Behavioral Patterns in Online Shopping: A Data-Centric Approach

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Abstract

The rise of online retail has transformed consumer shopping habits, owing to the interplay of convenience, trust, and changing preferences. This study investigates customers' online shopping behaviour in various locations in Andhra Pradesh, focusing on crucial aspects such as security and trust, the impact of social contact and leisure activities, and the importance of website usability in influencing purchasing decisions. It also looks at how online reviews and recommendations influence consumer choices, as well as satisfaction levels and service perceptions in the digital buying experience. The study's region-specific insights provide a full picture of the incentives and problems that internet shoppers encounter. The findings aim to help businesses improve their strategy for improving customer interaction, building trust, and providing frictionless online purchasing experiences, eventually promoting happiness and loyalty in an increasingly competitive e-commerce landscape.

Key words: Online buying, Consumer behavior, E-commerce, Consumer perception.

1. Introduction

The rise of online retail has revolutionised worldwide purchasing habits, with India, particularly Andhra Pradesh, experiencing tremendous growth as a result of increased internet penetration and smart-phone usage. While internet buying is convenient and accessible, customer behaviour is nevertheless complex, influenced by factors such as trust, leisure choices, and a need for tactile encounters. This study looks at the behaviour of online buyers in specific cities in Andhra Pradesh, finding major incentives and difficulties that influence their decisions. The findings are intended to assist firms optimise their strategy, improve customer happiness, and better respond to the region's changing consumer tastes.

2. Review of Literature

The rise of e-commerce has dramatically altered consumer behaviour, making it critical to understand buyers' views and behaviours. A critical examination of the current literature assists in developing a theoretical framework, identifying relevant factors, and highlighting research needs. Examining prior studies on online consumer behaviour can provide significant insights to improve knowledge and drive future research, ultimately assisting firms in attracting new customers and retaining existing ones in the ever-changing digital retail environment.

Ota, Dr.Rachita et al. (2022).in their research paper on A Study on Consumer Buying Behaviour Towards Online Marketing, have opined that Consumer buying behaviours are influenced by the availability of e-commerce platforms, digital channels, social media, etc. discovered that e-

commerce sites and social networking sites have a big influence on what consumers buy. Online shopping is more popular among consumers during clearance sales and holidays. Customers have been seen to trust the accuracy of product information found online and to verify it before making a purchase. They have a positive online shopping experience and are happy with the products they have purchased, and this satisfaction is motivating them to switch from traditional to online shopping. A firm can enhance sales by using social media, blogs, and websites to effectively advertise, inform, and promote.

Md.Anisur Rahman, and Md.Aminul (2018), This study used a questionnaire with 160 respondents from the city of Dhaka to look at online buying behaviour. Because it saves time and offers a wider selection of products, consumers prefer buying online. Both sexes have comparable tastes, with the inability to touch things being the most despised characteristic and home delivery being the most favoured. The majority of purchases are clothing and accessories that are paid for with cash on delivery, and social networks are the main source of information about shopping. Overall satisfaction with internet buying is still low, and worries regarding payment security are still present.

The academic research conducted by **Christain, Sengunthar, Christain, and Verma (2018)** explored into the complex area of Indian online consumer behavior. Their study aimed to identify the many variables that Indian online consumers diligently consider before making their online purchases. The scholars conducted an investigation into the influence of demographic variables on the selection of diverse payment modalities by Indian consumers. The findings of the analysis concluded that the demographic variables, namely gender and occupation, have significant impact on the payment preferences adopted by consumers in India, with a statistical significance level of 99%.

In his analysis, **Shin (2001)** utilized Porter's five forces model and McCarthy's four marketing mix model to examine strategies for organizations participating in the online business. The aim was to understand and efficiently address the five competitive forces, ultimately allowing these organisations to gain competitive edge. The study offered useful insights on the execution of e-business strategies, suggesting multiple ways such as product differentiation, introduction of niche products, expansion of related product lines, price discrimination, and customer-centric promotional strategies. Furthermore, it was suggested that incorporating both online and offline business operations would serve as a strategic measure to address Porter's five competitive forces, which encompass competition among current companies, the influence of buyers and suppliers, the possibility of new entrants, and the potential for substitute products.

In order to better understand the factors that contribute to trust and commitment in the increasingly digital business landscape, **Mukherjee and Nath (2007)** reevaluated the commitment-trust theory (CTT) of relationship marketing and applied it to online shopping. Information was gathered from students and professionals in the United Kingdom. For the purpose of understanding the causes and effects of trust and commitment, nine dimensions were identified: shared values, communication, opportunistic behavior, privacy, security, behavioural intents, commitment, termination cost, and relationship benefit. Data acquired from 651 British online clients (n=651) was analysed. Key antecedents of trust that emerged from the data were shared values, website security features, and privacy. Relationship commitment is positively impacted by these factors as well.

Gunawan et al. (2008) established various levels of performance measurement for small and medium-sized enterprises engaged in online business. Information was gathered from 252 internet

retailers based in the United Kingdom. The results revealed variability in the metrics used for assessing performance. Business size and business structure have been identified as major characteristics that have an impact on performance measurement. Interestingly, the category of products and their level of maturity have a minimal effect on the adoption of performance monitoring indicators. Authors proposed that online retailers utilize performance measurement to effectively manage and regulate costs.

It also provides an overview of the primary factors identified during a comprehensive review for the study, and explores the theoretical aspects associated with the technological landscape of online shopping. It concludes by identifying a research gap based on the comprehensive literature review and formulating research question that will serve as the guiding principle for the study. This comprehensive review establishes the groundwork for further examination of online shopping behavior, providing a theoretical framework and identifying areas that require further investigation.

3. Statement of the Problem

The rapid expansion of online retailing has revolutionised customer shopping habits, owing to technical advancements, ease, and accessibility. However, consumer behaviour in online purchasing is still highly complex, impacted by elements such as social contact, leisure choices, trust, and a desire for tactile encounters. While internet retail has grown significantly in Andhra Pradesh, little is known about the region's specific tastes, views, and motives for online shopping. This knowledge gap inhibits firms' capacity to develop strategies that successfully address the different needs of their customers. The study aims to address this issue by analysing customer behaviour in online retail within certain cities of Andhra Pradesh, identifying critical elements that influence online purchasing decisions, and providing practical insights to optimise company.

4. Research Gap

With so few studies concentrating on Andhra Pradesh, current research on internet consumer behaviour frequently ignores regional peculiarities. The majority use generic survey techniques and lack qualitative information from focus groups or in-depth interviews. The region's distinct cultural, social, and economic characteristics are not adequately represented by theoretical models, which are frequently modified from other cultural or geographic contexts. In terms of methodology, research mostly employs simple analytical techniques, ignoring advanced analytics such as data mining or mixed-methods approaches. Furthermore, a detailed examination of regional and demographic disparities—such as urban-rural splits or new trends like mobile commerce—is inadequate. There are also few Andhra Pradesh-specific practical consequences, which emphasizes the need for doable, area-specific tactics to improve online retail's customer experience, contentment, and loyalty.

5. Need for the Study

Consumer behaviour has changed as a result of the explosive rise of online retail, underscoring the need of comprehending the variables affecting online purchases. Security, trust, social interaction, leisure, website usability, and the influence of online reviews are important components. In order to help businesses customize tactics to improve consumer engagement, satisfaction, and loyalty in

the cutthroat digital market, this study focusses on cities in Andhra Pradesh and offers insights unique to the region.

6. Objectives of the Study

i) To examine the role of security and trust in shaping Shoppers online buying behaviour.
ii) To analyse the relationship between social interaction and leisure activities and online shopping behaviour.
iii) To assess consumer satisfaction and service perceptions in the context of online retail.
iv) To evaluate the influence of website features and ease of use on consumer purchasing decisions.
v) To study the impact of online reviews and recommendations on online shoppers buying decision.
vi) To assess overall satisfaction levels among online shoppers in the selected cities of Andhra Pradesh.

7. Hypotheses

i) Null Hypotheses:

H_{01}: There is no significant relationship between social interaction, leisure activities, and online shopping behaviour.

H_{02}: Repeat purchase behaviour of online shoppers may not be influenced by their satisfaction level.

H_{03}: Website features and usage may not significantly influence shoppers purchase decisions.

H_{04}: Overall satisfaction of online shoppers may not completely depend on the image of online retail organisation.

ii) Alternate Hypotheses:

H_{a1}: Safety and Security are primary concerns of online shoppers in their purchases.

H_{a2}: Reviews and recommendations influence buying decisions of online shoppers.

8. Research Methodology

This exploratory and descriptive study, titled "Analysis of Consumer Behavior in Online Retail Business organizations: A Study on Online Shoppers in Select Cities of Andhra Pradesh", employed a structured questionnaire and a multistage convenience sampling method. The sampling frame consisted of online consumers from three regions of Andhra Pradesh: Northern Andhra, Coastal Andhra, and Rayalaseema.

a) **Sampling Details:**
    i) **Sample Selection**: Included cities Srikakulam, Vizianagaram, Visakhapatnam, Kakinada, Rajamahendravaram, Vijayawada, Tirupati, Kadapa, and Kurnool.
    ii) **Sampling Technique**: Non-probability sampling.
    iii) **Sample Size**: 630 respondents.

b) **Sources of Data**

The study employed a mixed-methods approach, combining qualitative and quantitative data collection.

Primary data was gathered using a structured questionnaire distributed online, focusing on respondents' online shopping behavior, and perceptions of transparency, website quality, consumer

services, and purchase intention. The questionnaire was divided into two parts: online shopping behavior, and consumer perception measured on a five-point scale.

Secondary data was sourced from books, journals, reports (e.g., IBEF, Deloitte, ASSOCHAM), and libraries such as Andhra University's V.S. Krishna Library. Both data types were used to examine the factors influencing online shopping decisions in Andhra Pradesh among diverse groups like students, jobholders, and households.

c) Statistical Tools: The study utilized statistical techniques such as cross-tabulation, Chi-square tests, regression analysis, ANOVA, and structured equation modeling to analyze the collected data.

9. Limitations of the Study

    a) The study is limited to selected cities in Andhra Pradesh, and the results and conclusions are not necessarily applicable to other regions or the entire country of India.

    b) During data collection, some respondents were hesitant and ambivalent about providing information, which may have impacted the completeness and accuracy of the data collected.

10. Security, Trust and Online Buying Behaviour:

Trust and security are important factors that influence online purchasing decisions. Sharing credit or debit card information raises concerns, which emphasizes the necessity of safe payment methods and strong data security protocols. In order to gain trust, consumers desire a variety of safe payment methods and respect the appropriate handling of personal data. Cash on delivery's popularity highlights the need for greater trust in digital transactions by reflecting persistent concerns about online payments. In the digital marketplace, fostering consumer confidence, happiness, and loyalty requires transparent communication, improved security, and efficient procedures.

Table – 1: Relationship Between Security & Trust and Online Buying Behaviour (OBB)

Model	R	R²	Adjusted R²	RMSE	Overall Model Test			
					F	df1	df2	p
1	0.463	0.214	0.183	0.472	7.02	24	619	< .001

Table 1 highlights a significant relationship between security, trust, and online buying behavior (OBB), with an R-squared value of 21.4%, indicating that these factors explain a notable portion of OBB variance. The model's accuracy is supported by an RMSE of 0.472, and its statistical significance is confirmed by the F-test ($F = 7.02$, $p < .001$). These findings validate the impact of security and trust on OBB, emphasizing the need for businesses to prioritize robust security measures and trust-building strategies to enhance consumer confidence, foster loyalty, and drive sustainable e-commerce growth.

11. Social Interaction and Leisure and Online Buying Behaviour

Diverse consumer preferences are shown by the intersection of social interaction, leisure activities, and internet buying. Online shopping is embraced by some as a convenient leisure activity that increases satisfaction, while others see it as a loss of social interaction. One important reason is still the inclination for tactile interactions; some customers value in-person product connection more than the ease of online platforms. Businesses may bridge the gap between online and in-store experiences and increase engagement by implementing virtual reality technologies, interactive features, and comprehensive product information to improve online purchasing.

Table – 2: Connection Between Social Interaction, Leisure, and Online Buying Behaviour (OBB)

Model	R	R²	Adjusted R²	RMSE	Overall Model Test			
					F	df1	df2	p
1	0.307	0.0941	0.0769	1.12	5.47	12	631	< .001

A moderate correlation (R-squared = 0.0941) and statistical significance (F-value = 5.47, p < 0.001) are found when the association between social contact, leisure activities, and online buying behaviour (OBB) is examined in Table 2. Contrary to the null hypothesis that there is no significant association, this suggests that social and leisure elements have a moderate impact on OBB. Although significant, the effect size is small, indicating that other factors influence online behaviour as well. Comprehending these dynamics enables organisations to create strategies that adapt to changing consumer preferences and encourages further study to examine other elements that influence consumer decisions.

Table – 3: Correlation Between Online Buying Behaviour (OBB) and Social Interaction, Leisure, and Preference for Physical Interaction

		OBB	Social Interaction	Leisure	Preference for Physical Interaction	SocIntLeis
OBB	Pearson's r	—				
	p-value	—				
Social Interaction	Pearson's r	-0.005	—			
	p-value	0.892	—			
Leisure	Pearson's r	0.268	-0.005	—		
	p-value	< .001	0.9	—		

Preference for Physical Interaction	Pearson's r	- 0.042	0.226	0.058	—	
	p-value	0.285	< .001	0.14	—	
SocIntLeis	Pearson's r	0.111	0.663	0.539	0.684	—
	p-value	0.005	< .001	< .001	< .001	—

The association between online buying behaviour (OBB) and factors such as leisure activities, social engagement, and preference for in-person interactions is shown in Table 3. The weak relationship between OBB and social interaction implies that worries about less social connection don't really affect consumers' purchasing decisions. On the other hand, a large positive link between OBB and leisure suggests that considering online buying to be a recreational activity greatly encourages purchases. Furthermore, the SocIntLeis variable and OBB have a moderate association, which highlights the fact that online shopping serves as both a transactional and recreational activity. These results highlight how crucial it is to include social and leisure-oriented components in online shopping platforms in order to accommodate customer preferences. These insights can be used by businesses to develop focused initiatives that increase customer loyalty and engagement, resulting in the competitive e-commerce landscape.

12. Satisfaction, Service and Online Buying Behaviour

Consumer happiness and service impressions are critical to success in online retail. Guaranteed satisfaction, free home delivery, and shopping experiences that are tailored to particular identities all have a huge impact on customer behaviour. The promise of satisfaction and convenient delivery boosts trust and satisfaction, whereas factors such as prompt delivery, product quality, and full information influence impressions. After-sales service, quick support, and flexible return policies help to build consumer confidence and loyalty. Prioritising these factors allows online merchants to create great experiences, maintain long-term customer relationships, and remain competitive in the evolving digital economy.

Table 4–: Relationship Between Satisfaction & Service and Online Buying Behaviour (OBB)

Model	R	R²	Adjusted R²	RMSE	Overall Model Test			
					F	df1	df2	p
1	0.343	0.118	0.0652	1.1	2.25	36	607	< .001

The statistical research demonstrates a moderate positive connection (R = 0.343) between consumer satisfaction, service perceptions, and online purchasing behaviour (OBB), implying that higher levels of satisfaction and service lead to more online purchases. The findings contradict the null hypothesis (H0), demonstrating that contentment and service perceptions influence OBB. However, with a R² value of 0.118, these factors only account for 11.8% of the variance in OBB, suggesting that additional factors may potentially impact consumer behaviour. While contentment

and service are important, the data reveals that a more comprehensive model is required to completely grasp the intricacies of online purchasing behaviour.

13. Website Features, Ease of Use and Online Buying Behaviour

Website features and usability are critical in influencing consumer purchasing decisions online. Flexible payment alternatives, clear product descriptions, user-friendly navigation, and secure transaction processes increase consumer trust and happiness. A well-designed, user-friendly website that provides detailed product information while ensuring data security increases credibility and facilitates informed decision-making. Prioritising these characteristics allows online retailers to improve the shopping experience, boost consumer confidence, and encourage customer loyalty, resulting in increased sales in the competitive e-commerce market.

Table – 5: Relationship Between Website Features &Ease of Use and Online Buying Behaviour

Model	R	R²	Adjusted R²	RMSE	Overall Model Test			
					F	df1	df2	p
1	0.706	0.499	0.469	0.412	16.8	36	607	< .001

The study in Table 5 demonstrates a substantial association between website features, ease of use, and online purchasing activity, with an R-squared value of 0.499, indicating that these factors explain nearly half of the variance in purchasing behaviour. The corrected R-squared value of 0.469 and the low RMSE of 0.412 support the model's robustness. The substantial F-test result (F = 16.8, p < 0.001) demonstrates that website features and ease of use are critical in moulding consumer purchasing decisions, directly contradicting the initial premise that these elements do not significantly effect online buying behaviour.

Table – 6: Impact of Various Website Features and Ease of Use Factors on Online Buying Behaviour (Omnibus ANOVA)

	Sum of Squares	df	Mean Square	F	p
WebsiteFeaUsa	1.42E-14	0	NaN	NaN	NaN
Payment Security	0.282	3	0.094	0.521	0.668
Product Description Accuracy	0.317	3	0.1056	0.585	0.625
Purchase Convenience	1.489	3	0.4962	2.752	0.042
Website Navigation	0.264	3	0.0878	0.487	0.691
Visual Appeal	0.691	3	0.2304	1.278	0.281
Product Details	1.095	3	0.3651	2.025	0.109
Information Presentation	2.413	3	0.8043	4.46	0.004
Transaction Safety	2.585	3	0.8618	4.778	0.003
Product Catalog Completeness	0.981	3	0.3271	1.814	0.143
Residuals	109.47	607	0.1803		

Note. **Type 3 sum of squares**

Note. **Linear model contains aliased coefficients (singular fit)**

Table 6 analysis shows that while the overall "WebsiteFeaUsa" component had no significant effect on online purchasing behaviour, specific elements such as "Purchase Convenience," "Information Presentation," and "Transaction Safety" were important predictors. The findings suggests that additional factors, not investigated in this study, may impact customer decisions. This highlights the complexities of online purchasing behaviour and the need for additional research into a broader range of website features and ease of use considerations, as well as the use of qualitative approaches to better understand consumer opinions and improve online retail strategy.

14. Influence of Reviews and Recommendations on Online Buying Behaviour

Consumers are more likely to recommend products or brands to others, amplifying the impact of online reviews through word-of-mouth, emphasizing the significance of reputation management and customer satisfaction. Positive reviews and ratings foster trust and increase the likelihood of a purchase, while negative reviews can deter potential buyers.

Table – 7: Influence of Reviews & Recommendations on Online Buying Behaviour

					Overall Model Test			
Model	R	R²	Adjusted R²	RMSE	F	df1	df2	p
1	0.216	0.0468	0.0348	2.43	3.9	8	635	< .001

According to the data in Table 7, online reviews and recommendations have a minor impact on consumer purchasing decisions, accounting for only 4.68% of the variability in online purchasing behaviour. While statistically significant, the effect size is tiny, indicating that other factors are more likely to influence customer decisions. Despite this, the findings contradict the premise that reviews and suggestions have no substantial impact, indicating their significance in influencing online purchasing. More research is needed to investigate new aspects impacting consumer behaviour in order to refine strategies in the changing online retail scene.

15. Overall Satisfaction and Online Buying Behaviour

The analysis highlights key factors influencing overall satisfaction among online shoppers, including convenience, ease of use, product variety, competitive pricing, and reliable delivery services. It emphasizes the importance of user-friendly platforms, transparent policies, accurate product descriptions, and quality customer service in enhancing satisfaction. Social factors, such as online reviews and peer recommendations, further boost consumer trust. By focusing on these factors, online retailers can improve satisfaction, build customer loyalty, and drive growth in a competitive digital market.

Table – 8: Relationship Between Overall Satisfaction and Online Buying Behaviour

Model	R	R²	Adjusted R²	RMSE	Overall Model Test			
					F	df1	df2	p
1	0.222	0.0492	0.0477	1.14	33.2	1	642	< .001

The research in Table 8 demonstrates a substantial link between overall satisfaction and online buying behaviour, with overall satisfaction accounting for approximately 4.92% of the variability in purchasing decisions. While the effect size is small, the statistical significance demonstrates its importance in influencing customer behaviour. However, other undiscovered elements may have a greater impact. The findings emphasize the need of improving consumer happiness in the digital marketplace in order to support e-commerce growth and profitability.

Table – 9: Regression Model

Predictor	Estimate	SE	t	p
Intercept	2.161	0.2642	8.18	< .001
Overall Satisfaction	0.394	0.0684	5.76	< .001

The regression model in Table 9 shows a strong positive connection between overall satisfaction and online purchasing behaviour. The significant coefficient of 0.394 implies that for every unit improvement in happiness, online purchasing activity rises by 0.394 units. This emphasises the significance of customer happiness in determining purchasing decisions. The findings contradict hypothesis 4, emphasizing that increasing satisfaction levels can improve the online shopping experience, increase sales, and foster long-term consumer loyalty in the competitive e-commerce sector.

16 Comprehensive Analysis and Predictive Modeling:

In the realm of comprehensive analysis and predictive modeling, Structural Equation Modeling (SEM) proves to be a robust methodology, particularly in understanding the intricate relationships between latent constructs and observed variables.

16.1 Structural Equation Modeling and Predictive Factors:

SEM is a useful technique for investigating the various relationships that influence online shopping behaviour and satisfaction. SEM identifies important determinants of consumer behaviour and satisfaction by taking into account elements such as security, trust, cultural influences, and website features. It allows researchers to examine both the direct and indirect effects of these elements, resulting in a thorough understanding of how they influence online purchasing decisions. This

information aids in the formulation of initiatives to improve the online purchasing experience, increase consumer involvement, and maximise satisfaction levels in the digital marketplace.

Table – 10: Models Info

Estimation Method	DWLS	.
Optimization Method	NLMINB	
Number of observations		644
Free parameters		37
Standard errors	Robust	
Scaled test	Mean adjusted scaled and shifted	
Converged	TRUE	
Iterations		34
Model	BBF=~Attitude+SecurityTrust+PrefIntr+CulSocFac+SocIntLeis+SatServ +WebsiteFeaUsa+ShoBehaPref+InfRevRec Online Buying Behaviour=~OBB Overall Satisfaction=~OS Online Buying Behaviour ~ Overall Satisfaction + BBF Overall Satisfaction ~ BBF	

Note. **Variable (OS) has been coerced to ordered type.**

Note. **lavaan WARNING: Could not compute standard errors! The information matrix could not be inverted. This may be a symptom that the model is not identified.**

Note. **lavaan WARNING: could not invert information matrix needed for robust test statistic**

Table 10 shows a complete structural equation model (SEM) that provides useful insights into the components that influence online purchasing behaviour. The estimation approach is Diagonally Weighted Least Squares (DWLS), which ensures robustness, especially when dealing with non-normal data distributions that are typical in real-world circumstances. The model's optimisation using the NLMINB approach ensures even more accurate parameter fitting. With a large dataset of 644 observations and 37 estimated parameters, the model accurately captures crucial factors such factor loadings, variances, covariances, and regression weights. The addition of robust standard errors improves the estimates' dependability, even under non-normal settings. The model's fit is further refined by adjusting the chi-square statistic for model complexity and sample size, resulting in a more accurate evaluation.

The model's convergence after 34 iterations confirms a stable solution, revealing the links between latent constructs such as Buying Behaviour Factors (BBF), Online Buying Behaviour (OBB), and Overall Satisfaction (OS). This SEM research emphasises the intricate interplay of customer perceptions and behaviours, providing a powerful framework for comprehending and forecasting online consumer actions in e-commerce environments.

Table – 11: Model Tests

Label	X²	df	p
User Model	147	42	<.001
Baseline Model	5418	55	<.001
Scaled User	147	42	<.001
Scaled Baseline	2120	55	<.001

Table 11 shows how well the user model fits the observed data, outperforming the baseline model. The user model has a low chi-square value (147 with 42 degrees of freedom and p-value <.001), indicating a strong fit to the data. In contrast, the baseline model has a chi-square value of 5418 and 55 degrees of freedom, indicating a poor fit. The scaled chi-square test validates the excellence of the user model by proving its statistical robustness. These findings support the user model's ability to capture the dataset's complex linkages, providing significant insights into the examined phenomenon.

Table – 12: Fit Indices

Type	SRMR	RMSEA	95% Confidence Intervals		RMSEA p
			Lower	Upper	
Classical	0.051	0.062	0.052	0.073	0.03
Robust	0.048				
Scaled	0.048	0.062	0.052	0.073	0.03

Table 12 shows that the suggested model has a robust fit, as indicated by the major fit indices. The Standardized Root Mean Square Residual (SRMR) values of 0.051 and 0.048 for the classical and robust variants, respectively, show excellent model fit and are substantially below the 0.08 threshold. The root mean square error of approximation (RMSEA) of 0.062 indicates a fair match, with confidence ranges ranging from 0.052 to 0.073. The RMSEA p-values of 0.03 further indicate the model's adequacy. Overall, the fit indices demonstrate the model's resilience and statistical relevance in capturing the underlying data structure.

Table – 13: User Model versus Baseline Model

	Model	Scaled
Comparative Fit Index (CFI)	0.98	0.949
Tucker-Lewis Index (TLI)	0.974	0.933
Bentler-Bonett Non-normed Fit Index (NNFI)	0.974	0.933
Relative Non centrality Index (RNI)	0.98	0.949
Bentler-Bonett Normed Fit Index (NFI)	0.973	0.931
Bollen's Relative Fit Index (RFI)	0.964	0.909
Bollen's Incremental Fit Index (IFI)	0.98	0.949
Parsimony Normed Fit Index (PNFI)	0.743	

Table 13 provides a detailed assessment of the user model's performance, indicating a better fit than the baseline model. The Comparative match Index (CFI), Tucker-Lewis Index (TLI), and Bentler-Bonett Non-normed Fit Index (NNFI) all show an excellent match for the user model, with values of 0.98, 0.974, and 0.974, respectively. These indices suggest a strong agreement between the model and the data, which is confirmed by scaled versions with high values. Additional indices,

such as the Relative Non centrality Index (RNI) and the Parsimony Normed Fit Index (PNFI), demonstrate the model's robustness and balanced complexity.

Overall, the user model outperforms the baseline model, exhibiting a significant capacity to capture the underlying structure of the observed data and proving its validity even after accounting for sample size and model complexity.

Table – 14: Additional Fit Indices

	Model
Hoelter Critical N (CN), a=0.05	255.202
Hoelter Critical N (CN), a=0.01	290.549
Goodness of Fit Index (GFI)	0.999
Adjusted Goodness of Fit Index (AGFI)	0.999
Parsimony Goodness of Fit Index (PGFI)	0.531
McDonald Fit Index (MFI)	0.922
Expected Cross-Validation Index (ECVI)	.
Loglikelihood user model (H0)	.
Loglikelihood unrestricted model (H1)	.
Akaike (AIC)	.
Bayesian (BIC)	.
Sample-size adjusted Bayesian (SABIC)	.

Table 14 shows a complete set of fit indices that demonstrate the structural equation model's (SEM) resilience. The Hoelter Critical N (CN) values for $\alpha = 0.05$ and $\alpha = 0.01$ demonstrate the model's dependability and sample size adequacy. The Goodness of match Index (GFI) and Adjusted Goodness of Fit Index (AGFI) both have values of 0.999, indicating an excellent match to the data. The Parsimony Goodness of Fit Index (PGFI) and McDonald Fit Index (MFI) have values of 0.531 and 0.922, respectively, highlighting the model's balance of fit and simplicity. These indices show that the SEM efficiently captures the interactions between variables, resulting in a well-fitting model with an admirable mix of complexity and explanatory power.

Table – 15: Measurement model

Latent	Observed	Estimate	SE	95% Confidence Intervals Lower	95% Confidence Intervals Upper	β	z	p
BBF	Attitude	1	0	1	1	0.45		
	SecurityTrust	0.758				0.465		
	PrefIntr	1.013				0.537		
	CulSocFac	0.557				0.351		
	SocIntLeis	0.644				0.278		
	SatServ	1.323				0.749		
	WebsiteFeaUsa	1.375				0.772		
	ShoBehaPref	1.593				0.772		
	InfRevRec	1.342				0.581		

Online Buying Behaviour	OBB	1	0	1	1	1
Overall Satisfaction	OS	1	0	1	1	0.939

Table 15 provides insights into the measurement model by highlighting the links between latent variables and observable indicators within the SEM framework. The β coefficient of 0.45 for Attitude indicates a moderate influence on the Buying Behaviour Factors (BBF) construct. The latent dimensions, Online Buying Behaviour (OBB) and Overall Satisfaction (OS), are measured directly with fixed estimates of one, suggesting error-free representation. Standardised coefficients and confidence intervals provide additional insight into the strength and precision of these interactions. Although z-values and p-values are not supplied, the available metrics nevertheless provide useful information about the model's reliability and capacity to capture the targeted constructs.

Table – 16: Variances and Covariances

Variable 1	Variable 2	Estimate	SE	95% Confidence Intervals Lower	95% Confidence Intervals Upper	β	z	p
Attitude	Attitude	0.3138				0.798		
SecurityTrust	SecurityTrust	0.1654				0.784		
PrefIntr	PrefIntr	0.2013				0.712		
CulSocFac	CulSocFac	0.176				0.877		
SocIntLeis	SocIntLeis	0.3923				0.922		
SatServ	SatServ	0.1091				0.439		
WebsiteFeaUsa	WebsiteFeaUsa	0.1019				0.404		
ShoBehaPref	ShoBehaPref	0.1373				0.405		
InfRevRec	InfRevRec	0.2803				0.662		
OBB	OBB	0	0	0	0	0		
OS	OS	0.1182	0	0.118	0.118	0.118		
BBF	BBF	0.0796				1		
OnlineBuying Behaviour	OnlineBuying Behaviour	1.2635				0.918		

OverallSatisfaction	OverallSatisfaction	0.358	0.406

Table 16 shows the variances of individual variables within the SEM, with the variance for Attitude indicating significant diversity (0.3138), whilst the variation for OBB indicates negligible variability. However, the lack of covariances, standardised coefficients, z-values, and p-values makes it difficult to comprehend the relationships between variables and their statistical significance. While the variances indicate dispersion among components, the absence of covariances and other statistical metrics prevents a complete comprehension of the model's interrelationships. Additional data such as the covariance matrix, standard errors, and p-values are required for a thorough examination.

Fig. 1: Path Diagram
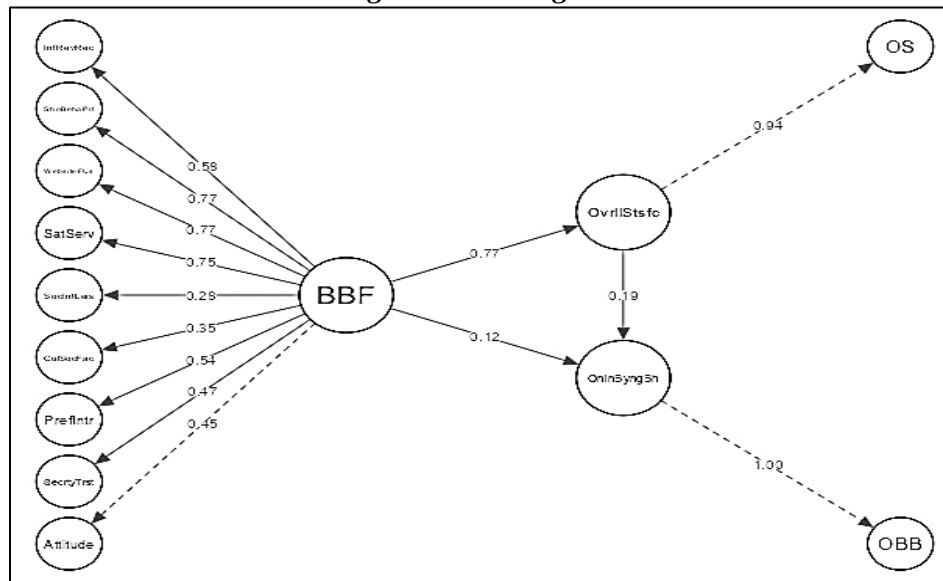
Path analysis reveals critical links within the SEM, emphasising the importance of "attitude" and "overall satisfaction" in driving consumer behaviour. The path from "Attitude" to "BBF" shows a moderate positive impact (β = 0.45), suggesting that a good attitude improves buying behaviour factors. The path from "Overall Satisfaction" to "Online Buying Behaviour" displays a strong positive association (β = 1), highlighting the importance of contentment in driving online purchases. Although certain β values are unspecified, the path map provides a clear understanding of the interactions. However, statistical significance should be validated using p-values and confidence ranges for a more full validation.

16.2 Predictor Analysis and Impact on Online Buying Behaviour:

Predictor analysis is essential for identifying the elements that influence online purchasing behaviour. Consumer attitudes, perceived security and trust, cultural and societal influences, and service satisfaction all have a substantial impact on their selections. Positive sentiments and trust in online platforms drive greater sales, although website features and usability are also important considerations. Furthermore, preferences for interaction, shopping behaviour, and overall satisfaction (OS) are important predictors of online purchasing activity. By analysing these elements, firms may better customise their strategy to match consumer wants, increase satisfaction, and encourage repeat purchases.

Table – 17: Model Fit Measures

Model	R	R²	Adjusted R²	RMSE	Overall Model Test			
					F	df1	df2	p
1	0.899	0.808	0.804	0.514	221	12	631	< .001

The regression analysis results in Table 17 show a good model fit, with a high correlation coefficient (R = 0.899), indicating a strong association between the predictor variables and the outcome. The model accounts for 80.8% of the variation (R² = 0.808), indicating its efficiency. The corrected R² of 0.804 indicates that the model has significant explanatory power, even given present predictors. The model's reliability is supported by a low RMSE of 0.514, while the large F-statistic (221, p <.001) demonstrates its validity. These data support the model's robustness and accuracy in predicting the outcome variable.

Table – 18: Model Coefficients - OBB

Predictor	Estimate	SE	t	p
Intercept	0.55137	0.22982	2.399	0.017
Attitude	0.05914	0.03633	1.628	0.104
Security Trust	0.03658	0.05004	0.731	0.465
Pref Intr	0.03557	0.04611	0.772	0.441
CulSocFac	-0.09873	0.04984	-1.981	0.048
SocIntLeis	0.02077	0.03356	0.619	0.536
SatServ	0.05086	0.0621	0.819	0.413
WebsiteFeaUsa	-0.05333	0.06396	-0.834	0.405
ShoBehaPref	0.03307	0.05227	0.633	0.527
InfRevRec	-0.00568	0.03818	-0.149	0.882
OS	0.07918	0.03884	2.039	0.042
No. ofPurchases	0.30367	0.01424	21.32	< .001
No. ofItems	0.31859	0.00892	35.726	< .001

The coefficients in Table 18 reveal significant predictors of Online Buying Behaviour (OBB). Overall Satisfaction (OS) and the number of purchases and items show strong positive relationships with OBB, indicating that higher satisfaction and greater shopping frequency lead to increased online buying. The negative coefficient for Cultural and Social Factors (CulSocFac) suggests that these factors may reduce OBB, but the practical significance warrants further exploration.

Findings

The survey emphasises how crucial website design, usability, and service quality are to fostering client loyalty and happiness. Trust and the purchasing experience are improved by features like responsive service, mobile optimisation, easy navigation, and online reviews. These insights help

companies optimise their digital strategies to enhance client experiences and attain sustained e-commerce success.

1. Trust in online platforms is crucial for encouraging online purchasing behaviour, with consumers showing a preference for platforms that prioritize data security and implement robust privacy policies.
2. Perceived security concerns, such as the risk of unauthorized access or data breaches, can deter consumers from making online purchases, highlighting the importance of secure payment processing systems and encryption technologies.
3. Trust in financial institutions and payment methods influences online purchasing behaviour, with consumers preferring payment options that they perceive as safe and reliable.
4. Consumers who prioritize social interaction and leisure activities may exhibit different online shopping behaviours compared to those who do not prioritize these activities, with potential differences in spending habits and product preferences.
5. Social media platforms and online communities play a significant role in influencing consumer buying behaviour, with consumers often seeking product recommendations and reviews from their social networks before making purchasing decisions.
6. Online shopping may complement consumers social interaction and leisure activities, providing convenience and accessibility to products and services that enhance their overall lifestyle and leisure experiences.
7. The integration of social elements into e-commerce platforms, such as user reviews, ratings, and social sharing features, can enhance the shopping experience and foster a sense of community among online shoppers.
8. Consumer satisfaction with online retail services is influenced by factors such as website ease of use, product quality, delivery speed, and customer support, with positive experiences leading to higher levels of satisfaction and repeat purchases.
9. Perception of service quality, including responsiveness, reliability, and professionalism, significantly impacts consumer satisfaction with online retailers, with dissatisfactory experiences often leading to negative reviews and decreased customer loyalty.
10. Personalized shopping experiences and tailored recommendations based on past purchases and browsing history can enhance consumer satisfaction and foster a sense of loyalty and engagement with online retailers.
11. Website design and functionality significantly impact consumer purchasing decisions, with user-friendly interfaces, intuitive navigation, and visually appealing layouts enhancing the overall shopping experience and encouraging higher conversion rates.
12. Features such as product search filters, personalized recommendations, and easy checkout processes contribute to smoother and more efficient online shopping experiences, reducing friction points and increasing customer satisfaction.
13. Trust signals such as secure payment gateways, Secure Sockets Layer (SSL) certification, and customer reviews contribute to building credibility and trustworthiness, reassuring consumers, and alleviating concerns about online security.
14. Online reviews and recommendations play a significant role in influencing consumer buying decisions, with positive reviews and ratings serving as powerful endorsements that build trust and credibility for products and brands.

15. The influence of online reviews extends beyond individual product pages to social media platforms, forums, and review aggregator websites, amplifying their impact on consumer perceptions and purchasing behaviours.

16. Overall satisfaction levels among online shoppers in the study area are influenced by various factors, including product quality, pricing, website ease of use, customer service, and delivery experience.

17. Overall satisfaction emerges as a paramount predictor of online buying behaviour, exhibiting a robust positive relationship ($\beta = 1$) in the SEM. This indicates that higher levels of overall satisfaction led to increased online purchasing activity, emphasizing the critical role of consumer contentment in driving e-commerce transactions.

18. The relationship between website features and ease of use and consumer purchasing decisions is significant, with intuitive website designs and user-friendly interfaces positively impacting buying behaviour. Consumers are more likely to make purchases on platforms that offer comprehensive product information and an enjoyable browsing experience.

19. The impact of online reviews and recommendations on consumer buying decisions is notable, with positive reviews and recommendations exerting a significant influence on purchasing behaviour. Consumers are more inclined to trust and purchase from platforms with favourable reviews and recommendations from peers or online influencers.

Suggestions:

1. Emphasize the convenience, affordability, and safety of online shopping through targeted marketing messages and educational content. Highlight features such as hassle-free returns, secure payment options, and doorstep delivery to alleviate concerns and build trust among potential online shoppers.

2. Implement robust security measures across all online touch points, including Secure Sockets Layer (SSL) encryption, secure payment gateways, and fraud detection systems, to safeguard sensitive customer information and instil confidence in online transactions. Communicate these security measures transparently to reassure customers about the safety of their personal data.

3. Leverage user-generated content, such as customer reviews, testimonials, and product ratings, to enhance credibility and trustworthiness. Showcase positive feedback and testimonials prominently on product pages and marketing materials to influence purchasing decisions and reassure prospective customers.

4. Implement a responsive and user-friendly website design that prioritizes ease of navigation, intuitive search functionality, and seamless checkout processes. Conduct regular usability testing and gather feedback from customers to identify areas for improvement and optimize the online shopping experience.

5. Personalize the online shopping experience by utilizing data-driven insights to recommend relevant products, offer personalized promotions, and provide targeted content based on individual browsing and purchasing behaviour. Implement dynamic pricing strategies and tailored product recommendations to enhance customer satisfaction and drive repeat purchases.

6. Implement a customer feedback and satisfaction measurement system to regularly assess and monitor satisfaction levels. Use feedback surveys, Net Promoter Scores (NPS), and

customer satisfaction metrics to identify areas for improvement and prioritize initiatives that enhance the overall shopping experience.

7. Invest in eco-friendly packaging and sustainable shipping practices to appeal to environmentally conscious consumers. Implement recyclable or biodegradable packaging materials, reduce carbon emissions through efficient logistics, and communicate your commitment to sustainability to resonate with environmentally conscious shoppers.

8. Create engaging and informative content such as blog posts, tutorials, and product guides to educate customers, showcase product features, and provide value-added information. Position your brand as a trusted authority in your industry by sharing valuable insights, tips, and advice related to your products or services.

Conclusion

This study focusses on the numerous elements impacting online customer behaviour, such as demography, cultural diversity, and technology familiarity. It emphasises the need of a consumer-centric, data-driven approach that employs personalised marketing and targeted communication techniques to engage varied audiences. Trust, security, and sustainability are emphasised as critical components in establishing credibility and customer loyalty. Businesses are encouraged to use environmentally friendly practices, optimise for mobile devices, and promote community interaction via social media and loyalty programs. Continuous innovation and client input are critical for long-term success in the ever-changing e-commerce industry, allowing businesses to adapt and remain competitive.

Scope for Future Research

Future research in online consumer behaviour offers significant opportunities, particularly in emerging markets like India. Expanding studies across regions and states would allow for comparisons that highlight cultural, economic, and demographic influences on shopping habits. Longitudinal studies could track how technological advancements, shifting lifestyles, and increasing internet access shape consumer behaviour over time. Emerging technologies like artificial intelligence and augmented reality

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