

Transformation of Millennial Financial Lifestyles Through Financial Technology Adoption: A Case Study in Semarang City

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Abstract

The rapid advancement of information technology has encouraged the emergence of various innovations in the financial industry, one of which is Financial Technology (Fintech). This study aims to examine in depth how fintech adoption shapes and transforms the financial lifestyle patterns of the millennial generation in Semarang City. Using a qualitative descriptive approach through a series of data collection techniques consisting of field observations, a comprehensive literature review, and in-depth interviews with millennial respondents in Semarang City, this study produced several important findings. First, the level of fintech service use among millennials shows consistent and significant growth. Second, the convenience, speed, and efficiency offered by fintech platforms are the main factors driving adoption. Third, fintech has been shown to encourage more positive financial behavior, such as the emergence of digital saving and investment habits. Nevertheless, this study also identifies several crucial challenges, including low digital financial literacy and the high risk of being trapped in consumptive debt due to easy access to online loans. Therefore, more structured financial education programs and stricter regulatory supervision are recommended to ensure responsible fintech use.

Keyword Fintech, Millennials, Financial Behavior, Digital Payments, Financial Literacy

Introduction

The wave of digital transformation affecting almost all sectors of life has placed the financial industry at an unprecedented point of change. Amid this transformation, Financial Technology (Fintech) has emerged as one of the most disruptive innovations, fundamentally changing the way people access, manage, and use financial services. Fintech is defined as the integration of advanced technology with financial services to provide products and services that are more efficient, inclusive, and accessible to all segments of society (Gomber et al., 2018). The emergence of fintech is not merely a response to market needs; it also actively shapes a new and more democratic financial ecosystem.

Among the demographic groups most affected by the fintech revolution, millennials occupy the most central position. This generation, born between 1981 and 1996, grew up alongside the advancement of digital technology, making them more adaptive, faster in accepting innovation, and more skilled in using technology-based platforms (Howe & Strauss, 2000). These unique characteristics make millennials the most dominant and dynamic segment of fintech users. In Semarang City, the capital of Central Java Province, fintech penetration among millennials has grown significantly, in line with improvements in digital infrastructure and wider internet coverage in urban areas.

However, the high level of technological penetration among millennials is not necessarily accompanied by adequate skills in managing finances wisely. Several studies show that many millennials use fintech services mainly because of trends and lifestyle influences, rather than based on sufficient understanding of the financial products they use (Lusardi & Mitchell, 2023). This condition creates an interesting paradox: on the one hand, fintech opens broader opportunities for financial inclusion, but on the other hand, it can potentially lead users

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Semarang City was selected as the location of this study because it is one of the largest economic and educational centers in Central Java and has a relatively large millennial population, especially among students and young professionals. The dynamics of fintech use in Semarang reflect a broader picture of how Indonesia's urban middle-class society interacts with the digital financial ecosystem. Based on this context, this study aims to: (1) analyze the trends and patterns of fintech adoption among millennials in Semarang City; (2) identify the facilities and conveniences offered by various popular fintech platforms; (3) examine the development of digital payment systems in daily life; and (4) assess the impact of fintech use on the financial behavior and decisions of the millennial generation.

According to [Arner et al. \(2020\)](#), the current fintech revolution is unique because most innovations originate outside the conventional banking industry. Technology startups and global technology giants are competing to provide financial solutions that are more inclusive, faster, and more affordable, creating new competition that forces traditional financial institutions to transform as well. The regulations governing this ecosystem also continue to evolve; in Indonesia, the Financial Services Authority (OJK) and Bank Indonesia play important roles in providing a legal framework that encourages innovation while protecting consumers ([Bank Indonesia, 2023](#)).

From a broader perspective, fintech development in Indonesia cannot be separated from the national financial inclusion agenda. [OJK data \(2024\)](#) records that Indonesia's financial inclusion index has reached 88.7%, a figure largely driven by the penetration of digital financial services. This increase is highly relevant to Indonesia's geographically dispersed society, where fintech serves as an alternative solution for those who have not been reached, or are difficult to reach, by conventional banking services. In this context, millennials play a dual role: as active consumers and as agents of diffusion for digital financial innovation within their social environments.

Literature Review and Hypothesis Development

Financial Technology (Fintech): Concept and Development

Financial Technology (Fintech) refers to the application of digital technology to provide financial services and products that are more innovative, efficient, and inclusive. [Gomber et al. \(2018\)](#) define fintech as the convergence of advanced information technology and the financial services industry, with the aim of simplifying processes, reducing transaction costs, and expanding access for the wider community. This definition emphasizes that fintech is not merely the automation of conventional banking processes, but a new paradigm that fundamentally disrupts the structure of the financial industry.

[Arner et al. \(2020\)](#) classify the evolution of fintech into three major waves. The first wave (Fintech 1.0, 1866-1967) was marked by analog financial infrastructure such as the telegraph and telex machines. The second wave (Fintech 2.0, 1967-2008) brought digitalization through ATMs, credit cards, and online banking. The third wave (Fintech 3.0, 2008-present) represents the most disruptive era, characterized by the emergence of financial technology startups after the global financial crisis that utilize smartphones, big data, artificial intelligence, and blockchain to create an entirely new financial ecosystem. [Puschmann \(2017\)](#) adds that in this third wave, the boundaries between technology companies and financial institutions are becoming increasingly blurred, creating both competition and unprecedented opportunities for collaboration.

In Indonesia, fintech development has gained strong momentum through regulatory support from Bank Indonesia and the Financial Services Authority. The launch of the regulatory sandbox by OJK and the implementation of the QRIS standard by Bank Indonesia have become catalysts that encourage the structured growth of the national fintech ecosystem. [Liana et al. \(2024\)](#) note that Indonesia is one of the most dynamic fintech ecosystems in Southeast Asia, with more than 334 fintech companies registered and supervised by OJK by the end of 2023, covering digital payments, online lending, investment, digital insurance, and electronic money segments.

Millennials and the Characteristics of Their Financial Behavior

Millennials, defined by [Howe & Strauss \(2000\)](#) as individuals born between 1981 and 1996, are the first generation to grow up with the internet and digital devices as inseparable parts of everyday life. This characteristic shapes a unique psychological disposition: millennials tend to be more open to adopting new technologies, more accustomed to contactless transactions, and more oriented toward speed and convenience in accessing various services, including financial services ([Chishti & Barberis, 2016](#)). As digital natives, they do not merely use technology as a tool, but also make it a primary medium for constructing their social and economic identities. Nevertheless, millennial financial characteristics are not entirely positive. [Lusardi & Mitchell \(2023\)](#) reveal that although millennials demonstrate high confidence in managing finances, empirically their level of financial literacy--particularly in relation to understanding compound interest, portfolio diversification, and risk management--is lower than that of previous generations. This paradox, referred to by scholars as the overconfidence gap, creates vulnerability to impulsive financial decisions, especially when reinforced by the ease of access offered by fintech platforms. [Siregar & Fitriani \(2021\)](#), in the Indonesian context, add that millennial financial behavior is strongly influenced by social pressure and lifestyle construction promoted through social media, which often encourages consumption patterns beyond their actual financial capacity.

A study by [Pertiwi & Purwanto \(2021\)](#) conducted in several major Indonesian cities found that millennials are the dominant segment of fintech service users, with adoption reaching 73.4% of total active users of digital payment platforms. The most significant factors driving this adoption include perceived ease of use, system reliability, perceived benefits, and the influence of subjective norms from peer groups. These findings are relevant to the context of Semarang City as an urban center with a large millennial population, particularly students and young professionals who are demographically the most active segment in the digital financial ecosystem.

Theoretical Framework: Technology Acceptance Model (TAM) and Theory of Planned Behavior (TPB)

The literature on fintech adoption generally refers to two main theoretical frameworks. The first is the Technology Acceptance Model (TAM), developed by Davis (1989) and further developed into TAM 3 by Venkatesh & Bala (2008). TAM proposes that technology adoption is determined by two main constructs: perceived usefulness and perceived ease of use, which jointly influence attitudes, behavioral intentions, and ultimately the actual behavior of using the technology. [Ryu \(2021\)](#) applied TAM in the fintech context and found that perceived usefulness is the strongest predictor of fintech service adoption among young Asian consumers, with an effect greater than other demographic and psychographic variables.

The second is the Theory of Planned Behavior (TPB), developed by Ajzen (1991), which provides a complementary perspective by emphasizing the roles of attitude toward behavior, subjective norms, and perceived behavioral control as determinants of behavioral intention. In the context of fintech adoption, subjective norms are highly relevant because millennials' decisions to use or not use a fintech platform are strongly influenced by what their reference groups do, including peers, family members, and social media influencers. [Ozili \(2022\)](#) argues that integrating TAM and TPB provides a more comprehensive analytical framework for understanding the complexity of digital financial service adoption, especially when trust and perceived security are included as additional variables.

Fintech and Changes in Financial Behavior

The relationship between fintech adoption and changes in financial behavior has become one of the most productive research topics in digital finance literature over the last decade. [Banna et al. \(2021\)](#) report that fintech-based financial inclusion significantly increases the frequency and value of savings in developing countries, particularly among segments previously underserved by conventional banking, or the unbanked population. The ease of saving through autodebit features, goal-based savings, and round-up saving available on various fintech platforms has been shown to reduce psychological barriers to starting a consistent saving habit. On the investment side, democratized access through robo-advisory and micro-investing platforms has dramatically changed the landscape of retail investor participation. [Nugroho \(2023\)](#) notes that platforms such as Bibit and Ajaib in Indonesia successfully attracted more than 10 million new investors during 2020-2023, with the largest proportion coming from millennials and Gen Z, who previously did not have investment portfolios. This phenomenon is consistent with the findings of [Chen et al. \(2022\)](#), which show that user interface quality and integrated investment education features in fintech applications are key factors in retaining new users and encouraging periodic increases in investment value.

However, fintech also brings behavioral impacts that are not always positive. Easy access to Buy Now Pay Later (BNPL) and peer-to-peer lending services has documented a worrying increase in consumptive borrowing behavior among millennials. [Grohmann et al. \(2023\)](#) found a significant negative correlation between low financial literacy and the tendency to overuse BNPL services, increasing the risk of being trapped in a difficult debt spiral. [Morgan & Trinh \(2019\)](#) further note that millennials with low financial literacy but high digital skills actually show greater financial vulnerability than those who possess both competencies in a more balanced proportion.

Digital Financial Literacy as a Critical Moderator

Financial literacy is defined by [Lusardi & Mitchell \(2023\)](#) as an individual's ability to understand and apply various financial concepts--including simple and compound interest, inflation, risk diversification, and the time value of money--in everyday financial decision-making. In the digital era, this definition expands into digital financial literacy, which includes the ability to evaluate digital financial products and services, understand fee structures and hidden risks in fintech products, and manage personal financial data footprints responsibly. [Setiawan & Kartika \(2020\)](#) argue that digital financial literacy is a fundamental prerequisite to ensure that fintech adoption provides optimal long-term benefits, rather than merely short-term consumptive satisfaction.

OJK data (2024) shows that although Indonesia's financial inclusion index has reached 88.7%, the financial literacy index is only 65.4%, indicating a significant gap between access and understanding. This gap is increasingly evident among urban millennials who actively use fintech but often do not fully understand the long-term financial implications of decisions made through these platforms. Hasibuan (2022) emphasizes that effective digital financial literacy programs must be designed contextually and adaptively according to the specific characteristics and needs of the millennial segment, rather than merely translating conventional financial education materials into digital formats. Haddad & Hornuf (2023) empirically demonstrate that countries with higher levels of digital financial literacy tend to have healthier fintech ecosystems, with lower non-performing loan ratios and higher user satisfaction. This implies that investing in digital financial literacy is not only an ethical obligation for fintech service providers, but also a rational business strategy for building a more loyal and sustainable user base over the long term.

Proposition Development

Based on the synthesis of the literature review described above, this study develops several theoretical propositions that serve as the analytical framework for examining the phenomenon of fintech adoption among millennials in Semarang City. Although this study uses a qualitative approach and does not statistically test hypotheses, the following propositions function as analytical guidelines to help direct data collection and interpretation in a systematic and focused manner. The first proposition concerns the relationship between ease of use and the intensity of fintech adoption. Based on the TAM framework (Davis, 1989; Ryu, 2021) and consistent empirical findings in the literature, ease of interface navigation, a short registration process, and cross-device service accessibility are dominant factors determining millennials' decisions to adopt and continue using a fintech platform regularly.

P1: The higher the perceived ease of use of a fintech platform, the higher the intensity of adoption and use of that platform among millennials in Semarang City.

The second proposition concerns the impact of fintech adoption on saving and investment behavior. Referring to the findings of Banna et al. (2021), Nugroho (2023), and Chen et al. (2022), smart features in fintech platforms, such as automatic savings, AI-based spending analysis, and access to micro-investing, have the potential to encourage more disciplined and future-oriented financial behavior among millennials who previously did not have formal saving or investment habits.

P2: Intensive adoption of fintech services contributes to an increase in saving and investment behavior among millennials in Semarang City, particularly through the use of automation and micro-investing features available on the platforms.

The third proposition highlights the risk side of fintech adoption when it is not balanced with adequate financial literacy. Drawing on Grohmann et al. (2023), Lusardi & Mitchell (2023), and Morgan & Trinh (2019), a low understanding of interest mechanisms, default risk, and the long-term implications of using BNPL and online lending services worsens the tendency toward impulsive consumptive behavior among millennials who have high fintech access but low financial literacy.

P3: Low digital financial literacy strengthens the tendency toward consumptive behavior and unplanned use of digital credit services (BNPL and online loans) among millennials in Semarang City with high levels of fintech adoption.

The fourth proposition relates to the role of social factors and peer group norms in the diffusion of fintech adoption. Based on the TPB perspective (Ajzen, 1991) and the findings of [Pertiwi & Purwanto \(2021\)](#) in the Indonesian context, the influence of peers, close family members, and figures followed on social media is a significant determinant in encouraging millennials to try, adopt, and recommend fintech services to people around them.

P4: Subjective norms from peer groups and exposure to digital financial content on social media have a significant influence on fintech adoption decisions among millennials in Semarang City.

These four propositions form an integrated analytical framework to guide the qualitative exploration in this study. Verification and deeper examination of these propositions are carried out through thematic analysis of data obtained from field observations, literature studies, and in-depth interviews with informants, thereby generating a rich, contextual, and relevant understanding of fintech adoption in Semarang City.

Methods

This study uses an exploratory-descriptive research design with a qualitative approach, selected because the phenomenon under study is contextual, dynamic, and requires an in-depth understanding of the perspectives of research subjects. This approach is consistent with [Creswell & Poth \(2018\)](#), who emphasize that qualitative methods are the most appropriate instrument for exploring the meaning and complexity of human experience in a particular social context, especially when researchers seek to understand how individuals interpret and make sense of the reality around them. Data in this study were collected through three complementary techniques. First, participatory observation was conducted to directly observe the behavior patterns and interactions of millennials in Semarang City in the context of using digital financial services in various everyday situations, such as shopping centers, food stalls, and campus environments. Second, a literature study was carried out through the search and critical analysis of various recent academic sources, including reputable international journals, industry reports, and relevant regulations. Third, in-depth interviews were conducted using semi-structured interview guidelines with informants from the millennial generation who live and engage in activities in Semarang City.

Informants were selected purposively based on the criteria that they were residents of Semarang City, belonged to the millennial generation category (born between 1981 and 1996), actively used at least one fintech service in the last three months, and were willing to participate in interview sessions. Data validity was maintained through source and method triangulation, namely by comparing information obtained from different sources and data collection techniques. Data analysis was conducted thematically through data reduction, data display, conclusion drawing, and iterative verification as suggested by [Miles et al. \(2020\)](#).

Results

Trends in Fintech Use among Millennials in Semarang City

The results of field research and literature review consistently show that fintech adoption among millennials in Semarang City has experienced substantial acceleration in recent years. This phenomenon does not occur in a vacuum, but is a response to the convergence of various structural and situational factors that simultaneously encourage people to shift from

conventional financial services to digital platforms. This adoption pattern is consistent with the findings of Morgan & Trinh (2019), who report that fintech penetration in developing Asian countries, including Indonesia, is driven by a combination of increased internet access, urban middle-class growth, and dissatisfaction with traditional banking services.

Several key factors accelerating fintech adoption among millennials in Semarang include:

- a. **Unlimited Accessibility:** Fintech platforms allow users to access various financial services anytime and anywhere with only a smartphone and an internet connection. This convenience is highly relevant to the dynamic and mobile lifestyle of millennials.
- b. **Speed and Transaction Efficiency:** Unlike conventional banking systems, which often require longer processing times, transactions through fintech can generally be completed instantly. This is a primary consideration for a generation accustomed to speed in all aspects of life.
- c. **More Competitive Cost Structure:** Most fintech services offer much lower fee structures than traditional banks, and many even waive fees for certain transactions. This condition directly influences millennials' financial decisions, as they tend to be cost-sensitive.
- d. **Openness to Innovation:** As a generation that grew up with the internet and digital technology, millennials inherently have a more positive disposition toward technological innovation. Their identity as digital natives makes them faster in adopting and adapting to the latest fintech platforms.

These findings are in line with [Ryu \(2021\)](#), who identified perceived usefulness and ease of use as the strongest predictors of fintech service adoption among young Asian consumers. Meanwhile, [Ozili \(2022\)](#) emphasizes that trust and perceived security also play crucial roles in fintech adoption decisions, particularly in countries with a relatively high history of digital financial fraud.

Facilities and Conveniences Offered by Fintech Platforms

The fintech platforms most widely used by millennials in Semarang City, such as GoPay, OVO, DANA, and ShopeePay, offer a spectrum of financial services that go far beyond simple payment functions. Each platform competes to provide innovative features designed to meet diverse financial needs, ranging from utility bill payments, mobile credit and data package purchases, online transportation service bookings, ticket reservations, and cross-platform online shopping. This diversity of functionality has turned fintech applications into financial super-apps that integrate various financial needs into a single unified interface.

In terms of transaction security, leading fintech platforms have implemented multiple layers of comprehensive protection, including two-factor authentication (2FA), end-to-end data encryption, biometric verification (fingerprint and facial recognition), and artificial intelligence-based fraud detection systems. These multilayered security systems significantly increase user confidence in conducting digital transactions. This is confirmed by [Haddad & Hornuf \(2023\)](#), who conclude that investment in cybersecurity infrastructure is a key determinant in building consumer trust in fintech services and encouraging wider adoption.

Beyond security, user experience innovation has become the main competitive arena among fintech service providers. Intuitive interfaces, simple onboarding processes, fast application response, and responsive customer support have become new standards expected by millennial consumers. [Chen et al. \(2022\)](#) found that the quality of user experience in fintech applications has a strong positive correlation with user retention and the tendency to

Development of Digital Payment Systems

One of the most visible manifestations of fintech adoption in Semarang City is the accelerated transition toward a cashless, or at least less-cash, society. Digital payment systems have evolved very rapidly, from simple interbank transfers into a payment ecosystem that includes various transaction modalities. The use of QR (Quick Response) codes, for example, has become an almost universal standard payment method and can be found across merchants ranging from modern shopping centers, cafes, restaurants, street food stalls, and even traditional market vendors. The implementation of the QRIS (Quick Response Code Indonesian Standard) by Bank Indonesia in 2019, and its acceleration during the COVID-19 pandemic, has played a transformative role in Indonesia's digital payment ecosystem, including in Semarang City. QRIS simplifies payments by enabling one QR code to be used by all licensed digital payment applications, thereby encouraging financial inclusion from both the user and merchant sides. According to [Bank Indonesia \(2024\)](#), the number of QRIS-registered merchants has exceeded 30 million, with Central Java among the provinces with the highest merchant adoption growth nationally.

In addition to conventional payments, millennials in Semarang have begun to show growing interest in crypto assets and blockchain technology, although adoption remains limited and accompanied by considerable ambivalence. The main concerns hindering crypto asset adoption include extreme price volatility, regulatory uncertainty, and insufficient understanding of the underlying technology. These findings align with [Schar & Berentsen \(2020\)](#), who conclude that although blockchain technology has substantial transformative potential for the financial industry, barriers to mass adoption remain significant, especially among users who are relatively new to the digital financial ecosystem.

Millennial Financial Behavior in the Fintech Ecosystem

The presence of fintech platforms has brought fairly fundamental changes to the financial behavior patterns of millennials in Semarang City. These changes are not only technical in terms of payment tool use, but also touch on more substantive aspects such as saving habits, financial planning, and participation in investment instruments. Through various smart features, such as automatic spending analysis, notification-based bill reminders, and goal-based saving features, fintech applications have successfully provided financial planning services that were previously accessible only to those who could afford professional financial planners.

Democratized investment access is one of the most significant impacts of fintech development on millennials. Through platforms such as Bibit, Ajaib, Stockbit, and various neobanks such as Jenius and Blu, millennials can now invest in mutual funds, government bonds (retail government securities), stocks, and even digital gold with very affordable starting capital, often beginning from only Rp10,000 to Rp100,000. This ease of access effectively lowers the barrier to entry that has long prevented lower- and middle-income groups from participating in the capital market. [Banna et al. \(2021\)](#) confirm that the digitalization of investment services through fintech platforms significantly contributes to increasing retail investor participation in developing countries.

However, behind these benefits lies a darker side that requires serious attention. Easy access to Buy Now Pay Later (BNPL) or PayLater features and online lending services (peer-to-peer lending) has triggered an increase in potentially harmful consumptive behavior. Many

millennials use digital credit services not to meet essential or productive needs, but simply to satisfy hedonic and impulsive consumption desires, such as purchasing the latest gadgets, fashion accessories, or eating at premium restaurants. This situation is exacerbated by the low understanding among some users of compound interest mechanisms, late penalty structures, and the long-term consequences of unplanned borrowing behavior.

This phenomenon is closely related to the digital financial literacy gap, which remains a structural problem among Indonesia's younger generation. Recent research by [Grohmann et al. \(2023\)](#) reveals that although millennials possess high levels of digital skills, their financial literacy--particularly regarding risk, asset diversification, and the time value of money--remains far from adequate. This condition creates real vulnerability: individuals who are technologically literate but financially uninformed tend to make riskier financial decisions because of the ease of access offered by fintech.

In responding to this challenge, synergy among various stakeholders is absolutely necessary. The government needs to strengthen a regulatory framework that not only encourages innovation but also effectively protects consumers from predatory fintech practices. OJK, as the primary regulator of the financial services industry, must continue to strengthen supervision of illegal fintech platforms that remain widespread, while also encouraging product transparency and information disclosure for consumers. On the other hand, fintech platform providers themselves have an ethical responsibility to integrate educational features and user protection mechanisms into their product designs, rather than merely maximizing user engagement and conversion.

Discussion

Dynamics of Fintech Adoption: Between Utility and Digital Identity

The findings regarding the acceleration of fintech adoption among millennials in Semarang City are consistent with the predictions of the Technology Acceptance Model (TAM), which places perceived usefulness and perceived ease of use as the main determinants of technology acceptance (Davis, 1989). However, field data indicate that beyond these two functional constructs, there is an identity dimension that plays an equally significant role: for many millennials, fintech use is not merely a rational decision based on utility, but also an expression of identity as a tech-savvy and digitally literate generation. This phenomenon aligns with the concept of symbolic adoption developed by [Chishti & Barberis \(2016\)](#), in which financial technology adoption also functions as a marker of social status within digital community ecosystems.

Interestingly, the adoption patterns found in Semarang show a fairly clear gradation based on informants' educational backgrounds and types of employment. Millennials with higher education backgrounds and formal-sector jobs tend to adopt more diverse and complex fintech platforms--not only e-wallets but also investment platforms and robo-advisory services--whereas millennials with lower educational backgrounds or informal-sector jobs are more limited to using e-wallets for daily payment needs. This pattern confirms Ozili's (2022) argument that digital financial inclusion is tiered, meaning that access to more sophisticated fintech service layers is still highly influenced by an individual's human capital.

The trust factor emphasized by [Haddad & Hornuf \(2023\)](#) was also confirmed in this study. Most informants stated that their trust in fintech platforms was not formed instantly, but through a gradual process influenced by positive initial user experiences, recommendations from trusted people, and the presence of well-known major brands behind the applications, such

as GoTo behind GoPay or Sea Group behind ShopeePay. This implies that user acquisition strategies based on word-of-mouth and brand credibility remain relevant in a continually growing fintech ecosystem.

Fintech Service Ecosystem: From Payments to Financial Super-Apps

The findings regarding the broad spectrum of services offered by fintech platforms in Semarang reflect the global trend toward financial super-apps identified by [Puschmann \(2017\)](#). The convergence of various financial services--payments, savings, investment, microinsurance, and consumer credit--within one integrated interface is not merely a technical convenience; it is a platform strategy that systematically increases users' switching costs and creates an ecosystem that is difficult to leave. From the user's perspective, this integration provides real efficiency, but it also creates lock-in risks that may reduce competition and consumer choice in the long term.

The investment of fintech platforms in cybersecurity identified in this study is consistent with the findings of [Haddad & Hornuf \(2023\)](#), who emphasize that trust in system security is one of the strongest predictors of long-term user retention. The implementation of end-to-end encryption, biometric verification, and AI-based fraud detection not only responds to regulatory demands, but also represents a strategic investment in building the trust that forms the foundation of fintech business sustainability. Nevertheless, this study also found that security perceptions among informants were shaped more by superficial factors, such as a professional-looking interface and application popularity, than by substantive understanding of the actual security infrastructure. This cognitive gap may be exploited by increasingly sophisticated cybercriminals.

Digital Payment Systems and the Transformation of Consumption Behavior

The accelerated transition toward a less-cash society in Semarang City recorded in this study cannot be separated from the transformative role of Bank Indonesia's QRIS standardization policy (2024). This standardization addresses one of the biggest obstacles to digital payment adoption from the merchant side: ecosystem fragmentation caused by the proliferation of different QR codes across platforms. With one QR code readable by all applications, the friction for merchants to accept various digital payment methods is drastically reduced, thereby encouraging ecosystem expansion driven simultaneously by both demand-pull and supply-push mechanisms. [Morgan & Trinh \(2019\)](#) identify payment infrastructure standardization as one of the most effective policy factors in encouraging financial inclusion in developing Asian countries.

However, the convenience of digital payments offered by the QRIS and e-wallet ecosystems also presents behavioral implications that need attention. Research in consumer behavior psychology shows that contactless payments consistently reduce the pain of paying compared to cash transactions, thereby encouraging higher and less planned spending--a phenomenon known as the credit card premium effect in behavioral economics literature. Field findings in this study confirm this tendency: several informants admitted that they found it easier to make impulsive purchases when using e-wallets than when using physical cash. This condition is relevant to [Grohmann et al.'s \(2023\)](#) warning about the potential negative impact of easy digital transactions on self-control in financial management.

The growing yet ambivalent interest in crypto assets among millennials in Semarang reflects broader dynamics concerning literacy and risk tolerance in the digital financial

ecosystem. Schar & Berentsen's (2020) findings regarding barriers to mass adoption of blockchain technology are confirmed in the local context: most informants who expressed interest in crypto assets admitted that their knowledge of the underlying technology was still very limited. This creates a phenomenon of FOMO-driven investment (Fear of Missing Out), in which investment decisions are driven more by viral narratives of instant wealth on social media than by adequate fundamental analysis.

Fintech, Financial Literacy, and the Inclusion-Exclusion Paradox

The findings regarding increased saving and investment behavior through fintech platforms represent a concrete manifestation of Banna et al.'s (2021) thesis on the contribution of digital financial inclusion to household asset formation in developing countries. Behavioral nudge features integrated into platform design--such as savings autodebit, notifications on progress toward financial targets, and investment growth visualization--effectively use principles of behavioral economics to encourage better financial decisions. In this context, fintech functions not only as transaction infrastructure, but also as a digital financial coach that replaces the role of conventional financial planners, which are unaffordable for most millennials.

However, democratized investment access facilitated by fintech contains a paradox that must be seriously considered. When access to investment products that were previously available only to high-income groups--such as mutual funds and stocks--can now be enjoyed with capital of only Rp10,000, the barrier to entry indeed collapses, but the barrier to understanding becomes increasingly apparent. Nugroho (2023) warns that the wave of new retail investors entering the capital market through fintech platforms is largely not equipped with sufficient understanding of market volatility, portfolio diversification, and appropriate investment horizons. In this context, democratizing access without democratizing understanding risks creating a wave of mass disappointment when market corrections occur.

The gap between the financial inclusion index (88.7%) and the financial literacy index (65.4%) recorded by OJK (2024) is the most relevant analytical lens for understanding the ambivalence of fintech impacts found in this study. This gap indicates that much of the growth in new fintech users occurs among individuals who do not yet have an adequate foundation of financial literacy. Lusardi & Mitchell (2023) emphasize that low financial literacy is not merely an obstacle to optimizing individual financial decisions, but also a systemic risk factor that can threaten financial system stability when the scale of financially illiterate fintech users reaches a critical mass. Therefore, digital financial education programs integrated into the fintech ecosystem--not as optional additions, but as core components of product design--are an urgent necessity that cannot be delayed.

Overall, the findings of this study strengthen the narrative of fintech as a Janus-faced technology: on one side, it opens wider financial inclusion and encourages more progressive financial behavior, but on the other side, it presents new risks that users do not fully understand. In response to this duality, Hasibuan (2022) argues that a responsible fintech design approach--which integrates consumer protection, information transparency, and financial education into the core of product architecture--is both an ethical and strategic imperative for all stakeholders

Conclusion

This study has revealed complex and multidimensional dynamics in the relationship between fintech adoption and the transformation of millennial financial lifestyles in Semarang

City. Overall, fintech has made a clear positive contribution to increasing the accessibility, efficiency, and inclusiveness of financial services for the millennial segment, which has been a major driver of Indonesia's digital economic growth. The convenience of conducting transactions, investing, and planning finances through digital platforms has clearly encouraged more modern and progressive financial behavior among millennials in Semarang.

Nevertheless, this study also identifies several challenges that cannot be ignored. The deficit in digital financial literacy remains a structural barrier that places some millennials in a vulnerable position regarding financial risk, particularly in relation to the use of online lending services and unplanned BNPL features. Therefore, efforts to improve digital financial literacy must be positioned as a shared priority involving the active participation of the government, regulators, educational institutions, fintech service providers, and civil society.

The practical implications of this study point to several concrete policy recommendations. For the government and OJK, more adaptive yet protective regulation is needed, including an obligation for fintech platforms to present information on product costs and risks transparently and in easily understandable language. For higher education institutions in Semarang City, the integration of digital finance material into cross-disciplinary curricula should be considered as a response to students' financial competency needs in the digital era. For fintech platforms, adopting the principle of responsible fintech design, which prioritizes users' long-term welfare over short-term user growth targets, is an ethical imperative that cannot be compromised.

This study has several limitations that should be acknowledged honestly. First, its geographical scope is limited to Semarang City, which limits the generalizability of the findings to other contexts with different demographic characteristics and digital infrastructure. Second, the use of a qualitative method, although producing in-depth understanding, has limitations in terms of statistical representativeness. Future research using quantitative or mixed-method approaches involving larger samples and broader geographic coverage is strongly recommended to strengthen and expand the findings of this study.

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