

# Circular Economy Strategies for the Indian Apparel Industry

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## Abstract

Fast fashion, the trendy and affordable clothing produced by global fashion corporations, has dramatically altered the perception of clothing from a sustainable commodity into a disposable daily acquisition. Consequently, the fashion industry stands as one of the most ecologically unfriendly sectors for consumers. Over the past few years, there has been a growing emphasis on embracing the circular economy model as a means of achieving a more sustainable and waste-free fashion industry. This study delves into the progress made in the apparel manufacturing sector, examining the transformation of consumer needs into consumer desires throughout the stages of mass production, assembly line techniques, and the advent of fast fashion. By exploring these advancements, valuable insights were gained into the industry's journey towards a more environmentally conscious future. Consumers play an important role in the global apparel manufacturing process. The study touches upon the consumer perspective of circularity in industries and outlines the strategies that can be implemented to enable consumers to participate in the industrial supply chain. Based on interviews with sustainable development stakeholders, internal industry stakeholders, and brand sustainability managers and designers, this article attempts to map the circular economy strategies spanning two key stages: the industry and the consumers. The interaction with experts served to deepen the understanding of the significance of adopting an alternative manufacturing model to the prevailing linear economy. Crucially, this study argues that for the fashion industry to advance towards circularity, it is imperative for companies to implement suitable strategies throughout their entire supply chains, rather than limiting their application solely to the waste management stage. By integrating circularity principles at every stage, the industry can effectively address environmental challenges and foster a more sustainable future.

**Keywords:** Apparel industry, circular economy, consumers, sustainability, strategy development, system design

## Introduction

It has now become clear that the present 'take-make-dispose' system of the apparel industry is working against sustainable development. As a result of the ill effects of fast fashion, the circular economy paradigm is gaining momentum. A circular economy is described as an industrial system that, by intention and design, is restorative or regenerative and uses and reuses natural capital as effectively as possible in apparel manufacturing. The system finds value throughout the life cycle of goods.

One of the major reasons for the rising environmental crisis is the rise in carbon footprints. There are various parameters that contribute to the addition of carbon footprints to the existing ecosystem. Fast fashion has made a sizable contribution to climate change. As more and more developments came into place within the various processes in the apparel industry, policymakers noticed the depletion of resources that caused major consequences within the ecosystem and human lifestyles. The subsequent discussions that followed saw the term 'Fast Fashion' come into existence. The term, according to the Macmillan Dictionary, was coined in the year 1990, when it represented the speedily moving designs over the 'Catwalks' to the 'Mass Markets'. The word 'fast' here refers to the idea of negativity, whereas the opposite term 'slow' in the newer sense would refer to 'doing things carefully and over a longer period of time to improve the quality'.

Post-consumer apparel waste has been a topic of discussion for the past five years. As per the studies conducted by Reverse Resources in 2021, the post-industrial waste mapped in 20 countries was estimated to be 80 billion to 150 billion pieces a year before the Corona crisis. In addition to the post-industrial waste, garment manufacturing waste has also substantially increased. The research article strives to present innovative approaches to enhance sustainability management within the fashion and textile industry through experiments and strategic planning. The main objective is to analyze more effective practices for addressing the challenges inherent in current sustainability models.

## Research Design

Pluralism and serendipity describe modes of thought in the architecture of clusters when it comes to thinking about, with, and by design analysis. Design analysis may pave the way for the creation of a singularity, enabling philosophy to bridge the gap between theory and reality and emerge through the wormhole as something entirely novel. Design analysis provides a framework for integrating theory and experience in order to

improve the work. It creates a demilitarized zone between designers wary of discourse and critical information dismissive of designer-client negotiations. By shifting the focus away from the styling of individual components and delving into the interlocking structures that underpin manifest support restrictions, design analysis consistently plays a role in redefining the design process. This shift takes it from standalone objects to embedded systems, and it empowers material designers to rightfully seek a more extensive commitment (Laurel, 2003).

The objective of this research is to propose enhancements in the clothing manufacturing process by incorporating different strategies throughout the supply chain. The study is structured into three stages, including manufacturing processes, human factors, and overall design aspects. These elements are holistically assessed to formulate new design solutions.

Circularity as a “reevaluating system” has proven to be a strong modern framework for creating fresh concepts and sparking imaginative solutions. Adhering to these concepts and their application in terms of research and study in the ever-unsustainable fast fashion industries was initiated through the 5W1H (Who, What, Where, When, Why, How) approach. The 5W1H approach was employed to identify essential questions and their answers, leading to the formulation of the problem statement regarding unsustainable practices in the fast fashion industry. This approach aims to address these issues by implementing a circular economy through positive system disruptions.

To gain a deeper understanding of the nature of interdisciplinary research at the intersection of apparel industry manufacturing procedures and circular economy approaches, a systematic literature review was carried out. The research was then linked to the broader umbrella of the circular economy and/or business models present in the industry. To do so, a collection of titles and abstracts was carried out, accompanied by a review of the full text of related publications.

Following secondary data collection, the primary data was collected in three phases (Table 1). The first phase (structured approach) involved an online survey with 135 consumers across India. This helped outline the understanding of consumers towards the adaptation of the circular economy and its practices within retail spaces. The second phase (unstructured approach) consisted of a group of 15 consumers aged between 21 and 40 who were personally interviewed to understand the consumer reaction to the cluster ideas of using the circular economy on a large scale. The selection of 15 participants was done through the purposive sampling technique as a subset of the 135 survey candidates. The third phase (unstructured approach) of the primary study

was conducted through the identified stakeholders of the apparel industry, working for brands such as Subtleknots, Tiso Ghari by Badal, Lee Cooper, and Colordot. The stakeholders of the sustainability movement and industry experts like Mr. Sabyasachi Jana, Assistant Manager, Design, Lee Cooper, India; advocates of sustainability and circular economy; and founders of sustainable brands, Mr. Badal Kumar, Founder and Director, Tiso Ghari by Badal; and Ms. Starina Cabrel, Founder and Director, Subtleknots, were interviewed, and using the Delphi method, their responses were analyzed.

**Table 1:** Primary data collection

|                                     | No. of participants | Focused groups                               | Topic  |
|-------------------------------------|---------------------|--|--|
| Online Survey                       | N = 135             | Indian Consumers<br>Age Group 21 to 40 years | Consumer perspectives on environmental challenges due to fast fashion. Awareness of the circular economy model, interactions and promotion of circular fashion |
| 1:1 Consumer Interviews             | N = 15              | Indian Consumers<br>Age Group 21 to 40 years | Consumers' motivation in recycling and communication, modes of shopping, sustainability awareness, circular economy adaptability                               |
| 1:1 Industry Stakeholder Interviews | N = 4               | Internal Industry Stakeholders               | Stakeholder motivations and perspectives in the internal aspects of implementing circular economy and its adaptability across departments                      |

## Review of Literature

With newer initiatives in place to reduce the hidden environmental cost of clothing, the background research began with references to literature on sustainability and circular economy practices in the apparel industry.

Focusing on the various approaches to sustainability followed by the apparel industry, from technological fixations to textile developments and consumer perceptions, there are several case studies based on the manufacturing industry's outlook toward sustainability (Muthu, 2015). When examining sustainability in apparel manufacturing scenarios, the emphasis on behavioral aspects rather than impact measures and metrics is notable. A study by Torres, Rey-Garcia and Albareda (2017) proposes an action-

oriented tool to address the sustainability challenges faced by fast-fashion supply chains in order to take tangible actions towards sustainability. The researchers examine the sustainability reporting of the two largest fast-fashion companies in the world. This analysis was conducted in three phases to gain insights into the challenges faced by the organizations, align reporting with the United Nations' Sustainable Development Goals (SDGs), and analyze the reported sustainability actions.

Exploring the interconnection between intelligence systems and sustainability, many textile and apparel businesses are embracing and incorporating advanced technologies to gain competitiveness, a strategic advantage, and to support sustainable practices. During the rise of Industry 4.0, the textile and apparel sectors have encountered intense competition and shared challenges. These include the need to meet tighter order deadlines, navigate increasing material and labor expenses, and cope with shrinking profit margins. The emergence of fast fashion has further disrupted the industry with its demands for rapid production and frequent shifts in product orders. Though the fashion industry has made efforts to align their logistics warehouses, store inventories, and supply chains with customer demands and manufacturing plans, in practice, customer preferences often deviate from established production schedules. (Ahmad et al., 2020)

Measuring progress in the transition from linear to circular product chains is a complex task. Various measuring instruments and indicators are available to monitor the effects of circularity, the environment, and the economy. However, the challenge lies in consolidating these indicators into a manageable set that accurately reflects the effects of a circular economy transition. Measuring progress is particularly challenging due to the differences across product chains, their transition goals, innovation requirements, efforts needed, resistance from actors, and socio-institutional factors. The Ministry of Infrastructure and the Environment has commissioned research to investigate how to measure progress towards a circular economy within individual product chains. The study focuses on identifying what needs to be measured rather than the specific measurement methods. A conceptual framework has been developed to assess circular economy transitions in product chains, with a particular emphasis on the role of innovation (Potting, et al., 2017).

## **Identifying the Opportunity - The Circular Economy Model**

We've all been at a fork in the road before. The steam engine, invented by Thomas Savery in 1684, revolutionized the world. This innovation ushered in the industrial revolution, which transformed the ability to manufacture products. Raw materials and resources proved to be unlimited, and labor was abundant. Goods were mass-manufactured for the first time in history. In the 21st century, the knowledge to build

tools and techniques to support economies is, in many ways, impacting and negatively disrupting ecosystems. Following the secondary study and using the 5W1H technique, this disruption in the ecosystem of apparel manufacturing can be narrowed down to an opportunity that will help guide the manufacturing towards positive outcomes in terms of fashion rather than the negative impacts it creates today.

### ***Disruption by both producers and consumers (who)***

A major drop in garment prices over the years has allowed consumers to make more and more purchases. In turn, the huge production has given rise to pre- and post-consumer waste being generated, which has impacted the ecosystem negatively and is continuing to do so. Hence, the industry and consumers are two major factors in the process of linear fashion production.

### ***Industry's operations in excess (what)***

The rapid rate of technological development has continued since the industrial revolution. Among all the manufacturing industries, the apparel industry has a huge impact due to its linear production systems (take-make-use). Till date, the linear systems followed across the globe have accounted for 10 percent of the global carbon emissions, according to data from Business Insider, 2019.

### ***Societal shift towards readymade fashion (when)***

The 1840s saw the beginning of the industrial revolution in the US and Europe. The mid-20th century saw its spread in India. Assembly line production rose to prominence during the second half of the 20th century. The invention of graded paper patterns, sewing machines, power looms, cars, movies, and war, all put together, transformed the culture of ready-made clothing manufacturing. Consumerism and globalization are some of the aspects that also gave a push to the linear manufacturing system within the industry that gave rise to fast fashion.

### ***Impact on stakeholders and environment (where)***

Today's industries harvest energy from the earth to produce products that consumers need and then discard those goods until they are no longer needed. Within the industry scenarios, the linear systems that are followed involve not only the internal industry stakeholders but also the external ones. Apart from the stakeholders of the industries, the consumer's perception of the easy availability of apparel in today's time is a barrier.

It gives a boost to the industries to manufacture more and ignore the consequences of their actions on the ecosystems around them.

### ***Impact of fast fashion (why)***

The rapid turnover of clothing within consumer spaces is occurring due to the yearly deterioration in quality and the swift pace of changing trends that are difficult to keep up with. Fast fashion, responsible for mass-producing low-cost clothes, has led to the launch of countless new collections each year, constantly making consumers feel out of date and enticing them to buy more.

### ***From linear to circular model (how)***

The shift in the linear model of apparel industry production is important, and the shift in consumer perception, along with increased awareness, is a necessary step toward a circular economy. The circular economy system works on five principles:

- Newer business models that increase clothing use
- Eco-friendly and sustainable inputs
- Repurposing old clothes into new ones
- Making systems that generate less pre-consumer waste
- Consumer involvement within the system

People together can reinvent everything by eliminating waste and pollution, keeping products and materials in use, and regenerating natural systems.

## **Results and Discussion**

There is a widespread misunderstanding that after the clothes have passed from the fashion industry through retail outlets to the customers, they are no longer the industry's liability. However, recognizing and involving the stakeholder groups engaged in the management of pre-consumer and post-consumer waste is crucial. It will reduce wasteful behavior in both purchasing activities and throughout the entire process, as these trends are recurrent.

The increased demand in the apparel industry sector is mostly due to fast-changing, low-cost design, which unfortunately results in a rise in pre- and post-consumer textile and apparel waste. There is a lack of consensus about who is to blame for the apparel industry's overproduction. However, behavioral scientists argue that the underlying factors of overconsumption must be addressed by environmental proponents to

handle overproduction and its environmental consequences efficiently. This situation emphasizes the critical roles of two key stakeholders in the effective adoption of the circular economy concept within the framework of the apparel manufacturing economy: consumers and the textile and apparel industry.

**Consumer survey**

Examining consumer behavior, a comprehensive survey titled “A Sustainable Approach: Circular Economy” administered to 135 participants and a secondary study suggested that environmental and ethical issues do not always influence consumer buying behavior. According to the consumer survey, 77% of the respondents consider price and overall apparel quality as the two most important considerations when making a clothing purchasing decision. As a result, from the consumer decision-making point of view, the sustainability aspect will not be enough to fix the crisis of over-purchase and unethical usage of apparel.

The survey further aimed to gain insights into their apparel shopping habits, factors influencing their purchase frequencies, and their consideration of sustainability. The survey also explored participants’ awareness of sustainability and their willingness to prioritize it in their buying decisions. The findings revealed that in the 18–25 age group, 49 percent of respondents shopped for clothes once every three months, and 32 percent purchased clothing every month. It was also observed that 44 percent of those aged 26–34 shopped once every three months (Table 2). The examination of the gathered data pointed to a notable surge in consumer inclination towards readily available fast fashion. When consumers were questioned about their apparel shopping frequency, the data additionally conveyed that, on average, 42% of respondents anticipate their clothing to remain in active use for a maximum of three years.

**Table 2:** Consumer shopping frequency

| Fast fashion shopping frequency |               |          |          |          |        |
|---------------------------------|---------------|----------|----------|----------|--------|
| Group type                      |               | 1 Months | 3 Months | 6 Months | 1 Year |
| Age group                       | 18 – 25 years | 32%      | 49%      | 17%      | 02%    |
|                                 | 26 – 34 years | 15%      | 44%      | 30%      | 11%    |
|                                 | 35 – 45 years | 14%      | 43%      | 43%      | 0      |
|                                 | 46 – 60 years | 12%      | 40%      | 36%      | 12%    |
|                                 | 60 Plus       | 0        | 0        | 33%      | 67%    |



In order to provide further clarity to the analysis, personal interviews with consumers exhibited a favorable response towards the idea of transforming clothing waste into new garments. When questioned about their willingness to modify their purchasing behavior in order to make sustainable choices, consumers demonstrated an appreciation for circular apparel, considering it modern and attractive. 92 percent of the respondents expressed a willingness to embrace circular practices, such as extending the lifespan of high-quality, functional garments and reducing the frequency of new purchases by utilizing products in versatile ways on various occasions. To make more people embrace sustainable fashion, it was noticed that 94 percent of consumers are ready to switch to different brands if those brands offer clothes that match their style and promise to be eco-friendly, causing less waste. So, it's important to make these eco-friendly clothes more popular and create a strong brand identity to convey the message.

The personal interviews with consumers pointed out the importance of building the end user's awareness regarding the making of the product and its environmental impact in order to make a well-informed and responsible choice. Innovative value-added services related to circular clothing may provide added benefits to customers. It is therefore critical to consider customer desires and use them as a starting point for business growth. The optimum results can be obtained by designing future services in collaboration with users. The service component must be incorporated into the product concept and business model from the start.

### ***The industry viewpoint***

The interviews with industry experts indicated that there is a noticeable surge in the global fashion industry towards sustainability, with major fashion companies committing to net-zero goals. According to Mr. Badal Kumar, Founder and Director, Tiso Ghari, India, certain norms can be made for both the industry and the consumers, which state that there is a need to rethink production and improve consumer shopping habits. Consumers purchase; hence, the industries produce. This cycle has to be positively disrupted. Certain countries do follow norms of limited production and are successfully implementing the circular economy paradigm. The industries need a shift in perspective and stricter norms.

In the pre-pandemic and, particularly, the post-pandemic landscape, both developed and developing nations' economies are grappling with significant challenges. These challenges encompass disruptions in the supply chain, changes in incentive structures, fluctuations in pricing, and shifts in market dynamics, all of which exert a profound influence on companies and the apparel industry. Implementation of a circular economy can lead to opportunities within the industry work-frame, along with opportunities for

investment, optimizing material costs, improvement in supply chain resiliency, and reduction of the carbon footprint.

The industry experts highlighted the importance of the consumer's role in contributing towards a more eco-conscious and responsible fashion industry. Mr. Ravi Advani, founder and CEO of Colordot in Bengaluru, highlighted the pivotal role of consumer perception in fostering engagement and contribution towards environmental improvement. Currently, there is a low level of consumer awareness and ability to actively contribute to sustainability initiatives.

## **Analysis**

To restore the circular economy within the industry work-frame as a system, businesses need innovation to maintain and further build value from resources and generate a long-term economy. For the establishment of an innovation ecosystem in the industrial environment, both internal and external stakeholders must be involved. The key aspects of the industry framework were analyzed to formulate strategies for implementing the circular economy.

According to the survey conducted among key players within the industry, the internal stakeholders refer to those individuals who actively participate in the entire garment production process, starting from handling raw materials to managing clothing retail operations. These internal partners are vital contributors to the companies' innovation efforts.

The industrial process of apparel manufacturing employs an assembly line production technique in which each step is crucial for the implementation of circularity innovations. To further understand the industry system, the system was mapped along with the important internal stakeholders. The system mapping allowed the research to assess the differences in the two smaller sectors, namely the design process segment and the manufacturing process segment. The system analysis explains how the smaller businesses operate while also addressing the possibilities that the three sub-sectors, including internal stakeholders, the product division, and the manufacturing division, offer in the context of circular economy implementation.

The two key internal stakeholder stages were identified within the larger industries to develop a complete understanding of how a constructive disruption may be brought about in the industry supply chain.

### ***The product stage***

Stakeholders: design head, design team, merchandisers, buyers

Based on interviews with industry experts and researchers' experience in the apparel industry, the following framework is detailed: The first step in apparel manufacturing is the retail strategy. At this point, the team agrees on the number of stock-keeping units (SKU) to be generated in a given season, as well as the depth of each SKU. Following the decision-making process by the team, the buyer prepares the retail plan for the season, which is shared across the team. According to the forecasted trends, the designer begins with the first stage of the design process, where the 'look of the season' and the 'line sheet' are finalized. The conclusion of the production process from the designer's standpoint is supplemented by the completion of the process from the buyers' and merchandisers' perspectives. Once approved, the sampling is moved to raw material procurement and bulk order placement by buyers and merchandisers.

### ***The manufacturing stage***

Stakeholders: manufacturing team, washing team, and finishing team; export merchandisers

After receiving manufacturing orders and designs, the merchandisers input these orders into the system, which is also accessible to the production team. A minimum lead time of 45 days is needed for raw materials to arrive at the manufacturing site. The production staff subsequently processes the orders and issues purchase orders, specifying the number of SKUs and their respective component depths. Following the laying and cutting of cloth packets, assembly line manufacturing procedures take place. When the garments are finished, they are shipped to be processed further (e.g., washing, etc.). The finishing team then assembles the stock for retail stores, including final quality check procedures and rejections. The entire operation, as well as the bulk, is then audited by the brands before being shipped to the warehouses. The warehouse distribution has a minimum lead time of 60 days.

### ***Circular economy: A necessary revolution***

Based on the interviews with the brand managers and design directors, many industries are now adopting sustainable practices at various points in their distribution networks. A few small-scale retailers in India have incorporated circular economy policies into their supply chain operations. The rapid implementation of these policies has sparked a discussion about the essence of sustainability and its long-term consequences. However, the evidence shows that certain businesses are gaining a real competitive

edge by implementing sustainability initiatives. On the other hand, others contend that sustainability can be a tactic that provides a strategic edge, resulting in above-average success (i.e., “making better by doing good”). Companies that follow creative circular-economy-based business strategies or activities that improve employee recruiting, productivity, and retention, for example, do so to distinguish themselves and, as a result, fill an unexploited or underexploited niche by creating a distinct and difficult-to-imitate approach.

### ***Strategy: Increasing consumer awareness***

A significant transformation anticipated in the apparel industry’s circular economy is the changing consumer perception, with 84 percent of consumers open to actively engaging in a brand’s sustainable supply chain using various strategies. Today, companies work and benefit from supplying their end users with a rich customer experience in terms of their goods and services. As a result, the opportunity is in customer engagement, where users can be made mindful of their purchasing choices while still receiving a better user experience.

#### *Consumer awareness through a ‘phygital’ technology space*

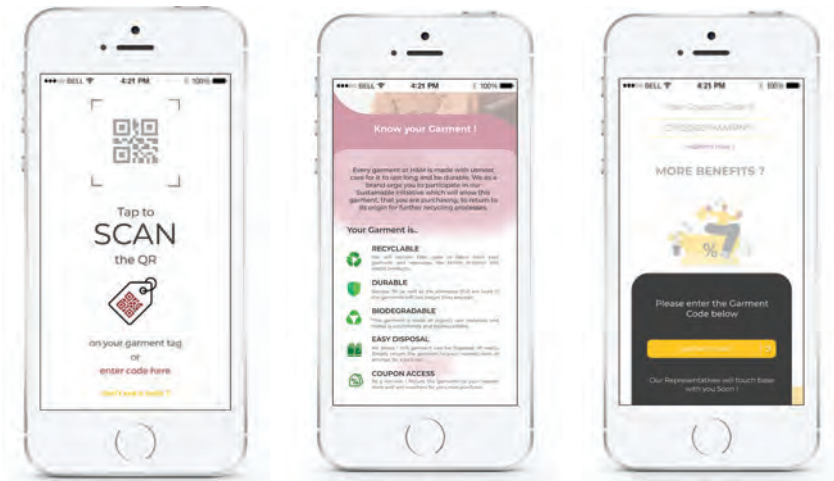
Process: Each brand present in the retail space would have an additional tag with scannable barcodes along with its original brand tag for customers (Figure 1). The user interface will be enhanced further because the barcodes will be 3D engraved, allowing users to get a hand-feel of the barcode in order to generate recognition. The first step in consumer interaction with the brand would be to educate them on the sustainability initiatives that the brands have implemented in retail spaces. The phase of customer engagement with the brand will begin with the customers being told about the new scannable tags, in addition to the garment tags, and the incentives involved.



**Figure 1:** The scannable hand tag

*Prototype by Jaya Advani*

The consumer incentives: The strategy of code scanning will allow the consumers to access information regarding their purchases and help in their decision-making aspects. Each consumer, upon scanning the tag, would be provided with an incentive based on the sustainability of the garment in their carts (Figure 2).



**Figure 2:** System strategy for scannable tags  
*Prototype by Jaya Advani*

### **Strategy: Industry blockchain – decode the garment DNA**

The single emphasis of apparel industry strategy development is transparency among the industry's many stakeholders, both internal and external. Agreed, sustainable growth should include information presented to customers in user-friendly methods; yet, there is a chance to fine-tune businesses to avoid fraudulent claims by manufacturers.

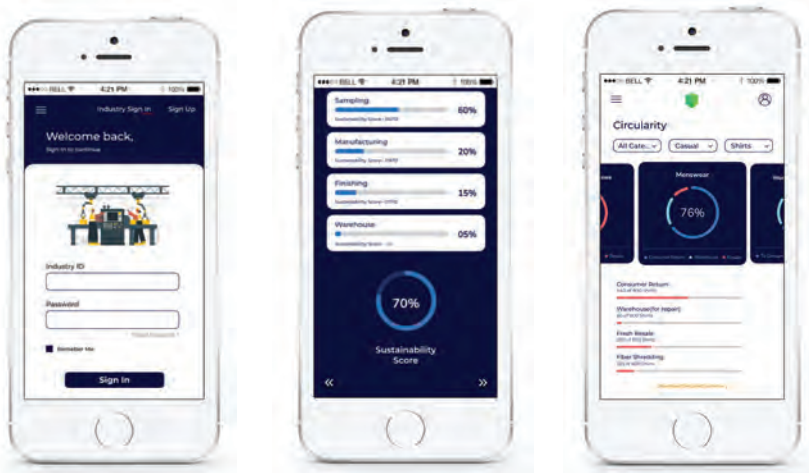
The use of 'natural' resources for the production of apparel is an obvious example of greenwashing by industries. The need to track down the garments' origins is pressing. Blockchain technology could transform the face of the fashion business in a genuine, practical way while supporting sustainability. Block-supply-chain technology can be innovated for an information sharing system within the industry that can be accessed by industry stakeholders.

#### *Block-supply-chain technology*

Process: The strategy will be implemented in a way that ensures traceability within the internal and external stakeholders of the industries. The access points for the

information will be in the form of internal industry stakeholders who will be able to track the singular areas of the sub-industries and also the external stakeholder activities relating to the manufacturing and other processes of that particular industry.

The Industry Incentives: Each stage of garment manufacturing within the industry processes will be recorded; the data cannot be altered. This would allow the companies to calculate the sustainability scores of the garments and keep track of pre- and post-manufacturing wastes (Figure 3).



**Figure 3:** System strategy for traceability  
*Prototype by Jaya Advani*

**Strategy: Garment tagging**

Another critical step for retail segments to facilitate a smooth transition into the circular economy is the successful tracking of clothing after the customer purchases it. The concept of incorporating a circular economy into the retail environment begins with people using clothing for longer than their typical lifetime. For this to happen, the brand must actively engage in the garment life cycle by focusing on two key aspects: producing high-quality, durable clothing and providing support to consumers through mid- or post-use apparel interventions.

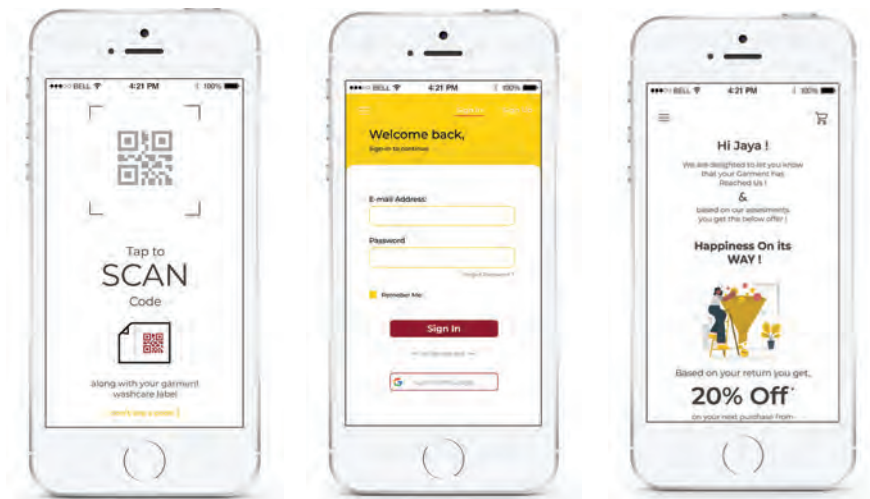
Significant advancements in apparel industry circular economy strategies can be attained by implementing a combination of digital and physical strategies that engage both consumers and the industry. Consumers today, as per the primary study, look forward

to such interactions and are willing to consciously make purchase decisions with brand guidance. They are also ready to actively engage in product life cycle treatments to make the products last longer and also want to make durable purchases. The brand guidance for product maintenance and durability is thus an important step.

### *Smart tagging and circular economy*

Process: Certain businesses have long practiced smart tagging of garments utilizing radio-frequency identification technology. The possibility here is to leverage comparable technologies to allow customers to communicate with companies about their products. Once the consumer has purchased the product, the brand will not only store the information for marketing but also for reverse logistics in cases of repair or garment return. The process of getting the garment back into the cycle would allow the circulation of apparel and reduce waste at the post-consumer level. The users will be able to return the garments, get them repaired, or access garment care for certain products through the online strategy initiatives of the brands.

The User Incentives: The users would get a chance to be a part of the supply chain, and this would increase the circularity of merchandise in the supply chain through the 'Click and Mortar' methods (Figure 4).



**Figure 4:** System strategy for smart tagging  
*Prototype by Jaya Advani*

## Conclusion

As resource utilization and reliance continue to increase, our development threatens to undermine our efforts to make the system completely circular. Policymakers and businesses have begun to see the circular model not only as a safeguard against resource shortages but also as a driver of innovation and prosperity. Our economies remain firmly enshrined in a system that supports the linear model of production and consumption, from production economics to contracts, regulations, and mindsets. However, as a result of strong, disruptive tendencies in the economy over the next few years, this lock-in is becoming weaker.

In recent decades, the technical potential of circularity for a broad range of products and service needs has been established. The next five to ten years will be a phase of experimentation in which the socioeconomic viability of circularity will be extensively demonstrated. If consumer behavior undergoes significant adjustments, customers and producers could realize the savings potential of the 'transition scenario'.

Two aspects of the circular economy appear to be fairly undisputed: reducing the economic effect of resource shortages and leading to innovation. For these reasons, governments and businesses have begun to see the circular model not just as a safeguard against resource scarcity but also as a driver of innovation and growth. Thus, there is a possibility of opening a lucrative new frontier for forward-thinking businesses and institutions.

## References

- Ahmad, S., Miskon, S., Alabdan, R. and Tlili, I., 2020. Towards Sustainable Textile and Apparel Industry: Exploring the Role of Business Intelligence Systems in the Era of Industry 4.0. *Sustainability*, [e-journal] 12(7), pp.2632. 10.3390/su12072632.
- Torres, G.S., Rey-Garcia, M. and Albareda, L., 2017. Effective Disclosure in the Fast-Fashion Industry: from Sustainability Reporting to Action. *Sustainability*, [e-journal] 9(12), p.2256. 10.3390/su9122256.
- Laurel, B., 2003. *Design research: Methods and Perspectives*. Cambridge: The MIT Press.
- Muthu, S.S., ed., 2015. *Handbook of Sustainable Apparel Production*. Boca Raton: CRC Press.
- Potting, J., Hekkert, M., Worrell, E., and Hanemaaijer, A., 2017. *Circular Economy - Measuring Innovation in the Product Chain*. PBL Netherlands Assessment Agency.



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**Jaya Advani** is a professional in the domain of user experience design, visual communication, and design research. She has experience in both the garment industry as a menswear designer and product developer and in academia as an assistant professor. Her expertise includes design strategy, brand development, and design thinking. She holds a Bachelor's Degree in Fashion Design from the School of Fashion Technology, Pune, and completed her Master of Design—Design Space with a focus on design strategy, branding, and user experience from NIFT, Mumbai, in 2021. Throughout her design journey, she has been passionate about user-centric product development and user interface design. She is dedicated to developing sustainable UX strategies and enhancing brand identities, with a strong belief that every user-centric environment should be inclusive rather than exclusive. Jaya measures her success in projects by the positive impact she creates for individuals and companies through design.

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