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Consumer Acceptance of Circular Economy Practices in E-Commerce Platforms

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ABSTRACT

The increasing issues related to environmental sustainability and resource depletion have led to the implementation of circular economy in e-commerce. This study examines the factors that influence the purchase intention with circular economy products considering consumer's perceived environmental benefits, social influence, and trust in e-commerce platforms. An exploratory design was used, in which 390 respondents of Ernakulam District were surveyed by means of a structured questionnaire and analyzed using PLS-SEM. The results indicate that the factors have significant impact on the mediator-consumer attitude which leads to purchase intention.

Keywords: *Circular Economy, E-commerce, Attitude, Purchase Intention, Environmental Benefits, Social Influence.*

Introduction

The growing pressure of limited resources, increase in waste and climatic change has heightened the necessity to have sustainable economic models. Linear system of take- make-dispose model have led to substantial environmental loss and ineffective use of resources. The circular economy has in turn become a viable alternative by focusing on reuse, recycling, refurbishment, and recovery, with product life cycle extension and reducing environmental impact (European Commission, 2020).Circular economy practices are the adoption of strategies that focus on extending the lifespan of products and materials in the economy, recovering resources, remanufacturing, sharing and closed-loop supply chains, which are designed to ensure that products and materials remain useful in the economy as long as possible (Kirchherr et al., 2017).

The fast-growing digital technologies placed e-commerce platforms(Amazon; eBay)as a facilitator of the circular economy practices. These platforms provide resale, sharing, repair services, recycling programs, and distribution of refurbished products, which facilitates the process of integrating circular business models and sustainable consumption in digital marketplaces(Accenture, 2015).

The success however greatly depends on how consumers perceive them. The adoption is still limited despite increasing institutional support due to low awareness, perceived risk, and lack of trust in recycled or remanufactured product(Hamari et al., 2016; Mugge et al., 2017). Attitude of consumers are very important as they determine the buying behavior, use of products and disposal patterns(Ajzen, 1991). Although environmental concern and economic benefits may be the driving force to participate, issues with quality, trust, and reliability tend to deter adoption(Confente et al., 2020).

This paper discusses the effect of Perceived Environmental Benefits (PEB), Social Influence (SI), and Trust in E-Commerce Platforms (TEP) on Attitude Towards Circular Economy Practices (ATCEP) and, subsequently, Purchase Intention (PI) with the goal of delivering insights that facilitates the development of sustainable consumption in the digital economy.

Literature Review

- **Perceived Environmental Benefits and Consumer Attitude**

Consumer attitudes are largely determined by perceived environmental benefits. Consumers believe that their purchases will help in conserving the environment by minimizing waste and using resources efficiently. Prior research shows attitude towards sustainable consumption is favorably affected by the increased level of environmental awareness (Camacho-Otero et al., 2018). Likewise, White et al. (2019) revealed that environmental concerns cause people to adopt eco-friendly practices, including using recycled and refurbished products. Moreover, consumers are better willing to adopt circular business models when they become aware of the environmental consequences of their decision (Kirchherr et al., 2017).

- **Social Influence and Consumer Attitude**

Another factor that influences consumer attitudes is social influence. It describes how people important to an individual like family, friends, and peers influence his decision-making. Venkatesh et al. (2003) explains people tend to embrace new products or services when they have seen a positive social recommendation. Peer reviews, social media engagements and online communities have a strong influence in shaping consumer perceptions in the digital environment (Hamari et al., 2016). Therefore, positive social impact improves customer attitudes to circular economy products sold by the e-commerce media.

- **Trust in E-commerce Platforms and Consumer Attitude**

Consumer attitudes are also determined by trust in e-commerce platforms. Trust indicates consumer confidence about reliability, security and performance of online platforms. Pavlou (2003) highlighted trust minimizes the perceived risk and enhances the willingness of the consumers to make online transactions. This aspect is especially essential when it comes to circular products where the issues of quality and authenticity are widespread. Matzler et al. (2015) observed that in online platforms trust create positive impact on accepting refurbished and recycled products among consumers.

- **Consumer Attitude and Purchase Intention**

Purchase intention largely depends on consumer attitude. Based on the Theory of Planned Behavior (Ajzen, 1991), the intention to act is highly predicted by attitudes. The green consumption literatures indicate positive disposition towards green products brings increased purchase intention (Joshi & Rahman, 2015). Likewise, Mugge et al. (2017) discovered positive perceptions about refurbished products increases consumer readiness to buy them.

Therefore, consumer attitude acts as a bridge between influencing factors and purchase intention in the context of circular economy practices.

Research Gap

Previous studies on circular economy and sustainable consumption, have little been directed to consumer acceptance in e-commerce platforms and was concentrated on organizational and policy-level adoption. Moreover, there is lack of research on impact of technological factors on consumer involvement in online circular marketplaces. The present study fills this gap by analyzing the factors that determine consumer acceptance to contribute to the creation of effective circular strategies and sustainable digital consumption.

Research Objectives

- To analyze how perceived environmental benefits, social influence, and trust in e-commerce platforms affect the consumer attitude towards circular economy products.
- To study how consumer attitude to circular economy products influences the purchase intention of consumers over e-commerce platforms.
- To identify the mediating effect of consumer attitude to circular economy products in the relation between perceived environmental benefits, social influence, trust in e-commerce platforms, and purchase intention.

Hypotheses of the Study

With available theories on sustainable consumption, technology adoption, and consumer behavior, the subsequent hypotheses are developed:

Direct Effect Hypotheses

H^1: There is significant positive effect of perceived environmental benefits on consumer attitude towards circular economy products.

H^2: There is significant positive effect of social influence on consumer attitude towards circular economy products.

H^3: There is significant positive effect of trust in e-commerce platforms on consumer attitude towards circular economy products.

H^4: Consumer attitude towards circular economy products has a positive impact on purchase intention.

Mediation Hypotheses

H^5: Consumer attitude about circular economy products mediates the relationship between perceived environmental benefits and purchase intention.

H^6: Consumer attitude about circular economy products mediates the relationship between social influence and purchase intention.

H^7: Consumer attitude about circular economy products mediates the relationship between trust in e-commerce platforms and purchase intention.

Research Methodology

- **Research Design**

The proposed study uses an exploratory research design to test the factors that affect consumer acceptance of circular economy practices in e-commerce platforms. The design is appropriate to relatively understudied research domains and helps uncover new phenomena more deeply (Creswell, 2014). It allows analyzing consumer perceptions, attitudes, and behavioral tendencies of circular consumption within digital marketplaces.

- **Population and Sample**

The population sample includes consumers of e-commerce websites within Ernakulam District, Kerala, that are potential buyers of refurbished products, resale platforms, and recycling or returns programs, which are considered part of the circular economy. A group of 390 respondents was chosen, considered sufficient to conduct rigorous statistical and Structural Equation Modelling (SEM) analysis.

- **Sampling Technique**

The study employed a simple random sampling method to select the respondents. As a method of probability sampling, it ensures that every population member equally probable to be selected (Sekaran & Bougie, 2016). This will reduce sampling bias and maximize the representativeness of e-commerce users in the study area.

- **Determination of Sample Size**

The sample of the study was calculated through a statistical formula that is commonly used to derive the sample size of research.

$$n = \frac{Z^2 \times p \times q}{e^2}$$

Where:

- **n** = required sample size
- **Z** = Z-value corresponding to the desired confidence level (1.96 for 95% confidence level)
- **p** = estimated proportion of the population possessing the characteristic (assumed as 0.5 when the population proportion is unknown)
- **q** = 1 − p
- **e** = acceptable margin of error (0.05)

Substituting the values into the formula:

$$n = \frac{(1.96)^2 \times 0.5 \times 0.5}{(0.05)^2}$$

$$n = \frac{3.8416 \times 0.25}{0.0025}$$

$$n = 384.16$$

In case of large population, the calculated sample size is about 384 respondents. The current study involved 390 respondents, which is more than the recommended sample size and contributes to the strength and credibility of analysis. A bigger sample size enhances the validity of the results and is suitable for advanced statistical tools like factor analysis and Partial Least Squares Structural Equation Modelling (PLS-SEM).

Data Collection Technique

The research mainly utilized primary data collected using structured questionnaire that measured perceptions, attitudes and acceptance of circular economy practices by consumers in e-commerce platforms. A five-point Likert scale was used to measure variables. Data was collected through web surveys and secondary sources from scholarly journals, books and research reports supported the theoretical framework.

Findings of the Study

Cronbach's Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE) were used to determine the reliability and validity of the measurement model which is showing in table 1.

Table 1: Construct Reliability and Validity

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
ATCEP	0.907	0.908	0.931	0.729
PEB	0.876	0.879	0.909	0.668
PI	0.908	0.909	0.932	0.731
SI	0.896	0.901	0.923	0.707
TEP	0.890	0.898	0.919	0.694

Source: Researcher's Compilation

All constructs have Cronbach's Alpha value of 0.876 to 0.908, exceeding the suggested value of 0.70, thus showing strong consistency among measurement items. Moreover, the Composite Reliability values are between 0.909 to 0.932, which, far exceeds the acceptable value of 0.70, confirming the reliability and the consistency of the latent constructs. AVE assessed convergent validity having values between 0.668 and 0.731 which exceeds the required threshold of 0.50. This indicates that the constructs adequately capture the variance of their indicators compared to measurement error. Overall, these findings prove that the measurement model is satisfactorily reliable and convergent, making it suitable for subsequent structural model analysis.

Table 2: Outer Loadings (Measurement Model)

	ATCEP	PEB	PI	SI	TEP
ATCEP1	0.872				
ATCEP2	0.854				
ATCEP3	0.849				
ATCEP4	0.892				
ATCEP5	0.799				
PEB1		0.796			
PEB2		0.817			
PEB3		0.889			
PEB4		0.816			
PEB5		0.764			
PI1			0.810		
PI2			0.891		
PI3			0.872		

PI4			0.834		
PI5			0.866		
SI1				0.803	
SI2				0.890	
SI3				0.875	
SI4				0.788	
SI5				0.845	
TEP1					0.866
TEP2					0.838
TEP3					0.875
TEP4					0.815
TEP5					0.768

Source: Researcher's Compilation

Outer loadings indicate the power of correlation between observed indicators and the associated latent constructs in Partial Least Squares Structural Equation Modeling (PLS-SEM). Loadings above the suggested level of 0.70 implies that indicators are reliable. The findings indicate that all indicators relating to Attitude Towards Circular Economy practices (ATCEP), Perceived Environmental Benefits (PEB), Purchase Intention (PI), Social Influence (SI), and Trust in E- Commerce Platforms (TEP) range from 0.764-0.892 exceeding the acceptable threshold. For example, ATCEP indicators show loadings between 0.799 to 0.892, reflecting good construct representation. Overall, these results indicate that all measurement items reliably measure's its respective constructs, ensuring sufficient indicator reliability.

Table 3: Path Coefficients (Direct Effect)

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
ATCEP -> PI	0.845	0.845	0.028	30.476	0.000
PEB ->ATCEP	0.234	0.234	0.065	3.579	0.000
SI ->ATCEP	0.302	0.308	0.069	4.347	0.000
TEP ->ATCEP	0.445	0.438	0.095	4.692	0.000

Source: Researcher's Compilation

Path coefficient analysis shows the strength and importance of relationships between the constructs in the structural model assessed using t-statistics and p-values through bootstrapping. The results indicate that the influence of Attitude Towards Circular Economy Practices (ATCEP) on Purchase Intention (PI) is strong, positive, and statistically significant (= 0.845, t = 30.476, p = 0.001), which suggests that favorable attitudes influence consumers intention to adopt circular economy practices in e-commerce

Perceived Environmental Benefits (PEB) significantly influence ATCEP (a = 0.234, t = 3.579, p = 0.001), indicating that environmental benefits awareness leads to the development of positive attitudes. Similarly, Social Influence (SI) also exhibits a strong positive influence on ATCEP (= 0.302, = 4.347, = 0.001), showing the impact of the peer opinions and social networks on consumer attitudes. Also, Trust in E- Commerce Platforms (TEP) show a significant positive influence on ATCEP (= 0.445, = 4.692, p < 0.001), which highlights the importance of efficient digital infrastructure in facilitating circular practices. Overall, all the hypothesized relationships are supported, expressed by t-values greater than 1.96 and p-values less than 0.05.

Table 4: Total Indirect Effects (Mediation Analysis)

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
PEB -> PI	0.198	0.198	0.056	3.501	0.000
SI -> PI	0.255	0.260	0.059	4.341	0.000
TEP -> PI	0.376	0.370	0.081	4.625	0.000

Source: Researcher's Compilation

Table 5: Specific Indirect Effect

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
PEB ->ATCEP -> PI	0.198	0.198	0.056	3.501	0.000
SI ->ATCEP -> PI	0.255	0.260	0.059	4.341	0.000
TEP ->ATCEP -> PI	0.376	0.370	0.081	4.625	0.000

Source: Researcher's Compilation

The mediation analysis evaluates the significance of Attitude Towards Circular Economy Practises (ATCEP) in linking Perceived Environmental Benefits (PEB), Social Influence (SI), and Trust in E-Commerce Platforms, (TEP), with Purchase Intention (PI). The findings show strong indirect impact among all pathways. Specifically, PEB → ATCEP → PI indicates the indirect effect of 0.198 ($t = 3.501$, $p < 0.001$), whereas SI → ATCEP → PI indicates the indirect effect of 0.255 ($t = 4.341$, $p < 0.001$). Notably, TEP→ATCEP-PI has the highest indirect effect (0.376; $t = 4.625$, $p = 0.001$). These results validate that ATCEP mediates the relationship among all independent variables and purchase intention.

Table 6: Model Fit Summary

Model Fit Index	Value	Recommended Threshold	Result
SRMR (Standardized Root Mean Square Residual)	0.056	< 0.08	Good Fit
d_ULS (Squared Euclidean Distance)	0.982	Lower values preferred	Acceptable
d_G (Geodesic Distance)	0.712	Lower values preferred	Acceptable
Chi-Square	742.365	Lower values preferred	Acceptable
NFI (Normed Fit Index)	0.912	> 0.90	Good Fit

Source: Researcher's Compilation

Key indices derived through Smart PLS algorithm determined the overall model fit of the structural equation model. Standardized Root Mean Square Residual (SRMR) value of 0.056 is below the recommended score of 0.08, which implies that the observed data and proposed model fit well. The Squared Euclidean Distance (d_ULS 0.982) and Geodesic Distance (d_G 0.712) are relatively low which indicates little discrepancy between the empirical and model-implied covariance matrices. Also, the Normed Fit Index (NFI) of 0.912 is greater than the acceptable key value of 0.90 indicating the model fits satisfactorily as compared to the null model. Even though the Chi-square value (742.365) is quite high, it is acceptable in PLS-SEM due to sensitivity to sample size. These indices on the whole, show that the structural model represents the data well and substantiates the theoretical relationships of the study variables.

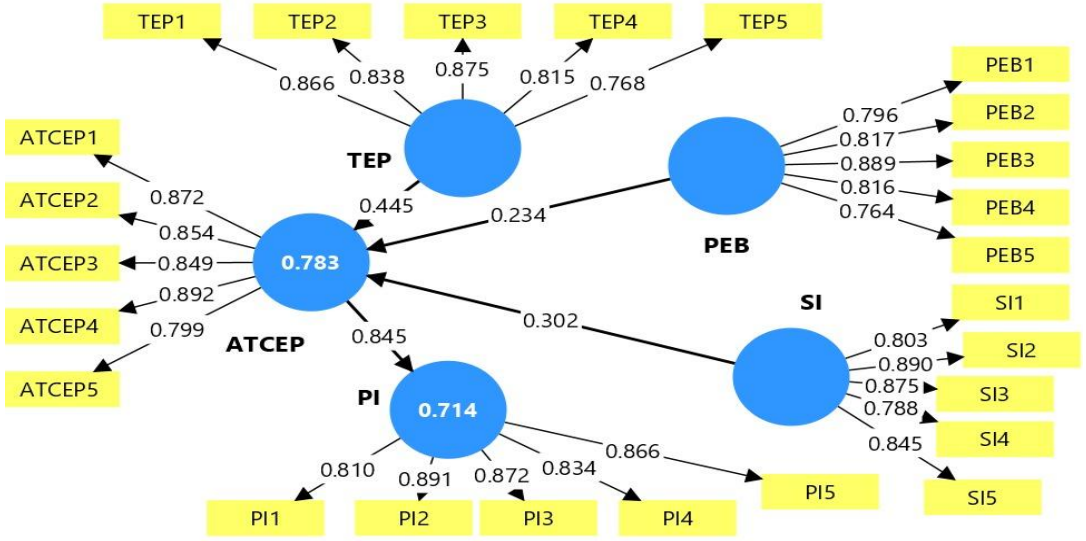

Figure 1: Structural Model

The results indicate that Perceived Environmental Benefits, Social Influence, and Trust in E-Commerce Platforms strongly influence consumers' attitudes towards circular economy practices in e-commerce environments, and Trust in E-Commerce Platforms have the most significant impact. In addition, Attitude Towards Circular Economy Practices indicates a significant positive effect on Purchase Intention, which confirms the role of positive consumer attitudes in facilitating circular consumption behavior. The mediation analysis reveals that attitude is a major intervening variable, effectively mediating the effects of environmental, social and trust factors on purchase intention. These findings show the overall significance of attitudinal creation in enhancing sustainable consumption within online marketplaces

Suggestions

Considering the high impact of perceived environmental benefits, e-commerce companies need to focus on consumer awareness about the environmental benefits of refurbishing, recycling, and reusing products in terms of sustainability through sustainability campaigns, eco-labelling and educational materials.

The social influence role implies that platforms ought to utilize the social networks, customer reviews, testimonials, and influencer marketing to develop favorable perceptions and generate consumer trust towards circular products. Also, strong impact of trust in e-commerce platforms demonstrates the necessity to enhance digital infrastructure by providing convenient interfaces, clear product descriptions, secure payments, and effective return or recycling policies.

To resolve the issue concerning the quality and reliability of their products, firms should enforce effective quality assurance, such as certifications, warranties, and flexible return policies. Moreover, companies are also urged to facilitate the circular model, which includes resale websites, repair shoppers, and buy-back plans. These initiatives should also be backed by specific rules, incentives, and awareness campaigns by the policymakers to promote sustainable consumption.

Conclusion

This study explored the consumer acceptance of economy practices in e-commerce platforms by exploring how social influence, perceived environmental benefits, and trust in e-commerce platforms influence consumer attitudes and purchase intention. These results show that these factors significantly influence consumer attitudes which in turn strongly drive purchase intentions. The paper highlights the importance of trust in e-commerce platforms, environmental consciousness, and social impact in creating sustainable consumption, which leads to waste minimization, resource utilization, and the entire sustainable development.

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