NUDGING RESPONSIBLE FINANCIAL BEHAVIOUR: EXTENDING THE TECHNOLOGY ACCEPTANCE MODEL WITH EPNM

Diksha Halder, Dr K.T. Vijaykarthigeyan
Faculty of Management, SRM Institute of Science and Technology, Kattankulathur, Chennai, India. Email: dh3648@srmist.edu.in, Vijaykat@srmist.edu.in

Highlight

This paper presents the Ethical Personalisation Nudging Model (EPNM), an extension of the Technology Acceptance Model, which demonstrates that ethical, personalized digital nudges have a significant impact on trust and good financial behavior among Indian university students, providing a culture-sensitive, autonomy-supportive framework for ethical fintech design.

Abstract

This research extends the Technology Acceptance Model (TAM) by incorporating the Ethical Personalisation Nudging Model (EPNM) to investigate how ethical and trust-related factors influence Responsible Financial Behaviour (RFB) among Indian students. A systematic survey of 310 participants assessed perceived usefulness (PUE), perceived ease of use (PEU), trust (TRS), and ethical considerations (ETC) as antecedents of budgeting, debt management, and savings self-discipline. Employing Partial Least Squares Structural Equation Modelling (PLS-SEM), the findings reveal that ETC ($\beta = 0.407$, $p < 0.001$) and TRS ($\beta = 0.425$, $p < 0.001$) have the most significant impact on RFB, whereas PUE ($\beta = 0.171$, $p < 0.001$) and PEU ($\beta = 0.098$, $p < 0.05$) have smaller but significant impacts. The model accounts for 65.6% of RFB variance ($R^2 = 0.656$), emphasizing that ethical and trust-based variables outperform classical TAM predictors. The results contribute theoretical insight by incorporating ethics into TAM and practical advice in designing open, trustworthy, and autonomy-supportive financial technology.

Keywords

Responsible Financial Behaviour, EPNM, TAM, Trust, Fintech.

Introduction

The growing digitalization of financial services has revolutionized the way people handle money, investments, and credit. Digital banking, e-wallets, and FinTech platforms have democratized access to financial means but also created issues of overspending, weak savings habits, and susceptibility to seductive digital signals. Within such settings, behavioural interventions such as digital nudges, subtle design features that influence decisions without curbing freedom, have been identified as potential means to promote responsible financial habits (Saravanos et al., 2022).

Although behavioural finance long ago demonstrated how biases like present bias, optimism bias, and loss aversion interfere with sound decision-making, nudges like default savings schemes or spending notifications can be used to counter them. Their success is highly reliant on user trust, transparency, and ethical implementation (Aldboush & Ferdous, 2023). As FinTech services become more dependent upon artificial intelligence and big data, privacy, manipulation, and fairness concerns make the models that fit between effectiveness and ethical accountability an imperative (Amnas et al., 2024). The Technology Acceptance Model (TAM) offers a strong framework for examining the uptake of digital financial services, with perceived usefulness and ease of use held as central to intention (Nizam et al., 2024; Krah et al., 2024). However, TAM cannot be used on its own to explain fully the ethical, psychological, and behavioural dynamics underlying responsible financial conduct. To fill this gap, the Ethical Personalisation Nudging Model (EPNM) is a supportive autonomy approach that integrates ethical protections into personalised nudging initiatives.

Earlier research has proved the mediating effect of trust, perceived safety, and service quality for FinTech adoption (Zhao et al., 2024; Setiawan et al., 2025). In the same manner, recent TAM extensions have proven that personalisation, warm-glow effects, and contextual factors such as financial literacy and government initiatives affect technology adoption behaviour (Chandani, 2025; Setiawan et al., 2025). Financial nudges' design and deployment have to comply with ethical principles to be assured that they promote responsible actions without manipulating the consumer, as set out in Table 2. For example, FinTech sites can implement digital nudging to develop individualized financial experiences for users based on their individual needs, driving them towards objectives like habitual savings, punctual bill payments, and debt reduction. Specifically, this study examines how

integrating the Ethical Personalisation Nudging Model (EPNM) with the Technology Acceptance Model (TAM) can provide a robust framework for promoting trust, transparency, and responsible financial behaviour, particularly in digital financial platforms.

Accordingly, this study responds to the following guiding questions:

RQ1: How do individualized digital nudges affect responsible financial behaviour and FinTech platform trust?
RQ2: What are the psychological and ethical processes that account for differences in nudge performance in different financial contexts?
RQ3: How can the integration of EPNM with TAM facilitate a better understanding of financial technology adoption while protecting autonomy and encouraging responsible financial behaviour?

Literature Review

Navigation, Trust, and Ethical Considerations: Digital Nudging in Financial Behaviour As financial services increasingly migrate to digital platforms, the ethical considerations surrounding digital nudges and their impact on user trust have gained critical importance. The COVID-19 pandemic accelerated the use of mobile banking, e-wallets, and FinTech apps as substitutes for traditional banking, raising questions of autonomy, transparency, and responsible financial decision-making (Aldboush & Ferdous, 2023). Yet, ethical frameworks for designing and implementing such nudges remain underdeveloped, particularly in financial contexts where trust is paramount (Zhao et al., 2024). Trust is a fundamental component in digital finance, essential for fostering long-term relationships between users and service providers (Gefen et al., 2003; Amnas et al., 2024). It creates reliability in the financial ecosystem, enhancing both perceived security and responsible behaviour. Ethical considerations are critical in promoting fairness, transparency, and accountability, ensuring that financial nudges do not devolve into manipulative "dark patterns" that exploit vulnerabilities (Brown et al., 2023). In contrast, collectivist societies such as India, Brazil, and South Africa emphasise communal values, interdependence, and relational accountability (Hofstede, 1980; Kim & Lee, 2023). This suggests that the perception of financial nudges as ethical or manipulative depends not only on individual agency but also on alignment with societal norms and expectations.

Table 1: Examples of Digital Nudges Used in Financial Behaviour for Connectivity, Ethical Considerations, and Trust

Nudge Mechanism	Ubiquitous Connectivity	Ethical Considerations	Trust in Financial Behaviour
Smart Feedback (e.g., monthly savings reports, spending dashboards)	Cross-platform integration (mobile & web banking dashboards provide unified financial tracking).	Transparency in showing how financial data is used and analysed.	Builds trust through accurate, unbiased reporting of users' financial progress.
Smart Reminders (e.g., bill payment alerts, savings deposit reminders)	Timely reminders via SMS, email, or app notifications.	Flexibility to opt out and customise alerts to avoid intrusiveness.	Creates reliability by ensuring users never miss payments, enhancing confidence.
Technology Defaults (e.g., default savings enrolment, auto-debt repayment)	Seamless onboarding through automatic features integrated with banks and wallets.	Privacy-first settings (opt-in defaults, GDPR/DPDP compliance).	Trust is reinforced when defaults are fair, reversible, and user-friendly.
Spending Limit Nudges (e.g., daily transaction cap, overspending alerts)	Works across devices in real-time, syncing card, wallet, and UPI limits.	Prevents harm by reducing impulsive spending and over-indebtedness.	Enhances trust by protecting users against financial risks.
Social Proof Nudges (e.g., peer savings challenges, community goals)	Enabled via group saving apps and P2P lending platforms.	Must avoid coercive peer pressure by including opt-out options.	Strengthens trust through shared accountability and collective achievement.

Similarly, in Brazil and Latin America, cooperative savings platforms and peer-to-peer lending services rely on community-driven nudges that reward collaboration and shared success (Saravanos et al., 2022). High levels of financial immersion, such as gamified budgeting dashboards or AI-driven investment recommendations, enhance engagement and loyalty but raise concerns about excessive reliance or compulsive behaviour (Thaler & Sunstein, 2021; Montag et al., 2018). By prioritising autonomy-supportive features like spending limit alerts and savings reminders, developers can cultivate platforms that are both effective and respectful, ultimately benefiting consumers and fostering financial resilience (Nizam et al., 2024).

TAM and EPNM Integration in Responsible Financial Behaviour

The Technology Acceptance Model (TAM) has been widely used to explain the adoption of financial technologies, with perceived usefulness and ease of use as critical predictors of behavioural intention (Davis, 1989; Krah et al., 2024). Studies confirm TAM's applicability to mobile banking, e-payments, and robo-advisory services (Chandani, 2025; Nizam et al., 2024). However, TAM has limitations when applied to responsible financial behaviour, as it often excludes ethical and cultural variables (Saravanos et al., 2022).

The Ethical Personalisation Nudging Model (EPNM) offers a complementary lens by embedding ethical safeguards into personalised nudges (Chen et al., 2025). Grounded in behavioural psychology and bioethics, EPNM integrates TAM constructs with principlist ethics autonomy, beneficence, non-maleficence, and justice to ensure that personalised nudges align with trust and responsibility (Beauchamp & Childress, 2013). For example, spending limit nudges score higher across ethical principles, as they promote self-regulation while minimising harm, whereas peer comparison nudges risk undermining autonomy if perceived as coercive (Brown et al., 2023).

- EPNM embeds principlist bioethics → (autonomy, beneficence, non-maleficence, justice).
- EPNM predicts *Responsible Financial Behaviour* (not adoption).
- Most TAM extensions only add "trust" or "ethics" as variables; EPNM integrates ethics into the structure of nudging.
- EPNM focuses on *autonomy-supportive* nudges, not manipulation.

Based on the reviewed literature and theoretical integration of TAM with the Ethical Personalisation Nudging Model (EPNM), we propose the following conceptual framework for responsible financial behaviour (Figure 1).

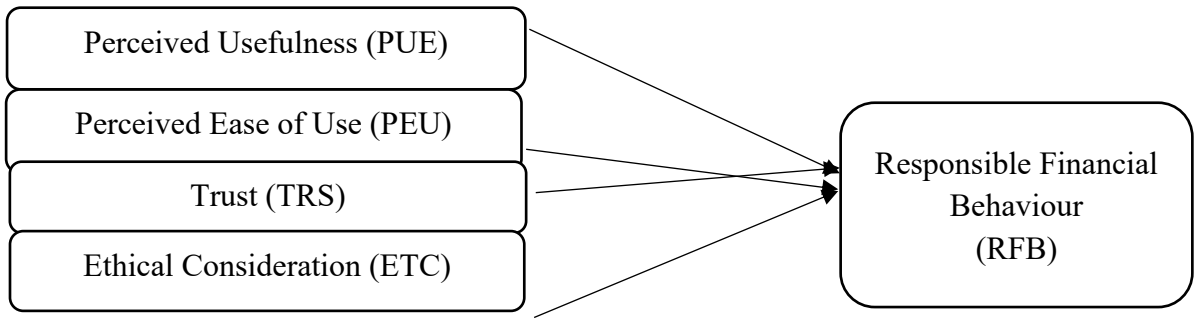

Figure 1: Ethical Personalisation Nudging Model for Responsible Financial Behaviour

Figure 1 illustrates the proposed conceptual framework integrating the Ethical Personalisation Nudging Model (EPNM) with the Technology Acceptance Model (TAM). The model proposes that Perceived Usefulness (PUE), Perceived Ease of Use (PEU), Trust (TRS), and Ethical Consideration (ETC) directly influence Responsible Financial Behaviour (RFB). Each construct appears only once in the diagram, and all four predictors are shown as direct antecedents of RFB. The proposed Ethical Personalisation Nudging Model for Responsible Financial Behaviour integrates digital nudging concepts with the Technology Acceptance Model (TAM) to explain how ethical, psychological, and technological factors interact to shape responsible financial outcomes. In this framework, digital nudging through mechanisms such as savings reminders, spending limit alerts, and personalised goal-setting directly influences user perceptions of usefulness, trust, ease of use, ubiquitous connectivity, and ethical considerations, all of which converge to promote sustainable and disciplined financial behaviour. while perceived ease of use ensures that such interventions remain intuitive and user-friendly (Krah et al., 2024; Chandani, 2025). Trust is central, as adoption depends on user confidence in financial platforms to operate transparently and securely (Gefen et al., 2003; Aldboush & Ferdous, 2023). Ubiquitous connectivity allows for seamless integration across devices and platforms, ensuring continuity in financial management (Setiawan et al., 2025). Importantly, ethical considerations grounded in Beauchamp and Childress's (2013) principles of autonomy, beneficence, non-maleficence, and justice guard against manipulative nudges and foster fairness and accountability (Meske & Amojo, 2020; Brown et al., 2023). By embedding these constructs into a unified model, this study highlights how digital nudging, when ethically designed, can significantly improve responsible financial behaviour, reduce impulsivity and fostering long-term financial resilience (Thaler & Sunstein, 2021; Chen et al., 2025).

To operationalise these principles, two common financial nudging strategies social proof nudges (e.g., peer savings comparisons, community investment groups) and spending limit nudges (e.g., daily transaction caps, overspending alerts) are evaluated as follows:

Table 2: Ethical Evaluation of Social Proof and Spending Limit Nudges in Responsible Financial Behaviour

Nudge Type	Social Proof Nudges (Finance Context)	Spending Limit Nudges (Finance Context)
Autonomy	May threaten autonomy if users feel pressured by peer comparisons (e.g., "80% of your peers saved more than you this month"). Autonomy can be protected if users are given options to disable or customise such comparisons.	Respects autonomy by allowing users to set and adjust their own daily/weekly spending caps with opt-out flexibility, ensuring nudges remain supportive rather than coercive.
Beneficence	Can motivate saving and investment by leveraging social influence (e.g., community savings challenges, peer comparisons). However, excessive pressure may lead to anxiety or counterproductive behaviour.	Encourages responsible spending, budgeting, and debt reduction. These nudges promote long-term financial well-being by reinforcing savings discipline and protecting disposable income.
Non-maleficence	Risk of increasing financial stress, guilt, or risky borrowing behaviours if users feel they are underperforming compared to peers.	Reduces harm by limiting impulsive purchases, overspending on credit cards, or unnecessary UPI transactions thus preventing debt accumulation.
Justice	May disadvantage users with smaller financial networks or lower-income groups, reinforcing inequality in financial achievement benchmarks.	Ensures fairness by applying equally across socioeconomic groups. Spending limits safeguard vulnerable users while promoting equitable access to responsible financial tools.
Contribution to Responsible Financial Behaviour (RFB)	Social proof can raise awareness and motivate initial behaviour change, but its effectiveness depends on context and cultural acceptance.	Spending limits directly improve responsible financial behaviour by promoting savings discipline, budgeting control, and debt management across all demographics.

These findings show that spending limit nudges generally score higher across all four ethical principles, making them ethically robust. Social proof nudges, while effective in driving engagement, require careful implementation such as including opt-out features and frequency limits to ensure they do not undermine autonomy or create financial harm (Thaler & Sunstein, 2021). We recommend that financial institutions and FinTech developers adopt ethical design checklists aligned with these principles during product development. Nudges should empower individuals toward financial well-being rather than exploit cognitive biases. This approach aligns with the principle of respect for persons, ensuring that persuasive financial technologies support informed, voluntary, and fair decision-making (Beauchamp & Childress, 2013; Aldboush & Ferdous, 2023).

EPNM also draws on psychological frameworks such as Dual Process Theory (Kahneman, 2011), which distinguishes between intuitive (System 1) and reflective (System 2) decision-making. Financial nudges leverage both: visual cues like "low balance alerts" appeal to System 1, while structured notifications about "long-term savings projections" engage System 2. Similarly, Self-Determination Theory (Ryan & Deci, 2000) suggests that nudges that support autonomy (customisable reminders), competence (goal-tracking), and relatedness (peer challenges) foster more ethical financial behaviours. The COM-B model (Michie et al., 2011) further highlights how nudges can enhance capability (budgeting tutorials), opportunity (access to credit tools), and motivation (gamified savings).

Research Gap

In spite of the promise of digital nudging, financial apps generally continue to use utilitarian or Western-dominated ethical schemes while ignoring cultural pluralism and long-term accountability (Carpendale, 2000). This deficiency highlights the necessity for an integrated approach that marries TAM's forecasting capability with EPNM's ethical controls. By incorporating trust, autonomy, and cultural sensitivity in financial nudging approaches, this study fills the gap concerning how digital finance can not only facilitate adoption but also responsible financial conduct across different settings.

Research Methodology

Research Objectives

The main aim of the current research is to conceptualise and empirically test an integrated model by merging the Technology Acceptance Model (TAM) with the Ethical Personalisation Nudging Model (EPNM) to describe Responsible Financial Behaviour (RFB) among Indian university students. The research specifically seeks to:

- Study the impact of (PUE), perceived ease of use (PEU), trust (TRS), and ethical factors (ETC) on students' responsible financial behaviour, such as savings discipline, budgeting, and debt management.
- Validate the explanatory ability of the extended model to predict RFB through a comparison of the efficacy of ethical and trust constructs versus conventional TAM variables.
- Discover the role of ethical positioning and disclosure in the development of trust and user adoption in online finance platforms.
- Present empirical evidence for designing financial technologies which combine usability with ethical controls, such that nudging techniques promote autonomy while encouraging responsible behaviours.

Offer practical advice for managers, policymakers, and developers to instill ethical principles into digital financial environments to foster sustainable and reliable financial conduct. (Beauchamp, 2013; Thaler & Sunstein, 2008).

Data Collection

Data were gathered using a systematic questionnaire. Participants were aged between 18-30 (Mean = x), representing digitally active university students. Participation was voluntary, and informed consent was obtained. Sent via Google Forms to a population of 310 Indian university students (around 63% male and 37% female), employing a simple random sampling technique. University students were chosen as the population for study because they are digitally active early adopters of FinTech, mobile banking, and digital payments, and so are the best subjects to observe behavioural reactions to personalized financial nudges (Venkatesh & Davis, 2000). India's FinTech market, which was worth over $50 billion in 2023 and is set to be over $150 billion by 2027 (Statista, 2023), is largely influenced by young consumers between the ages of 18-30. College-going students, who actively employ UPI applications, mobile wallets, and investment apps, were found to be extremely pertinent to study nudge effectiveness as they are highly active digitally. The cross-sectional design used in this study was appropriate for drawing associations between constructs, though it does not imply causality. Longitudinal designs could be used in future studies to verify causal relationships.

The university setting also provided a controlled environment conducive to capturing reliable behavioural data. This methodological choice is further supported by behavioural science literature suggesting that personalisation increases engagement and satisfaction, but simultaneously raises questions about ethics, privacy, and manipulation (Skinner, 1957; Festinger, 1957).

Measures

All measures were captured through validated multi-item Likert scales: 4 items for PUE, 4 items for PEU, 4 items for Trust, 4 items for Ethical Consideration, and 3 items for Responsible Financial Behaviour (RFB). Perceived Usefulness (PUE): Four items from Davis (1989) adapted to the degree of users' perception that digital financial services enhance their handling of finances. Perceived Ease of Use (PEU): Four items from TAM scales (Davis, 1989), gauging ease and effortless usage. Trust (TRS): Four items adapted from Pavlou (2003), indicating dependability, security, and privacy of personal information. Ethical Considerations (ETC): Four items derived from Beauchamp and Childress (2013), reflecting fairness, transparency, non-maleficence, and moral integrity in system design. Responsible Financial Behaviour (RFB): Three self-reported behavioural indicators, budgeting habit, debt control, and savings discipline, borrowed from consumer finance and behavioural economics literature.

User Engagement and Responsible Behaviour Metrics

For measuring user engagement, questions were administered that targeted the frequency of platform usage, comfort in adopting personalised nudges, and trust in information transparency. Responsible behaviour measures were arrived at based on actual self-reported behaviours:

- Budgeting habit (expense tracking and limiting),
- Debt management (repayment discipline and avoiding excessive borrowing),
- Savings discipline (discipline in directing income to savings).

These measures as a whole offered a behavioural operationalisation of RFB.

Measures Validation

Reliability and validity tests were performed, based on PLS-SEM analysis was conducted using SmartPLS (4.0), with 5,000 bootstrapping subsamples, and model fit was assessed using SRMR and NFI. All constructs surpassed minimum requirements: Cronbach's alpha > 0.70 and Composite Reliability (CR) > 0.80, validating internal consistency. Convergent validity was evident as all Average Variance Extracted (AVE) measures were > 0.50 (Fornell & Larcker, 1981). Discriminant validity was guaranteed through the Fornell-Larcker criterion and the HTMT ratio (<0.85), creating construct distinctiveness. Predictive power was ensured using $R^2 = 0.656$ for RFB, verifying significant explanatory power. In addition, Harman's single-factor test revealed no significant common method bias, where the initial factor explained less than 25% of variance.

Results

Reliability and Validity

Table 3: Structural Model Path Coefficients

Path	β Coefficient	p-value	Effect Size (f^2)
ETC → RFB	β = 0.407	p < 0.001	$f^2 = 0.26$
TRS → RFB	β = 0.425	p < 0.001	$f^2 = 0.29$
PEU → RFB	β = 0.098	p < 0.05	$f^2 = 0.07$
PUE → RFB	β = 0.171	p < 0.001	$f^2 = 0.11$

Reliability and Validity Tests

The work utilized Partial Least Squares Structural Equation Modelling (PLS-SEM) to evaluate the validity and reliability of the constructs in forecasting Responsible Financial Behaviour (RFB). All the constructs had good internal consistency, as Cronbach's alpha values were above the suggested value of 0.70, while Composite Reliability (CR) values were more than 0.80, affirming measurement stability (Hair et al., 2019). Convergent validity was demonstrated as the Average Variance Extracted (AVE) for every construct was more than 0.50, reflecting adequate explanatory power at the item level (Fornell & Larcker, 1981). Discriminant validity was validated using the Fornell-Larcker criterion and HTMT ratio (<0.85) such that each construct was different from others (Henseler et al., 2015). Structural findings pointed out that Ethical Considerations (ETC) (β = 0.407, p < 0.001, $f^2 = 0.26$) and Trust (TRS) (β = 0.425, p < 0.001, $f^2 = 0.29$) were the best predictors of RFB. Both measures emphasize fairness, transparency, and secure financial platforms as drivers of responsible decision-making, supporting previous studies on ethics-based technology adoption (Beauchamp & Childress, 2013; Pavlou, 2003). Perceived Ease of Use (PEU) (β = 0.098, p < 0.05, $f^2 = 0.07$) likewise had a significant but small effect, implying that handy, easy-to-use tools promote budgeting and saving behaviour. Likewise, Perceived Usefulness (PUE) (β = 0.171, p < 0.001, $f^2 = 0.11$) had a positive contribution, implying that where financial tools are perceived as functionally useful, people tend to adopt responsible behaviours.

The model captured 65.6% of RFB variance ($R^2 = 0.656$), which was a very strong explanatory power. Predictive relevance ($Q^2 > 0$) also established the robustness of the model. Common method bias was tested using Harman's single-factor test, which captured less than 25% of the total variance, showing no severe bias. These results overall confirm the validity and reliability of the constructs, providing a strong foundation for explaining responsible financial behaviour in the context of the Ethical Personalisation Nudging Model (EPNM).

Results of the Structural Model

The structural model was assessed based on Partial Least Squares Structural Equation Modelling (PLS-SEM). The findings corroborated that each of the four constructs was a significant predictor of Responsible Financial Behaviour (RFB): Ethical Considerations (ETC) (β = 0.407, **p < 0.001**, **$f^2 = 0.26$**) and Trust (TRS) (β = 0.425, **p < 0.001**, **$f^2 = 0.29$**) were the strongest predictors of responsible financial behaviour (RFB). Perceived Ease of Use (PEU) (β = 0.098, **p < 0.05**, **$f^2 = 0.07$**) also had a statistically significant but smaller effect. Perceived Usefulness (PUE) (β = 0.171, **p < 0.001**, **$f^2 = 0.11$**) contributed positively as well. The structural model explained **$R^2 = 0.656$** of the variance in RFB., which implied robust explanatory power. The effect sizes imply that ETC and TRS had the strongest impact, while PEU contributed moderately but significantly.

Measurement Model Evaluation

Reliability and validity tests showed that the measurement model was consistent with all quality standards. Cronbach's alpha ranged above 0.70, while Composite Reliability (CR) ranged above 0.80, verifying internal consistency. Average Variance Extracted (AVE) values ranged above 0.50, validating convergent validity (Fornell &

Larcker, 1981). Discriminant validity was verified using the Fornell-Larcker criterion and the HTMT ratio (<0.85), proving that constructs were empirically different. Standardized factor loadings for all items were over 0.70, additionally confirming construct reliability.

Common Method Bias

To minimize threats to common method variance, Harman's test alone is insufficient to rule out CMB (Podsakoff et al., 2012). Full collinearity: VIF values < 3.3 indicate no serious CMB (Kock, 2015). Future research may apply marker-variable techniques or temporal separation. procedural and statistical tests were utilized. Harman's single-factor test revealed that the first factor accounted for less than 25% of the total variance, which was far from the critical 50% level. Furthermore, a complete collinearity check ensured that all VIF values remained less than 3.3, which meant common method bias posed no significant threat to validity.

Interpretation

The results indicate that trust-based and ethical considerations are better predictors of sound financial conduct than TAM constructs in isolation. There is greater usage of budgeting, saving, and debt management when the platforms are fair, transparent, and secure, ensuring the ethical consideration of non-maleficence. Trust increases safety perceptions of online transactions, while ease of use and perceived usefulness guarantee usability and utility value. Collectively, these findings solidify that the addition of the Ethical Personalisation Nudging Model (EPNM) to TAM provides a richer framework to account for financial responsibility in digital environments. The research emphasizes incorporating ethical protection into nudging tactics so that interventions are compelling without being manipulative, hence enhancing long-term user interaction and sustainable financial behaviour.

The SEM Model

Figure 2 displays the Partial Least Squares Structural Equation Modelling (PLS-SEM) findings, which identify how ethical and trust-based factors, and conventional TAM dimensions, influence students' Responsible Financial Behaviour (RFB) under the Ethical Personalisation Nudging Model (EPNM) framework. The model identifies that Ethical Considerations (ETC) ($\beta = 0.407$, $p < 0.001$) and Trust (TRS) ($\beta = 0.425$, $p < 0.001$) have the highest impact on RFB. This result emphasizes that when financial platforms are seen as transparent, equitable, and reliable, students are much more likely to embrace prudent practices like budgeting, debt management, and savings restraint. The model had an explanatory power of $R^2 = 0.656$, meaning that 65.6% of the variance in RFB is explained by the four predictors. This is a marked improvement from classical TAM, where Perceived Usefulness (PUE) is supposed to be the leading driver (Davis, 1989). Rather, the findings affirm a paradigm shift towards ethical guarantee and trustworthiness as core predictors in digital finance adoption (Gefen et al., 2003). Notably, Perceived Usefulness (PUE) ($\beta = 0.171$, $p < 0.001$) and Perceived Ease of Use (PEU) ($\beta = 0.098$, $p < 0.05$) were also positively contributing, albeit their impacts were relatively weaker. This implies that intuitive design and functional advantage urge adoption, but they are not enough in the absence of the support of ethical and trust-related factors. Basically, usability is not enough to instigate responsible behaviour unless supported by fairness, transparency, and reliability. From a pragmatic viewpoint, the model proposes three coordinated strategies for financial platforms: Ethical assurance mechanisms - placing transparency elements like privacy assurances, fairness declarations, and apparent data protection measures. Trust-building interventions – establishing users' trust with robust security cues and credibility markers. User-centred design - providing intuitive ease of navigation and functional utilities to reduce behavioural hurdles.

In combination, these methods broaden TAM by integrating ethical values of autonomy, beneficence, non-maleficence, and justice (Beauchamp & Childress, 2013) into digital nudging. The results affirm that ethical framing is not simply a normative necessity but also a practical facilitator of long-term financial prudence (Meske & Amojo, 2020).

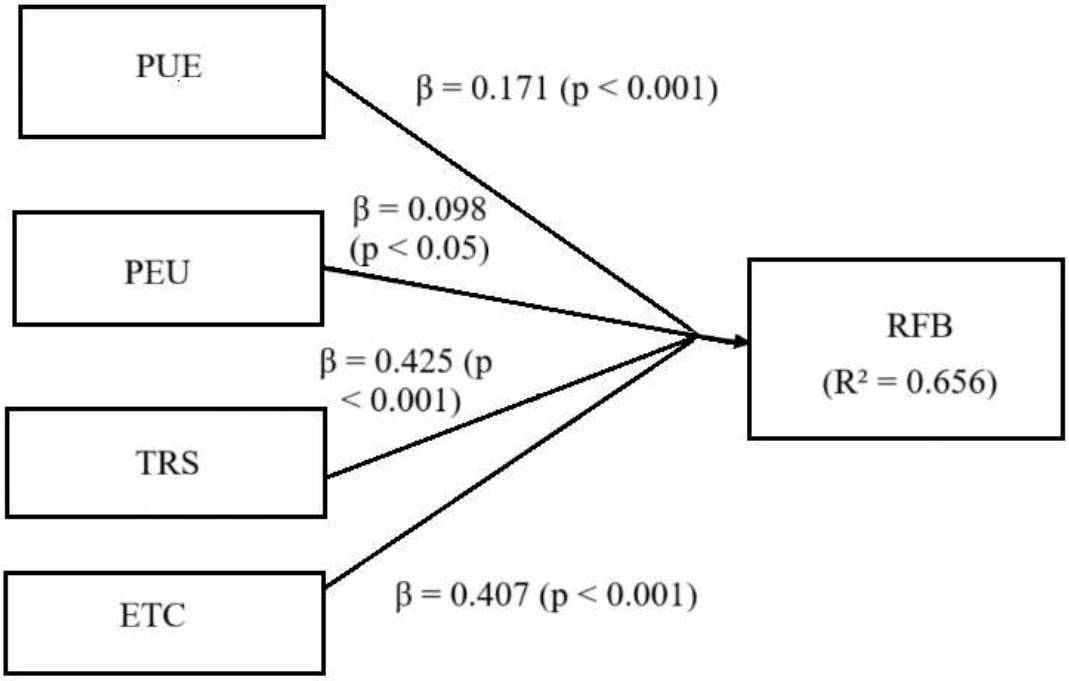

Fig.02 PLS-SEM Results for the Ethical Personalisation Nudging Model (EPNM)

Conclusion and Implications

The Technology Acceptance Model (TAM) is extended with the Ethical Personalisation Nudging Model (EPNM) to account for Responsible Financial Behaviour (RFB) by Indian students. Ethical and trust-based factors were stronger predictors of responsible behaviour than traditional TAM constructs, with explanatory power of R^2 = 0.656. The model shows that integrating ethics and trust mechanisms into financial platforms has a profound effect on behavioural responsibility, outperforming the predictive strength of conventional TAM constructs in isolation. What this means is that value alignment and moral guarantee are, as if not more critical than usability and performance in digital finance environments.

Theoretical Implications

Expansion of TAM with ethical considerations: Through the incorporation of ETC and TRS into TAM, research indicates that moral controls and trust-based assurances are at the core of financial responsibility, focusing beyond utilitarian advantage (Davis, 1989). Support of digital ethics frameworks: Results are supported by ethical tenets of autonomy, beneficence, non-maleficence, and justice (Beauchamp & Childress, 2013), proving their functional applicability in finance technology uptake. Validation of behaviour-centered models: The findings reinforce that moral heuristics and fairness perceptions are better predictors of variance in responsible behaviour than the classic cognitive predictors, reaffirming behavioural finance insights (Gefen et al., 2003). Contribution to personalised nudging scholarship: Whereas TAM long accounted for adoption, the model demonstrates how tailored, ethically worded nudges enhance intention and actual action, advancing theories of electronic persuasion.

Managerial Implications

This study also contributes to the broader agenda of responsible innovation in digital finance. The integration of EPNM with TAM demonstrates how ethical, autonomy-supportive nudges can be embedded into financial technologies without compromising user trust or transparency. For FinTech platforms, this means developing design architectures that incorporate ethical audit trails, personalised and customisable nudges, and clearly presented data-use information. Platforms may implement opt-out designs for reminders, savings suggestions, or spending alerts, ensuring that nudges support rather than manipulate financial behaviour.

From a policy standpoint, regulators such as the Reserve Bank of India (RBI) and the National Payments Corporation of India (NPCI) can incorporate ethical nudging guidelines into digital payment frameworks, focusing on transparency, fairness, and accountability. These guidelines would promote responsible innovation by

ensuring that digital platforms provide users with clear information on privacy, consent, and data governance. Implementing data transparency panels, fairness-based nudging protocols, and user-controlled preference settings can further enhance trust and long-term engagement. Collectively, these innovation-oriented implications strengthen the ethical governance of India's rapidly expanding FinTech ecosystem.

Unique Contributions

Synthesis of TAM and EPNM: The research shows that the convergence of usability, usefulness, trust, and ethics gives rise to a more robust model for responsible behaviour than either approach in isolation. Predictive hierarchy shift: In contrast to classical TAM, where usefulness takes precedence, this research identifies ETC and TRS as top predictors, reflecting a paradigm shift towards ethics-driven adoption. Operationalisation of RFB: By quantifying budgeting, saving, and debt management as behavioural impacts, the study offers an empirical, quantifiable model for other digital finance research. Contextual validation in India: The study's focus on Indian university students captures the views of a fast-digitising youth culture with high adoption and ethical consciousness.

Future Research Directions

Cross-cultural validation: It is recommended that future research investigate if ETC and TRS superiority over TAM constructs remains valid across collectivist vs. individualist cultures. Longitudinal analysis: Longitudinal tracking of behaviour might uncover if ethical trust results in long-term financial responsibility or deteriorates with extended use. Multi-group comparisons: Research into differences by age, gender, or digital literacy levels could also be conducted, as demographic factors may differentially affect ethical perceptions. Integration of other constructs: Future models might include financial literacy, government regulation, or cultural norms to expand the explanatory model. Experimental testing of nudges: Field experiments comparing various ethical nudge designs (e.g., savings targets vs. debt notifications) can confirm causal effects on financial choices.

Limitations of the Study

The study has several limitations that should be acknowledged. First, the cross-sectional design restricts the ability to draw causal conclusions, and future research may employ longitudinal or experimental approaches to examine changes in responsible financial behaviour over time. Second, the sample consists solely of Indian university students, which limits the generalisability of the findings to other demographic or cultural groups. Third, the use of self-reported measures may introduce bias despite adequate tests for common method variance. Future research may include additional behavioural, cultural or regulatory factors, but these were beyond the present scope of the current model. Lastly, perceptions of manipulative versus autonomy-supportive nudges were not specifically measured by the study, which is a major challenge for keeping digital interventions grounded in respect for user choice and free of exploitative design (Sunstein, 2015; Meske & Amojo, 2020).

References

Adams, J.S., 1963. Towards an understanding of inequity. The Journal of Abnormal and Social Psychology, 67(5), 422-436.https://doi.org/10.1037/h0040968

Amir, O., & Ariely, D. (2008). Resting on laurels: the effects of discrete progress markers as subgoals on task performance and preferences. Journal of Experimental Psychology: Learning, Memory, and Cognition, 34(5), 1158–1169. https://doi.org/10.1037/0278-7393.34.5.1158

Alter, A. L., & Oppenheimer, D. M. (2009). Uniting the tribes of fluency to form a metacognitive nation. Personality and social psychology review, 13(3), 219-235.https://doi.org/10.1177/1088868309341564

Asch, S.E., 1956. Studies of independence and conformity: I. A minority of one against a unanimous majority. Psychological Monographs: General and Applied, 70(9), 1-70.https://doi.org/10.1037/h0093718

Batson, C.D. & Shaw, L.L. (1991). Evidence for altruism: Toward a pluralism of prosocial motives. Psychological Inquiry, 2(2), 107-122.

Beauchamp, T. L. (2018). The principles of biomedical ethics as universal principles. In Islamic Perspectives on the Principles of Biomedical Ethics: Muslim Religious Scholars and Biomedical Scientists in Face-to-Face Dialogue with Western Bioethicists, 91-119.

Bayır, T., & Akel, G. (2024).Gamification in mobile shopping applications: A review in terms of the Technology Acceptance Model. Multimedia Tools and Applications, 83(16), 47247–47268. https://doi.org/10.1007/s11042-023-16823-7

Brown, A., Basson, M., Axelsen, M., Redmond, P., & Lawrence, J. (2023).Empirical evidence to support a nudge intervention for increasing online engagement in higher education. Education Sciences, 13(2), https://doi.org/10.3390/educsci13020145

Binns, R. (2018).Fairness in Machine Learning: Lessons from Political Philosophy. In Proceedings of the 1st

Conference on Fairness, Accountability and Transparency(Proceedings of Machine Learning Research, 81, 149–159). PMLR.

Bagozzi, R. P. (2007).The legacy of the Technology Acceptance Model and a proposal for a paradigm shift. Journal of the Association for Information Systems, 8(4), 244–254. https://doi.org/10.17705/1jais.00122

Couldry, N., & Mejias, U. A. (2019). Data colonialism: Rethinking big data's relation to the contemporary subject. Television & New Media, 20(4), 336-349.

Chatterjee, S., Rana, N. P., Dwivedi, Y. K., & Sharma, A. (2021). Responsible AI Adoption in Emerging Markets: Ethical UX Design in Data-Driven Applications. Information Systems Frontiers, 23(3), 697–712. https://doi.org/10.1007/s10796-020-10029-1

Carpendale, J.I. (2000) 'Kohlberg and Piaget on stages and moral reasoning', Developmental Review, 20(2), pp. 181-205.

Chen, A., Lu, Y. and Wang, B. (2017) 'Customers' purchase decision-making process in social commerce: A social learning perspective'. International Journal of Information Management, 37(6), 627-638.

Cialdini, R. B. (2003). Influence: Science and Practice(4th ed.). Allyn & Bacon.

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

Dholakia, U. M., & Morwitz, V. G. (2002).The scope and persistence of mere-measurement effects: Evidence from a field study of customer satisfaction measurement. Journal of Consumer Research, 29(2), 159–167. https://doi.org/10.1086/341568

Deterding, S., Sicart, M., Nacke, L., O'Hara, K., & Dixon, D. (2011).Gamification: Using game-design elements in non-gamingcontexts. CHI '11 Extended Abstracts on Human Factors in Computing Systems(pp. 2425–2428). https://doi.org/10.1145/1979742.1979575

Festinger, L. (1954).A theory of social comparison processes. Human Relations, 7(2), 117–140. https://doi.org/10.1177/001872675400700202

Gefen, D., Karahanna, E., & Straub, D. W. (2003).Trust and TAM in online shopping: An integrated model. MIS Quarterly, 27(1), 51–90. https://doi.org/10.2307/30036519

Gouldner, A. W. (1960).The norm of reciprocity: A preliminary statement. American Sociological Review, 25(2), 161–178. https://doi.org/10.2307/2092623

Hamari, J., Koivisto, J., & Sarsa, H. (2014).Does gamification work? A literature review of empirical studies on gamification. In Proceedings of the 47th Annual Hawaii International Conference on System Sciences (HICSS 2014), 3025–3034. IEEE. https://doi.org/10.1109/HICSS.2014.377

Hsu, C.L. and Lu, H.P. (2004). Why do people play online games? An extended TAM with social influences and flow experience,Information & Management, 41(7), 853-868.

Heatherton, T. F., & Baumeister, R. F. (1996).Self-regulationfailure: Past, present, and future. Psychological Inquiry, 7(1), 90–98. https://doi.org/10.1207/s15327965pli0701_1

Kahneman, D. (2011).Thinking, Fast and Slow. Farrar, Straus and Giroux.https://doi.org/10.1007/s00362-013-0533-y

Kluger, A. N., & DeNisi, A. (1996).The effects of feedback interventions on performance: A historical review, a meta-analysis, and a preliminary feedback intervention theory. Psychological Bulletin, 119(2), 254–284. https://doi.org/10.1037/0033-2909.119.2.254

Locke, E. A., & Latham, G. P. (2002).Building a practically useful theory of goal setting and task motivation: A 35-yearodyssey. American Psychologist, 57(9), 705–717. https://doi.org/10.1037/0003-066X.57.9.705

Lindell, M. K., & Whitney, D. J. (2001).Accounting for common method variance in cross-sectional research designs. Journal of Applied Psychology, 86(1), 114–121. https://doi.org/10.1037/0021-9010.86.1.114

Latham, G.P., Locke, E.A. and Fassina, N.E. (2002) 'The high-performance cycle: Standing the test of time', Psychological Management of Individual Performance, 5(6), 201-228.

Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995).An integrative model of organizational trust. Academy of Management Review, 20(3), 709–734. https://doi.org/10.5465/amr.1995.9508080335

Mertens, S., Herberz, M., Hahnel, U. J. J., & Brosch, T. (2022). The effectiveness of nudging: A meta-analysis of choice architecture interventions across behavioural domains. Proceedings of the National Academy of Sciences, 119(1), e2107346118. https://doi.org/10.1073/pnas.2107346118

Meske, C., & Amojo, I. (2020). Ethical guidelines for the construction of digital nudges. Proceedings of the 53rd Hawaii International Conference on System Sciences, 3928–3937.https://doi.org/10.24251/hicss.2020.480

Michie, S., Van Stralen, M. M., & West, R. (2011). The behaviour change wheel: a new method for characterising

and designing behaviour change interventions. Implementation science, 6, 1-12.

Petty, R. E., & Cacioppo, J. T. (1986).Message elaboration versus peripheral cues. In Communication and Persuasion: Central and Peripheral Routes to Attitude Change(pp. 124–205). Springer. https://doi.org/10.1007/978-1-4612-4964-1_6

Ryan, R. M., & Deci, E. L. (2000).Intrinsic and extrinsic motivations: Classic definitions and new directions. Contemporary Educational Psychology, 25(1), 54–67. https://doi.org/10.1006/ceps.1999.1020

Reeck, C., Posner, N. A., Mrkva, K., & Johnson, E. J. (2023).Nudging app adoption: Choice architecture facilitates consumer uptake of mobile apps. Journal of Marketing, 87(4), 510-528. https://doi.org/10.1177/00222429221114020

Straub, D., Loch, K., Evaristo, R., Karahanna, E., & Srite, M. (2002). Toward a theory-based measurement of culture. Journal of Global Information Management (JGIM), 10(1), 13-23.

Simon, H. A. (2000).Bounded rationality in social science: Today and tomorrow. Mind & Society: Cognitive Studies in Economics and Social Sciences, 1(1), 25–39. https://doi.org/10.1007/BF02512227

Sargolzaei, S., Mohamdi, M. and Shiran, G.R. (2021) 'Identifying the factors affecting the acceptance of technology in the municipality using the method of grounded theory',Motaleate Shahri, 10(39), 41-54.

Thaler, R. H., & Sunstein, C. R. (2008).Nudge: Improving decisions about health, wealth, and happiness. Yale University Press. https://doi.org/10.1016/S1477-3880(15)30073-6

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. Science, 185(4157), 1124–1131. https://doi.org/10.1126/science.185.4157.1124

Van Dijck, J., Poell, T., & De Waal, M. (2018). The platform society: Public values in a connective world. Oxford University Press.

Venkatesh, V., & Davis, F. D. (2000).A theoretical extension of the Technology Acceptance Model: Four longitudinal field studies. Management Science, 46(2), 186–204. https://doi.org/10.1287/mnsc.46.2.186.11926

Verma, V., Sharma, D. and Sheth, J. (2016) 'Does relationship marketing matter in online retailing? A meta-analytic approach',Journal of the Academy of Marketing Science, 44, pp. 206-217.

Wang, C., Cui, W., Zhang, Y., & Shen, H. (2022).Exploring short video apps users' travel behaviour intention: Empirical analysis based on the SVA-TAM model. Frontiers in Psychology, 13, Article 912177. https://doi.org/10.3389/fpsyg.2022.912177

Wang, R., Bush-Evans, R., Arden-Close, E., Thomas, S., Hodge, S., McAlaney, J., Bolat, E., & Phalp, K. T. (2021).Transparency in responsible gambling: A systematic review. EROGamb 2 Systematic Review. https://doi.org/10.1007/s41463-021-00107-y

Weinmann, M., Schneider, C., & vom Brocke, J. V. (2016).Digital nudging. Business & Information Systems Engineering, 58(6), 433–436. https://doi.org/10.1007/s12599-016-0453-1

Zhang, L., & Chen, H. (2024). Personalization and player well-being: Balancing engagement and ethics in online games. Computers in Human Behaviour, 152, 108056