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THE UK TEXTILE INDUSTRY AND CLOTHING INDUSTRY: THE CHALLENGES OF SUSTAINABILITY, THE CIRCULAR ECONOMY, AND THE DIGITAL TECHNOLOGIES

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Introduction

The UK textile and clothing industry has a global reach and embraces a range of elements including, the production of the raw materials, a variety of treatment and manufacturing processes, retailing, and consumption, and all these elements face a variety of environmental and social challenges. The production of the raw materials, spinning them into fibres, weaving these fibres into fabrics and dyeing, for example, require large volumes of water, as well as chemicals, notably pesticides and insecticides. Widespread concerns have been expressed about working conditions, notably forced labour and modern slavery, in textile and clothing manufacturing factories in retailers supply chains. Here consumer demand for cheap clothes and fast fashion is seen to be driving the clothing retailers' business model which is based on cheap labour, and low prices. At the same time, western consumers' clothing shopping behaviour generates the emission of greenhouse gases associated shopping journeys and online shopping deliveries, and is more generally seen to be part of unsustainable patterns of consumption. In short, the transition to sustainable patterns of development within the textile and clothing industry faces a variety of pressing public challenges, and according to DeSL (2022, para 14), a digital transformation solutions consultancy, *'sustainability is no longer optional'* in the *'retail, fashion, apparel and footwear industries.'* A variety of approaches have put forward been tackle the industry's sustainability challenges, including adopting a more circular business model and harnessing the digital technologies. With this in mind, this chapter provides a summary outline of the origins and characteristics of the UK textile industry, and then goes on to explore how the T&C industry, and, more specifically, how some of the industry's major players, are publicly addressing sustainability, and more specifically, if, and how, the circular economy and digital technologies are playing a role in the transition to sustainability within the industry in the UK.

Origins and Characteristics of the Textile and Clothing Industry in UK

The T&C industry is complex and can be seen to include a number of interlinked elements, namely the production of materials, including cotton fibres, leather, fur and silk that form the primary units in cloth making the manufacture of men's, women's and children's apparel; and retailing. Within the UK the retail element is arguably the most prominent. The retailing of clothes embraces a wide range of routes to market, including department stores, speciality stores, boutiques, discount stores, outlet stores, supermarkets, retail warehouses, online sales, and second-hand shops.

Within the UK the T&C industry was a driving force in the UK's industrial revolution in the seventeenth and eighteenth century and a leader in world exports. It developed as a result of the demand for clothing for the country's rapid growing population. Before the

eighteenth century the T&C industry was essentially a domestic industry, had been undertaken by individual workers in their own homes, Initially the clothes produced from wool and flax were functional, but by the middle of the eighteenth century, increasingly skilled craftsmen and craftswomen were using cotton and linen, to make more fashionable clothes, demanded by the more affluent sections of the population.

During the eighteenth century, a number of inventions and innovations, including the flying shuttle, the water frame, the spinning jenny, and the power loom, along with the harnessing of steam power saw the textile industry transformed from a craft-based cottage industry to a highly mechanised one centred on factories, or mills, as they were widely known, centred on Manchester and South Lancashire. Textile manufacture in the UK was at its height at the turn of the twentieth century, but declined during that century in the face of increasing competition from cheaper overseas producers and the growing importance of synthetic fibres, including grain and nylon. In 2020, there were some 2,400 businesses he manufacturing textiles in the UK. (ukft 2020, para 2).

Research Method

In the light of the Introduction, the authors addressed a composite research question, namely

- How are the leading companies within the UK's textile and clothing industry publicly illustrating their transition to sustainability and in what ways are they harnessing the circular economy and the digital technologies in approaching that transition.

In order to explore this research question, the top five textile manufacturing companies, namely Coats, MAF, Quantum Clothing Group, Karazeen Textile and Jimmy Choo, as listed by Zoom Info (2023), and the top five clothing retailers, namely Next, J.D. Sports, Primark, M&S and Asda, as listed by Retail Economics (2023), were selected for investigation. The authors then chose a simple method of enquiry, based on three sets of Internet searches, conducted on the Google search engine, in October 2023. These searches used the key terms 'sustainability', 'circular economy', and 'digital technologies' in conjunction with the names of the top five textile manufacturing companies, and the top five clothing retailers

The search revealed that five of the selected ten companies, Coats, Next, JD Sports, Primark, and Asda posted dedicated sustainability reports (or Corporate Social Responsibility or Environmental, Social and Governance reports, or Integrated Annual Reports which embraced sustainability) and that the Quantum Clothing Company, Jimmy Choo, and M&S posted information on their approach to sustainability. Further, while only Coats had posted specific information on its approach to the circular economy, the sustainability reports, posted by Jimmy Choo, Next, JD Sports, Primark, and M&S included material on circularity, and while Asda's sustainability report did not mention the circular economy explicitly, it did include material on recycling. Only three of the selected companies posted material on how the digital technologies were harnessed to promote sustainability. The empirical material on which this chapter is based was drawn from the corporate reports and information generated by these searches. However, this information

dos not easily lend itself to comparison, or to comparative tabular summary, but all sources are referenced. Pen pictures of the selected companies are provided below.

Coats is a UK based multinational thread manufacturing company, and was founded in Paisley, Scotland in 1755, has operations across 50 countries and employs 17,000 people. The company works with 30,000 apparel and footwear manufacturers and 4,000 retailers and its products are sold in over 100 countries. The Quantum Clothing Company manufactures and supplies clothing and apparel, particularly women's lingerie, sports and shapewear products, to a number of European retail companies. The company, founded in 2000, has its Head Office in the UK and owns manufacturing sites in Sri Lanka and Cambodia, employing 5,000 employees. Jimmy Choo, founded in 1996 but acquired by Capri Holdings in 2006, is a luxury UK fashion company.

Next is a multinational UK clothing and footwear retailer, originally founded in 1864. The company trades from some 700 stores, of which 500 are in the UK, where it is the country's largest clothing retailer, with a further 200 in mainland Europe, Asia and the Middle East. JD Sports is a UK sports omnichannel fashion retailer, founded in 1981. The company trades from 3,400 stores principally in the UK, mainland Europe North America, and the Asia Pacific region. Primark is a leading clothing international retailer, founded by Associated British Foods in 1969. has over 400 outlets across Europe and the US. The retailer's product range menswear, womenswear, and childrens' wear, and has some 70,000 employees. Marks and Spencer is a UK multinational retailer, established in 1894. The company's product range includes, clothing, food, and household goods. Asda is a UK supermarket retailer founded in Yorkshire in 1965, it trades from over 600 locations within the UK, and the company's product range includes food, general merchandise and clothing. The George at Asda brand is one of the UKs leading clothing brands, and is available within the company's stores and in some locations in free standing outlets.

The chapter draws extensively on quotations drawn from the selected textile and clothing companies' websites and the aim here, was to explore how the selected textile clothing companies publicly expressed, and looked to evidence, their approaches to sustainability, the circular economy, and the digital technologies. Here, the authors were of the opinion that an important way of capturing such approaches was to cite the companies' own words, not least in that such citations could convey corporate authenticity, and offer greater depth of understanding. The specific examples and quotations drawn from the companies' websites were used for illustration purposes, and there was no attempt to undertake any explicit comparative analysis of variations in the retailers' approaches to sustainability.

Findings

In order to report the findings, the original composite research question was broken down into three components namely:
RQ1. How are the leading companies within the UK's textile and clothing industry publicly communicating their transition to sustainability?
RQ2. In what ways are the UK T&C companies harnessing the circular economy to support this transition?

RQ3. What role are digital technologies playing in facilitating the sustainability and the circular economy in the UK T&C companies?

RQ1. How are the leading companies within the UK's textile and clothing industry publicly communicating their transition to sustainability?

The sustainability reports and information posted by the selected UK textile and clothing companies varied in their detail and content, but rather than looking to describe each company's approach to sustainability in detail, the authors looked to identify, and draw out, a number of interlinked general themes, namely strategic corporate commitment; climate change and greenhouse gas emissions; energy efficiency; materials; water; biodiversity; waste; responsible sourcing and supply chains; human rights and modern slavery; health and safety at work: diversity, equity and inclusion; links with communities; and the United Nations Sustainable Development Goals (SDGs); to provide a narrative account to capture how the companies were addressing sustainability.

Strategic corporate commitment was articulated in a variety of ways. In his Introduction" to Primark's "Sustainability and Ethics Report 2021/22" (Primark 2023, p. 2), Paul Marchant, the company's Chief Executive Officer, claimed "at Primark, we have always been about quality clothing at affordable prices. Now we want to help people buy better and more sustainably. This is what our customers tell us they want, and now more than ever, they want to be able to do this without breaking the bank. Our Primark Cares strategy is deliberately set out to challenge the premise that affordable fashion and sustainability are incompatible. We want to show that we can use our size and scale to drive meaningful change to make more sustainable fashion affordable for all, to reduce our impact on the planet and to better support the livelihoods of the people who make our clothes. We understand that we have a critical role to play along with the whole industry to deliver this change" (Primark, 2023, p.2).

Jimmy Choo (2023, para. 1) introduced its "Sustainability Manifesto" with the claim that "at Jimmy Choo we are glamorous optimists, designing products that create beauty and deliver joy, holding ourselves to the highest standards of excellence and craftsmanship. We are now deepening that promise by embarking on a journey towards a sustainable future." In a similar vein, in his introduction to Coats' 2022 sustainability report Rajiv Sharma, the Group Chief Executive, emphasised that "sustainability lies at the heart of our business strategy" (Coats 2023, p. 6), while Regis Schultz, Chef Executive Officer at JD Sports (2022, p.23), claimed "we are very passionate at JD about sustainability".

All the selected textile and clothing companies identified climate change is a major, perhaps the major, challenge to sustainability. Asda (2023, p.8), for example, recognised that "climate change is the defining crisis of our time, it's happening much more quickly than previously anticipated and will have a major impact on our business". M&S (2023a, para. 7) emphasised "the impact of climate change affects all of us and the scientific evidence is clear – urgent action is needed by everyone." More specifically, a few of the selected textile and clothing companies posted details of their targets to reduce greenhouse gas emissions. Next, for example, reported its commitment to reduce Scope 1 (which occur within a company and are within its control) and Scope 2 emissions (which occur when energy is produced and supplied from outside the company) by 55% by 2030, against a 2016/2017 baseline, while

Marks & Spencer (2023) reported its commitment to reduce Scope 1 and scope emissions by 55% by 2030 against a 2017 baseline.

Notwithstanding the role of reducing and changing energy use in tackling climate change, several of the selected companies in the textile and manufacturing industry reported on their plans to increase energy efficiency. Next (2023, p. 22) emphasised that one of its priorities was "to work to improve energy efficiency", and the company reported that it actively tracked its energy performance in an attempt to "ensure our properties are operating efficiently". More specifically, Next reported that during 2022 it had optimised the heating and cooling systems within its stores to reduce the amount of electricity used, and that it fitted additional solar panels in its warehouses. More generally Next claimed that it worked closely with its energy provider to actively identify new energy efficiency opportunities. In addressing "distribution efficiency", Next (2023, p. 22) reported that it was involved its testing electric vehicles and investigating the possibility of using hydrogen as an alternative fuel.

The consumption of raw materials is widely seen as a challenging issue within the textile and clothing industry. Coats (2023, p. 33), for example, reported "during 2022 we consumed 121 thousand tonnes of direct raw materials, the majority of which comprised the fibres and filaments", that "84% of our products are made from oil-derived plastic materials, principally polyester", and that the company is looking "to deliver a transition to 60% sustainable raw materials by 2026." Next (2023, p.15) reported that "cotton is our most significant raw material, both in terms of volume used and the associated environmental and social issues linked with its production", and the company reported employing a number of measures, including looking to reduce the dependency on pesticides and synthetic fertilisers, to reduce water use, to improve the social conditions for farmers, to improve the economic sustainability of farmers, and to reduce water use.

Indeed, the textile industry uses large volumes of water, especially in the dyeing process. Coats (2023, p. 41) claimed "we recognise our responsibility to use water as efficiently as possible to ensure that our water extraction activities create no negative impact on the local communities and biodiversity in the areas in which we operate. We are committed to minimising freshwater abstraction, and commit to reducing water consumption especially in areas of high-water stress, and we strive to return the water we have used to the environment in a fit state for use by others". More specifically, Coats (2023), reported on its investment in Twine, a start-up company, which is developing digital dyeing technology for yarns. Primark (2023, p. 31) acknowledged "water is a critical natural resource within the fashion industry – from the irrigation of the cotton fields to the dyeing and finishing of our fabrics and materials. It is vital that we manage it effectively. Ensuring factories of our suppliers manage their water use effectively and control their wastewater responsibly is crucial for helping to reduce our environmental impact as a business".

Many of the damaging impacts of the textile and clothing industry are generated at three stages of the industry's value chain, namely material production; material preparation and processing; and product use and disposal. Next (2023, p. 12) reported that it looked to "reduce our overall impact on biodiversity and natural ecosystems in our supply chain", while JD Sports (2022, p. 78) claimed to ensure that "licensed cotton farms and farmers adopt management plans to conserve and enhance biodiversity". More expansively, Primark (2023,

p.29) reported commissioning a biodiversity consultancy to conduct a biodiversity risk assessment of its operations, which helped shape its biodiversity strategy, and claimed that "given that cotton is our most widely used raw material, our biodiversity strategy has cotton at its core". Here, the focus is on regenerative farming, but the company acknowledged that given that its suppliers source cotton from different geographical locations, this effectively means that no single approach is appropriate, and perhaps more importantly that improving biodiversity will be a long-term project. However, Primark claimed to have been working closely with farmers and to be developing a monitoring framework to assess biodiversity where its supply source cotton.

Waste is a major problem across the T&C industry and many of the selected companies have developed programmes to reduce its impact. Coats (2023, p. 46), for example, recognised two types of waste generated within its overall operations, namely, product and packaging waste generated principally by its manufacturing activity, and liquid effluent and sludge, generated by wet processing activities. Further, Coats (2023, p. 46) argued that "reducing materials usage and minimising the impact of the materials that we consume is a very high priority for us", and claimed that adopting the European Union's Waste Framework Directive in 2019, gave the company increased transparency across the business, and assisted the company in identification of opportunities for reduction, and where possible, prevention. understanding of waste generation streams across its business. In addressing effluent waste, Coats (2023, p. 48) claimed to recognise its responsibilities "as temporary custodians of the water we use, and are committed to ensure that this sometimes-scarce resource is returned to the local communities in which we operate in a fit state". The Quantum Clothing Group (n.d., para. 3) simply claimed to be "minimising the use of resources and the creation of waste wherever possible and practical."

Next (2023, p. 14) emphasised their "we are committed to responsible sourcing and ensuring traceability back to source", and acknowledged that "we use raw materials such as cotton, polyester, man-made cellulosics, wool, timber and leather. These raw materials can have a wide-ranging environmental and social impact during their production and extraction. If not responsibly sourced, this can contribute to critical issues such as deforestation, water scarcity and climate change". Further, the company claimed that its "responsible sourcing strategy sets out our ambition to source 100% of the key raw materials we use through known, responsible or certified routes by 2025" (Next, 2023, p. 14). Next also reported on how it looked to secure the responsible sourcing of polyester, man-made cellulosic fibres, microfibres and leather. Marks and Spencer (2023) reported that 100% of the cotton used in its clothing products is responsibly sourced and that the company was empowering farmers to use water more efficiently, to care for the soil and to respect biodiversity.

Responsible sourcing also covers a series of major economic and social challenges, not least in supply chains. Under the banner "Improving People's Lives" Primark (2023, p. 35) acknowledged its commitment to "pursuing a living wage for workers in our supply chains" and reported that "our approach builds on what is already a well-established process to monitor the payment of workers' wages", and that "this is a key aspect of social audits conducted in our suppliers' factories through our Ethical Trade programme". In a similar vein, JD Sports (2022, p. 94) reported that its ethical code of practice stipulates that "living wages are paid in line with local laws and for a standard working week, overtime must be paid at

premium rate", that "the organisation shall respect the right of personnel to a living wage and ensure that wages for a normal work week, not including overtime, shall always meet at least legal or industry minimum standards, or collective bargaining agreements", and that "wages shall be sufficient to meet the basic needs of personnel and to provide some discretionary income". JD Sport's ethical code of practice also emphasises freedom of association and the right to collective bargaining, that working hours must not be excessive and must be voluntary and that regular employment be provided. Here again, the company reported that factories in its supply chain are independently audited.

Protecting workers in supply chains is certainly a major challenge for textile and clothing companies, and a few of them have explicitly addressed human rights, and more specifically, modern slavery. Next (2023, p. 7), for example, reported "the violation of human rights anywhere in our operations is unacceptable and we deal firmly with any infringements identified in our supply chain". Coats emphasised its full support for the United Nations Guiding Principles on Business and Human Rights in its operations, and that it upheld the United Nations Declaration of Human Rights. At the same time, Coats (2023, p. 58) reported that "our Group Internal Audit team include a series of 30 human resource audit areas in their audit templates", that "most of these are related to compliance, "with our employment policies or directly with human rights issues", and that "during 2022 they completed 8 audits (compared to 11 in 2021) and identified 10 minor issues requiring remediation within a number of people-related process areas, compared to 13 in 2021".

Some, but not all, of the selected textile and clothing companies, reported on their policies on modern slavery, as part of their approach to human rights and protecting workers. Next (2023, p. 6) emphasised "we will not tolerate any instance of modern slavery in our business or in our supply chain. Next products should be made by workers who are treated honestly and fairly for the work they undertake and whose human rights and wellbeing are respected." In looking to evidence this commitment, Next (2023, p. 6) reported that it had "worked with 13 factories to successfully remediate modern slavery issues", with "an additional four sites are being supported through an agreed remediation process", and that it had "disengaged seven factories where remediation of modern slavery issues had not been achieved to an acceptable level." Primark (2023, p. 11) reported that "we ban all forms of modern slavery, including child labour, forced labour and human trafficking", and that "we publish our Modern Slavery Statement annually". These statements are accessible via a hyperlink from the company's sustainability report.

Health and safety at work are also important elements in protecting workers. Under the banner "Health and Safety", Coats (2023, p.56), for example, outlined its approach to "occupational safety", which is seen to "be at the heart of our business strategy", and "health and wellbeing". In focussing upon its approach to health and wellbeing, Coats (2023, p. 56) emphasised its commitment "to the wellbeing of all employees" and acknowledged "workplace mental health as an important issue for the business and its employees". More specifically, Coats (2023, p. 56) reported that its "Energy4Performance strategy" looked to provide a health promoting workplace", which embraced "health-related opportunities and risks being identified and regularly assessed"; "increased employee awareness about the benefits of a healthy lifestyle"; "incentives being provided to local management to offer health-promoting programs", and "medical services in plants based on local law and

regulations". Jimmy Choo (2023, para. 1) emphasised it commitment "to ensuring that our employees enjoy a healthy working life, both within our business and across our supply chain", that "we prioritize the safety and wellbeing of our Jimmy Choo community, our benefits are designed to meet the healthcare, financial, work, life and mental wellbeing needs of eligible employees", and that "we are committed to strengthening the labour protections of our artisans by routinely auditing suppliers around health and safety."

A commitment to diversity, equity and inclusion feature in the sustainability reports of many of the selected companies. Next (2023, p. 27), emphasised "we are an equal opportunities employer and we offer career opportunities without discrimination", "we treat all employees fairly regardless of gender, sexual orientation, marital status, race, colour, nationality, religion, ethnic or national origin, age, disability or union membership status", and "we believe that having a diverse and inclusive working environment is vital to supporting the health and wellbeing of our employees." Under the banner "Championing Diversity and Inclusion", Primark (2023, p. 43) claimed "it's important that all our people are treated with dignity and respect, which means listening to our colleagues and learning what's important to each person", that "our workforce is a diverse collection of individuals, all with their own stories, viewpoints, ideas, and insights. It makes us a stronger, more adaptive and resilient business", and that "we are also careful to understand local variations and comply with relevant legislation in each market".

Primark (2023, p. 37) also reported its commitment to "promote equal opportunities for women." In addressing this commitment, Primark emphasised that "women account for the majority of its global supplier factory workforce", and that the company's goal is to strengthen the position of women in the garment industry through skills development and addressing barriers to progression by 2030". These barriers were seen to "include the risks of gender-based violence and harassment in the workplace and unpaid care work, which often forces women out of the workplace" (Primark 2023, p. 37). More specifically, Primark (2023, p. 37) outlined its largest skills programme, which supports factories to introduce an efficient in-house training system for both new and existing sewing operators, most of whom are women. They receive quality technical training which improves their productivity and can often open-up opportunities for promotion". JD Sports (2023, p. 88) reported on its "Behind the Label" project, which supports women and girls around the world, with specific focus on women working within the textile manufacture supply chain, and this project includes a commitment to fund initiatives to support women in those countries seen to be most at risk of gender-based harassment and violence in the workplace.

A few of the selected apparel companies reported on their links with local communities and on their charitable donations, as part of their sustainability commitments. Coats (2023, p. 60-61), for example, reported on its contribution to flood alleviation in Pakistan, a Save the Children campaign in Mexico, a book donation and tree planting programme for school children in Bangladesh, tree planting programmes in Mexico and Romania, and beach clear ups in Sri Lanka and Bangladesh. In addressing "Supporting Our Communities", Next (2023, p. 29) emphasised its commitment "to support causes that make a real difference", noting "we particularly focus on supporting charities and organisations that have an impact in the countries and communities we source from and operate in". The company reported on its approach which looked to "provide donations that are of the most

benefit – this can be in the form of financial or product donations, expertise, knowledge or time", and to support charities for a number of years with a specified annual donation, as this commitment helps them plan their work with confidence and allows us to become strategic partners". More specifically, Next reported that its charitable giving policy focused on the advancement and promotion of health and supporting both end of life and emergency care services; the advancement of education, life and work skills and the development of youth amateur sport; the advancement of environmental protection or improvement; and reducing inequality, by supporting the promotion of diversity, inclusion, human rights and by the prevention or relief of poverty.

Some of the selected textile and clothing companies outlined how their approach to sustainability was aligned to the United Nations SDGs, which were agreed at a United Nations General Assembly in 2015 and designed to shift the world on to a sustainable and resilient path. In reporting its alignment to eight of the SDGs, Coats (2023), outlined why each of them was relevant to the company, identified the company's opportunities and responsibilities, its priorities, planned actions, and desired goals. In addressing SDG 13, climate action, for example, Coats recognised that their activities contributed to global warming, and that it had a responsibility to reduce its greenhouse gas emissions and those of its value chain, in line with minimising the damage from climate change, and that the principal opportunity to achieve this objective was via a transition to renewable electricity and via energy conservation schemes.

In a similar vein, Next (2023) reported its alignment to nine of the SDGs, covering poverty, health and well-being, gender equality, clean water and sanitation, decent work and economic growth, responsible consumption and production, climate action, life on land, and partnerships. In outlining its focus on life on land, Next (2023, p. 5) claimed to be, "committed to the protection of natural resources and will source all land based raw materials responsibly", and that partnerships underpin all the company's business activities. In contrast, JD Sports (2023, p. 62) reported that its sustainability strategy was aligned to the three SDGs it considered "most relevant" to the textile and clothing industry, namely the promotion of inclusive and sustainable economic growth, sustainable production, and consumption, and acting to combat climate change and its impacts.

3.2. RQ2. In what ways are the UK T&C companies harnessing the circular economy to support this transition?

Only two of the selected textile and clothing companies, namely Coats and Jimmy Choo websites posted specific information on the circular economy, but some of the other companies included details of their approach to circularity in their sustainability reports. Jimmy Choo (2024b, para.1), for example, claimed "we continually strive to extend the life of our products by through repair and reuse, minimising waste and embracing a circular approach to fashion". In supporting this claim, Jimmy Choo (2023b, para.3) emphasised "our products are designed to last and come with a five-year repair service", "we aim to give our products a second life and be active in the resale market", and "we are committed to ongoing research and innovation in circular product design, as well as collaborating with others to contribute to a redesign of the systems required to create a truly circular fashion industry".

In January 2021, Coats announced that it had joined the Ellen MacArthur Foundation Network, which looks to develop and promotes the concept of the circular economy. More specifically Coats (2023, p.34) showcased its "Ecocycle" innovation, which the company claimed will "propel us towards a fashion landscape where circularity is not just a concept but a reality." The company claimed that "Ecocycle" introduced "the ground-breaking concept of water dissolvable threads", which dissolves the seams at 95 degrees Centigrade during a 30minute wash cycle, and enables garments to be pulled apart into recyclable components, with zips, buttons, and labels being easily removed, thus enabling paving the way for end-of-lifecycle recycling and championing the ideals of a circular economy (Coats 2023b). The company claims that Ecocycle can be used in a range of garments, including knitwear, dresses, underwear, children's apparel and workwear. Coats (2023) also provided details of Epic EcoVerde, a 100% recycled premium polyester sewing thread which offers durable, attractive seams across a wide range of recycled fabrics and materials.

For some of the selected companies, the circular economy seemed to be predominantly linked to waste management, while others looked to embrace circularity across their value chain. Under the banner "Moving Towards Circularity", Next (2023, p. 17), for example, reported it was "supporting the transition to a more circular economy by designing, producing and selling products that limit pollution and waste and help to keep materials in use for longer". In looking to evidence its commitment to circularity Next outlined that it was working to reduce packaging, using customers" returned packaging to create new packaging, and to develop takeback schemes to ensure valuable resources were kept in circulation.

Marks and Spencer (2024a, para.1) claimed "as a business we are committed to driving circularity and sending zero waste to landfill from our own operations and construction activities in the UK and Republic of Ireland". Further, the company emphasised that it was "working across our value chain to drive circularity and reduce waste in key areas such as used clothing, food waste, packaging, and carrier bags", that "we've started our transition to new circular business models, by improving the recyclability of our packaging and goods, increasing the durability and use of recycled materials in our products, and introducing refill and reuse options for customers", and that "we support the transition to a sustainable circular economy and will prioritise business model innovation, working with our partners to put circular ways of working into practice" (Marks and Spencer 2024a, para 3).

More specifically focussed on clothing, Marks and Spencer (2024a, para11-12) outlined the company's "Circular Partnerships", namely its "M&S Hire Street", "Shwopping" initiatives, and reported that it had joined the "Dotte collective." The M&S Hire Street initiative, founded in 2021 and run by the Zoa Group, enables customers to rent up to seven items, while the Shwopping initiative, introduced in 2008, allows customers to recycle their clothes, which are donated to Oxfam, by placing them in Shwop boxes in the company's UK stores. M&S reported that in 2021/22, the initiative generated £227,00 for Oxfam. The company described the Dotte collective as "the UK's first fully circular kidswear peer-to-peer marketplace where parents can buy, sell, donate and recycle kidswear" (Marks and Spencer (2024b, para.1).

More expansively, Asda (2023, p. 16) argued that "circularity is a key pillar of our George clothing sustainability strategy", suggested that its "customers were more likely than the average UK customer to participate in circular initiatives, such as repairing, donating, buying second-hand and selling used items", and claimed that "as we develop our ranges, we are designing with longevity in mind, aiming to ensure our products last longer, can have a second life and at the end of life be recycled or disposed of in a responsible and low-impact way". JD Sports (2023, p. 86) reported developing its "supply chain to extend material and product life at every opportunity", and while the company acknowledged that "this is not circularity by definition", it argued that "extending product life represents an investment in the same principles that support the circular economy".

3.3. RQ3. What role are digital technologies playing in facilitating sustainability and the circular economy in the UK T&C companies?

Only one/two of the selected companies, namely Coats and Primark had posted information on how the digital technologies were contributing to sustainability and/or the circular economy, though two companies, Marks and Spencer and JD Sports, referred to such contributions in their sustainability reports. Coats (2023, para.2) claimed to offer "business critical garment software and fashion industry expertise, powering an agile, resilient, transparent and sustainable supply chain", and that "our fashion supply chain software harnesses industry best practices and the latest technology to improve speed to market, agility, efficiency and sustainability". Coats (2023, para.2) argued that digital technologies enabled it to "simplify complexity", and that "in an increasingly volatile, uncertain and complex world, in which sped, efficiency and sustainability are terms of trade, we enable fashion businesses to meet these challenges by focusing on simplifying and optimising key business processes which have disproportionate impact on performance". Although Coats looked to showcase a number of its digital technology innovations on its corporate website, the focus was on improving productivity and business efficiency, rather than on sustainability and the circular economy. Primark (2023) reported on using a digital platform, 'Tracebale' to track cotton from farmers in its supply chain.

Marks and Spencer (2023) reported on a variety of ways in which the digital technologies were contributing on its approach to sustainability, including integrating data from environmental performance in the company's supply chain into its clothing footprint, improving the quality and granularity of packaging data, tracking greenhouse gas emissions, complementing supplier audit processes, and providing equal opportunities for women. JD Sports (2023) reported on using QR code identifiers on digital passports, to enable private label products to be traced through the supply chain, from mill to distribution centre, thus enhancing supply chain transparency.

Discussion

The findings revealed that selected textile and clothing companies publicly addressed a wide range of themes in reporting on their approach to sustainability, though they were much less fulsome in reporting on the role that the circular economy and the digital technologies were playing in their transition to sustainability. That said, a few wider issues, relating to sustainability, the circular economy and the digital technologies, merit reflection and discussion. At the outset it is important to recognise that that sustainability is

a contested concept, which “means different things to different people” (Aras & Crowther, 2008, p.436), and while some definitions are rooted in ecological principles, others include social and economic, as well as environmental, goals, and look to embrace equity in meeting human needs. Typical of the first set is Sutton’s (2004, p.i) definition of environmental sustainability as “the ability to maintain things or qualities that are valued in the physical environment”, while the second set is reflected in McCann-Erickson’s (2007, p.6) definition that sustainability “is a collective term for everything to do with the world in which we live”, and “is about consuming differently and consuming efficiently”.

In some ways, the selected textile and manufacturing companies’ approach to sustainability can be interpreted as being built around economic efficiencies and thus to reflect the demands of their businesses, as much as a fundamental concern for the maintenance and enhancement of natural resources and ecosystems, or the welfare of their employees or of the communities in which they operate. While several of the selected textile and clothing companies’ environmental, designed to reduce energy consumption, and thus to reduce greenhouse gas emissions, also produced cost savings. At the same time, commitments to diversity in the workplace, to health and safety initiatives, and to investment in local communities, can be seen to promote stability and loyalty amongst the workforces.

In many ways the selected textile and clothing companies’ approaches and commitments to sustainability cited above, can be seen as aspirational, in that they are often couched in terms of what the companies hope and plan to achieve in the future. However, such approaches could essentially be seen as public relations, or marketing exercises, rather than genuine commitments to sustainable development. As such, the selected companies’ commitments to sustainability could be seen as greenwashing, designed to appeal to consumers and investors, who are increasingly concerned about the environmental and social impact of the textile and clothing industry’s operations, while effectively ignoring fundamental and social concerns. Adamkiewicz et al. (2022) looked to demonstrate the extent to which greenwashing could jeopardise the fashion industry in addressing challenges related to the implementation of more sustainable circular economy in the context of designing with intention of recycle, reduction of by-products, lower energy consumption, and wise purchase habits. Here, Adamkiewicz et al. (2022) suggested that these challenges included lacking accurate information, a lack of transparency and doubts about sharing information, and argued that education programmes and the active participation of all stakeholders in the circular value chain were important in addressing such challenges. At the same time, the independent external assurance of the sustainability reports published by some of the selected companies was, at best, limited, and this could be seen to undermine the credibility of the companies claims about their sustainability achievements. More generally, Williams (2024, para.1) argued that the processes of obscuring social and ecological relations via greenwashing are central to the (dis) functioning of contemporary capitalism.

While a few of the selected textile and clothing companies emphasised their commitment to responsible sourcing, not least from their supply chains, such commitments present several challenges. Bhandari et al. (2022), for example, argued that a transition to sustainable sourcing, was essential if the fashion industry was to address some of the

environmental and social challenges facing it, but suggested that a transition from conventional methods to a new sustainable business model posed a variety of challenges for companies and for their supply chain partners. More specifically, Bhandari et al. (2022, p. 225) identified a range of barriers to the implementation of sustainable sourcing in the fashion industry but suggested that "insufficient commitment from top management" was the most important barrier to implementing sustainable sourcing in the fashion industry. This finding emphasises the critical importance of securing full executive support for sustainability strategies, and for ensuring that sustainability is reflected throughout the business.

Working conditions, and more specifically, concerns about human rights and modern slavery in the selected textile and clothing companies' supply chains, have attracted attention from consumers, pressure groups and governments. Not least in that the Global Slavery Index 2018 (Walk Free Foundation, 2018) listed the textiles and fashion industry as one of the largest global perpetrators of modern slavery. Here, the approach adopted by some of the selected companies can be seen to be expectational, at least one step removed from their direct corporate control, in that they put the emphasis on the supplies to ensure compliance with their policies on human rights and modern slavery. In an attempt to verify that suppliers are complying with their supply chain policies, a number of the selected companies reported employing a variety of audit processes. Here, it is important to recognise that though widely used in industries with complex and geographically diverse supply chains, the role of auditing to verify compliance has attracted considerable criticism. LeBaron et al. (2017, p.958), for example, argued that "the growing adoption of auditing as a governance tool is a puzzling trend, given two decades of evidence that audit programs generally fail to detect or correct labor and environmental problems in global supply chains

In many ways, fast fashion epitomises the sustainability challenges facing the C&T industry. In focusing on the environmental costs of fast fashion, the United Nations Environment Programme (2022, para.3) argued that "sustainable fashion and circularity in the textiles value chain are possible, yet this century the world's consumers are buying more clothes and wearing them for less time than ever before, discarding garments as fast as trends shift." More specifically, the Geneva Environment Network (2024, para.5) has emphasised that *"fast fashion also has a human cost: textile workers, primarily women in developing countries, are often paid derisory wages and forced to work long hours in appalling conditions. In many places, these conditions create infringements on human rights"*, while the *"use of chemicals in clothes production also raise serious health concerns, both for the workers in the industry and consumers."* Looking more positively towards the future, Chen (2024), looks to explore the complex interplay between financial imperatives and environmental responsibilities in the fast fashion industry, but concludes that digital transformation could be an effective solution to this problem for the fast fashion industry.

More generally there are, arguably fundamental, tensions between sustainability and economic growth, and the issues of sustainable consumption and the current structure of market economies loom large. On the one hand, sustainable consumption, described by Cohen (2005, p. 25) as "the most obdurate challenge for the sustainable development agenda", and in many ways the textile and clothing industry, and more specifically, the fashion industry, epitomises unsustainable consumption. The selected textile and clothing

companies' business models, based on continuing growth and aggressive marketing strategies, essentially to promote consumption, but such growth is dependent on the continuing depletion of the earth's finite resources, is incompatible with sustainability. At the same time, many consumers may be unwilling to reduce their levels of consumption, any such reduction would be seen as a retrograde step, in societies where consumption is prized and where consumption has become part of many people's identity. .

Here, Ropke (2009, p. 2492), for example, argued "trying to persuade individuals that curbing consumption would contribute to environmental improvements and increased wellbeing, has little chance of success". On the other hand, major changes in the levels of consumption also poses challenges for the current structure of market economies. In looking to address such challenges Jackson (2010, p. 18) argued "it is entirely fanciful to suppose that deep emission and resource cuts can be achieved without confronting the structure of market economies", while Mansfield (2009, p.37) claimed that mainstream approaches to sustainable development fail to recognise "the political nature of sustainability."

While a transition to a more circular economy has been proposed as a way of tacking the sustainability challenges facing the textile and clothing industry, as with sustainability, the concept of the circular economy can have different meanings. Korhonen et al. (2018, p. 545), for example, saw "the circular economy as an essentially contested concept", and "in terms of scientific research, it appears to be vague". Arguably more critically, Gregson et al. (2015, p.218) suggested the idea of the circular economy is "more often celebrated than critically interrogated" and that "its actual enactment is limited and fragile". Corvellec et al. (2020, p. 97) acknowledged that the circular economy "allows for a whole range of interpretations and approaches to be bundled together". As such, this effectively allows companies to define the circular economy to mean what they want it to mean.

The transition to a circular business model within the textile and clothing industry would certainly constitute a dramatic change in the ways in which consumers approach consumption and could see the emergence of a "new consumption culture" (Korhonen et al. 2018a, p.41). Indeed, the emergence of such a new culture of consumption where the focus would be on co-operative endeavour, is seen to be central to the circular economy, with "user groups and communities sharing the use of the function, service and value of physical products" (Korhonen et al. 2018b, p. 548). Such a transition towards a circular economy, would surely be seen to challenge the current social value which consumers often ascribe to many of the products and services they buy, which may in turn, make it difficult for large numbers of consumers to buy into second hand, or reusable, patterns of consumption. While Marks and Spencer, for example, do facilitate a clothes recycling scheme, as noted earlier, at the present time, the company seems unlikely to radically change their current business model to fully accommodate reuse and recycling at what would be the expense of their current retail operations.

While harnessing the digital technologies has been suggested as offering a way forward in tacking the sustainability challenges in the textile and clothing industry, the increasing use of the digital technologies also brings new sets of responsibilities and generates its new environmental and social challenges. In some ways, the increasing

adoption of digital technologies, which effectively enable retail customers, for example, to buy a wide range of clothes instantly, regardless of their location or the time of day at the touch of a button or key, might be seen to be the antithesis of sustainability. Not least because the data centres which drive the digital technologies, and on which they ultimately depend, are major energy users and, as such, contribute to greenhouse gas emissions and to global warming.

There are also thorny social issues about whose interests are best served by the digital technologies. Lobschat (2021, p. 879), for example, argued "the multisided natures of many markets for digital products and services makes the assessment of beneficence for all involved stakeholders so complex". More worryingly, Van der Merwe and AlAchkar (2022, webpage, para. 2) suggested that even when companies claim to have recognised their digital responsibilities, this can offer "corporations an opportunity to build a cover for unethical behaviours and practices", and the authors emphasised the need for "a comprehensive approach to ensure data are manged responsibly and protect customers".

Conclusions

This chapter has provided an exploratory narrative on how some of the leading players in the textile and clothing industry in the UK are publicly addressing sustainability, and the extent to which the circular economy and the digital technologies are contributing to such corporate policies and strategies. The findings reveal that while the majority of the selected companies have publicly addressed sustainability, albeit in varying measure, the companies have provided much less material in the public realm on the role of the circular economy and the digital technologies in facilitating corporate approaches to sustainability. Such approaches to sustainability embraced a wide range of environmental and social issues, including climate change and greenhouse gas emissions, energy, materials, water, biodiversity, waste, responsible sourcing, workers' remuneration working conditions and welfare, health and safety, diversity, equity and inclusion, local communities, and the United Nations' SDGs. That said, many of the selected companies' approach to sustainability can be seen to be aspirational and expectational. A minority of the selected companies emphasised their corporate commitment to the circular economy, and while some companies seemed to focus their approach to circularity principally in terms of waste management, some of the selected retail companies outlined their initiatives on recycling and reuse. The role of the digital technologies in promoting sustainability received little public attention from the selected companies.

More generally, the authors offered some wider critical reflections on the selected companies' approaches to sustainability, the circular economy and the digital technologies. and to the circular economy and to the digital technologies. Their reflections on sustainability focused on the different meanings of sustainability and the relative importance of business drivers vis-à-vis environmental and social sustainability drivers, the aspirational nature of many of the selected companies' approaches to sustainability and the spectre of greenwashing, the challenges of securing sustainability, and more specifically of safeguarding human rights and tackling modern slavery, within supply chains, and the tensions between sustainability and continuing business growth, centred, for example, on sustainable consumption and the structure of market economies. All these issues have

important implications for the textile and clothing industry as it looks to pursue the transition to a more sustainable future. In reflecting on the role of the circular economy in contributing to the selected companies' approaches to sustainability, the authors drew attention to the varied meanings of the concept, which effectively enables companies to define it to suit their own purposes without radically changing their traditional business models, and perhaps more tellingly, argued that corporate moves to adopt a comprehensive circular approach, would have major implications for consumers. Finally, the authors also argued that harnessing the digital technologies to contribute to sustainability had important environmental and social implications for corporate approaches to sustainability.

The chapter has several limitations, not least in that it is drawn exclusively from Internet sources, in that it involves the authors' selection from these sources, and that in offering a narrative of how the selected textile and clothing companies publicly addressed sustainability and how the circular economy and the digital technologies are contributing to those companies' approach to sustainability, it involves considerable generalisation. Nevertheless, the authors believe that the chapter not only offers a valuable exploratory picture of sustainability challenges and corporate strategies and measures to address these challenges within the UK's textile and clothing manufacturing industry, but that it may also provide a platform for future research. Future research agendas might, for example, include detailed empirical investigations into how major companies within the UK's textile and manufacturing industry, are looking to develop their sustainability strategies, and into if, how, and why, they are looking to adopt more circular business models and the digital technologies within their approach to sustainability. At the same time, research into UK consumers" perceptions of the nature and importance of sustainability within the textile and clothing industry, and into the extent to which consumers may be willing to change their patterns of textile and clothing buying behaviour in the of increasing awareness of the varied environmental and social challenges facing textile and clothing companies, may also pay dividends.

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