Evaluating Behavioral Intention and Financial Stability in Cryptocurrency Exchange App: Analyzing System Quality, Perceived Trust, and Digital Currency

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ABSTRACT

This study evaluates the factors influencing financial stability (FS) and behavioral intention (BI) in a cryptocurrency exchange app, explicitly focusing on system quality (SQ), perceived trust (PT), and digital currency (DC) within the Indonesian context. Utilizing structural equation modeling (SEM) with SmartPLS, the research analyzed data from 345 respondents who are active users of the cryptocurrency exchange app. The results confirmed that SQ significantly enhances PT ($\beta = 0.832$, $t = 27.216$, $p < 0.001$) and BI ($\beta = 0.718$, $t = 12.675$, $p < 0.001$). Additionally, DC positively impacts FS ($\beta = 0.578$, $t = 8.177$, $p < 0.001$), while PT influences both FS ($\beta = 0.391$, $t = 5.478$, $p < 0.001$) and BI ($\beta = 0.198$, $t = 3.490$, $p = 0.001$). These findings validate all five proposed hypotheses, highlighting the critical role of SQ and PT in driving FS and user engagement in cryptocurrency exchange apps. The study's measurement model demonstrated good reliability and validity, with Cronbach's alpha values exceeding 0.7 for all constructs: SQ (0.891), PT (0.812), DC (0.767), FS (0.819), and BI (0.745). Composite reliability values were also high, ranging from 0.855 to 0.933. Average Variance Extracted (AVE) values indicated good convergent validity, with SQ (0.822), PT (0.727), DC (0.689), FS (0.743), and BI (0.663). Discriminant validity was confirmed using the Fornell-Larcker criterion. The structural model's fit indices, including an SRMR of 0.045 and an NFI of 0.914, demonstrated a good model fit. The R^2 values for BI (0.791), FS (0.873), and PT (0.693) indicated substantial explanatory power. Despite its contributions, this study has limitations, including its focus on a single cryptocurrency exchange app in Indonesia, which may affect the generalizability of the findings. Future research should expand the sample to include multiple apps and geographical contexts. Additionally, incorporating other relevant factors, such as user experience and regulatory compliance, could provide a more comprehensive understanding of FS in digital financial services. This research underscores the importance of SQ and PT in achieving long-term success and sustainability in the rapidly evolving digital finance landscape.

Keywords System Quality, Perceived Trust, Digital Currency, Financial Stability, Cryptocurrency Exchange App

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INTRODUCTION

The evolution of traditional financial services involves a multifaceted process that includes technological advancements, cultural shifts, and changes in business strategies. Fintech, driven by digitalization and the fourth industrial revolution, has significantly reshaped the financial services landscape [1]. This

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transformation integrates digital technologies such as big data, cloud computing, and artificial intelligence into traditional financial services, enhancing efficiency and reducing transaction costs [2]. Digital finance, which merges digital technology with financial products, has been crucial in overcoming the limitations of traditional financial services, fostering innovation, and boosting entrepreneurship [3]. Furthermore, digital finance has a notable impact on sustainability and corporate performance. Studies have shown that fintech can support sustainable finance and contribute to corporate sustainability [4]. The adoption of green finance and fintech services highlights the shift of financial institutions towards meeting sustainability objectives [5]. Additionally, digital finance is crucial in improving financial inclusion, optimizing resource allocation, and guiding industrial transformation and upgrading [6]. The digital transformation of financial services encompasses technological advancements and addresses challenges like financing constraints, information asymmetry, and economic exclusion [7]. The proliferation of smartphones and internet access has further accelerated the adoption of digital financial services. Consumers now expect seamless, on-demand financial services that can be accessed from anywhere, at any time. This shift towards digital finance is evident in developed countries and emerging markets, where digital financial services offer a viable solution to bridge the gap in financial inclusion. In these regions, digital platforms provide unbanked and underbanked populations access to essential financial services, fostering economic growth and development. Consequently, the global financial ecosystem increasingly relies on digital financial services to drive innovation and efficiency.

Financial services in emerging markets like Indonesia have been significantly influenced by financial technology (fintech) innovations. Fintech has played a crucial role in advancing Islamic banking in Indonesia by introducing digital-based financial services such as payment channel systems, digital banking, digital insurance online, Peer-to-peer (P2P) Lending, and crowdfunding. These technological developments have aimed to enhance the efficiency of operational activities and improve the quality of banking services for customers in Indonesia. Moreover, the concept of financial inclusion, which entails universal access to affordable financial services, has become essential for economic development in emerging markets like Indonesia [8]. Financial innovation, particularly in the form of digital finance, has positively impacted economic development in advanced and emerging markets, providing valuable opportunities for individuals with low and variable income [9]. By leveraging digital payment services, Indonesia aims to expand financial inclusion significantly, overcoming various challenges in the process [10]. The Indonesian government has also played a significant role in responding to the era of banking disruption innovation, catalyzed by the emergence of new financial services through fintech [11]. Efforts by institutions like PT Pos Indonesia (Persero) to innovate in providing logistics and financial services responsive to technological developments have further contributed to the transformation of financial services in Indonesia [12]. In Indonesia, digital financial services are becoming an integral part of citizens' everyday lives. The convenience and accessibility of these services have made them an attractive alternative to traditional banking methods, which often require physical presence and are time-consuming. Digital platforms such as cryptocurrency exchanges and digital wallet apps are at the forefront of this transformation.

A cryptocurrency exchange app is a digital platform that enables users to buy, sell, and trade various cryptocurrencies securely and efficiently. These apps provide a user-friendly interface for individuals to engage in cryptocurrency transactions, offering features such as real-time pricing information, order placement, and portfolio management. Cryptocurrency exchange apps play a vital role in the digital asset ecosystem by facilitating the exchange of cryptocurrencies between users securely and transparently [13]. They are major gateways to the blockchain ecosystem, allowing users to access a wide range of digital assets and participate in the growing cryptocurrency market [14]. Cryptocurrency exchange apps are designed to provide a seamless trading experience, offering functionalities that enable users to execute trades, monitor market trends, and manage their digital assets effectively. These apps leverage blockchain technology to ensure the security and immutability of transactions, providing users with high trust and transparency in their dealings [15]. Additionally, cryptocurrency exchange apps contribute to the liquidity and efficiency of the cryptocurrency market by enabling users to convert between different digital assets quickly and efficiently [16]. Furthermore, the adoption of cryptocurrency exchange apps has been driven by the increasing demand for DC trading platforms that offer convenience, accessibility, and a wide range of trading options. These apps cater to a global audience of cryptocurrency enthusiasts and investors, providing them with the tools and resources needed to engage in the digital asset market[17]. As the cryptocurrency market continues to evolve, exchange apps play a crucial role in shaping the financial landscape by allowing users to participate in this innovative and dynamic sector[18].

The rise of digital financial services in Indonesia reflects broader global trends and highlights unique local dynamics. Factors such as the young and tech-savvy population, increasing smartphone penetration, and supportive government policies have created an environment conducive to the growth of digital financial platforms. As more Indonesians embrace these services, there is a growing need to understand the factors influencing their adoption and stability. This research paper aims to evaluate the FS of cryptocurrency exchange apps, focusing on critical aspects such as SQ, PT, and the integration of DC. By analyzing these factors, the study seeks to provide insights into the broader implications for the digital financial ecosystem in Indonesia. Despite the promising growth of digital financial services in Indonesia, the sector faces several significant challenges that must be addressed to ensure sustained development and user trust. The challenge of digital financial services in Indonesia encompasses various aspects that impact the adoption and effectiveness of these services. One significant challenge is the need for adequate and supportive infrastructure to facilitate the adoption of digital financial services among microenterprises in Indonesia. The availability of robust infrastructure, including reliable internet connectivity and digital payment systems, is crucial for universal access to digital financial services nationwide. Moreover, the regulatory environment plays a vital role in shaping the digital financial services landscape in Indonesia. Bank Indonesia and the Financial Services Authority have issued several regulations regarding digital financial services to increase financial literacy and inclusion in the country. Regulatory frameworks need to balance fostering innovation and ensuring consumer protection to promote the sustainable growth of digital financial services in

Indonesia.

Financial inclusion through digital payment services can significantly expand access to financial services in Indonesia. However, overcoming security, trust, and financial literacy challenges is essential to drive the adoption of digital financial services among the population. Building confidence in digital financial services and enhancing financial literacy are critical components of promoting the widespread use of these services in Indonesia. One of the primary issues is trust. Many users are still wary of digital platforms due to security, fraud, and data privacy concerns. High-profile security breaches and fraudulent schemes have heightened these concerns, making it imperative for digital financial services to establish robust security measures and transparent operations. Building and maintaining trust is essential for these platforms to attract and retain users, particularly those new to digital finance, who may be skeptical of its benefits. Regulatory concerns also pose a substantial challenge for digital financial services in Indonesia. The regulatory environment for digital finance is still evolving, and there is a need for clear, comprehensive regulations that protect consumers while encouraging innovation. Uncertainty in regulatory policies can hinder the growth of digital financial platforms by creating an unpredictable business environment. Digital financial service providers, including cryptocurrency exchange apps, must navigate these regulatory complexities while advocating for policies that balance innovation with consumer protection. Additionally, aligning with international standards and practices is crucial for fostering trust and ensuring the long-term viability of these platforms.

The need for robust digital infrastructure is another critical challenge in Indonesia. While internet penetration and smartphone usage are increasing, there are still significant disparities in access to digital technologies across different regions. Inadequate infrastructure can limit the reach and effectiveness of digital financial services, particularly in rural and underserved areas. Ensuring reliable internet connectivity and access to affordable smartphones is essential for the widespread adoption of digital financial platforms. Furthermore, developing supporting technologies, such as secure payment gateways and efficient transaction processing systems, is crucial for the seamless operation of digital financial services. Understanding the factors that influence the stability and reliability of digital financial platforms is paramount. FS refers to the ability of these platforms to maintain consistent performance, manage risks, and ensure the economic health of their operations. For the cryptocurrency exchange app, a key player in Indonesia's digital financial ecosystem, evaluating FS involves analyzing several critical factors, including SQ, PT, and the integration of DC. SQ encompasses the platform's performance, reliability, and user-friendliness, vital for user satisfaction and retention. PT is another essential factor influencing the stability of digital financial services. Trust is built through transparency, security measures, and consistent performance. Users need to feel confident that their transactions and personal information are secure. For platforms like cryptocurrency exchange apps, establishing trust is necessary to encourage users to engage more deeply with their services. Additionally, integrating DC into the platform adds a layer of complexity that requires careful management. Understanding how these elements influence FS can provide valuable insights for improving digital financial services' overall performance and user experience.

While substantial research has been done into individual factors such as SQ, PT, and DC within digital financial services, a significant gap exists in understanding how these variables interact as part of an integrated model. Previous studies have typically examined these factors in isolation. For instance, numerous studies have delved into how SQ impacts user satisfaction and trust in digital platforms. Similarly, another research has explored the role of PT in influencing user behavior and platform adoption. The adoption and impact of digital currencies have also been scrutinized, particularly their role in enhancing transaction efficiency and reducing costs. However, these studies often fail to provide a holistic view that encompasses the combined effects of these critical factors on FS. The lack of an integrated approach means the complex interrelationships between SQ, PT, and DC remain underexplored. FS, a crucial outcome for digital financial platforms, is likely influenced by combining these factors rather than any single one. Understanding their synergies and trade-offs is essential for comprehensively evaluating FS in digital platforms like cryptocurrency exchange apps. An integrated model would allow for a more nuanced understanding of how these variables collectively contribute to the robustness and resilience of digital financial services. This gap highlights the need for research that moves beyond siloed investigations and adopts a multidimensional perspective. Furthermore, there is limited empirical evidence on how these factors interplay specifically within the context of digital financial services in Indonesia, particularly for platforms like cryptocurrency exchange app. Most existing research focuses on more mature markets, often overlooking the unique challenges and opportunities in emerging markets like Indonesia. These markets are characterized by rapidly growing digital adoption, diverse user bases, and varying financial literacy and infrastructure levels. The specific dynamics of Indonesian digital financial services, including regulatory environments, user behavior, and technological adoption, necessitate targeted research. Without empirical evidence grounded in this context, it isn't easy to formulate effective strategies for enhancing FS in platforms operating within Indonesia. This research gap underscores the importance of developing and validating an integrated model that can capture the interdependencies between SQ, PT, and DC in influencing FS. By addressing this gap, the study aims to provide valuable insights that can inform both theoretical frameworks and practical applications. Understanding these dynamics for cryptocurrency exchange apps is crucial for developing strategies that enhance user trust, optimize system performance, and effectively leverage DC. Ultimately, filling this research gap will contribute to Indonesia's more resilient and stable digital financial ecosystem, fostering greater user confidence and broader adoption of digital financial services.

The primary objective of this research is to develop and validate an integrated model that elucidates the factors influencing FS in the cryptocurrency exchange app. In this context, FS refers to the platform's ability to maintain consistent operational performance, manage risks effectively, and ensure its financial operations' long-term health and sustainability. By creating an integrated model, this study aims to comprehensively understand how various critical factors interact and collectively impact FS rather than examining these elements in isolation. To achieve this objective, the research focuses on three pivotal factors: SQ, PT, and DC. SQ encompasses the technical performance of the cryptocurrency exchange app, including its reliability, user interface, and

transaction speed. These aspects are fundamental as they directly affect user satisfaction and the seamless execution of financial transactions. On the other hand, PT relates to users' confidence in the security, transparency, and overall integrity of the cryptocurrency exchange app platform. Building and maintaining a high level of trust is essential for user retention and engagement, particularly in the digital financial services sector, where concerns about data security and fraud are prevalent.

DC represents another critical factor, considering the cryptocurrency exchange app's role in facilitating cryptocurrency transactions. Integrating digital currencies introduces unique opportunities and challenges, impacting transaction efficiency, cost, and user adoption rates. Understanding how DC interacts with SQ and PT to influence FS is crucial for developing effective strategies to enhance the platform's robustness. The specific objectives of this research are twofold. First, it aims to delineate the direct relationships between SQ, PT, DC, and FS within the cryptocurrency exchange app. Second, it seeks to identify and analyze potential mediating effects, mainly how PT may mediate the relationship between SQ and FS. By focusing on these relationships, the study intends to uncover the underlying mechanisms contributing to the FS of digital financial services like cryptocurrency exchange apps. Ultimately, the insights gained from this research will have significant theoretical and practical implications. Theoretically, the study will contribute to the existing body of knowledge by integrating multiple dimensions of digital financial services into a cohesive model. Practically, the findings will provide actionable recommendations for cryptocurrency exchange apps and similar platforms to enhance their FS. This includes strategies to improve system performance, build and sustain user trust, and effectively manage the adoption and integration of digital currencies. Through this comprehensive approach, the research aims to support Indonesia's ongoing development and resilience of digital financial services.

Literature Review

System Quality (SQ)

SQ refers to the performance characteristics of a digital platform that determine its effectiveness and user satisfaction. In digital financial services, the system ensures that users can conduct financial transactions smoothly, securely, and without interruptions. Research has shown that the quality of the website or app plays a significant role in building trust in cryptocurrencies [19]. Additionally, PT has been identified as a substantial driver for cryptocurrency adoption, indicating its importance in influencing users' intentions to use cryptocurrencies [20]. Moreover, perceived risk and trust have been found to significantly impact attitudes towards cryptocurrencies, with trust potentially being influenced by the volatile nature of cryptocurrencies [21]. Furthermore, trust has been highlighted as the most significant driver of adoption in South Africa in the context of Bitcoin adoption, emphasizing its critical role in shaping users' decisions [22]. Similarly, in adopting mobile banking apps, PT directly influences continuous intention to use them, underscoring its importance in fostering continued usage [23]. Studies have also revealed that security, ease of use, and delivery positively influence PT, leading to a higher intention to use app-based shopping for specific products [24].

The relationship between quality factors and user acceptance has been explored in the realm of mobile apps, with trust mediating between quality factors and the intention to use banking apps [25]. Moreover, trust has been identified as a crucial factor influencing citizens' acceptance, willingness to disclose personal data, and continued use of such apps in the context of contact tracing apps [26]. Therefore, understanding and improving SQ is crucial for digital financial apps to enhance their FS and competitive edge. Research indicates that SQ, including information quality, SQ, and service quality, is essential in continuously influencing users' intention to use online cryptocurrency exchanges [27]. Moreover, the quality elements of apps significantly affect users' intentions, with perceived enjoyment being a key predictor of app users' intention to use [27]. Similarly, in the context of mobile banking apps, SQ has been found to significantly impact the intention to use the app, highlighting the importance of quality factors in driving user behaviors [28].

Perceived Trust (PT)

PT in the context of digital financial transactions refers to users' confidence in a digital financial platform's security, reliability, and integrity. Trust is a fundamental component in the adoption and continued use of digital financial services. It encompasses users' belief that the platform will protect their financial information, execute transactions accurately and promptly, and act in their best interests. Trust is particularly crucial in the digital realm, where users cannot physically interact with the service provider and must rely on the platform's digital interface and security protocols. The role of PT in influencing users' intention to use cryptocurrency exchange apps is well-supported by recent research. High trust levels can enhance users' intentions to use cryptocurrencies, indicating the significant impact of trust on user behavior [29]. Additionally, the intention to use cryptocurrency is influenced by various factors such as social influence, facilitating conditions, financial literacy, and perceived risk, all of which play essential roles in shaping users' BI [30]. Additionally, [31] emphasized that PT has the highest impact on intention among Malaysian consumers compared to other variables. These studies collectively underscore the importance of trust in shaping user behavior and fostering acceptance of cryptocurrency platforms. Trust has also been consistently identified as a crucial factor influencing customers' intention to use and adopt cryptocurrency in various studies [22], [32]. Additionally, [21] highlight the impact of trust on user behavior and adoption of cryptocurrencies. Trust is shown to be more influential than other factors such as perceived risk, conditional value, epistemic value, emotional value, monetary value, perceived usefulness, perceived ease of use, subjective norms, and facilitating conditions in shaping users' intentions to use and adopt cryptocurrencies

Digital Currency (DC)

DC refers to any currency available only in digital or electronic form, as opposed to physical forms such as banknotes and coins. In the financial ecosystem, digital currencies play several critical roles. They provide a new medium of exchange that can facilitate transactions without intermediaries, thereby reducing transaction fees and processing times. Digital currencies also offer new opportunities for financial inclusion, particularly in regions with underdeveloped banking infrastructure. By leveraging digital wallets and mobile technologies, individuals who lack access to traditional banking services can

participate in the financial system. Furthermore, digital currencies can enhance transparency and security in financial transactions due to blockchain technology's immutable and traceable nature. Adopting DC, positively correlates with factors like education, democracy, regulatory quality, and gross domestic product [33]. The younger generation is embracing digital currencies to participate in the global economy and preserve wealth in the face of inflation [34]. Cryptocurrency, with its encryption techniques and decentralized nature, offers opportunities for financial inclusion and stability [35]. Adopting digital currencies can reshape the financial landscape by providing alternative payments, investments, and trading systems, potentially contributing to FS. However, adopting digital currencies also poses several challenges to FS. One primary concern is the volatility of cryptocurrency prices, which can create significant financial risks for users and institutions. The rapid price fluctuations of cryptocurrencies like Bitcoin can lead to substantial losses for investors and undermine confidence in digital financial platforms. Additionally, the regulatory environment for digital currencies is still evolving, creating uncertainty and operational risks for platforms that deal with these assets. Inconsistent regulations across different jurisdictions can complicate compliance efforts and expose platforms to legal and financial liabilities.

Financial Stability (FS)

FS refers to the condition in which a financial system operates effectively, withstanding economic shocks and maintaining its ability to facilitate smooth financial transactions and services. In digital financial services, FS encompasses the platform's capacity to manage operational risks, maintain user trust, and ensure the continuity of financial operations without significant disruptions. It is critical for digital platforms, where consistent performance and reliability are paramount for user confidence and long-term success. Cryptocurrencies have emerged as a substantial factor influencing FS, with their volatility posing challenges that necessitate careful consideration [36]. Regulations are crucial in addressing economic, social, and technological factors impacting FS in cryptocurrency [37]. Speculative bubbles in cryptocurrency markets can lead to contagion effects that weaken FS [38]. While Central Bank Digital Currencies (CBDCs) and Fintech services have the potential to enhance FS, cryptocurrencies present risks that require effective regulation for mitigation [35]. Critical determinants of FS in digital financial services include SQ, PT, liquidity management, regulatory compliance, and technological infrastructure. SQ, as previously discussed, affects the reliability and efficiency of the platform, directly influencing FS. PT plays a crucial role as users are likelier to engage with and remain loyal to platforms they trust. Effective liquidity management ensures the platform can meet its financial obligations and user demands without facing solvency issues. Regulatory compliance is essential to avoid legal repercussions and build a reputation for reliability and integrity. Lastly, robust technological infrastructure supports the platform's operations and scalability, enabling it to handle increasing transaction volumes and user activities without compromising performance. For a cryptocurrency exchange app, employing a combination of these measurement methods is crucial to gain a holistic view of its FS. Regular monitoring of financial ratios and conducting stress tests can help identify and mitigate potential risks. Collecting user feedback and engaging with industry experts can provide additional context and guidance for improving stability. Multivariate analysis

techniques will enable the cryptocurrency exchange app to understand how various factors interact and impact its financial performance, leading to more informed decision-making and strategic planning.

Behavioral Intention (BI)

BI in digital financial services is significantly influenced by SQ, PT, and the use of DC. SQ, which includes reliability, usability, and performance, plays a crucial role in shaping users' BI to continue using a platform [41]. When users perceive a system to be reliable, easy to use, and efficient, their overall satisfaction with the platform increases, leading to stronger BI [41]. Previous studies in online banking and mobile payment systems consistently show that high system quality positively impacts users' BI to use these services, underscoring the importance of investing in high-quality system infrastructure [23].

PT is another critical factor, referring to users' belief that the platform is secure and reliable, capable of protecting their personal and financial information. PT reduces perceived risk and uncertainty, fostering user loyalty and engagement. Empirical studies have shown that trust significantly predicts users' intentions to use and recommend digital financial services, particularly in contexts with heightened security concerns like cryptocurrency exchanges. Additionally, the availability and use of DC enhance users' BI. Features such as ease of transaction, low fees, and global accessibility improve user experience and satisfaction, making the platform more appealing. Research indicates that integrating DC features positively impacts user engagement, emphasizing the need for continuous innovation in digital currency offerings to maintain user retention and achieve FS in the competitive digital financial services market in Indonesia.

Method

This study employed a quantitative approach utilizing structural equation modeling (SEM) with SmartPLS to analyze the relationships between SQ, PT, DC, and FS within the cryptocurrency exchange app. SEM is a robust statistical technique that examines complex relationships between observed and latent variables, making it well-suited for testing the integrated model proposed in this research. SmartPLS, in particular, was chosen for its ability to handle complex models with multiple indicators and its effectiveness in dealing with smaller sample sizes compared to covariance-based SEM methods. This approach enabled a comprehensive analysis of the hypothesized relationships and the mediating effects within the model. A sample size of 345 respondents was determined to be adequate for this study to ensure statistical power and representativeness. This range was chosen based on the requirements for SEM analysis, which typically necessitates larger sample sizes to provide reliable estimates and meaningful results. A sample size within this range allowed for detecting medium to large effect sizes and ensured that the findings could be generalized to the broader population of cryptocurrency exchange app users and providers. Additionally, this sample size supported the robustness of the SEM analysis, enabling the study to accurately test the hypothesized relationships and mediating effects within the integrated model.

This study focuses on the general category of cryptocurrency exchange apps as the research object. The respondents are users of applications that fall into this category, providing a broad understanding of user behavior and financial

stability within the digital currency market. Several prominent cryptocurrency exchange apps are included in this category, each offering unique features and services to cater to different user needs. Some of the well-known apps in this category are Binance, known for its extensive range of cryptocurrencies and advanced trading options; Coinbase, popular for its user-friendly interface and robust security measures; Kraken, which offers comprehensive market data and advanced trading tools; and Pintu, an Indonesian-based platform focusing on simplifying cryptocurrency transactions for local users. The target population for this study included active users and providers of the cryptocurrency exchange app in Indonesia. This population was selected to ensure that the data collected was directly relevant to the research objectives and reflected the experiences of those most impacted by the platform's performance. By focusing on this specific group, the study aimed to gather detailed insights into the factors that influence FS within the context of cryptocurrency exchange app operations in Indonesia. Data was collected via an online survey using Microsoft Forms from March-April 2024. The online survey method was chosen for its efficiency and convenience, allowing participants to complete the questionnaire at their own pace and from any location. Microsoft Forms was selected due to its user-friendly interface, ease of distribution, and ability to store responses securely. The survey included structured questions to measure the critical variables of SQ, PT, DC, and FS. It was distributed through various channels, including email invitations and social media platforms, to reach a broad and diverse group of cryptocurrency exchange app users and providers.

To ensure high response rates and data quality, the survey was pre-tested with a small group of cryptocurrency exchange app users to identify and address potential issues in the questionnaire design. Additionally, reminders were sent to participants to encourage timely survey completion. The collected data was then cleaned and prepared for analysis, with attention given to maintaining the confidentiality and anonymity of all respondents. This systematic and comprehensive data collection procedure was designed to yield robust and reliable data for subsequent analysis using SEM with SmartPLS. This study developed five key hypotheses to explore the relationships between SQ, PT, DC, BI, and FS within the cryptocurrency exchange app. These hypotheses were based on extensive literature review and theoretical grounding in digital financial services.

H1: SQ → PT

The first hypothesis posited that SQ would positively influence PT. High SQ, characterized by reliability, ease of use, and efficient performance, was expected to enhance users' trust in the cryptocurrency exchange app platform. This relationship was grounded in the notion that users are more likely to trust a system that consistently meets their expectations and delivers a seamless experience.

H2: SQ → BI

The second hypothesis suggested that SQ would positively influence BI. It was theorized that higher SQ would increase BI to engage with the platform. This includes frequent use, recommending the platform to others, and reliance on the platform for financial transactions. A high-quality system is expected to positively affect users' willingness to continue using and endorsing the platform.

H3: DC → FS

The third hypothesis proposed that adopting DC would positively affect FS. With its potential for reducing transaction costs and enhancing efficiency, DC was expected to contribute directly to the platform's FS. This hypothesis considered the dual aspects of DC's impact: operational benefits and market attractiveness.

H4: PT → FS

The fourth hypothesis posited that PT would positively impact FS. It was theorized that higher levels of trust in the platform would lead to increased user engagement, loyalty, and transaction volumes, all contributing to the FS of cryptocurrency exchange apps. Trust was seen as a critical factor in ensuring sustained user participation and platform growth.

H5: PT → BI

The fifth hypothesis proposed that PT would positively influence BI. Users who trust the platform are likelier to have higher BIs, including continued usage, increased transaction frequency, and recommending the platform to others. Trust is a significant driver of user behavior, impacting how users interact with and perceive the platform. A research model diagram (see figure 1) was developed to visually represent the hypothesized relationships among the variables. This diagram depicted the direct and mediated paths between SQ, PT, DC, BI, and FS.

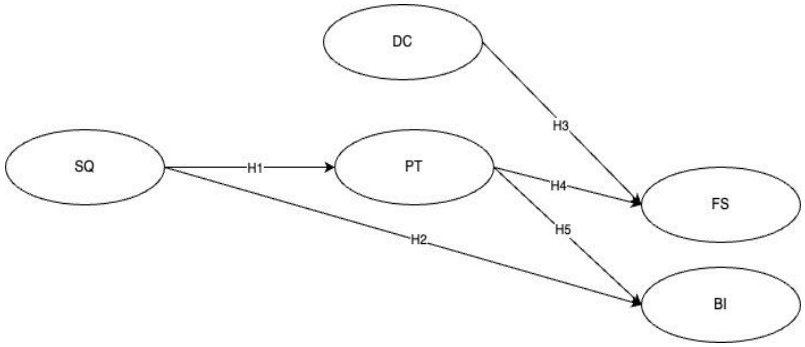

Figure 1 Research Framework

The research model diagram provided a concise summary of the hypothesized relationships. It illustrated the direct effects of SQ and DC on FS, the mediating role of PT, and the impact on BI. This framework guided the subsequent data collection and analysis processes, ensuring that the study systematically addressed each hypothesized relationship. To accurately measure the constructs within the proposed model, we developed or adapted existing scales based on established literature. Each construct is measured using a set of three indicators, ensuring comprehensive coverage and reliable measurement of the underlying variables. Using multiple indicators for each construct helps capture the full dimensionality of the concepts being studied, enhancing the robustness and validity of the measurement model as shown in table 1.

Table 1 Item Questionnaire

Item	Questionnaire
PT, source: Adapted from [39]	

Table 1 Item Questionnaire

Item	Questionnaire
PT1	The platform's trustworthiness reflects users' belief in the app's reliability.
PT2	Transparency of operations, measuring how openly and the app communicates its processes and policies.
PT3	User confidence in platform security, assessing users' perceptions of the safety measures to protect their financial and personal data.
SQ, source: Adapted from [40]	
SQ1	System reliability and uptime, measuring the consistency and dependability of the app's performance.
SQ2	User interface and ease of use, assessing how intuitive and user-friendly the app is.
SQ3	Speed of transactions and processing, evaluating the efficiency and quickness of financial operations within the app.
DC, source: Adapted from [41]	
DC1	Integration of digital currency transactions, assessing how seamlessly digital currency transactions are incorporated into the app.
DC2	User satisfaction with digital currency use, measuring users' overall satisfaction with using digital currencies on the app.
DC3	Security measures for digital currency, evaluating the effectiveness of the app's security protocols for digital currency transactions.
FS, source: Adapted from [42]	
FS1	Stability of financial performance, evaluating the app's financial health and consistency over time.
FS2	Risk management practices, assessing how well the app manages and mitigates financial risks.
FS3	Overall financial health of the platform, capturing the app's general financial soundness and reliability.
BI, source: Adapted from [41]	
BI1	Intention to continue using the platform, measuring users' plans to keep using the app in the future.
BI2	Likelihood to recommend the platform, assessing how likely users are to suggest the app to others.
BI3	Frequency of transactions on the platform, evaluating how often users intend to use the app for financial transactions.

The data analysis involves a comprehensive evaluation using SmartPLS, a software tool specifically designed for Partial Least Squares Structural Equation Modeling (PLS-SEM). The study conducted two main phases: evaluating the measurement model and assessing the structural model. In the first phase, the measurement model was analyzed to ensure the reliability and validity of the constructs. This step confirms that the indicators accurately measure the intended constructs. The second phase involves evaluating the structural model to test the hypothesized relationships between the constructs and determine the

model's overall fit. This dual approach ensures that the measurement properties and the structural relationships are rigorously examined, providing a robust basis for interpreting the results.

To assess the measurement model, we examine both reliability and validity. Reliability refers to the consistency of the measurement, while validity concerns whether the instruments measure what they are intended to measure. Cronbach's Alpha is used to evaluate the internal consistency of each construct. A Cronbach's alpha value above 0.7 is generally acceptable, indicating that the items within each construct consistently measure the same underlying concept. Composite Reliability (CR) is used alongside Cronbach's alpha to provide a more nuanced view of reliability. Composite reliability values above 0.7 indicate good reliability, suggesting that the constructs are consistently measured across their indicators. Convergent Validity was assessed by examining each construct's AVE. An AVE value above 0.5 indicates that the construct explains more than half of the variance of its indicators, demonstrating good convergent validity. Discriminant validity was evaluated using the Fornell-Larcker criterion and cross-loadings. The Fornell-Larcker criterion requires that the square root of the AVE for each construct is more significant than its highest correlation with any other construct. Cross-loadings ensure that indicators load higher on their respective constructs than on any other, confirming that the constructs are distinct.

The structural model assessment focuses on testing the hypothesized relationships between constructs and evaluating the model's overall fit. Path coefficients represent the strength and direction of relationships between constructs. These coefficients will be examined alongside t-statistics and p-values to determine the significance of each hypothesized path. A p-value less than 0.05 typically indicates a statistically significant relationship. Several fit indices will be used to evaluate the adequacy of the structural model. Key indices include 1) An SRMR value below 0.08 is considered a good fit, indicating that the model's predicted and observed matrices are similar. 2) An NFI value above 0.90 suggests that the model fits well. 3) Higher R^2 values signify a better explanatory power of the model. By systematically analyzing the measurement and structural models, we ensure a thorough evaluation of the constructs and their interrelationships. This rigorous approach provides robust evidence to support or refute the hypothesized paths, offering valuable insights into the factors influencing FS in the cryptocurrency exchange app within the Indonesian context.

Result and Discussion

Descriptive Statistics

The sample for this study consisted of 345 respondents who are active users of the cryptocurrency exchange app in Indonesia. The demographic characteristics of the sample were as follows. The sample included a balanced distribution of genders with 172 (49.9%) male respondents and 173 (50.1%) female respondents. The educational background of the respondents was also diverse, with 210 (60.9%) having a college education and 135 (39.1%) having a non-college education. The age distribution of the respondents was as follows: 78 (22.6%) were aged 18-24, 105 (30.4%) were aged 25-34, 92 (26.7%) were aged 35-44, 45 (13.0%) were aged 45-54, and 25 (7.2%) were aged 55 and

above. The frequency of app usage among respondents varied, with 60 (17.4%) having used the app for less than 6 months, 82 (23.8%) for 6 months to 1 year, 123 (35.7%) for 1-2 years, and 80 (23.2%) for more than 2 years (see table 2).

Table 2 Demographic Data

Characteristics	Item	Count	Percentage
Gender	Male	172	49.9%
	Female	173	50.1%
Education	College	210	60.9%
	Non-College	135	39.1%
Age	18-24	78	22.6%
	25-34	105	30.4%
	35-44	92	26.7%
	45-54	45	13.0%
	55+	25	7.2%
Frequency of Use	< 6 months	60	17.4%
	6 months - 1 year	82	23.8%
	1-2 years	123	35.7%
	2+ years	80	23.2%

These demographic characteristics indicate a well-rounded sample, providing a comprehensive perspective on the cryptocurrency exchange app's user base.

The Variance Inflation Factor (VIF) is a measure used to detect the presence of multicollinearity in regression models as shown in table 3. Multicollinearity occurs when predictor variables are highly correlated, which can lead to unreliable estimates of regression coefficients. Generally, a VIF value above 5 suggests significant multicollinearity, while a VIF value above 10 indicates severe multicollinearity. In this study, the VIF results for the path model indicate that the relationship between SQ and PT has a VIF value of 1.000. This value suggests that there is no multicollinearity between SQ and PT, ensuring that the estimation of the path coefficient from SQ to PT is reliable. For the relationship between SQ and BI, the VIF value is 3.255. This indicates moderate multicollinearity, suggesting that while the estimation of the path coefficient from SQ to BI is reliable, it should be monitored for potential multicollinearity issues. Similarly, the relationship between PT and BI also has a VIF value of 3.255. This moderate multicollinearity indicates that the path coefficient from PT to BI is reliable but should be watched for any multicollinearity concerns. The VIF value for the relationship between DC and FS is 3.718, indicating moderate multicollinearity. This suggests that the estimation of the path coefficient from DC to FS is reliable but should be monitored for potential multicollinearity issues. Lastly, the relationship between PT and FS also has a VIF value of 3.718, indicating moderate multicollinearity. This suggests that the estimation of the path coefficient from PT to FS is reliable but should be monitored for

potential multicollinearity issues.

Table 3 Inner Variance Inflation Factor (VIF) Results

Path	VIF Value
SQ → PT	1.000
SQ → BI	3.255
PT → BI	3.255
DC → FS	3.718
PT → FS	3.718

Measurement Model Evaluation

To ensure the reliability of the constructs, Cronbach's alpha and composite reliability (CR) were calculated for each variable shown in table 4. Both measures exceeded the commonly accepted threshold of 0.7, indicating good internal consistency. For SQ, Cronbach's alpha was 0.891 and the composite reliability was 0.933. PT had a Cronbach's alpha of 0.812 and a composite reliability of 0.889. DC demonstrated a Cronbach's alpha of 0.767 and a composite reliability of 0.868. FS showed a Cronbach's alpha of 0.819 and a composite reliability of 0.895. Lastly, BI had a Cronbach's alpha of 0.745 and a composite reliability of 0.855. These high Cronbach's alpha and composite reliability values indicate that the measurement scales used for all constructs are reliable.

Table 4 Reliability Analysis and Convergent Validity

Construct	Item	Factor Loading	Cronbach's Alpha	Composite Reliability	AVE
BI	BI1	0.803	0.745	0.855	0.663
	BI2	0.826			
	BI3	0.813			
DC	DC1	0.888	0.767	0.868	0.689
	DC2	0.903			
	DC3	0.681			
FS	FS1	0.925	0.819	0.895	0.743
	FS2	0.93			
	FS3	0.714			
PT	PT1	0.884	0.812	0.889	0.727
	PT2	0.834			
	PT3	0.84			
SQ	SQ1	0.934	0.891	0.933	0.822
	SQ2	0.87			
	SQ3	0.916			

The validity of the constructs was assessed through convergent and discriminant validity. For convergent validity, the AVE for each construct was calculated and found to be above the threshold of 0.5, indicating good convergent validity. Specifically, the AVE for SQ was 0.822, for PT it was 0.727, for DC it was 0.689, for FS it was 0.743, and for BI it was 0.663. These AVE values demonstrate that the latent constructs explain a significant portion of the variance in the indicators, confirming good convergent validity. Discriminant validity was assessed using the Fornell-Larcker criterion, which compares the square root of the AVE values with the correlations between constructs. The square root of the AVE for each construct was more significant than its correlations with other constructs, indicating good discriminant validity. The √AVE for SQ was 0.907, for PT it was 0.853, for DC it was 0.830, for FS it was 0.862, and for BI it was 0.814 as shown in table 5. These results confirm that each construct is distinct from the others, thereby demonstrating good discriminant validity. The Fornell-Larcker criterion results support the discriminant validity of the constructs, as the square root of the AVE for each construct is higher than the correlations with other constructs.

Table 5 Discriminant Validity

Construct	BI	DC	FS	PT	SQ
BI	0.814				
DC	0.761	0.83			
FS	0.716	0.912	0.862		
PT	0.795	0.855	0.885	0.853	
SQ	0.883	0.71	0.697	0.832	0.907

The measurement model evaluation confirms that the constructs used in this study are reliable and valid. High values of Cronbach's alpha and composite reliability demonstrate internal consistency, while AVE values confirm convergent validity. Furthermore, the Fornell-Larcker criterion validates the constructs' discriminant validity. This rigorous assessment ensures that the measurement model provides a robust foundation for evaluating the structural model and testing the hypothesized relationships.

Hypothesis Testing Results

The inner model results, summarized in the table 6 below and illustrated in figure 2, include path coefficients, t-statistics, and p-values for each hypothesized relationship. The hypothesis testing results provide detailed insights into the relationships between the constructs based on the path coefficients (β), t-statistics, and p-values obtained from the structural model evaluation. Hypothesis 1 (H1) examined the relationship between SQ and PT. The path coefficient (β) was 0.832, with a t-statistic of 27.216 and a p-value of 0.000. This solid positive path coefficient indicates that SQ significantly enhances PT. The extremely high t-statistic and the p-value provide strong evidence supporting this hypothesis, confirming that Hypothesis 1 (H1) is supported. Hypothesis 2 (H2) evaluated the relationship between SQ and BI. The path coefficient (β) was 0.718, with a t-statistic of 12.675 and a p-value of 0.000. The positive path coefficient indicates a significant positive impact of SQ

on BI. The high t-statistic and the p-value confirm this relationship, thus supporting Hypothesis 2 (H2).

For Hypothesis 3 (H3), the relationship between DC and FS was tested. The path coefficient (β) was 0.578, with a t-statistic of 8.177 and a p-value of 0.000. The path coefficient suggests that DC has a strong positive effect on FS. The high t-statistic and the p-value indicate that this relationship is statistically significant, supporting Hypothesis 3 (H3). In Hypothesis 4 (H4), the impact of PT on FS was analysed. The path coefficient (β) was 0.391, with a t-statistic of 5.478 and a p-value of 0.000. The positive path coefficient indicates that PT significantly enhances FS. The high t-statistic and the p-value confirm this relationship, supporting Hypothesis 4 (H4). Finally, for Hypothesis 5 (H5), the relationship between PT and BI was examined. The path coefficient (β) was 0.198, with a t-statistic of 3.490 and a p-value of 0.001. The path coefficient suggests a positive relationship between PT and BI. The t-statistic and p-value confirm the significance of this relationship, thus supporting Hypothesis 5 (H5).

Table 6 Hypothesis Testing Results

Hypothesis	Path	Path Coefficient	T Statistics	P Values	Supported
H1	SQ → PT	0.832	27.216	0.000	Yes
H2	SQ → BI	0.718	12.675	0.000	Yes
H3	DC → FS	0.578	8.177	0.000	Yes
H4	PT → FS	0.391	5.478	0.000	Yes
H5	PT → BI	0.198	3.490	0.001	Yes

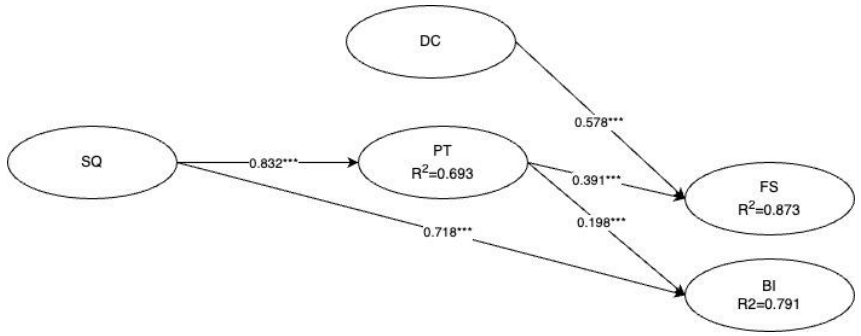

Figure 2 Inner Model Results Framework

The hypothesis testing results indicate that the data support all proposed hypotheses. The relationships between SQ, PT, DC, BI, and FS are confirmed as significant. These findings validate the theoretical model and underscore the critical role of SQ and PT in enhancing user engagement and FS within the cryptocurrency exchange app. The strong support for all hypotheses provides robust evidence for the importance of these constructs in the context of digital financial services in Indonesia.

Testing for Mediating Effects

To assess the role of mediating variables, we conducted the Sobel test to

determine the significance of the mediation effects as shown in table 7. Specifically, we examined the mediation effect of PT between SQ and FS. The Z-value for the Sobel test is approximately 5.395. This value is greater than the critical value of 1.96, indicating that the mediation effect of PT between SQ and FS is statistically significant at the 0.05 level. This result supports the hypothesis that PT significantly mediates the relationship between SQ and FS in the context of the cryptocurrency exchange app. Similarly, we examined the mediation effect of PT between SQ and BI. The Z-value for the Sobel test is approximately 3.445. This value is also greater than the critical value of 1.96, indicating that the mediation effect of PT between SQ and BI is statistically significant at the 0.05 level. This result supports the hypothesis that PT significantly mediates the relationship between SQ and BI.

Table 7 Mediation Testing Results

Construct	Construct Relationship	t-value of Path Coefficient	Sobel test
SQ→PT→FS	SQ→PT	27.216	5.395
	PT→FS	5.478	
SQ→PT→BI	SQ→PT	27.216	3.445
	PT→BI	3.490	

Discussion

The results of this study provide several important implications for both theory and practice in the context of digital financial services, particularly for cryptocurrency exchange apps in Indonesia. This research contributes significantly to the existing knowledge on digital financial services by validating the hypothesized relationships between SQ, PT, DC, BI, and FS. The strong positive relationship between SQ and PT (H1) and between SQ and BI (H2) emphasizes high SQ's critical role in fostering user trust and encouraging continued platform use. This supports the theoretical frameworks that posit SQ as a crucial determinant of user satisfaction and trust in digital platforms. Additionally, the positive relationship between DC and FS (H3) highlights the importance of integrating digital currencies effectively within financial platforms to enhance their financial health. This finding aligns with previous research suggesting that digital currencies can improve operational efficiency and reduce transaction costs, contributing to overall FS. The positive impact of PT on FS (H4) and BI (H5) underscores the importance of trust in maintaining user engagement and ensuring the financial viability of digital platforms. These results reinforce the theoretical perspective that trust is a crucial factor in the success of digital financial services, particularly in emerging markets like Indonesia.

From a practical standpoint, this study's findings offer valuable insights for managers and developers of cryptocurrency exchange apps and other digital financial services. The strong influence of SQ on both PT and BI suggests that investments in improving the app's technical performance and user interface can yield significant benefits in terms of user satisfaction and engagement. Ensuring high system reliability, ease of use, and fast transaction processing can help build and maintain user trust, which is essential for the platform's long-

term success. Moreover, the positive impact of DC on FS indicates that cryptocurrency exchange apps should focus on enhancing their DC features to improve their financial health. This could involve implementing robust security measures, ensuring seamless integration of DC transactions, and providing a user-friendly experience for DC users. The findings also highlight the importance of fostering PT among users. This can be achieved through transparent communication, data security, and reliable and consistent service. By building a trustworthy platform, cryptocurrency exchange apps can enhance user loyalty and encourage more frequent use of their services, thereby contributing to their FS. The results of this study are consistent with previous research that emphasizes the importance of SQ and PT in digital financial services. However, this study extends the existing knowledge by examining these relationships within the context of a cryptocurrency exchange app in Indonesia, providing new insights into the unique dynamics of this emerging market.

One unexpected finding was the powerful impact of SQ on PT (H1) and BI (H2). While previous studies have highlighted the importance of SQ, the magnitude of its effect in this context suggests that users of cryptocurrency exchange apps place a high value on technical performance and usability. This underscores the need for continuous improvement and innovation in SQ to meet user expectations and maintain their trust and engagement. The discussion highlights the theoretical and practical implications of the findings, providing valuable insights for researchers and practitioners in digital financial services. The strong support for all hypotheses underscores the critical role of SQ and PT in enhancing user engagement and FS. The results suggest that focusing on these factors can help cryptocurrency exchange apps in Indonesia achieve more tremendous success and sustainability.

Conclusion

This study evaluated the factors influencing FS in a cryptocurrency exchange app, explicitly analysing the roles of SQ, PT, and DC within the Indonesian context. The research utilized structural equation modelling (SEM) to test the hypothesized relationships between these constructs. The findings confirmed that SQ has a strong positive impact on PT and BI. DC positively influences FS. PT significantly impacts both FS and BI. These results validate all five proposed hypotheses, underscoring the importance of SQ and PT in driving FS and user engagement in cryptocurrency exchange apps. The study makes several critical contributions to the theoretical understanding of digital financial services. This research provides a comprehensive framework that extends existing theories on technology acceptance and FS by integrating SQ, PT, DC, BI, and FS into a single model. The findings highlight the critical role of SQ in building user trust and engagement and the importance of DC integration in enhancing FS. These contributions offer new insights into the dynamics of digital financial services, particularly in emerging markets like Indonesia. From a practical perspective, the results provide valuable guidance for developers and managers of cryptocurrency exchange apps. The strong influence of SQ on PT and BI suggests that enhancing the technical performance and usability of the app should be a priority. Ensuring system reliability, ease of use, and efficient transaction processing can significantly boost user trust and engagement. Additionally, the positive impact of DC on FS indicates that apps should optimize

their DC features to improve financial health. This includes robust security measures, seamless transaction integration, and user-friendly interfaces. Building and maintaining user trust through transparency and reliable service is also crucial for sustained success. Despite its contributions, this study has several limitations. The sample was limited to users of a single cryptocurrency exchange app in Indonesia, which may affect the generalizability of the findings. Future research could expand the sample to include users of multiple apps and explore different geographical contexts. Additionally, this study focused on a limited set of constructs. Future studies could incorporate other relevant factors, such as user experience and regulatory compliance, to provide a more comprehensive understanding of FS in digital financial services.

Declarations

Author Contributions

Conceptualization: A.R.Y.; Methodology: G.S.N.; Software: M.H.M.; Validation: H.G.; Formal Analysis: A.R.Y.; Investigation: G.S.N.; Resources: M.H.M.; Data Curation: H.G.; Writing Original Draft Preparation: A.R.Y.; Writing Review and Editing: G.S.N.; Visualization: M.H.M.; All authors have read and agreed to the published version of the manuscript.

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The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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