

Modeling The Relationship Between Influencing Factors, Service Quality, Satisfaction and Effectiveness With Regard To Digital Payment Apps

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1. INTRODUCTION

Digital payment apps have revolutionized the way financial transactions are carried out in both urban and rural settings. Their adoption and continued usage are shaped by a combination of factors such as transaction, technological adoption and features. This impacts on the service quality, effectiveness and satisfaction in the usage of digital payment apps.

The adoption and effectiveness of digital payment applications are influenced by various technological, behavioural, and economic factors. One of the primary determinants is perceived usefulness, which refers to the degree to which a user believes that using a particular digital payment app enhances their transaction efficiency. As per David's research when users find an app convenient and time-saving, their likelihood of adopting it increases significantly [1].

Ease of use and user interface design are equally important. Apps with intuitive navigation, minimal transaction errors, and quick processing times see higher levels of engagement [2]. Trust and security also play a crucial role. Consumers are more inclined to use apps that they perceive as secure and reliable for handling financial information [3]. A successful digital payment app reduces cash dependency, promotes transparency, supports financial inclusion, and enhances economic activity.

Effective apps provide real-time payments, seamless integration with banks and wallets, 24/7 customer support, and detailed transaction histories. They also facilitate small businesses, vendors, and self-employed professionals by enabling easy, traceable payments. In India, for instance, apps like Google Pay, PhonePe, and Paytm have contributed to the growth of a digital economy, supported by the government's Digital India initiative. Social influence is the impact of peer usage and societal norms—has been shown to encourage usage, especially among younger, tech-savvy populations [4]. Furthermore, awareness and digital literacy are essential; individuals with greater exposure to digital tools are more likely to adopt digital payment methods effectively [5].

When evaluating effectiveness, factors such as transaction speed, success rate, user satisfaction, customer support quality, and integration with banking systems are critical. Effective apps not only facilitate seamless payments but also contribute to financial inclusion, especially in developing economies [6]. Their impact is amplified by governmental incentives and initiatives like Digital India, which promote cashless transactions and digital literacy.

2. LITERATURE STUDY

In this section, relevant previous studies are synthesized to establish a foundation for examining how digital payment systems are adopted, perceived, and the challenges they entail.

2.1 Service Quality

Service quality plays a critical role in shaping user satisfaction and effectiveness in digital payment applications. In the context of digital financial services, service quality refers to the overall performance of the app in terms of reliability, responsiveness, security, ease of use, and user support. In the digital payment ecosystem, service quality encompasses several dimensions including reliability, responsiveness, assurance, empathy, and tangibility—often based on the SERVQUAL model [7]. A high level of service quality ensures that transactions are processed quickly and accurately, interfaces are user-friendly, and any issues are resolved promptly. Elements such as 24/7 accessibility, minimal downtime, real-time payment confirmation, and multi-layered security protocols contribute to a positive user experience.

2.2 Servqual Scale

The SERVQUAL scale is a widely accepted tool for measuring service quality across various industries, including digital platforms. Developed by Parasuraman, et al., the model identifies five key dimensions that determine consumer perceptions of service quality[7]. Furthermore, Originally created for traditional service environments, the SERVQUAL model has since been adapted to e-services, including digital payment apps, where these dimensions manifest through interface quality, transaction speed, customer support, and digital security [8]. The Technology Acceptance Model (TAM) is a foundational framework used to explain and predict user behaviour toward the adoption of technology. TAM is based on the Theory of Reasoned Action (TRA) and focuses on two primary constructs that influence user acceptance of a technological system[9].

Key dimensions that determine consumer perceptions of service quality & Technology Acceptance:

1. **Tangibles** – The physical aspects such as the appearance of equipment, personnel, and digital interfaces (e.g., app design and visuals).
2. **Reliability** – The ability to perform the promised service dependably and accurately (e.g., successful and timely transactions).
3. **Responsiveness** – The willingness to help customers and provide prompt service (e.g., fast support responses or issue resolution).
4. **Assurance** – The knowledge, courtesy, and ability of employees (or systems) to inspire trust and confidence (e.g., secure logins and privacy policies).
5. **Empathy** – Providing caring, individualized attention to customers (e.g., personalization and customer service options).
6. **Perceived Usefulness (PU)** – the degree to which a person believes that using a particular system would enhance their job or task performance.
7. **Perceived Ease of Use (PEOU)** – the degree to which a person believes that using a particular system would be free of effort.

2.3 Customer Satisfaction

Customer satisfaction is a crucial indicator of the success and sustainability of digital payment applications. It reflects the degree to which users' expectations are met or exceeded when interacting with a service. In the context of digital payment apps, satisfaction is typically influenced by factors such as service quality, ease of use, transaction speed, security, reliability, app design, and customer support.

Studies have found that perceived usefulness and ease of use—core elements of the Technology Acceptance Model (TAM)—positively influence customer satisfaction, as they reduce the cognitive effort required to complete transactions. Additionally, system quality and information quality—as proposed in the DeLone and McLean Information Systems Success Model[10]. Users value platforms that are not only efficient but also provide secure, seamless, and transparent experiences.

Trust and security are especially critical in digital financial services. Users are more satisfied when they feel their personal and financial data is protected [11]. Moreover, customer support, whether through FAQs, live chat, or call centers, adds to the overall experience by offering quick resolutions to issues and ensuring a sense of assurance.

In emerging markets like India, customer satisfaction is further enhanced by features such as cashback rewards, multi-language support, UPI integration, and low transaction fees. For instance, apps like Google Pay, PhonePe, Paytm, and BHIM have focused on localizing the user experience to improve satisfaction and retention. Ultimately, higher customer satisfaction leads to greater user retention, increased app usage frequency, positive word-of-mouth promotion, and long-term loyalty—factors essential for the growth of digital payment ecosystems.

2.4 Customer Satisfaction and Service Quality

Customer satisfaction and service quality are closely interlinked concepts that play a vital role in determining the success and continued usage of digital payment applications. While service quality reflects how well a service meets user expectations in terms of functionality and performance, customer satisfaction is the emotional outcome of a user's overall experience with that service. The constructs of TAM model perceived usefulness and ease of use are strongly related to the quality of service offered through the app, such as the smoothness of transactions, minimal downtime, and availability of customer support. Moreover, trust and security, particularly in financial transactions are critical service elements that influence both satisfaction and loyalty. High service quality not only enhances satisfaction but also builds customer loyalty, positive word-of-mouth, and repeated usage—factors that are critical for app success in highly competitive markets. As digital payment services become more integral to daily life, maintaining superior service quality becomes essential for retaining users and reducing churn. The key distinction lies in the understanding that service quality represents

a long-term attitude and overall evaluation of the service, whereas customer satisfaction is linked to a specific transaction or service encounter (Gotlieb et al., 1994).

2.5 Customer Effectiveness

Customer effectiveness in the context of digital payment apps refers to how well users are able to utilize the features and functionalities of an app to meet their financial transaction needs efficiently, securely, and independently. It encompasses aspects such as ease of navigation, successful completion of transactions, confidence in using app features, and problem-solving without external help. High customer effectiveness is a sign of a user-friendly, accessible, and well-designed application that empowers users. In the early 1990s, research primarily focused on the impact of quality on competitive advantage and the overall economic performance of companies, with these being the key factors under investigation [13]

Research indicates that perceived ease of use, a core element of the Technology Acceptance Model (TAM), significantly contributes to customer effectiveness by reducing the cognitive effort required to perform transactions. Moreover, digital literacy and technological self-efficacy also influence how effectively users engage with digital payment platforms. Subsequent research extended the focus to examine how service quality influences repurchase intentions and marketing performance through the mediating role of customer satisfaction [14],[15]. Users who are more digitally literate and confident in using mobile technologies tend to utilize a broader range of features—such as bill payments, QR scanning, UPI transfers, and transaction tracking.

The user interface design plays a crucial role in enhancing customer effectiveness. Features like intuitive layout, multi-language options, minimal steps for completion, and clear feedback (e.g., transaction confirmations and alerts) contribute positively. However, merely emphasizing quality alone does not inherently yield competitive advantages, as the link between service quality and business outcomes is not always direct or apparent [16]. Furthermore, apps that provide in-app guidance, FAQs, and chatbot support reduce dependency on external help and promote independent usage.

In developing countries such as India, increasing customer effectiveness has been a key goal of initiatives like Digital India, which aims to bridge the digital divide by promoting financial literacy and infrastructure development. Numerous studies have reported positive correlations between customer satisfaction and outcomes such as customer retention, loyalty, and word-of-mouth promotion [17]. As digital payment apps become integral to everyday transactions, improving customer effectiveness ensures broader inclusion, higher adoption rates, and better user satisfaction.

Research Methodology

The present research consists of several stages. At the first stage, a questionnaire was designed to measure the service quality, satisfaction and effectiveness in the usage of digital payment apps by using the influencing factors. In the second stage, data were collected through a structured questionnaire, followed by an assessment of the measurement model. Path analysis was employed to test and validate the proposed dimensions of service quality. At the third stage, the path analysis of service quality was conducted in order to determine the satisfaction, service quality and effectiveness among the different constructs of influencing factors.

Overall goodness of fit model was established and direct positive relationship between influencing factors, service quality, satisfaction and effectiveness hypothesis was framed. Both the standardized and unstandardized regression weights were calculated. The influencing factors namely transactions, technology adoption and features were assumed and measure the service quality and satisfaction with respect to the usage of digital payment apps. The effectiveness on using digital payment apps influenced by influencing factors, service quality and satisfaction factors.

The influencing factors and service quality have been hypothesized to influence the satisfaction of respondents. The influence of service quality on satisfaction has been studied with the assumption that influencing factors have both direct and indirect effect on satisfaction. The theoretical path analysis models explaining the relationship between the factors are given below.

Path Model Showing Relationship between Influencing Factors, Service Quality, Satisfaction and Effectiveness

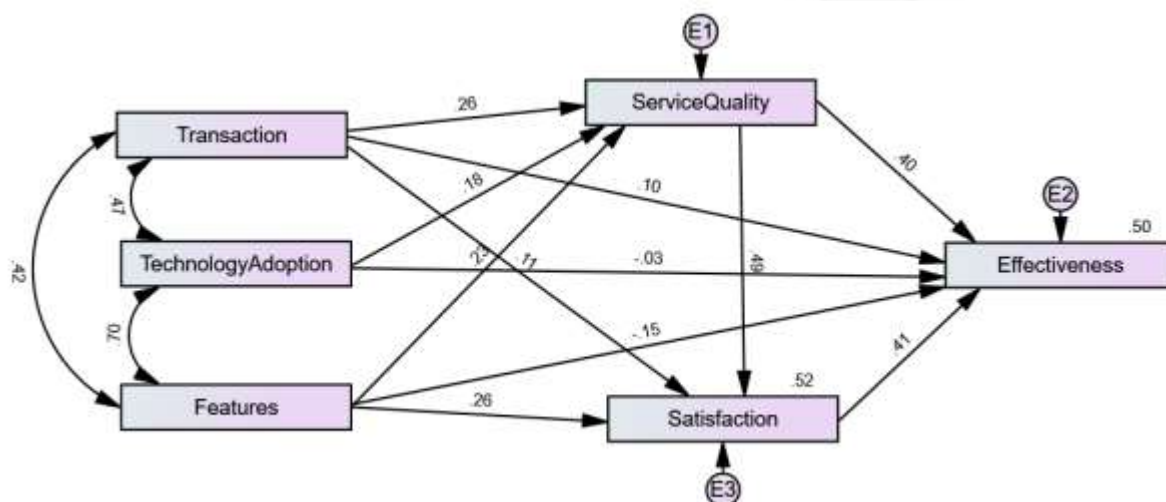


Fig 1: From Influencing Factors to effectiveness

Source: Primary

The model fit statistics estimated by AMOS for the path model developed are given below.

160

CMIN = 1.254 ($P > 0.05$); DF = 1

CMIN/DF = 1.254

GFI = 0.999

NFI = 0.999

CFI = 1.000

RMSEA = 0.025

The results show that all the goodness of fit indices namely, GFI, NFI and CFI satisfy the criteria value of being above 0.90. The chi-square value is not significant ($P > 0.05$) and also CMIN/DF value is within the admissible limit of 5. The RMSEA value is less than 0.05 which indicates the good fit. Since all the goodness of fit indices has matched the criteria, it represents that the model fit is good.

The magnitude and direction of relationship between Influencing factors, Service Quality, Satisfaction and Effectiveness are studied in detail with the unstandardized regression weights produced by AMOS are given below.

Table 1: Regression Estimates of Path Coefficients

Variable To	Path	Variable From	Estimate	S.E	C.R	P	Sig
Service Quality	②	Transaction	.306	.055	5.520	***	**
Service Quality	②	Technology Adoption	.148	.051	2.911	.004	**
Service Quality	②	Features	.203	.051	3.985	***	**
Satisfaction	②	Transaction	.121	.045	2.653	.008	**
Satisfaction	②	Service Quality	.479	.040	11.935	***	**
Satisfaction	②	Features	.221	.034	6.435	***	**
Effectiveness	②	Transaction	.102	.045	2.254	.024	*
Effectiveness	②	Technology Adoption	-.021	.040	-.516	.606	NS
Effectiveness	②	Features	-.122	.042	-2.194	.004	**
Effectiveness	②	Satisfaction	.391	.048	8.114	***	**
Effectiveness	②	Service	.367	.045	8.091	***	**

		Quality					
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Source: Primary Data

(**/* Significant at 1%/5%level; NS- Not Significant)

The results show that all the influencing factors have significant impact on the service quality, satisfaction and effectiveness of the respondent except the technology adoption on effectiveness.

However, it has been found out that service quality that is perceived service quality has significant effect on satisfaction. The regression weight of service quality (0.479) is found to have significant effect on satisfaction at 1% level. This depicts that positive perception on service quality has resulted in the increased satisfaction of the respondents.

Similarly, the effect of service quality (0.367) and satisfaction (0.391) are positive on effectiveness at 1% level of significance. This reveals that increases in positive perception on service quality and higher level of satisfaction will result in Effectiveness.

Table 2: Direct, Indirect and Total Effects – Unstandardized

Effects	Features	Technology Adoption	Transaction	Service Quality	Satisfaction
Direct Effects					
Service Quality	.203	.148	.306	---	---
Satisfaction	.221	---	.121	.479	---
Effectiveness	-.122	-.021	.102	.367	.391
Indirect Effects					
Service Quality	---	---	---	---	---
Satisfaction	.097	.071	.146	---	---
Effectiveness	.199	.082	.216	.187	---
Total Effects					
Service Quality	.203	.148	.306	---	---
Satisfaction	.318	.071	.267	.479	---
Effectiveness	.077	.061	.318	.554	.391

Source: Primary Data

ESTIMATES OF DIRECT EFFECTS

The direct effects are the coefficients associated with the single headed arrows in the path diagram. In unstandardized model, all the three influencing factors namely Features (0.203), Technology Adoption (0.148) and Transaction (0.306) have direct positive effect on service quality. All three influencing factors are found to have direct positive effect on Satisfaction. When the influencing factors' score goes up by 1, the relational factors' score increases/decreases by the respective value of the coefficients on the influencing factors. Similarly, among three influencing factors, two factors such as features and technology adoption have direct negative effect on effectiveness except transaction under the influencing factors. That is, increase in the score of influencing factors will appropriately increase the effectiveness of digital payments among respondents. In the case of both Service Quality (0.367) and Satisfaction (0.391) have positive impact on the effectiveness of digital payment apps among respondents.

7.3 ESTIMATES OF INDIRECT EFFECTS

The above table also explains the indirect effects of each of the column factor of influencing factors on each row factors. It represents the indirect effect of all the influencing factors on service quality and satisfaction as similar to the direct effect of the influencing factors. All the three influencing factors have indirect positive effect on both satisfaction and effectiveness. The indirect effect service quality (0.187) on Effectiveness is also positive.

Table 3: Regression Models of Influencing Factors Before and After Introduction of Mediation variables namely, Quality Service and Satisfaction

Dependent Variable	Path	Independent Variable	Before Mediation		After Mediation	
			Estimate	P	Estimate	P

Effectiveness	?	Transaction	.313	***	.102	.024*
Effectiveness	?	Technology Adoption	.079	.122	-.021	.606
Effectiveness	?	Features	.065	.201	-.122	.004**

Source: Primary Data

The result shows that when the direct effects of the influencing factors before mediation were considered, it is seen that the only influencing factor transaction has significant impact on the effectiveness on the usage of digital payment apps. It is also observed that the regression coefficients are comparatively lesser after the introduction of mediation variables such as service quality and satisfaction. That is, it reveals that the introduction of service quality and satisfaction have significant impact on effectiveness of the respondents towards digital payment apps.

Total Effects- Estimates

Table 4: Direct, Indirect and Total Effects – Standardized

Effects	Features	Technology Adoption	Transaction	Service Quality	Satisfaction
Direct Effects					
Service Quality	.235	.176	.263	---	---
Satisfaction	.263	---	.107	.494	---
Effectiveness	-.154	-.027	.096	.401	.414
Indirect Effects					
Service Quality	---	---	---	---	---
Satisfaction	.116	.087	.130	---	---
Effectiveness	.251	.106	.203	.204	---
Total Effects					
Service Quality	.235	.176	.263	---	---
Satisfaction	.379	.087	.237	.494	---
Effectiveness	.097	.080	.299	.605	.414

Source: Primary Data

The Goodness of fit statistics namely, CMIN, GFI, NFI, CFI and RMSEA were identified from the validity of model. As the goodness of fit statistics matches all the admissible limits, the model developed was considered as good.

Conclusion

Here, path analysis was attempted to find the influencing factors namely Transaction, Technology adoption and Features on perceived service quality, satisfaction and effectiveness towards the usage of digital payment apps. The influencing factors have significant effects on service quality, satisfaction and effectiveness except the technology adoption for effectiveness. It has been clearly found that satisfaction and service quality have direct positive effect on brand loyalty. The effect of service quality of digital payment apps is relatively higher than the effect on effectiveness. Influencing factors also have indirect effect on Satisfaction and Effectiveness of digital payment apps. The indirect effect of Transaction contributes more to the Satisfaction as compared to other influencing factors. The total effect of Transaction is more on Service Quality as well as on Effectiveness. Here, Feature is acting as the highest satisfaction factor and service quality is the most influencing factor on Effectiveness.

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