

Impact of Perceived Risk on Adoption of Digital Payment by Customers in Madurai City

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Abstract: Digital payment services such as the Unified Payments Interface (UPI), mobile wallets, cards and internet banking have paved the way for customers to make everyday transactions in India. In spite of their convenience, customers hesitate to adopt them because of apparent financial loss, fraud, privacy invasion, transaction failure and uncertainty about dispute resolution. This study is designed to examine the impact of perceived risk on the adoption of digital payment by customers in Madurai city. The main objective is to identify the key dimensions of perceived risk and to observe the relationship between perceived risk and digital-payment adoption, including differences in risk perceptions across selected demographic groups. A descriptive and analytical research design is proposed where primary data is collected through a structured questionnaire from adult customers in Madurai city. The statistical tools used are Percentage analysis, standard deviation, Pearson correlation and one-way analysis of variance (ANOVA). The previous research study indicates that people can stop from wanting to adopt a new technology or behavior when they sense risk. The specific type of risk that matters the most depends heavily on the state of the situation. Since primary data were supplied, the numerical analysis establishes a strong empirical conclusion about customers in Madurai city. The framework helps researchers and service providers to identify the concerns of the customer and to develop digital-literacy, security-awareness and grievance-redressal initiatives.

Keywords: Perceived risk, digital payments, customer adoption, UPI, financial risk, privacy risk, Madurai city.

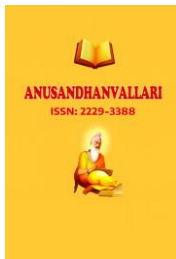
Introduction

Digital payments enable customers to transfer money and pay for products and services through UPI, mobile wallets, debit and credit cards, internet banking and mobile banking. These services provide increase in speed, reduction of time taken, enhance convenience and reduce dependence on cash. Customers use digital payments at retail shops, restaurants, transport providers, educational institutions, hospitals and online platforms.

However, usage of digital payments is not only for convenience but also to streamline transactions. The main risk customers face are unauthorized transactions, fraudulent calls or links, misuse of personal information, failed transactions, delayed refunds and difficulty in recovering money sent to an incorrect recipient. Perceived risk refers to a customer's expectation of possible negative consequences associated with using a product or service. It includes financial risk, security breach, fraud risk, privacy risk, performance risk and psychological discomfort.

Objectives Of The Study

1. To identify and assess the major dimensions of perceived risk influencing customers' use of digital payment services in Madurai city.



2. To examine the relationship between perceived risk and digital-payment adoption and determine whether perceived-risk scores differ across selected demographic groups.

Review Of Literature

Jacob, Jacob and Johnson (2024)

In their study, Jacob, Jacob, and Johnson explored the elements influencing the adoption of UPI among low-income consumers in India. They utilized responses from a questionnaire completed by 351 participants and applied structural equation modelling. The results exposed that perceived risk negatively impacted behavioural intention, whereas performance expectancy, effort expectancy, and facilitating conditions positively influenced it. Raghavendra and Eswara (2024) The study is relevant to inclusive digital-payment adoption, although its population may differ from customers in Madurai city.

Gupta, R., Kapoor, C., & Yadav, J. (2020) explains that "Paperless, Cashless, Faceless." The Government of India's flagship initiative, "Digital India," envisions India as a knowledge economy empowered by technology. Micro ATMs, banking cards, Internet banking, UPI (Unified Payment Interface), mobile banking, and mobile wallets are just a few of the digital payment options that have been implemented nationwide as India becomes a global contender in cutting-edge population-scale payment systems. Nonetheless, the Indian economy finds a hidden obstacle between the expansion of Digital India and full adoption of the Digital Payment System. India's cash to GDP (Gross Domestic Product) ratio of 11.4 percent as of 2019, which is significantly greater than numerous other emerging and developed nations, can be used to gage the country's current use of cash as a payment method. As an outcome, a more reliable, secure, and contemporary working model for a Digital Payment Wallet service using Blockchain Technology has been developed.

Featherman and Pavlou (2003)

Featherman and Pavlou developed and tested a perceived-risk perspective for electronic-service adoption. Their study extended technology-acceptance approaches by considering potential losses as well as perceived benefits. Shah and Parashar (2024) The findings indicated that perceptions of risk related to performance might negatively influence adoption, thereby creating a theoretical foundation for analyzing financial, performance, privacy, and various other risk factors.

Research On Digital-Payment Risk

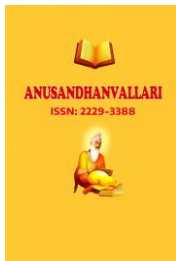
Research on digital-payment acceptance shows perceived credibility, facilitating conditions and financial risk. The customers who are doubtful about transaction security or the handling of personal information are mostly not willing to adopt a service. The relative importance of individual risk dimensions varies across groups, payment methods and usage experience.

Research Gap

Previous studies establish that perceived risk is relevant to digital financial-service adoption, but they differ in location, target population, service type and statistical method. A focused study of customers in Madurai city can identify locally salient risks and test the relationship between perceived risk and adoption using percentage analysis, standard deviation, correlation and ANOVA.

Statement Of The Problem

Digital payment services have become common medium of transaction, but it mainly concerns about fraud, unauthorized access, privacy, technical failures and dispute resolution may discourage some customers from using them. The extent of these concerns differs based on age, education, income, digital literacy and



previous experience. Tsai (2024) The problem addressed by this study is to identify the perceived risks experienced by customers in Madurai city and to determine whether perceived risk is associated with digital-payment adoption and whether risk perceptions differ among selected demographic groups.

Scope Of The Study

The geographical scope is Madurai city, Tamil Nadu. The study covers UPI, mobile wallets, debit and credit cards, internet banking and mobile banking. The perceived-risk dimensions include financial loss, security and fraud, privacy and data misuse, transaction performance, and psychological discomfort. Jumbe and Gor (2023) The evaluation of digital payment adoption relies on metrics such as frequency of use and the intention for sustained usage. The willingness to use these methods is for subsequent purchases and it is a distinct preference for digital options over cash. The study is limited to the respondents and fieldwork is for a very short period of time selected.

Research Methodology

Research design

A descriptive and analytical research design is proposed. The descriptive research design summarizes respondent characteristics, payment practices and risk perceptions and the analytical design shows the association between perceived risk and adoption and it compares risk scores across demographic categories.

Population and sample

The target population consists of adults residing in or regularly making purchases in Madurai city who are aware of digital payment services. A sample of 200 respondents is taken for the study.

Sources of data

Primary data is collected using a structured questionnaire. Secondary data is obtained from peer-reviewed journals and relevant official publications. The questionnaire is used to collect data from the respondents.

Measurement of variables

Perceived-risk statements are measured using a five-point Likert scale:

1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree and 5 = strongly agree.

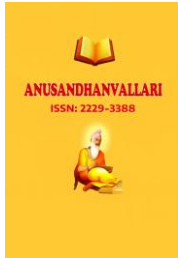
It includes concern about financial loss, fraudulent messages, and exploitation of personal data, transaction failure and difficulty resolving a failed transaction. Measure the perceived risk and adoption of digital payment separately then code the data so that higher risk scores always mean greater perceived danger, and higher adoption scores mean heavier use or a stronger intent to continue.

Research Tools And Hypotheses

Percentage analysis

Percentage analysis summarizes categorical responses such as age, gender, most-used payment method and frequency of use.

Percentage = (Frequency in a category ÷ Total valid responses) × 100.



Standard deviation

Standard deviation measures the spread of responses around the mean. A low standard deviation indicates that responses are relatively close to the mean; a high value indicates greater variation. For a sample, $s = \sqrt{[\Sigma(x - \bar{x})^2 / (n - 1)]}$. Report standard deviation alongside the mean for risk dimensions and composite scores.

Pearson correlation

Pearson's correlation coefficient (r) measures the direction and strength of the linear association between perceived-risk scores and adoption scores. A negative coefficient indicates that higher perceived risk is associated with lower adoption. Correlation alone does not prove causation.

H_{01} : There is no statistically significant relationship between perceived risk and digital-payment adoption among customers in Madurai city.

H_{11} : There is a statistically significant relationship between perceived risk and digital-payment adoption among customers in Madurai city.

One-way ANOVA

One-way ANOVA tests whether mean perceived-risk scores differ among age groups of 18–25, 26–35, 36–45 and 46 years or above. If the overall test is significant, a post-hoc test such as Tukey's HSD can identify which groups differ. The independence, residual distribution and homogeneity of variance are checked and Welch's ANOVA is suitable when variances are unequal.

H_{02} : There is no statistically significant difference in mean perceived-risk scores among the selected age groups.

H_{12} : At least one selected age group differs significantly in mean perceived-risk score.

5% significance level ($\alpha = 0.05$) is taken. Reject null hypothesis when $p < 0.05$; otherwise, Accept null hypothesis.

Data Analysis And Interpretation

The data below are prepared to shows the results and interpretation.

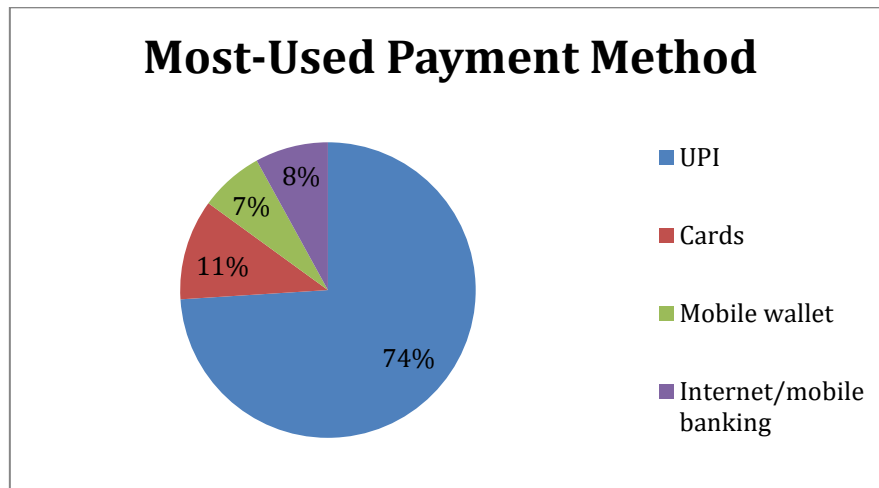
Percentage analysis and Pie Chart

Total Respondents: $N = 200$. The table 1 and pie chart show a distribution of respondents' most-used digital payment Method.

Table 1

Most-Used Payment Method	Frequency	Percentage
UPI	148	74.0%
Cards	22	11.0%
Mobile wallet	14	7.0%
Internet/mobile banking	16	8.0%
Total	200	100.0%

Source: Primary Data



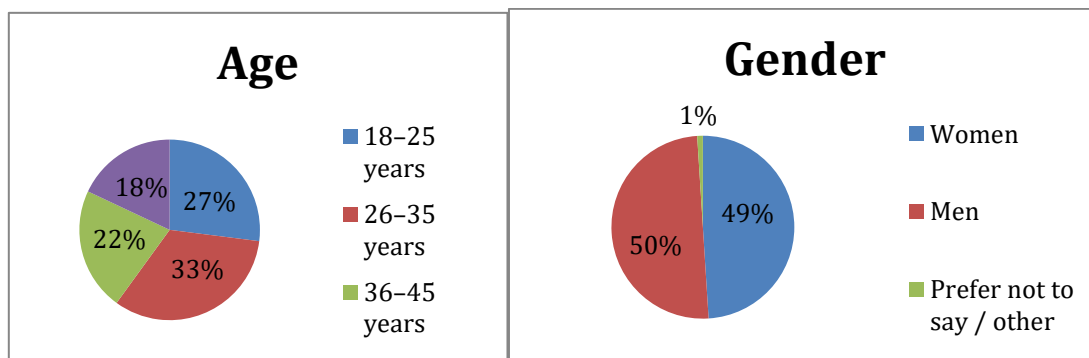
Interpretation: In this table 1, UPI accounts for the largest share (74%) of respondents' stated most-used payment method.

Demographic percentage analysis

Table 2

Variable	Category	Frequency	Percentage
Age	18–25 years	54	27.0%
	26–35 years	66	33.0%
	36–45 years	44	22.0%
	46 years and above	36	18.0%
Gender	Women	98	49.0%
	Men	100	50.0%
	Prefer not to say / other	2	1.0%

Source: Primary Data



Interpretation: The table 2 shows the largest age category is the 26–35 years group (33%) and majority of the gender are men which is 50%.

Standard deviation of perceived-risk dimensions

Table 3

Risk dimension	Mean (1–5)	Standard Deviation	Rank by Mean
Financial risk	3.82	0.91	I
Security/fraud risk	3.76	0.94	II
Transaction/performance risk	3.58	0.88	III
Privacy/data misuse risk	3.44	1.02	IV
Psychological discomfort	3.21	1.07	V

Source: Primary Data

Interpretation: In the table 3, financial risk has the highest mean score (3.82). Privacy risk (3.44) and psychological discomfort (3.21) show relatively higher response variation, as reflected by their standard deviations.

Correlation analysis

Table 4

Variables	Pearson r	p-value	Decision at 5%
Perceived-risk score and adoption score	– 0.46	< 0.001	Reject H ₀₁

Source: Primary Data

Interpretation: The correlation is – 0.46 which indicates a moderate negative association between perceived risk and adoption. In this, greater perceived risk is associated with lower adoption scores.

ANOVA: Perceived Risk by age group

Table 5

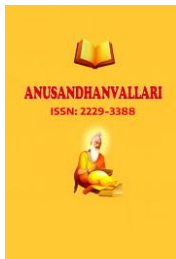
Source	Df	F	p-value	Decision
Between age groups	3	4.12	0.019	Reject H ₀₂
Within groups	196	—	—	—
Total	199	—	—	—

Source: Primary Data

Interpretation: The ANOVA indicates a statistically significant difference in average perceived-risk scores across at least two age groups.

Findings

- [1] In Table 1, UPI accounts for the largest share (74%) of respondents' stated most-used payment
- [2] Table 2 shows the largest age category is the 26–35 years group (33%) and majority of the gender are men which is 50%.



- [3] In the table 3, financial risk has the highest mean score (3.82). Privacy risk (3.44) and psychological discomfort (3.21) show relatively higher response variation, as reflected by their standard deviations.
- [4] The correlation is -0.46 which indicates a moderate negative association between perceived risk and adoption. In this, greater perceived risk is associated with lower adoption scores.
- [5] The ANOVA indicates a statistically significant difference in average perceived-risk scores across at least two age groups.

Suggestions

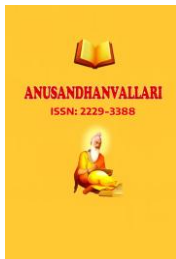
- [1] Educate customer about awareness on recognizing fake calls, messages and links.
- [2] Remind customers never to share OTPs, PINs or passwords.
- [3] Make fraud-reporting channels, complaint escalation and transaction-dispute steps easy to find and understand.
- [4] Improve transaction transparency by clearly displaying the recipient, amount and transaction status.
- [5] Conducts digital-literacy programmes through banks, colleges, workplaces, markets and community organizations to create awareness.
- [6] Improves accessibility through readable interfaces, simple language and provides support for older customers and people with limited digital skills and knowledge.
- [7] Explains security controls and alerts as no payment system is completely risk-free and also sometimes monitors fail to track transactions and complaints.
- [8] Divide the service problems separately to identify recurring ones.
- [9] Use periodic local surveys to target the risks that pose a threat to customers.

Conclusion

Perceived risk is an important factor to look into while understanding how customer adopts digital payments. Confidence of customers and willingness to use digital services is affected by concerns about financial loss, fraud, privacy, transaction reliability and complaint resolution. Existing system supports in examining perceived risk alongside usefulness, ease of use, trust and to facilitate conditions. This paper provides a research framework for Madurai city using percentage analysis with a pie chart, standard deviation, Pearson correlation and one-way ANOVA. This conclusion is about the impact of perceived risk properly collected and analyzed using primary data. The result shows about digital-literacy programmes, security communication and improvements in grievance redressal.

References

- [1] Featherman, M. S., & Pavlou, P. A. (2003). Predicting e-services adoption: A perceived risk facets perspective. *International Journal of Human-Computer Studies*, 59(4), 451–474. [https://doi.org/10.1016/S1071-5819\(03\)00111-3](https://doi.org/10.1016/S1071-5819(03)00111-3)
- [2] Jacob, R. C., Jacob, M. E., & Johnson, J. (2024). Understanding factors affecting UPI adoption among low-income consumers in India. *Indian Journal of Finance*, 18(7), 44–59. <https://doi.org/10.17010/ijf/2024/v18i7/174032>
- [3] Jumbe, G., & Gor, R. (2023). Examining the impact of debt maturity time, expected return and volatility on probability of default in credit risk modelling: The case of Merton and MKMV models. *International Journal of Engineering Science Technologies*, 7(1), 29–42. <https://doi.org/10.29121/ijolest.v7.i1.2023.542>
- [4] Gupta, R., Kapoor, C., & Yadav, J. (2020, June). Acceptance towards digital payments and improvements in cashless payment ecosystem. In *2020 International Conference for Emerging Technology (INCET)* (pp. 1-9). IEEE.



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- [5] Raghavendra, D., & Eswara, M. G. (2024). Integrating advanced technologies in retail: A conceptual framework for enhancing consumer experience and trust. *International Journal of Engineering Technologies and Management Research*, 11(10), 26–36. <https://doi.org/10.29121/ijetmr.v11.i10.2024.619>
- [6] Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425–478. <https://doi.org/10.2307/30036540>
- [7] Kim, D. J., Ferrin, D. L., & Rao, H. R. (2008). A trust-based consumer decision-making model in electronic commerce: The role of trust, perceived risk, and their antecedents. *Decision Support Systems*, 44(2), 544–564. <https://doi.org/10.1016/j.dss.2007.07.001>
- [8] Slade, E. L., Dwivedi, Y. K., Piercy, N. C., & Williams, M. D. (2015). Modeling consumers' adoption intentions of remote mobile payments in the United Kingdom: Extending UTAUT with innovativeness, risk, and trust. *Psychology & Marketing*, 32(8), 860–873. <https://doi.org/10.1002/mar.20823>
- [9] Shah, K., & Parashar, A. (2024). AI-powered financial planning tools and retirement readiness among IT sector employees in India: A structural equation modelling approach. *ShodhPrabandhan: Journal of Management Studies*, 1(1), 98–108. <https://doi.org/10.29121/ShodhPrabandhan.v1.i1.2024>
- [10] Kuisma, T., Laukkanen, T., & Hiltunen, M. (2007). Mapping the reasons for resistance to Internet banking: A means-end approach. *International Journal of Information Management*, 27(2), 75–85. <https://doi.org/10.1016/j.ijinfomgt.2006.08.006>
- [11] Tsai, H. C. (2024). Improving seal verification security and transparency using blockchain technology. *International Journal of Engineering Technologies and Management Research*, 11(8), 1–8. <https://doi.org/10.29121/ijetmr.v11.i8.2024.613>
- [12] Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340. <https://doi.org/10.2307/249008>
- [13] Bauer, R. A. (1960). Consumer behavior as risk taking. In R. S. Hancock (Ed.), *Dynamic marketing for a changing world* (pp. 389–398). American Marketing Association.
- [14] Pavlou, P. A. (2003). Consumer acceptance of electronic commerce—Integrating trust and risk with the technology acceptance model. *International Journal of Electronic Commerce*, 7(3), 101–134. <https://doi.org/10.1080/10864415.2003.11044275>
- [15] Chandra, S., Srivastava, S. C., & Theng, Y.-L. (2010). Evaluating the role of trust in consumer adoption of mobile payment systems: An empirical analysis. *Communications of the Association for Information Systems*, 27, Article 29, 561–588.
- [16] Mallat, N. (2007). Exploring consumer adoption of mobile payments—A qualitative study. *The Journal of Strategic Information Systems*, 16(4), 413–432. <https://doi.org/10.1016/j.jsis.2007.08.001>
- [17] Zhou, T. (2011). An empirical examination of initial trust in mobile banking. *Internet Research*, 21(5), 527–540. <https://doi.org/10.1108/10662241111176353>