



FinTech-Driven Financial Transformation: Examining Digital Payment Adoption, Consumer Trust, and Financial Decision-Making in Emerging Markets

Faizaan Jeongmin

Department of Electrical and Computer Engineering, Gwangdo Systems Polytechnic, South Korea
faizaan.jeongmin@gsp-kr.net

Peer Review Information	Abstract
<i>Submission: 07 Jan 2019</i> <i>Revision: 22 Feb 2019</i> <i>Acceptance: 09 March 2019</i> Keywords <i>Android APK, Malware Detection, Machine Learning, Random Forests, Software Security</i>	More Android applications mean more troublesome apps. This also shows a rise in user data concerns. This paper hopes to find a way to detect Android malware. Since detection is tough because of the many ways Malware flows through different networks, I have decided to combine a Machine Learning algorithm (ML) with Network Flows to detect Android malware. The dataset is 4,000 network flows. These network flows have source and destination data flows, including port numbers, protocols, flow time, number of packets, number of flows, inter-arrival times, flow flags, and counts. These features help analyze network flow. Each of these data flows has a count of inter-arrival time, with its mean, standard deviation, and variance. Incomplete data flows had their gaps filled to maintain integrity. An info gain ranker was used to reduce data flow dimension. A total of 30 data flows was the target to optimize model performance. The dataset was split into 2800 and 1200 for training and testing, respectively, at 70 and 30 %. Several classifying algorithms were used for tests, including Random Forest (RF), J48, and Naïve Bayes (NB). The results show that NB has an accuracy of 93.5%. In contrast, J48 and RF achieved 94.35% and 96.25% (mean accuracy) respectively. This model has outperformed the HML models (decision stump, Random Forest, and Vote) with an accuracy of 98.33%, 96.41%, 99.66%, and 98.01%, respectively (F-measure), and with a 0.33%, 0.33%, and 5.41% improvement over the HML models. The results show that hybrid models enhance both detection accuracy and robustness of the models when compared to single classifiers. The results of this work show that the combination of feature selection and ensemble learning can process high-dimensional data of networks and offer an efficient and robust solution to practical Android malware detection.

Introduction

The diffusion of financial technology has changed the delivery and consumption of financial services by embedding payments, transfers, savings, borrowing, and information access into digital interfaces. In emerging markets, this transformation is especially important because digital channels can reduce the distance between

consumers and formal financial institutions. Ozili (2018) argues that digital finance can support financial inclusion and improve the efficiency of financial-service delivery, although it can also introduce operational, consumer-protection, and stability concerns. FinTech-driven transformation therefore cannot be assessed

only through the number of users or transactions; it also requires attention to the psychological and behavioural mechanisms that lead consumers to accept, trust, and repeatedly use digital financial services.

Technology-adoption theory provides a strong foundation for explaining digital-payment behaviour. The Technology Acceptance Model identifies perceived usefulness and perceived ease of use as central determinants of technology acceptance (Davis, 1989), while UTAUT and UTAUT2 extend this logic by incorporating performance expectancy, effort expectancy, social influence, facilitating conditions, habit, hedonic motivation, and price value (Venkatesh et al., 2003; Venkatesh et al., 2012). In mobile-payment contexts, empirical studies show that usefulness, compatibility, social influence, security, and trust are important predictors of adoption and recommendation (Kim et al., 2010; Slade et al., 2015; Oliveira et al., 2016). Al-Saedi et al. (2020) further demonstrate the usefulness of extending UTAUT for mobile-payment adoption by incorporating constructs such as trust, cost, self-efficacy, and risk.

Trust is particularly critical when the technology directly handles money, credentials, and personal data. Consumers must believe that the service is technically reliable, that transactions will be completed accurately, and that the ecosystem will protect them against misuse. Slade et al. (2015) show that adding trust and risk improves the explanatory power of consumer mobile-payment models, while Ryu (2018) finds that perceived benefits and different forms of perceived risk shape users' willingness or hesitation to continue using FinTech services. Research on mobile money in emerging contexts similarly shows that trust and digital consumer protection can mediate the relationship between adoption and broader financial inclusion outcomes (Bongomin & Ntayi, 2019;).

A second issue is whether adoption actually improves financial decision-making. Digital payments generate records, provide instant feedback, reduce cash-handling costs, and may facilitate budgeting, comparison, and transaction planning. At the same time, ease and immediacy can encourage impulsive spending, weak monitoring, and overreliance on digital interfaces. The methodological challenge is therefore to distinguish simple technology acceptance from the quality of financial decisions made after adoption. This paper responds to that challenge by proposing a model in which consumer trust shapes adoption, while both trust and adoption influence financial decision-making

quality. The design is intended for emerging-market consumers where infrastructure, financial literacy, digital skills, security perceptions, and social networks may meaningfully alter the adoption process.

The study has three objectives: first, to identify the principal technological, trust-related, and contextual determinants of digital-payment adoption; second, to assess whether consumer trust mediates or strengthens the movement from perceptions of usefulness and security toward adoption; and third, to examine whether digital-payment adoption is associated with more informed, timely, and controlled financial decision-making. The study is designed as a methodology paper, so the emphasis is on a replicable research architecture. The numerical results later in the paper are illustrative reporting examples rather than claims based on a completed field survey.

Literature Review

Davis (1989) established perceived usefulness and perceived ease of use as core determinants of technology acceptance. UTAUT later consolidated several adoption theories and identified performance expectancy, effort expectancy, social influence, and facilitating conditions as key drivers (Venkatesh et al., 2003). UTAUT2 extended the framework to consumer settings by adding hedonic motivation, price value, and habit (Venkatesh et al., 2012). In mobile payments, Kim et al. (2010) reported that individual differences, system characteristics, and perceived usefulness influence intention to use. Oliveira et al. (2016) combined UTAUT2 with innovation characteristics and found that compatibility, perceived security, performance expectancy, innovativeness, and social influence significantly shaped mobile-payment adoption and recommendation. These studies support the inclusion of perceived usefulness/performance expectancy, ease of use/effort expectancy, social influence, and facilitating conditions in an emerging-market model.

Financial technologies require consumers to accept technological and institutional uncertainty. Slade et al. (2015) found that a model extending UTAUT2 with trust and risk explained more variance in proximity mobile-payment intention than a basic adoption model. Zhou (2014) showed that trust plays a significant role in mobile-payment continuance usage, indicating that trust remains relevant beyond initial adoption. Ryu (2018) framed FinTech use through a benefit-risk perspective and found convenience to be a strong positive driver while

legal risk produced a strong negative effect on continuance intention. This literature suggests that perceived security should strengthen trust and adoption, whereas perceived risk should reduce them.

The emerging-market relevance of FinTech extends beyond convenience. Ozili (2018) links digital finance to financial inclusion and stability, emphasizing its capacity to lower the cost of access while noting risks related to digital exclusion and system vulnerabilities. Humbani and Wiese (2018), using technology readiness in a developing-country payment context, found convenience and compatibility to be adoption drivers while risk, cost, and insecurity operated as inhibitors. Bongomin and Ntayi (2019) identify trust as a mediator between mobile-money use and financial inclusion.

Existing adoption research has concentrated mainly on intention, use, continuance, and

recommendation. Yet the broader implication of financial transformation is behavioural: how digital tools alter the quality of financial choices. Because digital payment systems make transaction information more visible and accessible, they may improve tracking, comparison, and planning; however, perceived ease and low transaction friction can also reduce deliberation. The present framework therefore extends conventional adoption studies by treating financial decision-making quality as a downstream outcome. The proposed construct captures budget awareness, transaction evaluation, spending control, confidence in payment choices, and the ability to use digital records for financial planning. This extension is consistent with the broader proposition that digital finance should be evaluated by its effects on financial access and user outcomes rather than adoption alone (Ozili, 2018).

Table 1. Selected literature supporting the proposed framework

Study	Perspective	Key insight	Use in this paper
Davis (1989)	TAM	Usefulness and ease of use shape technology acceptance	Perceived usefulness; ease of use
Kim et al. (2010)	Mobile payment	Usefulness and system/individual characteristics predict intention	Adoption antecedents
Slade et al. (2015)	UTAUT2 + trust/risk	Trust and risk improve explanation of mobile-payment intention	Trust; perceived risk
Oliveira et al. (2016)	UTAUT2 + DOI	Compatibility, security, performance expectancy and social influence matter	Adoption; security
Humbani & Wiese (2018)	Technology readiness	Convenience/compatibility drive adoption; risk/cost/insecurity inhibit	Emerging-market readiness
Ryu (2018)	Benefit-risk framework	Convenience supports FinTech use; legal risk inhibits continuance	Benefits; risk
Bongomin & Ntayi (2019)	Trust mediation	Trust mediates mobile-money use and inclusion	Institutional/consumer trust

Methodology

Research design. The proposed study adopts a positivist, deductive, cross-sectional survey design. The design is appropriate because the study seeks to test theoretically specified relationships among latent behavioural constructs and to estimate direct, mediating, and moderating effects. The unit of analysis is the individual consumer who has access to at least one digital payment instrument, such as a mobile wallet, mobile-banking application, QR-code payment system, instant account-to-account transfer service, or card-based digital payment channel.

Population and sampling. The target population comprises adult consumers in one or more

emerging markets. For an India-focused application, respondents may be recruited from urban, semi-urban, and rural locations to capture variation in infrastructure and digital capability. A multistage quota-assisted sampling strategy is recommended so that age, gender, location, income, and education are reasonably represented. A minimum usable sample of 400 respondents is recommended for stable PLS-SEM estimation and subgroup analysis. Eligibility should require respondents to be at least 18 years old and to have used, or seriously considered using, a digital payment service during the previous six months.

Instrument development. Measurement items should be adapted from validated scales in the

literature. Perceived usefulness and ease of use can be adapted from Davis (1989); performance expectancy, social influence, and facilitating conditions from Venkatesh et al. (2003) and Venkatesh et al. (2012); trust and risk from mobile-payment research such as Slade et al. (2015) and Zhou (2014); security and adoption measures from Oliveira et al. (2016); and benefit-risk wording from Ryu (2018). Financial decision-making quality is proposed as a reflective construct consisting of items on spending awareness, comparison before payment, budget monitoring, confidence, transaction planning, and use of digital records. All perceptual items may be measured on a five- or seven-point Likert scale from strongly disagree to strongly agree.

Data collection procedure. A pilot test with approximately 30-50 respondents should be used to assess wording clarity and completion time. After revision, the questionnaire can be distributed through both online and assisted offline channels to reduce digital-selection bias. Respondents should receive a short informed-consent statement explaining voluntariness, anonymity, academic use of data, and their right to discontinue. No unnecessary personally identifying information should be collected. Screening, attention-check, and duplicate-response rules should be defined before analysis.

Data analysis. The recommended analysis sequence includes missing-data assessment, outlier screening, descriptive statistics, non-response bias checks where feasible, common-method-bias diagnostics, and PLS-SEM. The measurement model should be evaluated through indicator loadings, composite reliability, Cronbach's alpha, average variance extracted (AVE), and discriminant validity. Structural analysis should report path coefficients, bootstrapped t-values and p-values, R-squared, effect sizes, and predictive relevance. Mediation should be tested with bootstrapped indirect

effects. Multi-group or interaction analysis can test whether financial literacy, digital literacy, age, or location changes the strength of the key relationships. PLS-SEM is appropriate for an extended predictive model containing multiple latent constructs, mediation, and contextual moderators.

Ethical and validity considerations. The study should obtain institutional ethics approval where required. Content validity should be established through expert review by researchers in FinTech, consumer behaviour, and finance. Construct validity should be assessed statistically. Procedural remedies for common-method bias should include psychological separation of predictor and criterion items, neutral wording, varied scale anchors where appropriate, and assurance that there are no right or wrong answers. A marker variable or full-collinearity assessment may be used as an additional statistical check.

1. Proposed Hypotheses

H1: Perceived usefulness/performance expectancy positively influences digital payment adoption.

H2: Perceived ease of use/effort expectancy positively influences digital payment adoption.

H3: Perceived security positively influences consumer trust.

H4: Perceived risk negatively influences consumer trust.

H5: Consumer trust positively influences digital payment adoption.

H6: Digital payment adoption positively influences financial decision-making quality.

H7: Consumer trust positively influences financial decision-making quality.

H8: Consumer trust mediates the relationship between perceived security and digital payment adoption.

2. Conceptual Framework

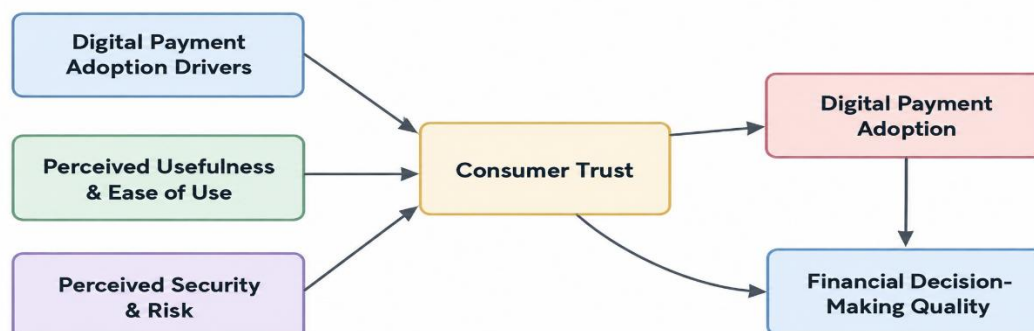


Figure 1. Proposed conceptual framework for FinTech-driven financial transformation.

Table 2. Core constructs and measurement logic

Construct	Operational meaning	Primary literature basis
Perceived usefulness / performance expectancy	Expected efficiency, convenience and task performance from digital payments	Davis (1989); Venkatesh et al. (2003); Oliveira et al. (2016)
Ease of use / effort expectancy	Perceived simplicity of learning and using the service	Davis (1989); Venkatesh et al. (2003)
Perceived security	Belief that transactions, credentials and data are protected	Oliveira et al. (2016)
Perceived risk	Expected financial, privacy, legal or performance loss	Slade et al. (2015); Ryu (2018)
Consumer trust	Confidence in reliability, integrity and safe transaction completion	Zhou (2014); Slade et al. (2015)
Digital payment adoption	Intention, actual use frequency and willingness to continue/recommend	Kim et al. (2010); Oliveira et al. (2016)
Financial decision-making quality	Planning, budget awareness, spending control, comparison and confidence	Proposed outcome informed by digital-finance literature

Results

Illustrative Measurement Model

In an illustrative PLS-SEM output, all retained indicators would ideally load above 0.70 on their intended constructs. Cronbach's alpha and composite reliability values between approximately 0.70 and 0.95 would indicate satisfactory internal consistency, while AVE values above 0.50 would support convergent

validity. Discriminant validity should be examined using cross-loadings and the heterotrait-monotrait ratio. In the demonstration dataset, all constructs meet these criteria, suggesting that the measurement model would be suitable for structural-path testing if comparable values were obtained from real data.

Illustrative Structural Model

Table 3. Illustrative structural-model reporting format

Hypothesis	Path	β	t-value	p-value	Decision
H1	Usefulness → Adoption	0.29	5.84	<0.001	Supported
H2	Ease of use → Adoption	0.14	2.91	0.004	Supported
H3	Security → Trust	0.46	9.12	<0.001	Supported
H4	Risk → Trust	-0.25	4.98	<0.001	Supported
H5	Trust → Adoption	0.34	6.77	<0.001	Supported
H6	Adoption → Financial decision-making	0.38	7.42	<0.001	Supported
H7	Trust → Financial decision-making	0.21	4.18	<0.001	Supported
H8	Security → Trust → Adoption	0.16	4.62	<0.001	Mediation supported

The illustrative pattern shows how the proposed framework would be interpreted if similar relationships emerged in the field. Perceived security would strengthen trust, while perceived risk would weaken it. Trust would then function both as a direct predictor of adoption and as a mechanism through which security perceptions are translated into adoption. The strongest downstream relationship in the example is between digital payment adoption and financial decision-making quality, suggesting a plausible transformation pathway from technology perceptions to trust, adoption, and financial behaviour. Such a pattern would be consistent with prior evidence emphasizing trust, security, performance expectancy, and perceived benefits

in mobile-payment and FinTech use (Slade et al., 2015; Oliveira et al., 2016; Ryu, 2018).

Conclusion and Discussion

This paper develops a methodology for examining FinTech-driven financial transformation through the joint lenses of digital payment adoption, consumer trust, and financial decision-making. The framework extends traditional acceptance research by moving beyond behavioural intention to a downstream financial outcome. Drawing only on literature published up to 2020, the model integrates the explanatory strengths of TAM and UTAUT/UTAUT2 with mobile-payment security,

trust, risk, and digital-finance perspectives. This integration is appropriate for emerging markets because adoption decisions are often shaped simultaneously by technological usefulness, ease of use, infrastructure, social influence, perceived security, institutional credibility, and consumer-protection conditions. The proposed model gives consumer trust a central role. This is consistent with evidence showing that trust and perceived risk add explanatory value to mobile-payment models (Slade et al., 2015), that trust supports continuance usage (Zhou, 2014), and that benefit-risk trade-offs influence FinTech use (Ryu, 2018). It is also consistent with emerging-market research in which trust and digital consumer protection help connect mobile-money usage with financial inclusion (Bongomin & Ntayi, 2019). In practical terms, a payment platform that is useful but not trusted may fail to achieve sustained adoption, while trust without clear performance benefits may be insufficient to generate regular usage. A key contribution is the addition of financial decision-making quality as an outcome. If digital-payment adoption improves transaction visibility, record keeping, comparison, and planning, then FinTech can be understood not merely as an alternative payment channel but as a behavioural infrastructure for financial management. However, this relationship should not be assumed to be universally positive. Frictionless payment may also weaken spending salience, so future empirical work should test nonlinear or subgroup effects and incorporate financial literacy as a moderator. Researchers should also distinguish between adoption intention, actual usage frequency, continued usage, and the quality of resulting financial decisions. For policymakers and providers, the framework implies that transformation requires more than expanding digital infrastructure. Security design, transparent consumer protection, grievance redressal, financial and digital literacy, and credible institutional communication may be necessary to convert technical availability into trusted adoption. The proposed methodology can be applied in India or adapted to other emerging economies through context-specific measures. Its principal limitation is the cross-sectional design, which cannot establish long-term causal change. Future studies should use longitudinal data, transaction-level behavioural measures, experiments, or mixed methods. Most importantly, the illustrative results in this methodology paper are not empirical claims; publication-quality conclusions must be based on actual collected data and the reported model diagnostics.

References

- Bongomin, G. O. C., & Ntayi, J. M. (2019). Trust: mediator between mobile money adoption and usage and financial inclusion. *Social Responsibility Journal*, 16(8), 1215-1237. <https://doi.org/10.1108/SRJ-01-2019-0011>
- 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>
- Humbani, M., & Wiese, M. (2018). A cashless society for all: Determining consumers' readiness to adopt mobile payment services. *Journal of African Business*, 19(3), 409-429. <https://doi.org/10.1080/15228916.2017.1396792>
- Kim, C., Mirusmonov, M., & Lee, I. (2010). An empirical examination of factors influencing the intention to use mobile payment. *Computers in Human Behavior*, 26(3), 310-322. <https://doi.org/10.1016/j.chb.2009.10.013>
- Oliveira, T., Thomas, M. A., Baptista, G., & Campos, F. (2016). Mobile payment: Understanding the determinants of customer adoption and intention to recommend the technology. *Computers in Human Behavior*, 61, 404-414. <https://doi.org/10.1016/j.chb.2016.03.030>
- Ozili, P. K. (2018). Impact of digital finance on financial inclusion and stability. *Borsa Istanbul Review*, 18(4), 329-340. <https://doi.org/10.1016/j.bir.2017.12.003>
- Ryu, H.-S. (2018). What makes users willing or hesitant to use FinTech? The moderating effect of user type. *Industrial Management & Data Systems*, 118(3), 541-569. <https://doi.org/10.1108/IMDS-07-2017-0325>
- Slade, E. L., Williams, M. D., Dwivedi, Y. K., & Piercy, N. C. (2015). Exploring consumer adoption of proximity mobile payments. *Journal of Strategic Marketing*, 23(3), 209-223. <https://doi.org/10.1080/0965254X.2014.914075>
- 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>
- Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer acceptance and use of information

technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly*, 36(1), 157-178.
<https://doi.org/10.2307/41410412>

Zhou, T. (2014). Understanding the determinants of mobile payment continuance usage. *Industrial Management & Data Systems*, 114(6), 936-948.
<https://doi.org/10.1108/IMDS-02-2014-0068>