

Identifying Factors Affecting User Satisfaction in Sri Lankan E-commerce Websites

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I. INTRODUCTION

The rapid growth of e-commerce in Sri Lanka, driven by internet penetration and technology, has reshaped consumer behavior [1]. User satisfaction is vital but influenced by website design, personalization, pricing, and responsiveness [2]. Local platforms struggle against global competitors like AliExpress and eBay due to poor design, limited products, and weak trust mechanisms [3], making user satisfaction crucial for retention and competition.

The UTAUT (Unified Theory of Acceptance and Use of Technology) model highlights key factors influencing technology adoption, such as performance expectancy and social influence, which can help optimize Sri Lankan e-commerce platforms [4]. However, weak consumer protection laws and a lack of regulation reduce user confidence in local e-commerce businesses [1].

This study explores key factors influencing user satisfaction in Sri Lankan e-commerce through a survey and literature review. Regression analysis and Machine Learning models will be used to develop a predictive model to identify the level of user satisfaction based on available features for improving e-commerce services and enhancing user experience.

II. LITERATURE REVIEW

User satisfaction in e-commerce depends on multiple factors, including website design, security, customer service, and payment methods. Research highlights usability and design as key drivers of satisfaction. Deyalage & Kulathunga found web design, security, and customer service crucial in Sri Lanka [5], while Semerádová & Weinlich emphasized content and navigation [6]. Trust is another major factor, with studies showing that security, service quality, and secure payments directly impact user satisfaction and repurchase intent [7]. Payment security and ease of transactions also play a key role, with studies in Sri Lanka and globally confirming their importance.

Customer service significantly impacts satisfaction, with research stressing the importance of responsiveness and post-purchase support [5]. Emerging trends, including usability, innovation, and fast delivery, continue to shape satisfaction in evolving e-commerce markets [8]. Studies in Sri Lanka

highlight affordability, technology limitations, and return policies as key barriers [9], while personalization and gamification improve user experience [8]. Comparative research across regions identifies key satisfaction factors, including secure payments and delivery efficiency [7].

This study fills research gaps by analyzing key satisfaction factors in Sri Lankan e-commerce, including cultural influences and consumer protection laws. It integrates trust, localization, and predictive analytics to provide deeper insights into user satisfaction, addressing the collective impact of these factors on online shopping experiences.

III. MATERIALS AND METHODS

A. Hypothesis Development

Hypotheses were formulated based on a comprehensive literature review and aligned with the conceptual framework.

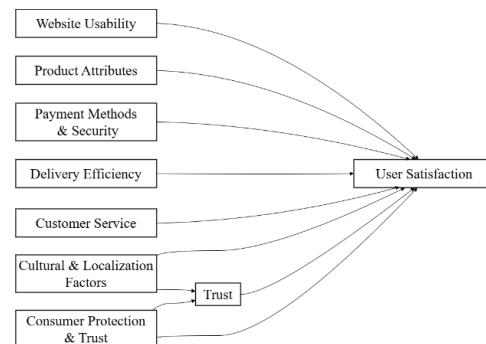


Fig. 1. Conceptual Framework

B. Data Collection and Questionnaire Design

A structured survey using purposive sampling gathered 706 Sri Lankan online shoppers identified through e-commerce reviews. The sample includes diverse demographics (23.8% aged 26-35, 51.7% males, 55.4% bachelor's degree). A five-point Likert scale ranging from "very satisfied" to "very dissatisfied" measured seven constructs, assessing key user satisfaction factors and demographic variations across age, education, and occupation.

C. Data Analysis Approach

The data analysis approach involved preprocessing in R, including data cleaning, handling missing values, and outliers.

Reliability was assessed using Cronbach's Alpha, while Pearson correlation analyzed variable relationships. Multiple Regression Analysis examined the influence of independent variables on user satisfaction, with model performance evaluated using R-squared (R^2).

D. Ethical Considerations

Participants provided informed consent, and responses were kept anonymous and confidential. The study adhered to ethical guidelines and data protection laws, ensuring academic use of data.

E. Future Works

Machine learning models (Decision Trees, Random Forests, Support Vector Machines (SVM), and Neural Networks) will be used to refine the findings and identify key factors. Feature importance will be analyzed using Random Forest and SHAP (SHapley Additive exPlanations). Model performance evaluated using R^2 , Mean Absolute Error (MAE) and Root Mean Squared Error (RMSE) for accuracy comparison.

IV. RESULTS AND DISCUSSION

A. Descriptive and Reliability Analysis (Table I,II):

Website usability (mean = 3.57) and payment methods (mean = 3.58) scored highest, while consumer trust (mean = 2.93) lagged. All constructs showed high reliability (Cronbach's Alpha > 0.82).

TABLE I. DESCRIPTIVE STATISTICS

Variable	Mean	Standard Deviation	Median	Mode	Skewness	Kurtosis
Website Usability	3.57	0.58	3.75	4	-0.13	0.59
Product Attributes	3.49	0.71	4	4	-0.27	0.44
Payment Methods and Security	3.58	0.63	4	4	-0.11	0.23
Delivery Efficiency	3.36	0.74	3.5	3.5	-0.13	-0.4
Customer Service	3.32	0.72	3	3	-0.12	0.68
Cultural and Localization Factors	3.03	0.8	3	3	0.25	-0.05
Consumer Protection and Trust	2.93	1.07	3	3	-0.31	-0.69

TABLE II. RELIABILITY ANALYSIS

Variable	Cronbach's Alpha	Corrected Item-Total Correlation
Website Usability	0.82	0.77
Product Attributes	0.83	0.62
Payment Methods and Security	0.84	0.59
Delivery Efficiency	0.83	0.64
Customer Service	0.83	0.63
Cultural and Localization Factors	0.84	0.53
Consumer Protection and Trust	0.84	0.65

B. Pearson Correlation Analysis (Table III):

User satisfaction strongly correlates with website usability ($r = 0.73$), highlighting its importance. Consumer trust shows a moderate correlation ($r = 0.55$), indicating a lesser but notable impact. Cultural and localization factors have the weakest correlation ($r = 0.43$), suggesting a smaller influence on satisfaction.

TABLE III. CORRELATION MATRIX

Variable	User Satisfaction	Website Usability	Product Attributes	Payment Methods
User Satisfaction	1	0.73**	0.57**	0.54**
Website Usability	-	1	0.69**	0.53**
Product Attributes	-	-	1	0.40**
Payment Methods and Security	-	-	-	1
Delivery Efficiency	0.47**	0.59**	0.50**	0.42**
Customer Service	0.51**	0.59**	0.53**	0.35**
Cultural and Localization Factors	0.43**	0.42**	0.35**	0.35**
Consumer Protection and Trust	0.55**	0.56**	0.40**	0.51**

(** means $p < 0.001$)

C. Regression Analysis (Table IV):

Significant predictors: website usability ($\beta = 0.53-0.54$, $p < 0.001$), payment methods ($\beta = 0.16-0.17$, $p < 0.001$), consumer trust ($\beta = 0.07-0.09$, $p < 0.001$). Non-significant:

delivery efficiency ($p = 0.18$), customer service ($p = 0.29$). Model explained ~59% variance (Adj. $R^2 = 0.591-0.592$).

TABLE IV. REGRESSION COEFFICIENTS (FULL VS. OPTIMIZED MODEL)

Variable	Full Model (β)	p-value	Optimized Model (β)	p-value
Intercept	0.44	0.0001	0.44	0.0001
Website Usability	0.54	<0.001	0.53	<0.001
Product Attributes	0.09	0.003	0.09	0.002
Payment Methods and Security	0.16	<0.001	0.16	<0.001
Cultural and Localization Factors	0.06	0.009	0.06	0.012
Consumer Protection and Trust	0.07	<0.001	0.07	<0.001
Delivery Efficiency	-0.04	0.178	-	-
Customer Service	0.03	0.291	-	-

D. Diagnostics

Residuals were non-normal (Shapiro-Wilk $p < 0.001$) but acceptable for large samples ($n = 706$). No autocorrelation (Durbin-Watson ≈ 2.06).

The analysis confirms website usability and payment methods as dominant satisfaction drivers, correlating strongly with user ratings. Consumer Trust, despite low mean scores, significantly influenced satisfaction, suggesting trust-building is critical. Non-significant delivery efficiency and customer service results suggest industry-wide standardization, whereas cultural factors reveal latent potential in localization.

V. CONCLUSION

This study identifies website usability, payment methods, and consumer trust as key satisfaction drivers in Sri Lankan e-commerce, while delivery efficiency and customer service showed no significant impact, likely due to market standardization and cultural prioritization of cost over speed. Strategic priorities include intuitive design, trust-building payment systems, and localized interfaces, while future research should longitudinally track emerging tech adoption (AI/voice commerce) and evolving satisfaction gaps in Sri Lanka's transforming digital marketplace.

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