

EXAMINING HOW SELF-SERVICE TECHNOLOGY SHAPES CUSTOMER SATISFACTION AND LOYALTY IN ZAMBIA'S PAY-TV INDUSTRY

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Abstract

This study examines how self-service technology (SST) service quality shapes customer satisfaction and loyalty in Zambia's pay-TV industry, a context where empirical evidence on digital service experiences remains limited. Grounded in Expectation Disconfirmation Theory and the Technology Readiness and Acceptance Model (TRAM), the study adopted a positivist approach and cross-sectional survey design, collecting data from 410 pay-TV subscribers. Data were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) in Jamovi to evaluate both measurement and structural models.

The findings revealed that SST service quality dimensions, functionality, security, design, assurance, enjoyment, and customisation significantly enhance customer satisfaction, which in turn strongly predicts customer loyalty. The model demonstrated substantial explanatory power, accounting for 68% of the variance in customer satisfaction ($R^2 = 0.680$) and 75.9% in customer loyalty ($R^2 = 0.759$), with acceptable model fit (RMSEA = 0.089; SRMR = 0.056). Customer satisfaction also played a mediating role in translating SST experiences into sustained loyalty. The study highlights the strategic importance of delivering reliable, user-friendly, and personalised digital platforms to strengthen retention and competitive advantage in subscription-based services.

Keywords: Self-service technology, customer satisfaction, customer loyalty, pay-TV, PLS-SEM, Zambia.

1.0 Introduction

Over the past decade, the global service landscape has been profoundly reshaped by the rapid diffusion of self-service technologies (SSTs), driven by advances in digital infrastructure, cost-efficiency imperatives, and changing customer expectations (Safaeimanesh et al., 2021). In Zambia, this transformation has accelerated since the COVID-19 pandemic, with mobile commerce and digital self-service platforms becoming integral to service delivery across banking,

telecommunications, utilities, and subscription-based services. Internet penetration increased from approximately 50.4% in 2019 to 56.7% in 2022, with mobile broadband accounting for over 97% of subscriptions (ZICTA, 2022). This digital expansion has created fertile ground for SST adoption, positioning customer satisfaction and loyalty as strategic priorities for firms operating in technology-enabled service environments (Rajab et al., 2025).

The pay-TV industry in Zambia has not been immune to these developments. The sector has experienced steady growth, with more than 30% of urban households and 15% of rural households subscribing to pay-TV services as of 2022 (ZICTA, 2022). To enhance operational efficiency and customer convenience, pay-TV providers increasingly rely on SSTs such as mobile applications, USSD platforms, online portals, and automated payment systems (Ikpeazu, 2025; Mada, 2025). These technologies allow customers to manage subscriptions, make payments, resolve service issues, and access support with minimal human interaction. However, intensified competition from digital streaming platforms has raised customer expectations regarding service quality, making the effective deployment of SSTs critical for customer retention (Kurhasku-Hoti & Rustemi, 2025; Mwiya et al., 2022).

Despite their potential benefits, SSTs present significant challenges, particularly in emerging economies. Globally, while over 67% of customers prefer self-service channels for routine transactions, approximately 42% report dissatisfaction due to system failures, security concerns, and poor interface design (Jansson et al., 2022; Shahril et al., 2021). In Zambia, these challenges are exacerbated by infrastructural limitations, inconsistent network reliability, and uneven levels of digital literacy. Consequently, pay-TV providers face mounting pressure to ensure that SST service quality translates into positive customer experiences that foster satisfaction and long-term loyalty (Dawi et al., 2018).

Existing literature consistently demonstrates that SST service quality is a critical determinant of customer satisfaction and loyalty across digital services. SST service quality is commonly conceptualised through dimensions such as functionality, enjoyment, security, design, assurance, and customisation (Shahid Iqbal et al., 2018). Studies conducted in Pakistan, Turkey, China and South Africa confirm that well-designed and reliable SSTs enhance customer satisfaction, which subsequently drives customer loyalty (Luo & Paulino, 2023; Shahid Iqbal et al., 2018; Yalçinkaya & Çataldaş, 2025; Yum & Yoo, 2023). These findings underscore the central role of customer satisfaction as a mediating mechanism linking SST service quality to loyalty outcomes.

Within Africa, empirical evidence further supports these relationships. Mwiya et al. (2017), Chawala et al. (2022), Choongo et al. (2023) and Mwiya et al. (2022) demonstrated that electronic service quality significantly influences customer satisfaction and continued usage intentions in Zambia's banking sector. Similarly, Ul Hassan et al. (2020) and De Leon et al. (2020) confirmed that SST quality dimensions such as ease of use, reliability, and perceived control positively shape customer attitudes and loyalty intentions. However, much of this evidence is derived from banking, retail, and e-commerce, leaving subscription-based services such as pay-TV relatively underexplored.

A growing concern in the literature is the limited contextualisation of SST research in developing economies. Systematic reviews by Vakulenko et al. (2018) reveal a strong concentration of SST studies in developed markets, with fewer conducted in sub-Saharan Africa. Moreover, recent

reviews highlight inconsistencies in the operationalisation of SSTQUAL dimensions, particularly enjoyment, assurance, and customisation, which weaken theoretical clarity and limit generalisability (De Leon et al., 2020; Ghosh, 2020). These shortcomings are particularly problematic for industries like pay-TV, where customer interactions are frequent, technology-dependent, and emotionally driven (Xia & Shannon, 2025).

Furthermore, most SST studies adopt cross-sectional designs and generic service settings, offering limited insights into industry-specific dynamics (Chan & Petrikat, 2022). The pay-TV sector presents unique characteristics, including recurring subscription payments, service interruptions, and content-driven value perceptions, which may shape customer evaluations of SST service quality differently from other digital services (Udeh et al., 2022). Additionally, contextual factors such as socio-economic conditions, infrastructural reliability, and culturally shaped trust perceptions are rarely integrated into empirical models, despite being identified as key moderators of SST effectiveness in emerging markets (Vardari & Hameli, 2025; Wang et al., 2023).

Failure to address these gaps, inadequate understanding of how SST service quality influences customer satisfaction and loyalty may result in poorly designed systems that frustrate users, reduce trust, and increase customer churn (Hien et al., 2024; Malek & Dave, 2023). In an increasingly competitive digital entertainment market, such outcomes pose a direct threat to the sustainability of pay-TV providers. From a theoretical standpoint, neglecting emerging-market constraints, the development of robust, globally relevant SST frameworks (Fan, 2024).

The importance of this issue is further amplified by the intensifying competition between traditional pay-TV providers and global digital streaming platforms. To remain competitive, pay-TV firms must leverage SSTs not merely as cost-saving tools but as strategic mechanisms for enhancing customer experiences (Udoakpan & Tengeh, 2020). Customer satisfaction, therefore, becomes a critical pathway through which SST service quality can be transformed into enduring customer loyalty, reinforcing the need for empirical investigation within the Zambian context.

Against this backdrop, the present study seeks to address these gaps by examining how self-service technology service quality shapes customer satisfaction and customer loyalty in Zambia's pay-TV industry. Specifically, the study investigates customer satisfaction as a mediating variable between SST service quality dimensions and customer loyalty. The next sections are outlined in the following sequence: It begins with a comprehensive review of the literature and the development of hypotheses; then the methods are highlighted before the presentation and discussion of results. In conclusion, the key findings are summarised, and future directions for research are proposed.

2.0 Literature Review

The concept of service quality in technology-mediated environments differs from traditional service settings because customer evaluations are largely shaped by system performance, user experience, and perceived control rather than face-to-face interactions (Lee et al., 2026). In self-service technology (SST) environments, quality is assessed through customers' cognitive and affective responses to system functionality, ease of navigation, reliability, and interactivity (Shahid Iqbal et al., 2018). As digital services are intangible, automated, and experience-based, measuring quality depends heavily on users' perceptions of efficiency, security, and convenience during service encounters. High SST service quality is therefore regarded as a strategic capability for

enhancing customer value, sustaining competitive advantage, and encouraging continued usage of digital platforms (Kurniawan et al., 2025).

Empirical studies conducted in Portugal, the United States, the United Kingdom, and Singapore consistently demonstrate that SST attributes such as functionality, reliability, perceived ease of use, and interface design significantly improve customer satisfaction, which subsequently drives loyalty behaviours (Attar et al., 2023; Florea et al., 2025; Sun & Pan, 2023; Torrão & Teixeira, 2023). These studies emphasise that customers develop favourable attitudes when digital platforms deliver seamless, efficient, and user-friendly experiences (Choongo et al., 2023). However, some findings indicate that SST adoption alone does not automatically produce loyalty; rather, satisfaction plays a mediating role, particularly when systems incorporate experiential features such as enjoyment, assurance, and customisation (Shahid Iqbal et al., 2018; Thaichon et al., 2024).

In developing regions, contextual and infrastructural factors strongly influence SST evaluations. Research from Nigeria, Ghana, Zimbabwe, and Zambia identifies trust, system reliability, responsiveness, and security as dominant predictors of satisfaction with digital self-service platforms (Makofane et al., 2025; Mukuka & Chasha, 2025; Tetteh, 2022; Ugwuanyi et al., 2022). These studies confirm the relevance of SST service quality but largely focus on banking, telecommunications, and mobile money services, with limited application to subscription-based industries such as pay-TV.

2.1 Theoretical Background

2.1.1 Expectations Disconfirmation Theory

Expectation Disconfirmation Theory (EDT) provides the primary theoretical foundation for examining customer satisfaction in e-service environments developed by Oliver (1977). The theory posits that satisfaction is an affective response arising from a comparison between customers' pre-service expectations and their actual service performance; positive disconfirmation leads to satisfaction, whereas negative disconfirmation leads to dissatisfaction (Schiebler et al., 2025). EDT has been widely applied in digital contexts such as online banking, e-commerce, and mobile services to explain how system quality, reliability, and usability shape post-usage evaluations (Mwiya et al., 2022). However, its application in subscription-based digital services within emerging economies remains limited, particularly in understanding how infrastructural constraints and varying digital literacy influence expectation formation and confirmation. This study applies EDT to Zambia's pay-TV self-service platforms to examine how SST service quality dimensions shape expectation confirmation, thereby influencing customer satisfaction and ultimately driving customer loyalty within a developing market.

2.1.2 Technology Readiness and Acceptance Model (TRAM)

The Technology Readiness and Acceptance Model (TRAM), developed by Lin et al. (2007) integrates Technology Readiness (TR) and the Technology Acceptance Model (TAM) to better explain customers' intentions to adopt and use electronic services. While TAM emphasises perceived usefulness and perceived ease of use as primary determinants of technology acceptance, TRAM extends this view by incorporating individual readiness factors such as optimism, innovativeness, discomfort, and insecurity toward technology (Schorr, 2023). The model has been

widely applied in e-banking, e-commerce, and self-service environments to explain variations in user adoption behaviour and satisfaction outcomes (Mwiya, Chikumbi, et al., 2017). Empirical studies show that customers with higher technology readiness are more likely to perceive SST platforms positively, enhancing usage and satisfaction levels (Kwon et al., 2026; Shim et al., 2020). However, limited research has applied TRAM in emerging-market digital subscription services, where infrastructural limitations and digital literacy disparities may shape readiness differently. This study applies TRAM to understand customers' preparedness to engage with pay-TV self-service technologies in Zambia.

2.2 Hypotheses Development

In light of the foregoing theoretical background as well as the identified gaps in the literature, this study proposes a conceptual model reflecting the interrelationships amongst SST service quality dimensions, customer loyalty and the mediating influence of customer satisfaction.

2.2.1 SST Service Quality and Customer Satisfaction

SST service quality is expected to positively influence customer satisfaction in digital service environments such as pay-TV platforms. This relationship is grounded in the multidimensional nature of SST service quality, which includes functionality, enjoyment, security, design, assurance and customisation (Shahid Iqbal et al., 2018). When these elements are effectively delivered, customers perceive the technology as convenient, efficient, and empowering, leading to favourable evaluations of the service encounter. Drawing on Expectation Disconfirmation Theory, satisfaction occurs when SST performance meets or exceeds users' expectations for speed, control, and ease of use.

The relationship is further explained by the Technology Readiness and Acceptance Model (TRAM), which suggests that individuals who exhibit optimism and innovativeness toward technology are more likely to perceive SST platforms as useful and easy to use, thereby strengthening satisfaction outcomes (Games et al., 2026). Empirical evidence supports this linkage: studies in the United States show that reliable and secure SST systems enhance user trust and satisfaction in digital banking (Ru-Zhue et al., 2025; Waluyo et al., 2025). A similar research done in South Korea demonstrates that interactive and enjoyable interfaces improve engagement in telecommunications services (Chung et al., 2016); and findings from South Africa indicate that well-designed and customised self-service platforms significantly elevate customer experiences in subscription-based services (Zungu et al., 2025). These findings collectively suggest that high-quality SST delivery fosters satisfaction by enhancing usability, confidence, and personal relevance. Therefore, the first hypothesis is as follows:

H₁: SST service quality positively influences customer satisfaction.

2.2.2 Customer Satisfaction and Customer Loyalty

Customer satisfaction is expected to positively influence customer loyalty in digital service contexts such as pay-TV platforms. This relationship is grounded in Expectation Disconfirmation Theory, which posits that when service performance meets or exceeds customer expectations, positive evaluations are formed, encouraging repeat usage and long-term relationships (Azzahra, 2025). Satisfied customers develop trust and emotional attachment to the service provider, which

reduces switching intentions and strengthens commitment. In technology-mediated environments, consistent system performance, convenience, and perceived value enhance satisfaction, which in turn motivates customers to renew subscriptions, recommend the service to others, and resist competitive alternatives (Paulose & Shakeel, 2022).

Studies in South Africa show that reliable digital platforms encourage continued subscription among pay-TV users (Müller et al., 2020; Samudro et al., 2024), while research in Zambia found that satisfaction with self-service options significantly predicted repeat usage intentions (Mwiya, Bwalya, et al., 2017). Similarly, findings from the United Kingdom indicate that satisfied digital-service customers are more likely to engage in positive word-of-mouth and maintain long-term provider relationships (Liana et al., 2024). Therefore, customer satisfaction serves as a critical pathway through which service experiences translate into sustained customer loyalty. Hence, the second hypothesis is that:

H₂: Customer satisfaction positively influences customer loyalty.

2.2.3 The Mediating Role of Customer Satisfaction

Customer satisfaction is hypothesised to mediate the relationship between SST service quality and customer loyalty in digital service environments. This mediation occurs because high-quality SST attributes such as functionality, enjoyment, security, design, assurance and customisation first shape users' service evaluations, which then translate into loyalty behaviours such as repeat usage and positive word-of-mouth (Hidayat et al., 2024). The rationale for this mediated relationship is supported by Expectation Disconfirmation Theory and the Technology Readiness and Acceptance Model (TRAM). Expectation Disconfirmation Theory explains how perceived performance relative to expectations generates satisfaction, while TRAM suggests that users' readiness and acceptance of technology influence how service quality is interpreted and internalised before behavioural outcomes occur (Chatterjee & Suy, 2019).

Empirical evidence supports this pathway across multiple contexts. Studies by Udeh et al. (2022) in Nigeria reveal that satisfaction explains continued use of pay-TV self-service platforms, while research in South Africa and Singapore shows that positive digital experiences enhance loyalty primarily through satisfaction rather than direct service-quality effects (Morgan & Govender, 2017; Yessi et al., 2023). Therefore, satisfaction functions as a key explanatory mechanism linking SST service quality to customer loyalty. Therefore, the third set of hypotheses is as follows:

H₃: Customer satisfaction mediates the relationship between SST service quality and customer loyalty.

Conceptual framework

Based on the foregoing hypotheses, the conceptual model in Figure 3 reflects the direction of influence in the relationships being explored.

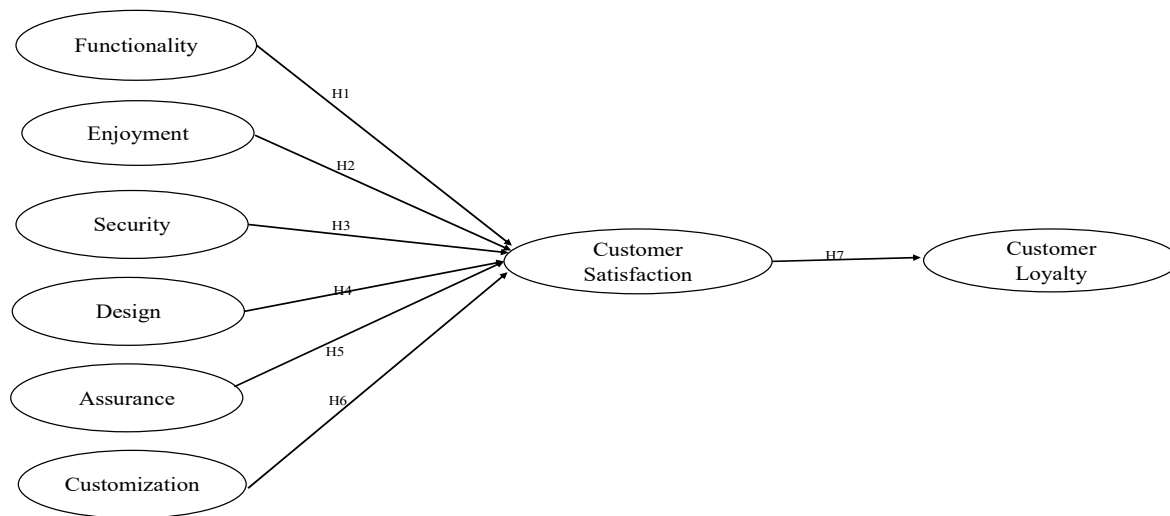


Figure 1. Conceptual framework

Figure 1 Alt Text: Conceptual model with SST Service Quality dimensions (functionality, enjoyment, security, design, assurance, customisation), customer satisfaction and customer loyalty variables.

3.0 Methods and Measurements

Population, unit of analysis, and sample

This study employed quantitative methods, focusing on objective measurement, hypothesis testing, and generalizable findings to examine causal relationships (Creswell, 2014). Using a survey method approach, it adopted an explanatory research model to analyse how one variable influences another (Creswell, 2014). Primary data were collected through a structured questionnaire designed on a five-point Likert scale. To gain deeper insights, open-ended questions were included in the survey, as shown in the appendix. The target population for this study was SST's users in Zambia. There are about 20,000 SST users in Zambia. The Raosoft calculator indicates that 377 is the representative sample, with a 5% margin of error at a 95% confidence level and a 50% response rate (Raosoft, 2026). A sample size of 410 respondents was selected for this research, which is sufficient for research and provides a diverse range of responses. To enhance accessibility and participation, the survey was conducted online and distributed via social media platforms, allowing for a broader reach and efficient data collection. The resulting sample profile is given in Table 1.

Table 1. Sample profile.

Variable	Description	Frequency	Percent	Valid percent	Cumulative percent
Gender	Male	242	59.0	59.0	59.0
	Female	168	41.0	41.0	100.0
Age-group	18-25 years	28	6.8	6.8	6.8
	61-35 years	224	54.6	54.6	61.5

Level of Education	36-45 years	95	21.7	21.7	84.6
	46-55 years	45	23.2	23.2	95.6
	Above 56	18	11.0	11.0	100.0
	Form 5/Grade 12 and below	11	4.4	2.7	2.7
	Certificate	25	6.1	6.1	8.8
	Diploma	82	20.0	20.0	28.8
	Undergraduate	253	61.7	61.7	90.5
	Master's degree	39	9.5	9.5	100.0
	Use of Pay-TV Self-Service System				
Use of Pay-TV Self-Service System	Yes	401	97.8	97.8	97.8
	No	9	2.2	2.2	100.0
Most Frequently Used Pay-TV Provider	DSTV	168	41.0	41.0	41.0
	GO-TV	121	29.5	29.5	70.5
	Netflix	54	13.2	13.2	83.7
	Show-Max	16	3.9	3.9	87.6
	Startimes	10	2.4	2.4	90.0
	Airtel TV	5	1.2	1.2	91.2
	Zuku	5	1.2	1.2	92.4
	Muvi TV	10	2.4	2.4	94.9
	Top Start	21	5.1	5.1	100.0
	Duration of Pay-TV Self-Service Usage				
Duration of Pay-TV Self-Service Usage	Less than 3 months	39	9.5	9.5	9.5
	3-12 months	55	13.4	13.4	22.9
	1-5 years	162	39.5	39.5	62.4
	Above 5 years	154	37.6	37.6	100.0
Frequency of Pay-TV Self-Service Usage	Always	252	61.5	61.5	61.5
	Sometimes	117	28.5	28.5	90.0
	Rarely	31	7.5	7.5	97.6
	First time	10	2.4	2.4	100.0
	Internet Access				
Internet Access	Yes	378	92.2	92.2	92.2
	No	32	7.8	7.8	100.0
Monthly Pay-TV Expenditure	K200 and below	59	14.4	14.4	14.4
	K201 to 400	93	22.7	22.7	37.1
	K401 to 600	108	26.3	26.3	63.4
	K601 to 1000	113	27.6	27.6	91.0
	Above K1000	37	9.0	9.0	100.0
Purpose of Pay-TV Usage	Personal	107	26.1	26.1	26.1
	Household	279	68.0	68.0	94.1
	Business premises	24	5.9	5.9	100.0

Table 1 Alt Text: Sample Profile reflecting characteristics such as gender, age group, level of education, use of Pay-TV self-service systems, most frequently used Pay-TV provider, duration and frequency of self-service usage, internet access, monthly Pay-TV expenditure, and purpose of Pay-TV usage for the 410 respondents.

Data analysis method

Data were analysed using Structural Equation Modelling (SEM) implemented in Jamovi software to test the proposed hypotheses (Sadenova et al., 2025). The Partial Least Squares SEM (PLS-SEM) approach available in Jamovi enables the simultaneous assessment of both measurement and structural models, making it well-suited for examining complex relationships among latent constructs (Hair et al., 2014). PLS-SEM is increasingly applied in management and social science research due to its flexibility in handling non-normal data, relatively small or unbalanced samples, and exploratory model development (Hair et al., 2014). The method emphasises prediction and variance explanation rather than strict theory confirmation, distinguishing it from Covariance-Based SEM (CB-SEM). Additionally, PLS-SEM demonstrates strong capabilities in evaluating composite reliability, convergent validity, and discriminant validity, making it appropriate for causal-predictive analysis in this study (Arunraju, 2025).

4.0 Results

Measurement Model

The measurement model explains how observed indicators or variables are used to assess the endogenous and exogenous constructs. Since measurement variables form the foundation for testing the abstract hypothesis, the attributes of the survey items (observed variables) are essential. It also helps identify potential mistakes that could occur during the survey process. The study's measurement framework included eight constructs adapted from Shahid Iqbal et al. (2018), each with reflective indicators. The validity and reliability of these constructs were assessed, including convergent and discriminant validity, indicator reliability, factor loading for the indicators, and internal consistency reliability. To reduce common method bias (CMB), procedural and statistical measures were implemented, such as ensuring respondent anonymity, improving item clarity, and conceptually separating items (Podsakoff et al., 2024). Additionally, Harman's single-factor test and marker variable techniques were utilised to detect bias, in accordance with Podsakoff et al. (2024). The evaluation of common method variance (CMV) using the Harman single-factor test has been carried out, and the variance value is 46.2%. If the percentage variance is below 50%, then it can be said that the measurement of the research indicators has passed the common method bias (Pangarso et al., 2020).

Exploratory Factor Analysis (EFA) was performed using Principal Component Analysis (PCA) with and without varimax rotation. Table 2 states the results of the Harman single-factor test for CMV testing with Bartlett's Sphericity at Chi-square (χ^2) = 7139, df = 300, $p < 0.001$ and KMO measure of sample adequacy at 0.942 in the acceptable range for factor analysis. In Bartlett's Sphericity, a significant result gives confidence that the correlations within the data are meaningful and not just random chance, making the dataset suitable for factor analysis. The KMO test assesses whether the data are suitable for factor analysis by comparing observed correlations to partial correlations. A high KMO value indicates strong correlations between variables, making factor analysis appropriate (0.80 to 1 is high, 0.70 middle, below 0.50 unacceptable). Appendix 1 shows the survey questionnaire items.

Table 2: Harman single-factor test, Total Variance Explained

Component	Eigenvalue	% of Variance	Cumulative %
1	11.555	46.22	46.2
2	2.141	8.564	54.8
3	1.509	6.034	60.8
4	1.349	5.397	66.2
5	1.092	4.368	70.6
6	0.714	2.854	73.4
7	0.637	2.548	76.0
8	0.591	2.362	78.3
9	0.541	2.165	80.5
10	0.506	2.023	82.5
11	0.440	1.759	84.3
12	0.412	1.648	85.9
13	0.394	1.578	87.5
14	0.374	1.496	89.0
15	0.347	1.387	90.4
16	0.310	1.240	91.6
17	0.300	1.199	92.8
18	0.279	1.117	94.0
19	0.276	1.106	95.1
20	0.263	1.052	96.1
21	0.255	1.019	97.1
22	0.212	0.848	98.0
23	0.194	0.777	98.8
24	0.168	0.673	99.4
25	0.141	0.566	100

Table 2 Alt Text: Table of Harman's single-factor test showing total variance explained. Results indicate that a single factor does not account for the majority of variance, supporting the absence of common method bias.

The measurement model in Table 3 exhibits high validity and reliability, with the majority of outer loadings surpassing the indicated threshold factor loading of 0.71. Very low factor loading scores

(less than 0.40) are eliminated from the measurement model and do not contribute to the model (Hair & Alamer, 2022). Before this, and based on factor loadings, some items were excluded to enhance model robustness: one item functionality, one item from design and one item from customer satisfaction. This refinement process sought to ensure that each item's loading exceeded the commonly accepted threshold of 0.5 (Benitez et al., 2020), thereby contributing positively to construct validity (see Table 3) since the loadings range from 0.432 to 0.931.

Table 3: Analyses of Outer loadings

Construct	Items	Outerloadings
Functionality	FUN1	0.714
	FUN2	0.776
	FUN3	0.835
	FUN4	0.738
Enjoyment	ENJ1	0.635
	ENJ2	0.432
	ENJ3	0.711
	ENJ4	0.734
Security	SEC1	0.638
	SEC2	0.789
Design	DES1	0.582
Assurance	ASU1	0.696
	ASU2	0.591
Customisation	CUS1	0.583
	CUS2	0.781
	CUS3	0.830
Customer Satisfaction	CS2	0.556
	CS3	0.819
Customer Loyalty	CL1	0.877
	CL2	0.931
	CL3	0.861
	CL4	0.728

Table 4 Alt Text: Table presenting analyses of outer loadings for measurement items. All loadings exceed recommended thresholds, confirming indicator reliability and supporting construct validity.

Construct validity test results

The current study evaluated the reliability and convergent validity of constructs using several metrics. Composite reliability values for all constructs ranged from 0.638 to 0.909, indicating that internal consistency was within the acceptable range. The average variance extracted (see Table 4), which measures convergent validity by the squared loadings of items, displayed values between 0.469 and 0.716 for all variables, exceeding the threshold of 0.5 and confirming sufficient explanatory power of the constructs (Hair et al., 2019).

Table 4: Convergent Validity and Reliability

Construct	Cronbach's alpha	Composite reliability (rho_c)	Average variance extracted (AVE)
Functionality	0.845	0.850	0.534
Enjoyment	0.847	0.847	0.585
Security	0.805	0.813	0.687
Design	0.638	0.638	0.469
Assurance	0.763	0.775	0.636
Customisation	0.809	0.817	0.600
Customer Satisfaction	0.828	0.835	0.629
Customer Loyalty	0.906	0.909	0.716

Table 4 Alt Text: Table reporting convergent validity and reliability results. Average variance extracted exceeds threshold, and composite reliability values confirm internal consistency.

Discriminant Validity Test Results

The HTMT criterion has recently gained prominence, replacing the Fornell & Larcker (1981) criterion, as it provides a more comprehensive and less restrictive measure of discriminant validity. The primary objective of HTMT is to assess whether the ratio approaches 1, with values closer to 1 indicating weaker discriminant validity. According to Henseler et al. (2015), recommended threshold values are 0.85 and 0.90. The results presented in Table 5 suggest that all HTMT values are below the 0.85 threshold, thereby confirming discriminant validity.

Table 5: Heterotrait-monotrait ratio (HTMT)

	FUN	ENJ	SEC	DES	ASU	CUS	CS	CL
Functionality								
Enjoyment	0.844							
Security	0.734	0.779						
Design	0.692	0.765	0.870					
Assurance	0.666	0.587	0.792	0.936				

Customisation	0.532	0.528	0.497	0.837	0.658		
Customer Satisfaction	0.681	0.589	0.566	0.770	0.700	0.906	
Customer Loyalty	0.691	0.697	0.641	0.674	0.683	0.572	0.776

Table 5 Alt Text: Table presenting discriminant validity results using the Heterotrait–Monotrait (HTMT) criterion. All HTMT values fall below recommended thresholds, confirming discriminant validity among the constructs.

Correlation Matrix

The mean, standard deviation (SD), and correlation coefficients for all six study constructs are presented in Table 5. The results indicate that customisation ($r = 0.489, p < 0.001$), design ($r = 0.512, p < 0.001$), security ($r = 0.524, p < 0.001$), assurance ($r = 0.573, p < 0.001$), functionality ($r = 0.586, p < 0.001$), and enjoyment ($r = 0.617, p < 0.001$) all exhibit significant and positive correlations with customer satisfaction. It is observed that customer satisfaction positively influences customer loyalty ($r = 0.670, p < 0.001$). A further notable aspect of the correlation coefficients is that all values are below 0.9, which is an acceptable threshold. This indicates the absence of multicollinearity among the six constructs, thereby supporting the robustness of the model.

Table 6: Correlation Matrix

Variable	Mean	SD	N	1	2	3	4	5	6	7	8
CL	4.000	0.738	41								
CS	3.780	0.758	41	0.670*							
CUS	3.660	0.749	41	0.489*	0.748*						
DES	3.820	0.718	41	0.512*	0.561*	0.602*					
SEC	3.880	0.773	41	0.524*	0.475*	0.403*	0.625*				
ASU	3.940	0.750	41	0.573*	0.566*	0.517*	0.657*	0.626*			

FN	3.77 0	0.75 3	41 0	0.586* **	0.587* **	0.444* **	0.512* **	0.624* **	0.550* **	
ENJ	3.77 0	0.69 1	41 0	0.617* **	0.530* **	0.439* **	0.565* **	0.648* **	0.476* **	0.723* **

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 6 Alt Text: Correlation matrix showing the means, standard deviations, and intercorrelations among eight study variables. All correlation coefficients are below 0.90 threshold, confirming the absence of multicollinearity.

Structural Model

The statistical analysis presented in Table 7 provides valuable insights into the model's explanatory power and predictive relevance regarding customer satisfaction. The R^2 value, which represents the proportion of variance in the dependent variable explained by the independent variables, stands at 0.680. This indicates that 68.0% of the variance in customer satisfaction is accounted for by the model, suggesting a substantial explanatory power. According to Chin (1998), recommended R^2 values for endogenous latent variables are: 0.67 (substantial), 0.33 (moderate), 0.19 (weak).

Residual fit indices, such as RMSEA and SRMR, measure the discrepancy between the model and the observed data. RMSEA assesses model fit, with values below 0.05 indicating a good fit and values below 0.08 considered acceptable (Sadenova et al., 2025). SRMR reflects the average discrepancy between predicted and observed covariances, with a value below 0.05 considered excellent, while a value between 0.05 and 0.08 indicates an adequate fit. However, as noted by Schuberth et al. (2023), fit indices such as RMSEA and SRMR can vary depending on the complexity of the model and its parameters, highlighting the importance of using multiple indices to ensure reliable conclusions. In this study, the RMSEA value of 0.089 indicates an acceptable fit, while the SRMR value of 0.056 suggests that the model achieves an adequate fit, reinforcing its validity and robustness.

Table 7: R Squared, RMSEA, and SRMR

Explanatory	R^2	RMSEA	SRMR
CS	0.680	0.089	SST SQ ->CS->CL = 0.056
CL	0.759		

Table 7 Alt Text: Table present the structural model's explanatory power and fit indices. Reported values meet recommended thresholds.

Mediation results

Usually, when a variable affects another, scholars are interested in establishing how the influence is transmitted to the outcome variable. Mediation analysis is meant to establish whether, besides the direct path, an explanatory variable transmits its influence on the consequent variable indirectly through a mediator (Hayes, 2018). In this study, customer satisfaction was tested as a mediator

between functionality, enjoyment, security, design, assurance, customisation and customer loyalty. Bootstrapping mediation analysis in Jamovi revealed both significant and insignificant effects (Table 8).

For functionality, the total, direct, and indirect effects were all significant, with VAF at 49.8%, indicating partial mediation. Enjoyment showed significant total, direct, and indirect effects, with VAF at 41%, signifying partial mediation. Security also revealed significant effects, with VAF at 49.3%, confirming partial mediation. Similarly, design showed significant effects with VAF at 61.2%, also indicating partial mediation, and assurance showed significant effects with VAF at 50.1%, also indicating partial mediation. Finally, customisation demonstrated significant total and indirect effects, which are significant while the direct effect is insignificant, with VAF at 100%, confirming full mediation (i.e. Indirect effect divided by total effect) and all supported the hypothesis. These findings highlight the crucial role of customer satisfaction as a mediator, demonstrating the complex interactions between SST service quality influencing customer loyalty both directly and indirectly.

Table 8: Mediation results

Procedure	Path	Total effect	Direct effect	Indirect effect	P-Values	boot LLCI	boot ULCI	VAF	Hypotheses
X on Y with M present	FUN -> CL (c')		0.288		0.001	0.198	0.387		
X on Y	FUN -> CL (c)	0.574			0.001	0.467	0.672		
X on Y via M	FUN ->CS -> CL (ab)			0.286	0.001	0.201	0.371	49.8%	S
X on Y with M present	ENJ -> CL (c')		0.389		0.001	0.286	0.5		
X on Y	ENJ -> CL (c)	0.659			0.001	0.542	0.763		
X on Y via M	ENJ ->CS -> CL (ab)			0.270	0.001	0.188	0.347	41%	S
X on Y with M present	SEC-> CL (c')		0.253		0.001	0.179	0.327		
X on Y	SEC -> CL (c)	0.500			0.001	0.421	0.579		
X on Y via M	SEC ->SC -> CL (ab)			0.247	0.001	0.19	0.303	49.3%	S
X on Y with M present	DES-> CL (c')		0.204		0.001	0.117	0.291		

X on Y	DES-> CL (c)	0.526		0.00 1	0.441	0.612		
X on Y via M	DES ->SC -> CL (ab)		0.322	0.00 1	0.255	0.389	61 .2 %	S
X on Y with M present	ASU -> CL (c')		0.282	0.00 1	0.200	0.363		
X on Y	ASU -> CL (c)	0.564		0.00 1	0.486	0.642		
X on Y via M	ASU ->CS -> CL (ab)		0.283	0.00 1	0.222	0.344	50 .1 %	S
X on Y with M present	CUS -> CL (c')		-0.028	0.60 8	- 0.135	0.079		
X on Y	CUS -> CL (c)	0.482		0.00 1	0.399	0.5651		
X on Y via M	CUS ->CS -> CL (ab)		0.510	0.00 1	0.419	0.6009	10 0. 0 %	S

Table 8 Alt Text: Table presenting mediation analysis results. Indirect effects are significant,

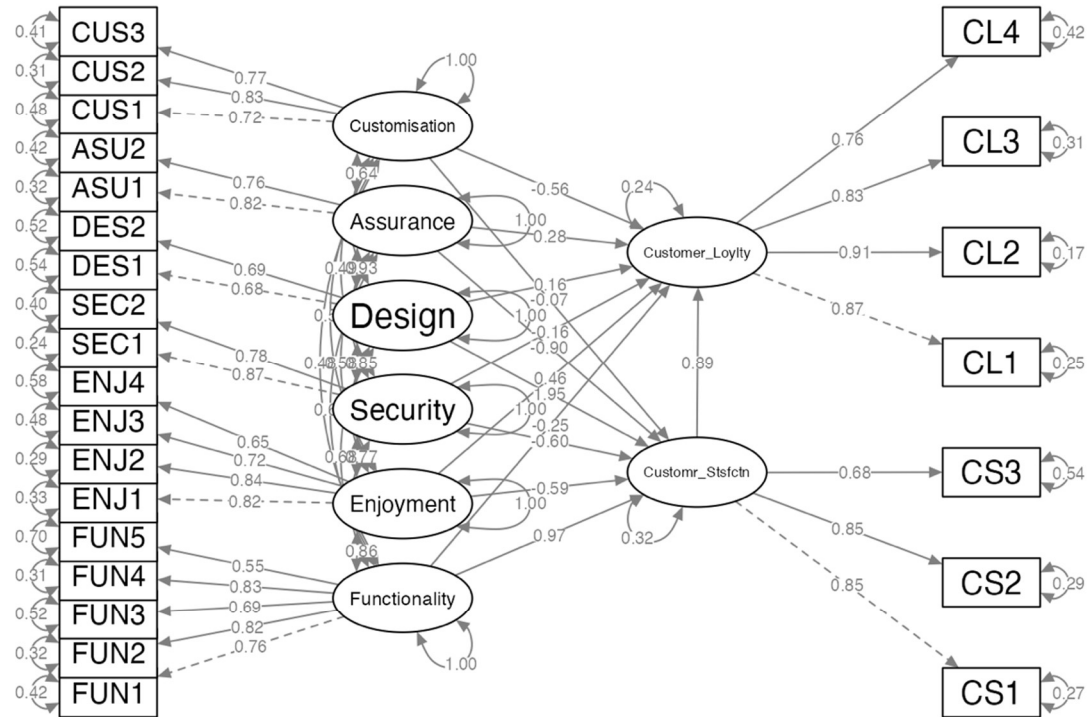


Figure 2. Results of the SEM Model using Jamovi

Figure 2 Alt Text: Structural equation model diagram with eight latent variables linked to observed indicators. Arrows show significant positive paths between SST service quality → customer satisfaction → customer loyalty.

5.0 Discussion and Implications

The findings of this study largely support prior research demonstrating that self-service technology (SST) service quality is a significant driver of customer satisfaction and, ultimately, customer loyalty (Shahid Iqbal et al., 2018). The strong positive relationship between SST dimensions and customer satisfaction aligns with studies conducted in developed economies such as the United States, the United Kingdom, and Singapore, where functionality, ease of use, and system reliability were found to enhance user evaluations of digital services (De Leon et al., 2020; Tseng et al., 2025; Ugwuanyi et al., 2022). Similarly, the confirmed link between customer satisfaction and loyalty is consistent with research from South Africa and Nigeria, which shows that satisfied users of digital

platforms are more likely to continue subscriptions and engage in positive word-of-mouth behaviour (Bingwa et al., 2024; Olowo & Kolapo, 2025).

However, the Zambian context reveals some distinct dynamics. While SST quality explains a substantial proportion of variance in customer satisfaction and customer loyalty, the slightly higher dependence on satisfaction as a mediating mechanism suggests that technology alone does not guarantee loyalty (Mwiya et al., 2022). This finding echoes studies in other emerging economies such as Ghana and Zimbabwe, where infrastructural reliability, trust, and perceived security strongly shape how customers interpret service quality (Padi et al., 2026; Virima et al., 2019). Unlike findings in highly digitised markets, where direct SST–loyalty relationships are often stronger, this study shows that Zambian consumers require positive experiential confirmation before forming enduring loyalty. The mediation results further highlight that satisfaction functions as the central pathway through which SST attributes translate into behavioural outcomes. Full mediation observed for customisation indicates that personalised features influence loyalty only when they enhance overall satisfaction, underscoring the importance of user experience rather than technological availability.

Overall, these findings suggest that in emerging markets, SST should be implemented not merely as an efficiency tool but as a customer-experience strategy. For Zambia's pay-TV industry, investing in system reliability, security, and user-friendly design is essential to converting digital adoption into sustained customer relationships.

This study also suggests that scholars should extend research on SST service quality within underexplored subscription-based industries in emerging economies to strengthen contextual theory development. Practitioners, particularly pay-TV providers, should prioritise system reliability, security, and user-friendly design to enhance satisfaction-driven loyalty. Policymakers should support digital infrastructure and consumer digital literacy to improve technology adoption outcomes. Consumers benefit from more efficient, secure, and personalised services, leading to improved service experiences and sustained value from digital platforms.

6.0 Limitations and future research

This study is limited by its cross-sectional design, which restricts the ability to establish causal relationships over time; future research should adopt longitudinal approaches to capture changes in satisfaction and loyalty behaviours (Mwiya, 2012). The study also focused on selected urban users, limiting generalisability to rural populations; subsequent studies should include more diverse geographic samples. Additionally, reliance on self-reported data may introduce response bias, suggesting the need for mixed-method designs incorporating behavioural or usage data (Mwiya, 2006). Future research could also examine additional experiential and technological variables to enrich the understanding of SST adoption outcomes.

7.0 Conclusion

The overall purpose of this research was to examine how self-service technology (SST) service quality influences customer satisfaction and, ultimately, customer loyalty within the pay-TV industry, particularly in the Zambian context, where empirical evidence remains limited. The study found that SST service quality dimensions significantly enhance customer satisfaction, which in

turn serves as a key mechanism driving customer loyalty. These findings imply that technology alone does not guarantee loyal customers; rather, service experiences that are reliable, secure, and user-friendly are essential in transforming digital interactions into sustained customer relationships and competitive advantage.

Disclosure statement

No potential conflict of interest was reported by the author(s). **Appendix 1**

Variables	ITEMS
Functionality	I can get my service done with the pay- tv self-service system in a short time
	The self-service process on the platform is clear
	Using the pay-tv self-service system on the platform requires little effort
	I can get my service done smoothly with the pay-tv self-service system
Enjoyment	The self-service system on the platform is error-free
	The operation of the pay-tv self-service system is interesting
	I feel good being able to use the pay-tv self-service system
	The self-service system on the pay-tv platform has interesting additional functions
Security	The self-self-service system on the pay- tv platform provides me with all the relevant information
	I feel safe in my transactions on the pay- tv self-service platform
Design	A clear privacy policy is stated when I use the pay-tv self-service platform
	The layout on the pay-tv self-service platform looks appealing
Assurance	The pay-tv self-service system appears to use up-to-date technology
	The company that provides the pay-tv self-service is well-known
Customasition	The company which provides the pay-tv Self-Service has a good reputation
	The pay-tv self-service system understands my specific needs
	The pay-tv self-service system has my best interest at heart
Customer Satisfaction	The pay-tv self-service system has personalized features for me
	Overall I am satisfied with the pay-tv self service System
	The pay-tv self-service system meets my expectations
Customer Loyalty	The pay-tv self-service system exceeds my expectations
	I would use the pay-tv self-service system again
	I would recommend the pay-tv self service to others
	I would speak positively about pay-tv self service to others
	The pay-tv self-service system is my preferred choice

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