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Artificial Intelligence: Building Sustainability in the Implementation of SDGs

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Introduction

The fashion supply chain tends to use resources from developing countries where poverty and inequality have a significant impact on society and economic progress. Fast fashion has become synonymous with the fashion industry. Fast fashion production and delivery to market are

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swift; designs are changed to keep the flow of fashion items moving. Consequently, a fast fashion product's lifecycle is shortened, which could increase the risk of overproduction (Fletcher, 2010). This chapter will argue that fashion has negatively impacted the implementation of sustainable development goals (SDGs), especially SDG 5, gender equality, and SDG 1, no poverty, which has made economic growth in developing countries much slower than anticipated. However, the introduction of "slow fashion" could contribute to the achievement of no poverty and gender equality and concurrently improve economic growth (SDG 8). Slow fashion involves longer production lead times, the use of local materials, and a focus on sustainability and quality (Fletcher, 2007). One could view fast fashion through the prism of greed because more products are produced that lead to more sales that deliver ever-increasing profits. However, this is at the expense of workers' rights (leading to inequality) and exploitation (leading to poverty). Living better, designing better, and consuming better are the hallmarks of slow fashion; this approach requires designers, buyers, retailers, and consumers to do things differently. All the stakeholders understand the impact of fashion products on workers, communities, and ecosystems (Azemi & Ozuem, 2023; Fletcher, 2007). The main hypothesis of this chapter is that adopting a slow fashion approach could improve employment and economic conditions in emerging developing countries that have the fashion industry as their main industry. A supplementary hypothesis is that artificial intelligence (AI) could help to drive the fashion ecosystem to the slow fashion paradigm. Slow fashion is an attempt to counterbalance the negative impacts of fast fashion, and AI could help in achieving a new equilibrium in the fashion industry.

The topics in this chapter are the fashion industry, SDGs (economic growth, gender equality, and no poverty), supply chain and AI implementation, consumer behaviour in the slow fashion ecosystem, and models of societal behaviour, the last two sections are implications and conclusion.

Fashion Industry

A McKinsey & Company report (Balchandani et al., 2023) on the fashion industry suggested that storm clouds are gathering over the fashion industry, but it continues to do well. The luxury segment of the fashion industry continued to show strong growth in 2022 with a 36% rise in profit over 2021. Even the non-luxury fashion segments showed strong growth in 2022 leading to the fashion industry achieving at least double the growth it experienced in the period 2011–2020, except for one year.

According to the website FashionUnited, the largest retail markets globally are USA, China, United Kingdom, Germany, and Japan (FashionUnited, n.d.). The fashion industry faced many challenges in 2023, which included persistent slow growth in Europe and the USA throughout 2023. China maintained strong growth part of the year, but it faded towards year-end. The luxury fashion segment started well in 2023 but faded towards the end of 2023 due to weakening demand. The business environment in the fashion industry faced uncertainty, which led to slowing economic growth and a high level of inflation (compared to recent historical levels), which was persistent and led to weak consumer confidence. An improvement is predicted for 2024 with a top-line growth of 2 to 4%. The expectation is that the luxury fashion segment will have the strongest growth (3 to 5% globally). Fashion industry executives have cited geopolitical instability as the greatest impediment to growth with economic uncertainty and inflation the next biggest impediments to growth (Balchandani et al., 2023).

According to Balchandani et al. (2023), the themes for the 2024 fashion market include an unsettling global economic outlook with the major fashion markets facing economic headwinds, climate change issues, and changes in consumer attitudes, such as an increase in travel now the pandemic is in the rearview mirror, following new fashion brand influencers, and embracing a healthier lifestyle that will drive sales of outdoor clothing (gorpcore). The other themes identified were: the capturing of value in the fashion industry with the application of generative AI; competition from challengers such as Shein and Temu that are lowering prices and giving customers a new experience with increased

speed; an emphasis on brand marketing that fosters emotional connections with consumers to build long-term branding; sustainability as a driver that will end self-regulation for the fashion industry, and sustainability requirements that cross many jurisdictions and require changes to business models; and the bullwhip effect could resonate due to customers cutting back, which could lead to order volatility and unpredictability in supply chains. Strategic partnerships will add pressure to suppliers as retailers focus on brands and transparency.

According to Bhardwaj and Fairhurst (2010), fashion is under-researched, and researchers focus on quick or fast fashion in the research context of buyer–supplier relationships (Forza & Vinelli, 1996; Ozuem et al., 2023), role of the supplier in fast-moving fashion (Doyle et al., 2006), buyer behaviour (Bruce & Daly, 2006), and financial performance (Hayes & Jones, 2006). The lifecycle of fashion pre-1980s had four stages: introduction of a fashion product and adoption by leaders of fashion (fashion conscious); maturity, which was characterised by public acceptance leading to growth; the final stage was decline and obsolescence of the fashion (Bhardwaj & Fairhurst, 2010). There have been several major changes in the fashion industry since the pre-1980s. One of these changes was a reduction in the low-cost mass production and standardisation of product styles and the infrequent change of designs that characterised the 1980s (Brooks, 1979). The demise of the mass production of fashion led to consumers becoming more fashion conscious and more sensitive to style (Bailey, 2001). In response to fashion conscious consumers the fashion industry introduced colour and texture, which led to more co-ordination between outfits for women and some men (Donnellan, 1996). Fashion trends evolve with the change in seasons; this is considered a temporary phenomenon that is a cyclical process (Ozuem et al., 2024; Sproles, 1979). Increasing the variety of fashion apparel products in the market led to an increase in phases in the fashion season (Bhardwaj & Fairhurst, 2010); three to five mid-seasons put additional pressure on suppliers to deliver fashion items in smaller bundles with reduced lead times (Tyler et al., 2006).

Another major change in the fashion industry was the demise of several large retailers in the late 1980s, which increased competition

in the fashion industry (Barnes & Lea-Greenwood, 2006). Structural changes since the late 1980s include outsourcing of material and offshoring manufacturing to places with low-cost economies that have low labour costs (Bhardwaj & Fairhurst, 2010). The benefits of outsourcing were not necessarily complementary to streamlining because lead times were increased, diverse geographical supply chains impacted management of the supply chain on both the supply and retail side, and the import/export procedures were more complex (Bruce & Daly, 2006). The savings expected from outsourcing were a mirage that increased inventory costs and led to mark downs to shift the excess stock (Christopher et al., 2004). The shortcomings caused by the issues mentioned above forced more changes in the fashion industry, such as just-in-time techniques; from 1994 to 1995, the percentage of retailers implementing the just-in-time technique grew from 60 to 72% (Jones, 1995). Given the documented issues that arose from the introduction of fast fashion techniques, consumer behaviour is likely to change and the desire to purchase throwaway fashion apparel is likely to diminish, especially among younger generations.

Is the slow fashion paradigm an enabler to overcome some of the challenges and themes identified? How can slow fashion minimise the economic headwinds and geopolitical instability? Sustainability and unpredictability of fashion supply chain activities could be improved with a slow fashion approach that incorporates the SDGs that link to inequality and poverty. These topics will be returned to in the Implications section of the chapter.

SDG 8 Economic Growth, SDG 5 Gender Equality, and SDG 1 No Poverty

The politics of sustainability and innovation in the fast fashion industry will determine the success of SDGs in the fashion industry. The concepts of sustainability and innovation emerged simultaneously along parallel paths (Pérez-Bou & Cantista, 2023). The fashion industry's commitment to building a sustainable framework of social and economic success

needs to be underpinned by innovation in the fashion industry (Pérez-Bou & Cantista, 2023). Sustainability in the fashion industry requires national models of sustainability, such as the national innovation system proposed by Nelson and Rosenberg (1993). They identified important factors of innovation capacity: economic power by companies, the power of education and training, the power of politics, and the power of finance (Nelson & Rosenberg, 1993: 4).

Economic Growth (SDG 8)

The fashion industry is one of the most polluting industries in the world: textiles require high levels of water and raw materials, and they are a major contributor to greenhouse gases (EU, 2020).

Actions undertaken by two leading fashion companies towards achieving SDGs are discussed below.

Inditex

Inditex, in its 2022 annual report (Inditex, n.d.), specifically mentions sustainability in its organisational strategy. It bases sustainability on four pillars: unique fashion proposal, increasingly engaging shopping experience, extraordinary team, and sustainability and responsibility (Inditex, n.d.). The company claims it can adapt to changes in the marketplace or changes in fashion processes that may require a change in processes. Inditex states that a significant weight of geographical manufacturing is close to its headquarters in Spain and analysis of the locations they operate globally this is an accurate account. The customer experience is based on innovative technological stores with cutting-edge energy systems in prime locations around the world. Inditex makes the point that they employ 160,000 "passionate and curious people" that form an extraordinary team. How the firm interacts with the surrounding environment is described as sustainable and responsible. The outcome is quality fashion apparel at an attractive price. Inditex has also adhered to the United Nations Global Compact since 2001. Inditex SDG milestones include good health and well-being (SDG 3), gender equality

(SDG 5), decent work and economic growth (SDG 8), responsible consumption and production (SDG 12), climate action (SDG 13), and partnerships for the goals (SDG 17) (Inditex, n.d.).

H&M

The key economic and social goals for H&M include a reduction in carbon dioxide emissions by 2030 against a 2019 baseline, and net-zero emissions by 2030. Both goals are science-based targets. Products are designed with the circular economy in mind; H&M works in partnership with the Ellen MacArthur Foundation, which has a vision for a circular economy for fashion. H&M's aim is that by 2025 at least 30% of its source material is recyclable and, by 2030, 100% of commercial goods will be recyclable or sustainable. Another goal is to reduce packaging by 25% by 2025 using a 2018 baseline (it appears to be making very good progress on this metric) and to use 100% recyclable or sustainable packaging by 2030. In 2030, suppliers must be compliant with the ZDHC Manufacturing Restricted Substances List (there appears to be very good progress on this metric). Water goals include a reduction in absolute total freshwater use by 10% by 2025 using a 2022 baseline and a reduction in absolute total freshwater use by 30% by 2030 against a 2022 baseline. Fair and equal goals include an annual increase in percentage terms of female supervisors for Tier 1 suppliers (27%) and an annual increase in percentage terms for worker representation for Tier 1 suppliers (2022—63%) using a baseline 2022 (H&M Group, n.d.). Interestingly, SDG metrics are not explicitly assigned but one can deduce them from the website report.

Gender Equality (SDG 5)

SDG 5 is about gender and not sex, which is a biological process. The differences between men and women and gender are influenced by social status, religion, ethnicity, environment, and age (Pathania, 2017). Gender equality is a concept in which all genders have equal rights and

freedoms in all social settings, the work environment (salary ratio, gender ratio), education, and voting (Shastri, 2014).

The aim of SDG 5 is to end all forms of discrimination against women and girls; this includes ending violence, giving them access to sex health and reproductive health, ending child marriages, and sexual exploitation. Women must be more visible in society and enter all the spheres in society (Stuart & Woodroffe, 2016). Although gender inequality is decreasing, women still face challenges (Küfeoğlu, 2020). Gender equality is a universal issue; women and girls make up approximately 50% of the global population and consequently a significant part of the global population could face discrimination (UN Women, 2021).

No Poverty (SDG 1)

According to the World Bank, poverty is a significant lack in well-being (Malmberg Calvo et al., 2000). According to Haughton and Khandker (2009), well-being is concerned with monetary advantage, such as command over income or consumption. People experiencing poverty do not have an adequate level of income or consumption. People experiencing poverty do not have control over specific consumption, such as housing, food, and health quality. In a broad sense poverty is about individuals being able to function in society. Measuring poverty keeps its importance upfront. Interventionalist strategies can be applied to aid people experiencing poverty and the effectiveness of organisations' projects and policies to help them can be monitored and evaluated.

The fashion industry uses labour in developing countries and thus has direct responsibility for the level of poverty of its employees and their families. The effectiveness of the fashion industry's activities and policies to alleviate poverty is not necessarily directly included in its SDG metrics.

The drivers of poverty include globalisation, increasing population, inflation, economic crisis, and growth rates; all these drivers need to be continually confronted and SDG 1 is an aspirational goal (Küfeoğlu, 2020). Unfortunately, the drivers identified are not normally predictable. Individual countries can face economic issues; thus, global economic

issues are not always the cause of a country's poverty (Jolliffe et al., 2015). The eradication of poverty is a long-term objective which will be challenging to achieve even with the application of technology.

The SDG goal for no poverty includes income poverty and human deprivation in many dimensions, such as eradicating extreme poverty, universal primary education, getting rid of gender inequality in primary and secondary schooling, reducing infant mortality by two-thirds, reducing maternal mortality by three-quarters, universal access to reproductive health services, and the implementation of national sustainable strategies in every country (Haughton & Khandker, 2009).

Strategies to overcome poverty, according to the World Bank, include promoting opportunities for people experiencing poverty, such as giving them access to financial services, jobs, schools, sanitation, and skills. Another strategy is giving people living in poverty access to public services and market opportunities; however, access in this context requires political influence and requires people experiencing poverty to collaborate, which could lead to changes in governance and the removal of institutional barriers. The final strategy suggested by the World Bank is that people living in poverty need to be insulated from economic shocks, natural disasters, ill health, disability, and personal violence. Overall, a strengthening of democratic institutions and processes will help people experiencing poverty to progress and this will give them social mobility (Haughton & Khandker, 2009). A driver of reducing poverty is the adoption of the circular economy and sustainability strategies in general, particularly in the fashion industry.

Supply Chain and AI to Implement SDGs and Build Sustainability

Some consider generative AI to be beneficial but dangerous and that the benefits outweigh the dangers. Bengel (2020), Elon Musk, Stephen Hawkins, and Bill Gates have warned that AI could increase global poverty and that it is a threat to humankind. The acceptance of AI is based on multiple and interrelated variables that are classified into five

significant dimensions: organisational, individual, financial, technological, and societal.

Artificial general intelligence (AGI) has the potential to displace jobs on a mass scale and it could have a more significant impact on job losses than generative AI (also known as narrow AI). AGI could have a significant effect on the following SDGs: SDG 1 (no poverty), SDG 9 (industry, innovation, and infrastructure), SDG 8 (decent work and economic growth), and SDG 10 (reduced inequalities). AGI could have the greatest impact on developing countries that have few social rights: labour rights and employment protection (Goralski & O'Connor, 2020).

Not all researchers agree that AGI will be a panacea; some think that AGI could cause an increase in income inequality (SDG 10). The use of AGI will be concentrated in developed countries and not equally distributed globally. It is unlikely the developers of AGI will distribute it equally. Thus, the wealth will be concentrated in countries that have access to AGI, which is generally not developing countries (Goralski & O'Connor, 2020).

AI has been used to benefit SDG projects, such as the application of AI to manage water management systems (smart water management). AI achieves this by mimicking human decision-making on investments in water management infrastructure (Hill, 2018). Another application of AI is in agriculture, for example, the PlantVillage project focuses on bringing AI benefits to small farmers who farm 2 hectares or less, which is the "standard size" for farms in developing countries (Lohr, 2018); "in low-income countries that lack human capital in fields like agricultural science, there is an opportunity to use AI to help break the cycle of poverty" (Hughes, 2018, as cited in Lohr, 2018: 5). The final example is AI and sanitation and health (Datafloq, 2018); a critical problem for the world, including developing countries, is testing and confirming that water is clean, which requires expensive test equipment and analysis of the data that is carried out manually. PeterMa a software innovator at Intel has developed an algorithm that uses pattern recognition and machine learning to detect bacteria.

The examples discussed demonstrate that AI can be harnessed by the developed world and shared with the developing world to decrease inequality and improve productivity, which would lead to a reduction in poverty.

Consumer Behaviour—Perception of Sustainability of Fast Fashion

Times have changed from the past decade to the present; sustainability and ethical conduct are now more important and have more prominence in the fashion industry than they did before (Emberley, 1998; Moisander & Personen, 2002). Sustainability is often linked to social corporate responsibility (Aguilera et al., 2007). Seidman (2007: 58) stated that "sustainability is about much more than our relationship with the environment; it's about our relationship with ourselves, our communities, and our institutions". Joy et al. (2012: 274) opined that "sustainability involves complex and changing environmental dynamics that affect human livelihoods and well-being, with intersecting ecological, economic, and sociopolitical dimensions, both globally and locally". The fashion supply chain has global reach, which leads to fragmentation that results in complexity, which in turn leads to a lack of transparency in the industry (Mihm, 2010; Partridge, 2011).

Fast fashion is at a crossroads; thus, sustainability and fast fashion are in conflict. Is modifying fashion to slow fashion enough? H&M's and Zara's fashion product cycle from catwalk to consumer is a mere few weeks, previously it was six months, which heightens profitability (Tokatli, 2008). To keep customers coming back, retailers source new trends and purchase them on a weekly basis to introduce new fashion items and to replenish existing stock (Tokatli & Kizilgun, 2009). The exclusiveness of fashion is lost, and mass exclusiveness replaces it (Schrank, 2004). Is this not a contradiction of exclusiveness in fashion style? Mass production of fashion leads to higher volumes and lower unit costs and increasing profitability. In addition, fashion retailers such as Zara use Turkey to make fashion items instead of China due to the faster manufacturing turnaround from Turkey: shipping from China takes three weeks and from Turkey five days (Tokatli, 2008). To sustain fast fashion requires high disposable incomes or ready availability of credit; this can lead to immediate self-gratification and temporary self-identification (Bauman, 2005). However, fast fashion retailers are facing a backlash from consumers. Joy et al. (2012: 277) stated, "consumers are

also aware that individual consumption fosters organizational production, creating an ongoing cycle of appetite, simultaneously voracious and insatiable". According to Binkley (2008), anti-consumerism encompasses a multitude of ethical and political positions and is a mediator in consumer choice at an everyday level through a critical discourse of the market. Binkley's (2008) comments suggest anti-consumer sentiment is an influencer on consumer behaviour and product decision-making.

Joy et al. (2012) employed a methodology to examine subconscious metaphors and combined interviews with Zaltman Metaphor Elicitation Technique to access subliminal thoughts (Zaltman, 1997). Their research took place in Hong Kong and Canada. Joy et al.'s (2012) findings suggest that consumers in Hong Kong and Canada showed concern for the environment and the social impact of non-fashion items, but this concern did not extend to fashion items. Thus, social and environmental considerations influence decision-making for non-fashion items but not for fashion items. Thomas (2008: 525) defined ethical fashion as "the positive impact of a designer, a consumer choice, a method of production as experienced by workers, consumers, animals, society, and the environment". The contradiction with the findings of Joy et al. (2012) is unsurprising and is like the findings on consumer values (Moisander & Personen, 2002). The themes that dominate the research of Joy et al. (2012: 281) are "speed and style at low cost" and "disposability and limited durability". These themes enable consumers to constantly change their identity.

The "speed and style at low cost" theme is linked to consumers wanting to look different in a fashion context and consumers do not want to wait. One respondent likened it to fast food restaurants that are visited once a week and where customers do not want to wait. Another respondent related the theme to Flash Gordon—gone in a flash. Fast fashion is seen as cheap chic. The "disposability and limited durability" theme set expectations that fashion apparel will only last a few washes and this concept was implanted by the fashion retail industry that suggests garments will last for at least 10 washes (Joy et al., 2012).

Joy et al.'s (2012) analysis of luxury fashion identified three fashion themes: desire/dream, history/heritage, and elegance/art. Fast fashion allows dreams of luxury to come true according to one participant. Style

is achievable even if the quality is not the best. Even if the beauty and elegance of the fashion item is not as good as the "real" thing, at least consumers can afford the item. Luxury fashion product ownership is an aspiration according to the participants. The history/heritage of luxury fashion products is aspirational and, thus, participants showed a sense of pragmatism. The participants understood that fast fashion products are substitutes for luxury fashion products. The theme of elegance and art was discussed by one participant in the context of pearls that give a feeling of luxury, because pearls are elegant, bright, luminous, expensive, and gloriously beautiful.

The findings from research will have profound implications for sustainability in the fashion industry. Consumers around the world understand the implications of environmental issues but, in the words of Bonini and Oppenheim (2008: 56), "when it comes to actually buying green goods, words and deeds often part ways". Clark (2008: 428) was of the opinion that slow fashion could be a way to get consumers to apply ethical fashion (eco-fashion) ideas to fast fashion decision-making and not just other consumables by emphasising the fashion "buzz" (what is seen and heard). Joy et al. (2012: 291) opined, "However, the promise is evident, provided the focus is shifted from fashion as image, to the materiality of fashion".

Models of Societal Behaviour

Unprecedented changes in the global environment due to climate change leading to global warming require a rethink of the fashion industry's business models. According to Islam and Iyer-Raniga (2023), the circular economy offers some radical and innovative approaches to energy and material reduction and taking care of people and business. Incorporating the ideas of a circular economy into a business model is an appropriate direction of travel to get the best of all worlds (environment, social, and business); it would convert a linear economy into a circular business model (CBM).

Many definitions of the circular economy exist, such as "the core of circular economy is the circular (closed) flow of materials and the use of

raw materials and energy through multiple phases" (Yuan et al., 2006: 5). Furthermore, Bocken et al., (2016: 309) categorised the characteristics of a circular economy as "design and business model strategies [that are] slowing, closing, and narrowing resource loops". The final definition given here is by the Ellen MacArthur Foundation (2013: 23):

> 'circular economy' denotes an industrial economy that is restorative by intention and design. In addition to meeting current demand/consumption needs, a circular economy also actively invests in improving resource systems and increasing their resilience to ensure their continuing availability in the future. In short, it replaces a throughput- and efficiency-driven view that ultimately degrades capital with one where capital rebuilding and maintenance offers an upward spiral or virtuous cycle, and a continuous flow of materials and products. In a circular economy, agricultural practices aim at optimising yields while also improving the quality of soil, water, and air. It views the long-term health of our agricultural systems as our best chance for long-term performance.

The CBM tool originally only applied circular economy strategies (Geissdoerfer et al., 2020) and was not underpinned with theory (Islam & Iyer-Raniga, 2023). According to Islam and Iyer-Raniga (2023), revamping of the CBM by Geissdoerfer et al. (2020) included several theories; these theories are discussed below.

The CBM reflects theories on customers' needs and wants and how business can meet them and do it profitably (Teece, 2007). Another underpinning theory is that the business model emphasis is on the value proposition, which identifies the appropriate technology and features, and the target market segments that help to define value chain activities; thus, it identifies potential costs and profit (Chesbrough & Rosenbloom, 2002). CBM is discussed by many researchers in the context of sustainability-related business models that support the development of frameworks on circular and sustainability models; this approach leads to innovation in business model theory (Cardeal et al., 2020; Giourka et al., 2019). Lewandowski (2016) considered the circular economy an important concept in the development of business model theory. However, sceptics such as Nußholz (2017) disagreed that resources efficiency theory can be implemented in CBM. There are gaps in our

understanding of what makes a business circular (Islam & Iyer-Raniga, 2023).

The building blocks of sustainable CBM frameworks are varied and many CBM and sustainable CBM frameworks exist. The Triple Bottom Line Business Model Canvas is a sustainable CBM; its purpose is to provide a unified business model that focuses on social, economic, and environment dimensions (Joyce & Paquin, 2016). The Circular by Design model is a circular economy-related model that focuses on circular design and product/process with an emphasis on the lifecycle (Ballie & Woods, 2018). Mentink (2014) developed the Circular Business Model Innovation framework that is based on the business model canvas to aid development of circular supply chains. The sustainability attributes of the circular economy business model canvas (Pollard et al., 2023) are in the dimensions of social responsibility and eco-design within logistics and distribution with consideration of skills and training. The business models described in this section focus on sustainability (Joyce & Paquin, 2016) or a circular economy (Mentink, 2014), but some focus on both (Pollard et al., 2023).

Implications

The fashion industry has been affected by recent events in the global business environment, such as geopolitical tensions in the Middle East and Ukraine, the cost of living, and slowing or stationary economic growth. The fashion industry is not immune to these environmental changes that have proved not to be transitionary. Changes in the fashion industry, as discussed in this chapter, have not mitigated the current global economic performance but the headwinds are starting to abate. Over-reliance on a fast fashion paradigm that appears to thrive in economies that are not experiencing economic and political headwinds requires a different approach from all industries, especially the fashion industry. How to future proof the global fashion industry when substantial economic and geopolitical storms occur is a pressing problem.

The ready to wear fashion ecosystems give fast fashion retailers the ability to gain profitably because of the competitive advantages that

the retailers can accrue. How long can the low-cost and disposable fast fashion industry exist without eventually harming fashion retailers' profitability and exacerbating environmental concerns that will manifest in global climate warming and potentially scar the world permanently. Will environmental concerns lead consumers to apply the constructs of ethical fashion (eco-fashion) not only to other products but also to the fashion industry? Sustainability does not always get the airing it should and not all fast fashion retailers put the same amount of focus and emphasis on sustainability one would expect (e.g. H&M versus Inditex).

Fast fashion's approach of feeding consumers products weekly will likely lead to consumer fatigue. Fatigue could exhibit itself due to global economics and geopolitical situations, which impact fashion supply chains or cause economic havoc for consumers. The global cost of living crisis that started in 2021/22 has cut living standards, which has led to less global disposable income. There is also the anti-consumerism brigade, which started with Gen Z but is spreading across other generations; it is also likely to add to the woes of the fast fashion industry. Furthermore, not all fashion retailers are comprehensively embracing sustainability, which could lead to pressure from consumers to change (Pérez-Bou & Cantista, 2023). Fashion firms need to put the SDGs front, centre and back of their strategy and ensure they influence the decision-making process. The context of the fashion industry must change from economic profitability to sustainability that is tangible and visible, if fashion is not to be accused of greenwashing. Sustainability and innovation are inextricably linked to improving economic growth, which leads to improving profitability; these are the reasons for the fashion industry to harness the opportunities provided by sustainability and innovation. Applying innovation and sustainability ingenuity will increase profits and, at the same time, not damage consumer trust and confidence in the industry, with accelerating price increases to compensate for the "alleged" additional costs of implementing sustainability techniques and policies.

How to the change the industry context is a real challenge for the industry. Two recommendations are suggested in this chapter: a social contract between developed countries and developing countries based

on the new business models (models of societal behaviour) in the deployment and implementation of AI. The second recommendation is that the fashion industry changes radically to move to a slow fashion approach. These recommendations are discussed below.

The characteristic of fast fashion is to persuade consumers that fashion style is everything and it is a substitute for aspirational fashion brands (Joy et al., 2012). Is this akin to brainwashing leading to manipulation of fashion consumers? To afford the increasing rapid changes in style requires increasing disposable income or to be eligible for credit using options such as buy now pay later. Is this a sustainable proposition for fashion consumers? The reverse of fast fashion is slow fashion. The idea of slow fashion originated in Italy in response to the imagery of fast fashion (Fletcher, 2007). The concept of slow fashion is not to literally slow fashion down the fashion supply chain; the purpose of slow fashion is to develop holistically a sustainable supply chain process to include design, transparent production sourcing, and consumer education (Clark, 2008; Fletcher, 2010), which would lead to less consumption and less waste (Hall, 2018). Slow fashion characteristics include understanding the impact of fashion on communities and ecosystems, and increased awareness of how fashion items are produced with the possibility to have experiential contact with the production process (Hall, 2018). Slow fashion is an evolving object and its business model has various names, "…terms, such as sustainable new, eco fashion, ethical fashion, locally made, vintage and second-hand, under one unified movement" (Cataldi et al., 2013: 24). The slow fashion approaches challenge existing approaches based on the fast fashion concept. These challenges are identified below (Clark, 2008: 429):

> These slow approaches: • challenge existing hierarchies of "designer," "producer," and "consumer;" • question the notion of fashion being concerned exclusively with the "new;" • challenge fashion's reliance on image; • present fashion as a choice rather than as a mandate; • highlight collaborative/cooperative work—providing agency especially to women.

The change to a slow fashion approach requires a cultural change in the fashion industry, the fashion retailers, and the fashion consumers. To

successfully implement a slow fashion approach requires the fast industry to lead, if not then Gen Z and other generations will become an enabler of change. Change identifies new opportunities and new competitors that see the future as slow fast, which could displace the fast fashion retailers, especially with the harnessing of AI making it more probable than less.

The implementation of slow fashion requires a social contract between the developed and developing countries to engage in, and encourage, sustainability holistically and particularly in the fashion industry. What is the social contract going to look like? It must treat the developing countries as equals despite most of the funding coming from the West and developed countries. The social contract needs to be underpinned by models similar to those identified in the section "Models on societal behaviour". Stakeholders in the social contract should include governments, society, businesses (wider businesses), consumers, non-governmental organisations, charities, fashion suppliers, fashion retailers, the press, and online influencers. The greater the stakeholders' representation, the more likely the contract will be implementable. The social contract would issue in a wind of change in the fashion industry that focuses on sustainability and not exclusively on profitability (obviously, profit is a necessary requirement but how it is made is also a consideration in the social contract). Implementation of the social contract will help to overcome the scepticism of the circular economy from some stakeholders. The use of emerging technologies, such as blockchain and AI, has many benefits for the fashion industry, such as dealing with fake brands, mitigating fraud, and traceability in the supply chain. However, some of the other applications of blockchain and AI are not applied in the fashion industry, such as building a social relationship between supplier and buyer. The developing countries will have to resist the concentration of technology in the West and developed countries. The need to share technology competences will be necessary, but this could be challenging. Leveraging technology give businesses a competitive advantage, which they are reluctant to share. Otherwise, the benefits of slow fashion will not be fully realised, and sustainability will become further away. However, the fashion industry needs to embrace sustainability models and develop strategies that incorporate them at all levels of the

organisation. Integrating sustainability models into the strategic planning and business decision-making processes is a challenge for the fashion industry, but one it needs to accept, so that it can work towards a solution for the good of society and all stakeholders.

To reduce poverty and inequality in developing and developed countries requires a social contract implemented by government and organisations with people experiencing poverty. This will require the strategies identified by the World Bank being championed and implemented by organisations that rely on developing countries to underpin and drive their economy, which is virtually all the developed countries. The fashion industry relies heavily on supply chains that extend to developing countries. Moving to a slow fashion approach will require a social contract with the developing countries that is implemented fairly and ethically. Implementation of the social contract will require the fashion industry to shift to new business models where sustainability and the circular economy are central to the way business is done. Poverty and inequality could be diminished to an extent that developing countries level up to a better quality of life for a vast majority of the population. Technology will aid improvement in tackling inequality and poverty, and support economic growth, but technology will require the participation of society to eradicate inequality and poverty, which requires a binding social contract.

Conclusion

The fashion industry is at a crossroads due to geopolitical and economic circumstances, which have impacted global economic growth and led to fashion consumers to retract their spending habits and at least temporarily change their behaviour. The challenge for the fashion industry is to make the changes in consumer behaviour permanent, but in the context of a fashion industry that identifies with innovation and sustainability. How can slow fashion minimise the economic headwinds and geopolitical instability that afflict the fashion industry? Is the slow fashion paradigm an enabler to overcome some of the challenges and themes identified? These are questions that require further

research. However, the view of the researchers is that AI, sustainability, and innovation in a culture that embraces slow fashion and truly implements SDGs can minimise the unpredictability of fashion supply chain activities. To ensure that SDGs on no poverty and inequality in the developing world are achieved requires a social contract between the "haves" and the "have nots"; this approach requires the distribution of AI technology from the developed countries to the developing countries. Will developed countries continue to concentrate technology in the West and developed countries or share it for all of humankind?

References

Aguilera, R. V., Rupp, D. E., Williams, C. A., & Ganapathi, J. (2007). Putting the S back in corporate social responsibility: A Multi-level theory of social change in organizations. *Academy of Management Review, 32*(3), 836–863.

Azemi, Y., & Ozuem, W. (2023). How does retargeting work for different Gen Z mobile users? *Journal of Advertising Research*, 2023-023. https://doi.org/10.2501/jar-2023-023

Bailey, T. (2001). Organizational innovation in the apparel industry. *Industrial Relations, 32*(1), 30–48.

Balchandani, A., Starzynska, E., Barrelet, D., Berg, A., D'Auria, G., Rölkens, F., & Amed, I. (2023, November 29). *The state of fashion 2024: Findings pockets of growth as uncertainty reigns*. McKinsey & Company. https://www.mckinsey.com/industries/retail/our-insights/state-of-fashion. Accessed 17 March 2024.

Ballie, J., & Woods, M. (2018). Circular by design: A model for engaging fashion/textile SMEs with strategies for designed reuse. In R. Crocker, C. Saint, G. Chen, & Y. Tong (Eds.), *Unmaking waste in production and consumption: Towards the circular economy* (pp. 103–121). Emerald Publishing Limited, Leeds. https://doi.org/10.1108/978-1-78714-619-820181010

Barnes, L., & Lea-Greenwood, G. (2006). Fast fashioning the supply chain: Shaping the research agenda. *Journal of Fashion Marketing and Management, 10*(3), 259–271.

Bauman, Z. (2005). *Liquid life*. Polity Press.

Bengel, D. (2020). *Organizational acceptance of artificial intelligence*. Springer.

Bhardwaj, V., & Fairhurst, A. (2010). Fast fashion: Response to changes in the fashion industry. *The International Review of Retail Distribution and Consumer Research, 20*(1), 165–173.

Binkley, S. (2008). Liquid consumption. *Cultural Studies, 22*(5), 599–623.

Bocken, N. M. P., de Pauw, I., Bakker, C., & van de Grinten, B. (2016). Product design and business model strategies for a circular economy. *Journal of Industrial and Production Engineering, 33*(5), 308–320. https://doi.org/10.1080/21681015.2016.1172124

Bonini, S., & Oppenheim, J. (2008). Cultivating the green consumer. *Stanford Social Innovation Review,* Fall, 56–61.

Brooks, J. (1979, November 12). A friendly product. *The New Yorker*, 58–94. Accessed 24 March 2024.

Bruce, G., & Daly, L. (2006). Buyer behavior for fast fashion. *Journal of Fashion Marketing and Management, 10*(3), 329–344.

Cardeal, G., Höse, K., Ribeiro, I., & Götze, U. (2020). Sustainable business models–canvas for sustainability, evaluation method, and their application to additive manufacturing in aircraft maintenance. *Sustainability, 12*, 9130.

Cataldi, C., Dickson, M., & Grover, C. (2013). Slow fashion: Tailoring a strategic approach for sustainability. In M. Gardetti & A. Torres (Eds.), *Sustainability in fashion and textiles: Values, design, production and consumption* (pp. 22–46). Greenleaf.

Chesbrough, H., & Rosenbloom, R. S. (2002). The role of the business model in capturing value from innovation: Evidence from Xerox Corporation's technology spin-off companies. *Industrial and Corporate Change, 11*, 529–555.

Christopher, M., Lowson, R., & Peck, H. (2004). Creating agile supply chains in the fashion industry. *International Journal of Retail and Distribution Management, 32*(8), 367–376.

Clark, H. (2008). Slow + fashion—An oxymoron—Or a promise for the future? *Fashion Theory, 12*(4), 427–446.

Datafloq. (2018, May 7). *AI-driven test system detects bacteria in water*. Intel. https://datafloq.com/read/ai-driven-test-system-detects-bacteria-in-water/. Accessed 2 April 2024.

Donnellan, J. (1996). *Merchandise buying and management*. Fairchild Publications.

Doyle, S. A., Moore, C. M., & Morgan, L. (2006). Supplier management in fast moving fashion retailing. *Journal of Fashion Marketing and Management, 10*(3), 272–281.

Ellen MacArthur Foundation. (2013). Towards the circular economy: Opportunities for the consumer goods sector TCE_Report-2013.pdf (ellenmacarthurfoundation.org). Accessed 29 March 2024.

Emberley, V. (1998). *Venus and Furs: The cultural politics of Fur*. I. B. Tauris & Co.

FashionUnited. (n.d.). *Global fashion industry statistics*. FashionUnited. https://fashionunited.com/global-fashion-industry-statistics. Accessed 16 March 2024.

Fletcher, K. (2007). Slow fashion. *The Ecologist, 37* (5). Slow fashion (theecologist.org). Accessed 17 March 2024.

Fletcher, K. (2010). Slow fashion: An invitation for systems change. *Fashion Practice, 2*(2), 259–266.

Forza, C., & Vinelli, A. (1996). An analytical scheme for the change of the apparel design process towards quick response. *International Journal of Clothing, 8*(4), 28–43.

Geissdoerfer, M., Pieroni, M. P., Pigosso, D. C., & Soufani, K. (2020). Circular business models: A review. *Journal of Cleaner Production, 277*, 123741.

Giourka, P., Sanders, M. W., Angelakoglou, K., Pramangioulis, D., Nikolopoulos, N., Rakopoulos, D., Tryferidis, A., & Tzovaras, D. (2019). The smart city business model canvas—A smart city business modeling framework and practical tool. *Energies, 12*(24), 4798.

Goralski, M., & O'Connor, M. (2020). Artificial intelligence and sustainable development. *The International Journal of Management Education, 18*(1), 1003. https://doi.org/10.1016/j.ijme.2019.100330

Hall, J. (2018). Digital Kimono: Fast fashion, slow fashion? *Fashion Theory, 22*(3), 283–307. https://doi.org/10.1080/1362704X.2017.1319175

Haughton, J., & Khandker, S. R. (2009). *Handbook on poverty + inequality*. World Bank.

Hayes, S. G., & Jones, N. (2006). Fast fashion: A financial snapshot. *Journal of Fashion Marketing and Management, 10*(3), 282–300.

Hill, T. (2018, March 5). *How artificial intelligence is reshaping the water sector*. Water Finance & Management. Retrieved from How Artificial Intelligence is Reshaping the Water Sector - Water Finance & Management (waterfm.com). Accessed 2 April 2024.

H&M Group. (n.d.). *Annual and sustainability report 2022*. H&M Group. https://hmgroup.com/about-us/. Accessed 25 March 2024.

Inditex. (n.d.). *Inditex annual report 2002*. Inditex. Accessed 25 March 2024.

Islam, M. T., & Iyer-Raniga, U. (2023). Circular business model value dimension canvas: Tool redesign for innovation and validation through an

Australian case study. *Sustainability, 15*, 11553. https://doi.org/10.3390/su15151155

Jolliffe, D., Lanjouw, P., Chen, S., Kraay, A., Meyer, C., Negre, M., Prydz, E. B., Vakis, R., & Wethli, K. (2015). *A measured approach to ending poverty and boosting shared prosperity: Concepts, data, and the twin goals, policy research report*. World Bank Group.

Jones, J. (1995). Forces behind restructuring in US apparel retailing and its effect on the US apparel industry. *Industry, Trade, and Technology Review*, March 23–30.

Joy, A., Sherry, J. F., Jr., Venkatesh, A., Wang, J., & Chan, R. (2012). Fast fashion, sustainability, and the ethical appeal of luxury brands. *Fashion Theory, 16*(3), 273–295. https://doi.org/10.2752/175174112X13340749707123

Joyce, A., & Paquin, R. L. (2016). The triple layered business model canvas: A tool to design more sustainable business models. *Journal of Cleaner Productivity, 13*(5), 1474–1486.

Küfeoğlu, S. (2020). Emerging technologies: Value creation for sustainable development. *Springer*. https://doi.org/10.1007/978-3-031-07127-0

Lewandowski, M. (2016). Designing the business models for circular economy—Towards the conceptual framework. *Sustainability, 8*, 43.

Lohr, S. (2018). From agriculture to art—The AI wave sweeps in. *New York Times*, Business Day. Retrieved from https://www.google.com/search?client=firefox-b-d&q=Agriculture+to+Art+—+the+A.I.+Wave+Sweeps+In+-+The+New+York+Times+(nytimes.com). Accessed 2 April 2024.

Malmberg Calvo, C., Das Gupta, M., Grootaert, C. N., Kanbur, R., Kwakwa, V., & Lustig, C. (2000). *World development report 2000–2001: Attacking poverty—Overview.* World Development Report, World development indicators. World Bank Group. http://documents.worldbank.org/curated/en/673161468161371338/World-development-report-2000-2001-attacking-poverty-overview

Mentink, B. (2014). *Circular business model innovation: A process framework and a tool for business model innovation in a circular economy*. Master's Thesis, Lahti University of Technology, Lappeenranta, Finland.

Mihm, B. (2010, June). Fast fashion in a flat world: Global Sourcing strategies. *International Business and Economics Research Journal, 9*(6), 55–63.

Moisander, J., & Personen, S. (2002). "Narratives of sustainable ways of living: Constructing the self and others as a green consumers. *Management Decisions., 40*(4), 329–342.

Nelson, R. R., & Rosenberg, N. (1993). Technical innovation and national systems. In R. R. Nelson (Ed.), *National innovation systems—A comparative analysis*. Oxford University Press.

Nußholz, J. L. (2017). Circular business models: Defining a concept and framing an emerging research field. *Sustainability, 9*(18).

Ozuem, W., Ranfagni, S., Willis, M., Salvietti, G., & Howell, K. (2024). Exploring the relationship between chatbots, service failure recovery and customer loyalty: A frustration–aggression perspective. *Psychology and Marketing*. https://doi.org/10.1002/mar.22051

Ozuem, W., Willis, M., Ranfagni, S., Howell, K. E., & Rovai, S. (2023). Examining the role of social media influencers in service failure and recovery strategies: An empirical investigation of millennials' views. *Information Technology & People*. https://doi.org/10.1108/itp-05-2022-0371

Partridge, D. J. (2011). Activist capitalism and supply chain citizenship: Producing ethical regimes and ready-to-wear clothes. *Current Anthropology, 52*(S3), S97–S111.

Pathania, K. (2017). Sustainable development goal: Gender equality for women's empowerment and human rights. *International Journal Research, 5*(4), 72–82. https://doi.org/10.29121/granthaalayah.v5.i4.2017.1797

Pérez-Bou, S., & Cantista, I. (2023). Politics, sustainability and innovation in fast fashion and luxury fashion groups. *International Journal of Fashion Design, Technology and Education, 16*(1), 46–56.

Pollard, J., Osmani, M., Grubnic, S., Díaz, A. I., Grobe, K., Kaba, A., Ünlüer, Ö., & Panchal, R. (2023). Implementing a circular economy business model canvas in the electrical and electronic manufacturing sector: A case study approach. *Sustainable Production and Consumption, 36*, 17–31.

Schrank, A. (2004). Ready to wear development? Foreign investment, technology transfer, and learning by watching in the apparel trade. *Social Forces, 83*(1), 123–156.

Seidman, D. (2007). *How we do anything means everything*. John Wiley & Sons.

Shastri, A. (2014). Gender inequality and women discrimination. *IOSR Journal of Humanities and Social Science, 19*, 27–30. https://doi.org/10.9790/0837-191172730

Sproles, G. (1979). *Fashion: Consumer behaviour toward dress*. Burgess Publishing Company.

Stuart, J., & Woodroffe, J. (2016). Leaving no-one behind: Can the sustainable development goals succeed where the millennium development goals lacked? *Gender Development, 24*, 69–81. https://doi.org/10.1080/13552074.2016.1142206

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and micro-foundations of (sustainable) enterprise performance. *Strategic Management Journal, 28*, 1319–1350.
Thomas, S. (2008). From "Green Blur" to eco fashion: Fashioning an eco-Lexicon. *Fashion Theory, 12*(4), 525–540.
Tokatli, N. (2008). Global sourcing insights from the clothing industry: The case of Zara, a fast fashion retailer. *Journal of Economic Geography, 8*, 21–38.
Tokatli, N., & Kizilgun, O. (2009). From Manufacturing garments for ready to wear to designing collections: Evidence from Turkey. *Environment and Planning, 41*, 146–162.
Tyler, D., Heeley, J., & Bhamra, T. (2006). Supply chain influences on new product development in fashion clothing. *Journal of Fashion Marketing and Management, 10*(3), 316–328.
UN Women. (2021). *United Nations women, sustainable development goal 5: Gender equality*. UN Women. https://www.unwomen.org/en/news/in-focus/women-and-the-sdgs/sdg-5-gender-equality. Accessed 20 April 2024.
Yuan, Z., Bi, J., & Moriguichi, Y. (2006). The circular economy: A new development strategy in China. *Journal of Industrial Ecology, 10*(1–2), 4–8.
Zaltman, G. (1997). Rethinking market research: Putting people back in. *Journal of Marketing Research, 34*(4), 424–432.