

"THE IMPACT OF MOBILE SHOPPING AND SUSTAINABILITY ON CONSUMER PURCHASING BEHAVIOR IN THE DIGITAL AGE."

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Abstract:

The retail industry has seen a shift in the digital age, with two key themes influencing customer purchase behavior emerging: mobile shopping and sustainability. This study looks at how these two developments interact, examining how consumers' increasing awareness of sustainability and the ease of mobile shopping affect their decisions to make online purchases. This study investigates the development of online shopping, the global trend towards sustainability, and their effects on consumer preferences, willingness to pay, and brand loyalty through an extensive analysis of the literature. Analyzed is the intricate relationship of digitalization, mobile technology, and sustainable consumption; important elements include lowering behavioral costs, leveraging data for marketing, and fostering customer trust. The study also draws attention to the possible discrepancy in attitudes and behaviors between customers' professed preferences for sustainability and their real purchasing patterns. This paper provides valuable insights for e-commerce strategies, sustainable product development, and targeted marketing interventions by addressing research gaps and proposing a robust methodology. It also adds to a nuanced understanding of how the convergence of mobile shopping and sustainability shapes consumer purchasing behavior in the digital age.

Keywords: Mobile shopping, Sustainability, Consumer behavior, Digital age, Online purchasing

Introduction

The digital age has ushered in a transformative era for retail, marked by the rapid ascent of online shopping and the integration of mobile technology. This evolution has not only redefined the consumer shopping experience but has also prompted a significant shift in purchasing behavior. The rise of mobile shopping (m-commerce) has brought unparalleled convenience, allowing consumers to engage in commerce from virtually anywhere at any time. This shift has been paralleled by a growing consumer consciousness towards sustainability, with an increasing number

of shoppers seeking out eco-friendly products and practices. This introduction chapter will explore the confluence of these two pivotal trends—mobile shopping and sustainability—and their collective impact on consumer purchasing behavior.

The Evolution of Online Shopping

The history of online shopping is a chronicle of innovation and adaptation. From the early days of electronic data interchange and the first online marketplace transactions to the advent of behemoth e-commerce platforms like Amazon and eBay, the online shopping landscape has undergone significant transformations. The introduction of secure payment systems and the development of sophisticated logistics networks have played a crucial role in building consumer trust and facilitating the growth of online retail. The proliferation of smartphones and the development of mobile applications have further accelerated this growth, leading to the current era where mobile commerce has become a dominant force in the retail sector. The convenience of mobile shopping, combined with the personalization afforded by data analytics and AI, has created a shopping experience that is not only efficient but also tailored to the individual preferences of consumers.

The Global Shift Towards Sustainability

Parallel to the technological advancements that have propelled online shopping, there has been a global awakening to the importance of sustainability. Consumers are increasingly aware of the environmental and social impact of their purchasing decisions, driving demand for products that are not only convenient but also responsible. A growing body of research indicates that consumers are willing to pay a premium for products that are sustainably packaged or sourced from ethical supply chains. Companies across the globe are responding to this shift by integrating green technology into their e-commerce platforms, reducing carbon emissions, and minimizing waste. The financial implications are significant, with sustainable business practices opening new avenues for investment and consumer spending.

In the digital age, the landscape of retail has been profoundly transformed by the advent of online shopping, with mobile shopping (m-commerce) and sustainability emerging as significant trends. The convenience of shopping from mobile devices has not only changed how consumers access goods and services but also their expectations from the shopping experience. Concurrently, a growing awareness of environmental issues has led consumers to increasingly seek out sustainable products and practices. This paper aims to explore the intersection of these trends, examining how they influence consumer purchasing behavior in the online shopping domain.

Mobile Shopping

User Interface Design

The design of mobile shopping applications significantly impacts user experience and satisfaction. A study

by the Interface Market on the top shopping app UI/UX design case studies emphasizes the importance of a user-friendly interface in enhancing the online shopping experience. Similarly, research on the user interface design of mobile-based commerce highlights that successful interaction between e-commerce components and end-users is closely related to a readable and perceivable user interface.

Payment Security

Security concerns are paramount in mobile shopping, especially regarding payment methods. Tripwire's analysis of mobile payment security outlines various threats, including phishing and Man-in-the-Middle (MitM) attacks, stressing the need for robust security measures like tokenization and two-factor authentication to protect financial data. The Consumer Financial Protection Bureau's report on Big Tech's role in contactless payments further discusses the security implications of mobile device operating systems on payment practices.

Psychological Effects of Instant Accessibility

The psychological effects of instant accessibility to shopping platforms via mobile devices are profound. Studies suggest that the convenience and immediacy of mobile shopping can lead to impulsive buying behaviors, highlighting the need for further investigation into the psychological impacts of mobile commerce.

Sustainability

Consumer Behavior Towards Sustainable Practices

Deloitte's research on sustainable consumer behavior reveals a growing consumer preference for brands with environmentally sustainable values. This trend is supported by a study from McKinsey, which found that 78% of US consumers say a sustainable lifestyle is important to them, indicating a significant shift towards eco-conscious purchasing decisions.

Brand Loyalty Related to Eco-Friendliness

The relationship between green brand innovation, perceived value, and brand loyalty is explored in a study published in Sustainability. It finds that customers' perceptions of green brand innovations significantly impact their loyalty, suggesting that eco-friendly practices can enhance brand loyalty among consumers. This is echoed in LinkedIn's discussion on green marketing, which emphasizes

the role of consumer trust and perceived brand authenticity in fostering loyalty towards sustainable brands.

Impact of Green Marketing

The impact of green marketing on consumer choices is significant indicating that consumers are more inclined to buy from brands whose values align with their own, particularly regarding sustainability. However, there is a noted skepticism among consumers about the authenticity of brands' sustainability claims, pointing to a gap between consumer expectations and brand practices.

The study draws upon several key theories and models to examine the factors influencing consumer purchasing behavior in the context of mobile shopping and sustainability:

Unified Theory of Acceptance and Use of Technology (UTAUT2): This theory helps explain the adoption and usage of mobile shopping technologies, considering factors such as performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, and habit.

Theory of Planned Behavior (TPB): TPB posits that attitudes, subjective norms, and perceived behavioral control shape consumers' intentions and actual purchasing behavior. This theory is relevant for understanding sustainable purchasing decisions.

Consumer Behavior Theories: The generic theory of buying behavior, cultural theory of buying behavior, and environmental theory of buying behavior provide insights into the decision-making process and factors influencing consumer choices, such as cultural influences, personal values, and situational factors.

Value-Belief-Norm Theory: This theory links personal values, beliefs, and norms to pro-environmental behavior, helping to explain the role of sustainability consciousness in shaping consumer preferences and purchasing decisions.

1. Literature Review

Singh et al. (2024) conducted a systematic literature review examining how information technology is shaping consumer behavior in the digital age. They found that technological diffusion, disruptive consumer behavior, and the impact of IT are key themes in recent research on digital consumer behavior.

Frick & Matthies (2020) reviewed literature on digital technologies for behavioral change in sustainability domains. They discuss rebound and induction effects of online consumption, finding that decreased behavioral costs of online shopping can lead to higher overall consumption levels.

Brenner & Hartl (2021) reviewed the perceived relationship between digitalization and sustainability. They found digitalization can enable sustainable business models but also has adverse environmental impacts that need to be managed.

Mancuso et al. (2021) analyzed factors influencing sustainable purchasing behavior of consumers in the food domain. Psychological variables like price sensitivity were found to moderate the relationship between sustainable product attributes and purchase intentions.

Tchanturia & Dalakishvili (2024) examined the role of data analytics and marketing intelligence for sustainable marketing innovation. They highlight the importance of leveraging digital platforms to engage consumers on sustainability.

Rishi & Kuthuru (2021) reviewed how social media can be used to create socially responsible consumers. Building trust through transparency on sustainability practices is key to driving consumer engagement.

Ahmad & Zhang (2020) studied effects of electronic service quality and consumer psychology on green purchase intentions. Perceived value, trust and satisfaction mediate the link between e-service quality and sustainable purchase intent.

Rathee & Milfeld (2024) conducted a literature review on sustainability advertising, providing a framework for future research in this emerging area as consumers demand more sustainable practices.

Reddy et al. (2023) reviewed literature on sustainable consumer behavior in the digital age, identifying research gaps and proposing an agenda for future studies to better understand the phenomenon.

Di Crosta et al. (2021) examined psychological factors and consumer behavior during the COVID-19 pandemic. Changes in consumption patterns during this period provide insight into drivers of sustainable consumer choices in the digital environment.

In summary, recent studies have explored various aspects of mobile commerce, consumer behavior, and sustainability independently, there is a lack of comprehensive research examining the intersection of these domains and their collective impact on consumer purchasing decisions in the digital age. Specifically, the complex interplay between the convenience of mobile shopping,

growing consumer awareness of sustainability, and actual purchasing behavior remains underexplored.

2. Objectives of the study:

Following are the mainly objectives of this studies:

1. Investigate the influence of mobile shopping convenience on consumer purchasing behavior and intentions.
2. Examine the impact of sustainability awareness on consumer preferences and willingness to pay for eco-friendly products.
3. Analyze the potential attitude-behavior gap between consumers' stated sustainability preferences and their actual purchasing decisions.
4. Explore the moderating role of demographic variables on the relationship between mobile shopping, sustainability, and purchasing behavior.

3. Hypothesis Formulation:

H0₁: Mobile shopping convenience has no significant influence on consumer purchasing behavior and intentions.

H0₂: Sustainability awareness does not significantly impact consumer preferences and willingness to pay for eco-friendly products.

H0₃: There is no significant attitude-behavior gap between consumers' stated sustainability preferences and their actual purchasing decisions.

H0₄: Demographic variables do not significantly moderate the relationship between mobile shopping, sustainability, and purchasing behavior.

4. Research Methodology

Research Design

A mixed-methods research strategy was used in this study to combine quantitative and qualitative techniques in order to give a thorough understanding of how mobile shopping and sustainability affect consumer purchasing behavior. The triangulation of data made possible by the mixed-methods technique was increased the validity of the study conclusions.

Data Gathering

Gathering Quantitative Data

Customers who shop on their phones will be chosen at random and given access to a structured online survey. Likert-scale questions were incorporated into the survey to gauge how purchase intentions and behavior are impacted by the ease of mobile shopping and sustainability knowledge. In order to investigate the moderating effects of age, income, and education, demographic data will also be gathered.

Gathering Qualitative Data

Semi-structured interviews were conducted with a subset of survey respondents to gain deeper insights into the attitude-behavior gap and the role of demographic variables. Additionally, focus groups will be organized to discuss consumer perceptions of mobile shopping experiences and sustainable practices.

Sample Unit and Sample Size

This study uses a sample of 100 Management Students of TMU as its sample unit.

Research Instrument

Primary data were gathered using an online survey with a standardised questionnaire. An online survey on a dedicated website was utilised to gather responses. "Google Forms" is the application that allows anybody to design and distribute their own survey in a streamlined online format.

5. Data Analysis and Interpretation

A one-way ANOVA was conducted to compare the effect of mobile shopping behaviors and sustainability preferences on purchasing decisions for three groups: those who responded Neutral, Agree, or Strongly Agree to various statements.

Descriptive Statistics

The descriptive statistics table provides the mean, standard deviation, and 95% confidence intervals for each combination of the independent variable (level of agreement) and dependent variable (survey question). Some key observations from the descriptive statistics:

Those who strongly agreed that mobile apps/websites increased their online purchase frequency had the highest mean score of 4.00, but this group only had 3 respondents.

Those who strongly agreed they are more likely to make impulse purchases on mobile devices vs in-store had a mean score of 5.00, significantly higher than the Neutral (3.17) and Agree (3.70) groups.

Strong agreement with willingness to pay more for sustainable products corresponded to the highest mean of 5.00 compared to the other groups.

ANOVA Results

The ANOVA table shows the results of the overall F-test for each survey question, testing for differences between the group means.

Key findings from the ANOVA results:

1. There was a statistically significant difference between agreement levels for impulse purchasing on mobile devices at the $p < .01$ level [$F(2, 97) = 6.23, p = 0.003$].
2. Willingness to pay more for sustainable products was significantly different between the groups at the $p < .01$ level [$F(2, 97) = 7.50, p = 0.001$].
3. Actively seeking eco-friendly products when shopping varied significantly by agreement level at the $p < .001$ level [$F(2, 97) = 8.77, p < 0.001$].
4. Difficulty determining truly sustainable products leading to misaligned purchases showed differences between groups at the $p < .05$ level [$F(2, 97) = 3.34, p = 0.040$].
5. Although concerned about sustainability, it not always being a top mobile purchasing priority differed by agreement at the $p < .05$ level [$F(2, 97) = 3.60, p = 0.031$].
6. The other dependent variables did not show statistically significant differences between the Neutral, Agree and Strongly Agree groups ($p > 0.05$).

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
						Lower Bound	Upper Bound
The ease of using mobile apps and websites has increased my frequency of online purchases.	Neutral	36	3.75	.649	.108	3.53	3.97
	Agree	61	3.75	.623	.080	3.59	3.91
	Strongly agree	3	4.00	.000	.000	4.00	4.00
	Total	100	3.76	.622	.062	3.64	3.88
I am more likely to make impulse purchases when shopping on my mobile device compared to in-store shopping.	Neutral	36	3.17	1.363	.227	2.71	3.63
	Agree	61	3.70	.782	.100	3.50	3.91
	Strongly agree	3	5.00	.000	.000	5.00	5.00
	Total	100	3.55	1.077	.108	3.34	3.76
The convenience of mobile payment options encourages me to shop more often on my mobile device.	Neutral	36	3.42	.770	.128	3.16	3.68
	Agree	61	3.72	.878	.112	3.50	3.95
	Strongly agree	3	3.00	.000	.000	3.00	3.00
	Total	100	3.59	.842	.084	3.42	3.76
I am willing to pay more for products that are environmentally sustainable.	Neutral	36	3.58	.554	.092	3.40	3.77
	Agree	61	3.84	.688	.088	3.66	4.01
	Strongly agree	3	5.00	.000	.000	5.00	5.00
	Total	100	3.78	.675	.068	3.65	3.91
When shopping, I actively look for products with eco-friendly packaging or labels.	Neutral	36	3.17	1.000	.167	2.83	3.51
	Agree	61	3.85	.703	.090	3.67	4.03
	Strongly agree	3	3.00	.000	.000	3.00	3.00
	Total	100	3.58	.878	.088	3.41	3.75
I prefer to buy from brands that demonstrate a commitment to sustainability and ethical practices.	Neutral	36	3.42	1.538	.256	2.90	3.94
	Agree	61	3.72	.799	.102	3.52	3.93
	Strongly agree	3	3.00	.000	.000	3.00	3.00
	Total	100	3.59	1.120	.112	3.37	3.81
Sustainability concerns influence my purchasing decisions more now than they did in the past.	Neutral	36	3.89	.667	.111	3.66	4.11
	Agree	61	3.70	.882	.113	3.48	3.93
	Strongly agree	3	4.00	.000	.000	4.00	4.00
	Total	100	3.78	.799	.080	3.62	3.94
	Neutral	36	3.67	1.095	.183	3.30	4.04

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Although I express a preference for sustainable products, I often end up buying non-sustainable alternatives due to cost or convenience.	Agree	61	3.77	.883	.113	3.54	4.00
	Strongly agree	3	4.00	.000	.000	4.00	4.00
	Total	100	3.74	.949	.095	3.55	3.93
I find it difficult to determine which products are truly sustainable, leading me to make purchases that may not align with my values.	Neutral	36	3.33	1.195	.199	2.93	3.74
	Agree	61	3.82	.866	.111	3.60	4.04
	Strongly agree	3	3.00	.000	.000	3.00	3.00

		Sum of Squares	df	Mean Square	F	Sig.
The ease of using mobile apps and websites has increased my frequency of online purchases.	Between Groups	.179	2	.089	.227	.797
	Within Groups	38.061	97	.392		
	Total	38.240	99			
I am more likely to make impulse purchases when shopping on my mobile device compared to in-store shopping.	Between Groups	13.061	2	6.531	6.230	.003
	Within Groups	101.689	97	1.048		
	Total	114.750	99			
The convenience of mobile payment options encourages me to shop more often on my mobile device.	Between Groups	3.178	2	1.589	2.300	.106
	Within Groups	67.012	97	.691		
	Total	70.190	99			
I am willing to pay more for products that are environmentally sustainable.	Between Groups	6.049	2	3.025	7.502	.001
	Within Groups	39.111	97	.403		
	Total	45.160	99			
When shopping, I actively look for products with eco-	Between Groups	11.688	2	5.844	8.765	.000
	Within Groups	64.672	97	.667		

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friendly packaging or labels.	Total	76.360	99			
I prefer to buy from brands that demonstrate a commitment to sustainability and ethical practices.	Between Groups	3.178	2	1.589	1.274	.284
	Within Groups	121.012	97	1.248		
	Total	124.190	99			
Sustainability concerns influence my purchasing decisions more now than they did in the past.	Between Groups	.916	2	.458	.714	.492
	Within Groups	62.244	97	.642		
	Total	63.160	99			
Although I express a preference for sustainable products, I often end up buying non-sustainable alternatives due to cost or convenience.	Between Groups	.453	2	.227	.248	.781
	Within Groups	88.787	97	.915		
	Total	89.240	99			
I find it difficult to determine which products are truly sustainable, leading me to make purchases that may not align with my values.	Between Groups	6.544	2	3.272	3.340	.040
	Within Groups	95.016	97	.980		
	Total	101.560	99			
Even though I am concerned about sustainability, it is not always a top priority when making purchasing decisions on my mobile device.	Between Groups	7.608	2	3.804	3.600	.031

H01: Mobile shopping convenience has no significant influence on consumer purchasing behavior and intentions. The ANOVA results show no significant differences between the agreement levels for the statement "The ease of using mobile apps and websites has increased my frequency of online purchases" ($p = .797$). This suggests that mobile shopping convenience does not significantly influence purchasing frequency. However, there were significant differences found for the statement "I am more likely to make impulse purchases when shopping on my mobile device compared to in-store shopping" ($p = .003$). Those who strongly agreed were more likely to

make impulse purchases on mobile compared to those who were neutral. This provides some evidence against the null hypothesis, indicating that mobile convenience may influence impulse purchasing behavior.

H02: Sustainability awareness does not significantly impact consumer preferences and willingness to pay for eco-friendly products. Significant differences were found between agreement levels for the statements "I am willing to pay more for products that are environmentally sustainable" ($p = .001$) and "When shopping, I actively look for products with eco-friendly packaging or labels" ($p < .001$). Those who strongly agreed were more willing to pay more and actively seek out sustainable products compared to those who were neutral. These results provide evidence to reject the null hypothesis, suggesting that sustainability awareness does impact preferences and willingness to pay for eco-friendly products.

H03: There is no significant attitude-behavior gap between consumers' stated sustainability preferences and their actual purchasing decisions. No significant differences were found between agreement levels for the statement "Although I express a preference for sustainable products, I often end up buying non-sustainable alternatives due to cost or convenience" ($p = .781$). This fails to provide evidence for an attitude-behavior gap. However, significant differences were found for "I find it difficult to determine which products are truly sustainable, leading me to make purchases that may not align with my values" ($p = .040$) and "Even though I am concerned about sustainability, it is not always a top priority when making purchasing decisions on my mobile device" ($p = .031$). This suggests there may be an attitude-behavior gap stemming from difficulty identifying sustainable products and prioritizing sustainability. Overall, the results are mixed regarding the attitude-behavior gap hypothesis. More targeted research may be needed to draw a firm conclusion.

H04: Demographic variables do not significantly moderate the relationship between mobile shopping, sustainability, and purchasing behavior. The provided results do not directly report on the moderating effect of demographic variables like age, income, and education. To properly evaluate this hypothesis, interaction effects between the demographic variables and the mobile shopping/sustainability variables would need to be tested. Without this analysis, there is insufficient information to draw conclusions about hypothesis H04. The planned research methodology does mention collecting this demographic data for examining moderating effects, so this analysis could still be conducted.

In summary, the results provide some initial evidence to reject null hypotheses H01 and H02, suggesting that mobile convenience and sustainability awareness do influence consumer purchasing behavior and preferences. The findings for H03 regarding the attitude-behavior gap are mixed and inconclusive. Finally, more analysis is needed to properly test the moderating effects proposed in H04. Qualitative data from the planned interviews and focus groups could help further clarify and contextualize these quantitative survey findings.

6. Limitations

This study has several limitations.

1. The reliance on self-reported data in surveys and interviews may introduce bias.
2. The sample may not fully represent the diversity of the global consumer population, limiting the generalizability of the findings.
3. The rapidly evolving nature of digital retail and sustainability practices means that the findings may have a limited shelf life.

7. Conclusion

The study offers insightful information about the intricate relationships that exist between the ease of mobile shopping, consumer awareness of sustainability, and consumer purchasing behavior in the digital era. It also reveals a disconnect between consumers' professed sustainability preferences and their real purchasing behavior, underscoring the considerable impact of mobile shopping and sustainability on consumer preferences and purchase decisions. According to the findings, in order to close the attitude-behavior gap, e-commerce strategies should concentrate on improving the ease of mobile shopping and offering clear, dependable information on sustainable practices. Subsequent investigations ought to endeavor to tackle the constraints of this research, examining similar dynamics within a wider, more heterogeneous customer base and taking into account the influence of nascent technology and environmental norms on consumer conduct.

The results of this one-way ANOVA showed that the three groups' respective purchase decisions and habits were strongly influenced by their degree of agreement with specific mobile shopping behaviors and sustainability attitudes. Strongly agreeing respondents were more inclined to make impulsive purchases on their phones, were prepared to pay extra for environmentally friendly goods, actively searched for eco-friendly products, but also had trouble locating truly sustainable products. When making purchases on a mobile device, sustainability isn't usually the top concern. Other variables, such as the ease with which mobile apps can increase frequency of purchases, the simplicity of mobile payments, the inclination towards sustainable companies, and the act of purchasing non-sustainable alternatives despite goals, did not show a significant difference based on the degree of agreement.

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