# TECHNOLOGY, TRUST, AND NEUROSCIENCE: EXPLORING FINTECH ADOPTION AMONG GEN X IN INDIA THROUGH A SOCIO-CULTURAL LENS

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## ABSTRACT

*Digital finance is transforming the economies of emerging markets, although the degree of adoption is vastly different across demographic groups. This study explores Generation X's views from the context of urban India towards FinTech adoption and considers the moderating role of neuromarketing to examine these views. The study was developed off technology adoption models and supplemented with interdisciplinary views related towards cultural cognition, social identity, sociotechnical systems, and diffusion of innovation. Generation X is positioned as a strategic case to study technological adoption, and a structured survey was used to collect data. Analysis was through Structural Equation Modelling (SEM) and moderated analysis was with the PROCESS Macro. Findings, in short, suggest that perceived usefulness, perceived ease of use, and trust are strong predictors of FinTech adoption for Generation X and subjective norm and attitudes were comparatively weaker predictors. Neuromarketing was identified as a strong moderator to predict FinTech adoption and involved the importance of the subconscious cognitive and emotional responses to financial decision-making. The discussion suggests the duality of neuromarketing in that despite its capacity to build human agency through a culture of inclusivity and trust, ethical risks exist by being manipulative. This study connects to the literature and frames adoption with neuromarketing and cultural approaches.*

# 1. INTRODUCTION

Digital finance has become a symbol of the economic upheaval of the twenty-first century (Dafri & Al-Qaruty, 2023). The transformation is of increasing importance in emerging markets where the leapfrogging of existing financial and social structures has gained momentum. Digital finance, once the purview of banks and formal institutions, has now entered all manner of digital platforms and has provided new forms of payment, loan, and investment mechanisms (C. Li et al., 2023). FinTech is not simply the matter of technology, it is a transformation of life in most instances. Due to the financial aspect of FinTech applications that deliver finance to mobile phones and online platforms, they are expanding economic access for individuals and increasing entrepreneurial activity while reducing the reliance on cash (Alsharif & Mohd Isa, 2024). In contexts of stark inequality, questions of inclusion, access, and trust arise at the same time.

The disruptive possibilities of FinTech are often framed through an inclusion lens mobile money, digital wallets, and credit-based apps offer ways in, particularly for those groups that have previously been excluded from formal banks and similar systems (Khondakar et al., 2024). The payoffs are not equally distributed. The persistence of the digital divide defined by income, education, and geography suggests that groups will adopt and access digital spaces at various paces (C. Li et al., 2023). Equally pressing is the question of cognitive access; there are uneven perceptions of value, understanding, access, and trust with digital interfaces, which can clearly affect whether a person will consider FinTech adoption (Mu et al., 2023). Digital natives have relatively little trouble moving in and out of FinTech practices, while older cohorts must navigate their discomfort managing the unfamiliar, often forced to reconcile financial behaviours, norms, and practices they've been accustomed to for some time (Mashrur et al., 2022). These dynamics show that the adoption of FinTech practice includes overlapping identities cultural fit and generational, not only technical access.

In this context, Generation X is introduced. Generation X are people born sometime in the early 1960s through to the late 1970s. They did not grow up during the time of computers, but have adapted to the changes in technology, which is essential to FinTech (Tirandazi et al., 2023). In India, generation X makes up a large segment of the workforce and a person who likely participates in family systems with financial decisions. They possess a high degree of pragmatism with a conservative risk attitude have grown up in both the analog, and digital world, thereby creating what

we are labelling as the bridge generation. It is, therefore, important for FinTech companies to know what Gen X's has attitude towards digital finance. They are not digital rejectors on behalf of the elders, they are not unreflective adopters on behalf of younger workers, but they live in a space of acceptance with doubts (Neves & Mead, 2020). Therefore, they are a rich case to explore how the cultural, cognitive and social ways of understanding the world mediate financial technology such as FinTech.

To understand these dynamics requires expanding beyond the accepted technology acceptance models. The Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) explain adoption primarily in terms of perceived usefulness, perceived ease of use, and social influence. Certainly, from an educational technology perspective, these are important but only explain a small percentage of the cultural basis and neuro-cognitive underpinnings of financial choice (Aytekin et al., 2022). More precise lenses can be identified in interdisciplinary theories.

As Cultural Cognition Theory infers, people perceive new information in ways that reconfirm their worldview and culture. Lastly, for Gen-X in India, every financial decision will be filtered through shared memories of economic mess, bank trust, and risk aversion (Johnson & Swedlow, 2020). Gen-X's reaction related to FinTech is more in terms of cultural inclinations towards pragmatism, security and stability in broader social contexts, rather than for reasons of utilitarian cost-benefit analysis. Thus, it should be no surprise that values of perceived safety, transparency, trust were so prominent in the financial decision making related to FinTech adoption.

Social Identity Theory suggests that some of people's decisions will also be about groups identity or membership, as is the case in every decisions to engage in FinTech (Hogg, 2016). Again, in this scenario, membership by generation matters Gen X may see engaging in FinTech to bring themselves to the leading edge of younger generations' engagement but also as a means of signifying themselves as not succumbing to the pressures to change how they 'do' personal finance. As such, there is meaning in FinTech engagement, or identity form of meaning, which connects the engagement of Gen X to socio-political forms. In collectivist cultures, such as India, family and peer networks of sociality enhance social cues of identity signalling which all contribute to attitudinal shaping, identify formation, and engagement within and across digital finance generations.

From a systems perspective, Sociotechnical Systems Theory reflects it is not possible to think about

technologies anything other than part of the social and organizational context they exist in. Gen X engagement in FinTech speaks to the intersection of technology design, institution trust, and social-cultural expectations (Appelbaum, 1997). Even where the technology itself works well, if the interface is too complex to understand, regardless of the comprehensiveness of the regulatory environment in which digital finance occurs, and the trust mechanisms such as insurance or safety are not too faltering, the odds of the interaction occurring at all, never mind increasingly adopting FinTech will be poor (Xu et al., 2022). This underscores the value of designing FinTech systems that align with the sociocultural contexts of the people for whom they are designed.

When thinking about how culture and context of environment influence patterns innovation adoption, the Diffusion of Innovation Theory is useful (Dearing, 2009). An innovation will diffuse based primarily on relative advantage but also according to social influence and that diffusion will happen at differential rates of diffusion, across contexts. In collectivist societies, patterns of adoption rely on affirmations of acceptance by networks which are significant in the society. Generation X in India will adopt FinTech technologies in a different way than a western context influenced by peer acceptance as well as cultural stories regarding advancements and legitimacies of institutions. The emerging field of neuromarketing provides a dual lens on consumer behavior because it examines alongside behavior, the unconscious emotional and cognitive processes. Neuromarketing suggests decision-making is heuristic and emotional rather than rational in a conventional sense (Lyons & Kass-Hanna, 2021). If we reckon neuromarketing behavior in concert with cultural neuroscience and neuro-sociology we can observe financial behavior as a process situated biologically and culturally (Mu et al., 2023). The role of FinTech as part of Gen X's financial behavior will therefore be pivotal for understanding both instrumental decisions made about utility and examining deeper sociocultural scripts, or emotional reactions to perceived risk and the meanings we assign to the term money.

The various arguments across different fields of study suggest that Generation X's FinTech adoption is much more than simply thinking through the available technological utility or just a rational choice. It is complex and is likely driven by a multi-layered sociotechnical context, collective generational identity, cultural cognition, or potentially even some unconscious-neuro-cognitive system response (Bhardwaj et al., 2023). Each of these arguments adds greater depth and richness when viewed through a frame of reference that is particular to Indian context. As one of the fastest growing FinTech markets in the world, India has the potential to lead in digital inclusion while negotiating the equally complicated nuances of inclusion (Khondakar et al., 2024). In terms of policy, understanding the FinTech adoption processes of Generation X will be critical in terms of attempting to expand socially inclusive digital activity beyond generational focused considerations. Furthermore, this is a powerful consideration for FinTech firms when it comes to developing services and messaging that connect with cultural sentiments and cognitive realities. This leads to the development of two basic research questions for the current inquiry (1) What are the perceptions of Indian Generation X regarding FinTech adoption? and (2) Does neuromarketing play a role in influencing those perceptions through moderation? These questions will allow the research to add to three separate bodies of literature regarding technology adoption, cultural cognition of financial behavior, and neurocognitive approaches to consumer behavior.

## 2. LITERATURE REVIEW

### 2.1. Theoretical Underpinning

Though mainstream adoption frameworks like the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) explain FinTech adoption by considering perceived usefulness, ease of use, and social influence, they neglect how cultural and identity-related factors may play a role in decision making (Aytekin et al., 2022). Culturally Cognition Theory argues that actors encode information through a culturally based viewpoint which in Indian Gen X, is premised on values of security, pragmatism, and wariness (Johnson & Swedlow, 2020). The position that senses of trust, security, and stability hold in their FinTech adoption becomes clear within this cultural prism. Similarly, Social Identity Theory is evocative that generation-based orientation concerns the self about other groups. For Gen X, accepting or rejecting FinTech entails association with the new digital nomad-type generations or persistence in identification with older, traditional paradigms (Alsharif & Mohd Isa, 2024). In a collectivist culture of India, these identification-recognition processes are also reinforced through peer group and family ties, so the process of adoption is therefore socially situated rather than wholly individualistic choice.

More systemic theories complement this view. Sociotechnical Systems Theory highlights that technologies are adopted not alone, but as part of an interaction among technical design, organisational form and cultural context, we can observe reluctance to adopt even technically feasible innovations where all

three of these components fall out of sync (Appelbaum, 1997). The Diffusion of Innovation Theory also serves to remind us that innovations have adoption curves which are all but predetermined by belief system cultures peer suggestions and suggesting third parties are weighted heavily in individual adoption decisions in collectivist cultures (Dearing, 2009; Murad et al., 2025). In the process, neuromarketing taps into the unconscious or affective drivers associated with consumer choice and partners with cultural neuroscience and neuro-sociology to enhance the idea that cognitive responses of consumers are socially validated and culturally reliable. Combined, these multidisciplinary perspectives advance a unifying lens through which we can analyze Gen X's FinTech adoption as a socially mediated, cognitively advanced, and culture-embedded attempt.

## 2.2. Perceived Usefulness and Perceived Ease of Use

Perceived use is prospective user's subjective probability that using a specific application system will increase his or her job performance within an organizational context (Tubaishat, 2018). While perceived ease of use is degree to which the prospective user expects the target system to be free of effort (Romero-Rodríguez et al., 2023). Numerous studies have used these factors to identify the drivers of information technology adoption (Arghashi & Yuksel, 2022) replicated the existing theories to examine the adoption of mobile payment among young people. They confirmed significant influence of perceived usefulness on intention to use m-payment. Similarly, Feng et al. (2022) found that perceived ease of use and perceived usefulness are the key drivers of mobile money adoption. Daragmeh et al. (2021) conducted a study aimed at understanding the factors affecting users' attitudes towards usage of mobile banking. The results indicated that consumers are inclined to utilize mobile banking when they perceive it to be advantageous and user-friendly. Moreover, Mu et al. (2023) proposed a conceptual model for understanding the factors affecting users' adoption behavior of mobile payment services. They posited that perceived usefulness and ease of use impact the intention to use mobile payments services. In consonance with previous studies, we propose that
HI: Perceived Usefulness has a positive influence on perception of Gen X towards FinTech adoption.
H2: Perceived ease of use has a positive influence on perception of Gen X towards FinTech adoption.

## 2.3. Subjective Norms

Subjective norms are person's subjective belief that most of his 'important others' think that he should behave in a specific way (X. Li et al., 2023). Subjective norms are not included as influencing factor in the original iteration of TAM. However, Anderson (2023) extended TAM for including subjective norms attributed as social influence process. Harjadi and Gunardi (2022) confirmed that subjective norms moderate the impact of users' perceived risk on their intention to use. Further, Xu et al. (2022) argued that during introductory stages, when potential adopters have limited direct experience with a new technology, they are more likely to look to the advice of people they trust to support them in their adoption intentions. Likewise, Izquierdo-Yusta et al. (2022) conjectured that during the diffusion of technology, subjective norms become more prominent and exert a significant influence on both behavioural intention to use and perceived usefulness. Moreover, Roh et al. (2022) documented that in a collectivist culture, individuals pay more emphasis on the opinion of others. Accordingly, in a collectivist economy like India, subjective norms are likely to affect the adoption of Fintech. To explore this further, the following hypothesis has been offered.
H3: Subjective norms have a positive influence on perception of Gen X towards FinTech adoption.

## 2.4. Trust

Trust is an important but difficult element to explain in virtual environments (Roh et al., 2024). The extant literature has defined trust from numerous perspectives. Devlin et al. (2025) defined trust from behavioural perspective as "predisposition of one party to be vulnerable to the actions of the other party based on the hope that the other will perform a particularly important action for the one who trusts, independently of the ability to monitor or control the other". In E-commerce, Lyons and Kass-Hanna (2021) stated trust as the belief that permits consumers to voluntarily expose themselves to online retailers after considering the characteristics of retailers. From business point of view, Mu et al. (2023) elucidated it as buyer-seller relationships as the perception by a prospective buyer of credibility and benevolence in the target of trust. Che Hassan et al. (2024) documented that trust becomes intricate in environments like m-commerce and e-commerce owing to information asymmetry and uncertain environment. The buyers do not meet each other and remain worried about transfer of their money and personal information to third party without their knowledge (Alshari & Lokhande, 2022). Since the influence of trust in perception towards FinTech adoption is hard to be ignored; the study hypothesizes.
H4: Trust has a positive influence on perception of Gen X towards FinTech adoption.

### 2.5. Attitude

Attitude is an expression of a person in favour of an object or a concept in a situation (Lyons & Kass-Hanna, 2021). Zhang et al. (2023) empirically confirmed the effect of users' attitude on their intentions to adopt technology. Similarly, Rahman et al. (2024) argued that attitude is an evaluative belief about a particular conduct and has been proven to affect behavioural intentions. In the context of cloud computation, Murad (2025) observed that a user having positive attitude regarding management of company data in the cloud environment is more likely adopt cloud. Mu et al. (2023) also documented attitude as a strong predictor of students' inclination to utilize E-learning. Furthermore, scholars in an examination of factors influencing customers' acceptance of hotels' technology-based innovations concluded that attitude towards technology has a significant influence on the booking intentions of consumers. Accordingly, the study hypothesizes.

H5: Attitude has a positive influence on perception of Gen X towards FinTech adoption.

### 2.6. Neuromarketing

Neuromarketing is the fusion of consumer behaviour research & neuroscience, and is the latest tool used by marketing researchers to analyse consumer behaviour (Alsharif et al., 2023). Casado-Aranda et al. (2023) concluded that neuromarketing tools influence the effectiveness of advertising campaigns to impact consumers in online retailing. For instance, Singh et al. (2023) identified the most desired automotive brand applying video advertisements and using electroencephalography (EEG). Further, predicting consumer preference for shoe products, Bhardwaj et al. (2023) noted that predictions based on brain scans may yield greater accuracy compared to those based on self-reports. Likewise, Mashrur et al. (2022) documented that including human right-related concept in advertisement elicits empathy and enhances willingness to pay among consumers. Scholars also used ERP analysis to examine the impact of product description on consumer decision in online shopping. The study found that while positive framing resulted in less difficult decision making and increased purchase intention, negative framing attracted more attention. In the current innovative era, every industry needs a unique kind of marketing that links companies with their target markets, conforms to industry-specific laws and regulations, and establishes brands. The FinTech sector is no exception (Feng et al., 2022); accordingly, there is a need to transfer the incredible results of Neuromarketing to the Fintech sphere. Consequently, the study hypothesizes.

H6: Neuromarketing influences Gen X perception towards FinTech adoption.

## 3. METHODOLOGY

### 3.1. Population and Data Collection

The purpose of the present empirical work is to explore the factors which influence the acceptance of fintech amongst Gen X through empirical investigation. The population who participated in the present investigation are members of Generation X, implying individuals who were born between 1965 and 1980. Generation X in Indian urban settings was deliberately chosen as the focal population for this study. Urban Gen X constitutes a critical segment of financial decision-makers they are established in their careers, actively manage household finances, and are exposed to both traditional banking systems and rapidly expanding digital alternatives. Unlike younger cohorts, their adoption of FinTech is not automatic, but involves negotiating trust, usability, and perceived risk making them a revealing group for studying cultural and cognitive dimensions of technology adoption. Delhi, as one of India's most digitally connected metropolitan regions, provides a rich environment where FinTech services are widely available, but adoption remains uneven across demographic strata. Examining Gen X in this setting thus allows the study to capture how cultural identity, social positioning, and cognitive accessibility interact with technological diffusion in an emerging economy context.

A stratified convenience sampling method was adopted to gather the requisite data and for ensuring the representativeness and generalizability of the results. To accomplish this, data was collected from all eleven districts or zones of Delhi as mentioned by Government of NCT Delhi. To do this, the Generation X population was bifurcated into appropriate strata basis numerous demographic variables like age, income, education, and profession. The adapted online questionnaire was circulated to nearly 850 respondents. Following an initial screening process, 671 legit responses were considered fit for further analysis, implying an effective response rate of 79%. All the invalid and uncompleted responses were excluded. The chosen sample size was tested for sample adequacy and found satisfactory for investigating relationships amongst identified variables. The descriptive information of the respondents is mentioned in Table 1. The initial analysis revealed that 70% of the respondents were male and 30% were females. Out of the total 671 respondents, 11.11% percent are earing income between 20K-35K monthly, 26% between 35K - 50K, and 43% between 50K-65K while 18% are earning

income above 65K. The analysis of the education profile of the respondents revealed that 15 % of the respondents were high school graduates, 43% are college graduates, and 23.54 are postgraduates while 18.25 have pursued professional education.

*Table 1: Descriptive Statistics of Respondents.*

| Demographic Variable | Category | Frequency | Percentage |
|---|---|---|---|
| Gender | Male | 470 | 70 |
| | Female | 201 | 30 |
| Education | Schooling | 101 | 15.01 |
| | Graduate | 290 | 43.21 |
| | Postgraduate | 128 | 23.54 |
| | Professional | 122 | 18.25 |
| Profession | Government Employee | 75 | 11.11 |
| | Private Sector Employee | 267 | 39.79 |
| | Profession | 145 | 21.60 |
| | Entrepreneur | 184 | 27.42 |
| Income | 20K – 35K | 75 | 11.11 |
| | 35K -50 K | 180 | 26.82 |
| | 50K- 65K | 290 | 43.21 |
| | Above 65K | 126 | 18.77 |

## 3.2. Questionnaire Development

The authors incorporated a few theoretical frameworks and models from the domains of technology adoption, consumer behaviour, and prior studies to develop a customized questionnaire that investigates the factors impacting the adoption of fintech among Generation X. The adapted questionnaire has two sub sections namely A and B. Sub-section A comprises of demographic questions like gender, age, education, profession and income. Sub-sections B comprises of construct wise questions for each dependent and independent variables. Every measuring variable had an item that was represented by a five-point Linkert scale. The instruments of the study are presented in Appendix A.

## 4. RESULTS

### 4.1. Scale Validity and Reliability

The proposed model was verified using confirmatory factor analysis, which involved tests of discriminant validity, convergent validity, and internal consistency reliability.

*Table 2: Results of Measurement Model.*

| Construct | Items | Factor Loading | CA | CR | AVE |
|---|---|---|---|---|---|
| Perceived Usefulness | PEUS1 | 0.712 | 0.803 | 0.816 | 0.549 |
| | PEUS2 | 0.676 | | | |
| | PEUS3 | 0.741 | | | |
| Perceived Ease of Use | PEOU1 | 0.621 | 0.811 | 0.882 | 0.539 |
| | PEOU2 | 0.713 | | | |
| | PEOU3 | 0.783 | | | |
| | PEOU4 | 0.677 | | | |
| | PEOU5 | 0.824 | | | |
| Trust | TT1 | 0.693 | 0.721 | 0.829 | 0.629 |
| | TT2 | 0.896 | | | |
| | TT3 | 0.686 | | | |
| Attitude | AT1 | 0.789 | 0.849 | 0.888 | 0.631 |
| | AT2 | 0.819 | | | |
| | AT3 | 0.793 | | | |
| | AT4 | 0.823 | | | |
| | AT5 | 0.699 | | | |
| Subjective Norms | SN1 | 0.657 | 0.851 | 0.889 | 0.631 |
| | SN2 | 0.738 | | | |
| | SN3 | 0.911 | | | |
| | SN4 | 0.893 | | | |
| Fintech Adoption | FA1 | 0.764 | 0.809 | 0.859 | 0.531 |
| | FA2 | 0.709 | | | |
| | FA3 | 0.869 | | | |

The degree of consistency or stability of the measurement outcomes, which shows the

dependability of the questionnaire items, is referred to as reliability. The present study investigated the data's internal consistency using statistics of Cronbach's alpha (CA) and composite reliability (CR). According to Fornell and Larcker's recommendations, the sample's CR and Cronbach's alpha must both be more than 0.7 and 0.8, respectively to be reliable and consistent. Following table presents the statistics, where the findings of average variance extracted (AVE) were found above 0.50. Since the statistics are above the minimum benchmark, the proposed model can be used for further analysis. The findings are presented in Table 2.

### 4.2. Regression Analysis using Structural Equation Modelling

The ability to assess both observed and hidden variables is a key advantage of the SEM approach when compared to traditional statistical methods. This makes it possible to determine subtle causal relationships between multiple constructs. The SEM approach has been suggested for complicated data analysis study because of its ability to capture measurement errors while analysing several variables at once. Giving a thorough understanding of the relationships between many features is the aim of this method. SEM is used to determine whether a model is appropriate given the samples that were obtained. The statistical p-values for the variables like perceived usefulness, perceived ease of use, and trust are below 0.001, according to the Table 3. Therefore, the study's findings support the following hypotheses: H1: perceived usefulness has a substantial influence on fintech adoption. H2: Perceived Ease of Use has a substantial influence on fintech adoption; and H4: trust has a substantial influence on fintech adoption. The p values are not supported for the other independent variables like attitude and subjective norms.

#### Table 3: Results of Path Analysis.

| Route/ Path | Estimate | SE. | CR. | p-Value | Result |
|---|---|---|---|---|---|
| FA <--- PEUS | .431 | .070 | 6.99 | .001** | Supported |
| FA <--- PEOU | .089 | .051 | 2.05 | 0.03** | Supported |
| FA <--- AT | .052 | .041 | 1.41 | .171 | Not Supported |
| FA <--- SN | -.031 | .061 | -.39 | 0.72 | Not Supported |
| FA <--- TT | .189 | .049 | 3.91 | .001** | Supported |

The values of goodness-of-fit indices stood as 0.904, 0.921, and 3.433 against GFI, CFI, and CMIN respectively. While the minimum thresholds for goodness of fit models like GFI, CFI and CMIN are >.80, >0.90 and as high as 5.0 respectively. The threshold value of badness of fit model RMSEA should be between 0.08 to 0.10 whereas the achieved value stood as 0.067. The goodness of fit model indices is above the minimum threshold limits while the badness of fit model index is below the maximum limit. The findings of fit indices are reported in Table 4.

#### Table 4: Models of Fit Indices.

| Fit Index | Goodness of Fit Index (GFI) | Comparative Fit Index (CFI) | Chi-Square Degrees of Freedom | Root Mean Square Error of Approximation |
|---|---|---|---|---|
| Minimum Recommended Value | >0.80 | >0.90 | As high as 5.0 | between 0.08 to 0.10 |
| Achieved Value | .904 | .921 | 3.433 | 0.067 |

### 4.3. Analysing Moderating Role of Neuromarketing

Another objective of the current research work is to investigate the moderating role of neuromarketing using Process Macro given by Andrew F. Hayes. Table 5 displays the results of moderating role of neuromarketing in regards of fintech adoption. The value of interaction effect of neuromarketing for fintech adoption comes out to be -0.13031 with f and t statistics equal to 236.7 and 3.02 respectively with 0.000000001 and 0.00369 as significance values. Since the statistical value of f and t are above the prescribed threshold limits, moderating effect is significant. The result from the moderation analysis presents a significant positive role of neuromarketing on fintech adoption. The findings of moderating variables are presented in Table 5.

#### Table 5: Moderating Results.

| Independent Variable | Dependent Variable | Moderator | F value | Significance | T value | Significance | Interaction Beta |
|---|---|---|---|---|---|---|---|
| Determinants of Fintech Adoption | Fintech Adoption | Neuromarketing | 236.7 | 0.000000001 | 3.02 | 0.00369 | 0.13031 |

## 5. DISCUSSION AND CONCLUSION

This study aimed to better understand Generation X's attitude toward FinTech adoption in India with the moderating influence of neuromarketing in mind. The results indicate strong predictive contributions of perceived usefulness, ease of use, and trust, while attitude and subjective norms had weaker contributions within the Generation X segment. The results replicated findings within the technology adoption literature, but the findings offer insight into generational and cultural perspectives (Dafri & Al-Qaruty, 2023). Generation X considers adoption not merely a convenience, but rather an experience-based evaluative process influenced by scepticism, pragmatism, and choice (C. Li et al., 2023). Furthermore, neuromarketing serves a moderating purpose for testing the relationship between rational evaluation and unconscious effect on decision-making (Alsharif et al., 2023).

The findings of this study are aligned with previous research which highlighted that Fintech adoption has become important for the modern generation to improve their capabilities and utilize the resources (Casado-Aranda et al., 2023). Furthermore, the studies also reported that the financial choices of the modern generation are based on the mental decisions that are important (Singh et al., 2023). Based on these choices, people feel more comfortable to work and align themselves with the social culture. The Generation X of Indian society is more inclined towards the benefits of financial choices, and marketers can target their financial choices for this purpose. Neuromarketing also reveals that financial choice is influenced by emotional cues, mental decisions, and cultural scripts. It is especially relevant for Generation X because they straddle the unique role of adapting or adopting digital finance after coming of age prior to its onset (Bhardwaj et al., 2023). They may consider the operational capabilities of FinTech in their lives, but there must be a level of belief in the cues of trustworthiness and emotional familiarity in selecting this technology. To sum up, the findings of this research are aligned with previous studies which contributed significantly to the body of knowledge. Similarly, this research also has significant contribution for literature and practice.

## 6. IMPLICATIONS AND SIGNIFICANCE OF THE STUDY

The study carries important real-world implications for FinTech firms, policymakers and designers. First, researchers will need to advocate for neuromarketing research to inform inclusive technology design. By designing platforms that consider various levels of digital literacy and cognitive inclusivity will provide companies assurances that financial inclusion is meaningful and ultimately equitable. Second, building trust should be primary as it is a precondition for sustainable technology adoption. Trust-building will require integrating transparency, trust signals, and spaces for empathetic conversation into the design structure, as well as regulating. Third, ethical considerations are necessary with respect to neuromarketing. Regulators and others in the industry space must design regulations and standards that protect users from potentially manipulative techniques, while simultaneously maximizing the users' ability to question manipulation and act. Finally, should FinTech uptake be positioned within a broader social development agenda, then stakeholders in the social development agenda will be able to rethink how FinTech uptake is approached, moving from a short-term uptake approach to a long-term wellbeing approach. This shift links financial inclusion via digital finance to inclusive growth and transformative social change.

## 7. LIMITATIONS OF THE STUDY

Although this research has contributed significantly to the body of knowledge. While perceived risk an additional significant factor influencing FinTech adoption is not included in the present study which serves a major limitation. Confronting perceived advantage and perceived danger would be made possible by including perceived risk in the analysis. It would be fascinating to undertake research on Generation Z and Y, in addition to the current group of respondents in the future studies, focusing on perceived risk. Future studies could improve the generalizability by involving a greater number of participants, as the current study had limitations associated with its exploratory technique.

## REFERENCES

Alshari, H. A., & Lokhande, M. A. (2022). The impact of demographic factors of clients' attitudes and their intentions to use FinTech services on the banking sector in the least developed countries. Cogent Business & Management, 9(1), 2114305. https://doi.org/10.1080/23311975.2022.2114305

Alsharif, A. H., & Mohd Isa, S. (2024). Revolutionizing consumer insights: the impact of fMRI in neuromarketing research. Future Business Journal, 10(1), 79. https://doi.org/10.1186/s43093-024-00371-z

Alsharif, A. H., Salleh, N. Z. M., Abdullah, M., Khraiwish, A., & Ashaari, A. (2023). Neuromarketing Tools Used in the Marketing Mix: A Systematic Literature and Future Research Agenda. SAGE Open, 13(1), 21582440231156563. https://doi.org/10.1177/21582440231156563

Anderson, J. R. (2023). The role of subjective norms in developing entrepreneurial intentions in university students. Journal of Strategy and Management, 16(4), 643-653. https://doi.org/10.1108/JSMA-10-2022-0190

Appelbaum, S. H. (1997). Socio-technical systems theory: an intervention strategy for organizational development. Management Decision, 35(6), 452-463. https://doi.org/10.1108/00251749710173823

Arghashi, V., & Yuksel, C. A. (2022). Interactivity, Inspiration, and Perceived Usefulness! How retailers' AR-apps improve consumer engagement through flow. Journal of Retailing and Consumer Services, 64, 102756. https://doi.org/10.1016/j.jretconser.2021.102756

Aytekin, A., Özköse, H., & Ayaz, A. (2022). Unified theory of acceptance and use of technology (UTAUT) in mobile learning adoption: Systematic literature review and bibliometric analysis. COLLNET Journal of Scientometrics and Information Management, 16(1), 75-116. https://doi.org/10.1080/09737766.2021.2007037

Bhardwaj, S., Rana, G. A., Behl, A., & Gallego de Caceres, S. J. (2023). Exploring the boundaries of Neuromarketing through systematic investigation. Journal of Business Research, 154, 113371. https://doi.org/10.1016/j.jbusres.2022.113371

Casado-Aranda, L.-A., Sánchez-Fernández, J., Bigne, E., & Smidts, A. (2023). The application of neuromarketing tools in communication research: A comprehensive review of trends. Psychology & Marketing, 40(9), 1737-1756. https://doi.org/10.1002/mar.21832

Che Hassan, N., Abdul-Rahman, A., Ab. Hamid, S. N., & Mohd Amin, S. I. (2024). What factors affecting investment decision? The moderating role of fintech self-efficacy. PLoS One, 19(4), e0299004. https://doi.org/10.1371/journal.pone.0299004

Dafri, W., & Al-Qaruty, R. (2023). Challenges and opportunities to enhance digital financial transformation in crisis management. Social Sciences & Humanities Open, 8(1), 100662. https://doi.org/10.1016/j.ssaho.2023.100662

Daragmeh, A., Lentner, C., & Sági, J. (2021). FinTech payments in the era of COVID-19: Factors influencing behavioral intentions of "Generation X" in Hungary to use mobile payment. Journal of Behavioral and Experimental Finance, 32, 100574. https://doi.org/10.1016/j.jbef.2021.100574

Dearing, J. W. (2009). Applying Diffusion of Innovation Theory to Intervention Development. Research on Social Work Practice, 19(5), 503-518. https://doi.org/10.1177/1049731509335569

Devlin, J. F., Roy, S. K., Sekhon, H., Moin, S. M. A., & Sahiner, M. (2025). Trust and FinTech: A review and research agenda. Electronic Markets, 35(1), 62. https://doi.org/10.1007/s12525-025-00803-w

Feng, S., Zhang, R., & Li, G. (2022). Environmental decentralization, digital finance and green technology innovation. Structural Change and Economic Dynamics, 61, 70-83. https://doi.org/10.1016/j.strueco.2022.02.008

Harjadi, D., & Gunardi, A. (2022). Factors affecting eco-friendly purchase intention: subjective norms and ecological consciousness as moderators. Cogent Business & Management, 9(1), 2148334. https://doi.org/10.1080/23311975.2022.2148334

Hogg, M. A. (2016). Social Identity Theory. In S. McKeown, R. Haji, & N. Ferguson (Eds.), Understanding Peace and Conflict Through Social Identity Theory: Contemporary Global Perspectives (pp. 3-17). Springer International Publishing. https://doi.org/10.1007/978-3-319-29869-6_1

Izquierdo-Yusta, A., Martínez–Ruiz, M. P., & Pérez–Villarreal, H. H. (2022). Studying the impact of food values, subjective norm and brand love on behavioral loyalty. Journal of Retailing and Consumer Services, 65, 102885. https://doi.org/10.1016/j.jretconser.2021.102885

Johnson, B. B., & Swedlow, B. (2020). Comparing cultural theory and cultural cognition theory survey measures to each other and as explanations for judged risk. Journal of risk research, 23(10), 1278-1300.

Khondakar, M. F. K., Sarowar, M. H., Chowdhury, M. H., Majumder, S., Hossain, M. A., Dewan, M. A. A., & Hossain, Q. D. (2024). A systematic review on EEG-based neuromarketing: recent trends and analyzing techniques. Brain Informatics, 11(1), 17. https://doi.org/10.1186/s40708-024-00229-8

Li, C., Wang, Y., Zhou, Z., Wang, Z., & Mardani, A. (2023). Digital finance and enterprise financing constraints: Structural characteristics and mechanism identification. Journal of Business Research, 165, 114074. https://doi.org/10.1016/j.jbusres.2023.114074

Li, X., Dai, J., Zhu, X., Li, J., He, J., Huang, Y., Shen, Q. (2023). Mechanism of attitude, subjective norms, and

perceived behavioral control influence the green development behavior of construction enterprises. Humanities and Social Sciences Communications, 10(1), 266. https://doi.org/10.1057/s41599-023-01724-9

Lyons, A. C., & Kass-Hanna, J. (2021). A methodological overview to defining and measuring "digital" financial literacy. Financial Planning Review, 4(2), e1113. https://doi.org/10.1002/cfp2.1113

Mashrur, F. R., Rahman, K. M., Miya, M. T. I., Vaidyanathan, R., Anwar, S. F., Sarker, F., & Mamun, K. A. (2022). An intelligent neuromarketing system for predicting consumers' future choice from electroencephalography signals. Physiology & behavior, 253, 113847. https://doi.org/10.1016/j.physbeh.2022.113847

Mu, W., Liu, K., Tao, Y., & Ye, Y. (2023). Digital finance and corporate ESG. Finance Research Letters, 51, 103426. https://doi.org/10.1016/j.frl.2022.103426

Murad, M. (2025). Responsible consumption and production as 12th sustainable development goal: a commentary on Pakistani students green entrepreneurship orientation. Journal of Responsible Production and Consumption, 2(1), 375-399. https://doi.org/10.1108/JRPC-04-2024-0021

Murad, M., Othman, S. B., & Kamarudin, M. A. I. B. (2025). Identifying the researchable themes in seventh sustainable development goal: affordable and clean energy. International Journal of Energy Sector Management. https://doi.org/10.1108/IJESM-11-2024-0023

Neves, B. B., & Mead, G. (2020). Digital Technology and Older People: Towards a Sociological Approach to Technology Adoption in Later Life. Sociology, 55(5), 888-905. https://doi.org/10.1177/0038038520975587

Rahman, S. u., Nguyen-Viet, B., Nguyen, Y. T. H., & Kamran, S. (2024). Promoting fintech: driving developing country consumers' mobile wallet use through gamification and trust. International Journal of Bank Marketing, 42(5), 841-869. https://doi.org/10.1108/IJBM-01-2023-0033

Roh, T., Seok, J., & Kim, Y. (2022). Unveiling ways to reach organic purchase: Green perceived value, perceived knowledge, attitude, subjective norm, and trust. Journal of Retailing and Consumer Services, 67, 102988. https://doi.org/10.1016/j.jretconser.2022.102988

Roh, T., Yang, Y. S., Xiao, S., & Park, B. I. (2024). What makes consumers trust and adopt fintech? An empirical investigation in China. Electronic commerce research, 24(1), 3-35. https://doi.org/10.1007/s10660-021-09527-3

Romero-Rodríguez, J.-M., Ramírez-Montoya, M.-S., Buenestado-Fernández, M., & Lara-Lara, F. (2023). Use of ChatGPT at University as a Tool for Complex Thinking: Students' Perceived Usefulness. Journal of new approaches in educational research, 12(2), 323-339. https://doi.org/10.7821/naer.2023.7.1458

Singh, P., Alhassan, I., & Khoshaim, L. (2023). What Do You Need to Know? A Systematic Review and Research Agenda on Neuromarketing Discipline. Journal of theoretical and applied electronic commerce research, 18(4), 2007-2032. https://doi.org/10.3390/jtaer18040101

Tirandazi, P., Bamakan, S. M. H., & Toghroljerdi, A. (2023). A review of studies on internet of everything as an enabler of neuromarketing methods and techniques. The Journal of Supercomputing, 79(7), 7835-7876. https://doi.org/10.1007/s11227-022-04988-1

Tubaishat, A. (2018). Perceived usefulness and perceived ease of use of electronic health records among nurses: Application of Technology Acceptance Model. Informatics for Health and Social Care, 43(4), 379-389. https://doi.org/10.1080/17538157.2017.1363761

Xu, Y., Du, J., Khan, M. A. S., Jin, S., Altaf, M., Anwar, F., & Sharif, I. (2022). Effects of Subjective Norms and Environmental Mechanism on Green Purchase Behavior: An Extended Model of Theory of Planned Behavio. Frontiers in Environmental Science, Volume 10 - 2022. https://doi.org/10.3389/fenvs.2022.779629

Zhang, W., Siyal, S., Riaz, S., Ahmad, R., Hilmi, M. F., & Li, Z. (2023). Data Security, Customer Trust and Intention for Adoption of Fintech Services: An Empirical Analysis From Commercial Bank Users in Pakistan. SAGE Open, 13(3), 21582440231181388. https://doi.org/10.1177/21582440231181388

## Appendix A

| Nature of Variable | Construct | Statements |
|---|---|---|
| Independent Variable | Perceived Usefulness | I can avail the amenities I need by using fintech. |
| | | Fintech offerings help you save time. |
| | | Fintech offerings can boost effectiveness. |
| | | In general, I discover Fintech services to be supportive. |
| | | I believe that Fintech's user interface is easy to use and simple. |
| | | Using Fintech services is simple if you have the necessary hardware (a smartphone, an app, WiFi, etc.). |
| | | Perception of the user that a specific IT system takes less work. |
| | | I think it's simple to do transactions using the financial technology services I use. |
| | | I have control over the financial technology services I use, and I can tailor my use of them to meet my needs. |
| | Trust | Fintech services, in my view, safeguard my private data. |
| | | I think Fintech services are reliable. |
| | | Overall, I ponder Fintech services are reliable. |
| | Attitude | Using Fintech services is a wonderful experience. |
| | | Fintech services are of curiosity to me. |
| | | It's a pleasure to use Fintech services. |
| | | The positive or negative emotions that a person experiences when engaging in a specific behaviour. |
| | | I appreciate the concept of making payments with digital modes. |
| | Subjective Norms | My use of fintech gives me a unique advantage over my peers and coworkers. |
| | | Among my peers, I feel respected when using fintech. |
| | | It makes me popular with my friends. |
| | | I blend in with my peer group when I use fintech. |
| Moderating Variable | Neuromarketing | Neuromarketing techniques have the potential to influence my purchasing decisions. |
| | | Using neuromarketing techniques can influence my purchasing decisions. |
| | | Neuromarketing techniques are more effective when compared with traditional marketing methods. |
| Dependent Variable | Intent towards Fin-tech Adoption | I'm willing to keep using Fintech services if I have already utilized them. |
| | | I hope to soon make use of Fintech services. |
| | | I'll tell my friends about Fintech services. |