Blockchain Technology in the Fashion Industry:
Virtual Propinquity to Business

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ABSTRACT

The concept of fashion has been coupled with technology, where technology has become the protagonist. The transparency between an organization and a customer works as a catalyst, and the customer has taken a more mainstream role. With blockchain technology, companies can reconnect with customers and customers can track the journey of a product from its raw materials to the finished goods. The primary focus of the study is on services and data collected from the following sectors, namely fashion, apparel, and online platforms. The author's main goals are (1) to illustrate an overview of how big data is transforming the service industry, especially the fashion and design sector, and (2) to present various mechanisms adopted in the service industry. The study aims to investigate a model that fits through EXT-TAM and uses additional attributes of blockchain technology with a special reference to fashion apparel. The findings of this study depict a model, where PEOU, PU, and attitude are the major constructs and present a win-win scenario for both the customer and the organization.

KEYWORDS

Attitude, Blockchain Technology, Technology Acceptance Model, Traceability, Transparency

1. INTRODUCTION

Corona virus has affected the world which was caused by the severe acute respiratory syndrome corona virus 2 (SARS-CoV-2), initially discovered in December 2019 in Wuhan, Hubei Province, China. The unprecedented spread of this virus has created a slew of problems that have shaken the foundations of established businesses. One of the primary characteristics of the contemporary era is technological advancements, which may assist us overcome the obstacles provided by COVID-19 (Kalla et al 2020). The introduction of new technologies has produced efficiencies, innovative products, and close customer relationships. The recent technology among them is blockchain technology. Blockchain is a network of peers, signing and consensus protocol, ledger, and smart contracts. It is non-controversial and is being successfully applied to both commercial and non-commercial applications. By allowing

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digital information to spread but not be copied, blockchain offered a new type of internet. Ethical policies related to data transparency are executed using smart contracts (Emrouznejad, A. 2016 and Bertino et al., 2019). Even though originally it was devised for the digital currency, Bitcoin, the tech community is finding other unexplored uses for it. The apparel industry is no exception. By introducing effective use of smartphones, IoT (Internet of Things), social networks, cloud technology, and analytics, Blockchain has revolutionized business models in a new perspective to security, safety, resiliency, and effectiveness of systems, and ethical requirements in the digital world (Bertino et al., 2019).

Modern companies, primarily online or e-commerce traders, collect and pile large amounts of consumers' personal details (big data for their users/customers about liking, habits, geolocalization, shopping, family detail, personal information, previous searches, and social networks), and maintain up to date record of all their previous transactions (Emrouznejad, A., and Marra, M. 2017). Experts opine that this is just the beginning and big data is maintained and used by few multinationals, but considering its benefits, very soon, every local trader will base most operational decisions on such big data. Such an exercise is repeatedly discussed to as data-driven algorithms and data-driven decision making (Zhi, Liao, and Emrouznejad 2021). With the fast-changing business environment where the customer is the reason for the success and failure of any business, future growth increasingly depends on trusted partnerships. But increasing regulations, internet crime and online fraud, ethical concerns pose a threat to business expansion. To address these modern challenges post COVID-19, blockchain offers more responsive value chains, quicker product innovations, enhanced customer relationships, and faster integration with the IoT and cloud technology and all of this is at a lower cost of a trade. Further, it facilitates smart contracts, strong engagements, and pacts with intrinsic, robust cybersecurity features. This study attempts to discuss the much talked but less understood issue in the modern perspective and demonstrate the application of blockchain technology post COVID-19 in multiple avenues, especially in the apparel industry.

A modern business has now become a very competitive and demanding enterprise. It necessitates a transptracearent system to establish successful and long-lasting customer relationships. Companies are now getting accustomed to digital realism and have been using the same in their daily operations. This study focuses on apparel and its allied industries. The reason for selecting apparel industry is the need for traceeablity that has emerged as one of the crucial requirement for a multi-site and multi-tier production (Aggarwal et al. 2021) and emerged as one among the badly hit sector due to COVID-19 crisis. Traceability facilitates discernibility and tailors to the consumer necessities of limpidity and quality assurance (Aggarwal 2018, 2021). It also addresses prevailing evils of information disproportionateness, low visibility and encourages ethical buying practices by assuting product authenticity (Bullon et al 2020). The use of blockchain (tracking and identification feature) allows fashion and textile industry to control and monitor their articles, directly from the stage of production to its purchase by the end consumer (Elmessiry 2018).

In the past decade, the apparel industry has grown multiple folds. To keep pace with the growth and stay ahead in the apparel and fashion industry, leading players are taking the services of BitSE, specializing in blockchain and cloud product management solutions. Their clothing line has been embedded with VeChain and BitSE Chips having unique identity codes that are stored on a Blockchain. It offers a transparent environment where customers can access information on their smartphones to identify counterfeit goods, making it impossible to duplicate goods (Fran Casino 2019). Besides this, blockchain technology helps professionals to create their own register of products, and monitor their supply chains (Apte and Petrovsky 2016).

A similar approach can effectively be applied by the textile and fashion houses to ascertain whether a product is genuine or not (Lu and Xu (2017). The amalgamation of securely chaining blocks together and copying the ledger over multiple systems successfully makes blockchain records tamperproof (Bullon 2020). It presents a scenario where business growth is aligned with the growth of the stakeholders concerned. Consequently, deploying new technology such as blockchain is justifiable if it helps the organization improve its productivity, save middlemen cost, more transparency in

operations, and hence the organizational revenues while sticking with ethical policies. The findings of this study reinvent such win-win business relationships (Tian (2017).

The concept of fashion has been coupled with the vagueness of sustainability to do something for the wellbeing of the humankind without polluting the environment. The term 'circular fashion' has been coined by Brismar (2014) based on the principles of circular economy and sustainable development. Circular fashion is a wide terminology which is not only related to fashion industry, but also has its application to sportswear and outdoor wear. Circular fashion talks about the process of designing, sourcing, producing and providing the products with an intention to environment responsible human being by using the product in the most effective form and thereafter, when having no human use, dispose-off it to environment back safety (Kosba et al., (2016); Agrawal et al (2018), Global Fashion Agenda, 2017). Circular fashion is attaining its popularity in the market and has been reached to predominant level where an organization's whole objective is to provide apparel at cheap rates with an intention of using it for 2-3 seasons maximum. There is a sudden shift in the consumption pattern of consumers and in place of using 2-3 collections per year, an individual is using 1-2 collection for maximum 2 seasons (Birtwistle and Moore, 2007). In the apparel segment, fast fashion apparel embodies unsustainability because it is low-cost clothing which is based on current fashion trends and has a high demand in the young generation (Joy A et al., 2012). To have the high customer response, companies introduce new clothing trends and items. The duration of change in the trends has been reduced drastically from six months to 2-3 weeks (Tokatli 2008). Though, fast fashion has been with high scale employment generation, but, it creates the dissonance among the young consumers. Fashion is thriving at a very fast pace and it's difficult to hold something which is beyond human control. As a marketer, we can only increase our speed and match with this pace to excel and sustain in the market by keeping the same momentum. Fast fashion industry which has a low quality of products, has potential to grow double and led to textile waste (Kirsi and Lotta, 2010). It has been found that society is not able to get the full value of the apparel till the end of its life-cycle and even before decomposing (Global Fashion Agenda, 2017). As per the report, more than 30% of the apparels have not been worn even once in a year and over half of the used apparels end up in the form of landfills. There is a huge opportunity to recycle and transition the fashion apparel and sent back to the market in a usable form with the help of circular fashion system. With the help of circular fashion, the fashion apparel can be used maximum in its most-usable way by circular system i.e. sharing and re-circulating it. Consequently, deploying new concept of Circular Fashion through online Renting Clothing is justifiable if it helps organization to improve its revenues, productivity, and saving middlemen cost. The findings of the study reinvent such win-win business relationships. There is a fundamental requirement of the change in clothing industry which may come up with sustainable and environment friendly approaches to deal with these issues through recycle and reuse.

Fast fashion leaves a footprint which led to more pollution and waste burden. So, there is a need of eco-friendly textile material, ethical production and reuse approach in the clothing industry. Technology will work as a catalyst in the scenario. The effect of technology will be like a pebble and it will create ripples in the fashion industry not just inwardly but outwardly also. The authors main goals with the study are (i) to illustrate an overview of how blockchain is transforming the service industry, especially the fashion and design sector post COVID-19, (ii). to present various mechanisms adopted in the service industry that influence the latent information concealed in big data, and (iii) to highlight some of the drawbacks and risks incurred. The study aims to investigate a model that fits through EXT-TAM and uses additional attributes of Blockchain Technology with a special reference to fashion apparel. Futhermore, this study adds to the body of knowledge on IT adoption by highlighting blockchain adoption, a hot topic for academics and practitioners seeking a deeper understanding of adoption behaviour at the individual level.

2. LITERATURE REVIEW

Blockchain is going to be the new normal in the market of technology driven applications for business purposes. Blockchain technology has been used in a variety of areas, including financial services, manufacturing, food, agriculture, pharmaceuticals, fight COVID-19, hotels, airlines, healthcare, and government, as well as supply chain management. Traceability, visibility, authenticity, legitimacy, aggregation, automation, resiliency, accurate and quick judgments, lower costs, improved supply chain performance, and customer happiness are all benefits of blockchain technology. We have seen the wide adoption of Blockchain technology in the finance sector so far. Blockchain technology is also working as a revolutionary solution in the healthcare industry where the primary focus is on the issue of counterfeiting of drugs (Mettler, 2016). In another study, it has been posited that with the help of Blockchain technology, healthcare industry will have immense innovation in terms of providing 24*7 monitoring to high risk patients with the help of a real-time application or wearable data sense machine (Linn et.al., 2016 and Charles V., Emrouznejad A. 2019). Some of the key blockchain application areas are detailed in Table 1:

Table 1. Potential Blockchain application

Study	Focus	Application Field
Van Hoek, 2019	RFID implementation framework for blockcahin in supplychain	Supply Chain
Martinez et al., 2019	Blockchain for resource and information processing	
Apte and Petrovsky, 2016	Verification of material ingredients	
X. Y. Wu et al., 2021	Blockchain-based traceability system	
Kumar et al., 2021	Blockchain integrated vaccine supply chain architecture	
Beinke et al. 2018	Cross-border transaction without currency exchange fees	Finance
Wang and Kogan 2018	Stengthening accounting, auditing, and bank transfer	
Nowiński and Kozma 2017	Reducing transaction cost	
Kowalski et al., 2021	Developing trust relationship in trade finance	
Bhardwaj et al., 2018	Sharing medical records	Healthcare
Bocek et al., 2017	Storing and accessing medical products	
Sikorski et al., 2017	Health data privacy and security	
Emrouznejad A. 2019	Patient monitoring	
Palma et al., 2019	Safe academic record and automatic degree issue after course completion	Higher Education
Vidal et al., 2020	Blockchain-based assessment of learning outcomes	
Griffey 2016	Unique identity and transferability of digital documents	
Mori et al., 2019	Data encryption and security	
Kumar, Upreti, Raut, et al., 2021	Blockchain for data integrity	

The field of fashion and textile is also not untouched by the application of blockchain. It has been observed that blockchain has the likelihood to revolutionaries' fashion industry through traceability and transparency in supply chain and protection of intellectual property. Blockchain provides numerous options for ensuring traceability and transparency throughout the supply chain. It is feasible to identify the different actors represented as network components by applying this technology to a company's production and distribution chain. The movement of a product from one actor to the next is tracked in the network, which makes each transaction public. The traceability and transparency of the manufacturing and distribution process, as well as the identification of all players involved, is critical for all businesses that want to meet environmental and social sustainability rules and demonstrate sustainable practises to their customers. Furthermore, Blockchain provides a decentralization, transparency, automation, and immutability characteristics for environmental sustainable solution in fashion apparel manufacturing industry to reduce the carbon emissions in all key steps of clothing making (Fu et al., 2018). Blockchain may contribute in developing sustainable circular economy through blockchain-enabled circular supply chain management in the fast-fashion industry (B. Wang et al., 2020). Blockchain is a promising tool for addressing the fashion industry's infringement problem. Designers and brand owners can use blockchain to better the protection of their intellectual property. A disruptive tool against counterfeiting might be a mix of blockchain with AI (Artificial Intelligence), QR (Quick Response) codes or RFID (Radio-frequency Identification) chips (di Bernardino, 2019).

In this study, the adaptability of Blockchain technology has been analyzed by using the technology acceptance model and its dimensions have been analyzed to understand the behavioral Intention and purchase behavior from the consumer point of view.

2.1 Theory of Reasoned Action (TRA)

Fishbein & Ajzen (1980) posited that theory of reasoned action depicts the Intention related to the behavior of an individual. TRA is a widely used theory that describes the factors that influence consciously intended behaviours and thus appropriate to determine users' intention to use technology (Ajzen and Fishbein, 1980). A person's ability to do a certain behaviour is determined by his or her behavioural intention, which is impacted by the person's attitude and subjective norm regarding the conduct (Davis et al., 1989). In addition, Davis (1986) created the technology acceptance model (TAM) from TRA with the goal of explaining technology consumption behaviour. TAM employs TRA as a theoretical framework for determining the fundamental relationship between two key beliefs: perceived utility and perceived ease of use, and users' attitudes, intentions, and actual technology use. TAM is less general than TRA to determine technology usage behavior. TRA and TAM have been commonly used together to describe people's intentions to utilise technology. Davis et al. (1989) used TRA and TAM to study users' acceptance of computer technology; Yuen and Ma (2008) adopted TAM to explore teacher acceptance of e-learning technology and applied both TRA and TAM to examine student–teachers' intention to use technology. Many researchers have looked into the determinants of environmentally friendly mobility, such as bikesharing, hybrid electric vehicles, and electric cars, using the theory of planned behaviour (TPB), an extended form of the TRA (Ka- plan et al. 2015; Wang et al. 2016; Klöckner et al. 2013). TRA an appropriate model for behavioral measure involves two major constructs i.e. attitude and subjective norms. Attitude, the first construct, determines the behavioral belief of an individual towards a specific behavior that leads to change in behavioral intention. A subjective norm,the second construct, determines the normative belief of an individual towards a specific behavior. Various studies have been theorized that prove that the change in the behavioral intentions of an individual is due to the effect of behavioral beliefs and normative beliefs (Wang et al. 2016, Buabeng-Andoh, 2018).

2.2 Technology Acceptance Model

The technology acceptance model (Davis, 1993); (Davis, Bagozzi and Warshaw, 1989) determines the attitude and behavioral intentions of an individual towards using a specific technology.Two

important constructs i.e. perceived ease of use and perceived usefulness have been used to understand the intention of acceptance of technology from a user's point of view. It depicts the intention of a user to use a specific technology which has been provided in a specific circumstance. These two major constructs have been used in the model as external components to figure out their effects on the attitude of an individual due to PEOU (perceived ease of use) and PU (perceived usefulness). The two beliefs i.e. PEOU and PU have been used in various studies to determine the effects of change in the technology platform on the behavioral Intentions of an individual (Pavlou, 2003); (Gefen, Karahanna and Straub, 2003). Technology acceptance model is helpful in understanding the acceptance of information technology.

2.3 Attitude

According to the theory of reasoned action (TRA) (Ajzen and Fishbein, 1980); (Davis, 1993), an individual's attitude plays a significant role in determining an individual's behavioral beliefs towards using the technology. In relation to an individual's behavioral belief, attitude plays a significant role in evaluating the desire or intention of an individual towards using a new technology. By using this construct, an individual's behavioral belief impact on behavioral intentions has been calculated. In place of using subjective norms, Davis (1993) has used behavioral intentions to predict the intention to use a specific technology.

H1: Attitude of an individual is positively associated with their purchase intention

2.4 Perceived Ease of Use

Perceived ease of use has been used as one of the major determinants of the technology acceptance model (TAM). It is one of the major antecedents of determining the impact of new technology based on attitude and behavioral intention of an individual, though this determinant is not directly predicting the impact (Gefen, Karahanna and Straub, 2003). Technology acceptance model has been used in various studies to understand its contribution when new technology is used. Analyzing the contribution of this model is necessary in understanding the impact of new technologies. Technology acceptance model posited the impact of various feature of technology, whether it's hedonic or utilitarian, on the consumer's behavior intentions and the purchase behavior. Perceived ease of use is of the determinants of the technology acceptance model which shows the effortless intention of an individual to use the technology (Davis, Bagozzi and Warshaw, 1989). Perceived ease of use is helpful in case of understanding the extent to which an individual perceives the effectiveness and perceived ease of using blockchain technology in getting the transparency in information while searching for product information.

H2: Perceived ease of use of an individual is positively associated with their purchase intention

2.5 Perceived Usefulness

Perceived usefulness is an important determinant to find the extent of an individual's belief in using a technology which would enhance their skill of in performing a task (Davis, 1989). Perceived usefulness is the degree to which an individual perceives his performance in finding the information by using technology. TAM theorized the two major construct of the study which determine the importance of these determinants in predicting the behavioral Intentions of an individual to use a specific technology. Synthesis of literature suggests that the perception about technology changes the attitude of the consumers and it affects the consumer behavioral intentions towards online shopping. Previous studies have also discussed the positive relationship between perceived usefulness and Intention to

buy; whereas, there is a weak relationship between perceived usefulness and attitude (Davis, Bagozzi and Warshaw, 1989); (Jackson, Chow and Leitch, 1997) and (Lucas, Henry C., Spitler, 1999).

H3: Perceived usefulness of an individual is positively associated with their purchase intention
H4: Purchase intention of an individual is positively associated with their purchase behavior

2.6 Development of the Conceptual Model

The current study is an effort to determine the adoption of new technology to help resolve the counterfeiting issue with a special reference to fashion apparel (as per figure 1). To find the said relationship, a conceptual model has been proposed and hypotheses have been farmed accordingly to prove the relationship among these different attributes. In the proposed model, an extension and revision of the TAM model has been used in addition to the other four major attributes like personal gratification, conspicuous consumption, moral intensity, and perceived counterfeit detection (PCD). Perceived ease of use, perceived usefulness and attitude are the integral parts of the TAM model (Davis et al., 1989). The current study has highlighted a new technology, which has become dominant in the current market, and its acceptance in relation to the Intention of purchase.

Figure 1. Conceptual Model
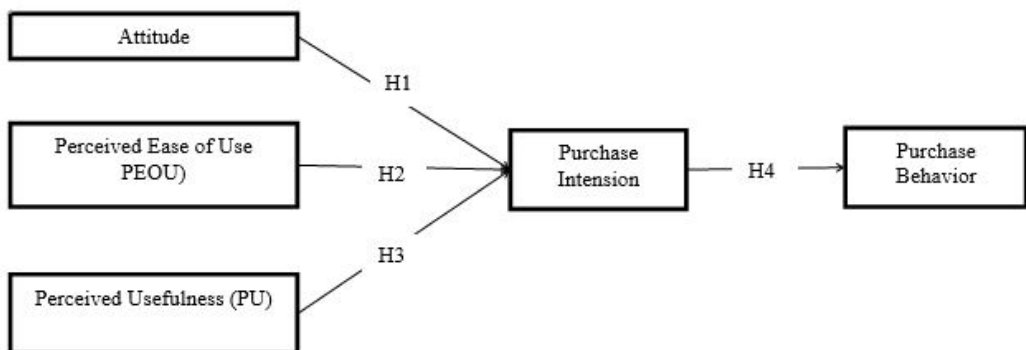
3. METHODOLOGY

In response to the advancement in technology, the current study is trying to explore the acceptability and behavioral intention of the respondents towards blockchain technology to meet challenges post COVID-19. Technology acceptance model covers the basic purpose of determining the acceptance towards the technology from a user's point of view.

3.1 Method and Data Collection

The major focus has been given to understand the behavioral intention towards using blockchain technology with a special reference to the fashion industry. The Indian luxury fashion industry has observed tremendous growth in the past few years and it is expected to increase from US$30 in 2017 billion to US$50 billion by 2020 (ASSOCHAM report, 2018). Another study by BCG has estimated that the industry will touch $ 500 billion by 2025 (BCG report, 2025). As per a report from AT Kearney (published in 2016), India has the largest population of young people and their shopping preferences show a bigger bend towards luxury as compared to the Gen X.

A questionnaire has been developed by considering previous studies where technology acceptance model was used as a theoretical framework (Wu and Wang, 2005; Abu-Dalbouh & H.M., 2013; Pavlou & Fygenson, 2006). After reviewing the researches (Wu and Wang, 2005; Abu-Dalbouh & H.M., 2013; Pavlou & Fygenson, 2006), the questionnaire has been made in two parts. The first part of the questionnaire covers the demographic variables and the second part of the questionnaire covers the behavioral intentions of the respondent towards using blockchain technology for the fashion industry. The major demographic variables which have been considered under this study are age, gender, marital status, level of education, monthly personal income and internet accessibility. The selections of these demographic variables were based on the previous researches where technology acceptance model has been used as the theoretical framework for the study (Wu and Wang, 2005 and Pavlou & Fygenson, 2006).

Data for the analysis has been collected through a primary survey from online fashion apparel shoppers, who have used mobile applications within the last year. The convenience sampling method has been used for this study where the respondents have been selected with a pre-defined selection criterion. The survey method has been used to understand the behavioral intentions of a respondent towards using blockchain technology in the fashion industry because the present study is an effort to find a conceivable solution which will contribute to future research on blockchain technology. The target segment for the respondents is between the age of 18-45 years from Indian metropolitan areas i.e. majorly from Delhi/NCR (National Capital Region) and other cities are Mumbai, Bangalore and Kolkata, who have purchased fashion apparel recently online with in a span of 4-5 months. Respondents have been told about the basic functioning of blockchain technology which will be helpful for tracking purposes. Thus, the respondents have been selected with a pre-defined criterion of previous online shopping experiences. Even though, it's an emerging area of research, the absence of substantial research on the application of blockchain technology in the fashion industry is a major road block in this area. Due to unavailability of previous research on the application and usage of blockchain technology from the customer's point of view, it was difficult to give an understanding to the respondents while filling the questionnaire. A previous research performed in the healthcare domain (Linn & Koo, 2016) has been used as the base for explaining the features and usage for future scenarios to those who have previously done online shopping. The whole concept of using a technology acceptance model is just to understand the behavioral intentions of a user towards new technology and its application. Lastly, Adaptation of technology in the fashion industry has a huge contribution in terms of understanding the consumer behavior (Jain et. al., 2018).

3.2 Measurement

A survey instrument has been formed in a structured manner to fulfill the objectives of the study and the questions have been designed to measure the variables based on the theory of technology acceptance model. There are 15 items that have been developed for the current study and all the items have been use for analysis the indicated variables of the model like perceived ease of use, perceived usefulness and attitude. These items have been adapted from previous research papers where technology acceptance model has been used as theoretical model (Wu and Wang, 2005; Abu-Dalbouh & H.M., 2013). To capture the significance of technology in the fashion industry the 7-point Likert scale has been used in the study. Existing literature has adopted the Likert scaling method which has been considered as the primary study based on theoretical framework i.e. the technology acceptance model. A pilot study was carried out first, with a total of 20 questionnaires issued to twenty research experts. Following the pilot study's recommendations, only minor adjustments were made to the final surveys to make them more understandable to respondents. A total of 268 questionnaires were received out of a total of 380 instruments sent. Unfilled responses and responses to scaled items that were nearly identical were removed. A total of 250 questionnaires were retained for additional examination, resulting in a response rate of 66%. As the response rate is less than 85%, a non-response error test is recommended to assure external validity (Lindner et. al., 2001). The study follows the guidelines of Armstrong

and Overton (1977) and Hill et al. (1997) to address non-response error. We divided responses into three categories based on the information we received: (1) correct respondents (who completed the questionnaire completely), (2) inaccurate respondents (who returned the questionnaire incompletely), and (3) non-respondents (who did not return the questionnaire). The results of the χ2 test show that there is no significant difference between the three groups based on demographic features, social characteristics and factors in the study, ruling out non-response error.

3.3 Descriptive Statistics

After screening the data, multivariate analysis has been done on the data to determine the differences in response time as respondents' profiles vary. The demographic profile of respondents are detailed in Table 2 and Table 3. The data posits that approximately 77% of the respondents are have at least an undergraduate degree as the part of their education level. Nearly 70% of the respondents have above 25000 in monthly personal income. Almost 60% of the respondents have done online shopping more than 2 times in the previous year and it indicates clearly that the respondents had a good experience of online shopping for fashion apparel. further, the classification in terms of gender shows that males with high income and education level have also high propensity to do online shopping for fashion apparel and they are displaying a comfort towards using a new technology in line with prior research (Seock & Bailey, 2008; Dholakia et al., 2003).

The Cronbach alpha value for the 15 items proves the reliability test (Hair et al., 2007).

Table 2. Sample demographics

Variable	Category	Count	%
Gender	Female	112	44.8
	Male	138	55.2
Internet Access Hardware	Mobile phone	67	26.8
	Desktop/laptop	183	73.2 69.6
Marital Status	Married	173	69.2
	Single	77	30.8
Level of Education	Undergraduate	78	31.2
	Postgraduate	116	46.4
	Others	56	22.4
Monthly Personal Income	Below 10K	53	21.2
	10K-25K	27	10.8
	25K-50K	48	19.2
	50K-100K	110	44
	Above 100K	12	4.8

Table 3. Cross-tabulation

Cross-tabulation							
		Monthly Personal Income					
		Below 10K	10K-25K	25K-50K	50K-100K	Above 100K	Total
How many times purchased women ethnic apparel online	1-2 times	28	12	16	46	2	104
	2-3 times	17	9	9	0	4	39
	3-5 times	8	6	19	11	0	44
	5-8 times	0	0	0	53	0	53
	>8 times	0	0	2	0	8	10
Total		53	27	46	110	12	250

Table 4. Reliability Coefficient

Reliability Statistics (Cronbach α)		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.954	.961	15

3.4 Model Testing

CB-SEM, uses the maximum likelihood (ML) estimation approach to replicate the covariance matrix. The method needs the specification of the whole theoretical model prior to data analysis because it is a confirmatory approach. Proposed research model has strong theoretical foundation hence CB-SEM is an appropriate multivariate modelling technique.This study is aiming to understand the impact of blockchain technology on the consumer Intention to purchase a product online. By seeing the current market scenario, it has been observed that the use of new technologies is the need of the hour. With the help of such new technologies, retailers can build trust with the customers and provide a safe online transactional environment to them. There are various variables which play a significant role in the final decision making process of the customers and their purchase Intention and purchase behavior. To prove the impact of blockchain technology, Structural Equation Modeling (SEM) has been used in the current study. SEM has been performed in two major steps. The first step is a confirmatory factor analysis (CFA) which has been performed to measure the measurement model's acceptability. Following that, structural equation model (SEM) has been performed to find the model fit of the structural model based on the theoretical model given.

4. RESEARCH ANALYSIS AND FINDINGS

A priori, Common Method Bias (CMB) was eliminated by randomising questions and rotating items. Harman's single-factor test, which demonstrated the lack of CMB, was used to further control for CMB. Confirmatory factor analysis has been performed on the factors which have been formed on the basis of the conceptual model i.e. technology acceptance model of the study. The model consists of

3 exogenous factors (attitude, perceived ease of use, perceived usefulness) and 2 endogenous factors (behavioral Intention and purchase behavior). Behavioral Intention has been considered as one of the endogenous factors. It has been used as a mediator while performing the analysis and proving the relationship among exogenous and endogenous variables. While performing the analysis, it has been considered that regression estimation of the observed variables above 0.3 should be taken as normal; whereas, above 0.5 has been considered as healthy for the analysis (Hair et al.2007). The observed values of the construct items prove the relationship and confirms the validity test.

Finally, the remaining 13 items have been considered for the study in the final analysis. As per the defined method, the selection of items is based on regression estimation, there are only 13 items which are fulfilling the rules of selecting these variables. These 13 items show a strong relationship with 5 major factors which have been examined as per the theory of technology acceptance. The result of the loading values of the observed variables proves the underlying relationship of these variables with the factors based on theory.

Table 5. Measurement model indices

Variable	Code	Attribute	Factor Loadings
Factor 1 (Attitude) 4 items	ATT1 ATT2 ATT3 ATT4	Online shopping by having personalized feature is time saving Online shopping is 24*7 Buying personalized things over the internet is a good idea I like to do online shopping when I am having personalized product offerings	0.85 0.63 0.42 0.55
Factor 3 (Perceived Usefulness) 3 items	PU1 PU2 PU3	Allows authorized participants to log in would be useful for getting information about the product For me, valuable information about the product is important to me Relevant tracking information would enhance my effectiveness in getting useful product information compare to other technology (like NFC, RFID)	0.57 0.64 0.86
Factor 4 (Perceived Ease of Use) 2 items	PEOU1 PEOU2	With Blockchain technology, user can browse information specific to the product would be easy like help in avoiding counterfeit For me, access to secure private data and information based on my requirement easily available from website	0.77 0.43
Factor 5 (Behavior Intension) 2 items	PI1 PI2	I intend to use the Blockchain technology in purchasing for products as much as possible I intend to use the Blockchain technology for purchasing in the future also if services will be provided	0.88 0.70
Factor 6 (Purchase Behavior) 2 items	PB1 PB2	I would feel comfortable buying products over the internet on my own with the help of Blockchain technology Blockchain Technology is a reliable way for me to take care of my personal affair	0.65 0.58

4.1 Measurement Model

The measurement model has been used to prove the relationship of the various constructs based on this theorized model. By using the measurement model, various items have been measured to perform the analysis and find a model fit. CFA has been performed to prove the relationship between all the constructs. The findings of the measurement model has been compared with the base theory to check the model fit.

Figure 2. Measurement Model
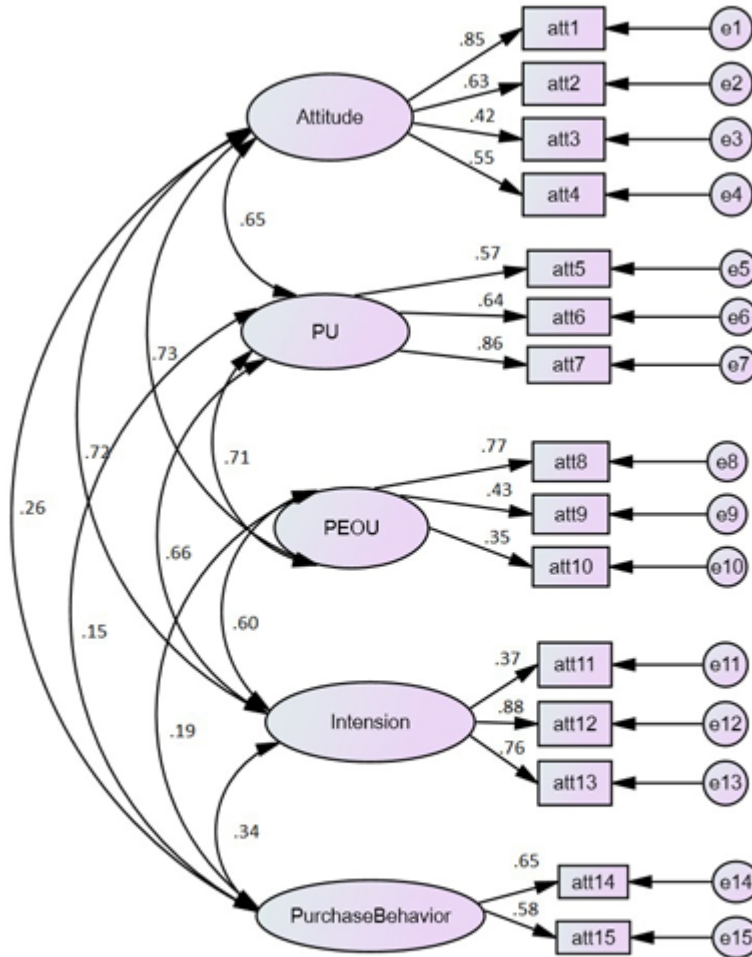
4.2 Construct Validity

To check the validity of the study, the values of the constructs have been used to measure the model fit. CFA has been used to measure the construct validity for various dimensions which have been designed on the Likert scale. The AMOS 20 software has been used perform the statistical analysis for this study. After performing the analysis, the indices for the various constructs have been analyzed and it has been found that the values of these constructs are falling in the underlying acceptable range. The value of these construct proves the model fit for this study.

Table 6. Model Fit Indices for Measurement Model

| Statistic	Recommended Value	Obtained Value
Chi-Square value		270.878
Df		220
CMIN/DF	< 3.00	1.231
GFI	> 0.90	.962
AGFI	> 0.80	.913
TLI	> 0.80	.872
CFI	> 0.90	.919
RMSEA	< 0.10	.065

4.3 Structural Model

To check the model fit for the study, the most important analysis is to perform the structural equation modelling (SEM). The structural model analysis analyzes the measurement model's validity. Based on the theoretical model, the various constructs of the conceptual model have been structured on the basis of the given literature.

4.4 Estimated Standardized Path Coefficients

To perform the model fit, SEM analysis has been used as the primary requirement of the study to estimate all the 15 constructs. It has been observed that the standardized paths of the estimated

Figure 3. Structural Model
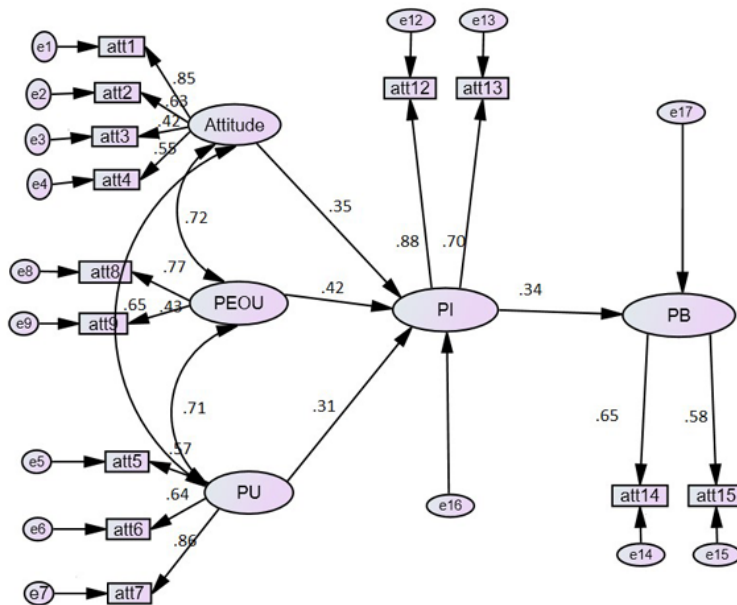
coefficients are significant in nature. As per the analysis, the relationship between all the constructs is significant in nature.

In the current analysis, it has been examined that the relationship between various construct is at a significance level of (0.01*, 0.05**).

It has been observed that the hypothetical relationships between all the constructs are fulfilling the relationship and found to be significant in nature. The values of the model fit indices fall in the permissible and acceptable range.

Table 7. Significance (p) values

Hypothesis				Estimate	S.E.	P
H1	PI	<---	Attitude	.35	0.012	**
H2	PI	<---	PEOU	.42	0.010	**
H3	PI	<---	PU	.31	0.009	*
H4	PB	<---	PI	.34	0.024	**

Table 8. Model Fit Indices for Structural Model

Statistic	Recommended Value	Obtained Value
Chi-Square		281.545
Df		230
CMIN/DF	< 3.00	1.224
GFI	> 0.90	.953
AGFI	> 0.80	.895
TLI	> 0.80	.883
CFI	> 0.90	.904
RMSEA	< 0.10	.062

4.5 Findings

The proposed conceptual model has been evaluated by keeping the technology acceptance model as the benchmark and by using the structural equation modelling (SEM) in addition to it. To test the reliability and validity of the data, confirmatory factor analysis (CFA) has been performed. The model has a good fit based on the defined acceptable range (Joreskog & Sorbom, 1993). Confirmatory factor analysis has been done using AMOS software and results show good fit between theoretical model and conceptual model. After performing CFA, chi square/ degree of freedom has been calculated and value for the same is 1.224. There are parameters to define the overall fit of the model like GFI, AGFI, TLI, CFI, and RMSEA, which have been calculated and represented in Table no 8. Thus, it proves that the model has a good fit with the data. The internal reliability of the model has been calculated and the value for the same is 0.954 which is in the recommended range as per table no 3. Figure 1 represents the conceptual model and the relationship amongst all the research variables with the research hypothesis. For H1, the result indicates that the attitude has a significant effect on behavioral intentions with $\beta = 0.35$ and $p = 0.012$. The result indicates a positive relationship

among these variables. For H2, the result indicates that the perceived ease of use has a significant relationship with behavioral intentions with $\beta = 0.42$ and $p = 0.010$. For H3, the result indicates that the perceived usefulness has a significant relationship on behavioral intentions with $\beta = 0.31$ and $p = 0.009$. For H4, the result indicates that the behavioral intentions have a significant relationship with purchase behavior with $\beta = 0.34$ and $p = 0.024$. All the variables have significant relationships. However, only perceived ease of use has a very strong relationship with behavioral intentions when compared to other variables.

## 5. IMPLICATIONS OF BLOCKCHAIN TECHNOLOGY ON BUSINESS REVENUES

This study is aiming to understand the impact of blockchain technology on the consumer Intention to purchase a product online. Findings of the study revales that the behavioral intentions have a significant relationship with purchase behavior. Furthermore, attitude, perceived ease of use, perceived usefulness are the significant predictors of technology adoption for online product purchase intension. Technology with a positive attitude towards its adoption is the most important function, and marketers must concentrate on cultivating a favourable attitude toward their products through rich product knowledge, a strong brand image, and improved customer communication (Pickett et al. 1993; Su et al. 2017; Kumar & Mohan, 2021). Marketers should educate clients about the environmental benefits of blockchain technology and the difference it can make in their lives as well as the lives of future generations to combat the COVID-19 challenges. Study confirmed that perceived usefulness and perceived ease of use are important determinants in behavioural intentions to use blockchain enabled online purchase system, which is in line with previous TAM theories (C. Kim et al., 2010; Nuryyev et al., 2020). Furthermore, the findings strengthens the viewpoint the customers give importance to blockchain utility in online product purchase system.

Designing new trends and meeting the fast-changing demands of consumers are not the only two challenges that the global apparel industry face today due to COVID-19. The troublesome issue that has been eroding the high-end apparel and fashion industry is 'counterfeiting'. The industry leaders spend millions of dollars on creating a new trend and when it comes to earning revenues, dishonest producers and traders jump in the race and eat up a major chunk of the profits by offering cheap duplicable goods and accessories. There are plenty of measures to catch someone from walking out of a store with stolen apparel goods, but counterfeiting is a completely different monster. The gravity of the matter can be understood from the underlying figures that reveal that counterfeit goods take away more than $1000 billion from the apparel and fashion industry every year. The frightening part of it all is that despite of strict government regulations, counterfeiting has been increasing with time.

Now imagine the likelihood of easily tracking clothing from the material that was used to create it, to its purchase in a store or on a website. What would it mean for consumers? With the help of smart phones, by scanning a tag on their trouser or shirt or any other item, they will know the authenticity of the product they are planning to buy. Where it was made, which raw material was used, information will be in their hands, resulting in transparency and traceability. Customers will decide themselves which product to buy with enhanced confidence. This will leave no space for copying and making duplicate goods as a blockchain will enable brands to hold and control the data they provide both out to their employees and the outside world while following required ethical standards.

The Win-Win Scenario
CUSTOMERS ORGANISATION
No Middleman, Direct Interface
Transparency, Data Protection
Stronger Customer Bonds
Increased Customer Loyalty
Increased Revenues

Figure 4.
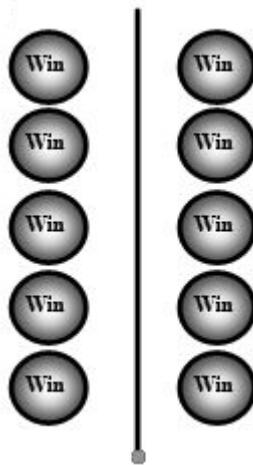
Using blockchain will result in enhanced revenues and better customer relations post COVID-19. This will also enable customers to know and understand the complexity in bringing a product to market (Zhi W., H. Liao and A. Emrouznejad 2021). This can help alter their perception of buying similar and cheaper goods. With the increased buying and sales figures, apparel companies instead of limiting themselves to disposable items and focusing only on cost cutting measures, the apparel and fashion industry can put more emphasis on quality and sustainability, without sacrificing on levels of margins and revenues.

6. CONCLUSION

In the study, we have performed the analysis and postulated a hypothesis which has been structured on the basis of a theorized model described in the literature review. In the current study, various constructs of the technology acceptance model have been analyzed to check the model fit between the conceptual model and the theorized model. Various dimensions like perceived ease of use, perceived usefulness, and attitude have been analyzed to check the significance of the technology acceptance model used in blockchain technology (Davis et.al., 1989). Technology acceptance model has been used to understand the behavior of a consumer in terms of an individual's acceptance towards a new technology by considering the variable of the underlying model. To test the conceptual model fit with the theoretical model, the data has been collected using non probability sampling and the respondents that have been considered are between the age of 18-45 years and majorly from Indian metropolitan cities which can be considered as a major limitation of this study. Secondly, the present study only surveyed Indian consumers, which ignores online platforms in different cultures and countries. Thirdly, considering the large size and spread of the country, the sample used in the study seems unequally distributed between those without experience and those with online fashion renting exposure, which might present a potential attitude–behavior gap. Finally, the study only investigated the relative advantage of circular economy and online fashion renting, while some probable drawbacks might exist, for instance hygiene-related issues by used clothing during COVID-19 era. These limitations present research opportunities and scope to the future researchers.

It appears that access to big data especially in service industry such as fashion could allow organisations to exploit the multi dimensionality of their sustomers' communications in order to perceive a comprehensive image and to augment the service quality, as well as the sustainable profits

(Singh H et al, 2019). In short, it is very much clear that big data has been changing the way businesses interact with their users in the service industry (Jain G et al., 2020). It is also to note the big data revolution is only in its early stages. What is not clear is the scope of the continuing impact of such a technological disruption. Though big data definitely brings numerous returns, some disadvantages are in order. One of the such drawback for organisations is to prudently exploit and reveal the dimensions of big data while conserving trust, fairness, and consumers' delight. Recognizing the reasonable line involved in the said trade-off appears to be elusive and may necessitate marketers, data scientists, psychologists, regulators and advocates to work together.

To take the responses based on the current scenario, the respondents have been briefed about the advantages and features of the Blockchain technology. They have been explained the use of Blcokchain technology in a detailed manner with special reference to fashion apparel. The brief about the Blockchain technology is required due to the unavailability of a physical existence of this technology in the current market.

As per the theory of the technology acceptance model (Davis et.al., 1989) attitude, perceived ease of use and perceived usefulness have a direct impact on the online consumer behavioral intentions; vis-à-vis behavioral intentions have the direct impact on the purchase behavior. The result and findings of this study proves the relationship of the underlying constructs of the posited model which has been used to find the acceptance of the blockchain technology. The respondents have given their feedback on the basis of items which have been constructed on the basis of previously held similar studies. The findings proved that a perceived ease of use has a stronger relationship with Behavioral Intentions as compared to attitude and perceived usefulness; whereas behavioral Intentions also show a strong relationship with purchase behavior. So, the analysis proved that perceived ease of use for customers is the dominating factor for considering the technology for an advantage over the traditional methods of technology. It also shows that customers consider this technology as a way of making their life easy with the available information and content online .

With the advent of technology, customers are accessing information and shift to better technologies within a fraction of a second. As per findings of the analysis, Blockchain has a high impact on the consumers and moves at a high pace in contrast to the earlier technology which has been adopted in different industries at a snail's pace (Charles V., Gherman T. 2019). Blockchain technology will hasten the process of trust and transparency among customers predominantly because of its decentralized, democratic and disintermediary nature (Ballandies et al., 2018; Drescher, 2017; Pirson et al., 2016). The ethical salience of the technology eradicates information asymmetries (Dierksmeier and Seele, 2020). The unprecedented degrees of transparency and accuracy provided by blockchain has positive ethical implications. It has been observed that customers show perceived ease of use as the major indicating factor towards accepting a new technology; perceived usefulness and attitude also have a positive relationship with behavioral intentions. The values of estimated coefficient for all these fall under the permissible range of significance in nature proves that the relationship among various constructs and values signify a model fit. Study findings would help practicenors especially after COVID-19 pandemic to make informed decisions in order to harnesh full potential of Blockchain not only alone but also in combination with all shorts of evolving technologies, as the world is passing through big digital transformation.

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