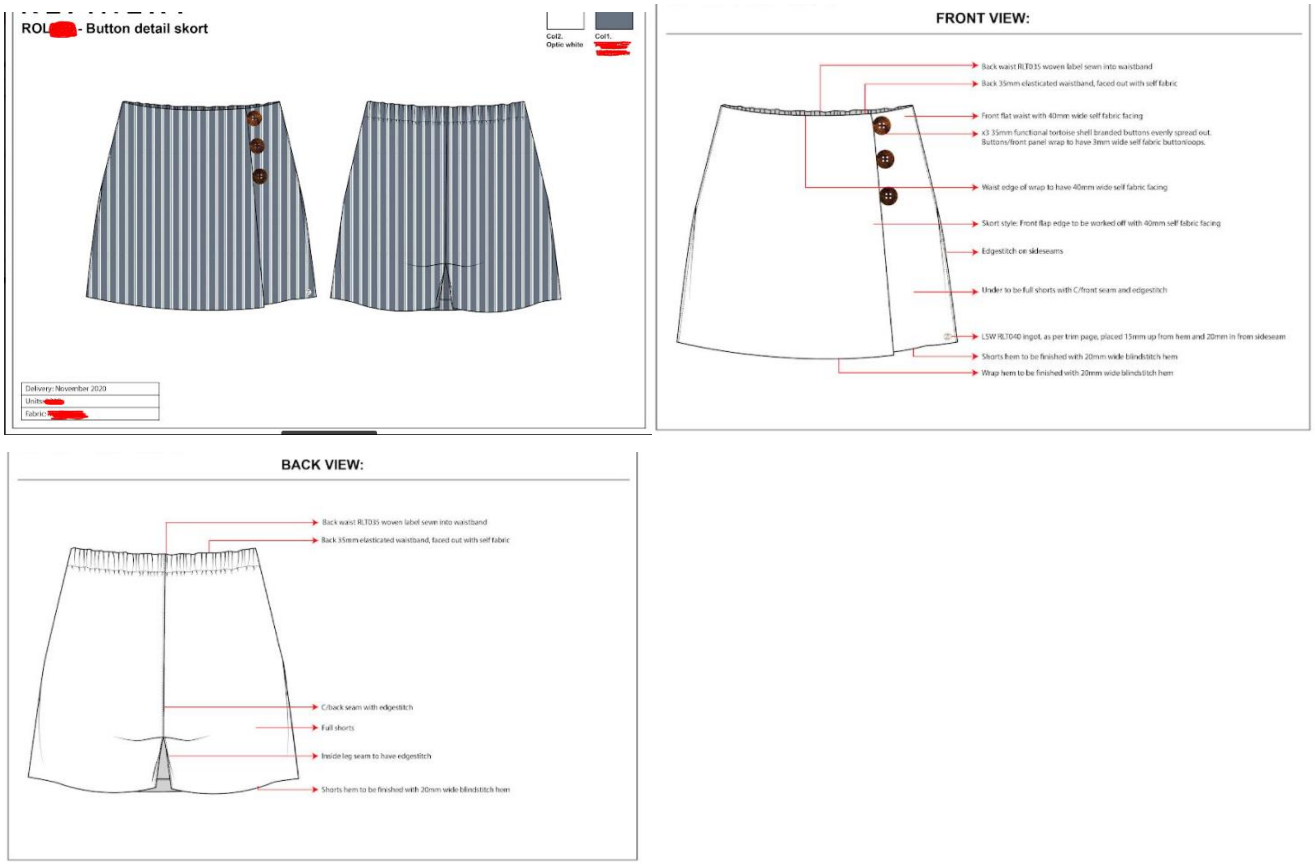


Figure 4.3: An example of pages from a Tech Pack developed by a designer - confidential information has been removed (Source: Designer A, 2021)

The first 3 pages of the Tech Pack are devoted to CAD representations of the colour design and technical drawings, which are drawings that are provided to suppliers to explain how garments need to be constructed.

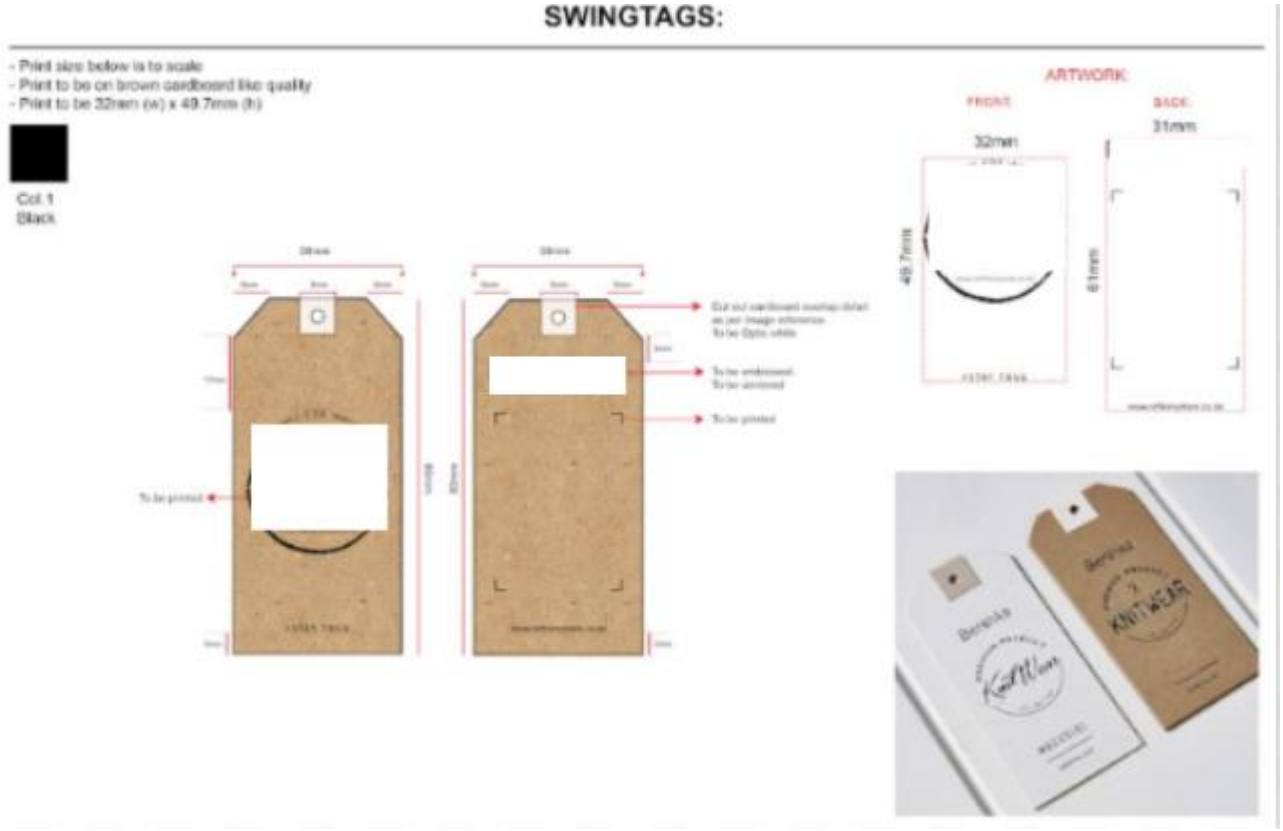


Figure 4.4: An example of a page from a Tech Pack developed by a designer - confidential information has been removed (Source: Designer A, 2021)

The last 3 pages of a Tech Pack are devoted to depictions of swing tag designs, label designs, and relevant artwork, such as print designs.

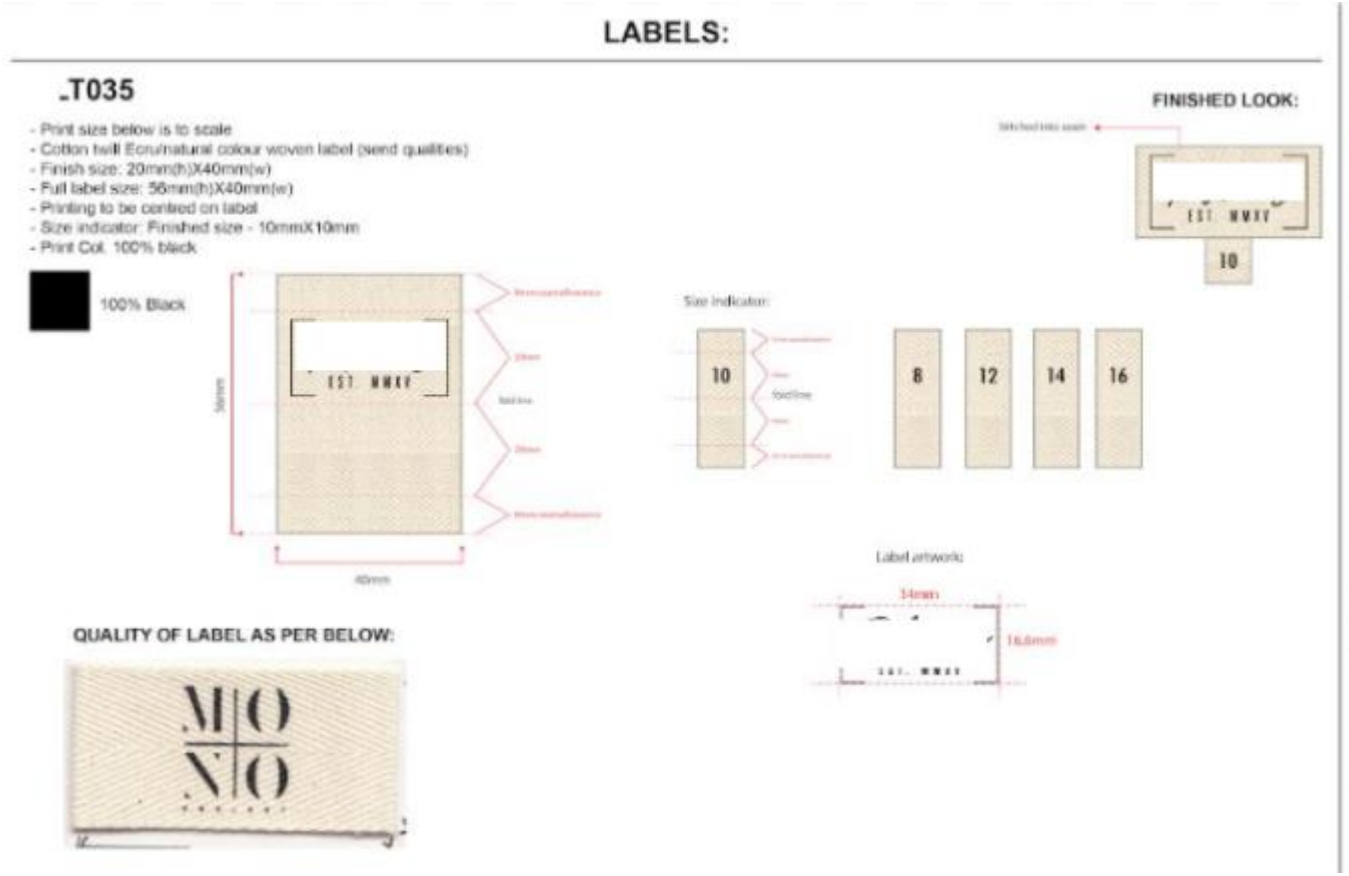


Figure 4.5: An example of a page from a Tech Pack that depicts label designs - confidential information has been removed (Source: Designer A, 2021).

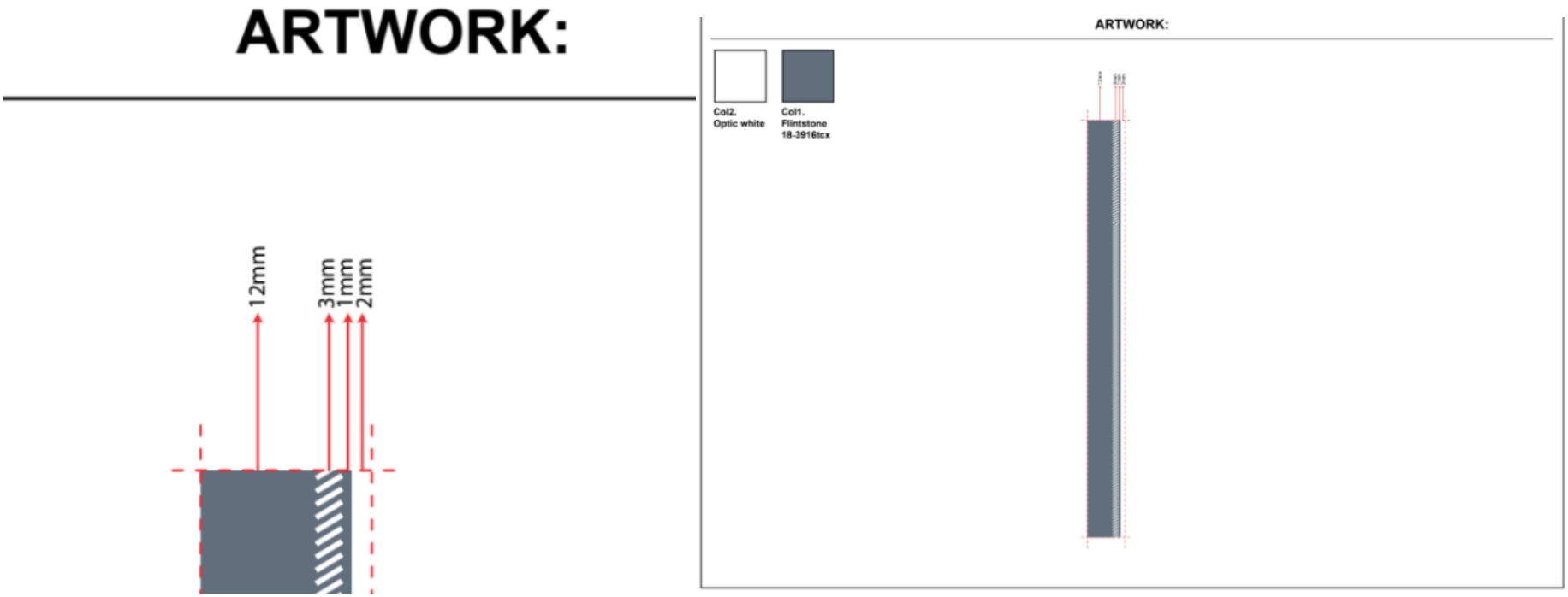


Figure 4.6: An example of a page from a Tech Pack that depicts details of artwork for a print design - confidential information has been removed (Source: Designer A, 2021).

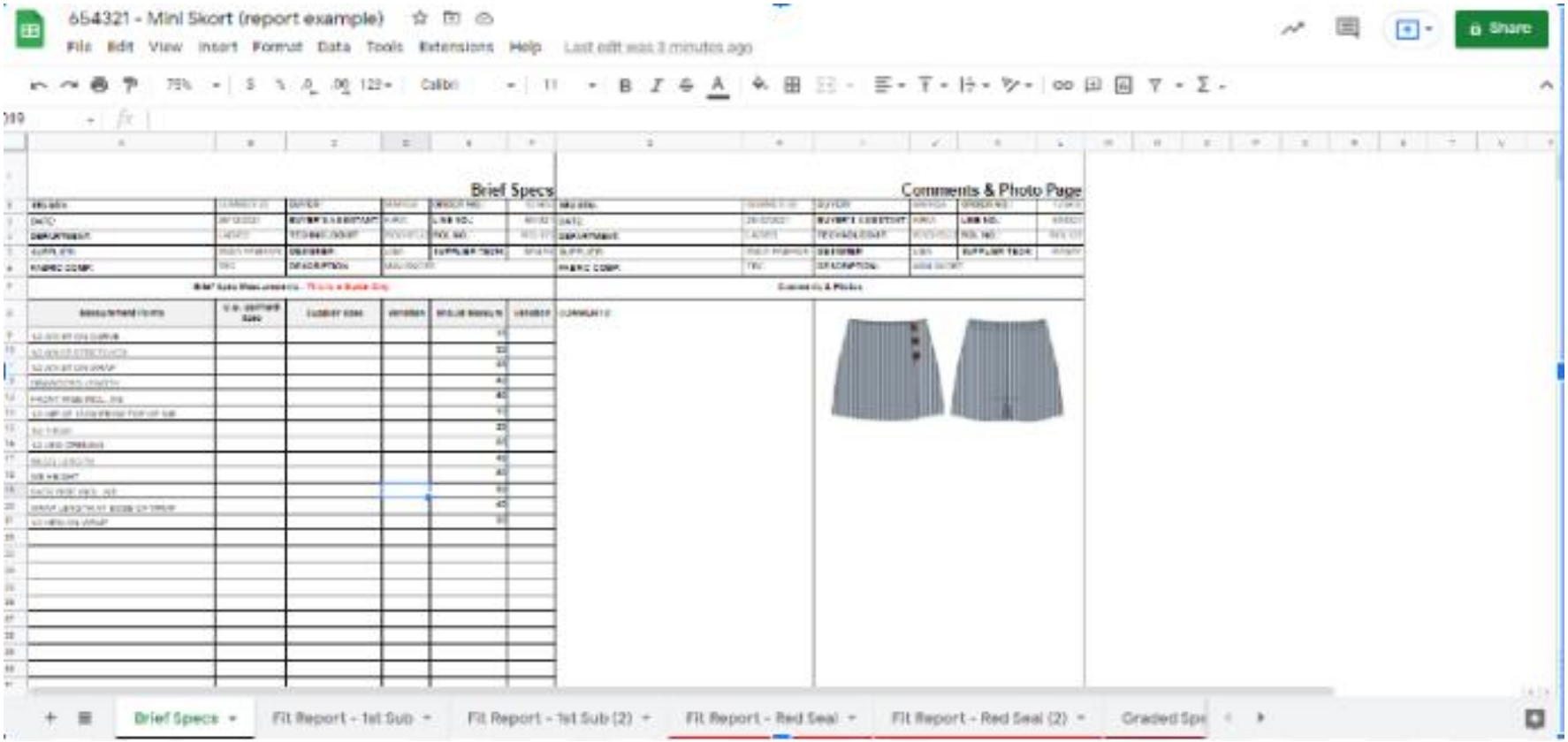


Figure 4.7: An example of the fit report from a brief specification - the measurements are examples only and do not reflect the garment (Source: Product Technologist A, 2021).

"A brief specification contains measurements to enable suppliers to calculate unit prices for garments that retail chains intend to order, which are forwarded by the supplier to the buyer of the company. A pattern-maker uses the measurements to make up the first fit garment for fitting" (Product Technologist A, 2021).

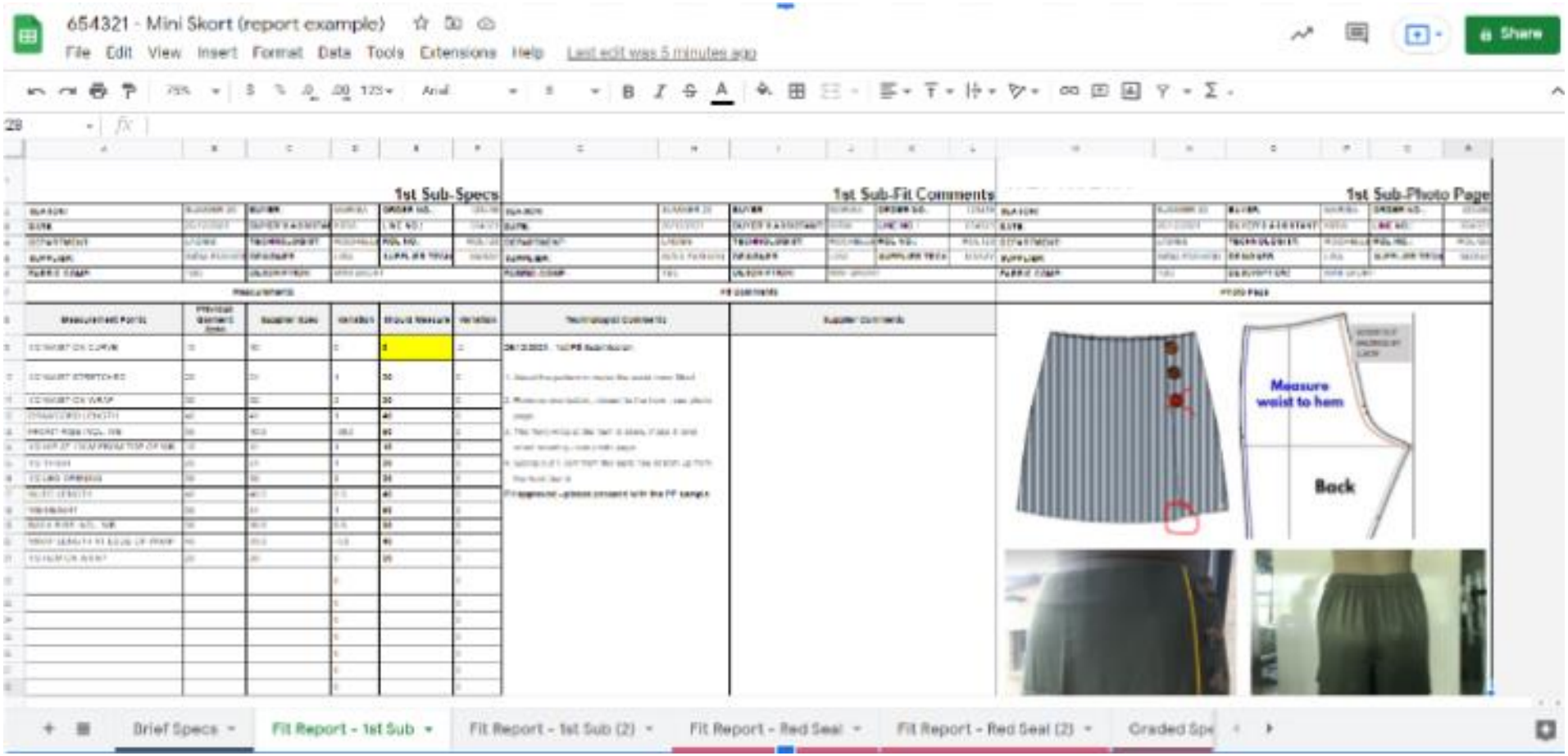


Figure 4.8: An example of the fit report for a first fit submission - the measurements are examples only and do not reflect the garment (Source: Product Technologist A, 2021).

The first fit report provides the measurements of a garment that the supplier has made up on the basis of the measurements that had been provided as a guide by the product technologist.

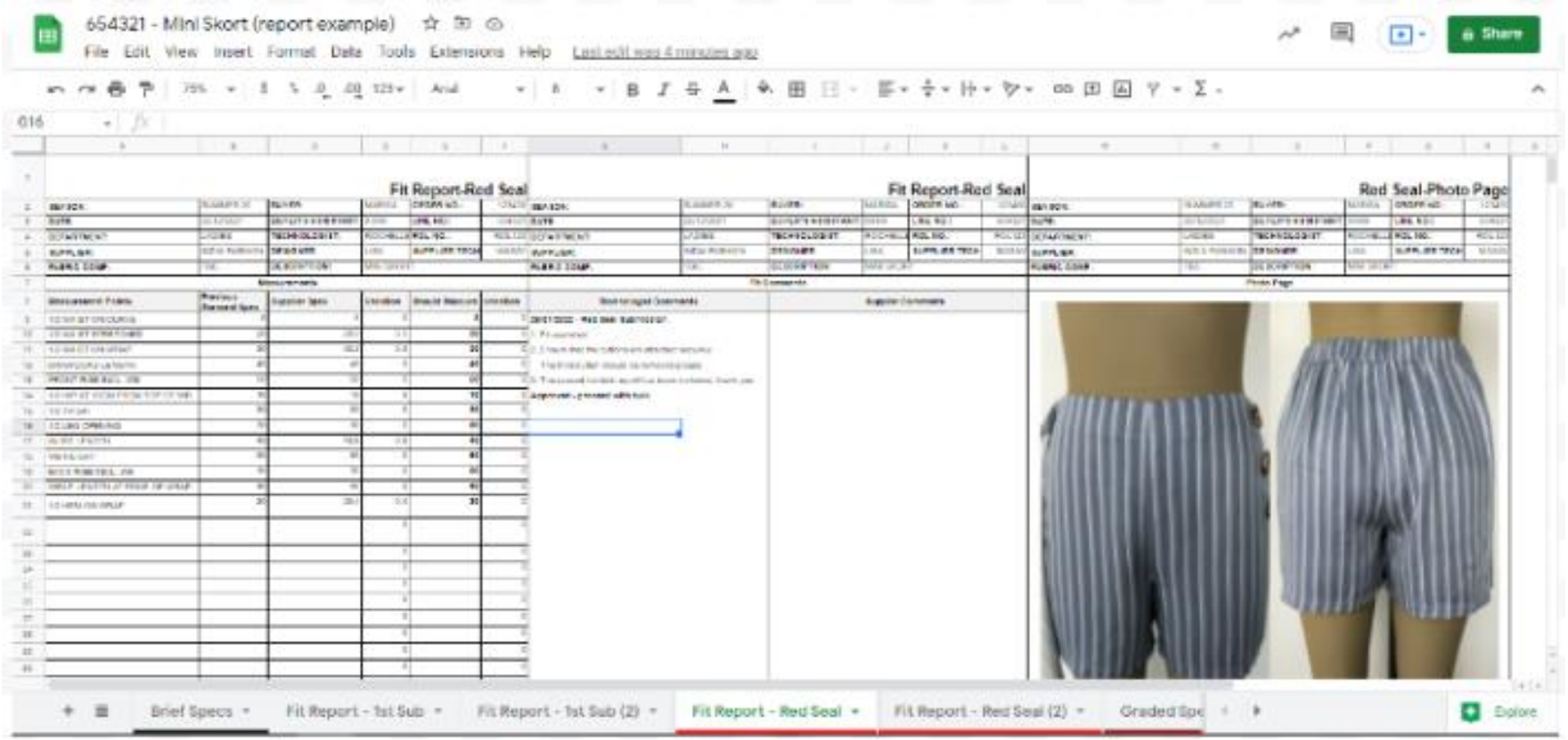


Figure 4.9: An example of a fit report for a red-seal submission - the measurements are examples only and do not reflect the garment (Source: Product Technologist A, 2021).

A red-seal fit report contrasts the measurements of a sample garment that a supplier has made up with those that were requested by the product technologist. The product technologist will also review the laboratory test report at this stage.

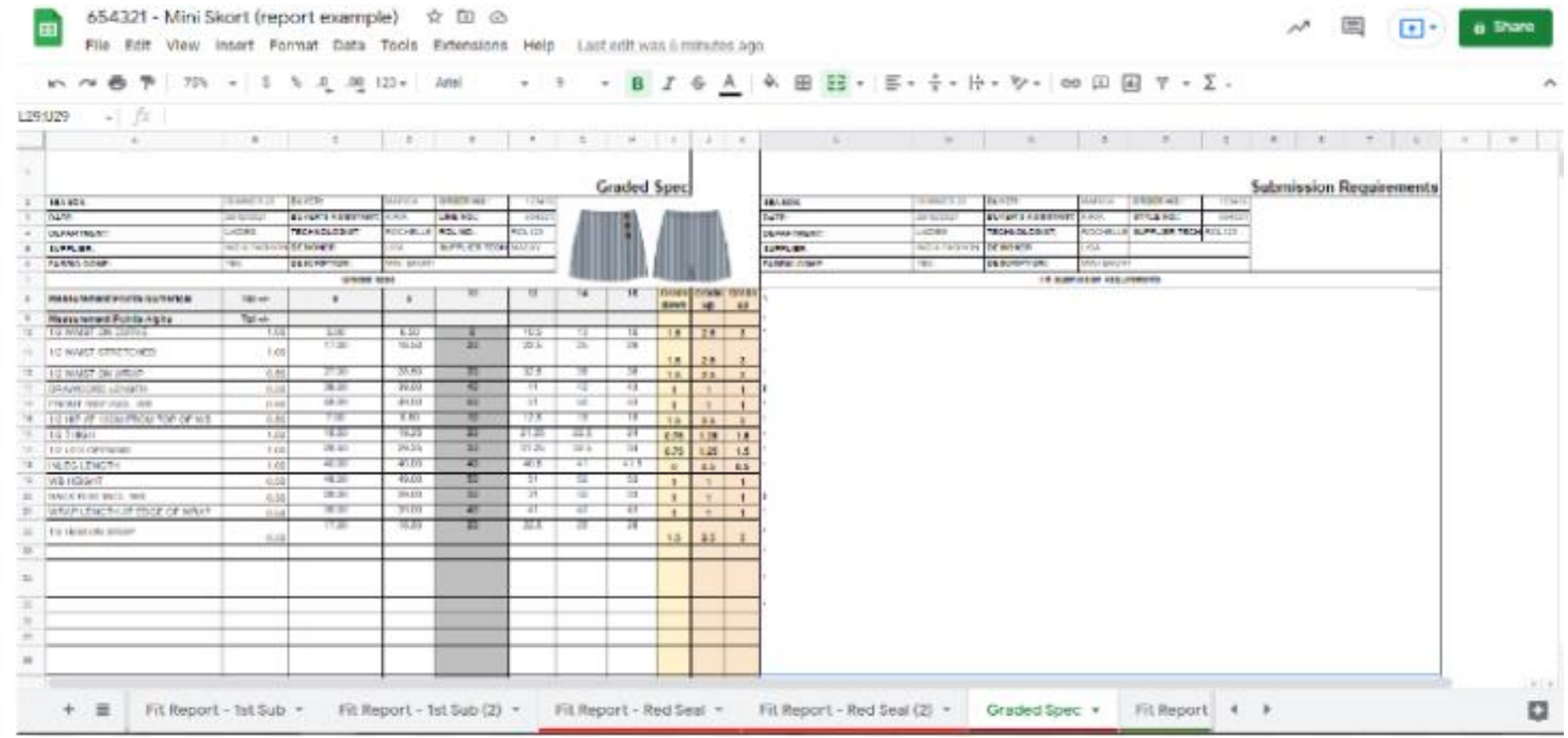


Figure 4.10: An example of a graded specification fit report - the measurements are examples only and do not reflect the garment (Source: Product Technologist A, 2021).

A graded specification fit report provides measurements for all of the sizes in a size curve. It plays a significant role in the costing of garments, as it determines the quantities of fabric would be required for each component of each garment in a size curve.

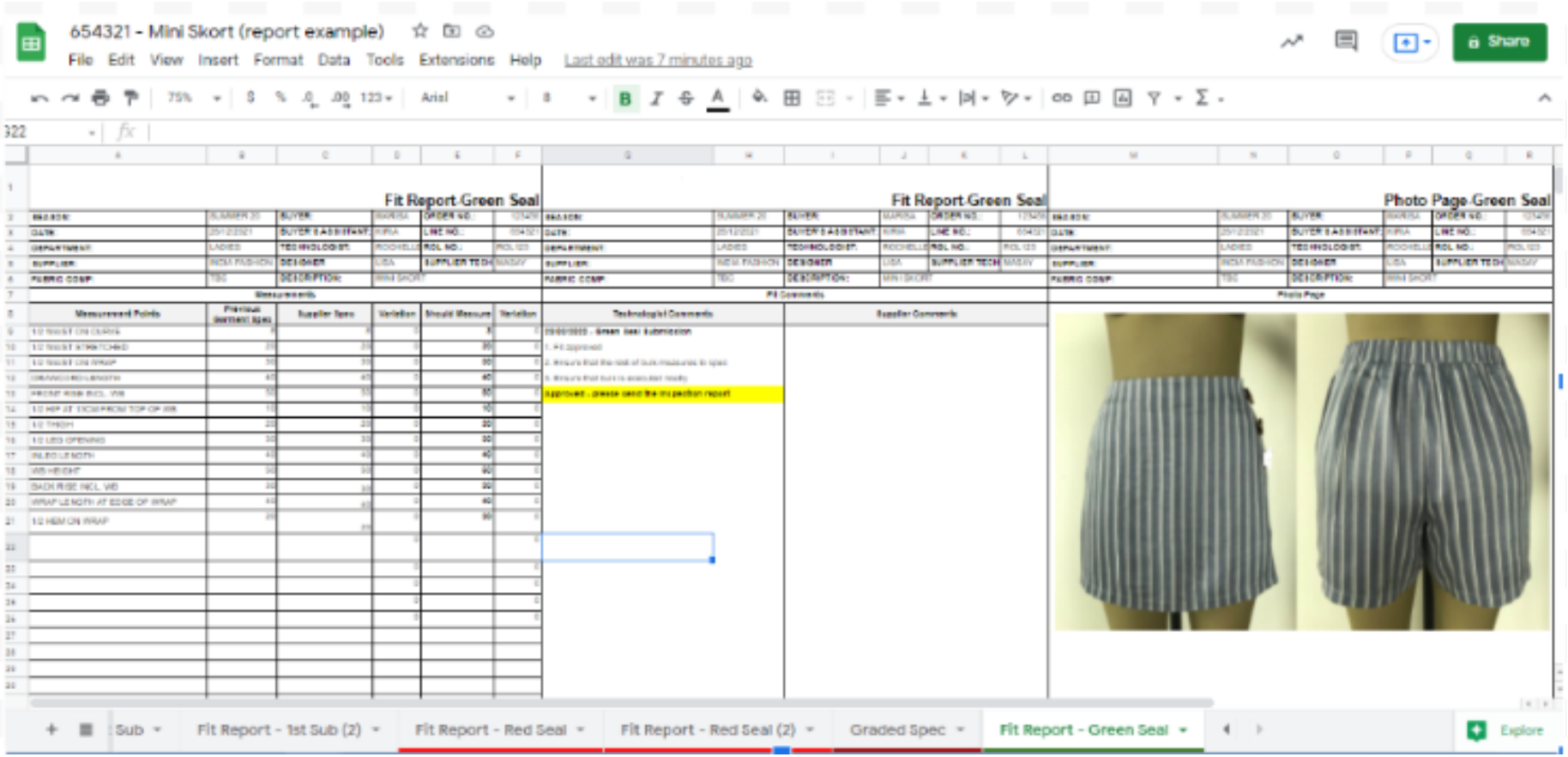


Figure 4.11: An example of a fit report for a green-seal submission - the measurements are examples only and do not reflect the garment (Source: Product Technologist A, 2021).

A green-seal report provides measurements for off-bulk samples, which are representative of the garments that will be produced during bulk production in the factories of suppliers, prior to being shipped to the company that placed the order for the garments.

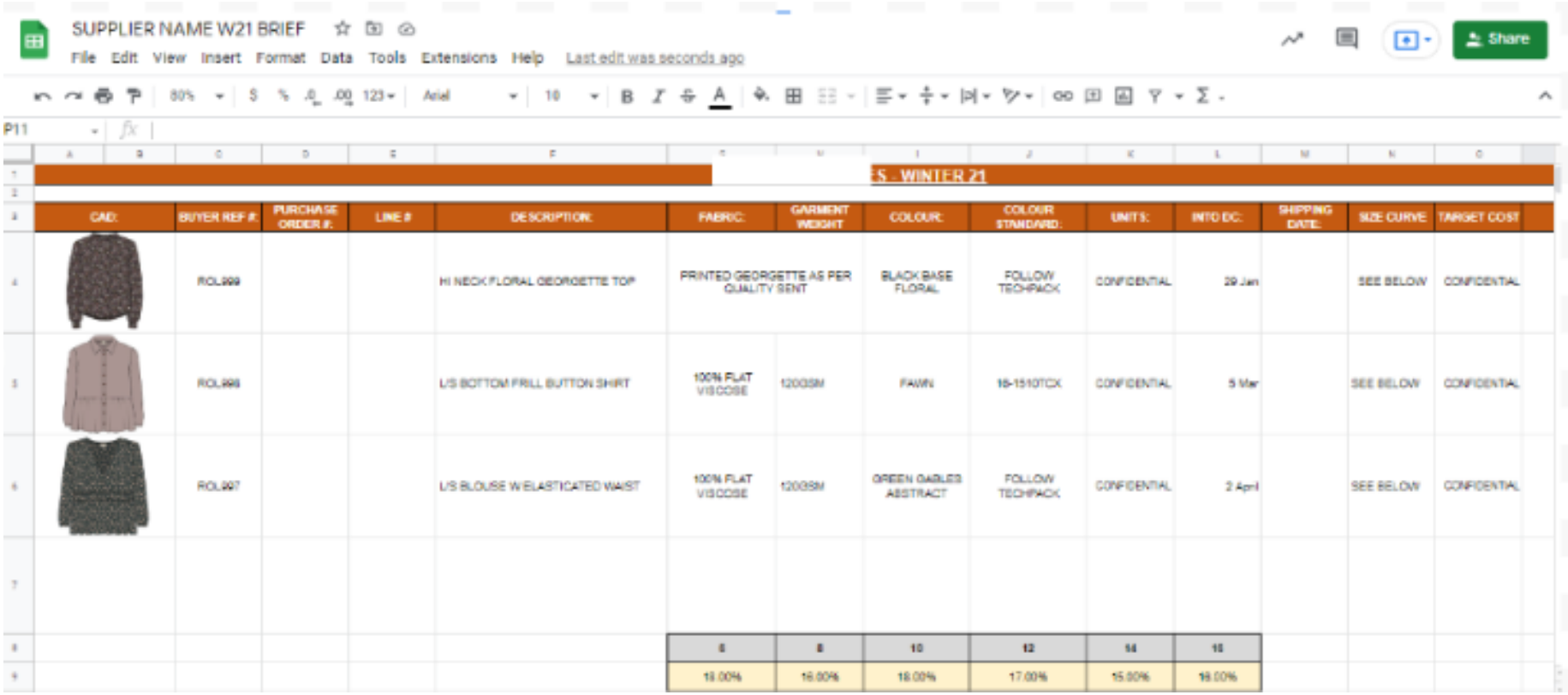


Figure 4.12: An example of a buyer's brief sheet - the percentages have been altered for confidentiality purposes (Source: Buyer A, 2021).

In this instance, the buyer's brief sheet provides details to the supplier concerning the garments that *Company R* wishes to order to stock its stores and the numbers of units for each category. For the Summer 22 season, orders for ladieswear amounted to 740, 000 units and menswear 1,156,300 units (Buyer A and Buyer B, 2021).

The costing phase entails negotiations with suppliers to arrive at desired costs per unit, reworking designs to achieve desired costs, strategic assessments of the volumes or units per category that are required for all stores, and shared fabrication, to lower production costs. In the case of the latter, "*the ladieswear and menswear departments strategise together to use the same types of fabric, to increase the numbers of metres of fabric that are purchased, to reduce the unit prices of garments for both departments" (Buyer D, 2021)*. This strategy permits suppliers to use resources efficiently, which significantly reduces the quantities of waste that are produced. "*The more units that are ordered, the lower the prices of individual units will be. When suppliers receive a brief from a buyer, they will respond with a costing and delivery confirmation"* (Buyer D, 2021).

"Strategic intent guides the decisions of buyers in relation to costs and profit margins. The legal contract between a retailer and a supplier takes the form of a purchase order" (Brand Manager, 2021). *"An order is raised on the internal system of a company and sent to the supplier by email. At this stage, the supplier is required to send a batch of samples to the company. The first is a first fit sample, which is intended to fulfil the brief of the buyer. Strike-offs are samples of printed fabric that are intended to confirm that the fabrics accord with the requirements that the buyer has specified, with respect to colour, weight, and composition. Laboratory dips, which are generally known as lab dips, are samples of dyed fabric to demonstrate to the buyer the colours that the supplier is able to mix for dyeing the trims and fabric that the buyer has requested"* (Buyer A, 2021).

In the first stage of fitting and sampling, "*the product technologist fits the samples and the buyer and designer check and evaluate the trims, strike-offs, and lab dips. The product technologist fits the sample with the buyer and designer in attendance. Once the product technologist has approved the first fit, the supplier will make up more samples, which eventually culminate in the pre-production sample (PP) of a garment"* (Product technologist, 2021). "*PP samples are required to be in the specified colours and styles and have the correct trims. One sample of each colour is sent in size 10, which is the size that the product technologist fits, which is known as the base size, as it provides the starting point for the grading of all other sizes. The combinations of colours in which garments are made available are known as*

colourways. If there are three different colourways, the supplier is required to send a sample of each colourway in size 10" (Product technologist, 2021).

The marketing coordinator uses the samples to create photographic images for e-commerce, while the buyer retains them for the duration of the season, as reference to illustrate each garment at the point at which it was approved for bulk production. "*The supplier is also required to send a marketing sample of each garment in each colour in which it is to be manufactured in size 8, the sample size that models wear in the photographic shoots for marketing campaigns"* (Marketing coordinator, 2021). Accordingly, if one particular style is to be made available in three different colours, the supplier will have sent six different samples for a single style by the PP stage of fitting (Buyer D, 2021). "*A PP sample could be failed by the product technologist on the grounds of incorrect specifications, weight, or colour, inconsistent fit, incorrect thread colour, incorrect measurements, or poor workmanship. In addition, if a fabric is failed in the laboratory test report, the fit will not be approved until the fabric is deemed to be fit for end use" (Product technologist, 2021).*

"Samples are fitted from two to four times before the last sample is sent directly from the bulk production, which is known as the off-bulk sample. In addition, fabric is sent for testing by the laboratory before the bulk production is delivered" (Product technologist, 2021). During the phase in which fits are assessed, "*the marketing department carries out photographic shoots in which the marketing samples are modelled. As the samples are signed off, the final samples arrive for fitting and photographing"* (Buyer A, 2021). "*The photographs are saved, categorised for the digital content coordinator, and images are provided to the visual merchandiser, who is responsible for having large once-off posters printed, to be displayed in windows and inside stores"* (Marketing coordinator, 2021). "*The manufacturing stage entails the manufacture of bulk consignments of garments, in the factories of suppliers"* (Product technologist, 2021). The scope of the research in this study is confined to the retail cycle of the company, as broadening it to include the roles of suppliers would have rendered the enterprise impracticable.

4.1.4. THIRD PHASE OF THE RETAIL CYCLE: PRODUCT TECHNOLOGIST, MARKETING, DISTRIBUTION CENTRE, AND AUDITING

"Once the manufacturing of a particular garment has been completed, a final off-bulk sample that is required to be representative of the entire production run is sent to the product technologist" (Product Technologist A, 2021). "*If the sample is deemed to accord with the specifications of the company, the product technologist will sign it off and approve it for delivery. The supplier conducts an auditing inspection in the country of origin and sends an inspection report to the product technologist, who will then approve or reject the bulk stock on the basis of the outcome of the inspection. If the bulk stock is approved, the supplier will ship the goods, which will be delivered to the distribution centre (DC) by an outsourced logistical transport company. Local suppliers use road transport to ship orders, while suppliers whose products are imported either use road transport or sea-freight shipments. Once shipments reach the DC, they are processed by the staff who are responsible for receiving shipments, whereupon they immediately undergo a quality inspection in the quality control (QC) room, which is conducted by the auditing team. If an order is rejected, it is either returned to the supplier or sent for a local inspection to be rectified, after which it is received once more by the DC*" (QC manager, 2021).

The next step is a logistical one, in that it entails breaking down shipments to meet the requirements of individual stores and delivering them, to commence the trading phase. "*When the first deliveries reach the stores, the visual merchandiser creates a mock display in one of the larger stores and photographs it, in order to provide detailed briefs to the operations teams, to enable the manager of each store to supervise the creation of visual displays in accordance with the prototype that has been prescribed by the visual merchandiser, who is responsible for the creation of all imagery, posters, and table displays and the dressing and placement of mannequins"* (Visual merchandiser, 2021). "*After shipments have been delivered to stores, members of staff receive, check, and unpack the cartons in which the merchandise has been shipped. The products are either packed onto shelves or placed on hangers on the sales floor. Data pertaining to the movement of stock is relayed to the head office for assessment"* (Area manager B, 2021).

4.2. INDIVIDUAL ROLES OF EACH DEPARTMENT AND THEIR FUNCTIONS WITHIN THE CLOTHING RETAIL CYCLE

This section is devoted to an assessment of the present retail cycle of the company and the phases that potentially result in the generating of the most waste. The roles of each player or set of players overlap with respect to duties and responsibilities and some steps of the retail cycle are repeated**.**

4.2.1. Roles and responsibilities of designers

4.2.1.1. Responsibilities of designers: Post-seasonal meetings

"At the post-seasonal stage of the retail cycle, designers gain insights into the design-related factors that contribute to the sales performance of individual products. They evaluate the roles of fabrics, colours, artwork, garment details, and branding insights in the sales of individual products and channel the information into future designs" (Designer A, 2021).

4.2.1.2. Trends: The role of designers in fashion trends

Designers are responsible for driving innovation and creating novelty in a manner that accords with the design identities of their brands. Their work usually entails travelling overseas, to visit fashion retailers and carry out week-long shopping expeditions to identify competitive trends and innovations, an undertaking that is often referred to as "the trend trip" (Designer B, 2021). "*As a consequence of Covid restrictions in South Africa and around the world, the merchandising team stopped travelling to conduct research into trends and engage in competitive shopping. As research needed to continue, owing to the crucial role that it plays in the life cycles of products, the management developed the concept of a trend workshop, which is similar to the trend trip, although the competitive shopping is carried out locally and in a single day"* (Designer A, 2021). "*A designer conducts research prior to a trend trip, to present findings to the merchandising team in the form of images on computer-aided software, to compile trend boards and colour palettes that accord with identity of the brand"* (Designer B, 2021).

The imagery is printed and pasted onto a mounting board and then presented as a mood board (Figure 4.13). Mood boards are created in preparation for trend presentations. Suppliers courier large quantities of files that contain fabric swatches and trims, for designers to peruse: *"We do ask the suppliers for fabric swatches, which they send on swatch cards and it will amount to piles and piles of swatches that we go through to see if it is something that we can use"* (Designer A, 2021).

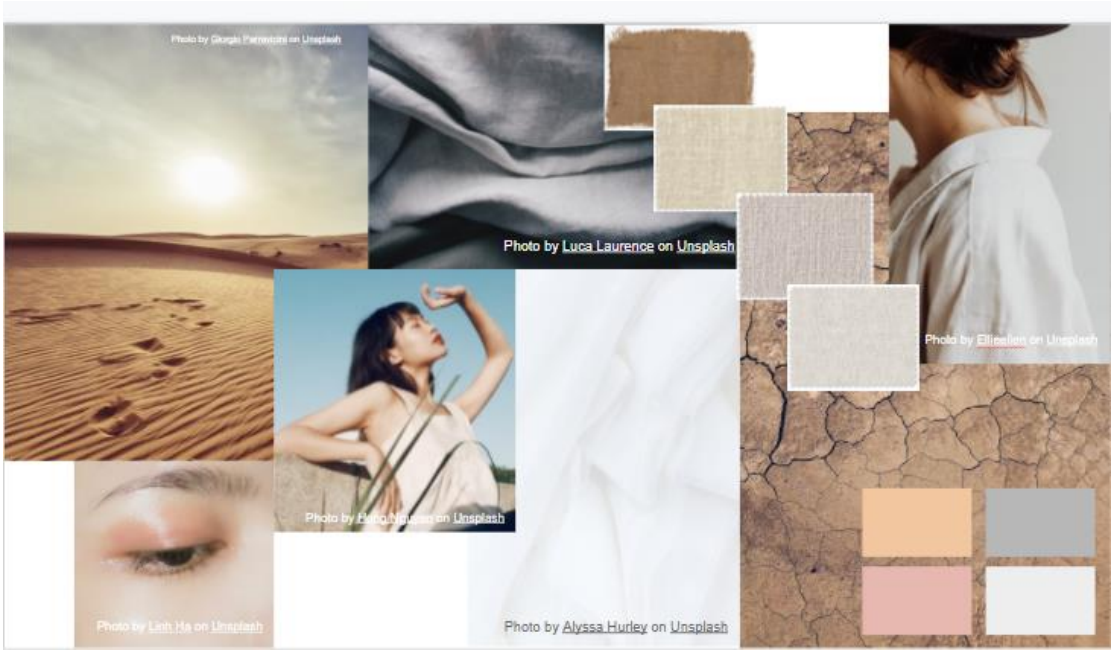


Figure 4.13: Example of a mood board (Source: The researcher, 2020)

A mood board provides a collection of images that exemplify crucial features of ideas for designs. The mood board in Figure 4.14 is an example only and was created for the purpose of illustrating its essential components. The trend that it conceptualises could be launched under the rubric of *summer desert* and provides an appropriate colour scheme, silhouettes, and examples of potentially suitable fabric swatches. The board is usually made from thick cardboard that has been purchased from a supplier of art materials. The fabric swatches are usually obtained from suppliers and disposed of after they have been used in a presentation: *"At the trend presentation we will pull out what we don't want, we use some, and others we don't use"* (Designer B, 2021).

Although suppliers occasionally send the designers samples of fabric whose quality places them outside of the price range of the brand or do not accord with its overall strategy, to entice designers and buyers to use the fabrics, they are seldom used: *"Suppliers should send us fabric qualities that are within our price point and fabrics that we would use in our business. We cannot use just any kind of fabric for menswear, as an example"* (Designer B, 2021). Each fabric option is sent in a polyethylene (LDPE) bag or polybag, which is recyclable. For example, twenty different samples of nylon could be packaged in a single bag, for the designers to evaluate. Suppliers send samples of many different types of fabrics, each of which is packaged according to its composition. In the words of one designer: *"A style that might be made in viscose, there might be 10 to 15 cards with swatches on the card and that will be in one polybag. Then in the next polybag will be different nylons with maybe 20 options of nylon, etc., and then all of these polybags get put into a DHL bag"* (Designer B, 2021). The samples are sent to designers in plastic packaging to ensure their protection. At present, all plastic bags and polybags are placed into a generic bin and there are no recycling bins in the office: *"Perhaps the business could place bins for recycling plastic like we have for paper and communicate that to staff"* (Designer B, 2021). Although individual designers use as many as twenty different boards to display images that provide the inspiration for designs, the boards are recycled and used for subsequent trend presentations.

4.2.1.3. Responsibilities of buyers: Developing ranges for future seasons

The designers collaborate with the buyers to discuss the design intent for the coming season (Brand Manager, 2021). They print out all of the ideas that have been put forward and create a collage to view the envisaged range as a whole: *"If we don't have a garment as a representation of what we want to do, there is always a reference image. Each person attending the meeting prints out a bunch of ideas on paper, that we go through for print inspo* [inspiration]*, style inspo, whatever the case might be"* (Designer A, 2021). Before the Covid pandemic, the designers travelled and returned with samples, which were used to review future ranges. The samples were mutilated, as they were to be used solely for the purpose of conducting research for future designs and not to create merchandise for sale. The term "mutilated samples" is used in the fashion industry and by all retailers, suppliers, and customs officials (SARS, 2014). No import duties or taxes are imposed on mutilated samples,

provided that they are declared as samples that have no commercial value (Product technologist A, 2021).

Figure 4.14: Example of a mutilated sample used by designers at *Company R* (Source: Product Technologist A, 2020)

The law stipulates that duties and taxes should not be levied on garments that are made from mutilated samples of fabrics and sent from one country to another, as the mutilated condition of the fabrics results in the garments being without commercial value, owing to their having been mutilated to an extent that precludes them from being sold for commercial gain.

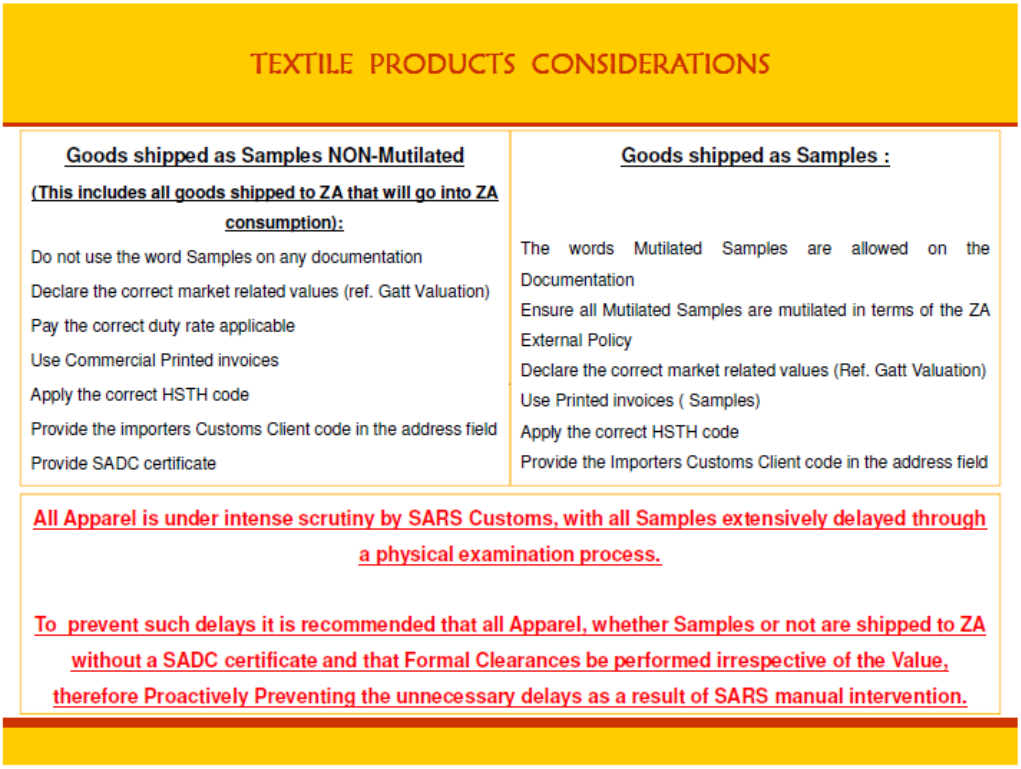


Figure 4.15: Customs act pertaining to mutilated samples (SARS, 2014)

Upon returning to Cape Town, the designers evaluate the garments and begin to develop the new range. All of the garments are placed on hangers and stored together. Garments are sent to suppliers for briefing purposes, retained for one more season for reference, or cut up to create reference samples of fabric (Designer A, 2021). The samples that are left are kept in storage for as long as possible or until they can no longer be used as reference or inspiration for new designs, whereupon they are disposed of. *"It's only after a few years when the samples are thrown out, because there is always something we can reference from an overseas sample"* (Designer A, 2021). The Covid restrictions obliged the merchandising team to find other ways to carry out their research for new designs, by searching for and printing images, rather than using physical samples (Designer A, 2021). Buyers and designers communicate the designs for each month to other members of staff, by distributing printouts on the floor or placing them on the desks of colleagues. When restrictions became increasingly strict in South Africa, designers and the merchandising team were forced

to hold online meetings, which precluded the use of both printed images and garments (Designer B, 2021).

4.2.1.4.: Reviewing the computer-aided drawings and ranges of designers

In this step, designers are responsible for gaining insights into the requirements of the buyers and evaluating the options and silhouettes that are available to create each individual design. Designers also provide direction and guidance pertaining to details such as printed images or artwork, trims, and branding devices. Before the effects of the Covid pandemic began to be felt, the designers would make use of CAD software programmes to finalise the designs that had been developed during the compiling of the range, which would then be printed and mounted onto mounting boards, to be used in the CAD review meetings. At the meetings all designers would lay out their designs on the floor, for the merchandising team to evaluate (Designer B, 2021).

As the discussions progressed, the designers made notes on the printouts of their designs, to enable them to make any changes that were required. Fabrics and silhouettes were also discussed. All of the reference samples that had been collected were used to create a mock-up of the final appearance of each design. Since the pandemic, designers have had little choice but to conduct their CAD review meetings online, by means of Google Meet, in which designers present their designs in CAD format, rather than as printouts. *"CAD review meetings online have been okay, because when it comes to the CAD review stage, you already know what you plan to do, it's just a review of the designs all together. The visual aspect of the CADs is much easier, because if it's on the screen, it's nice to see all the designs together and the prints come out in the correct colour, whereas the printer can change the colours slightly and it's not always a good representation of the colour"* (Designer B, 2021).

When suggestions are made in online CAD reviews, changes to a style can be made relatively easily, but as it is possible to do so only later when designs are printed out, subsequent meetings are necessitated to review the changes, to determine whether the suggestions have produced the desired results, which can entail an unnecessary waste of time and resources (Designer B, 2021).

4.2.1.5.: Creating briefs and technical packs for the purposes of costing and developing samples

As it was explained in section 4.1.4., "*designers are responsible for creating Tech Packs in CAD format, in which all of the design and trim details are specified. They are required to collaborate with product technologists to ensure that the specifications of garments accord with the characteristics of their designs in relation to proportion, construction, and finishing"* (Brand Manager, 2021).

4.2.1.6.: Assessments of samples in the retail cycle and the role played by designers

Suppliers submit strike-offs, laboratory dips, and trims to the merchandising team for approval. Strike-offs are samples of printed fabric that have been created and dyed in accordance with the specifications of designers. They are essentially mock-ups of the patterns or printed designs that designers have submitted to them and reveal how particular fabrics react to the dyes that are used and provide an indication of final colours and the scale of the artwork as it will appear on a garment. "*A strike-off is ultimately a piece of fabric that is printed to reflect the artwork of a designer as closely as possible"* (Designer B, 2021).

Figure 4.16: Example of a strike-off (Source: Designer B, 2020)

By contrast, a laboratory dip is a sample of fabric that has been dyed to meet the specifications of a customer such as Company R, which is provided to enable customers to confirm that the finished product accords with their requirements (Designer B, 2021).

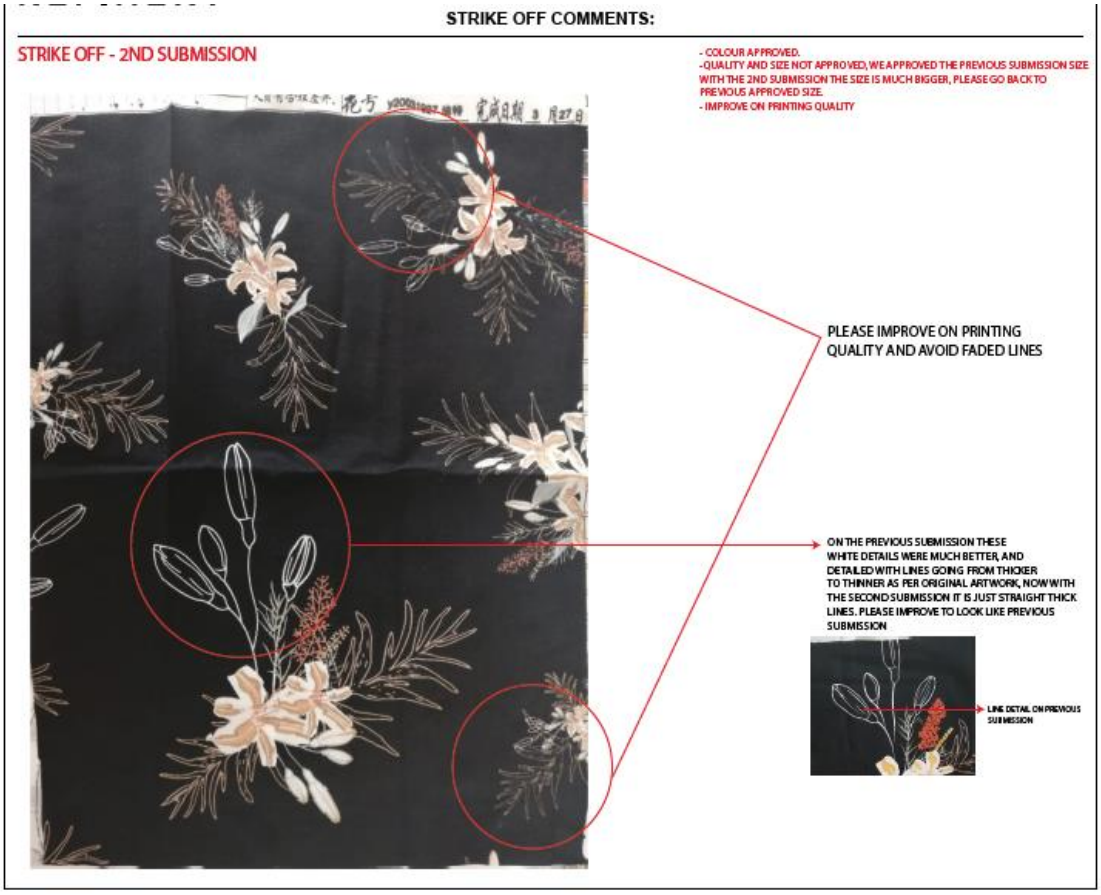


Figure 4.17: Example of an approval document for a strike-off (Source: Designer A, 2020)

An approval of a strike-off is a document that is forwarded to a supplier with annotations to indicate how the artwork needs to be improved.

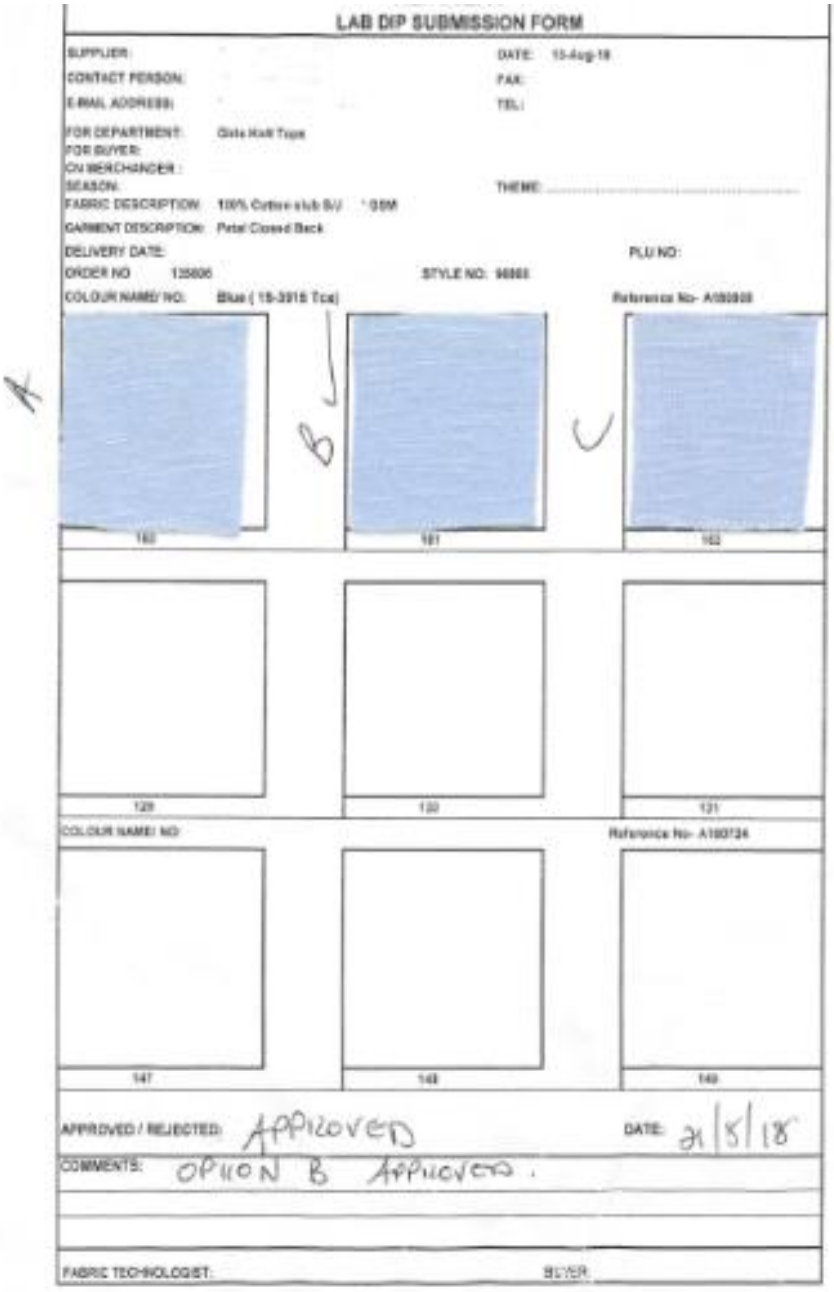


Figure 4.18: Example of an approval document for a laboratory dip (Source: Designer A, 2020)

Lab dips are provided in swatches that have been created in the specific colours that buyers have requested. They are sent for approval until the buyers are satisfied that the final colour accords with their requirements.

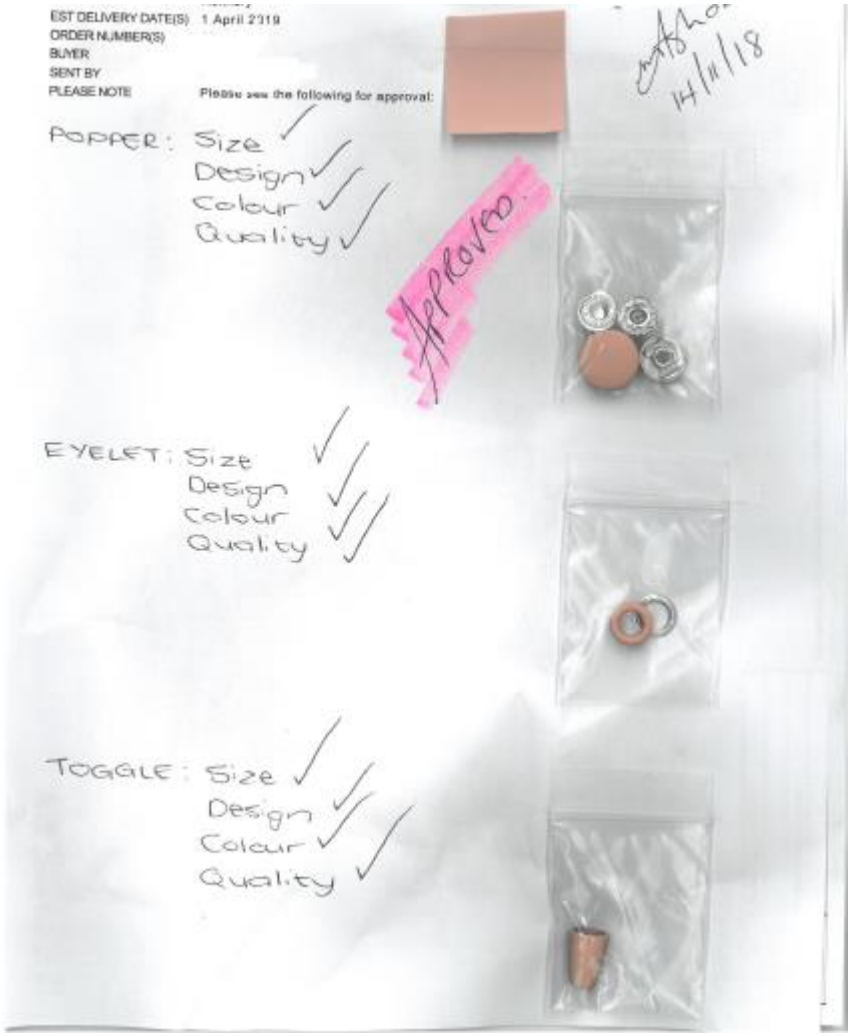


Figure 4.19: Example of an approval document for trims (Source: Designer B, 2020)

Samples of trims are sent by suppliers as being representative of those that are to be used in the manufacturing of designs. The document is received in the form of an A4 piece of cardboard or paper. "*If a trim cannot be pasted onto the cardboard or paper, it will be placed in a small plastic bag with a seal and either taped or stapled onto the document. The samples are checked and signed off by the designer and the buyer"* (Designer A, 2021).

If there are any complications, the designer and buyer will ask the product technologist for assistance to determine whether the fabric will be suitable for its intended use. If the design, colour, or construction of the fabric, a trim, or button is deemed to be unsuitable, it will be rejected and the supplier will be required to resubmit the approval

document, which can entail wastage of time and resources. In some instances, more than two submissions are necessary: *"If the print colour is wrong but the base colour is right, the sample would need to be resubmitted. If the base is corrected and the print has a flaw, it would have to be resubmitted again and this process will be repeated until the supplier gets it right"* (Designer A, 2021). In addition, files and trims that are not used during a season are disposed of: *"It gets chucked out, as does the plastic, paper, and trims are chucked and files are emptied for the new season"* (Designer A, 2021).

"Fit assessments are conducted by the product technologist. Each garment is sent to the head office in a plastic bag, with a plastic sleeve containing a printed copy of the garment specification fit report. Every garment that arrives wrapped in plastic is fitted and the plastic is discarded, a procedure that generates large quantities of plastic waste. When the first garment is fitted on a dummy, the designer will attend the fitting session, with the buyer and product technologist. The purpose of this session is to ensure that the elements of the design have been correctly interpreted and reflect its specifications" (Product technologist, 2021).

Other items that require approval are the extra care instructions, which are designed on an *ad hoc* basis by designers when they are required by product technologists as a proactive measure to prevent the damage to products after they have been purchased. They can take the form of a sticker, a swing tag, or a card that contains instructions for maintaining the condition of the product (Product technologist, 2021).

The participation of designers generally ends at the manufacturing stage. Although designers often visit stores to evaluate the likely perceptions of customers in a real-life context, doing so is not a formal responsibility. Any evaluations that a designer makes will be relayed to the product technologist if they pertain to quality, or to the buyer and planner if they pertain to sales and prices. "*General appraisals can also be provided by employees at all levels of the company, as irrespective of the positions that they might hold, all are also customers of business enterprises"* (Designer A, 2021).

4.2.2. RESPONSIBILITIES OF BUYERS AND ASSISTANT BUYERS

Buying procedures are an integral component of the retail cycle. They play an oversight role and are connected to each role in the retail cycle. Accordingly, they contribute directly to and largely determine the amounts of waste that are produced by the operations of the company.

4.2.2.1. The post-seasonal meeting: Reviewing the sales of the previous season from the perspective of buying and planning

The role of buyers in post-seasonal meetings is to collate and present all of the relevant information pertaining to the sales of products, from the best-selling to the least-selling in each category. Although the meetings were attended in person before 2021, Covid restrictions have necessitated holding the meetings online, which has resulted in significantly reduced production of printed paper and quantities of waste from the consumption of take-away food (Buyer C, 2021). The meetings begin with a presentation by the planners of financial figures from the previous season, which is followed by an analysis of the sales of products by the buyers. The buyers provide a comprehensive appraisal of the factors that contributed to the performance of individual products, from the perspectives of purchasing decisions and full product cycles, including aesthetics, quality, fits, delivery, numbers of units, and prices.

4.2.2.2. The role of buyers in trend workshops

"The role of buyers in trend workshops is to maximise the effectiveness of existing brand strategies. Vital data, such as sales histories and performance, are taken into account, which enables the buyers to evaluate existing strategies in relation to the established identity of the brand. Buyers work with designers to identify relevant trends, silhouettes, and colours that accord with the overall ethos of the brand" (Brand Manager, 2021).

As it has been explained, travel restrictions and other consequences of the Covid pandemic have necessitated confining strategizing to predict trends to workshops and local competitive shopping. The merchandising team engages in competitive shopping to evaluate the products that other fashion retailers are marketing during a particular season, to obtain insights into the styles and fabrics that tend to predominate. Before the imposition of restrictions as a consequence of Covid-19 in South Africa, the merchandising team would travel to countries abroad in which fast fashion retailers were a season ahead of South Africa. This practice enabled them to obtain invaluable insights into likely trends for garments and fashion accessories that would be likely to command markets in South Africa during the following season. In the fashion industry, the practice is known as going on a buying trip, whose purpose is to identify and purchase garments that are relevant to the trends that embody the identity of the brand. Garments that are deemed to accord with the identity of the brand are purchased and taken back to South Africa, to provide inspiration for the development of new ranges. "*All sample garments are mutilated to ensure that they are considered by customs officials in South Africa to have no commercial value, as they are to be used as samples to provide ideas for new styles only, rather than sold as commercial merchandise"* (Designer A, 2021).

The merchandising team continues to purchase garments from other local fashion retail stores during the Covid era, to research recent trends in relation to styling, colours and print designs, and construction. "*The garments that are selected and purchased will usually have been manufactured from a range of different fabrics, such as virgin polyester, acrylics, nylon, cotton, viscose, elastane, and linen. Trend workshops are hosted by the designers and presented to the merchandising team".* They are usually held over a full day at a venue away from the premises of the company, with catering being provided by the venue. As one buyer explained *"Previously, when the strategy meeting was in-house, the catering team provided our meals in a glass jar with wooden spoons, which is great for reducing waste"* (Buyer C, 2021).

During the presentations, the designers make use of mood boards, which have fabrics attached as a reference to demonstrate styles that are most popular or widely discussed online at the time, particularly on social media websites. *Company R* is

committed to reducing its use of synthetic fibres and increasing its reliance on natural fibres. It is evident from recent sales histories that this stance appeals to customers and provides an improved aesthetic component (Buyer D, 2021). "*As the brand prioritises quality, although it endeavours to negotiate competitive prices with suppliers, it is not prepared to compromise with respect to quality to obtain desired prices. Buyers rely on product technologists for insights concerning fabrics whose durability and quality accord with the standards of the brand"* (Product technologist, 2021).

Designers use Pantone colour guides to demonstrate the intended colours of their designs and supply new diaries, pens, and writing pads to enable the members of the team to take notes during the presentation concerning points that pertain to their specific roles: for example, a product technologist would record fabric innovations, silhouettes, colours, and new dyeing methods. They use the information to perform their overarching role of ensuring that the standards of quality of the company are maintained (Product technologist, 2021).

4.2.2.3. The role of buyers in the implementation of strategic intent

The buyers play the leading role in meetings that are held to discuss strategy: *"Here we decide the categories we want to buy into, based on the post-seasonal meetings and trends"* (Buyer A, 2021). The buying team reviews the sales of the previous season and develops a strategy for the buying plan for the next season, which it presents to the merchandising team, along with examples of the products that epitomise the trends that the strategy prioritises. The buyers provide reasons for shifts of emphasis from previous seasons and information pertaining to volumes per category, price points, novelty, and brand elevation. The strategy for dealings with suppliers is also presented. Suppliers whose performance is deemed to be excellent in respects such as delivering goods on time, providing products of appropriate quality, and delivering products that accord with the specifications of the company are retained as preferred suppliers of particular categories of products. Conversely, suppliers whose performance has been poor or mediocre in these respects, or have repeatedly delivered defective products, are likely to be dropped.

4.2.2.4. How a buyer develops a range for a season

Buyers endeavour to compile accurate representations of the ranges that they intend to launch. "*They are required to integrate effectively and successfully the findings that emerge from post-seasonal meetings with those of their research into trends and the priorities that are advanced during discussions of strategic intent. Company R stores have ladieswear and menswear departments. The ranges for the Summer 22 season comprise 251 styles for ladieswear and 280 styles for menswear, with 740,000 units of the former being placed in ladieswear departments of stores and 1,156,300 units of the latter in menswear departments"* (Buyer A & Buyer D, 2021). These units will determine the quantities of fabric and polybags that are used and the number of samples that need to be fitted for the season (Buyer's assistant B, 2021).

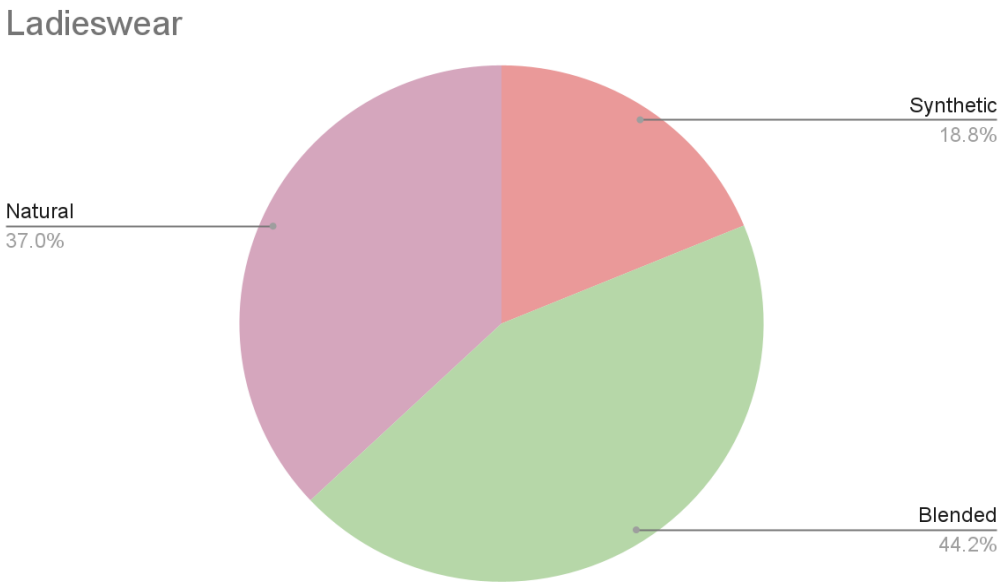


Figure 4.20: LADIESWEAR: COMPOSITIONS OF FABRICS PURCHASED BY THE COMPANY IN PERCENTAGES (Source: The researcher, 2021)

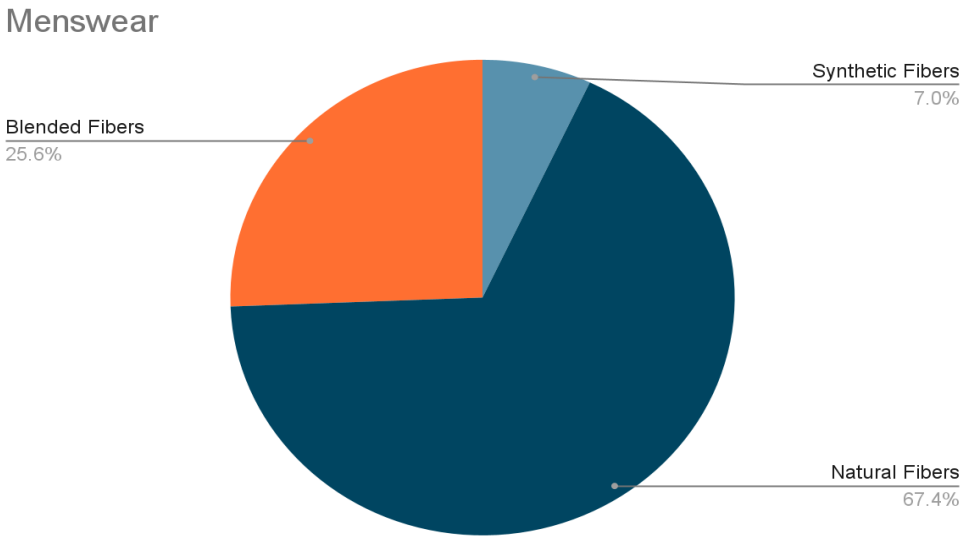


Figure 4.21: MENSWEAR: COMPOSITIONS OF FABRICS PURCHASED BY THE COMPANY IN PERCENTAGES (Source: Buyer A and Buyer B, 2021)

4.2.2.5. Reviewing the range

"The meetings at which ranges are reviewed take the form of structured and logical presentations, with visual aids, in which buyers introduce new ranges to the staff, with respect to the months during which products and specific categories of products are to be introduced. The visual aids include printouts, samples, fabric swatches, and colour palettes. Buyers receive guidance from the merchandising team concerning silhouettes, fabric, colour, and print designs. At this stage it is possible to make changes to a range in respects such as design or methods of fabrication." For the Summer 22 season the distribution of compositions of fabrics that were purchased for ladieswear was 37 percent natural fibres, 18.8 percent synthetic fibres, and 44.2 percent blended fabrics, with the last mentioned consisting of a blend of natural and synthetic fibres. For menswear it was 25.6 percent blended fabrics, 7.0 percent synthetic fibres, and 67.4 percent natural fibres.

4.2.2.6. Briefing suppliers with design details, tech packs, and garment specifications

It is the responsibility of buyers to create brief sheets for suppliers. In the case of *Company R*, a buyer, with the assistance of a buyer's assistant, populates a Google spread sheet with all of the requirements for each product that the company intends

to develop. "*The buyer develops a timeline for the product technologist and the designer, which stipulates the dates on which garment specifications and technical packs need to have been completed"* (Buyer's assistant A, 2021).

Once all of the suppliers have been briefed, the buyer's assistant sends samples to the suppliers, to provide references from which to work. These samples could be samples from a trend trip or, in the case of a new supplier, a sample from a previous season. "*The samples are cut up, a small section of each garment is kept for reference and the remainder is sent to the supplier, to use as a reference for fabric composition, weave or knit construction, colour, or styling details. The supplier will replicate the fabric or garment that has been sent and send the merchandising team a sample that is based on it"* (Buyer D, 2021).

4.2.2.7. Creating purchase orders and raising orders for suppliers

"A purchase order is the legal contract between a buyer and a supplier, which contains all of the relevant details pertaining to an order and the products that are stipulated in it" (Brand Manager, 2021). *The buyer manages all communication to suppliers, to ensure that the briefs are clear and concise* (Buyer's Assistant A, 2021)*. Each supplier would have been chosen to produce a specific order on the basis of past history and the strategy of the company for the future* (Buyer D, 2021). The role of buyers is to ensure that suppliers agree to the costs per unit that permit the margins that the company requires and the strategic intent to be achieved.

"A buyer's assistant assists the buyer to collate brief documents, ensures that due care is given to the raising of orders, assists in the management of communication with suppliers, and attends to requirements such as the loading of new suppliers onto the business systems of the company. Buyer's assistants are also responsible for informing suppliers of the requirements of the company with respect to packaging, to conform to shipping and logistical stipulations and with the requirements of the distribution centre. Company R specifies in its manual for suppliers how products are required to be packaged, which is usually in a polybag and then in a cardboard carton" (Buyer's assistant B, 2021).

Figure 4.22: *Company R* carton, sealed with box-sealing tape by a supplier (Confidential information has been removed) (Source: Product technologist A, 2021).

"Suppliers are required to package the products that have been ordered in cartons of one standard specified size. Stipulated numbers of units are packed into the cartons and weighed to ensure compliance with the required weight of 18 kilograms per carton for shipping and receiving at the Company R distribution centre" (Buyer's assistant A, 2021). "*The cartons are sealed with plastic box-sealing tape by the supplier. When shipments reach the DC, the tape is removed, products are repacked, and cartons are stapled closed. Suppliers are held responsible for the packing of cartons, shortages, damages, and claims that result from sub-standard packing or packaging".* (Distribution manager, 2021).

4.2.2.8. The roles of buyers and buyer's assistants in the assessment of samples

"Buyers are responsible for managing timelines for fitting approvals and production, to ensure that manufacturing schedules are able to meet stipulated delivery dates. They are also responsible for working in collaboration with product technologists and designers to ensure that products are manufactured in accordance with the briefs that have been provided to suppliers, while buyer's assistants are responsible for controlling and managing all samples" (Buyer's assistant A, 2021). "*The buyer's assistant receives samples of garments and items such as trims, strike-offs, and lab-*

dips and distributes them to the members of the team who are responsible for evaluating them. The samples are sent in a plastic bag, which is placed in a plastic courier bag for protection while they are in transit from the supplier to the head office. When the parcel is opened, the courier bag is discarded and placed in a refuse bin and the plastic bag in which the samples had been packed is placed in a carton. Cartons are collected by a cleaner and placed in a carton recycling bin, for collection by a recycling company" (Buyer's assistant B, 2021). As buyer's assistant B (2021) explained: *"Sometimes I give my plastics to the cleaner, I don't know if she has a recycling bin, but sometimes I have to store it in a box because that's how much plastic I have"*.

Each sample that is received is booked on a system document, in order to keep a record of samples that have been received for fitting. Samples that are booked onto the system are required to be accompanied by a paper fitting ticket, which is attached to the garment by means of a plastic kimble tie: *"My suppliers sometimes use a cable tie to attach a ticket to the product and sometimes it destroys my samples"* (Buyer B, 2021). The ticket contains all relevant details pertaining to the product, such as the style number, order number, product description, colour, and season. The booking system facilitates the management of timelines by buyers and enables them to trace the sources of problems in the event of delays. During the time of Covid restrictions, all of the members of the team have contributed to carrying out the duties of buyer's assistants by collecting goods from the mailroom when buyer's assistants are working from home (Buyer's assistant A, 2021).

All fitting samples are kept in a sample room, which is controlled by a buyer's assistant. Once the room has been filled to capacity, the garments are either sent to the sample shop or disposed of to create space for the samples for the next season (Buyer B, 2021). All samples from buying trips are filed in a separate room and discarded when they are no longer needed. "*All swatches, strike-offs, trims, and lab dips are kept in lever arch files, which are subsequently discarded to empty the files for the next season. Fitting ticket tags are also discarded, along with their plastic kimble ties"* (Buyer's assistant A, 2021).

4.2.2.9. The compiling of orders and the crucial role of communication in the buying department

Buyers are responsible for managing communication with suppliers at all stages of the manufacturing of products that have been ordered. When members of the team or suppliers report problems, they are discussed with the buyer concerned and a solution is arrived at, either within the team or by the management of the company. On the basis of decisions that are made during the discussions, the buyer and members of the team inform the supplier concerned whether or not the order in which the problems had occurred has been cancelled. "*If an order is cancelled, the products that have been manufactured remain the property of the supplier, whose prerogative it is to decide the future of goods that have already been produced. If the supplier elects to sell the goods, they can be sold only after the season for which they had been intended has elapsed, which is usually a period of 6 months. Suppliers who do not comply with the conditions of contractual agreements are subject to penalties or legal action"* (Buyer C, 2021).

Buyer's assistants issue suppliers with manuals in which packaging requirements are specified. "*Once production has been completed, the supplier sends examples of packaging to the buyer's assistant for approval, which confirms that the packaging has been deemed to be suitable for shipping the manufactured goods to the company. Each of the categories of merchandise that are sold in the stores, namely, apparel, accessories, and footwear, has its own specifications pertaining to packaging materials. As this research concerns the retail cycle of apparel only, data was obtained concerning the packaging specifications for apparel and applicable accessories such as caps and hats"* (Buyer C, 2021). "*Each garment from the bulk production run is required to be folded in accordance with the instructions of the product technologist to maintain its shape, before it is placed in a polybag with a sachet of silica gel, which controls the moisture in the packet. Each polybag is placed into a carton, which needs to be of a specific height and weight to fulfil the requirements of the shipping protocol"* (Buyer's assistant A, 2021).

4.2.2.10. Delays or wastage as a consequence of problems encountered during the clearance of shipments

Although the buying department does not take part in logistical arrangements, in the event of problems pertaining to transport or any type of delay, the merchandising team will intervene if the distribution centre is unable to resolve the problem. "*On occasion, when suppliers require a letter for clearance through customs, clearance can be delayed as a consequence of random inspections. In these cases, the buying department provides a letter to request the release of the shipment"* (Buyer's assistant A, 2021). "*If a shipment continues to be held at the customs and the letter fails to elicit permission for it to be released, the shipment could be blocked by the customs for a period of several months. In these instances, customs officials sometimes advise that the merchandise should be destroyed, which obliges the management to obtain legal advice to secure the release of the shipment"* (Brand Manager, 2021).

4.2.2.11. The movement of goods from the distribution centre to stores and the role of buyers in ensuring adherence to delivery times

The staff of the distribution centre are responsible for the management of the logistical requirements pertaining to delivering goods from shipments that have been received to stores. "*Buyers intervene in distribution if problems arise with respect to timelines or the delivery of an order. In the event of problems pertaining to quality, the distribution centre might need to communicate with the buyer concerning a revised order, which could entail splitting the order and sending batches of it to specific stores, which can be necessary when problems arise with respect to shading. "Shading" is a term that is used to describe discrepancies in the colours of production runs of garments that have been ordered in particular colours. In some cases, the colours of individual garments might not be uniform, while in others there could be unacceptable variations in the shades of the colours of garments. If it is possible to group garments into specific shades and there are sufficient units to warrant sending batches of grouped shades to stores, orders are sorted by the supplier or a third party and then returned to the distribution centre for redistribution to stores"* (Distribution Manager, 2021).

4.2.3. The final phase of the retail cycle: trading

Trading is a crucial phase in the operations of the company during the retail cycle. Once products have been received and are displayed in stores, it is the responsibility of buyers to visit stores to evaluate them. Each Monday buyers review the sales reports of stores to evaluate the performance of products. Performing a weekly analysis of performance enables buyers to make decisions concerning future orders for the same or similar styles. "*Weekly sales are discussed in meetings and if the performance of particular products is deemed to be unacceptable, the buyer concerned might remove particular consignments from stores if it has been concluded that they lack appeal for customers. In the event of orders being cancelled as a consequence of decisions to remove products from stores, the products might either be donated or destroyed by suppliers if the order has not yet been shipped"* (Buyer D, 2021).

In rare instances, orders are recalled from stores if particular products are deemed to be faulty. In these cases, all of the products that have been placed in stores will be removed and returned to the distribution centre. Goods are returned to local suppliers and also to suppliers abroad if they are able to pay for the transport costs. "*Defective orders are usually donated to charity once all the labelling has been removed. Company R has never been obliged to destroy an order that has been recalled from stores"* (Planner A, 2021).

4.2.4. Responsibilities of planners

Planners formulate strategies for distribution and financial plans for buying throughout each season. Planning begins with discussions with buyers of strategic intent and the development of ranges: "*We create a wish-list with the insights from post-seasonal trend meetings and strat* [strategy]*"* (Planner A, 2021). To enable buyers to place orders to purchase products from suppliers, planners are required to allocate budgets to individual buyers. Planners advise buyers of the numbers of units that their budgets are able to accommodate. The first criterion is variety, which pertains to the numbers of different styles that are needed for each commodity, while the second consideration

entails advising buyers concerning the volumes that need to be purchased for each style and in how many colours each is to be purchased. It is crucial that buyers should base their purchasing decisions on the findings that are generated by post-seasonal meetings, to eliminate cancellations as far as possible, which could result in wastage (Buyer A, 2021).

4.2.4.1. The role of planners and how it could contribute to the quantities of waste that are generated

The role of planners entails analysing sales figures, which they monitor on the basis of sales histories, by means of business systems. They also use sales histories to predict or forecast future sales and present their sales plans each season, in the forms of both general overviews and also by category, including options and volumes for each sub-category, on a digital software programme. Prior to the Covid restrictions, when strategizing was carried out in person, planners would print their sales histories and forecast future sales for entire teams that attended the meetings, to enable each member to follow the presentation and financial report. Each member would be issued with a copy of the proceedings, from which to work in their specific roles. If the copy was lost, the member could request a reprint from the planner. Online meetings enable planners to report their figures online, to which anyone who needs to consult them or other components of the presentation has direct and immediate digital access, which eliminates the need to issue printed copies: *"It's a much better way of communicating and there is a record of the meeting, because at times, what will be a problem is that people will lose papers"* (Planner A, 2021).

As another planner explained, *"As the planners, we're always planning, we're planning all the time"* (Planner B, 2021). Constant planning is a strategic and systematic approach to maximising return on investment, through planning and accurately monitoring sales, margins, and inventory, to increase profitability. Planning merchandising enables these goals to be achieved by maximising sales and potential profit margins and minimising losses that result from being obliged to clear stock by marking it down or being out of stock of saleable merchandise, while taking into account all existing constraints. "*The planning of merchandising is carried out at*

several different stages of the retail cycle and is often repeated for the same time period with updated information" (Planner B, 2021).

"Stores are profiled in accordance with their turnover figures and the profits that their sales generate. This data enables planners to make accurate assessments of the stock that individual stores require at particular times and ensure that assortments of stock that are delivered contain the correct quantities of individual items. The planners continuously evaluate figures and report them to their merchandising teams. Both the forecasting of sales and the formulation of strategic intent are crucial components of the planning phase. Planners are responsible for maintaining financial plans and ensuring that buyers adhere to them and do not allow purchases to exceed the figures that had been arrived at during strategizing. The overall responsibility of planners is to manage stock and sales and ensure that the stock that is delivered to stores accords with the figures for sales that they have forecast and that the profits that have been estimated are realised. Planners are authorised to make decisions pertaining to how products are to be packaged by suppliers. In previous years, the planning team required suppliers to pre-pack cartons of stock for individual stores, which significantly reduced the amount of waste that was generated by packaging. Cartons would go directly from the supplier to the store. This is something that we could implement again to contribute to sustainable practices" (Planner A, 2021). "*Planners endeavour to improve particular ratios of the previous year, by strategising to maximise sales from the smallest possible quantities of stock, minimise the percentages of stock with respect to turnover of quantities of products that are to be marked down to clear, and maximise the rates at which stock is turned over"* (Planner B, 2021).

4.2.4.2. The logistical role of planners and the consequences of logistical failures

Planners play a logistical role, by communicating by email with the transport companies that the company patronises to deliver merchandise to stores and the distribution centre, to ensure that the scheduling of deliveries is maintained and that stock from the distribution centre arrives by the dates that have been projected for maximal sales. "*In many instances, stock that arrives after scheduled dates could*

result in severe losses as a consequence of unsold stock. If stock that has been ordered for a particular season arrives at the end of that season and is still placed on the floor to be sold, there is a significant likelihood that a high percentage of it could become dead stock, which is effectively unsaleable and is usually drastically marked down to clear" (Buyer B, 2021).

4.2.4.3. How the failure of suppliers to comply with the specifications of planners can adversely affect the distribution of shipments to stores

"The receiving department at the distribution centre communicates with the planner concerned to report whether orders are received on time or fail to arrive. Orders that are received are required to reflect the quantities of units that have been ordered, from which suppliers are not permitted to deviate by more than 5 percent" (Planner B, 2021). If the numbers of units that are received exceed, or are less than those that have been specified in the original order by a greater margin, the distribution centre is required to obtain permission from the planner concerned to receive the merchandise into the centre for distribution. In the event of the planner determining that the quantities do not accord with the ratios that had been strategically planned, the planner will either refuse the order or deduct a discount from the amount that is due to the supplier. Any decisions that are made that do not accord with plans that have been formulated on the basis of forecasts of sales necessarily entail risk. "*Decisions pertaining to whether or not to take the risk are usually based on past experience or the performance histories of the products in question. In instances of orders being cancelled on the grounds of the failure of suppliers to comply with the specifications of a planner, the merchandise could either be donated or returned to the supplier"* (Planner B, 2021).

4.2.4.4. Sales figures and the strategies of planners for predicting the future saleability of products

Each week planners consult the style track, which is an online record to which members of the team have access, to evaluate the performance of individual products. Data is relayed directly by stores to the style track. If the sales of a product are exceeding the projected figures of a planner, it would need either to be replenished or

the delivery dates for replacement stock would need to be moved forward. Conversely, if the movement of stock fails to match the projections of the planner, it would be necessary to mark it down as a means of avoiding being encumbered with dead stock, although the degree to which items are marked down would need to accord with the budget and not threaten to derail the original plan. If it is not feasible to mark the stock down, any replenishment stock of the same or similar styles would need to be significantly reduced, to offset losses and enable it to be replaced with merchandise that customers are likely to feel motivated to purchase: *"For example, if you're dealing with a winter jacket, in the height of summer, it is not ideal and you would need to sell it for next to nothing"* (Planner B, 2021).

4.2.5. Responsibilities of the marketing coordinator

The marketing department begins to participate in the retail cycle by carrying out flat-lay photographic shoots using marketing samples that the buying department has requested, which are communicated to consumers through social media platforms such as Instagram and Facebook. Each style that is featured is represented by a marketing sample in size 8. Flat-lay photographic shoots entail the two-dimensional modelling of garments on plain or decorative surfaces with a few accessories, to convey the ways or contexts in which they could be worn to prospective customers. The social media specialist provides direction concerning the types of images that need to be created for social media platforms (Marketing coordinator, 2021).

The marketing coordinator carries out an e-commerce photographic shoot each month, using samples in size 10. The garments are photographed according to both style and colour and every month new styles are uploaded onto the website: *"The e-comm shoot is a monthly shoot that we shoot for our website and it has to be done within a specific timeframe"* (Marketing coordinator, 2021).

All of the products that are to be featured need to be prepared, steamed, and labelled for the photographic shoot. If a particular product is missing, the marketing coordinator will advise the buyer accordingly. Detailed flat-lay photographs of each product are taken, before the products are photographed on models. The shoots take place

according to the estimated dates of arrival of the products of the distribution centre, one month before the goods are due to be delivered to the distribution centre: *"I catalogue exactly for myself what has been handed over and then I cross-reference it with the into distribution centre list that the buyers and buyer's assistants do for us on a monthly basis. That's also nice to keep a track record of what's actually coming in, has it been moved out to the next month or whatever, then we can make a call to shoot it next month or just shoot it now, then it's done"* (Marketing coordinator, 2021).

After the flat-lay photography shoot, the marketing coordinator hands the products over to the photographer on the following day, to be photographed on models. The marketing coordinator briefs the stylist, to ensure that the model is dressed in accordance with the prescriptions of the brief, to create the look that the buyer has requested: *"I have to ensure that the photos are taken according to the brief and that there are enough shots to choose from as well, because sometimes the model will turn and the garment will pull funny and the photographer must also make sure that he edits out all the cuts* [mutilation] *on the garments"* (Marketing coordinator, 2021).

Once the e-commerce photographic shoot has been completed, all garments are transported back to the head office from the studio: "*Often I have two months of product with me at any given time because after the upcoming month's e-comm is shot, I need to shoot the current month's flat lays for Facebook and Instagram and ensure that all the product that is shot will be delivered to stores within a month from when the shoot is done. This will enable the digital content coordinator to upload all the content as is on social media and not be concerned that a particular item will not be available. A customer can then find each product that is presented on social media in stores or on the website"* (Marketing coordinator, 2021).

When the digital content coordinator uploads images that reflect a particular seasonal look onto the website or posts them on Instagram or Facebook, all items that are portrayed need to be available in stores, to prevent dissatisfaction, disappointment, and a loss of faith in the brand among customers, as a consequence of being unable to purchase items that have been advertised. It is crucial for the marketing coordinator to adhere meticulously to timelines, to coordinate the printing of posters with the arrivals of new products. In instances in which orders for products are cancelled, the

posters and other printed materials that have been created from marketing photographic shoots might not be used (Visual merchandiser, 2021). It was evident that relatively little waste was generated during the activities of the marketing phase of the retail cycle: *"All garments are handed back to the buying team. We do not necessarily create any waste. The only waste I can think of is the waste that is created by the consumption of takeaway food at shoot locations, such as water bottles, coffee cups, or food containers"* (Marketing coordinator, 2021).

4.2.6. Responsibilities of the digital content coordinator

The digital content coordinator coordinates all advertising through the *Company R* website and social media platforms such as Instagram and Facebook. Another responsibility is the management of communication with customers who place orders online. As the functions of the digital content coordinator are performed solely by means of digital equipment, they pose the least threat to the sustainability of natural environments and generate the least waste in the retail cycle (Digital content coordinator, 2021).

4.2.6.1. The role of the digital content coordinator in minimising the disposal of plastic and overall implications for sustainability

The images from the photographic shoot that the marketing coordinator supervised are sent to the digital content coordinator, whose schedule is synchronised with the delivery dates for each product. Once they have been delivered to the distribution centre, the digital content coordinator loads the e-commerce images onto the website with descriptions of the products that the designers have provided (Digital content coordinator, 2021).

All photographic material for social media platforms is loaded in accordance with the marketing campaign schedule. Each campaign is launched on a specific date, which coincides with the date on which the products are delivered to stores and necessitates updating social media platforms with the specific images that the marketing coordinator has produced to market them (Digital content coordinator, 2021).

The digital coordinator also plays an active role in e-commerce transactions at the distribution centre. The marketing team makes decisions pertaining to the packaging of e-commerce orders, which the digital content supervisor supervises. At present, e-commerce orders are packaged in a polybag and then placed in a cardboard box: *"The polybag is not removed because the plastic ended up lying in the e-commerce distribution centre, causing a mess. Keeping it on also prevents the garments from getting dirty"* (Digital content coordinator, 2021). Although the present policy for the packaging of e-commerce orders precludes the large-scale disposal of plastic by the distribution centre, the environmentally irresponsible behaviour of large numbers of consumers throughout the world inevitably contributes to the vast amounts of plastic waste that pollute marine and other natural environments.

4.2.7. Functions of the quality assurance department and the role of product technologists

Product technologists are responsible for setting all standards pertaining to quality in the company. Accordingly, their decisions have a significant influence on the quantities of waste that are generated during the retail cycle.

4.2.7.1. The role of product technologists at post-seasonal meetings and in preventing the wastage of textiles

"One of the principal functions of product technologists is to gain insights into the factors pertaining to quality that contribute to the performance of individual products with respect to sales. They carefully record and assess all problems that arise and the concerns that customers express during the trading phase of the retail cycle. If they identify potential problems, they advise the buyer concerned of improvements that need to be made to the durability or quality of fabrics and production methods, as a proactive measure to prevent the potential wastage of textiles" (Product technologist A, 2021).

During the trading phase, product technologists take careful note of comments that are made by both members of staff and customers concerning the fit of individual

garments, to enable them to provide guidance for improvements for the next season. Another factor that is crucial to the success of the retail cycle is the extent to which suppliers adhere to the standards pertaining to quality that product technologists set on behalf of the company. In cases in which the quality of particular products is found not to comply with the standards that product technologists have stipulated, the product technologist concerned conducts a comprehensive investigation of the problem, by visiting stores, taking photographs, measuring garments, questioning the managers of stores to determine the response of customers to the products, and conducting laboratory tests.

"All information is collated in a report, which is forwarded to both the supplier and the management of the company. In some instances, on the basis of the number of problems pertaining to quality that have been identified in the products of a particular supplier, the product technologist might advise the management either to terminate the contract of the supplier or significantly reduce volumes that are ordered until it has been established that the supplier complies with the standards that have been set sufficiently consistently" (Product technologist A, 2021). The conclusions that are drawn from the findings of post-seasonal meetings can result in the carrying out of investigations in stores. "*In cases in which it has been determined that the quality of products has been detrimental to the image of the brand of the company, particular orders or products could be recalled from stores and either donated or destroyed, in accordance with an evaluation of the quality of the products"* (Product technologist B, 2021).

4.2.7.2. The role of product technologists in ensuring that wastage through the production of poor quality products is prevented

Although designers play a leading role in trend workshops, product technologists contribute by analysing new fabric technologies, new fit silhouettes, and the proportions of garments in new trends. Apart from the aesthetic appeal of particular trends, the standards according to which they are produced need to accord with those that are laid down by the company through product technologists. As the company prioritises high quality, suppliers are required to manufacture fabrics that do not tear or shrink, or are prone to pilling. Product technologists participate in planning for

forthcoming seasons by providing guidance and insights into any new applications or techniques that could adversely affect the quality or construction of garments. "*Accordingly, as they do not authorise the use of any fabrics, designs, or products whose quality is likely to reflect poorly on the brand, they actively contribute to reducing the quantities of waste that are produced during the retail cycle of Company R"* (Product technologist A, 2021).

4.2.7.3. The contribution of strategy and planning to the ability of product technologists to avoid the consequences of poor quality and minimise the production of waste

The data that product technologists collect from previous stages of the retail cycle, post-seasonal meetings, and trend workshops enables them to determine the numbers of units that are to be placed in stores during the following season, in respects such as styles, types of fabrics, and volumes, to optimise the levels of performance that are achieved (Product technologist A, 2021).

Planners consult with product technologists to determine the distributions of sizes of styles in stores when significant changes in existing distributions occur. As it can be seen in Table 4.3., "*specific percentage distributions are calculated for each product that is to be stocked in stores"* (Planner A, 2021).

Table 4.3: Example of a distribution of sizes for a particular garment (Source: Planner A, 2020)

SIZE	6	8	10	12	14	16	18
%	17%	15%	17%	16%	15%	12%	8%
UNITS	170	150	170	160	150	120	80

4.2.7.4. The role of product technologists in reviews of ranges and CAD review meetings to assist buyers to develop ranges, ensure optimal quality, and prevent waste

Product technologists use reviews of ranges and CAD review meetings to assess the requirements of buyers concerning fabrics and silhouettes, to provide them with appropriate guidance. The advice that buyers solicit from product technologists concerning the composition and quality of fabrics, silhouettes, types of fit, or methods that are used to construct garments enables them to make decisions concerning the next season that accord optimally with the priorities of the company. "*The insights that product technologists afford buyers are based on experience, qualifications, and their ability to discern whether styles or silhouettes that are manufactured in fabrics of particular compositions will accord with the standards of the company for quality, which enables them to play a proactive role in preventing the unnecessary generating of waste"* (Product technologist A, 2021). Consequently, product technologists are required to be sufficiently well-versed in the quality standards of the company to ensure that the influence of any factors that could adversely affect the construction or quality of any product is effectively counteracted and nullified before the trading phase of the retail cycle, to enable potential problems to be resolved in a proactive, rather than a reactive, manner (Product technologist A, 2021).

At CAD review meetings the entire team is apprised of the combined contributions of silhouettes, colour, construction, and types of fabric to the overall appearance of items in ranges for the next season and provided with an opportunity to discuss and clarify specific details of garments with their designers. Product technologists use the information that they obtain from CAD review meetings to compile specifications for the measurements of garments. "*Concerns pertaining to the quality of finished garments can be expressed at the meetings to enable changes to be made before CAD briefs are submitted to suppliers"* (Product technologist A, 2021).

4.2.7.5. The potential of briefs and tech packs to influence the production of waste

The specifications for the measurements of garments that product technologists compile are loaded onto a system to create patterns, which are used to cut out pieces

of fabric, which, in turn, are sewn together to construct garments. Product technologists are required to take the specific characteristics of types of fabric adequately into account, to ensure that samples from suppliers have an acceptable fit at the stage of the first fitting, which would effectively preclude the need to produce unnecessary samples. The characteristics of each type of fabric, whether it is made from natural or synthetic fibres or woven or knitted, all contribute to its behaviour, which becomes evident when a single pattern is used to make a garment in several different fabrics. Consequently, product technologists are required to have an extensive knowledge of the characteristics and behaviour of fabrics. "*The analysis of the product technologist of the characteristics of a fabric that is to be used, together with the specifications of the buyer concerning styling, provide the basis for the measurements that are used in the development of patterns from which fabric is cut"* (Product technologist B, 2021).

"Specifications for garments are also based on particular body shapes and sizes. To ensure the consistency of fits, product technologists make use of dummies that have been developed by the company as being representative of the body shapes and sizes of its customer base. In accordance with the size curve that the company uses, product technologists grade the sizes of garments in increments, from the smallest to the largest size, taking the characteristics of fabrics, fits, silhouettes and body changes adequately into consideration" (Product technologist A, 2021). As an example, although a woven dress in size 10 with a straight sleeve might fit a size 10 customer well, it might not fit a size 18 customer well if the grading of the length of the sleeve is too small. While sleeves sometimes also need to be graded according to length, to preserve the proportions of the styles of garments, in the case of long-sleeved garments, it might not be necessary to grade the lengths of sleeves: the arms of a person 168cm in height who makes the transition from size 10 to size 18 do not grow longer. As only the biceps and shoulders become increasingly broad as sizes increase, the lengths of sleeves would need to be increased in accordance with the proportions of the body shape and the style of the garment (Product technologist A, 2021). "*In cases in which incorrect grading results in the manufacture of garments that will not fit any body size, the likely consequence would be dead stock, which could contribute significantly to the volumes of waste that are produced in a retail cycle"* (Product technologist B, 2021).

Product technologists make use of a performance standards manual, a quality assurance manual, a methods of measurement manual, and many other types of manual that have been developed in the company to ensure that suppliers adhere to its standards for quality. The standards are communicated in briefings of suppliers by buyers, in which updated or new standards are forwarded to ensure that the weaving and dyeing of fabric accords with the standards for quality that the product technologist has stipulated, to realise the designs as the buyer has envisioned them (Product technologist A, 2021). Failure by suppliers to adhere to the standards is highly likely to have a range of undesirable consequences, not the least of which is an unanticipated rapid proliferation of post-consumer waste, as a consequence of severely shortened lifespans of garments (Product technologist B, 2021).

4.2.7.6. The role of product technologists in the preparation of purchase orders and the raising of orders

"Suppliers often respond to the briefs of buyers with relevant questions, before negotiating prices, which buyers either accept or endeavour to renegotiate in the interests of permitting production costs to fall within the range that is required to achieve the margin of profit that the company stipulates. Product technologists assist buyers with costing, by suggesting alternative fabrics or construction methods to reduce costs or ensuring that the quality of merchandise is of a sufficiently exceptional standard to add to the perceived value of garments in relation to their selling prices" (Buyer's assistant A, 2021).

4.2.7.7. Assessments of samples by product technologists and their potential for contributing to the generating of waste

Product technologists play the leading role in the assessment of samples, whose internal cycle is depicted in the diagram in Figure 4.23. The data collected in the interview was collated into the process flow below.

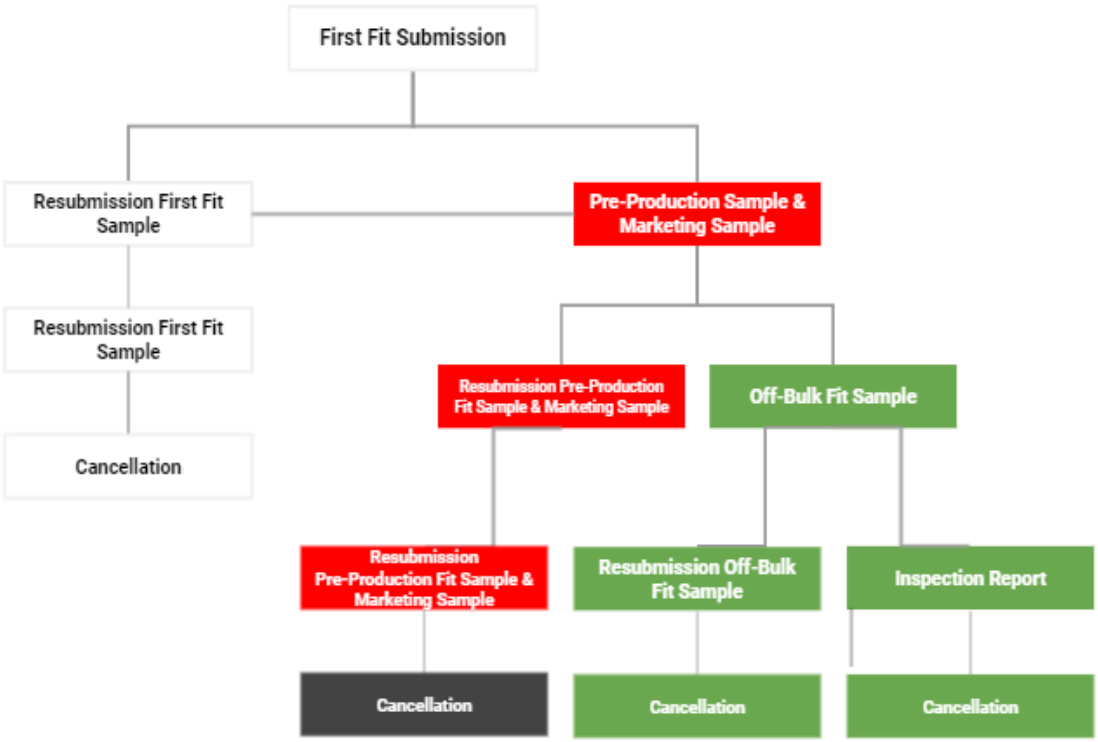


Figure 4.23: The internal cycle of the assessment of samples by product technologists (Source: Product technologist A, 2021)

"Product technologists are responsible for ensuring the fit and quality of each garment and schedule fitting sessions with the buyer and designer. Together they fit the incoming samples on a dummy and also on a human body whose measurements are similar to those of the body of the dummy. Each member of the team makes a professional assessment of the samples that the supplier has submitted for evaluation" (Product technologist A, 2021).

4.2.7.8. The first fitting

"Product technologists either approve or fail samples after the first fitting. If a sample is approved, a pre-production sample will be requested from the supplier. Conversely, if a sample is failed, the supplier will be required to submit another first sample, a procedure that can entail the generating of unnecessary waste" (Product technologist A, 2021).

4.2.7.9. Pre-production procedures

In addition to evaluating the fits of samples, product technologists also review and assess the laboratory test reports that suppliers submit, which are required to conform to the standards that they had specified for the supplier concerned. They evaluate the methods that have been used to conduct the tests, to ensure that they have been carried in accordance with specifications pertaining to criteria such as temperature or apparatus, and also to determine whether the results comply with the standards that have been specified. Test results are scrutinised to ensure that there are no inconsistencies and there is no evidence of tampering or fraudulent practices in the reports (Product technologist A, 2021).

In the event of a supplier appearing to have tampered with test results, the technologist will notify the supplier and conduct an investigation by liaising directly with the laboratory to determine whether the results have been falsified or there is evidence of any other improper conduct. Suppliers who are found to have tampered with laboratory test reports are held accountable by the company, which stipulates that suppliers are required to have tests carried out by its accredited laboratories only. Accredited laboratories have been inspected by a conformance officer and provided with a certificate of accreditation if they are found to be in compliance with the standards of the company. If the fit of a pre-production sample has been approved and the test results have been approved by an accredited laboratory, the supplier will be authorised to commence bulk production of the garment (Product technologist A, 2021).

Table 4.4: Summary of tests that are applied to materials that are used in the manufacture of apparel

Product type	Probable test	Purpose of test	Significance of test	Implications for sustainability
Fabric	Weight (grams per square metre)	To determine whether the weight of the fabric accords with specifications	Weights are selected specifically to meet the requirements of particular styles. For example, a coat will be made from heavy fabric for warmth and stability.	Durability
Fabric	Dimensional stability	To determine whether the fabric shrinks or grows after washing	Although dimensions will inevitably change as a result of washing, changes are required to fall within a specific level of tolerance that is specified by the company.	Durability
Fabric	Fastness of colour in response to light, washing, rubbing, or abrasion	To check ifthe fabric will retain its colour or the colour will fade, wash, or rub out	The colour of a garment should not wash out or fade, as its appearance would deteriorate and significantly increase the likelihood of it being discarded.	Quality
Fabric	Slippage of seams	To evaluate the strength of the weave of yarn weave at the seams of garments	The fabric is required to have sufficient strength to permit garments to be worn for at least a single season.	Durability
Fabric	Pilling	To ascertain whether the fabric is prone to pilling on its surface	Pilling on the surfaces of fabrics give garments the appearance of being tattered and worn.	Quality

Fabric	Tensile strength	To ascertain the strength of the yarn	The yarn needs to possess sufficient strength to preclude the possibility of garments breaking apart.	Durability
Fabric	Abrasion	To determine the percentage of fibres that are lost in a specific area on a garment	Loss of fibres causes fabrics to become thin and prone to tearing.	Quality
Fabric	Composition	Conduct tests to determine that the composition of the fabric conforms to the specifications of the brief of the company	The composition of the fabric must accord with the use to which it is intended to be put, with respect to design and performance.	Validation
Fabric	Stretch and recovery	To ascertain the degree to which the fabric stretches and recovers	It is essential that garments that are made from knitted fabrics should be able to stretch and revert to their original dimensions after stretching.	Durability
Fabric	Snagging	To ascertain that the yarn is not prone to the formation of loops on the surface of the fabric	Snagging gives garments the appearance of being tattered and worn.	Quality
Trims	Tests of durability or the fastness of colour are usually conducted. In some instances, all of the	To ensure that the colour of the trim does not bleed into the garment or change and that the trim does not	As faded or damaged trims detract from the overall quality of garments, their quality and durability should match those of the fabric from which the garment is manufactured.	Durability

	tests that are applied to fabrics are conducted	become damaged during washing		
Print	Durability	Washing the fabric to check that it is in the same condition after being washed	The print to deteriorate.	Durability

As all of the criteria against which materials are tested contribute to maximising the lifespans of garments, they play a potentially significant role in reducing the generating of post-consumer waste and contributing to the sustainability of local environments.

4.2.7.10. The manufacturing phase of the retail cycle: bulk production

"Manufacturing, which is also known as bulk production, commences after suppliers have been authorised by a product technologist to begin production" (Product technologist A, 2021). A sample of each product in a production run is delivered by courier to the product technologist for evaluation. If a style is manufactured in several different colours, a sample in each colour is required to be submitted. The product technologist evaluates the fit of the bulk production samples on a dummy and carries out a fitting on a model only if the fit on the dummy appears to be problematic. "*If the appearance of a sample on the dummy is deemed to accord with the specifications of the product technologist, it will be approved and production will continue"* (Product technologist B, 2021).

Once a bulk production sample has been approved, the product technologist requests an inspection report, which is compiled by an auditor, who evaluates bulk production in relation to the lot size. "*The quality of the products in the bulk production run needs to conform to the Acceptable Quality Level (AQL) standards that the product technologist has specified, to ensure that stores receive products of sufficiently high quality to attract and retain the confidence of customers. It is crucial that the quality of garments should accord with their prices, to ensure that the perceptions of customers motivate them to purchase them"* (Product technologist A, 2021).

If the inspection report is favourable, the product technologist will approve the bulk production for shipment and delivery. Conversely, if the report is unfavourable, the product technologist will advise the supplier of any potential defects that are required to be remedied or instruct that defective products should be removed from the order. Once the potential problems that have been identified have been overcome or defective units have been removed from the order, the supplier will be required to conduct a further inspection and compile an inspection report. After passing the inspection report, the product technologist will approve the order for shipping and delivery (Product technologist A, 2021).

Once the manufacturing of a production run has been completed, the products are packaged at the factory of the supplier for shipment. A swing tag is attached to each garment, by means of a cord and a plastic connector, before it is placed in a polybag, along with a sachet of silica gel, to minimise the effects of moisture (Product technologist A, 2021). The polybags are then placed into cartons whose dimensions are specified by the company, to comply with the specifications of shipping and road freight companies (Product Technologist A, 2021).

4.2.7.11. The contribution of logistical procedures to the production of waste

"The cartons are collected from the factory and delivered and placed in shipping containers at the harbour from which they are to be shipped to the company. The containers are duly loaded onto a designated ship and transported as sea freight to the port of Durban in South Africa, the city in which the distribution centre is located. Shipments of goods from foreign countries are required to be cleared through customs, which entails ensuring that all relevant documentation complies with the laws, regulations, and policies that are enforced in South Africa. Problems that arise during clearance could result in cargo being retained by the customs for periods that could range from hours to weeks, depending on the nature of the problem. If shipments are successfully cleared through customs, they are transported by truck to the distribution centre" (Product technologist A, 2021).

The manager who was interviewed provided an example of the complexity of the problems that can be encountered at this stage of the retail cycle. "*In one instance, the company had received orders whose quality was deemed to be unacceptable from a supplier in China and had requested the supplier to cover the full amount of the inspection. On the basis of the findings of the inspection, the company requested to cancel some of the orders. At the time of the cancellation, five orders were in transit on a ship when South Africa implemented a lockdown to prevent the spread of Covid-19. The supplier suggested that the goods should be returned to China, to which the company agreed, as accepting the goods would have entailed a potentially high degree of risk. Although the supplier ceased all communication with the company at*

this juncture, it was later learnt that the as supplier had wished to claim insurance rather than cover the costs of returning the goods to China, as it would be less costly to do so, which had prompted the decision of the supplier not to facilitate the release of the goods to the company by providing the necessary documentation to the customs" (Brand manager, 2021).

"The five orders were retained by the customs for more than a year and the company incurred considerable legal costs as it endeavoured to secure their release. Customs officials recommended that the stock should be destroyed, but the company was reluctant to do so, for several reasons. Not only did it consider the option to be wasteful, but there would be adverse consequences for the environment, irrespective of the methods that were used to dispose of the stock. Incinerating it would result in pollution of the atmosphere and owing to the length of time that it would take for the materials to decompose, it would not be advisable to send it to a landfill site. The alternative solution that customs officials suggested, namely, that the goods should be recycled, was also not feasible, owing to a coating on the materials" (Brand manager, 2021).

"The goods remained impounded by the customs for an additional six months while the company continued its efforts to secure the release of the goods, with the intention of donating them to one of the charities that it supports. The mounting legal fees at this stage necessitated expediting the release of the goods, which was eventually successfully negotiated after a delay of almost two years" (Manager, 2021). "*As the goods were evaluated at the distribution centre and found to be of sufficiently high quality to be sold in stores, it could be concluded that it would have been both unnecessary and highly wasteful to destroy them"* (Brand manager, 2021).

4.2.7.12. Receiving and auditing procedures and their contribution to the production of waste

"At the distribution centre, containers on trucks are opened and drivers sign in with the receiving clerk. While the cartons are being unpacked, some are randomly selected and delivered to the quality control (QC) office for inspection. Instances in which deviations from specifications are detected, such as the use of incorrectly dimensioned cartons by suppliers, are reported to the merchandising team, which comprises a product technologist, buyer, planner, and buying manager, to draw to the attention of the supplier" (QC manager, 2021).

"The DC reports deliveries of wet cartons to the product technologist. It has been found that rushed production to meet delivery dates can result in steamed garments being placed immediately in polybags without being allowed to cool down and packed into cartons. Within a few hours, moisture is generated inside the bags, which has been known to accumulate to the point of being precipitated as water, which, in turn, frequently results in garments being marked by mould and card swing tags being destroyed. In these cases, the product technologist usually requests a comprehensive inspection and assessment of the shipment" (Product technologist A, 2021).

4.2.7.13. The contribution of quality control procedures to the production of waste

"The quality control team determines whether suppliers have adhered to the standards that the product technologist has set for Company R. The randomly selected cartons that are delivered to the quality control office are opened by auditors, who remove garments at random from the cartons for evaluation. Garments are measured individually and fitted on a dummy, to evaluate overall fit and quality, and a percentage of the order is inspected for defects with respect to quality" (QC manager, 2021).

"If it is concluded in the report that the garments fail to meet the standards that had been specified, the product technologist reviews the report and deliberates, through

the application of logical reasoning, experience, and theoretical knowledge of textiles, whether the goods are suitable for their intended purpose. In instances of occurrences such as mould, the supplier would be required to arrange for the goods to be collected from the distribution centre and inspected in accordance with procedures that the product technologist specifies for sorting the merchandise. If products that are made from fabrics that contain natural fibres are affected by mould, the product technologist will advise that the goods should be rejected, as the mould would render them unsaleable and begin to appear on garments on which it might not yet be visible. In these cases, the supplier would arrange to have the goods sold to a designated jobber or destroy goods that cannot be salvaged" (Product technologist A, 2021). "*After goods have been passed by the quality control department, the distribution centre proceeds to send them for selection, packaging, and delivery to stores"* (Quality control manager, 2021).

4.2.7.14. Consequences of delivering products to stores in polybags

"Trading is the final phase of the retail cycle and is primarily the responsibility of the operations department, which oversees the operations of stores. After products have been selected and packed for individual stores at the distribution centre, they are loaded onto trucks and delivered to stores by road transport companies that the company uses" (DC manager, 2021). "*When they arrive at their destinations, quantities are checked against a delivery note and the new stock is unpacked and placed on the floors of the stores"* (Area manager A, 2021). "*Store managers are required to report any apparent problems pertaining to incoming stock to the product technologist, who will recommend appropriate action. Each store implements a defective quality system that has been developed by the area manager and product technologist"* (Area manager A, 2021). Goods that are damaged after they have been delivered to stores are placed in a designated box as "store damages", while those that have been damaged before they left the factory of the supplier are stored as "supplier damages".

“In some cases, the store manager consults the product technologist to determine whether items that have been returned as defective by customers had been delivered damaged or damaged as a result of wearing” (Area manager A, 2021). “*If a customer were to return a pair of denim jeans because the fabric at the location of a belt loop had torn as a result of pulling the jeans up at the belt loops, it would be necessary to determine whether the damage had occurred as a consequence of abuse or defective manufacture. As pulling on a belt loop should not cause surrounding fabric to tear under normal circumstances, the product technologist would need to perform a test of tensile strength on the fabric to determine whether its strength complied with the specifications that had been stipulated to the supplier of the garment”* (Product technologist B, 2021). “*This system enables customers to return items that are found to be defective even after the time periods that are stipulated in the terms of the returns policy have been exceeded”* (Product technologist A, 2021). “*The area manager reviews all returns and signs them off to be donated. Goods that cannot be sold are donated to charities, rather than destroyed or dumped at a landfill site”* (Area manager A, 2021).

Goods that product technologists determine, on the basis of scientific evidence, cannot be donated owing to their toxicity are disposed of (Product technologist A, 2021). “*It is a rare occurrence, as suppliers who have been briefed by the product technologist concerning the standards of the company are able to take proactive measures to prevent defective manufacture or damage”* (Product technologist A, 2021).

4.2.8. Procedures for distribution to stores and online customers

The company has two distribution centres, one of which distributes orders to its brick-and-mortar stores, while the other distributes to individual customers who order products online. The e-commerce distribution centre receives its merchandise from the main distribution centre, after it has been approved for distribution by the quality control team.

4.2.8.1. Logistical procedures for recalling goods from stores

"Goods that are delivered to stores but subsequently found to be defective are usually removed from stores and returned to suppliers for credit. Since the company began to stipulate clearly articulated standards for quality through its quality assurance department, recalling merchandise from stores has become a relatively rare occurrence at Company R. In cases in which it is necessary to return merchandise to suppliers, it is re-packaged in cartons in stores and collected by logistics teams, to be transported to the distribution centre, where it is retained until it is collected by an agency that the supplier has authorised to do so. As it has been explained, in these instances suppliers are permitted to resell the goods after the season for which they had been ordered has ended, with all labelling removed, to protect the reputation of the brand and prevent negative perceptions of the quality of its merchandise" (Product technologist B, 2021). "*In cases in which suppliers are unable to collect and remove the goods, they are usually donated to charities after all labels and branding have been removed, while the supplier remains liable for all costs that are incurred"* (Product technologist B, 2021).

4.2.9. Quality control procedures

"The quality control team is required to adhere strictly to prescribed procedures during the auditing of shipments" (Product technologist B, 2021). Each order is required to be assessed for quality in accordance with specified AQL (Acceptable Quality Level) inspection levels, namely:

- *"Inspection level I: The lowest and most lenient level, which is applied to merchandise that is considered to be subject to low levels of risk, such as stationary decorative products*" (Quality Control Manager, 2021).
- *"Inspection level II: A moderate level, which is applied to merchandise that is considered to be subject to a medium level of risk, such as garments. This inspection level is widely applied in the clothing industry throughout the world" (Quality control manager, 2021).*

- *“Inspection level III: The most stringent level, which is applied to merchandise that is subject to potentially high levels of risk, such as high value garments, electronics, and toys”* (Quality control manager, 2021).

“The company has a quality manual, to which all suppliers are required to adhere to pass the inspections that the quality control team carries out. If the findings of an inspection reveal that specified standards for quality have been met consistently, the merchandise will pass the inspection. The team carries out AQL 2 or 1 inspections, in accordance with the degree of stringency that the company requires in each instance. The quality control manager is notified of the sizes of orders, which are determined by the numbers of units that are delivered, and determines the quantities that need to be assessed for quality by applying the stipulated AQL” (Product technologist B, 2021).

Each unit that is selected is meticulously scrutinised, both inside and outside, for evidence of defective quality, such as unsatisfactory stitching, colour defects, stains, or poor workmanship. A certain number of units are also measured and evaluated against the grading specification that the product technologist had stipulated to the supplier. As each measurement point on a garment has a specified tolerance, deviations are permitted only within narrow specified ranges. The quality control team records its findings in an AQL report. If the units are passed for distribution, they are distributed to stores, while the findings of unsatisfactory reports are forwarded for review by the quality assurance department (Product technologist B, 2021).

The quality assurance department re-evaluates the merchandise against the findings of the report and determines whether the goods are of sufficiently high quality to be sold under the *Company R* brand, in which case they would be graded as commercially acceptable. If goods are not deemed to be commercially acceptable, the department will recommend one of two courses of action. In the case of suppliers who are based inside of South Africa, they are advised that the goods need to be collected and removed from the distribution centre. Conversely, in the case of suppliers who are based outside of South Africa, the supplier is informed of the problems pertaining to quality that have been identified and the department arranges for the goods to be sent

to the inspection facility of a third party for an in-depth inspection, whose costs are to be borne by the supplier. The findings of the inspection will reveal the quantities of items in an order that are not defective and those that need to be either removed or repaired. On the basis of the findings, the quality assurance department will make a decision and advise the staff of the inspection facility of the procedures that are to be followed. In the event of complications that arise and a great many units are likely to be lost as a consequence of excessively high numbers of defective garments, or if the sorting of merchandise requires more time than the scheduled launching of the marketing campaign for the season could accommodate, the problem will be discussed by the quality assurance department with the buyer, planner, and buying manager, to arrive at a joint decision for resolving the matter. Owing to the commitment of the company to high standards of quality and its overarching commitment to maintaining the image of the brand, orders that contain unacceptably large quantities of defective merchandise or fail to meet specified deadlines for launching marketing campaigns are likely to be cancelled. "*As it has been explained, in these instances, the order will either be returned to the supplier, which is usually the procedure in the case of local suppliers, or donated to charity, after the procedures that were described earlier have been carried out. In these cases, the company and the supplier jointly negotiate payment or credit"* (Product technologist B, 2021).

4.2.10. RESPONSIBILITIES OF VISUAL MERCHANDISERS

4.2.10.1. The uses to which visual merchandisers put photographs from marketing shoots

Although visual merchandisers do not participate in marketing shoots, the photographs that are obtained from them are used for in-store marketing, which is the responsibility of the visual merchandiser. The visual merchandiser of a store uses the images that are best suited to the store displays that they develop. Before images, portraits, or large posters are displayed in stores, the visual merchandiser is required to print each poster to determine whether the colours, size, and the content of the photograph accord with the aesthetics of the store. All posters are printed on vinyl

sheets, whose dimensions can range from 1 to 2 metres, depending on the locations in stores at which they are to be displayed. If posters do not conform to the requirements of visual merchandisers, they are modified and reprinted, while rejected posters are discarded and disposed of as refuse. Each store is required to display printed banners, posters, and photographs to mark the launching of seasonal campaigns (Visual merchandiser, 2021).

4.2.10.2. The photographic shoot of the floor plan that is used to brief the staffs of stores and its potential for contributing to the production of waste

Floor plan shoots are carried out in individual stores. "*Displays are created at specified locations in stores and photographed, to enable the visual merchandisers to brief staffs concerning envisaged layouts for marketing particular products. Visual merchandisers use the photographs to create briefs for stores to follow. The briefs stipulate the positioning of specific posters and products that are required to be placed on hangers and those that are to be folded. Floor plans are retained for periods of a few months, until the next ranges of products are launched, at which point all existing promotional material is removed and disposed of as refuse. Posters are not reused"* (Area manager A, 2021).

4.2.10.3. Visual merchandising in stores and its potential for generating waste

Although visual merchandising procedures are similar to those that are followed in the development of floor plans, they are more concerned with specific displays than the layout of a store as a whole. Visual merchandisers assemble displays in windows and other areas in stores that are most likely to attract the attention of customers. The displays in each store are representative of the trends that have been developed by the buying and design teams. "*Visual merchandising in stores plays a crucial role in promoting trends and maximising sales. All display items that are no longer relevant to the trends that are promoted in the next season are discarded and disposed of at the end of their seasons"* (Visual merchandiser, 2021).

4.2.11. THE TRADING PHASE OF THE RETAIL CYCLE AND THE ROLE OF THE OPERATIONS TEAM

This section is devoted to a detailed elucidation of the specific operations of stores during the trading phase of the retail cycle.

4.2.11.1. Receiving

"At the end of 2021, the number of Company R stores in South Africa stood at 81, which is projected to increase to 100 by the end of 2022. Each store receives an average of one delivery a day, three times a week. The road freight company with which the company has a contract delivers all stock in cartons to the receiving doors of stores. A designated member of staff at each store signs receiving documents and is responsible for determining whether all units that are reflected in receiving documents have been delivered. Instances of shortages are required to be reported to the area manager and head office immediately, to enable an investigation to be logged" (Area manager A, 2021).

"Previous policy of the distribution centre required cartons to be sealed with a tape that bore the brand of the company, to enable broken or damaged sealing tape to alert receiving staff to possible instances of theft. The practice was subsequently discontinued, as it was found that losses occurred as a consequence of the ease with which sealing tape was damaged. In response, the distribution centre then began to use industrial staples to seal cartons. Although they provided significantly more secure sealing, the staples frequently damaged garments and rendered them unsaleable, which necessitated either donating or disposing of the damaged stock, in the latter case contributing to the production of waste. After having received many complaints, the distribution centre discontinued the use of staples and elected to glue cartons closed, which has proved to provide an effective solution" (Area manager A, 2021).

4.2.11.2. Unpacking

Each carton is opened with a Stanley knife and members of staff take care not to cut into the products that have been packed in them. "*Each product is individually packaged in a* (polyethylene (LLDPE) bag) "*which is recyclable, although bags are not recycled at present"* (Area manager A, 2021). "*The staff of stores remove products from polybags and place the bags in refuse bins". As it is not uncommon for each style to be received in quantities of as many as 3000 units, each style would generate plastic waste in the form of a corresponding number of polybags* (Area manager B, 2021).

"When the staffs of stores unpack incoming consignments, they occasionally encounter instances of defective manufacture" (Area manager A, 2021). "*The occurrences often result from defects in batches of products that have not been inspected in orders that have passed AQL inspections"* (Product technologist B, 2021). Although problems of this nature have been known to occur when orders are rushed, they are nonetheless infrequent, as the quality control procedures of suppliers usually result in instances of defective manufacture being identified during the manufacturing of orders. If defective garments reach stores, managers are required to report the defective merchandise to the product technologist, who will advise appropriate action and provide an analysis of the nature of the defects that have been identified, to enable the staff to recognise and act upon them in the future. "*If a store has received a garment that is marked with mould, the product technologist will advise that it should be removed and kept apart from all other products in the stock room, as mould is able to spread, depending on the type of fibre on which it is found. If mould is detected sufficiently early and only one garment has been affected, the product technologist will advise that the remainder of the stock should be assessed for evidence of mould. If it is found to be wet, it will automatically be placed in a separate area, to monitor the growth of mould. Garments on which mould appears are removed from stores and donated to charities with advice for removing mould, such as washing with vinegar"* (Product technologist B, 2021). "*Stores seldom discard or destroy garments"* (Area manager B, 2021).

4.2.11.3. Merchandising

“All products that are required to be hung on racks in stores are placed on hangers, which are drawn from their hanger reserves. Different types of hangers are used. Garments such as trousers for formal wear are placed on metal clip hangers, while woven dresses and tops are placed on plastic hangers. Hangers that are coated with a plastic film on the ends are used for knitted dresses and other knitwear. If these hangers are not used, the weight of garments is likely to cause them to stretch, even to the extent that their shape becomes distorted, which would render them unsaleable. Broken hangers are discarded and hangers that are considered to be superfluous to present requirements are boxed and retained for later use. Plastic and metal hangers are regularly ordered, in accordance with the numbers of units that are expected and the present availability of the types of hangers that will be required” (Area manager B, 2021). Some garments are folded and placed according to the briefing documents of the visual manager, which requires members of staff to display the garments, posters, and other props in stores in strategically favourable positions, to attract the attention of customers. As it has been explained, “*all posters and other merchandising materials are discarded and disposed of at the end of the seasons for which they had been designed”* (Visual merchandiser, 2021).

4.2.11.4. Sales: Brick-and-mortar stores

Company R replaced the plastic bags in which store purchases were placed with bags that were manufactured from recycled plastic two years ago, which, in turn, were replaced with brown paper bags a year later. “*The recycled plastic bags were discontinued after they had been used up, as they were not recyclable. The brown paper bags are recyclable and are supplied by a supplier of products that are manufactured in accordance with practices that are intended to safeguard the sustainability of the environment”* (Visual merchandiser, 2021). Customers are given the option to purchase a brown paper bag or receive their purchases without a bag,

which enables them to make conscious decisions concerning whether they feel that they require shopping bags (Area manager A, 2021).

4.2.11.5. Sales: E-commerce transactions with the online store

Customers make online purchases through the *Company R* website. The e-commerce centre receives orders in digital format, which are processed by means of its online collection system. Members of its staff draw merchandise from the storage areas, in which merchandise is categorised in alphabetical order and located through the use of scanners. Purchases are placed in a plastic bin and forwarded to a packer, who packs orders into cartons for delivery to customers by courier, which in turn, are packaged in plastic courier packets (E-commerce distribution manager, 2021).

4.2.11.6. Returns

Customers who are not satisfied with their purchases are able to return them, irrespective of whether they have been purchased from stores or online. If returned goods are found to be in a satisfactory condition, they are resold, while goods whose quality is found not to accord with the standards of the company are either donated to charities or discarded and disposed of if they are considered not to be suitable for donating (Area manager A, 2021).

4.2.11.7. Appraisal of types of waste generated during the retail cycle

Table 4.5 provides a summary of the types of waste that are generated during the retail cycle, from the pre-consumer stage to the post-consumer stage. Each type of waste that was identified is listed and categorised as either plastic or textile waste.

Table 4.5: Summary of types of waste generated during the retail cycle (Source: Designer A, B., Buyer A, B, C, D., Planner A, B., Buyer's Assistant A, B., Merchandise Coordinator. Digital Coordinator, Product Technologist, Distribution Centre, Visual Merchandiser, Area Manager A, 2021)

TYPE OF WASTE	CATEGORY OF WASTE	DESIGNER	BUYER	PLANNER	BA	MC	DG	PT	DC	VM	TRADING (stores)	CONSUMER
Plastic sleeve	Plastic	x	x		x			X			x	
Trims packet	Plastic	x									x	x
Plastic bag for samples	Plastic	x	x		x			X	X		x	
Box-sealing tape	Plastic	x	x		x	x		X			x	
Plastic refuse bags	Plastic										x	
Nylon swatches	Textile	x	x					X				
Virgin polyester swatches	Textile	x	x					X				
Viscose swatches	Textile	x	x					X				
Polyurethane swatches	Textile	x	x					X				
Cotton swatches	Textile	x	x					X				
Linen swatches	Textile	x	x					X				
Synthetic and natural	Textile	x	x					X				

fibre blend swatches												
Lab dips	Textile	x	x									
Trims: buttons, poppers, toggles	Plastic	x									x	x
Trims: drawcord, clip labels	Textile	x									x	
Polyethylene (LLDPE) bag	Plastic	x	x	x	x				x		x	x
Strike-offs	Textile	x	X									
Garment approval sample	Textile	x	X		x	x		X	x			
Store signage posters	Textile									x	x	
Store poster	Plastic									x	x	
Garment hangers	Textile				x	x		X			x	
Courier bags	Plastic				x			X	x		x	x
Garments (purchased in store)	Textile	x	x	x	x	x	x	x	x	x	x	x
Laminated trade calendar	Plastic			x								
Plastic cups from drinks consumed	Plastic					x						

on location												
Water bottles	Plastic					x			x		x	
Plastic plates	Plastic					x						
PET masks	Textile	x	x	x	x	x	x	x	x	x	x	x

4.3. PHASES OF THE RETAIL CYCLE

4.3.1. First phase of the retail cycle: operations of the product team

One of the significant findings that emerged from the investigation of the first phase of the retail cycle was the disclosure by one of the planners who was interviewed that previous but discontinued practices of the distribution centre had eliminated the use of LDPE polybags and that pre-packing of cartons by suppliers for individual stores could have the same desirable result. As other findings revealed that polybags were not recycled and disposed of in refuse bins instead, it could be concluded that both practices that eliminated the use of polybags and recycling represented viable options for eliminating the production of large quantities of plastic waste at the distribution centre.

4.3.2. Second phase of the retail cycle: roles of product technologist, designers and the marketing department

The strategy of shared fabrication that the company implements, which entails the teams of the ladieswear and menswear departments collaborating to develop designs that are made from the same fabrics not only lowers the unit prices of garments, but also enables suppliers to reduce the quantities of pre-consumer waste that are produced. As waste that is generated during this phase of the retail cycle includes samples of garments, strike-offs, and lab dips that are ultimately discarded, the quantities of waste are significantly increased when resubmissions of samples are necessary. It was also found that the company has taken steps to begin implementing

strategies that integrate concern for the well-being of the environment, by negotiating with manufacturers of denim who use green methods to dye the fabric.

4.3.3. Third phase of the retail cycle: roles of product technologists, the marketing department, the distribution centre and auditors

The submission of final off-bulk samples of garments by suppliers can potentially result in the generating of a great deal of waste if the auditing team recommends that orders should be rejected on the basis of the findings of its quality control procedures. "*In instances in which suppliers are either unable or unwilling to cover the costs of rejected orders being returned to them, it is the usual practice of the company to donate rejected merchandise to charities that it supports, after all branding and labelling have been removed"* (Product technologist A, 2021). To date the company has never resorted to destroying merchandise, even against the recommendations of customs officials, in the case of a shipment that had been impounded for more than a year owing to a lack of required documentation. Although high costs had been incurred, the option to destroy the merchandise was rejected, as either incinerating it or consigning it to a landfill site would have resulted in pollution. The decision was ultimately vindicated, as the merchandise was found to be saleable after its release had eventually been secured, thereby avoiding both wastage and pollution of the environment.

At present, the visual material that visual merchandisers develop to be displayed in stores is disposed of as refuse and not recycled at the end of a season. In addition, rejecting samples of fabrics or trims requires suppliers to resubmit them until designers are satisfied that they accord with their specifications. "*Rejected samples are disposed of and, at the end of a season, files are emptied and samples of fabric and trims are also disposed of, along with considerable quantities of paper and plastic" (Product technologist B, 2021).* Fit assessments by product technologists also result in the generating of large quantities of plastic waste, as each individual garment sample is delivered wrapped in plastic, which is discarded. As the present policy of the company pertaining to recycling does not yet extend to paper and plastic waste, the recycling of

both would be essential components of an alternative model to ensure the sustainability of the environment. By contrast, the company has implicitly acknowledged the need for recycling, as the cardboard cartons in which shipments are delivered to the distribution centre are collected by a recycling company.

4.3.4. Final phase of the retail cycle: trading

Recent developments in the trading phase of the retail cycle have resulted in significant reductions in the quantities of waste that are generated by some of its activities. "*Planners no longer print their sales histories and forecasts of future sales on paper, for distribution to entire teams, as online meetings give all members immediate access to the data without generating any paper waste" (Planner A, 2021)*. "*The transition that stores have made from packing the purchases of customers in plastic shopping bags, to using bags that are made solely from recycled plastic, to making brown paper shopping bags available to customers who are prepared to pay for them, would inevitably contribute to a drastic reduction of both plastic litter and plastic waste that is ultimately consigned to landfill sites" (Digital Coordinator, 2021)*. Requiring customers to purchase the brown paper shopping bags would also contribute to customers not immediately discarding them and, instead, saving them for other subsequent uses, owing to their perceived value. These benefits stand to be offset by steadily increasing e-commerce purchases, which entail garments being packaged in plastic and cardboard shipping cartons, before being placed in plastic courier bags, all of which many online customers are likely to discard, either as litter or refuse. As e-commerce transactions stand to contribute significantly to the amounts of plastic that eventually pollute marine and other natural environments, measures need to be taken to limit the quantities of plastic waste that are generated and also to integrate the need for environmentally responsible behaviour into the values that the brand communicates to its customer base.

4.4 SUMMARY

This chapter took the form of a detailed investigation of the operations of each phase of the retail cycle, to determine its potential for contributing to the production of waste and to gain the insights that were needed to develop an alternative model to reduce the degree to which the retail cycle threatens the sustainability of the environment at present. This summary represents an endeavour to provide provisional assessments of the overall potential of each phase to generate waste, as a means of identifying sources of waste that need either to be eliminated or significantly reduced. The findings that emerged from the follow-up questions that were administered to one manager and pertinent employees, revealed that while the manager displayed a comprehensive knowledge of the concept of sustainability and the measures that the company was taking at present to implement an agenda that contributed to environmental sustainability. The study shows that the understanding of the employees tended to be more varied. Nonetheless, some did display an understanding of sustainability and the measures that either were being taken, or could be taken, to reduce the production of waste.

CHAPTER 5: ANALYSIS OF THE FINDINGS

5.1. INTRODUCTION

As discussed in the literature review, fashion retail continues to produce apparel items prolifically and consumers continue to consume at a rapid pace. However, consumers are increasingly starting to appreciate the dire effects of waste pollution on the environment (Hammonds, 2020). This has led to some retailers changing their selling strategy by, amongst other strategies, providing the consumer with recyclable plastic bags and environmentally conscious messages (Brooks, 2019). Some international retailers from countries that have seen the negative effects of plastic and synthetic waste, have started to change their business model processes, also known as the retail cycle, taking into consideration the environment, social and economic effects (Harvard Business Review, 2017). Textiles and plastic have been in existence for centuries. In 1907 Leo Baekeland, also known as “the father of plastics” developed a completely synthetic polymer (Mercelis, 2020). The synthetic polymer, which was not made of any natural resources, is well-known as Bakelite (plastic) and has been used in many products, such as radio cabinets and Art Deco jewellery. Plastic has been used in many different chemical forms and modified by scientists throughout history.

Plastic replaced components in vehicles and aircrafts (Mercelis, 2020). Natural fibres formed the first known textiles, but as the demand for fashion increased over the ages, scientists developed synthetic fibres, such as polyester and nylon (Corbman, 1983: 346). In conjunction with these synthetic fibre innovations, plastic was developed and became a household item, to the extent that society changed from preserving tools and clothing, to embracing a throw-away mentality (Clarke, 1999).

Extensive use of synthetic fibres and the exponential growth of the fashion industry, contributed (and is still contributing at an increasing rate) to environmental degradation. The earth cannot accommodate the vast amount of plastic and synthetic fibres in the form of discarded clothing, being sent to landfill. Fast fashion is a leading contributor to the problem (Anguelov, 2015). South African clothing retailers use

products which are discarded as waste, since these materials are seen as expendable. They include hangers, packaging, plastic swing tags, polybags, signage and defective garments. Manufacturers produce massive units rapidly in order to reach business profits, and this is how fast fashion becomes low quality. Low quality means waste (Purewastetextiles.com, 2019) (Pradip *et al,* 1998).

The thesis was formulated to investigate and review the retail cycle within a South African retailing operation to identify which steps in the business model contribute the most textile and plastic waste. I was particularly interested in exploring how the waste was produced and where the waste was ending up. The study focused on identifying the types of waste (non-recyclable textile and plastic waste) generated during the operations of *Company R*. The intention was to locate the types of waste produced pre-consumer and post-consumer, by identifying waste generated during the retail cycle operations. This was done in order to ascertain how long these different types of waste under investigation take to degrade and their impact on the environment. In order to help prevent pre-consumer and post-consumer waste, I have developed an improved retail cycle. The aim with this improved retail cycle model is to introduce it into the company's operational strategies, since *Company R* is looking to the future of actively reducing plastic and textile waste.

To achieve the aims and objectives of the study, the following research questions were asked:

5.2. MAIN RESEARCH QUESTION

What are the essential characteristics of the clothing and fashion retail cycle of a single leading retail company that has its headquarters in Cape Town at present?

5.2.1. SUB-QUESTIONS

- How does the retail cycle of this company negatively affect the sustainability of the local environment as a consequence of plastic and textile waste that is generated?

- How can a more sustainable retail cycle be developed in the local region, on the basis of an investigation of the operations of one leading retail company that has its headquarters in Cape Town, South Africa, with the specific aim of reducing the generation of waste?

The findings show that the retail cycle consists of individual processes within this selected South African fashion clothing retail business. A workshop was conducted with the CEO write out and brand manager to plot, investigate and review the retail cycle. Thereafter, each step in the cycle was identified that potentially contributed the most waste by interviewing the planning, marketing, buying, design, quality, distribution and operations departments. Each operational step of the cycle is named, which relates back to a specific department, and these departments are responsible for executing each process in the business. To gain an understanding of the full retail cycle, I conducted a workshop with the CEO and the Brand Manager. In this workshop I presented my proposal to provide the participants with insight into the study. Both were interested in the subject and immediately provided their take on the subject. The CEO was very open to conducting research within the business to reduce the business' impact on the environment. We discussed the business' current stance and how it would like to move forward. The brand manager shared the business' current retail cycle model and critical path of the garment. In the workshop we openly discussed that the business is not currently focused on sustainability but would like to embark on the journey to becoming sustainable. During the discussion, management provided me with the names of the best employees to speak to, but also offered that if I had any issues with gaining information, I could let them know and they would assist. After this discussion, I realised that I had neglected to include the marketing manager. The marketing team plays a vital role in the business and does contribute to waste in the business. I had an online meeting with the marketing manager. She provided me with the marketing critical path and the staff names, so that I could interview for role in the department.

The findings describe the daily routine of each individual participant in their respective roles, their processes and the types of waste that are produced by that specific department. This detailed process description was needed in order to pinpoint where, when, and what types of waste were generated.

By interrogating the business retail cycle model, factors were identified in the local retailer's processes, which were possibly negatively impacting sustainability issues. These factors were identified chiefly as the types of waste, namely non-recyclable textile and plastic waste, pre-consumer and post-consumer waste. Many textiles and clothing are designed with a mixture of fibres whose composition is difficult to separate with the existing technology, resulting in non-recyclable fibres (Luján-Ornelas, et.al, 2020). Plastic waste exists in many different forms. Many strategies are formulated by countries to address the plastic waste problem. Poor waste management in developing countries is associated with both weak economic and socio-economic factors that stem from a lack of proper environmental legislation (Ili´c & Nikoli´c, 2016). Textiles and clothing waste has become a huge global concern. The European Union circular economy package is opening new scenarios for pre-consumer waste (waste materials or processing waste) and post-consumer waste (textiles or other items) in the garment value chain. The European Union package includes the use of economic instruments and other measures to provide incentives for the application of waste hierarchy. This would be extended producer responsibility and also introduces a change in the concept of producer responsibility, and changes the perspective of waste so that it could be increasingly treated as a resource, with a great impact on the fashion industry (Jacometti, 2019). The fashion industry is a sector with a high environmental and social impact: it involves an extremely long and complicated supply chain, is recognized as one of the most polluting sectors and with the greatest consumption of water, and is often associated with workplace abuses (Fletcher, 2014).

5.3. RESPONSES TO THE INTERVIEW QUESTIONS

Each staff member was emailed and invited to an interview time. All interviews were conducted online. Where there was more than one employee in a role, group interviews were conducted. Where there was one employee, a one-on-one interview was conducted. The first interview was conducted with a group of buyers, the second was conducted with a group of planners and the third group interview was conducted with the design team. These role players are all part of the merchandise team.

The fourth interview was conducted with the Digital Coordinator, this was a one-on one interview. The fifth interview was conducted with the Distribution Manager who is based in Durban, this was a one-on-one interview. From this interview I could ascertain if I needed to interview any other staff within the distribution centre. The Distribution Centre manager was able to provide me with an in-depth overview of the entire process, thus it was not needed to interview anyone else.

After this interview, the sixth interview was one-on-one with the visual merchandiser. I conducted the seventh group interview with the *Company R* area managers. Thereafter, I conducted the eighth interview with the E-Commerce Distribution Centre Manager, the ninth interview was conducted with the Quality Assurance manager. The tenth interview was conducted with the Marketing Coordinator. In each of the interviews, I posed the same questions. The interview questions were constructed this way to ensure that the responses were not filtered. This way I could gain raw feedback and use the research that pertained to the study.

5.3.1. *Projecting the retail cycle from the beginning of a garment cycle until the end (question 1).*

5.3.1.1. The buying and design department's overview of the retail cycle and how they contribute waste

The buying role has a part to play in each step of the retail cycle. The first part of the retail cycle is the post-seasonal, *"here we look at our performance in the past season and see what did well and what didn't do so well".* The second part of the retail cycle

is where we look at the trends, this is a presentation that is conducted by the designers. "*When thinking about physical waste, the trends meeting has mounting boards and pantones, which will be a different colour from screen to screen, so the pantones need to be dyed on fabrics, whether it is a polyester or a cotton, each fabric will show colour differently and we need to see the physical lab dips to see what it will look like".* Textiles are heavily intertwined with environmental, social and governance issues. The exact environmental impact of textiles differs depending on the type of fibre the garment is made from. However, generally they include energy use, greenhouse gas emissions, nutrients releases (leading to eutrophication) and eco-toxicity from washing (water heating and detergents) and dyeing of textiles. Energy use, resource depletion and greenhouse gas emissions from processing fossil fuels into synthetic fibres, e.g. polyester or nylon; heavy water usage, toxicity from fertiliser, pesticide and herbicide use, energy use and greenhouse gas emissions associated with fertiliser generation and irrigation systems related to production of fibre crops, e.g. cotton water usage, toxicity, hazardous waste and effluent associated with the production stage, including pre-treatment chemicals, dyes and finishes (European Commission, 2013). Responsible cotton farming should be invested in if high percentages of cotton are going to be continued to be used or cotton could be recycled as well.

Garments are sourced and bought that reflect the brand's identity and these are used for design inspiration. The garments are all brought back to South Africa, but all samples are mutilated (an industry term for cutting samples in order for the sample to have no value when passing through customs). The garments will not be for sale, they are used for sampling purposes only (Designer A, 2021). With the increasing growth of the fashion industry the quantity of industrial pre-consumer textile waste has increased (Lau, 2015). The garments bought from fast fashion retailers overseas become post-consumer waste once *Company R* purchases the garments, mutilates it and discards it if it cannot be donated. Every year million tons of textile waste is being sent to landfills. Only in Turkey, 287 thousand tons of textile waste was brought to controlled landfills and it is 2.62 percent of municipal solid waste (Turkish Statistical Institute, 2012). The numbers increase significantly for developed countries. It is estimated that 14.3 million tons of textiles were generated in the United States of

America in 2012 which is 5.7 percent of total municipal solid waste (Environmental Protection Agency, 2012).

During Covid, *Company R* purchased less garments for trend for garments locally to reference styling, prints and fabrication. This was a mix of synthetic fabrics such as virgin polyester, acrylics, nylon, cotton, viscose, elastane and linen. These fibres can be recycled in isolation, as a non-blended fibre, but prove to be challenging to recycle as a blend (Henniger *et al*., 2017). In other countries, there is a focus to buy locally and support local suppliers. Less samples are bought overseas and less waste is produced. Sustainable fashion has a local focus thereby not only supporting the local community and creating jobs, but also reducing transportation millage and costs (Henninger et.al.2017). Overall the design process should be centred around longevity and less on fast moving consumer trends, thereby developing a classic style that does not go in and out of fashion quickly (Yip 2010).

In Strategy meetings, the buyers decide what they would like to put into the business, Strategy *"is where we decide what categories we want to buy into, where we saw the growth. We decide what we want, do we want more tops or do we want more bottoms…"* The Strategy intent is a suitable place to decide what the units need to be and how the business wants to change the focus to being more sustainable. Here suppliers can be discussed and chosen. Fashion companies are urged by their stakeholders to reduce environmental impact created by fashion retail and build a sustainable fashion business (Chan and Wong 2012; Gupta and Hodges 2012). Shen *et al*. (2012) speaks of a distinction between socially responsible business and environmentally responsible business. The environmental impact includes using chemicals and pesticides in cotton plantations that are toxic to and pollute the ecosystem and can be harmful to humans and the discarding of textiles in landfill that damage the environment (Bianchi & Birtwistle 2012). To reduce the impact, the industry has started to introduce small-scale ethical retailers by launching sustainable ranges within large retailers (Goworek *et al.* 2012). Sustainable fashion can range from garments made from organic cotton to recycling textiles (Shen *et al*. 2012; Goworek *et al*. 2012).

For the building of the range, the buyer mentions that the key lessons learned are kept in mind from the post-seasonal meeting; it has to align with the trend research and the strategy intent discussions. *Company R* has a ladieswear and menswear department. For the coming Summer 22 season, for ladieswear, there are 251 styles and 740000 units being placed and for menswear there are 280 styles and 1,156,300 units being placed. These units will determine how much fabric needs to be used, how many polybags are used and how many samples need to be fitted for the season (Buyer's assistant B, 2021). *Company R*, while not one of the largest retailers in South Africa, has a large number of units that are sold in stores every season and each garment is packaged in a polybag. As a part of the whole fashion industry value chain, the carbon impact assigned to packaging and distribution generally is relatively small, perhaps even less than 5% (H&M Sustainability Report, 2015) of the total carbon emissions of a garment lifecycle (Księżak, 2017). There is growing consumer focus on plastic, specifically packaging and single use-plastics and in the fashion industry, there are a few different sources of plastics. The largest usage is polyethylene terephthalate (PET) as fibres (polyester), but there are also buttons, hangers (made from polypropylene – PP, or Polystyrene – PS), as well as packaging, including garment polybags, e-commerce mailing bags and various filler materials (mostly made of polyethylene - PE) (Fashion for Good, 2019).

According to Fashion for Good (2019), if every garment is shipped in a polybag, there could be more than 150 billion polybags produced per year (Vogue, 2016). Customers and staff complain of the amount of plastic packaging that garments often come with – especially with e-commerce retail customers, where the packaging is one of the first things encountered. Fashion and apparel companies may find that a significant amount of their waste is composed of plastic film as polybags (Fashion for Good, 2019). Plastic in the form of polybags, other plastics or polyester fibres are harmful to the environment and do not promote sustainability. It is estimated that at least 10 tonnes of waste plastic is estimated to reach the sea from land-based sources in South Africa each year (Ryan et.al, 2012). After exposure to sunlight, wind or sea, plastic debris stemming from landfills or from littering is reduced into smaller particles posing

a threat to marine wildlife as these particles are mistaken for food. This way, plastic particles end up in the human food chain and appear for example in fish and bivalves (mussels, oysters, scallops) sold for human consumption or in table salt (Rochman, *et al*., 2015; Yang, et. al., 2015).

Globally the fashion industry produces extensive quantities of textile waste (92 million tonnes per year) (Quantis, 2018). The textile waste often ends up in landfills or is destroyed by incineration, this can include unsold products, which is classified as pre-consumer waste (Dahlbo, 2017; Ellen MacArthur Foundation, 2017).

In the range review meeting the buyer presents the range with visual aids. These visual aids will include print-outs, samples, fabric swatches and colour palettes. The buyer will receive input from the merchandise team providing guidance on silhouette, fabric, colour and print. This is the step where changes can be made to the range, to change the fabrication or design. At this stage of the retail cycle, questioning current fashion design and manufacturing practices could indeed lead to more creative ways of producing garments. Proactive methods have been developed to design garments that minimize cutting waste and put nearly all offcuts into production. This could include: invisible remanufacturing, where fabrics are placed in invisible sections of the garment; visible remanufacturing, where they are placed in external visible places; and design-led manufacturing, where offcuts are used creatively to decorate the garment. Closer collaboration between design and manufacturing could initiate a low-waste-driven-sustainable-design-manufacturing-consumption model (Runnel *et.al*., 2017).

The briefing stage involves the team work of the buyer, product technologist, designer and buyer's assistant. Currently the buyer briefs the supplier with a digital document that encapsulates a garment specification provided by the product technologist and a tech pack that is developed by the designer. The buyer's assistant sends the supplier a reference sample or reference swatches that are cut from the samples that were bought overseas or garments from past seasons that were kept for reference. The supplier then sends *Company R* the first development samples, lab dips, trims and strike-offs (Designer B, 2021). The samples are resubmitted until it is approved, which

can amount to thousands of samples benign produced before the accrual product is produced to be sold in stores (Product Technologist B, 2021) and brands are now producing almost twice the number of clothing collections compared with pre-2000. The overall clothing-production demand is estimated to be 2% yearly (Fletcher, 2016). This is astounding and would categorise *Company R* as a fast fashion retailer. Speed is linked to fast fashion. Originally there were two seasons, summer and winter, however retailers have started to create smaller capsules in-between that open up new opportunities for consumption. The high street chain stores have perfected the just--in--time manufacturing, now with a turnaround for a collection in as little as three weeks and along with that a high pace of change of today's fashion trends (Fletcher, 2008).

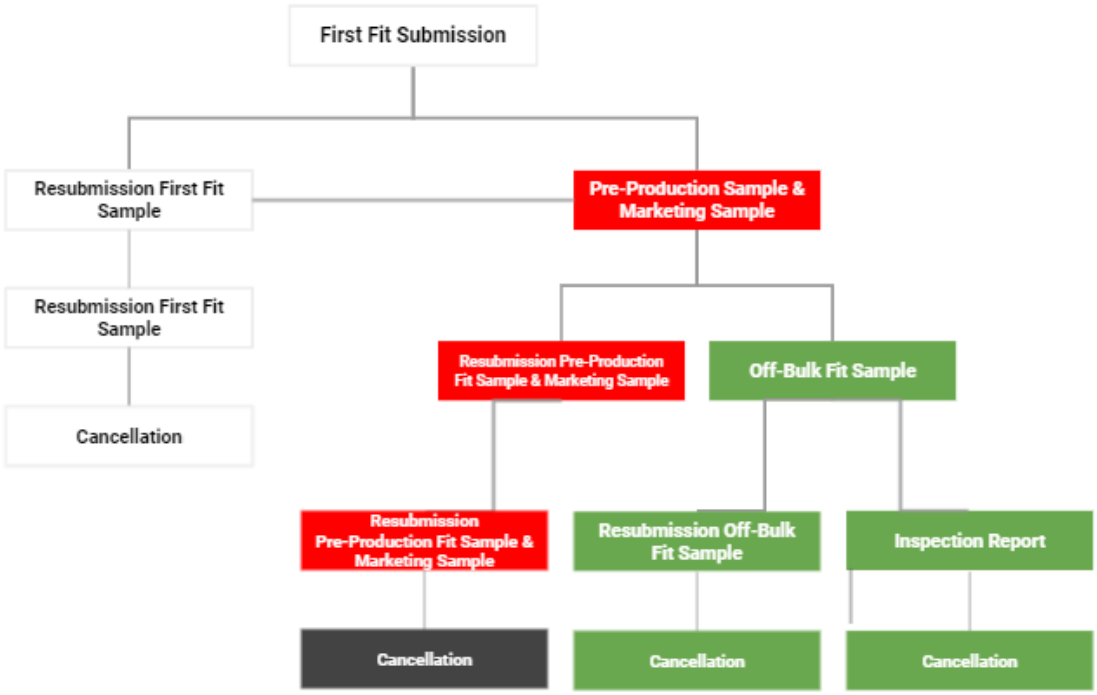
According to Fletcher, the root of the cause of fast fashion must be addressed, which is consumption. The cause of the problem in fashion is our addiction to consumption. Part of this growth in consumption is linked to an increase in speed, which in turn is made possible by the exploitation of people and natural resources. We need fashion in our society but fashion needs to take on a more sustainable role. This is a concept that must be discussed with suppliers and enrolled within businesses to ensure sustainability, it is a concept of slow fashion (Fletcher, 2008).

5.3.1.2. The Product Technologist role, linking the Quality Control role, and how it can reduce the amount of waste produced in the retail cycle

As per the presentation of the findings, the Product Technologist sets the quality standards for the business and the Quality Control team checks that those standards have been adhered to.

Within *Company R's* retail cycle, at the sample assessment stage, the product technologist is the custodian (Product Technologist A, 2021). The Product Technologist has an internal process, which can lead to the production of not only thousands of samples but fabric pieces being wasted. As part of the data analysis, a

created a visual map of the process to understand the process.



Product technologist internal cycle process (Product technologist A, 2021) (Figure 4.24 as seen in Chapter 4)

According to the findings, there are many samples that are fitted, then potentially new samples are fitted and this cycle continues until the final samples are fitted before production can start. There is also a testing stage, where the supplier has to test fabric to make sure that it is durable, has longevity and to validate that it is the correct fabric composition. This step creates many layers and blends of textile waste. It is estimated that approximately 10-20% of textiles are wasted during garment manufacture. Reusing pre-consumer textile waste within the fashion supply chain offers many environmental advantages, including, directing waste away from landfill and incinerators, the conservation of resources and providing a solution for the current shortages of natural resources and virgin fibres. Pre-consumer textile waste is easier to reuse than post-consumer waste because it does not have the same hygiene and collection challenges (Lau, 2015).

During the production phase, besides the production of textile waste, there are many other types of wastes. The production of polyester alone contributes a significant amount of toxins. The value chain begins with the oil industry, which extracts and refines the crude oil to generate building blocks used by the chemical industry to produce PET and other chemicals (additives). Pellets or chips are supplied to the textile industry, which is then extruded and spun into fibres for knitting and weaving. Thereafter this process involves dyeing and finishing which adds certain qualities to the fabrics. Only after this intensely resource draining process, is the fabric cut and sewn into garments. All these steps require significant amounts of energy, as much as 125 MJ/kg polyester fibre (European Commission's Joint Research Centre, 2014), which results in the emission of 27.2 kg CO2 eq/kg polyester woven fabric (Muthu, 2020). The poor management of residues along the supply chain can cause soil and water pollution via the direct release of wastewater containing dyes and/or chemicals into nearby water bodies. This not only affects the environment but also the health of the communities living nearby.

The dyeing and finishing step is ranked first in terms of environmental unsustainability, considering the following five impact indicators: climate change, freshwater withdrawal (which includes water use and emissions to water), depletion of resources, ecosystem quality, and human health (European Commission's Joint Research Centre, 2014).

Company R tests for multiple quality defects which have been tabulated in chapter 4, see table 4.4. The testing standards create fabric waste, but it contributes to the longevity of an item by having good durability, which is an attribute of sustainability (Purvis, et. al., 2018). The waste produced in fabric pieces initially can be reused or donated by *Company R.* This will allow the brand to create garments with longevity and less post-consumer waste. Pre-consumer waste is easier to recycle than post-consumer waste. The amount of post-consumer waste is still increasing, so a waste stream should also be used. The problem with post-consumer waste is collecting and separation, where issues include chemicals, unknown fibre content, low quality, and therefore the predicted end quality from this origin is uncertain (Hvass, 2016).

According to the findings, the product technologist receives samples up until and including the bulk production step, which is the last step for receiving samples. Each garment is tagged with a swing tag. The swing tag is attached with a rope and a plastic connector. Each product is placed into a polybag. If there are 3000 units, there will be 3000 polybags. Each polybag will have a silica gel packet that helps to prevent moisture (Product Technologist A, 2021). The polybags are then placed into cartons. Each carton is sized to certain dimensions, these dimensions are provided by the retailer. Each carton takes a certain amount of polybags. The ladieswear and menswear departments together, manufacture millions of garments for one season, which translates to millions of post-consumer garments that become waste eventually if the quality is not good and millions of polybags, which becomes post-consumer waste. Adidas, a well-known active wear brand, is exploring the development of a recycling infrastructure for used polybags as well as innovative recycling processes for polybags, testing the technical feasibility of polybag circularity. In addition, the company aims to reduce its use of virgin plastic and aims to use 100% recycled LDPE poly bags by 2021 and is moving towards a completely circular business model in aims of becoming more sustainable (Adidas Annual Report, 2020).

The quality control stage in the retail cycle has many check-points according to the study. The quality control team has a strict process to follow during auditing. Each order has to be quality checked by following an A.Q.L (Acceptable Quality Level) number. Each retailer has an A.Q.L that is followed for the purpose of sorting through the order to check that there are no defective goods within the order. See Figure 4.25 and Figure 4.26 in Chapter 4.

To analyse the findings for this section, I merely noted the process and recorded the findings within the initial retail cycle to understand how the process flow would contribute to waste. This department or role does not directly contribute waste, but acts as a gateway for waste to be created based on the standards set by the product technologist.

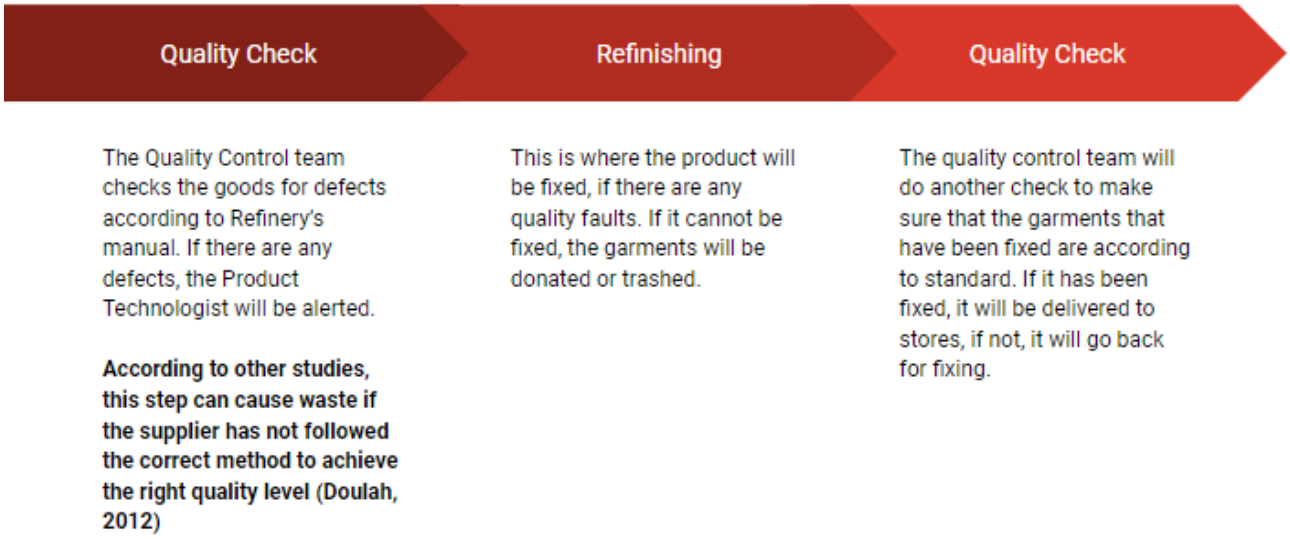


Figure 5.1. Quality control process - analysis of the process (Source: Quality Control Manager, 2021)

There are strict standards within *Company R*. These standards determine whether an order will have post-consumer waste or not. According to the findings, if the supplier does not follow the standards, the order could very well be defective and the order might need to be removed from stores or be donated, which may or may not result in the garments landing up in landfills. I have not found that *Company R* incinerates any of their products and there has only been one instance mentioned by the Brand Manager where the brand had a few orders that were stuck in customs that could have been incinerated due to the laws of trade. However, the *Company R's* persistence in preventing the stock from being irresponsibly burnt and not reused, was what allowed for the order to be released and sent back to the retailer (Brand Manager, 2021). In aims to reduce the smuggling of clothing and selling of counterfeit goods in South Africa, the South African Revenue of South Africa (SARS), has strict laws and regulations that importers and exporters have to follow, this is why many retailer's stock is stopped during shipping, as customs has many checks in place to prevent this (SARS, 2014). According to SARS (2014), "Problematic detained shipments could potentially take up to 3-4 weeks to clear due to the complex and comprehensive STOP process instituted by SARS Customs. However, should shipments be compliant and processed in accordance with the import requirements any potential delays can be

minimised. All shipments containing Textiles / Clothing are subject to a higher than usual inspection rate".

In my analysis I have found that the South African customs laws are very strict but do not do proper investigations to check the origin and destination of the goods. The delay of more than a year could have been avoided if the communication levels were better from the customs side. *"Customs advised that the stock needed to be destroyed. We didn't want to destroy the goods, as this would have been wasteful and damaging to the environment if incinerated and would take forever to decompose and be wasteful if it were sent to a landfill site. Customs suggested that the goods be recycled but due to the coating on the goods, the goods could not be recycled"* (Brand Manager, 2021). Customs could have released the goods sooner in order for it to be donated to charity. South Africa is very behind in terms of implementing sustainability awareness. South Africa is a country that demonstrates both extremes around issues surrounding the external natural environment. On the one hand, the country attempts to educate its population and implement strategies that are concerned with the protection and sustainability of the natural environment while on the other hand it is the world's eighth largest polluter of greenhouse gas emissions (Dos Santos, 2009).

If the South African customs department were more informed of sustainability and integrated this into the laws, especially relating to textile and plastic waste, the system would be very different and would have clear categories on what must be destroyed and what should not be destroyed. Clothes are often discarded when there is still life left in the items. There are many charitable organisations that offer to collect clothing items or resell them to poorer communities in Africa. The environmental burden of clothing has been studied by many other researchers; however, most studies focus on the energy consumption and pay little attention to the potential benefits of donation of clothes, diverting it from the waste stream (Farrant, et. al., 2010).

5.3.1.3. The responsibility the marketing team has in creating post-consumer waste

The interviews with the marketing team have shown little waste production internally. The waste produced is mainly external, which is linked to the store waste.

Visual Merchandising, which falls under the marketing team, prints out large posters, in many different sizes. These posters do not get used again once they are removed. The posters are made from a plastic material, called poly twill. The posters are used for a few months and then discarded. There is no particular waste disposal process, it is simply disposed of into the trash. I have not found many studies that focus on this type of waste produced by the retail industry, however, many retailers have gone digital in stores where the imagery is shown on a screen instead of on posters. (Dennis et. al., 2010; Kent *et al.*, 2018).

The Digital Coordinator's role is completely digital but the Digital Coordinator also coordinates the packaging for the e-commerce stores which contain a LDPE polybag (Digital Coordinator, 2021). The packaging for e-commerce stores is covered in the next section.

5.3.1.4. The Distribution Centres and Operations role in the production of waste

Company R requests that cartons are a certain size to be carried on the ship, as the ship has area restrictions, trucks have weight restrictions and the distribution centre has carton size restrictions because the boxes have to fit onto the machinery, such as the conveyor roller (Product Technologist A, 2021). According to the findings, the cartons that are wrapped by suppliers are wrapped in box-sealing tape, which is the opposite of what the distribution centre is trying to achieve. The distribution centre does not use box-sealing tape, but instead uses glue to seal the cartons. According to my analysis, this is an ineffective method of working, as there is still box-sealing tape being used and disposed of, see figure 4.20.

5.3.2. *Participants daily schedules to ascertain types of waste generated (question 2)*

Each interviewee answered the question very briefly. The purpose of this question was to gain insight into the employees' daily routine to find what types of waste was produced by each role individually without the interviewees' understanding of what waste is, influencing the answers. This way I was able to gather raw data and map it into a table to record the types of waste they produced. These findings were tabulated into the types of waste found, which is in table 4.2. The feedback was tabulated by role. Each role contributes some type of waste within the retail cycle.

Table 4.5. A summary of the types of waste found in each role with indicators of the most waste contributed. In the findings, it indicates that there are daily wastes produced, which is a general product that the employees use. Employees use disposable plastic bottles, plastic cups and other disposable food products for meetings that are discarded when meetings are held. This can be seen as a lack of awareness, leading to the non-practice of sustainability.

The business does not practice sustainability, this I have found in the interviews with the merchandise team and brand manager. The awareness is not there to practice, but some employees practice sustainability on their own. This is not effective in being completely sustainable. The store employees are consumers too but do not practice sustainability and only some employees are aware of sustainability, as shown in the data (Table 4.2, p 4-8.). Raising awareness might fail to resonate as humans are arguably becoming numb to the impact of emotional dramas. Adbusters writer Richard DeGrandpre has described the current society where people commonly medicate to shut down their emotions and where empathy has been grinded down to the point where we are not inspired enough to action as there are too many problems to necessitate committed involvement to just one (DeGrandpre, 2004). This similarly has been echoed by the Brand Manager when

asked how employees are informed about sustainability and practicing environmental responsibility, the response was, *"Unfortunately this is not something that is done well within our business, it is very much an individual approach and not necessarily a combined effort. I think the focus in the last 18 months has been to survive all the many battles and challenges brought on by COVID and everything else has taken a backseat"* (Brand Manager, 2021).

Besides the daily routine, the business has a retail cycle, which is the focus of this study. The retail cycle produces many types of waste. The role players in this cycle are the determining factors, each role that produces a product, produces some type of waste. The data shows (as highlighted in table 4.5. in orange), that there are specific roles that contribute the most waste. These roles are buying, design, the buyer's assistant, the product technologist, trading (stores) and the consumer. These can be split into two categories, pre-consumer waste and post-consumer waste. Pre-consumer waste is waste that has not reached the consumer yet. The types of waste pre-consumer waste produced are swatches in natural and synthetic fibres, lab dips in both natural and synthetic fibres, plastic trims, metal trims, plastic bags, garment samples, plastic garment hangers, poly bags and large fabric pieces that are used for testing. The data shows that these types of wastes are produced and not discarded properly *"To be honest, we don't really keep anything, we just throw it in the bin. The business should provide recycling options for plastic and the fabrics like they do with the paper in the garage"* (Designer A, 2021). This means that many of the pre-consumer wastes at head office are not donated, but simply thrown into a bin and most-likely ending up in a landfill.

Post-consumer products are defined as any garment or household product that the owner no longer needs and decides to discard (Hawley, 2011). Post-consumer waste is waste that has reached the consumer; these types of wastes, data shows, are produced by Trading, Visual Merchandising and the Digital Coordinator's process. The types of waste found were plastic bags, poly bags, plastic garment hangers, plastic sleeves, box-sealing tape, plastic refuse bags, store signage,

water bottles and garments that cannot be donated that customers have returned or that have been received that are full of mould. Studies show that there are several methods of recycling post-consumer textile wastes and almost all, natural and synthetic are recyclable. There are also charities and second-hand stores that take in products to sell. Garments can be processed back into fibres or re-designed into another product, these are only some of the ways textiles can be recycled (Hawley, 2011).

Besides the types of waste that are produced within the *Company R* retail cycle in the business, suppliers have their own waste and by-products that are produced during manufacturing. The study does not focus on this, as the scope would have been too big.

5.3.3 *Identification of plastics and synthetic materials in daily operations (Question 3)*

All interviewees were able to identify the types of plastic waste, the wastes that were mentioned were plastic bags, pens, plastic bottles, poly bags, broken hangers and fabric samples.

The marketing department was able to identify that the visual merchandising posters that are used in stores are waste, as they are discarded after use and new posters are printed for each store. *Company R* has 80 stores, which means annually, thousands of posters are dumped.

The store interviewees were able to identify many types of waste, the biggest concern being plastic poly bags and lay-buy bags that are discarded after use.

The data shows that plastic waste, even though the retailer has stopped providing plastic bags to consumers, is still a problem. Poly bags are used in high numbers and discarded once the bag is opened. This plastic is not recycled, when it is 100% recyclable. Stores also refuse their lay-buy bags once the customer has used it,

instead of reusing it for something else. A theme of disposing of, instead of reusing is prevalent in the findings within the business and it could be due to the lack of awareness within the company and practicing sustainability.

5.3.4 *Effects of cutting out plastic or synthetic items (Question 4)*

Although this question was relevant at the time, the answers were not viable to use for this study. Most employees mentioned their experience during the pandemic and how online meetings were favourable for the future. The planning team mentioned that they would be able to forgo the poly bags on each garment and use a new method to transport the goods, such as pre-packing, this was reiterated by the distribution manager. *"This is something I have been working on as well, pre-packing will reduce time, cost and it will reduce waste, the DC would be open to doing something like this" (Distribution Manager, 2021).*

Again the theme is that some employees are aware of how sustainability can improve the business and have started implementing it in their roles where possible, others are in the thought-process, but need assistance from the business to implement it.

5.3.5 *Additional feedback (Question 5)*

Each of the participants were clear on the questions and did not have any further questions. The only interviewee that asked me a question was planner B. The planner asked what suggestions I had as the researcher to improve the sustainability process at *Company R.* I did not disclose what the recommendations were but reiterated the suggestions that were discussed in the interview. These recommendations are mentioned in the recommendations section of this thesis.

Sustainability has taken on increased importance in recent years, with increased awareness internationally that sustainability is a top priority. The issue of sustainability is crucial in fashion business and has received considerable attention from consumers. Topics on sustainable production and remanufacturing, green information

sharing, and green attitude and education once received heated discussions in the mid-2000s, green marketing has become the main focus within retail chains more than the action of true sustainability, reviewing the triple bottom line and maintaining a balance thereof (Shen *et al* 2013). The employees that were interviewed lack the awareness of the business strategy in terms of sustainability. The business lacks the proper planning and implementation of the wealth of knowledge within the supplier base and the utilisation of the willingness of employees to get on-board with evolving into a sustainable brand. *Company R* is an agile South African retailer that is in the position to create awareness within the business to its employees and ensure that profitability, people and the planet are in balance.

Each individual role within *Company R* has the capability of implementing and managing sustainable practices. The need is for the business to enable those practices and create awareness around what the action-plan is for the business to become environmentally sustainable, so that each employee, within the head office or on operations level, will have the tool of knowledge and implement the business strategy without hesitation. At operations level, each staff member will have the ability to conduct a sale at a the till and have the ability to teach the customer why sustainability is so important to the brand, instead of questioning the customer on why they do not want to purchase a paperbag for the sake of being environmentally responsible, or why the customer has sustainability preferences when making a purchase.

5.4 *COMPANY R'S* ENVIRONMENTAL SUSTAINABILITY STANCE

Once I plotted out the current retail cycle model as per Figure 4.1, I explored what the current stance of the company is in terms of sustainability policy and if the current retail cycle model is environmentally sustainable or not. To gain insight, I conducted interviews with 22 employees on sustainability and asked follow-up questions related to the business to understand what the mind-set was of the managers and if the employees understood the intentions of the business' environmental sustainability

strategy. The follow-up questions *Company R* management team asked questions around the business, suppliers and employees and how environmental sustainability was viewed in this context in terms of plastic and textile waste and employee perceptions regarding those issues. Follow-up questions to the employees helped me to gain insight to their understanding of the business' intentions in relation to sustainability. In this chapter I will interpret the findings in the context of the 3 pillars of sustainability, environmental, social and economic.

5.4.1 Sustainability in the Fashion business: MANAGEMENT'S PERSPECTIVE

When posing the question about *management's approach towards becoming more sustainable as a fashion business*, the response was that *Company R*, within the Pepkor group, is finding ways to work in ethical and sustainable ways. According to management, this is a key focus for the business within the group. According to the research, the retailer audits the supplier on ethics in terms of environmental impact, but there is not much visibility on supplier processes in the context of sustainability. This is interpreted as there are limited or no sustainability compliance policies currently. The company does not have any rules or regulation policies in terms of sustainability *"I do not think there is a clear policy on rules and regulations for sustainability" (*Brand Manager*,* 2021). If there is no accountability built into a company's operations, with clear guidelines regarding the pillars of sustainability (Nyfeler, 2013), the pillars will be flouted in favour of profit. Chow *et al*. (2018) point to the big contribution the retail industry makes in terms of global pollution. Sustainability in the fashion industry is directed at profitability, the focus on social responsibility and environmental sustainability does not play a role in many retail structures. Sustainability, when echoed by retailers, can be focused on many different areas. It doesn't necessarily mean environmentalism, especially not in the direction of textile and plastic waste (Nayfeler, 2013). Sustainability is not only a philosophy and is dealt with in the social responsibility department. Marketing ethos and brand ethics also play a major role. The first pillar of sustainability, environmental, under this pillar I have classified the textile and plastic production as one of the contributing areas of waste, which falls under environmental sustainability. One of the major consistencies in the interviews I have found is that the fibres and fabrics used are conventional and are

specifically sourced with environmental sustainability in mind. Alternative solutions have to be considered and the conventional way should be replaced as a start to becoming a more sustainable business. This is also echoed by authors (Fletcher 2008: 3ff.; Gwilt and Rissanen 2011: 17ff.; Myers and Stolton 1999).

Company R makes use of high percentages of cotton, as stipulated in the findings chapter 4. According to the Better Cotton Initiative, the problem is that conventional cotton fabric production entails the use of a lot of chemicals. Cotton is relatively drought tolerant and can be grown with rain water in many regions. Half the growth area requires some irrigation as fresh water becomes an increasingly scarce resource and therefore it is important to ensure that it is used in environmentally sustainable ways. Cotton farmers that practice irresponsible water management can cause long term effects on the growth of cotton and that of the community in the areas surrounding the farm who share water resources (Bettercotton.org, 2019).

Cotton production impacts water resources in multiple ways, the quantity of water used for surface irrigation and groundwater irrigation, the rainwater stored in land and the water quality due to the use of agrochemicals (pesticides and fertilisers) (Bettercotton.org, 2019).

Manufacturers produce massive units rapidly in order to reach (often excessive) business profits, and this phenomenon of fast fashion frequently represents low quality apparel (Debord, 2002). In turn, low quality garments enhance the possibility of waste, since low quality garments are quickly replaced by the next season's fast fashion offerings (Fletcher, 2016; Purewastetextiles.com, 2019). *Company R's* supplier factories, whose names have been kept confidential for the sake of supplier confidentiality, in Bangladesh and India are offering sustainably sourced fabrics, including ecologically compatible dyeing processes, however *Company R* is in the early phases of investigating supplier processes to ensure suppliers conform to ecological guidelines. My interpretation, derived from the brand manager's answer, *"We currently do not have as much visibility to our suppliers' processes on sustainability. We audit our factories and ensure they are ethical, but in terms of the environmental impact - there is a lot that still needs to be done. We are aware of many factories offering more sustainably sourced fabrications and wash/dying processes -*

but we are only in the beginning stages of vetting these processes and testing the outcomes" (2021), is that the business is audits suppliers to check that ethics are followed, in ensuring that the supplier or factory is truly sustainable by implementing compliance steps within the larger group, not directly within *Company R* factories. That leads me to interpret *Company R* does not have any environmental sustainability guidelines in place that their own suppliers can follow yet as there are no set guidelines for factories and suppliers to follow "*Groupwise I know (name removed) at Pepclo has established many sustainable practices for the group, I do think that information should be shared a bit better"* (Brand Manager, 2021).

Company R management should take the necessary steps to implement guidelines for suppliers, so that they are aware of the business' intention to become environmentally sustainable. If suppliers are communicated about the intentions of the business, suppliers are provided with the platform to be transparent about their sustainability practices and therefore *Company R* would know what the suppliers' sustainability solutions are.

The initial step in the retail cycle that is covered by the designers: trends, designers are able to source sustainable trends and research how they can design with efficiency in mind, whilst still making a profit. *Company R* uses seasonal trends from other international retailers and websites to conduct research as a guide to the coming season in ladieswear and menswear. The designer interprets the trends by creating similar designs that echo the *Company R* brand. The designer does not copy the designs from trends or other retailers directly as *Company R* has its own brand identity. *Company R's* carbon footprint is being reduced, initiated by the Covid 19 outbreak, it started implementing digital methods to conduct the sample process, such as online meetings, less or no travel and in-house design and less buying of samples (Designer A, 2021). There has been an increase in online sales and deliveries with Covid, which means more single-use plastics (polybags). Though the focus has not been on sustainability, the pandemic has forced the business to change its model in order to survive financially. The brand has opted to keep certain processes as is and not revert back to the old way of doing business, which is where the entire merchandise team travels overseas to visit suppliers and buy samples from other retailers (Buyer B, 2021).

Currently there is a high focus on using less paper and becoming more digital where less printing of print design will be needed as digital prints can be seen on a 3-dimensional avatar, "*All tech packs get sent electronically. Cad review meetings are held online which helps reduce our paper usage. Artworks get printed out to check the scale. Once we are more comfortable in using 3D, this will help with scaling artwork electronically".* Each year textile waste is increasing, according to Dalton *et al,* 92 million tons of textile waste is created globally by the fashion industry and is growing worse annually. It is projected that waste could increase by 60% by 2030 (2013). Post-consumer textile waste contributes millions of tons and these are sent to landfill or incinerated or shipped to dump (Hawley, 2008) (Fischer & Pascucci, 2017; Singh & Ordoñez, 2016).

The buying and sourcing departments have the biggest influence when it comes to sustainability as these role players decide what goes into the product. Although the designer presents trends to the merchandise team, the buyer makes the final call on the product details (Brand Manager, 2021). The buyer selects the fabrics for the garments, polyester or cotton, as an example. The most common synthetic fibre used by clothing manufacturers is polyester. Polyester, a polymer, is very similar to plastic - the molecular structure is the same, which means that polyester, just like plastic, is virtually indestructible (Webb *et al*, 2012). The briefing stage is a critical stage in *Company R's* retail cycle, this is where suppliers are informed of the retailer's buy for the season. The supplier is provided with information such as silhouette, fabric construction, fabric composition, trims, quality standards and garment measurements. This is where the buying, design and quality department are able to be intentional about being environmentally sustainable (Buyer A, 2021). Suppliers should be requested to source sustainable fibres such as organic cotton or sustainably sourced cotton, recycled fibres such as polyester or polyethylene terephthalate (PET) or sustainable methods of production should be discussed at this stage. Polyester clothing manufactured from oil-based PET is the most frequently used fibre type in the retail industry (Palacios-Mateo, *et al.*, 2021). PET made the conventional way creates pollution along its entire value chain during the production, use and end-of-life phases. The production of this fibre also depletes natural resources, which means that the

consumption of garments made from virgin fibres threaten the quality of human health, quality of land, water and air and destroys ecosystems (Palacios-Mateo, et.al., 2021).

The research suggested that the retailer intends to reduce waste in the business by reducing the amount of physical samples produced (Buyer D, 2021) as *Company R* will be utilising 3D technology, to fit garments on avatars instead of dummies (Buyer A, 2021). This means that samples suppliers are sending for fitting purposes, the retailer is currently looking to reduce. This means that instead of fitting thousands of samples every season and mutilating these samples, it will be significantly reduced or completely removed from the retail cycle (Brand Manager, 2021). This is a good starting point towards becoming more sustainable, as the fit samples, according to the research, could be repeated 2-4 times per style. One first fit sample is fitted, one Pre-Production sample is fitted, but one in each colour is sent at this stage for e-commerce photographic shoots, as well as one of each colour for marketing photographic shoots in a size 8. This amounts to a minimum of 6 garments being sent to be fitted per style. This number could be doubled if there are 2 colours per style or tripled if there are 3 colours per style (Product Technologist B, 2021). It all depends on how well the garment is briefed to the supplier and how well the supplier executes the product that will allow the fitting sample to be approved the first time. This in turn leads to minimal resubmissions, however the marketing department will still need one sample in a size 8 and 10, and in all colours (Marketing Coordinator, 2021). Reducing the fitting samples is not enough, the fashion industry is known as the second most polluting industry in the world and doesn't repeat the same phrase over and over. Include fresh, scientifically backed literature as well to advance the argument. In theory, natural fibres decompose over time while synthetics do not. Buried natural fibres also hardly decompose. Even though decomposition occurs, toxic leachate or biogases form due to decomposing. Textile, fibre and cotton industries produce by-products during production and some of these by-products can be recycled to be used for the furniture and fashion industry (U.S. Environmental Protection Agency, 2010). Textile manufacturers can easily assort their textile waste as the waste materials are more predictable. For example, a denim factory’s textile waste is limited to certain fibres that can easily be categorised and recycled. Moreover many textile manufacturers are aware of the profitability of textile waste, 62% of textile manufacturers in Turkey sell their textile wastes to recyclers for payment (Altun, 2012).

Company R and the Pepkor group are implementing the 3D process, which means a large amount of fit sample waste will be reduced, which is a very positive baseline approach. However, this is a fraction of the business' manufacturing output. Retailers are increasingly required to decrease the internal and external environmental impacts of operations by progressively adopting different corporate environmental sustainability strategies and actions. Environmentally sustainable retailing refers to retailing practices, where "retailers minimise emissions, effluents, and waste through continuous improvement in their internal operations. Sustainable retail practices involve the production and transportation of green products. It entails green store operations: retail operations that focus on waste reduction and recycling where possible, it also entails the conservation of energy. It also includes non-product greener practices such as employee communication and awareness regarding environmental sustainability and sustainable strategies within the business. Lee *et al*., show that sustainable retailing involves green product sales and non-product management, such as retail supply chain, customer-facing initiatives and facilities management (2012).

Company R is not currently reviewing post-consumer waste, the business does however review the amount of garments returned for the purpose of reducing quality problems on garments (Product technologist A, 2021). This process could be used as an indicator as to how long garments are able to last before the consumer will discard the item, in efforts to reduce post-consumer waste. The business does not focus on reducing textile waste in the form of virgin polyester or to use responsibly sourced natural fibres in the designs currently (Designer A, 2021)). Fast fashion has a reputation for manufacturing disposable clothing, it lasts for a season or two and then consumers need to purchase more goods. It is particularly worrisome for sustainable development as it creates a demand for cheap clothing with a limited life-span, this in-turn results in massive amounts of textile waste, increasing carbon emissions and global warming (Yang *et al*., 2017).

According to Fletcher (2010) there are questions around how speed affects fashion's ability to be sustainable where economic systems, business models and value sets are concerned (Fletcher, 2010). In order for retailers to favour sustainable practices,

retailers have to look at their products, production and business model processes, (e.g.: buying, quality, production, packaging, assortment) (Bocken, et. al, 2014). *Company R* has not focused on sustainability within the business, employees have not been informed about practicing environmental sustainability. Management is transparent about sustainability being an individual responsibility, where it is the onus of the employee to understand sustainability, to practice sustainability or to not practice sustainability.

When I asked *"Within the business, how are employees informed about sustainability and practicing environmental responsibility?"*. Management's response was that Covid has taken first priority. *"The last 18 months to survive all the many battles and challenges brought on by COVID and everything else has taken a backseat" (*Brand Manager, 2021). It suggests that the profitability of the business takes precedence over issues of sustainability. The pillars of sustainability are broadly used to indicate programs, initiatives and actions aimed at the preservation of a particular resource. However, it actually refers to four distinct areas: human, social, economic and environmental - known as the four pillars of sustainability" and therefore includes economic survival. Human survival, economic opportunity and prosperity have always been connected to ecological survival and integrity whether this is acknowledged or not.

Globally we are faced with many economic difficulties, partly rooted in the fact that economic development has been beneficial for human development, which has lifted billions of people out of poverty and into lives of opportunity over the past 50 years. Within this context, the earth's ecological stresses are certain to increase. *"To promote sustainable development so as to ensure the protection of the region's environment, the sustainability of its natural resources, the preservation of its cultural heritage and the high quality of life of its peoples"* (ASEAN, 2008). What must be considered is that in the context of sustainability, environmental sustainability is key to human survival and quality of life on the earth will be reduced in terms of time. What happens 100 years from now is irrelevant to the worst case of ecological crises that humans could create and face over the next 50 years. The outcome depends on the speed of implementation of effective sustainability solutions. This depends on sustainability decision-making and practices into retail business and society. The in-depth changes necessary to immerse sustainability objectives in cultural and market

activities must reach the whole range of human activities and environmental impacts. The key tool in creating a structure and policies are the pillars of sustainability (Clune and Zendher, 2018).

In comparison to other sustainability models, the three pillars of sustainability model moves from a conceptual framework to an implementation and action framework. The three pillars of framework is a simultaneous approach to implement goals and considerations in the fabric of our social objectives and institutional processes. The pillars are a framework that can be used to successfully implement sustainability solutions at speed and scale. This approach can be highly impactful and is informative of decision-making and balancing priorities at various levels, such as economic, social and environmental. Sustainability combines a living space for human society within our environmental protection and ecosystem protection objectives. All environmental and sustainability challenges are directly connected to economic production and consumption, and need to be considered alongside other objectives (Clune and Zendher, 2018).

The three pillars of sustainability, social, environment and economic provide a basis for implementation of sustainability. There are multiple ways which retailers can influence society and help the development of a more sustainable environment. It differs between activities focusing on social issues and issues that focus on environmental issues. According to Maignan *et al.* retailers should find a balance between market demand and what stakeholders expect in order to achieve sustainable retailing (2005). Retail practices are placed between upstream and downstream practices. It forms a type of hybrid of life-world and system rationalities, referred to as “consumption junctions” (Schwartz-Cowan, 2005). To be sustainable in production processes and have more sustainable products, retailers must pressure their suppliers to avail and achieve more sustainable manufacturing practices, as well as promote and encourage changes in consumer behaviour that will improve social and environmental issues (Durieu, 2003). This provides real value to retailers, since many current consumers identify with values of sustainable companies or brands, looking for ethics that not cover price, product and quality, but also of having shared values and social ties with other sustainable companies (Arvidsson, 2008).

Upon exploring the internal sustainability practices within the group, management responded that the group has a specific person allocated to sustainability that has established many sustainable practices, however, this has not been shared with *Company R* in full (Manager, 2021). Multiple researchers advocate that in order to teach consumers how to make ethical judgements, more information has to be present in fashion brands' marketing communication, in order to demonstrate the advantages of diminishing post-consumer waste pollution (Carrigan & Attalla 2001; Chan & Wong 2012; Gupta & Hodges 2012; Shen *et al.* 2012 cited in Henninger, *et al*. 2017). The same goes for awareness within a company. Data gathered from the operations team revealed how, too often, large corporate companies have an ethics direction regarding sustainability matters, but the staff of the company do not share the same understanding. Therefore, staff need to be educated and inducted into the benefits of sustainable practices. If staff are not "on board" they cannot possibly advocate the company ethics to consumers. It is important to train staff regularly on the broader philosophy of sustainability, and on detailed impacts that decision making has in the full retail cycle. This resonates with (Ehnert, 2012) who underpins the value of employee training in understanding and promoting sustainable values.

5.4.2. Sustainability in the Fashion business: EMPLOYEE'S PERSPECTIVE

When asking the question, "what is the current approach towards becoming more sustainable as a fashion business?" The overarching message is that the business is trying to move towards being more sustainable, this is in context to paper and plastic, *"from the field side there very little we can do, but we try our best to recycle the plastics that come out of the boxes when we receive stock and reuse paper as much as possible" (Area Manager A, 2021).* Most employees are well educated when it comes to the plastic side of waste pollution (Area Manager B, 2021). The buying and quality team showed awareness of recycled fabrics, *"More and more fashion brands and businesses are making clothing out of recycled fabric, it just shows that the concern for the environment is there and we are trying to find the best solution (Buyer C). Within our business I'm not sure if sustainability approaches are even discussed" (Buyer's Assistant A, 2021), "using sustainable materials so that we don't harm the environment*

and ourselves in the long run" (Buyer A, 2021), "switching plastic bags to paper or woven bags (Buyer B, 2021). Recycle paper (Marketing Coordinator, 2021). More online meetings than printouts needed (Buyer D, 2021). Looking into recycled fabrics" (Buyer D, 2021). These were all individual responses sent by the merchandise team.

This shows that there is an interest in the sustainability subject and that it is a discussion within the brand. However, the business is not completely aligned with its employees on this. The employees show readiness to evolve, yet the business is slow to do so. South African retailers need to be more proactive in supporting sustainable product life cycles, including reducing waste generation. This includes reducing the need to produce synthetic virgin fibres in fashion apparel through recycling practices (Fletcher, 2013) and more recent refs. Participants were asked to indicate types of suppliers and their sustainability approaches, 50% of the participants didn't know what the approach was or found that the question didn't apply to them. Each and every participant works with a supplier, whether in marketing or in merchandise team. This shows that 50% of the staff are not discussing this with suppliers or in their teams yet. This aligns with the management response, where the suppliers are not monitored on their production processes. When materials and pre-products are sourced, environmental parameters must be executed, not only in terms of the used materials and trims but also by the respective processes at suppliers. For this reason, monitoring must cover the materials as well as the supplier processes. Third parties might be employed for monitoring respective conduct regarding related processes. In many fashion retail brands, suppliers not meeting the standards of the business risk being delisted and removed from the supply chain (Freise & Seuring, 2015). Many reports show unacceptable working conditions and environmental or ethical burdens through production within the supply chain, along with other issues such as child labour, these are all environmental concerns (Baskaran *et al*, 2012).

One participant mentioned that "*the business is looking at using woven suppliers that can supply recycled fabrics and using natural dyes on knit suppliers. One denim supplier turned factory is a green factory and has OEKO-TEX certification" *Buyer D, 2021).* OEKO-TEX is a certification that has an environmental sustainability standard that 'green' factories need to follow. The basis is that the product must be tested for harmful substances and certified. *"To ensure that the textile or leather product has*

*been manufactured using environmentally friendly processes and under socially responsible working conditions, the production facilities must be certified in accordance with STeP by OEKO-TEX®"(*OEKO-TEX, 2021). I have contacted the company to check if they do cover labs globally and locally in South Africa and have not had any response. The green factory would be a viable option for the business. If the green factory does not produce virgin polyester fibres, it would help in reducing the amount of synthetic garments that are sent to landfill. If more garments are recycled into fibres for the purpose of creating new products, the landfill sites will be able to keep up with the amount of waste being received. For instance, 31% of waste in Western Cape landfill sites is made up of non-recyclable waste (Waste Market Intelligence Report, 2020). Textile waste made up 6.38% of this waste in 2020. In 2021 non-recyclable waste made up only 9% of all waste received, the percentage has increased by 22% in 2021.

5.4.3. The buying and sourcing sustainability approach: EMPLOYEE PERSPECTIVE

When asked about the sourcing and buying process and the sustainability approach, the majority of the employees answered that they were not aware of any sustainability approaches. The company has not communicated any sustainability plans to the employees. However there are certain practices already in place in operations. Each *Company R* store has gone plastic-free, "*from an operational point of view, we are no longer giving our customers plastic bags, we are now making use of brown paper bags" (Area Manager B, 2021).* Customers purchase paper bags instead of plastic bags for the purpose of carrying their purchases.

The operations team, headed by the area manager, advised that at the front of the store, paper bags are used, but when customers make lay-buy purchases, the lay-buy is placed into a large clear plastic bag. This bag is then brought out to the customer and placed into a paper bag. The plastic bag is then thrown in the bin. The area manager said *"Sometimes the customers ask for the big plastic bag but then we have to say no because they have to pay for a paper bag and we don't want to give them plastic, but the plastic goes into the bin, that process can be improved, maybe recycle the plastic" (Area Manager A, 2021).*

Within the business, the employees are not informed of any sustainability approaches but the mind-sets of some, both at the head office, at the distribution centre and operations level, are geared towards being sustainable. One buyer is knowledgeable on the topic of sustainability and said, *"there are no set rules as far as I am aware but the unspoken rules of behaving in such a manner that is kind to the environment, such as recycling and using electricity wisely"* (Buyer D, 2021). An interesting observation that was made is that although employees are knowledgeable, sustainability is not ingrained, in other words, what is preached is not practiced. This observation was made in the context of everyday behaviour, - when in contact with the employees - some staff wore PET masks (polyethylene terephthalate - plastic) and disposed thereof afterwards. These disposable masks are damaging to the environment. Plastic water bottles were used to drink water on a regular basis in the distribution centres. Staff purchase take-away lunches in plastic containers every day and when making purchases at other retail stores, often carry their product in plastic bags if the store did not provide a paper bag (Designer B, 2021). This is in some way a contradiction to the practice at *Company R* stores where the plastic bags have been removed from stores to practice environmental sustainability but the employees do not practice environmental sustainability. Environmental awareness in terms of sustainability is important, but it is theoretical, practicing awareness by doing things differently is what counts. For instance, *Company R* has a recycling option for paper, but this is not communicated in the business, rather the responsibility is left to the cleaning staff, who are informed by word of mouth. There are no notices displayed in the building to promote the recycling of paper and why it is important, so it is challenging for all employees to know where to go to recycle and to understand why it is important. Most South African consumers are undereducated about waste solutions due to the lack of awareness created around this subject (WWF, 2020) and around sustainability issues in fashion and the difference that engaging in ethical behaviour could make (Shen *et al*. 2012 cited in Henniger, *et al*. 2017). Awareness is an important tool in helping consumers decide to practice it, if they have the knowledge it will be the difference between practicing and not practicing sustainability.

5.4.4 The design sustainability approach: EMPLOYEE PERSPECTIVE

Designers are responsible for minimising waste when designing a product in order for the retailer to get the best cost, the appropriate units and best sales out of the product (Wang, 2006) (Zaman, 2015). With the increasing rates of fashion consumption, fashion retailers industry business models shift towards cost reduction methods while ignoring essential factors such as the environmental cost of the fashion industry (Niinimäki & Hassi, 2011). Fashion designers are beginning to challenge the fast fashion cycle and are seeking to prevent waste through the elimination of fabric waste during the development process and manufacturing of a garment. In the follow-up questions I posed the question to all the participants about the design sustainability approach, "*Elaborate on product design and the sustainability approach".* In the marketing roles, the responses were that the company is going paperless and moving towards fitting in 3D. The merchandise team's (designers and buyers) responses were similar to that of the marketing department, "*All tech packs get sent electronically. Cad review meetings are held online which helps reduce our paper usage. Artworks get printed out to check the scale. Once we are more comfortable in using 3D, this will help with scaling artwork electronically" (Designer B, 2021).* The second designer responded, "*Designing products that are not too fashion forward allows for hopefully a considered purchase. Designing with all relevant details required by the supplier, it allows less garments and packages having to be sent to and from suppliers. Considering what trims or tags are required or relevant to ensure we get the message across, but limiting additional things needing to be produced",* (Buyer D, 2021). The focus here is on designing garments that are less fashion forward so that the customer purchases it from a perspective of being able to wear it for longer. The buyer mentions that the designer needs to provide the supplier with all the relevant information to make up garments to prevent waste. This is a good start to becoming more sustainable but the designer is still not designing with the intention of having less textile waste and plastic waste. The general focus is on paper reduction, there is no focus on textile or plastic waste reduction. The responses suggest that the focus within the company currently is to reduce paper and not plastic and textile waste.

In an interview held with the designers, I asked how the textile waste is discarded. The textile waste is discarded as is every season, into bins, with plastic sleeves and trims

(Designer A, 2021). Based on the previous question around sustainability through design, the designers are focused on using less paper but they have not yet considered designing with the intention to use less synthetic fibres, less plastic or less natural fibre textile waste. The observation I have made is that the designers' focus is solely on designing for the business without the intention of taking the environment into consideration. Some employees are sustainably-minded but they do not have the support or knowledge on how to implement it into the business.

"To be honest, we don't really keep anything, we just throw it in the bin. The business should provide recycling options for plastic and the fabrics like they do with the paper in the garage" (Designer A, 2021). One designer said that the company should communicate where the waste should go and perhaps the company should start implementing other recycling options for textiles and plastic. It is the business' responsibility to promote awareness and to reduce waste and to provide the employees with access to waste distribution, this will allow the staff to make better choices. With this being said, the company could empower the designer with the ability to make sustainable choices in design, as this company designs its own product and does not copy other retailers' designs.

Generally the designer decides which fabrics and trims should be used to make up a product. The product technologist guides the buyer and designer on the type of fabric to use for the desired look and for the best quality performance for the product to have longevity and meet quality standards. The fabric may contain polyester blended with cotton, 100% polyester or it could be 100% cotton, depending on what the retailer can afford. The materials chosen have an influence on the processes of manufacturing, the ability to be recycled and how it is disposed of at the end of its life. Design predetermines all of these processes (Wang, 2006) (McQuillan, 2020).

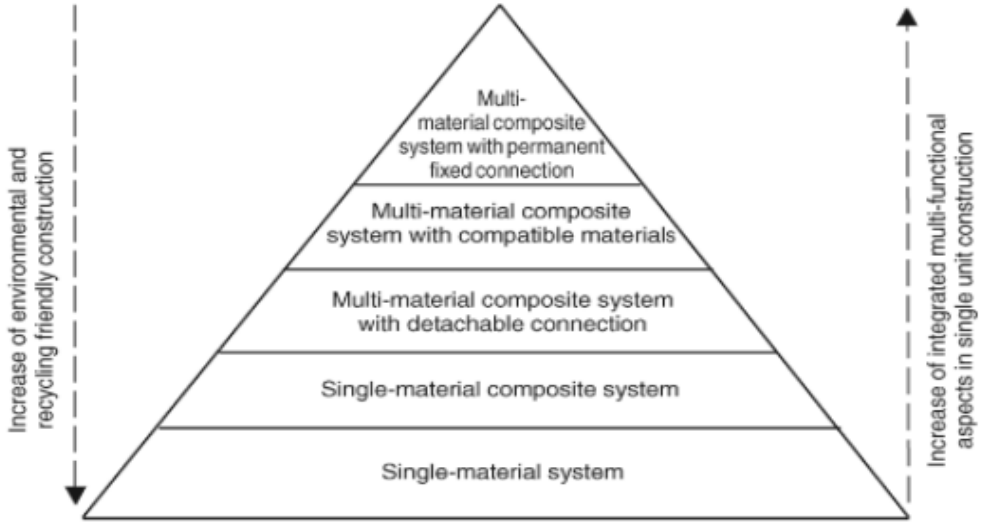


Figure: 5.2. : Principles of materials systems; recycling friendly construction and functionality (Wang, 2006)

The figure provides an overview of materials available and potential to make products that are fully functional and designed to be easily recycled. Products made of a single fabric in a single system (non-composite) are pure and will be easy to reuse. It would not be necessary to separate the fibres or product structure prior to processing. Combinations of different compositions made from the same polymer would be easy to recycle. Gluing and coatings result in composites not being able to be separated (Wang, 2006). *"Customs suggested that the goods be recycled but due to the coating on the goods, the goods could not be recycled (Manager, 2021)".* This is an example of goods that were stuck in customs and could not be recycled due to the coatings that the designer did not take into consideration before-hand.

In conjunction with the innovative design-thinking, if the design is communicated well to the supplier, there will be less requests for more samples, strike-offs, lab-dips and trim approvals, which again, reduces the amount of in-house samples. If sustainable sampling through effective communication is applied to the actual product design, less waste will be produced as well. The buyer has the power to appoint a sustainable supplier, the designer has the ability to make use of the strike-offs in the design and design with the intention of being able to recycle, compost or reuse. The product technologist has the knowledge to guide both the designer and buyer on the fabrications and trims that will provide durability as well as ensuring the conformance of sustainable suppliers. There are many sustainable design

methods for clothing manufacturing. Designing with low-impact materials and for durability ensures the efficient use of materials. Designing to minimise transportation and reduce packaging also contributes to environmental sustainability (Gwilt, 2018).

5.4.5 Supplier compliance in the context of sustainability

The current strategy at *Company R* is to provide the consumer with great quality. This has been echoed by management and all employees and this is the current sustainability strategy. There are no sustainability conformance laws within the business yet (Buyer A, 2021) stated *"Ensuring good quality standards are adhered to, I believe customers will wear their garments for longer and avoid just dumping it. Furthermore, ensuring that suppliers do not take shortcuts that might not be so sustainable when making garments as these shortcuts could be harmful to the environment, but much cheaper to do".* The product technologist (Product Technologist A, 2021) mentioned in the interview that suppliers have tampered with lab test results. When a product has passed a colour fastness test for example, the actual fabric test might have been failed. This means that the customer will have problems with the garment, where it might lose colour and discolour other clothing. This will end up in the customer either returning the item or trashing it because of inferior colour fastness. For the retailer to be truly sustainable, it would need to have conformance laws in place and regular tests to check that the suppliers are conforming to the sustainability standards.

5.5 THE ENVIRONMENTAL IMPACT OF THE RETAIL CYCLE

In this section I analyse the findings by discussing why the retail cycle of this company negatively affects sustainability issues. Fast fashion, which refers to clothing with short product life cycles (Anguelov, 2015), has presented itself as a competitive force (Niinimäki, 2018). Fast fashion brands create new styles at frequent intervals (Mooallem, 2009), focusing less on durability, and more on low cost (Johansson, 2010). When trends emerge, there are quick turn-on products

(Claudio, 2007), these products are usually easy to make and are based on existing silhouettes within the business, with the ability to compress the retail cycle lead time within 15 days (Ferdows, *et al*, 2004). The unfortunate consequence of fast fashion is the rampant consumerism trend that results in increased textile and plastic waste (Mukherjee, 2015).

5.5.1. The production of waste by the buyer, designer and buyer's assistant

Within the retail cycle of *Company R*, the first stage is the post-seasonal meeting, the business does not generate waste. This meeting is held online and no additional paperwork is printed or fabrics are used. Everything is digital. The second stage in the cycle is Trend, this is a workshop hosted by the designers. The preparation for this meeting includes sourcing trims, fabric swatches and garments if necessary to show in the workshop. The purpose of the workshop is to present overseas trends (Designer A, 2021). These swatches are sent via courier in a plastic courier bag by the supplier. Inside the courier bag, each fabric swatch is wrapped in a polybag and if trims such as plastic buttons, little plastic button packets with smaller trims, zips, toggles, elastic, plastic poppers, plastic kimbles, lab-dips are sent. Trims are either stapled or wrapped placed in a small plastic packet. The swatches come in different types of compositions, constructions and colours to show the designers what is trending and what the supplier's capabilities are. *"The suppliers send us lots and lots of fabrics, sometimes it can be 20 different types of swatches per bag for just one type of fabric"* (Designer B, 2021). At this stage the findings show evidence that this is the first stage of waste production within the business as only certain textile swatches are used for the purpose of trend presentations and kept for the season. Once the season is over, the swatch samples are discarded by being thrown away into dust bins.

Retailers such as *Pure Waste i*n Europe have initiated more intense strategies to prevent waste from reaching landfills, no textiles go to waste, not even cuttings (Pure Waste, 2020). In the study, there were no findings that the other areas in the first 5 stages of the *Company R* retail cycle contributed waste, strategy and planning are stages in the cycle that assist in the development of the garment but are a

planning phase, there are no samples being created at this stage. Although this stage of the retail cycle does not directly contribute to waste, it is the initial stage of the retail cycle where the prevention of waste can be planned by incorporating sustainability strategies, planning sustainability outcomes from the start is the only way that it can be promoted and entrenched within the business.

Range building does not produce waste directly from the retailer itself, however the buying department travels to purchase samples from other retailers, mutilate the garment samples and then use those samples to generate inspiration for a range *"Compiling imagery or bought garment samples to represent the direction"* (Designer A, 2021). The garment samples are removed after a few years. *"It's only after a few years when the samples are thrown out because there is always something we can reference from an overseas sample"* (Designer A, 2021). This is an important component of the study, because the initial stages of the lifecycle, from design to end-use, are the most crucial to planning sustainability outcomes and entrenching within the business. This is where the role players such as the designer and buyer decide the type of fabric composition to use, which could be synthetic or natural fibres, trims, which could be plastic or metal, silhouettes which is the styling, that determines how much fabric will be used and colours that will determine the dye types that will be used. The amount of units that the business wants to order for each style is also determined here, which in turn affects how many polybags are ordered so that the goods can be delivered. The amount of polybags that need to be used can be briefed to the supplier at this stage as this is a business requirement. Changing the way of working upstream can really make a difference in the retail cycle, as it will determine the entire lifecycle of the product and retail critical path.

5.5.2. THE HIDDEN TRUTH IN THE FACE OF RETAIL: What employees have visibility to but do not action

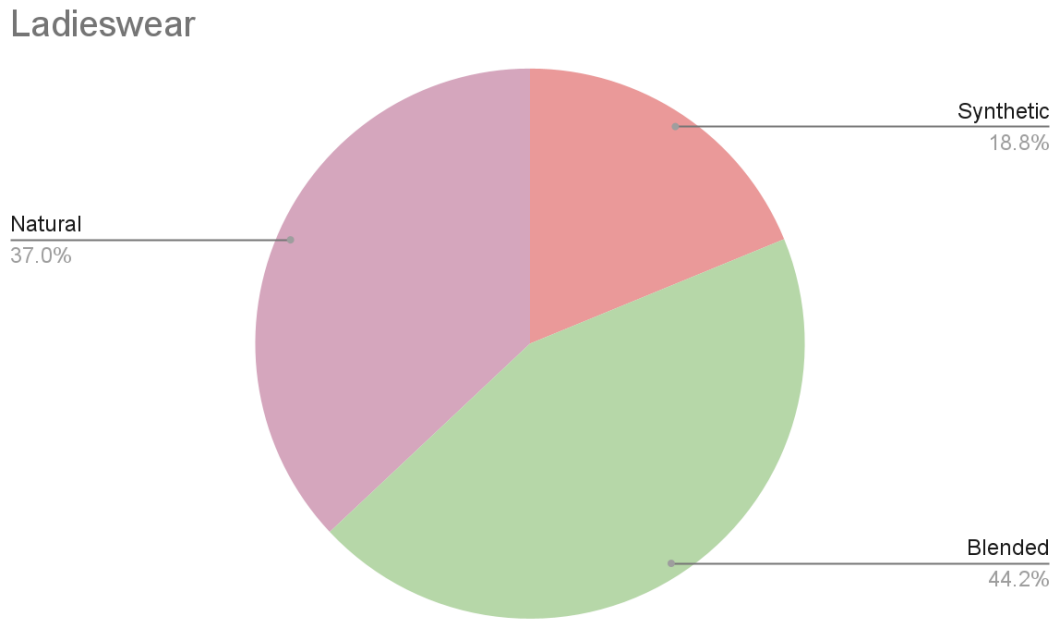
5.5.2.1. The ability to plan for environmental sustainability

In the interviews with the buyers and designers, the consensus was that the Range Review stage is where the buyer shows the merchandise team how the range looks and what the intentions are for the season. In Range Review, the buyer uses overseas samples, paper printed photos and fabric swatches to help create a visual for the team to see what the intention is for the season. All of these materials are used throughout the initial stages to create the product design *"if we don't have a garment as representation of what we want to do, there is always a reference image, each person attending the meeting prints out a bunch of ideas on paper that we go through for print inspo, style inspo, whatever the case might be"* (Designer A, 2021). The merchandise team will comment on fabrics, colour, silhouettes, trims and relevance to the brand. If the buyer needs assistance, the Product Technologist will be consulted on and provide advice on fabrication, and if it suits the end-use of the garment. *Company R* is a brand that favours natural fibres over synthetic fibres, as the brand believes that the performance of synthetic fibres is not good. The interviewees did not mention that natural fibres are used for the purpose of being environmentally sustainable. This is also evident in the follow-up questions. One employee, not from the merchandise department mentions "*Using sustainable materials so that we don't harm the environment and ourselves in the long run*" *(Buyer's Assistant, 2021).*

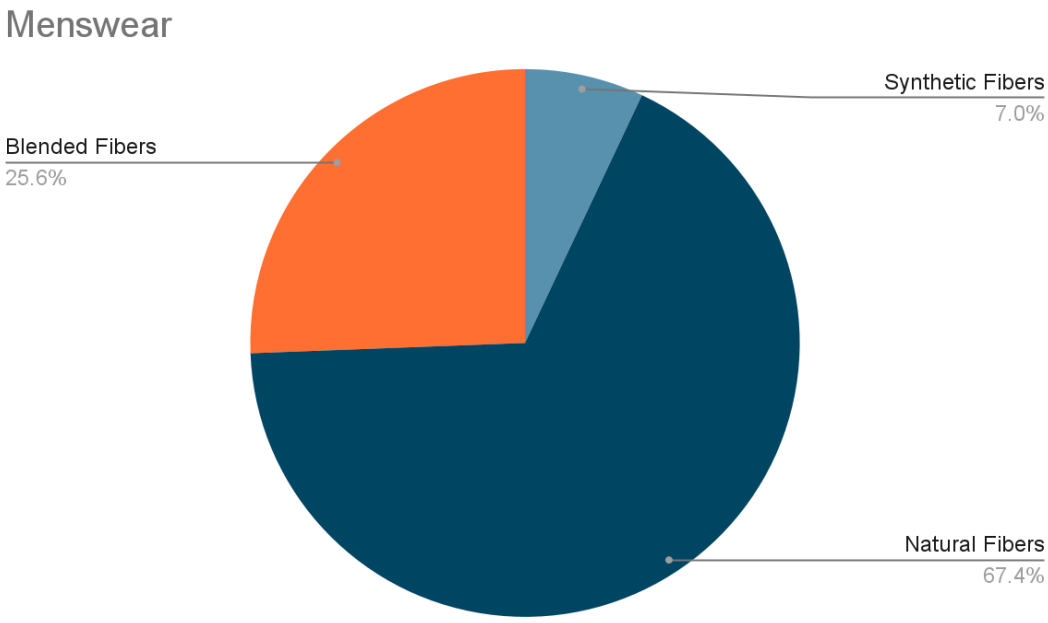
In the presentation of the findings in Chapter 4, it is clear that the employees are trying to be more sustainable and gain visibility and knowledge on how to be more sustainable within the business. However, when comparing this to the management response, it is evident that these suggestions have not been implemented (refer to Tables 4.1 and 4.2).

At the time of the study, the buying percentage for *Company R* for ladieswear Summer21 was 44.2% blended fibres with the higher percentage in natural fibres. Synthetic fibres account for 18.8% and natural fibres account for 37% of the fabric

percentage used in garments for the season, see Figure 4.2. in Chapter 4.



LADIESWEAR FIBRE COMPOSITION BUYING PERCENTAGES (Source: The researcher, 2021) (refer to Chapter 4, Figure 4.21 p 40)



MENSWEAR FIBRE COMPOSITION BUYING PERCENTAGES (Source: The researcher, 2021) (refer to Chapter 4, Figure 4.22 p 40)

The results show that the supplier is currently buying large quantities of blended fibres. For menswear the percentage was 7% synthetic, 25.6% blends and 67.4% natural fibres produced in the typical farming methods, see Figure 4.21. The

ladieswear department has a higher percentage of blended and synthetic fibres buying formula and the menswear department has a lower percentage of blended and synthetic fibres. The ladieswear department has a lower buying formula of natural fibres in comparison to the menswear department. One of the reasons for this is that the female customer tends to purchase garments for the purpose of following trends; not focusing on the longevity of the garment, whereas the male customer purchases garments for the purpose of durability and function, so the garment would need to last much longer. The ladieswear department could move towards buying more natural fibres for the purpose of comfort, function and durability. This argument is borne out in the Fredonia Focus Reports (Stuart., 2021) that outlines the difference between male and female buying behaviour.

5.5.2.2. The importance of environmental sustainability awareness within the retail business

The research shows that many of the fast fashion clothes in our wardrobes contain polyester or elastane. In the findings, one participant was asked to elaborate on the sourcing and buying approach in terms of sustainability, the participant said, *and "Not being a fast fashion retailer, I believe we also assist in not creating wasteful buying behaviour. Garments are considered for the customer in this regard. Furthermore, we are working with our suppliers to look into either sustainably sourced fabrics or recycled fabrics and what their capabilities are around dyes. In trying to reduce the amount of parcels sent, we accommodate to only send what is necessary"* (Buyer D, 2021). It suggests that there is an ignorance in regards to fast fashion and this may be because there is no focus on awareness around environmental sustainability and becoming sustainable. If there were, the employees would understand the difference between slow fashion and fast fashion. Cheap, easy-care fibres are becoming the textile industry's normal solution and because *Company R* produces more natural fibres and natural fibre blends, it may be the belief that the business is not a fast fashion business. This can be linked to green washing, a term that has recently become prevalent in recent years. Greenwashing refers to selling products or services by marketing their environmental benefits. Consumers recognise this and make a decision to

purchase products from the brand with the intention of being sustainable and environmentally responsible (Parguel *et al*., 2011) (Chen & Chang, 2013). Greenwashing that is intentionally published as a company practice, may also be used to trick the audience by using carefully formulated deceiving statements that claim the product is organic or green, when it is not true. Some retailers do this to create a positive image for the brand or product. The consumer is manipulated into making a purchase thinking they are being more sustainable (Pomering & Johnson, 2009, 420)" (Bhatnagar & Verma, 2019, 22). Greenwashing is a practice used by many fast fashion retailers such as *H&M*, *Uniqlo* and *Lululemon* (Vogt, 2020).

In the case of *Company R,* the marketing in-store is not promoting sustainability on their product or stating that the garment is organic in any way. However, the employee perspective is that because they are using more natural fibres over synthetic fibres that the brand is engaging in sustainable practices. This in effect is the employees being greenwashed, by not being educated on what environmental sustainability is. It is important that employees are aware of the full process of making natural and synthetic fibres and then producing it, in order to be knowledgeable on the effects of fast fashion on the environment. *Company R* is in the position to learn from suppliers in other countries, where sustainability and green factories have advanced knowledge on environmental sustainability practices. These suppliers have the ability to train and educate the employees to provide them with the tools to implement the correct processes within the business.

5.5.2.3. Plastic waste and textile waste production in internal processes

Manufacturing polyester and other synthetic fabrics is an energy-intensive process that requires large amounts of crude oil and releases emissions including volatile organic compounds and acid gases such as hydrogen chloride, all of which can cause or aggravate respiratory disease (Claudio, 2007). The industry method of growing and manufacturing cotton is harmful to the environment as it consumes high volumes of water. On average, 11000 litres of water is needed to grow one kilogram of cotton. In further processing water is used to wash, process and dye the cotton (Pure Waste, 2021). Recycled cotton has shown promising benefits for

a European brand, Pure Waste. Pure Waste uses only recycled fibres, synthetic and natural, this is a sustainable method of creating fashion apparel as no virgin polyester is being developed and it prevents products from reaching landfill sites. In 2020 alone, Pure Waste has utilised 108 051 kilograms of recycled raw material, 64,831 kilograms of this was cotton that was prevented from reaching incinerators and landfills and the benefit of mechanical recycling according to the Pure Waste, is that the colour of the raw material is retained throughout the process and there is no need to dye the fibres or spun yarns (Pure Waste, 2021).

The buyer mentioned that she is responsible for providing the suppliers with the brief pack. In this pack there are details pertaining to the fabric composition, the units, the colour and trims. In the group interview with the designers, they mentioned that the technical pack incorporates all the design details that would make up a garment and that the designs are all digital *"the visual aspect of the CADs is much easier because if it's on the screen, it's nice to see all the designs together and the prints come out in the correct colour, whereas the printer can change the colours slightly, it's not always a good representation of the colour" (Designer B, 2021)*. It shows that the employees are agile, which means that the business is agile and will be able to change their model to become more sustainable. During my interviews, many of the participants mention the pandemic and how it has changed the way of working in the business. I believe that this has been a starting point for other retailers to become agile and change their business model to continue selling goods to customers. Literature shows that the fashion industry has slowed down significantly and has been forced to relook many of its processes to help fashion businesses stay afloat. There have been supply and demand disruptions along with supply changes. An example of this imminent change is an open letter sent by Georgio Armani in April 2020 to the American Fashion journal, Women's Wear Daily, requesting a slower fashion movement and announcing plans to realign his collections with the seasons in store (Zargani, 2020). At *Company R*, the range is one or two seasons ahead depending at which stage the stores are in their trade, this is a fast fashion symptom. The European fashion industry has consistently been raising sustainability concerns. It is more prominent now that millennials, the core consumers of fast fashion, are demanding sustainable products (Lo, 2018).

The buyer's assistants were open about the excess plastic that is within the internal process *"I have boxes and boxes of plastic, some we reuse and some we just throw in the bin when it becomes too much, which I think is recycled"* (Buyer's Assistant A, 2021). This I did interpret as a wasteful mentality and that perhaps there is a lack of communication within the business about what should be done with plastic that is accumulated from all the samples that are couriered. For the process of order raising and purchasing, the buyers mentioned that they do reuse some of the plastic in the office to send off overseas reference samples to the suppliers. The plastic bags that are not used, but that are recycled, could be reused within the business. Research suggests that more innovative eco-fashions are being developed in the fast fashion industry. Retailers are using fibres that are made from clear recycled plastic bottles. This recycling process takes clear plastic bottles made of polyethylene terephthalate (PET), melts them, and reconfigures them into fibres that can be woven into fabrics and other applications (Claudio, 2007). According to Baskar. et.al, many textile companies use recycled plastics as synthetic fibre raw materials in order to reduce their costs and support nature and sustainable economy (Baskar, *et al*., 2020). The increasing amount of solid waste in Cape Town is a concern, as well as on a global level. According to the department of trade and industry, plastic is one of the most complex materials to recycle (Department of Trade and Industry, 2016).

The South African Department of Trade and Industry mentions that it is important to separate plastic, as each plastic has a different melting point and will react differently during the recycling process. In this public document that was referenced, the Department of Trade and Industry provides a list of companies that can recycle. A large retailer like *Company R,* part of the large group Pepkor, should have the means to communicate with recyclers to start sustainable processes for the entire group.

5.6 THE RESPONSIBILITY OF MARKETING AND THE DIGITAL FUTURE WITH REGARD TO WASTE

The Coronavirus pandemic circumstances restricted the social aspect of humanity and during that time underlined even more than before the importance of digital communications. Social platforms have become a large part of the fashion industry, now more than ever, consumers are shopping online. The pandemic has opened a way of life that makes it easier for consumers to sit in the comfort of their own home and purchase an item more conveniently than before (McKinsey & Company & Business Of Fashion, 2020).

It is evident that *Company R* needs more social media communication with regards to environmental sustainability. The Digital Coordinator at *Company R* posts on the social media platforms regularly and is involved in the e-commerce distribution process. The Digital Coordinator is fully aware of sustainability issues surrounding the company however, the business as a whole has not implemented any strategies to remove plastic or promote environmental sustainability on social media and the focus is on the profitability of the business and ensuring that products are sold, *"The product comes from the larger DC into the e-commerce DC in a transparent polybag, the clothes stay on those bags because it is easier to stack it on the boxes in the DC. When we launched e-commerce we wanted to use a biodegradable option however the cost was too high. We initially wanted the packaging to be able to be one with the soil and be able to be thrown into plants for composting, but unfortunately the costing was too high for the amount of packages we needed to send out on a daily basis. We also needed to be able to market the compostable item properly, as there is no sense in selling a biodegradable option if it's not marketed properly".*

The marketing team and the digital coordinator are in charge of the parcel wrapping process and how it is delivered to the consumer. *"The polybag is not removed because the plastic ended up laying in the e-commerce distribution centre causing a mess, keeping it on also prevents the garments from getting dirty"* (Digital Coordinator, 2021). The polybag is also used in the e-commerce packaging for consumer orders. The garments that are packaged by the supplier, are kept in the

polybag and placed directly into a cardboard box with some *Company R* marketing notes and sent off (E-Commerce Distribution Manager, 2021).

I found the least amount of waste contribution in the Digital Coordinator's role as the role is completely digital. The daily responsibilities do not produce textile or plastic waste. *"The buying department hands the product over to us in what used to be called the product review, it goes into a plastic crate that we reuse and off it goes to the shoots. That is the first time I handled the product. I don't handle anything physically product-wise, other than that".* (Digital Coordinator, 2021). However, the marketing department does oversee the process of packaging and with the assistance of the business as a whole and the marketing manager, can influence the amount of polybags that are sent to the consumer.

What I observed as the researcher in study is that the online shopping process versus the store shopping process is less sustainable at the post-consumer stage. With in-store purchases, the customer is provided with a paper bag. With online purchases the customer is provided with two plastic bags, one is a polybag and the other is the courier bag. In a publication called *New Communications in a Digitalised World* (Worlcat.org, 2021), it covers in-depth the demands of customers for the perfect packaging when purchasing online. *"The demands and needs of society can be easily met, and applications created in a way as to cause minimum harm to natural life are referred to as green marketing. Green marketing is the whole set of applications"* (Learn Hub, 2021). It is the encouragement of the consumption of environmentally friendly products, using the least amount of packaging and influencing the public to recycle that will reduce the amount of textile and plastic waste to landfill and make the business more sustainable.

Studies show it is important to provide environmentally friendly, recyclable products that are made out of non-toxic, non-polluting, non-harmful materials that will not necessarily deplete natural resources (Fletcher, 2008). There is a big focus on e-commerce retailers to reduce the amount of plastic waste produced, retailers such as Amazon have already started investing millions in a closed loop model, where reverse logistics is applicable and recyclable mailers are used for packaging. According to DHL,*" it is estimated that up to seven types of packaging material go*

into a single parcel: box sealing tape, cardboard boxes, Styrofoam padding, and bubble wrap are some common examples that protect goods during transport. Before a parcel arrives safely at the consumer's door, it has already left a trail of environmental destruction in its wake. And all too often, this excess packaging ends up in the bin (DHL.com, 2021). The Amazon recyclable mailer is of paper layers and a water-based cushioning material for protection of the goods. All inks are specifically designed to separate easily from the cardboard during the recycling process (Amazon, 2020). Courier packaging is on the outside of the parcel. As mentioned by the participant, the garment is delivered in a polybag. Hundreds of billions of polybags are estimated to be produced for the fashion industry every year, although it is not precisely known what the scale of the packaging footprint is. For *Company R* specifically, if I work on the amount of units for the ladieswear department alone, there are 740 000 units, that means 740 000 polybags for one season. There are two seasons in a year, so for the ladieswear department that could amount to 1 480 000 polybags for the ladieswear department. When the menswear department is included it would total an estimated 2 960 000 polybags annually generated by one local retail brand.

A study conducted by Freichel et al, found that customers demand packaging that is easy to open. For some years now, there have been easy-to-use opening mechanisms for this purpose, which are either used or manufactured by the interviewed companies themselves. A less popular issue is that the shipping packaging is frequently used as return packaging. This is an argument against the widely used polybag in the fashion industry, which tears easily when opened, thus making returns more difficult for the customer and often leading to increased use of packaging material (e.g. parcel tape (2019). A possible solution to the primary packaging problem is currently the use of tissue paper as a substitute for the polybag, which is used for distance shipments. To enable channel adequate packaging solutions for Click & Collect, companies are currently working on converting their existing processes (Freichel *et al*, 2019).

In another study conducted by Enlund & Nilsson in Sweden, a quotation from an interviewed sustainability lead reads, "Would rather use more packaging and protect our clothes better because the footprint of a damaged product is way higher

than using a polybag" (2021). This shows that profitability is far more important than balance and sustainability for this retailer. However, customers are noticing plastic use and the effects it has on the environment, specifically packaging and single-use plastics. The public is aware of plastic contaminating the marine environment and causing harm to wildlife and the ecosphere. If every garment is shipped in a polybag the reality is that there may be more than 150 billion manufactured per year. In e-commerce, retail customers and staff complain about the plastic that garments arrive in. Fashion retailers that are aiming to be more sustainable may find that a large portion of the problem may lie with polybags and this is something that needs to be factored when taking on a sustainability business model (Holding *et al*., 2019).

Within the marketing cycle is the floor plan photographic shoot, this is the visual merchandiser's role. In the interview with the visual merchandiser I asked what the routine was and noted the kinds of waste that is generated in the development of the floor plan photographic shoot. In order to carry out a photographic shoot, the Visual Merchandiser uses props in the store, such as garments, hangers, signage, decals and plastic plants to name a few. The list will vary depending on what is needed for the story that is being portrayed and how many units need to be displayed in the store. I found in the interview that there are many components of waste in this role and it is linked to operations, as the store ideally manages the sales, the Visual Merchandiser only puts the displays together using props. The Visual Merchandiser is provided with a brief from the buying team and creates a display order based on what is needed to create the story. *"If anything new has to be developed for the displays I write out a description to our supplier and get them to develop a new display for the store based on what is needed for the type of item we will be selling". (*Visual Merchandiser, 2021). Displays are set up in the store and then photographed, this is the floor plan photographic shoot. Display items such as focal hanging poster clamps, birch base holder - A5 landscape - with perspex. Birch base holders with perspex of different sizes (figure 5.5), wooden stands, metal rail clamps with perspex and plastic fitting room discs to name a few. The equipment is re-ordered annually as needed when store equipment breaks, is lost or if new stores are opened (Visual Merchandiser, 2021).

The Visual Merchandiser mentioned that each store needs posters to be printed for each new trend or seasonal new drops of clothing so that the store can look fresh and exciting to draw customers in. The photographs that are taken by the Merchandise Coordinator are printed to test what the images look like first. The images are printed on a poly twill fabric that is hanged up in the store. *"We can't keep the posters that we can't use, so we have to throw them away but if it comes out right, then we can keep it and use it for the store and order more for all the other stores. Once the season is over, the posters are removed and thrown away because we need new fresh images for posters."* (Visual Merchandiser, 2021). Poster sizes can be from 1 meter in length to 3 meters in length depending on the window size and each store needs to receive one. There are over 80 stores, which means that annually, if the store prints new posters by season, that 160 large posters are going into the trash. This does not seem like a lot when one observes it annually, however, this is for one retailer only. Literature shows that due to the variety of classifications for plastic packaging, there are also varying ways in which it needs to be disposed of. For example, plastic film is commonly used in grocery store packaging, pallet wrapping, and plastic bags. To discard plastic, there are specific locations it should go to for recycling instead of the dumpster. It must be clean and dry to prevent contamination of other recycled products (Montoro, 2006).

In retail waste, these materials would be found in hanger tags, silica gel packets and some display packaging. Some store display items are made from multi-materials. These are materials that have inseparable layers, which could be beneficial in terms of performance, but is overall detrimental, because most times, it cannot be recycled. In fashion retail stores, this can be found in a variety of spaces, including merchandising displays such as posters, hangers, and mannequins (Merritt, 2022). For this reason it is imperative that fashion retail relook its store display and consider other ways to portray the product. There are many digital advances in other retail stores that could potentially work for *Company R.* This could result in using less mannequins, plastic displays and posters (Lazaris, 2021).

5.6.1 The contribution of waste by internal sample assessment and manufacturing

In the interview the product technologist said that the supplier submits each fit sample as a polybag. Certain suppliers send the sample with a digital fit report that has been printed and placed into a plastic sleeve. *"Suppliers are told not to print and send plastic sleeves but they still do it, we don't use the hard copies, so we just throw that away. Usually the plastic sleeve is reused for filing but it is also thrown away sometimes."* (Product Technologist A, 2021). The sample assessment stage is where the buyer's vision for what the product comes to life. According to the product technologist the supplier will send 3 samples in stages, the first fit sample, and PP sample and off bulk sample. "*Each sample arrives with a ticket as well, the ticket is attached to the garment with a plastic kimble, and there are so many kimbles".* (Product Technologist, A, 2021).

The fit samples could be submitted multiple times before the final approval is provided for the supplier to go into production. In addition to this, the supplier submits fabrics to a laboratory for fabric testing. This fabric comes from the mill and is representative of bulk. If the fabric is not approved, it will have to be retested. The laboratory needs approximately 2 metres of fabric every time a test is requested, depending on which kinds of tests are being conducted. The product technologist also does wearer trials if there are any concerns about the quality or performance of the style. The technologist will request one sample or all sizes and have general people wear it for a period of time. Wearer trials could be conducted for one week or 3 weeks depending on what the issue is. The wearer trial garments are kept on file or given to the wearer with the permission of the supplier. *"Once the test is approved and the PP sample is approved, the supplier can go into bulk production. The supplier must send a bulk inspection report for review, once it is approved the supplier may ship the product"* (Product Technologist A, 2021). In this interview I noted that there are many samples that are sent for approval. If one notes that there are 251 styles planned for the season and each style will be fitted at least 3 times, that amounts to a minimum of 753 samples that are manufactured just for sampling, for the season. Each style is fabric tested by colour, which means that if there are 2 or 2 colours, there are hundreds of fabric cuttings that go to waste just by testing.

According to my analysis, *Company R* does not have a pre-consumer waste plan, the textile waste is handled by suppliers during production and garments that are sent as samples are discarded after a few seasons to charity or given to employees (Designer A, 2021). One study estimates that 15% of fabric used in garment production is wasted. In other studies, it stipulates 10% for pants and jeans and 10% for blouses, jackets and underwear and some studies estimate textile waste during garment manufacturing to be 25–30%. Many studies show that current fashion practices result in large amounts of textile waste, most of which is incinerated or landfilled (Runnel, *et al*., 2017).

Company R typically transports production from other countries once production has been completed and if the supplier is local, it is transported by road. Garments are typically transported by container ships but if the stock is delayed and needs to be rushed, it is transported via air cargo. Globally, in places like Europe or the UK, garments have travelled from country to country to be manufactured and in some cases at the end of life, garments are incinerated or transported to other developing countries such as Africa and end up in landfill (Sandin & Peters, 2018).

5.6.2 THE INFLUENCE ON WASTE PRODUCTION BY RECEIVING, AUDITING AND DISTRIBUTION

In interviews with the distribution centre and auditing team, I found no direct causes of waste production. The distribution centre receives the product that has been shipped by the supplier, opens the stock randomly and starts with an auditing process. I interviewed the QC manager, who is based at the distribution centre on a daily basis. The daily routine is to check the stock for defects. *"The QC ladies will check the garments against the off-bulk sample and a spec, the entire order will be checked using the AQL standards of Company R"* (Quality Control Manager, 2021).

If the supplier has sent the Distribution Centre stock that is defective, there is a protocol in place where Quality Control has to send the product technologist an audit report for review. This audit report will contain all the defects and it will show which measurements are out of tolerance. If the auditor has failed an order for

inspection, the product technologist will advise that the order has to go for an inspection. An outsourced agent will inspect each and every item to check the issues that the Quality Control department has highlighted. The outsourced inspection agency will send a full inspection report to the product technologist, buyer, planner and buying manager to review. *"The product technologist will decide if the order has to be reworked or if it's commercially acceptable and sometimes the technologist will request samples to be sent to the head office to review if a commercial decision is to be made"* (Quality Control Manager, 2021).

At *Company R* the quality standards are high. The retailer does not accept defective products as the customer's perception of value will change. According to the Quality Control manager, the product technologist will sometimes make commercial decisions if the product can be seen as acceptable. If the product is not acceptable, the supplier is required to uplift the order from the distribution centre. The distribution centre does not keep any stock in the facility. The brand manager mentioned that there have been experiences where the supplier did not uplift the order after the order had been rejected. This resulted in other orders being cancelled by *Company R* as the suspicion was that there were more defective products on the way, this is what the inspection reports showed. Certain orders were requested to be cancelled as the inspection findings were very bad. At the time of the cancellation, 5 orders were on a ship. When South Africa issued a lockdown to prevent the spread of Covid. The supplier suggested returning the goods to China and the retailer agreed as it would have been a risk to take the goods. The supplier stopped communicating with the retailer completely, but it was later found that the supplier wanted to claim insurance instead of returning the goods to China as it would be less costly but the supplier did not want to release the goods to the retailer by providing the necessary documentation to customs.

The brand manager said, *"5 orders stayed at customs for over a year. We ended up paying many legal fee bills in order to retrieve the stock at customs. Customs advised that the stock needed to be destroyed. We didn't want to destroy the goods, as this would have been wasteful and damaging to the environment if incinerated and would take forever to decompose and be wasteful if it were sent to a landfill*

site. Customs suggested that the goods be recycled but due to the coating on the goods, the goods could not be recycled.

The goods stayed at customs for an additional 6 months while we continued to try to get the goods released so that it could be donated to one of the charities. We were paying legal fees at this stage and needed to have the goods released, as it was becoming costly to keep it at customs. Eventually we managed to have the goods released, it took almost two years.

The goods were checked at the distribution centre and found to be commercially acceptable for store sales" (Brand Manager, 2021). The goods would have been destroyed for no reason and lots of money was wasted. Other studies show that unnecessary waste can be generated by strict inspection standards. It is important that retailers develop innovative ways to make use of defective products so that it does not go to waste. The product technologist advised in her interview, *"Cotton On has an outlet in Kenilworth and they sell all the defective product, you can see the puckering and long threads but some people don't mind that if it's selling for much less. They pay for what they want, but at least that garment doesn't go to waste".*

This is an innovative way of thinking. In my research I have found that the retailer has many resources in the employees. Employees are highly qualified and equipped with knowledge and experience to guide the company in the right direction if allowed to do so. One difficulty with production processes is achieving a desired quality level of manufacturing whilst maintaining economy in production cost. Studies show, a defect is imperfection of a product which contains one or more faults. Failure to meet requirements with respect to quality characteristics are usually described in terms of defects or defectives. There are mainly 3 types of defects:

- Critical defects
- Major defects
- Minor defects

While these can vary from client to client, the typical definitions are as follow:

• A Minor defect is a discrepancy from the standards, but one that is not likely to affect the usability of an object
• A Major defect is one that is likely to create failure of the unit for its intended purpose
• A Critical defect is one that is deemed to be hazardous or unsafe (Doulah, 2012).

The Quality Control manager (2021) mentions that *"If all are happy, the goods can go back into the polybag and into the boxes and back into receiving".* Receiving will take the cartons into the distribution centre process.

I interviewed the Distribution Centre manager and he advised that the distribution process is very efficient. It is important that all suppliers conform to Distribution Centre rules and regulations if the product is to be delivered to stores on time. *"All stock is moved to the marshall area and placed onto a pallet by the receiving clerk. The pallet is scanned and moved to the final destination. The product is quality control checked against the delivery note, the price and quantity is checked, if it is corrected, the buyer is contacted to confirm and must advise to accept or not. If the order is correct, if correct the stock can be allocated to the racks. If there are any price changes to be made on the tickets, there is a rework process in the distribution centre".*
The cartons are then moved to dispatch sealing. Some brands have their product taped, some glued and some shrink wrapped. *Company R's* cartons are glued shut to prevent theft while in transit. This is a good initiative as it prevents the need to use box-sealing tape. The box-sealing tape that the supplier adds to the carton is removed from the carton however and this becomes waste (Product Technologist, B, 2021). The carton is shut on one side. The carton is transported to the picker via conveyor. "*The picker scans the barcode and gets the instructions for picking. The cartons go through a quality control check to make sure that there are no picking errors. The order is then ready for delivery"* (Distribution Manager, 2021).

The distribution centre does not hold onto any stock, the stock goes into the distribution centre and back out. When doing this research I did assume that there would be waste production in the distribution centre because of the potential stock that is found defective or damaged, however, this distribution centre seldom has

reverse logistics, where the product is sent back to the distribution centre from stores. "*In the event that the supplier cannot collect the goods, the goods will then be sent to charity after all labels and branding have been removed. The supplier will still be liable for all costs"* (Product Technologist, B, 2021).

I asked the distribution manager about the potential to reduce waste and if he had any suggestions, he said that the pre-packing method would help to reduce waste and it would reduce labour. *"This is something I have been working on as well, pre-packing will reduce time, cost and it will reduce waste, the distribution centre would be open to doing something like this" (Distribution Manager, 2021).* If the distribution centre is open to reducing waste by pre-packing, it suggests that there is room for more improvement and review of processes to become more sustainable.

The first distribution centre orders are all sent out to the stores. The e-commerce distribution centre is also seen as a store. When the stock is sent out from this distribution centre, it goes to the e-commerce centre. The e-commerce distribution centre manager advised in his interview that their process is very similar to the larger distribution centre, however the process is much shorter. In the interview he said that *"we receive the goods, it's offloaded and checked at a station. The product is placed into a plastic bin/crate. The goods are scanned and placed into the put-away area. A stock check is done. The stock is stored in the centre in plastic crates in the polybag, the polybag is not removed" (E-commerce Distribution Centre Manager, 2021).* The goods are held in the distribution centre until a customer places an order. The problem is that the polybag is sent to the customer.

The e-commerce centre has a very simplified process. I found that there is minimal waste and the team is also very small. All cartons that the goods were delivered in are placed into a bin that is removed for recycling. The findings are in line with research, I have found that the e-commerce distribution centre does deal with customer returns. All *Company R* returns are placed in a "supplier damages" box and then donated to a charity. None of the product returns are sent to landfill or incinerated. Studies show that product returns often are returned to different points and are straight to the point of incineration in other countries. There is a need to more effectively manage product returns in most supply chain processes. With

many e-commerce retailers there is the option to return the goods within a week if the customer is dissatisfied. With these types of return policies and the throw-away consumer culture, product returns are at high percentages, especially if the product is cheap and of bad quality. Returns can then contribute high percentages to waste. I have not found that *Company R* is wasteful in this sense, in fact, the retailer has many charities and with the efforts to deliver good quality to customers, there are minimal returns.

5.6.3 WASTE ACCUMULATION AT THE TRADING STAGE

The operations level is the final stage in the retail cycle. During my interview with the area managers I found that there was strong knowledge on recycling and waste control. One of the area managers mentioned that he is involved in waste collection. My discussion with him was insightful. *"At stores we try to be mindful of the amount of waste we produce, we don't use any plastic bags either or give it to the customer, behind the till we do use plastic, but only because we don't have any other options right now"* (Area Manager B, 2021). When speaking further, I understood why there were no alternative options for the stores.

When the truck arrives to deliver, the stores check each carton, the cartons are scanned and the stock will immediately show on the system. Each carton is then unpacked. Each garment has a polybag. The polybags are placed into the bin for throwing away. The stores do not have a recycling option for plastic. There are thousands of polybags that are thrown away every day. I could not locate many studies that were conducted on this problem. One fashion platform, Fashion For Good mentions that polybags are present 'behind the scenes. A polybag is made of low-density polyethylene (LDPE).It is commonly derived from the cracking of petroleum or gas. It is a bag that is used during transit from the manufacturer to the distribution centre. A polybag generally has signage on it to show that it can cause suffocation and it will have punch holes to allow moisture to leave the bag. The polybag typically has a silica gel packet on the inside to absorb moisture. Hundreds of billions of polybags are estimated to be produced for the fashion industry every year. However, it forms only a very small part of the overall impact of a garment

lifecycle. The treatment of waste at the end of its use is a key issue. When orders are delivered the customer receives the polybag and disposes of it, which means it ends up becoming post-consumer waste which eventually ends up in landfill. According to studies, there is no guarantee of where polybags end up in places like Europe, the majority of plastic packaging waste is sent to landfill or to the incinerators. In the US, the recycling of PE film, which is closely categorised, was at 12.5%. Generally, in the UK, retail brands work with recyclers in contract to collect waste such as shrink-wrap, film waste and polybags, which is typically more costly than collecting from households. If the plastic is recycled it can be used for refuse bags or used to make hard products like plastic lumber (Holding &Gendell, 2019).

Once the garments are unpacked, the garments are placed onto plastic hangers and steamed. The stores have a lot of plastic hangers. Hangers are ordered by style, a woven garment has a normal plastic hanger and a knitted garment has a hanger with rubber to prevent the garment from slipping. One operations assistant said that *"on average when a new store opens, 7500 hangers are ordered, 1500 of which are metal clip hangers, the last order we did was 20 thousand plastic and 20 thousand metal for stores, but the hangers are only ordered every 3 years on average".* (Operations Assistant, 2021).

When asking the area managers which types of plastic waste was in store, they were able to provide me with a long list. *"Where do we start, we have plastic sleeves, hangers, refuse bags, polybags, lay-buy bags, decals, which is the plastic signage, ziplock bags, sanitiser bottles, detergent bottles, plastic electronic tags, which if it's broken, it will be chucked, perspex for signage, box-sealing tape, plastic pens, plastic on accessories that need to be thrown away, wall banners, window banners, plastic plants, perspex boxes for the purpose of holding accessories" (Area Manager A, 2021).* All the plastic items that stores use are generally kept and cycled in the store. The product that is thrown away is marketing signage, plastic hangers when broken, detergent bottles, and polybags and lay-buy bags. *"Each store is provided with lay-buy bags, there are 1000 bags in a bale, each store receives one bale every 3 months generally"* (Operations Assistant, 2021). Many

stores have boxes and boxes of hangers that are not being used, yet more hangers are ordered because each style needs a specific hanger.

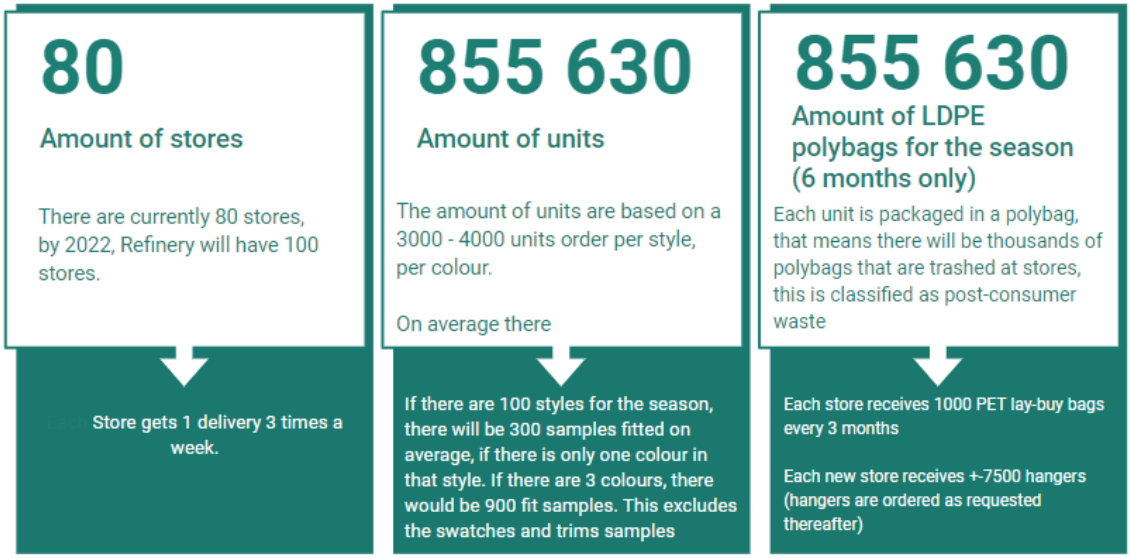


Figure 5.5.: *Company R* menswear and ladieswear contribution to polybags per season (Source: Buyer A, Buyer B, 2021)

Once the product is on the store floor, the consumer can make purchases. All product that is purchased is either taken in a bag that the consumer brings or there is the option for the consumer to purchase a paper bag. *Company R* does not sell plastic bags or provide any bags for free. The reason for this is to allow customers to think before taking a bag and being wasteful. One area manager mentioned *"the plastic bags at Checkers are different, the bags are 100% compostable, that is a great alternative"* (Area Manager A, 2021).

Effective policies should motivate the fashion industry and individuals to reduce plastic pollution collaboratively. The Extended Producer Responsibility (ERS) scheme in the European Unions has increased the recycling rate of plastic packaging (MacArthur, 2017). It has failed to encourage industries to explore the full potential of plastic pollution reduction. On one hand, the low compliance fees for plastic producers do not provide sufficient incentive for producers to adopt an eco-design (Filho, 2019).

Eco-design or compostable bags would be a good option for *Company R* if the entire group were to invest in the bag to bring down the cost. *Company R* is one

step ahead of many South African retailers, most SA retailers still provide customers with plastic bags but add a recyclable print on it. *"Many stores still offer plastic bags, sometimes the cashiers ask if the customer wants a bag and even if the customer says they don't want the bag, they say it's free, not thinking about the environment"* (Area Manager B, 2021). Studies show that single use plastic bags is one of the leading causes of environmental and social-economic problems. In South Africa, plastic bags use is still widespread, despite intervention efforts to reduce use with a levy. Consumers still consume plastic at high rates because it is convenient (Brien, Thondhana, 2018).

"The stores have waste removal twice or thrice a day, it can be very wasteful if the stores are throwing the bags away if it's not full, so that is something that must be monitored" (Area manager, 2021).

"For admin, we have large files to keep training manuals and other important documents that are needed that we work with regularly. The papers are kept in plastic sleeves. We need the sleeves to keep the paperwork neat. We also keep the store certificates, such as sprinkler certificates in the file and ready to have on-hand" (Area manager, 2021).

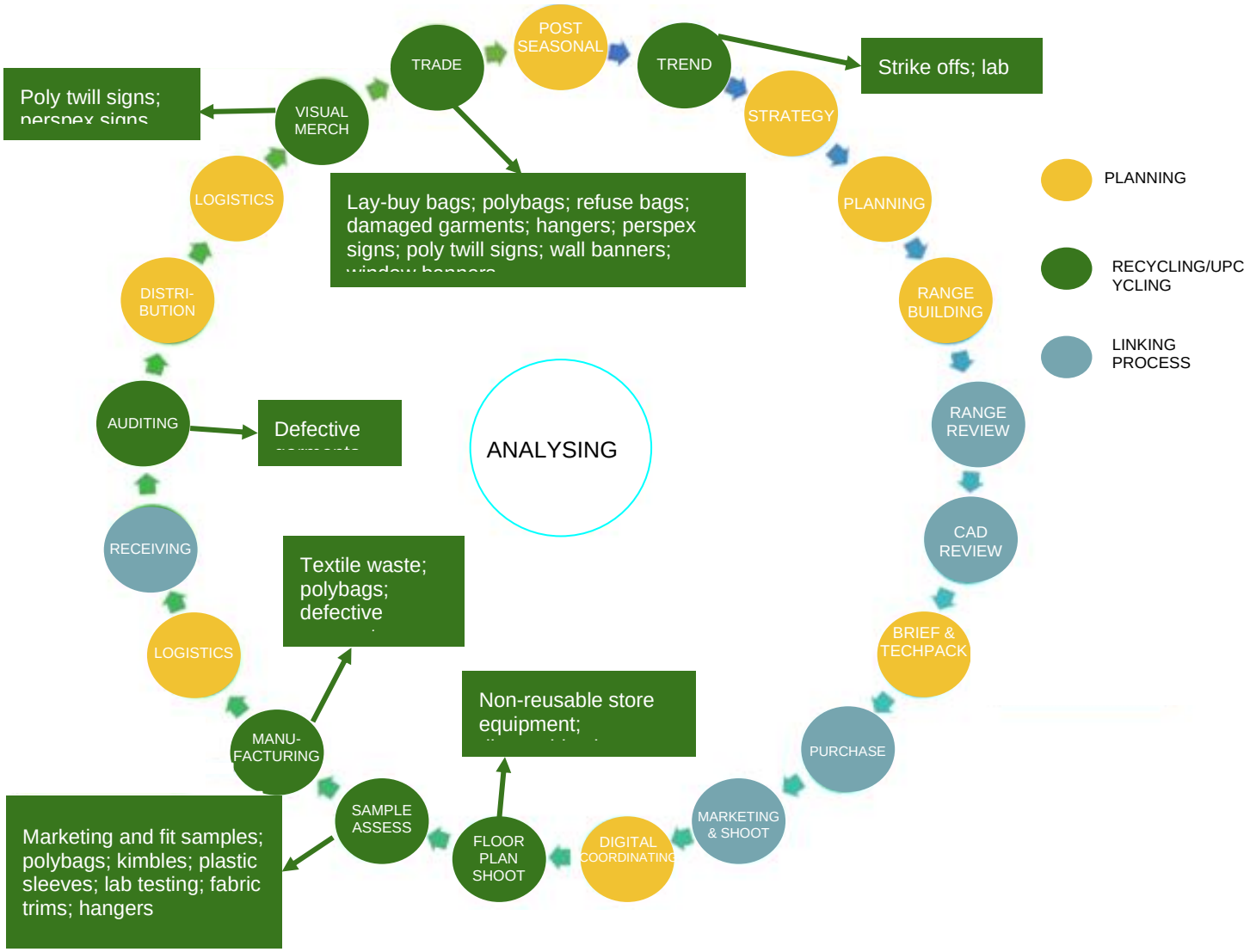


Figure 5.6.: A sustainable retail cycle model (focus on plastic and textiles only)

5.7. A SUSTAINABLE RETAIL CYCLE MODEL (FOCUS ON PLASTIC AND TEXTILES ONLY)

The model presented is central to providing suggestions and solutions derived from the findings. This is a model that can be adopted and adapted by *Company R* and other businesses. The retail cycle model is based on practical applications. Each colour represents the process action.

Yellow is for sustainable planning. Planning of sustainability throughout the retail cycle is an integral part of achieving balance in the retail cycle.

- Post seasonal and strategy: the post-mortem of the season will allow the brand to understand what the positives and negatives were of the previous season and allows the brand better the previous season's sustainability outcomes
- Planning: planners can utilise their function to continue to improve processes within the DC for holding stock and distributing stock
- Range building: this important stage in the cycle is where the range is planned, creating a range that focuses on all aspects of sustainability, from textiles to trims and packaging and should be executed in Range review and CAD review
- Brief and Techpack: these documents should house important instructions to suppliers on what the retailer's sustainability plan is and which materials and green suppliers should be utilised to action production
- Digital coordinating and floor plan: should be utilised to create awareness on social media platforms and in stores, about the retailer's stance and plans for sustainability. Awareness is imperative in achieving SDG goals.
- Logistics: the study did not cover logistics specifically as this is an outsourced function

Green is for recycling and upcycling:

- Strike offs, lab dips and trims waste should be recycled if possible or upcycled by donating for reuse if possible.
- A process should be implemented for the reuse or recycling of store equipment waste as the rate at which the waste is produced increases yearly, with new stores opening for growth
- The waste produced at sample assessment, manufacturing stages and auditing stages, namely, fit samples, production waste, fabric trims, polybags, kimbles, plastic sleeves, lab testing (fabric), plastic hangers, these types of waste can be reduced immensely by changing the way

these wastes are created and implementing a more sustainable business process

- Visual merchandising and trading stages: these stages produce high amounts of waste, namely, poly twill signs and perspex (synthetic), that may take hundreds of years to degrade. Trading also produces lay-buy bags; polybags; refuse bags; damaged garments; hangers; perspex signs; poly twill signs; wall banners; window banners, these are all once off waste productions that should be recycled or upcycled to meet SDG goals.

Grey is linking processes:

- Range review, CAD review, Purchase order raising, marketing shoots and receiving are stages that do not directly create waste and are processes that run in-between that link other processes together, these should be utilised to maintain and execute sustainability goals within the retail cycle as well as current and future global SDG goals.

These are suggestions for more sustainable practices in the retail cycle. These practices can be applied in any business and can be adapted for larger cycles. The model does not cover other pertinent areas of pollution such as water waste, production waste (at supplier/factory level), energy waste, e-waste, paper waste and other similar wastes caused by the retail industry.

In the model, there is a minimum implementation strategy that *Company R* and other businesses could start with to move towards becoming sustainable. This model shows only a fraction of the capabilities that models have to be improved, which means that *Company R* could extend their sustainability actions into suppliers, operations, employees and conformance and ethics.

Table 5.1: Sustainable methods for production (Source: The researcher, 2021)

PLAN SUSTAINABLE METHODS FOR PRODUCTION	RECYCLING/UPCYCLING	LINKING PROCESSES
- Create a business strategy and communicate sustainability within the business internally - (awareness) - Maintain communication within the business to employees about how they can contribute to being environmentally responsible and why it is important (use factual statistics) - Review products that could be more sustainable through the use of recycled fibres (synthetic and natural), sustainable natural fibres, reduction of LDPE polybags - Strategically discuss methods of applying sustainability within the business - Develop and build relationships with certified green suppliers, agencies and laboratories for the intention of maintaining conformance and environmental ethics - Develop relationships with local recycling companies to recycle textile and plastic waste - Plan reduced LDPE polybags in for the packaging of products - Be clear about sustainability action with suppliers - Be transparent about sustainability solutions with consumers - Be sustainability proactive during the process - Maintain efficient processes and reduce waste (cartons to continue to be glued shut instead of taped or stapled at DC) - Operations environment to prevent textile and plastic waste, e.g. UV lighting	- Provide recycling stations within physical spaces for employees to place textile and plastic waste - Work with recycling company on plastic waste - Work with a recycling company on textile waste - Collect textile and plastic waste internally for recycling and upcycling - Request samples only when necessary - Request sample with intention to reuse/recycle - Produce sustainability/use certified green factories - Package product with sustainability efficiency in mind (less LDPE bags; recycled LDPE bags; pre-pack without LDPE bags) - Recycle or donate defective product - Remove LDPE polybags from e-commerce product and recycle - do not send to customers (reduce post-consumer waste) - Stop the use of plastic in stock rooms or use recycled plastic - Replace PET lay-buy bags with large fabric bags that can be washed - Use recycled PET bags for the purpose of refuse in brick and mortar stores - Create opportunity for customers to return old garments for an incentive - Recycle consumer returned goods, for the purpose of re-weaving or knitting - Review lighting in stores (UV lights) to reduce garment defects (textile waste)	- Execute and maintain the process of sustainability

Planning sustainable methods of production is essential in the implementation of a sustainable business model. As per the research, certain suppliers are already equipped with factories that can produce garments sustainably. The retailer needs

to implement supplier conformance to ensure that the supplier processes are aligned with the company policy to ensure sustainability is a possibility (Ciccullo, et. al., 2018).

The world is slowly becoming dependent on consumerism and for that reason, clothing retail companies and any business for that matter, should consider using this sustainable retail business model. The more consumers consume, the more retailers have to produce. Therefore, retailers should improve their business models, ways of working, communication to employees and the consumer, as well as processes. This research was particularly important because textile and plastic waste in the fashion retail sector is damaging the environment as the findings show. Natural textile production is resource-intensive, blended textiles (a mixture of natural and synthetic textiles) are resource intensive and the chemicals are toxic to the environment. Synthetic textiles are toxic to the environment and the production of plastic, very similar to polyester, is as toxic to the environment and detrimental to the health of marine-life (Trifuoggi, M *et al.,* 2019).

Sustainability should start with prevention and reduction of waste, strengthening the company's internal waste management system and recycling along with safe and controlled disposal of plastics. Recycling is a beneficial practice for retailers. *Company R* specifically has the support of a large retail group, Pepkor and could utilise the stance it has in the fashion industry, as well as the relationships with government, other industries and schools to develop mutual relationships and drive sustainability from the perspective of recycling.

Economic variables: look at income or expenditures, taxes, business climate factors, employment, and business diversity factors such as: personal income; cost of underemployment; establishment churn; establishment sizes; job growth; employment distribution by sector; percentage of firms in each sector; revenue by sector contributing to gross state product (Hall, 2011).

Environmental variables represent measurements of natural resources and reflect potential influences on its viability. It could incorporate air and water quality, energy consumption, natural resources, solid and toxic waste, and land use/land cover. Ideally, having long-range trends available for each of the environmental variables

would help *Company R* identify the impacts a project or policy would have on the area, such as: toxic chemicals from dye processes; electricity consumption; fossil fuel consumption; solid waste management; hazardous waste management; landfill pollutants; marine-life pollutants; air pollutants; overuse of natural resources (Hall, 2011).

Social variables, specifically social elements of a community or region and could include education, access to social resources, equity, health and well-being, quality of life, and social capital. This could refer to: unemployment rate; female labor force participation rate; median household income; relative poverty; percentage of population with a post-secondary degree or certificate; average commute time; method of commuting; violent crimes per capita; wealth-adjusted life expectancy.

Sustainability within the business can be successful if businesses inform employees of the business' intentions and give reason as to why the business is trying to become sustainable. Too often, staff are unaware of what sustainability means and why it is necessary. This in-turn creates a break in the consistency of the business intentions to be sustainable and create balance of the triple bottom line. As mentioned by one of the participants, a different retailer's point of sales cashier questioned why he did not want to purchase a plastic bag, although the retailer was promoting sustainability and also charging customers for plastic bags, in aims of reducing the consumption rate, the employee didn't have the knowledge to understand that the less single-use plastic bags they sold, the better it was for the environment (Area manager B, 2021).

5.8. SUMMARY

In the first phase of the findings it is evident that the buying department has a major influence on the outcome of the product. The research shows that the retailer is using mostly natural fibres in menswear, however in ladieswear the predominant fibre is blended. There are more blends that are made from natural fibres and synthetic fibres, blended fibres with the higher percentage in natural fibres. Synthetic fibres account for 17.1% and natural fibres account for 31.2% of the buy for the season for summer. Research also shows that the retailer was unable to recycle 5 orders due to it being coated with a resin. This would have contributed to textile waste, had the retailer not been able to get the orders released from customs. Each order usually contains 3000 units on average.

Although marketing coordination and digital coordination do not work with textiles and plastic directly, the digital coordinator and marketing team implemented and currently oversee the e-commerce of the business. In e-commerce there is more post-consumer plastic waste being created than at brick and mortar stores. According to other studies-commerce parcels can have up to 7 different types of plastic for protection. At *Company R*, the e-commerce DC does not remove the polybag, so the consumer discards that as well as the PET plastic courier bag. That is two single-use plastic bags per purchase.

The sample assessment and manufacturing stage I have found is very polluting. According to research this is the most-polluting stage in retail, as the factories produce toxic waste, air pollution, textile waste, and plastic waste at this stage. The research focuses on textile waste only, literature shows that natural resources are depleted when cotton is produced in the conventional way, thousands of litres of water is used to grow cotton, during the yarn production there is fibre waste, during the fabric production there is dye waste and during production there is cutting waste. Once the sample eventually reaches the retailer for fitting, 3 samples per size are made for fighting, this does not include the marketing samples that need to be made. All these samples can add up to over 700 samples produced just for the ladieswear department at *Company R*. This does not include the textile swatches,

trims and testing fabric that could add up to triple the amount of styles ordered for the season. All these samples are also sent in polybags and courier bags, single plastics are removed from stores but are still being used behind the scenes in retail. All polybags, courier bags, textile swatches, cuttings, testing trims and samples that are too mutilated to use, are thrown into the waste disposal.

The large distribution centre is very efficient in their way of working, all products are received on time and sent out on time. In the distribution centre there is an apparel Quality Control process. This process prevents any defects from reaching stores. The product technologist oversees the quality reports, reviews it and advises if the product quality is good enough for trading. If the goods are defective, the goods will be sent to an outsourced facility to be 100% inspected. All goods will be checked for defects and those that are defective will be removed. This exercise contributes to textile waste, especially if the supplier has not conducted their inspection correctly and shipped imperfect qualities to the distribution centre. In this case, the defects could be removed or the entire order will be stopped. Literature shows that these products are often sent to incinerators or landfill. At *Company R*, the research suggests that defective garments are donated to charity instead of being thrown into waste disposal.

Trading is the last stage in the retail cycle, *Company R* has been proactive in stopping single-plastic use in stores. All customers are required to pay for a paper bag or make use of their own bag. Area managers are transparent about the heaps of plastic behind the scenes though. Every day there is at least one order that is delivered to stores. *Company R* has over 80 stores. One order contains 3000 units on average, that is, per colour. Each garment is wrapped in a LDPE polybag. The polybag is thrown into the trash. Each store is provided with lay-buy bags, there are 1000 bags in a bale and each store receives one bale every 3 months on average. The lay-buy bags are used to house the customer's purchase for a maximum of 3 months, after which the single-use plastic is disposed of. In addition to this stores have refuse bins that use single-use plastic and are removed 3 times a day. Many stores have boxes and boxes of hangers that are not being used, yet more hangers are ordered because each style needs a specific hanger, when a new store is opened, 7500 hangers are ordered on average, 1500 of which are metal hangers.

The consensus was that there are no set sustainability practices or policies in place for the employee for suppliers. This finding in combination with the research and literature shows that there is a need for the retailer to adopt a sustainability model. What should be noted is that there is a need to review the buying strategy to be improved, the types of fabrics, trims and other production methods should be reviewed. The sampling methods are excessive, the retailer is moving into 3D and this will help reduce the amount of textile waste, however the swatches, trims and fabric testing waste will remain excessive and needs to be addressed. Although *Company R* has removed plastic from the consumer's purchase, a contradiction lies in the stock rooms. There is still excessive plastic use, which needs to be reduced.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1. AIMS ACHIEVED THROUGH THE STUDY

6.1.2. The research questions asked were as per below, the aims were set out based on the research questions, to investigate and develop findings.

MAIN RESEARCH QUESTION

What are the sustainability processes within the retail cycle of this single leading fast fashion retail company that has its headquarters in Cape Town?

Sub-questions

How does the retail cycle of this company negatively affect the sustainability of the local environment as a consequence of plastic and textile waste that is generated?

How can a more sustainable retail cycle be developed in the local region, on the basis of an investigation of the operations of one leading retail company that has its headquarters in Cape Town, South Africa, with the specific aim of reducing the generation of waste?

The aims of the research study were:

- *To investigate and evaluate the present retail cycle of one retail chain and identify the steps in that cycle that potentially contribute the most waste.*
  The study investigated the case, Company R's retail cycle by conducting a workshop with 3 executives to determine the business' process flow and roles that are in place within the business. Each department and senior role was recorded. After the workshop, the employees were interviewed, all data and additional documents received was recorded and saved. The study did not find

any sustainability processes that had been implemented, within the scope of the study.

The study aimed to firstly investigate and review the retail cycle within one South African retailer to identify each step that could produce the most waste. Initial findings show the retail cycle process has more or less 20 stages before reaching trade and that each stage in the retail cycle produces waste. The research shows that in this retail cycle, sustainability is not a focus and that the employees could be ignorant to the meaning of sustainability, purely because of awareness and potentially non-practice.

- *To identify the types of non-recyclable textile and plastic waste that negatively affect the sustainability of the local environment.*
  The company's retail cycle was plotted and reviewed to identify the steps in the cycle that generate the most waste, that takes 20 years or longer to degrade, through an overall assessment of its operations, in departments such as planning, marketing, buying, design, technology, distribution and store operations.

  The findings showed that the only non-waste producing phase is the post-seasonal, strategy and distribution phase. Secondly the research aimed to identify which types of waste (non-recyclable textile and plastic waste) that negatively affect sustainability issues, to help improve the current retail cycle processes. Literature shows that there are multiple types of textile waste, blended fabric compositions, such as cotton and polyester/elastane blends which cannot be recycled, natural fibre waste which depletes natural resources and synthetic recyclable and non-recyclable waste that end up in landfills and in doing so negatively affects sustainability issues.

- *To develop an improved retail cycle model that will reduce plastic and non-recyclable textile waste and prevent the negative effects that they have on the sustainability of the local environment.*

Thirdly the aim was to develop an improved retail cycle model that would help to reduce plastic and non-recyclable textile waste. The study shows that the green factories are ready to start providing retailers with sustainably produced garments, such as recycled denim, employees are geared towards being more sustainable and buyers are able to change the buying strategy to be more mindful of selecting virgin polyester instead of recycled polyester. The study has found that cotton is being used in many products but is not being produced sustainably as there are no practices in place to ensure sustainability, which means that with the high percentage of cotton in products, natural resources are being depleted, investigation into this problem has not been furthered, as the scope would have been too wide. Further findings also show that the single-use plastic bags have been removed from stores, which means customers have to buy paper bags, however, behind the scenes within internal processes, stores as well as the head office are making use of single-use polybags every day. The stores are also using large PET bags for lay-buys as well as PET refuse bags in stores, which are not recycled. One mall potentially has a paper recycling collection and the head office has a paper recycling collection, however there are no plastic recycling facilities or practices in place. Thousands of polybags are being disposed of in trash by this one South African retailer. The improved model could help to prevent the retailer's textile and plastic waste from becoming pre-consumer and post-consumer waste, which would have negatively affected sustainability issues. This could help *Company R*'s business to become more sustainable. A retail cycle model was created based on the findings, see figure 5.6: A sustainable retail cycle model (focus on plastic and textiles only).

6.2. HOW THE RESEARCH CONTRIBUTES TO THE FIELD OF STUDY

6.2.1. What has been achieved and the value thereof in the local context

The research confirms that there are improvements to be made in the South African fast fashion retail sector. Each retailer can learn an in-depth review of its critical

path in a detailed manner in aims of achieving a more sustainable way of working and thinking. The study will play a crucial role in increasing exposure, increasing efforts and driving momentum towards a sustainable resource model for textiles and plastic. Types of waste generated were successfully investigated, not only at the trading stage but internally from the brief stage, buying, design, quality, inspection stages, within marketing, e-commerce and in stock rooms, in stores - post-consumer and pre-consumer plastic and textile waste.

6.2.2. The research outputs

- The research shows the percentages of textile waste generated specifically by making garments with virgin polyester and cotton produced in the typical manner
- The research shows how sample fitting, marketing samples, swatches, trims and the polybags and courier bags in arrives in can contribute to pre-consumer and post-consumer waste
- It shows how the retailer has come to the realisation that buying more natural blends or cotton is more sustainable, and how this awareness and practice within the business is important so that employees' way of thinking and knowledge aligns with the business' intentions
- The study shows how the marketing and e-commerce process contributes to plastic waste by delivering customer packages with the polybag in addition to the courier bag
- The study shows the types of post-consumer waste stores generate internally, although plastic bags have been removed from the customers and replaced with paper bags

6.2.3. How it can help to solve the problem

This study aimed to solve the problem of plastic and textile waste being generated by creating a model that could assist in preventing these types of wastes reaching landfill sites. This study has solved the problem because many types of wastes

were found to be generated and a model was developed for the reduction of plastic and textile waste. The research is important because many South African and other global retailers have not reviewed their full retail cycle and have not investigated the root of the problem of textile and plastic waste within the retail business, which is the method of buying and sustainability awareness within the business and the awareness thereof. These findings matter because fast fashion retailers make the buying and designing decisions and suppliers act in response. When fast fashion starts to intentionally seek ways to be more sustainable by looking internally first, sustainability can be achieved.

6.2.4. Gaps in existing research and how this study attempted to fill them

Research into specific single-use plastics has advanced. There is a lot of research concerning single-use plastics, but this study contributes to the limited studies on the use of the polybag (Bianchini and Rossi, 2021) (Fashion for Good, 2019). Polybags are the ubiquitous packaging of the fashion industry – something that unites brands small and large, from sportswear to luxury, to fast fashion retailers. This clear plastic bag that covers every garment goes from factories, to retail stores and is disposed of in waste bins thereafter. Other studies do not focus on the millions and billions of LDPE plastic bags that are generated during manufacturing (Holding *et al.*, 2019). The other gap this study addresses is textile waste and plastic waste generated within the business itself by sampling styles before manufacturing the bulk production, hundreds of fit samples, swatches, plastic buttons, little plastic button packets, zips, toggles, elastic, plastic poppers, plastic kimbles, lab-dips, hangers, plastic bags and courier bags. The focus of other studies is the single-use plastic and production waste usually, but not the internal practices of the fast fashion retailer, which is the full retail cycle. Another gap is the analysis of the waste produced by e-commerce stores and brick and mortar stores, studies show that e-commerce stores like Amazon, have started to review their waste production and are working towards becoming more sustainable (Amazon, 2020). The research shows that there are many types of plastics still being used within stores, such as plastic hangers, plastic lay-buy bags, plastic refuse bags, plastic hand sanitiser

bottles, plastic box-sealing tape, plastic decals and store signage such as synthetic posters that are being discarded of and are incinerated or end up in landfill sites (Bocken, 2014).

6.2.5. Engaging the literature

The research study is linked to many other studies on waste pollution produced by the fashion retail industry and the environmental impact thereof. According to other studies, the short garment lifecycles along with increased consumption has led to an increase of 40% of textile waste being sent to landfill in the USA between 1999 and 2009 (United States Environmental Protection Agency, 2010). Another study conducted in South Africa by Annette Vanaardt in 2009 shows that South African manufacturers showed an interest in recycling. It was found that many manufacturers used landfills to dispose of textile waste and some recycled. Barriers experienced in the fashion industry were lack of equipment, lack of material to recycle and lack of consumer awareness around recycling. In 2021, the same issues remain, there is a tremendous need for South African retailers to recycle textile waste to prevent the effects of pollution from damaging the earth.

6.2.6. Practical application

There are many studies that provide waste solution strategies. For the purpose of the research, the practical solutions suggested pertain to plastic and textile waste only.

6.2.6.1. Creating Awareness

- Discussing sustainability with intention within the workplace, creating awareness between employees, allows employees to become passionate about the environment which in effect makes employees naturally practice environmental responsibility at home. Employees are customers too, this creates a domino effect and spreads awareness

- Discussing sustainable solutions with suppliers and enforcing supplier conformance
- Set clear internal milestones for product creation teams

6.2.6.2 Product Reducing, Reusing and Recycling

Many retail businesses are initiating programs for their consumers to recycle their garments and shoes post-consumer, vintage clothing stores have always existed specifically from the 1960s, thrift shops were initiated by hippies. Vintage could suggest more luxury brands but with the amount of poor communities there are in South Africa, there is a market for second-hand stores. This is not just a trend but a way of life with sustainability and financial tribulations that people face in this day and age. *Company R* could open a second-hand store, one per city, in a central area, could be enough. The customers that return their goods, the defects that are removed from the original product order, could be sent to the second-hand store for resale at a fraction of the price. Rent is something that could be negotiated based on the social-responsibility factors. In recent years there has been a movement towards selling “preloved clothing” like on the Yaga SA app and other online preloved clothing retailers like Encore.com. These are great examples of sustainable models.

The intention of returning goods to stores is to reduce the company’s waste footprint locally and often globally. Many businesses provide their consumers with incentives to partake, this could be in the form of a discount or voucher. Creating a tangible benefit assists the retailer in initiating a sustainable commitment to environmental causes such as reducing energy costs, attracting new customers and demonstrating corporate responsibility, which in turn could earn the consumer’s trust. In the United Kingdom there is a movement towards “swapping” instead of shopping. Marks & Spencers and OXFAM have promoted this through marketing campaigns. *Company R’s* marketing team has the knowledge and ability to assist in marketing something similar for the brand. In earlier years there were “Swap-Shops”, particularly in schools for uniforms and school wear (Henninger, *et al,* 2019).

- The fast fashion South African retail industry should design and develop clothing in a manner that will ensure recyclability. Clothing should not contain substances that will hamper the ability of the clothes to be recycled and trims should be easily removable in order to make the recycling process easier.

- Reducing the creation of virgin fibres for plastic, synthetic fibres and natural fibres if possible. The prevention of virgin fibre production can be achieved by using polyester fibres made from plastic bottles, polyester clothing can be recycled into new polyester fibres and this would prevent the need for dyeing potentially if done correctly.

- Using responsibly made cotton that does not use pesticides and fertilisers or using recycled cotton, which will drastically reduce the amount of water used. The BCI is a good initiative and can guarantee and traceability on cotton

- Entice consumers to return product to stores for the purpose of recycling and provide an incentive, this could be in the form of a discount or a points system

- Utilise the returning of garments for resale or swapping for 2nd-life of products to prevent it from reaching landfill sites

6.2.6.3. Cut Down On E-Commerce and Product Packaging Waste

Retailers encourage customers to provide recommendations based on their own experiences to help reduce waste. Clothing retailers are refining their processes to detect inefficiencies before they snowball within the product line and incur additional waste.

- Reduce the amount of plastic waste being sent to consumers, remove polybags from e-commerce garments when packaging and place into recycling bins
- Reduce the amount of polybags by 50% by packing 2 units in one bag

- Pre-packing with local suppliers - auditor can do on-site inspection (will save on plastic and distribution costs)
- The merchandise team could continue to have online meetings for CAD reviews, instead of printing out images and using samples

6.2.6.4. New Technology to Correct An Archaic Problem

A consistent problem is the creation of entry and exit of plastic waste to brick and mortar stores. The amount of waste fluctuates based on the season and changes in stock or processes within the retail cycle. This results in an inefficient system. Waste management is an important factor in this regard.

- Polybags sent to stores should be collected and recycled

- Instead of using large PET bags for lay-buys, large fabric bags can be made for lay-buys so that stores can reuse the bags, instead of discarding lay-buy plastic bags (similar to a laundry bag)
- All posters and signage, that has been used for stores, that cannot be recycled can be sent to a factory to make tents for homeless people

6.3. LIMITATIONS OF THE STUDY

- Time constraints
- Putting on the hats of practitioner and researcher, checking for bias constantly and remaining open to the data and the interpretation of the same
- Limited studies on Retail Cycles in South Africa specifically

6.4. RECOMMENDATIONS FOR FUTURE RESEARCH

- Awareness within fast fashion retail stores, between staff members
- There was a lack of studies on where South African retailer's textile waste goes to

- South African fashion clothing retailer textile waste distribution
- Local methods of reducing waste from fashion buying trips

6.5. FINAL CONCLUSION

In the study I investigated and reviewed one local retailer's retail cycle and plotted each step to identify the types of waste produced within each step in the retail cycle. A workshop and interviews were conducted with 22 participants. The findings showed that there are over 20 stages in the cycle and that the retailer did not have sustainable practices or policies in place. Some employees were knowledgeable on the subject of sustainability and others were ignorant to what it meant and whether the retailer itself is a fast fashion business or not, this I observed as the result of awareness on the subject of non-practice of environmental sustainability. There were multiple types of plastic and textile waste found within the retailer's cycle and literature shows that these types of waste affect environmental sustainability. The retailer also uses a high percentage of cotton that if not processed properly will utilise many of the earth's valuable resources. Blended fabrics are mostly used, which are hard to recycle. The third aim was to develop a retail cycle model that would help to reduce the amount of plastic and textile waste and model how the retailer could be more sustainable and reduce waste.

The study shows that this research will be valuable to the field of study as there are so many improvements that can be made with the findings. The study will play a crucial role in increasing exposure, increase efforts and drive momentum towards a sustainable resource model for textiles and plastic. The research is important because many South African and other global retailers have not reviewed their full retail cycle and have not investigated the root of the problem of textile and plastic waste within the retail business, which is the method of buying and sustainability awareness within the business and the awareness thereof. These findings matter because fast fashion retailers make the buying and designing decisions and suppliers act in response. When fast fashion starts to intentionally seek ways to be more sustainable by looking internally first, sustainability can be achieved.

Rampant consumerism will remain a problem as long as retailers continue to provide clothing at the speed they currently do. It was found that many manufacturers in South Africa used landfills to dispose of textile waste and some recycled in 2009. Barriers experienced in the fashion industry were lack of equipment, lack of material to recycle and lack of consumer awareness around recycling. In 2021, the same issues remain, there is a tremendous need for South African retailers to recycle textile waste to prevent the effects of pollution from damaging the earth (Vanaardt, A, 2009). South African retailers need to act fast and start sustainability discussions in the workplace with employees as well as in the retail space itself so that employees can naturally become environmentally conscious and create a domino effect. Employees are customers too and many South African consumers are undereducated about waste solutions due to the lack of awareness created around this subject (WWF, 2020) and around sustainability issues in fashion and the difference that engaging in ethical behaviour could make (Shen *et al.* 2012 cited in Henniger, *et al.* 2017). Small community members are especially undereducated and will not make environmentally conscious efforts without an incentive (Plastics SA, 2018). Therefore it is important to create awareness in the workplace and start compliance with suppliers. Retailers should invest in green factories, design with the intention of cutting out waste, preventing pollution and with the intention of being able to recycle clothing. Virgin fibre production should be slowed down or stopped completely, clothing should be recycled and new life should be given to old clothes. This will also prevent the need to dye clothing if the textile waste is sorted properly. Responsible cotton farming should be invested in if high percentages of cotton are going to be continued to be used or cotton could be recycled as well.

Polybags should be reduced immensely, polybag waste is prominent behind the scenes even though the retailers have cut out single-use plastic bags, to brick and mortar customers, the stores are still throwing away single-use plastic that garments are packaged in. E-commerce customers are also creating post-consumer waste as the purchase they have made is received in a polybag, cardboard box and wrapped in a plastic courier bag. Thousands of polybags are being disposed of in trash by this one South African retailer. The improved model could help to prevent the retailer's textile and plastic waste from becoming pre-

consumer and post-consumer waste, which would have negatively affected sustainability issues. This model has the potential to make local businesses more sustainable.

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7. APPENDIX

7.1. THE WORKSHOP AGENDA

For the workshop I presented my proposal to the CEO and Brand Manager of *Company R*. The presentation provided the participants with context and background to the research, which included the aims and objectives. I also explained the ethics in detail to the participants and confirmed that they were clear and understood.

7.1.1. Workshop focus

- Business processes and retail cycle outline
- List of employee participants in each department that will be selected to participate in the study

As the study continued, after this workshop, I had the same workshop with the marketing manager to get a full understanding of the marketing processes and cycle within the larger retail cycle.

7.2. THE INTERVIEW QUESTIONS

As the researcher I conducted initial workshops with the purpose of selecting the correct participants for the interviews, these were with 2 participants that have an in-depth understanding of business information and processes, as they are in management roles. The interviews were conducted for the purpose of understanding the chosen business' retail cycle as its business processes. Another objective of the interviews was to get an understanding of the types of waste, non-recyclable textile and plastic waste that the retail cycle generates that affects the sustainability of the local environment. Data collected from the interviews is presented and analysed in chapter 4. The data collected from these interviews were used as the basis to develop a retail cycle that demonstrates how the quantities of plastic and non-recyclable textile waste that are generated can be reduced or prevented from reaching landfill sites, to minimise the depletion of local natural resources.

7.2.1. Preliminary questions

Do you have any questions before we start?

Do you have a clear understanding of what is meant by a sustainable retail cycle?

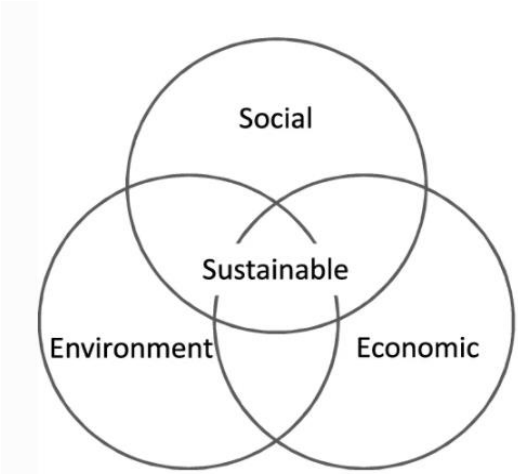

Figure 5.7.: Representation of sustainability as three intersecting circles
Source: (Purvis, 2018: 682)

7.2.3. The questions asked to all employees

Question 1

Take me through your role, from the beginning of the retail cycle till the "end" of the cycle, what is your role?

Question 2
What does your daily routine look like, from the time that you enter the building until you leave the building or if you're working remotely, in your work times?

Question 3
Would you be able to identify or list where you use plastic or synthetic materials (not paper), as part of your role and responsibilities?

Question 4
How is sustainability being discussed with new and current suppliers and are suppliers asked for sustainable options on any of the components on the end product, including fabric?

Question 5

If you were to think alternatively or out of the box, would you be able to identify anything in your daily routine made of plastic or synthetic fibers that you could remove for good or that could potentially be replaced with a more sustainable solution?

Question 6
Do you have any questions for me or do you have anything else that you would like to add, even if it does not pertain to your specific role in the business, it could be something you noticed in other areas?

7.3. ETHICAL DOCUMENTS

7.3.1. Ethics committee clearance

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03 June 2021

Rochelle du Plessis
c/o Department of Applied Design
CPUT

Reference no: 204539544/2021/15

Project title: Land pollution caused by the clothing retail industry: towards a proactive approach in supporting sustainable product life cycles in fashion

Approval period: 03 June 2021 – 31 December 2022

This is to certify that the Faculty of Informatics and Design Research Ethics Committee of the Cape Peninsula University of Technology approved the methodology and ethics of Rochelle du Plessis (204539544) for the MTech Fashion Design.

Any amendments, extension or other modifications to the protocol must be submitted to the Research Ethics Committee for approval.

The Committee must be informed of any serious adverse event and/or termination of the study.

A/Prof I van Zyl
Chair: Research Ethics Committee
Faculty of Informatics and Design
Cape Peninsula University of Technology

7.3.2. Consent documents from CEO and Brands manager

7.3.2.1. Consent document from CEO

I [redacted] in my capacity as (***Brands CEO***) at [redacted] give consent in principle to allow ***Rochelle du Plessis*** a student at the Cape Peninsula University of Technology, to collect data in this company as part of her M Tech (Design) research. The student has explained to me the nature of his/her research and the nature of the data to be collected.

This consents in no way commits any individual staff member to participate in the research, and it is expected that the student will get explicit consent from any participants. I reserve the right to withdraw this permission at some future time.

In addition, the company's name may or may not be used as indicated below. (Tick as appropriate.)

	Thesis	Conference paper	Journal article	Research poster
Yes	✓	✓	✓	✓
No				

7.3.2.2. Consent document from Brand manager

I [redacted] in my capacity as (***Brand Manager***) at [redacted] give consent in principle to allow ***Rochelle du Plessis*** a student at the Cape Peninsula University of Technology, to collect data in this company as part of her M Tech (IT) research. The student has explained to me the nature of his/her research and the nature of the data to be collected.

This consents in no way commits any individual staff member to participate in the research, and it is expected that the student will get explicit consent from any participants. I reserve the right to withdraw this permission at some future time.

In addition, the company's name may or may not be used as indicated below. (Tick as appropriate.)

	Thesis	Conference paper	Journal article	Research poster
Yes	✓	✓	✓	✓
No				