

A CRITICAL REVIEW ON THE NEED FOR SUSTAINABLE DESIGN SOLUTIONS IN GLOBAL GARMENT INDUSTRY

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ABSTRACT

Environmental health has seen a consistent downtrend over the last few centuries with severe implications on people's health and overall societal welfare. While the apparel industry has made large developmental strides in the years gone by, it has come at the cost of many environmental and social effects. The mountain of waste left behind by the apparel industry after each production cycle, as well as the use of dangerous chemicals and non-renewable resources, are just a few of the significant issues that require immediate attention. One of the key reasons why these challenges have become even more pronounced now is the rising consumption of garments owing to higher disposable income which in turn has created massive production demand. So, while we look at how the production process can be made cleaner, it is equally important to understand how these garments are getting discarded once they reach the end of utility for the buyer.

Recycling and reusing garments is definitely a low hanging fruit owing to the increased awareness of environmental concerns in customers and their willingness to take steps to address it given the impacts it can have on their health. This is evident from the changing consumption patterns that are being recorded. There have been studies analyzing the impact of fashion on consumers, mainly focusing on disposal of clothes to study the waste generated by this industry. But not much research has been done to understand consumers' approach towards apparels and their choice of disposal methods. This study aims to review the existing design movement towards sustainability and longevity.

KEYWORDS: *Sustainable Design, Garment Life Span & Product Longevity*

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INTRODUCTION

Globalization has accelerated the social and economic development of the world, but it has come at the cost of impacting the environment in negative ways. The deterioration of the environment has become a major concern in recent decades, with implications for both human well-being and the environment (Boeve-de Pauw & Van Petegem, 2011). Actions are now required to solve the challenge of the global ecological disaster. According to McDonough and Braungart (2013), an individual must not only properly reuse and recycle resources, but also recover the environment, the place where we live, and every one of us must protect the globe from the costs of irresponsible human behavior.

Consumer garments have gotten inexpensive in recent years (Rivoli, 2005). Offshore manufacturing has allowed for cheaper clothes to be made in higher volume, allowing for more utilization. As a result, the apparel industry is focusing on mass production, leading to apparels being sold at very low prices, even those of the latest

trends. This in turn is encouraging consumers to buy more than they need. There is an increase in demand for yard goods from consumers who regard garments as a way to distinguish their personality (Jackson, 2). There is concern regarding how consumers dispose of their clothing, as the constant shift in design leads to overconsumption of clothing styles and underutilization of some items that will only be worn a few times (Birtwistle & Moore, 2007). Each stage, from material manufacturing to clothes disposal, adds to worrying environmental effects. Fibers and fiber-containing commodities are widely consumed in our daily life. Interior and home textiles, apparel, and industrial and technical textiles are the three types of end-use commodities. The garment sector, as a significant user of these fibers, is contributing to this problem in a variety of ways (Allwood C. K., 2006).

According to the survey, people are purchasing one-third more clothing now than they were four years ago. (K. Fletcher, 2009) Consumer behavior that is friendly to the environment can help to address the problem of excessive pollution created by the use of clothes and textiles. Consumers are designated as one target group in most governmental and intergovernmental environmental projects.

NEED FOR SUSTAINABILITY

In the last 60 years, fashion production has grown at an exponential rate, combining mass-market concerns about rapidly changing trends and product turnover (Farrer, 2011). The ability to provide diversity to a customer used to be a competitive advantage, as it met consumers' perceived requirements and originally resulted in a growing profit margin. These mass-market techniques have now become an albatross of costly waste and excess, resulting in the fashion industry becoming ensnared in a succession of harmful ecological practices in the name of unsustainable economic profit (Kunz & Garner, 2011). To make up the difference between what clothing costs to make and what buyers want to pay for their clothing, manufacturers and fashion corporations rely on cheaper fabric (sometimes manufactured in ways that pollute or inefficiently utilize resources) and minimal labor outlay. As a result, a waste loop is generated, with an increasing variety of poorly manufactured garments being swiftly abandoned, leading to increased consumption of low-cost goods (Farrer, 2011). For secondhand apparel, the abandoned inexpensive goods damage Third World countries, suffocating local economy or ending up in landfills (Hawley, 2011).

Long-term sustainability has been hampered by excessive consumption and fast disposal of trendy products. Many fast fashion businesses focus on producing low-cost, low-quality goods. As a result, people are increasingly buying low-cost, low-quality products. These goods usually have a shorter lifespan. This concept paper's purpose is to come up with a long-term solution to overconsumption of fashion garments by using durable fashion apparel. By looking at the functional and emotional durability as a possible solution for long-term sustainability will an integrated approach to fashion consumer sustainability can be found. In the former the research deals with many forms of reading, as well as functional and emotional endurance, as a possible solution for long-term sustainability, (Saha, 2018).

The later focuses on fashion garments with a long-lasting emotional design that includes meaningful design and builds an emotional attachment in buyers for their outfit. The outcomes of this study imply that functional design is essential for long-term durability, and that functional longevity is the first step toward long-term fashion consumption. However, it has been discovered that an apparel product's physical durability cannot be the ultimate solution to overconsumption of fashion garments (Saha, 2018).

In the last two decades, the concept of "ethical fashion" has been developed by conscious and responsible persons.

However, the fact that this is being implemented as a concept is apparent. The textile and fashion industries cover "Ethical Fashion," which includes ecological products, labour conditions, fair trade, and sustainable products. "Ethical Fashion" first appeared and flourished in the United Kingdom, the United States, and other European countries. Nowadays, we can find a plethora of textile and fashion designers, fabric and garment collections, fairs etc. (Pinar & Kenan, 2015). The worldwide pandemic of 2020 has brought to light the geographically dispersed but interconnected nature of many corporate activities, as well as the levels of inequality within and across countries. Because of the Covid-19 crisis, numerous clothing stores in rich economies had to cancel orders with their suppliers, worsening the living conditions of many garment workers even more (Rana, 2021).

In recent years, the literature has paid more attention to concerns of responsible consumerism and environmental sustainability. Many researchers in the garment field have looked for ways to encourage customers to use apparel responsibly. Despite the fact that various scholars and marketers have advocated for responsible apparel consumption, observations show that consumers are still enthusiastic about purchasing apparel and are doing so in large quantities and at frequent intervals, giving the impression that most people are buying more than they need. Other sectors of marketing and consumer behaviour have shown that customers are aware of the need of responsible consumption and environmental sustainability, suggesting that there may be some underlying rationales for consumers' continued increase in garment purchases and consumption (Lim, Weng Marc & Ting, 2012).

CURRENT GARMENT CONCERNS

Fashion sustainability will necessitate radical changes in the practices of all people concerned: designers, producers, marketers, and consumers. Consumers, on the other hand, require a vision for sustainable fashion approach. This research focuses on a new kind of fashion practice that is focused on transformational behaviors during the consumption process (Reiley, 2011). Our fashion industries are currently focused on short production cycles, rapidly shifting trends, and deliberate obsolescence of apparel, which are all important contributors to unsustainability. Producers boost output to fulfill rising demand and retain profitability as the price of a product declines. As a result, stock is collected in large quantities, and markets are saturated. To start an eco-fashion firm, you must first research consumer preferences in order to implement sustainable production processes. They must also be able to see ways to convert societies into sustainable ones, seeing sustainable business practices as an opportunity rather than a constraint (Chandra, 2017).

Consumers embrace fast-fashion consumption because it is pleasurable, serves as a tool for expressing one's identity to the world, and allows for the identification of social groupings; as a result, it offers cognitive and emotional experiences. Fast-fashion products are low-cost and in-style from the consumer's perspective; they have an appropriate degree of quality, and collections are refilled on a regular basis (Baghi, 2013). Consumers associate fast-fashion products with opportunity to socialise, express their self-perception images, and act differently during buying from an emotional point of view (Zarley, 2007). Furthermore, because fast-fashion products are sold by firms that imitate luxury fashion labels, they have previous experience with premium fashion products (Joy, 2012). Consumers' willingness acceptance and purchase of new fast-fashion or other fashion products is proportionate to the level of innovation in those products. He uses a time-of-adoption methodology in his method, Rogers defined innovativeness as "the extent to which an individual adopts new ideas more quickly than other members of his or her social system" (Rogers, 1995).

This approach was utilised in non-fashion fields of study, it was later applied in fashion adoption studies. On the

other hand, no unique application for researching fast-fashion customer uptake was created. However, given the fast-fashion idea and product characteristics, disparities in adoption rate and cycle are likely to emerge. In the fashion industry, fast fashion consumption is still the main cause. This study initiated categorization of fast-fashion customers in terms of innovation adoption, assessed their opinions of fast-fashion, or established the relationship between consumer groups and their adoption justifications. (Okur&Nazan, 2021).

DESIGN FOR LONGEVITY

Designers voiced a variety of opinions about consumers as product buyers and users, as well as the implications for product lifespan. Several people mentioned how views had shifted through time; for example, some people suggested that passing things down through generations had become less usual. Consumers' expectations of product lifespan are also being lowered, according to the report. The degree to which clients conveyed an awareness of design and their level of engagement with items was one positive pattern that emerged. Several designers expressed the belief design awareness has increased in recent years, and that buyers are becoming more design-conscious. It was indicated that such appreciation would lead to a greater demand for higher-quality, longer-lasting items, as well as a willingness to invest in them. However, a need to nurture product awareness was also deemed vital, notably the ability to contemplate the entire product life cycle: comprehending the nature of trees and forests in the case of furniture, and the animals from which leather is obtained in the case of leather goods (Cooper, Tim, 2012).

In the current fashion scenario items are frequently discarded while still functional, it may be possible to support durability through design that encourages a more long-term relationship between the object and its owner. One promising strategy to support long-term relevance is to design items with a stronger predisposition for the attribution of happiness-related symbolic value. Researches should be based on a framework that includes six different sorts of symbolic product meanings: positive interpersonal relationships, personal development, life purpose, environmental mastery, autonomy, and self-acceptance (Casais, 2015).

The emotional link that exists between a product and its owner is known as consumer-product attachment. A range of dimensions are implied. Only good experiences and memories positively reinforce attachment, according to Schifferstein and Zwartkruis- Pelgrim (2008), who described these dimensions as enjoyment, memories of people, places, and events, support of self-identity, life vision, utility, and reliability and market worth. Increased product attachment can, in the long run, inadvertently affect consumer behaviour. Each design process should consider the prospects for building a valued product person relationship in order to achieve an optimal product life cycle. Designing for a valued person-product relationship necessitates a better understanding of the drives and personal reasons for customer purchases, as well as product use and satisfaction, and disposal behaviour. Furthermore, in order to completely comprehend consumer behaviour, it is necessary to understand the general position of consumption and the meanings of products in society (Niinimäki, 2011).

Objects must be capable of co-creating a narrative with their owners over time. The closer the emotional connecting through experience, the more a person may engage with a product. It is possible to build a foundation of trust and closeness between the object and its owner (Chapman, 2009). Designers and scholars can, for example, concentrate on the symbolic meaning of a historical product. This necessitates memory embedding, which is a design problem. It is simpler to create products that allow users to record current or future events, memories, and emotions over time. As a

result, the product's personal value and significance will rise. (Anja Hirscher, 2013).

Customers' garments are redesigned after they have been abandoned due to their inutility or insufficient size. Up-cycling secondhand clothing has a lot of potential in the sustainable fashion trend. There is still more that can be done to improve the garment industry's pro-environmental behaviour, particularly commercial sustainability. The global consumer has a significant part to play in accomplishing this goal, and as such, informing and educating them on not just the influence of their purchase patterns, but also the methods of clothing disposal will go a long way toward achieving this goal (Mehta, Rhuta, 2021).

The reduction of fabric waste, the extension of garment life, and the reduction in overall garment consumption were all beneficial outcomes of studies on transformable garments. Fashion design could be one step closer to attaining full sustainability in the future if it is used in conjunction with sustainable fabric sources and ethical labour standards. Our objective is that the industry will adopt transformable design methodologies more readily, and that an increasing number of designers and customers will engage in the design process, whether motivated by sustainability, mass customisation, or a general curiosity in transformable fashion (Gong, 2015).

Designers can lead the way in recycling the many tonnes of textile discards produced generated to meet the ongoing need for fashion thanks to the notion of upcycling as technical advancements lead to more sustainable production methods. Consumers' drive for novelty has led to current levels of over-consumption and over-production, resulting in waste, pollution, and toxic emissions, as well as depletion and exploitation of natural resources. Although high levels of textile waste are assumed to be the end of the line for discarded garments, the fashion industry may be able to exploit this resource to create well-designed and sustainably sourced upcycled clothing. (Han, SLC & Chan, 2017).

Individual upcycling, defined as the creation or modification of any product from used materials in order to produce a product of higher quality or value than the compositional elements at the household level, is especially relevant to product attachment because practitioners frequently use old products with which they have already developed an emotional bond. As a creative, interactive user activity, upcycling may provide opportunities for self-expression, group affiliation, particular memories, and pleasure, all of which might influence product attachment. Individual upcycling, in other words, is likely to result in high product attachment and product longevity (Sung, Kyungeun & Cooper, 2015).

When it comes to designing for sustainability, the design phase of the garment life-cycle is crucial. The decisions made at this point can have an impact on the garment's environmental impact. A designer might, for example, choose to design for zero-waste, working with the patternmaker to eliminate textile waste when the garment is cut (Rissanen, 2008). A designer, whether in the mass market or on the upper end, may choose to create 'classic' items that can be worn year after year and are more likely to be kept by the consumer. The challenge for mass market designers is that 'design' has always meant sourcing or direct copying of an existing garment from an overseas label. This is less expensive than creating unique designs in-house. Around the world, mass market styles regularly adapt and consume design ideas from higher market sectors (Payne & Alice, 2011).

The focus of zero waste fashion design is on arguments and techniques for designing and manufacturing these clothes within the current fashion education and industry framework. However, the link between the outputs of zero waste fashion design and the potential for improved fashion user experience has gotten little attention. This research and accompanying creative works look at a hot problem in the fashion industry: improving the user experience. The milieu of

post-production and post-retail, which has received little attention in the past. Zero waste fashion is conducted within the context of user practice, in which the user becomes an agency in both the design and ongoing use and modification of the garment. An improved designer-maker-user relationship is feasible thanks to the designer's actions and opportunities (McQuillan & Holly, 2019). While many products utilising mass customization have been developed using other digital methods, none have attempted to combine this with the positives of zero-waste fashion design, or to change the fashion buyer together into fashion consumer - a contributor in the continual use of garments. (McQuillan & Holly, 2019).

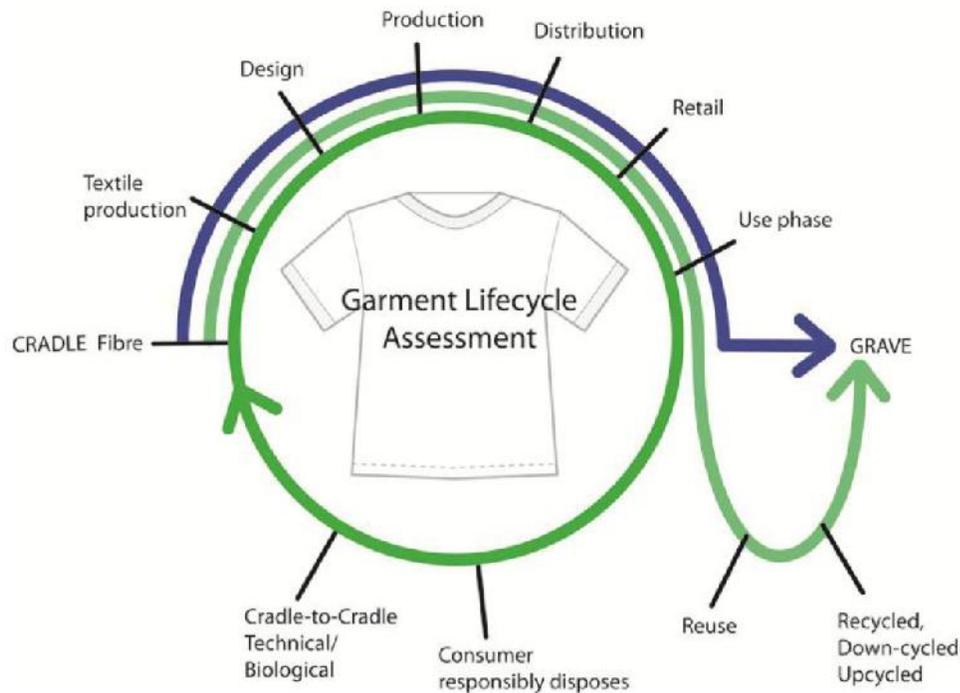


Figure 1: Garment Life Cycle Assessment

Although design practitioners are paying more attention to extending a product's psychological lifetime, little research has been done and there is minimal knowledge to support the motivation to consider this as a design strategy. A well-thought-out solution can encourage customers to keep their belongings and avoid premature product waste. It also aids in the transformation of consumer behaviour to one that is more positive and long-term. Durability is, without a doubt, one of the most evident sustainable design solutions for extending product lifespan. Longer-lasting products, on the other hand, necessitate not only an extension of the physical lifetime of the product, but also an extension of the psychological lifetime of the product, which necessitates significant involvement of various practices such as designer, manufacturer, secondary markets, social networks, and supporting organisations in the direction of an environmentally sustainable economy (Zo, Kimmi & Ward, 2011).

Because items are frequently discarded while still functional, it may be possible to support durability through design that encourages a more long-term relationship between the object and its owner. This research is based on the idea that designing products with a stronger proclivity for the attribution of

Long-term product attachment is a tiny step toward educating industrial designers about the consequences of

product lifetimes and how psychological attachment theory may be used to develop solutions that are not only emotionally enduring but also delightful in many ways. As long as industrial designers make an effort to truly comprehend the consequences of their work and implement appropriate solutions to avoid quick obsolescence and resource waste, the objective of sustainable design will be achieved (Zo, Kimmi& Ward, 2011).The thorough assessment of how a product's life cycle is defined is part of Design for Longevity. Longevity is defined as how long a product, either as a group of resources or as an item that acts as a way to deliver a function, can fulfill any intended function over a given length of time. Design for Longevity seeks to create goods with an optimal lifetime, where ideal means considering the user, the business, and resource efficiency while planning a product's lifespan (Carlsson& Simon, 2021).

The integration of localization in the design process is required for product personalisation should be in accordance with sustainability principles. As a result, throughout the design process, designers must consider both product customisation and the usage of local skills, materials, production techniques, and post-use services. Furthermore, people's personalisation goals and practices reveal information about their needs. Furthermore, ease of re-personalization during the use phase is an important factor for product lifespan, as it allows users to adjust a product to their changing needs and tastes. This necessitates design features that allow for easy attachment and disengagement (Ozan, Ezgi& Do an,2017).

CONCLUSIONS

The consumer's need in today's fashion market has shifted from mass-produced garments to a more individualised garment with the proper fit and chosen style. Because of the increased demand for product customization, clothes producers must shift away from bulk production and toward mass customization. In the apparel industry, mass customization refers to creating a personalised style by incorporating unique consumer preferences at the right moment and at the right price. While mass manufacturing produces vast quantities of identical products, mass customization produces unique items for specific client needs for a reasonably big market with efficiency comparable to bulk manufacturing. Customers are given the opportunity to modify the standard mass production process to produce their chosen design and fit in a technology-assisted production process known as mass customization (Dissanayake & Kanchana, 2019).

An increasing number of apparel manufacturers have expressed an interest in implementing a sustainable strategy. This is a promising method to solving some of the sustainability issues inherited from the mass-produced business model, but the manufacturers' motivations remain purely economic. However, a thorough examination of the characteristics of mass customization yields promising results in terms of lowering excess production, overconsumption, product life extension, and waste formation. As a result, it is critical for manufacturers and retailers to consider this strategy not only from an economic standpoint, but also from an environmental and social standpoint. This study briefly examines some ways that design solutions can help the fashion industry to be more sustainable.

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