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A factor analysis study on relationship across electronic-service quality & behavioral intent with structural equation modeling: Across algo-driven shopping apps & fintech platforms

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Abstract

The service quality identifies as the core element of marketing practices. The e-marketing practices and their probable mediation in shaping the marketing environment in Indian algorithmic driven online and e-channel derived platforms; is a novel construct and needs extensive dimensional and theoretical exploration. The study explores the impact of e-service quality and algorithm-guided programs on customer satisfaction and behavioral intent in Indian algorithmic-driven online platforms. Likert scaling instruments were used to gather data from app users, and the reliability and validity of the data were ascertained. The research identified the determinants shaping service quality in Indian algo-driven platforms and their possible consequences for business development, and economic development.

Subject Classification: *91D30.*

Keywords: *E-service quality, Behavioral intentions, SEM, Fintech, Algo-driven shopping apps.*

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Introduction

The service quality identifies as a critical research area as the marketization of economic needs is rising fast. The rampant evolution of innovative forms of customer stimulating and satisfying and consumption enhancing methodologies are shaping the consumption propensity in novel ways. The service quality seems a natural sufferer as the marketization is increasing yet the marketing discourses on tangible and intangible aspects of product or service are either non convergent (Zhou,Wang, 2019) or fail to address the emerging realities. Technology induced marketization and service quality concerns are genuine as the personalization with algorithm and machine learning is there, yet the service paradigms, reliability and trust aspects are reported to be at the faltering end. Though the constituents, domain, and ingredients of 'service quality' remain under researched and undefined, yet the current trends especially the technology induced consumption and electronic channel service delivery loopholes do count as vital aspects of research study. The service quality discourses have their roots in SERVAQUAL scales (Parasuraman,Berry, 1985) and other similar quantification attempts. A review of measurement indices on service quality reveals the plethora of approaches like the SERVPERF (service performance), SERVRQ (service quality in rural); all of which emphasizes the tangibles, reliability, responsiveness, assurance, and empathy (Berry,Zeithaml, 1990) as the vital elements of the discussion and research focus.

Literature Review and hypothesis

The studies (Bunjak, Cerne, Popovic, 2021) considerably point to the multidimensional nature of research construct and emphasize the influx of multiple influences from across individual retail customer, from across service provider's customer connect interfaces and other contingent and contextual aspects. The phenomenon of theorizing the ongoing marketization of consumer needs and respective service quality challenges; could involve the discussion regarding individual's role, the role of social values being promoted, the role of social and economic developments, the unseen government-based interventions, and the lateral influences on service quality paradigms. The retail customer's exposure to novel and new marketing practices (across app driven and algo guided platforms) has been observed as instrumental in shaping the market orientation across consumer mindsets. The direct effects of individual materialistic

aspirations have been observed as enhancing the ability of the consumer's mindset to gain market-based appreciation instead of tinkering after existing product offering. The emergence of personalizing algorithms (Antretter,Wincent, 2020) and personal targeting (Liu,Wei, 2021) across algo-driven platforms in e-commerce and financial technology sector; often seem to build the stimulus for technology induced marketisation (Hovermann,Messer, 2015). Bharadwaj et al (2022) conducted study which found that factors such as trust, perceived use and usefulness, e-service quality, perceived behavior control, and subjective norms influence consumers' online purchasing intentions (COPI), which in turn mediate their online shopping behavior for domestic appliances. Perceived use and usefulness had a negative impact on purchase intention and behavior, but overall, consumer online purchase intention had a significant effect on consumer online purchasing behavior.

Research Hypothesis

H1: The first hypothesis proposes a significant relationship between perceived reliability and perceived e-service quality.

H2: The second hypothesis proposes a significant relationship between perceived privacy and perceived e-service quality.

H3: The third hypothesis proposes a significant relationship between perceived responsiveness and perceived e-service quality.

H4: The fourth hypothesis proposes a significant relationship between perceived ease of navigation and perceived e-service quality.

H5: A significant relationship exists between perceived access and perceived e-service quality.

H6: A significant relationship exists between perceived trust and perceived e-service quality.

H7: A significant relationship exists between perceived personalization and perceived e-service quality.

H8: A significant relationship exists between perceived subjective norms and perceived e-service quality.

H9: A significant relationship exists between perceived behavioral control and perceived e-service quality.

H10: A significant relationship exists between perceived e-service quality and perceived behavioral intention.

H11: A significant relationship exists between perceived e-service quality and perceived customer satisfaction.

Methodology

Study Participants and methodology

The study participant involve the NCR based young population with ownership of smartphone and considerable online shopping, app usage and online transaction history. The study setting was consciously considered as digitally literate population with exposure to online and android and mackintosh-based platforms. The research study leveraged on random sampling and attracted a valid sample size of 350 respondents. The study incorporated the factor analysis methodology to reduce the representing dimensions of the factors undertaken for the current research. The sampling adequacy was examined with aid of comprising KMO Test. The scale-based elements were subjected to Reliability Assessment with Cronbach Alpha, Correlation Assessment in SPSS platform. The research study relied on the IBM software SPSS version release 24.0 for the conduct of empirical calculations, validity assessment and reliability exploration. The factor structure was examined with aid of factor analysis and subsequent tests like variance examination, Scree plot analysis and pattern matrix determination. The research study leveraged the factor analysis methodology (Carsud, Brannback, 2014) as a tool for exploring the representing dimensions of the factors assumed for the analysis. The extractive factor analysis facilitates the evaluation of the dimensions as well as leads to dimensional validity assessment regarding data as collected with aid of pre validated the Likert based scales secured form the existing literature on subject matter.

Analysis

Reliability assessment of scale elements

The reliability assessment constitutes a vital elements of scale development and validation studies. This constitutes the focus on considerable evaluation of the internal consistency of the responses collected from Likert scaling instrument. As mentioned in the academic literature on subject matter, the traditional Cronbach alpha figures as the most prominent tool for the achievement of internal reliability assessment. The responses exhibited a collective reliability measure of 0.912 with 65 loading sub scale items which points to satisfactory reliability across scale items.

Dimensional validity

The research leverages the extractive factor analysis methodology to ascertain the respective dimensions. This was accomplished through series of tests namely the theme wide consideration of factors, usage of principal component analysis in SPSS, KMO-Bartlett's test for ascertainment of factorability, communality test for ascertaining the extent of variance that a particular variable or factor has in common with the construct and finally the conduct of extractive factor analysis with focus on dimension segregation. The KMO measure for chosen scale-based elements was observed to be 0.886 which seems to be in the satisfactory range of 0.7 to 0.99 as advocated and devise din the literature on subject. This is equivalent to observing that the data collected regarding factors comprising is widely and factorable vis a vis further data analysis and undertaking the extractive factor analysis in systematic manner. The respective Bartlett test of data sphericity too reflected on the satisfactory presence of statistically significant variance cross the data collected regarding scale representing scale items. The observed p-value of 0.000(<0.05) exemplified the incidence of respective statistically significant range. The KMO illustrated that the zero-order correlation are positive and the observed KMO value as over 0.5 pointed towards the incidence of statistical significance level for Bartlett's test. The observed KMO values as greater than 0.8 signified the usefulness of subsequent factor analysis and dimensional validity analysis.

The reported "p-value" pointed towards the incidence of statistically significant relevance and usability of the primary data collected form Likert scaling instruments and suitability of the data for consideration regarding factor analysis. As observed, the factor 'trust' and 'privacy' exhibited maximum reported variance (Figure 1).

Conclusions and Observations

The research deployed the structural equation modeling for ascertaining the relationships that could possibly exist amongst the factors as per conceptual model. The data- model fit was regarded as essential to vindicate the conceptual model as per existing literature. The research leveraged the tool of structural equation modeling for the determination of the linkages across the input and the output variables. The regression weights as achieved across the AMOS output help interpret the pattern of relationships across the constituent variables in current research activity. The factor analysis extracted twelve factors namely the navigation, privacy, access, trust, responsiveness, reliability, personalization, perceived service quality, norms, behavioral control, customer satisfaction and behavioral

intent. The respective path-based regression estimates are mentioned in the diagram and table below, which categorically point to incidence of significant path-based influence son the outcomes (Table 1).

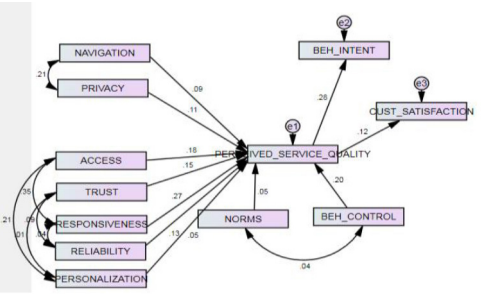

Figure 1

Table 1

Path regression estimates

			Estimate	S.E.	C.R.	P	Label
PERCEIVED_ SERVICE_QUALITY	<---	NAVIGATION	.129	.059	2.182	.029	par_1
PERCEIVED_ SERVICE_QUALITY	<---	PRIVACY	.176	.067	2.644	.008	par_2
PERCEIVED_ SERVICE_QUALITY	<---	ACCESS	.209	.054	3.864	***	par_3
PERCEIVED_ SERVICE_QUALITY	<---	TRUST	.183	.051	3.610	***	par_4
PERCEIVED_ SERVICE_QUALITY	<---	RESPONSIVE-NESS	.340	.057	5.992	***	par_5
PERCEIVED_ SERVICE_QUALITY	<---	RELIABILITY	.114	.036	3.121	.002	par_6
PERCEIVED_ SERVICE_QUALITY	<---	PERSONAL-IZATION	.104	.085	1.222	.222	par_7
PERCEIVED_ SERVICE_QUALITY	<---	NORMS	.063	.058	1.095	.274	par_8
PERCEIVED_ SERVICE_QUALITY	<---	BEH_CON-TROL	.150	.032	4.767	***	par_16
CUST_ SATISFACTION	<---	PERCEIVED_ SERVICE_ QUALITY	.081	.033	2.438	.015	par_17
BEH_INTENT	<---	PERCEIVED_ SERVICE_ QUALITY	.292	.047	6.161	***	par_18

Standardized regression path estimates

				Estimate	
H	PERCEIVED_ SERVICE_QUALITY	<---	NAVIGATION	.092	No
H	PERCEIVED_ SERVICE_QUALITY	<---	PRIVACY	.112	Supported
H	PERCEIVED_ SERVICE_QUALITY	<---	ACCESS	.175	Supported
H	PERCEIVED_ SERVICE_QUALITY	<---	TRUST	.150	Supported
H	PERCEIVED_ SERVICE_QUALITY	<---	RESPONSIVENESS	.266	Supported
H	PERCEIVED_ SERVICE_QUALITY	<---	RELIABILITY	.130	Supported
H	PERCEIVED_ SERVICE_QUALITY	<---	PERSONALIZATION	.052	No
H	PERCEIVED_ SERVICE_QUALITY	<---	NORMS	.045	No
H	PERCEIVED_ SERVICE_QUALITY	<---	BEH_CONTROL	.197	Supported
H	CUST_ SATISFACTION	<---	PERCEIVED_ SERVICE_QUALITY	.116	Supported
H	BEH_INTENT	<---	PERCEIVED_ SERVICE_QUALITY	.283	Supported

Findings

The reliability of the Likert scaling instrument was satisfactory with a collective reliability measure of 0.912 across 65 loading sub-scale items. Extractive factor analysis was used to determine the dimensions, and the KMO measure was 0.886, indicating satisfactory validity. The Bartlett test reflected statistically significant variance, and the trust and privacy factors exhibited the most variance. Twelve factors were extracted from the factor analysis, and path-based regression estimates showed significant influences on the outcomes. Perceived service quality was influenced by navigation, privacy, access, trust, responsiveness, reliability, personalization, norms, and behavioral control, while customer satisfaction was influenced by perceived service quality, and behavioral intent was influenced by perceived service quality.

Managerial policy making implications.

Online marketers should explore technology readiness and align their strategies with evolving technology-based interventions to shape the cognitions and mindset development of users on algo-driven fintech, e-commerce apps, and other platforms. E-service quality issues depend on the cognitions and mental health of individuals. Customer-driven increased access to physical, economic, and social infrastructure, information infrastructure, and smartphones have a positive impact on mobility, exchange of ideas, and market forces at the grassroots level (Kirca,Bearden, 2011**)**. The retail customer's exposure to novel marketing practices has been observed to shape the market orientation of consumer mindsets. The marked increase in information inflows, new media, mutual exchanges, and exposure to new ways of interacting with probable customers have consequences for changes in service quality perceptions, formulation, and transformation (Bagana, Irsad, Santoso, 2021). The e-commerce industry needs to manage service quality by taking care of product and service-related dimensions, pricing, returns, and add-on service delivery options. The direct effects of individual materialistic aspirations enhance consumers' ability to appreciate market-based offerings rather than tinkering with existing product offerings. Personalizing algorithms and personal targeting on algo-driven platforms in e-commerce and financial technology sectors build the stimulus for technology-induced marketization (Hovermann,Messer, 2015) .

Limitations

The study was limited to select geography of NCR and across select strata. The e-service quality as a construct and its conceptualization was based on the availability of literature on the subject matter. The literature was further rarely classified in the context of developing economy. The scale selection could have some element of bias. The resources availability could count as another roadblock.

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