PLANNED FASHION OBSOLESCENCE IN THE LIGHT OF SUPPLY CHAIN UNCERTAINTY

Reena Susan Philip, CHRIST (Deemed to be University)
Aswathi Mary Anian, CHRIST (Deemed to be University)
Anand Shankar Raja M, CHRIST (Deemed to be University)

ABSTRACT

Fast fashion has popularised the phenomenon of perceived obsolescence whereby customers try to stay in line with the current fashion trends in the market even though the apparel they own are in perfect condition. This has ultimately led the fashion industry to become the second largest polluter in the world. The primary objective of this research paper is to comprehend how the media manoeuvres customers to indulge in fast fashion and how that in turn leads to uncertainty in the supply chain. To understand this, a maximum variation sampling method was adopted which consisted of customers, supply chain partners and marketers. In order to draw a parallel between the variables researched in the past and the present day scenario, an interview schedule was employed. Through the variables selected with the help of Dedoose, a model was created to identify the hurdles faced by suppliers as well as the customer in the fast fashion cycle. The results found that the power to break the fast fashion phenomenon lay in the hands of the media as it is through them that customers' perception can be altered. The importance of artificial intelligence in SCM and the modern tools used in industry 4.0 have also been discussed.

Keywords: Supply Chain Uncertainty, Fast Fashion, Media, Circular Economy, Artificial Intelligence.

INTRODUCTION

Fashion is an erratic concept. It is ever-changing and rightly so, as with the advent of technology and e-commerce platforms, new design creation and fashionable products are made available for customers all over the word (Drew & Sinclair, 2015). Successful heroines in the film industry neither imitated nor copied fashion trends. They created one for themselves which was admired and appreciated by all. 92 years have passed by, but the world still talks about the *"Fashion god"*, *"Marilyn Monroe"* (Porter, 2000; McAndrew, 2009). Fashion and style rebels ranging from the neoclassical Cleopatra to the eccentric Lady Gaga have left their mark in the industry (Distad, 2018). Style and fashion are an essential means of expressing one's personality and individualism (Yuksel, 2012). The fashion industry has grown in leaps and bounds in the past 20 years, giving importance to fast fashion which involves cost-effective fashion that is moving in line with the continuously changing trends (Bhardwaj & Fairhurst, 2010; Vanathi & Swamynathan, 2014). Perceived obsolescence, the most vital part of fast fashion, is witnessed about when consumers deem their apparel to be *"unusable"* because it is no longer trendy (Ryan, 2014). For many years fast fashion had been considered as a brilliant move that allowed consumers to stay in style and corporates to stay in business. However, when realization set in that to make these items available at low prices, objectionable practices were taken up it led to

Sustainable Fashion, which encourages conscious fashion by adopting environmentally mindful practices and circular fashion wherein items are reused, reduced, or recycled (Namrata, 2016). Firms in China have begun to implement an *"Environmental Supply Chain Cooperation (ESCC)"* approach wherein the supply chain players and consumers join hands to care for the environment (Zhu et al., 2011). Dressing style in India changes from state to state as well as within cities due to the vast difference in culture and ethnicity (Amin, 1998). Indians are major contributors to the world fashion industry and are influenced by demographic constructs (Roy et al., 2016). Arora (2014) says that hybrid fashion sense has the power to invent global lifestyle and one such example is the Indian fashion industry (Amin, 1998; Presley & Campassi, 2013). Indian textile and clothing industry is expected to generate approximately US$ 80 billion by 2020. It was additionally discovered that it contributes 17% to the fair profit and 4% for the nation's GDP (Sahoo, 2018).

Planned Obsolescence in Fashion is a Triple Layered Cake

The emergence of fast fashion has broadened the mindset of people. Even though metrosexuality was discovered for over 10 years, it was just recently that the social stigma of men spending time and money for dressing and grooming themselves has become socially acceptable (Elyt Club, 2017). The film industry plays a major role in this as people look up to celebrities and imitate their mannerisms and dressing styles. Fast fashion makes the latest styles more economical to all (Martinez, 2017). This eliminates the use of one's dressing style as a measuring stick for social status. Further, to keep the consumers from brand-switching in the search for something different and exciting, such planned obsolescence seems to be the only solution. It is a win-win situation for both the parties as customers get maximum utility with the products they purchase and the producers earn continuous revenue (Aladeojebi, 2013). However, just as there are two sides to a coin, the uncertainty in demand caused by elevated level of obsolescence, is unfavourable to the supply networks in the fashion business (Stefan Reidy, 2019). Fashion and clothing supply chains operate in a rapidly changing setting and always require greater performance, greater product accessibility, wider ranges and shortened dispatch cycles (Martino et al., 2017). The continuously changing fad leads to a change in customer requirements, which makes it difficult to predict the industry and forecast necessary materials and equipment at the correct moment (Stefan Reidy, 2019).

LITERATURE REVIEW

Media

A growing body of literature has examined the impact of media on the worldwide growth of fast fashion. Shephard et al. (2016) revealed that retailers may profit from having their apparel worn by television and film superstars as well as advertisements in between programs. Retailers may opt for advertising through videos than photographs as individuals were found to be more likely to purchase clothing items based on the former as they received more information to make a purchase decision (Anderton & Workman, 1994). Along the similar line, Lennon et al. (2003) conducted a study that concluded that the higher the education level of an individual was, the less likely they were to involve in teleshopping. Also, women, especially older women, were found to be more drawn to teleshopping than men. With the advent of technology, radios, televisions, newspaper and so on are replaced by social media (Krushali, & Jojo, 2018). Not too long ago, Chang & Fan (2017), employing a Structural Equation Model, found that consumers

tend to show commitment, engagement and intention to use those brands with whom they are able to interact with on social media platform. Subsequently, Loureiro et al. (2019) established that the best fashion brands ceaselessly update photographs and recordings, communicate with customers, and make them feel part of the brand by using famous personalities. Owing to this fact, Nash (2019) discovered users who actively utilize Social Media to pick up motivation and information with respect to high street fashion retailers were not as highly impacted by the substance delivered as previously anticipated. With the advent of social media platforms, consumers can directly express their honest, uncensored opinions about products or services for the whole world to see, which was concluded to have positive influence on purchase intention of consumers (Michaela & Orna 2015). Zhao et al. (2019) also established that social media has a significant impact on an individual's increasing sustainable fashion consumption and that awareness about social and environmental issues paved the way for conscious fashion.

Supply Chain

In Fast Fashion, delivering the latest trends at the earliest possible is of paramount importance. A study revealed that small fast fashion businesses could produce fast fashion quicker with closer relationships with their customers and suppliers. To remain competitive in today's cut-throat market, business firms are compelled to cater to every whim and fancy of the consumers. However, the fast-moving consumer demands and the unforeseeable actions of the supply chain co-partners, triggers uncertainty along the supply chain which can weigh down on the overall performance of organisations (Patil et al., 2012). Christopher & Lee's (2004) analysis on supply chain uncertainty notes that with transparency in the supply chain and smooth flow of information throughout, such lack of confidence can be alleviated. Muñoz-Villamizar et al. (2019) unveils that the idea of digitalizing supply chain cycles is gaining popularity which (Yu et al., 2001) proposes as the solution for the existing lack of transparency. Incorporation of Artificial Intelligence can further aid the same (Min, 2010). With the unfolding global eco-consciousness, business organizations are giving more weight to sustainability in their operations. A recent review of the literature on the topic of supply chain (Abbas et al., 2019) highlights that the espousal of green practices in the supply chain can be instrumental to boost the economic growth of a country. Through an Interpretive structural modelling technique, Majumdar & Sinha (2018) found that difficulty in adopting green processes, designing such a system, and lack of government support along with poor consumer support were major barriers to Green Supply Chain in India. However, in (Mihardjo et al., 2019) the authors unveiled that to maintain brand image business concerns would attempt to promote their supply chain image as well, which in turn stimulated sustainability in supply chain. For the same, Shen (2014) suggests assumption of extended producer responsibility. Furthermore, the study of Gouda & Saranga (2018) points out that, strategies to mitigate supply chain risks worked better when used in conjunction with sustainable practices. Omar et al. (2019) suggests that to successfully implement environmental responsibility, alongside mending their ways, firms must secure the cooperation of their suppliers and well as customers. All participants in a supply chain must collaborate for a circuler economy scheme to thrive (Zhu et al., 2010). Combining sustainability principles with the notion of circular economy allows supply chain players to protect the environment they exist in (Genovese et al., 2017).

Objectives of the Study

1. To shed light on the sandwich effect faced by consumers between the producers and the marketers along with the impact of media in the fast fashion effect

2. To frame a model that encompasses the problems faced by customers and suppliers due to planned obsolescence
3. To determine the role of supply chain participants and consumers in the emerging circular economy.

METHODOLOGY

The ability to illuminate human experience is possible through the usage of CAQDAS. The aim of this research is to run through individual experience of various individuals associated with planned obsolescence and to understand the overall perusal of many individuals on one task. This is accomplished using a maximum variation purposive sampling methodology (Suri, 2011). An interview schedule method has been adopted based on which responses are obtained from marketers, suppliers, and consumers. The schedule consists of a set of questions constructed by the researchers and given to the respondents which basically provides a manual for gathering information on a specific subject (Bolderston, 2012). From the responses received, the researchers will capture the most used variable using a software program, Dedoose, and the same will be converted into a variable matrix (Appendix: Table 1). From the variables selected, a model is framed to understand the problems faced by suppliers owing to planned obsolescence and customer's role in the fast fashion cycle. The research is three dimensional since it considers three main respondent domains (Customers, Supply chain planners, and marketers). The customer profile is extensive and hence, the researchers have chosen only students (youth community). They possess an impeccable sense of fashion as this is the right age to exhibit their individuality (N=12). Heavy promotions and suitable marketing campaign planning is a major task and involvesheavy investments. The mass advertising campaign of the manufacturer de-promotes the older products offered by the marketer that causes a substandard profit situation. The marketer's attempts are therefore wasted due to planned fashion obsolescence (N=15). Supply chain partners work between producers and ultimate consumers where the presence of marketers are also observed. If the producer has planned to introduce a new product, it has to be an *"Informed Obsolescence"*. If not, suppliers may experience a significant issue in establishing partnerships with production entities and in distributing them to the marketer (N=16). The random population selected are various end users *"The consumers"* (N=990) from across the world using social media, & the questions has been shown in Appendix: Table 2, Statements on Problems faced by end-users (Consumers) due to fast-fashion).

Theoretical Framework

The theoretical framework (Grant & Osanloo, 2014; Lederman & Lederman, 2015; Rocco & Plakhotnik, 2009) furnishes a conceptual basis for the research work, facilitating comprehension of the research area and the variables involved, which in this case is consumer behavior, the influence of media, and influence of players in a supply chain and their relationship with each other. The concept of planned obsolescence was coined in the quest for profit, where developed businesses organizations were attempting to guarantee growing sales (Guiltinan, 2009). Planned Obsolescence as described by Bulow, 1986), *"suppliers of durables in imperfectly competitive markets producing goods with uneconomically short useful lives, so that consumers will have to repurchase more often"*. However, not all researchers agree that the act is backed by the intention to induce repeated purchase among the consumers (Cook & Yurchisin, 2017). Vasseur (2017) contemplated that Technological Obsolescence will be minimized as a number of governments, private organizations and customers are attempting to eradicate the

practice. The patterns are moving towards circular economy, eco-conception, substitutability, and reconditioning of products' lifetime. Our economy will gradually undergo a move from possession to experience (Boumphrey & Brehmer, 2017). Nonetheless, psychological obsolescence is likely to increase. Uncertainty in the supply chain is an expansive term referring to uncertainties that can happen at any stage in the supply chain. Fisher (1997) claims that *"innovative"* products that have short life cycles and display inconsistency have unpredictable demand, leading to higher level of uncertainty in the supply chain, which can be reduced by better knowledge about the market behavior. The SANDWICH effect is the highlight in the conceptual model. Consumers are stuck between the producers and the marketers and are put in a *"What should I do?"* situation. The below matrix (Figure 1) summarizes the involvement of various supply chain participants throughout the life of a given product (Will Kenton, 2019).

FUNCTION	PRODUCTION	LOGISTICS	SALES	MARKETING	ACCOUNTS & FINANCE	HRM	OUTCOME
DESIGNING A PRODUCT AS PER MARKET TRENDS		✗	✗				• RESEARCH & DEVELOPMENT • INNOVATION
MAKING THE PRODUCT AVAILABLE FOR SALES	✗				✗	✗	• LEAD TIME • SUPPLY CHAIN UNCERTAINTY • SUPPLY CHAIN MANAGEMENT
SELLING THE PRODUCTS TO THE CONSUMER	✗	✗			✗	✗	• PROMOTIONAL STRATEGY • INTEGRATED MARKETING COMMUNICATIONS
POST PURCHASE BEHAVIOUR	✗	✗		✗	✗	✗	• EXCESS INVENTORY • WASTAGE PILING

FIGURE 1
INVOLVEMENT OF VARIOUS SUPPLY CHAIN PARTICIPANTS THROUGHOUT THE LIFE OF A FAST FASHION PRODUCT

In the first stage, to keep up with fast fashion, manufacturers are compelled to make a choice on manufacturing before demand is realized. The choices of channel members rely on manufacturers' original decision on production and retailers' storage choices (Biyalogorsky et al., 2004). At this stage, the Finance and Accounting department is responsible to ensure the availability of required funds at the right time as well as to analyze the project from a cost-benefit perspective (Hempelmann & Engelen, 2015). Excessive inventory can be addressed by locating the origin of uncertainty in demand and supply, and scrutinizing the existing information (Patil et al., 2012), which can be aided by Artificial Intelligence and Chatbots (Bedford, 2016). Further, as seen in Figure 2, Fan (2018) discovered that a significant portion of consumers gather information about fads and fashion through social media, television, magazines, and newspapers and sets a standard of what their expectations are from the purchase (Yinyin, 2011). Post purchase, a riveting finding was that albeit some fast fashion consumers were environmentally conscious, they did not recycle or reuse due to lack of better awareness (Joung, 2014). When a particular trend reaches its decline stage, marketers again take up Research & Development to come up with new trends leading to a continuation of the fast fashion cycle.

FIGURE 2
FAST FASHION CONSUMER'S BUYING BEHAVIOR

From the above two conceptual models for consumers (Figure 1) and supply chain function (Figure 2) (Red coloured cross) is an indication of wasted time and (Squared boxes) indicate the work time and engagement. It is obvious that a lot of time is wasted by many departments in this process. This has to be considered by the top management to plan cost effective model. The study on costing and planning for an effective model can be a future research.

Factor Analysis

Customers acknowledge firms that deliver goods on the right time with perfect quality (Simatupang & Sridharan, 2002). The success of a firm in the nation and in the global market is owing to customer loyalty. Thus the major target respondents for this research work are the customers. 17 question statements were formulated where the respondents had to answer on a likert scale (Likert, 1932; Joshi et al., 2015; Harpe, 2015). The same was used for a factor analysis after testing the normality of the data (Principal Components and Factor Analysis, 2003; Beckett et al., 2018; MacCallum et al., 2001). A statistical method is used to describe variability among observed correlated variables. This method is called as factor analysis which mentions five important steps shown as output: Sample adequacy norms (Table 1: KMO and Bartlett's test), factor loadings (Table 2: Factor Loadings)/ (Table 3: Total Variance), derived iterations (Table 4: Rotated Component Matrix), variables transformation matrix (Table 5: Component Transformation Matrix).

Table 1 KMO AND BARTLETT'S TEST		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.771
Bartlett's Test of Sphericity	Approx. Chi-Square	16400.562
	df	136
	Sig.	0.000

Table 2 FACTOR LOADINGS		
Communalities	**Initial**	**Extraction**
Motivated to save money to buy	1	0.827
Leads to arguments with family members	1	0.835
I have been appreciated by others	1	0.82
Culture, traditions does not support my fashion expectations	1	0.751
Boosts my attitude and personality	1	0.844
I try creating attention as I like to show my new fashion exhibits	1	0.712
Leads to imitating others style	1	0.669
I feel happy wearing new trendy clothes	1	0.29
Unwanted time searching new trends	1	0.785
I take extra care in designing my wardrobe	1	0.815
Sometime paves way for unwanted spending	1	0.846
I keep thinking about my fashion being copied by others which worries me	1	0.871
I start spending time in online searching	1	0.912
Sometimes leads to criticisms	1	0.818
I started to take up designer courses	1	0.832
I take extra time to dress up	1	0.805
I like to open my new fashion boutique	1	0.805
Extraction Method: Principal Component Analysis.		

Table 3 TOTAL VARIANCE									
Total Variance Explained									
Component	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**			**Rotation Sums of Squared Loadings**		
	Total	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	5.853	34.427	34.427	5.853	34.427	34.427	5.099	29.995	29.995
2	5.154	30.315	64.742	5.154	30.315	64.742	4.309	25.348	55.343
3	1.213	7.136	71.878	1.213	7.136	71.878	1.935	11.384	66.726
4	1.016	5.977	77.855	1.016	5.977	77.855	1.892	11.129	77.855
5	0.868	5.108	82.963						
6	0.53	3.118	86.081						
7	0.483	2.843	88.924						
8	0.363	2.135	91.058						
9	0.307	1.804	92.862						
10	0.248	1.456	94.319						
11	0.236	1.39	95.709						
12	0.207	1.216	96.925						
13	0.19	1.12	98.046						
14	0.131	0.768	98.814						
15	0.111	0.651	99.465						
16	0.061	0.357	99.822						
17	0.03	0.178	100						
Extraction Method: Principal Component Analysis.									

Factor analysis is a procedure used to reduce large number of questions into few variables (factors) based on their relevance. It checks interdependencies among the observed variables and is used to know how many dimensions a variable has. The sample size of (N=990) using a random sampling method to collect data from across the world using social media has satisfied the sample size criteria (MacCallum et al., 2001; Lingard & Rowlinson, 1992).

Table 4 ROTATED COMPONENT MATRIX				
Rotated Component Matrix[a]				
	Component			
	1	**2**	**3**	**4**
Motivated to save money to buy	0.902			
Leads to imitating others style	0.902			
Sometime paves way for unwanted spending	0.897			
Leads to arguments with family members	0.888	**Fast fashion leads to unexpected issues**		
Unwanted time searching new trends	0.851			
Sometimes leads to criticisms	0.788			
Culture, traditions does not support my fashion expectations	0.659			
I feel happy wearing new trendy clothes		0.917		
I take extra care in designing my wardrobe		0.872		
I try creating attention as I like to show my new fashion exhibits		0.852	**Fast fashion creates psychological issues**	
I start spending time in online searching		0.836		
I keep thinking about my fashion being copied by others which worries me		0.608		
I take extra time to dress up	**Fast-fashion leads to new spending issues**		0.357	
I like to open my new fashion boutique			0.904	
I started to take up designer courses			0.753	
Boosts my attitude and personality	**Fast-fashion leads to positive attitude**			0.847
I have been appreciated by others				0.788
Extraction Method: Principal Component Analysis/Rotation Method: Varimax with Kaiser Normalization.				
a. Rotation converged in 5 iterations.				

Table 5 COMPONENT TRANSFORMATION MATRIX				
Component	**1**	**2**	**3**	**4**
1	0.185	0.791	0.4	0.424
2	0.973	-0.231	-0.013	0.018
3	-0.107	-0.489	0.852	0.155
4	0.089	0.286	0.338	-0.892
Extraction Method: Principal Component Analysis Rotation Method: Varimax with Kaiser Normalization.				

RESULTS

India's textile industry has seen tremendous growth and is expected to reach greater heights by the FY2021. This is all possible because of the sale, which happens by influencing the users. Media contribution through advertisement is projected to reach Rs. 1232 Billion US$ in the FY2023. Television and print advertisement have a positive impact on increasing the

revenues. It is seen that the fashion producers and the marketers crush consumers. Each time a consumer goes in search of an apparel they come across a variety of clothes, which creates confusion. Speed and agility is always seen with the new fashion producers with a thirst to attract the users. This works! But not all the time. Steady stream of trends with little benefits will be accepted. Digital marketing platform and social media have added fuel to further confuse the consumers. To understand the reality, consumers were randomly selected through social media (Facebook) by sending survey links to fast fashion pages across the world. Thus, the sampling method here covers vast geographical location and hence we have named it *"Vast population sampling technique"* (VPST). This introspection on reality was measured using question statements related to problems due to fast fashion. The respondents (N=990) were asked to answer the question statements in a Likert five point scale. The similar statements were clubbed and were given a name tag.

Component 1: Fast fashion leads to unexpected issues
Component 2: Fast fashion creates psychological issues
Component 3: Fast-fashion leads to new spending issues
Component 4: Fast-fashion leads to positive attitude

If the above components associated with purchase issues, psychological issues and unwanted spending pattern then it is an obvious forecasted uncertainty. This can be easily predicted by the producers what will the new fashion create in the market and its impact on the purchase decision. We as researchers feel that fast-fashion creates positive impact leading to creativity, innovation, thick-competition but at the same time its *"real concern factor"* is that it is a *"Wastage of Resources"*. When the producers and marketers know to create artificial demand why don't they create a situation where only limited resources will be used. This is a great contribution to the country and her resources. Stakeholders have to start thinking wise! Production, supply chain, consumers should consider the environment and economic sustainability. Old gone are days of customization! New days are concern for environment.

Supply Chain Optimization deals with two major components called Make-To-Stock (MTS) and Make-To-Buy (MTB) and a detailed blueprint of the entire supply chain planning process (Rajagopalan, 2002; Zaerpour et al., 2008; Sawik, 2011). This entire planning goes for a stake due to fast-fashion which is a quick rush into the industry with no clue even to the marketers and the consumers. In reality the importance of bullwhip effect is more because fast-fashion cannot maintain transparency using the traditional supply chain techniques and methods. Fast fashion is all about the distorted information which amplifies the demand (Lee et al., 2015 & 1997; Chen et al., 2000). Thus, all the traditional methods used in the olden days and recent olden days cannot be used when the world is reviling with positive vibes of Digital Supply Chain Capabilities. Information Flow (OT), Supply Chain Dual Twin, AI and Cognitive services, IoT and edge analytics, Design and Simulation are the most trendy tools for the next two decades. Thus as mentioned in Figure 3 showing the Decision Matrix to avoid fast-fashion uncertainty the best decision is to catch hold of Artificial Intelligence which falls under the category of Important and urgent. The usage of this matrix will help the Supply Chain Managment in ensuring many positive changes. Other digital and technology based tools such as Machine learning, Chatbots can be used to facilitate distribution and warehousing to organize fast-fashion in a better way. Thus, this matrix can be a base work for the future research because it has incorporated the expectations of industry 4.0 which entices the readers. This very next phase in digitalization driven by four important components: data volumes, computational

power, better connectivity and well organized network will be the backbone based on which a firm will have to plan its strategies.
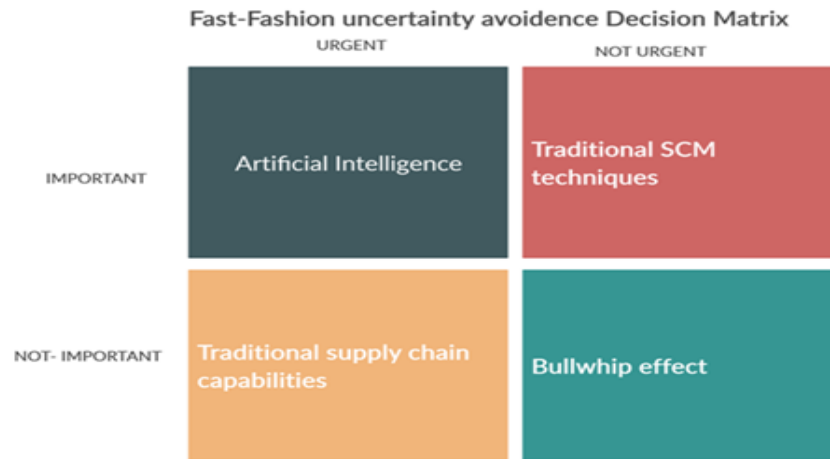
FIGURE 3
DECISION MATRIX TO AVOID FAST-FASHION

DISCUSSION
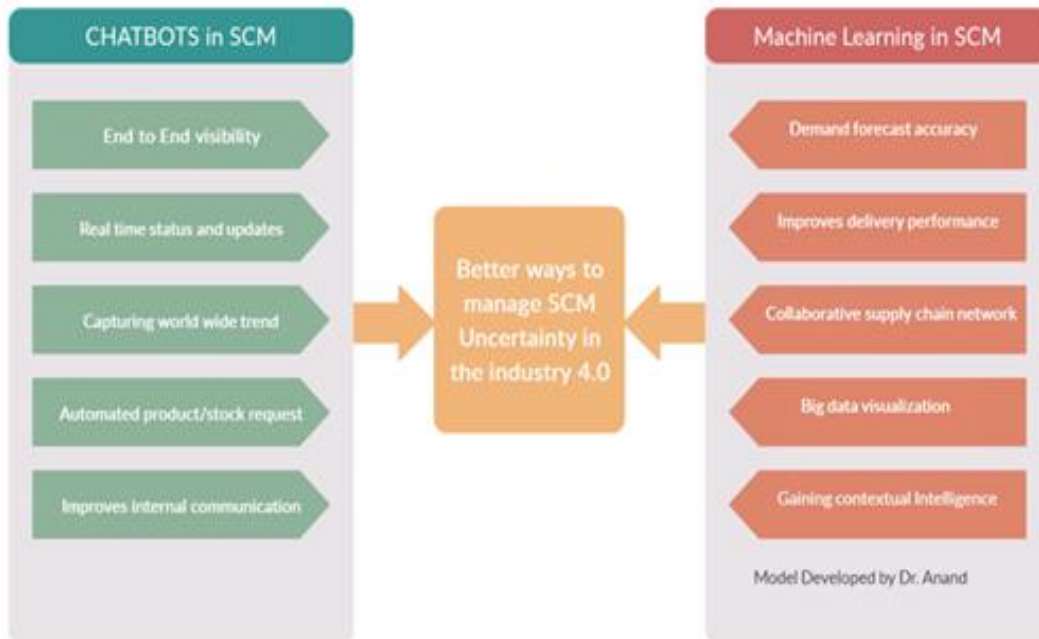
FIGURE 4
THE ROLE OF CHATBOTS AND MACHINE LEARNING FOR BETTER FAST-FASHION MANAGEMENT

Objectives of business are not going to be smart anymore as it cannot be relied it might change but the focus can be on big-data, business analytics, Human Machine Intefrace and

Digital-to-physical transfer. The usage of these mechanics will change the entire Supply Chain in the golden tomorrow. An example illustration has been shown in the Figure 4 explaining the role of Chatbots and Machine Learning for better fast-fashion management.

CONCLUSION

In Fast Fashion, the fashion item being of the latest trend takes precedence over the quality of the product. The product life cycle, from concept design to having items ready at the point of sale, can take about a few months to a few years. Shorter this cycle, the faster the fashion. This requires a perfectly positioned supply chain and design staff that can produce products and procure corresponding materials without delay. Apparel manufacturers as well as retailers have to keep themselves updated with who and what is currently trending in fashion and what will be in a short time. However, this task becomes difficult, as with the advent of social media, customers are quickly updated with the fashion trend changes that are more frequent in contrast to the past. Consequently, there exists considerable uncertainty in their supply chains which in turn inhibits their adaptability as well as competitiveness in the market. Suppliers can plan for their stock, color choices and patterns by monitoring international trends, as eventually, in the span of a season, it influences the Indian trend. In order to address the depletion of resources caused by fast fashion, the concept of sustainable fashion originated. However, consumers remain ambivalent about the same owing to the popular misconception that sustainability is synonymous to expensive. Although it can be argued that a small increase in price can reap long-lasting benefits, in a market like India where the consumers are eminently price-sensitive, it would take time to make the transition. Even so, the practice will help businesses tap the talent of the Generation Z who care a lot about the type of company they work for. In addition, their goodwill will also improve. With the rise of transparency in supply chains and accessibility that consumers have to information on who they're buying from, they can just as quickly find alternative choices causing fast fashion brands to lose their share. Hence, every company has to rethink and make changes to their system. It might not be a quick or agile change, but definitely a necessary one.

RECOMMENDATIONS AND SUGGESTIONS

Due to the emerging environmental concerns, Sustainable fashion is gaining prominence along with the notion of circular economy. Therefore, fashion students, who will soon enter and mould the industry, should be educated more on the concept and the same has to form a vital part of their syllabus, which does not seem to be the current situation. Furthermore, only when there is mass production of unconventional but eco-friendly materials like sugarcane bagasse, banana fibre, and coffee beans will it become viable for clothing businesses to use them as raw material. Fast-fashion confuses the production planning and this delay has a further impact on other departments such as finance, Human Resource, marketing, supply chain etc (Patil et al., 2012). For a domestic firm changes in fast fashion and its impact on supply chain may not be a major concern but for a global business it is. Thus hybrid supply chain strategies (Van Der Vorst et al., 2001) have to be framed. The new agile and holistic strategies will be a motivation to survive in turbulent and volatile markets (Agarwal et al., 2007). The Indian government can frame strong rules and regulations to safeguard the end consumers, as they are the ones being sandwiched between various coupled effects. Thus, major recommendation is to know the demand and the market trend without blindly giving importance to *"Here and Now decision"* (Gupta & Maranas,

2003; Wilding, 1998). In the latest revolution of Industry 4.0 where machine learning, AI, Chatbots and other big data analytics play a major role, it is easy to streamline the fast-fashion to facilitate the business without causing any problems to the stakeholders. Thus, it can be said that opportunities are always seen in fast-fashion but the tools and capability strategies to streamline is lacking which has to be taken seriously by the concerned firms to improve. A step away from the fast-fashion mentality needs to be taken. People must give more importance to their own style and not follow the footsteps of others. This can be transformed with awareness and the reform of high street stores. Individuals who like to revamp their wardrobe often ought to resort to thrift stores and vintages that offer a lower price point on second-hand clothes, promoting the concept of a circular economy in doing so. With that, the ability to change and tweak garments is a great skill to upgrade one's wardrobe offering. Clothes and fashion are to be celebrated by the wearer and inspire those around them. Within this, the makers should be highly celebrated and their stories showcased as you will find with truly ethical brands. Supply chain players, on the other hand, can contribute towards a circular economy by adopting the *"waste-to-energy"* system to meet their energy demands (Pan et al., 2015).

SCOPE FOR FURTHER RESEARCH

Three key stakeholders viz. Consumers (end-users), Media and Supply Chain Players have been considered in this research. Future researchers can incorporate farmers and agriculturists as major target respondents as they are indisputably the primary contributors to any fashion-textile industry. Researchers can also concentrate on the role of the government in bringing in new rules, regulations and policies to eradicate or at the least abstain the textile and fashion sector from indulging in un-healthy competition. Though fast-fashion creates good employment opportunities and flexi-work for Gig workers the unexplored scandals on labour torture affiliated with fast-fashion can be explored through case study methods. The future researchers can also plan to research the cost effective model which can be implemented to face issues due to fast fashion. Additionally, with the entire world talking about Corporate Social Responsibility, the endless resource crushing due to fast-fashion has a lot of scope of being explored. Thus, the economists can also develop theories on planned fashion obsolescence and fast-fashion and its impact on the economy. Although the approach adopted in this study is sound, future researchers can incorporate more sophisticated methodologies such as systematic literature review and meta analysis. Moreover, there is scope to widen the sample size and gain a more extensive outlook about the subject. The role of supply chain players in the proposed circular economy is another notable research area that is left neglected.

APPENDIX

Table 1 VARIABLE MATRIX ASSOCIATED WITH FACTORS ASSOCIATED WITH FASHION OBSOLESCENCE	
Fcators	Count
Brand website	1
Competition	8
Consumer Attitudes	25
Need Recognition	1
Psychographics	1
Self-Esteem	2

Consumer Awareness	12
Consumer Behavior	41
Consumer Demand	17
Consumer Direct Marketing (CDM)	2
Consumer Engagement	6
Consumer Expectations	4
Corporate Social Responsibility	6
Ease of Access	2
Environmental importance and impact	13
Ethical Fashion	5
Extended Producer Responsibility	1
Factors influencing Fast Fashion	3
Fashion Clothing Involvement	1
Generational Cohorts	1
Relationship between players in SCM	22
Wholesale-Retailer relationship	6
consumer-retailer relationship	20
supplier-retailer relationship	4
Fashion Consciousness	9
Fashion Leaders	4
Fast Fashion	27
Five-R Model	1
Recycle	3
Redesign	2
Reduce	2
Reimagine	1
Reuse	2
Green Supply Chain Management	7
Influence of Age	2
Influence of Gender on Fashion	10
Influence on young adults	1
Marketing Strategies	9
Mass Media	11
Catalog Shopping	1
Television	1
Product Life Cycle	2
Reasons why companies go green	1
Economic Prosperity	1
Environmental Stewardship	1
Social Wellbeing	1
Research and Development	1
Social Influencers	9
Social Media	31
Supplier-wholesaler relationship	12
Supply Chain Management	19
Lead Time	5
Supply Chain Risk	2
Sustainability	5
Environmental Sustainable Apparel	9
Theory of Planned Behavior	3
Theory of Reasoned Action	2
Transparency in Supply Chain	1
Trends	3

Various players in SCM	7
Buying Wholesalers	3
Manufacturing Wholesalers	2
eWOM	5
Online Buyer Reviews	3

Interview schedule

1. What, according to your understanding, is fast fashion?
2. What are the difficulties that the fashion designers and owners of fashion boutiques face in terms of staying updated with the latest trends? On what basis are the latest trends determined?
3. Fashion trends are constantly changing. Old items are going out of fashion soon and being replaced with new styles. What do you do with the stocks that have become outdated/ old fashioned?
4. With the increased awareness of fast fashion and its effects in today's world, do you have any recommendations to tackle this issue?
5. Do you see sustainable fashion as an alternative that is viable or beneficial?
6. We all know that sustainable fashion is a better option than fast fashion. But the cost involved in adopting sustainable fashion is high and this is why businesses hesitate to adopt sustainable fashion. Do you have any suggestions as to how to promote sustainable fashion among businesses as well as consumers?
7. The present fashion trend where we buy cheap clothes to keep up with trends is causing a lot of environmental damage. As a fashion student, who will enter the industry soon, does sustainable fashion and how to go about with it form part of your curriculum?
8. Clothes can be made out of plastic, sugarcane bagasse, coffee beans, and such materials too. Do you see these as viable options for raw materials?
9. Low-cost clothes have a lot of unethical practices behind them, but on the other hand, it allows the lower-income groups to afford clothes that are stylish and trendy. What are your thoughts on the same?
10. Vintage shops and other shops that sell second-hand clothing do not keep up with the latest fashion trends. With fast fashion, individuals are able to purchase unused clothes of the latest trends at cheap rates. This enables them to blend in with people from a higher class. In your opinion, can this line of thought of the people be overcome? Would it be possible to even in economically backward areas? If so, how?

Cherry-picking the driving factors of planned fashion obsolescence in the light of supply chain uncertainty creating sandwich effect for the consumers

	Table 2 PROBLEMS FACED BY END-USERS (CONSUMERS) DUE TO FAST-FASHION					
Question No	Statements on Problems faced by end-users (Consumers) due to fast-fashion	SD	D	N	A	SA
Q1	Motivated to save money to buy					
Q2	Leads to arguments with family members					
Q3	I have been appreciated by others					
Q4	Culture, traditions does not support my fashion expectations					
Q5	Boosts my attitude and personality					
Q6	I try creating attention as I like to show my new fashion exhibits					
Q7	Leads to imitating others style					
Q8	I feel happy wearing new trendy clothes					
Q9	Unwanted time searching new trends					
Q10	I take extra care in designing my wardrobe					
Q11	Sometime paves way for unwanted spending					
Q12	I keep thinking about my fashion being copied by others which worries me					
Q13	I start spending time in online searching					

Q14	Sometimes leads to criticisms				
Q15	I started to take up designer courses				
Q16	I take extra time to dress up				
Q17	I like to open my new fashion boutique				

Note: The future researchers can use this questionnaire for research purpose. The above listed 17 questions are associated with the problems faced bycustomers due to fast fashion (Planned fashion obsolescence). This scale constructes can be tested in other industries in the golden tomorrow. The authors can be contacted reacing at anand.shankar@christuniversity.in

REFERENCES

Abbas, B., Razak, A., & Wekke, I. (2019). Investigating green supply chain practices for economic growth. *Uncertain Supply Chain Management*, *7*(4), 783-792.

Agarwal, A., Shankar, R., & Tiwari, M.K. (2007). Modeling agility of supply chain. *Industrial Marketing Management*, *36*(4), 443-457.

Aladeojebi, T.K. (2013). Planned obsolescence. *International Journal of Scientific & Engineering Research*, *4*(6), 1504-1508.

Amin, S. (1998). Clothing matters: Dress and identity in India. *The Journal of Asian Studies*, *57*(1), 265-266.

Anderton, B.A., & Workman, J.E. (1994). Effects of two nonpersonal information sources on student buyers evaluation of apparel merchandise. *Clothing and Textiles Research Journal*, *12*(3), 1-5.

Arora, S. (2014). Globalized Frames of Indian Fashion. *Global Studies Journal*, *6*(1).

Beckett, C., Eriksson, L., Johansson, E., & Wikström, C. (2018). Multivariate data analysis (MVDA). *Pharmaceutical Quality by Design: A Practical Approach*, 201.

Bedford, S.C. (2016). Post purchase behavior of compulsive and impulsive fast fashion shoppers: hoarding of fast fashion products.

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.

Biyalogorsky, E., & Koenigsberg, O. (2004). Lead time, uncertainty, and channel decision making. *UCD-GSM Working Paper*.

Bolderston, A. (2012). Conducting a research interview. *Journal of Medical Imaging and Radiation Sciences*, *43*(1), 66-76.

Boumphrey, S., & Brehmer, Z. (2017). Megatrend analysis: Putting the consumers at the heart of the business.

Bulow, J. (1986). An economic theory of planned obsolescence. *The Quarterly Journal of Economics*, *101*(4), 729-749.

Chang, S.W., & Fan, S.H. (2017). Cultivating the brand-customer relationship in Facebook fan pages. *International Journal of Retail & Distribution Management*.

Chen, F., Drezner, Z., Ryan, J.K., & Simchi-Levi, D. (2000). Quantifying the bullwhip effect in a simple supply chain: The impact of forecasting, lead times, and information. *Management science*, *46*(3), 436-443.

Christopher, M., & Lee, H. (2004). Mitigating supply chain risk through improved confidence. *International Journal of Physical Distribution & Logistics Management*.

Cook, S.C., & Yurchisin, J. (2017). Fast fashion environments: Consumer's heaven or retailer's nightmare?. *International Journal of Retail & Distribution Management*.

de Lenne, O., & Vandenbosch, L. (2017). Media and sustainable apparel buying intention. *Journal of Fashion Marketing and Management: An International Journal*.

Distad, M. (2018). Bad girls of fashion: Style rebels from Cleopatra to Lady Gaga by J. Croll. *The Deakin Review of Children's Literature*, *7*(4).

Drew, L., & Sinclair, R. (2015). Fashion and the fashion industry. In *Textiles and fashion*. Woodhead Publishing.

Elyt Club. (2017). How movie industry influences fashion in men-Elyt Club. Retrieved from https://www.elytclub.com/blogs/news/how-movie-industry-influences-fashion-in-men

Fan, Y. (2018). Buying behaviors of generation x women on fast fashion products: A mixed methods study.

Fisher, M.L. (1997). What is the supply chain for your product. *Harvard Business Review*, *75*(2), 105-106.

Genovese, A., Acquaye, A.A., Figueroa, A., & Koh, S.L. (2017). Sustainable supply chain management and the transition towards a circular economy: Evidence and some applications. *Omega*, *66*, 344-357.

Gouda, S.K., & Saranga, H. (2018). Sustainable supply chains for supply chain sustainability: impact of sustainability efforts on supply chain risk. *International Journal of Production Research*, *56*(17), 5820-5835.

Grant, C., & Osanloo, A. (2014). *Understanding, selecting, and integrating a theoretical framework in dissertation research: Creating the blue print for your house*.

Guiltinan, J. (2009). Creative destruction and destructive creations: environmental ethics and planned obsolescence. *Journal of Business Ethics*, *89*(1), 19-28.

Gupta, A., & Maranas, C.D. (2003). Managing demand uncertainty in supply chain planning. *Computers & Chemical Engineering*, *27*(8-9), 1219-1227.

Harpe, S.E. (2015). How to analyze Likert and other rating scale data. *Currents in Pharmacy Teaching and Learning*, *7*(6), 836-850.

Hempelmann, F., & Engelen, A. (2015). Integration of finance with marketing and R & D in new product development: The role of project stage. *Journal of Product Innovation Management*, *32*(4), 636-654.

Joshi, A., Kale, S., Chandel, S., & Pal, D.K. (2015). Likert scale: Explored and explained. *British Journal of Applied Science & Technology*, *7*(4), 396.

Joung, H.M. (2014). Fast-fashion consumers' post-purchase behaviours. *International Journal of Retail & Distribution Management*.

Krushali, S., & Jojo, N. (2018). Cognitive marketing and purchase decision with reference to pop up and banner advertisements. *The Journal of Social Sciences Research*, *4*(12), 718-735.

Lederman, N.G., & Lederman, J.S. (2015). What is a theoretical framework? A practical answer.

Lee, H.L., Padmanabhan, V., & Whang, S. (1997). Information distortion in a supply chain: The bullwhip effect. *Management science*, *43*(4), 546-558.

Lee, H.L., Padmanabhan, V., & Whang, S. (2015). The bullwhip effect in supply chains. *IEEE Engineering Management Review*, *43*(2), 108-117.

Lennon, S.J., Sanik, M.M., & Stanforth, N.F. (2003). Motivations for television shopping: clothing purchase frequency and personal characteristics. *Clothing and Textiles Research Journal*, *21*(2), 63-74.

Likert, R. (1932). A technique for the measurement of attitudes. *Archives of psychology*.

Lingard, H.C., & Rowlinson, S. (2006). Sample size in factor analysis: why size matters. *Hong Kong: University of Hong Kong*.

Loureiro, S.M.C., Serra, J., & Guerreiro, J. (2019). How fashion brands engage on social media: A netnography approach. *Journal of Promotion Management*, *25*(3), 367-378.

MacCallum, R.C., Widaman, K.F., Preacher, K.J., & Hong, S. (2001). Sample size in factor analysis: The role of model error. *Multivariate Behavioral Research*, *36*(4), 611-637.

Majumdar, A., & Sinha, S. (2018). Modeling the barriers of green supply chain management in small and medium enterprises. *Management of Environmental Quality: An International Journal*.

Martinez., F. (2017). The benefits of fast fashion for college students. Retrieved from https://studybreaks.com/culture/fast-fashion/

Martino, G., Iannnone, R., Fera, M., Miranda, S., & Riemma, S. (2017). Fashion retailing: A framework for supply chain optimization. *Uncertain Supply Chain Management*, *5*(3), 243-272.

McAndrew, M. (2009). Glamour: A history: Gundle, Stephen: Oxford: Oxford University Press, 472 pp., Publication Date: July 2008.

Michaela, E. (2015). Fashion conscious consumers, fast fashion and the impact of social media on purchase intention. *Academic Journal of Interdisciplinary Studies*, *4*(3 S1), 173.

Mihardjo, L., Sasmoko, S., Alamsjah, F., & Elidjen, E. (2019). The influence of digital customer experience and electronic word of mouth on brand image and supply chain sustainable performance. *Uncertain Supply Chain Management*, *7*(4), 691-702.

Min, H. (2010). Artificial intelligence in supply chain management: Theory and applications. *International Journal of Logistics: Research and Applications*, *13*(1), 13-39.

Muñoz-Villamizar, A., Solano, E., Quintero-Araujo, C., & Santos, J. (2019). Sustainability and digitalization in supply chains: A bibliometric analysis. *Uncertain Supply Chain Management*, *7*(4), 703-712.

Namrata., B. (2016). Fast fashion-a growing phenomena? Retrieved from https://allenaustin.com/fast-fashion-a-growing-phenomena/

Nash, J. (2019). Exploring how social media platforms influence fashion consumer decisions in the UK retail sector. *Journal of Fashion Marketing and Management: An International Journal*.

Omar, H., Ali, M., & Jaharadak, A. (2019). Green supply chain integrations and corporate sustainability. *Uncertain Supply Chain Management*, *7*(4), 713-726.

Pan, S.Y., Du, M.A., Huang, I.T., Liu, I.H., Chang, E.E., & Chiang, P.C. (2015). Strategies on implementation of waste-to-energy (WTE) supply chain for circular economy system: a review. *Journal of Cleaner Production*, *108*, 409-421.

Patil, D.P., Shrotri, A.P., & Dandekar, A.R. (2012). Management of uncertainty in supply chain. *International Journal of Emerging Technology and Advanced Engineering*, *2*(5), 303-308.

Porter, D. (2000). The stars. *World Literature Today*, *74*(4), 769.

Presley, A.B., & Campassi, W.U. (2013). Measuring clothing color and design symbolism preferences and purchase intentions of asian indian females at different levels of acculturation. *ISRN Textiles*, *2013*.

Principal Components and Factor Analysis. (2003). Retrieved from https://doi.org/10.1016/S0922-3487(08)70234-X

Rajagopalan, S. (2002). Make to order or make to stock: model and application. *Management Science*, *48*(2), 241-256.

Rocco, T.S., & Plakhotnik, M.S. (2009). Literature reviews, conceptual frameworks, and theoretical frameworks: Terms, functions, and distinctions. *Human Resource Development Review*, *8*(1), 120-130.

Roy, S., Sethuraman, R., & Saran, R. (2016). The effect of demographic and personality characteristics on fashion shopping proneness. *International Journal of Retail & Distribution Management*.

Ryan., V. (2014). What is perceived obsolescence? Retrieved July 6, 2019 from http://www.technologystudent.com/prddes1/plannedob2.html

Sahoo, A. (2018). An overview of indian textile and clothing industry. *International Journal of Ayurveda*.

Sawik, T. (2011). Supplier selection in make-to-order environment with risks. *Mathematical and Computer Modelling*, *53*(9-10), 1670-1679.

Shephard, A., Pookulangara, S., Kinley, T.R., & Josiam, B.M. (2016). Media influence, fashion, and shopping: a gender perspective. *Journal of Fashion Marketing and Management*.

Simatupang, T.M., & Sridharan, R. (2002). The collaborative supply chain. *The International Journal of Logistics Management*, *13*(1), 15-30.

Stefan Reidy. (2019). Fashion supply chain: supply chain visibility to streamline it. Retrieved from https://arviem.com/fashion-supply-chain-needs-supply-chain-visibility/

Suri, H. (2011). Purposeful sampling in qualitative research synthesis. *Qualitative Research Journal*, *11*(2), 63.

Van der Vorst, J.G., Dijk, S.J.V., & Beulens, A.J. (2001). Supply chain design in the food industry. *The International Journal of Logistics Management*, *12*(2), 73-86.

Vanathi, R., & Swamynathan, R. (2014). Competitive advantage through supply chain collaboration–an empirical study of the Indian textile industry. *Fibres & Textiles in Eastern Europe*.

Vasseur, L. (2017). The society of the future? Retrieved from https://www.halteobsolescence.org/quelle-societe-du-futur/societe-future/

Wilding, R. (1998). The supply chain complexity triangle: uncertainty generation in the supply chain. *International Journal of Physical Distribution & Logistics Management*.

Will Kenton. (2019). Supply chain definition. Retrieved from https://www.investopedia.com/terms/s/supplychain.asp

Yinyin, W. (2011). Consumer behavior characteristics in fast fashion.

Yu, Z., Yan, H., & Cheng, T.E. (2001). Benefits of information sharing with supply chain partnerships. *Industrial Management & Data Systems*.

Yuksel, S. (2012). An outlook of the fashion industry through fashion history. *Procedia-Social and Behavioral Sciences*, *51*, 1016-1021.

Zaerpour, N., Rabbani, M., Gharehgozli, A.H., & Tavakkoli-Moghaddam, R. (2008). Make-to-order or make-to-stock decision by a novel hybrid approach. *Advanced Engineering Informatics*, *22*(2), 186-201.

Zhang, S., & Hong, S. (1999). Sample size in factor analysis. *Psychological Methods*, *4*(1), 84-99.

Zhao, L., Lee, S.H., & Copeland, L.R. (2019). Social media and Chinese consumers' environmentally sustainable apparel purchase intentions. *Asia Pacific Journal of Marketing and Logistics*.

Zhu, Q., Geng, Y., & Lai, K.H. (2010). Circular economy practices among Chinese manufacturers varying in environmental-oriented supply chain cooperation and the performance implications. *Journal of Environmental Management*, *91*(6), 1324-1331.

Zhu, Q., Geng, Y., & Lai, K.H. (2011). Environmental supply chain cooperation and its effect on the circular economy practice-performance relationship among Chinese manufacturers. *Journal of Industrial Ecology*, *15*(3), 405-419.

Shen, B. (2014). Sustainable fashion supply chain: Lessons from H&M. *Sustainability*, *6*(9), 6236-6249.